DEPARTMENT OF PLANNING AND PERMITTING
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET, 7TH FLOOR • HONOLULU, HAWAII 96813
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JUL 23 2010

MUFI HANNEMANN
MAYOR

DAVID K. TANOUE
DIRECTOR

ROBERT M. SUMITOMO
DEPUTY DIRECTOR

2010/ELOG-209 (mw)

June 28, 2010

Ms. Katherine Puana Kealoha, Director
Office of Environmental Quality Control
State of Hawaii
235 South Beretania Street, Suite 702
Honolulu, Hawaii 96813

Dear Ms. Kealoha:

Subject: EIS Preparation Notice for the Kapa'a Light Industrial Park, Kailua, Koolaupoko, Oahu, TMK 4-2-15: 1 (por.), 6 and 8

We are the accepting authority for this project. Based on the Final Environmental Assessment prepared for this project, we have determined that the proposed action may have a significant effect, and thus are issuing an Environmental Impact Statement Preparation Notice for this project.

A hard copy and a CD of the Final Environmental Assessment for the above project are attached. We have already e-mailed your office the OEQC publication form, as per your web site's instructions.

Please publish a notice for this project in your next issue of The Environmental Notice.

Should you have any questions, please contact Mike Watkins of our staff at 768-8044.

Very truly yours,

David K. Tanoue, Director
Department of Planning and Permitting

DKT:js

cc: Kapa'a I, LLC

Enclosures: 1 hard copy of the FEA
1 CD of the FEA

Transm'l to OEQC

FINAL ENVIRONMENTAL ASSESSMENT
FOR
KAPA'A LIGHT INDUSTRIAL PARK
KAILUA, HAWAII

Prepared For:
Kapa'a I, LLC
905 Kalanianaloe Hwy.
Kailua, HI 96734

Prepared By:
Marc M. Siah & Associates, Inc.

December 2009

Marc M. Siah & Associates, Inc.

Consulting Civil • Structural • Environmental & Ocean Engineers
820 South Beretania Street, Suite 201, Honolulu, Hawaii 96813

FINAL ENVIRONMENTAL ASSESSMENT
FOR
KAPA'A LIGHT INDUSTRIAL PARK

This environmental document is prepared pursuant to Chapter 200 of Title 11, Department of Health Administrative Rules, "Environmental Impact Statement Rules"

PROPOSING AGENCY

Kapa'a I, LLC
Kailua, Hawaii

ACCEPTING AUTHORITY

Department of Planning & Permitting
City and County of Honolulu

PREPARED BY:

Marc M. Siah & Associates, Inc.
820 S. Beretania Street, Suite 201
Honolulu, HI 96813
(808) 538-7180

December 2009

PREFACE

This Final Environmental Assessment is prepared pursuant to the requirements of Chapter 343, *Hawaii Revised Statutes*, Act 241, Session Laws of Hawaii 1992, and Chapter 200 of Title 11, Department of Health Hawaii Administrative Rules, “Environmental Impact Statement Rules”.

This Final Environmental Assessment is prepared to be submitted, as part of Zone Change Application, to the City and County of Honolulu Department of Planning and Permitting. This assessment documents the technical characteristics and environmental impacts of the proposed Kapa’a Light Industrial Park project and presents the findings, determination, and reasons supporting the determination associated with the significance of the project.

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SUMMARY OF THE FINAL ENVIRONMENTAL ASSESSMENT FOR KAPA'A LIGHT INDUSTRIAL PARK

Marc M. Siah & Associates, Inc.

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SUMMARY OF THE FINAL ENVIRONMENTAL ASSESSMENT

FOR

KAPA'A LIGHT INDUSTRIAL PARK

A. Proposing Agency:

Kapa'a I, LLC
905 Kalanianaloe Hwy.
Kailua, HI 96734
Contact: Mr. John King

B. Approving Agency:

City and County of Honolulu
Department of Planning & Permitting
650 So. King St, Honolulu, HI 96813
Contact:

C. Consultant

Marc M. Siah & Associates, Inc.
820 S. Beretania Street Suite 201
Honolulu, Hawaii 96813
Contact: Manfred Zapka, Ph.D., P.E., CEM

D. Name of Action

Environmental Assessment for the Proposed Kapa'a Light Industrial Park

E. Description of Proposed Action

Kapa'a I, LLC and John King propose to expand the existing light industrial warehouse development on three contiguous land parcels that are located in the Kapa'a valley, on the windward side of Oahu. There are presently about 250,000 square feet of warehouse space in the existing warehouses development, many of them Quonset structures, on one of the parcels. The proposed expansion of the warehouse development would increase the available warehouse space by about 660,000 square feet and would entail construction of about 35 new steel framed with metal siding warehouse structures with floor areas ranging from 5,400 to 24,000 square feet. When fully developed, the industrial park would include 9,700- linear feet of paved roadways, three two-bay and one three-bay loading docks, 570 parking stalls, more than 9,100 feet of drainage infrastructure including concrete channels, pipes and grass swales and three detention ponds with a total volume of 123,500 cubic feet for storm flows.

The proposed expansion of the light industrial park is in response to the growing needs for industrial space in the Koopaupoko region. The Koolaupoko region is currently significantly under supplied with industrial space and the per capita allowance of industrial space in Koolaupoko region is presently only about 20 percent of the average per capital allowance on Oahu. This makes the per capita allowance of industrial space in the Koolaupoko region one of the lowest in the state and it underlines the sound rational of the developer to add more industrial space on the land available at the proposed site.

When realized, the proposed industrial development would provide new warehouse space to the region and compensate for the loss of warehouse space due to rezoning or other than zone permitting land use of land that is presently zoned industrial. The proposed industrial development would be consistent with existing City & County of Honolulu's policies and vision and would be developed over a span of 16 to 18years. The development would occur in four development phases, phases A through D. During each of the development phases site preparation work (e.g. grading) and infrastructure development (e.g. construction of roadways and drainage system) would be completed before the individual warehouses would be added over a period of several years. Thus, the warehouse structures would be constructed gradually and at a somewhat constant rate to meet the evolving demand for industrial space in the Koolaupoko region.

The proposed industrial warehouse park would be built using sustainable technologies and approaches in order to reduce the ecological footprint and to mitigate impacts on the community. The project development and design approach of the proposed industrial park is compliant with the Leadership in Energy and Environmental Design (LEED) process and upon completion the proposed development would apply to be awarded LEED certification. The project approach intends is to mitigate potential impacts by utilizing a range of sustainable design and construction technologies and approaches. The major areas of sustainable building design would include sustainable site development, efficient water use, effective wastewater treatment and disposal options, lowering the energy demand below baselines of conventional warehouses as well as air quality, noise control and stormwater runoff considerations.

The development footprint of the proposed project would encompass portions of three contiguous land parcels, two of which require zone change as a prerequisite for the construction of industrial warehouses. This Final Environment al Assessment (FEA) is prepared as part of zone change application to be submitted to the City and County of Honolulu Department of Planning and Permitting to allow the proposed expansion. Since a small portion of the site is also located within the Special Management Area (SMA), an SMA permit would also be necessary for the project.

F. Project Setting

The proposed project site is located on the windward side of Oahu in the Kapa'a Valley. The Kapa'a valley is currently used for intensive and light industrial activities. The valley

has been significantly altered over the past decades; primarily by quarry and land fill operations. The proposed site is comprised of portions of three contiguous land parcels, identified by their Tax Map Key (TMK) numbers as 4-2-15:001 (portion of), 4-2-15:008 and 4-2-15:006, with a total land area of about 77 acres, of which about 60 per cent would be used for the buildings and hardscape structures (e.g. roadways, parking areas and other ancillary facilities) and 40 percent would be left as or developed into open space (e.g. pervious and vegetative area within the property).

Two of the three parcels, namely, TMK: 4-2-15:006, and portion of TMKs 4-2-15:001, would require a zone change from General Preservation (P-2) to Intensive Industrial (I-2) as a zoning requirement for the construction of the proposed industrial development. A zone change to I-2 is therefore sought for these two parcels. The third parcel, TMK 4-2-15:008, is located at the center of the proposed site, and is already within the Intensive Industrial (I-2) District and encompasses about 30 existing warehouses.

The proposed site is located on several plateaus at the foothills of Ko'olau. The near level areas that would comprise the proposed site were established by deposition of tailings and overburden materials and wastes from quarry operations, which occurred some 40 years ago. The eastern portion of the property has a relatively flat topography established by deposition of quarry spoils and residential solid wastes. A drainage canal, which runs along the Kapa'a Quarry Road, defines the eastern boundary of the eastern portion of the proposed site. The remainder of the proposed site is equally relatively flat and is located at a slightly higher elevation than the eastern portion of the proposed site, which is referred to as lower portion of the site. Access to the proposed site is by means of several driveways from the Kapa's Quarry Access Road.

The close proximity to the Kawainui Marsh and the presently poor water quality of the Kapa'a Stream, which runs along the northern boundary of the proposed site, mandates the implementation of an effective stormwater treatment management and treatment system. A large array of mitigation measures would be used to decrease possible impacts of the proposed industrial development on the environment and community.

As part of the environmental mitigation the developer has started with the development of a 15- acres wildlife habitat on restored wetland area. The land designated for the habitat development is located in parcel TMK 4-2-15:006 and within the Kapa'a Stream corridor. The wildlife habitat will provide a suitable living and nesting environment for endangered water birds and other indigenous aquatic wildlife. The habitat and wetland restoration project includes the construction of several cascading ponds and clearing of thick vegetation cover of mainly invasive plant species and the planting of native or adaptive plants instead. The wildlife habitat and wetland restoration will be surrounded by 6,000 linear feet of special wildlife fence to keep out non-native predators.

G. Project Funding

The development of the proposed Kapa'a Light Industrial Park project would be privately funded.

H. Relationship to Plans, Policies and Controls

Plans, policies and controls considered in the evaluation of the proposed action are as follows:

State Land Use Districts
Honolulu City and County Land Use Districts
Honolulu City and County Land Use Ordinance
Honolulu City and County General Plan
Koolaupoko Sustainable Communities Plan

I. Probable Impact

Impact associated with the proposed warehouse development can be classified in short-term and long-term effect. Short-term impacts are those related to construction activities. Long-term effects are those related to the operation of the warehouses. These long-term impacts include impacts on watershed, air, flora and fauna, resource utilization, infrastructure, traffic, public health and safety as well as socio-economic, cultural and historic resources impacts.

The development of the proposed Kapa'a Light Industrial Park would occur incrementally over a span of 16 to 18 years. Short-term impacts would occur during site development work and construction of individual warehouses. The development of the proposed industrial park would progress in four development phases, which represent the construction of a certain amount of industrial space in certain areas of the proposed site. Most of the impacts during construction would occur from site preparation work, such as work associated with grading, road construction and installation of infrastructure, early in all four development phases. Long-term impacts would occur in conjunction with the operation of the completed industrial warehouses.

The proposed industrial park would be developed in accordance to sustainable design and construction standards of LEED. Development under the LEED standard would ensure that only environmentally friendly and energy efficient buildings and facilities would be designed, built and operated. Therefore the impact during construction and operation would be significantly less than for industrial developments that would use conventional building standards.

Short-Term Impacts

The construction of the proposed warehouses development would include standard construction methods for site development, such as grading, installation of drainage and utilities infrastructure, roadway construction, as well as construction of warehouse structures. Using mitigating measures such as soil erosion control, Best Management Practices (BMPs) and noise and air control measures would keep impacts during construction within acceptable levels. In addition to conventional mitigating measure used in conventional construction, the proposed development approach for this project would entail methods of sustainable developments. This would further decrease impacts during construction.

Short-term impacts from construction can be categorized into site preparation work and construction of individual warehouse buildings. Site preparation work would include earthmoving work, infrastructure and road construction and initial landscaping. During this period, environmental impacts from soil erosion and potential contaminated run-off discharges, as well as noise and air pollution would be mitigated with implementation of Best Management Practices such as dust control measures, using muffling measures for running equipment and other effective measures. During construction there would be increase in vehicular traffic, which would require short-term traffic mitigation and coordination.

After the site has been prepared the construction of individual warehouse structures would cause other short-term impacts, which would, however, be significantly less intrusive than those during site preparation. Main impacts from warehouse construction would be during building of the warehouse shell, with cranes, increased numbers of heavy trucks and the use of construction equipment. Once the building shell has been completed construction activities would be mainly inside the buildings, with significantly less impact to the surrounding.

Summarizing, short-term impact would occur only over short durations and could be effectively mitigated using conventional mitigation measures and in addition advanced mitigation measures under the LEED project approach. Short-tem impacts are not expected to be significant; especially since effective conventional and advanced construction impact mitigation measures would be employed.

Long- term Impacts

Long-term impacts would result from operation of the proposed warehouse park after construction is completed. Main long-term impacts would include vehicular traffic, energy and water consumption, wasterwater disposal, stormwater management, visual impact, light pollution as well as noise and air pollution impacts. The sustainable building approach for the proposed warehouse park would be effective to mitigate and lower emissions from the site. In addition, the environmentally friendly and resource efficient design and

outfitting of the proposed warehouse development would significant lower energy and water demand as compared to conventional development approaches. The proposed site would generate a part of its electricity demand by on-site renewable energy generators, e.g. photovoltaic panels on the roofs of the warehouses, thus further lowering the impact on community resources.

In the long-term, the project would not have significant adverse environmental effect because of the comprehensive range of sustainable mitigation measures. The project would improve the business infrastructure in the Koolaupoko region and would promote the development of a vibrant economy for windward Oahu. While the proposed project would help to safeguard the future economic infrastructure within the Koolaupoko region, the business initiative would be implemented with an effective and environmentally friendly "green" development approach and in a socially and culturally responsible manner approach.

J. Alternatives Considered

Alternative 1: No Action Alternative

Alternative 1, the "No Action" alternative, suggests that the land within the proposed site would essentially remain in its current state. There would be some, yet limited, additions to the warehouse space in on site. However, the planned industrial warehouse park within a framework of sustainable development would not be realized. As a result, there would be relatively little industrial space added to the Koolaupoko region, where industrial space is short supply. This alternative is not advantageous to the developer and the community and is not acceptable since it would not represent the best utilization of available land.

Alternative 2: Scaled Down Development - Warehouse development on only one Parcel

Alternative 2, would limit the development of warehouses to only one parcel, TMK 4-2-015:008, instead of three parcels. The parcel TMK 4-2-15:008 is already within the Intensive Industrial District (I-2) and therefore no zone change would be required for the development of additional industrial warehouses and base yards. The two parcels TMK 4-2-015:001 and 4-2-015:006 would not be rezoned and the current land use would basically remain as is.

Since one key objective of the proposed development is to provide urgently needed industrial space to the Koolaupoko region, developing future industrial space on only one parcel would curb the size of land that could be developed for industrial uses. Since land for industrial uses is in short supply, the development of warehouses would result in a high building density. Many of the sustainable development measures, which are planned for the proposed action, would not be implemented since such advanced development

measures would need ample space within the development footprint to serve their intent (e.g. the development of open space, rainwater harvesting, landscaping around individual warehouses).

This alternative does not present the best use for the land resources. Developments using sustainable technologies typically require higher initial commitment of resources than conventional warehouse development. The extent of future development of warehouses space would be limited which would reduce the viability of investment for a truncated project under this alternative. This in turn would result in spread of warehouse development in other parts of the windward community and reducing the potential benefits for the community.

Leaving the two parcels TMK 4-2-015:001 and 4-2-015:006 out of the development, would result in inefficient use of a land. In addition, the existing runoff patterns and surface flows to the Kapa'a Stream would continue to contribute to degradation of water quality in Kapa'a Stream.

Alternative 2 would not be desirable since it would curb benefits to the community and the developer and would not mitigate environmental impact to the same extent as would occur if the planned environmentally friendly development approach would be applied.

Alternative 3: Full Scale Development - Warehouse Development on the entire proposed site, using conventional development technologies

Alternative 3 would result in the planned industrial development on the entire proposed site, comprised of the three contiguous parcels. By developing the proposed project on the entire proposed site this alternative could achieve best use of land resource. Under this alternative, however, the site and buildings would be developed using conventional technologies and approaches for the development of the warehouse park. Impacts on resource utilization and emission from the warehouse park would not be as low as using sustainable technologies and development approaches, which the proposed action would employ. The anticipated investment costs for Alternative 3 would be most likely lower than for the proposed development approach, since the proposed action would use a wide range of environmentally friendly development technologies and methods. Since the developer favors developing in an environmentally, socially and culturally responsible way, this Alternative 3 would not be desirable.

All three alternatives to the proposed action are not favorable. Therefore the proposed action to build the Kapa'a Light Industrial Park on the proposed site within the three designated land parcels, using sustainable development approaches is the preferred approach.

K. Irreversible and Irretrievable Commitments of Resources

The construction of the proposed Kapa'a Light Industrial Park would involve irreversible and irretrievable uses of energy, materials, labor and private funds. The construction of the warehouse development would proceed in development phases. In each development phase the site infrastructure (e.g. grading, and landscaping of the area, roadways, parking spaces, underground utility infrastructure, drainage systems with conveyance and detention basins, etc.) has to be constructed first, followed by incremental construction of individual warehouses, at a pace that is dictated by economic conditions.

The commitment in energy, material, labor and finances to build the proposed warehouse development using sustainable technologies possibly requires a higher initial commitment of funds and resources than conventional warehouse development. The sustainable design, construction and operations approaches of the proposed industrial warehouse park, however, would result in lower life-cycle cost, lower life-cycle resources utilization and in lower long-term adverse impacts for the environment and the community than conventional industrial developments.

L. Anticipated Determination

A notice of determination of **Findings of No Significant Impact** is deemed applicable for the proposed Kapa'a Light Industrial Park.

SECTION ONE

INTRODUCTION

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SECTION ONE

INTRODUCTION

1.1 Study Purpose

The purpose of this Environmental Assessment is to identify and evaluate possible impacts on the environment and community, due to the proposed expansion of an existing warehouse development along Kapa'a Quarry Access Road in Kailua, Oahu, and to propose effective impact mitigation measures. The proposed industrial development, the Kapa'a Light Industrial Park would encompass all or portions of three contiguous land parcels owned by Kapa'a I, LLC. Two of the parcels would require land use zone changes from the P-2 (General Preservation) to I-2 (Intensive Industrial) as a prerequisite for the planned construction of warehouses on the proposed site. Since the proposed industrial development meets the criteria for a "significant" zone change, this Environmental Assessment is prepared to be submitted as part of Zone Change Application, to the City and County of Honolulu, Department of Planning and Permitting.

1.2 Proposed Action

Kapa'a I, LLC, is the owner of three contiguous parcels of land encompassing about 77 acres in the vicinity of Kapa'a Quarry Road in Kailua, Oahu. A vicinity map indicating the general location of the property is depicted in Figure-1-1. The proposed site would be a portion of these three parcels. The first parcel is comprised of a 22-acre parcel identified by TMK: 4-2-015-008 and has a County zone classification of Intensive Industrial (I-2) and is within the state's Urban District. The second parcel has an area of about 44 acres and is identified by TMK: 4-2-015-006. This second parcel has a County zone classification of General Preservation District (P-2) and is within the state's Urban District. The third parcel is a portion of the parcel TMK: 4-2-015-001. The portion of the third parcel is owned by the developer and is located southeast of the H3-freeway. The total area of the parcel TMK 4-2-15:001 is 378 acres. The 11-acre portion of TMK 4-2-15:001 has a County zone classification of General Preservation District (P-2) and is within the state's Urban District. The remainder of parcel TMK 4-2-15:001, which would not be part of the proposed site, is located northwest of the H3-Freeway, has a County zone classification of Restricted Preservation District (P-1) and is within the state's Conservation District.

The site of the proposed Kapa'a Light Industrial Park is located on several plateaus, which were created by depositions of quarry tailing and overburden materials from the quarry and landfill operations in the Kapa'a valley staring in the early 1950s. At present, a portion of the property, i.e. the parcel with TMK: 4-2-015-008 has about 30 larger warehouse structures and smaller Quonset huts. The industrial space is presently leased to various business entities. The parcel TMK 4-2-15:008 lies in the center of the proposed site. The eastern portion of property is made of parcel TMK: 4-2-015-006. This parcel has a 23-acre relatively level topography that was established by deposition of quarry spoils and residential solid wastes in the early 60s. This parcel also has 21-acre of open space, which located in the Kapa'a Stream corridor. At present time, a part of the 23-acre plateau area is used for green waste processing. The eastern boundary of the property is defined by a drainage canal, which runs parallel to the Kapa'a Quarry Road and drains into the Kapa'a Stream. The confluence of drainage canal and Kapa'a Stream is on the mauka side of the existing culvert beneath the Kapa'a Quarry Road, from where the Kapa'a Stream merges into the Kawainui Marsh.

The western part of the property is defined by a 11-acre portion of parcel TMK: 4-2-015-001. This portion of parcel 4-2-15:001 is composed of an approximately 4.5-acre landfill area, which is relatively flat. The remainder of the 11-acre portion of TMK 4-2-15:001 is open space. Only the 4.5 acre landfill area would be used to the development of the proposed development.

In light of the increasing demand for industrial space and warehouse space in the Koolaupoko region, the developer intends expand the existing warehouse development and add about 660,000 square feet of warehouse space on portions of the parcels TMK 4-2-15:001, 006 and 008. The construction of warehouse space and the use of industrial space would require a County zoning of I-2 (Intensive Industrial). The parcel TMK 4-2-15:008 already is zoned as I-2 and therefore the intended land use of the proposed action already conforms with the zoning requirements. The two other parcels TMK 4-2-15:001 (portion of) and 4-2-15:006 are presently zones P-2 (General Preservation) under the County's zoning regime. All three parcels are within the state's Urban District.

The zone change for the two parcels TMK 4-2-15:001 (portion of) and 4-2-15:006 is necessary to allow the development of the proposed Kapa'a Light Industrial Park, in accordance with a project master plan for the consolidated and re-zoned property. The project master plan is briefly discussed Section 1.3.

Likely industrial uses for the proposed Kapa'a Light Industrial Park would include the following (these uses would be either permitted or would have to receive conditional of special permits):

- Automobile sales, rentals, and servicing services
- Automobile service stations
- Base yards
- Contracting, home improvement and furnishing services
- Data processing facilities
- Home improvement centers
- Laboratories, medical
- Manufacturing, processing and packaging
- Offices, accessory (Note**)
- Photographic processing
- Sale and service of machinery used in agricultural production
- Sawmills
- Self-storage facilities
- Storage and sale products essential to agricultural production
- Warehousing
- Wholesaling and distribution

(Note **) indicates that offices are only allowed in a supporting function that is part of an allowed use and no stand-alone office space would be allowed.

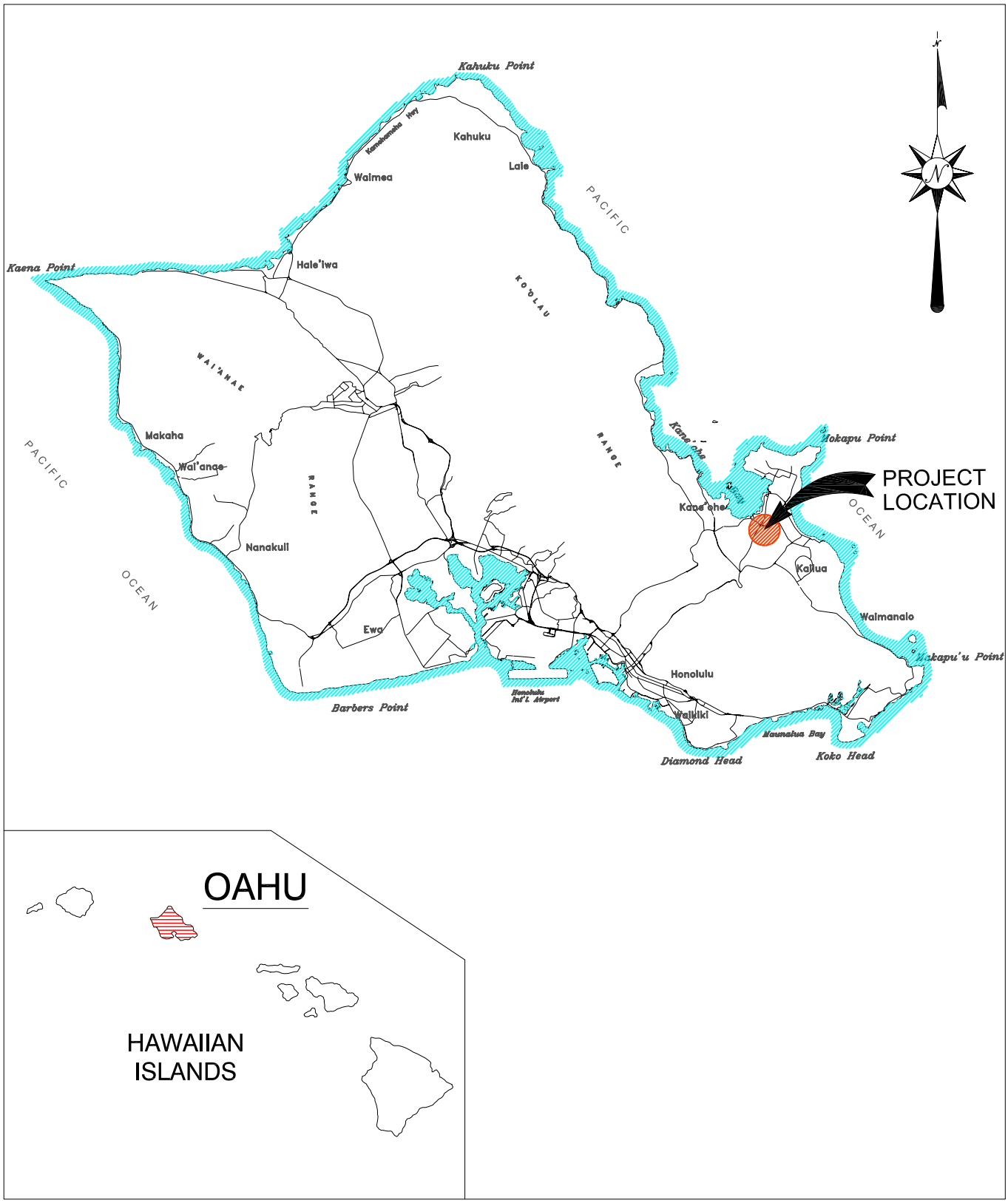

Figure 1-1 Vicinity Map

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Figure 1-2 Aerial Vicinity Map

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Figures 1-3 and 1-4 show the existing and the proposed land use zoning pf the three contiguous land parcels that represent the proposed site, respectively. Figure 1-3 shows that parcel TMK 4-2-15:008 that is presently zoned as I-2 (Intensive Industrial), while the adjacent parcels TMK 4-2-15:001 (portion of) and 4-2-15:006 are presently zoned as P-2 (General Preservation). The yellow line shown in parcel TMK 4-2-15:008 in Figure 1-3 indicates the extent of the existing warehouses within parcel 4-2-15:008. Figure 1-4 shows the proposed land use zoning at the proposed site. All three contiguous parcels TMK 4-2-15:001 (portion of), 006 and 008 would be zoned as I-2, which is a prerequisite for the intended light industrial uses within the proposed Kapa'a Light Industrial Park. The yellow areas shown within the three contiguous parcels TMK 4-2-15:001 (portion of), 006 and 008 indicate the extent of the proposed industrial park development. It can be seen that the site of the proposed industrial development would leave significant open space within the rezoned parcels TMK 4-2-15:001 (portion of) and 006.

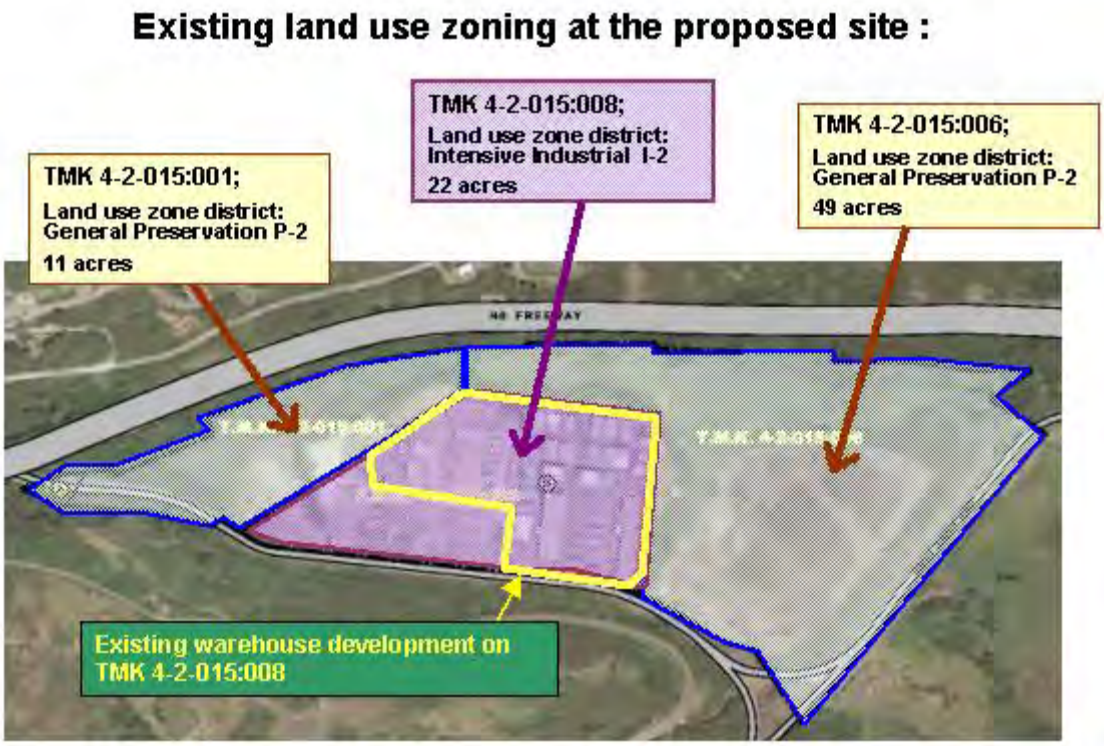

Figure 1-3 Existing Land Use Zoning at the Proposed Site

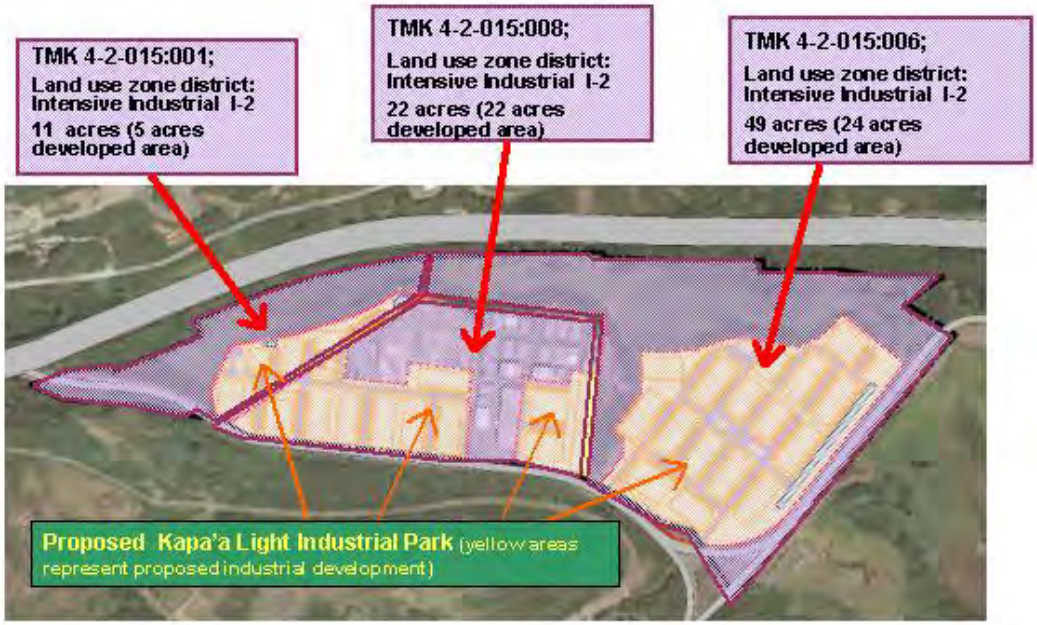

Figure 1-4 Proposed Changes of Land Use Zoning at Proposed Site

1.3 Project Master Plan

The master plan for the proposed Kapa'a Light Industrial Park calls for expansion of the existing warehouse development and support facilities, loading docks, roadways, utilities and drainage infrastructure in accordance with development concept that uses sustainable and environmentally friendly technologies and approaches. Elements of the project master plan are defined in the following paragraphs.

1.3.1 Conceptual Layout

The site of the proposed Kapa'a Light Industrial Park is comprised of all or portions of three contiguous land parcels with Tax Map Key Numbers, TMK: 4-2-15:008, TMK: 4:2-15:001 (portion of) and TMK: 4-2-15:006. As depicted in Figure 1-5, the central parcel, i.e. TMK: 4-2-15:008, presently contains about 30 warehouses consisting of steel framed and Quonset warehouse structures. In contrast, only a small portion of parcel within TMK: 4-2-15:001 is used by commercial of industrial activities. The rest of the parcel including a southern slice indicated as (A) in Figure 1-5, and designated to be within the State Conservation District; is vacant and open space. In the north-eastern part of the proposed site, identified by TMK: 4-2-15:006, about 20 acres are presently used for green waste processing, the rest of the 43 acre large parcel 4-2-15:006 is open space. The proposed layout for the Kapa'a Light Industrial Park is shown in Figure 1-5. The proposed development at full build would provide more than 662,000 square feet of industrial space, 9,690 linear feet of paved roadways, three two-bay and one three-bay

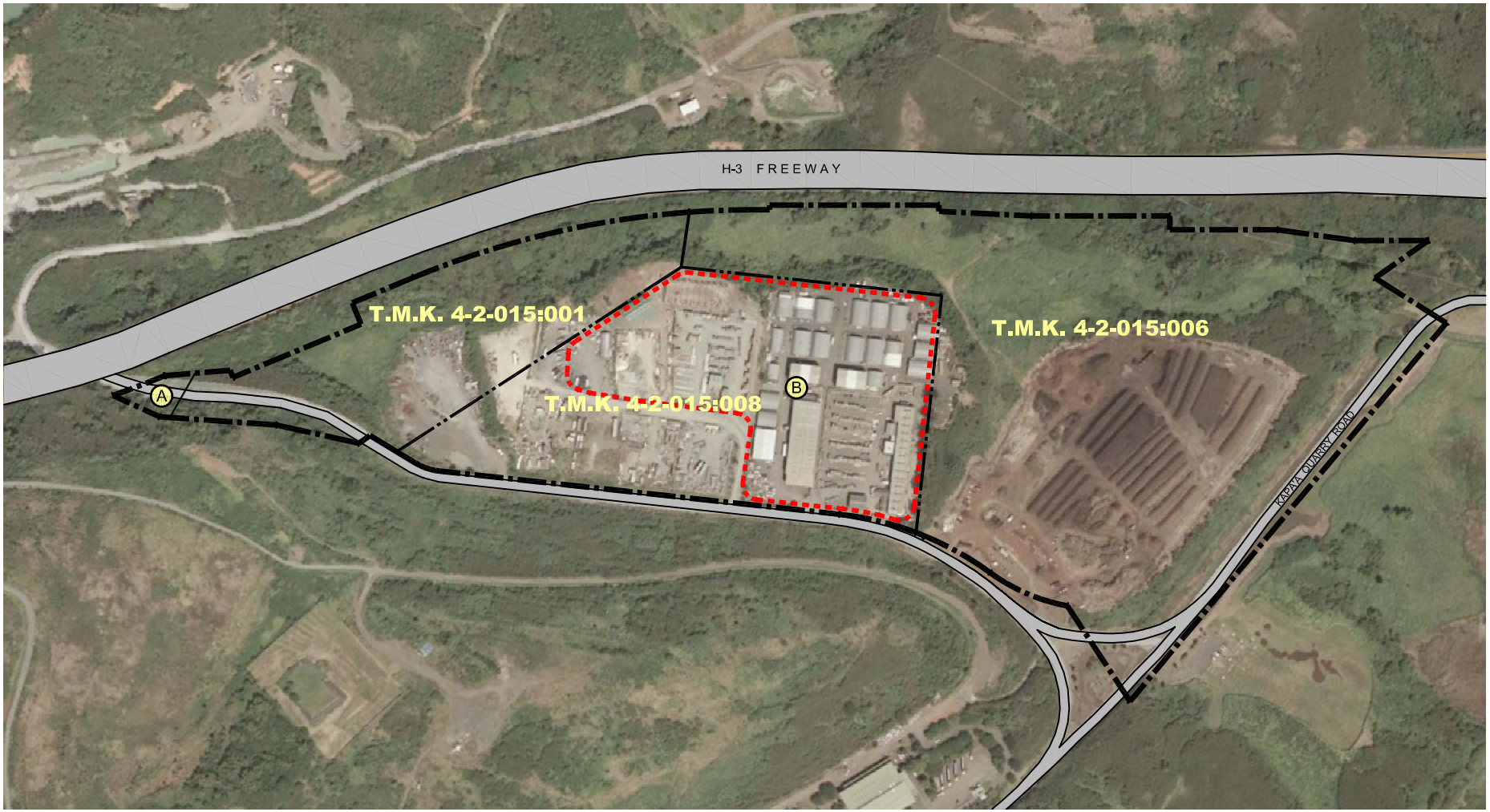

Figure 1-5
Existing Commercial Warehouses on Project Site

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LEGEND:

A — Portion of TMK 4-2-015:001 Designated "Conservation" State Land Use Zone

B — (- - - - - - - - - -) Area Containing Present Warehouses and Commercial Development

loading docks, 570 parking stalls, more than 9,120 feet of drainage infrastructures including, concrete channels, pipes and grass swales, 123,500 cubic feet of detention volume for storm flows and individual septic tanks for warehouse structures. The scope of the development shown in Figure 1-6, is summarized in Table 1-1.

Table 1-1 General Information about Three Contiguous Land Parcels Comprising the Site

Description		TMK parcels containing proposed site		
		Upper portion of site		Lower portion of site
	unit	**4-2-15:001**	**4-2-15:008**	**4-2-15:006**
Size of land parcel	Acres	11.3 *(Note A)*	22.3	43.8
Existing State Land Use Designation	-	Urban	Urban	Urban
Existing County Land Use Zoning (LUZ) District	-	P-2 General Preservation	I-2 Intensive Industrial	P-2 General Preservation
Proposed State Land Use Designation	-	Urban (unchanged)	Urban (unchanged)	Urban (unchanged)
Proposed County Land Use Zoning (LUZ) District	-	I-2 Intensive Industrial	I-2 Intensive Industrial	I-2 Intensive Industrial
Proposed developed footprint in parcel (incl. bldgs.+roadw.+open space)	acres	4.3	22.2	23.8
	sq.ft.	180,000	970,000	1,036,000
Existing building footprint in parcel	sq.ft.	None	253,000	None
Proposed building footprint in parcel with proposed LUZ	sq.ft.	**59,000**	**249,000**	**355,000**
Allowable building area with proposed LUZ; *using 80% max. building area criterion*	sq.ft.	144,000	776,000	829,000
Allowable Floor area with propose LUZ *using FAR - 2.5 (FAR = Floor Area Ratio)*	sq.ft.	451,000	2,424,000	2,590,000

Note A: The entire parcel TMK 4-2-15:001 has an area of 378 acres; only the 11.3 acre portion of TMK 4-2-15:001 is affected by the proposed project and only 4.3 acre of the 11-acre would be used for the proposed development footprint.

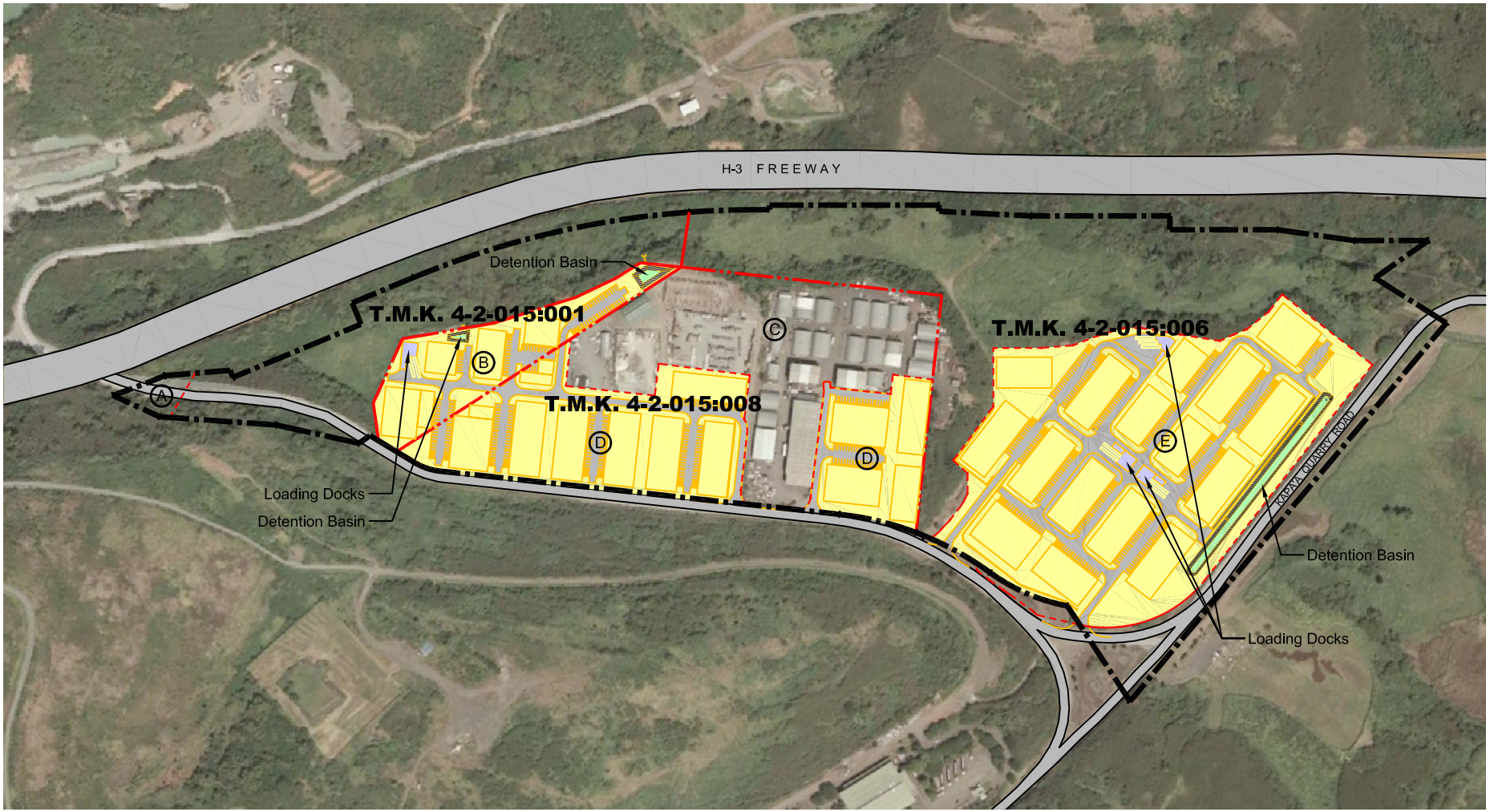

Figure 1-6
Proposed Development Layout

LEGEND:

- (A) — Portion of TMK 4-2-015:001 Designated "Conservation" State Land Use Zone
- (B) — Portion of TMK 4-2-015:001 with New Warehouses Development
- (C) — Portion of TMK 4-2-015:008 with Existing Warehouses
- (D) — Portion of TMK 4-2-015:008 with New Warehouses Development
- (E) — Portion of TMK 4-2-015:006 with New Warehouses Development
- External Property Boundary
- Internal Property Boundaries
- Boundary of Proposed Warehouse Development

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1.3.2 Key Components of the Proposed Warehouse Development

Warehouse Structures:

The development concept calls for adding new warehouse structures utilizing sustainable design and construction technologies and methods. The warehouse structures would be designed for maximum energy efficiency and would be based on green building concepts. The planned 35 new warehouse buildings would range in size from 5, 400 to 24,000 square feet and would be basically steel frame structures with metal sidings, conform to the development standards for industrial land use districts, such as:

Maximum building area (percentage of zoning lot)	< 80%
Maximum density FAR (floor area ratio)	< 2.5
Maximum height	< 40 feet (as per zoning map)

Roadways:

Although not mandatory for the private development, the internal roadways would be constructed in conformance with standard details for public works with 11-feet wide paved traffic lane and 4-feet shoulder. Concrete channel or swales along the centerline of the roadways would be used to convey stormwater runoff to several on-site detention basins, where each detention basin would serve a certain portion of the proposed site. The design approach for the proposed development calls for maximizing perviousness; therefore the use of pervious surfaces for traffic areas would be preferred. Since, at the present, conventional pervious roadway surface has no good track record of accommodating high axial loads of the type of trucks, which would drive on internal roadways within the proposed site, only impervious roadway pavement is considered for roadways inside the proposed development. The use of pervious roadway pavement would be considered in the final design if new types of previous pavement could accommodate high axial loads.

Parking Spaces:

The arrangements and dimensions of parking spaces would be in conformance with City and County of Honolulu Land Use Ordinance (LUO). The number of required parking spaces is a function of the size of warehouses, e.g. the floor area. One parking space must be provided for every 1,500 square feet of warehouse floor area. The total number of parking stalls for the entire development will be 569, which exceeds the minimum requirement of 446 stalls, based on the estimated total floor area. Parking spaces would have pervious gravel surfaces in order to reduce runoff through infiltration of rainwater. Handicap parking spaces would be furnished for all warehouses in accordance with ADA standards.

Loading spaces:

The arrangements and dimensions of loading spaces for warehouses would be in conformance with City and County of Honolulu Land Use Ordinance (LUO). The number of loading spaces per warehouse is a function floor area of the warehouse. The total number of loading spaces would be 94 stalls. Loading spaces would have gravel surfaces in order to reduce runoff.

Loading docks:

There are no strict requirements for the minimum number of loading docks (loading docks are different from loading spaces). Rather, the number and dimensions of loading docks would be determined by the anticipated specific demand of each warehouse. Figure 1-7 shows a 3-D rendering of two detached loading docks, which would serve the warehouses in the lower portion of the proposed site as staging areas for cargo loading operations. Large trucks would back-up against a loading dock platform, where forklifts would transfer cargo from holding areas to the trucks. The dimensions and arrangements of the external loading docks would conform to industry standards. Every external loading dock could accommodate between two and three large trucks. The detached loading docks in the lower portion of the proposed site could serve seven large trucks and docks in the upper portion of the proposed site could serve two trucks.

Figure 1-7 Detached Loading Dock within New Warehouse Development

Wastewater collection and treatment:

It is anticipated that the volume of wastewater generated on-site would not to be significant because of the use of water efficient toilets, urinals and other fixtures, in conformance to the

LEED design approach. On-site wastewater treatment systems (septic systems) would be used for treatment and disposal of wastewater from the proposed development.

Landscaping and water efficient irrigation:

The proposed development would use open space design as a key design element. Open space would be planted with native or adaptive plants, which require less irrigation, less fertilizer and less maintenance than non-native plants. Landscaping would be used to lower heat island effects, increase the aesthetic appearance of the development and allow rainwater infiltration. It is planned to use harvested rainwater for irrigation and for other graywater application, if permissible under future applicable codes. Rainwater would be collected on all or a portion of the warehouse roofs and would be stored in underground cistern after filtering for subsequent use. Each underground cisterns would typically serve two warehouse structures.

Stromwater runoff management and treatment system:

The design approach for the proposed development calls for large pervious and planted areas within the development to the extent possible. Rainwater would infiltrate from pervious areas and would reduce the amount of stormwater runoff and also the amount of associated pollution from runoff. All runoff from the remaining impervious surfaces would be collected and conveyed to treatment units and detention ponds, before being discharged to receiving waters. A network of concrete channels and pipes would collect stormwater runoff from imperious areas and convey it to a series of on-site detention systems. In the upper portion of the proposed site, two detention ponds with combined volume of 53,000 cubic feet would be built to detain stormwater runoff prior to discharge into the Kapa'a Stream. Similarly, 70,500 cubic feet of detention volume would be provided by a single detention pond in the lower portion of the proposed site. Runoff collected in these detention ponds would be released into the Kapa'a Stream after the storm event. The detention ponds would serve two functions. First, the detention ponds would provide flood control functions by shaving off high peak runoff discharge to the proposed to the Kapa'a Stream. Second, the detention ponds type used for the proposed site would be an "extended detention pond", which can remove a significant portion of pollutants (typical 50 to 60 percent) contained in the stormwater runoff. Stormwater runoff treatment in the detention ponds is augmented by placing pre-treatment units upstream of the detention ponds. The combined removal efficiency of the pre-treatment units and detention ponds would be higher than 80 percent.

1.3.3 Project Development Milestones and Project Schedule

The proposed Kapa'a Light Industrial Park would be developed in four development phases. Figure 1-8 shows the spatial arrangement and the extent of the warehouses development for each phase of the project.

Figure 1-8 Locations and Extent of Development Phases A through D

The four development phases are as follows:

- Phase A entails construction of about 80,000 square feet of new warehouse space on the upper section of the development on parcel TMK 4-2-015:008. This parcel is already zoned as Intensive Industrial (I-2) and requires no zone change. The anticipated completion date for the site preparation work for Phase A (e.g. roadways, utilities, drainage infrastructure) would be in 2010. Construction of warehouse structures for this phase of the project is anticipated to last for two years with a completion date of 2012.

- Phase B entails construction of approximately 147,000 square feet of new warehouse space on parcels TMK 4-2-015:008 and TMK 4-2-015:001. This phase also include construction of new roadways, utilities and one new detention pond with a volume of 40,000 cubic feet. The proposed start of construction of warehouses would be in 2012 and all warehouse construction activities of Phase B are to be completed by late 2014.

- Phase C entails construction of about 81,000 square feet of new warehouse space on parcels TMK 4-2-015:008 and TMK 4-2-015:001. This phase include construction of new roadways, utilities and one new detention pond with a volume of 13,000 cubic feet. The anticipated completion of the site development work for Phase C (e.g. roadways, utilities, drainage infrastructure) would be in 2014. The proposed start date for construction of new warehouses would be in 2014. Construction activities for this phase of development will be completed by 2016.

- Phase D entails the construction of about 355, 000 square feet of new warehouses on parcel TMK 4-2-015:006. Infrastructure in this phase of project would include roadways, utilities and a 70,500 cubic feet detention pond. The anticipated completion of the site development work for Phase D (e.g. roadways, utilities, drainage infrastructure) would be late 2016. The proposed start of construction for new warehouses would be in 2016 with a target completion date 2026.

Since the construction of warehouses would be carried out sequentially in four development phases, the available warehouse space would grow over time until full build is reached in 2026. Figure 1-9 shows the anticipated growth of available warehouse space during each of the planned four phases. The curves indicate the anticipated timeframe for the warehouses to reach 100 percent of their total warehouse area; as an example, the construction of 100 percent warehouse space of Phase D, about 355,000 square feet, would be accomplished over a time period of 10 years, from 2016 the 2026.

Figure 1-10 shows the anticipated growth of new warehouse space for the entire proposed Kapa'a Light Industrial Park. As Figure 1-10 suggests, the growth in warehouse space over time would follow an approximate linear function, indicating a near constant pace of addition of new warehouse space. These drawn-out increments of warehouse space over time would represent a gradual rather than steep pace of development. The gradual development would minimize impacts to the environment and community that might arise and would facilitate implementation of mitigating measures to allow affected infrastructure to be expanded as the project adds more industrial space over a projected development time frame of 16 to 18 years to full build.

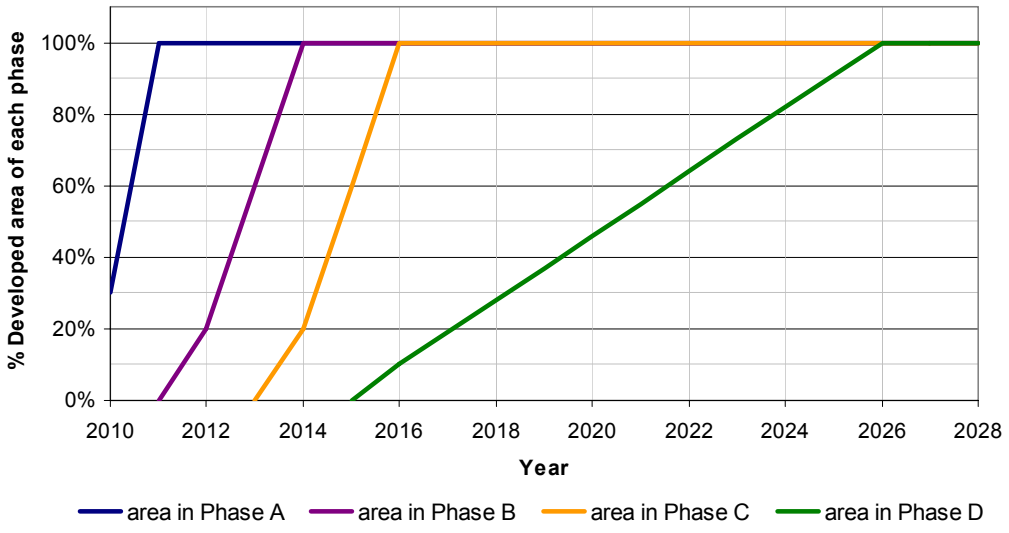


Figure 1-9 Anticipated Progress of Building New Warehouses Space in Each Development Phase

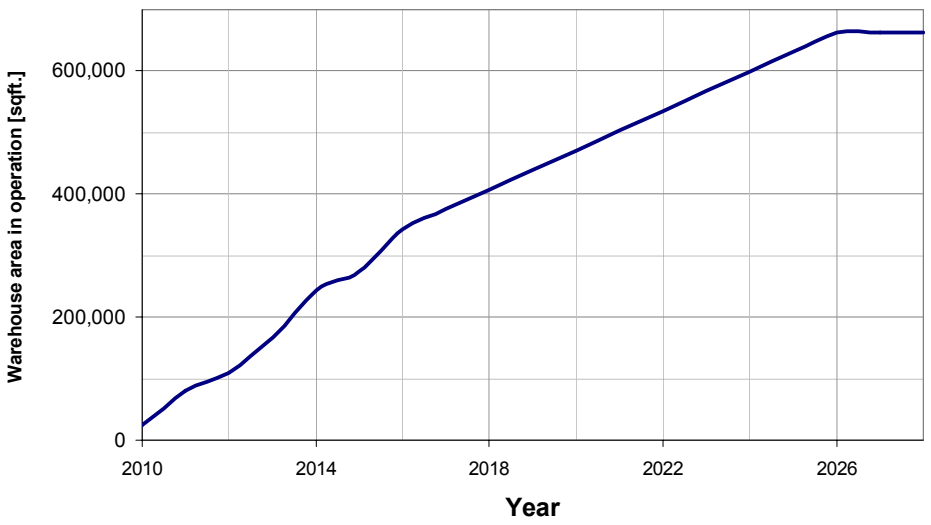


Figure 1-10 Anticipated Pace of Adding New Warehouse Space over Project Duration

1.3.4 Sustainable Development Strategies Considered

The proposed Kapa'a Light Industrial Park would utilize sustainable design, construction and operational features in order to lower potential impacts on the community and the natural environment. The design, construction and operation approaches for proposed Kapa'a Light Industrial Park are in accordance to LEED (Leadership in Energy and Environmental Design) standards for integrated building design and construction. It is the goal of the developer that upon completion the proposed project would acquire certification under LEED for New Construction Rating System.

The following discussion introduces areas where sustainable design, construction and operational technologies and approaches would be considered for the proposed project. The process of LEED certification is basically an accumulation of credit points, which are awarded for fulfilling the requirements of certain credits. A certain number of credit points is required to obtain basic or advanced certification levels. Following the Whole Building Design in accordance with LEED the design team is free to develop a strategy to obtain the required credit points for the targeted level of certification. This means that the design team can chose the credits that would best apply to the project, the propose site and the level of certification. Typically the project team would select credits that would offer high synergy between design categories, in order to increase the benefits to the environment and community.

Consequently, the final configuration of the proposed industrial park could vary from the present master pans, since this master plan represents an initial design concept. Regardless of the

specific strategy selected by the design team to obtain the required level of credits, there are eight prerequisites, representing five major compliance areas of LEED sustainable design and constriction rating systems, which must be fulfilled under any certification level and under any combination of credits. These prerequisites are as follows.

1. Prerequisite for Sustainable Site Development: Reduction of pollution from construction activities by controlling soil erosion, avoiding water way sedimentation and avoiding air borne dust generation;

2. Prerequisite for Water Use: Increase water efficiency within buildings to reduce the burden on municipal water supply and wastewater systems. Target a minimum of 20% reduction of water consumption (not including irrigation) under applicable baseline;

3. Prerequisite for Energy and Atmosphere: Achieve minimum energy savings according to applicable baselines; utilize only non-polluting refrigerants; carry out comprehensive building commissioning;

4. Prerequisite for Materials and Resources: develop and implement waste reduction and recycling plans and procedures;

5. Prerequisite for Indoor Environmental Quality: Establish minimum indoor air quality and prevent exposure to environmental tobacco smoke.

The following areas represent sustainable technologies or approaches that would be considered by the design team for the proposed Kapa'a Light Industrial Park. The final design configuration would determine which of these sustainable technologies and approaches are adopted. Figures 1-11 and 1-12 show the concept layout of the proposed Kapa'a Light Industrial Park and indicate certain components of the sustainable site development approach. Figure 1-11 shows the conceptual site arrangements of the upper portion of the proposed site (e.g. the upper portion of the proposed site encompasses development phases A, B and C on the parcels TMK 4-2-15:001 (portion of) and 008). Figure 1-12 shows the conceptual site arrangements of the lower portion of the proposed site (e.g. the lower portion of the proposed site encompasses development phase D and is the portion of parcel TMK 4-2-15:006 that would be used for the industrial warehouse development).

Sustainable design, construction and operation methods considered for the proposed Kapa'a Light Industrial Park are as follows:

<u>Prevention of pollution during construction activity:</u> During construction, loss of soil would be prevented by using Best Management Practices (BMPs) for water pollution. Topsoil would be stockpiled for reuse. Sedimentation in receiving streams would be prevented. Air pollution would be prevented by appropriate means. (These measures would not be optional but would have to be adopted as a prerequisite for LEED certification)

Site selection: The proposed Kapa'a Light Industrial Park would be developed on an appropriate site and any environmental impact from the development would be reduced.

Development connectivity: The proposed development would be built in urban areas with existing infrastructure. Natural habitats and resources would be protected. The proposed industrial warehouse park would be an expansion of an existing industrial warehouse development at the project site, which has grown over the past decades into an important site of industrial activity within the Koolaupoko region. Therefore, certain infrastructure is already in place. The proposed Kapa'a Light Industrial Park, as a multi-phased expansion project, would implement new or enlarged infrastructure, which would use sustainable design and construction methodologies. The developers of the Kapa'a Light Industrial Park have committed themselves to develop and maintain a wildlife sanctuary adjacent to the proposed site of the new commercial development, which restores or enhances environmentally important wetland area in the vicinity of the Kawainui Marsh.

Brownfield Redevelopment: The proposed site would be built on deposits from previous quarry and landfill operations. Therefore, the proposed development would not use land that is presently Greenfield area. The proposed development would therefore have to cope with construction methods that are more difficult than using undisturbed land. Using and restoring the proposed site would mitigate current environmental impact on downstream wetlands that is resulting from erosion and runoff from landfill areas that have exposed soil and therefore increased pollutant loads with stormwater runoff and air-borne dust.

Alternative Transportation: The proposed development would actively support alternative modes of transportation.

- Since, at present, there is no public transportation connecting the proposed site with other urban centers, the developer would strongly support implementation of public transportation service, either by public transportation (e.g. TheBus) or by private shuttles.
- The use of bicycles would be promoted by installing secure bicycle racks and providing changing and shower facilities at appropriate locations within the development.
- The use of low-emitting and fuel-efficient vehicles would be promoted by providing preferred parking to such vehicles as well as for car-pools and van-pools.
- The occupants of the park would further be encouraged to use other means to lower the scope of transportation using private cars

Protection and restoration of habitats: The developer of the proposed Kapa'a Light Industrial Park has commenced the development of a 15-acre wildlife habitat on restored wetland adjacent to the proposed site of then Kapa'a Light Industrial Park. The wildlife habitat will include the construction of a number of cascading ponds and of a 6,000 linear feet long 6-feet high wildlife security fence to keep non-native predators of water birds out of the habitat. The proposed site will be surrounded by vegetative buffer zones. These buffer zones would contain densely planted tress and shrubs, primarily for visual and noise impact mitigation. In addition to these mitigation functions the vegetative buffer zones could also serve as habitat for certain birds species and other wildlife.

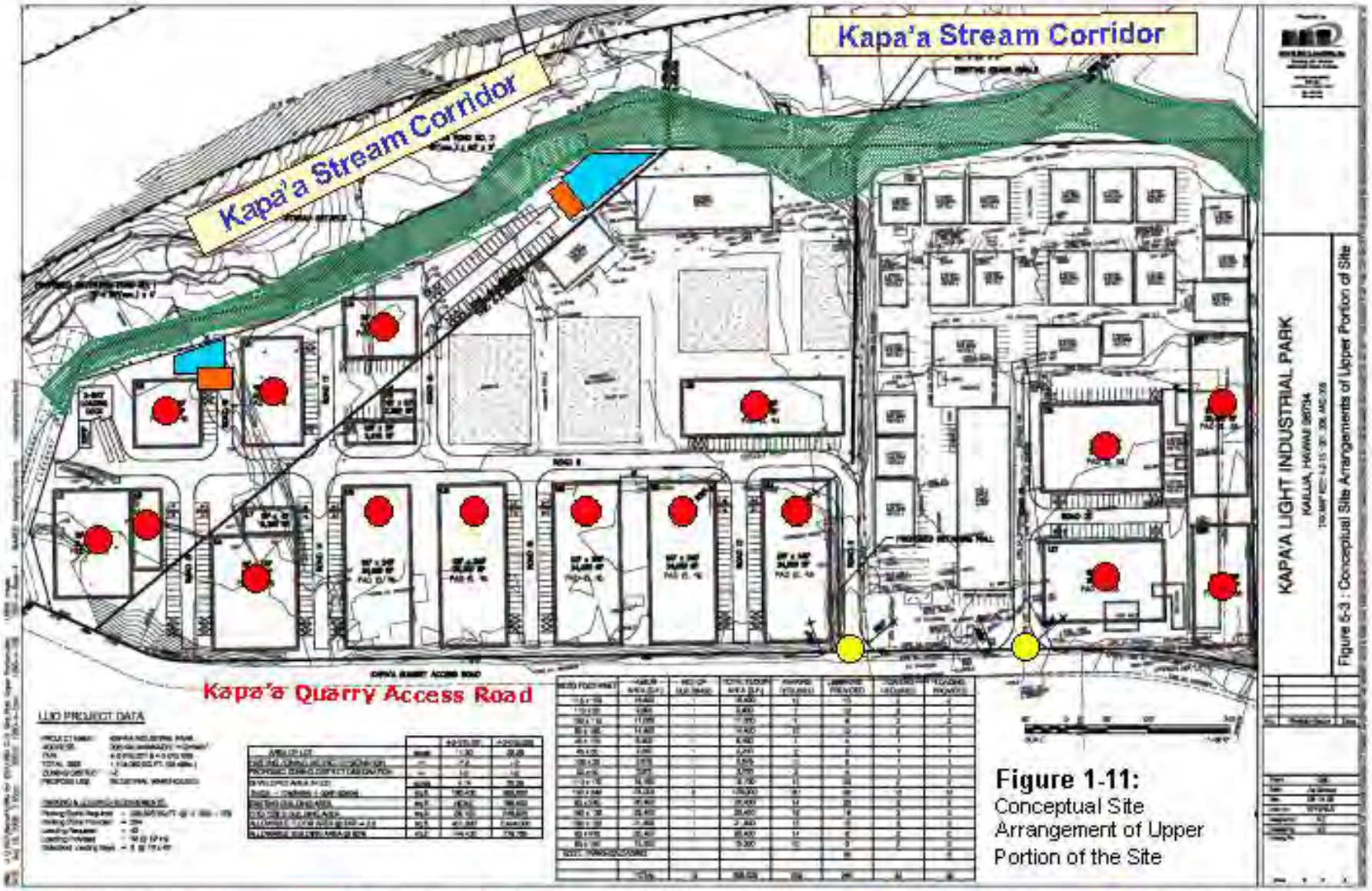


Figure 1-11:
Conceptual Site Arrangement of Upper Portion of the Site

= Propose new warehouses

= Detention pond

= Vegetative buffer zones around proposed site

= stormwater pre-treatment units

= road entrance to proposed development

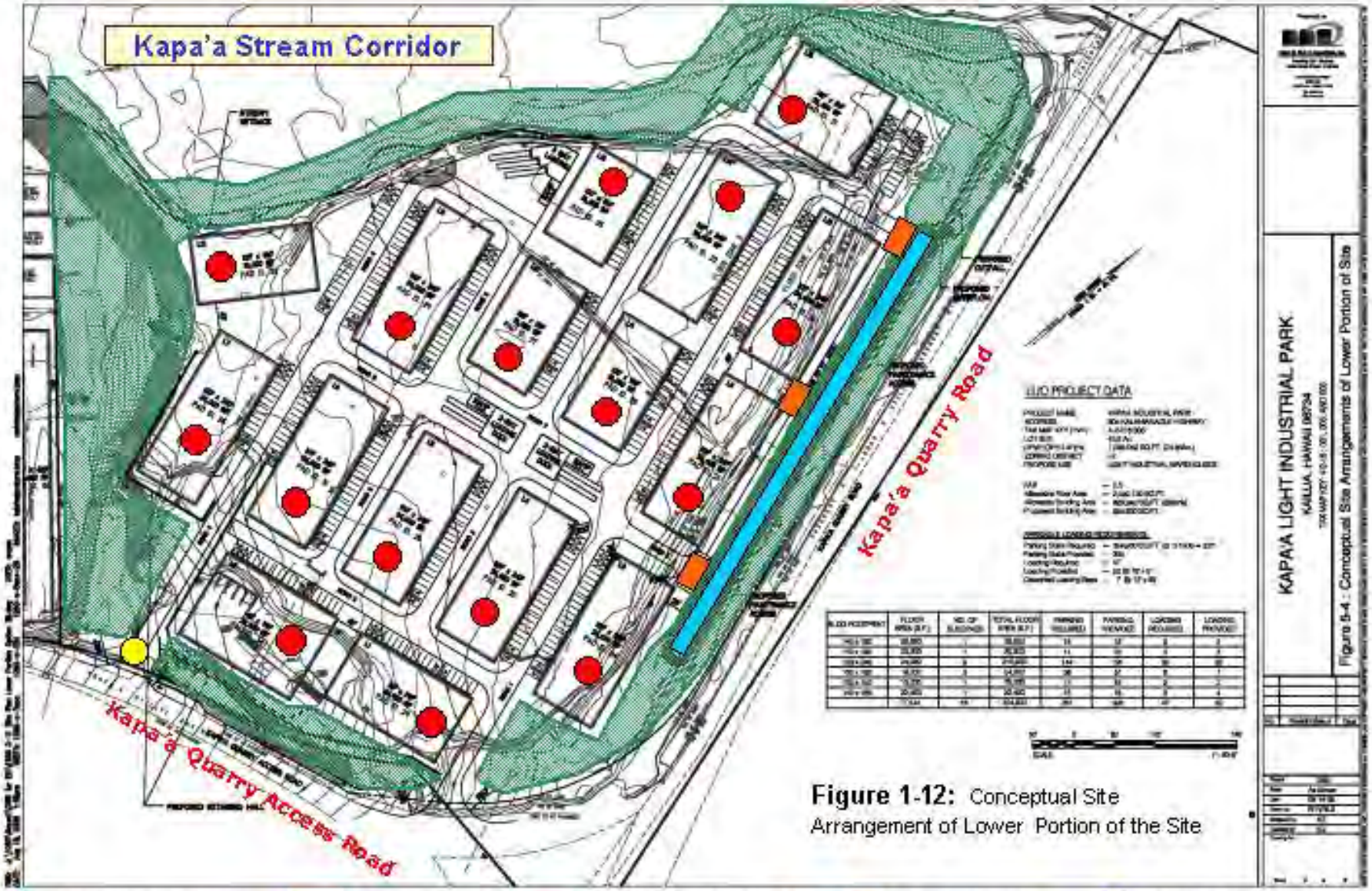


Figure 1-12: Conceptual Site Arrangement of Lower Portion of the Site

= Propose new warehouses

= Detention pond

= Vegetative buffer zones around proposed site

= stormwater pre-treatment units

= road entrance to proposed development

Maximizing Open Space: The proposed development would use open space design. Approximately 40 percent of the total area of the proposed site would remain or would be improved as open space. Fifteen (15) acres of open space would be developed and maintained as a wildlife habitat. Open space design is an important facet of the design approach of the proposed project.

Quantity and quality control of stormwater: The proposed site would de designed to improve water quality in the adjacent Kapa'a Stream. Pervious surfaces would be preferred, such as pervious paving, vegetated roofs and other construction methods, to enhance infiltration and recharging of the water table in the ground. Harvested rainwater would be used for irrigation, toilet or urinal flushing as well as other applicable custodial uses. Rainwater harvesting and using the harvested rainwater for irrigation would transform impervious roof areas to "quasi pervious surfaces", since it would result in more infiltration and less runoff. All stromwater runoff would be treated using recognized Best Management Practices (BMPs). Infiltration would be promoted, wherever possible, thereby reducing pollution levels. Erosion would be diminished, which would result in lower turbidity and less suspended solids in the runoff water and less sedimentation in the receiving waters.

Heat island effects: Appropriate measures would be used to reduce heat island effect in the proposed development in order to mitigate impact on microclimate. Heat islands are defined as man-made thermal gradient differences between developed and undeveloped areas. Mitigation measures could include selecting appropriate roofing material with high solar reflectance index, open grid pavement (where appropriate), increasing vegetated areas, using vegetated roofs, planting trees, using green walls, creating shades and other measures.

Light pollution reduction: Lighting schemes for the proposed development park would be used to minimize light pollution, e.g. reduce sky-glow to increase night sky access and improve nighttime visibility through glare reduction. Since the development is located next to the important Kawainui Marsh, special attention would be given to avoid light pollution to affect the adjacent wildlife areas.

Water Efficient Landscaping: The proposed development would limit or eliminate the use of potable water or other natural surface or subsurface water resources available on or near the project site, for landscape irrigation. Water efficient landscaping would be realized by selecting native or adaptive plants, increase the irrigation effectiveness through appropriate irrigation measures and the use of harvested rainwater or recycled water for irrigation..

Effective wastewater technologies: The proposed design would minimize the amount of wastewater generated in the proposed development. The wastewater would be treated on-site, preferably with septic tanks combined with septic leach fields. High-efficiency fixtures, toilets and/or waterless urinals would achieve significant wastewater reduction, resulting in

less wastewater requiring treatment and disposal. The treatment of wastewater on-site would eliminate the need to pump the wastewater to treatment plants in the area, which are currently already close to design capacity. Pumping the relatively small amount of wastewater through a long forces sewer would require significant energy. The proposed design would target a significant wastewater reduction of between 20 to 30 percent, relative to conventional warehouse designs.

Energy efficient buildings and refrigeration management: All building within the proposed development would be designed to achieve significant energy savings. The refrigeration systems would only use environmentally friendly and safe refrigerants. The buildings would be commissioned and re-commissioned on a regular schedule to assure that the design intent of energy efficiency systems has been met and is being maintained in efficient operational modes.

Optimization of energy performance: The overall usage of energy would be reduced significantly below the consumption rate of conventional warehouses, which are not or only limited energy-efficient. Energy savings would be achieved by passive and active measures. Passive measures would include insulation, heat reflective windows, light or reflective building skin, natural lighting, shading to avoid heat buildup, avoidance of heat islands and other measures. Active energy savings measure would include smart building controls, high-efficiency air-conditioning or ventilation, advanced lighting, evaporative cooling or other measures.

Renewable energies on-site: The developer plans to install a significant capacity of photovoltaic (PV) panels and thermal solar collector on warehouse roofs. The generated energy from the VP-panels would either be entirely used on site or would be fed into the grid. On-site renewable energy generation would lower the baseline and peak electricity demand and thus would mitigate possible capacity bottlenecks for utilities serving the proposed development.

Recycling: The proposed development would implement a structured plan for recycling of at least glass, metal, plastic, paper and cardboard. Organic wastes might be collected and processed for composting. The warehouse park management would establish appropriate recycling areas and receptacles and would administer or oversee recycling operation.

Construction waste management and material reuse: A construction waste management program would be used that would recycle and reuse portions of construction waste.

Rapidly Renewable Materials: The proposed development might use building material that are rapidly renewable, rather than using long-cycle renewable materials. Using locally produced material could reduce the energy required to construct the proposed industrial development.

Safeguarding indoor air quality: The proposed Kapa'a Light Industrial Park would use measures to improve and safeguard air quality by using some or all of the following measures:

- The buildings would be controlled in regard to tobacco smoke, in accordance to strict Hawaii laws and regulations; (This is a required pre-requisite)
- Outdoor air delivery monitoring would be adopted to safeguard that no dangerous or unwanted built-up of indoor pollutants occurs, such as carbon dioxide (CO_2);
- Appropriate space ventilation would provide building occupants with sufficient air ventilation to maintain indoor air quality at a high level. The proposed development would use advanced HVAC technologies to provide sufficient ventilation without incurring high energy loads;
- High efficiency filters would preferably be used.

Low emitting building materials: The use of low emitting construction and outfitting, materials would be promoted and implemented, in order to avoid negative impacts on the indoor air quality. Only low emitting adhesive, sealants, paints, coatings and carpets would be considered for the warehouses.

Effective lighting: The use of individually controllable lighting would be promoted as well as a significant portion of natural lighting through windows, sky-lights and light harvesting systems. This would increase occupants' well being and save energy and costs.

Controllability of thermal comfort: The use of advanced indoor climate control systems, where applicable, would increase occupant's comfort and would contribute to energy savings. Though it is planned that only about 10 percent of the proposed industrial warehouse space would be air-conditioned, controlled thermal comfort setting would be an effective measure to increase indoor environmental quality and lower energy consumption.

Innovation in design and operation: The proposed development would incorporate both innovative and proven technologies to achieve high resource conservation, energy savings and occupants satisfaction. Design, construction and operating professionals of the proposed Kapa'a Light Industrial Park would cooperate to achieve innovative and sound solutions to energy and environmental issues. These solutions that would safeguard that proposed industrial warehouse park would become an important part of the economic infrastructure of the Koolaupoko region, while causing only minimal impacts to the community and the environment.

1.3.5 Development of Wildlife Habitat on Restored Wetland Adjacent to the Proposed Site

The developer of the proposed Kapa'a Light Industrial Park has started with the development of a 15-acre wildlife habitat and wetland restoration project. The land that will be developed into the habitat is located within the Kapa'a Stream corridor and is open space within the parcel TMK 4-2-015:006. The habitat would be adjacent to the proposed project site.

The habitat and wetland restoration project seeks to improve open space by restoring and creating wetland area, so that it can provide much needed nesting and living habitat for endangered water birds and other wildlife. This conservation project is presently in the design and permitting phase.

The wildlife habitat and wetland restoration program is partially funded with federal funds. The objective of the project is the creation of a high-quality habitat for endangered water birds and other indigenous animals in the vicinity of the Kawainui Marsh. Figure 1-13 illustrates the concept design phase and points out the approximate location and size of the wildlife habitat and wetland restoration. The main project tasks of the wildlife habitat and wetland restoration comprise of the following items:

- 6,000 linear feet of special wildlife and security fence to keep out non-native predators, such as feral cats, which are ferocious predators of the bird population. The special wildlife fence has a height of 6 feet and is equipped with a special fence top overhang at the outside to avoid cats from climbing up and over the fence. The fence will effectively protect an area of 15 acres for the protected bird and wildlife habitat. The fence will primarily be installed on land but will cross the Kapa'a Stream at two locations.

- Multiple cascading ponds: The wetland conservation and wildlife habitat area will create multiple cascading ponds, which will be fed water from by the Kapa'a Stream or other water sources. The ponds will provide ecologically important water habitat for birds and indigenous aquatic life.

- The habitat area will be scrubbed of the current dense vegetation that primarily consists of invasive plant species. The objective is to provide suitable vegetation of native and adaptive plants to provide a secure habitat for indigenous birds.

- Trees and shrubs and vegetation will be planted that are compatible and conducive to an indigenous wetland environment; preferably native and adaptive plants will be used.

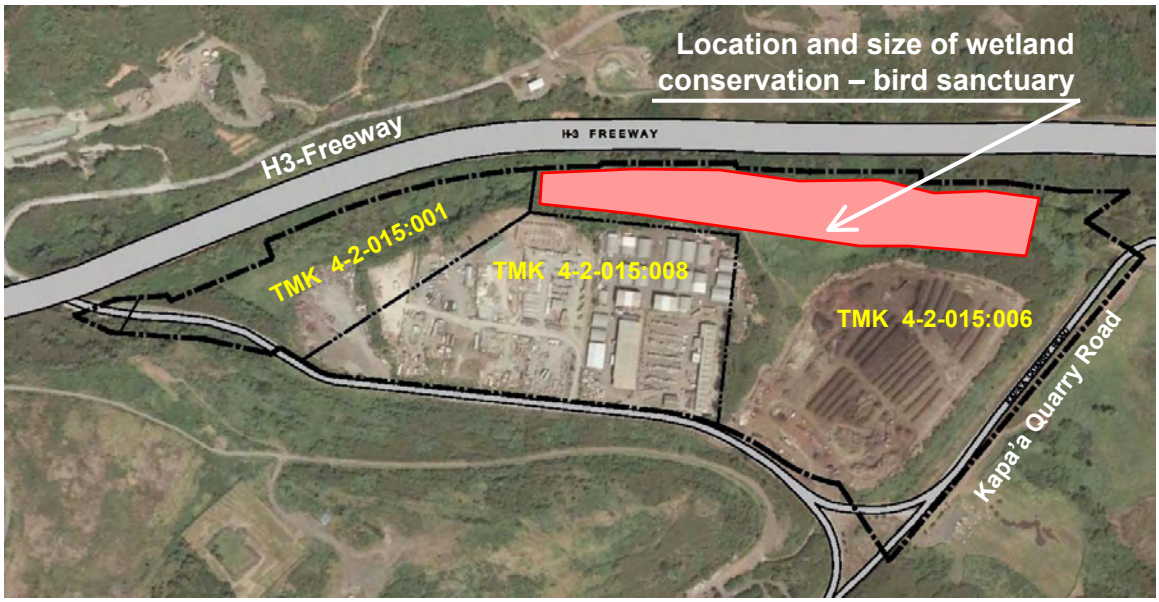
- On a continuous basis environmentally sensitive prevention, avoidance, monitoring and suppression strategies will be employed to manage weeds, insects, diseases, animals and other organisms that might directly or indirectly cause damage and disturbance to the habitat and restored wetland.

- The restored wildlife habitat will be administered by the industrial park management in cooperation with local conservation organizations.

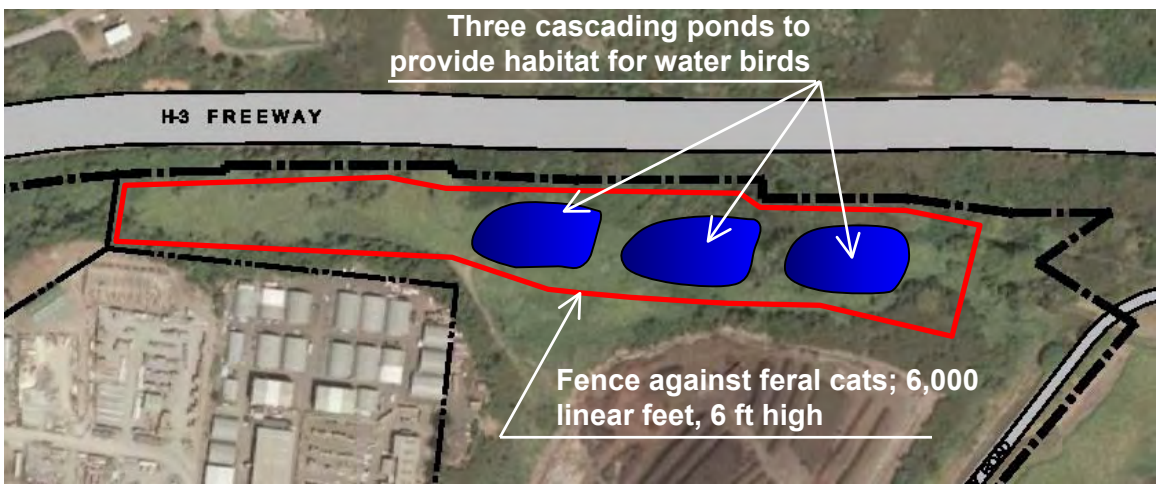
- The developer will provide opportunities to the public for bird watching. It is planned that one or more viewing sites will be constructed, either grassy areas or elevated platforms from where visitors could observe birds and wildlife. The developer might also opt to provide access to the habitat in form of a pathway so that birdwatching groups can access the habitat under supervision during times outside of the nesting season, during which birds should not be disturbed.

In summery, the wildlife habitat and wetland restoration project will create a valuable improvement to the existing open space in the vicinity of the Kawainui Marsh and will provide a secure environment for endangered water birds. These measures will be environmentally beneficial and will significantly improve the quality of open space in the vicinity of the proposed Kapa'a Light Industrial Park.

Appendix G of the Final EA provide more information of the 15-acre wildlife habitat and wetland restoration project.



Overview



Detail

Figure 1-9 Wetland Conservation Area Built as a Bird Sanctuary by the Developer

SECTION TWO

DESCRIPTION OF EXISTING ENVIRONMENT

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SECTION TWO

DESCRIPTION OF EXISTING ENVIRONMENT

This section describes the physical, environmental and socio-economic settings at the proposed site for the Kapa'a Light Industrial Park.

2.1 Physical Setting

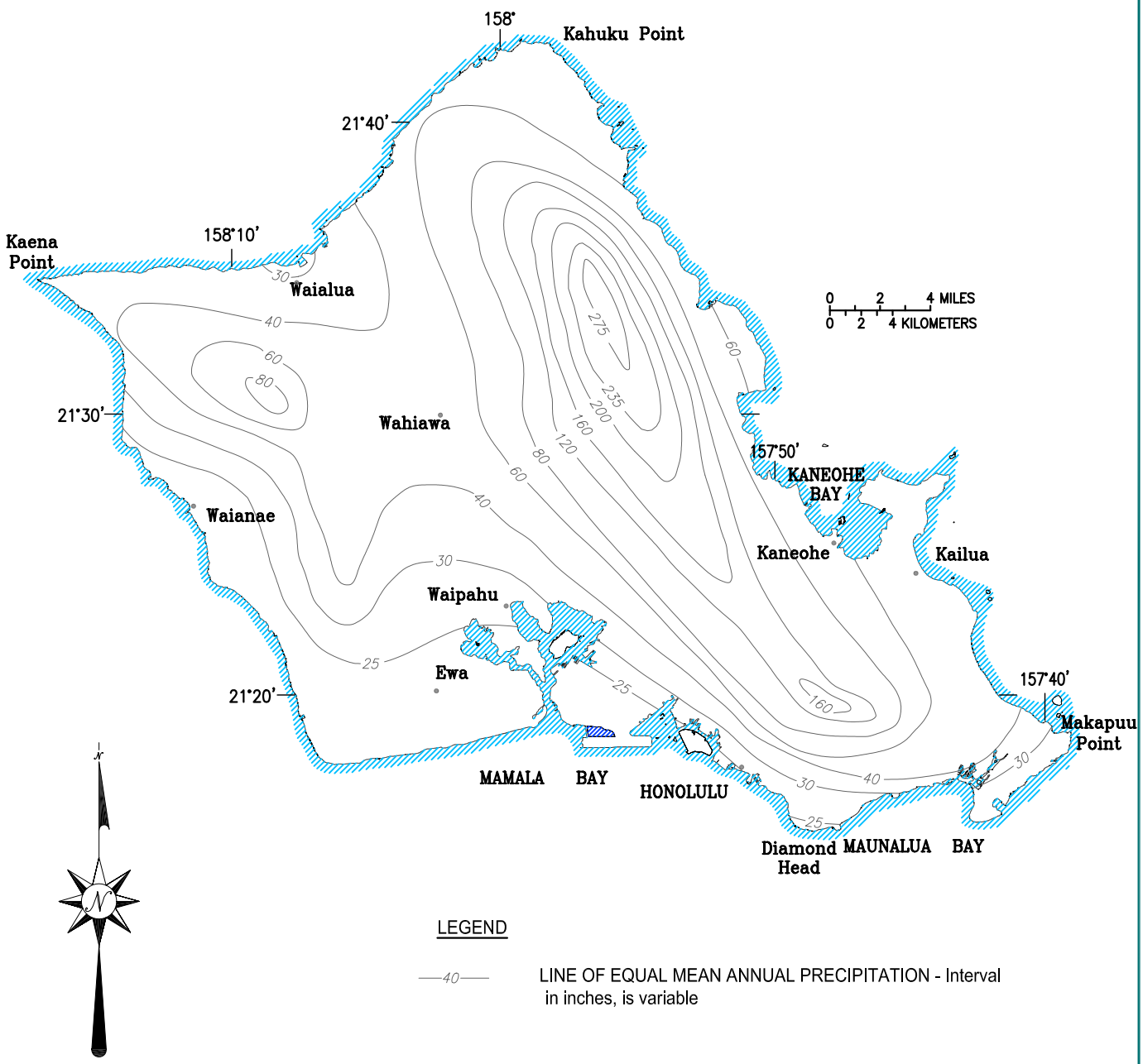
2.1.1 Climate

The proposed site for the Kapa'a Light Industrial Park, is located south of the H3-Highway Right-of-way and west of the Kapa'a Quarry Road, approximately one mile away from the ocean in windward Oahu. With the exception of few months in the winter, like most areas in the windward Oahu, the climate in the project area is characterized by its elevation above sea level, distance from the ocean and exposure to the prevailing trade winds. The general climate is sunny and relatively uniform year-round. Day time temperatures range between 73 to 80 F, whereas at night the temperatures dip into 60's.

The rainfall map of Oahu as shown in Figure 2-1, depicts the mean annual precipitation in windward Oahu to range from 60 to 120 inches, where higher rainfall occurs in higher elevations of the Ko'olau range due to orographic lift caused by the Koolau mountain ranges. The rainfall at the project site, however, is due mostly to non-thermally induced trade wind showers or large weather systems over the entire island. Mean annual Rainfall at the project site is about 50-60 inches. Most of this rainfall occurs during winter months from December through March.

2.1.2 Geology

The proposed industrial park site is situated in the Kapa'a valley, flanked by the Ulumawao mountain ridge in the southeast and the Mahinui mountain ridge in the northwest. The geological formations of the hills surrounding the valley are mainly defined by very dense rock formations of volcanic origins. Geologic map of Oahu depicted in Figure 2-2 shows that at higher elevations, the geology is mostly defined by volcanic rocks of Kailua volcanic series characterized by massive basaltic flows which contain numerous dike structures filled with secondary minerals. In contrast, the proposed project site located in the lower reaches of Kapa'a Stream, the geology is defined by terrigenous alluvium and fine organic mud. In this lower part of the watershed much of the surface has been impacted by quarry and land filling operations, which have resulted in deposition of more than 20 feet of quarry tailings and municipal solid wastes.



LEGEND

—40— LINE OF EQUAL MEAN ANNUAL PRECIPITATION - Interval in inches, is variable

Figure 2-1 Mean Annual Precipatition for Oahu

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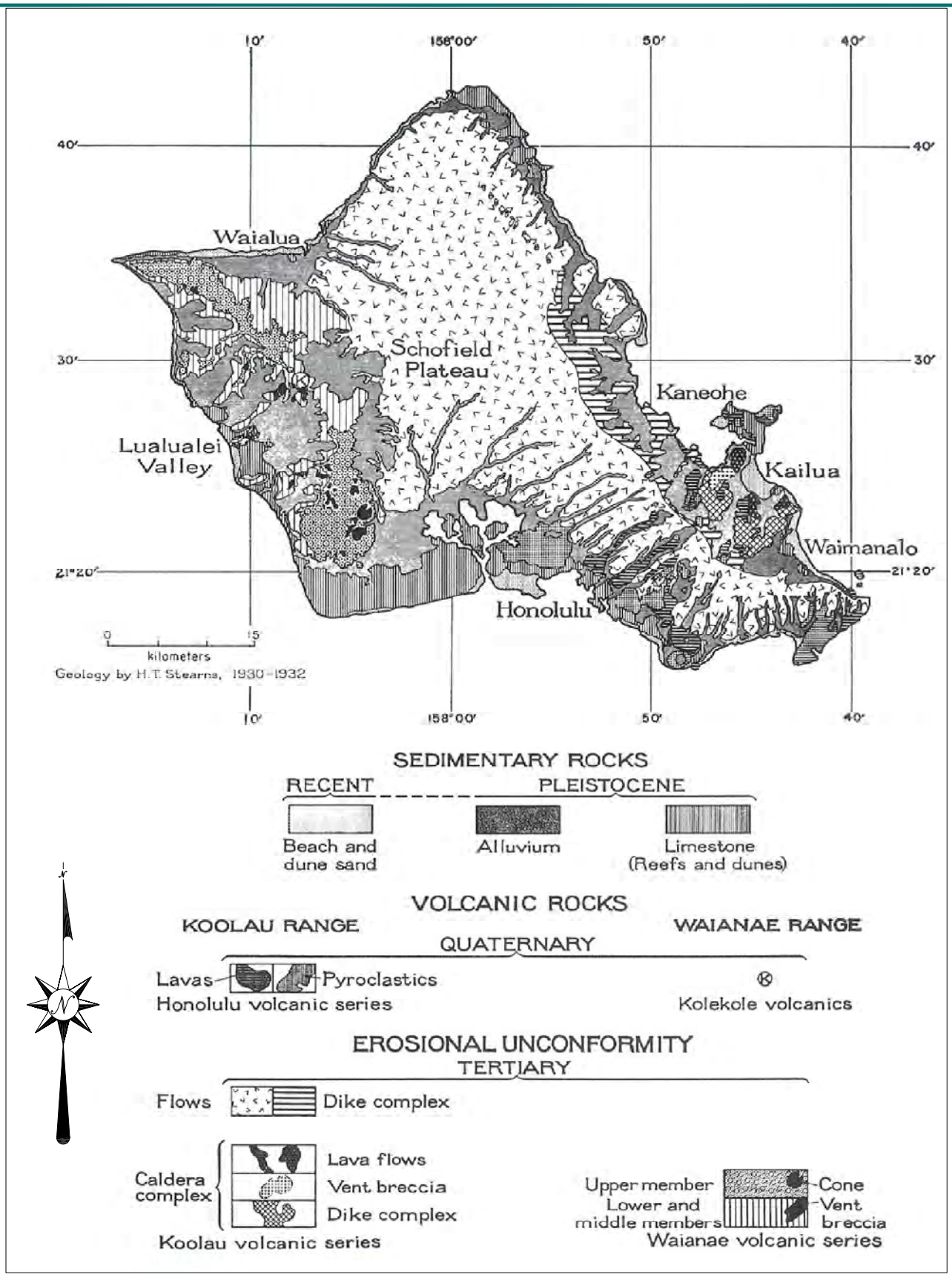

Figure 2-2 Geological Features of Oahu

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2.1.3 Topography

The existing topography at the proposed site is characterized by gently sloping terrain from southwest to the northeast and towards the Kapa'a Stream. The natural topography at the site has historically been heavily impacted by quarry and landfill operations starting in the 1940s and through the 1960s. The most recent topographic map of the proposed site depicted in Figure 2-3, shows that the relatively flat eastern section of the site is separated from the lower section by a narrow 25 to 30 feet drop line which meanders northward before ending at the right bank of the Kapa'a Stream. Ground elevations in the western section of the site, range from 80 to 95 feet above Mean Sea Level, MSL, and gently slope towards the Kapa'a Stream. The northern section of the site is formed by a relatively flat plateau bounded in the north by Kapa'a Stream and in the west by a drainage ditch, which runs along Kapa'a Quarry Road and drains into the stream. Ground elevations in this section range between 20 and 50 feet above MSL with a gentle slope in easterly direction.

2.1.4 Soils

In reference to the U.S. Natural Resources Conservation Service (NRCS) soil classifications, originally and prior to quarry operations in the valley, two broad classes of soil types were found at the proposed project site. The soil in the upper portion of the site belongs to the Kawaihapai Soil Series. This series consists of well-drained soils in drainage ways and on alluvial fans. These soils formed as alluvium derived from igneous rock in humid areas and generally consist of an upper layer of dark brown stony clay loam underlain by stratified sandy loam. Runoff in this type of soil is slow, and erosion hazards are slight.

In the lower portion of the proposed site, the original soils belong to the Pearl Harbor Series. This series consist of poorly drained soils on nearly level coastal plains. This soil type has very low permeability, with slow runoff characteristics. However, due to intensive quarry and landfill operations in the area dating back to early 40s, the original soils at the site, have been drastically altered by excavation and deposition of quarry tailings and overburden materials as well as residential solid wastes.

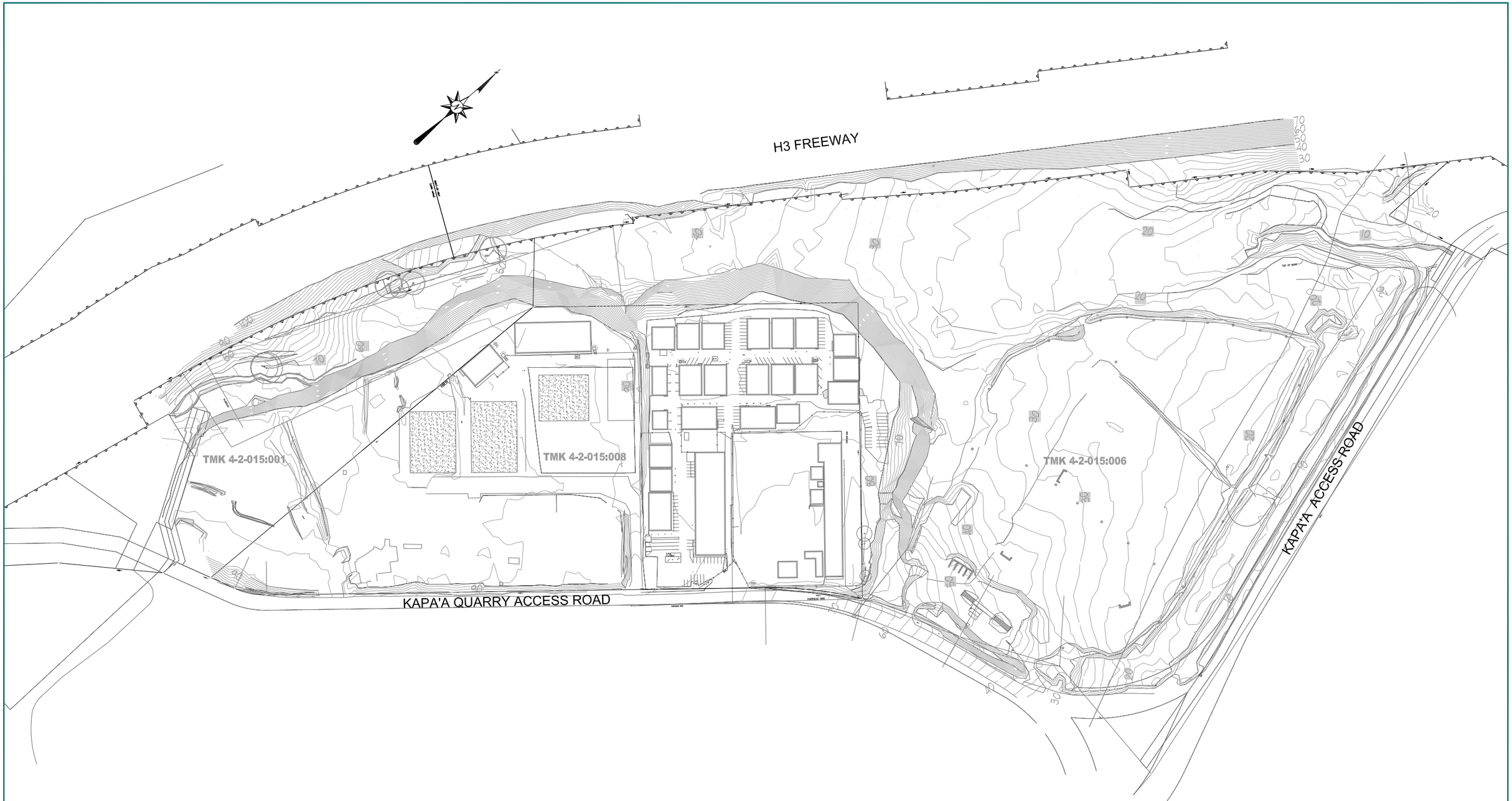

Figure 2-3 Topographic Map of Proposed Site

250' 0 250' 500' 1000'
SCALE: 1" = 250'-0"

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2.1.5 Hydrological Characteristics

The proposed project site is located in the lower reaches of the Kapa'a valley and within the Kapa'a watershed. Figure 2-4 shows the Kapa'a watershed and the location of the proposed Kapa'a Light Industrial Park.

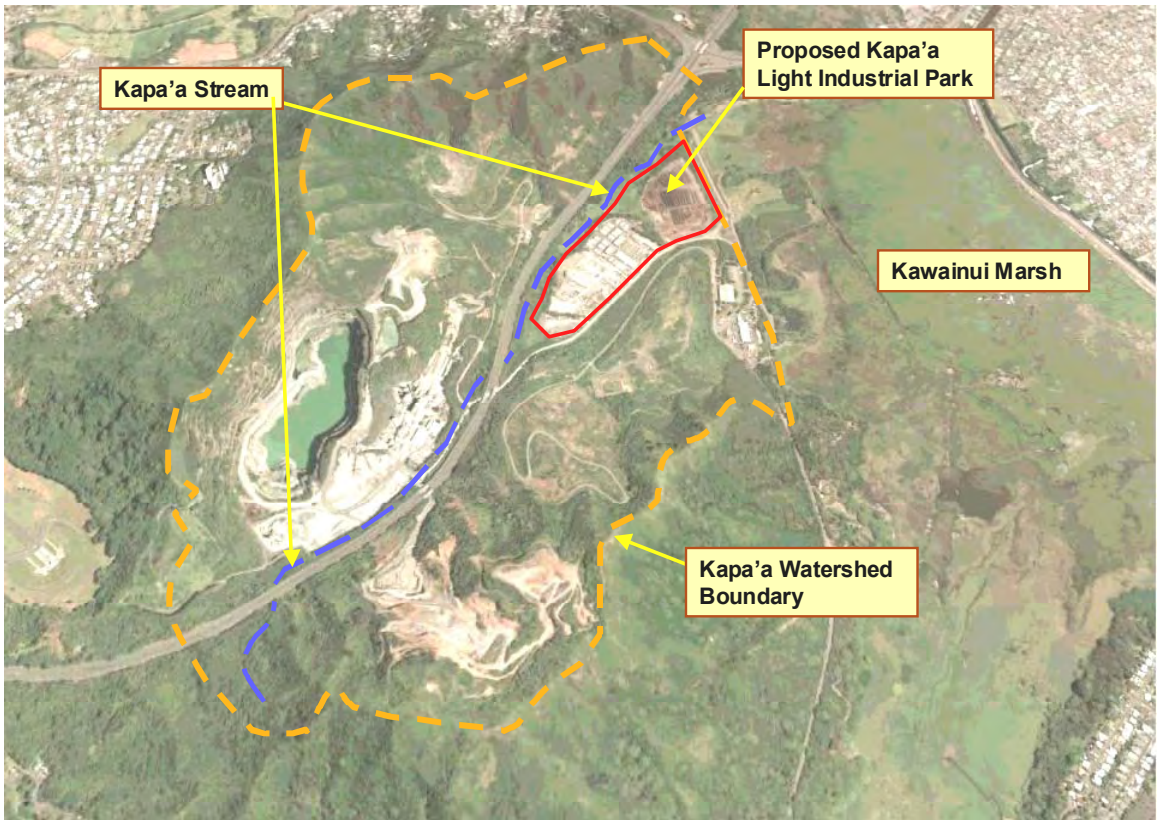


Figure 2-4 Kapa'a Watershed

The relatively short Kapa'a Stream is the main drainage way for the watershed, which drain into Kawainui Marsh and ultimately to the Pacific Ocean via Oneawa Canal and Kailua Beach. The stream, which is a little over one mile long, has a very low base flow of about half a gallon per minute. During rainy season and after heavy storm, however, the base flow increases significantly.

2.1.5.1 Existing Drainage Conditions

The three parcels (TMK: 4-2-015:001; TMK: 4-2-015:008; TMK: 4-2-015:006), which comprise the site for the proposed Kapa'a Light Industrial Park are located in the lower reaches of the Kapa'a Stream. Figure 2-5 shows the existing drainage patterns on and in the vicinity of the

proposed project site. As shown, all or most of the onsite storm run-off is directed and conveyed, by means of surface flow, into existing detention ponds or directly into the Kapa'a Stream. This discharge also include off-site flows that are directed into the property, namely, an existing 36-inch drainage pipe, which delivers runoff from up slope vacant land south of Kapa'a Quarry Access Road into the lower tier portion of the project site.

Presently storm runoff on vacant land within the portions of the TMK 4-2-015:001 flows into the Kapa'a Stream either through direct surface flow or ground percolation, since the parcel is mostly composed of pervious surface.

The parcel in the center of the proposed site and identified by TMK 4-2-015:008 has an existing drainage infrastructure since it contains about thirty warehouses and paved roadways. In addition, this area also provides ample space for outdoor equipment and material storage area for various enterprises operating at the site. The existing drainage infrastructure includes grass channels, drain inlets with inlet skimmer boxes, two detention ponds and flow diversion berms. Existing drainage infrastructure components are placed throughout the area to intercept the storm runoff prior to discharge into Kapa'a Stream.

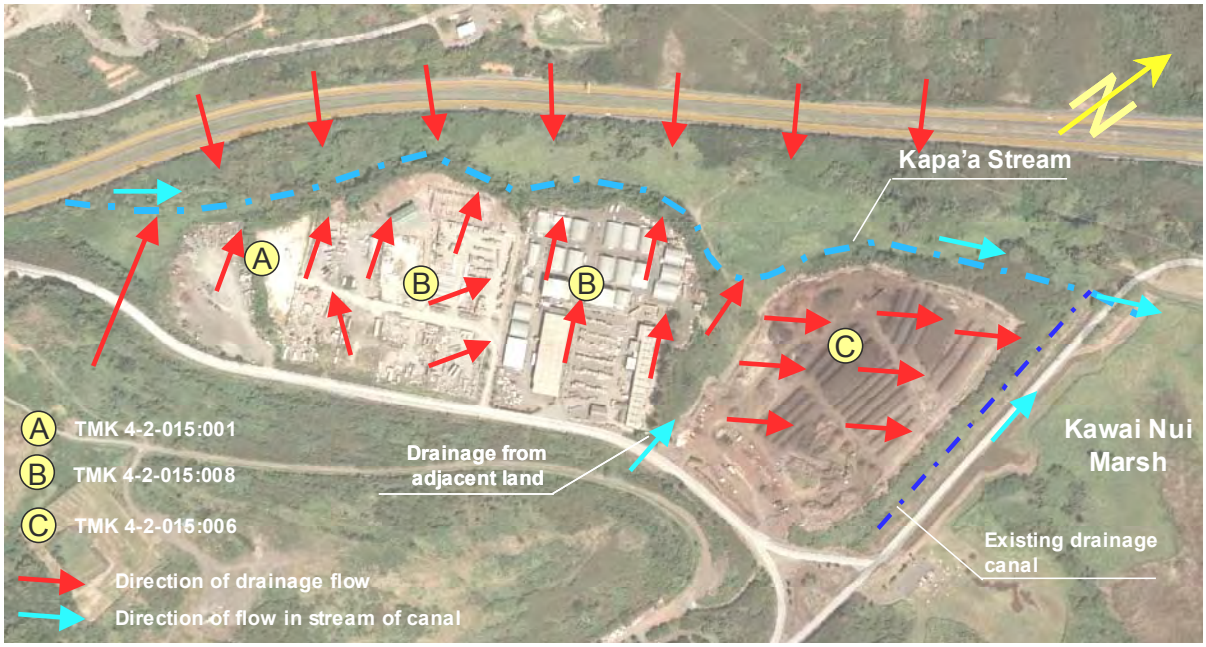


Figure 2-5 Existing Drainage Conditions

In the west and along the boundary with parcel TMK: 4-2-015:001, a 250 feet long grass swale conveys run-off to one of the two detention ponds on the property. Along the northwestern property line and adjacent to the bank of Kapa'a Stream there are four drain inlets with skimmer boxes. A 6-inch concrete curb running parallel to the stream bank ensures that the storm runoff

is contained on the property and directed to these four drain inlets for subsequent discharge into the Kapa'a Stream.

In the central part of parcel TMK: 4-2-015:008, a 500-feet long grassed swale collects run-off from the area before discharging it into a drain inlet or one of the two existing detention ponds before discharging into the stream. A portion of surface runoff from the eastern part of the parcel is also conveyed via this swale to the existing detention ponds for treatment prior to discharge into the stream.

The most northern portion of the three-parcel proposed for the project is designated as TMK 4-2-015:006. Except for an existing 36-inch drainpipe, which delivers off-site storm water from upslope property south of the access road, there is no other drainage infrastructure in this parcel. All or most of the storm runoff in this area sheet flows into an existing drainage ditch along the eastern border of the property running parallel to the Kapa'a Quarry Road. Flows from this ditch enters the Kapa'a Stream upstream of an existing culvert under the Kapa'a Quarry Road.

In summary, most of surface run-off on the proposed project site directly enters the Kapa'a Stream and ultimately the Kawainui Marsh. Observations suggest that during extreme rain events the water level in Kapa'a Stream rises to such extent as to inundate sections of the Kapa'a Quarry Road in proximity to the Kapa'a Stream culvert under Kapa'a Quarry Road. In these events the Kapa'a Quarry Road becomes impassable for traffic.

2.1.5.2 Water Quality in Kapa'a Stream

As previously mentioned, the Kapa'a Stream is the main drainage pathway for the Kapa'a watershed, which has a total area of about 800 acres. Some minor flows from the watershed into the Kawainui Marsh occur through several smaller direct outlets and through underground water movement. The Kapa'a Stream has a total length of about two miles. Along its way through the watershed it meanders through different parts of the Kapa'a valley that been significantly altered by industrial and other developments in the past 60 years. From its source the stream flows through several permanent pools until the stream enters a permanent channel not far from where it flows into the Kawainui Marsh.

Industrial developments in the valley, such as quarry and landfill operations, depositions of quarry tailings and overburden on previous wetland areas and other industrial activities have had significant effects on the Kapa'a Stream. The streambed has undergone changes and the water quality has deteriorated. The State of Hawaii Department of Health identified the water quality in Kapa'a Stream as impaired by elevated turbidity, total suspended solids (TSS), nutrients (TN, TP), and metals (DOH,2007).

In 2007 the Department of Health performed an evaluation of the water quality in the Kapa'a Stream (DOH,2007). The evaluation involved a comprehensive model of the water discharge and pollutant loads of the stream, for both typical wet and dry seasons. The hydraulic model comprised 13 sub-basins, which were characterized by different hydrographical properties,

drainage characteristics and land uses. The sub-basins had various sizes. With the applied assumptions of rainfall, infiltration rates, runoff rates and stream morphology assimilation rates, the sub-basins produced different flow rates and loads of various pollutants in the Kapa'a Stream.

Figure 2-6 shows the extent the Kapa'a watershed and location and size of the 13 sub-basins used in DoH model. Table 2-1 describes the sub-basins used in the DoH hydraulic model. It should be noted that in the model all sub-basins, with the exception of sub-basin L, drain into the Kapa'a Stream. Runoff from Sub-basin L drains directly into the Kawainui Marsh through an outlet under the Kapa'a Quarry Road. In addition to surface drainage through the Kapa'a Streama and the different direct outlets into the Kawainui Marsh, underground flow contributes to the total drainage of the watershed.

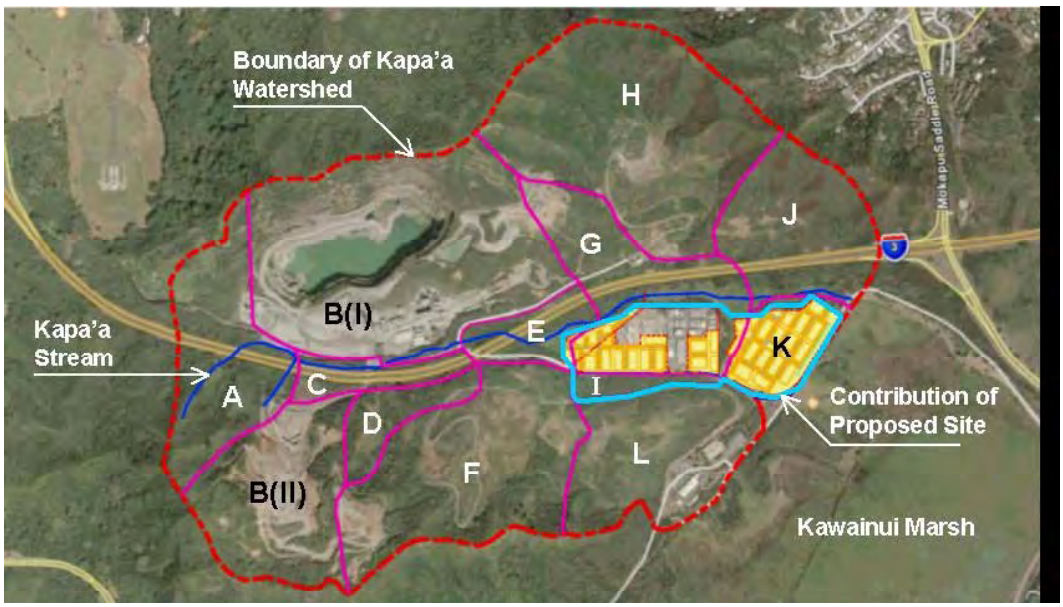


Figure 2-6 Location and Size of Sub-basins as Defined in DoH Kapa'a Watershed Model

Table 2-1 Description of Sub-basins Used in DoH Kapa'a Watershed Model

Sub-basin ID	Area (acre)	Description of Sub-basin
A	96	Sub-basin A is the headwater tributary drainage area for Kapa'a Stream.
B (I) and B(II)	150 35	Sub-basin B is divided into sub-basin B(I) and B(II). The sub-basins B(I) and B(II) represent the Ameron Phase I and Phase II quarry operations. The two sub-basins are divided by the H3-Freeway. The run-off from

Sub-basin ID	Area (acre)	Description of Sub-basin
		Sub-basin B(II) is conveyed to the sub-basin B(I). Sub-basin B(I) has a retention pond that accommodates a 10-year, 24-hour rain event.
C	17	Sub-basin C consists of the right-of-way for the H-3 highway and is located between the sub-basins B(I) and B(II).
D	29	Sub-basin D is a steeply sloped area that drains toward the H-3 highway. Runoff from this area is collected and point-discharged into the Kapa'a Stream through a culvert.
E	24	Sub-basin E is an immediate tributary drainage area for the Kapa'a Stream. The sub-basin is divided by the H3 Freeway. This sub-basin is directly to the south of the Kapa'a Light Industrial Park.
F	98	Sub-basin F drains the City & County of Honolulu Kapa'a Landfill (Phase II) and relatively undisturbed slopes up to the ridgeline. Drainage is collected in a circumferential drainage swale constructed around the inner landfill. Drainage is conveyed to sub-basin E.
G	60	Sub-basin G is an immediate tributary drainage area for Kapa'a Stream. The sub-basin encompasses area to both sides of the H3-Freeway and the Kapa'a Stream. Sub-basin FG is divided into an eastern and western part. The western parts drains through several culverts under the freeway. The eastern part includes a part of the proposed Kapa'a Light Industrial Park.
H	126	Sub-basin H includes the Kalaheo Landfill, which is surrounded by larger sloped scrub-covered areas. The municipal landfill is no longer in operation. The sub-basin drains into the Kapa Stream through a large culvert under the H3-Freeway. The sub-basin has a retention pond to control the drainage and sedimentation discharge.
I	8	Sub-basin I is a small area that drains into the Kapa's Stream through a pipe that passes under the Kapa'a Quarry Access Road and terminates in Sub-basin K
J	59	Sub-basin J drains slopes to the west of the H3-freeway and the stream valley adjacent to sub-basin K. The area west of the H3-Freeway is drained into the Kapa'a Stream through several culverts under the freeway.
K	28	Sub-basin K is a landfill area that consists of quarry deposits. The sub-basin drains into a drainage canal that separates Sub-basin K from the Kapa'a Quarry Road. Sub-basin K is the area that will be used for the lower portion of the Kapa'a Light Industrial Park.
L	62	Sub-basin L contains the lower Phase I part of the Kapa`a landfill, which is also the site of the old first Ameron quarry. A drainage swale collects the runoff and conveys it to a retention pond. The Sub-basin L is the only sub-basin of the Kapa'a watershed that drains directly into the Kawainui Marsh and not into the Kapa'a Stream.
Sum	792	Total area of Kapa'a watershed; with 730 acres draining into the Kapa'a Stream and 62 acres draining directly into the Kawainui Marsh.

Using wet season flow rates and pollutant loads in the Kapa'a Stream, provides an assessment of the contribution of the proposed Kapa'a Light Industrial Park to the overall water quality of the Kapa'a Stream.

The assessment considered a wet season baseline scenario and a 2% flow event scenario of and the resulting flow rates and pollutant load levels in the Kapa'a Stream. The baseline case refers to drainage conditions, where the flow rate and resulting pollutant load level in the stream is causes by release of groundwater from the watershed. The 2% event refers to the highest 2% of the average rainfall events in the watershed; it is a statistical means to express high flow rates and resulting high loads of pollutants discharged into the Kapa'a Stream. The 2% event, thus, reflects flow rates and pollutant loads resulting from baseline plus high runoff.

The resulting flow rates and pollutant load rates for the wet season baseline and 2% event are presented for the existing conditions at the proposed site. Only 12 of the 13 sub-basins contribute to the water quality of the Kapa'a Stream; Sub-basin L does not drain into the Kapa'a Stream, but drains directly into the Kawainui Marsh.

Table 2-2 and Figure 2-7 indicates estimated average flow rates and Total Suspended Solids (TSS) loads for the wet season baseline case as percentages of total flow and loading. Under baseline conditions, Sub-basin B (sum of B(I) and B(II)) is the largest contributor to both the water flow rate and the pollutant loading in the Kapa'a Stream. Other large contributors are sub-basins A,F, G and H, whereby sub-basin A contributes less TSS as the other three sub-basin in this group of four. The sub basins E, G, I and K, which include the flows and pollutant loads under existing conditions at the proposed site, contribute more TSS than water flow. This is due to the high TSS contributions of the industrial part of sub-basin G, which represents the existing warehouse development on parcel TMK 4-2-015:008, and the sub-basin K, which is the landfill area with Green Waste processing.

Table 2-3 and Figure 2-8 indicate estimated average flow rates and Total Suspended Solids (TSS) loads for the wet season 2% event as percentages of total flow and loading. The contributions of sub-basins B and H are significantly reduced due to the effect of sedimentation ponds, which hold back TSS loads from these two sub-basins. In the DoH analysis the runoff from sub-basin B and H does not contribute to the water flow and TSS loading of the Kapa'a Stream or is greatly reduced, respectively. Sub-basin D is by far the biggest contributor in regard to TSS loading, followed by Sub-basin F. The proposed site, in the present condition, contributes more water flow than TSS. This is partly due to the fact that in the 2%-event the industrial part of sub-basin G discharges more flow than TSS. It can be seen that the TSS loading of the lower part of the proposed site, the landfill area of sub-basin K, contributes most of the TSS loading. This suggests that the landfill area in sub-basin K, which currently does not have sufficient measures against surface erosion, is the main contributor of TSS loading to the Kapa'a Stream from the land that would constitute the proposed site.

Table 2-2 Wet Season Baseflow and Pollutant Load; Present Contribution from Proposed Site

Subbasin	Flow (cfs)	TSS (kgd)	Flow % of total	TSS % of total
A	0.17	20	14%	8%
B	0.40	91	33%	34%
C	0.03	4	2%	2%
D	0.04	5	3%	2%
E	0.04	8	3%	3%
F	0.14	38	11%	14%
G	0.12	36	10%	14%
H	0.18	33	15%	12%
I	0.01	4	1%	2%
J	0.07	16	6%	6%
K	0.03	11	2%	4%
sum	1.23	266	100%	100%
Proposed site contribution from:				
subbasin E; Industrial	0.00	2	0%	1%
subbasin G; Industrial	0.08	30	7%	11%
subbasin I; Landfill	0.01	3	1%	1%
subbasin K; Landfill	0.03	10	2%	4%
sum	**0.12**	**45**	**10%**	**17%**

Note: Subbasin L does not contribute to flow and pollutant load of Kapa'a Stream

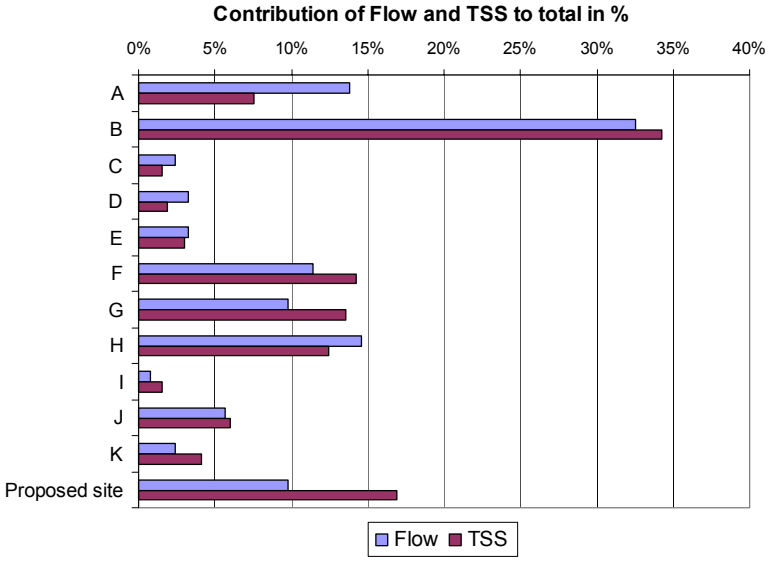


Figure 2-7 Wet Season Baseflow and Pollutant Load; Present Contribution from Proposed Site

Table 2-3 Wet Season 2% Event and Pollutant Load; Present Contribution from Proposed Site

Subbasin	Flow (mcf)	TSS (kgd)	Flow % of total	TSS % of total
A	0.03	140	3%	0%
B	0	0	0%	0%
C	0.02	61	2%	0%
D	0.11	27,031	13%	42%
E	0.05	344	6%	1%
F	0.21	16,212	24%	25%
G	0.17	1,538	20%	2%
H	0.06	3,155	7%	5%
I	0.03	1,659	3%	3%
J	0.1	7,044	12%	11%
K	0.08	6,779	9%	11%
sum	0.86	63,963	100%	100%
Proposed site contribution from:				
subbasin E; Industrial	0.01	60	1%	0%
subbasin G; Industrial	0.1	1179	12%	2%
subbasin I; Landfill	0.02	1527	2%	2%
subbasin K; Landfill	0.08	6728	9%	11%
sum	**0.21**	**9494**	**24%**	**15%**

Note: Subbasin L does not contribute to flow and pollutant load of Kapa'a Stream
mcf = million cubic feet

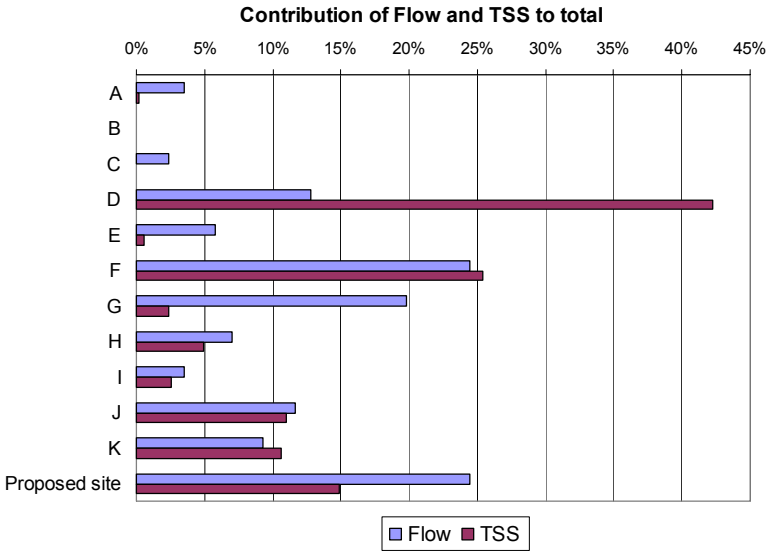


Figure 2-8 Wet Season 2% Event and Pollutant Load; Present Contribution from Proposed Site

When assessing the contribution of different sub-basins to the total flow and pollutant loading in the Kapa'a Stream it is helpful to compare the relative size of the sub-basin, e.g. its percentage of the total size of the watershed, to the relative flow and pollutant loading which originates from that sub-basin. If all conditions, such as amount of impervious area, erodable surfaces and ratio of infiltration to runoff, were the same in all sub-basins, the relative runoff volume and generated pollutant loads would be a function of the relative size of sub-basin. As can be seen from the data, this is not the case and different sub-basins contribute more than would be expected from the relative size only.

Figure 2-9 depicts a correlation of the percentage contributions of size of sub-basins and TSS loadings for the wet season baseline and 2%-event scenario. It can be seen that the DoH study concluded sub-basin D as being the biggest contributor of TSS loading in the 2%-event case. The relative small size and high TSS loading of sub-basin D is striking. Sub-basin B, while being the largest sub-basin in the watershed does not have any TSS loading in the model, due to its sedimentation pond. Furthermore, the relative size and TSS loading in the 2%-event deviates significantly for sub-basin F. The existing conditions of the proposed site suggest that the relative baseline and 2%-event TSS loading is larger than its relative size, suggesting that current conditions of the proposed site could be improved to lower the impact of peak run-off and associated pollutant loading.

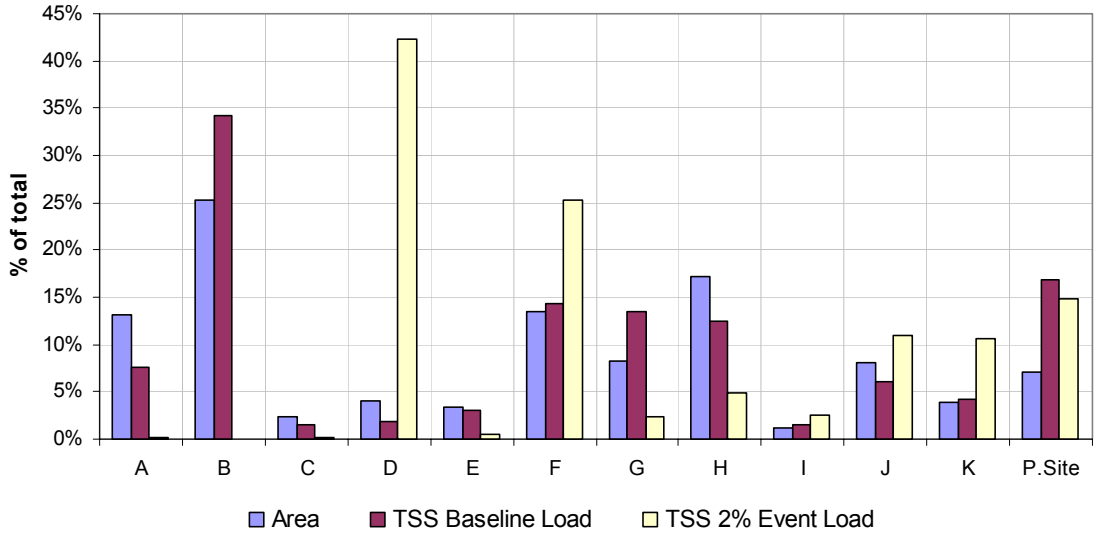


Figure 2-9 Comparison of Size and TSS Loading for Baseline and 2%-Event Contributions

2.1.6 Flood and Tsunami Hazards

The project site is located outside of any potential tsunami inundation area. In contrast to it, as shown in Figure 2-10, the Flood Insurance Rate Maps (FIRM), which are used to determine the vulnerability of land to flooding, depict the designated flood zones in the vicinity of the proposed site. It has been observed that sections of the Kapa'a Quarry Road adjacent to the mouth of the

Kapa'a Stream and the existing culvert under the Quarry Road are intermittently inundated at times of heavy rainfall. During such periods of flooding the Kapa'a Quarry road has to be closed for traffic.

Most of the land within the proposed site is in FEMA Flood Zone D, which indicates areas with possible but undetermined flood hazards. Some low-lying areas of parcel TMK 4-2-015:006 adjacent to the Kapa'a Quarry Road are within the flood zones X and A. The Flood Zone A refers to land, which is likely to be inundated by the flood event having a one-percent chance of being equaled or exceeded in any given year. The one-percent annual chance flood is also referred to as the base flood or 100-year flood. Flood Zone A is limited to the existing drainage channel adjacent to the Kapa'a Quarry Road and to the mouth and the lower sections of the Kapa'a Stream, which are located within parcel 4-2-015:006. Land that is within the Flood Zone X represents moderate to minimal flood hazards. Land designated as Flood Zone X has flood vulnerability of equal or lower than the 0.2-percent-annual-chance or 500-year flood.

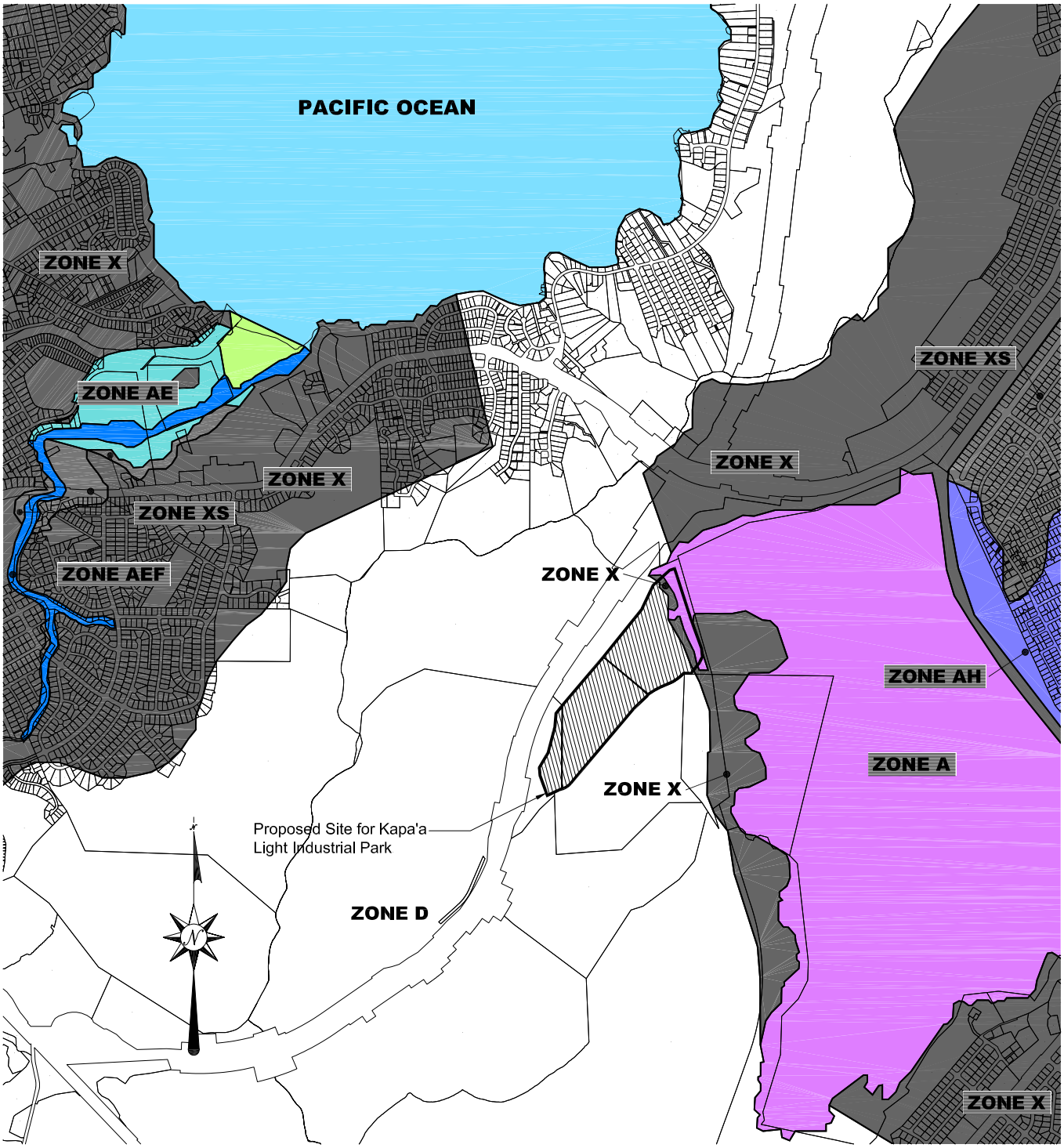
2.1.7 Wetlands

Wetlands are defined by the United States Army Corps of Engineers and the United States Environmental Protection Agency as "those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetations typically adapted for life in saturated soils. Wetlands generally include swamps, marshes, bogs, and similar areas." While in the past wetlands were frequently filled or drained to make room for agriculture or other land uses, the significant ecological value of wetland is now recognized. This has resulted in comprehensive efforts to secure and restore wetlands.

The Kawainui Marsh is adjacent to the proposed site and represents one of the most important wetlands in the State of Hawaii. Some wetland areas are present within the lower reaches of the Kapa'a Stream corridor in the vicinity of the confluence of the Kapa'a Stream and the drainage canal adjacent to the Kapa'a Quarry Road. Since the Kapa'a Stream drains into the Kawanui Marsh, the stream's flow conditions and water quality directly affect the marsh.

2.1.8 Flora and Fauna

The proposed project site is located at the mouth of Kapa'a Stream in the lower reaches of the Kapa'a watershed. The site is laid out in two tiers, separated by a sharp 25 to 30 feet drop in elevations, which bisects the site. The drop line starts midway of the southern boundary and meanders northerly to the right bank of the Kapa'a stream. Kawainui Marsh borders the northeastern corner of the site, whereas Kapa'a stream runs along the north and northwestern boundary of the project site. A drainage ditch running along the Kapa'a Quarry Road forms the southern and eastern boundary of the property.



Scale: 1 inch = 2000 feet

ZONE DESCRIPTION

A - 100 YEAR FLOOD ZONE; NO BASE FLOOD ELEVATIONS DETERMINED
AE - 100 YEAR FLOOD ZONE; BASE FLOOD ELEVATIONS DETERMINED
AEF - 100 YEAR FLOOD ZONE; FLOOD WAY AREA WITH AE
AH - 100 YEAR FLOOD ZONE; WITH 1-3 FT PONDING
D - POSSIBLE BUT UNDETERMINED FLOOD HAZARDS
X - BEYOND 500 YEAR FLOOD PLAIN
XS - 500 YEAR FLOOD PLAIN

LEGEND:

PROPOSED SITE OF KAPA'A LIGHT INDUSTRIAL PARK

Figure 2-10 Flood Zone Map

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The lower- tiered land has been mostly cleared and the area is used for commercial green wastes processing. Relatively heavy vegetation occurs along the banks of Kapa'a stream, the drop line separating the toe tiers of the property, and the drainage ditch along Kapa'a Quarry Road.

The existing vegetation in these areas include overgrown vegetations and shrubberies and sometimes dense growth of:

- Koa haole (Leucaena leucocephala)
- Guava (Psidium guajava)
- Chinese banyan (Ficus microcarpa)
- Monkeypod (Samanea).
- Hau (Hibiscus tiliaceus)
- Overgrown umbrella sedge (Cyperus alternifolius)
- Elephant grass (Pennisetum purpureum)
- California grass (Brachiaria multica)

The land in the upper tier of the property is heavily impacted by industrial and operations and is currently basically devoid of any vegetation, except along the banks of the Kpa'a stream where some or all of the previously mentioned species of vegetation and growth are observed. There are areas of slow moving or stagnant water bodies in the lower parts of the Kapa'a watershed, including the lower reaches of the Kapa'a Stream and the existing drainage ditch along Kapa'a Quuarry Road. These areas are often infected with intense growth of Salvinia Molesta. Invasive species, such as Salvinia Molesta, have become a major problem for the Kawainui Marsh, by severely choking off marsh drainage passageways and deteriorating the streams natural capacity to flow into the Kawainui Marsh. Figures 2-11 and 2-12 show typical occurrences of Salvinia growth in the waterway.

Due to historic use of the property for various industrial activities in the past 50 years, the upper tier of the site is devoid of any avifaunal (bird) habitat mostly because of removal of natural vegetation cover and ongoing human activities. The open space within the lower tier and at the mouth of Kapa'a stream, however, provides habitat for a range of birds, mammals and aquatic species. Observations suggest that the feral cat population in the area has been a main predator for the bird population. Birds and mammals sighted or observed around and within the proposed project site include:

Birds:

Common name	**Scientific name**
Cardial	Cardinalis cardinalis
Cattle egret	Bubulcus ibis
Barred dove	Geopedia striata
Mynah	Acridothera tristis
Lace-necked dove	Streptopedia chinensis
Sparrow	Passer domesticus
Japanese white-eye	Zosterops jaonica
Shama thrush	Copsychus malalaricus

Mammals:

Common name	Scientific name
Mongoose	Herpestes auropunctatus
Mice	Mus musculus
Rat	Rattus rattis, norvegicus
Feral Cat	

Figure 2-11 Lower Reach of Kapa'a Stream Corridor Covered with Salvinia Molesta (Picture Taken from Existing Culvert under Kapa'a Quarry Road)

The adjacent Kawainui Marsh is an important habitat for birds and other wildlife. The number and variety of birds observed in the Kawainui Marsh has varied over time. When the Kawainui Marsh was an open lake, before vegetation overgrowth and sedimentation had reduced the habitat area, a large number of endemic birds made their habitat there. Over time the number and variety of birds have decreased. The following birds have been sighted by different investigators in and around the Kawainui Marsh:

Figure 2-12 Water surface in Existing Drainage Canal Alongside Kapa'a Quarry Road Covered with Salvinia Molesta

Common name	Scientific name
Cardial	Cardinalis cardinalis
Pintail	Anas acuta
Mynah	Acridothera tristis
Pacific Golden Plover	Pluvialis dominica fulva
Japanese White-eye	Zosterops jaonica
Black-crowned Night Heron	Nycticorax nycticorax hoactli
Hawaiian Duck (*)	Ana wyvillienu
Hawaiian Coot (*)	Fulica americana alai
Hawaiian Stilt (*)	Himantopus himantopus knudseni
Hawaiian Gallinule (*)	Gallinula chloropus sandvicensis
Shoveler	Anas clypeata
Frigate Bird	Fregata minor

(*) = endangered birds

The following aquatic fauna has been sighted by different investigators in waters in and around the Kawainui Marsh:

Common name	Scientific name
Pelagic milkfish or awa	Chanos chanos
Aholehole	Kuhlia sandvicensis
Mullet	Mugil cephalus
Papio	Caranx sp.
Barracuda	Sphyraena
Nehu	Encrasicholina purpurea
O'opu	Eleotris sandwicensis
Rice eels	Monopterus sp.
Hawaiian river shrimp	Macrobrachium grandimanus
Crenate swimming crab	Thalamita crenata
Worm	Tendipes

In order to enhance and restore the natural habitat and encourage remigration and nesting indigenous fauna to the area, lately there have been initiatives to reintroduce some of the species of bird and restore appropriate habitats within the Kawainui Marsh or on adjacent land. One of these initiatives is the planned development of a 15-acre wildlife habitat, which the developers of the proposed Kapa'a Light Industrial Park has stated within the parcel TMK 4-2-015:006. Upon completion this 15-acre wildlife habitat will be home to endangered birds and other wildlife. The protected wildlife habitat will be developed on restored wetland and will include a number of cascading ponds and a wildlife fence that keeps out feral cats.

2.1.9 Historic and Archaeological Features

As it has been mentioned in the preceding sections, the proposed site for the project has been heavily impacted by industrial activities in the last fifty years. The site is devoid of any archaeological or historic resources. A comprehensive archaeological survey conducted by Cultural Surveys Hawaii, Inc. (CSH) (Cultural Survey Hawaii, 2000) indicates that most of the historical or culturally significant sites in the vicinity of the proposed development are found around the southern perimeter of Kawainui Marsh. Figure 2-13 shows the locations of significant historical finds close to the Kawainui Marsh, as presented in the CSH study. The Pahukini Heiau is a major historical site that is closest to the proposed site for the Kapa'a Light Industrial Park. The Pahukini Heiau is a 120 by 180 feet stone structure and is on the site of a landfill within TMK 4-2-15:003. According to the website of the Office of Hawaiian Affairs the heiau was built by the wealthy Chief Olopana and was used in important state functions. The heiau is completely surrounded by Kapa'a landfill and has been badly neglected for many years, until it was restored and rededicated in the late 1980s.

Other historical sites close to the Kawainui Marsh are shown on Figure 2-13 and are briefly described in Table 2-4. The "State Site #" in Table 2-4 and Figure 2-13 refer to the Hawaii State Register for Historic Places.

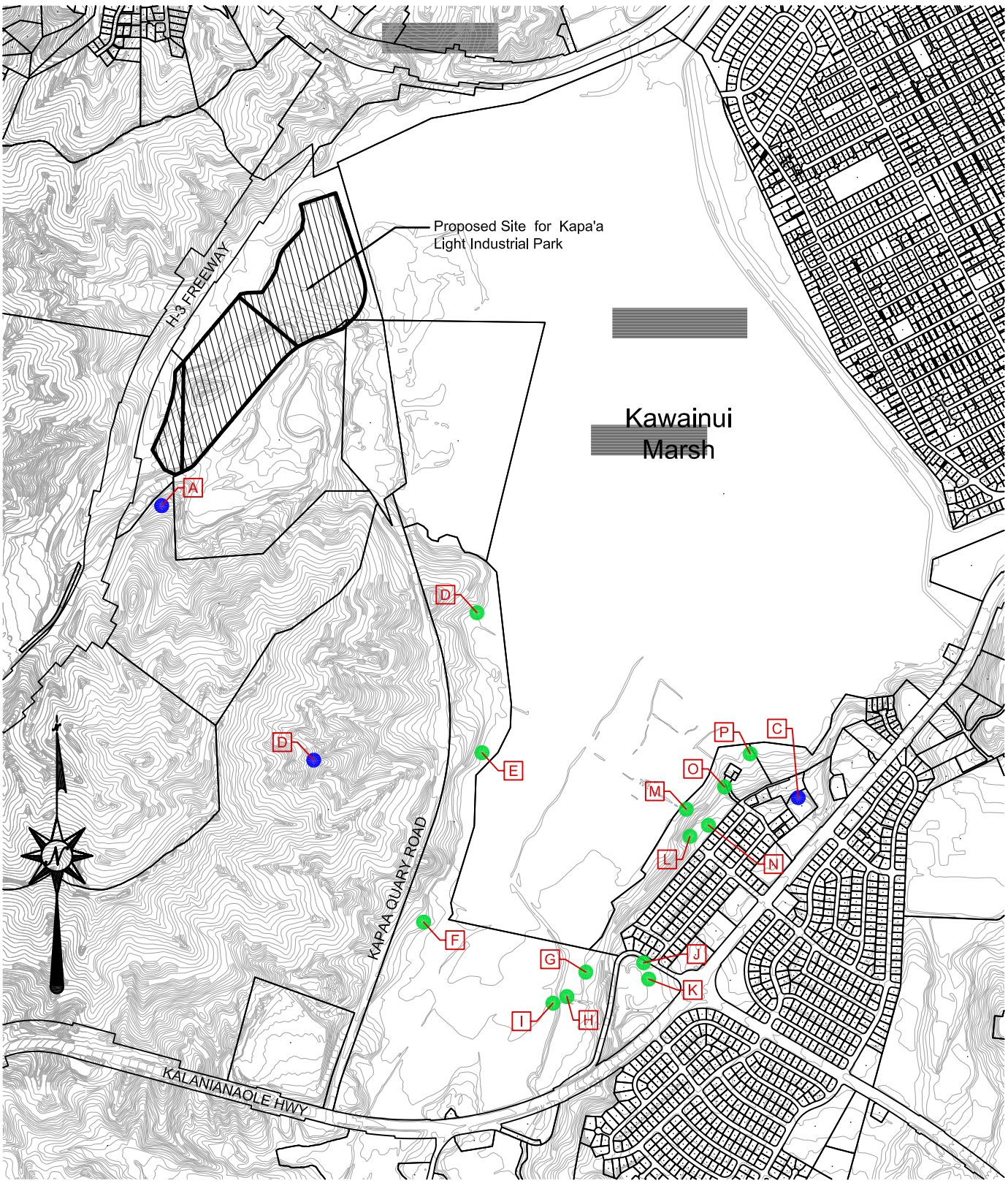

Figure 2-13
Archaeological Historic Sites in the
Proximity of the Proposed Development

LEGEND:

- HEIAU
- OTHER HISTORICAL SITES
- D DESIGNATED IN TABLE 2-4

1400' 0 1400' 2800'

SCALE: 1" = 1400'-0"

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Table 2-4 Historical Sites Around the Kawainui Marsh

ID in Figure 2-13	State Site #	Site Description
A	50-80-11-359	Pahukini Heiau; in the middle of landfill in Kapa'a Quarry. Heiau alos called Mo'okini Heiau; said to be built by High Chief Olopana in the 12th century; heiau is a Luakini or state-class heiau , where important state matters, including preparation for war were conducted.
B	50-80-11-360	Holomakini Heiau; supposedly built by high chief Olopana in the 12th century; the heiau was long thought to be destroyed when the land it occupied was cleared for agriculture; the indicated location is the presumed location of the Holomakini Heiau.
C	50-80-11-371	Ulupo Heiau; heiau was thought to be built mystically in one night by the Menehune; heiau had significance in preparing animal sacrifice; the site is a State park.
D	50-80-11-2023	Remnants with retaining walls, alignments of rocks, terraces and platforms
E	50-80-11-3865	Low stone wall and terrace
F	50-80-11-2026	A large agricultural terrace
G	50-80-11-2024	Mounds, wall remnants, a terrace
H	50-80-11-3962	Three historical building
I	50-80-11-3962	Earthen mounds
J	50-80-11-3960	A large lo'i, stone and earthen platform, stone lined channel, mound
K	50-80-11-2028	Wall remnants
L	50-80-11-2029	Large agricultural complex with rectangular fields
M	50-80-11-3959	Large number of mounds, agricultural terraces, walls, historical house foundation, etc.
N	50-80-11-2031	Several surface artifacts, evidence of prehistoric occupation
O	50-80-11-3961	Stone mounds, stone-edged canal, terraces, retaining walls
P	50-80-11-3957	Agricultural terraces, mounds, walls, remains of historical structure
Q	50-80-11-2022	Series of terraces, long retaining wall, remnants of historical house, a spring
R	50-80-11-3958	Terrace, walls
S	50-80-11-2027	Stone-walled enclosure, piles of rock, terrace

2.1.10 Air Quality

Air pollution in the vicinity of the proposed site can be attributed to anthropogenic and natural sources. Air quality impacts due to human activities mainly result from various commercial and industrial activities and from traffic. Relevant anthropogenic sources are:

- Motor vehicles, cars and trucks, around the proposed site. There is a considerable portion of heavy vehicles that serve the quarry and landfill operations, the refuse transfer station, the existing warehouse development and other industrial activities in the area. Commuters from Kailua and Kaneohe use the Kapa'a Quarry Road to travel to and from the central part of Oahu. The H3-Freeway directly passes the proposed site on its northern boundary and represents a significant contributor for release of air pollutants from motor vehicles.
- Dust from quarry, landfill and Green Waste operations, which represent earth moving activities
- Dust set free by the outdoor equipment storage and building material processing activities
- Waste deposition in landfills, which generate methane.
- Fumes from paint, varnish, aerosol sprays and other solvents used in industrial and commercial activities in the Kapa'a valley

Relevant natural sources for air pollution in the area is dust emitted from areas of land with little or no vegetation cover. Past land use in the area has resulted in extensively denuding of the site from natural vegetative cover facilitating erosion and soil loss.

In addition to release of airborne pollutants directly to the atmosphere, indoor air pollution is an increasingly important aspect to characterize the impact of air pollutants to occupants of buildings. Low Indoor Air Quality (IAQ) is generally attested in cases of poor ventilation and the elevated internal release of pollutants such as building materials emitting gaseous ingredients, paints and solvents emitting volatile organic compounds (VOCs), particulates and carbon monoxide. In addition, biological agents, either produced in the buildings or introduced by the ventilation system of imported materials, can accumulate in buildings and can cause significant health risks for the occupants.

Possible problems with indoor air quality in existing warehouses at the propose site of the Kapa'a Light Industrial Park could result from older warehouse construction technology and inappropriate handling of materials. Indoor air pollution is an important consideration for the new warehouses development with environmentally friendly construction and operation.

2.1.11 Noise Characteristics

Noise pollution by definition is displeasing human- or machine-created sound that has negative effects on human beings or animal life. The main sources of noise at the proposed site are vehicular traffic, industrial and commercial activities and noise generated by recreational activities, mainly from model airplanes operated from the Kawainui Model Airplane Field.

The sources of noise in the vicinity of the proposed sites are augmented by distant noises, such as traffic noises from the H3-Freeway, noise from aircraft passing the site and noise from the urban developments in the north, west and south of the Kawainui Marsh.

Current noise levels are not high enough to cause direct damage to human physiological and psychological health. But the current noise level can have an effect on how the natural beauty of the marsh and the surrounding areas is perceived. The main recreational activities in the vicinity of the propose site is associated with operating model airplane, an activity that inherently produces a certain level of noise since small, high-pitched engines are used in the model planes. With the planned expansion of recreational and nature education activities in the Kawainui Marsh, such as the envisioned perimeter path around the marsh, noise pollution could become a more influential factor for human activities in the vicinity of the site.

With the current and anticipated future noise levels the impact on the animal world might be more acute than on humans. Noise can have negative effects on animals through interference with their use of sounds in communication and by causing stress. The main result of elevated and anthropogenic noise on the animal world is the reduction of usable habitat that noisy areas may cause. Elevated noise levels would cause migration of animals away from the source of noise. It is evident that this would cause an effective reduction of available habitat.

2.1.12 Aesthetic and Visual Consideration

The Kapa'a Valley is characterized by diverse industrial and commercial activities, which have significantly affected the appearance of the valley where agriculture was once thriving. The proposed site has been drastically altered by land filling and quarry operations. It has witnessed major changes to the topography and appearance including large quantities of earth moving, exposed rock formations, large quarry or landfill equipment and groups of commercial warehouse structures, all of which have had a profound effect on the aesthetic appearance in the valley. Construction of the H3-Freeway has also resulted in major changes in the topography and appearance within the Kapa'a valley.

The dominating views at the site are the majestic Koolau Mountainrange in the west and Kawainui Marsh in the east. Various views of the site from different vantage points are presented in the following Figures. The views are categorized as follows:

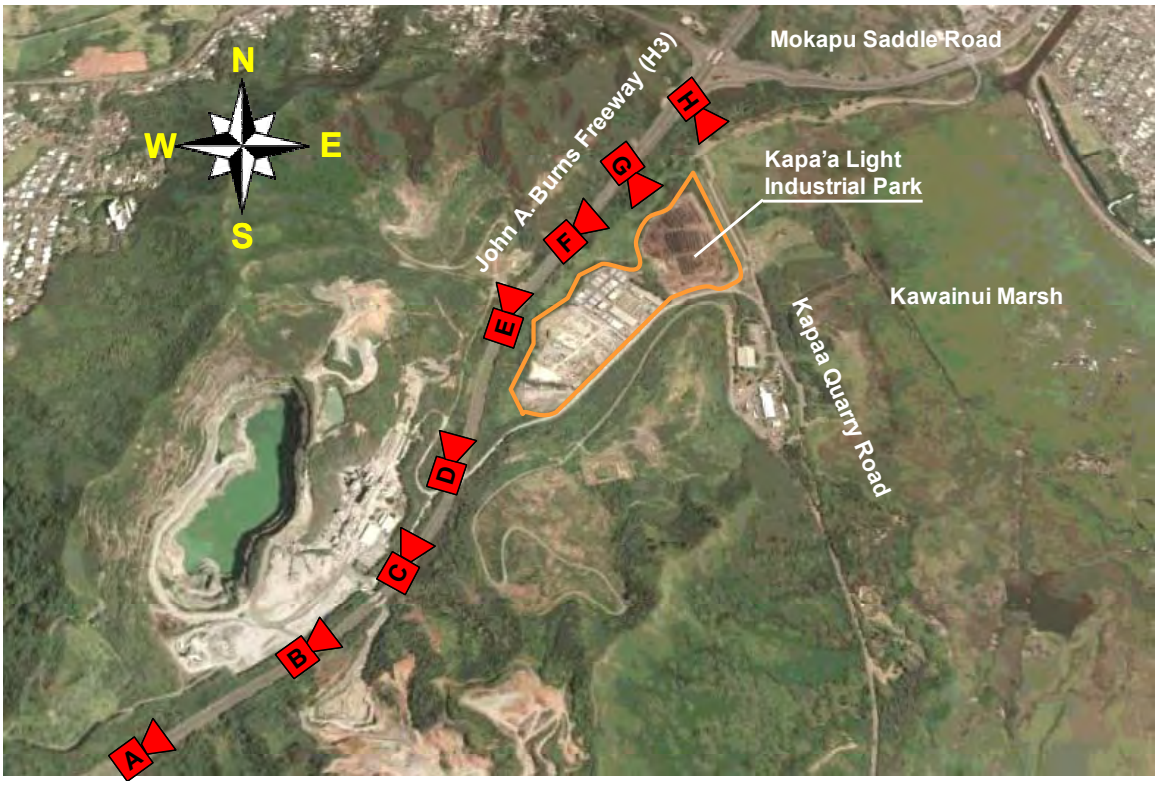
<u>Views from the H3-Freeway Northbound:</u> Figure 2-14 is an overview map that shows the vantage points for the set of photos depicted in Figures 2-15 through 2-22. These views portray existing visual impressions of the proposed site experienced by an observer traveling northbound on H3-Freeway.

<u>Views from the Mokapu Boulevard:</u> Figure 2-23 is an overview map that shows the vantage points for the set of photos depicted in Figures 2-24 through 2-31. These views portray existing visual impression of the proposed site experienced by an observer traveling eastbound on Mokapu Boulevard.

Views from Kapa'a Quarry Road: Figure 2-32 is an overview map that shows the vantage points for the set of photos depicted in Figures 2-33 through 2-40. These views portray existing visual impression of the proposed site experienced by an observer travelling southbound on Kapa'a Quarry Road.

Views from the H3-Freeway Southbound: Figure 2-41 is an overview map that shows the vantage points for the set of photos depicted in Figures 2-42 through 2-49. These views portray existing visual impression of the proposed site experienced by an observer travelling southbound on the H3-Freeway.

Views from Kapa'a Quarry Access Road while Passing the Site: Figure 2-50 is an overview map that shows the vantage points for the set of photos depicted in Figures 2-51 through 2-58. These views portray existing visual impression of the proposed site experienced by an observer while travelling along the Kapa'a Quarry Road and Kapa'a Quarry Access Road.



Site views from the H3-Freeway traveling northbound

Above indicated Views represent the following Figures:

A Figure 2-15	D Figure 2-18	G Figure 2-21
B Figure 2-16	E Figure 2-19	H Figure 2-22
C Figure 2-17	F Figure 2-20	

X Direction of view

Figure 2-14 Definition of Vantage Points for Views in Figures 2-15 through 2-22

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Figure 2-15: View from H3-Freeway traveling northbound, site is beyond the saddle in the road.

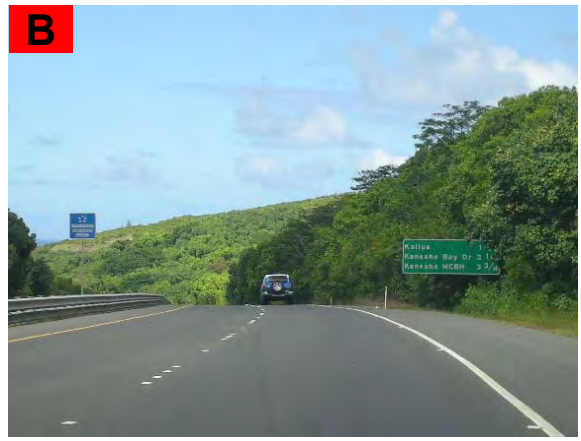

Figure 2-16: View from H3-Freeway traveling northbound at the saddle in the road.

Figure 2-17: View from H3-Freeway traveling northbound from some distance past the Saddle. The proposed site is on the right, obstructed by thick vegetation.

Figure 2-18: View from H3-Freeway traveling northbound at the overpass over the Kapa'a Quarry Access Road. The proposed site, is obstructed by thick vegetation on the Right side of the H3-Freeway.

Figure 2-19: View from H3-Freeway traveling northbound while passing along the proposed site; thick vegetation on the right side of the H3-Freeway obstructs the proposed site.

Figure 2-20: View from H3-Freeway traveling northbound while passing along the proposed site; thick vegetation on the right side of the H3-Freeway conceals the proposed Site.

Figure 2-21: View from H3-Freeway traveling northbound. The lower portion of the site is visible in the background.

Figure 2-22: View from H3-Freeway traveling northbound. Kawainui Marsh and the Kawainui Model Airplane Park; are visible in the background

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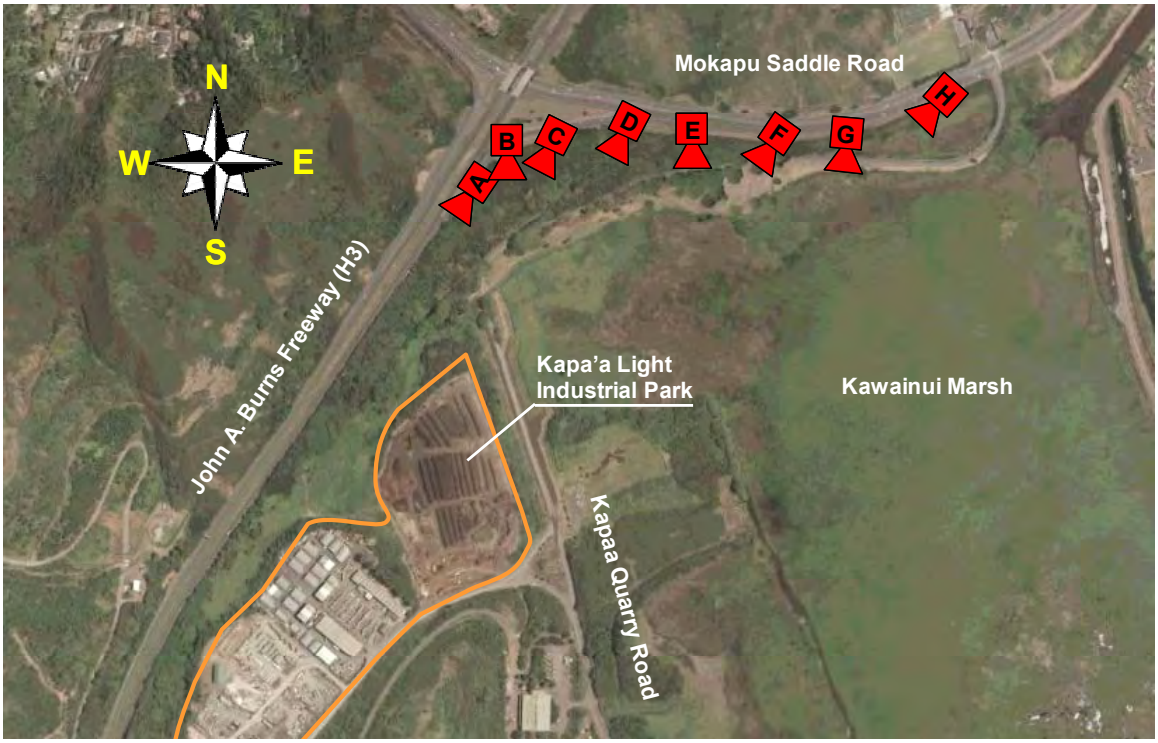

Site Views from Mokapu Boulevard

Above indicated Views represent the following Figures:

A Figure 2-24	D Figure 2-27	G Figure 2-30
B Figure 2-25	E Figure 2-28	H Figure 2-31
C Figure 2-26	F Figure 2-29	

X Direction of view

Figure 2-23 Definition of Vantage Points for Views in Figures 2-24 through 2-31

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Figure 2-24: View from the H3-Freeway traveling southbound at the exit to Mokapu Saddle Road. Existing warehouses in the upper portion of the site can be seen above the road barrier on the right side of the photo.

Figure 2-25: View from H3-Freeway traveling southbound from the H3-Freeway Exit Ramp, towards the center of Kapa'a Valley. The existing warehouses are seen in the center of the photo.

Figure 2-26: View from H3-Freeway traveling southbound from the H3-Freeway exit ramp towards the center of Kapa'a Valley. The existing warehouses are in the center of the photo; quarry operations are in the background in the Right side.

Figure 2-27: View from H3-Freeway traveling southbound from the H3-Freeway exit ramp towards the center of Kapa'a Valley; the existing warehouses are on the right and in the foreground the lower portion of the proposed site shows the existing green waste operations.

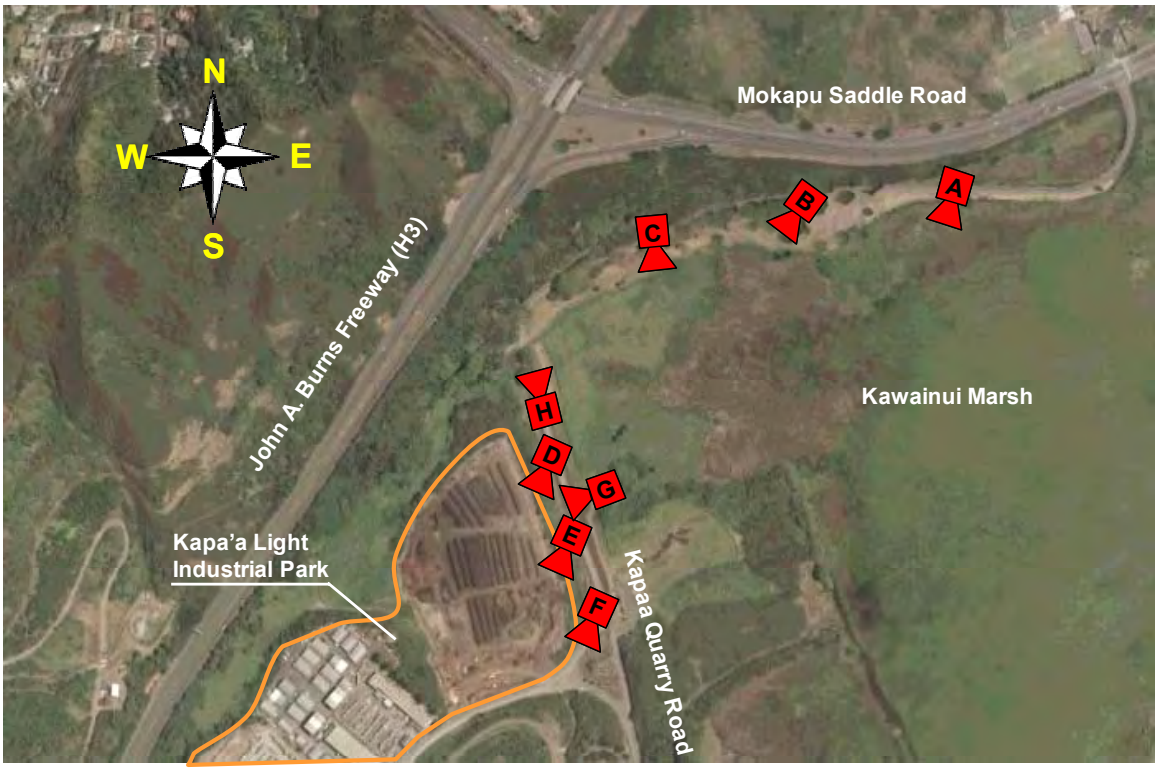
Figures 2-24 through 2-27

Figure 2-28: View from Mokapu Blvd. towards the proposed site; the lower portion of the proposed site is in center right.

Figure 2-29: View from Mokapu Blvd. traveling southbound, the existing warehouses are at the center right.

Figure 2-30: View from Mokapu Blvd. traveling southward, the Kawainui Marsh, which is seen in the foreground.

Figure 2-31: View from Mokapu Blvd. traveling southward, the lower portion of the proposed site is seen in the center of the photo; the existing warehouses are shown in center right.



Site views from Kapa'a Quarry Road

Above indicated Views represent the following Figures:

A Figure 2-33	D Figure 2-36	G Figure 2-39
B Figure 2-34	E Figure 2-37	H Figure 2-40
C Figure 2-35	F Figure 2-38	

X Direction of view

Figure 2-32 Definition of Vantage Points for Views in Figures 2-30 through 2-40

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Figure 2-33: View from the Kapa'a Quarry Road traveling southbound. The exiting warehouses in are seen in the foreground and quarry facilities in background.

Figure 2-34: View from the Kapa'a Quarry Road travelling southbound. The exiting warehouses in are seen in the foreground and quarry facilities in background.

Figure 2-35: View from the Kapa'a Quarry Road traveling southbound, thick vegetation on the right obstructs the site.

Figure 2-36: View from the Kapa'a Quarry Road southbound passing the site shown beyond the existing drainage canal along the road.

Figure 2-37: View from the Kapa'a Quarry Road southbound passing the beyond the existing drainage canal along the road.

Figure 2-38: View from the Kapa'a Quarry Road southbound passing the site beyond the existing drainage canal along the road.

Figure 2-39: View from the Kapa'a Quarry Road northbound passing the site beyond the existing drainage canal along the road; the existing earth berm obstructs the lower parts of the site.

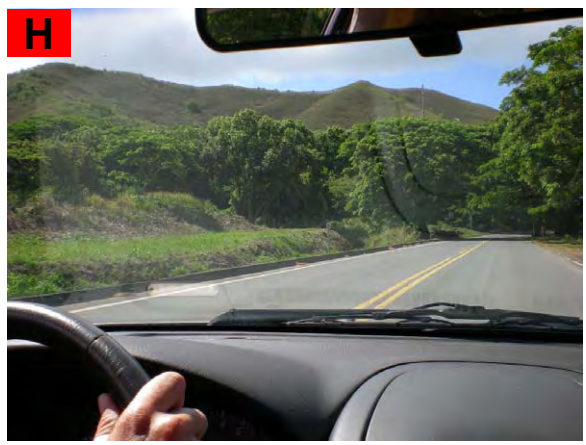
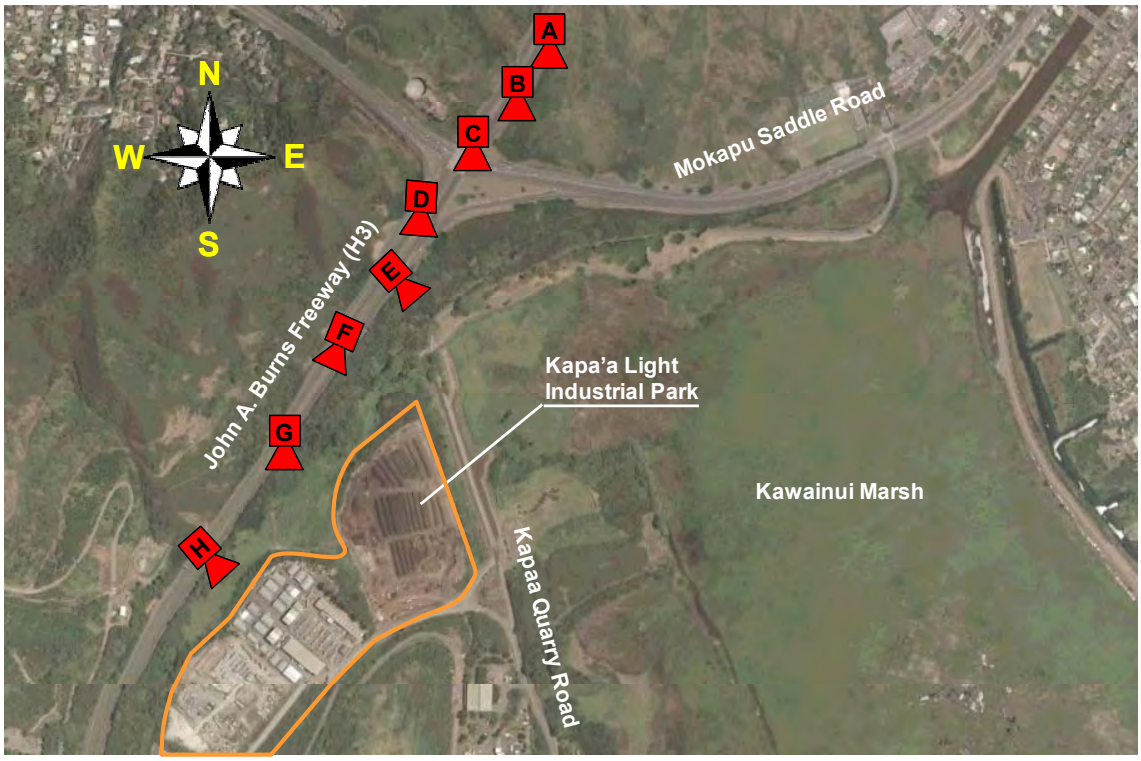


Figure 2-40: View from the Kapa'a Quarry Road northbound passing the site beyond the existing drainage canal along the road. The Kapa'a Stream Flows into the Kawainui Marsh at this location.



Site views from the H3-Freeway traveling southbound

Above indicated Views represent the following Figures:

A Figure 2-42	D Figure 2-45	G Figure 2-48
B Figure 2-43	E Figure 2-46	H Figure 2-49
C Figure 2-44	F Figure 2-47	

X Direction of view

Figure 2-41 Definition of Vantage Points for Views in Figures 2-42 through 2-49

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Figure 2-42: View from H3-Freeway traveling southbound at the saddle of the freeway; existing warehouses appear just above the H3-Pavement, some quarry facilities are visible

Figure 2-43: View from H3-Freeway driving south, after passing the saddle of the freeway; existing warehouses are center of picture are seen at a distance.

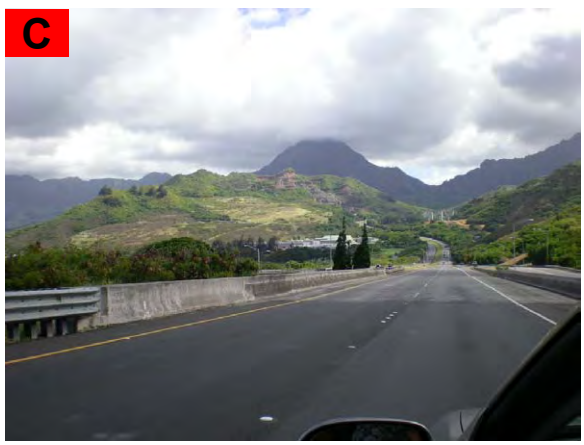


Figure 2-44: View from H3-Freeway traveling southbound at Mokapu Blvd. Overpass; existing warehouses are at the Center of Photo.

Figure 2-45: View from H3-Freeway traveling southbound at Exit to Mokapu Blvd.; existing warehouses are seen at center of photo.

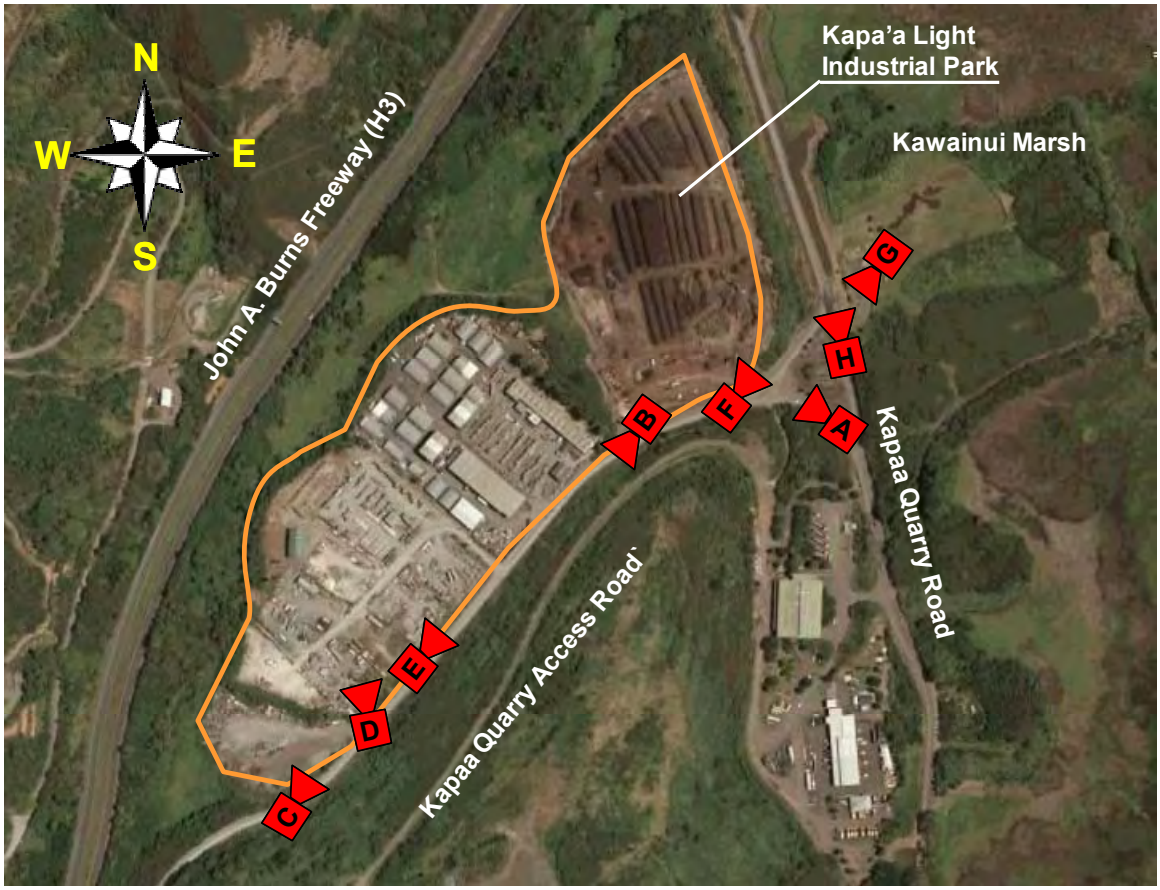
Figure 2-46: View from H3-Freeway traveling southbound at Exit to Mokapu Blvd.; existing warehouses are seen at center of photo.

Figure 2-47: View from H3-Freeway traveling southbound beyond the exit to Mokapu Blvd.; existing warehouses are seen at the center of photo.

Figure 2-48: View from H3-Freeway traveling southbound beyond the exit to Mokapu Blvd.; existing warehouses are partially obstructed by thick vegetation on the left.

Figure 2-49: View from H3-Freeway traveling southbound while passing existing warehouses. The H3-Freeway is at its lowest elevation and thick vegetation partially obstructs the view of the site on the left

Figures 2-46 through 2-49



Site Views from Kapa'a Quarry Access Road

Above indicated Views represent the following Figures:

A Figure 2-51	D Figure 2-54	G Figure 2-57
B Figure 2-52	E Figure 2-55	H Figure 2-58
C Figure 2-53	F Figure 2-56	

X Direction of view

Figure 2-50 Definition of Vantage Points for Views in Figures 2-51 through 2-58

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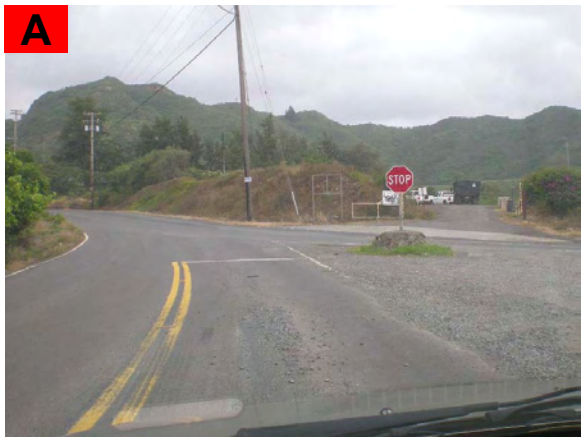


Figure 2-51: View from Kapa'a Quarry Access Road at the entrance to the lower portion of the proposed site.

Figure 2-52: View from Kapa'a Quarry Access Road traveling westbound. The lower portion of the proposed site is obstructed by the berm on the right.

Figure 2-53: View from Kapa'a Quarry Access Road traveling eastbound. The upper portion of the proposed site, is beyond the trees on the left

Figure 2-54: View from Kapa'a Quarry Access Road traveling eastbound, existing warehouses are seen in the photo.

Figure 2-55: View from Kapa'a Quarry Access Road traveling eastbound, the upper portion of the proposed Site, is beyond the trees on the left.

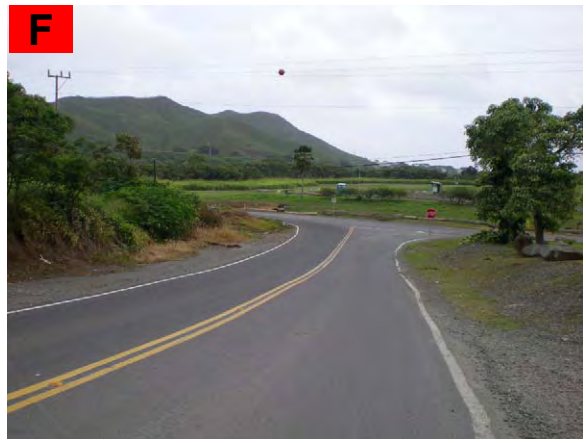


Figure 2-56: View from Kapa'a Quarry Access Road traveling eastbound, at intersection with the Kapa'a Quarry Road.

Figure 2-57: View from the Kawainui Model Airplane Park towards the lower portion of the proposed site, the Kapa'a Quarry Access Road in seen on the left.

Figure 2-58: View Along the Kapa'a Quarry Road traveling northbound at the intersection with the Kapa'a Quarry Access Road. The lower portion of the proposed site is seen on the left.

2.2 Community Setting

2.2.1 Land Use and Ownership

The proposed location for the Kapa'a Light Industrial Park in the Kapa'a Valley has been subject to significant commercial and industrial use during the past fifty years. Historically, agriculture was the prime land use in the Kapa'a Valley from the time of early settlement of the Hawaiian Islands through the mid 1900s. Cattle ranching for example, was an important economic feature in the valley until the 1940s.

Quarry operations started in the valley in the early 1950s. This significantly changed the primary land use of the valley and the general appearance of the valley. The lower plateaus of the valley changed appearance as the quarry operations expanded; what was an agricultural landscape became a more industrial landscape. Significant deposits of quarry tailings and overburden altered the topography of the valley. Part of the overall changes of the valley was a raised roadway that became the Kapa'a Quarry Road. The roadway ran across the valley mouth and segregated the Kapa'a watershed from the Kawainui Marsh. While the Kapa'a watershed previously drained into the marsh through numerous water conveyances, the drainage of the watershed became concentrated to a limited number of openings through the raised roadway. The Kapa'a Stream subsequently acquired the present streambed, which is located between the plateau created by the deposits and the H3-Freeway raised roadway.

The 1960s and 1970s brought about an increase in quarry related activities to the area. As quarry operations ceased in different locations, due to the end of cost effective processing, municipal solid waste landfill operations followed in its place. A large municipal landfill was operated through 1990. Today, there are still municipal waste related activities going on in the valley with the Kapa'a Refuse Transfer Station being an integral part of the valley. Construction of the H3-Freeway and the associated earth moving and mass grading introduced another significant change to the Kapa'a Valley starting in the 1970s.

The construction of commercial warehouses in the valley started in the mid-1970s on deposits of tailings from quarry operations. The warehouses are located on a near-level plateau. The number of warehouses has continuously increased over the years in response to a strong demand for commercial warehouse space in the area.

In summary, the Kapa'a Valley has been subject to intensive industrial activities over the past decades, which have caused significant impact on the environment. Earth moving and deposition activities have changed the original natural topography and visual vistas. Noise and air pollution have been introduced to the area due to land filling and other commercial activities. And finally, surface run off and erosion have contributed to degradation of water quality in Kapa'a stream. Although the proposed Kapa'a Light Industrial Park would introduce a significant number of new warehouse structures in the lower parts of the Kapa'a valley, which would probably have impact on a local scale, the proposed warehouse park would not significantly change the industrial characteristics of the entire Kapa'a Valley.

2.2.1.1 City and County of Honolulu Land Use Zone Designation

All land within the City and County of Honolulu are classified into specific zoning districts. The site of the proposed Kapa'a Light Industrial Park encompasses portions of three land parcels. Two of which, TMK 4-2-015:001 (portion of) and 4-2-015:006 are presently classified as General Preservation District (P-2). The third parcel, TMK 4-2-015:008 is classified as Intensive Industrial District (I-2). Figure 2-59 shows the General Location Map of the proposed site.

Most of the land parcels in the vicinity of proposed project site are classified as either Restricted Preservation District (P-1) or General Preservation District (P-2). Figure 2-60 illustrates the land use zoning districts in the vicinity of the proposed site.

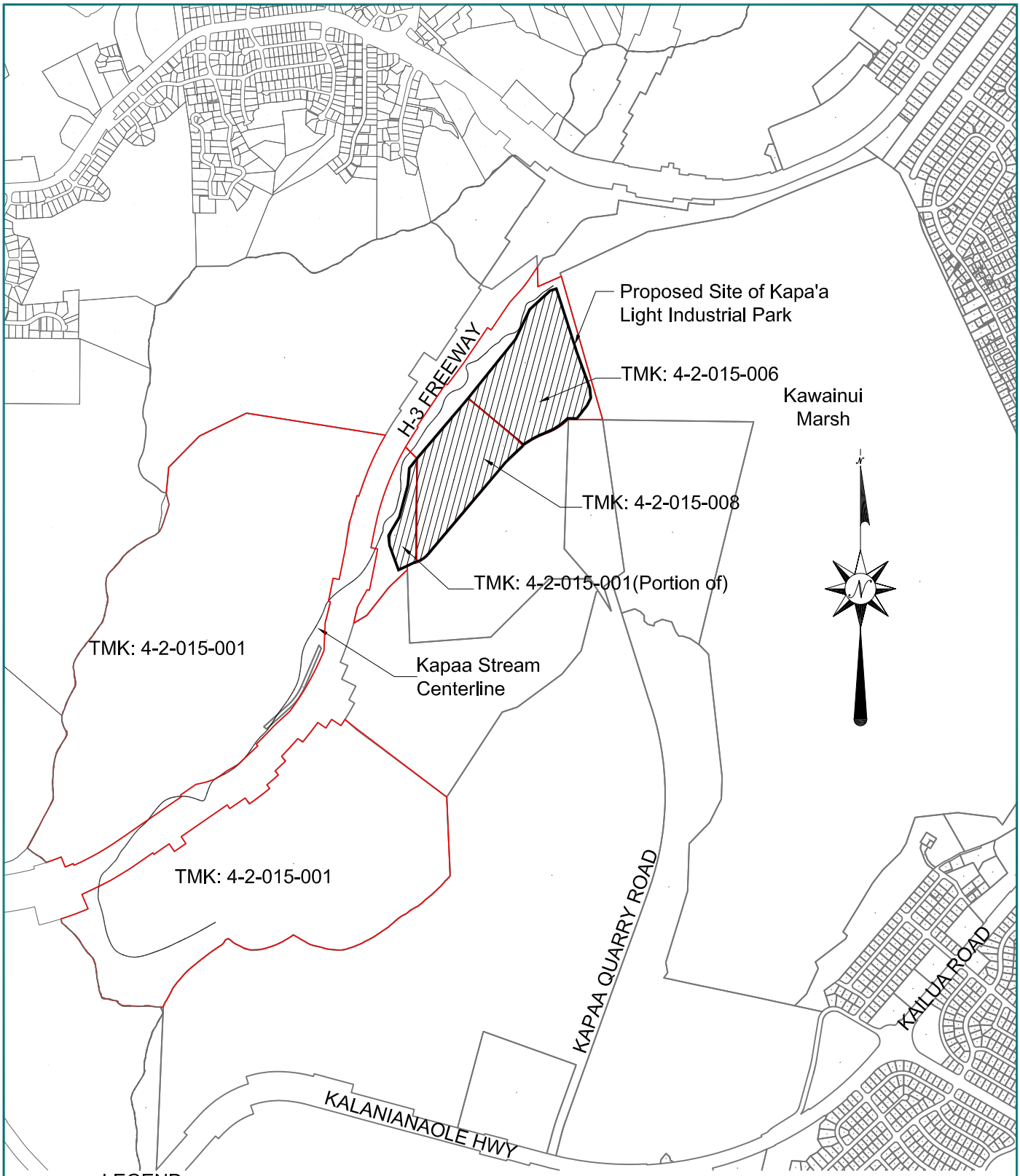
2.2.1.2 State Land Use Classification of Proposed Site

All lands in the State of Hawaii are classified into one of four land use districts; Conservation, Agricultural, Rural and Urban Districts. Urban districts include lands that are now urban land use or represent a sufficient reserve area for foreseeable urban growth. Urban districts include land use activities that are regulated by ordinances of the counties within which the urban districts are situated.

The proposed Kapa'a Light Industrial Park would be within the State Urban district. Figure 2-61 shows the State Land Use Districts in the vicinity of the proposed site. A small portion in the southwest of parcel TMK 4-2-015:001 (about 1 acre) is within the State "Conservation" District. This small portion of parcel TMK 4-2-015:001 would not be used for the warehouse development and would remain open space. The requested zone change for the parcel TMK 4-2-015:001 would not include this land small portion and therefore the requested zone change would not require a State land use zone change from Conservation to Urban district.

2.2.1.3 Special Management Area

According to Hawaii Revised Statutes (HRS) Chapter 205-A the City and County of Honolulu has the authority to regulate land use in Special Management Areas (SMA). As depicted in Figure 2-62, parts of the proposed site of the Kapa'a Light Industrial Park are within the SMA District. Therefore the proposed development will be subject to regulatory procedures, permit requirements, and review under the City's SMA regulations.



LEGEND:

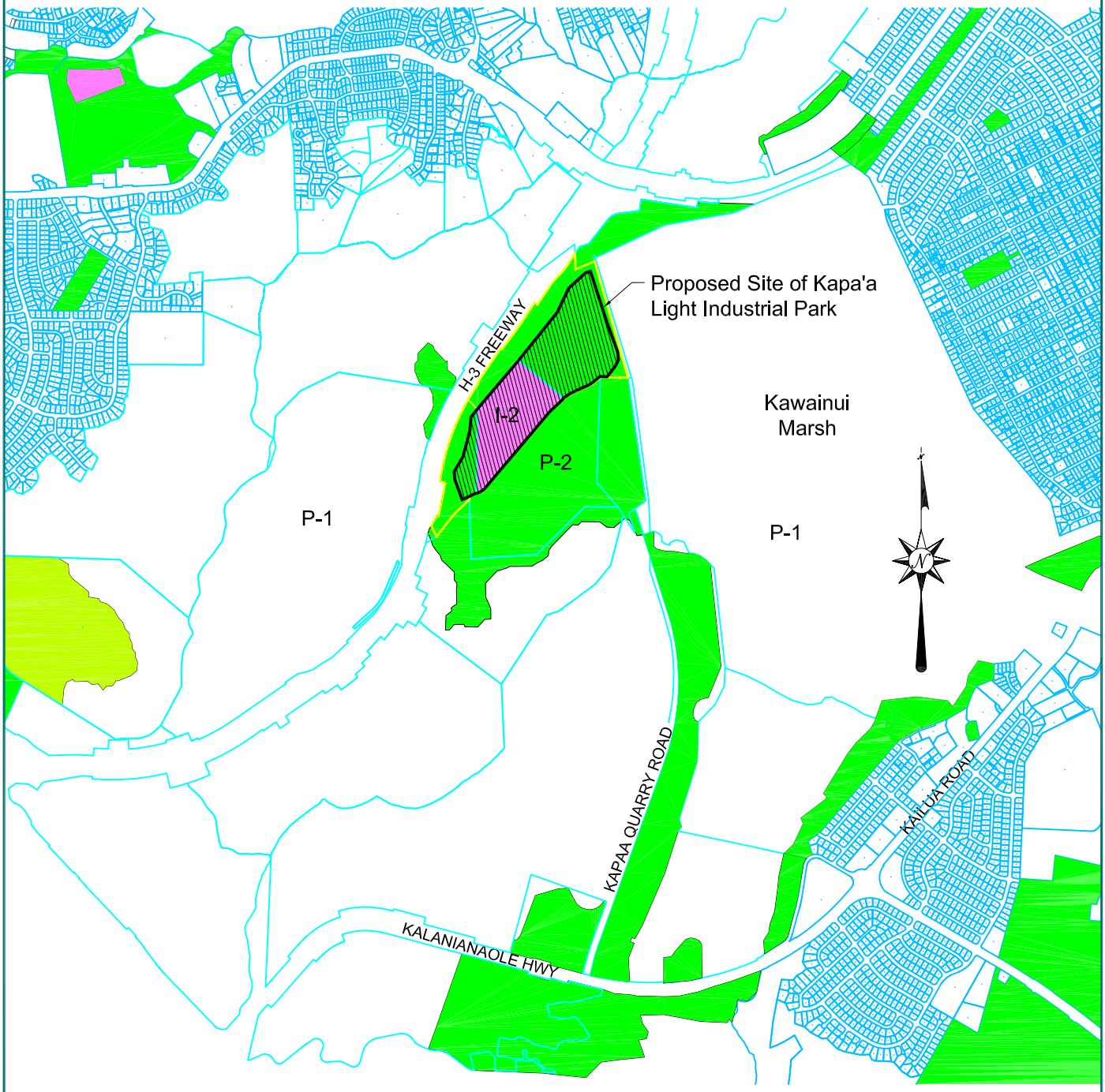
PROPOSED SITE OF KAPA'A
LIGHT INDUSTRIAL PARK

Figure 2-59 General Location Map

Marc M. Siah & Associates, Inc.
Consulting Civil . Structural . Environmental & Ocean Engineers
820 South Beretania Street, Suite 201, Honolulu, Hawaii 96813

1500' 0 1500' 3000'

SCALE: 1" = 1500'-0"



LEGEND:

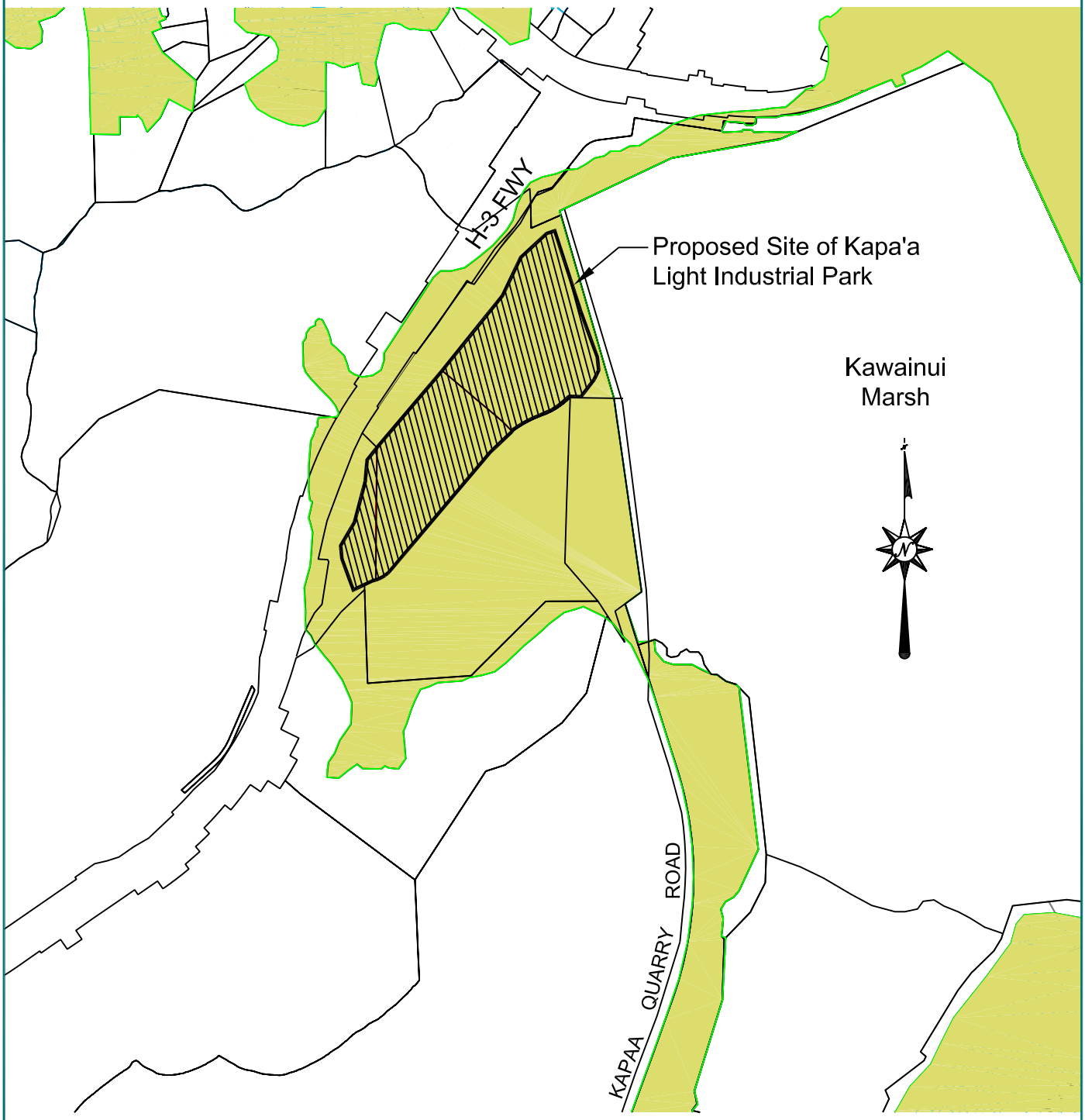
- P-1 RESTRICTED PRESERVATION DISTRICT
- P-2 GENERAL PRESERVATION DISTRICT
- I-2 INTENSIVE INDUSTRIAL DISTRICT
- AG-1 RESTRICTED AGRICULTURAL DISTRICT
- R-5 RESIDENTIAL DISTRICT
- PROPOSED SITE OF KAPA'A LIGHT INDUSTRIAL PARK

Figure 2-60 City & County Zone Map

Marc M. Siah & Associates, Inc.
Consulting Civil . Structural . Environmental & Ocean Engineers
820 South Beretania Street, Suite 201, Honolulu, Hawaii 96813

2000' 0 2000' 4000'

SCALE: 1" = 2000'-0"



LEGEND:

URBAN DISTRICT

CONSERVATION DISTRICT

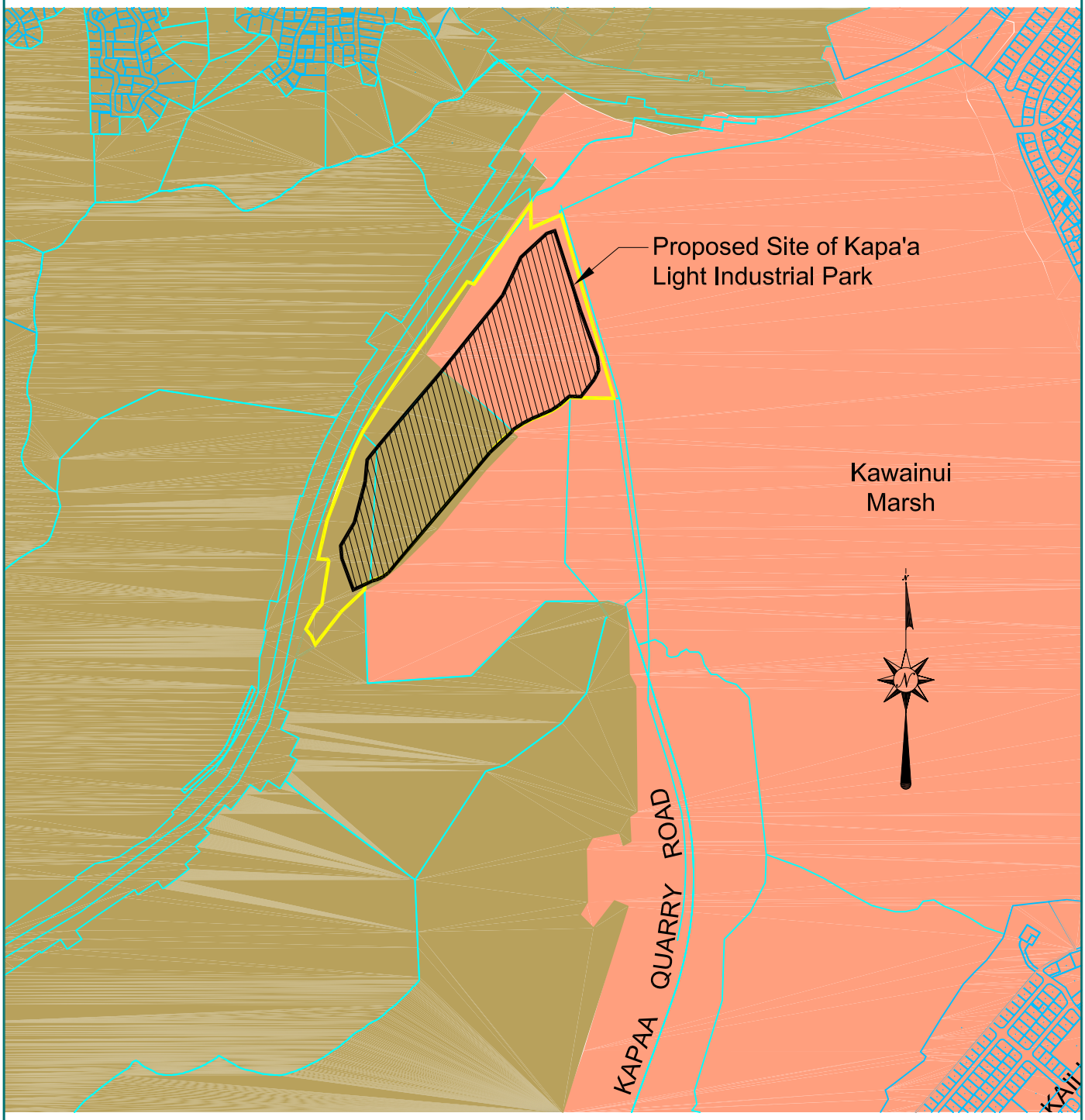
PROPOSED SITE OF KAPA'A
LIGHT INDUSTRIAL PARK

Figure 2-61 State District Map

Marc M. Siah & Associates, Inc.
Consulting Civil . Structural . Environmental & Ocean Engineers
820 South Beretania Street, Suite 201, Honolulu, Hawaii 96813

1250' 0 1250' 2500'

SCALE: 1" = 1250'-0"



LEGEND:

OUTSIDE SPECIAL MANAGEMENT AREA

INSIDE SPECIAL MANAGEMENT AREA

PROPOSED SITE OF KAPA'A
LIGHT INDUSTRIAL PARK

Figure 2-62 Special Management Area

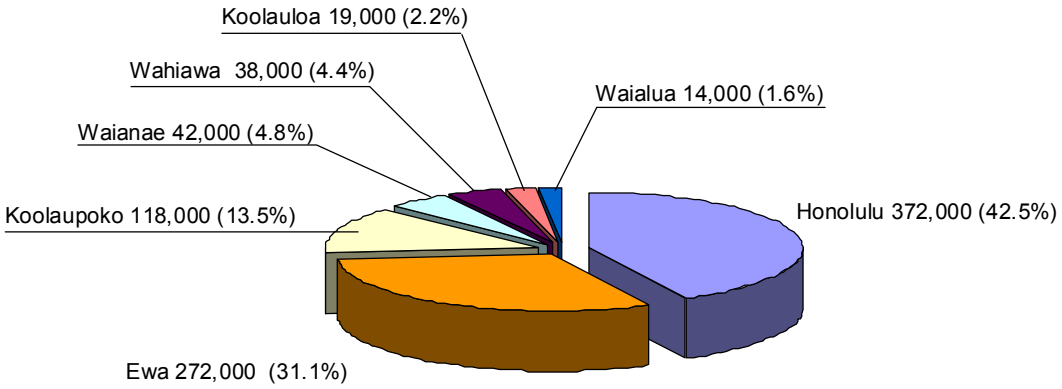
1250' 0 1250' 2500'

SCALE: 1" = 1250'-0"

Marc M. Siah & Associates, Inc.
Consulting Civil . Structural . Environmental & Ocean Engineers
820 South Beretania Street, Suite 201, Honolulu, Hawaii 96813

2.2.2 Population and Economy in the Koolaupoko Region

The Koolaupoko region has the third largest population among the seven main districts of the City & County of Honolulu. Figure 2-63 indicates the distribution of population on Oahu. As indicated about 13.5% of the Oahu population lives in the Koolaupoko region. Figure 2-64 indicates that the main population centers in the Koolaupoko region are Kailua and Kaneohe neighborhoods, which together account for approximately 70% of the population in the Koolaupoko region.



Note: District xxx,xxx = absolute population ; (xx.x%)= present of C&C of HNL

Figure 2-63 Population Distribution in the City & County of Honolulu (data from DBEDT 2007 State Data Book)

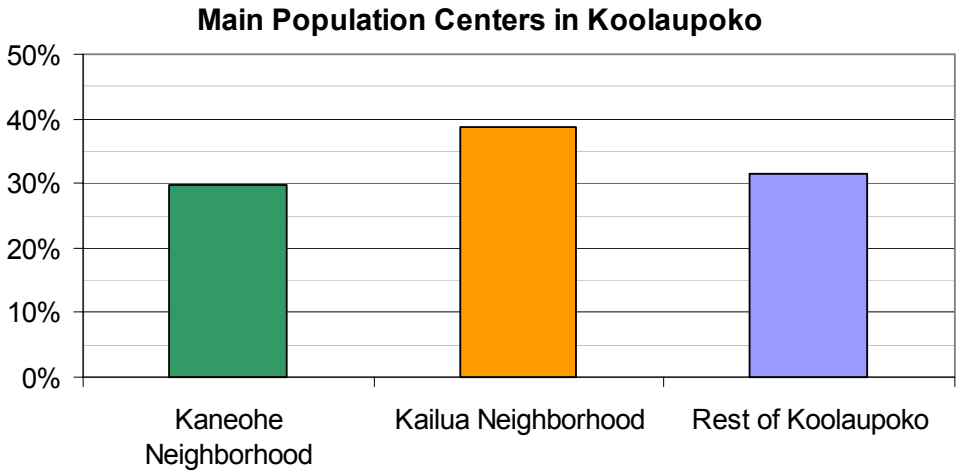


Figure 2-64 Main Population Centers in Koolaupoko Region (data from DBEDT 2007 State Data Book)

Existing policies and future visions of the region call for measures that retain a constant population density in the Koolaupoko region and discourage significant population growth in the region over the next decades.

For the period from 1980 through 2000, Figure 2-65 indicates that the Koolaupoko region has shown little growth. While the total population within the City & County of Honolulu has been growing, the population in the Koolaupoko regions has remained essential constant. For the year 2030 it is predicted (DBEDT, 2006) that the population in the Koolaupoko region will decrease about 3% relative from its current number, while Oahu's total population is expected to increase by 22% over its current number. The Koolaupoko region is the only region on Oahu, which is predicted to have a negative population growth in the years to come.

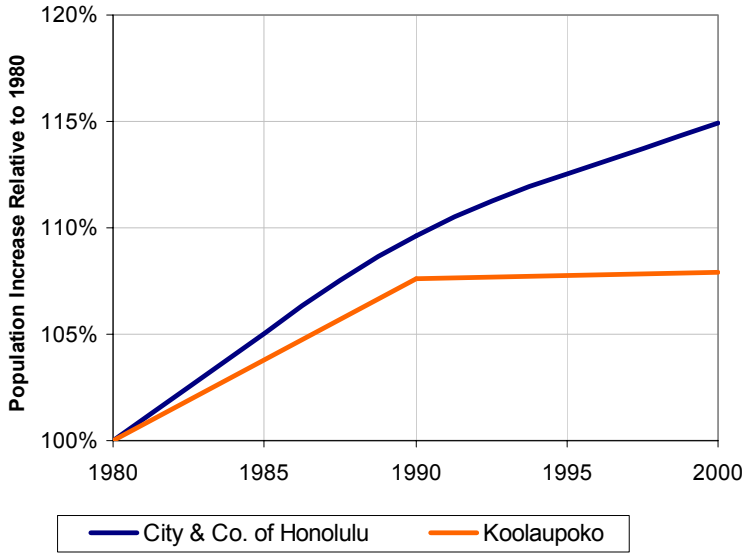


Figure 2-65 Comparison of Population in the City & County of Honolulu and the Koolaupoko Region (data from DBEDT 2007 State Data Book)

The urban areas of Kailua and Kaneohe are generally categorized as "bedroom" communities. The bulk of the population in these two regions commutes everyday to employment centers in the central part of Oahu. The development of the labor force on Oahu shows that it has been growing at a faster rate than the population over the past years, suggesting that Oahu provides a favorable employment environment. Figure 2-66 indicates the development of the labor force and population relative to the year 2002.

According to State Department of Business and Economic Development, 2007 Data Book, the median income per house hold in the area, which is primarily affected by the proposed development, is $66,000 to &72,800. The median income per household for the county of Honolulu, in comparison is $51,900.

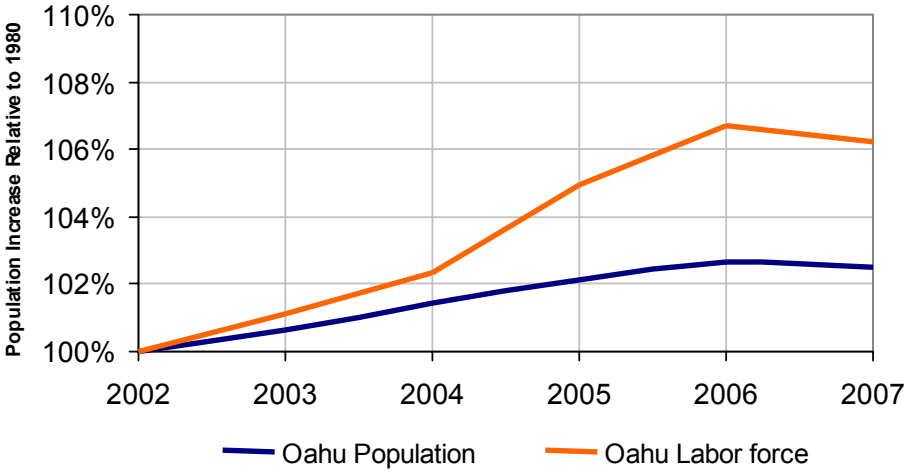


Figure 2-66 Development of Labor Force and Population on Oahu
(data from DBEDT 2007 State Data Book)

2.2.3 Police and Fire Department

Fire stations: There are three fire stations that serve the Kailua area and would also serve the proposed Kapa'a Light Industrial Park. These fire stations and the approximate distances to the proposed site are as follows:

(1) Main Kailua fire station on Kuulei Road, at a three mile distance,
(2) Fire station on Kaneohe Bay Drive at the Aikahi Park Shopping Center, at a two mile distance,
(3) Olomana fire station on Kalanianaole Hwy., at a two mile distance.

Police Stations: The police station that would serve the proposed Kapa'a Light Industrial Park is located next to the Kailua main fire station on Kuulei Road, about three mile from the proposed site.

2.2.4 Medical Facilities

There are two major medical facilities within five miles of the proposed site:

- Castle Medical Center - 2.5 miles distance from proposed site
  640 Ulukahiki Street, Kailua, HI
  Castle Medical Center is a non-profit medical facility owned by the Seventh-day Adventist Church and operated by Adventist Health. This 157-bed primary health care facility is located next Kawainui Marsh on the Windward side of Oahu. The clinic serves

the entire island of Oahu. The medical facility provides a wide range of inpatient and outpatient services. The clinic has a 24-hour emergency department.

- Hawaii State Hospital - 5.0 miles distance from proposed site
  45-710 Keaahala Rd., Kaneohe, HI
  Hawaii State Hospitak is a 194-bed hospital located in Kaneohe on the windward side of Oahu. The hsopital provides integrated and evidence-based psychiatric treatment and rehabilitation to individuals suffering from mental illness and co-occurring disorders. It is the only hospital in Hawaii which is dedicated to serving adults with serious mental illnesses.

2.2.5 Recreational Facilities

There are two community parks within a one-mile distance from the proposed site. Kawainui Model Airplane Park is located on the western edge of the Kawaiinui Marsh and would be directly adjacent to the proposed site. The Kapa'a Quarry Road would separate the "airplane" park from the proposed Kapa'a Light Industrial Park.

The future Kawainui Gateway Park will be located east of the intersection of Mokapu Boulevard and Kapa'a Quarry Road and will be located within one mile from the proposed site.

In addition, the future Kawainui Marsh Trail will provide a perimeter trail around the 830 acre wetland. The trail would pass the proposed site of the Kapa'a Light Industrial Park and would run in south-north direction along the eastern side of the Kapa'a Quarry Road.

2.2.6 Schools

There are several public and private schools within a two mile distance from the proposed site. The closest school campus is the Kalaheo High School & Windward Community School, which is less than one mile from the proposed site. This school is the only educational institution within walking distance to the proposed site. The Kapa'a Quarry Road does not serve any residential areas between the proposed site and the school and student would not normally walk past the proposed site.

Other schools that are within a two mile distance from the proposed site are Le Jardin (private School), Kailua High School, Maunawili Elementary School, Kailua Elementary School, Aikahi Elementary School and Kainalu Elementary School.

2.2.7 Refuse Collection and Disposal

There is presently no municipal refuse collection at the proposed site. Refuse is collected and disposed of by private waste management companies. City and County solid wastes transfer station is less than a quarter of miles from the proposed development site.

2.2.8 Public Transportation

At present there is no public transportation service to the proposed site. The two nearest bus stops are on Kalanianaole Highway and Mokapu Boulevard.

The bus stop on Kalanianaole is at the intersection with Auloa Street, for both westbound and eastbound buses. This bus stop is at a distance of 1.3 miles from the proposed site. This bus stop is served by six bus lines (TheBus routes 56, 57, 70, 77, 85, and 89).

The bus stop on Mokapu Blvd. is at the intersection with Oneawa St., for both west and east bound buses. This bus stop is at a distance of 1.9 miles from the proposed site. This bus stop is served by three bus lines (TheBus routes 56, 85, and 86).

2.3 Area History and Surrounding Land Uses

This section briefly describes types and histories of the land uses surrounding the proposed project site.

2.3.1 Kawainui Marsh

Kawainui Marsh is the largest wetlands in the Hawaiian Islands. The total area of the marsh with all associated wetland areas is about 830 acres. In 2005 the Kawaiinui Marsh together with the Hamakua Marsh Complex was introduced into the international Ramsar List, a list of Wetlands of International Importance. According to the Ramsar guidelines, " .. wetlands included in the list acquire a new status at the national level and are recognized by the international community as being of significant value not only for the country, or the countries, in which they are located, but for humanity as a whole…".

Approximately 4,000 years ago the marsh was an inland sea, which was divided from the ocean by a sediment barrier. The marsh accommodated a large fishpond and an agricultural field system that sustained the Hawaiian population in the area. The marsh is part of the ahu pua'a of Kailua, a section of land that stretched from the mountains to the ocean and encompassed a diversity of natural resource, which supplied the life essentials of Hawaiian populations.

The marsh played an important role in the Hawaiian culture. The marsh supported a 400-acre fishpond and an agricultural field system that provided to the people. Several heiaus and other gathering place were constructed in the area. Several of them are preserved to date and provide a rich educational and spiritual experience to the people living and visiting the area. Most of the cultural assets are located in the southern part of the marsh.

A rich wildlife of birds, fish and aquatic animals use the Kawainui Marsh as their home. The marsh is also habitat for the federally endangered Hawaiian stilt, Hawaiian moorhen, Hawaiian coot and Hawaiian duck as well as populations of protected migratory waterfowl and shorebirds

protected. The extent of the natural habitat for wildlife has been shrinking in the marsh due in part to a decrease of open water area caused by sedimentation and encroachment of vegetation. Measures to restore important wetland throughout the marsh have been ongoing, though at times with different scope and intensity. The goal of such efforts is restore the capacity of the marsh to serve as quality habitat and effective flood control.

The marsh plays an important hydrological function for the Kailua watershed. During heavy stormwater events runoff, associated suspended solids and nutrients are held back in the marsh resulting in lower runoff impacts on Kailua Bay. Four decades of increased urbanization of the Kailua watershed increased soil erosion and sedimentation that have resulted in a decreased usable volume of the marsh and its ability to hold back water. Increased influx of nutrients into the marsh has caused an increase of free-flowing vegetation that has resulted in a decreased amount of free water surfaces.

The Kawainui Marsh has been an important area for recreation and repose for the population of Kailua, the Windward community and Oahu as a whole. Several recreational parks are riming the marsh. A Model Airplane Field at the north-eastern edge of the marsh provides recreational opportunities for fans of model flying aircraft. The marsh furthermore offers many scenic views of wetlands and mountains.

2.3.2 Proposed Kawainui Marsh Perimeter Trail System

The construction of a multifunctional pathway, e.g. a combined pedestrian walkway and bikeway around the perimeter of the Kawainui Marsh, has been promoted by State and County agencies and residents of the Kailua region for more than a decade. A combined pedestrian and bicycle pathway around the marsh is recommended as a part of efforts to preserve, protect and enhance the ecological and historic/cultural resources of the marsh.

Plans of the Kawainui Marsh Pathway that have evolved over the years envision several segments of paths stretching around the entire perimeter of the Kawainui Marsh. Figure 2-67 shows the proposed six segments of the pathway.

<u>Segment 1, 2 and 3 would be located at the southern boundaries of the Kawainui Marsh:</u> Segment 1 would be a pedestrian-only pathway along the slopes of the marsh. The path would be within an area that features several archeological and historic sites. Segment 2 would be basically a continuation of Segment 1 and would be a pedestrian-only pathway. The alignment would be finalized after the completion of a proposed water bird habitat restoration project. This segment would offer some archeological and natural features and would have excellent marsh viewing. Segment 3 would connect the pathway Segment 2 with the trail system that commences at the intersection of Kalanianaole Hwy and Kapa'a Quarry Road. Construction of Segment 3 might be contingent on the construction of ponds for wildlife habitats and the relocation of cattle grazing in this area.

<u>Segment 4 would be located along the western boundary of the Kawaunui Marsh:</u> Segment 4 would stretch from the intersection of Kalanianaole Hwy to the Model Airplane Park.

Segment 4 would be the longest part of the proposed pathway system. It would feature a multi-purpose pathway for pedestrians and bicyclists. The proposed alignment of Segment 4 is on the marsh side of the Kapa'a Quarry Road. The proposed design of the pathway would place a small median between the multi-purpose pathway and the Kapa'a Quarry Road in order to separate vehicles from pedestrians and bicyclists, increasing safety along the pathway.

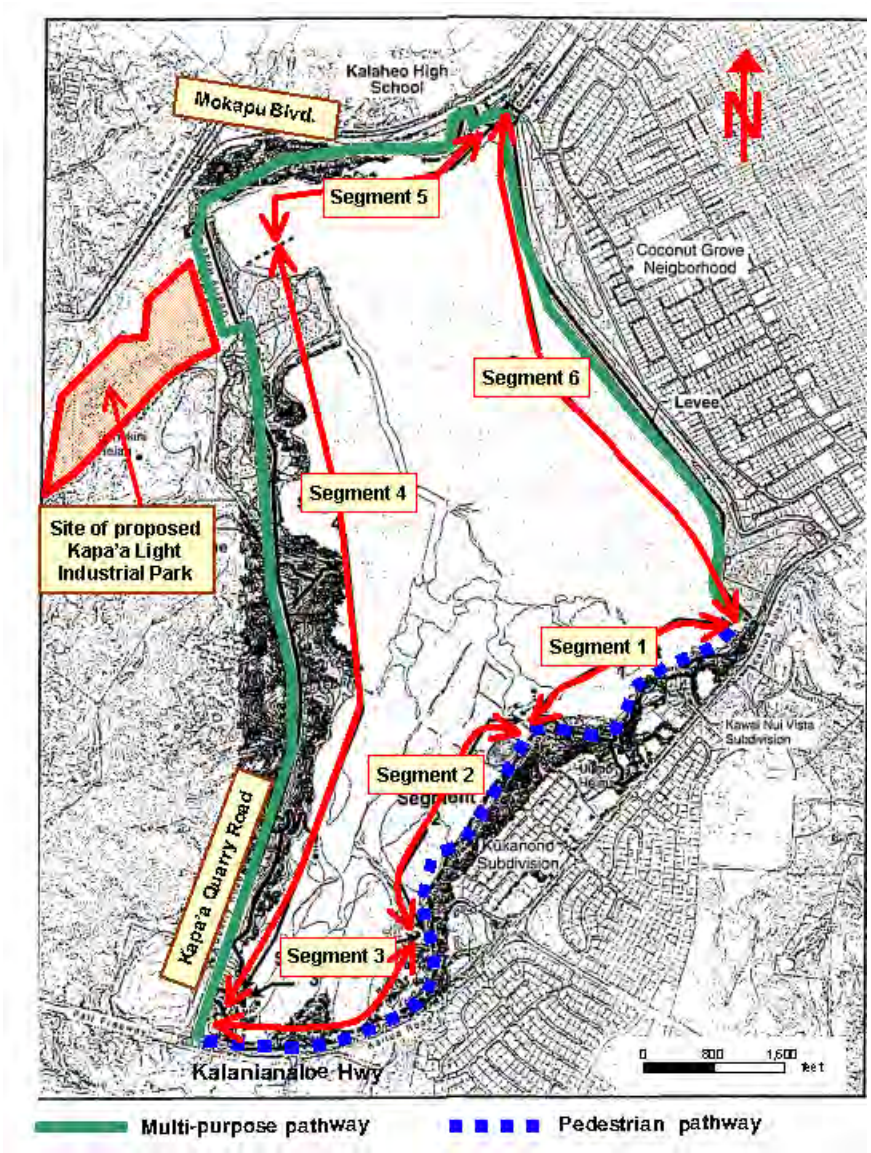


Figure 2-67 Segments of Proposed Kawainui Marsh Pathway (source: Helber, Hasters and Fee, Planners (2003), enhanced graphics by the author)

Segment 5 would be located at the northern boundary of the Kawainui Marsh: Segment 5 would extend from the Model Airplane Park to a location on Mokapu Blvd. across Kalaheo High School. This segment of the perimeter pathway would feature a multi-purpose pathway for pedestrians and bicyclists. The pathway would cross from the marsh side to the mauka (mountain) side of the Kapa'a Quarry Road at the intersection of the quarry road and the quarry access road (close to the entrance to the Model Airplane Park). The pathway would cross the Kapa'a Stream with its own bridge alongside the existing overpass of the Kapa'a Quarry Road over the Kapa'a Stream.

Segment 6 would be located along the eastern side of the Kawainui Marsh: Segment 6 would be an existing multi-purpose pathway for pedestrians and bicyclists along the levee.

Relevance of Perimeter pathway to the proposed Kapa'a Light Industrial Park:

Segment 4 and 5 of the planned Kawainui Marsh Pathway could benefit the proposed Kapa'a Light Industrial Park. The developer plans to offer alternative means of transportation that would promote the use of bicycles to commute to the industrial park and visit the park. In its existing configuration the Kapa'a Quarry Road presents traffic conditions for pedestrians and bicyclists that are far from safe. A multi-purpose pathway that is separated from the quarry road by a median would significantly improve the safety for bicyclists and pedestrians along the Kapa'a Quarry Road as they travel between Mokapu Blvd, Kalanianaole Hwy. and the proposed Kapa'a Light Industrial Park.

The proposed alignment of Segment 5 would locate a significant portion of the pathway on the mauka side of a section of the Kapa'a Quarry Road that borders the proposed site of the Kapa'a Light Industrial Park. For the construction of the multi-purpose pathway in this location the existing drainage canal along the Kapa'a Quarry Road would have to be modified to make room for the pathway. The proposed site layout for Kapa'a Light Industrial Park envisions a vegetative buffer to be constructed along the existing drainage canal, which would leave little room for the proposed multi-purpose pathway. Since the amount of water that needs to be drained by the drainage canal along the quarry road would significantly be reduced under the new drainage infrastructure, the drainage canal could be reduced in size. Another option would be to fill the drainage canal with pervious rock and install an underground pipe to convey drainage to the Kapa'a Stream. Either a reduced or filled drainage canal would create enough room for the construction of the multi-purpose pathway.

2.3.3 Land Use in Kapa'a Valley

The Kapa'a Valley has been going through many and deep changes over the past centuries; from agricultural cultivation starting several centuries ago, when the valley was home to the first settlements, to cattle ranching and last to industrial uses.

In the middle of the last century industrial uses started in the valley with quarry operations on the slopes of the Ulumawao ridge in the south of the valley. The quarry operations later expanded also to the upper parts of the valley. A dike supporting a raised roadway was installed in the lower part of the valley, which effective segregated approximately 40 acres of wetland from the Kawainui Marsh. This raised roadway became the Kapa'a Quarry Road. While quarry operations expanding in the valley there still were farming activities ongoing in the valley.

The start of the quarry operations also resulted in the deposits of overburden and tailings on wetland areas on both sides of the raised roadway. The deposits on the makai (ocean side) side of the Kapa'a Quarry Road and located on the fringes of the marsh resulted in the creations of landfilled area that today is used, among others, for the Model Airplane Park and a City and County of Honolulu baseyard.

In the mid-1960s the 40-acre wetland area was filled to become a landfill area, displacing the remaining farming operations from the Kapa'a Valley. The upper half of the 40 acres became a refuse dump, which was eventually covered with quarry overburden, and the lower half of the area was filled with quarry overburden to create an approximately level plateau. Due to the obstruction of the landfill the Kapa'a Stream changed streambed, which moved further to the north and assumed its present location.

In addition to the quarry and landfill operations in the Kapa'a Valley the construction of the Interstate H-3 Freeway created another impact.

With ongoing and expanding quarry operations larger portions of the valley were used for landfills. Landfill operations in the lower stretches were completed in the mid 1970. The landfills were then used to start other industrial uses in the lower stretches of the Kapa'a valley. About 23 acres of the area generated by landfill was converted to industrial land use and industrial warehouses have been built on this land over the past three decades. The remaining landfill area directly adjacent to the Kapa'a Quarry Road is presently used for green waste processing. Other industrial uses at the southern fringes of the valley include a refuse transfer station.

The proposed Kapa'a Light Industrial Park would be built exclusively on land that was created from deposits of refuse and quarry tailings overburden and would not be built on land that was previously undisturbed.

The Kapa'a Valley has gone through extensive changes over the past century changing from farming to industrial uses and significant changes in the valley's landscape. The changes reflect the scope of urbanization in the Kailua region and growth on Oahu. These changes have placed a burden on the natural resources in the valley. Recent efforts of the public and business community try to reverse the impacts that were started decades ago and mitigation measures, such as restoration of wetland area and more environmentally responsible construction and operation will surely bring about more balanced land uses in the Kapa'a Valley in the years to come.

2.3.4 Federal H3-Freeway

The H3-Freeway connects central Honolulu with the leeward side of Oahu and is an important part of the freeway system on Oahu. The freeway is about 15 miles long and features a tunnel system of about 1 mile length and numerous viaducts that elevate the roadways and support the freeway structure over significant lengths.

The idea of the linking central Oahu and the windward part of Oahu by the H3-Freeway was conceived as part of the Statehood Act and initial federal planning started in 1963 to select a route of the freeway. On the Honolulu side of the Koolau Mountain range initial design considered the Moanalua valley route. On the windward side the route of the H3-Freway passes through the Kapa'a Valley. By the year 1972 the construction of the freeway through the Kapa'a Valley was in full process.

In the face of mounting public opposition to the construction the U.S. District court issued an injunction halting most design and construction work in 1972. By 1976 the route through Moanalua Valley was blocked and the State proposed a new route through Halawa Valley, which, in 1981, was confirmed by the Federal Highway Administration. Court injunctions were lifted and construction work resumed only to be stopped and further delayed by more public and court interventions.

Further into the construction schedule of the H3-Freeway the route was again slightly relocated in order to avoid some cultural and historic sites. In 1997, almost four decades after being proposed, the H3 opened. The H3-Freeway now has become an important part of Oahu's freeway system. Due to numerous delays, re-designs, relocation of the route and the need to build a roadway over viaducts over long distances has resulted in making the H-3 one of the most expensive (on a cost per unit distance basis) of any Interstate constructed. Its final cost amounted 1.3 billion dollars or more than 80 million dollars per mile of freeway.

The construction of the H3-Freeway though the Kapa'a Valley has had considerable impacts on the valley and its watershed. The roadway crosses the valley in East West direction and its embankment basically segregates the valley into a northern and southern part. Since the road embankment affects the drainage of the valley watershed, drainage openings had to be installed for the Kapa'a Steam and other smaller drainage ditches.

In addition to affecting the watershed the H3-Freeway has also altered the visual appearance in the valley and has caused other impacts, such as increase impacts from noise and light.

The H3-Freeway is located directly adjacent to the land parcels that will constitute the site of the proposed industrial warehouse development. The proposed 15-acre wildlife habitat will be located between the H3-Freeway and the site of the proposed industrial development. The H3-Freeway will be separated from the wildlife habitat by a thick vegetative buffer zone.

2.3.5 Le Jardin Academy

The Le Jardin School is a private school that has served the Kailua and Kaneohe region since its founding almost 50 years ago. The school has seen significant growth since and in 1999 the school campus moved to a new location at the intersection of Kalanianaole Highway and Kapa'a Quarry Road, at the site of the former Kailua Drive-in. The Le Jardin Campus is located 1.6 miles away from the site of the proposed industrial warehouse park.

2.3.6 Kapa'a Refuse Transfer Station

The Kapa'a Transfer Station is located at the Kapa'a Quarry Road south of the site of the proposed Kapa'a Light Industrial Park.

The Kapa's transfer station serves in two functions:

1. As of three refuse transfer stations on Oahu where volume of refuse is consolidate and transferred from locally operating refuse collection trucks to larger hauling trucks for cost effective transport of combustible and non combustible refuse to the waste incinerators or landfills on the leeward side of the island, respectively.

2. As part of 10 locations on Oahu that serve as drop-off convenience centers for Refuse and Recycling: At these locations residents can dispose of their household rubbish. Containers are provided onsite for the separate collection of different types of materials: combustibles are processed at H-POWER, non-combustibles are taken to landfill; organic waste is hauled to mulching and composting sites; and large appliances, tires and auto batteries are taken to recycling facilities.

The Kapa'a Transfer Station is open every day, including Saturday and Sunday. The transfer Station is located about 0.4 miles away from the proposed site.

2.4 Existing Infrastructure

2.4.1 Roadways and Traffic

The existing traffic conditions at the proposed site consist of traffic on the Kapa'a Quarry Road and the Kapa'a Quarry Access Road. Figure 2-68 depicts the existing network of roadways in the vicinity of the proposed site.

The Kapa'a Quarry Road connects the proposed site and other facilities in the Kapa'a Valley to main roads south and north of the Kawainui Marsh. The Kapa'a Quarry Road runs along the western boundary of the Kawainui Marsh. Beside providing access to the commercial and industrial facilities in the Kapa'a Valley the road is also a popular shortcut, connecting the two major roads, the Kalanianaole Highway, in the south and the Mokapu Boulevard, in the north.

Vehicles traveling on the Kapa'a Quarry Road between Kalanianaole Highway and Mokapu Boulevard can bypass heavier traveled roads in Kailua and Kaneohe. The Kapa'a Quarry Access Road intersects with the Kapa'a Quarry Road and connects the installations in the Kapa'a Valley with the Kapa'a Quarry Road.

The main commercial, industrial and recreational activities that generate current traffic volumes on the Kapa'a Quarry Road are as follows:

- Ongoing quarry and landfill operations (heavy truck traffic)
- Kapa'a Refuse Transfer Station (heavy truck traffic)
- Existing warehouses on parcel TMK 4-2-015:001
- Equipment storage and processing of construction material on parcel TMK 4-2-015:008
- Existing green wastes operations on parcel TMK 4-2-015:006 (heavy truck traffic)
- Model Plane Recreational Park (opposite the intersection of Kpa'a Quarry Road and Kapa'a Quarry Access Road

A recent 2007 traffic count conducted by the Honolulu City and County Department of Transportation Services was used to assess the current traffic conditions around the proposed site. The traffic count was recorded at three locations in the vicinity of the intersection of the Kapa'a Quarry Road and the Kapa'a Quarry Access Road, so that actual traffic volume into the Kapa'a Valley could be estimated. The traffic count was recorded within one week at three locations, which are identified in Figure 2-69.

- Location 1 of the traffic count is on the Kapa'a Quarry Road north of the entrance to the Kawainui Model Airplane Park. This count represents the traffic on the northern leg of the Kapa'a Quarry Road, between the intersection with the Kapa'a Quarry Access Road and Mokapu Blvd.

- Location 2 is on the Kapa'a Quarry Road south of the Kapa'a Refuse Transfer Station. This traffic count represents the traffic on the southern leg of the Kapa'a Quarry Road, between the intersection with the Kapa'a Quarry Access Road and Kalanianaole Highway.

- Location 3 is on the Kapa'a Quarry Access Road west of the entrance to the Green Waste Processing facility. This traffic count represents the traffic to and from the industrial and commercial users in the Kapa'a Valley.

Figure 2-68 Existing Traffic Situation

The traffic counts at the three locations during morning and afternoon hours are presented in the Table 2-5. The traffic counts reported in Table 2-5 are for to two-axes equivalent counts, i.e. the contribution of heavy trucks, which have more than two axes, were not identified by a vehicle classification count. Figures 2-70 through 2-72 show the recorded traffic count distribution over the length of one day at the three locations.

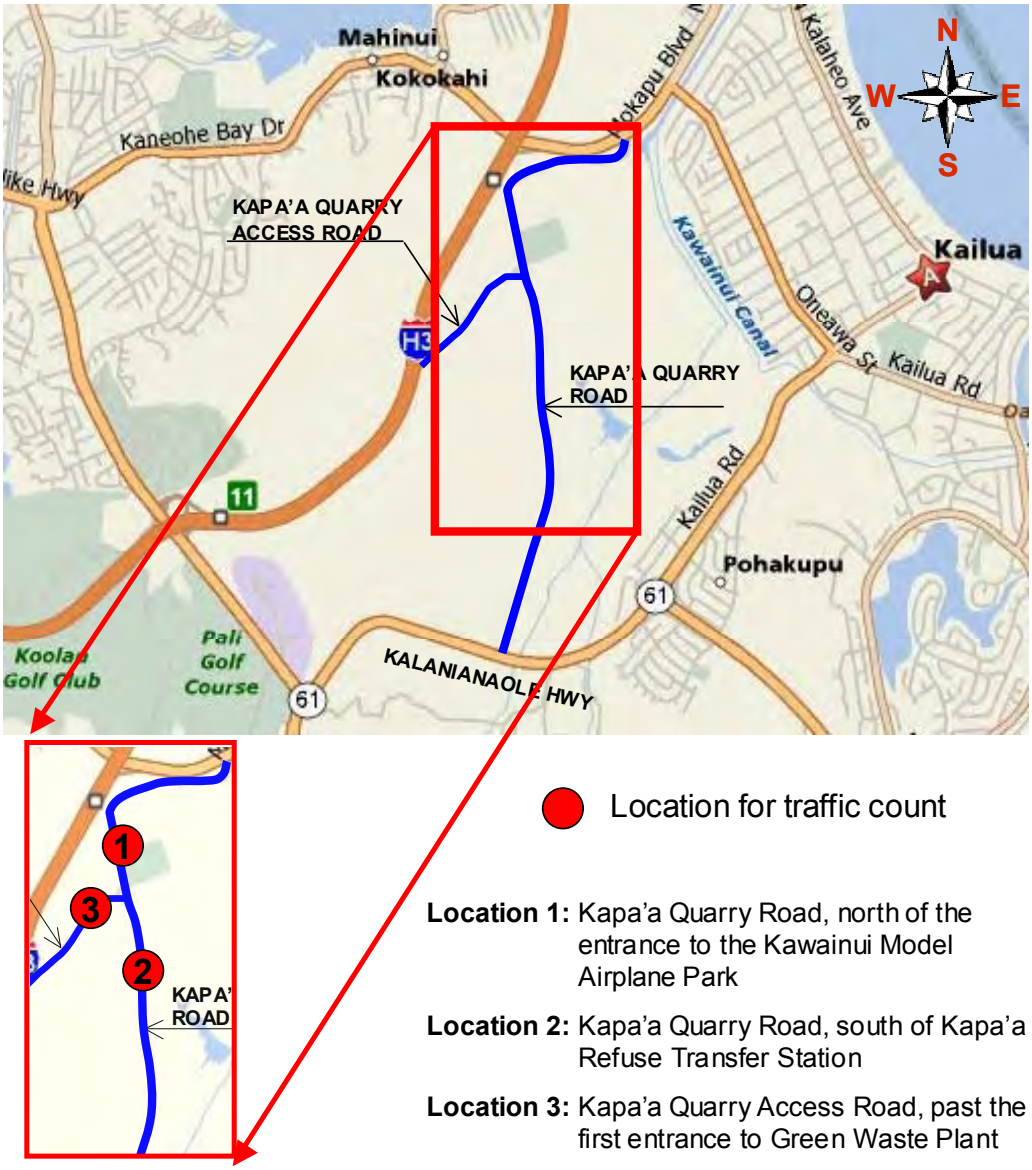


Figure 2-69 Three Test Locations of City & County 2007 Traffic Counts

Table 2-5 Traffic Count on Kapa'a Quarry Road

Location (as defined in Figure 2-68)		**Direction of traffic flow**	**Direction of traffic flow**
Loaction 1: Kapa'a Quarry Road, North of Model Park		North-bound on Kapa'a Quarry Road	South-bound on Kapa'a Quarry Road
	12 h total AM	973	1,636
	12 h total PM	1,691	1,319
	24 h total	2,664	2,955
Loaction 2: Kapa'a Quarry Road, South of Transfer Station		North-bound on Kapa'a Quarry Road	South-bound on Kapa'a Quarry Road
	12 h total AM	739	1,195
	12 h total PM	1,196	1,150
	24 h total	1,935	2,345
Loaction 3: Kapa'a Quarry Access Road, past entrance to Green Waste Facility		West-bound on Kapa'a Quarry Access Road	East-bound on Kapa'a Quarry Access Road
	12 h total AM	626	605
	12 h total PM	425	767
	24 h total	1,051	1,372

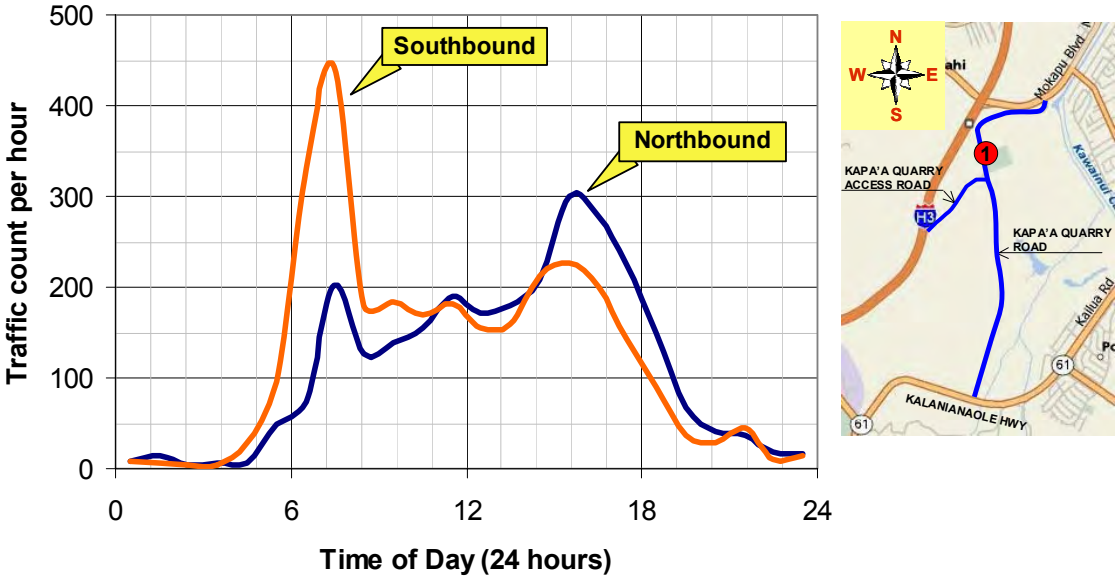


Figure 2-70 Traffic Count at Location 1

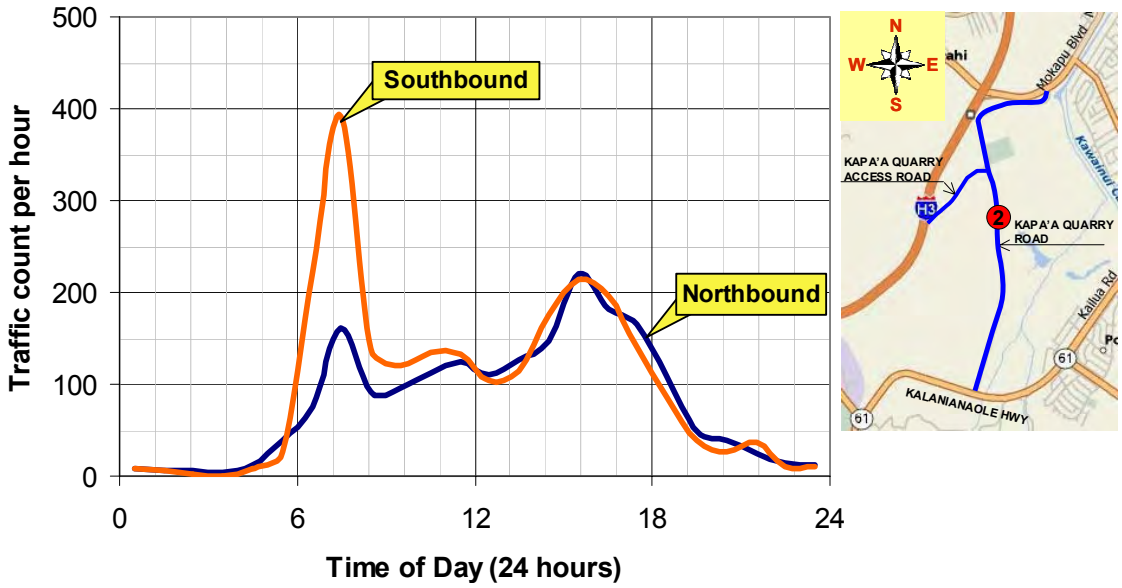


Figure 2-71 Traffic Count at Location 2

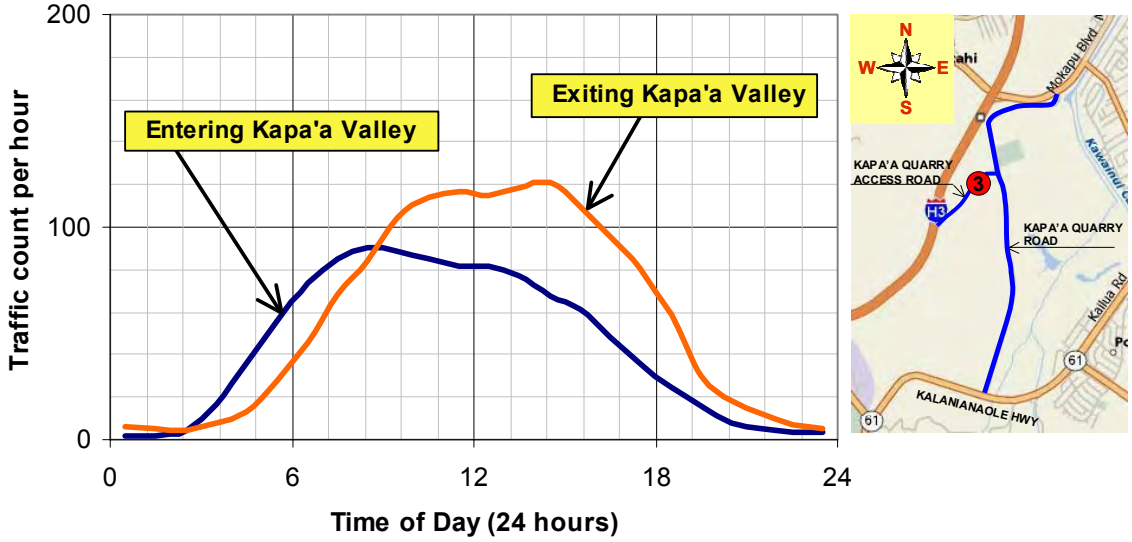


Figure 2-72 Traffic Count at Location 3

Figures 2-70 and 2-71 indicate two daily peaks in traffic volumes; the larger peak for the southbound traffic during morning peak traffic and a smaller peak for the northbound traffic in the afternoon peak traffic. The results suggest that the main traffic peaks occur in the morning and afternoon rush hours, when commuter traffic uses the Kapa'a Quarry Road in southbound and northbound directions, respectively. Figure 2-72 indicates that the traffic on the Kapa'a Quarry Access Road, which serves all traffic going into the Kapa'a Valley, including to the the proposed site, is more uniformly distributed over the entire length of the day.

Analysis of the traffic count indicates that the main traffic on the Kapa'a Quarry Road is generated by vehicles traveling between Mokaou Blvd. and Kalanianaole Highway. The traffic volume count distributions suggest that the traffic between Mokapu Blvd. and Kapa'a Quarry Access Road is heavier than between Kapa'a Quarry Access Road and Kalanianaole Hwy. Therefore, it can be concluded that the traffic into the Kapa'a Valley uses the northern leg of Kapa'a Quarry Road , to and from Mokapu Blvd. to a higher degree than the southern leg, to and from Kalanianaole Hwy. It should be noted that the Kapa'a Quarry Road between Mokapu Blvd. and the intersection with the Kapa'a Quarry Access Road, has sections with missing or narrow shoulders, which can impede traffic and reduce flow capacity. Such limitations of road geometry are not as pronounced between the section of Kapa'a Quarry Raod, between the intersection with Kapa'a Quarry Access Road and Kalanianaole Highway.

At present the three parcels that would constitute proposed site are accessed from Kapa'a Quarry Access Road by five road entrances, as shown in Figure 2-73.

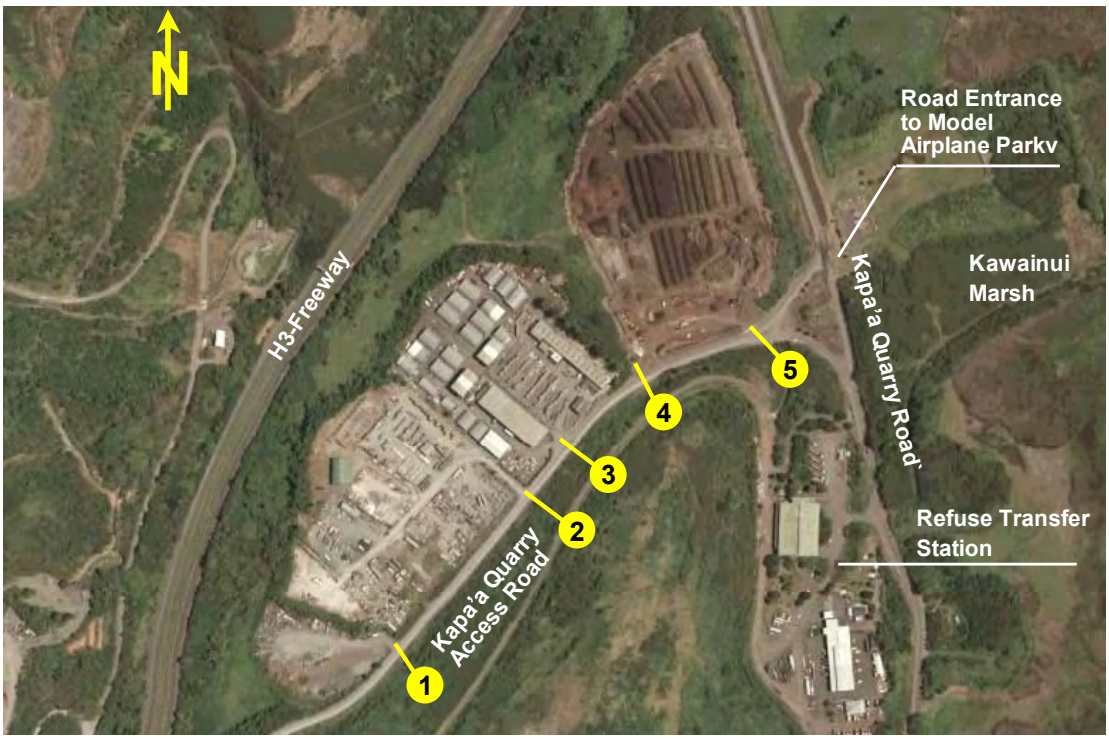
Entrance No. 1 provides access from the Kapa'a Quarry Access Road to parcel TMK 4-2-015:001. This is an unpaved entrance.

Entrance No. 2 provides access from the Kapa'a Quarry Access Road to parcel TMK 4-2-015:008. This is a paved entrance.

Entrance No. 3 provides access from the Kapa'a Quarry Access Road to parcel TMK 4-2-015:008. This paved entrance, provides access to existing warehouses and outdoor equipment storage areas in the south-western part of parcel TMK 4-2-015:008.

Entrance No. 4 provides access from the Kapa'a Quarry Access Road to parcel TMK 4-2-015:006. This is an unpaved entrance.

Entrance No. 5 provides access from to the Kapa'a Quarry Access Road to parcel TMK 4-2-015:006. This is an unpaved entrance.



X = No. of Present Road Entrance to Proposed Site

Figure 2-73 Existing Road Entrances to the Proposed Site

2.4.2 Water System

The existing potable water infrastructure supplying potable water and fire fighting water is depicted in Figure 2-74. An existing 36-inch water main runs along Kapa'a Quarry Road and supplies water to the site. A 2-inch water line connects the existing users at the site with the 36-inch water main in Kapa'a Quarry Road. There is a 2-inch water meter on the property next to the Kapa'a Quarry Road. A 10-inch firewater main also connects the 36-inch water main to an existing fire pumping station on parcel TMK 4-2-015:008. The pump station boosts the water pressure if fire fighting water is needed. The current water demand at the existing warehouse development is estimated as about 20,000 gallons per day. The fire fighting water demand is 4,000 gallons per minute for a three hours fire.

2.4.3 Wastewater System

The proposed site is currently not connected to the municipal sewer system since there is no gravity sewer or force wastewater main serving the property or along the Kapa'a Quarry Road.

Wastewater is presently treated on-site in five septic tanks with a capacity of 1,250 gallons each. Every septic tank is connected to its own leach field. The average dimensions for all five leach fields are 60 feet in length, 18 feet width and 4 feet depth. The sludge, collected in the five septic tanks is removed by private operators every four to six weeks. Figure 2-74 shows the locations of the five septic tanks on the parcel TMK 4-2-015:008.

2.4.4 Electricity and Telephone

The existing users of electricity on the proposed site are supplied via a HECO 4.16 kV line that connects to one 4.16 kV circuit on Mokapu Blvd. Figure 2-74 shows the alignment of the 4.16 kV line. From Mokapu Blvd. the power line runs first southwest parallel to the H3-Freeway and then changes direction to the southeast. The line crosses the parcel TMK 4-2-015:006 and then runs parallel to the Kapa'a Quarry Road to the intersection of Kapa'a Quarry Access Road and Kapa'a Quarry Road. From there the line again changes direction and runs westwards along the Kapa'a Quarry Access Road to different consumers of electric power in the Kapa'a Valley.

The existing 4.16 kV is the only electricity supply line to the Kapa'a Valley. According to HECO there is little spare capacity on the circuit from Mokapu Blvd. to serve new loads. Therefore in order to serve new loads a new circuit would need to be installed to the proposed site along Kapa'a Quarry Road from an existing 12.47 circuit at Kalanianaole Hwy.

Telephone service to the Kapa'a Valley is provided by an aboveground telephone line that runs along Kapa'a Quarry Road towards Mokapu Blvd., as illustrated in Figure 2-74.

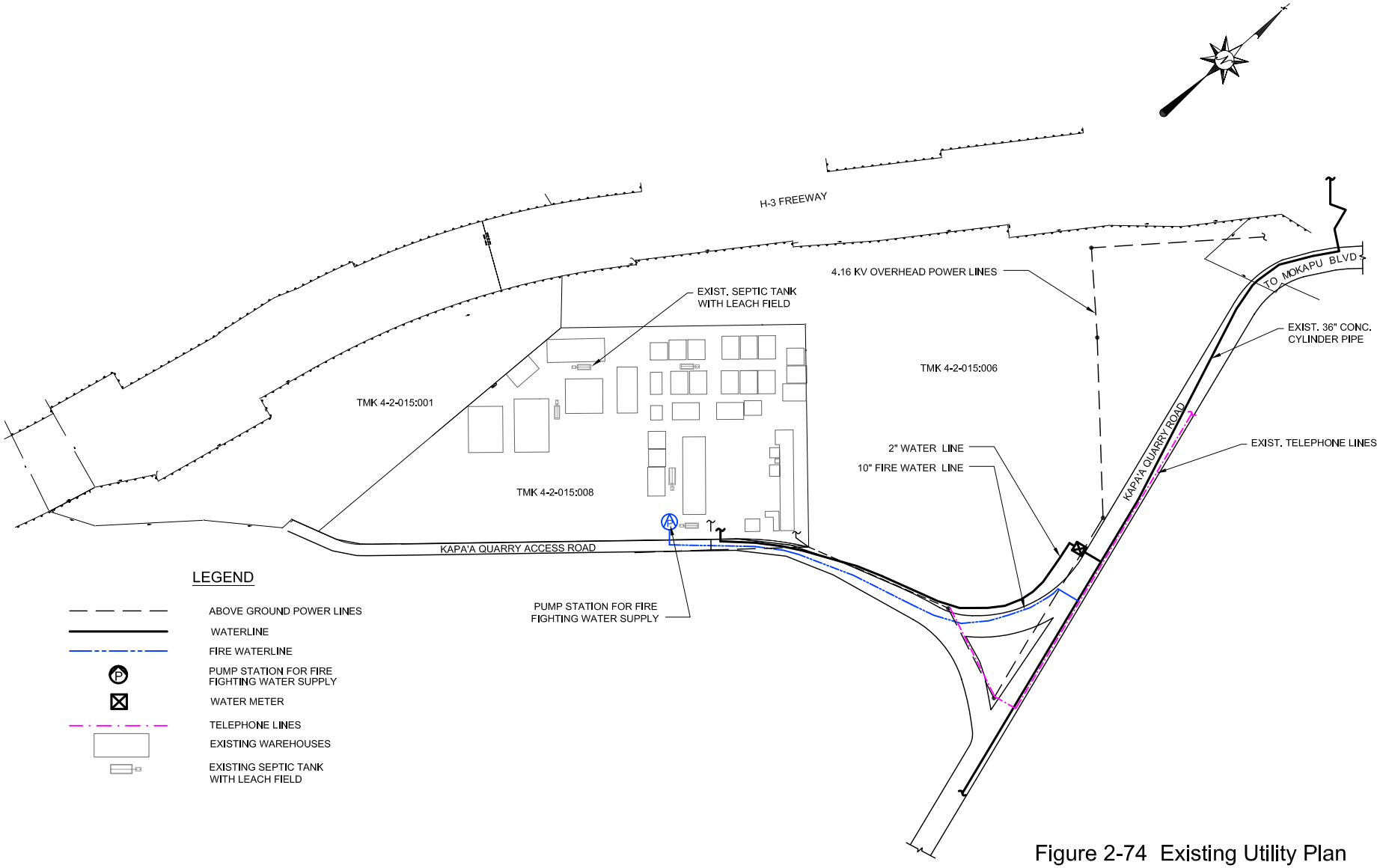


Figure 2-74 Existing Utility Plan

500' 0 500' 1000' 2000'

SCALE: 1" = 500'-0"

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SECTION THREE

ASSESSMENT OF IMPACTS OF THE PROJECT

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SECTION THREE

ASSESSMENT OF IMPACTS OF THE PROJECT

In this section, potential impacts of the proposed development on the physical environment and the community are discussed.

3.1 Sustainable Site Development

The developer of the proposed Kapa'a Light Industrial Park has opted to develop the proposed Kapa'a Light Industrial Park in accordance to LEED (The Leadership in Energy and Environmental Design) standards. LEED is a third-party certification program for the design, construction and operation of high performance "green" buildings. The design approach of the proposed development calls for the implementation of sustainable building technologies and development measures for all of parts of the proposed project design. The LEED certification would be awarded upon completion of the development, if an independent review authority certifies that the development was designed and built in accordance the LEED "green" building standards.

As a first step in the process the proposed project is now LEED registered and, upon completion, the project will apply to become LEED certified. Under the LEED integrated project work approach the design team works according to a so-called "whole building approach" that would incorporate technologies and development strategies to significantly lower impacts of the project on the environment and the community.

The outcome of the design process would be an integrated light industrial development that integrates optimized sustainable measures and that could attain enough LEED credits for certification. At the present time basic certification is planned, but the developer might opt to pursue a higher certification level for certain parts of the proposed industrial park.

The final selection of building technologies, building outfitting and construction materials will be done in the structural design phase. The final design would effectively lower or avoid impacts to the environment and the community, while at the same time ensure a positive economic impact by providing much needed industrial space to the Koolaupoko region.

The building technologies, building material and development approaches to be selected for the proposed industrial warehouse park would be such as the following:

- Construction Waste Management
- Recycled Content
- Regional materials; using indigenous building material for a portion of the structure or building outfitting, rather than importing all material
- Rapidly renewable materials
- Increased natural ventilation; utilizing natural rather than forced ventilation technologies
- Indoor air quality management, improving indoor air quality by avoiding potentially harmful building materials, such as low-emitting materials typically found in adhesives & sealants, paints & coatings, carpet systems, composite wood & agrifiber products

- Optimizing energy performance of the structure by avoiding unnecessary mechanical cooling, forced ventilation and artificial lighting
- On-Site Renewable Energy, to generate for on-site electricity demand or for feeding into the public electricity grid.
- Thermal Comfort, by using modern air-conditioning technologies or natural ventilation
- Daylight & Views, utilizing daylight and "green" views in lieu of artificial lightings
- Green walls to improve visual appearance of warehouse structures and to improve energy performance and indoor environmental quality.
- Responsible resource utilization, especially lowering electricity and water consumption significantly below typical building baseline consumption.
- Reducing electricity by passive and active building construction strategies
- Reducing water demand by using water saving fixtures and using no potable water for irrigation. Using rainwater harvesting for water recycling for irrigation and other gray water applications, if applicable
- Avoidance of light pollution by appropriate choice of lamps, lamp fixtures, lighting control, and exterior lighting strategies.
- Conservation and improvement of open space; adopting stewardship to the natural resources surrounding the proposed site
- Wastewater reduction through low-flow fixtures
- Comprehensive stormwater management to promote reduced stormwater runoff, erosion associated with run-off and comprehensive treatment of run-off.

3.2 Impacts on Physical Environment

3.2.1 Climate

The proposed warehouse development will not have a noticeable impact on the climate in the immediate vicinity of the proposed site. There is, however, a possibility of slight changes to the microclimate to occur within the warehouse development due to the presence of heat islands caused by development of new warehouses and paved surfaces. Heat islands are generated as asphalt and concrete used in roadways and warehouse structures replaces landscape areas. These hard surfaces absorb, rather than reflect, the sun's heat, causing an increase in surface temperatures and overall ambient temperatures. The impact of local heat islands in the proposed warehouse development could therefore be local increases in temperatures and reduction in evaporation. Another potential impact can be attributed to the blocking of wind, which would, in turn, inhibits cooling by convection. Waste heat from vehicles and machineries, air conditioning, industrial activities, and other miscellaneous sources could contribute to the heat island effects.

The heat island effect is pronounced in dense urban developments, which lack vegetation cover and feature a large area of paved surfaces and tall buildings. The effect of heat islands in the proposed warehouse development would be noticeable but would be much smaller than in other

densely developed areas of Kailua. The adverse effects of heat islands could be effectively mitigated by appropriate mitigation measures to be discussed in the Section Four.

3.2.2 Erosion

Erosion is the displacement of solids from ground surface by wind or water. Erosion can be a problem when appropriate measures of surface stabilization, such as vegetation or pavement are missing and steep slope is high enough to induce runoff. If water can infiltrate into the ground the level of erosion diminishes.

Under the existing conditions at the site, erosion can be observed in areas that lack ground cover and where the slope is large enough so that rainwater runs off rather than infiltrates into the ground. The partly developed areas in TMK 4-2-015:001, which are used for outdoor equipment storage and construction material processing, show limited effects of surface erosion, due to the fact that the slope is mild and the surface is not paved. The area of TMK 4-2-015:008, which contains existing warehouses and outdoor storage has a sizable paved area but due to mild slope there is limited erosion. The area of TMK 4-2-015:006, has a large area of exposed soil with no to limited vegetative ground cover. Average ground slope in this area is 2.5% and 3.6 % in west-east and south-northerly directions, respectively. This area exhibits some level of surface erosion, mainly in small channels rills.

3.2.3 Flora and Fauna

The project site does not contain any habitat or habitat for rare, endangered and threatened species. The master plan for the development includes restoration and expansion of a 15-acre wildlife habitat at in the Kapa'a Stream corridor, which will greatly improve wildlife habitat conditions.

The site does not contain any significant indigenous plants, shrubs or large trees. The master plan for the proposed development calls for plating of shrubs, trees and grass areas between various structures and more landscaping at the boundaries of the development. This action would balance removal of scant vegetation and wild shrubberies during grubbing of the property before mass grading. In short, the development would not significantly impact the flora or fauna at the site.

3.2.4 Noise Environment

The existing noise environment at the proposed site is mostly the noise originating from highway traffic on the adjacent roads and the H3-Freeway, which envelope the site.

Noise levels over a certain threshold can have negative health effects, such as hearing impairment, hypertension, ischemic heart disease, sleep disturbance, and decreased performance. Even lower noise levels can cause a high level of annoyance and stress.

Different perception of the noise impact can be experienced by different observers, due to psychological and non-noise related factors.

Due to quarry and landfill operations as well as commercial operations at the existing warehouses on the proposed site, heavy truck traffic is prevalent on the Kapa'a Quarry Road and Kapa'a Quarry Access Road. Table 3-1, presents traffic factors, which contribute to increase in noise levels.

Generally, the existing average noise level at the proposed site, which is defined as the steady sound level that contains the same amount of acoustical energy as the corresponding time-varying sound sources, is not high enough to cause direct health effects. There are no residential areas in the vicinity of the proposed site. Existing noise impact is primarily perceived by people visiting sites of commercial and industrial activities in the Kapa'a Valley and people visiting the Kawainui Marsh, especially the Model Airplane Park, on the eastern side of Kapa'a Quarry Road in the vicinity of the proposed site. The Model Airplane Park itself emits considerable noise level during short periods of the week coming from the operation of smaller high-pitched model plane engines.

Table 3-1 Factors Contributing to Noise Level at Proposed Site

Typical Causes of Highway Noise	Expected Contribution to Noise Level at the Proposed Site
Volume of the traffic	Noise generated by larger traffic volume
Speed of the traffic	Traffic noise greatly reduced by slower traffic
Number of trucks in the traffic flow	Larger number of trucks increases the noise level
Noise emitted by the vehicle, as a combination of the noises produced by the engine, exhaust, and tires	Newer vehicles are subject to reduced operating noise
Defective mufflers or other faulty equipment on vehicles	Defective vehicles add to the generated noise
Steep inclines on roads adjacent to site	Causes heavy laboring of motor vehicle engines and greatly increases the noise level
Acceleration of vehicles	Unnecessary high acceleration increases the noise level
Idling of stationary or loading vehicles	Unnecessary idling increases the noise level

The wildlife in the Kawainui Marsh is exposed to the existing noise level originating from the traffic on Kapa'a Quarry Road and other sources of noises, as indicated above. The reaction of wildlife on noise is complex and depends on a range of factors, such as noise level, frequency distribution, duration, number of events, variation over time, noise type (e.g., white noise versus harmonic or pure tones), level of ambient (background) noise, time of day and other factors. Generally, the typical reaction of wildlife to noise is avoidance, meaning that wildlife density around the noise sources would diminish over time of exposure. With the existing level of noise it is anticipated that wildlife density around the primary sources of noise, e.g. Kapa'a Quarry Road, is lower than in more distant areas of the Kawainui Marsh.

The construction of new warehouses at the proposed site will inevitably add new noise sources to the existing noise environment. The anticipated sources noise would originate from construction activities and from normal operations of the proposed warehouse development.

It is anticipated that the dominant noise sources during construction will be through operation of machinery used in earth moving and road construction. The duration of this noise intensive period of the site development work would be several months. Once the site preparation and development is completed, individual warehouses would be added over an extended period of up to 18 years, until full build of the proposed Kapa'a Light Industrial Park is reached. Normal types of construction noise during the construction of individual warehouse structures would be significantly less than noise during site preparation work.

Sources of noise during operations rage from traffic noise to the operation of machinery inside the warehouses. Among the significant new noise sources originating from highway traffic is the increased traffic volume on the adjacent streets and traffic within the warehouse development. By implementing suitable mitigation measures, which are discussed later in this Environmental Assessment, it is anticipated that the construction and operation of the proposed warehouse development would not significantly increase the existing noise levels at or in the vicinity of the proposed site.

3.2.5 Air Quality

The main anthropogenic sources of impaired air quality around the proposed site are from vehicle exhaust and the dust and other agents that are released into the atmosphere during commercial or industrial activities. The existing level of air pollution at the proposed site is low and has not shown to cause any acute effects on people and wildlife.

The proposed warehouse development would increase the traffic level and would therefore contribute to an increase in air pollution. The level of increase of air pollution from the proposed warehouse development would, however, be relatively small when compared to the exhaust from traffic flow serving the entire Kapa'a Valley. While the level of air pollution from traffic would increase, air quality impacts from dust emissions would be significantly reduced due to reduction of bare and unprotected ground surfaces. Air quality impacts from the release of harmful agents during the commercial and industrial activities in the proposed warehouses

could be effectively mitigated with appropriate measures. It is anticipated that the proposed development will have no significant adverse impact on air quality in the area.

3.2.6 Artificial Light Environment – Light Pollution

The presence of a significant source of artificial light can result in a range of impacts. Relevant impacts at the proposed site could include the following effects:

- Safety issues for traffic on the adjacent roads: The roads are unlit at night and brighter light emitted by fixtures at the new warehouses could be a hazard to motorists due to scattering of light and glare;
- Disruption of ecosystems: The disruption of natural light and dark patterns could affect aspects of animal behavior. Light pollution can confuse animal navigation, alter competitive interactions, change predator-prey relations, and influence animal physiology. Birds can be disoriented by lights;
- Energy waste: Excessive lighting typically results in high energy consumption, especially if energy in-efficient light sources are used for the external illumination.
- Night glare: Excessive illumination could result in night glare that can be noticed over a significant distance, e.g. from Kailua across the Kawainui Marsh and from remote scenic vistas;
- Effect on night sky: Excessive illumination can result in sky glow that in turn reduces the ability to see the stars. Urbanization around the proposed site causes a certain level of sky glow. The proposed site is close to important wildlife habitats and sky glow can have a negative effect on wildlife.

The master plan for the proposed warehouse development calls for an environmentally responsible illumination scheme to be implemented that would mitigate the impacts of fugitive light on safety, wildlife and night sky. It is anticipated that with effective mitigation the proposed warehouse development would have no significant impact due to light pollution.

3.2.7 Cultural Considerations

As discussed previously, the project site is located exclusively on landfill and previously disturbed land. There are no known cultural or historic resources at the site. Therefore, it is anticipated that the project will have no impact on cultural and archaeological resources and sites in the area.

3.2.8 Key Design Components

It is anticipated that the proposed key design components of the project to have the following impacts:

- Roadways: Impacts from construction and maintenance of roadways are mainly due to storm runoff and the presence of associated pollutants in the runoff water. All roadways in the development would have impervious surfaces and a grated drainage trench along the centerline of smaller roadways would collect the surface drainage, which would then be conveyed to one of the on-site detention ponds. The ponds would remove of a significant portion of suspended solids and pollutants before storm flow is finally discharged into the Kapa'a Stream;

- Parking Spaces: All parking spaces would have pervious surfaces that would allow infiltration of rainwater into the ground;

- Loading Docks: The main possible impacts from the proposed detached loading structures could be runoff from parked trucks and temporarily stored cargo, air pollution from idling trucks and noise pollution from loading operations. The runoff would be controlled similar to the roadways, with special emphasis on spilled fuel or chemical agents at the loading docks. Air pollution would be mitigated by avoiding unnecessary idling of truck engines and using propane powered fork lifts. Noise pollution could be mitigated by appropriately shielding the loading docks by appropriate noise buffers towards sensitive areas, such as the 15-acre wildlife habitat;

- Warehouse Structures: Possible impacts from the warehouse structures could be visual, rainwater runoff related, energy consumption, air pollution and noise pollutions. The warehouse shells are typically lightly colored which would result in a low solar reflective index, which is beneficial in regard to energy savings and heat accumulation. Light colored building shells, however, could add to the visual impact. The development calls for the planting of trees at the site perimeter, which could camouflage the site and could also help to mitigate the adverse visual impacts, help to lower noise propagation and lower the ambient temperatures within the development, through mitigation of heat islands. The large roof surfaces of the proposed new structures could generate large quantities of stormwater runoff. The proposed mitigation measure to high runoff volumes from roof areas is "rainwater harvesting", which is the method of collecting and storing of rainwater for subsequent uses in irrigation and other appropriate non-potable water uses. The energy consumption in new warehouses would be mitigated by the use of energy efficient fixtures and on-site photo-voltaic (PV) energy generation. The noise generated in the warehouses would be mitigated by appropriate noise abatement technologies discussed in details in Section Four. Release of the expected types of air pollutants from commercial and industrial activities in the proposed warehouses could be mitigated by appropriate ventilation and filtering;

- Wastewater Treatment: Wastewater generated by the proposed industrial development would require effective treatment to avoid negative impacts. It is planned to construct a sufficient capacity of septic system, which are comprised of one septic tank and one septic leach field per septic system. The septic systems would treat and dispose of the wastewater generated on-site. Solids that accumulate in the septic tanks would be routinely pumped and properly disposed of. The effluent from the septic tanks would flow to the septic leach fields, where the effluent would infiltrate into the ground, with no adverse significant impact on the watershed or sources of potable water;

- Drainage Infrastructure and Detention Ponds: A combination of concrete conduits and grassed swales would collect and convey stormwater runoff that is generated at the proposed site to several detention ponds, before the runoff would be finally released to the Kapa'a Stream. The runoff would flow through pre-treatment units upstream of the detention ponds in order to remove a significant portion of typical pollutants in the stormwater runoff, such as grease and other harmful oily pollutants, suspended solids and floatables. The detention ponds would remove additional portions of such pollutants. The detention basins would not cause adverse impacts on the safety or health of the occupants of the proposed warehouse development.

3.2.9 Open Space Considerations

Open space considerations have become important design tools to decrease the ecological footprint of new developments. The term open space as used in this Environmental Assessment, is defined as vegetated and pervious land that surrounds the developed areas contained warehouses, roadways, parking areas and other infrastructure components. Open space is important to an environmentally friendly development. Existing open space surrounding the proposed site of the warehouse would be restored, preserved, and enhanced in order to maintain or improve the natural, scenic and hydrological properties of the site.

The proposed Kapa'a Light Industrial Park would use sustainable design approaches to arrive at a low ecological footprint while achieving its business performance goals. The creation and/or conservation of open space within the proposed development would be an important aspect to create a low-impact environmental approach for the proposed Kapa'a Light Industrial Park.

In keeping with the environmental goals, the proposed Kapa'a Light industrial Park would employ an open space design by clustering the warehouses, instead of evenly spreading them over the available land within the three parcels of the proposed site. The proposed development would restrict the construction of warehouses, roadways and other ancillary facilities to areas that are presently already developed.

No area that is presently open space would be used for the construction of warehouses and ancillary facilities. Therefore no environmentally significant vegetation, wetland and areas with large trees would be destroyed to make room for warehouses and road system. Rather than resulting in a deterioration of open space and associated environmental impact, the proposed Kapa'a Light Industrial Park would improve and restore conditions of the present open spaces, such as preserving the number of large trees, wetlands, streambeds or thick vegetation. Parts

of this open space that surrounds the proposed site will be improved to construct a 15-acre wildlife habitat on restored wetland area.

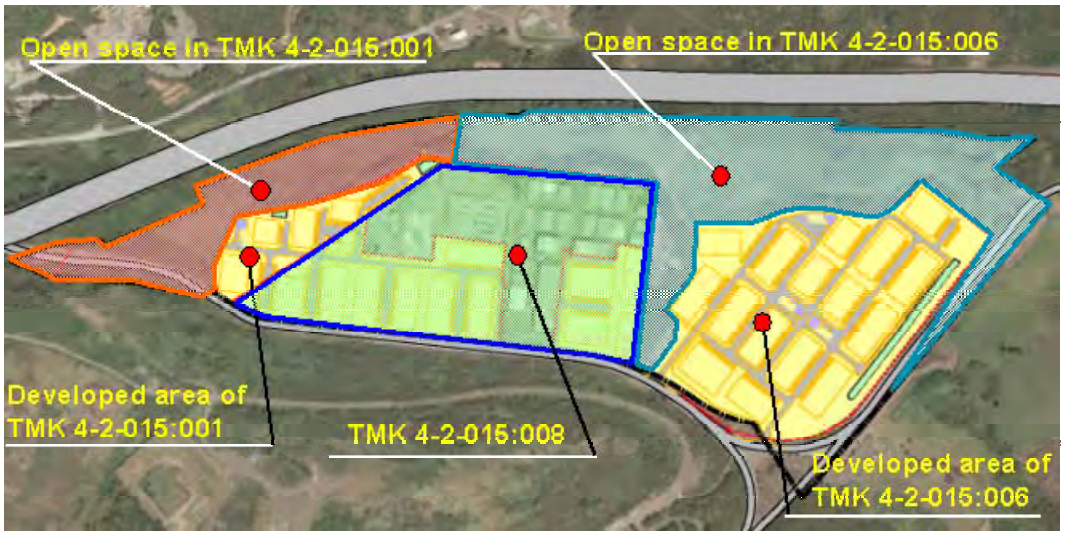
Figure 3-1 shows the three parcels TMK 4-2-015:001, 006 and 008, that comprise the proposed site for the Kapa's Light Industrial Park. Figure 3-1 indicates the percentages of open space, developed area (including buildings, roadways and support areas) and the building footprint. The parcel TMK 4-2-015:008, which is presently within the Intensive Industrial District (I-2) zone, has almost no open space. The other two parcels, for which a zone change is being sought, have a relatively high percentage of open space.

In keeping with sustainable development objectives, open space design is promoted in the proposed site layout. Paved and impervious surfaces within the proposed site would be held to a minimum in order to reduce stormwater runoff and the discharge of associated pollutants to the receiving waters. Replacing paved and impervious surfaces with pervious surfaces would promote infiltration of storm water, which is beneficial to the environment. The areas between the warehouse structures would be landscaped using grass and native or adaptive plants to enhance the appearance and promote infiltration.

Parking areas would have pervious gravel surfaces. Impervious asphalt would be used for roadways; although pervious types of roadway pavement might be considered in the final design if such pervious pavement could accommodate high axial loads of trucks that would serve the proposed industrial development. The large detention pond in the lower portion of the proposed development would be part of an effective open space development with a vegetative buffer zone between the warehouse development and the adjacent Kawainui Marsh. The vegetative buffer zones are effective measures to mitigate visual, noise and air pollution impacts.

The developer has started with the development of a 15-acre wildlife habitat on restored wetland in the lower reaches of the Kapa'a Stream corridor. The wetland restoration will involve clearing of sections of the present open space from invasive weed and planting native and adaptive plants instead. A series of cascading ponds would be installed to serve as habitat for endangered water birds.

Consequently, the proposed Kapa'a Light Industrial Park would have no significant adverse impact on the open space, rather the ecological value of the existing open space on the property would be significantly enhanced.



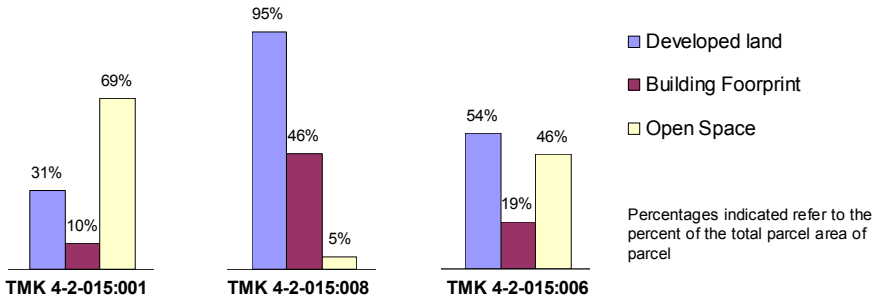


Figure 3-1 Open Space Considerations

3.2.10 Visual Impacts of the Proposed Warehouse Park

The proposed Kapa'a Light Industrial Park is a relatively large development, which would have visual and aesthetic impacts if no mitigation would be implemented. A series of mitigation measures could dampen adverse visual impacts of the proposed development. Possible mitigation could include utilizing soft color schemes for exterior of the warehouse building, planting tall trees (e.g. wind breaks) along the perimeter of the development in the form of vegetative buffer zones and installing "green walls".

A 3D-visualization model, which serves as an intuitive spatial impression of the proposed development is presented hereafter to illustrate visual impacts of the development. The 3D-model provides a visual approximation of nearby and remote vistas of the project site and suggests how the geometric proportions of the proposed development would fit into its immediate vicinity. The following 3D-visualization provides some approximate illustration of

future overviews of the site, more detailed arrangements and views of the future development and a superposition of the "virtual" warehouses into the present view of the Kapa'a Valley.

As it is demonstrated by means of a three-dimensional visualization, the proposed development would have no significant impacts on views from the adjacent roadways and public gathering places (e.g. the public park adjacent to the lower portion of the site). As can be seen, the planned vegetative buffer zones around the lower portions of the site would effectively shield the warehouse structures from observers passing the proposed site on the Kapa'a Quarry Road.

3.2.10.1 3D-Overview of the Proposed Site

Figures 3-2 through 3-4 show remote virtual overviews of the entire proposed warehouse development site.

Figure 3-2 provide an overview of the proposed warehouse development from a "virtual" vantage point that is above the center of the Kawainui Marsh. This view is towards the west. The vantage point is purely virtual, since no actual vantage point is at such a high elevation in this view direction. The lower portion of the site, the parcel designated as TMK 4-2-015:006 is in the foreground. Symbols of trees represent the vegetative buffer zones between the proposed warehouses in the lower portion and adjacent open space, the Kapa'a Quarry Road and the adjacent Kawainui Marsh. The upper portion of the proposed site, the parcels designated as TMK 4-2-015:001 and 4-2-015:008, is in the background. Existing warehouses in parcel TMKs 4-2-015:008 are shown in red color.

Figure 3-3 shows the proposed warehouse development from a vantage point that is above the northern part of the Kawainui Marsh, close to the Mokapu Blvd. The view is towards the south. The vantage point is purely virtual, since the actual vantage point at the corresponding location has a lower elevation. Figure 3-3 shows the lower portion of the proposed site in more detail than Figure 3-3. The trees represent the vegetative buffer around the warehouses.

Figure 3-4 shows the proposed warehouse development from a vantage point that is above the saddle of the H3-Freeway. The view is towards the north. The vantage point is purely virtual, since no actual vantage point is at such a high elevation in this view direction. The upper portion of the proposed site, with warehouses in parcels with TMKs 4-2-015:001 and 4-2-015:008, is in the foreground. Existing warehouses in parcel TMKs 4-2-015:008 are shown in red color. The lower portion of the site, the parcel designated as TMK 4-2-015:006 is in the background.

3.2.10.2 Detailed 3D-Views of the Site.

This section provides more detailed 3D-views of the proposed site. The 3D-views are grouped in three categories:

- 3D-image category 1 depicts visualization of the upper portion of the proposed site in Figures 3-5 through 3-9. Figure 3-5 indicates the vantage points for views in Figures 3-6 through 3-9. The warehouses of the upper portion of the site are surrounded by roadways, parking spaces and grassy areas. One detached loading dock is shown that would allow large trucks to load and unload. There are no broad vegetated buffer zones surrounding the warehouses at the outer perimeter, as for the lower portion of the proposed site. The new warehouses would be clearly visible from the Kapa'a Quarry Access Road. The traffic on the Kapa'a Quarry Access Road, which would pass the new warehouses, would be essentially restricted to traffic bound for the industrial landfill and quarry activities in the upper portions of the Kapa'a Valley.

- 3D-image category 2 depicts visualization of the upper portion of the proposed site in Figures 3-5 through 3-9. Figure 3-10 indicates the vantage points for views in Figures 3-11 through 3-14. The lower portion of the proposed site has a larger visual impact than the upper portion of the site, since the upper portion of the site is further up in the Kapa'a Valley and is shielded by existing vegetation from observes traveling on the H3-Freeway and from observers in the Kawainui Mars. Roadways, parking spaces and grassy areas surround the warehouses in the lower portion of the proposed site. The final lay-out of the lower portion of the site would most likely contain a significant number of trees, which would not only mitigate the visual impact but would also be mitigating noise, water and energy impacts. These trees are not shown in the virtual model. Three detached loading docks are shown that would allow large trucks to load and unload. Two of which would be located in the interior of the warehouse development, in order to decrease the visual impact but also to mitigate noise and air impacts. The vegetative buffer zone is shown that would surround the lower portion on all sides. The large detention basin that would contain the run-off water from the lower portion of the proposed site is shown with the vegetated buffer zone separating the warehouse development from the Kapa'a Quarry Road and the Kawainui Marsh.

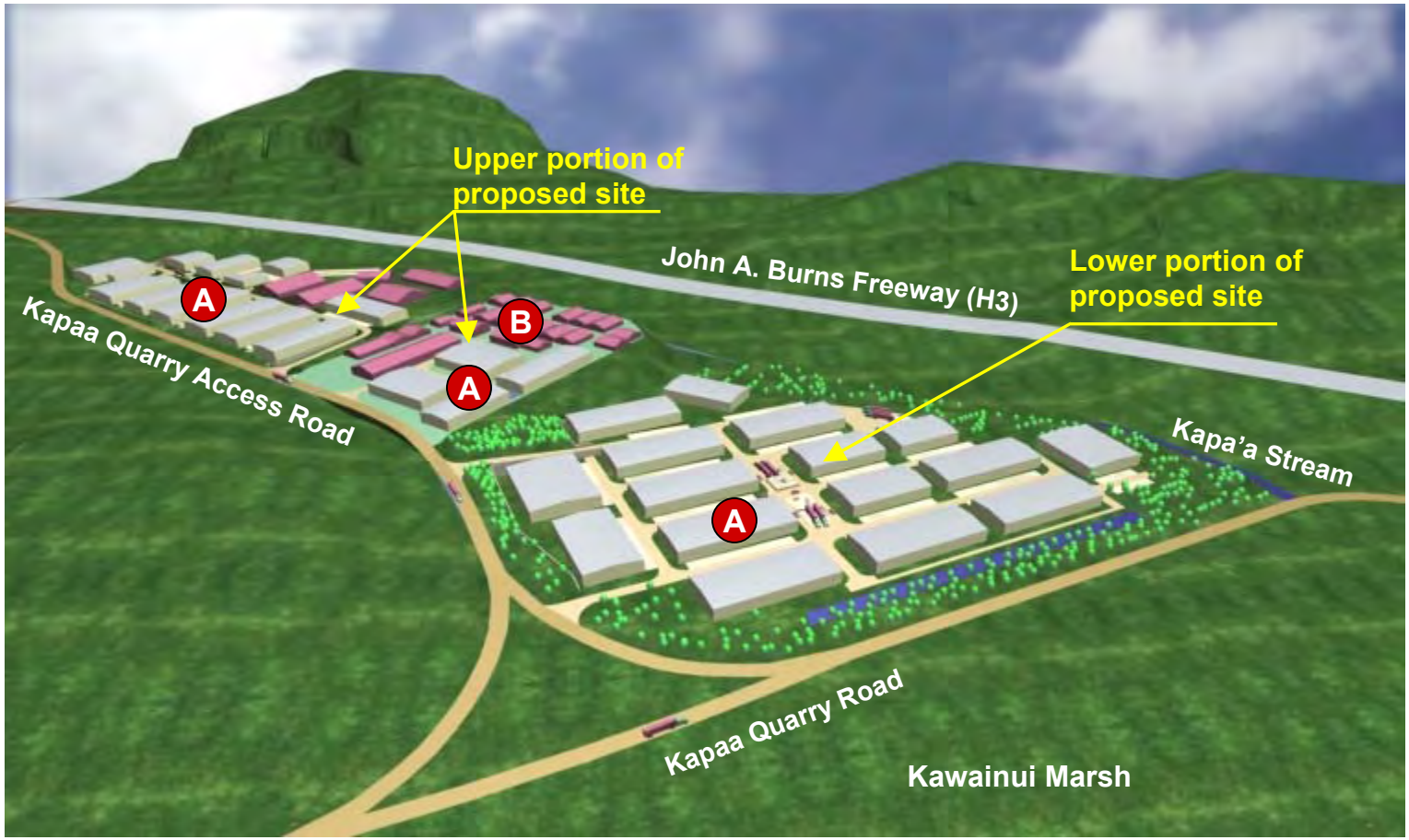
- 3D-image category 3 depicts views on the lower portion of the proposed site from adjacent roads. Figure 3-15 indicates the vantage points for views in Figures 3-16 through 3-21. This group of six 3D-views simulates views from traffic areas around the proposed site. Views from the Kapa'a Quarry Road on the lower portion of the proposed site are shown since the largest number of observers passing the proposed site would experience these views.

3.2.10.3 Synthesis of Virtual and Real-world Images

A synthesis of virtual image and real-world photographic image is presented in Figure 3-22, in order to assess how the warehouses of the proposed site would appear in relationship to the present surrounding to a northbound observer passing the site on the H3-Freeway. The panoramic view in Figure 3-22 focuses on the western portions of the Kawainui Marsh and the lower portion of the proposed site.

The image shows the future warehouses without an extensive and dense vegetative buffer, which is planned, thus the actual visual impact would be somewhat less adverse than it appears in the image. In its final configuration the visual impacts of the proposed warehouse park would be mitigated by a range of measures, such as the vegetated buffer zone, color scheme of the warehouse buildings, trees inside the warehouse development, vegetated roofs and green walls around selected warehouses.

Summarizing, it is anticipated that the proposed warehouse development would not cause significant visual impacts to the scenic impression of the Kapa'a Valley, since the industrial appearance of Kapa'a Valley is established by existing industrial activities and installations that have been in place for many years.



A New Warehouse (GREY image; typical)

B Existing Warehouse (RED image; typical)

Figure 3-2 3D-Overview of Proposed Site

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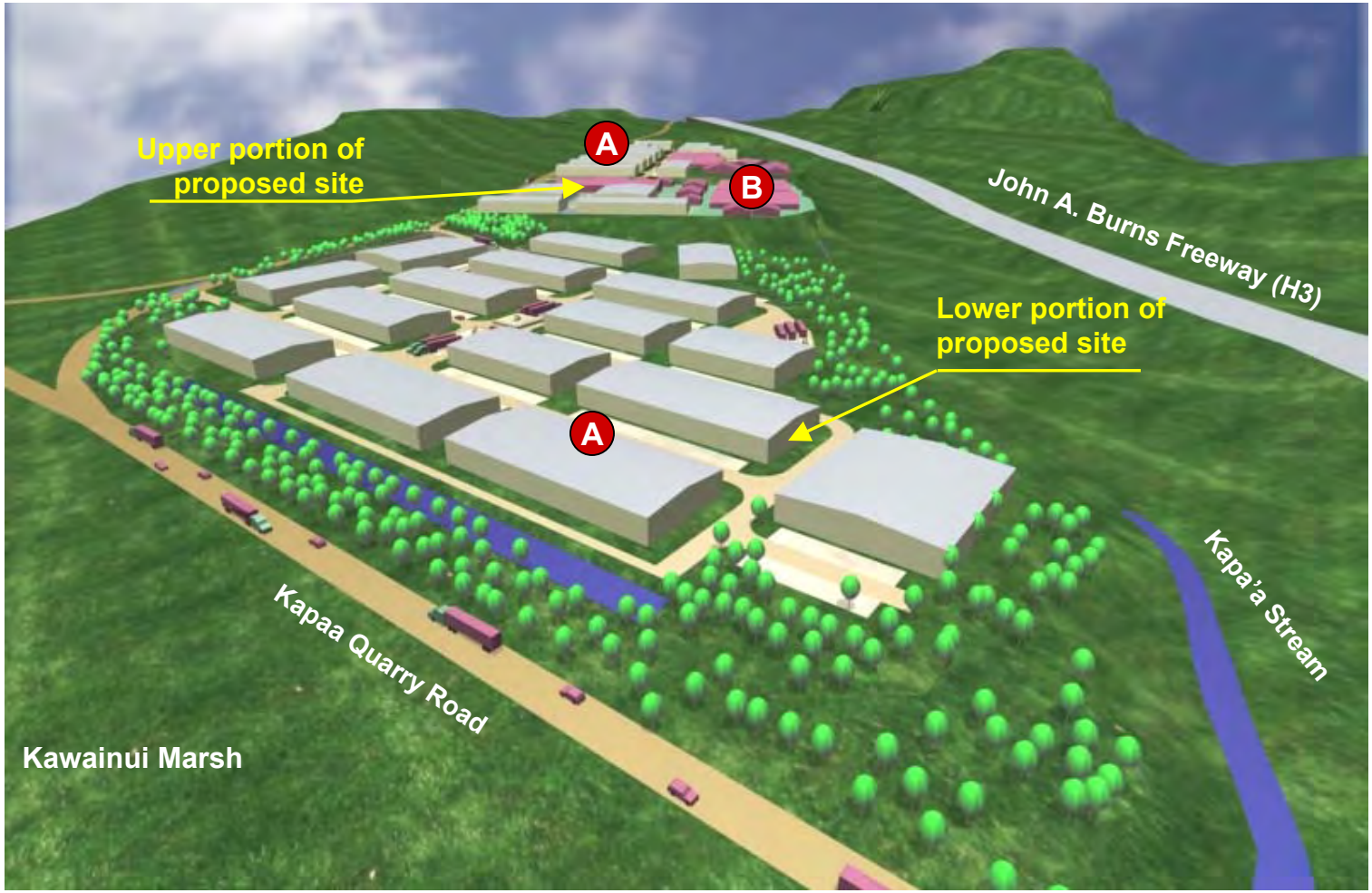

A New Warehouse (GREY image; typical)

B Existing Warehouse (RED image; typical)

Figure 3-3 3D-Overview of Proposed Site

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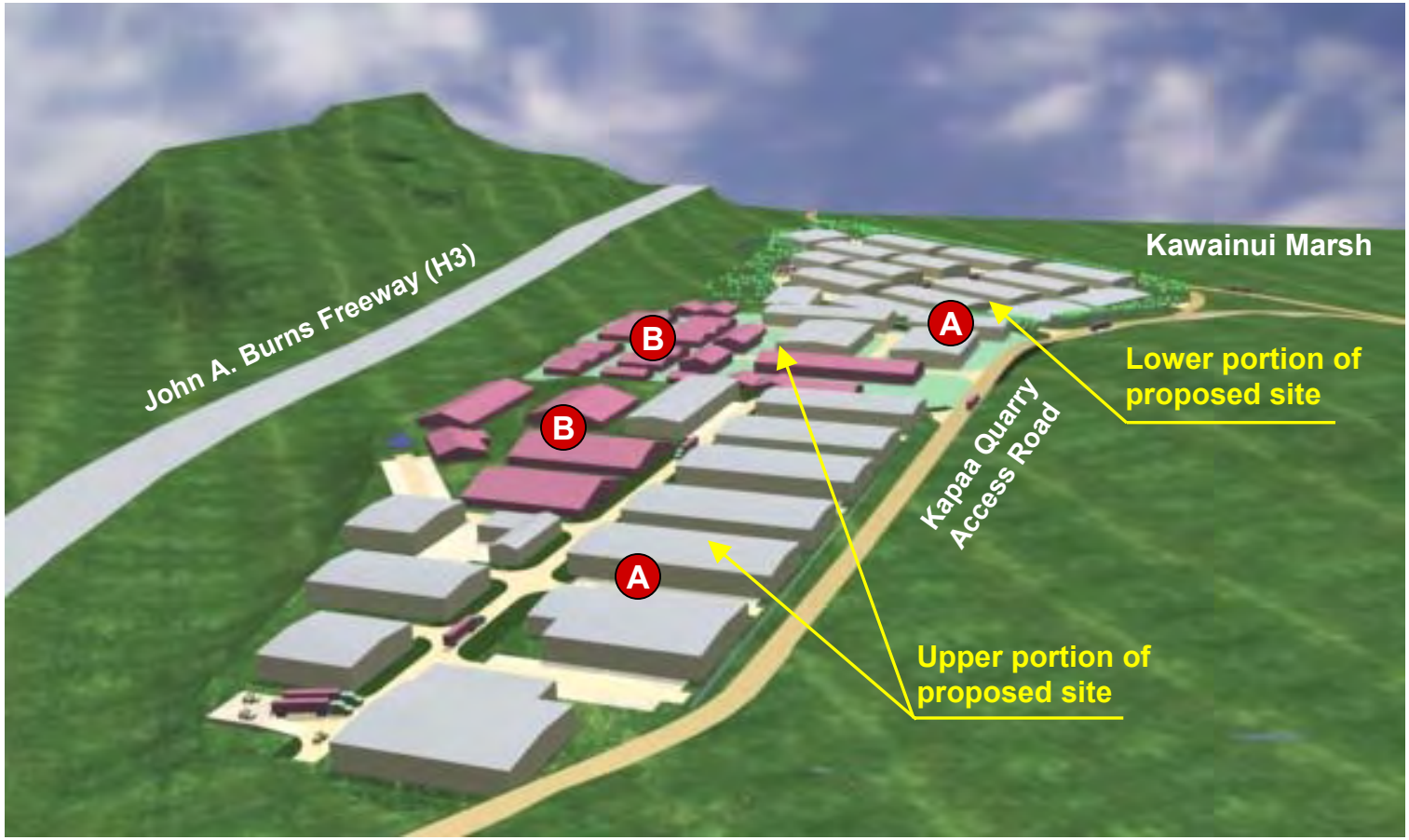

A New Warehouse (GREY image; typical)

B Existing Warehouse (RED image; typical)

Figure 3-4 3D-Overview of Proposed Site

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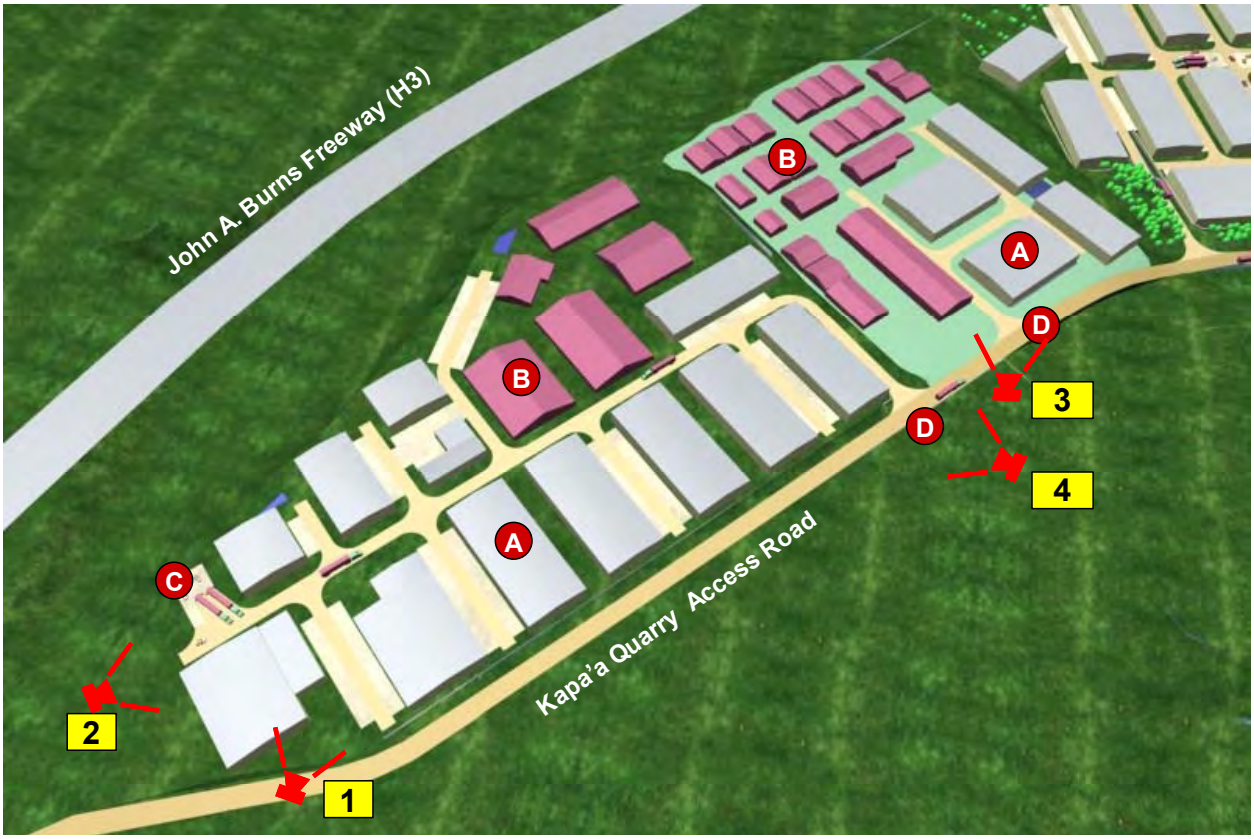

Views of Upper Portion of Proposed Site

- **A** New Warehouse (GREY image; typical)
- **B** Existing Warehouse (RED image; typical)
- **C** Detached Loading Dock
- **D** Road Entrance to Upper Portion of Site

Above indicated Views represent the following Figures:

- **1** Figure 3-6
- **2** Figure 3-7
- **3** Figure 3-8
- **4** Figure 3-9

Direction of view

Figure 3-5 Definition of Vantage Points for Views in Figures 3-6 through 3-9

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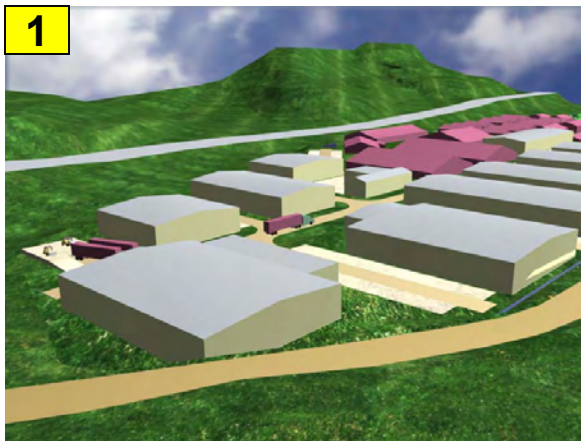


Figure 3-6: View on the upper portion of the proposed site. The Kapa'a Quarry Access Road is on the foreground. The red buildings in the background represent existing warehouses.

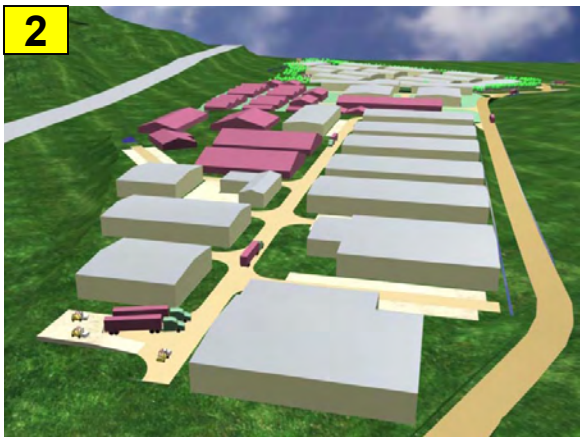


Figure 3-7: View on the upper portion of the proposed site. The detached loading dock, , which can accommodate two trucks, is in the foreground. The red buildings in the background represent existing warehouses.

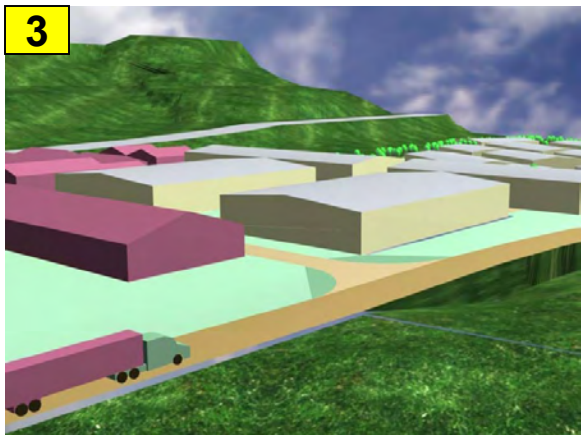


Figure 3-8: View on the upper portion of the proposed site. The Kapa'a Quarry Access Road is on the foreground with the existing paved road entrance.

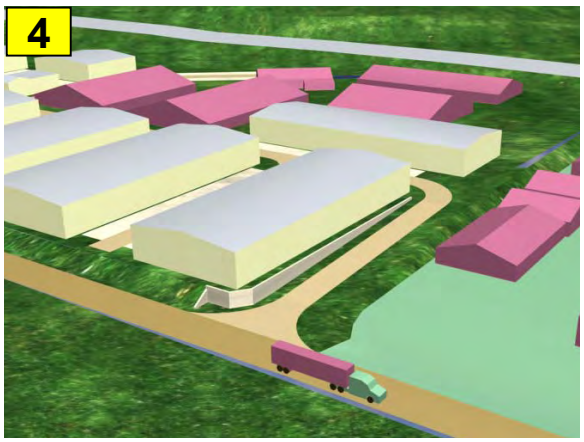
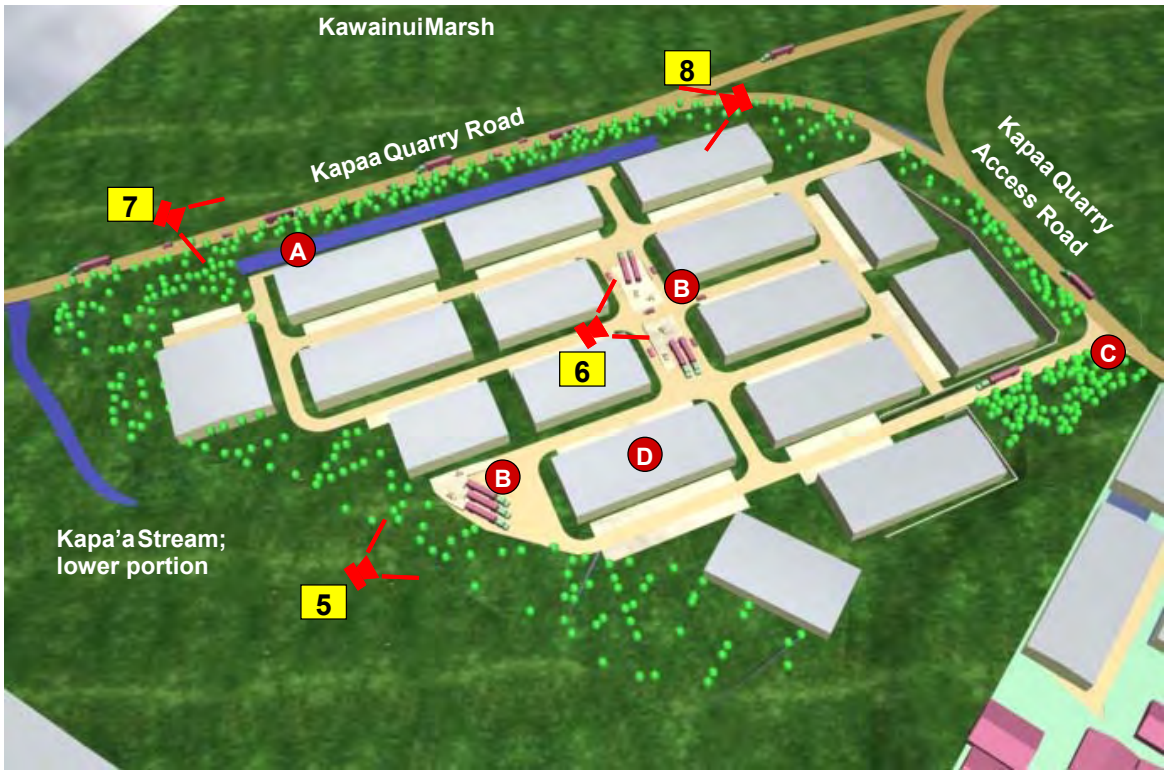


Figure 3-9: View on the upper portion of the proposed site; the Kapa'a Quarry Access Road is in the foreground, with the existing paved road entrance. A new retaining wall would surround the warehouse next to the road entrance.



Views of Lower Portion of Proposed Site

A Detention Pond

B Detached Loading Dock

C Road Entrance to Lower Portion of Site

D New Warehouse (typical)

Above indicated Views represent the following Figures:

5 Figure 3-11

6 Figure 3-12

7 Figure 3-13

8 Figure 3-14

Direction of view

Figure 3-10 Definition of Vantage Points for Views in Figures 3-11 through 3-14

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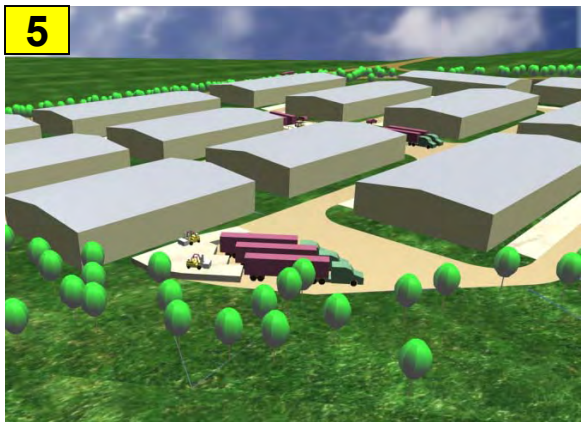


Figure 3-11: View from a vantage point above Kapa'a Stream. One detached loading dock for three trucks is in the foreground. The trees in the foreground represent a thick vegetative buffer zone between the Kapa'a Stream corridor and the warehouses.

Figure 3-12: View on the center of the warehouse development; two detached loading docks are shown, for two trucks each.

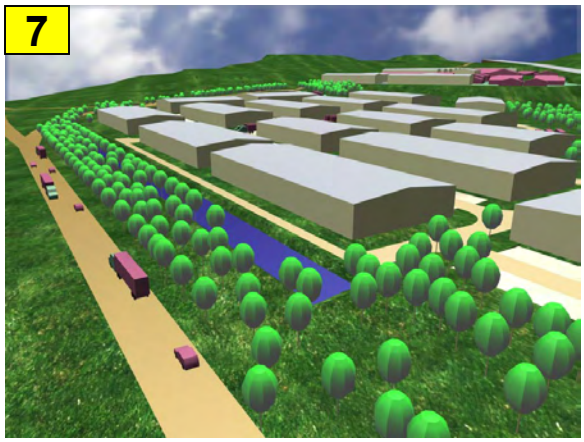


Figure 3-13: View on the large detention basin and the vegetative buffer zone of the lower portion of the proposed site. The Kapa'a Quarry Road is in the foreground.

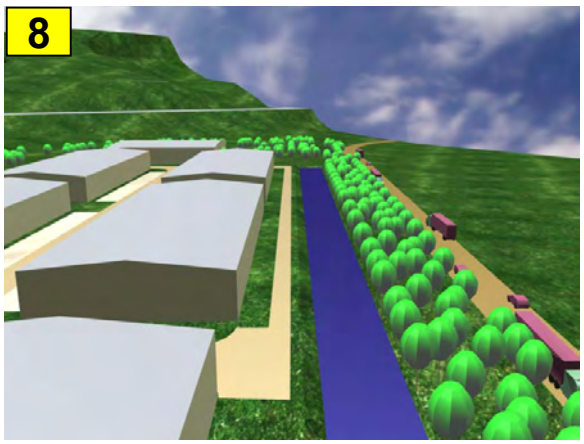
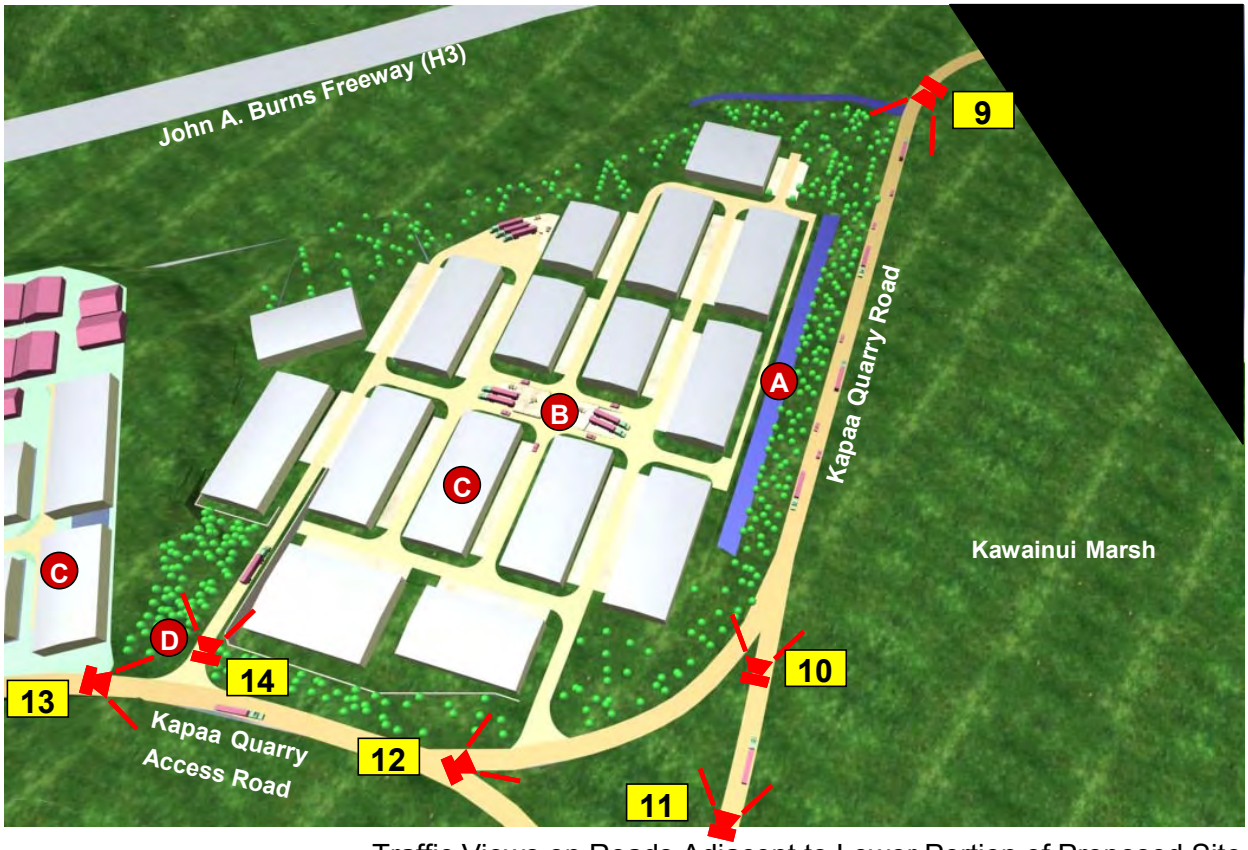


Figure 3-14: View on the large detention basin and the vegetative buffer zone of the lower portion of the site. The Kapa'a Quarry Road is on the right. The Kawainui Marsh is to the right of the road.

Figures 3-11 through 3-14



Traffic Views on Roads Adjacent to Lower Portion of Proposed Site

A Detention Pond

B Detached Loading Docks

C New Warehouse (typical)

D Road Entrance to Lower Portion of Site

Above indicated Views represent the following Figures:

9	Figure 3-16	12	Figure 3-19
10	Figure 3-17	13	Figure 3-20
11	Figure 3-18	14	Figure 3-21

Direction of view

Figure 3-15 Definition of Vantage Points for Views in Figures 3-16 through 3-21

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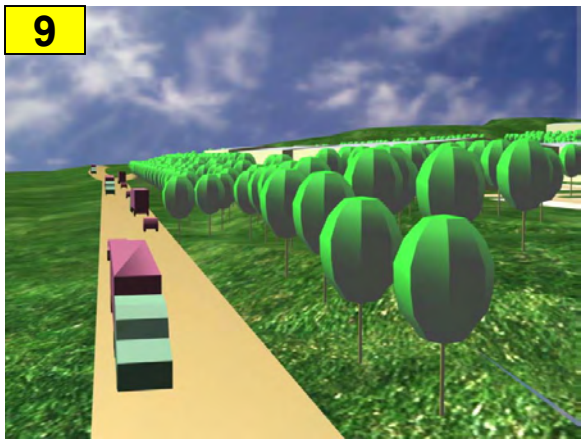

Figure 3-16: View from Kapa'a Quarry Road traveling southbound. The trees are the vegetative buffer that surrounds the lower portion of the proposed site

Figure 3-17: View from Kapa'a Quarry Road traveling northbound. The trees are the vegetative buffer that surrounds the lower portion of the proposed site. The road left is the intersecting Kapa'a Quarry Access Road.

Figure 3-18: View from Kapa'a Quarry Road, traveling northbound and approaching the intersection with the Kapa'a Quarry Access Road.

Figure 3-19: View from Kapa'a Quarry Access Road, traveling eastbound. The road entrance to the lower portion of the proposed site, which is furthest to the Kapa'a Quarry Road, is on the left. The truck in the background travels northbound on Kapa'a Quarry Road.

Figures 3-16 through 3-19

Figure 3-20: View from Kapa'a Quarry Access Road, traveling eastbound. The road entrance to the lower portion of the proposed site, which is away from the Kapa'a Quarry Road, is on the left. The upper part of the retaining wall is visible in the center. The roof of one warehouse can be seen protruding past the retaining wall.

Figure 3-21: View from Kapa'a Quarry Access Road into the lower portion of the proposed site. A retaining wall with warehouses behind it is on the right. The Trees on the left are part of the vegetative buffer that surrounds the lower portion of the proposed site.

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A Proposed Warehouse Development; Lower Portion of the Site
Trees and Vegetation buffer zone around lower portion of site not shown

B Existing Warehouses on Upper Portion of Site

C Kawainui Marsh

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Figure 3-22 Proposed Warehouse Development; placed in Current Site View

3.3 Impacts on Hydrology

The hydrological impacts of the proposed project are attributed mainly to increases in stormwater runoff levels and impacts on water quality in the Kapa'a Stream and the Kawainui Marsh. The proposed development would primarily change the existing drainage patterns on the property, while only slightly affecting the Kapa'a watershed and the flood inundation zones.

3.3.1 Impacts by Site Drainage System

At the present time, the drainage infrastructure on the property consists of grass swales, concrete channels, drain intakes and a single detention pond. This infrastructure is limited to portions of parcel TMK 4-2-015:008 where all existing warehouses are located. The rest of the property basically which has primarily pervious gravel cover lacks structural drainage components and storm runoff typically flows over barren or scantly vegetated ground surface before infiltrating into the ground or draining into the Kapa'a Stream.

The drainage system of the proposed development would be significantly different from the existing present drainage system. The drainage system of the proposed project would incorporate pervious and impervious areas. The design approach of the proposed drainage system is to provide as much pervious surfaces as possible and treat all runoff from impervious surfaces.

The total area of impervious roadways in the upper and lower portions of the proposed warehouse development would be 5.4 acres. The initial design approach has selected pervious pavement for the internal roadways and the detached loading docks. The final design might select pervious or "semi-pervious" pavement for roadways. Conventional pervious or semi-pervious roadway pavement is presently available only for traffic application with limited axial loads and limited roadway slopes. Such limitations are not suitable for the type of trucks that would serve the proposed warehouse development. Therefore, at present, the conservative design approach is taken and the 5.4 acres of roadway surface would be covered with conventional impervious asphalt or concrete.

The total area of impervious warehouse roof area in the upper and lower portions of the warehouse development would be 15.2 acres. Rainwater harvesting is planned to collect rainwater from all or a large portion of the warehouse roofs. Harvesting rainwater and using it for irrigation basically converts all or a large part of the impervious warehouse roofs surfaces into quasi "permeable" surfaces, since the collected water is subsequently distributed on permeable ground for irrigation. The exact size of the rooftop areas that would be used for rainwater harvesting would be determined in the detail design phase of the project and would depend on the irrigation needs for landscaping and on the extent of non-potable water application, which could also make use of the harvested rainwater.

Pervious surfaces are selected for the off-street parking spaces, where a pervious gravel surface would allow infiltration of rainwater. The spaces between the warehouses, which are not roadways or other hardscaped surfaces, would be pervious landscaped land.

Runoff from impervious surfaces would be collected and conveyed to detention ponds before discharging into the Kapa'a Stream. Even though the overall runoff volume generated in the proposed development would be higher than the current runoff rates, the nature of stormwater collection, conveyance to detention ponds detention and timed release of the flood waters would result in better effluent quality and would directly and positively impact the water quality in the receiving water. The detention and timed release of collected stormwater would allow settlement and removal of suspended solids in the detention ponds and ensures that the release of treated stormwater would occur after the storm event. In addition, installation of pre-treatment units upstream of the detention ponds oil water separators would increase the overall removal rate of the stormwater treatment.

The proposed comprehensive stormwater treatment system is built around the detention pond system. The proposed type of "detention" system is a "dry extended detention pond", which provide two basic functions, stormwater flood control and removal of pollutants in the stormwater. The detention pond system has the following components:

- Pre-treatment: Pre-treatment units would be installed upstream of the detention ponds, e.g. stormwater would run through the pre-treatment before entering the detention pond. The pre-treatment units would remove a significant portion of sediments, nutrients and oil-grease contained in the stormwater. (note the short discussion of the anticipated removal rate at the end of this section);

- Treatment inside the detention pond: Treatment features in the extended detention ponds can remove a portion of pollutants and settleable agents from the stormwater;

- Conveyance of the stormwater in detention pond: The proposed type of detention pond is "dry" during dry weather periods. Since the detention volume is designed to accommodate and store a "design storm event", according to County rules, smaller flows of runoff stormwater from lesser storm events would need a preferred flow path through the detention pond. Therefore a "pilot channel" inside the detention pond would be provided ensures adequate conveyance into, through and out of the detention pond when flow rates are produced by small rain events rather than the "design" stormwater event;

- Landscaping around and in detention ponds: Landscaping would use a vegetated buffer around the pond and would select plants that could withstand both wet and dry periods;

- Discharge outlet system: The discharge outlet from the detention pond to the Kapa'a Stream would be through a discharge structure that allows a certain "safe" discharge" from the detention pond into the Kapa'a Stream. The outlet structure could be a pipe or a weir structure. The goal of the detention pond is that the water in the pond should be

held long enough to ensure a certain amount of treatment and to "flatten" out discharge rates to the Kapa'a Stream, e.g. to avoid high peak flow discharge rates, during strong storm events.

The design assumption for the overall removal rate of stormwater pollutants by the combined system of pre-treatment units and extended detention ponds is 80%. The overall pollutant removal for stormwater drainage from the proposed site is a combination of two successive structural BMPs; (1) extended detention ponds and (2) so-called nutrient separating baffle box, which are pre-treatment units and which would be installed upstream of the detention ponds.

(1) The removal rate in the dry detention ponds is assumed to be at least 50% of the loads contained in stormwater. (according to the Stormwater Management Resource center, (www.stormwatercenter.net) average pollutant removal rates of dry detention ponds for selected agents are as follows; TSS 61%, TP 20%, TN 31%, Metals 29%-54%, Bacteria 78%).

(2) The stormwater would run through in-line pre-treatment units before flowing into the detention ponds. The inline treatment units would be designed to catch most, if not all, of the floatable debris and remove a significant amount of suspended solids and oil / grease contamination. The reported effectiveness of these types of treatment units are as follows (reference of the manufacturer). Pollutant removal efficiency: Trash & Debris 99%, TSS 76% to 93%, Fine TSS (d50 63 µm) 67%, Metals Up to 57%, Total Nitrogen 38% to 63%5, Total Phosphorus 18% to 70%.

Anticipated overall removal rate evaluated using TSS:

- Pre-treatment: Removal rate for TSS: 67% to 93%, depending on particle size, say 70%
- Remaining after pre-treatment 30% from original TSS load
- Detention ponds: Removal rate for TSS: 60%
- Remaining after pre-treatment 12% from original TSS load
- Therefore the calculated overall removal rate for TSS would be around 88%.

For the stromwater treatment analysis a conservative estimate of 80% overall removal rate of pollutants for the stormwater is considered. The proposed development would improve run-off water quality and reduce storm discharge peak runoff rates into the receiving waters due to retaining and releasing stormwater in a controlled manner.

Other drainage related potential impacts are rainwater infiltration and construction related drainage impacts and appropriate Best Management Practices, which would mitigate construction related drainage impacts.

An important design goal is to increase perviousness within the proposed warehouse development to the extent possible. Infiltration of rainwater from pervious surfaces reduces stormwater runoff and related erosion problems and pollutant loading in the run-off. Infiltration promotes groundwater recharging and drainage of stormwater through groundwater seepage through unconsolidated formations towards the receiving waters. Since groundwater seepage is

a time-delayed release of stored rainwater it contributes to flood control of the watershed. Unabated and untreated stormwater run-off from impervious areas reaches the receiving waters much faster after the storm event and contributes to high peak flows in the stream and related erosion and sedimentation problems. Infiltration is preferred over runoff from impervious surfaces, especially if a vegetative groundcover avoids entrainment and transport of soil particles.

Infiltration in the proposed warehouse development would be achieved by the following mechanisms:

- Infiltration of rainwater or irrigation water in open space (vegetated and pervious surfaces)
- Vegetated swale designs
- Harvesting rainwater from impervious surfaces and storing it for later irrigation application or distribution on pervious surfaces

Drainage during construction has to be conducted in such a way to avoid entrainment and erosion of significant amounts of exposed soils on the site. Best Management Practices (BMPs), such as structural, non-structural and managerial practices to lower or eliminate erosion due to stormwater drainage, during construction include the following:

Applicable BMPs for the proposed projects are as follows:

- Pre-construction planning to determine scope of erosion control: development of an erosion and sediment control plan (would be required for permit);

- Preserve existing vegetation wherever possible: Established populations of trees, bushes, and grass could help keep erosion to a minimum;

- Limit disturbed areas through phasing. No disturbed surfaces should be left without erosion control measures in place;

- Providing primary and secondary containment for fuel and other hazardous materials should be placed around any storage tanks;

- Install clean water diversions, sediment traps/ basins and stabilize drainage channels with grass, liners, and silt check dams before excavation, fill, or grading work begins. Diversion berms or ditches could avoid upland runoff from flowing through the construction site;

- Install construction entrances and control dust to avoid mud tracked on paved roads. Mud on roadways that originates from construction is annoying and also unsafe;

- Dewatering operations and discharges: sediments should be removed from water before they discharge into storm sewers, streams, lakes, or wetlands. Silt fence enclosure or use of bag filters or other device should be applied to remove sediments. If possible, water generated as part of construction dewatering should be discharged onsite and should not be discharged to surface waters;

- Installation of vegetated buffers above and below the construction site to avoid volume sheet flows from moving across cut or fill areas and help filter and trap sediments before it can move into ditches, channels, and streams, respectively;

- Protecting soils with seed, mulch, or other products (e.g. erosion control blankets, turf reinforcement mats, temporary plastic covers);

- Using silt fences and other sediment barriers below (downhill from) areas of bare soil should be installed to avoid sediments from escaping the construction sites and flowing into downhill areas of receiving waters;

- Temporary downdrain using plastic pipe or rock lined downdrain channel should be used to stabilize sloped faces of temporary channels that carry water down slope;

- Steep slope protections: rock-filled, stacked gabion baskets or retaining walls should be used to protect steep slopes that cannot be effectively protected with other measures;

- Protecting Culvert and Ditch Inlets and Outlets; Sandbags stone aprons or other measures should be placed around inlets and outlets to allow ponding for energy dissipation.

3.3.2 Impact on the Kapa'a Watershed

The water quality in the Kapa'a Stream is identified by the State of Hawaii Department of Health as impaired by elevated levels of turbidity, total suspended solids (TSS), nutrients and metals (DoH, 2007). The impaired water quality is mainly caused by surface runoff from quarry and landfill areas upstream of the project site.

The proposed site has a somewhat limited yet nevertheless noticeable effect on the water quality and runoff flow volumes into the Kapa'a Stream. During wet season, the proposed site contributes about 10% of flow rate and 17% of total suspended solids (TSS) loading to the Kapa'a Stream. In contrast, during a 50-year storm event, the corresponding contributions are 24% and 15% for the total discharge flow volume and the total suspended solids loading, respectively. This is due to fact that a significant amount of runoff and TSS loading originates from several areas where large tracts of land have no or minimal ground cover, are retained in existing retention ponds and therefore, contribute less to deterioration of water quality in Kapa'a Stream than during normal wet season events.

A comparison of TSS runoff contributions to the overall Kapa'a watershed TSS loading originating from the proposed site under present drainage conditions and estimated future drainage conditions is shown in Figures 3-23 through 3-25.

Figure 3-23 shows the contributions of different subbasins as defined in a recent State Department of Health study (DoH, 2007). The sub-basins are identified and described in Figure 2-6 and Table 2-1. The TSS contribution of the large sub-basin B (Ameron Quarry Phases I and II) is zero since the DoH models stipulates that during larger storm events all TSS loading from sub-basin B is retained a retention pond. As indicated in Figure 3-23 sub-basins D and F contribute most to the TSS load in the watershed. The sub-basins identified with a red dot represent the TSS loading in the drainage from the proposed site. Figure 3-23 compares the present drainage conditions with the future expected drainage conditions when the drainage from the proposed site would be treated with the proposed comprehensive runoff treatment system.

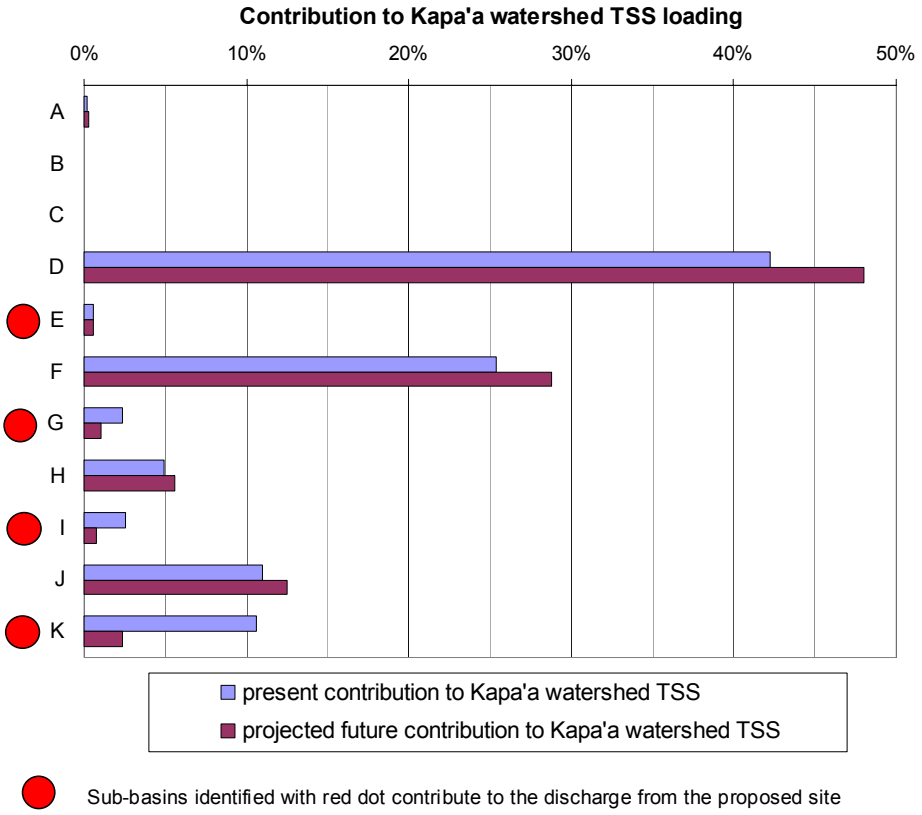

Figure 3-23 Comparison of Contribution to total TSS Loading Originating in the Kapa'a Watershed During High Rain Events for Existing Conditions and Condition with New Drainage System on Proposed Site

Figures 3-24 and 3-25 compare the present and anticipated future total amount of TSS load in the stormwater runoff from the proposed site to the Kapa'a Stream during the representative extreme storm event. Figure 3-24 shows the absolute mass of TSS loads in the drainage from the proposed site and Figure 3-25 shows the percentage of contribution of TSS loads from the proposed site relative to the total TSS load in the Kapa'a watershed.

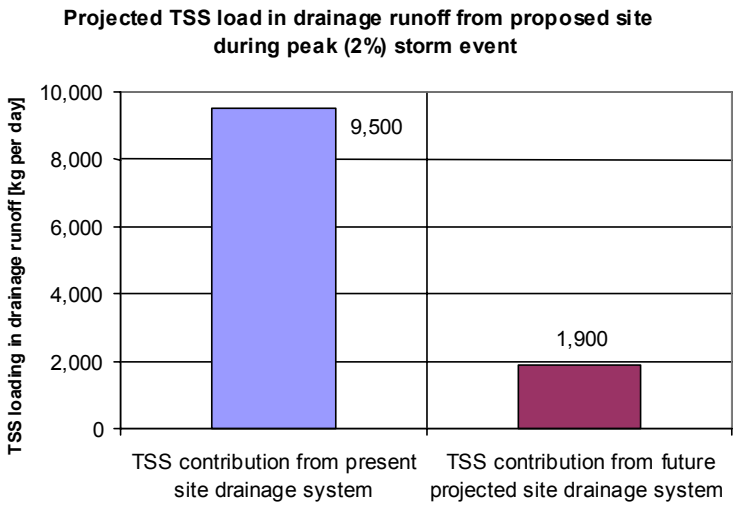

Figure 3-24 Comparison of TSS Runoff from Proposed Site for Existing and Future Drainage System Conditions

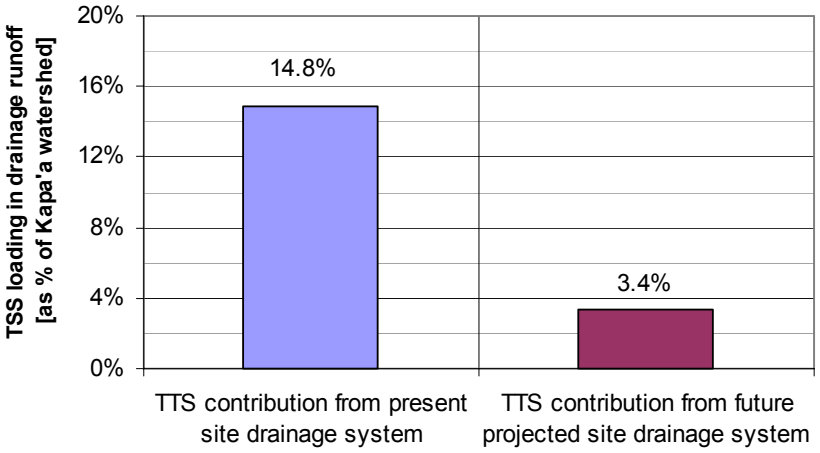

Figure 3-25 Comparison of TSS Runoff from Proposed Site for Existing and Future Drainage System Conditions Expressed as Percentage Contribution to Total TSS Loads from Kapa'a Watershed

A 80 percent reduction of TSS in the runoff to the Kapa'a Stream from the proposed drainage system (the assumed 80 percent overall removal efficiency in the proposed strormwater management system is described in Section 3.3.1) would result in a reduction of TSS loading of the drainage from the existing site from about 14.8 to 3.4 percent of the total TSS loading in the Kapa'a Stream.

As stated before the improvement of the runoff would result from holding back stormwater runoff in detention ponds, employing advanced stormwater treatment and releasing the stormwater in a time-delayed and controlled manner, so that both the runoff peak flow rates and the pollutant loading of the runoff would be reduced. The proposed drainage infrastructure and the mitigation measures would therefore positively rather than adversely impact the water quality in the Kapa'a Stream.

Other pertinent issues that related to the impact of the proposed project on the Kapa'a watershed are possible impacts from occasional stormwater overflow from the quarry's retention ponds, how the project will assist in restoring wetlands and long term impacts of greater runoff from the site on the water level in the Kawainui Marsh.

The possible impacts from occasional storm water overflow from the quarry's retention ponds have been addressed in a meeting with the State Department of Health (DoH; refer to Appendix C). The outcome of this meeting suggested that possible impacts of such possible occasional overflow should be addressed in conjunction with the developments of the 15-acre wildlife habitat in lower stretches of the Kapa'a Stream corridor, since the possible impacts from overflow of the quarry's retention pond would not impact the proposed project.

The proposed project would not directly affect wetland area within or adjacent to the propose site, since no construction and development work related to the proposed Kapa'a Light Industrial Park would occur within wetland areas. The developer of the proposed Kapa'a Light industrial Park will restore a 15-acre section of wetland within the Kapa'a Strealm corridor and will create a wildlife habitat within this area. This 15-acre restored wetland area will be within the parcel TMK 4-2-15:006, which is owned by the developer, and this land is directly adjacent to the site of proposed warehouse park. While the development of the 15-acre wildlife habitat and wetland restoration is a separate project the habitat will improve wetland and open space directly adjacent to the proposed site. The development of the habitat will therefore be an important mitigation measure and will improve of open space directly adjacent to the proposed site.

The long-term impacts of stormwater runoff from the proposed site on the water level in the Kawainui Marsh are more beneficial and than they will be detrimental. Under the proposed comprehensive stormwater management scenario all stormwater runoff from impervious surfaces would flow through pre-treatment units and detention ponds to control peak flow discharge rates. The rainwater drainage from impervious warehouse roof areas would be

harvested and stored in underground cisterns for subsequent irrigation and, possibly, other non-potable water applications. When the storage capacities of the underground cisterns for harvested rainwater is reached the rainwater runoff from the roofs would be conveyed to the detention ponds. Open space (e.g. vegetated and pervious surfaces) within the proposed site would allow infiltration of rainwater and avoid surface erosion by virtue of the filter function of vegetation. In addition to infiltration vegetation (e.g. trees, shrubs and grass) would stimulate evaporation and therefore would reduce stormwater runoff.

3.3.3 Impact on Flood Zones

The proposed development has little or no impacts on the flood zones on and around the proposed site, since the extent of earthwork within the 100-year and 500-year flood inundation zones would be minimal. There would be a very limited, if any, grading within the 100-year flood zone, all of which would be limited to possible changes in the drainage canal along the Kapa'a Quarry Road. Apart from possible minor modifications the flood zone designation at the site would remain in the present state. The proposed warehouse development would therefore have no significant adverse impact on the flood hazards in the area.

3.4 Impacts on Utility Infrastructure

The proposed Kapa'a Light Industrial Park would generate additional demand on the existing utilities infrastructure. The following sections evaluate and assess the impacts of increased demands for basic utilities on the existing infrastructure.

3.4.1 Electricity

The proposed warehouse development would increase additional demand for electric power from the existing Hawaii Electric Company (HECO) grid. In order to assess the impacts of the project on the existing power grid serving the area, the anticipated future electricity demand is compared to the demand scenario of the existing warehouses in parcel TMK 4-5-12:008.

Existing electricity demand: The existing electricity demand pattern were assessed by review of existing energy demand and peak power data of some of the existing warehouses that have individual meters. Representative electric bills for businesses in the existing warehouse development were reviewed and the average annual energy consumption and peak power was estimated was determines as a function of warehouse space. The peak power was assessed as a derivative of the energy demand.

The estimated electricity demand compared well with baseline demand figures for industrial warehouses published by the U.S. Department of Energy, Energy Information Administration

(EIA). The assessment of the existing electricity demand scenario was determined for air-conditioned and not air-conditioned space as 0.015 and 0.049kWh per day per square foot of warehouse space, respectively. It is anticipated that about 10% of the future industrial warehouse space would be air-conditioned, which would follow the existing ration of air-conditioned to not air-conditioned warehouse space at the site.

Improved electrical efficiency case: The proposed warehouse development would be developed using a design approach that promotes significant energy savings. The future planned electricity demand scenario of the proposed warehouse development would save at least 35 percent energy for areas without air-conditioning (AC) and 28 percent energy for areas with air conditioning (AC). The energy savings would be realized by employing passive means for energy savings (e.g. improved insulation around selected parts of the warehouses, elimination of heat islands, use of reflective building coats, promoting natural lighting and natural ventilation) as well as active means for energy savings (e.g. use of energy efficient fixtures and technologies for lighting, ventilation, cooling and air-conditioning).

In addition to making the future warehouses energy efficient, the developer of the proposed warehouse development, has concrete plans to install a significant photovoltaic (PV) capacity on roofs of warehouses. Installing PV solar panels on all or some of the proposed warehouse could reduce electrical demand on the grid by an additional 20 percent. Since the photovoltaic panels are intermittent electricity generation assets their main contribution to the electricity supply would be generated during daytime hours, a time period when peak power demand has to be drawn from the public electricity grid. Thus the PV solar panels installed in the warehouse park would significantly reduce the peak load demand. Mitigating peak load on the island of Oahu is a major concern for the electric utility.

Figure 3-26 compares daily energy and peak load demand per square foot of warehouse space for the existing warehouses and the proposed future energy efficient warehouses. Figure 3-27 compares the annual electricity demand for the proposed warehouse development that would result when using the energy demand per square feet of existing warehouse space and the future energy efficient warehouses. Figure 3-28 compares the projected energy demand of the proposed warehouse development that would result from using conventional warehouse design (e.g. the warehouses that are presently at the site) and from using warehouse with improved energy efficiency. As can be seen in Figures 3-26 through 3-28 the more energy efficient warehouse designs of the proposed Kapa'a Light Industrial Park would offer substantial energy and peak power demand savings relative to conventional warehouses designs.

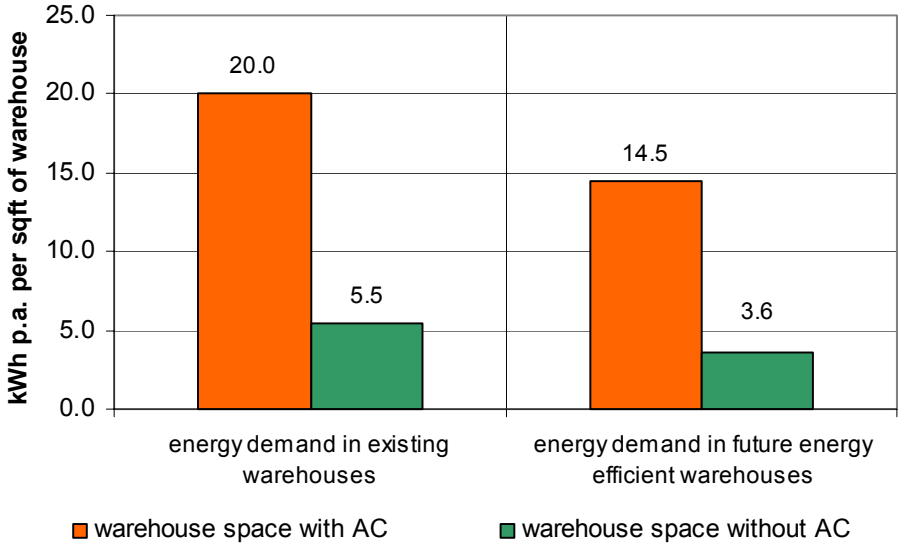

Figure 3-26 Comparison of Annual Energy Demand Per Square Foot of Warehouse Space Using Existing and Future More Efficient Energy Demand Scenarios

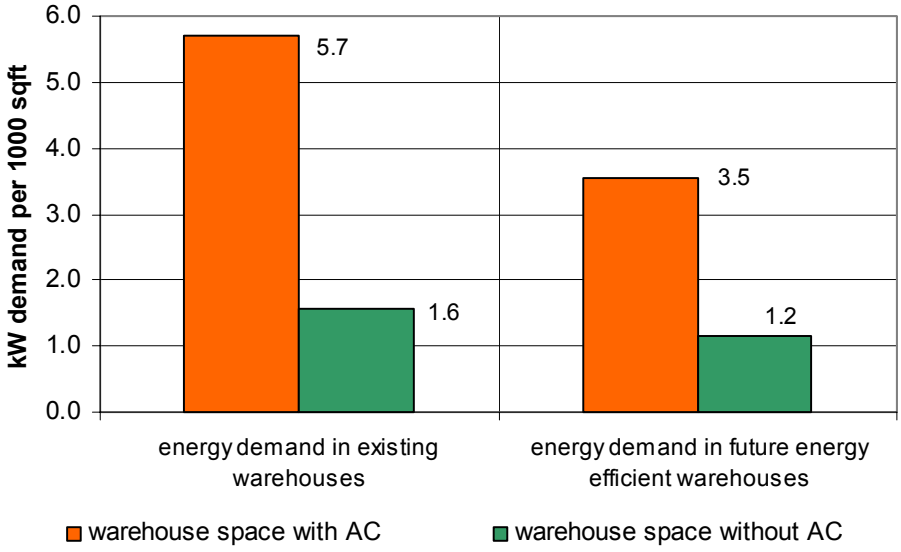

Figure 3-27 Comparison of Peak Power Demand per 1,000 Square Feet of Warehouse Space Using Existing and Future More Efficient Energy Demand Scenarios

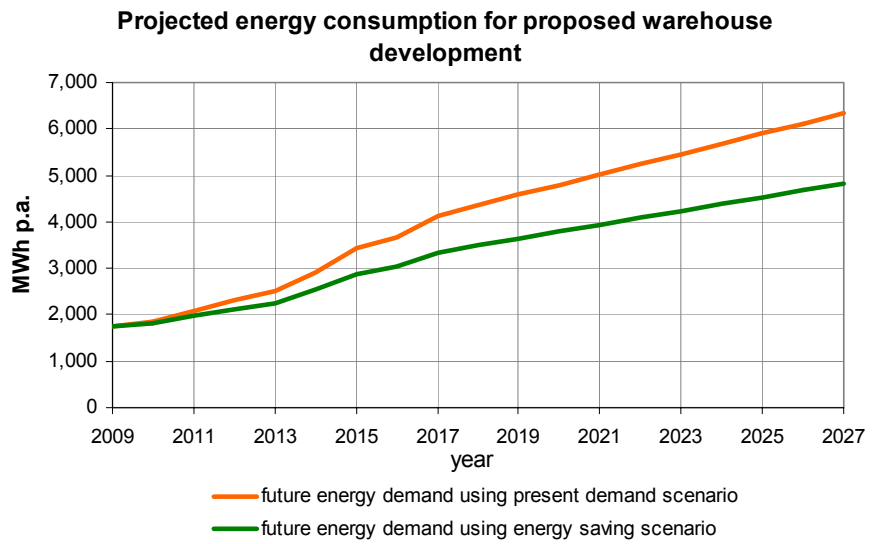

Figure 3-28 Comparison of Projected Annual Total Energy Demands for Warehouse Development Using the Energy Demand Scenario of Existing Warehouses and Future Anticipated Total Energy Demand in Energy Efficient Warehouses

Summarizing, the planned energy efficiency approach for the proposed warehouse development would significantly reduce impacts on the public electrical system. Initial communication with HECO suggests that anticipated load demand for the proposed warehouse development may exceed the capacity of the existing 4.16 kV circuit in Mokapu Blvd. In the event that the future demand could not be met by the existing circuit, a new power line would be necessary to connect the proposed development with the existing 12.47kV circuit along Kalanianaole Hwy.

At the present time there are no existing HECO utilities along Kapa'a Quarry Road and therefore approximately 10,000 linear feet of power line and associates appurtenances would need to be installed along Kapa'a Quarry Road from Kalanianaole Highway to the proposed site in order to supply the proposed site with additional power. Impacts of such a new power line would be mainly due to construction activities during installation of new power poles, which may be limited to excavation, erosion and traffic obstructions.

3.4.2 Water Supply

Estimates of the anticipated daily water demand in the proposed warehouse development are presented in Table 3-2. Implementation of stringent water conservation measures, such as low-flow fixtures, water recycling, and rainwater harvesting for on-site irrigation, would reduced the future potable water demand below baseline consumptions in conventional industrial buildings. Figure 3-29 shows the projected average daily and peak potable water demands for the

proposed warehouse development. Figure 3-29 includes the present daily water and peak flow demand for the existing warehouses on parcel TMK 4-2-015:008 as the base flow in the year 2008. As discussed in the Section Two, the proposed site is served by a 36-inch water main along the Kapa'a Quarry Road. Communications with the Board of Water Supply indicate that the existing infrastructure can accommodate the projected daily water demands with adequate pressures for firefighting emergencies.

Table 3-2 Estimated Additional Water Demand for the New Warehouses

Development Phases	Total Area of Phase square feet	Daily Water Demand gpd	Design Water Flow gpm	Design Peak Water Flow gpm
A	80,000	8,000	15	38
B	147,000	14,700	27	68
C	81,000	8,100	15	38
D	355,000	35,500	66	165
sums >>	663,000	66,300	**123**	**309**

The proposed development has no adverse impacts on the existing water supply infrastructure in the area.

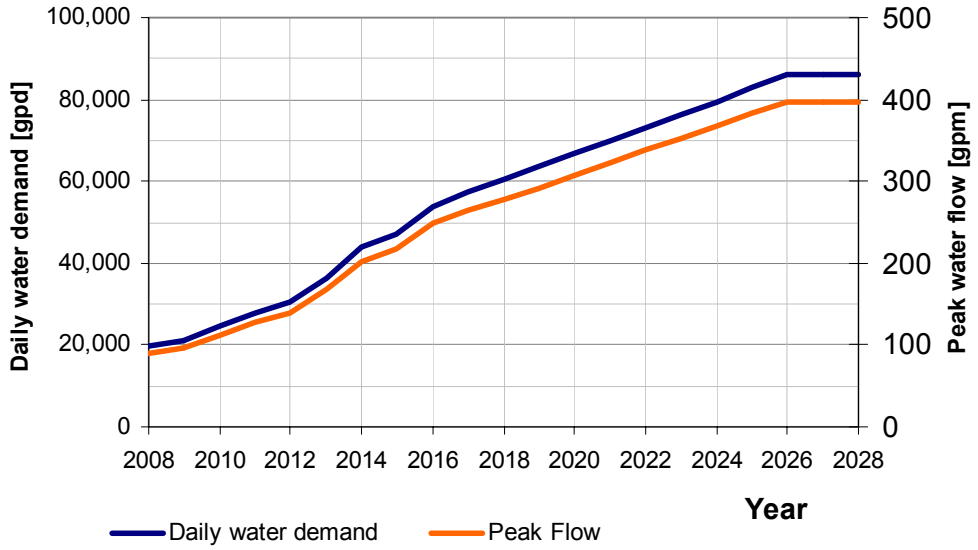

Figure 3-29 Projected Average Daily and Peak Water Demand (Includes demand for existing warehouses)

3.4.3 Wastewater Treatment

The Kapa'a Valley is presently not connected to the municipal sewer collection system. The closest distance between the proposed site and an existing sewer main along Mokapu Boulevard is approximately 1.5 miles. An approximately 1.5 miles long forced sewer line to discharge the relatively small wastewater quantity of the proposed warehouse park to the existing sewer system would be expensive to install and operate and it would require significant pumping energy, thus causing impacts through increased consumption of electric power. The preferred alternative to connecting the proposed site to the municipal sewage system is to treat the wastewater on-site.

Candidate onsite wastewater treatment technologies include septic systems and a centralized private sewage treatment system. Septic systems are established wastewater treatment systems that operate with anaerobic digestion of sludge that settles from the wastewater that flows into a multi-chamber tank system. The overflow of the septic tank is treated wastewater that is directed to a drain field or septic leach field, where any impurities that still exist decomposes naturally. The treated water is then consumed by plant roots or it may become part of the groundwater. The size of the septic leach fields depends on the porosity of the soil. The present on-site wastewater treatment is carrier out with five septic systems. The septic tanks are periodically pumped by a licensed pumper to remove the waste sludge and to retain design capacity inside the septic tanks

A centralized sewage treatment systems could treat the entire sewage volume from the proposed warehouse development. The type of treatment technologies of such a centralized wastewater plant would depend on the type of wastewater that is generated by the occupants in the proposed warehouse development. Specialized industries such as iron and steel industry, food industry and certain chemical industrial applications would require wastewater treatment technologies that are different and more specialized than conventional treatment technologies for domestic wastewater. Since the type of operations, and therefore the type of wastewater, in the proposed warehouse development would be similar to the present conditions and basically resemble domestic wastewater, advanced industrial wastewater treatment technologies would not be required for the proposed development.

One challenge of operating a centralized wastewater treatment system effectively would be to assign a design system capacity, while the wastewater volume to be treated would continues to grow in accordance to the projected growth of warehouse square footage over a long period of 16 to 18 years. The alternative to using one large treatment system would be several centralized wastewater treatment modules, which would come into operation whenever a certain development phase has been completed. Since the proposed warehouse park would be developed with the design goals of significantly reducing water consumption, the volumes of wastewater generated might be small for conventional sewage treatment systems. Wastewater treatment plants, which do not operate at design capacity levels operate inefficient and therefore consume excessive energy for the treatment achieved. Since the wastewater treatment in the

existing warehouses is successfully carried out using septic systems, septic systems are selected as the wastewater treatment process for the proposed development. Septic systems can be added in phases in conjunction to the progress of adding warehouse space.

The septic systems (e.g. one septic tank with one associated septic leach fields per septic system per septic system) would be located close to the warehouses that they serve. Typically, one septic system would serve about 38,000 square feet of warehouses space each, which means that on average one septic system would serve two warehouses. The septic systems would be installed underground at suitable locations close to the warehouses they would serve. The exact locations of the septic tanks and leach fields would be selected in the final design phase. According to established design standards and also in accordance with state guidelines, septic systems should be located as far away from streams, wetlands and the ocean as possible. One hundred feet is a minimum distance. The septic systems would be best located in open grassy spaces adjacent to the warehouses. The location of the septic systems would be well marked above ground and would also be documented. The septic systems would not be located under structures. Since sludge has to be periodically extracted from the septic tanks, the manholes of septic tanks have to be accessible and in reach of larger service trucks. In normal operation the leach fields do not need to be accessible for maintenance.

There are various design and operational measures that would safeguard against sewage overflow or spill from the septic systems. The distances of the septic systems to wetlands and the Kapa'a Stream would have to be larger than the minimum distances. The soils would have to have a suitable permeability to ensure percolation of the wastewater and avoid backing up of the sewage. The septic system would have to be large enough to accommodate the projected wastewater load of the warehouses that are served by the septic system. After construction of the septic system no construction would be permitted that would damage the septic systems. With adequate maintenance septic systems function well. Indications that septic systems are overloaded or structurally damaged would require immediate attention. The septic tanks would require regular pumping by a licensed pumper. The area around the septic system would have to be regularly inspected for signs such as foul odor, slow or back-up drains, wet, spongy ground or lush plant growth, algal blooms and excessive weed growth in nearby streams.

The estimated volume of wastewater that would be generated by the 660,000 square feet of new warehouse space is about 14,000 gallons per day. The anticipated wastewater treatment for the new warehouses would consist of a series of septic systems, where, on average, each septic system would serve two new warehouses. Each septic system would consist of a 1,250-gallons septic tank and a 1100-square feet leach field would for disposal of the wastewater effluent. A total of 18 septic systems would be installed to serve the new warehouses in the parcels TMK 4-2-15:001, 006 and 008.

No adverse environmental impacts are anticipated from installation and operation new septic tanks and leaching fields in the proposed development. Septic systems are well-established wastewater treatment processes and a well maintained septic system should perform well to treat common wastewater discharge from the proposed warehouse development.

3.4.4 Telecommunication

Presently, the commercial and industrial warehouses at the project site are served by existing telephone and cable network. The existing communication networks have the capacity and the bandwidths to accommodate the anticipated demand for the proposed warehouse development. The development therefore, has no adverse impacts on the telecommunication infrastructure in the area.

3.4.5 Solid Waste Collection and Recycling

All solid waste that is generated at the existing warehouses development is collected by commercial waste companies. This practice would continue for the proposed development as well. It is not anticipated that future solid waste collection and disposal to adversely affect the level of service. There is limited recycling in the present warehouses complex.

Applicable LEED prerequisites and credit categories, which would be considered by the design team would address the environmental concerns related to material selection, waste disposal and waste reduction. At a minimum the propose warehouse development would have a properly designed recycling system, which would recycles all paper, cardboard, glass, metal and plastic. Possibly the proposed development would also recycle yard trimmings and food scraps if onsite composting is feasible.

Therefore, under the anticipated operational procedures of the sustainable warehouse development more comprehensive recycling operations would be offered than is presently performed at the existing warehouse development. The occupants of the warehouses would be encouraged to actively recycle a wide range of materials. All required infrastructure measures, such as conveniently and properly seized and located recycling areas would be provided by the developer. It is anticipated that there would be no additional demand on public waste collection services since the remaining (e.g. not recycled) solid waste stream would be collected and disposed of by private companies.

Proper site maintenance during construction and operation of the proposed warehouse development includes strict management of any litter and waste material in the industrial park so that no litter and waste encroaches into adjacent sites.

3.5 Anticipated Traffic Impacts

The proposed Kapa'a Light Industrial Park would generate additional traffic and would therefore impact roadways and intersections in the vicinity to the proposed project. A **Traffic Impact Analysis Report** (TIAR) was prepared that assesses and quantifies the anticipated traffic

impact of the proposed Kapa'a Light Industrial Park. The TIAR is attached in Appendix E of this Final EA.

The main conclusions of the TIAR are summarized as follows:

The study area of the TIAR include three intersections and two roadways:

The three intersections :

1. Kapa'a Quarry Road at Mokapu Boulevard (existing, under State jurisdiction)
2. Kapa'a Quarry Road at kalanianaole Highway (existing, under State jurisdiction)
3. Kapa'a Quarry Road at Kapa'a Quarry Access Road (existing, under County jurisdiction)

The two roadways are:

1. Kapa'a Quarry Road
2. Kapa'a Quarry Access Road

The location of the three intersections and two roadways are shown in Figure 2-67.

The existing traffic conditions on the two roadways and the three intersections were assessed with traffic volume and vehicle classification counts for the morning and afternoon peak traffic hours. Daily traffic volumes were not directly measures but daily traffic volume were deduced from the measures traffic by proven ratios that correlate peak hour traffic to daily traffic volumes of different vehicle classifications. The level-of-service (LOS) analysis to assess the impact of the proposed project was conducted using the peak morning and afternoon traffic

The traffic volume on the roads in the vicinity of the proposed project and intersections affected by the project can be expressed with two components. The first component is the so-called background traffic, which would be present without the proposed projects. The second component is traffic volume due to the proposed project, which can be expressed in terms of trip generation rates per applicable quality. Thus with growing warehouse space the traffic volume would increase proportionally. Trip generation rates are published for different land uses on the basis of many projects in terms of daily trips as well as morning and afternoon peak traffic volume. In the case of the proposed Kapa'a Light Industrial Park the trip generation rates are expressed as trips per one thousand square feet of gross industrial space.

Traffic volume and vehicle classification counts were conducted at roadways and intersections within the study area for the present TIAR. These counts assessed the existing trip generation during the morning and peak hours. It was found that trip generation rates of the existing industrial warehouse development within the TMK 4-2-15:008 are about 10 percent below the national average for comparable industrial developments. Consequently, the trip generation rates that were used to estimate the future traffic were also 10 percent below the national average.

The future background traffic volume on the roadways and intersections within the study area were considered to grow at compounding future growth rates. The growth rates used for the

TIAR were published date, as referenced in the TIAR. The background traffic on the affected roadways and intersections will therefore grow in the future.

The future project related traffic volume was estimated to grow in concert with the addition of industrial space over the projected development time period of 16 to 18 years until full build of the development is reached. As a simplification the present trip generation rates were considered for the next 16 to 18 years of study time, although a change in trip generation rates for the proposed industrial is very likely due to the fact that in future alternative modes of transportation would be actively promoted for the proposed development. The estimated traffic volume at a certain time is the product of trip generation rate (e.g. trips per one thousand square feet of industrial space) multiplied with the amount of gross leasable area that is occupied at that time. Since the project is defined in distinct development milestone the estimated future traffic volumes would also follow the development milestones and increase in the future.

The resulting estimated future overall traffic volumes on the affected roadways and intersections are the sum of the background traffic and the traffic that is produced by the proposed project.

The TIAR has assessed the estimated future traffic volumes and the anticipated level-of-service for the affected roadways and intersections for two future project milestones. The first milestone is the expected completion of the development phases A, B and C in the year 2016. This milestone would represent the completion of the development of the upper portion of the proposed site. The second milestone is the completion of the project development phase D, which also represents the completion of the project at full build. This milestone is set for the years 2026.

The TIAR presents all assumptions and assessment procedures of the analysis. The main conclusions and recommendations of the TIAR are briefly summarized in the following:

- The level-of-service (LOS) analysis carried out in the TIAR of this Final EA suggests that the traffic impact will remain under a threshold LOS level that would require mitigation through at least 2016.

- For the time after 2016 and before 2026 the LOS analysis suggests that some traffic mitigation measures might be required at least at the affected three intersections since LOS levels increase past level "D" for some of the intersection traffic flows.

- The TIAR concludes that until 2016 traffic impact is not as high as to warrant traffic mitigation and improvements; but after 2016 and as the development approaches the development milestone in 2026, traffic mitigation would be required.

- It should be noted again that the trip generation rates would probably not remain constant but would likely diminish over the entire projected development time of the project to full build. Since the proposed project would actively promote and support alternative transportation modes, trip generation rates in the future might be smaller than used for the LOS analysis in the present TIRA. Consequently the TIAR suggests

reassessing the trip generation rates through actual measurements after the completion of the 2016 development milestone. A new LOS analysis could be performed at that time to determine if, and if applicable, what traffic mitigation measures might be called for.

- Possible mitigation measures after 2016 should be addressed after the 2016 development milestone.

Other recommendations include:

- It is understood that a sidewalk might be required along the property on Kapa'a Quarry Access Road.
- No improvements are deemed required to accommodate traffic volumes on Kapa'a Quarry Access Road. However, some improvements might be considered to facilitate traffic in and out of the different driveways of the proposed developments.
- Implementation of alternative modes of transportation are recommended for the proposed project, such as suggested in the Final EA, in order to lower the trip generation rates.

A **sight distance analysis** was performed to evaluate traffic impacts from vehicles entering and exiting the proposed site through three driveways from te Kapa'a Quarry Access Road. The sight distance analysis is presented in Appendix E. The analysis indicates that the applicable sight distance criterion is departure of vehicles from driveways that are controlled by stop signs. The analysis indicates that sight distances from all driveways are adequate under the stated assumptions.

3.6 Impacts on Police and Firefighting

The proposed Kapa'a Light Industrial Park development would increase the level of business activities in Kapa'a Valley and would therefore increase the probabilities for emergencies situation or fire which would require emergency assistance and firefighting. The closest police department is located in downtown Kailua, approximately 3.1 miles away from the proposed site. The response time is about 9 minutes. The closest fire station to the project is at 2.9 miles. The response time is about 7 minutes.

It is anticipated the proposed development would not pose a significant impact on police or firefighting resources in the area.

3.7 Surrounding Industrial Uses

The proposed warehouse development would represent a major addition to the industrial activities in the Kapa'a Valley. While the surrounding industrial activities in the Kapa'a Valley use heavy machinery and large process facilities, the anticipated light industrial and commercial activities in the proposed warehouse development would be far less intrusive. It is therefore anticipated that there would be no negative impacts from the activities in the propose warehouses on the surrounding industrial activities in the Kapa'a Valley. Possible impacts on the surrounding industrial uses would be from increased traffic and additional demands on water and electrical infrastructure in the area, which are addressed in the preceding sections.

3.8 Impacts on Demand for Industrial Space in the Koolaupoko Region

The proposed expansion of the existing industrial warehouse development, which presently offers about 250,000 square feet of gross industrial floor space, into the full Kapa'a Light Industrial Park would add approximately 660,000 square feet of gross industrial floor space to the proposed site.

In response to comments to the DEA about the Koolaupoko region's ability to absorb an additional 660,000 square feet of industrial space a market study was conducted to assess the anticipated market demand and estimated region's absorption level for the proposed Kapa'a Light industrial Park. The market study is attached as Appendix D to the Final EA. The following summarizes the main conclusions of the study.

The Koolaupoko region, where the proposed site is located, is significantly undersupplied with industrial space, despite being one of the most populous and above-average income markets of the islands. While it is widely accepted that the Windward Coast should not be the location of intensive industrial uses that serve an island-wide market, there are many regional relevant industrial uses that are essential on a local level, such as neighborhood-oriented contractors, suppliers, repair shops, landscaping, steel/woodworking and warehousing.

Table 3-3 compares estimated Gross Leasable Area (GLA), present population levels and the derived per capita GLA for the major trade regions of Oahu. Table 3-3 suggests that the per capita GLA of the Koolaupoko region is significantly smaller than of other regions on Oahu.

Table 3-3 Comparison of Existing Industrial Space Development by Trade Area on Oahu

Trade Area on Oahu County data of C&C of HNL given as benchmark	Population in trade area	estimated total GLA in trade area [sqft]	estimated Capita GLA in trade area [sqft/resident]
Honolulu	488,000	18,458,000	37.8
Ewa/Waianae	141,000	5,741,000	40.7
Central Oahu	162,500	5,971,200	36.7
Koolaupoko	119,000	991,618	8.3
C&C of HNL (total Oahu)	905,034	35,588,597	39.3

Gross Leasable Area (GLA)
data effective end of first quarter 2009

Figure 3-30 illustrates the per capita GLA of the major trade regions on Oahu and compares these with the Oahu average per capita GLA. Figure 3-31 compares the per capita GLA of the major trade regions on Oahu as a percentage of Oahu's average per capita GLA. Figures 3-30 and 3-31 also highlight the future scenario where the planned 660,000 square feet of industrial space is added to the present Koolaupoko industrial space. The results suggest that at present the Honolulu, Ewa/Waianae and Central Oahu regions have all per capita GLA that are close to the island average per capita GLA allocation level. The Koolaupoko region, however, has presently only 21 percent of the island average level, indicating the significant undersupply with industrial space.

While assuming that the population level within the Koolaupoko region will be relatively constant in the next decades and further assuming that per capita GLA allocations in the other major trade regions on Oahu will not drop, Figure 3-31 suggested that the addition of the planned industrial space in the proposed Kapa'a Light Industrial Park and other possible growth of industrial space in the regions would still keep the future per capita GLA of Koolaupoko at approximately 35 percent of the average GLA on Oahu. This suggests that the near-doubling of the currently available industrial inventory in the Koolaupoko region would still support only about 35 percent of the industrial demand created by its residents and local businesses; a level nominally sufficient to house most local and sub-regional industrial uses.

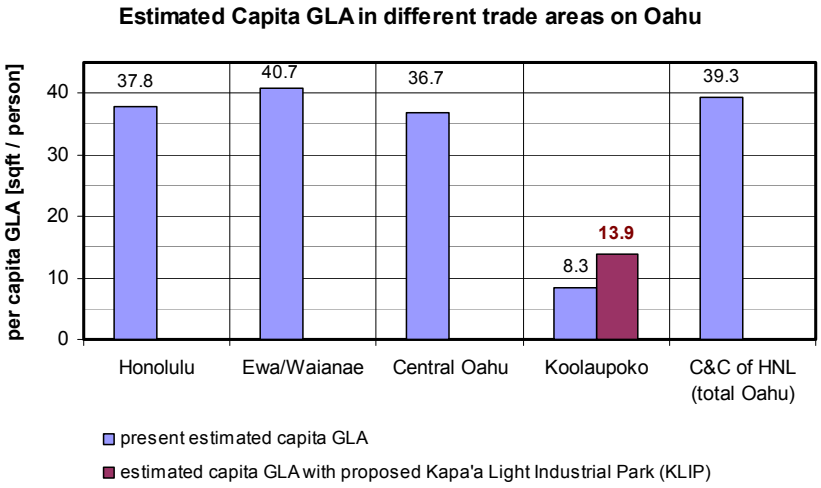

Figure 3-30 Comparison of Industrial Space Development by Trade Areas on Oahu

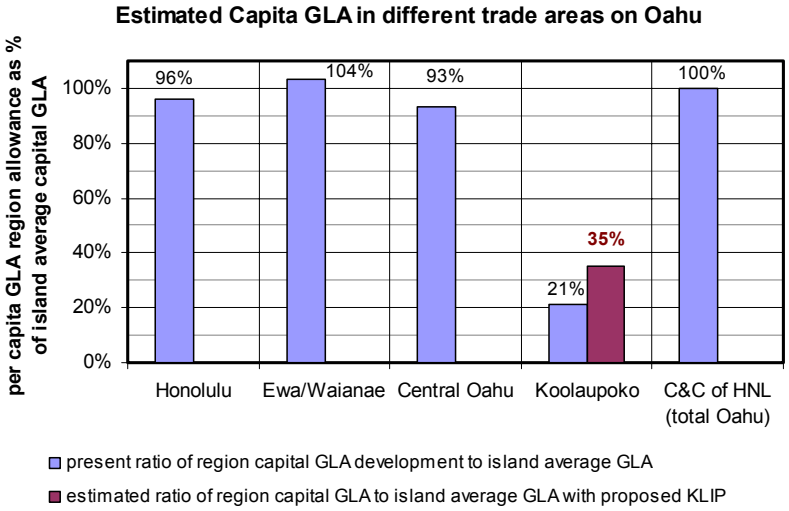

Figure 3-31 Comparison of Industrial Space Development by Trade Area on Oahu

The proposed site of the Kapa'a Light Industrial Park is favorably located in regard to existing industrial uses at the site, good access to major routes into and through the Koolaupoko region and its central location in the Koolaoupoko trader area. The planned sustainable building technologies and energy efficient and environmentally friendly operation of the proposed industrial development would result in far less impact on the environment and community than the historic industrial uses in the vicinity of the project site.

Based on forecast trends for the Greater Kailua / Kaneohe industrial sector the study implies three scenarios which suggest that it would require between 16 and 18 years for the proposed 660,000 square feet of industrial space to reach full absorption in the region. Faster absorption would be achieved if sufficient land acreage would be made available for base yards.

It is noteworthy to point out that the market study of this FEA concluded that existing industrial space in the Koolaupoko regions will be lost due in the coming years due to ongoing and panned transformation of industrial sites into higher return residential and commercial developments. Over the coming years many well-established businesses located on non-conforming sites will have to find alternative sites. Furthermore, the environmentally friendly and energy efficient development of the proposed Kapa'a Light Industrial Park would address environmental issues associated with historic industrial development types, especially those in non-conforming locations.

An important finding of the study is that the planned expansion of industrial space would primarily benefit businesses that serve the Koolaupoko regions with industrial uses and not businesses that are active on an island wide market. Thus, the planned industrial space would primarily improve light industrial service to the residents in the region, avoid relocation of local businesses to other sites on Oahu and thus would help avoiding long commutes of residents to other parts of Oahu and long distances consumers have to drive to find much needed industrial services. These findings therefore argue against concerns that the planned addition of industrial space within the proposed Kapa'a Light Industrial Park would attract businesses to the Koolaupoko region and would therefore significantly impact the local infrastructure.

3.9 Impacts of Increased Employment by the Proposed Project

The proposed light industrial development would offer space for a variety of light industrial activities ranging from wood working and cabinet making to commercial retail, landscaping, storage space and other light manufacturing. This sizeable expansion of industrial warehouse space would consolidate light industrial activities in the region of the proposed site and away from already congested downtown Kaiula and Kaneohe.

The proposed Kapa'a Light Industrial Park would create new employment opportunities for residents of Kailua and Kaneohe regions. The additional 660,000 square feet of new office space would likely result in 500 to 700 new employment opportunities. Based on a conservative estimate of one employee per 1,000 square feet of warehouse space, the estimated trend for new employment by the development over the next 16 to 18 years is depicted in Figure 3-32.

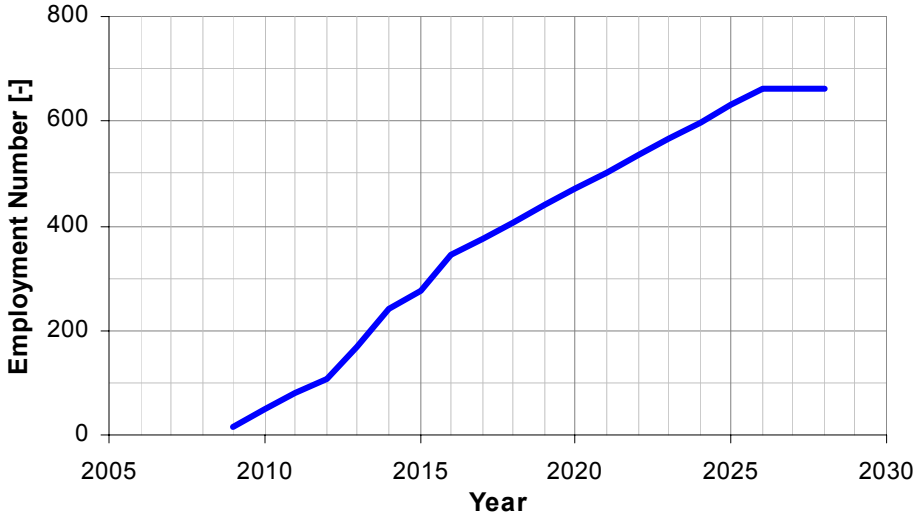

Figure 3-32 Estimated Employment Generated by Proposed Kapa'a Light Industrial Park

Figure 3-32 suggests that the increase in possible employment would be slow over time. Any impact from increased employment of the proposed Kapa'a Light Industrial Park would therefore be gradual. As pointed our in Section 3.7, a significant portion of the work force employed by businesses in the proposed warehouse development, would come from within the Koolaupoko region and not from other parts on Oahu. Consequently, it is anticipated that the new warehouse development would have a small but gradual socio economic impact.

For employees of companies, which relocate to the proposed park and who live in the Kailua and Kanehoe neighborhoods, the daily commute might be slightly longer and would include trips over the Kapa'a Quarry Road, whose traffic volume would increase. Those employees, who presently use public transportation to get to their place of employment, would have to change from using public to other transportation modes, which could include driving themselves, car-pooling, bicycling or using company sponsored shuttles. Employees coming from the Central Oahu region would find their commute likely shortened, since they would most likely use a shorter approach route via the H3-Freeway or Pali Highway and avoid driving through Kailua or Kanehoe urban areas. Employees from Central Oahu using public transportation would face the same challenges of no present bus service to the proposed site.

In addition to well-established businesses relocating within the Koolaupoko region, new local business and businesses from the Central Oahu region might find the proposed location and the modern and environmentally friendly industrial space more attractive than other warehouse locations. In these cases additional employment would be created in the Koolaupoko region.

In summary, it is anticipated that the proposed development would not significantly and adversely impact socio-economic conditions in the region. This is mainly due to the fact that proposed development would not create a large pool of new employment converging to the

windward areas and placing new and heavy burden on housing, day-care center, schools, hospitals and other institutions in the region.

3.10 Considerations and Potential Impacts on the Kawainui Marsh

The Kawainui Marsh has witnessed significant changes over the past centuries. The Kawainui Marsh was once a large inland sea, which evolved into a freshwater regime over a period of many centuries. The marsh was used as the largest cultivated freshwater pond in Hawaii. Today the Kawainui Marsh is the largest wetlands in the Hawaiian Islands and is home of several endangered water birds. The marsh also serves as an important nutrient sink and sedimentation trap for a large windward watershed and provides important flood control functions. The marsh is recognized for its environmental and historical importance to the region. There are plans to develop parts of the marsh for recreational and educational purposes.

The proximity of the proposed site of the Kapa'a Light Industrial Park to the environmentally important Kawainui Marsh places special responsibility for a respectful and environmentally responsible development approach. This makes it imperative that the proposed Kapa'a Light Industrial Park would be developed with a small ecological footprint. The major areas of potential impact to the Kawainui Marsh by the proposed action are as follows:

- Kapa'a watershed considerations: The Kawainui Marsh receives water from the Kapa'a watershed. The watershed provided abundantly to early Hawaiians, who settled in the area. The land provided wood (for structures, canoes, fuel) and food (taro, fish). Agriculture was a prime land use from the start of settling of the Hawaiian Islands. Cattle ranching was carried out in the Kapa'a Valley until the 1940s. Quarry operations started in the early 1950s. Later, landfilling of municipal solid wastes added to the range of terrain disturbing activity in the valley. These operations have since significantly altered land use and appearance in the valley while impacting the ecology of the area. Initially, to access the landfill areas in the valley, a raised roadway was constructed that has segregated the watershed from the lower-lying Kawainui Marsh.

  With the commencement of construction for the H3-Freeway in the early 1970s, the extent of man-made changes to the ecosystem of the valley drastically proliferated. In addition, around the same time, the quarry operations was relocated from the eastern to the western part in the valley, leaving the old quarry site for a new municipal solid waste landfill, which continued operation as late as early 1990s. Construction of commercial warehouses in the area started in the 1970s capped activities in the area to the present levels. In Summary, quarry and land filling operations has resulted in massive earth moving, deforestation, reduction of vegetation and ground cover, and erosion of the watershed contributory to the Kapa'a Stream and Kawainui Marsh.

- Water quality considerations: The Kapa'a Stream is the primary perennial stream, which delivers fresh inflow to the Kawainui Marsh. Analyses of Kapa'a Stream flow show elevated levels of turbidity and suspended solids, nutrients and metals. Presence of high levels of turbidity and pollutant loadings in the Kapa'a Stream, pose major concerns not only for the aquatic life in the stream, but also for the Kawainui Marsh and, eventually, the Kailua Bay.

- Impact on wildlife: Wildlife in the Kawainui Marsh is affected by the encroachment of development and human activities to the marsh. The marsh is surrounded by a network of roadways that are sources of constant and unmitigated traffic noise levels in addition to being potential sources of air emissions. The natural response of the wildlife to this encroachment is migration to interior of the marsh or elsewhere.

- Noise impact: Noise generated by industrial activities, such quarry operations, flow of commercial and private vehicular traffic, commercial activities in the existing warehouse complex, and recreational activities such the Kawainui Model Airplane Park, all contribute to noise pollution in the area.

- Air pollution: The main contributor to air pollution in the area is the exhaust from traffic flow on the roads as well as fugitive dust emissions from bare ground surfaces and earthmoving activities. The impact of airborne pollution from activities in the western part of the marsh is somewhat mitigated by the simple fact that winds from the east dominate in the area.

- Impact from Light Pollution: Impact from artificial light can have negative effect on the wildlife since it causes stress in animals and can distort their navigational capability. Artificial light deteriorates the enjoyment of the night sky and lessens the experience of open space.

- Visual Impact: the existing industrial developments in the Kapa'a Valley adjacent to the Kawainui Marsh have created distinct sights that portray the industrial character of the valley.

- Traffic Impact: The Kapa'a Quarry Road serves as an important access road to the installations in the Kapa'a Valley and also as an important road that connects Mokapu Boulevard and Kalanianaole Highway, thus providing an important road at the western side of the Kawainui Marsh. The impact of the traffic on the Kawainui Marsh also includes noise and air impacts.

3.11 Impacts during Construction

According to the initial project plan, development of the proposed light industrial park would occur in four development phases and would be completed in 16 to 18 years. The first construction activities in each development phase would include mass grading of the entire

project site and the construction of infrastructure. This initial project work would be followed with phased construction of warehouse structures. The progress of warehouse construction would advance in response to market demand. The potential impacts of the development during construction are therefore twofold. First impacts are due to site preparation work and the second impacts are those due to the construction of the individual warehouse structures.

As pointed out phases might slightly overlap at times since for instance installation of utilities in one phase may occur while construction of some of the warehouse structures in another phase is in progress. Impacts of the proposed development during construction are generally associated with one of the following categories described below.

3.11.1 Erosion Control

The site preparation work would include a significant amount of earthwork, especially in the lower portion of the proposed site, designated as TMK 4-2-015:006. Construction activities would naturally cause elevated levels of erosion during site preparation. The proposed sequence of site preparation work would include implementation of Best Management Practices, BMPs such as installing silt fences and vegetated earth berms, and other measure discussed in more details in the Section Four.

3. 11.2 Water Quality

During site preparation work, there is ample opportunity for adverse impact on water quality due to occasional discharges from the construction area. Appropriate Best Management Practices (BMPs) would be used to contain and treat polluted water on site before discharging in surrounding bodies of water.

3.11.3 Flora and Fauna

As mentioned earlier, the areas designated for construction of roadways, warehouses and ancillary facilities for the development are devoid of any endangered flora or fauna. The only creatures that presently find habitat in the periphery of the proposed site are common rats, mice, mongoose and feral cats. During site preparation, the area would be cleared, grubbed, and stripped by using construction equipment. There would be no clearing, grubbing or other construction related activities in the open areas close to mouth of the Kapa'a Stream and along the stream banks, as well as along the drop line bisecting the two-tiered site. Due to the use of noisy construction equipment, birds and other creatures in the open areas may temporarily avoid the area during the construction activities. Construction activities, therefore, would not have a significant and long-lasting impact on the flora and fauna in the area.

3.11.4 Traffic and Road Improvements

During construction there would be increased traffic on the two roads adjacent to the proposed site. Site grading and preparation would not require significant amounts cut and fill, which would suggest limited transport of materials to and from the site. Thus, the increase in traffic volume due to construction would not be excessive.

A limited amount of roadwork improvements may be required on the existing roads serving the project site. Anticipated roadwork may include improvement s to the lower sections of the Kapa'a Quarry Access Road, improvement to the intersection of Kapa'a Quarry Road and the Kapa'a Quarry Access Road to allow smoother left-turn into Kapa'a Quarry Access Road for north-bound traffic on the Kapa'a Quarry Road, improving the shoulders on Kapa'a Quarry Road adjacent to the lower portion of the proposed site and improvements of the culvert under Kapa'a Quarry Road. During road construction, potential impacts would have to be mitigated by implementation of proper BMPs and traffic control measures.

During the construction of warehouse structures, there would be additional traffic along Kapa'a Quarry Road due to construction related traffic for delivery and transport of construction materials to the site. The impact would be mitigated by instituting proper BMPs.

3.11.5 Air Pollution

Impacts of the proposed project during construction, is limited to two categories. One category relates to impacts on the open ambient air and the other deals with in-door air quality during construction of each individual warehouse.

General impacts on outside air quality at the project site, are either due to operation of petroleum powered construction equipment and vehicles, particularity during the site preparation work or due to fugitive emissions during grading and landscaping work. All such impacts during construction would be mitigated to a certain extent by applying appropriate BMPs.

Interior air pollution is typically due to the release of a range of volatile agents, especially volatile organic compounds (VOC) as well as dusts and fibers during work in the interior of the warehouse structures. By using sustainable technologies such as using products with minimal harmful agents as in paints, coatings and carpets, as well as providing sufficient ventilation and filtration would mitigate indoor air pollution during construction.

3.11.6 Construction Waste

As mentioned earlier, site grading and installation of the infrastructure do not require excessive amount of fill or cut materials and would not produce significant wastes. Construction of the warehouse structures, however, is associated with generating wastes that would be hauled for

proper disposal at city and county landfills. It is anticipated that during construction, the solid waste stream from the proposed site will not be significant. By using environmentally friendly construction materials and sustainable construction technologies, the development could mitigate the anticipated volume of construction wastes.

3.11.7 Noise Climate

Construction activities would unavoidably increase the ambient noise levels. Sources of noises could be either air-borne or ground-borne. Heavy construction machinery and equipments such as backhoes, graders, power generators, compressors, earth-moving machinery, pile driving machinery, trucks and trailers would generate most of the noise impacts. While unavoidable construction related noise would be a nuisance, using proper noise muffling and control devices would mitigate adverse impacts on ambient noise levels at the project site.

3.11.8 Historical and Archeological Resources

As mentioned earlier, the proposed site does not contain any archaeological or social resources. The proposed site has been heavily disturbed during the past 50-60 years by intensive quarry and landfill operations. The proposed site is comprised mainly of deposition of quarry tailings, overburden materials and solid wastes. No historic or archaeological findings, has been reported on or in close vicinity of the site. Should any archaeological or historic and culturally important artifact or resource be discovered during the construction, all construction activities would be suspended and the archeological experts and State Historical Preservation Division would be notified. The findings would then be verified by expert to assess the nature, extent and methods of proper handling of the findings. It might be necessary to develop an archeological monitoring plan that would delineate the scheme for on-site monitoring during construction.

SECTION FOUR

PROPOSED MITIGATION METHODS

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SECTION FOUR

PROPOSED MITIGATION METHODS

Section Four presents mitigation and control measures, which would be available to eliminate or reduce possible impacts.

It should be noted that some mitigation measures could reduce multiples of impacts. Both conventional and advanced mitigation measures are discussed. The advanced mitigation measures utilize sustainable technologies to reduce the potential impact further than conventional design and construction methods. The expressed goal of impact mitigation is to create a framework for an environmentally friendly and culturally and socially respectful development at the proposed site.

The mitigation measures proposed hereafter would effectively lower impacts of the proposed action by virtue of an integrated sustainable building approach, which would be consistent with LEED (Leadership in Energy and Environmental Design) standards. In several instances the adopted sustainable design and construction approach would not only lower impacts under a level achievable with conventional mitigation, but the results of the planned mitigation would actually improve the environmental conditions at the proposed site in comparison to the present situation. Examples of such objective improvements of environmental conditions by the proposed development are the significantly lower impact from stormwater runoff, improved open space at the boundaries of the site, restored wetland areas and comprehensive new landscaping throughout the proposed industrial park whereby no potable water but harvested rainwater would be used for irrigation.

It should be noted that the actually adopted mitigation strategy for the proposed warehouse park would be finalized in the design phase by the project team, which would work under the project goal of qualifying the proposed development for LEED certification. LEED certification requires the award of certain number of credit points, depending on the level of certification. The project team is free to choose the type of credits for an integrated design of a high performance building development. Therefore not all of the impact mitigation measures discussed in this section would be necessarily be part the final design. But in any case LEED certification would ensure through independent third party review that the project would be environmentally friendly, energy and water efficient and socially and culturally responsible.

4.1 Short-Term Mitigation Measures for Impacts During Construction

As mentioned in previous sections, the proposed industrial development would be constructed over a span of 16 to 18 years. The development would be constructed in four development phases, Phases A through D, and each development phase would include several periods of site development work, such as grading, landscaping, of construction of roadways and parking spaces, of installation of stormwater management system, of installation of utilities and of construction of individual warehouse structures. Unlike many other development projects that have a relatively short development schedule of months from start to completion, the proposed development would have constructing activities ongoing through most of the 16 to 18 years of development time. During the 16 to 18 years of total development time to full build, however, the level of construction activities would be relatively low for most of the time. Periods of elevated construction activities would be relatively short and would be at the start of the four development

phases. Periods of more intensive construction activities would be during site grading, construction of basic infrastructure, including roadways, off-street parking spaces and the drainage system, consisting of collection, conveyance and treatment units. The periods of higher construction activities would be followed by long periods of low or no construction activities, such as the construction of individual warehouse structures. The fact that the length of development of the park would stretch over a long period of 16 to 18 would reduce the intensity of impacts, while extending its duration.

Short-term mitigation refers to measures to reduce or relieve environmental impacts during the construction phase of the project. Potential environmental impacts during construction may include, increase in rate and volume of runoff and associated pollution, soil erosion, airborne pollution, noise pollution and increased traffic.

The proposed project would have a comprehensive construction activity pollution prevention strategy. An effective erosion and sedimentation control plan would be at the center of the attention of the design team. The loss of topsoil is the most significant on-site consequence of erosion. The loss of topsoil greatly reduces the soil's ability to support plant life, regulate water flow and maintain biodiversity (according to LEED guidelines). The comprehensive erosion and sedimentation control plan would have to accomplish the following objectives:

- Prevention of loss of soil during construction by stormwater runoff and/or wind erosion
- Protection of top soil by stockpiling and reuse, preferably using recycled organic material from the site.
- Prevention of sedimentation of receiving waters
- Prevention of pollution of the air with dust and particular matter

<u>Proposed mitigation measures:</u>

During construction of the proposed industrial development the following Best Management Practices (BMPs) represent options that the project team could use to reduce or eliminate adverse environmental impacts during construction:

Table 4-1 Potential Impacts and Mitigation Measures during Construction

Potential Impact	Mitigation Measure during Construction
Erosion & Sediment Control	o Plant fast growing grasses for temporary soil stabilization of there are breaks or delays in construction of the final stabilized grade o Place hay, grass, woodchips, straw or gravel on the soil surface to cover and hold soils

Potential Impact	Mitigation Measure during Construction
	o Utilize silt fences to remove sediments with filter media as stormwater flows through the fence o Utilize grass swales o For entry/exist use stabilization gravel to avoid soil and dirt to be carried onto public roadways. o Utilize inlet protection o Utilize sedimentation basins, to allow for settling of sediments from stormwater volumes o Use or conserve vegetation cover
Reuse of construction material	o Building material re-use; decreasing the amount of construction waste o Construction Waste Management o Recycled construction material content
Noise	o Build vegetative buffer zones with berms around the proposed site early in the site development. o Reduce noise pollution (e.g. careful handling of materials, quiet power tools, equipment and generators; low impact technologies; sound shields).
Traffic	o Schedule delivery or construction trucks to serve the site outside peak AM and PM hours o Schedule road construction in off peak hours
Air pollution	o Control dust (e.g. fine water sprays) o Place fine mesh screening close to the dust source o Continuously inspect for and decrease sources of dust (from exposed earth and building materials) o Cover trucks loaded with construction materials o Prevent spills of hazardous agents o Proactive measures to prevent site contamination. o Use of non-toxic paints, solvents and other hazardous materials wherever possible o Vegetative buffer zones with berms around the proposed site o Cover piles of building materials like cement, sand and other powders o Use low-emission diesel fuel and construction vehicles that incorporate particulate filters and catalytic converters. o No burning of any materials on site

Potential Impact	Mitigation Measure during Construction
Water Quality	o Utilize silt fences o Utilize storm inlet protections o Prevent spills of hazardous agents take Proactive measures to prevent site contamination. o Avoid building material being washed into the receiving stream or other drainage areas. o Cover piles of building materials like cement, sand and other powders o Use of non-toxic paints, solvents and other hazardous materials wherever possible o Collection of wastewater generated from site activities in settlement tanks, screen, discharge the clean water, and dispose of remaining sludge according to environmental regulations.
Socio-Economic	o Keep an open and proactive communication with the community; e.g. community meetings, newspaper, etc. o Informing the community that the construction of the Kapa'a Light Industrial Park will not reduce access to important natural resources nor would reduce employment. o Informing the community that proposed warehouse development would sustainable commercial development. Involving community groups to maintain the planned wildlife sanctuary.
Cultural and Historical	o During construction an archeological expert would be kept on call. o If cultural site or artifacts were found, construction work would be halted to inform the State Office of Historic Preservation. o An archaeologist preservation and monitoring plan to ensure no adverse impact on the cultural resources would be implemented.
Flora and Fauna	o Avoid the destruction of valuable large trees and other vegetation that would require a long time for replacement, especially during grading and the operation of heavy equipment.
Visual Impact	o Build the vegetative buffer zones with berms around the proposed site before grading and site development commenced.

4.2 Long Term Mitigation Measures for Impacts During Operation

The following presents and discusses potential mitigation measures that individually or in a combination with other mitigation measures would effectively reduce various impacts of the completed project are.

4.2.1 Mitigation of Impacts on the Kapa'a Watershed

Potential environmental impact:

The construction and operation of the proposed warehouse development could negatively affect the quantity and quality of storm water runoff from the project site. The addition of impervious surfaces such as roofs and roadways increases peak runoff at the site. Erosion of bare ground surfaces can contribute to high turbidity and high concentration of suspended particles and associated pollutants in the receiving waters, e.g the Kapa'a Stream.

Proposed mitigation measures:

The master plan for the proposed development calls for installation of the following measures to reduce storm discharge from the site and improve water quality in Kapa'a Stream:

- Maintain grassed and pervious surfaces in the project to the extent possible to promote infiltration and reduce surface run-off;
- Install detention ponds to collect and treat surface run-off from the developed areas. Subsequent to detention and settlement of suspended solids and subsiding of the storm event, flow will be discharged into the Kapa'a stream;
- Install BMPs to prohibit exposure of bare ground to reduce erosion. Exposed surfaces shall be landscaped or otherwise protected against surface erosion;
- Install sediment catchment devices, drain inlets with skimmers to stop discharge of floatable extraneous materials from entering the Kapa'a Stream;
- Install oil-water separators at strategic locations within the development to remove grease and hydrocarbon contaminants from the discharge.

4.2.2 Mitigation of Site Drainage Impacts

Potential environmental impact :

Potential impacts of site development on drainage can be due to increase of discharge rate and level of pollutants in stormwater runoff from the proposed site. Surface runoff discharge from the site may cause erosion and increase transport of silt and other pollutants into the

receiving waters and therefore cause sedimentation or accumulation of harmful agents in the receiving waters.

Proposed mitigation measures:

The following proposed measures would reduce or eliminate adverse impacts from the drainage of the proposed site:

- Increase the portion of vegetated and pervious area within the development boundaries
- Use porous surfaces for all landscaped surfaces, use pervious roadway pavement (pervious roadway pavement is presently not considered since the high axial loads of trucks in the proposed industrial park seem incompatible with pervious pavement);
- Install Best Management Practices (BMPs) to increase environmental compliance and lower the impact to the receiving waters, such as dry detention ponds, catchment basin, sedimentation traps, oil-water separators, nutrient traps;
- Ensure that all exposed surfaces are protected against erosion, either by vegetation or other suitable cover material;
- Install grass swales to promote infiltration and reduce run-off and avoid erosion;
- Install oil water separators to remove grease and hydrocarbon from the runoff waters;
- Install detention ponds to store peak storm, until the water can be released into the stream in a controlled and environmentally safe way;
- Promote rainwater catchment and harvesting to be used for irrigation and other graywater applications.

4.2.3 Mitigation of Impacts from Noise pollution

Potential environmental impact :

Noise emanating from the proposed warehouse park could be a nuisance to people and may cause avoidance by animals. The proximity of the proposed site to the Kawainui Marsh could exacerbate the impact of additional noise generated by the proposed development on the environment.

Proposed mitigation measures:

The following candidate noise abatement measures would lower or eliminate impacts from noise:

- Install buffer zones made of vegetated berms to reduce the noise that is a normal byproduct of industrial and commercial activities;
- Orient and construct warehouse structures that direct emission of indoor noise (e.g. through large rolled gates) away from the areas that are sensitive to noise;
- Promote the use of low noise emitting machinery (e.g. shielding noise sources);
- Ensure that all vehicles are in good operating condition (e.g. mufflers should work efficiently);
- Install insulation for machinery noise such as, acoustic barriers, noise dissipation walls and vegetative buffer zones in the proposed development;
- Mandate enforcement of guidelines and procedures to reduce noise levels such as guidelines against unnecessary idling engines over a long time;

- Locate noise generating commercial and light industrial activities to the interior of the development and away from sensitive areas;
- Prohibit noise generating activities at night or over the weekend;

4.2.4 Mitigation of Impacts from Increased Waste Occurrence

Potential environmental impact :

Waste, if not managed properly, can create environmental hazard and cause nuisance for the public and occupants in the proposed park.

Proposed mitigation measures:

The following proposed measures would lower or eliminate impacts from generating on-site waste:

- Mandate institution of environmentally sensitive waste management procedures that includes, segregation and separation and handling of hazardous wastes from general solid wastes stream in accordance to EPA and OSHA regulations;
- Promote recycling of waste stream. Facilitate segregation of waste into paper, cardboard, plastics, metal, glass, oil and grease, etc., if co-mingled waste management is found not to be efficient;
- Provide easily accessible waste bins to facilitate waste disposal;
- Promote collection and recycling of green waste (e.g. organic waste, waste from landscaping) and preferably reuse as organic material in open spaces on the proposed site;
- Strictly enforce that no waste ends up in open spaces;
- Enforce effective guidelines for handling of waste responsibly by the warehouse park operator;
- Promote the use of regional material for construction and interior uses.

4.2.5 Mitigation of Impacts from Increased Traffic

Potential environmental impact :

Increase of local traffic can impact the level of service on the adjacent roadways, which may cause higher risks of traffic accidents and result in traffic induced pollution (e.g. air and noise pollution)

Proposed mitigation measures:

The following proposed measures would lower or eliminate impacts from increased traffic generated by the proposed warehouse development:

- Plan improvements to the roads that serve the proposed warehouse park (e.g. improvements and widening of shoulders, plan new left-turn lane on northbound Kapa'a Quarry Road, improve intersection of Kapa'a Quarry Access Road and Kapa'a Quarry Road);
- Plan large and accessible means of egress and ingress for the development;

- Encourage truck operators to schedule trips from and to the proposed warehouse park outside the Am and PM traffic peak hours;
- Implement public transport such as private shuttle to serve the proposed warehouse park;
- Encourage car-pooling for employees;
- Encourage bicycle use (e.g. implement bikeways, install bike racks, provide locker and shower facilities for bicycle users);
- Promote the use of low-emitting and fuel-efficient vehicles by measures such as preferred parking.

4.2.6 Mitigation of Impacts from Air Quality

Potential environmental impact :

Impact from impaired air quality can range from a nuisance to acute danger for the health of occupants as well as people and animals affected by air-borne agents. Besides outdoor impacts, indoor air pollution is an increasingly important safety, health and occupational consideration.

Proposed mitigation measures:

The following proposed measures would lower or eliminate impacts from poor external and indoor air quality:

Outdoor air quality:

- Reduce dust emissions from unpaved surfaces or from exposed ground by promoting planting grass and ground cover;
- Reduce emission of airborne particles from light industrial and commercial activities (e.g. saw dust from wood working operations) by installing proper BMPs;
- Do not allow open fires or sources of fugitive emissions from combustive substances;
- Promote electric or battery powered utility vehicles (e.g. fork lifts) instead of diesel engines;
- Enforce operational guidelines to avoid unnecessary idling of engines;
- Enforce safeguards that no vehicles with noticeable exhaust emissions operate in the proposed park.

In-door air quality:

- Enforce a strict no-smoking rules;
- Insists on safeguarding adequate ventilation for enclosed spaces;
- Encourage dedicated outdoor air systems in lieu of conventional "all-air" air-conditioning;
- Promote safe handling of volatile organic compounds in enclosed spaces;
- Utilize advanced air-conditioning with dedicated outdoor air systems;
- Keep air pollutant sources away from intake air ducts;
- Dispose air pollutants in a safe manner (e.g. high air volume and exhaust ducts);

- Avoid use of harmful building material (e.g. paints, carpets, etc.)

4.2.7 Mitigation of Impacts from Increasing Electricity Demand

Potential environmental impact :

The projected electrical demand for the development will burden Oahu's energy supply that is highly dependent on fossil fuel.

Proposed mitigation measures:

The following proposed measures would lower or eliminate impacts of additional energy and peak power demand:

- Plan, construct and outfit the proposed warehouse park with effective passive energy savings (e.g. insulation, natural lighting, natural ventilation, avoidance of heat islands) as well as active energy savings (e.g. energy efficient lighting, energy efficient air-conditioning, appliances, etc.);
- Manage power requirements to reduce the peak power demand;
- Comply with LEED certification to ensure high energy savings;
- Install photovoltaic devices and solar panels to generate portion of electrical load;
- Lower the demand of water to avoid pumping power;
- Inform the park occupants about measures to reduce electricity.

4.2.8 Mitigation of Impacts from Increasing Water Demand

Potential environmental impact :

The proposed industrial development would increase the demand of potable water.

Proposed mitigation measures:

The following proposed measures would mitigate any potential impacts from increase in water demand:

- Install water saving fixtures in buildings (e.g. waterless urinals, low-flush toilets, fixtures and appliances with the EPA WaterSense certification);
- Use combination of low-flow toilets and urinals, automatic sensors for lavatories, low-flow kitchen sinks and low flow showers to achieve high water savings;
- Reduce process water consumption, such as in air-conditioning by using closed cycle systems and avoid losses in wet cooling towers;
- Maintain the water supply system in good order to avoid leaks and unnecessary water consumption;
- Harvest and store rainwater to be used for irrigation of landscaped open areas; exclude potable water from being used in irrigation; use recycled wastewater for irrigation
- Use high efficiency irrigation methods, such as drip irrigation, as well as effective and efficient watering practices
- Use native or adaptive plants for landscaping.

4.2.9 Mitigation of Impacts from Wastewater Disposal

Potential environmental impact :

The proposed on-site wastewater disposal method could cause exposure to untreated and raw sewage and could therefore be a health concern:

Proposed mitigation measures:

The following proposed measures would lower or eliminate impacts from wastewater disposal system:

- Install high performance wastewater treatment systems comprising of septic tanks and septic leach fields, with adequate maintenance to safeguard a continuous high level of treatment and reduction of organic wastes;
- Ensure no harmful discharge occurs into the septic tank, which could lower or compromise the performance of the septic tanks and leach fields;
- Safeguard that no untreated wastewater is released into the ground or the receiving waters;
- Ensure safe disposal of sludge from septic tanks;
- Collect and segregate harmful liquid waste from wastewater stream to avoid disposal into septic tank and possible deterioration of treatment performance by septic tank system.

4.2.10 Mitigation of Impacts from Encroachment on Open Space

Potential environmental impact :

The extent and environmental quality of open space at the proposed site could be deteriorated by the development of the industrial park and the construction of warehouses.

Proposed mitigation measures:

The following proposed measures would reduce or eliminate impacts from encroachment on open space:

- Provide a high ratio of open space to development footprint in order to promote biodiversity;
- Plan warehouses in denser clusters to ensure open space on the property;
- Plan vegetative buffer zones that surround the high-density warehouse development to shield open space from visual and noise impact.
- Conserve all large trees and important patches of other vegetation on-site;
- Restore the wetland areas on the proposed site (e.g. restoration and improvement of the drainage canal along the Kapa'a Quarry Road);
- Construct, maintain and operate a new 15-acre wildlife habitat on restored wetland adjacent to the proposed warehouse development. The wildlife habitat will feature multiple ponds to create an environment conducive to endangered water birds and other aquatic fauna. The wildlife habitat will be developed on restored wetland in the Kapa'a

stream corridor. A 6,000 linear feet special wildlife fence will effectively keep out the considerable non-native predator population at the site (i.e. feral cat).

4.2.11 Mitigation of Visual Impacts

Potential environmental impact :

The construction of the proposed warehouse development could negatively affect the existing views in the area.

Proposed mitigation measures:

The following proposed measures would reduce or eliminate the adverse visual impacts:

- Install vegetative buffer zones including wind-breaks with densely planted trees around the proposed warehouse development; the vegetative buffer zone would screen the facilities from the traffic flow on roadways, especially the Kapa'a Quarry Road, and from the Kawainui Marsh;
- Use tall trees in the vegetative buffer zone or "green belt" to increase the level of visual protection of the site;
- Plan grassed and shrubberies in the interior of the site to enhance visual environment;
- Use "green walls" to create a vegetated vertical layer around selected warehouses in the lower portion of the proposed site; use appropriate plants to grow at vertical trellis around the warehouse structures;
- Use light appropriate exterior color schemes to lessen the impacts of the development of the surrounding areas;
- Conserve all large trees so that vegetative buffers can retain all large trees;

4.2.12 Mitigation of Light Pollution

Potential environmental impact :

The site lighting at the proposed warehouse development could negatively affect the safety on the adjacent Kapa'a Quarry Road, the human enjoyment of the night sky and the wildlife living environment in the adjacent open spaces and the Kawainui Marsh.

Proposed mitigation measures:

The following proposed measures would reduce or eliminate impacts from light pollution:

- Utilize outdoor lighting with minimum intensity necessary to accomplish purpose; use only as much foot-candles as needed for exterior lighting to ensure safety and security;
- Use timers and, motion detector devises manage on and off operation of site lighting;
- Ensure lighting fixtures properly direct their light areas needed to be lighted; ensure lights do not illuminate adjacent areas outside the proposed warehouse park;
- Use light sources that have a high luminous efficacy per watt; e.g. avoid Incandescent or Mercury-Vapor light sources in lieu of Low Pressure Sodium light fixtures;
- Avoid energy inefficient lighting; use fully shielded or cut-off lighting fixtures;
- Avoid upward lighting and lighted bill boards;

- Avoid any light trespassing from the proposed site into adjacent areas;
- Reduce interior lighting to create light pollution outside the buildings; reduce input power of all non-emergency interior luminaries with a direct line of sight to any openings in the envelope;
- Use the "Dark" zone designation, as defined by the Illuminating Engineering Society of North America, for areas of the proposed development, which are closest to the Kawainui Marsh and the 15-acre wildlife habitat and follow all the requirements for that zone.

4.2.13 Mitigation of Impacts from Increased Demand on Public Services

Potential environmental impact :

The activity generated by the proposed industrial development could burden the level of public service in the regions, especially be creating added demand on law enforcement, fire fighting services, health services, schools, day-care, and other services.

Proposed mitigation measures:

The following proposed measures would mitigate impacts on public service in the area:

- Use private security service on the site to reduce the risk of crime and necessary intervention or presence of police in the area;
- Use security fences and gates to lower criminal intention;
- Ensure constant surveillance of areas surrounding the proposed development;
- Improve traffic conditions in the vicinity of the proposed site to reduce the risk of traffic accidents and lower the need for police, fire and emergency medical services;
- Install high performance fire protection systems in the industrial warehouses (e.g. non-flammable building material, easily accessible portable fire fighting equipment, sprinkler systems) which would lower the risk of fire;
- Ensure an adequate fire fighting water system incorporating adequate quantity and pressures, a dedicated water supply main for fire fighting water, booster pumps, and fire hydrants;
- Promote local businesses from using the proposed industrial park in lieu of businesses that would attract increased influx of employees into the Koolaupoko area;
- Promote private day-care givers to offer services for employees of businesses which lease space in the proposed warehouse development

4.2.14 Mitigation of Impacts from Increase Demand for Telecommunication

Potential environmental impact :

The increased demand for telecommunication could burden the existing bandwidth capacity of communication infrastructure in the area.

Proposed mitigation measures:

The following proposed measures would reduce or eliminate impacts on communication infrastructure:

- Since the communication technology is advancing faster that the demand for wire-based communication no substantial bandwidth problems are anticipated for the proposed site;
- High capacity wireless networks are available in the area to augment wire-based bandwidth and customer comfort in the area.

4.2.15 Mitigation of Impacts by Using Sustainable Building and Operating Technologies

Potential environmental impact :

The proposed warehouse development would cause considerable impacts if it were built as a conventional warehouse development. Since the developers would seek certification under Leadership in Energy and Environmental Design (LEED) the warehouse park would be built and operated using a wide array of environmentally friendly and energy efficient technologies.

Proposed mitigation measures:

The proposed Kapa'a Light Industrial Park would use comprehensive mitigation efforts in accordance of LEED rating system for new construction. A list of suitable measures that would limit the ecological footprint of the proposed warehouse development is presented in Section One of this report.

4.2.16 Mitigation of Impacts on Kawainui Marsh

Potential environmental impact :

The proximity of the proposed site to the environmentally and culturally important Kawainui Marsh could create a impact potential. Since the proposed warehouse development would be built and operated using sustainable technologies a wide range of possible impacts could be effectively mitigated.

Proposed mitigation measures:

The following proposed measures would mitigate the main possible impacts on the Kawainui Marsh:

Water quality impacts: Use of BMPs (Best Management Practices) to significantly reduce peak stormwater runoff rates and associated runoff loading due to suspended solids, nutrients and other pollutants. Appropriate BMPs would include extended detention ponds, controlled release of the detained stormwater volume, pre-treatment units with catchment devices for the removal of a large portion of suspended sediments, all floatable debris, nutrients, and oil and grease. Mitigation measures would reduce the imperviousness within the development boundaries by increasing open space (pervious and vegetative space outside the development footprint), vegetative swales, rainwater harvesting for

irrigation and use of recycled wastewater and gray-water for irrigation, decreasing the amount of wastewater by water efficient fixtures.

Air pollution: The proposed Kapa'a Light Industrial Park would utilize passive and active measures to lower air pollution. Active mitigation would include to lower car emissions from cars and trucks by promoting low-emission or alternative fuel cars, regulate that no unnecessary idling of trucks and cars are allowed in the proposed industrial development, avoid the accumulation of dust in the park, keeping all equipment in the park in good working order to lower the emission in internal combustion engines or to create electricity used in the proposed park and promulgate to the occupants in the park the need and recommended measures to lower air emissions. Passive measures would include measures to attenuate the propagation of air pollution from the sources in the park to the adjacent areas. Examples would be the proposed extensive vegetative buffer zones around the proposed development.

Noise pollution: Noise pollution that impacts the Kawainui Marsh would be decreased by passive measures (e.g. orientation of warehouse openings away from the marsh) and active measures (sound insulation of noise equipment, acoustic barriers, noise dissipation walls and vegetative buffer zone). Noise levels in the areas adjacent to the proposed industrial park could be effectively mitigated by lowering the noise level at the sources and lower the noise propagation by appropriate means. The proposed vegetative buffer zones would be created around the entire proposed site. The planned vegetative buffer zones around the lower portion of the proposed site, which is closest to the Kawainui Marsh, would have denser and wider plantings than the buffer zones around the around the upper portion of the proposed site. At selected locations the noise mitigation measures would include more elaborate efforts, such as noise walls around the detached loading docks adjacent to the Kapa'a Stream corridor.

Light Pollution: Excessive outdoor lighting would be avoided that could directly shine into the Kawainui Marsh or that could significantly contribute to strong glare to be seen from the marsh. The lighting scheme of the industrial development within the lower portion of the proposed site would be developed in accordance to Lighting Zone LZ1 – "Dark" of the Illuminating Engineering Society of North America. The lighting requirements would call for low emitting lamps, full cut-off or shielded lamps to avoid light trespass into the adjacent areas, avoidance of light intensities that exceed the objective of lighting, timed and event controls of lighting, directing of lights on tasks to avoid glare and controlling lighting power of interior light with a direct line of sight to any opening in the envelope by a significant degree between a certain time of the night. External lighting would be directed on areas where light is needed and all excessive lights will be avoided or effectively shaded in regard to the wildlife sanctuary.

Visual Impact: The proposed development would use measures to hold reduce visual impact to a minimum. The exterior of the warehouses would be configured in such a way to lower the remote visual impact (e.g. appropriate exterior paint, vegetated roofs, green walls).

Vegetative buffer zone would be used to mitigate visual impact by planting a dens wind-break.

Traffic Impact: Following sustainable development approaches, the use of alternative transportation (e.g. public transportation, private shuttle, bicycles, carpools) would be encouraged. Portions of the roads that need upgrading due to high local traffic would be improved and increased for capacity.

4.2.17 Mitigation of Impacts from Flooding

Possible impact potential:

Some northern parts of the site around the mouth of the Kapa'a Stream are low lying and subject to perennial flooding.

Proposed mitigation measures:

The warehouses on the proposed site would be built outside flood zones designated with elevated flood occurrence.

4.2.18 Mitigation of Possible Growth Impacts in the Koolaupoko Region:

Potential impact:

The existing visions, policies and guidelines of the Koolaupoko region do discourage significant growth.

Proposed mitigation measures:

The proposed Kapa'a Light Industrial Park would be developed over an extended period, spanning approximately 16 to 18 years from start of development to completion of construction of all warehouses. This moderate pace of growth would mitigate social impacts of the proposed industrial development. If the consequences of the proposed warehouse development would require certain intervention, appropriate mitigation measures could be formulated and implemented at a later stage of the project, when the impacts can be better identified and mitigated with effective and appropriate measures.

4.2.19 Mitigation of Impacts on Cultural and Archeological Resources

Potential cultural Impact:

The presence of culturally important sites and gathering places would require respectful consideration for the design, construction and operation of the proposed warehouse development.

Proposed mitigation measures:

It was determined that no culturally important sites, gathering places and properties exist on the proposed site. The area that would serve as the site for the warehouses, roadways and ancillary facilities represent previously land that was heavily disturbed by quarry and landfill operations in the past fifty years. In the remote event that cultural sites or artifacts were discovered during the construction the following mitigating measures would be used:

- During construction an archeological expert would be kept on call.
- In the event that a cultural site or artifacts would be found, construction work would be halted to inform the State Office of Historic Preservation. The archaeologist, in close coordination with the agency and the community, would compile a preservation and monitoring plan to ensure that no adverse impact would affect cultural resources.

SECTION FIVE

RELATIONSHIP TO LAND USE PLANS POLICIES AND CONTROLS

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SECTION FIVE

RELATIONSHIP TO LAND USE PLANS POLICIES AND CONTROLS

The proposed Kapa'a Light Industrial Park would need to be consistent with the main principles of existing land use visions, policies and guidelines for Oahu and the Koolaupoko region. This section discusses to what degree the proposed Kapa'a Light Industrial Park would be consistent with the City and County of Honolulu General Plan and the Koolaupoko Sustainable Communities Plan.

5.1 State Land Use Districts

The proposed Land Use Zone Change would not require a change of State land Use Districts. All land that would be used for the proposed industrial development is presently located within the state's Urban district.

5.2 Compliance with General Plan

The five following sub-sections of the General Plan apply to commercial and industrial developments, such as the proposed Kapa'a Light Industrial Park. These sections discuss how the proposed Kapa'a Light Industrial Park would be consistent with such policies, visions and guidelines of the General Plan.

5.2.1 Consistency with Views and Policies of Economic Activity

Objective A To promote employment opportunities that will enable all the people of Oahu to attain a decent standard of living.

Policy 1: Encourage the growth and diversification of Oahu's economic base.
The proposed Kapa'a Light Industrial Park development would be consistent with this policy, since it would provide important infrastructure prerequisites for the growth and diversification of Oahu's economic base. The Koolaupoko region is significantly under supplied with industrial space. Employees and customers of businesses, which serve the windward region but cannot find leasable industrial in the Koolaupoko region, have to travel considerable distances to commute or visit these businesses in other parts of Oahu. Increased time and costs to travel and commute costs businesses, employees and customers valuable resources that could be saved if more leasable industrial space were available in the Koolaupoko area. The proposed Kapa'a Light industrial Park would alleviate the shortage of industrial space and would help to encourage growth and diversification.

Policy 2: Encourage the development of small businesses and larger industries, which will contribute to the economic and social well-being of Oahu residents.
The proposed Kapa'a Light Industrial Park development would be consistent with this policy, since it would provide ample opportunity specifically to small businesses and some larger businesses in the Koolaupoko area to develop and diversify. Industrial space in the Koolaupoko region is scarce and small and larger companies are hampered in their development by such shortages. Growing small companies from

Koolaupoko region can lack the resources required to incur logistical cost caused by the need to find industrial space outside of the region that they want to serve. Large companies could save on cost if they could locate service centers and base yards close to the customers in the Koolaupoko region, instead of incurring costs and time to drive from service centers and base yards outside of the region.

Policy 3: *Encourage the development in appropriate locations on Oahu of trade, communications, and other industries of a nonpolluting nature:*
The proposed Kapa'a Light Industrial Park development would be consistent with this policy, since it would provide an appropriate location for businesses and light industries developed on the premises of sustainable site and socially responsible development. The proposed Kapa'a Light Industrial Park would be built utilizing sustainable design, construction and operational methods, thereby decreasing emission that typically accompany such industrial activities. While the sustainable development approach would be initiated and administered by the developer, individual businesses would have to decide whether they would intend to align their businesses practices, products and services into a non-polluting. The fact that the Kapa'a Light Industrial Park would be developed in accordance to LEED and would, upon completion, apply to be LEED certified, would help to attract businesses who are environmentally aware and would also help businesses offer more environmentally friendly products and services.

Policy 4: *Encourage the development of local, national, and world markets for the products of Oahu-based industries.*
The proposed Kapa'a Light Industrial Park development would be consistent with this policy, since it would provide sufficient infrastructure and warehouse space for innovative businesses that can compete with products on the local, national and world market. The innovative nature of the development, using sustainable technologies and alternative energies promises to attract innovative thinking organizations.

Objective G: *To bring about orderly economic growth on Oahu.*

Policy 2: *Permit the moderate growth of business centers in the urban-fringe areas:*
The proposed Kapa'a Light Industrial Park development would be consistent with this policy, since it would provide the means for existing and new businesses to grow or to provide a better long-term basis for their businesses. The capacity of the proposed Kapa'a Light Industrial Park would be able to accommodate moderate growth. More important yet, the Kapa'a Light Industrial Park would be geared to provide the framework for a sustainable infrastructure to engage in entrepreneurial activities.

Policy 3: *Maintain sufficient land in appropriately located commercial and industrial areas to help ensure a favorable business climate on Oahu:*
The proposed Kapa'a Light Industrial Park development would be consistent with this policy, since it would provide space for commercial and light industrial activities to help

ensure a favorable business climate on Oahu. There is an urgent and significant need for quality industrial space in the Koolaupoko region. Industrial space, including industrial warehouses space, is lost in the Koolaupoko reghion due to changing land uses and rezoning. In addition, there are industrial warehouses now in use in the region, which are old and are not satisfying current demand for more modern and environmentally friendly facilities. Relocation of businesses and establishing new businesses in the new Kapa'a Light Industrial Park would help to create opportunities for businesses and the local community.

5.2.2 Consistency with Views and Policies of Natural Environment

Objective A: To protect and preserve the natural environment.

Policy 1: Protect Oahu's natural environment, especially the shoreline, valleys, and ridges, from incompatible development:
The proposed Kapa'a Light Industrial Park development would be consistent with this policy, since it would provide important light industrial infrastructure, which is developed in an environmentally and socially responsible manner. The location of and general approach of developing the proposed warehouse development with sustainable technologies would minimize impacts on the environment and community of the proposed warehouse park.

Policy 2: Seek the restoration of environmentally damaged areas and natural resources:
The proposed Kapa'a Light Industrial Park development would be consistent with this policy, since it would be built on land that has been significantly impacted by industrial activities over the past decades. The proposed development would improve an area that was formed by landfill many years ago. The proposed project would decrease harmful runoff and would actively engage in restoring natural resources. The developer has commenced the development of a 15-acre wildlife habitat on restored wetland within the Kapa'a Stream corridor. The proposed site of the habitat is entirely within the property on which the proposed industrial park would be built. The 15-acre wildlife habitat and wetland conservation program will provide a safe habitat for endangered water birds that live in the area in or around the Kawainui marsh.

Policy 3: Retain the Island's streams as scenic, aquatic, and recreation resources:
The proposed Kapa'a Light Industrial Park development would be consistent with this policy, since it would improve the runoff conditions and water quality of the Kapa'a Stream and would create additional aquatic wildlife habitat on lands adjacent to the future warehouse development. The development of the wildlife habitat adjacent to the proposed site would improve important wetland areas and replace invasive plants with native or adaptive plant species. The creation of ponds within the planned wildlife habitat would provide important improvements to the aquatic environment in the area. The developer will make the habitat accessible to groups of residents and visitors for

birdwatching thereby supporting environmentally responsible recreation and educational opportunities for residents and visitors.

Policy 4: *Require development projects to give due consideration to natural features such as slope, flood and erosion hazards, water- recharge areas, distinctive land forms, and existing vegetation:*
The proposed Kapa'a Light Industrial Park development would be consistent with this policy, since it would give due considerations to important natural features such as slope, flood and erosion hazards, water-recharge areas, distinctive land forms, and existing vegetation. The development of the Kapa'a Light Industrial park would follow LEED standards of environmentally friendly and energy efficient buildings.

The proposed project would give due consideration for the features mentioned above:

- Slope, flood and erosion hazards: All slopes in within the development area would be stabilized with appropriate means to avoid erosion. Flood exposure would be avoided since the development would be built outside areas with defined flood hazards;
- Water- recharge areas: The proposed development would endeavor to increase perviousness within the proposed site. All open space within the development would be pervious and vegetated. Rainwater harvesting would be done from all or a significant portion of the warehouse roof and the harvested rainwater would be used for irrigation (e.g. potable water would no longer be used for irrigation) and allow water recharging through infiltration;
- Distinctive landforms would be retained within the proposed site. The existing site is a landfill area that was formed about 30 – 40 years ago. The landfill area would be graded to create an attractive landscaped surface where there is exposed soil with signs of surface erosion at the present time;
- Existing vegetation would not only be conserved but vegetation on the site would be significantly improved by using native and adaptive plants for landscaping and open space restoration and eradicating the existing thick vegetation of invasive plant species.

Policy 6: *Design surface drainage and flood-control systems in a manner, which will help, preserve their natural settings.*
The proposed Kapa'a Light Industrial Park development would be consistent with this policy, since it would use an array of BMPs to create an advanced surface drainage and flood-control systems. The stormwater management system would include the following components:

- The portion of pervious areas would be maximized to the extent possible;
- All land outside the development footprint would be pervious area, stabilized with native of adaptive plants or other suitable final soil stabilization measures;
- While at the present impervious roadway pavement is considered for the roadways, impervious pavement would be used if this type of pavement could accommodate the heavy trucks inside the proposed development;

- All off-street parking spaces would be pervious to increase the amount of rainwater infiltration;
- All or a large portion of the impervious warehouse roofs would have rainwater harvesting. Harvested rainwater would be stored in underground cistern for subsequent use of irrigation; therefore converting impervious roof area to "semi-pervious area";
- All stormwater would be collected and conveyed to detention basins. No stormwater would be released directly to the receiving water without first flowing through detention ponds;
- Upstream of the detention basins the stormwater would flow through pre-treatment units where all floatable debris and a high portion of sediments, nutrients, and oil-grease contained in the stormwater would be removed from the stormwater;
- The stormwater would remain in the detention basins for flood control. The detained stormwater would released after the storm event to the receiving water in order to shave off high peak runoff flow rates which could result in erosion in the receiving waters;
- The type of detention pond used is an "extended" extension pond, which has treatment features to remove a significant portion of suspended solids and nutrients;
- The banks of the normally dry detention ponds would be planted with plants that can either live in a dry or wet environment.

<u>Policy 7:</u> *Protect the natural environment from damaging levels of air, water, and noise pollution:*

The proposed Kapa'a Light Industrial Park development would be consistent with this policy, since it would incorporate active and passive measures to limit air, water, and noise pollution. In particular, some examples of such effective measures would include:

- Landscaping with native or adaptive plants for all land outside the development footprint
- Using vegetative buffer zones around the development to limit air and noise pollution;
- Using other means to lower air pollution such as avoid unnecessary idling of engines, promoting low-emitting vehicles, promoting alternative transportation, and other measures;
- Using other means to lower noise pollution, both mitigating noise at the source and attenuating noise propagation;
- Implementing an advanced and highly effective stormwater management and treatment system for flood control, and effective removal of pollutants in stormwater;
- Implementing effective onsite wastewater treatment in the form of up to 18 new septic systems for the entire new development;

- Implementing an effective waste management plan to avoid disposal of wastewater that is not compatible with the onsite wastewater treatment systems (septic systems).

Policy 8: *Protect plants, birds, and other animals that are unique to the State of Hawaii and the Island of Oahu:.*
The proposed Kapa'a Light Industrial Park development would be consistent with this policy. The developer has started the development of a 15-acre wildlife habitat and wetland restoration project that is located within on of the land parcels that contain the sites of the proposed industrial development. The wildlife habitat will provide a secure living and nesting environment for endangered waterbirds. The habitat is being designed in accordance with design and construction standards administered by the Natural Resources Conservation Service (NCRS) of the U.S. Department of Agruculture. The habitat will have 6,000 linear feet of special wildlife fence to restrict the movement of non-native predators and will have several shallow ponds to create unique aquatic habitat conditions.

Policy 9: *Protect mature trees on public and private lands and encourage their integration into new developments:*
The proposed Kapa'a Light Industrial Park development would consistent with this policy, since efforts would be made to preserve mature trees on the proposed site. Mature trees are mainly located in the area surrounding the Kapa'a Stream but not on the area where the warehouses would be built. The area containing mature trees would not be negatively impacted by the new development, thus most of the mature tress would be preserved. In addition to conserving existing trees the proposed project would plant a significant number of trees in vegetative buffer zones around the proposed development. The vegetative buffer zones would feature native or adaptive plants and would have densely planted wind-breaks to provide effective mitigation against noise pollution, air pollution and visual impact (including light pollution).

Policy 10: *Increase public awareness and appreciation of Oahu's land, air, and water resources.*
The proposed Kapa'a Light Industrial Park development would be consistent with this policy, since the proposed development would be designed and built based on sustainability concepts and since a wildlife habitat will be built and maintained adjacent to the new industrial development. It is planned that conservation groups from the region would cooperate with the industrial park operator in the operation and maintenance of the wildlife habitat . The developer will provide access and opportunities for birdwatching. Therefore the habitat would create most likely nature education and birdwatching opportunities to the public.

Objective B: *To preserve and enhance the natural monuments and scenic views of Oahu for the benefit of both residents and visitors.*

Policy 1: *Protect the Island's well-known resources: its mountains and craters; forests and watershed areas; marshes, rivers, and streams; shoreline, fishponds, and bays; and reefs and offshore islands.*
The proposed Kapa'a Light Industrial Park development would be consistent with this policy, since it would be developed using a wide range of mitigation measures to protect adjacent forests and watershed areas; marshes, rivers, and streams. The Kawainui Marsh, which is located adjacent to the proposed development would benefit from the new development through an improved upstream watershed and water quality of the Kapa'a Stream, achieved by the comprehensive stormwater management system, which would improve the present water quality impacts of the present site configuration. Erosion control measures used in the proposed project would decrease the amount of erosion. The detention ponds of the proposed development would regulate the storm-water discharge by retaining water in the soil and in the ponds. The wildlife habitat on restored land upstream of the marsh would add to the bio diversity of the area.

Policy 2: *Protect Oahu's scenic views, especially those seen from highly developed and heavily traveled areas:*
The proposed Kapa'a Light Industrial Park development would be consistent with this policy, since it would utilize measures to protect scenic views. The new warehouses would be built in an attractive style that blends into the surrounding area. Trees and an attractive landscaping would be planted in the open areas of the development. External lighting would be carried out in a way to avoid light pollution and help preserve enjoyment of our beautiful night sky. The proposed project would be planned in an area where previous industrial activities have changed the appearance of the Kapa'a valley. In contrast to the existing industrial uses in or adjacent to the Kapa'a Valley, the proposed development would greatly improve mitigation against visual impact.

Policy 3: *Locate roads, highways, and other public facilities and utilities in areas where they will least obstruct important views of the mountains and the sea:*
The proposed Kapa'a Light Industrial Park development would be consistent with this policy, since it would not impede important views of the mountains and the sea.

Policy 4: *Provide opportunities for recreational and educational use and physical contact with Oahu's natural environmental.*
The proposed Kapa'a Light Industrial Park development would be consistent with this policy, since it would provide educational opportunities about environmentally friendly commercial and industrial developments. The 15-acre wildlife habitat that will be developed on restored wetland within the Kapa'a Stream corridor, adjacent to the proposed site, will provide educational opportunities through local conservation groups, which maintain will work with the developer to maintain the habitat. The

developer will provide access to the habitat through one or more viewing sites, which can be accessed through the roadways of the proposed industrial development. Therefore the general public would have recreational opportunities through bird watching and the enjoyment of a secure living and nesting habitat for endangered waterbirds.

5.2.3 Consistency with Views and Policies of Transportation & Utilities

Objective A: To create a transportation system which will enable people and goods to move safely, efficiently, and at a reasonable cost; serve all people, including the poor, the elderly, and the physically handicapped; and offer a variety of attractive and convenient modes of travel.

Policy 9: Promote programs to reduce dependence on the use of automobiles:
The proposed Kapa'a Light Industrial Park development would be consistent with this policy, since the sustsinable development approach would promote the use of alternative transport modes. Alternative transport would include public transportation, private shuttles, bicycles, car pools, and other measures. Preferred parking would be offered for car pools and low-emitting vehicles. There would be secured bicycle racks and a locker-shower opportunity for bicycle users. At the present there are no concrete plans to extend TheBus service to the proposed site. The use of bicycles on the Kapa'a Quarry Road is far from safe and secure and a dedicated combined pedestrian and bikeway would be beneficial to create good traffic conditions for bicyclists and pedestrians. The developer would support plans to build the proposed Kawainui Marsh perimeter bikeway / walkway, since the masterplan of the perimeter path calls for construction of a section of the path on property belonging to the developer. Portions of this proposed Kawaiinui Marsh Perimeter Pathway could be used to safely and comfortably reach the project site from Mokapu Boulevard and Kalanianaole Highway.

Objective B: To meet the needs of the people of Oahu for an adequate supply of water and for environmentally sound systems of waste disposal.

Policy 3: Encourage the development of new technology, which will reduce the cost of providing water and the cost of waste disposal:
The proposed Kapa'a Light Industrial Park development would be consistent with this policy, since the proposed development would actively engage in incorporating new technology that reduces costs of water usage, as well as lowering the cost of waste disposal through recycling measures. The proposed industrial development would make extensive use of harvested rainwater for irrigation and other applicable non-potable applications. Rainwater harvesting in concert with use of high efficiency toilets, urinals and fixtures offer a significant technology solution to reduce water consumption.

Policy 4: *Encourage a lowering of the per-capita consumption of water and the per-capita production of waste.*
The proposed Kapa'a Light Industrial Park development would be consistent with this policy, since it would actively incorporate measures to lower the water consumption and would lower water consumption by recycling water and harvesting rainwater that can be used for irrigation or other grey water applications.

Policy 5: *Provide safe, efficient, and environmentally sensitive waste-collection and waste-disposal services:*
The proposed Kapa'a Light Industrial Park development would be consistent with this policy, since it would incorporate safe, efficient, and environmentally sensitive waste-collection and waste-disposal services. The proposed industrial park would implement a comprehensive waste management plans that would include construction waste management, material reuse, recycled content of both pre- and post consumer contents, preferred use of regional material, rapid renewable material and certified woods. These measures would be promoted under the LEED project approach of sustainable design, construction and operation.

Policy 6: *Support programs to recover resources from solid-waste and recycle wastewater.*
The proposed Kapa'a Light Industrial Park development would be consistent with this policy, since it would implement and maintain comprehensive waste management and recycling content programs.

Policy 7: *Require the safe disposal of hazardous waste.*
The proposed Kapa'a Light Industrial Park development would be consistent with this policy, since it would safely collect and dispose of any hazardous waste.

Objective C: *To maintain a high level of service for all utilities.*

Policy 1: *Maintain existing utility systems in order to avoid major breakdowns:*
The proposed Kapa'a Light Industrial Park development would be consistent with this policy, since it would implement and maintain, in good working order, all utilities in the proposed development. Implementation of energy savings and on-site photovoltaic electricity generation would reduce the baseline energy demand and in particular peak demand, thus mitigating system breakdown. Implementation of water saving products and management measures would significantly lower water consumption and preserve the existing infrastructure. Onsite wastewater treatment would provide effective treatment of sewage and avoid discharge of wastewater from the proposed development to municipally wastewater treatment plants in Kailua or Kaneohe.

Policy 4: *Increase the efficiency of public utilities by encouraging a mixture of uses with peak periods of demand occurring at different times of the day:*
The proposed Kapa'a Light Industrial Park development would be consistent with this policy, since it would incorporate load management technology to decrease peak electricity demand or to flatten out the peak demand curve over the day. In addition,

the proposed development would incorporate renewable heat recovery or electricity generation by photovoltaic in order to lower peak demand.

Objective D: To maintain transportation and utility systems, which will help Oahu, continue to be a desirable place to live and visit.

Policy 5: Require the installation of underground utility lines wherever feasible:
The proposed Kapa'a Light Industrial Park development would be consistent with this policy, since it would place all utilities underground within the proposed site.

5.2.4 Consistency with Views and Policies of Energy

Objective A: To maintain an adequate, dependable, and economical supply of energy for Oahu residents.

Policy 1: Develop and maintain a comprehensive plan to guide and coordinate energy conservation and alternative energy development and utilization programs on Oahu:
The proposed Kapa'a Light Industrial Park development would be consistent with this policy, since it would support active and passive energy conservation. The proposed development would utilize state-of-the-art energy conservation technology and measures to lower baseline and peak demand in the proposed development. A portion of the electricity demand would be generated using on-site renewable energy systems. The project development of the proposed industrial park would follow LEED standards for sustainable development, which requires energy savings and promotes high energy efficiency standards that are beyond efficiency targets for conventional developments.

Policy 2: Establish economic incentives and regulatory measures, which will reduce Oahu's dependence on petroleum as its primary source of energy:
The proposed Kapa'a Light Industrial Park development would be consistent with this policy, since it would promote the use of renewable energies and therefore help to reduce energy demand that is primarily based on petroleum fuel. The proposed development would promote energy efficiency that would consume electricity at levels that is far below design baseline performance prescribed in conventional building codes. At present about 80 percent of Hawaii's electricity is made fro petroleum. Effective energy savings therefore helps reducing Hawaii's dependency on petroleum. The proposed development would install a significant amount of photovoltaic panels on rooftops to generate electricity that is either used by the warehouses on site or is net-metered.

Policy 3: Support programs and projects, which contribute to the attainment of energy self-sufficiency on Oahu.

The proposed Kapa'a Light Industrial Park development would be consistent with this policy, since it would incorporate energy generation technology to provide electrify, heat and cooling from renewable or indigenous resources.

Policy 5: *Give adequate consideration to environmental, public health, and safety concerns, to resource limitations, and to relative costs when making decisions concerning alternatives for conserving energy and developing natural energy resources.*
The proposed Kapa'a Light Industrial Park development would be consistent with this policy, since it would strive to make required capital investments to use energy efficiently and to supply the proposed development with energy derived from renewable energy sources. The integrated LEED project development approach stresses a triple bottom-line to promote the economy, social responsibility and environmental stewardship. .

Objective B: *To conserve energy through the more efficient management of its use.*

Policy 1: *Ensure that the efficient use of energy is a primary factor in the preparation and administration of land use plans and regulations.*
The proposed Kapa'a Light Industrial Park development would be consistent with this policy, since it would follow the LEED project development approach and would make energy efficiency and renewable energy important design and development goals. Since LEED project certification involves a third party review process the public can be assured that energy efficiency and savings would be part of proposed industrial warehouse development. Energy efficient performance under a certain building energy consumption baseline is a prerequisite for all projects that want to achieve LEED certification.

Policy 2: *Provide incentives and, where appropriate, mandatory controls to achieve energy efficient siting and design of new developments:*
The proposed Kapa'a Light Industrial Park development would be consistent with this policy, since it would incorporate energy efficiency in the proposed development as per LEED project development approach. The sustainable building and site development standards of LEED entail the completion all or many of the following credits:

- Commissioning of building energy systems to increase energy efficiency
- Minimum energy performance
- Refrigeration management by avoiding or phasing out CFCs (Chlorofluorocarbons) and using environmentally friendly refrigerants
- Optimize energy performance
- Onsite renewable energy
- Measurement and verification of building and tenants
- Promoting green power applications

Policy 3: *Carry out public, and promote private, programs to more efficiently use energy in existing buildings and outdoor facilities:*
The proposed Kapa'a Light Industrial Park development would be consistent with this policy, since it would not only equip new warehouses with energy efficient technology, but would also convert existing buildings to be more energy efficient.

Policy 4: *Promote the development of an energy-efficient transportation system:*
The proposed Kapa'a Light Industrial Park development would be consistent with this policy, since it would encourage car-pooling and other means of alternative transportation for the users and employees of the proposed warehouse development. The proposed development would provide bicycle friendly infrastructure with bike racks and locker & shower facilities, which would encourage bicycle usage. Preferred parking would be offered for carpools and for high efficiency and alternative fuels cars. The developer would promote extension of public transportation to the proposed site; although at the moment such extension is not planned by the City & County traffic authorities. In the event that no public transportation would be offered to the serve the proposed site with public transportation, the developer plans to offer private shuttle service at a point in the development, when enough demand is being developed by businesses in the light industrial park.

Objective C: *To fully utilize proven alternative sources of energy.*

Policy 1: *Encourage the use of commercially available solar energy systems in public facilities, institutions, residences, and business developments.*
The proposed Kapa'a Light Industrial Park development would be consistent with this policy, since it would actively promote and install commercially available solar energy systems. In addition to photovoltaic energy generation selected warehouses would be equipped with solar hot water collectors for potable water needs and/or adsorption chillers, if such energy efficient HVAC system would be used.

Policy 2: *Support the increased use of operational solid waste energy recovery and other biomass energy conversion systems.*
The proposed Kapa'a Light Industrial Park development would be consistent with this policy, since it could implement a comprehensive waste management plan, which would include recycling of glass, metal, paper, cardboard and plastic as well as composting of some organic waste. The recycled combustible content (e.g. plastic, paper, cardboard) could be converted to energy in dedicated public facilities. The organic biomass could be composted onsite and reused, thereby reducing the energy footprint of the proposed development.

Objective D: *To develop and apply new, locally available energy resources.*

Policy 1: *Support and participate in research, development, demonstration, and commercialization programs aimed at producing new, economical, and environmentally sound energy supplies from:*

a. *Solar insolation;*
b. *Biomass energy conversion;*
c. *Wind energy conversion;*
d. *Geothermal energy; and*
e. *Ocean thermal energy conversion.*

The proposed Kapa'a Light Industrial Park development would consistent with this policy, since it would seek to attract companies that develop, build and sell innovative energy technology. In addition, the proposed development would make efforts to attract pilot installation of innovative energy conversion technology. Onsite renewable energy is a design goal of the LEED project development.

Objective E: *To establish a continuing energy information program.*

Policy 1: *Supply citizens with the information they need to fully understand the potential supply, cost, and other problems associated with Oahu's dependence on imported petroleum:*
The proposed Kapa'a Light Industrial Park development would be consistent with this policy, since it would make efforts to engage the users of the park to increase the portion of renewable energy resources and save energy (thus avoiding the use of petroleum derived energy)

Policy 2: *Foster the development of an energy conservation ethic among Oahu residents:*
The proposed Kapa'a Light Industrial Park development would be consistent with this policy, since it would actively engage the users of the park to use energy efficiently. The proposed warehouse development would be a "living proof" that energy conservation and enhanced business activities are not exclusive propositions. The proposed industrial development could publicly promote responsible energy use and would therefore offer valuable "real life" application knowledge of energy efficiency, energy saving strategies and renewable energy applications. Sharing of energy and water consumption data is a pre-requisite of a LEED certified development. The proposed industrial development would have a web site, which could promulgate energy and water consumption data.

Policy 3: *Keep consumers informed about available alternative energy sources and their costs and benefits:*
The proposed Kapa'a Light Industrial Park development would be consistent with this policy, since it would engage users of the park about using renewable energy resources. The proposed industrial development would encourage businesses, which lease space in the proposed park, to publish their energy efficiency programs or inform their customers in another way about their energy strategies.

Policy 4: Provide information concerning the impact of public and private decisions on future energy use:
The proposed Kapa'a Light Industrial Park development would be consistent with this policy, since it would encourage participation in energy issues of users of the propose warehouse park, which are not only relevant to the warehouses but also a broader public interest.

5.2.5 Consistency with Views and Policies of Public Safety

Objective A: To prevent and control crime and maintain public order.

Policy 1: Provide a safe environment for residents and visitors on Oahu:
The proposed Kapa'a Light Industrial Park development would be consistent with this policy, since it would provide a safe environment for the users and visitors of the proposed warehouse development. It is anticipated that the constant presence of security measures and private security patrols would decrease any possible criminal activities in the areas adjacent to the proposed site.

Policy 5: Establish and maintain programs to encourage public cooperation in the prevention and solution of crimes:
The proposed Kapa'a Light Industrial Park development would be consistent with this policy, since it would actively work with users of the park in the prevention of crime. It is anticipated that the development of the proposed warehouse park would lower the incidence of crime in the area since improved security on the proposed site would also positively impact adjacent areas.

Objective B: To protect the people of Oahu and their property against natural disasters and other emergencies, traffic and fire hazards, and unsafe conditions.

Policy 1: Keep up-to-date and enforce all City and County safety regulations:
The proposed Kapa'a Light Industrial Park development would consistent with this policy, since it would enforce all City and County safety regulations as well as additional safety regulations implemented by the users.

Policy 2: Require all developments in areas subject to floods and tsunamis to be located and constructed in a manner that will not create any health or safety hazard:
The proposed Kapa'a Light Industrial Park development would be consistent with this policy, since all buildings would be located outside high-risk flood zones and the buildings would be constructed in such a manner to not create any health or safety hazards.

Policy 6: Reduce hazardous traffic conditions:
The proposed Kapa'a Light Industrial Park development would be consistent with this policy, since all private roads and intersections with public would be constructed and maintained in such a manner to reduce hazardous traffic conditions.

Policy 7: Provide adequate fire protection and effective fire prevention programs:
The proposed Kapa'a Light Industrial Park development would be consistent with this policy, since effective fire prevention and protection would be implemented, such as adequate fire water supply, fire water booster pumps, preference to fire resistant construction materials, dedicated fire accesses to the buildings and comprehensive fire prevention instructions.

5.3 Consistency with Koolaupoko Sustainable Communities Plan

This section discusses how the proposed Kapa'a Light Industrial Park would support the visions, guidelines and planning principles set forth in the Koolaupoko Sustainable Communities Plan.

5.3.1 Consistency with the Role of Koolaupoko on Oahu

The Koolaupoko Sustainable Community Plan calls for sustaining quality of life in the region by balancing and integrating environmental, economic, social and cultural objectives. The proposed Kapa'a Light Industrial Park would positively affect economic and social aspects in the region, while providing an attract place of operation for commercial and light industrial businesses that would be environmentally friendly and respectful to cultural concerns and the natural surrounding.

Goals for the future land use the Koolaupoko region are shaped by the regions role to provide only minor population growth, while future significant residential growth is directed instead to Oahu's Primary Urban Center and Ewa Development Plan Areas in accordance the General Plan. The future role of the Kapa'a Light Industrial Park would be to attract beneficial new employment opportunities for residents of the Koolaupoko regions, while providing modern and environmentally friendly warehouse space for light industrial and commercial uses in the region, in order to mitigate a growing shortfall for warehouse space.

It would not be the goal of the proposed Kapa'a Light Industrial Park to attract significant growth of economic activity and employment. Rather, the primary business goal of the proposed Kapa'a Light Industrial Park would be contributing to the revitalization of the commercial base of the Koolaupoko region by providing much needed modern warehouse space that is built, equipped and operated in an environmentally friendly and energy efficient manner.

As was identified in the market study of this Final EA, the Koolaupoko region is presently significantly undersupplied with industrial space. Compared to the average per capita allowance of industrial space on Oahu, the Koolaupoko region only provide 21 percent of the average per

capita allowance at the present time. Adding the planned 660,000 square feet of gross leasable space of the proposed development to the industrial space supply in the Koolaupoko region would result in an approximately 35 percent of per capital allowance compared to the Oahu average. The market study suggested that the entire 660,000 square feet of leasable area would be introduced at a pace that conforms to the ability of the region to absorb the increased industrial space. It is assumed that the Koolaupoko region could absorb the planned industrial area within a development time frame of 16 to 18 years.

The proposed Kapa'a Light Industrial Park would be the expansion of an already existing industrial warehouse complex. The proposed expansion of the development is not a brainchild of "foreign" developers, who have identified the land adjacent to the Kauainui Marsh for a significant commercial project. The proposed development is a "local" initiative, initiated by "local" developers rooted in the community and directed to benefit the local community.

5.3.2 Consistency with the Visions of the Sustainable Community Plan

The vision of the Koolaupoko Sustainable Community Plan is the long-term protection of community resources and its residential character as well as the adoption of improvement and developments that reflect a stable population. The two cornerstones of the plan are protecting community resources and providing improved infrastructure to serve changing needs of the population.

The first cornerstone of the plan requires the preservation, conservation, and enhancement of the region's resources, which are:

1. Natural and scenic resources
2. Cultural and historical resources
3. Agricultural resources
4. Residential environmental of neighborhoods

The proposed Kapa'a Light Industrial Park would engage the first two resource categories of the above list, namely natural and scenic resources and cultural and historical resources. The area in the Kapa'a Valley is not in agricultural use and is not adjacent to residential neighborhoods. Appropriate measures for the design, construction, outfitting and operation of the industrial warehouse development would be applied to effectively protect important community resources.

The second cornerstone of the plan, calls for improved infrastructure to serve the changing needs of the population in the region. The proposed Kapa'a Light Industrial Park would provide urgently needed industrial space and modern, environmental friendly and efficient energy warehouses. Both environmental protection and an efficient and responsible use of energy are increasingly important and fundamental challenges for Hawaii.

Key elements of the vision, policies and guidelines for Koolaupoko futures, which are applicable to the proposed Kapa'a Light Industrial Plan, are as follows.

The concept of "ahupua'a" in land use and natural resource management: Ahupua'a refers to the old Hawaiian principle that the land provides abundantly only when revered as a unique entity stretching from the mountains to the ocean. All elements in the stream of natural abundance must contribute to the health of ahupua'a. Therefore any development in the ahupua'a will affect its viability. The proposed Kapa'a Light Industrial Park would therefore contribute by being developed in manner that is respectful to the land, limits its emissions to a minimum and consumes as little resources and in the most responsible manner as possible. Being located adjacent and upstream of the important Kawainui Marsh, the proposed industrial warehouse development would contribute to the health of the Kapa'a Stream by discharging only stormwater that has passed through a comprehensive stormwater management system that removes a significant portion pollutants and provides flood control. The developer contributes to a health Kapa'a Valley by developing a wildlife habitat on restored wetlands in the lower reaches of the Kapa'a Stream corridor.

Preserve and promote open space throughout the region: The proposed Kapa'a Light Industrial Park would be developed while leaving large areas within the three land parcels, which would contain the proposed site, as open spaces. The LEED project development approach embraces open space design and the developers have made a commitment to create and maintain open space on the proposed site. A 15-acre wildlife habitat and wetland restoration is under development at the present time. The wetland restoration will restore wetland area that is presently overgrown by invasive species and will replace vegetation in the Kapa'a Stream corridor with native and adaptive plants that promote indigenous wetland conditions. The proposed site would be surrounded by vegetative buffer zones comprised of dense planted shrubs and trees, establishing dense wind-breaks that could effectively mitigate noise, air pollution and visual impacts. The vegetative buffer zones would be open spaces that could serve as habitat for native wildlife.

Enhance existing commercial and civic districts; The proposed Kapa'a Light Industrial Park would be the expansion of an already existing warehouse development. While the present warehouse development represents a groups of individually designed and erected buildings, the future industrial warehouse development would be a consistently planned development, that would contain modern environmentally friendly and energy efficient warehouses.

5.3.3 Consistency with Land Use Policies, Principles and Guidelines

The relevant commercial and industrial activities that would define the land use of the proposed warehouse park would include service companies, light industrial activities and storage facilities. According to the Sustainable Communities Plan it is encouraged to satisfy evolving infrastructure needs for certain commercial and light industrial uses in the regions. The plan contends that the anticipated demand for industrial space in the region should be accommodated by existing industrial zones in the Kailua, Kaneohe and in the Kapa'a area, with the latter being a portion of the proposed Kapa'a Light Industrial Park that is already in operation at the present time.

The market study of the Final EA has determined that the demand for industrial space cannot be satisfied by existing industrial zoned land within the Koolaupoko region. At present the Koolaupoko region is significantly undersupplied with industrial space when compared to the average Oahu supply of industrial space. The per capita industrial space allowance in the Koolaupoko region is presently only 21percent of the average Oahu allowance. Another factor to be considered is that over the next years it can be anticipated that more and more industrial zoned land is being lost due to re-zoning and new developments on this land that is not industrial in nature. Recent significant increases in demand for commercial warehouse space and the limitation of expansion of existing, often old warehouse space in Kailua and Kaneohe make the proposed expansion of the commercial warehouse development in Kapa'a valley an urgent infrastructure need. The proposed Kapa'a Light Industrial Park would therefore be consistent with land use policies and guidelines of the Koolaupoko Sustainable Communities Plan.

General Policies indicate that light and extractive industry activities in the Kapa'a Valley are accepted land uses. Therefore the proposed Kapa'a Light Industrial Park would be consistent with future land use plans in the region.

Applicable Planning Principles of the Sustainable Community Plan would be consistent with the proposed Kapa'a Light Industrial Park, such as:

- The proposed park would promote alternative modes of transportation, such as bicycles uses and car-pooling. Though at the moment the site is not served by public transportation, the developer of the proposed warehouse park would promote some form of public transportation or private shuttles to serve the expanded industrial development in the futures.
- The buildings in the proposed commercial warehouse development would be built in such a manner to respect the natural surroundings.
- Landscaping features would use open spaces between the building and would use native and adaptive plants, which offer many advances over other plants, such as less irrigation requirements, less fertilizer, less maintenance, et cetera.
- The development approach of the proposed industrial development would be consistent with the demand for energy efficiency and resource conservation by promoting the use of alternative energy as well as implementing comprehensive energy efficiency measures. Water conservation would be promoted by use of appropriate water efficient fixtures (e.g. fixtures certified under the EPA WaterSense program) use of harvested rainwater for irrigation and more water efficient landscaping (e.g. plants that need less irrigation water, water efficient irrigation technology). The proposed development would establish comprehensive waste management programs during construction and normal operation that would include recycling and other sustainable waste reduction, use and reuse measures.
- The site of the proposed Kapa'a Light Industrial Park is composed of presently large areas of fill material from former quarry operations. Plans for restoring these areas of the site are consistent with the planning principles of the Sustainable Communities Plan,

which call for suitable depth of topsoil to establish plant material similar to that in the surrounding area.

The following planned measures of the proposed Kapa'a Light Industrial Park would be consistent with the Implementation Guidelines for light and extractive industry, set forth in the Koolaupoko Sustainable Community Plan, such as:

Visual Screening, Lighting and Signage:

- Noise and other adverse impacts from parking, loading and service areas would be buffered from adjacent wildlife preserves and public roads by an appropriate combination of vegetative buffer zones, landscaped setbacks other mitigation measures (e.g. sound barriers)
- Visual impact from large buildings and solid walls would be mitigated by landscaping to soften the appearance of buildings and by the installation of "green walls".

Drainage and Waste Material:

- A comprehensive stormwater management plan would mitigate impacts from runoff volumes from the site and from pollutants contained in the runoff. The stormwater management plan would contain a wide range of Best Management Practices (BMPs), such promoting infiltration of rainwater, collecting all stormwater in detention ponds for release into receiving waters after the storm event and removing at least 80 percent of main pollutants from the stormwater before discharge to the receiving waters. Wherever possible (e.g. loading requirements for heavy vehicles might exclude the use of pervious pavement) traffic surfaces, including parking areas, would be created as pervious areas, rather than using impervious roadway pavement. With the installation of the comprehensive stormwater management system of the proposed development the would be no direct discharge of stormwater runoff into receiving water such as adjacent wildlife preserves, streams or sanitary sewage systems;
- Leachate from underground storage tanks, if any, would be avoided by appropriate measures. Leachate from fill material, as currently happens, would be avoided by collecting the stormwater runoff into suitable detention basins and treating it efficiently before discharging it into the receiving waters;
- Litter and other waste material would be prevented from encroaching into adjacent sites through the use of landscaping as well as proper maintenance of the site.

5.3.4 Consistency with Infrastructure Policies and Principles

The proposed Kapa'a Light Industrial Park would be consistent with the following policies and principles in regard to public infrastructure.

Water system development: The general policies on conserving precious water resources would be adopted through planned design and operational measures:

- The sustainable development plan of the proposed industrial park calls for significant water savings, most likely in the order of 30 to 50 percent savings compared to conventional industrial developments with irrigation needs;
- The proposed development would install only water efficient fixtures such as certified under the EPA (including low-flush toilets, waterless urinals, flow constrictors and other water conserving devices);
- Native and adaptive plants would be used for landscaped areas; drip irrigation would be used, where applicable; rainwater harvesting and the use of recycled non-potable water would be used for irrigation, in lieu of potable water;

Wastewater treatment systems: The proposed Kapa'a Light Industrial Park would endeavor to minimize wastewater discharge in order to conserve natural resources and to alleviate current capacity problems of public wastewater systems.

The proposed development would be consistent with the following General Policies:

- Within the newly developed area wastewater effluent would be treated and recycle, where feasible, as a water conservation measure. The extent of wastewater recycling would be contingent on technology and other regulator aspects;
- The proposed on-site treatment of wastewater would be consistent with the requested delay of further sewer connections in Kailua;
- The reduced water use in toilets, urinals and other blackwater sources would result in less wastewater generated on the site and a reduced volume of wastewater to be treated.

The proposed development is consistent with the following Planning Principles and Guidelines:

- The proposed development would use recycled wastewater for the purpose of irrigation, provided these uses conform with State's rules and guidelines for the treatment and use of recycled water;
- Berms or other suitable landscape elements would be used, where applicable and necessary from the design, as a buffer between on-site wastewater treatment system and adjacent buildings on the property. The appropriate configuration of buffer zones would be determined in the phased design phases on the development.

Electrical and communication systems: The proposed development of the Kapa'a Light Industrial Park would be consistent with the applicable guidelines:

- Electrical and communication cables in the proposed development would be placed underground within the proposed development footprint,
- The proposed development would encourage and implement significant energy conservation and saving measures as well as on-site electricity generation (by renewable means); therefore, additional electrical grid capacity required by the proposed industrial development would be reduced;
- With innovations in the communication technology, no major additions of communication assets would be anticipated for the proposed development.

Solid Waste handling and Disposal: The anticipated waste management of the proposed Kapa'a Light Industrial Park would be consistent with the demanded general policies of the Koolaupoko Sustainable Communities Plan, regarding to waste reduction, re-use and recycling as well as the efficient disposal of waste.

- The design, construction and operational approach of the proposed development would follow LEED project development standards. Since the proposed industrial development will be developed in accordance with the LEED rating system for new construction implementation of energy efficient site development and technology is a requirement. The proposed development would be developed with a much high energy saving target.
- The proposed industrial development would actively engage in significant efforts to reduce and reuse solid waste. All or some of the following waste mitigation measures would be implemented by the proposed development, construction waste management, materials reuse, recycled content, regional material, rapidly renewable materials, certified wood.

Drainage systems: The sustainable development approach of the proposed Kapa'a Light Industrial Park would be consistent with drainage related policies of the Koolaupoko Sustainable Communities Plan. Due to the proximity and upstream location to important wetland area (e.g. Kawainui Marsh), the proposed development would implement and operate a comprehensive stormwater management system to mitigate all possible adverse drainage effects. In an effort to restore important wetland areas, which are contributors for an effective and environmentally friendly drainage system, the developers of the future Kapa'a Light Industrial Park are committed to create a wildlife habitat on open space within two of the three contiguous land parcels, which would be used for the site of the proposed industrial development.

The planned stormwater management and drainage system for the proposed Kapa'a Light Industrial Park is consistent with the following general policies and planning principles:

- The planned drainage system design would promote control and minimization of non-point source pollution and the retention of storm water on-site and in wetlands; the proposed system would collect all stormwater runoff from impervious surfaces and convey it to extended detention ponds where they are temporarily retained and then released after the storm event;
- A comprehensive drainage study of local flooding and drainage problems has been developed for the proposed site. All developed areas of the proposed commercial park would be outside the Kapa'a Stream set-back. This ensures that the natural drainage capacity of the Kapa'a Stream would not negatively affected by the development;
- Stormwater is recognized as an important source of non-potable water that should be retained for recharge of the aquifer rather than quickly moved to coastal waters. The planned drainage strategy would collect stormwater in detention ponds and releasing it in a controlled way. Stormwater would also be harvested from the roof areas of warehouses, stored in underground cistern and subsequently used for irrigation and, if possible, other graywater applications;
- The proposed development would promote infiltration of rainwater through natural and developed vegetated open space as the preferred solution to drainage problems

wherever these measures can be applied. The proposed development would implement structural and operation measures to control non-point source pollutants.

- The proposed development would utilize several stormwater detention basins of different sizes for gradual release of retained stormwater into the receiving waters.

Urban Design features:
It is recognized that the physical appearance or "design" of appurtenances comprising the infrastructure, individually and collectively, impact and influence the physical appearance of the community where they are located. The development approach of the proposed industrial development would to use the type of design features, building materials, layouts and operational measures that would positively affect the appearance of the proposed development. Examples of mitigation of visual impact are the vegetative buffer zones, significant planting of trees within the industrial development, green walls around selected building and the avoidance of light pollution emanating from the proposed the site. The proposed Kapa'a Light Industrial Park would therefore be consistent with the planning principles and guidelines for urban design of the Koolaupoko Sustainable Community Plan.

5.4 County Zoning

The development of the proposed Kapa'a Light Industrial Park would require a zone change for two of the three land parcels from General Preservation District (P-2) to Intensive Industrial District (I-2). The intended land uses of the proposed Kapa'a Light Industrial are industrial uses and warehousing, which would be a permitted land use within the Intensive Industrial District (I-2). Likely uses for the planned light industrial space within the proposed Kapa'a Light Industrial Park would include the following (these uses are "permittable and possible" within the I-2 land use zone, either they these land sues permitted or would have to receive conditional of special permits).

- Automobile sales, rentals, and servicing services
- Automobile service stations
- Base yards
- Contracting, home improvement and furnishing services
- Data processing facilities
- Home improvement centers
- Laboratories, medical
- Manufacturing, processing and packaging
- Offices, accessory (Note**)
- Photographic processing
- Sale and service of machinery used in agricultural production
- Sawmills
- Self-storage facilities
- Storage and sale products essential to agricultural production
- Warehousing

- Wholesaling and distribution

(Note **) indicates that offices are only allowed in a supporting function that are part of an allowed use and no stand-alone office space would be allowed.

The City and County of Honolulu Land Use Ordinance describe permitted uses for different land use designations. Permitted uses for I-2 and P-2 zone designations are presented in Table 5-1.

Table 5-1 Permitted Land Uses in I-2 and P-2 Districts

Key of Land Use, as defied in Land Use Ordinance of the City and County of Honolulu, Chapter 21 of Revised Ordinances of Honolulu.

Land Use KEY:

Ac = Special accessory use subject to standards in Article 5
Cm = Conditional Use Permit-minor subject to standards in Article 5; no public hearing required (see Chapter 21, Article 2 for exceptions)
C = Conditional Use Permit-major subject to standards in see Chapter 21, Article 5; public hearing required
P = Permitted use
P/c = Permitted use subject to standards in Chapter 21, Article 5
PRU = Plan Review Use

Table 5-1 Permitted Land Uses in I-2 and P-2 Districts

Land Use Description	Land Use Key	
	P-2	I-2
Agriculture		
Agricultural products processing, minor		P/c
Agricultural products processing, major		P/c
Animal products processing		P
Aquaculture	P	
Centralized bulk collection, storage and distribution of agricultural products to wholesale and retail markets		P
Composting, major	C	P/c
Composting, minor	P/c	P/c
Crop production	P	
Forestry	P	
Sale and service of machinery used in agricultural production		P
Sawmills		P

Table 5-1 Permitted Land Uses in I-2 and P-2 Districts

Land Use Description	Land Use Key	
	P-2	I-2
Storage and sale of seed, feed, fertilizer and other products essential to agricultural production		P
Animals		
Game preserves	P	
Kennels, commercial		P
Livestock grazing	P	
Zoos	C	
Commercial and Business		
Amusement and recreation facilities, indoor	P/c	P
Automobile sales and rentals, including sales and distribution of automobile parts and supplies		P
Bars, nightclubs, taverns		P
Business services		P
Catering establishments		P
Convenience stores		P/c
Data processing facilities		P
Drive-thru facilities		P/c
Eating establishments		P
Financial institutions		P
Home improvement centers		P
Laboratories, medical		P
Laboratories, research		P
Neighborhood grocery stores		Cm
Offices, accessory		Ac
Photographic processing		P
Plant nurseries		P
Retail, accessory		Ac
Self-storage facilities		P
Trade or convention center	PRU	PRU
Veterinary establishments		P

Table 5-1 Permitted Land Uses in I-2 and P-2 Districts

Land Use Description	Land Use Key	
	P-2	I-2
Dwellings and Lodgings		
Dwellings, owner's or caretaker's, accessory		Ac
Dwellings for cemetery caretakers	Ac	
Hotels		Cm
Vacation cabins	Cm	
Industrial		
Base yards		P/c
Building or similar contracting and home improvement and furnishing services, and materials and equipment sales or distribution; provided incidental storage of materials or equipment is within fully enclosed buildings		P
Centralized mail and package handling facilities		P
Explosive and toxic chemical manufacturing, storage and distribution		C
Food manufacturing and processing		P
Freight movers		P
Heavy equipment sales and rentals		P
Linen suppliers		P
Manufacturing, processing and packaging, light		P
Manufacturing, processing and packaging, general		P
Maritime-related vocational training, sales, construction, maintenance and repairing		P
Motion picture and television production studios		P
Petroleum processing		C
Publishing plants for newspapers, books and magazines		P
Repair establishments, major		P
Repair establishments, minor		P
Resource extraction	C	P
Salvage, scrap and junk storage and processing		Cm
Storage yards		P/c
Warehousing		P
Waste disposal and processing	C	Cm
Wholesaling and distribution		P

Table 5-1 Permitted Land Uses in I-2 and P-2 Districts

Land Use Description	Land Use Key	
	P-2	I-2
Outdoor Recreation		
Amusement facilities, outdoor, not motorized		C
Amusement facilities, outdoor, motorized		C
Golf courses	PRU P/c	
Marina accessories	Cm	P
Recreation facilities, outdoor	Cm	
Social and Civil Service		
Cemeteries and columbaria	P	
Day-care facilities		P
Hospitals	PRU	PRU
Meeting facilities		P/c
Prisons	PRU	PRU
Public uses and structures	P	P
Schools, vocational, technical, industrial, trade		P
Universities, colleges	PRU	PRU
Transportation and Parking		
Airports	PRU	PRU
Automobile service stations		P
Car washing, mechanized		P/c
Commercial parking lots and garages		P
Heliports		P
Helistops		P
Joint use of parking facilities		Cm
Off-site parking facilities		Cm
Truck terminals		P
Utilities and Communication		
Antennas, broadcasting	Cm	C
Antennas, receive-only	Ac	Ac
Broadcasting stations		P

Table 5-1 Permitted Land Uses in I-2 and P-2 Districts

Land Use Description	Land Use Key	
	P-2	I-2
Utility installations, Type A	P/c	P/c
Utility installations, Type B	Cm	Cm
Wind machines		Cm
Miscellaneous		
Historic structures, use of	Cm	Cm
Joint development	Cm	Cm
Source: City and County of Honolulu Land Use Ordinance, May 1999, Table 21-3		

5.5 County Special Management Area

A portion the land parcel designated as TMK 4-2-015:006, which is part of the proposed site, is within the County Special Management Area. A Special Management Area permit must be obtained from the City and County of Honolulu in order to allow the development of the Kapa'a Light Industrial Park on that portion of the parcel TMK 4-2-015:006.

SECTION SIX

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES AND UNRESOLVED ISSUES

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SECTION SIX

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES AND UNRESOLVED ISSUES

The proposed Kapa'a Light Industrial Park would involve irreversible and irretrievable uses of material, labor, energy and capital funds of the developer, Kapa'a I, LLC.

Construction of the proposed Kapa'a Light Industrial Park would augment the economic and social viability of the Koolaupoko region and would provide a centralized location with urgently needed industrial space for light industrial and commercial activities.

The proposed site is relatively remote from residential areas and within an area that is characterized by existing industrial uses. The proposed industrial park would be developed in accordance to LEED standards for sustainable project development. The project team would implement building approaches that would be consistent to the intent and objectives of sustainable site development. Upon completion the proposed Kapa'a light Industrial park would apply to be awarded LEED certification under the LEED rating system for Green Building Design and Construction.

The pending application for Zone Change and the Special Management Area permit are the unresolved issues for the proposed warehouse park at the present time.

SECTION SEVEN

LIST OF NECESSARY PERMITS AND APPROVALS

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SECTION SEVEN

LIST OF NECESSARY PERMITS AND APPROVALS

Permits required in order to develop the proposed warehouse park are listed as follows:

	Permit	Approving Agencies	Approximate Processing Time
1)	Stream Channel Alteration Permit	Department of Land and Natural Resources State of Hawaii	60 -90 days

The Commission on Water Resource Management requires this permit if any stream bed or stream bank is altered in any way. The need for this permit will be determined after the design is completed.

2)	Water Quality (401) Certification	Department of Health State of Hawaii Clean Water Branch	60 - 90 days

Title IV of the Clean Water Act of 1977 (Public Law 95-217) requires this certification if an applicant is seeking a Federal license or permit for activities involving the possibility of discharge into navigable waters.

3)	National Pollutant Discharge Elimination System (NPDES):	Department of Health State of Hawaii Clean Water Branch	60 - 90 days

Dewatering Permit

This permit is required for the discharge of dewatering effluent from construction activities.

4)	NPDES: Hydrotesting Permit	Department of Health State of Hawaii Clean Water Branch	60 - 90 days

This permit is required for the discharge of non-polluted hydrotesting water.

5)	NPDES: Storm Water Runoff Permit	Department of Health State of Hawaii Clean Water Branch	60 - 90 days

This permit is required for storm water discharges from construction activities including clearing, grading and excavation activities except for operations that result in the

disturbance of less than five acres of total land area which are not part of a larger common plan of development or sale.

6)	Special Management Area (SMA) permit	Department of Planning and Permitting City and County of Honolulu	90 – 180 days

A major Special Management Area (SMA) permit may be required for the development of the lower portion of the proposed site (TMK 4-2-15:006; portion of).

7)	Clean Water Act Section 404 permit	U.S. Army Corps of Engineers	90 – 180 days

This permit is required for the discharges of dredged or fill material into waters of the U.S. (including wetlands).

8)	City and County Right-of-Way Permit	Department of Transportation Services City and County of Honolulu	30 - 60 days

This permit is required for any construction activities within the City and County of Honolulu right-of-way (i.e. Kapa'a Quarry Road and Kapa'a Quarry Access Road).

9)	Building Permit	Department of Planning and Permitting City and County of Honolulu	30 - 45 days

This permit is required for the construction of any building or structure.

10)	Grading Permit	Department of Planning and Permitting City and County of Honolulu	15 - 30 days

This permit is required for grading which changes drainage patterns with respect to properties abutting the construction site, exceeds 50 cubic yards of cut or fill or exceeds three feet in vertical height at its deepest point.

11)	City Trenching Permit	Department of Planning and Permitting City and County of Honolulu	15 - 30 days

This permit is required for trenching (i.e. digging, breaking, disturbing or undermining) any public City highway, street, thoroughfare, alley or sidewalk or any similar public place.

12)	Noise Variance Permit (as needed)	Department of Health State of Hawaii	7 - 14 days

This permit may be required for unusually loud construction activities or night work.

13)	City and County Traffic Control Plans	Department of Transportation Services City and County of Honolulu	15 - 30 days

These plans must be approved by the City for work within City and County roadways.

14)	City and County Street Usage Permit (as needed)	Department of Transportation Services City and County of Honolulu	15 - 30 days

This permit may be needed for work within City and County roadways.

15)	Construction Plans and Specifications	Department of Planning and Permitting City and County of Honolulu,	30 - 60 days
		Department of Transportation Services City and County of Honolulu	30 - 60 days
		Board of Water Supply City and County of Honolulu,	30 - 60 days

These plans must be approved by the City an before construction may begin.

SECTION EIGHT

ALTERNATIVES TO PROPOSED ACTION

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SECTION EIGHT

ALTERNATIVES TO PROPOSED ACTION

Section Eight discusses three alternatives to the proposed development approach for the proposed Kapa'a Light Industrial Park. There are two key planning objectives for selection of alternatives, which indicate that alternatives must (1) provide much needed industrial space in order to serve the long-term socio-economic needs of the Koolaupoko regions and (2) accomplish the entrepreneurial endeavor of the developer in a way that effectively mitigates impacts of the proposed warehouse development on the environment and community. The three alternatives that were considered are discussed in the following sections.

8.1 No-Action Alternative – Alternative 1

Under the No-Action Alternative 1 the Kapa'a Light Industrial Park would not be developed. Although there might be some minor additions to warehouse space above the present level or substitution of warehouses to replace old structures, such warehouse development would not be based on a comprehensive development plan, as formulated in the master plan of the Kapa'a Light Industrial Park. The resulting situation would therefore be close to that depicted in Figure 8-1, which portrays the present warehouse development on the proposed site.

Figure 8-1 Site Situation with Alternative No-Action – Alternative 1

The No-Action Alternative, does not satisfy the two key objectives of the proposed actions. First, there would be no long-term increase in urgently needed warehouse space in the Koolaupoko region, and second, the improvement of existing environmental impacts, which would result under the proposed development plant, such as improvements of the water quality of the Kapa'a Stream and improvement and creation of open space surrounding the present site, would not be realized. Many of the existing warehouses are old and therefore lack the environmental friendly

and energy efficient design of the planned industrial warehouses for the proposed Kapa'a Light Industrial Park.

The existing land uses and therefore the environmental impact on the two parcels designated as TMK 4-2-015:001 and 4-2-015:006 would remain basically unchanged.

In summary, Alternative 1, the No-Action Alternative, would not resolve the urgent need of businesses and the community in the Koolaupoko region for industrial space at a centralized location far away from residential centers and would not bring about the improvements of environmental conditions at the proposed site. Therefore the Alternative 1, the No-Action alternative is not recommended.

8.2 Alternative 2- Limited New Warehouse Development on one Parcel

Under this alternative, a limited number of warehouses would be developed on the central parcel, which already is the site for existing warehouses as depicted in Figure 8-2. This parcel is identified by TMK 4-2-015:008 and is presently located within the I-2, Intensive Industrial District. Since the intended industrial land use is consistent with the County Land Use Ordinance, there is no need for any zone change. The new warehouses would be built using conventional building technology and the site would be developed to maximize the warehouse-building footprint.

Figure 8-2 Site Situation with Alternative 2 – Warehouse development on only One Parcel

Alternative 2 would provide only about 30% of the warehouse space, which would be provided by a full Kapa'a Light Industrial Park development under the proposed development master plan. Therefore Alternative 2 would provide only a significantly smaller area of warehouse space that could be provided to the Koolaupoko region. Thus, this alternative would not contribute to one of the two key planning objectives of the Kapa'a Light Industrial Park, since it would not significantly enhance the business infrastructure in the Koolaupoko region with leasable industrial space

Furthermore, Alternative 2 would not improve current environmental impacts on the two adjacent parcels TMK2 4-2-015:001 and 4-2-015:006. The existing conditions on these two parcels would be basically unchanged and would not be upgraded. Thus, the existing conditions in the Kapa'a watershed, which contribute to the poor water quality of the Kapa'a Stream, would basically remain unimproved. Furthermore, the water quality and the existing wetland habitat in the lower reaches of the Kapa'a Stream corridor would not be improved.

By not utilizing the two parcels TMK 4-2-15:001 (portion of) and 006, which are adjacent to the parcel TMK 4-2-015:008, for the proposed Kapa'a Light Industrial Park, the potential benefits for the best use of land would not be materialized. Alternative 2 does not contribute to the key objectives of the proposed Kapa'a Light Industrial Park to the extent possible under the proposed action and <u>therefore Alternative 2 is not recommended</u>.

8.3 Alternative 3 - New Warehouse Development on the Entire Site using Conventional Building Technologies

Alternative 3 would involve construction of new warehouses on the entire proposed site, comprising of the three contiguous parcels TMK 4-2-015:001 (portion of), TMK 4-2-015:008 and TMK 4-2-015:006. The scope of new warehouse developments is shown in Figure 8-3. Since the warehouse development would cover the entire three parcels, zone changes would be required for the eastern and western parcels, parcels TMK 4-2-015:006 and 4-2-015:001 (portion of), respectively.

Under Alternative 3 the warehouses would be built using conventional structures and roadways. The site would be basically divided into two sections, an upper and a lower portion of the proposed site.

The design of the warehouse development would endeavor to provide a large overall warehouse-building footprint, in order to maximize usable commercial space. The design of the warehouses and roadways would be within the design envelope of the County Land-Use Ordnances. This alternative would implement certain Best Management Practices (BMP) to control the environmental impacts of the project, according to established County codes.

This alternative would be consistent with the key objective of the proposed Kapa'a Light Industrial Park of providing significant commercial space to the Koolaupoko region and therefore improving its infrastructure. While the design under this alternative would utilize conventional and not sustainable building technologies, the resulting warehouse park would not minimize the

anticipated environmental and energy related impacts from the warehouse development to the same extent that would be achievable with sustainable technologies, which would be implemented under the proposed development approach that is consistent with LEED.

In an effort to implement the most effective mitigation of anticipated environmental impacts from the warehouse park, it is deemed that a warehouse development using sustainable design approaches would be more consistent with existing goals and policies for the region. Therefore Alternative 3 is not the preferred alternative, though it might be more cost effective and offer a better return of investment for the developer than the proposed action.

Figure 8-3 Site Situation with Alternative 3 – Warehouse Development on the Entire Proposed Site

SECTION NINE

FINDINGS AND NOTICE OF DETERMINATION

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SECTION NINE

FINDINGS AND NOTICE OF DETERMINATION

9.1 Significance Criteria

The proposed Kapa'a Light Industrial Park project, would increase the number of warehouses in an area, which has been used for industrial activities, by 35 structure from presently 29 to a total planned capacity of 64 warehouse structures. Thus the planned expansion would result in an about doubling of industrial warehouse structures at the proposed project site.

The proposed development would provide about 660,000 square feet of additional industrial warehouse space to the Koolaupoko region. The market analysis of the Final EA has concluded that the Koolaupoko region is presently significantly undersupplied with industrial space and especially the Kailua and Kaneohe areas would benefit from industrial space close to their markets. By adding an approximately 660,000 square feet of industrial space the proposed development the ration of per capita industrial space in the Koolaupoko region to the average per capita industrial space on Oahu would increase from presently 21 percent to 35 percent. The Koolaupoko region would therefore acquire about one third of Oahu's average per capita allowance after full build is reached in 2026, thus even with the addition of 660,000 square feet of new industrial space the Koolaupoko region would still lag behind other regions in terms of per capita allowance of industrial space.

While providing much needed industrial space for the Koolaupoko region the proposed development would be developed using environmentally friendly and energy efficient building approaches, in order to effectively lower impacts to the environment and the community. The development would be realized following LEED (Leadership in Energy and Environmental Design) standards and upon the completion the development would apply to become LEED certified. At the present the proposed project is registered to be developed under the New Construction LEED rating system.

The proposed project would not simply mitigate additional impacts of a growing industrial development but would effectively lower impacts to the environment such as improving the water quality and lower peak storm flow rates to the Kapa'a Stream relative to the present situation. Measures to effectively improve the environmental situation at the site would also include restoration of important wetland area and establishment of a 15-acre wildlife habitat adjacent to the proposed industrial warehouse park.

By implementing a comprehensive "green building" approach the development of the proposed Kapa'a Light Industrial Park would not have a significant negative impact to the environment and the community. Therefore, an Environmental Impact Statement is not required for the project. Based on the "Significant Criteria" listed in Section 12 of the Hawaii Administrative Rules Title 11, Chapter 200, an applicant or agency must determine whether an action may have a significant impact on the environment, including all phases of the project in its short-term and long-term impacts. In making the determination, the Significant Criteria" Rules are established as the basis for identifying whether the proposed project has significant environmental impact.

Based on the analysis of the Final Environmental Assessment, the following conclusions are reached:

1. *The proposed Kapa'a Light Industrial park would not involve an irrevocable commitment to loss or destruction of any natural or cultural resource.* The proposed project would be developed on previously disturbed land that was used for land filling and quarry operations. Significant quantities of landfill wastes and quarry tailings as well as overburden and solid wastes were deposited on the site over the past fifty years. Rather than deteriorating natural resources at the site, the proposed development would result in objective improvements to the environment and would rectify some of the impacted environmental conditions at the site. The proposed project would utilize sustainable building technologies for basically all aspects of the projects and would therefore protect natural and cultural resources.

2. *The proposed project would not curtail the range of beneficial uses of the environment*. The present land use on portions of the site of the proposed Kapa'a Light Industrial Park causes environmental impact that could be avoided by the environmentally friendly development approach of the proposed project. The developer of the proposed Kapa'a Light Industrial Park has started the development of a 15-acre wildlife habitat on restored wetland on the property. The habitat project is currently in the design and permitting phase. This 15-acre habitat development will significantly improve open space surrounding the proposed project site through the construction of ponds, a secured living and nesting environment of endangered water birds and eradicating areas of invasive plant species and replacing it with native and adapted plants. Thus, beneficial uses of the environment would be conserved and improved, resulting in an extension rather than curtailment of beneficial uses of the environment. The developer will make the 15-acre wildlife habitat accessible to the community to enjoy bird watching from viewing sites surrounding the habitat or from developed pathways within the habitat (outside of the nesting seasons when the birds should not be approached and disturbed).

3. *The proposed project would not conflict with the state's long term environmental policies and goals.* The proposed Kapa'a Light Industrial Park is consistent with applicable goals, visions and guidelines of the General Plan and the Koolaupoko Sustainable Communities Plan. By adopting an environmentally friendly design based on green and sustainable technologies the proposed industrial warehouse development, the short- and long-term needs for additional warehouse space in the Koolaupoko region can be satisfied in a manner that causes a small ecological footprint, supports the wellbeing of the community, conserves important natural resources of the regions and is respectful to cultural resources.

4. *The economic and social welfare of the community or state would not be affected.* The proposed Kapa'a Light Industrial Park would not negatively affect the economic welfare, social welfare, and cultural practices of the community or State. On the contrary, the propose project would provide much needed long-term upgrades of the economic infrastructure of the Koolaupoko regions and strengthen the employment situation in the

region. The Koolaupoko region is significantly undersupplied with industrial space to accommodate industrial service and light manufacturing companies. At present the region offers only one fifth of the per capita gross leasable area (GLA) for industrial uses of Oahu's average per capita GLA. With the addition of about 660,000 square feet of industrial space by the proposed project the ratio would only go up to about one third of Oahu's average per capita GLA. Thus, the proposed industrial development would contribute to ameliorate the economic base in the Koolaupoko region and would not burden the region with exceeding space for businesses that would be attracted to the region and thereby would cause a significant influx of new residents, negatively affect the local infrastructure.

5. *The proposed project would not substantially affect public health.* There would be no significant emissions from the site. Wastewater would be treated on-site using reliable and effective treatment options by septic systems. Stormwater would be treated using Best Management Practices (BMP) that would remove potentially harmful substances and would release the runoff to the receiving waters in a controlled and environmentally friendly way. There are no intended uses that would cause significant air and noise pollution. The sustainable design of the warehouses would avoid harmful agents and would provide a superior indoor environmental climate, when compared to conventional warehouses.

6. *No substantial secondary impact, such as population change, or effects, on public facilities are anticipated.* The proposed project would not precipitate substantial population changes or effects on public facilities. The project would not entice significant population influx, nor would it negatively affect public facilities. The proposed project would rather help to strengthen the economic viability of the region by providing much needed industrial space mainly to companies that serve the windward region. The proposed warehouse would implement effective measures to lower potential impacts on public utilities, such as water, electricity and wastewater. The sustainable building technologies adopted to the proposed warehouse park would lower demand for electricity by about 30 percent and water by about 30 to 40 percent under baseline consumption rates for conventional industrial warehouses; in fact, electricity would be generated by photovoltaic generation on-site, thereby supplying a part of the energy and peak power demand of the proposed project with renewable and environmentally friendly technologies. No substantial impact on law enforcement is anticipated, on the contrary, comprehensive security measures of the proposed warehouse development would help to lower criminal activities around the proposed site. No additional demand on fire fighting is anticipated since the warehouses would be built according to strict fire protection codes.

7. *No substantial degradation of environmental quality is anticipated.* The proposed warehouse development would not result in substantial degradation of environmental quality. The development approach of the proposed industrial warehouse park is based on energy efficient and environmentally friendly design, construction and operational methods. The proposed warehouse development would improve the environmental quality by improving stormwater runoff quality, providing a significant area for wetland conservation and effectively mitigate other potential environmental impacts from the warehouses. The proposed industrial development would be surrounded by vegetative buffer zones to

mitigate visual, noise and air pollution impacts. The interior of the proposed development would use measures such open space, green walls and providing shading by trees or other means to lower heat islands effect and thus improve the micro-climate within the proposed development when compared to hardscaped areas. The developer has started with the development of a 15-acre wildlife habitat and wetland restoration project. This habitat project will restore wetland area within the Kapa'a Stream corridor that is presently overgrown with invasive species. The habitat project will transform the 15 acres of restored wetland into a secure wildlife habitat. The habitat will have multiple ponds to create an suitable living and nesting environment for endangered water birds. The habitat will be surrounded by a 6,000 linear feet wildlife fence to control the movement of non-native predators. The habitat will provide limited accessibility for the public for birdwatching. The developer will provide one or more viewing sites and/or by a birdwatching pathway through the habitat. The habitat will be maintained in cooperation with local conservation groups.

8. *The proposed action does not involve a commitment to larger actions, nor would its cumulative impacts result in considerable effect on the environment.* The proposed warehouse development, especially if seen in conjunction to the other industrial activities in the Kapa'a Valley, would not significantly add to the cumulative effects upon the environment. On the contrary, the proposed warehouse development would employ means to improve the water quality and peak flow conditions in the Kapa'a Stream and would provide measures for a better groundwater situation, resulting from implementation of Best Management Practices (BMP). The proposed site is made of landfill area that was formed by deposits of quarry tailings and overburden, which started several decades ago. The proposed development would rectify some of the presently encountered environmental impacts at the brownfield site, such as large areas of exposed soil and resulting runoff problems, air-borne dust pollution and invasive species at the present site, to name a few.

9. *No rare, threatened or endangers species or their habitats would be affected.* The proposed warehouse development would not substantially affect rare, threatened, or endangered species, or their habitats. The warehouses would be exclusively built on previously disturbed land that represents no habitat for rare, threatened or endangers species at the present time. Rather than endangering important habitats, the proposed action would restore habitats and add a 15-acre wildlife habitat on restored wetland within the property owned by the developer. The habitat will be surrounded by a 6,000 linear feet of special wildlife fence in order to keep non-native predators from preying on the endangered water bird population. Thus, the habitat will provide a secure living and nesting environment for endangered water birds.

10. *Air quality, water quality and ambient noise would not be detrimentally affected.* The proposed warehouse development would not detrimentally affect air quality, water quality or ambient noise levels. Air pollution would be mitigated by passive and active measures. The developer would promote measures to lower exhaust from vehicles by ordering avoidance of unnecessary idling of trucks and vehicles within the park. All open space would be planted to avoid wind borne pollution. The park would maintain a clean appearance by ensuring that litter and debris are always disposed off in accordance to environmentally

responsible resource management. The roadways would be frequently cleaned so that little or no dust would be carried away from the site. Good water quality in the receiving waters would be ensured by a comprehensive and effective stormwater management program and effective wastewater treatment and disposal systems. By implementing the comprehensive stormwater runoff management system the impact of runoff would be effectively lowered in comparison to the present conditions at the site. Noise impacts would be lowered by controlling noise generation at the source and by attenuating noise propagation. Source noise control would be executed by avoiding unnecessary idling of engines, encapsulating significant noise sources and avoiding loud noise outside normal operation hours of the park. Effective noise propagation mitigation would be accomplished by buffer zones, orienting building opening away from noise sensitive areas, building noise control walls at selected locations and other measures.

11. *The proposed project would not affect environmentally sensitive areas, such as flood plains, tsunami inundation zones, erosion prone areas, geologically hazardous lands, fresh waters and coastal waters.* The proposed warehouse development would not affect flood plains. The proposed locations for the warehouses are outside areas designated as flood hazards. The proposed site would not impinge on natural flood plains since the warehouses would be built on elevated land. The proposed site would improve erosion conditions of the land fill areas on which the proposed warehouses would be built by planting or otherwise stabilizing any exposed soil areas. The proposed project would improve rather deteriorate the water quality of the receiving Kapa'a Stream since the proposed stormwater management would treat all stormwater runoff from the site. The planned comprehensive stormwater treatment approach would remove at least 80 percent of pollutants contained in stormwater runoff before the stormwater is released to the Kapa'a Stream.

12. *The proposed project would not substantially affect scenic vistas and view planes identified in country and state plans and studies.* The proposed warehouse development would not substantially affect scenic vistas and view planes in the Kapa'a Valley. The Kapa'a Valley has an historic industrial appearance due to its extensive quarry and landfill operations. The proposed warehouse park would not provide a substantial impairment of the existing vistas in the valley. The proposed development plan would implement extensive measures to mitigate visual impact. Vegetated buffer zones would be built around the warehouse park perimeter so that the development would be effectively shielded from people passing the park on the Kapa'a Quarry Road. The vegetative buffers zones would be wider and therefore more effective around the lower portion of proposed development since this part of the proposed Kapa'a Light Industrial Park would be closer to the Kawainui Marsh and might have more potential for visual impact without effective visual mitigation measures. The warehouses would be constructed so that the building shell and roof would be concealed and screened to the extent possible. Selected warehouses in the lower portion of the proposed site would be surrounded with so-called "green walls", a green building technology that provides metal trellises around outer warehouses walls where plants can grow to create vertical vegetative covers. Green walls create cost-effective visual mitigation with attractive "green" appearances, reduce energy consumption, reduce noise propagation and increase natural sights. The external and interior lighting design of the warehouses would effectively mitigate light pollution by selecting appropriate lamps, lighting controls, full

cut off or fully shielded fixtures and avoiding internal lighting to contribute to external light pollution. Therefore the nightly appearance of the proposed warehouse would help to retain the night sky conditions in the region.

13. *The proposed project would not require substantial energy consumption.* The proposed warehouse development would utilize sustainable measures to significantly lower energy consumption. The LEED based design approach will implement active and passive measures to lower the energy consumption by a design target of at least 30 percent under the applicable baseline for industrial warehouses. Energy saving measures would include appropriate orientation and shells of warehouses, sufficient insulation, high energy-efficient windows, using a significant degree of day-lighting, natural lighting, avoiding of unnecessary internal heat sources, integrated building controls, lowering water demand and wastewater generation and other measures. Apart from efficient energy consumption the design approach includes the generation of a significant amount of electricity onsite with photovoltaic energy systems on the warehouse roofs. The onsite energy generation would lower the energy and peak electricity demand of the proposed industrial development. At times when excess electricity would be generated, the project would perform net-metering, e.g. feeding electricity into the island electric grid. Since the proposed warehouse development would replace older warehouses rather than introduce a significant new capacity of warehouse space on Oahu, the proposed project would result in a net reduction of energy consumption on Oahu, which is an important objective in the future.

9.2 Notice of Determination

On the basis of the forgoing analysis of significance criteria the proposed Kapa'a Light Industrial Park would not have significant impacts on the environment. Therefore, a notice of determination of *Findings of No Significant Impact* for the proposed improvement is appropriate.

9.3 Reasons Supporting the Determination

The proposed industrial development would be beneficial for the Koolaupoko region to provide much needed industrial space and alleviate the significant undersupply of the region with industrial space. The challenge of the proposed project is not whether it would have a significant beneficial economical effect for the region, but rather that the proposed industrial development would be realize with the lowest achievable impacts to the environment and the community. The developer plans to proactively solve this challenge by making the commitment to develop the Kapa'a Light Industrial Park with a comprehensive sustainable development approach.

The design, construction and operation of the proposed development would represent a combination of energy efficient and environmentally friendly technologies and approaches in accordance with standards of LEED (Leadership for Energy and Environmental Design). The developer has taken the first steps and has registered the project under the LEED rating system for new construction and upon completion, the proposed project would apply to be awarded LEED certification. LEED is a third party audited certification process to ensure strict adherence

to integrated high performance buildings that can be developed in harmony with nature, while safeguarding a positive return of investment and creating a socially responsible development.

The proposed warehouse development would not only implement mitigation measures to lower environmental impacts of intrusive developments, it also would objectively improve certain environmental conditions presently found at the proposed site. While the proposed warehouse park would provide industrial warehouses, which are important and needed to maintain the economic and social wellbeing of the Koolaupoko region, this entrepreneurial endeavor would be accomplished in a way that drastically reduces impacts to the environmental and the community.

SECTION TEN

AGENCIES, ORGANIZATIONS AND BOARDS CONTACTED

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SECTION TEN

AGENCIES, ORGANIZATIONS AND BOARDS CONTACTED

The following agencies, organizations and boards were contacted in course of the preparation of this Final Environmental Assessment.

City and County of Honolulu
Department of Transportation Services
Transportation Planning Division
650 S. King Street 3rd Flr
Honolulu, Hawaii 96813

City and County of Honolulu
Kailua Neighborhood Board No. 31
Planning & Zoning Committee
P.O. Box 487
Kailua, Hawaii 96734

Hawaiian Electric Company (HECO)
820 Ward Avenue
Honolulu, Hawaii 96814

Honolulu Fire Department
Aikahi Fire Station
45 Kaneohe Bay Dr
Kailua, Hawaii 96734

Honolulu Police Department
Kailua City Police Station
219 Kuulei Road, Kailua, Hawaii 96734

Kailua Chamber of Commerce
600 Kailua Road, Suite 107
Post Office Box 1496
Kailua, Hawaii 96734

Natural Resources Conservation Service
United State Department of Agriculturr
Hawaii Field Office
99-193 Aiea Heights Drive, Suite 109
Aiea, Hawaii 96701

Oahu Transit Services Inc.
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