



Nanakuli Community Baseyard

TMK (1) 8-7-09:02 (por.)

Lualualei, O'ahu, Hawai'i

Final Environmental Impact Statement

April 2010



Prepared for: TROPIC LAND LLC

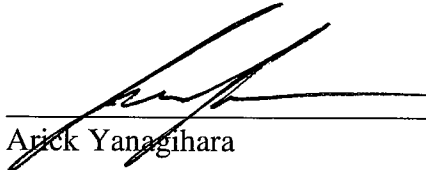
Final Environmental Impact Statement

Nānākuli Community Baseyard

Lualualei, Wai‘anae District, O‘ahu, Hawai‘i

This final environmental impact statement and all ancillary documents were prepared under the signatory’s direction or supervision, and the information submitted, to the best of the signatory’s knowledge, fully addresses document content requirements as set forth in HAR §11-200-17 and §11-200-18, as appropriate.

TROPIC LAND LLC



Arick Yanagihara

April 16, 2010

Date

Prepared for Tropic Land LLC

Prepared by Kimura International, Inc.

April 2010

Nānākuli Community Baseyard
TMK (1) 8-7-09: 02 (por.)
Lualualei, O‘ahu, Hawai‘i

Final Environmental Impact Statement

Prepared for:

Tropic Land LLC

Prepared by:

Kimura International, Inc.
1600 Kapiolani Boulevard, Suite 1610
Honolulu, HI 96814

For Submittal to:

State of Hawaii Land Use Commission
In support of a District Boundary Amendment

April 2010

CONTENTS

	Page
SUMMARY	
1 INTRODUCTION	1-1
1.1 Proposed Action.....	1-1
1.2 Project Location and Description	1-1
1.3 Background of the Project Area—Development History	1-7
1.4 Purpose of the Final Environmental Impact Statement	1-7
1.5 Steps in the Environmental Review and Implementation Process	1-7
1.6 List of Possible Permits, Approvals, and Requirements for Regulatory Compliance ...	1-9
1.7 Project Summary	1-9
2 PURPOSE OF AND NEED FOR ACTION	2-1
3 PROPOSED ACTION AND ALTERNATIVES	3-1
3.1 Project Description	3-1
3.2 Preliminary Cost and Timetable	3-8
4 ALTERNATIVES CONSIDERED	4-1
4.1 No Action	4-1
4.2 Golf Course	4-1
<u>4.3</u> Other Alternatives Considered	4-4
<u>4.4</u> Alternative Locations for the Light Industrial Park	4-5
4.5 Alternative Industrial Park Configurations	4-5
5 AFFECTED ENVIRONMENT, POTENTIAL IMPACTS, AND MITIGATION MEASURES	5-1
5.1 Topography and Soils	5-1
5.2 Groundwater Resources	5-7
5.3 Surface Water Resources	5-9
5.4 Natural Hazards	5-14
5.5 Vegetation Resources	5-17
5.6 Wildlife Resources	5-24
5.7 Agricultural Resources	5-28
5.8 Archaeological, Historic, and Cultural Resources	5-32
5.9 Roadways and Traffic	5-38
5.10 Air Quality	5-44
5.11 Noise	5-47

	Page
5.12 Visual Resources	5-50
5.13 Social and Economic Environment	5-53
5.14 Land Use	5-57
5.15 Infrastructure	5-60
5.15.1 Water	5-60
5.15.2 Wastewater Facilities	5-62
5.15.3 Non-Drinking Water	5-64
5.15.4 Solid Waste Disposal Facilities	5-65
5.15.5 Electricity and Telecommunications Services	5-66
5.16 Public Facilities and Services	5-67
5.16.1 Police and Fire Protection	5-67
5.16.2 Health Care Facilities	5-68
5.16.3 Schools	5-68
5.16.4 Park and Recreational Facilities	5-69
<u>5.16.5</u> Civil Defense Facilities	5-69
6 RELATIONSHIP TO EXISTING LAND USE PLANS, POLICIES, AND CONTROLS	6-1
6.1 Hawai‘i State Plan	6-1
6.2 State Functional Plans	6-2
6.3 State Land Use Classification	6-4
6.4 Coastal Zone Management Act (CZMA)	6-10
6.5 Hawai‘i Enterprise Zone (EZ) Partnership Program	6-12
6.6 City and County of Honolulu General Plan	6-13
6.7 Wai‘anae Sustainable Communities Plan	6-16
6.8 Land Use Ordinance (Zoning)	6-23
6.9 Special Management Area	6-26
7 SUMMARY OF ENVIRONMENTAL ANALYSIS	7-1
7.1 Unavoidable Short-term Adverse Impacts	7-1
7.2 Unavoidable Long-term Adverse Impacts	7-1
7.3 Proposed Mitigation Measures	7-2
7.4 Secondary and Cumulative Impacts	7-3
7.5 Irreversible and Irrecoverable Commitments of Resources	7-5
7.6 Summary of Unresolved Issues	7-6
8 REFERENCES	8-1

	Page
9 CONSULTATION AND COORDINATION	9-1
9.1 Scoping and Community Outreach	9-1
9.2 Early Consultation	9-1
9.2.1 Environmental Impact Statement Preparation Notice (EISPN)	9-2
9.2.2 EISPN Comments	9-4
9.3 Draft Environmental Impact Statement (DEIS)	9-4
10 PREPARERS OF THE FEIS	10-1

APPENDICES

- A. Preliminary Engineering Report
- B. Market Analysis and Employment Forecast
- C. Agricultural Feasibility Report
- D. Biological Surveys
- E. Traffic Impact Analysis Report
- F. Archaeological Inventory Survey
- G. Cultural Impact Assessment
- H. Correspondence related to Chapter 6E-42, Historic Preservation Review
for TMK (1) 8-7-009: 002
- I. Nānākuli/Mā‘ili Neighborhood Board Resolutions
- J. Economic/Fiscal Impact Analysis
- K. Correspondence related to Lualualei Naval Access Road
- L. Statements on Past Farming Activity
- M. Environmental Impact Statement Preparation Notice (EISPN): Comments Received

List of Figures		Page
1.	Location Map	1-3
2.	Aerial Photograph	1-4
3.	Site Plan	3-4
4.	Drinking Water Distribution System	3-5
5.	Wastewater System	3-6
6.	Non-Drinking Water System	3-7
7.	Project Phasing	3-9
8.	Comparison of Industrial Park and Golf Course	4-3
9.	Alternative Industrial Park Configurations	4-6
10.	Soils Map	5-2
11.	Subareas for Calculation of Soil Erosion Potential	5-4
<u>12.</u>	Underground Injection Control Area Map	5-8
13.	Pre-Development Catchment Areas	5-12
14.	Development Catchment Areas	5-13
15.	Flood Insurance Rate Map	5-15
16.	ALISH-LSB Map	5-30
<u>17.</u>	Agricultural Districts, Waianae Coast	5-31
18.	Cultural Resources Map (Regional)	5-34
19.	Cultural Resources Map (Site)	5-35
<u>20.</u>	Land Uses within 300' of Project Site	5-48
21.	Visual Simulations	5-52
22.	2000 Census Tracts	5-54
23.	Existing Industrial Zones, Waianae Coast	5-59
24.	Existing Public Infrastructure	5-61
25.	State Land Use Map	6-5
26.	Waianae Sustainable Communities Plan Map (A)	6-17
27.	Waianae Sustainable Communities Plan Map (B)	6-18
28.	Zoning Map	6-24

List of Tables	Page
1. Forecasted Jobs by Employment Category to the Year 2030 for the City and County of Honolulu and Wai‘anae Planning Area	2-4
2. Comparison of Population and Employment Forecasts for the City and County of Honolulu and Wai‘anae Planning Area	2-5
3. Industrial Land Use Demand Forecasts, 2005-2030, Proposed Light Industrial Park, Lualualei, O‘ahu	2-6
4. Infrastructure Phasing Plan	3-12
5. Summary of Soil Erosion Potential	5-6
6. Pre-Development Peak Flows	5-9
7. Post-Development Peak Flows	5-11
8. Listing of Plants (Flora) for Project Site	5-19
9. Avian Species Detected on the Project Site	5-27
10. Archaeological Sites Summary and Significance, TMK 8-7-09: 02	5-33
11. Level of Service Criteria (Highway Capacity Manual)	5-39
12. Traffic Assignment	5-41
13. Capacity Analysis: Farrington Highway and Lualualei Naval Access Road	5-43
14. Resident Population by Census Tract, Subarea, Region, County, and State 1990 and 2000	5-53
15. Occupational Profile for Wai‘anae Coast and O‘ahu, 2000	5-55
16. Fiscal Impacts	5-57
17. Estimated Drinking Water Use Demand	5-60
18. Estimated Non-Drinking Water Use Demand	5-64
19. Current and Proposed State Land Use Classifications, TMK 8-7-09: 02	6-6
20. Current and Proposed Zoning, TMK 8-7-09: 02	6-25
21. Development Projects on the Waianae Coast	7-4

Glossary of Acronyms

ALISH	Agricultural Lands of Importance to the State of Hawai‘i
BMP	Best Management Practice
BWS	Board of Water Supply
CBT	Cyclic Biological Treatment
CC&Rs	Covenants, Conditions, and Restrictions
CT	Census Tract
CY	Cubic Yard
dB	Decibel
DEIS	Draft Environmental Impact Statement
DOH	Department of Health, State of Hawaii
DPP	Department of Planning and Permitting, City and County of Honolulu
EA	Environmental Assessment
EISPN	Environmental Impact Statement Preparation Notice
FEIS	Final Environmental Impact Statement
FIRM	Flood Insurance Rate Map
GIS	Geographical Information System
GPD	Gallons per Day
GPM	Gallons per Minute
HAR	Hawai‘i Administrative Rules
HDOT	Hawai‘i Department of Transportation
HECO	Hawaiian Electric Company
HRS	Hawai‘i Revised Statutes
Ldn	(Noise) Level, day-night average
LOS	Level of Service
LSB	Land Study Bureau, University of Hawai‘i
LUC	Land Use Commission
MG	Million Gallons
MGD	Million Gallons per Day
MPH	Miles per Hour
MSL	Mean Sea Level
NPDES	National Pollutant Discharge Elimination System
OEQC	Office of Environmental Quality Control
OMPO	Oahu Metropolitan Planning Organization
ORTP	Oahu Regional Transportation Plan
PSI	Pounds per Square Inch

SCP	Sustainable Communities Plan
SHPD	State Historic Preservation Division
SMA	Special Management Area
TIAR	Traffic Impact Analysis Report
TMK	Tax Map Key
UA	Unilateral Agreement
UBC	Uniform Building Code
USLE	Universal Soil Loss Equation (U.S. Department of Agriculture)
V/C	Volume to Capacity (ratio)
VPH	Vehicles per Hour
WSCP	Wai‘anae Sustainable Communities Plan

This page is intentionally left blank.

SUMMARY SHEET

Project Overview

Tropic Land LLC proposes to develop a 96 acre industrial park on a 236.15 acre parcel of land fronting Lualualei Naval Access Road, approximately two miles *mauka* of Farrington Highway and south of a U.S. Naval installation. The project area is a portion of Oahu Tax Map Key No. 8-7-9: 02. The parcel is owned in fee by Tropic Land LLC.

The proposed industrial park would consist of approximately 41 lots, averaging two acres each, and developed on a condominium basis. A business incubator center comprised of three lots, and including a 25,000 square feet building is proposed to provide affordable start-up space for small businesses. The project will have a single secured entry on Lualualei Naval Access Road and a secondary access for fire and emergency purposes. The project concept was developed through extensive consultation with, and with the support of a larger number of Leeward Coast residents, the Nānākuli-Mā'ili Neighborhood Board and other business and community groups.

Tropic Land LLC seeks to amend the State Land Use District boundaries from the Agricultural District to the Urban District and a change in zoning from Preservation (P-2) to Industrial (I-1) for the planned industrial use. The remainder of TMK 8-7-9: 02 will remain in the State Agricultural and Conservation Districts and in the City and County Preservation Zone.

Alternatives Considered

A number of alternatives were considered for the site, which was formerly proposed for a golf course by the prior landowner. That proposal encompassed 259 acres, and included an 18-hole golf course, clubhouse, driving range, and nursery facility. In 1996, the Honolulu City Council approved a zoning change and Unilateral Agreement that entitles the landowner to build the golf course project. When Tropic Land acquired the property in 2005, it began considering alternative land uses, despite the existing land entitlements. Tropic Land was concerned with community opposition to the former golf course project, as well as economic conditions that reduced the viability of a golf course development. Diversified agriculture was considered and rejected due to adverse soil conditions and the adverse experience of prior tenants of the property..

The possibility of a light industrial park was raised through consultation with community members, who noted the Wai'anae Coast's growing residential population and labor force, yet limited employment and economic opportunities. There is no other site on the Wai'anae Coast that is zoned for the development of a light industrial park. Several alternative configurations for an industrial park were evaluated. The alternatives varied by number of entrances and provided different roadway layouts and lot configurations. The preferred plan with a single entry was selected as the most efficient and secure.

Project Impacts and Mitigation

Topography and Physical Conditions. The project will consist of clearing and grading the 96-acre site of existing vegetation and replacing it with an industrial park facility. All grading operations will be conducted in compliance with County erosion control requirements. To mitigate rockfall hazard from cliffs near the project area, a 100-foot wide buffer will be constructed along the *mauka* boundary. The buffer will prevent falling rocks from rolling into the developed area. The buffer, in the form of an unlined swale or culvert, will also be incorporated into the drainage improvements and serve as a fire break. Additional rockfall mitigation measures may be implemented if recommended in a geotechnical analysis to be conducted during the project's design phase.

Construction Period Noise and Dust. During construction, there will be short-term, construction related dust and noise. These impacts will be temporary, and will be mitigated by complying with State and County standards. Fugitive dust will be controlled by watering work areas, wind screens, limiting disturbed areas, and covering stockpiled materials and open truckloads. Timely paving and landscaping of project areas early in the construction schedule will also reduce dust emissions.

Visual Impacts. The project will modify the visual character at the base of the mountain range by converting an open, undeveloped area to an industrial park. To reduce the visual impact of the proposed industrial park, no development will occur above the 200-foot elevation. Palm trees have been planted along the front and sides of the property to soften the view of the project from the street. Accent landscaping will be provided at the front gate and street trees planted along the internal streets.

Agriculture. The project will convert approximately 40 acres of arable lands to urban use. The impact on agriculture will be minimal, as these lands are not currently cultivated, and have not been cultivated since the 1980s. The soils in the petition area are clayey and rocky, and only about 13% of the project site is classified as Class B agricultural land with irrigation, with the remainder having marginal productivity. Affordable irrigation water is not available to the site.

Roadways and Traffic. Lualualei Naval Access Road will serve as the primary access road for the project. Truck traffic to and from the proposed industrial park is consistent with traffic generated by existing land uses along Lualualei Naval Access Road, including the PVT construction and demolition landfill, the Pineridge Farms recycling facility and Joint Base Pearl Harbor Hickam (JBPHH) Lualualei Annex, a U.S. Navy ordnance storage area and radio facility. The U.S. Navy, which owns Lualualei Naval Access Road, is willing to extend access to Tropic Land and its buyers to use this roadway on the same basis as being afforded to other private business on Lualualei Naval Access Road. The Navy has also agreed to grant a long-term easement to use Lualualei Naval Access Road to an association of adjoining property owners who presently use the road, in consideration of the property owners' agreement to maintain the road.

Traffic on Farrington Highway may also be impacted by the increased truck traffic. Tropic Land will discuss traffic mitigation measures with the State and the City, and is willing to participate in a fair-share arrangement to construct improvements to accommodate increased traffic following project build-out. Possible mitigation measures could include a dedicated left-turn lane from Farrington Highway onto Lualualei Naval Access Road, and a second left turn lane from Lualualei Naval Access Road onto Farrington Highway.

Utilities. Energy efficient design will be incorporated into development, and the industrial park will utilize recycled effluent for irrigation. The industrial park will be served by a privately owned and maintained independent wastewater treatment system. A solid waste management plan will be developed including efforts to minimize waste generated at the proposed industrial park during construction and operation. Recycling and landfill diversion practices by construction contractors and businesses will be encouraged.

Other. A landscaped buffer has been planned where Ulehawa Stream crosses the northwest section of the project area, creating a building setback. The project will not adversely impact flora and fauna, or any critical habitat on the project site. Tropic Land will utilize non-invasive and/or native plant species in landscaping common areas. Feeding of feral or stray cats within the development will be prohibited to reduce potential adverse impacts on birdlife within the development and on neighboring properties. The project will not adversely affect cultural resources.

Unresolved Issues. As indicated above the U.S. Navy is willing to extend access to Tropic Land and its buyers to use Lualualei Naval Access Road. An unresolved issue is the form of the definitive access agreement, which is under discussion with the Navy.

Compatibility with Land Use Plans and Policies

The development of the light industrial park requires an amendment to the State Land Use District from Agricultural to Urban for the 96-acre project area. The ~~DEIS~~ **FEIS** analysis demonstrates that the project is reasonable, conforms with the objectives of the Hawai‘i State Plan, and with the applicable Urban district standards.

The project is consistent with the Wai‘anae Sustainable Communities Plan (WSCP) objectives and is directly supportive of the WSCP value of economic choices. As a job-producing and economy sustaining land use, the industrial park has the potential to become an employment center, providing greater economic choice to families in the WSCP area. The Honolulu Department of Planning and Permitting’s Draft Wai‘anae Sustainable Communities Plan Revision for 2009 identifies industrial as an alternative land use for this site. The revised Wai‘anae Sustainable Communities Plan must be approved by the Honolulu City Council.

The project area is currently zoned P-2, Preservation with a Unilateral Agreement allowing golf course use. This zoning was obtained in ~~1999~~ 1996 by the previous landowner, who proposed a

golf course on the site and surrounding areas. Tropic Land is seeking a change in zoning from P-2 to Limited Industrial (I-1). The proposed light industrial park is consistent with the purpose of the I-1 district, is compatible with surrounding land uses, and will have minimal environmental impact.

Listing of Permits or Approvals

The following permits are required or potentially required:

State of Hawai‘i

- State Land Use Commission, State Land Use Boundary Amendment
- Department of Health, Section 402, Clean Water Act, National Pollutant Discharge Elimination System (NPDES) Permit

City and County of Honolulu

- Wai‘anae Sustainable Communities Plan Amendment
- Zoning Change (from P-2 Preservation to I-1 Industrial)
- Grading Permit
- Building Permit

1. INTRODUCTION

1.1 Proposed Action

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 (see Figure 3, Site Plan). The industrial park would consist of approximately 41 lots, averaging two acres each, and developed on a condominium basis. Lots in higher visibility areas, such as those along the main entry road and around intersections, may be further divided into smaller parcels. These locations are more likely to attract commercial businesses with greater customer interaction.

An incubator center is proposed for three of the lots. The incubator concept will enable small businesses to obtain affordable, start-up spaces. The concept includes an industrial building with approximately 25,000 SF, providing basic indoor spaces of up to 1,800 SF for a full bay. Open yard space would also be available in units measuring approximately 8,750 SF each.

The project will have a single secured entry off of Lualualei Naval Access Road and a secondary access for fire and emergency purposes. The existing tree-lined setback will remain along the Lualualei Naval Access Road frontage. This setback measures 30 feet wide, except in the northwest corner of the property where a triangular piece of land, approximately 2.4 acres in size, is included in the setback. The north and south property lines have 15-foot setbacks. An additional strip of land, approximately 100 feet wide and *mauka* of the industrial lots, will be improved as an unlined swale or culvert for drainage improvements, rock fall hazard mitigation, and a fire break.

The project will be sold under a condominium form of ownership with individual lots and common ownership of internal roads and infrastructure. Tropic Land LLC is planning to seek an I-1 zone for the area that is planned for industrial use. The remainder of Oahu Tax Map Key 8-7-9: 02 will remain in the State Agricultural and Conservation Districts and in the City and County Preservation Zone.

1.2 Project Location and Description

The petition area is a portion of the property identified as Oahu Tax Map Key 8-7-9: 02. The entire parcel comprises 236.15 acres, of which the proposed project will occupy 96 acres. It is located in the upper Lualualei Valley approximately 2 miles *mauka* (inland) of Farrington Highway and immediately south of Joint Base Pearl Harbor Hickam (JBPHH) Lualualei Annex. The property is owned in fee by Tropic Land LLC. See Figures 1 and 2.

Access. At present, legal access to the property is via Hakimo Road. An easement from the Navy allows access from Hakimo Road across Lualualei Naval Access Road to the subject property. Tropic Land has reached an understanding with the Navy for the use of the Lualualei Naval Access Road, which provides a direct route to the property from Farrington Highway. Tropic Land is currently discussing the form of a definitive access agreement with the Navy. The Navy has agreed to grant a long term easement to use 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.

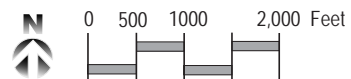
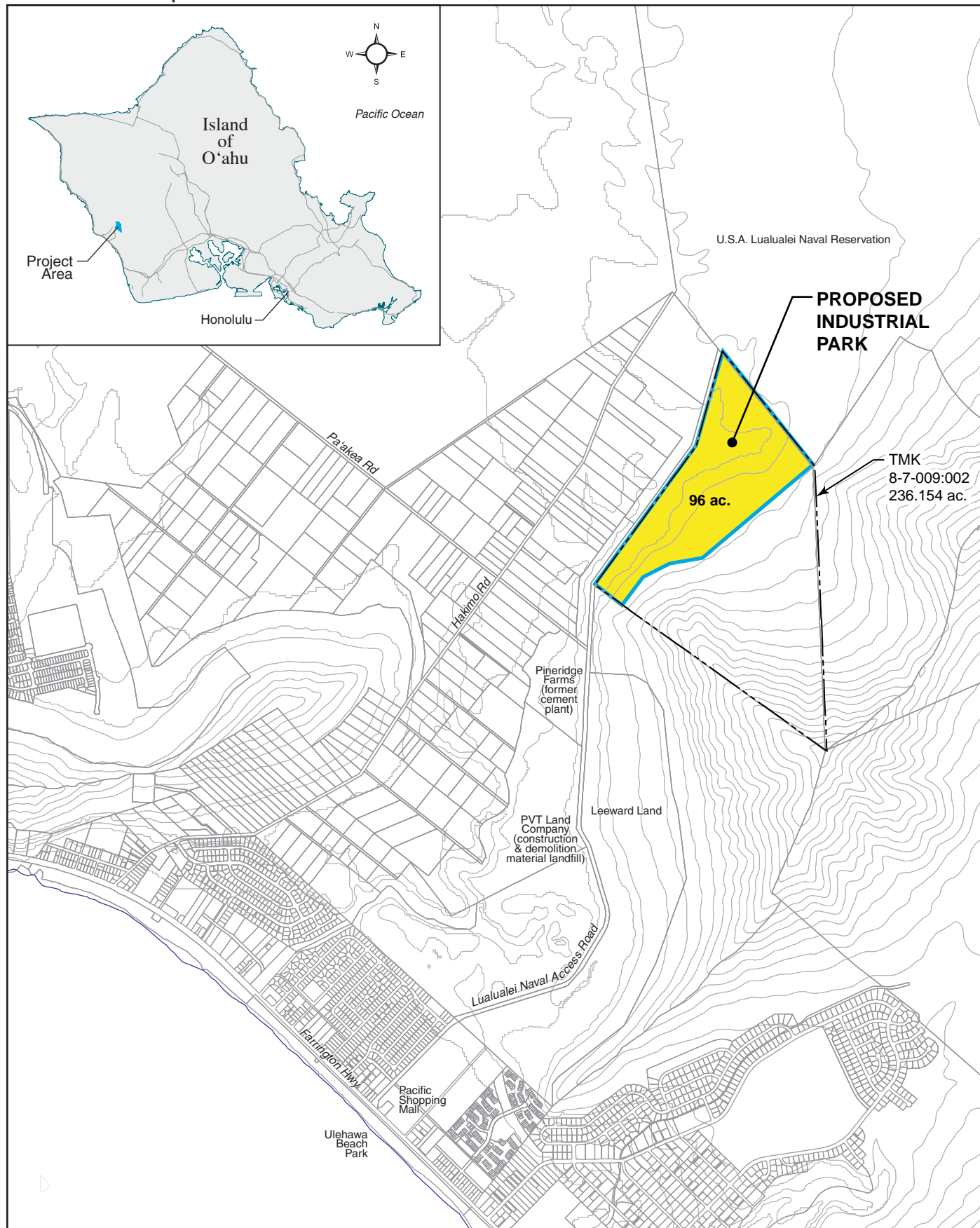


Figure 1
Location Map
March 2010

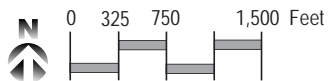


Figure 2
Aerial Photograph
March 2010



Project site frontage along Lualualei Naval Access Road.



Frontage along Lualualei Access Road



Tropic Land entrance facing the Naval Reservation at the end of Lualualei Naval Road



Flat lands facing mountains.

1.3 Background of the Project Area—Development History

The landowner prior to Tropic Land LLC was Kabushiki Kaisha Oban, (referred to as “Oban”) a Japanese corporation. Development of the project area for a proposed golf course was addressed in a Final EIS, accepted in 1991. The proposal included an 18-hole golf course and accessory uses. In 1996, Oban obtained approval of a conditional zoning change for approximately 188 acres from AG-1 Restricted Agricultural District and AG-2 General Agricultural District to P-2 General Preservation District. The zoning change was approved with conditions and recorded as Document 2337653 on September 24, 1996. The property has not been developed as a golf course. It was acquired by Tropic Land LLC from Oban in December 2005.

1.4 Purpose of the Final Environmental Impact Statement

This Final Environmental Impact Statement (FEIS) was prepared for the proposed action pursuant to Chapter 343, Hawai‘i Revised Statutes (HRS); and State Department of Health Title 11, Chapter 200, Hawai‘i Administrative Rules (HAR).

The environmental review process allows for three courses of action depending on a project’s anticipated level of environmental impact. The first course would be “exemption” from environmental review according to the HAR Chapter 200 (Environmental Impact Statement Rules). These procedures are applicable to projects that typically do not impact the environment under criteria determined by the relevant accepting authority.

The second course of action applies to projects whose environmental impact would not be “significant.” The term “significant” has a technical definition under HAR Chapter 200. For projects lacking a “significant” environmental impact, an Environmental Assessment (EA) is prepared and is the appropriate environmental review document.

The third course of action applies to projects expected to have a “significant” impact on the environment. For such projects, an Environmental Impact Statement (EIS) is prepared, and is the appropriate environmental review document.

Tropic Land LLC elected to proceed directly to prepare an EIS for two reasons. First, an EIS had been prepared to examine the impacts of the prior development proposal, the “Oban Golf Course,” and the current property owner desired a similar level of environmental evaluation for the proposed light industrial park. Second, an EIS would allow for comprehensive disclosure and discussion of potential environmental impacts and mitigation measures.

Before the proposed action can be implemented, the landowner (Petitioner) must obtain an amendment to the State Land Use District boundaries (from the Agricultural District to the Urban District), an amendment to the City and County of Honolulu Wai‘anae Sustainable Communities Plan, and a change in zoning from preservation (P-2) to industrial (I-1). The

completed EIS is intended to provide the environmental review needed to support the decision-making process in each case.

1.5 Steps in the Environmental Review and Implementation Process

An Environmental Impact Statement Preparation Notice (EISPN) was published by the State of Hawai'i Office of Environmental Quality Control (OEQC) *Environmental Notice* on May 23, 2009. The 30-day public comment period ended on June 23, 2009. Comments received are included in ~~Chapter 8~~ Appendix M of this document.

~~This DEIS will be submitted to the OEQC for publication in the *Environmental Notice* announcing a 45-day public review period. Copies of the DEIS will be distributed to government agencies and interested parties.~~

The DEIS was published in the *Environmental Notice* on November 23, 2009, initiating a 45-day public review period which ended on January 7, 2010. Copies of the DEIS were distributed to government agencies and interested parties. Comments are reviewed in Chapter 9.

The FEIS will be submitted to the Land Use Commission (LUC) which is the accepting authority. Once the LUC has accepted the FEIS, it will be sent to OEQC for publication in the *Environmental Notice*.

1.6 List of Possible Permits, Approvals, and Requirements for Regulatory Compliance

The following permits are required or potentially required. Input on other approvals that may be necessary is requested from government agencies and other participants in the environmental review process.

	<u>Anticipated Date for Application Submittal</u>
Federal <ul style="list-style-type: none"> • U.S. Army Corps of Engineers, Jurisdictional Determination (Ulehawa Stream) • <u>Lualualei Naval Access Road Lease of Easement</u> 	<p style="text-align: center;"><u>Completed</u></p> <p style="text-align: center;"><u>2010</u></p>
State of Hawai‘i <ul style="list-style-type: none"> • State Land Use Commission, State Land Use District Boundary Amendment • Department of Health, Section 402, Clean Water Act, National Pollutant Discharge Elimination System (NPDES) Permit 	<p style="text-align: center;"><u>2010</u></p> <p style="text-align: center;"><u>2011</u></p>
City and County of Honolulu <ul style="list-style-type: none"> • Wai‘anae Sustainable Communities Plan, Amendment • Zoning Change (from P-2 Preservation to I-1 Industrial) • Grading Permit • Building Permit 	<p style="text-align: center;"><u>2010</u></p> <p style="text-align: center;"><u>2011</u></p> <p style="text-align: center;"><u>2011</u></p> <p style="text-align: center;"><u>2011</u></p>

1.7 Project Summary

Project Name	Nānākuli Community Baseyard
Applicant/Landowner	Tropic Land LLC
Accepting Authority	State Land Use Commission
Tax Map Keys	8-7-9: 2 (portion)
Location	East side of Lualualei Naval Access Road, approximately 2 miles from Farrington Highway, Wai‘anae District, Island of O‘ahu
Petition Area	Approximately 96 acres
Project Description	<p>Tropic Land LLC proposes to develop a light industrial park on approximately 96 acres. The industrial park would consist of approximately 41 lots, averaging two acres each. The project would have a single secured entry off of Lualualei Naval Access Road and a secondary access for fire and emergency purposes. Surrounding the project site are a 30-foot wide, landscaped buffer along the Lualualei Road frontage, approximately 2.4 acres of green space in the northwestern corner, and 15-foot setbacks along the north and south property lines. On the <i>mauka</i> side, an additional strip of land approximately 100 feet wide is planned for construction of an unlined swale or culvert for drainage improvements, rock fall hazard mitigation, and a fire break.</p> <p>The project will be sold under a condominium form of ownership with individual lots and common ownership of internal roads and infrastructure. Three lots are set aside for a third party to develop an incubator center to provide start-up spaces.</p> <p>Tropic Land LLC is planning to seek an I-1 zone for the petition area. The remainder of TMK 8-7-9: 02 will remain in the preservation zone.</p>
Existing Uses	<p>The site is vacant and covered mostly with grasses, <i>haole koa</i> bushes, and isolated <i>kiawe</i> trees. Grasses are mowed periodically for fire control purpose and used for silage.</p> <p>The entire site remains subject to an existing Unilateral Agreement (UA) related to the development of a golf course.</p>
State Land Use	Agricultural District
Zoning	P-2 Preservation

Flood Insurance Rate Map The entire project site is situated within Flood Area Zone D (areas in which flood hazards are undetermined).

Special Management Area No

EIS Preparer Kimura International, Inc.
 1600 Kapi'olani Boulevard, Suite 1610
 Honolulu, HI 96814
 Contact: Glenn Kimura

This page is intentionally left blank.

2. PURPOSE OF AND NEED FOR ACTION

There is a disparity in economic development opportunities on the Wai‘anae Coast. On the one hand, there is a growing residential population and labor force—yet, on the other hand, limited, and even stagnant, employment and available industrial space for business creation and expansion. The proposed light industrial park is needed to develop a new employment center and alleviate the gap between jobs and the available labor force.

The Wai‘anae Coast accounts for almost 5.0 percent of total population on O‘ahu, but less than 1.5 percent of the island’s employment. The imbalance is not expected to improve in 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 O‘ahu*. The *Annual Report* for Fiscal Year 2006 indicates that population in the Wai‘anae Development Plan area will grow moderately from 44,656 in 2005 to 52,285 in 2030. However, employment is projected to *decrease* from 7,253 in 2005 to 7,126 in 2030.

One obstacle to job growth, particularly in the traditional industrial sectors (represented by the employment categories of Transportation, Industrial, and Construction) is the lack of available and affordable space. Existing industrial development on O‘ahu is overwhelmingly concentrated within three Development Plan Areas, namely the Primary Urban Center, ‘Ewa, and Central O‘ahu. The combined inventory of industrial space within the remaining Development Plan Areas of East Honolulu, Ko‘olaupoko, Ko‘olauloa, North Shore, and Wai‘anae totals less than 1.0 million square feet, or only 2.7 percent of the islandwide total. This means that a large proportion of Wai‘anae Coast residents work outside their communities requiring longer commutes, more time spent away from families, and the greater financial and environmental costs of increased fuel use.

The proposed action addresses the ongoing deficiency of developable industrial land on the Wai‘anae Coast. The sustainability of a community, including the ability to support a range of economic activities and workplaces for its residents, requires a broad distribution of land use types. The light industrial park will provide opportunities for blue-collar trade and craft employers to locate within the community.

Industrial Market Analysis¹

According to data compiled at the end of 2007 by Colliers Monroe Friedlander (Colliers), the total supply of existing industrial space on O‘ahu was estimated at approximately 36.4 million square feet of floor area within 1,668 buildings. The indicated overall vacancy rate within the island’s industrial marketplace was 3%.

¹ Based on a Market Analysis and Employment Forecast Study prepared by Hastings, Conboy, Braig & Associates, Ltd. dated March 2008.

The geographic distribution of industrial space on O‘ahu can be allocated among 11 major sub-markets, with the four largest market areas identified as:

Kalihi/Sand Island	8.47 million square feet
Airport/Mapunapuna	8.26 million square feet
Campbell Industrial Park/Kapolei Business Park	5.60 million square feet
Bougainville/Halawa	3.23 million square feet

The seven remaining market areas have smaller inventories of industrial space ranging from as low as 467,000 square feet in Kailua to just over 2.4 million square feet in Iwilei.

Among the more notable aspects or characteristics of O‘ahu’s industrial marketplace is the geographic concentration of the existing supply. Existing industrial development is overwhelmingly concentrated within three of O‘ahu’s planning areas, namely the Primary Urban Center, ‘Ewa, and Central O‘ahu. The Colliers data indicate that the combined inventory of industrial space within the other five planning areas—East Honolulu, Ko‘olaupoko, Ko‘olauloa, North Shore, and Wai‘anae—totals less than 1.0 million square feet, or only 2.7% of the islandwide total.

The Primary Urban Center is characterized as a predominantly built-out market with potential redevelopment as a possible key component of future opportunities for industrial growth. ‘Ewa and Central O‘ahu are characterized as developing areas where the availability of land capable of accommodating continued building expansion is the primary driving force regarding future opportunities for growth in the supply of additional industrial land and buildings. Increased industrial development in ‘Ewa and Central O‘ahu is also a response to the continued growth and development of substantial residential communities within these two areas.

Another significant feature of O‘ahu’s industrial marketplace is its relatively low vacancy rate as it relates to pent-up demand. Pent-up demand is defined as the component or quantity of additional market demand that would need to be absorbed or otherwise introduced in the marketplace to restore normal equilibrium between supply and demand during periods of unusually low vacancy. Typically, normal equilibrium between supply and demand is reflected by an overall vacancy rate of, say, 5%. The Colliers data indicate that O‘ahu’s overall vacancy rate is 3%, with the vacancy rate in selected market areas calculated at less than 1%.

O‘ahu’s vacancy rate of 3% equates to approximately 1.1 million square feet of available floor space among a total building inventory of 36.4 million square feet of floor space. Under these conditions, an additional supply of approximately 750,000 square feet of industrial space would be the implied requirement for a normal, equilibrium vacancy rate of 5%. The estimated amount of pent-up industrial demand is equivalent to roughly 50% or one-half of the total inventory floor space currently developed at the Gentry Business Park in Waipio.

Industrial Market Analysis, Wa‘ianae Planning Area

The subject property’s regional setting and relevant market area is defined as the Wai‘anae planning area. The area extends along the leeward coast of O‘ahu, west of the Wai‘anae Mountain Range, and encompasses the valleys of Nānākuli, Mā‘ili, Wai‘anae, Mākaha, and Mākua, and the residential communities of Nānākuli, Mā‘ili, Waianae, and Mākaha.

The Wai‘anae market area is characterized as an outlying, rural-agricultural district of O‘ahu. Almost one-fourth of the total land area within the Wai‘anae planning area is categorized as agricultural. Only about 5% of the total land area is categorized as urban, with most of the urban designated land used for single-family residential use. Almost two-thirds of the total land area is categorized as either reservation or military. The latter category includes the military installation located directly inland from the subject property.

Similar information is reported by the DBEDT Office of Planning. According to a 2004 report, the total acreage of vacant land zoned for commercial and/or industrial use within the Wai‘anae planning area was statistically equal to zero.

Yet, from an existing demand perspective, the Wai‘anae planning area accounts for roughly 5% of O‘ahu’s total resident population and that continued population growth is projected for the area over the next twenty years. Also, demographic and socioeconomic data from the 2000 Census indicate a significant level of industrial job holders residing within the Wai‘anae planning area. An important implication of these statistics is the presence of an available labor force with industrial job training and experience already residing within the Wai‘anae market area.

Industrial Land Use Demand Forecasts

The DPP Socioeconomic Projections for the Wai‘anae Development Plan Area forecast a steady and moderate growth in population for the area. In contrast the future outlook for job opportunities in the area is a no growth/ declining scenario. The population forecast for Wai‘anae increases from 44,656 in 2005 to 52,285 in 2030, while the job/employment forecast for Wai‘anae fluctuates at a modest level from 7,253 in 2005 to 7,126 in 2030.

Within the DPP project model, significant job growth to the year 2030 is forecast to occur within three planning areas: Primary Urban Center, ‘Ewa, and Central O‘ahu. All remaining planning areas, including East Honolulu, Ko‘olaupoko, Ko‘olauloa, North Shore, and Waianae, are projected to have limited prospect for increases in future job opportunities.

Table 1 presents a more detailed breakdown of the DPP job projections to 2030 by various employment categories. Of particular note is a marked decline forecasted construction jobs for the Wai‘anae planning area from 801 in 2005 to 368 in 2030. This represents more than a 50% loss in jobs for the construction industry within the subject market area. The forecasted decline

in construction jobs appears to reflect a perceived lack of anticipated new development within the Wai‘anae planning area.

Table 1
Forecasted Jobs by Employment Category to the Year 2030
for the City and County of Honolulu and Wai‘anae Planning Area

	2005	2010	2015	2020	2025	2030
City and County of Honolulu						
Armed Forces	40,368	40,368	40,370	40,370	40,370	40,370
Public Administration	36,703	37,606	38,601	39,392	40,304	41,282
Hotel	16,795	17,399	17,900	18,500	18,998	19,500
Agriculture	4,627	4,769	4,854	4,945	5,110	5,255
Transportation, Communication, Utilities	39,531	41,599	43,591	45,711	47,816	49,997
Industrial	30,143	31,094	32,052	32,873	33,715	34,636
Construction	25,086	26,187	26,281	26,464	26,975	27,475
Finance, Insurance, Real Estate	33,965	35,611	37,311	38,910	40,603	42,299
Services	201,186	211,296	221,665	231,745	242,163	252,844
Retail	94,447	99,300	104,237	109,120	114,059	119,053
Total Jobs	522,851	545,229	566,862	588,030	610,113	632,711
Wai‘anae Planning Area						
Armed Forces	47	47	47	47	47	47
Public Administration	401	401	401	405	414	421
Hotel	26	109	109	109	109	110
Agriculture	534	553	569	581	607	620
Transportation, Communication, Utilities	193	196	208	221	224	234
Industrial	115	115	115	115	115	115
Construction	801	649	356	373	368	443
Finance, Insurance, Real Estate	245	245	245	245	245	245
Services	3,586	3,586	3,586	3,586	3,586	3,586
Retail	1,305	1,305	1,305	1,305	1,305	1,305
Total Jobs	7,253	7,206	6,941	6,987	7,020	7,126

Source: Department of Planning and Permitting, Socioeconomic Projections, 2000-2030 by Development Plan Area

The data in Table 2 show the disparity in population and job distribution associated with the Wai‘anae planning area. Although Wai‘anae accounts for almost 5% of the total population count of O‘ahu, it has less than 1.5% of the total island-wide job count. This disparity is even greater with respect to jobs within the traditional industrial sectors of employment (represented by employment in the categories of Transportation, Communications, Utilities; Industrial; and Construction). For industrial sector jobs, the Wai‘anae planning area accounts for less than 1% of the island-wide forecast.

Table 2
Comparison of Population and Employment Forecasts for O‘ahu
and Wai‘anae Planning Area

	2005	2010	2015	2020	2025	2030
Resident Population Forecast						
O‘ahu	912,913	952,661	995,562	1,037,252	1,078,058	1,117,322
Percent of Island Total	100%	100%	100%	100%	100%	100%
Wai‘anae Planning Area	44,656	45,172	46,991	48,891	50,685	52,285
Percent of Island Total	4.9%	4.7%	4.7%	4.7%	4.7%	4.7%
Employment/Job Forecast (Total Jobs)						
O‘ahu	522,851	545,229	566,862	588,030	610,113	632,711
Percent of Island Total	100%	100%	100%	100%	100%	100%
Wai‘anae Planning Area	7,253	7,206	6,941	6,987	7,020	7,126
Percent of Island Total	1.4%	1.3%	1.2%	1.2%	1.2%	1.1%
Employment/Job Forecast of Industrial Sector*						
O‘ahu	94,760	98,880	101,924	105,048	108,506	112,108
Percent of Island Total	100%	100%	100%	100%	100%	100%
Wai‘anae Planning Area	1,109	960	679	706	707	792
Percent of Island Total	1.2%	1.0%	0.7%	0.7%	0.7%	0.7%

* Industrial Sector jobs include all jobs within the employment categories: Transportation, Communications Utilities; Industrial; and Construction

Source: Department of Planning and Permitting, Socioeconomic Projections, 2000-2030 by Development Plan Area

The land use demand forecast by the HCBA study are based, in part, on projected modifications to the prevailing disparity between population distribution and job count distribution in the Wai‘anae planning area. The other engine of the land use demand forecast is an employment-

driven model. The methodology used to derive the land use forecasts is explained in the full study which is reproduced in Appendix B. The results of the employment are shown in Table 3.

Table 3
Industrial Land Use Demand Forecasts, 2005-2030
Proposed Light Industrial Park, Lualualei, O‘ahu

	2005	2010	2015	2020	2025	2030
Industrial Land Use Demand Forecast—Employment Model						
O‘ahu						
Industrial Sector Job Forecast	94,760	98,880	101,924	105,048	108,506	112,108
Land Use Conversion Factor*	2,500	2,500	2,500	2,500	2,500	2,500
	SF/Job	SF/Job	SF/Job	SF/Job	SF/Job	SF/Job
Industrial Land Use Demand (acres)	5,438	5,675	5,850	6,029	6,227	6,434
Cumulative Demand (acres)	--	236	411	590	789	996
Wai‘anae Planning Area						
Modified Industrial Job Forecast	1,109	1,978	2,038	2,101	2,170	2,242
@ 2.0% of O‘ahu	5,000	5,000	5,000	5,000	5,000	5,000
Land Use Conversion Factor*	SF/Job	SF/Job	SF/Job	SF/Job	SF/Job	SF/Job
Industrial Land Use Demand (acres)	127	227	234	241	249	257
Cumulative Demand (acres)	--	100	107	114	122	130
HIGH END						
Wai‘anae Planning Area						
Modified Industrial Job Forecast	1,109	1,681	1,733	1,786	1,845	1,906
@ 1.7% of O‘ahu	5,000	5,000	5,000	5,000	5,000	5,000
Land Use Conversion Factor*	SF/Job	SF/Job	SF/Job	SF/Job	SF/Job	SF/Job
Industrial Land Use Demand (acres)	127	193	199	205	212	219
Cumulative Demand (acres)	--	66	72	78	85	92
MID RANGE						
Wai‘anae Planning Area						
Modified Industrial Job Forecast	1,109	1,483	1,529	1,576	1,628	1,682
@ 1.5% of O‘ahu	5,000	5,000	5,000	5,000	5,000	5,000
Land Use Conversion Factor*	SF/Job	SF/Job	SF/Job	SF/Job	SF/Job	SF/Job
Industrial Land Use Demand (acres)	127	170	176	181	187	193
Cumulative Demand (acres)	--	43	49	54	60	66
LOW END						

* Land Use Conversion Factor represented as Land Area per Employee/Job

Source: Hastings, Conboy, Braig & Associates, Ltd., March 2008

At the high end forecast, based on a 2.0% capture rate of O‘ahu’s industrial sector jobs to the Wai‘anae planning 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 net acres of new industrial land onto the market during the same approximate time period.

At the mid-range forecast, based on a 1.7% capture rate of O‘ahu’s industrial sector jobs to the Wai‘anae planning 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% capture rate of O‘ahu’s industrial sector jobs to the Wai‘anae planning 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.

The rationale behind the use of modified industrial sector job forecasts for the Wai‘anae planning area was based on an expectation that a significant level of relocation demand (also referred to as transient demand) could potentially be attracted to the subject market area. This potential form of demand might well be the future result of selected industrial businesses acting on a desire to relocate their operations to a lower-cost option with better proximity to available labor resources.

Available market data indicate a geographic disparity between a growing resident population and potential industrial labor force residing within the Wai‘anae market area and the scarcity of any discernable new industrial development and employment opportunities within the same market area. The proposed Nānākuli Community Baseyard has the potential to alleviate or mitigate some of the effects of this ongoing disparity between labor force and job market locations.

The market study concluded that if the proposed light industrial park were successful in obtaining the necessary government approvals, “there is sufficient potential demand in the marketplace to achieve project absorption within, perhaps, a three- to five-year time frame” (Hastings, Braig, Conboy & Associates, 2008: 18).

Interest from the Business Community

Twenty-one businesses have expressed interest in acquiring or leasing one or more units in the proposed light industrial park. Tropic Land LLC cannot presently offer condominium units for sale, but these businesses have tendered serious interest in the project and provided contact information to receive a condominium public report. Types of businesses expressing interest include trucking and hauling, equipment handling, general contracting, and trades (painting, welding, electrical, masonry, landscaping). Twelve of the 21 businesses are involved with trucking services, which is consistent with a “baseyard”-type development that offers industrial space for less intensive activities.

Fifteen of the 21 businesses reported current addresses in Wa‘ianae. The remaining six businesses are currently located in Honolulu, ‘Aiea, Pearl City, ‘Ewa Beach, and Kapolei.

The business incubator is proposed to afford a home for start up businesses. The Wai‘anae Coast Coalition, a non-profit organization, is leading the planning effort for the business incubator component of the project.

3. PROPOSED ACTION¹

This chapter discusses the proposed light industrial park, tentatively named Nānākuli Community Baseyard, and alternative development schemes that have been considered.

General History and Background

In December 2005, Tropic Land LLC purchased the property from Kabushiki Kaisha Oban and the rights to develop a golf course on the property. After purchasing the property, Tropic received numerous comments from Wai‘anae Coast residents opposing the development of a golf course and requesting that development options be reconsidered. One of the suggestions was to develop a light industrial park. Other suggestions included a Disney-type theme park, golf driving range, affordable housing, and stock car racing facility. However, the predominant request was to develop a light industrial park.

At the September 4, 2007 meeting of the Wai‘anae Coast Neighborhood Board, Tropic announced its willingness to reconsider the golf course development and to discuss alternative development options with members of the community. Tropic met with the Board’s Planning and Zoning Committee on October 10 and November 15, 2007 and shared preliminary plans for a light industrial park. The Planning and Zoning Committee voted to forward the proposed project to the entire Board for further discussion and consideration at its meeting on December 4, 2007.

Tropic first met with the newly established Nānākuli-Mā‘ili Neighborhood Board on May 20, 2008 and made a presentation to the full board. A follow-up presentation was made to the Planning and Zoning Committee on June 24, 2008. Both meetings provided opportunities for public input. On July 15, 2008, the Board unanimously adopted a resolution to support the development of the light industrial park.

3.1 Project Description

Light Industrial Park

Tropic Land LLC proposes to develop an industrial park that would occupy an approximately 96 acre portion of the property in the upper Lualualei Valley. The project is currently known as the Nānākuli Community Baseyard. The petition area is bordered by Lualualei Naval Access Road on the west, with agricultural lots on the other side of the roadway. Abutting the property on the north is the JBPHH Lualualei Annex. Steep cliffs, including the slopes of Pu‘u Heleakala, lie on the south and east. See Figure 3, Site Plan.

¹ Chapter 3 in the DEIS has been separated into two separate chapters. Chapter 3 in this FEIS focuses on the proposed action. Chapter 4 in this FEIS discusses other alternatives considered during the project planning process.

The industrial park will be comprised of approximately 41 lots, averaging two acres each. Lots in higher visibility areas, such as those along the main entry road and around intersections, may be divided into smaller parcels for commercial and service-oriented businesses.

An incubator center is proposed for three of the lots. The incubator concept will enable small businesses to obtain affordable, start-up spaces. The concept includes a 25,000-SF industrial building providing indoor spaces of up to 1,800 SF for a full bay. Open yard space would also be available in increments of approximately 8,750 SF each.

The project will be sold under a condominium form of ownership with individual units (lots) and common ownership of internal roads and infrastructure. Tropic Land LLC is planning to seek an I-1 zone for the area that is planned for industrial use. The remainder of TMK 8-7-9: 02 will remain in the preservation zone. Covenants, Conditions, and Restrictions (CC&Rs) will be imposed on the industrial park. The CC&Rs will be used as a mechanism to minimize and mitigate adverse environmental impacts, as described in Chapter 5 and 7 of this FEIS.

Infrastructure

Access and Circulation. Formal access to the project site is via Hakimo Road, across land situated between Hakimo Road and Lualualei Naval Access Road (TMK 8-7-10: 06, also owned by Tropic Land), and an easement from the U.S. Navy to cross Lualualei Naval Access Road. The U.S. Navy has agreed to grant Tropic Land LLC and other adjoining property owners a long term easement for the use of the Lualualei Naval Access Road, and is currently discussing the form of an easement agreement. Appendix K contains correspondence between Tropic Land and the Navy, including a conceptual outline for the operation and maintenance of Lualualei Naval Access Road by an association of road users. Consultation among the relevant parties is in progress.

The development is planned with a single, secured entry off Lualualei Naval Access Road and a secondary access for fire and emergency purposes. Interior roads will be privately owned and maintained. Street will be designed with a 44-foot right-of-way and two 12-foot lanes. Street corners will be designed with wide turning radii to accommodate large trucks and trailers. Curbs, gutters, and sidewalks may be installed. Street lights and street trees will be installed for safety and aesthetic purposes.

Buffers and Setbacks. The existing line of palm trees will remain as a 30-foot landscaped setback along the Lualualei Naval Access Road frontage. In the northwest corner of the property, the setback will encompass Ulehawa Stream. Additional landscaping may be installed within this permanent green space; however, all development will occur outside the setback. The stream itself will remain in its natural state.

The north and south property lines will have 15-foot setbacks. An additional strip of land, approximately 100 feet wide and *mauka* of the industrial lots, will be used for rockfall hazard mitigation and a fire break.

Drainage. Retention facilities will be constructed to retain increases in storm drainage runoff that occurs as a result of the proposed development. These facilities will include a combination of swales, detention ponds, and underground storage tanks. The 100-foot *mauka* strip will also include drainage improvements to accommodate peak runoff from the hillside. Retention facilities within the strip are intended to dampen the peak runoff generated from the hillside.

Drinking Water System. The project's drinking water system will be connected to the existing 8-inch Board of Water Supply (BWS) water line along Hakimo Road. A new 16-inch transmission line will be extended along Pa'akea Road and Lualualei Naval Access Road. The drinking water distribution system will be designed and constructed in accordance with BWS standards and also to meet fire protection requirements. (Figure 4)

Non-Drinking Water System. A pump system and non-drinking water main will dispense treated effluent for irrigation. (Figure 5)

Wastewater System. The major components of the proposed wastewater system are the gravity collection system, wastewater treatment unit, and effluent disposal system. The system will be designed and constructed to State and County standards, but the on-site wastewater system will be privately operated and maintained. (Figure 6)

The wastewater treatment unit will be located in a 10,000-SF, fenced area within the industrial park. A single basin reactor will employ cyclic biological treatment with a continuous activated sludge system. Treated wastewater effluent will be chlorinated, disinfected, and pumped to a non-drinking water storage tank. Effluent may be supplemented with ~~non-drinking water from the existing wells~~ potable or drinking water for irrigation purpose.

Utilities. The necessary electrical, telephone, cable TV, and high-speed internet services will be provided by Hawaiian Electric Co., Hawaiian Telcom, and Oceanic Time Warner Cable. The existing electrical facility at ~~Mikilua~~ Mikilua Substation is expected to supply power to the project site.

Nānākuli Industrial Park

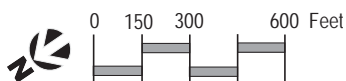
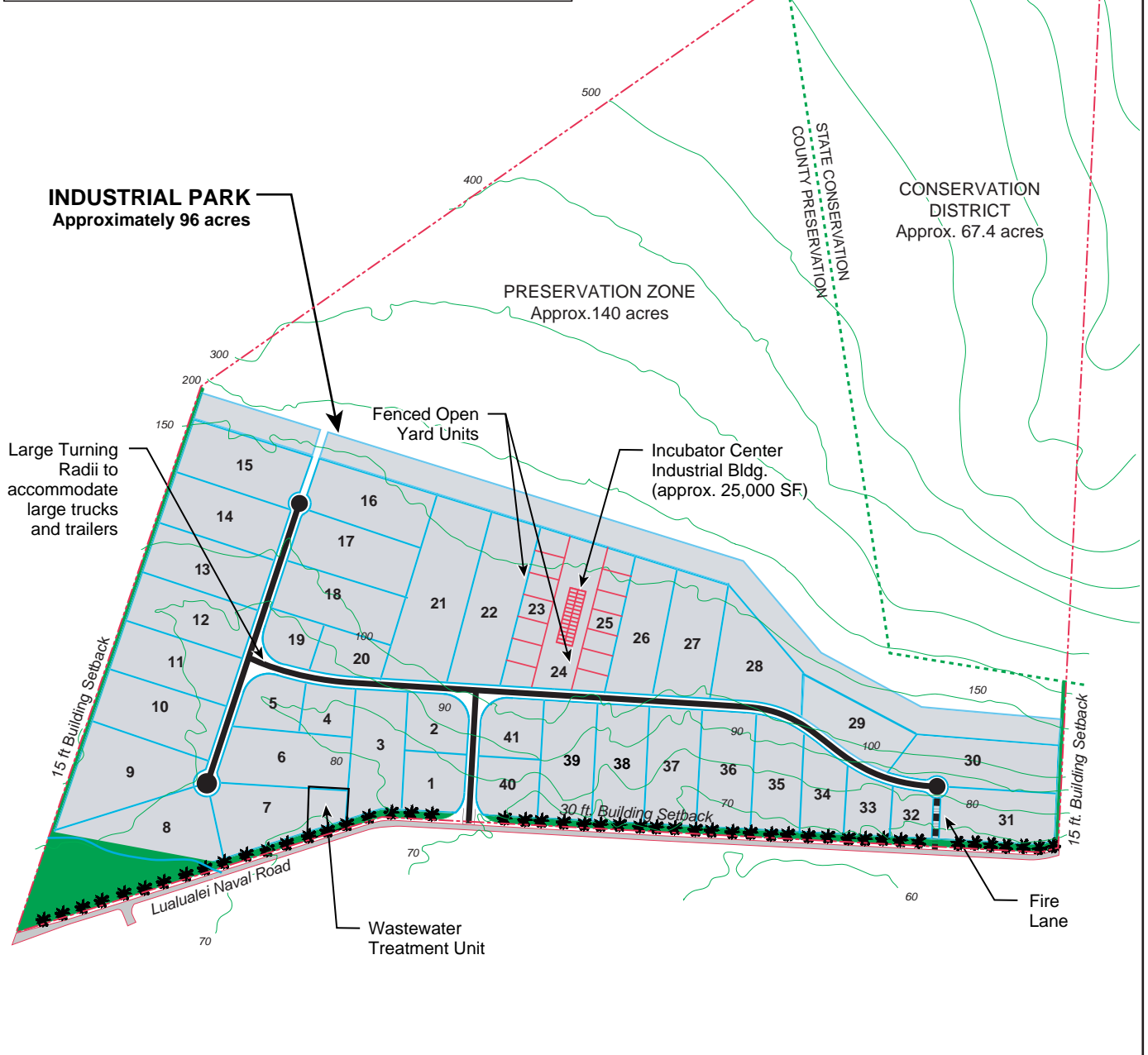
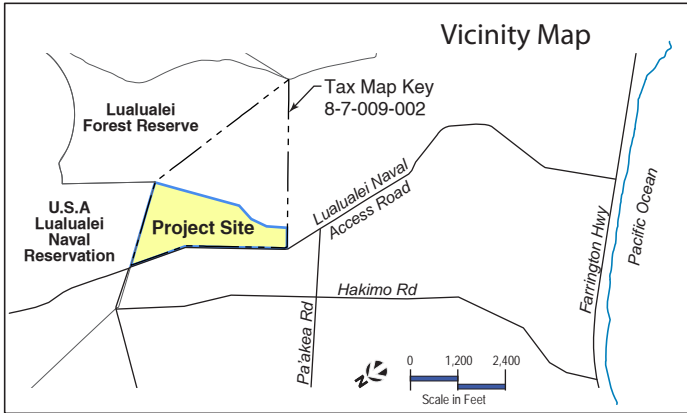


Figure 3
Site Plan
March 2010

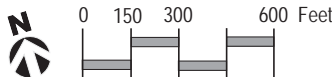
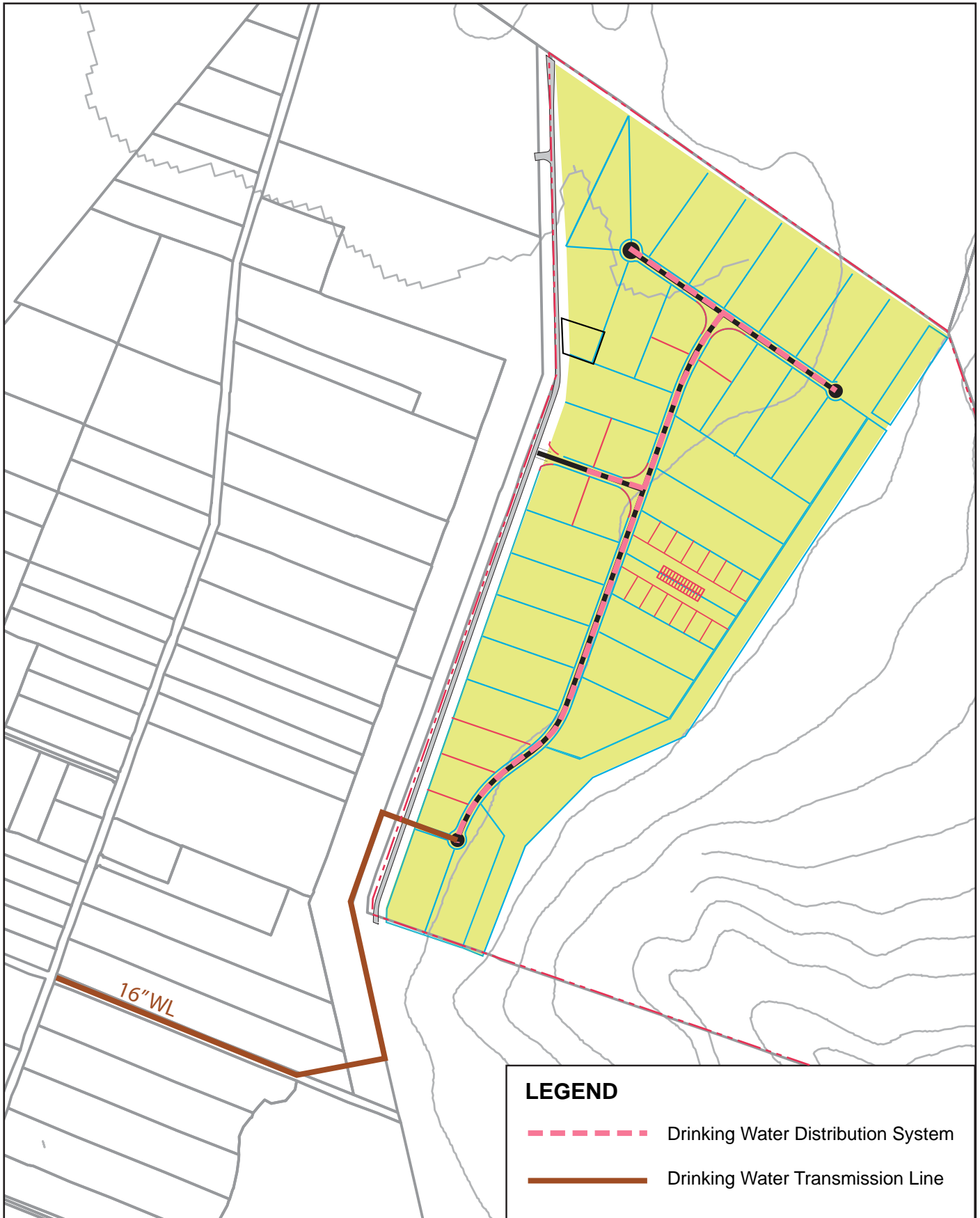


Figure 4
Drinking Water Distribution System
March 2010

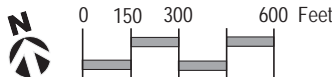
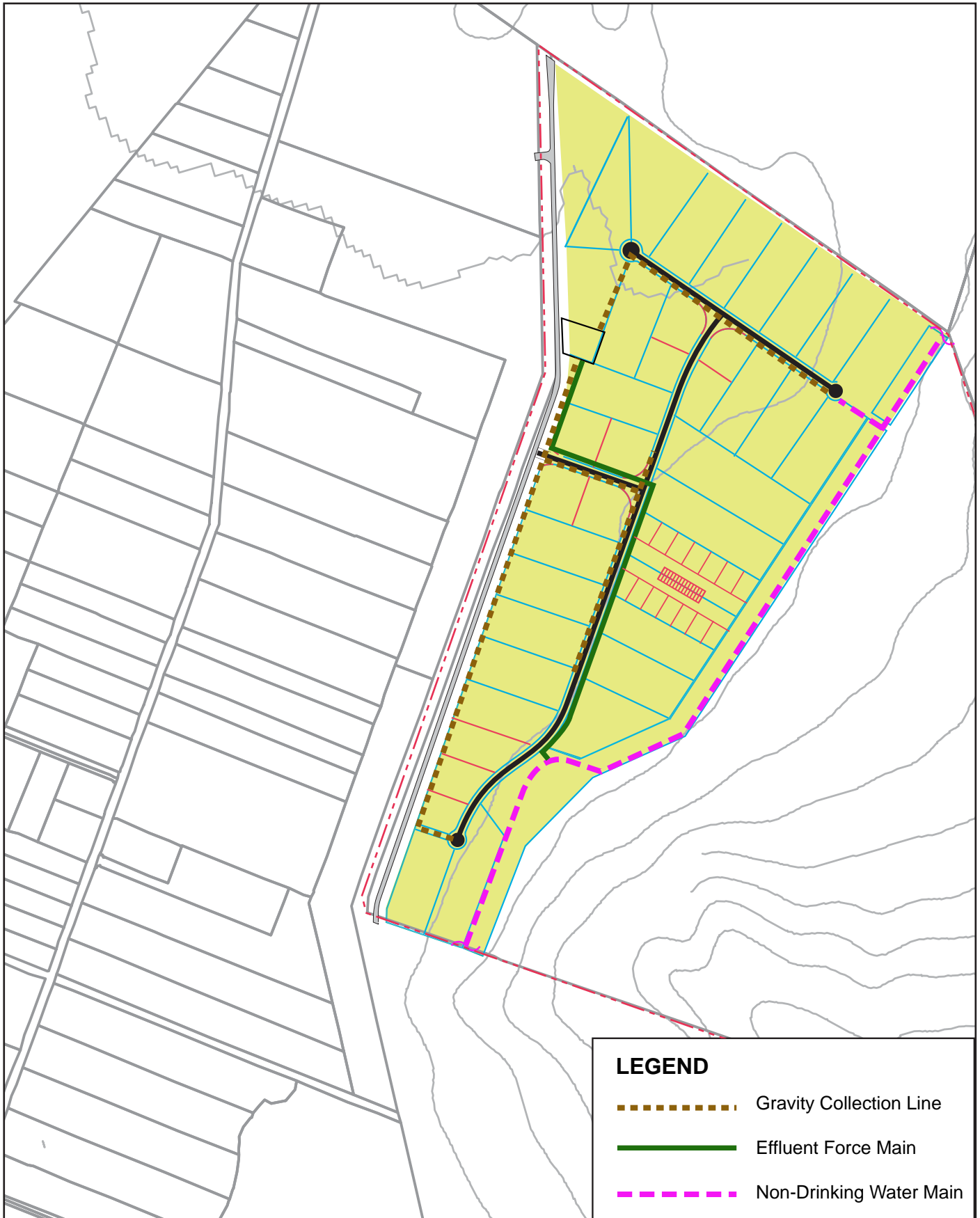


Figure 5
Wastewater System
March 2010

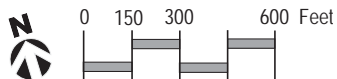
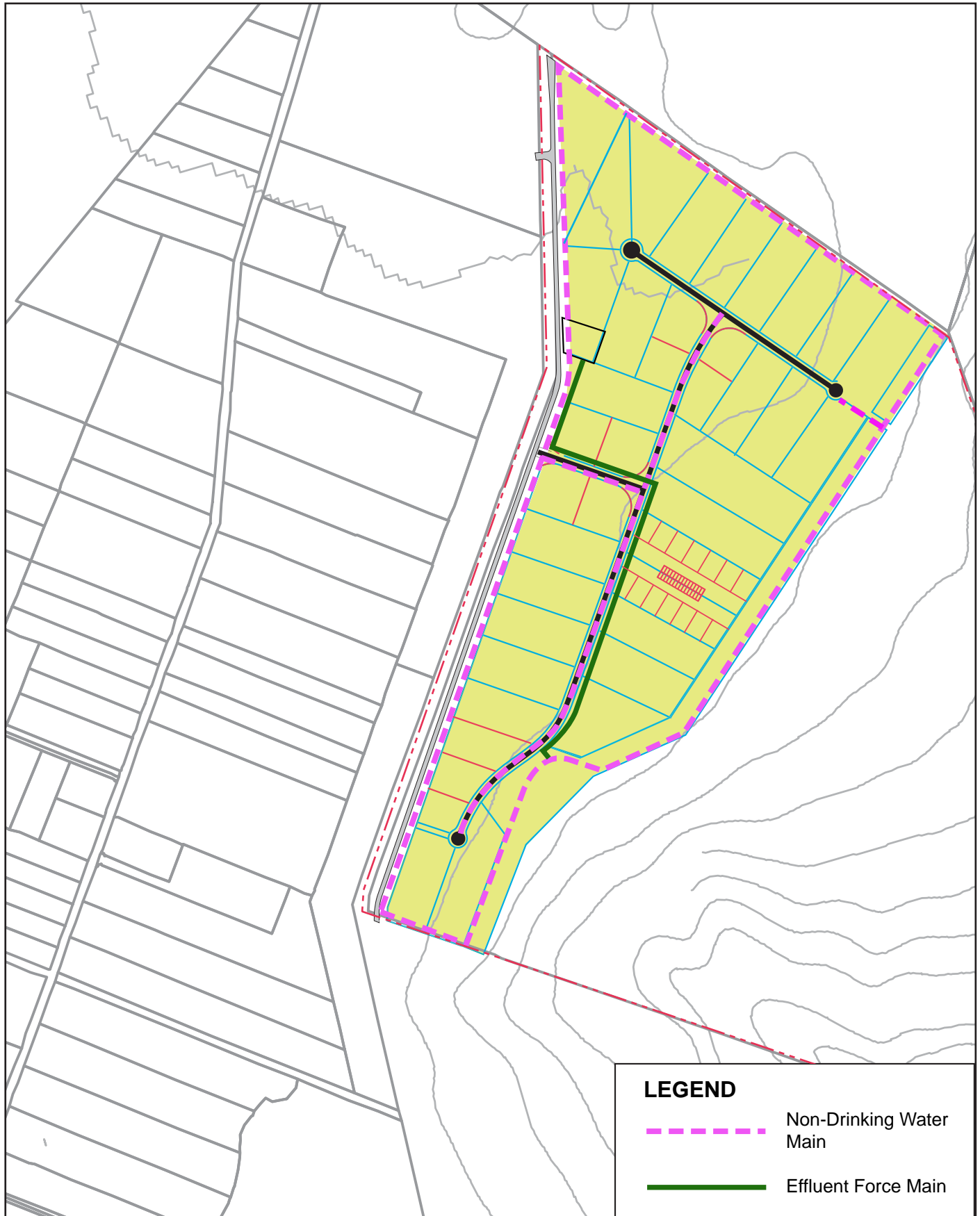


Figure 6
Non-Drinking Water System
March 2010

3.2 Preliminary Cost and Timetable

Based on the conceptual site plan, the preliminary cost for mass grading and infrastructure construction is estimated at \$29 million. Unit owners are expected to spend approximately \$30 million to construct unit improvements.

Project occupancy is expected to occur within 18 months from approval of necessary land use amendments, rezoning, and permits. As the master developer for the project, Tropic Land, LLC plans to construct the infrastructure for the light industrial park over a period of ten years. The phased development would proceed as shown in Figure 7. The affected land area and incremental infrastructure components are described in Table 4.

Table 4
Infrastructure Phasing Plan

Phase	Area (Acres)	Road* (Feet)	Grading** (Cubic Yards)	Wastewater Treatment System	Rockfall Mitigation	Irrigation	Off-site 16" Water Line	Fire Lane
I	23	1,400	40,000	X	X	X	X	
II	22	1,600	30,000			X		
III	15	400	25,000	X	X	X		
IV	36	1,300	53,000		X	X		X
Total	96	4,700	148,000					

* Road work to include curb, gutter, sidewalk, drainage, water, sewer, electrical, street lighting systems.

** Grading work is limited to the roadway and rockfall mitigation areas only; quantities approximate.

Industrial lot development will depend upon sales and market absorption. A market study for this project developed three forecasts for industrial land demand in the Wai‘anae planning area. The conservative forecast was based on the assumption that the Wai‘anae area would capture 1.5% of future industrial job growth on O‘ahu; the mid-range forecast was based on capturing 1.7% of future industrial jobs, and the aggressive forecast based on capture of 2.0% of future industrial jobs. Under the aggressive and mid-range forecasts, the 10-year demand for industrial land would exceed the supply of 70 net acres offered by this project. Under the conservative forecast, the 10-year demand for industrial land of 54 acres is 77% of the supply offered by this project. Under either forecast, Tropic Land can reasonably expect the project will be absorbed within 10 years of receipt of all government approvals. Under either forecast, Tropic Land can reasonably expect the project will be absorbed within 10 years of receipt of all government approvals. A summary of the market study is contained in Chapter 2 of this document and the full study may be found in Appendix B.

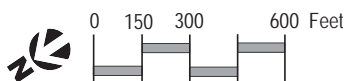
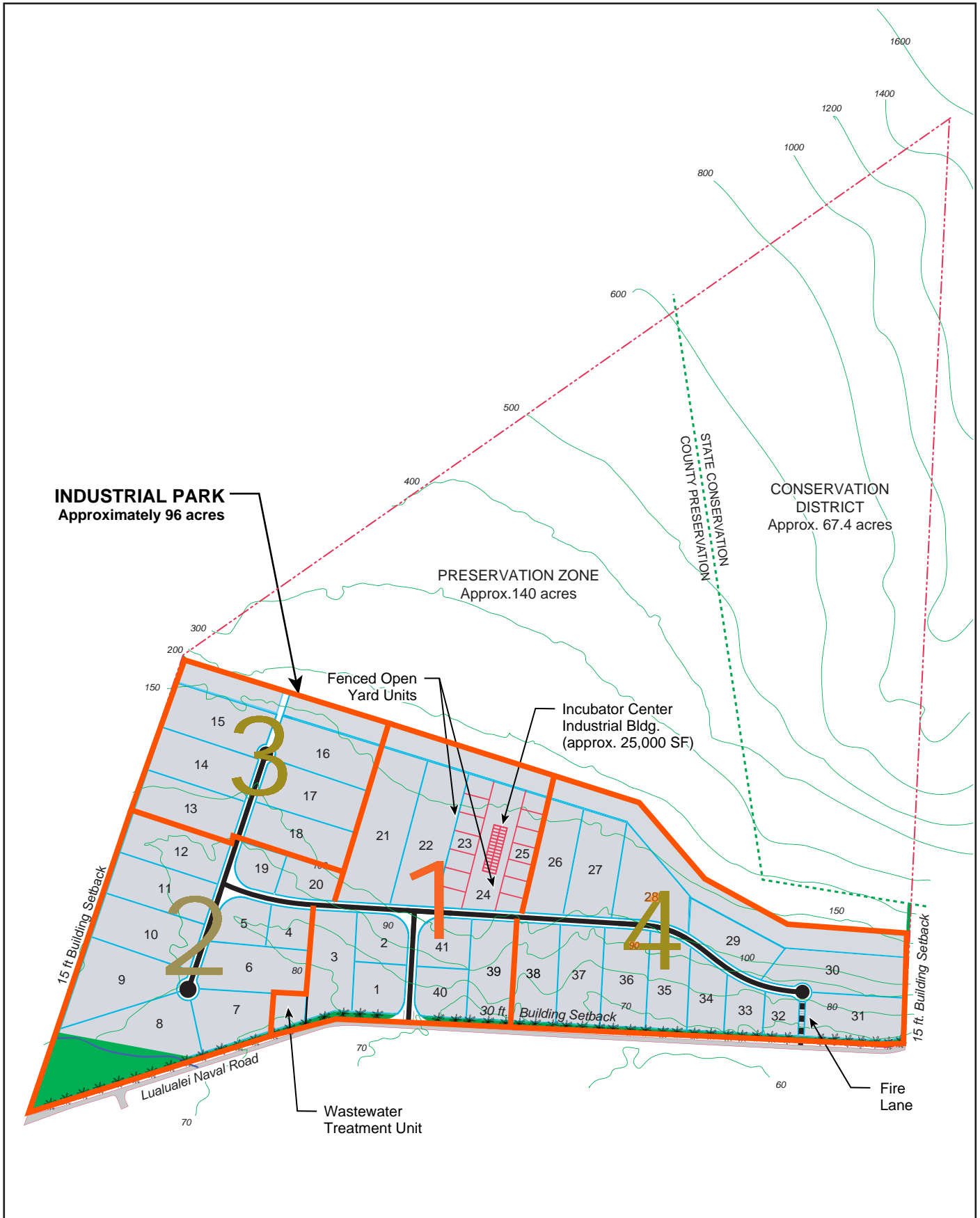


Figure 7
Project Phasing
March 2010

This page is intentionally left blank.

4. ALTERNATIVES CONSIDERED

This chapter discusses alternatives to the proposed development that were considered during the planning process.

4.1 No Action

Under the No Action alternative, the property would remain in its present fallow condition. The industrial facilities and associated infrastructure proposed under the Nānākuli Community Baseyard project would not be realized. This alternative would result in the loss of benefits generated by the proposed development:

- No light industrial uses would occur on the site. Demand for affordable industrial space on the Wai‘anae Coast would not be met.
- The employment forecast of 560 to 840 direct jobs at full build-out of the project would be a foregone benefit.
- Future opportunities for new businesses and relocation opportunities for businesses to relocate closer to their workforce would not be realized.

The No Action alternative does not meet the owner’s objectives, regional economic development benefits, and opportunities for new or expanded businesses, products, and markets. The No Action alternative would result in less environmental impacts than the proposed project since site conditions would remain unchanged. In light of changes made to the Wai‘anae Sustainable Communities Plan (draft currently under public review), this alternative would not address community support for limited industrial expansion.

4.2 Golf Course

The golf course alternative is based on an earlier master plan involving approximately 259 acres of Tropic Land’s land holdings, affecting TMKs 8-7-9: 2 (proposed industrial park site) and 8-7-10: 6 and 10 (located across Lualualei Naval Road). In addition to the regulation 18-hole golf course, the master plan includes a clubhouse, driving range, and nursery facility. The City Council approved a zoning change and Unilateral Agreement, effective September 24, 1996, that entitles the landowner to build the golf course project.

Figure 8 shows the footprint of the proposed light industrial park superimposed over the proposed golf course project. The proposed industrial park and golf course would entail conversion of the same amount of agricultural land (approximately 40 acres) with a “B” rating on the east side of Lualualei Naval Access Road. However, because of its larger footprint, the golf course would disturb about 50 percent more ground area than the proposed light industrial park. The light industrial park would have a greater amount of impermeable surfaces compared

to the golf course; however, each project is prohibited from increasing the net runoff from the property; therefore, drainage impacts will be the same. Neither project is expected to generate significant adverse effects on noise, air quality, threatened or endangered biological resources, or cultural resources.

Compared to the golf course, the proposed light industrial will have greater impacts in terms of traffic, water, and wastewater generated. These impacts are due to the significantly greater benefits in long-term employment, estimated between 560 and 840 jobs, compared to 70 for the golf course.

	Golf Course	Industrial Park
Area disturbed	145 ac.	96 ac.
Water use (drinking water)	9,850 gpd	22,550 gpd
Traffic generated	Weekday Peak AM: 73 Weekday Peak PM: 109	Weekday Peak AM: 522 Weekday Peak PM: 518
Jobs created	Construction: 170 person-year Long term: 70 jobs	Construction: 80-100 person-year Long term: 560 to 840 jobs

Despite existing entitlements, Tropic Land began considering alternative land uses upon acquiring the property in 2005. The search for other land use possibilities was based, in part, on community opposition to the golf course project that was evident in public comments on the EIS and during the City Council’s zoning deliberations. Moreover, the economic feasibility of developing a golf course has diminished over time with the decline of overseas visitors and the opening of other courses in West O‘ahu.

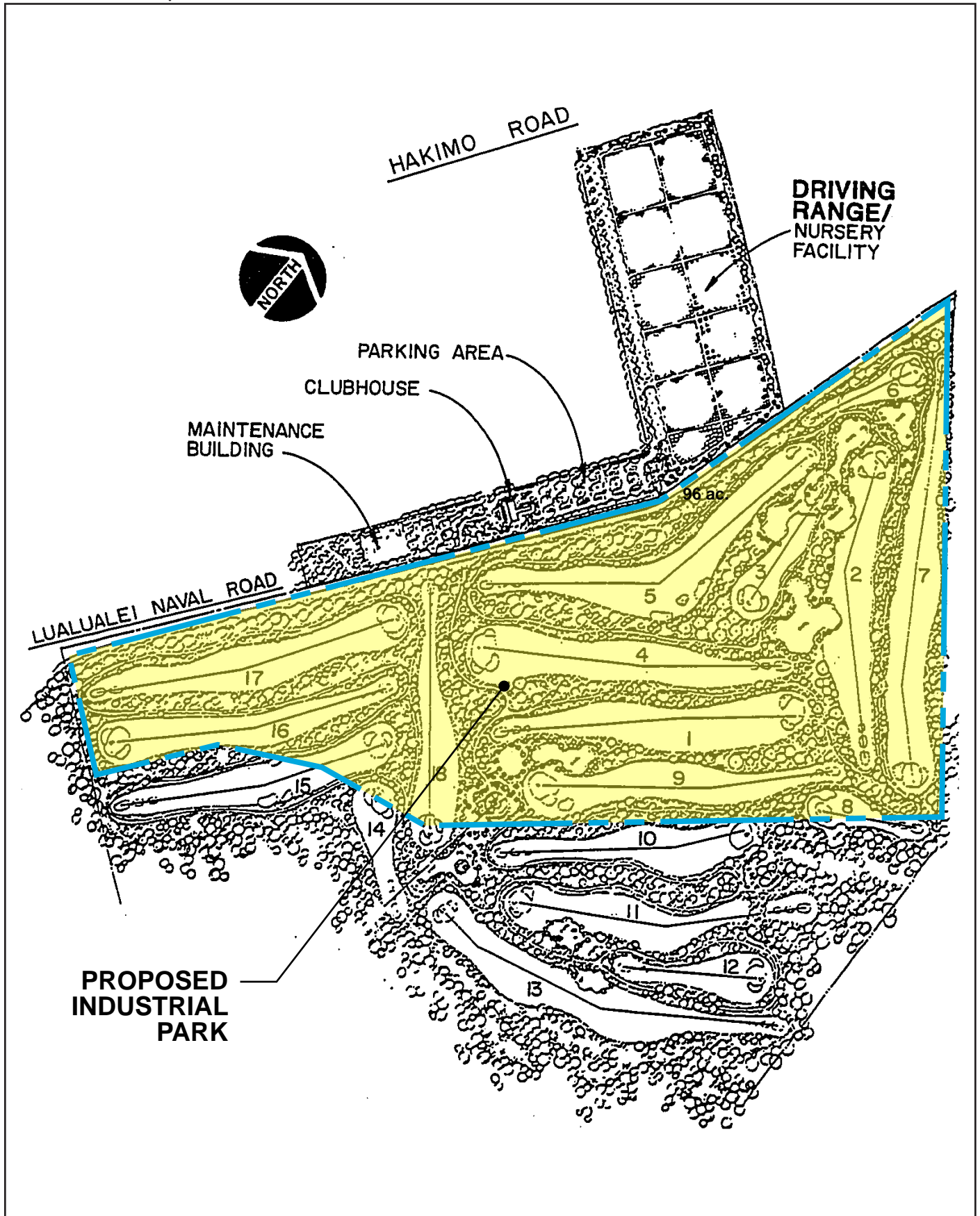


Figure 8
Comparison of Industrial Park and Golf Course

March 2010

4.3 Other Alternatives Considered

In 2007, project scoping meetings were held with the Wai‘anae Neighborhood Board—prior to establishment of the Nānākuli/Ma‘ili Neighborhood Board—during which suggestions for how the property should be developed were considered. Among the land uses suggested were affordable housing, amusement park, educational campus, golf driving range, heavy equipment training facility, and light industrial park. Of these, the light industrial park concept received a level of local endorsement that exceeded the other suggestions, with Tropic Land receiving numerous inquiries from business people and approximately 600 expressions of support from the community. Based on community interest, land use compatibility, and landowner experience and expertise, the other alternatives were considered but not pursued.

Farm Lots. Agricultural land use, either as a single operation or multiple farm lots was suggested initially by members of the Waianae Neighborhood Board and mentioned in some of the DEIS comments. Long-term use for agricultural purposes was dismissed as an alternative based on the agricultural consultant’s report and information obtained from individuals who previously farmed the project site. Following publication of the DEIS, Tropic Land further investigated the history of farming on the project site. Interviews were conducted with three men who have first-hand experience in farming the property. Appendix L contains oral histories provided by:

- Tadashi Araki, who, with his brother, farmed the site for approximately 25 years, ending in the early 1980s
- Sonny Bradley, who helped to install the irrigation system on the Araki farm, and whose relatives worked for the Arakis
- Albert Silva, whose *ohana* previously owned the property, who has been on the property since childhood, who raised cattle on a portion of the property, and who was employed at the Naval reservation, now known as JBPHH Lualualei Annex

A common theme of the interviews was the inability of the stony, adobe soil to support productive farm activity. Mr. Araki’s account details the intensive practices used to achieve a viable farm, including soil conditioning and amendments, pest control, experiments with different types of crops and auxiliary agricultural products, and advice from technical experts.

The poor outcomes obtained by the Araki brothers are consistent with Tropic Land’s own experience with on-site horticultural production. Since 2007, Tropic Land has cultivated a variety of palm trees in an attempt to landscape the setback areas. Despite soil amendments, fertilization, and irrigation, tree growth is stunted. There is no evidence that farming would be a sustainable enterprise given the particular conditions of this site. Therefore, agriculture is not considered a viable alternative.

4.4 Alternative Locations for the Light Industrial Park

Private, undeveloped land zoned for industrial use is unavailable on the Wai‘anae Coast (see Figure 23). Except for less than 5 acres in Wai‘anae Town, all other industrial land is used for public or quasi-public purpose, or supports an ongoing business. Therefore, implementing Tropic Land’s concept of industrial space for the “employment and service needs of rural and suburban communities”—as the I-1, Limited Industrial District is defined in the City and County of Honolulu’s Land Use Ordinance—is not possible without rezoning and, likely, redistricting.

4.5 Alternative Industrial Park Configurations

The planning process included an examination of alternative configurations for the proposed industrial park. The limits of development were established by the steep slopes in the interior of the property. Within the flatter area, the alternatives featured variations in roadway layout and lot division. In addition to the preferred site plan, two alternatives were considered (Figure 9).

Alternative A. This layout features two entrances to the development with internal roads forming a single “T” intersection. Ultimately, this alternative was dismissed in favor of a site plan with a single entrance with gate control for improved security.

Alternative B. This alternative features a single entrance, supplemented by a secondary fire lane for emergency access. However, the layout involves a more extensive network of roads and utility lines, resulting in higher development costs than the preferred site plan.

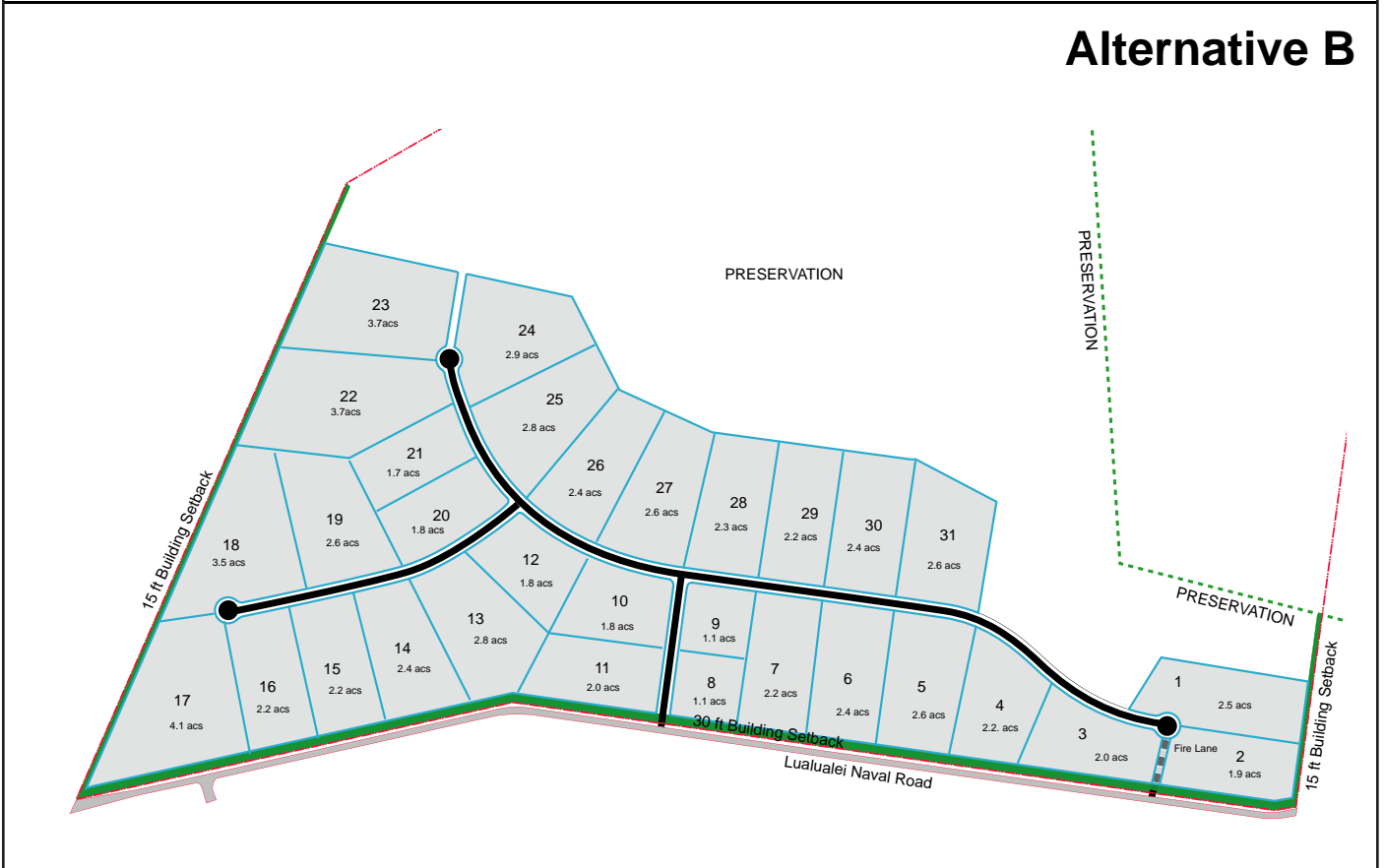
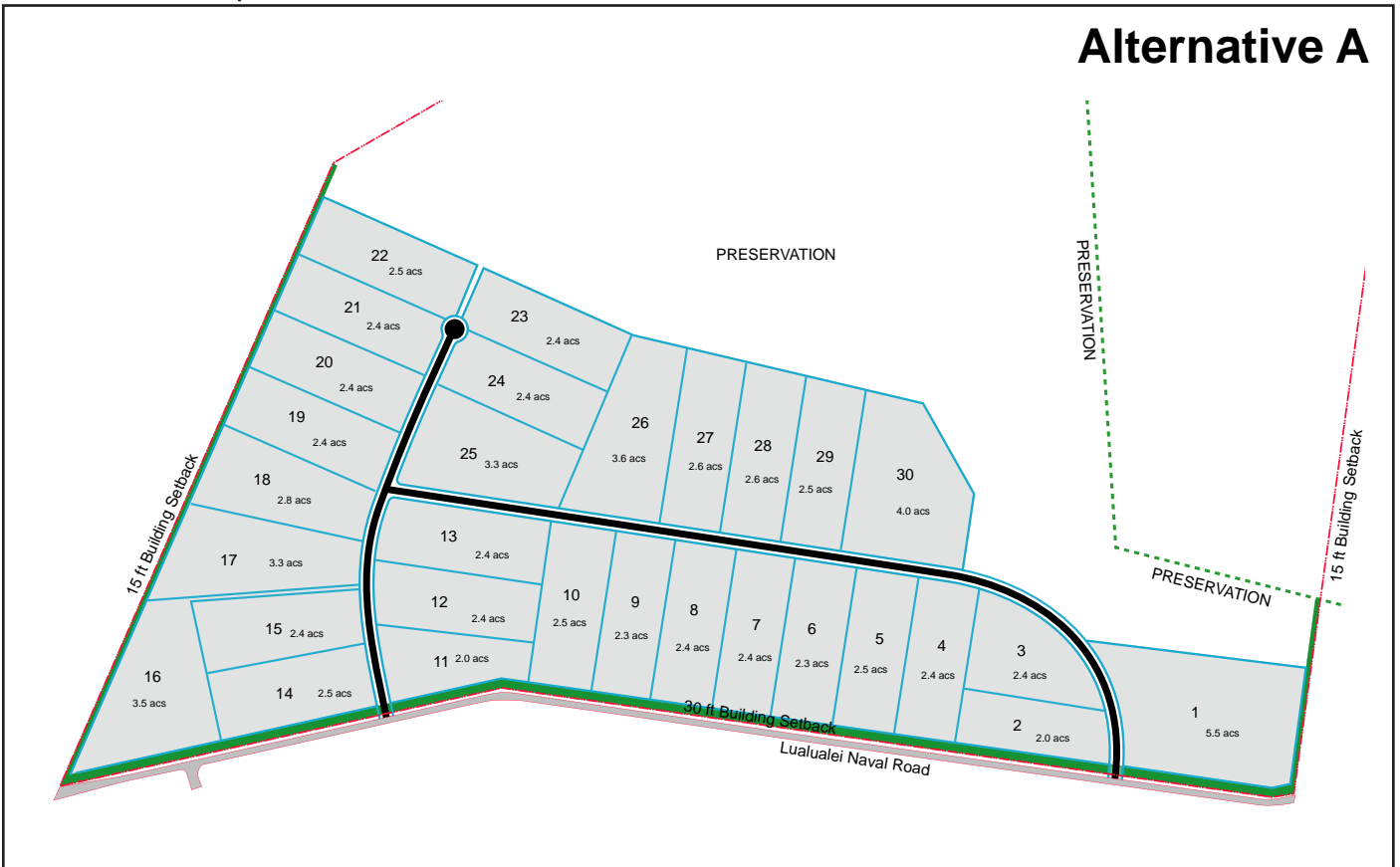


Figure 9
Alternative Industrial Park Configurations

March 2010

5. AFFECTED ENVIRONMENT, ANTICIPATED IMPACTS, AND MITIGATION MEASURES

This chapter presents background information on the existing human and natural environment pertaining to the project site. Utilizing this background, the proposed project is evaluated as to the potential for it to generate significant environmental impacts. Impact discussions are divided into short-term construction-related impacts and long-term operations-related impacts. Mitigation measures are identified and recommended in this chapter.

Technical consultant reports have been prepared to supplement the environmental impact statement. Findings from these reports are included herein and the reports may be found in the appendices.

5.1 Topography and Soils

Existing Conditions

Topography

Generally, the project site slopes in a southwesterly direction towards the Lualualei Access Road. Approximately one-third of the parcel is situated below the 200-foot elevation above sea level. This area is relatively flat, sloping at a 12% rate from Lualualei Access Road upward to the foothills of Pu‘u Heleakala ridge.

Above the 200-foot elevation, the site 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.

Soils

Soil types or classifications for the project site are based on soil surveys by the U.S. Department of Agriculture, Natural Resources Conservation Service (formerly Soil Conservation Service). According to the soil surveys, the project site contains mostly Lualualei extremely stony clay (LPE) with some Lualualei clay (LuB) on portions of the site directly abutting Lualualei Access Road and covering the flatter portions of the site (Figure 10). This section focuses on the erosion potential of on-site soils. Please see Section 4.7 for a discussion of soil suitability for agricultural production.

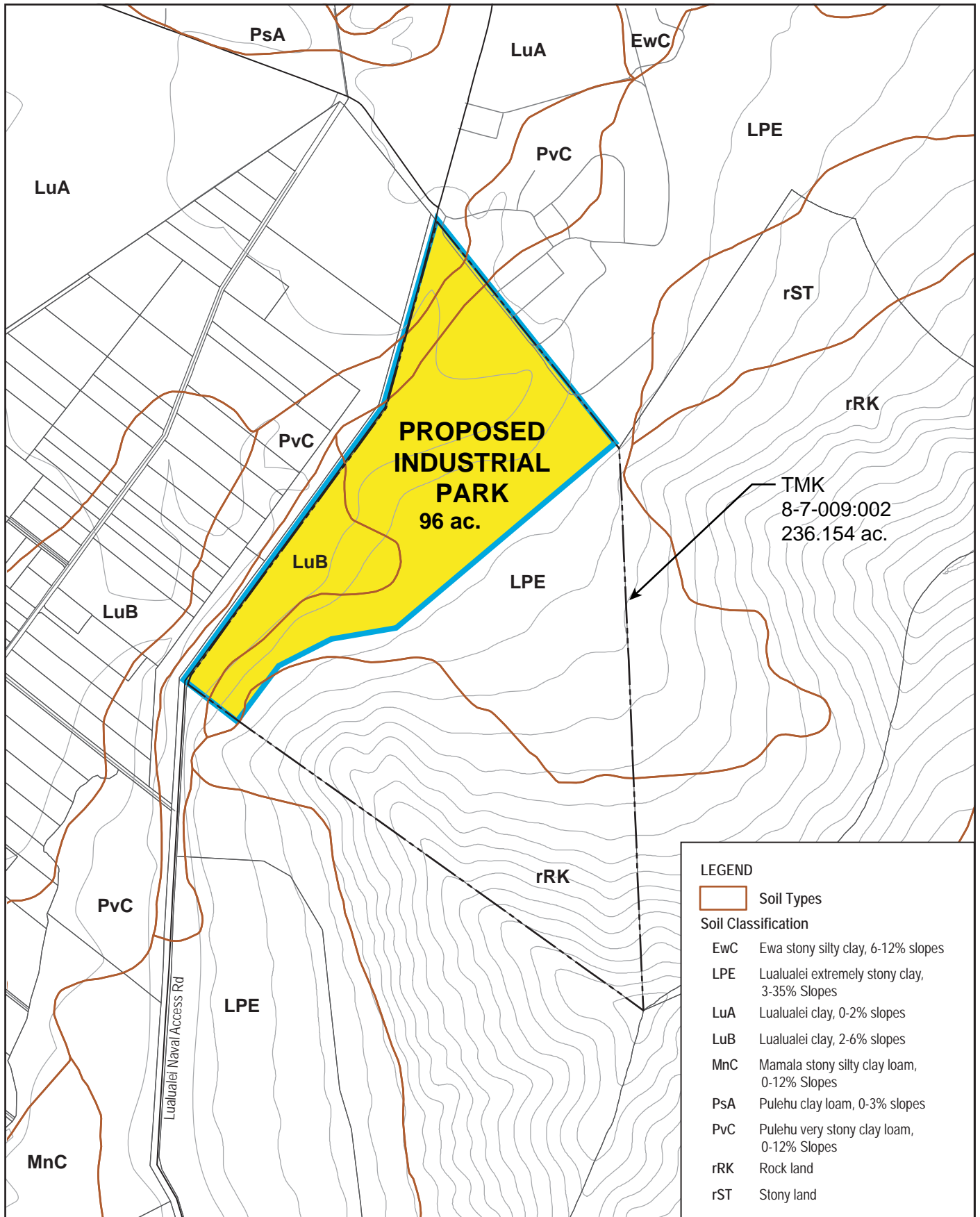


Figure 10
Soils Map
 March 2010

Erosion Potential

Most of the project site consists of LPE extremely stony clay. LPE soils occur on talus slopes on O‘ahu that range from 3 to 35 percent. The soil is similar to LuB soils except that there are many stones on the surface and in the profile. Runoff is medium to rapid, and the erosion hazard is moderate to severe in steeply sloped areas. LuB soils are also present in the project site and characterized by slow runoff with a slight erosion hazard.

Grading

The grading concept is to provide relatively level lots. Total earthwork quantities of cut and fill for the development is estimated to be approximately 450,000 cubic yards (CY). An effort to balance earthwork quantities is expected to minimize the cost of purchasing off-site borrow material and/or disposing of excess excavated material at an off-site location. Grading operations will be in conformance with the applicable ordinances of the City and County of Honolulu.

Soil Erosion

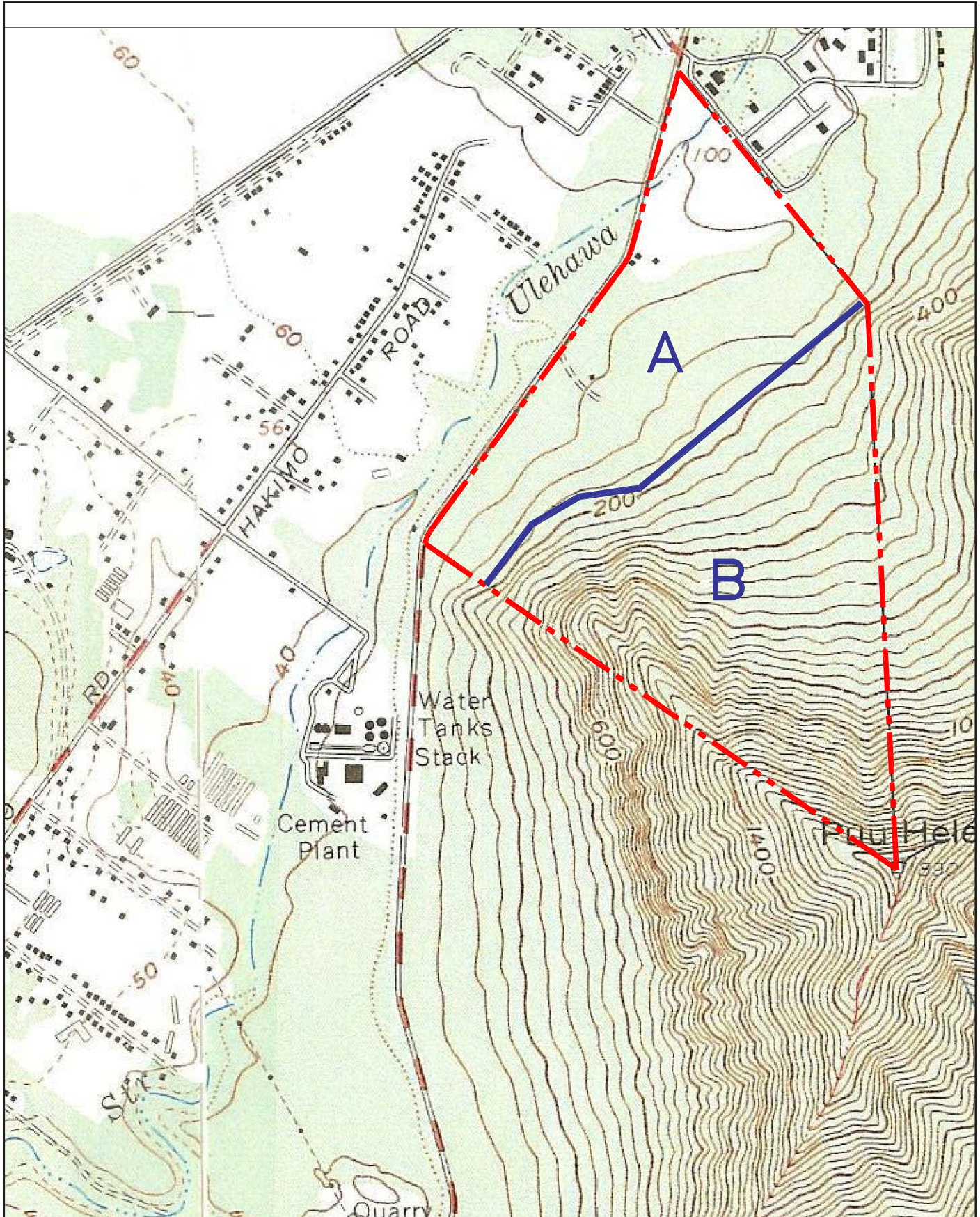
The project site was divided into two subareas for the purpose of calculating soil erosion potential (Figure 11). These subareas represent sites within the project area that vary in soil erosion potential characteristics, such as terrain and/or drainage network.

Subarea A, part of the Ulehawa Stream drainage basin, directly abuts Lualualei Access Road and covers the flatter portion of the project site. Subarea A occupies the approximate limits of the project area and is bounded to the north by the Naval installation, south by the ridge line of Pu‘u Heleakala, west by Lualualei Naval Access Road, and east by the approximate 190-foot contour. The entire area of Subarea A will be graded for the proposed industrial park.

Subarea B is located south of subarea A and is bounded on the south and east by the ridge line, and north by the approximate 190-foot contour, occupying an area of approximately 140 acres. Subarea B consists of medium-dense and rocky outcroppings with slopes ranging from 25 to 60 percent. No development is planned for Subarea B and it will remain in its existing state.

Soil Erosion Potential under Existing Conditions

As calculated in the *Preliminary Engineering Report* by Hida, Okamoto and Associates (October 2009 ~~October 2009~~ January 2010), see Appendix A) and using the U.S. Department of Agriculture, Universal Soil Loss Equation (USLE), the existing soil erosion potential of Subarea A (project site) is estimated at 403 tons/year. The existing soil erosion potential of Subarea B (the remaining 140 acres of the TMK) is estimated at 5,306 tons/year. Therefore, total existing erosion potential of the entire parcel is estimated at 5,706 tons/year.



Source: Hida, Okamoto & Associates, Inc., January 2010

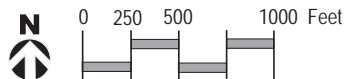


Figure 11
Subareas for Calculation of Soil Erosion Potential

March 2010

Soil Erosion Potential after Development

The long-term change in soil erosion potential based on the proposed land use change also was estimated using the USLE. After development, the soil erosion potential of Subarea A (project site) has been estimated at 264 tons/ year. The erosion potential of Subarea B (remainder of the TMK) would be unchanged at 5,306 tons/year. For the entire parcel, the estimated soil erosion potential after development is 5,570 tons/year.

Potential Impacts and Mitigation Measures

Topography

The project site plan consists of a development pattern that is compatible with the topography of the site. The light industrial park is confined to areas with flatter slopes below the 200-foot elevation. As shown in Figure 8 (Chapter 4 of this document), the development footprint is smaller than the golf course previously proposed for the site, and will leave more of the foothills undeveloped.

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 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 basin. Engineering plans will be prepared during the project design phase.

Soil Erosion

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

Using the USLE, the short-term construction impact was calculated at 36,860 tons of soil erosion for a one-year period. Of this amount, approximate 10% (3,690 tons) could potentially affect Ulehawa Stream.

Mitigation measures will be implemented to reduce short-term soil erosion. These measures include limiting grading to not more than 15 consecutive acres at a time and installing a sedimentation basin at least 12,000 square feet in size at the grading site.

Additional Best Management Practices (BMPs) will be taken to lessen construction impacts further, as listed below.

- Minimize time of construction to the extent possible.
- Retain existing ground cover until the latest date before construction.

- Sod or landscape all cut and fill slopes immediately after grading work has been completed.
- Early construction of drainage control features (i.e., detention/retention basins).
- Use of temporary area sprinklers and spraying in non-active construction areas when ground cover is removed.
- Station water truck on site during construction period to provide for immediate sprinkling, as needed, in active construction zones (weekends and holidays included).
- Use temporary berms and cutoff ditches, where needed, for erosion control.
- Thorough watering of graded areas after construction activity has ceased for the day and on weekends.
- Provide sedimentation basins.
- Use slope stabilization materials where needed.

A Grading and Erosion Control Plan will be prepared in compliance with Chapter 23 14, Revised Ordinances of Honolulu. Further, the National Pollutant Discharge Elimination System (NPDES) general permit will be obtained from the Department of Health, Clean Water Branch for: construction activities. The NPDES permit will include site-specific BMPs.

Long-term Impacts. Based on the USLE, the soil erosion potential of the entire parcel (TMK) should decrease after the proposed industrial park is developed. As shown in Table 5, the erosion potential of Subarea A is estimated to decrease by ~~0.55 tons/acre/year (139 tons/year) or 66%~~ 343 tons/year or 85%. Thus sediment transport should decrease after development.

Table 5
Summary of Soil Erosion Potential

Subarea	Existing Conditions (tons/year)	Developed Conditions (tons/year)	Percent Change (%)
A	403	264 <u>60</u>	-66 <u>-85</u>
B	5,306	5,306	0
Total	5,709	5,570 <u>5,366</u>	-2 <u>-6</u>

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

5.2 Groundwater Resources

The information contained in this section is based on a 1988 study of groundwater sources within the property and immediately surrounding area conducted by John F. Mink entitled *Groundwater Resources, Maile [sic], Wai‘anae, Pu‘u Haleakala to Ulehawa Stream*, October, 1988, appended to the Final Environmental Impact Statement for the Oban golf course project.

Existing Conditions

Mā‘ili is the driest part of the island of O‘ahu, receiving no more than an average of 25 inches of rain per year. Two-thirds of the total annual rainfall occurs from rainstorms between November and April.

Two separate aquifers occur on the property: one consisting of limestone in the valley and the other composed of basalt underlying the valley fill and talus slopes. These aquifers are independent of each other.

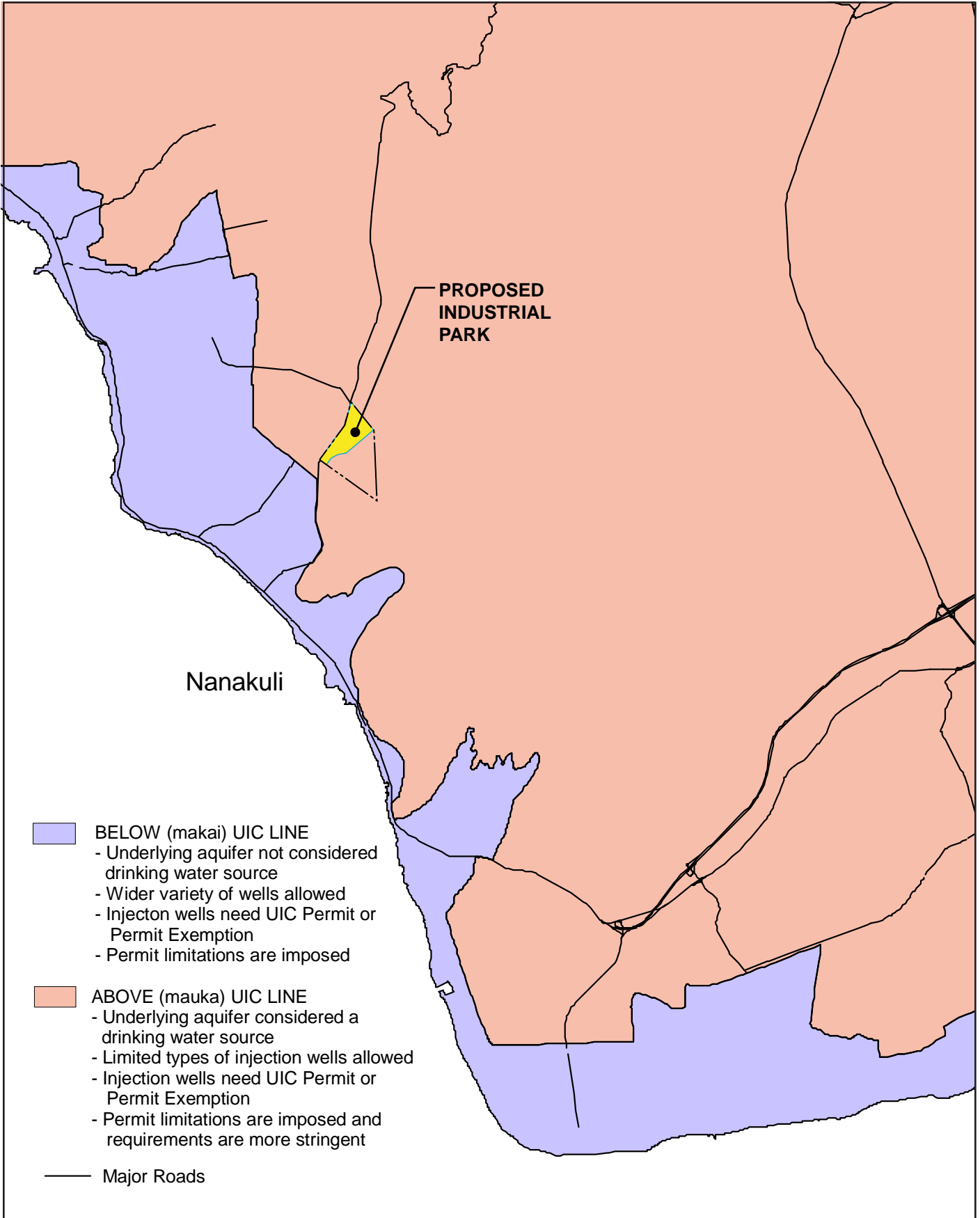
The limestone stratum extends throughout Lualualei Valley below the approximately 100-foot elevation contour, while the basalt constitutes the basement of the entire Wai‘anae district and is exposed as slopes and ridges above the level valley floor. The source of groundwater in the limestone is recharged from rainfall and from mountain runoff reaching the valley; the source in the basalt is rainfall on talus slopes and ridges exposed to bedrock.

Figure 12 shows a map of the Underground Injection Control (UIC) area. The UIC program, in conjunction with federal and State safe drinking water laws, is intended to protect groundwater from contamination. As shown in the map, the project site is located mauka of the UIC line, in an area with restrictions on injection wells.

Potential Impacts and Mitigation Measures

The previous owner, Oban, had drilled two wells with the expectation of tapping groundwater as a source of irrigation water for the proposed golf course and nursery. Groundwater will not be used for the proposed light industrial park and the existing wells will remain capped. Tropic Land is not planning to site, construct, or operate any injection well that could endanger underground sources of drinking water.

No mitigation is necessary.



Source: Department of Health, EGIS 9/99

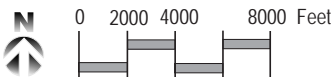


Figure 12
Underground Injection Control Area Map

March 2010

5.3 Surface Water Resources

This section discusses surface water conditions at the project site. Information contained in this section is based on the *Preliminary Engineering Report* by Hida, Okamoto & Associates, ~~October 2009~~ January 2010(Appendix A).

Existing Conditions

The Ulehawa Stream drainage basin encompasses approximately 3,178 acres of land and several tributaries which discharge into Ulehawa Stream. A section of Ulehawa Stream, measuring approximately 665 feet, passes through the northwest portion of the project area. In this section, stream flow is intermittent with a normally dry bed. Figure 13 shows the Ulehawa Stream drainage basin. The Ulehawa Stream watershed stretches from sea level to Ulehawa Beach Park to a maximum elevation of 3,098 feet at Palikea, at a distance of over 4.5 miles.

At the project site, the ridges to the west and south of the proposed development area are the most significant features of the watershed. Runoff from off site travels down-slope via the gulches and overland flow. Currently, runoff is conveyed across Lualualei Naval Access Road through four culverts beneath the roadway, eventually draining to Ulehawa Stream.

Existing Drainage Conditions

The Ulehawa Stream drainage basin was divided into 3 sub-catchment areas to determine the peak discharge using the County’s Storm Drainage Standards (Figure 12). Runoff peak flows were estimated for each sub-catchment area for a 100-year flood event as shown in Table 6.

Table 6
Pre-Development Peak Flows

Area Identification	Area (Acres)	100-Year Flow (cubic feet per second or cfs)
A	1,084	2,800
B-1	370	1,350
B-2	236	840
C	1,488	3,600
Total	3,178	8,590

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

The Flood Insurance Rate Map (FIRM) indicates that the entire project site is situated within Flood Area Zone D (areas in which flood hazards are undetermined). There are currently no drainage improvements within the project site.

As noted above, the project site contains Lualualei Soils which typically have two horizons, the surface A horizon and the underlying parent material or C horizon. In areas with nearly level topography the A horizon may be about 2 feet deep, but on the talus slopes the surface soil is expected to be thinner.

This soil cracks widely upon drying, but has a high shrink-swell potential so that the cracks close when the soil is thoroughly wetted. This shrink-swell characteristic has a great impact on the infiltration of water and permeability of the soil. When the soil is dry, water infiltration into the surface soil can be rapid; but once the cracks close in the wetted soil, the infiltration of water is greatly reduced. Consequently, runoff is medium to rapid on the steeper slopes.

Modifications After Development

Development will impact the hydrology of the watershed as sections of undeveloped land will be replaced with impervious surfaces (such as roads, buildings, and parking areas) 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.

The construction of new roadways and industrial lots will transect across the hillside. Basic drainage patterns and sub-catchment areas are unlikely to change, but have been divided into more discrete areas for analytical purposes (Figure 13). The estimated 10-year, 50-year, and 100-year peak flows through the development area are summarized in Table 7.

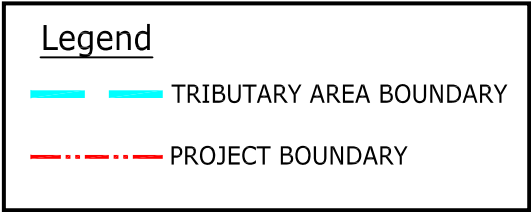
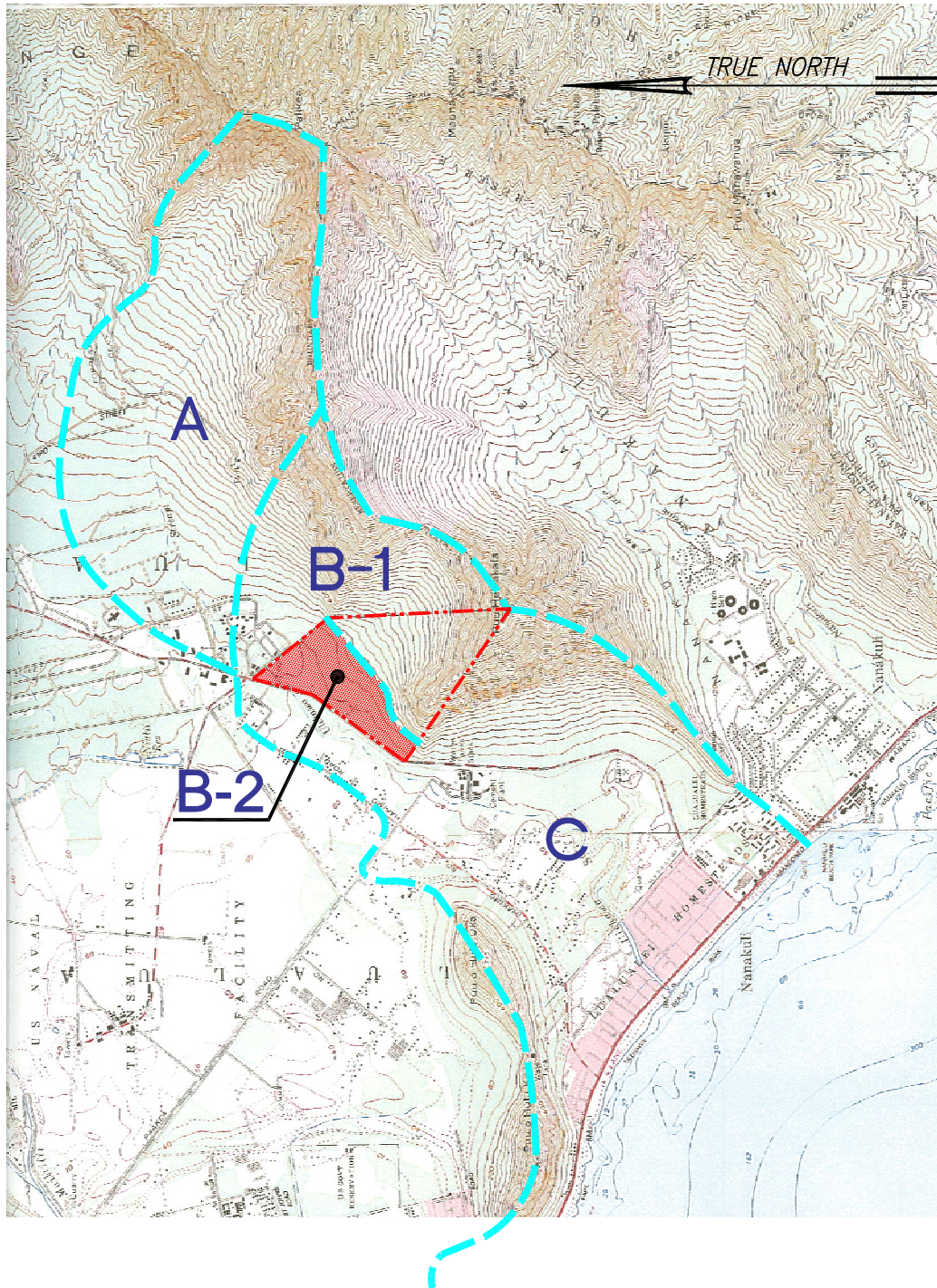
Table 7
Post-Development Peak Flows

Area Identification	Tributary Area (acres)	10-Year Flow (cfs)	50-Year Flow (cfs)	100-Year Flow (cfs)
A	1,084			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			

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

Potential Impacts and Mitigation Measures

Retention (or detention) facilities are typically constructed to retain increases in storm runoff that occurs as a result of development. These facilities will include open basins, detention ponds, and/or underground storage facilities. Tropic Land proposes to construct an unlined drainage swale or channel in the 100-foot wide strip of land *mauka* of the industrial lots. This detention basis will be designed to accommodate peak flow runoff from the hillside. By incorporating these elements into the industrial park’s design, there will be no net increase in the discharge of peak storm runoff from the project site due to existing conditions.



Source: Hida, Okamoto & Associates, Inc., January 2010

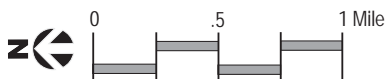
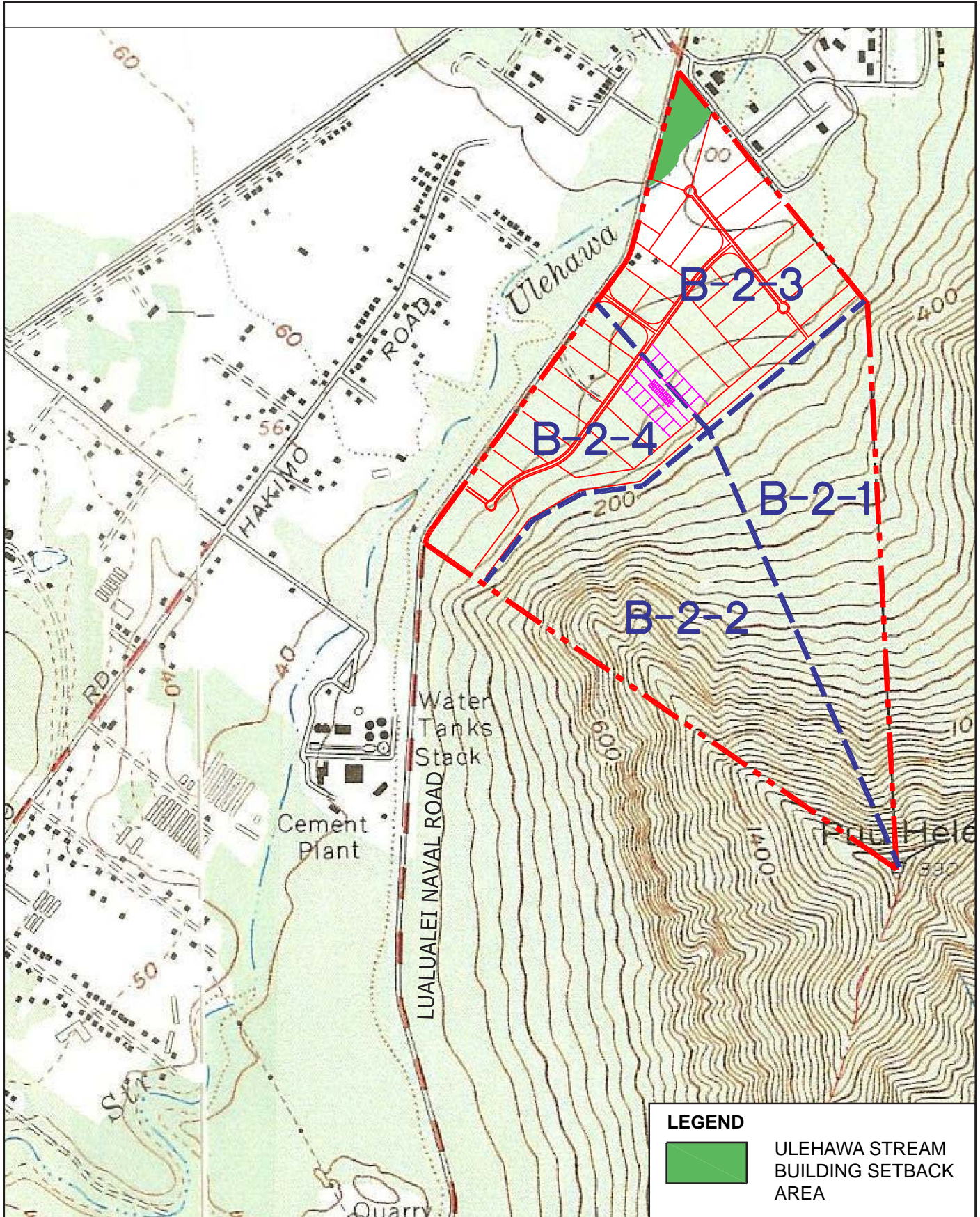


Figure 13
Pre-Development Catchment Areas

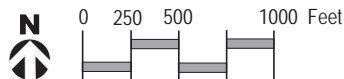
March 2010



Source: Hida, Okamoto & Associates, Inc., January 2010

Figure 14
Development Catchment Areas

March 2010



Stormwater Quality

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

During the detailed design of infrastructure, the consulting engineer will work with the City to confirm necessary water quality standards and develop an effective set of Best Management Practices (BMPs) for the project. The objective of the water quality BMPs is to mitigate the impact of pollutants (sediment, grit, oil, heavy metals) that could potentially enter the drainage system from frequent, smaller rainfalls. Plants and landscaping will be incorporated into the design to absorb particles and filter heavy metals. Additional water quality BMPs include the construction of infiltration swales along the roadway. These swales collect runoff, filter particles, and provide infiltration to recharge the groundwater.

Ulehawa Stream

Ulehawa Stream, an intermittent and normally dry-bed stream, will not be altered in any manner to accommodate the proposed project. Instead, it will be incorporated in its current natural state in the buffer area fronting Lualualei Naval Access Road. In the proposed site plan, the stream is shown outside the proposed development area.

Off-site Improvements

Runoff from the proposed development will be conveyed across Lualualei Naval Access Road through the existing culverts. On the north side of the road, runoff flows through Ulehawa Stream. The capacity of the culverts will be re-examined during the preliminary design stage to assess their adequacy and whether improvements are needed.

5.4 Natural Hazards

Flooding

Existing Conditions

According to the Federal Emergency Management’s Flood Insurance Rate Map (FIRM), lands at the project site are designated as Zone D, an area of “undetermined, but possible flood hazards” (see Figure 15).

Potential Impacts and Mitigation Measures

The project area is located in an area of low rainfall activity, but there are occasional storm events. The *mauka* buffer area will serve as a drainage channel that, combined with on-site catch basins, will address potential flood hazards. Buildings will be set back from Ulehawa Stream through the reservation of a buffer area in the northwest corner of the project site.

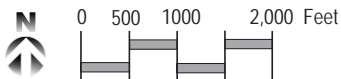
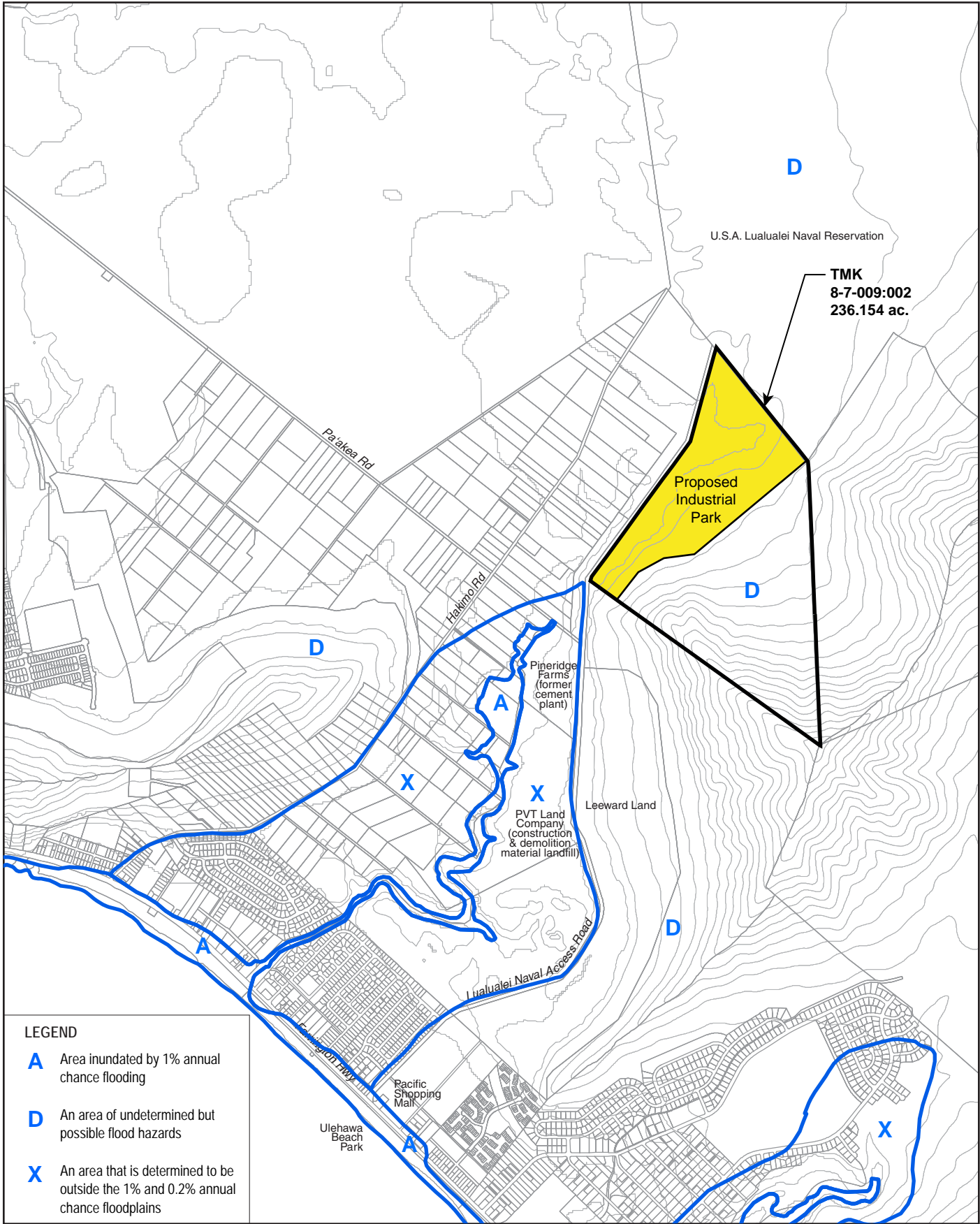


Figure 15
Flood Insurance Rate Map

March 2010