Sustainable Design & Consulting LLC
Practical Sustainability

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May 7, 2021

Dr. Keith Kawaoka, Acting Director
Office of Environmental Quality Control (OEQC)
State of Hawai'i
235 South Beretania Street, Suite 702
Honolulu, Hawai'i 96813

Sent electronically:

Subject: Request for Publication
Final Supplemental Environmental Impact Statement
Kapa'a Light Industrial Park - Kailua
Tax Map Keys 4-2-015: 013 and 014

Dear Dr. Kawaoka,

Please publish the attached Final Supplemental Environmental Impact Statement in the next edition of "The Environmental Notice", in accordance with Hawaii Administration Rules Section 11-2001-30(d).

Should you have any questions, please contact Manfred Zapka, at (808) 265 6321 or sustainabledc@gmail.com.

Sincerely,
Sustainable Design & Consulting LLC

Manfred Zapka

Manfred J. Zapka, PhD, PE
Principal

Attachment: PDF of FSEIS report (will be uploaded to OEQC)

Cc: Zack Stoddard, Land Use Approval Branch

Technical and Organizational Sustainability Consultants
P.O. Box 25914, Honolulu, Hawaii 96825, USA Tel: 808-265-6321 sustainabledc@gmail.com

21-157

From: webmaster@hawaii.gov
To: HI Office of Environmental Quality Control
Subject: New online submission for The Environmental Notice
Date: Wednesday, May 12, 2021 3:11:32 PM

Action Name

Kapaa Light Industrial Park

Type of Document/Determination

Final environmental impact statement (FEIS)

HRS §343-5(a) Trigger(s)

- (6) Propose any amendments to existing county general plans where the amendment would result in designations other than agriculture, conservation, or preservation

Judicial district

Koʻolaupoko, Oʻahu

Tax Map Key(s) (TMK(s))

(1) 4-2-015:013; (1) 4-2-015:014

Action type

Applicant

Other required permits and approvals

numerous

Discretionary consent required

zone change

Approving agency

City and County of Honolulu Department of Planning and Permitting

Agency contact name

Zachary Stoddard

Agency contact email (for info about the action)

zachary.stoddard@honolulu.gov

Email address or URL for receiving comments

sustainableDC@gmail.com

Agency contact phone

(805) 768-8019

Agency address

650 South King Street
Honolulu, Hawaii 96822
United States
Map It

Accepting authority

City and County of Honolulu Department of Planning and Permitting

Applicant

KAPAA I, LLC and KAPAA III, LLC

Applicant contact name

John and Paul King

Applicant contact email

sustainableDC@gmail.com

Applicant contact phone

(808) 265-6321

Applicant address

905 Kalanianaole Highway
Honolulu, HI 96734
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Map It

Was this submittal prepared by a consultant?

Yes

Consultant

Sustainable Design & Consulting, LLC

Consultant contact name

Manfred Zapka

Consultant contact email

sustainableDC@gmail.com

Consultant contact phone

(808) 265-6321

Consultant address

P.O. Box 25914
Honolulu, HI 96825
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Map It

Action summary

A supplemental EIS is being prepared for modifications to the Kapaa Industrial Park. The Final EIS for the project was accepted on 10/11/2011. There are 35 existing warehouses and 13 acres of outdoor equipment storage. The proposed modifications involve the stormwater management system, the number of structures and building area, grading, perimeter berms, the irrigation system, the wastewater system, roadway access and a relocated powerline. The modifications require a supplemental EIS because they may have significant environmental impacts and because mitigating measures will not be implemented as described in the 2011 EIS.

Attached documents (signed agency letter & EA/EIS)

- SDC-Kapaa-FSEIS-Transmittal-letter-to-OEQC-May-20211.pdf
- FINAL-Kapaa-FSEIS-report-for-May-23-2021-publication.pdf

Shapefile

- The location map for this Final EIS is the same as the location map for the associated Draft EIS.

Authorized individual

Manfred Zapka

Authorization

- The above named authorized individual hereby certifies that he/she has the authority to make this submission.

SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT

FINAL

For Activities to Develop the

Kapa'a Light Industrial Park

in Kailua, Island of Oahu

Report with 12 Appendices

April 2021

Draft SEIS was submitted in November 2020

Sustainable Design & Consulting LLC
Practical Sustainability

PROJECT SUMMARY

Project Summary

Project Name:	Kapa'a Light Industrial Park
Accepting Agency:	City & County of Honolulu, Department of Planning and Permitting
Location:	Kailua, Oahu, Hawaii
Tax Maps Keys	[1] 4-2-15:13 and (1) 4-2-15:014; Note: The former land parcels TMK 4-2-15:006 and 012, referenced in the FEIS, have been consolidated into the new TMK 4-2-15:014 and the former TMK 4-2-15:008 has been changed to 4-2-15:013.
Land Area:	The 57-acre project site stretches over portions of TMK 4-2-15:013 and 014, which have a combined land area of 79 acres. The project site includes a "Lower" and an "Upper" portion. The Lower portion of the project site is situated within a portion of TMK 4-2-15:014 and the Upper portion stretches over TMKs 4-2-15:013 and a portion of 014. The project site is being developed under a Joint Development Agreement (Conditional Use Permit (CUP) No. 2015/CUP-70)
Applicants:	KAPAA I, LLC and KAPAA III, LLC
Recorded Fee Owners:	KAPAA I, LLC and KAPAA III, LLC
Existing Use:	In the Upper portion of the project site there are 35 existing warehouse structures and 3 acres of outdoor equipment storage. In the Lower portion of the project site there are approximately 10 acres of outdoor equipment storage, and there are no permanent buildings.
State Land Use District:	Urban; the entire project site is within the Urban State Land Use District.
Special Management Area:	The Lower portion of the site is within the SMA area.
City and County of Honolulu Zoning:	Limited Industrial (I-1) / General Preservation (P-2)
Flood Zone Designation:	A / D / X

Project Summary

Proposed Action:	The Proposed Action is the development of a new portion of the updated site development plan of the Kapa'a Light Industrial Park, in Kailua, Oahu. The Proposed Action is consistent with the site development goals described in the 2011 FEIS and further developed and approved under subsequent land use permits, including Land Use Zone Change and Special Management Area Use Permit (SM), with two SMP Minor Modifications. The development within the project site will serve to construct warehouse structures for small services providers and light industrial uses, providing much needed light industrial space in the Koolau Poko region of Oahu. The Proposed Action would, however, modify certain site development strategies delineated in approved 2011 FEIS, to align with subsequent site design modification and further developed impact mitigation strategies. Modifications of the site development strategies were required to accommodate design constraints due to a new site layout and satisfy more stringent permitting requirements that were introduced after the accepted 2011 FEIS was approved. The Proposed Action proposes a new design for storm water treatment, among other site development changes, since the approved design is not feasible based on a recent soil engineering investigation. The new design for storm water will be more effective than the previous and currently approved design because of better pollutant removal and better flood control.
Impacts:	Analysis of the following environmental resource criteria will be addressed in the Draft SEIS: • Climate and Climate Change • Geology • Topography • Soils • Surface Waters • Groundwater • Flora • Fauna • Historic and Archaeological Resources • Cultural Resources • Air Quality • Noise

Project Summary

	• Visual Resources • Socio Economic Characteristics • Public Services and Facilities • Infrastructure, Traffic, and Utilities • Cumulative Impacts
Determination:	In accordance with HAR Section 11-200.1-30 (b) (Supplemental environmental impact statements) the Accepting Authority has the authority whether a Supplemental Environmental Impact Statement (SEIS) is required. A SEIS refers to an additional environmental impact statement that prepared for an action for which a FEIS was previously accepted, but which has since changed substantively in size, scope, intensity, use, location, or timing, among other things. A SEIS is warranted when the scope of an action has been substantially increased, when the intensity of environmental impacts will be increased, when the mitigating measures originally planned will not be implemented, or where new circumstances or evidence have brought to light different or likely increased environmental impacts or their mitigation not previously dealt with. The Accepting Agency has determined that a SEIS is required.
Agency Consulted in SEISPN Process:	City & County of Honolulu, Department of Planning and Permitting Point of Contact: Mr. Zachary Stoddard Zachary.Stoddard@honolulu.gov
Consultant:	Manfred Zapka, Ph.D., P.E. Certification: CIEC, LEED AP, WELL AP, CEM Sustainable Design & Consulting LLC P.O. Box 25914, Honolulu, HI 96825 Tel: 808 265 6321 sustainableDC@gmail.com https://greatplacesandspaces.com/sustainabledesign

FINAL
SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT

FOR THE

KAPA'A LIGHT INDUSTRIAL PARK

APRIL 2021

This Final Supplemental Environmental Impact Statement and all ancillary documents were prepared under the signatory's direction or supervision, and the information submitted, to the best of the signatory's knowledge, fully addresses document content requirements as set forth in Chapter 343, Hawai'i Revised Statues, and sections ll-z0,A-n and 11-200-18, Hawai'i Administrative Rules, as applicable.

Applicants:

Kapa'a I, LLC and Kapa'a III, LLC

May 4, 2021

Paul King, Managing Member
Kapa'a I, LLC

Date

May 4, 2021

John King, Managing Member
Kapa'a III, LLC

Date

Accepting Authority:
City & County of Honolulu
Department of Planning and Permitting

EXECUTIVE SUMMARY

Overview and Background

The Proposed Action is the continuation of development of the Kapa'a Light Industrial Park (KLIP) under an updated site development approach. The KLIP project site extends over two adjoining parcels TMK [1] 4-2-15:013 and 014. The development of the KLIP occurs on two land portions of the project site, the Lower and the Upper portion, which have different grade elevation and are located on Eastern and Western side of the project site, respectively.

At present, the Upper portion of the project site has 35 existing warehouse structures and 3 acres of outdoor equipment storage, which are leased by companies of diverse sizes. Within the next 2 to 3 years, seven more warehouse structures are planned for the Upper portion of the project site. At present, initial site preparation work is underway within the Lower portion of the project site. This includes initial mass grading.

In 2011 the Final Environmental Impact Statement (FEIS) was approved for the land of the Proposed Action. At that time, the EIS process was triggered by the zone change application from General Preservation (P-2) to limited Industrial (I-1) for portions of the former parcels TMK 4-2-15:006 and 012. The parcels TMK 4-2-15:006 and 012 have since been consolidated to the new TMK 4-2-15:014 designation. The zone change was required to commence site development for a next phase of the KLIP expansion on the two portions of parcel TMK 4-2-15:014. Furthermore, the approved FEIS was required for the Special Management Area Use Permit (SMP) for the Lower portion of the project site.

In the time since the 2011 FEIS was approved, development conditions for the KLIP as well as environmental impact mitigation technologies and permit requirements for the site development have changed. In general, permit requirements have become more rigorous. This has caused the Applicants of the KLIP, the Kapa'a I, LLC and Kapa'a III, LLC, to seek changes in the site development approach. The new site development approach of the Proposed Action offers higher levels of impact mitigation than the approach that was disclosed in the approved 2011 FEIS and the subsequent Special Management Area Use Permit (SMP), including subsequent SMP minor modifications.

Link to download the 2011 FEIS http://oeqc2.doh.hawaii.gov/EA_EIS_Library/2011-10-23-OA-FEIS-Acceptance-Kapaa-Light-Industrial-Park.pdf

General

This Final ~~Draft~~ Supplemental Environmental Impact Statement (F~~D~~SEIS) examines potential environmental impacts of the developing Kapa'a Light Industrial Park, in Kailua on the windward side of Oahu, under the Proposed Action. The FSEIS responds to comments received after publication of the Draft SEIS (DSEIS). Since some of comments required a more detailed description of impact mitigation measures, additional technical details are presented in the FSEIS as 12 Appendices.

Summarizing, the goals of the Proposed Actions are:

- To develop and implement a site development approach that is based on low impact development strategies to mitigate impacts to the environment and the community.
- To upgrade impact mitigation strategies from the earlier proposed strategies in the approved 2011 FEIS.
- To provide industrial zoned space so that specific needs within the windward Koolau Poko region of Oahu can be met and in concert with the General Plan current Sustainable Communities Plan.
- To continue supporting businesses and residents on windward Oahu with high quality industrial zoned space for businesses so that longer commutes and trips to alternative sites on the leeward side can be avoided and the financial sustainability of windward businesses can be supported.
- To work with the appropriate agency and community stakeholders so that optimized development strategies can be implemented, and a high project development synergy can be created, which serves the interest of the community as well as KLIP.

The Accepting Agency, the City & County of Honolulu, Department of Planning and Permitting, has determined that a Supplemental Environmental Impact Statement (SEIS) is required to implement the updated site development approach. This determination is that the Proposed Action represents substantive changes in scope, intensity, use, or timing, among other things, from the conditions disclosed in the accepted FEIS.

This ~~Draft~~ Final Supplemental Environmental Impact Statement (FSEIS) is prepared pursuant to the requirements of Chapter 343, Hawaii Revised Statutes, Act 241, and Chapter 200 -1 of Title 11, Department of Health Hawaii Administrative Rules, "Environmental Impact Statement Rules". The DSEIS documents potential environmental impacts of the proposed project and evaluates proposed impact mitigation measures.

The Kapa'a Light Industrial Park (KLIP) is situated to the West of Kailua town, on the island of Oahu. The KLIP stretches over 57 acres in the Lower stretches of the Kapa'a Valley, which is the watershed of the Kapa'a Stream. The KLIP is located on two contiguous land parcels, TMK 4-2-15:013 and 14, with a total land area of 79 acres. The two parcels are owned by members of the King family, who are longtime residents of Kailua and the land is developed under a joint development agreement.

The development of the KLIP started some 30 years ago when the founder, Mr. John King, started to offer leasable base yard land and soon after he built the first permanent warehouse structure at the project site. Growing over time there are presently 35 warehouses at the KLIP site, with building footprints ranging between 3,000 sqft to 24,000 sqft. The existing warehouses and those under active development are located within the Upper portion of the KLIP, within the TMK 4-2-15:013 and the Western portion of 4-2-15:014.

The KLIP has been playing an important role for the economic infrastructure of the windward side of Oahu. Businesses on the windward side have been at pains to find suitable places for their businesses

close to home and/or close to their windward customer base. Availability for industrial zoned land on the windward side will be flat or reduced, as existing industrial zoned space is converted to other use.

Providing sufficient, modern, and sustainably designed leasable space on the windward side for small service and light industrial businesses is a significant benefit to the community and the environment. The Applicants are meeting this present and future demand for leasable industrial zoned space by developing both the Upper and Lower portion of the project site, and in building out the overall plan over time in a manner consistent with market demand and community needs.

Even before more recent governmental requirements for low impact development strategies became mandatory, the Applicant made a commitment to use site development strategies and technologies that cause less impacts to the environment and the community than strategies that were typically used. The KLIP site is located upstream of the important Kawainui Marsh, Hawaii's largest and Ramsar certified wetland area, and the adjacent Kapa'a Stream corridor, which also includes wetland areas. The protection of aquatic resources has been a key commitment by the Applicants for the further development and operation of the KLIP.

Since the KLIP is located on a former landfill, site development strategies are more demanding than on land with regular soil. For the project site, selected conventional development and construction strategies as well as impact mitigation strategies will have to be replaced with strategies that consider soil conditions on a former landfill.

Alternatives

This Final ~~Draft~~ SEIS document presents two alternatives, the SEIS Preferred Alternative and the SEIS No-Action Alternative. The prefixes "FEIS" and "SEIS" are used in this Final ~~Draft~~ SEIS to distinguish between the 2011 FEIS and the 2021 SEIS alternatives.

The two SEIS alternatives differ from each other by whether the updated site development plan is used. The SEIS Preferred Alternative uses the updated site development plan, while the SEIS No-Action Alternative uses that which was already approved. The SEIS No-Action Alternative uses the site development approach that is based on the approved design concepts from the 2011 FEIS, the 2013 zone change and the 2014 SMP and the subsequent 2017 SMP minor modifications. The flow chart in Figure A describes the differences of the alternatives.

Under the updated site development, and therefore under the SEIS Preferred Alternative, the warehouse footprint in the Lower portion of the project site would have about 373,000 sqft, or 35,000 sqft. more than under the 2011 FEIS site development plan. Since the SEIS No-Action Alternative would be the same as under the 2014 SMP minor modification, the SEIS No-Action Alternative would have a 3.4-acre base yard and 217,000 sqft warehouse footprint. Under the SEIS Preferred Alternative the area of the 3.4-acre base yard would be used to build warehouses. The updated site development plan considers a range of design changes and includes new and more efficient impact mitigation measures.

A major difference between the two SEIS alternatives is the storm water treatment and management approach. Specifically, the SEIS No-Action Alternative would use the storm water design that was approved under 2017 SMP modification (2017/MOD-37). This storm water approach combined vegetated swales and below ground detention vaults, thus used low impact development strategies. Under this storm water system runoff would flow to vegetated swales and enter below ground detention vaults, where the runoff would infiltrate and migrate below ground and under the site perimeter berms.

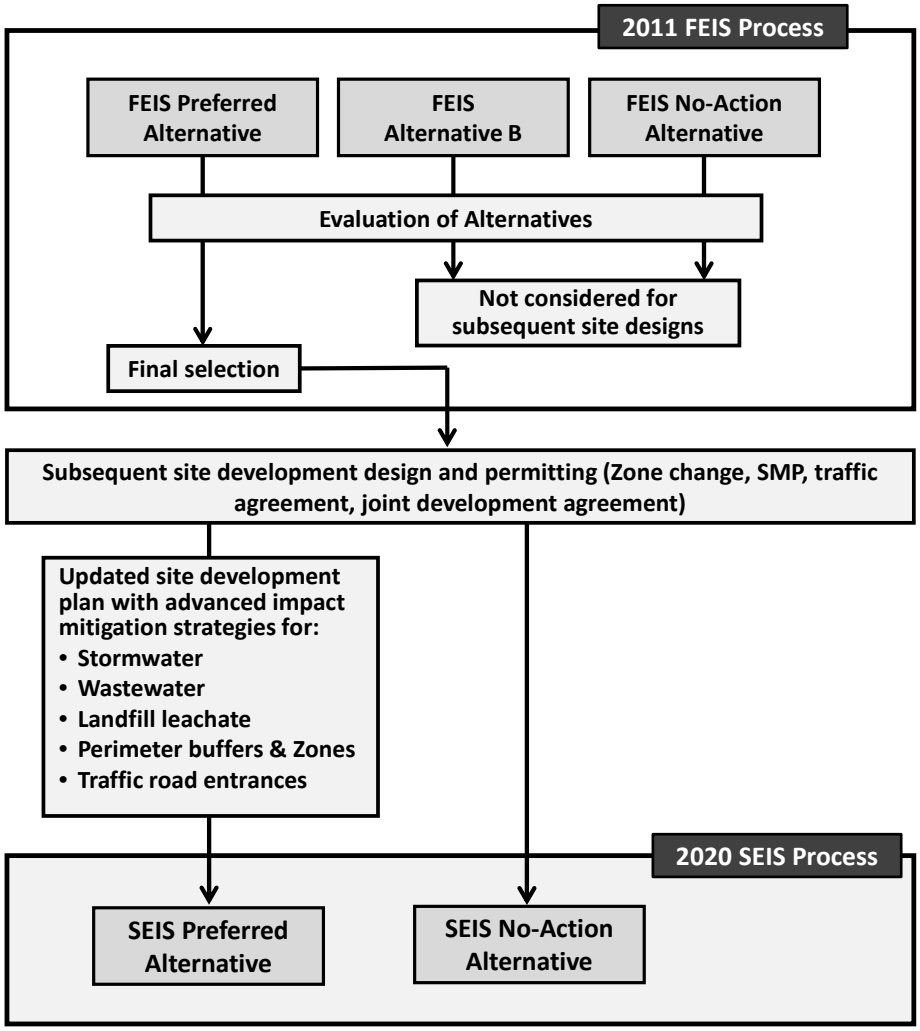

Figure A: Flow chart for alternatives referred to in the SEIS document

A geotechnical report completed in 2019 (Stewart Engineering, 2019) determined that the storm water treatment and management approach approved in the 2017 SMP minor modification could not be implemented since infiltration and subsequent migration of infiltrated water under the perimeter earth berm would contribute to perimeter berm instability. Consequently, a different storm water treatment and management strategy was completed which is part of the updated site development plan. This updated storm water plan necessitates an increase of the finish grade elevation to provide the

necessary hydraulic energy for gravity flow of storm water runoff to the treatment facilities at the Northern site perimeter.

In addition, the updated site development plan proposed the use of advanced onsite wastewater treatment in the entire project site. This advanced wastewater treatment technology would significantly reduce environmental impacts caused by treated wastewater disposal on-site. The advanced wastewater treatment would significantly reduce organic, TSS and nutrient loads in the effluent.

Table B shows the nine site development elements of the SEIS Preferred Alternative versus previous site development plans, including the SEIS No-Action Alternative.

Table B: Changes in the updated site development (the SEIS Preferred Alternative) versus previous site development plans

No.	Type of Change in Updated Site Development Plan	Reason for Change in the Site Development Strategy	Assessment of Effects on Impact Mitigation
A	Storm water drainage and treatment technology; keeping detention vaults and adding filtration Manufactured Treatment Device (MTD) and vegetated buffer strips as storm water treatment	More stringent storm water permit guidelines require adjusting the storm water approach, and design constraints require different drainage and treatment. Since storm water discharge without effective treatment can affect the important aquatic resources downstream of the project site. Therefore, effective treatment is important and would be enhanced.	The efficacy of impact mitigation will be enhanced.
B	Rainwater harvesting for irrigation – keeping the amount of harvested storm water but changing the use to irrigation.	Less vegetated area in the site interior would require less harvested storm water for irrigation. But more irrigation of the site perimeter would balance the need for harvest rainwater.	Efficacy of impact mitigation remains the same.
C	Site finish grade elevation of the elevation of the project site grade would need to be increased.	Finish grade needs to be raised to provide sufficient hydraulic flow energy for gravity flow of runoff to treatment units and discharge from the site.	Efficacy of impact mitigation remains the same.

Table B: Changes in the updated site development (the SEIS Preferred Alternative) versus previous site development plans

No.	Type of Change in Updated Site Development Plan	Reason for Change in the Site Development Strategy	Assessment of Effects on Impact Mitigation
D	Site perimeter berms would have increased height and width; dense vegetation cover with tall trees would be used on the new berms serving as vegetated buffer zone.	The site perimeter berms would have to be increased in height to accommodate the increased finish grade elevations.	Efficacy of impact mitigation remains the same.
E	Pervious and vegetated areas inside the project site would be reduced	Less storm water percolating into the landfill body would reduce the amount of harmful leachate.	Efficacy of impact mitigation would be enhanced.
F	Irrigation area would be limited to the vegetated buffer zone	Less vegetated areas within the site interior would require less irrigation.	Efficacy of impact mitigation remains the same.
G	Wastewater treatment technology; would use advanced onsite wastewater treatment technology.	New wastewater treatment technology would be used that is more effective than the previously used conventional septic systems.	Efficacy of impact mitigation would be enhanced.
H	Changed site road access: would use a single roadway entrance at a different location	The new site road access location would offer better visibility and a less complicated traffic flow, thus Lower traffic risks.	Efficacy of impact mitigation would be enhanced.
I	Changed layout of buildings would result in better internal layout with improved traffic areas; while the building arrangements would be changed, the overall building footprint would remain basically the same as in the 2011 FEIS.	Internal site layout was optimized by improving the accessibility of the buildings and the layout of the traffic areas. The previously planned 3.4-acre base yard would be removed and buildings would be constructed inside this area.	Efficacy of impact mitigation remains the same.

Table B: Changes in the updated site development (the SEIS Preferred Alternative) versus previous site development plans

No.	Type of Change in Updated Site Development Plan	Reason for Change in the Site Development Strategy	Assessment of Effects on Impact Mitigation
J	Relocation of the existing 4 kV power line in the Lower site: A section of the 4 kV power line which supplies the KLIP and the Kapa'a Transfer Station with electricity passes through the Lower site. This section of the power line needs to be removed and replaced with a section outside the Lower site.	The relocation of the power line was planned, and it was decided to include the proposed action, which is the relocation of the section of the 4 kV power line, in this environmental review of the FSEIS.	The Proposed Action (relocation of the 4 kV power line) will not affect the other impact mitigation measures at the site. The Proposed Action (relocation of the 4 kV power line) has its own impact mitigation measures.

Possible environmental impacts and impact mitigation

Significant issues and impacts associated with the two SEIS alternatives are described below.

Geology, topography, and soils: For the SEIS Preferred Alternative and the SEIS No-Action Alternative about 27 and 22 acres of the project site would be converted from pervious to impervious land, respectively. Before construction, the project would require an approved erosion and sediment control plan and applicable permits, which would require appropriate site-specific best management practices (BMPs) for controlling runoff, erosion, and sedimentation during construction.

Water Resources: Under both action alternatives, the implementation of erosion and sediment control plans would be required to reduce soil erosion, Lower runoff flow rates and capture eroded soils and concentrated nutrients before they enter the receiving water. Storm water runoff during construction would be controlled by specific stormwater BMPs and erosion and sediment control plans for phases of the development would have to follow guidelines for the NPDES general permit coverage. Structural and non-structural management practices would be implemented for the operation of the proposed industrial park.

Under both SEIS alternatives, all storm water runoff from impervious areas would be captured in drain inlets, conveyed by drainpipes to treatment facilities at the site perimeter and subsequently released to the receiving water. Pollutants in the storm water runoff would be significantly reduced through the comprehensive treatment. Furthermore, the detention vaults would be sized to capture sufficient volumes of storm water runoff to avoid high peak flow rates during heavy rain events. The volume of storm water which would bypass the detention vaults would be relatively small.

The storm water treatment and management approach under the SEIS No-Action Alternative, which is the same approach as approved under the 2017 SMP minor modification, was found not feasible

by a soil engineering report. The storm water approach under the 2017 SMP minor modification used infiltration of all runoff adjacent and upstream of the site perimeter berms, which was likely to jeopardize berm stability.

The storm water treatment and management approach under the SEIS Preferred Alternative would avoid these constraints. Under the SEIS Preferred Alternative, storm water runoff would be conveyed to vegetated buffer strips. After running through these buffer strips where vegetation would filter out pollutants, the runoff would enter detention vaults. Runoff detained in these detention vaults would be released and run through manufactured treatment devices (MTD) which would filter the runoff to remove all but the smaller solid fractions in the storm water. Runoff would be discharged to the Kapa'a Stream corridor via an armored outfall.

The DSEIS describes impacts from leachate which could be released from rainwater percolating through the landfill. The leachate could cause significant impacts to aquatic resources adjacent to the project site. Harmful leachate is generated when water infiltrates into the landfill body entraining pollutants which are discharged downstream to the environment if not contained and treated. The landfill at the project site lacks an underground seal, such as an impermeable barrier, to protect potential harmful leachate to seep into the groundwater. Therefore, leachate cannot be contained and treated at the project site. Thus, the proven way to avoid adverse impacts from leachate is to avoid its generation by creating an impervious cover on the landfill.

The DSEIS describes positive effect of the Proposed Action on the overall water quality of the Kapa'a Stream since the stormwater discharge of the Proposed Action would reduce pollutants compared with pre-construction conditions.

Biological Resources: The Proposed Action would convert only land that is presently graded and has no vegetation. No open space, natural vegetated land or mature forest habitat would be used for the development footprint of either alternative. Under both action alternatives, rare and endangered species would not be affected since the existing condition of the project site is only habitat for a population of urbanized birds and small mammals but no endangered species. The adjacent Kawainui Marsh is habitat for federally listed water birds and no land of the marsh will be used for the Proposed Action.

Air Quality: Impacts on air quality would be primarily through increased traffic on the adjacent roads. The Proposed Action would not emit air pollutants from power generation or process heat. Some minor air impacts within the proposed project could result from dust and the operation of engines. Some air impacts would be expected from diesel operated vehicles, such as trucks. While there would be a significant increase of project related heavy vehicle traffic on the section quarry road with the highest traffic volume after full build out, it is expected that air quality impacts would not significantly increase relative to the background traffic. Recent regulations for diesel engines exhaust and cleaner diesel would reduce the air quality impact of heavy vehicles over time.

Noise: Construction noise would occur under both SEIS alternatives but would be short-term. It is expected that no sensitive receptors are located within the range of construction noise. Traffic

related noise would be similar under both SEIS alternatives, while the SEIS would contribute more to the ambient noise. The increased noise impacts due to the expected increases in traffic would be typically below threshold of a discernible difference to the human ear. The expected noise impacts would remain within the range typical for urban regions. Noise impacts during operations are not expected to be at significant levels and would occur in industrially zoned land where some level of noise could be expected.

Traffic: The expected increase in traffic is a function of trips generated per unit of warehouse space. Though the SEIS Preferred Alternative would have more warehouse footprint than the SEIS No-Action Alternative, the SEIS No-Action Alternative would have a base yard, which the SEIS Preferred Alternative does not have. The base yard footprint approximately equals the added warehouse footprint. It is estimated that traffic caused by the Proposed Action is about the same under both SEIS alternatives since the traffic rates of the removed base yard and added warehouse footprint would balance the two alternative. A traffic impact assessment report (TIAR), conducted for the 2011 FEIS, estimated the level-of-service (LOS) on two roadways and three intersections. The LOS levels on both roadways, the Kapa'a Quarry Road, and the Kapa'a Quarry Access Road, were predicted to remain better than a LOS level, which would require traffic impact mitigation, for the current state of project development. But the Proposed Action would have unacceptable LOS for intersections at full build-out and would therefore require traffic mitigation measures.

The Applicant plans to conduct an updated TIAR after the updated site development plans are approved. New LOS projections would determine what type and what scope the traffic impacts mitigations would need to be. The road entrance to the project site differs between the two SEIS Alternatives. The SEIS No-Action Alternative would have two road access to the Lower site, whereas the SEIS Preferred Alternative would only have a single road access. The single road access was chosen because of more practical access to the project site, lower traffic risks through better traffic flow, and improved sight distance. The road access to the Upper site would be identical for the two SEIS alternatives.

Infrastructure: Impact on the infrastructure would have small differences between the two SEIS alternatives since the SEIS Preferred Alternative would have more warehouse footprint but no base yard area. The demands for electricity and water could deviate between the two SEIS alternatives, with the SEIS Preferred Alternative potentially having higher demands. The municipal water main supply to the project site would have sufficient transmission capability for the proposed expansion of the light industrial park. Likewise, the electric power transmission would be sufficient given that the electric power lines are scheduled for upgrades in 2021 . Water and electricity savings measurements would be used since they are a requirement for the planned LEED certification of the Lower portion of the project site. These savings would reduce the demand on the regional infrastructure.

Since the project site is presently not connected to the municipal sewer system, wastewater treatment must happen onsite. Under the SEIS Preferred Alternative, advanced onsite wastewater treatment would be implemented, while under the SEIS No-Action Alternative the wastewater system would not be as advanced and would remain mainly conventional septic system. The SEIS

Preferred Alternative would emit wastewater effluent with significantly lower residual pollutants, thus reducing adverse impacts to the aquatic resources.

Socio-economic: The beneficial socio-economic impacts from the Proposed Action would outweigh possible adverse impacts. The 2017 Koolau Poko Sustainable Communities Plan called for flat amounts of business development but acknowledged the importance of some limited light industrial developments near the Kapa'a Quarry. In addition, the availability of modern, sustainably designed, and operated small service businesses can allow older, less sustainable businesses to relocate and the land they move from can be used for higher level community needs. Finally, having local services near residents and helping locate businesses near the homes of employees has a positive impact on the community.

Cultural: Neither SEIS alternative would have any adverse effect on cultural assets, since no cultural or archeological sites are known at the project site. The land on which the proposed development would be built is a landfill area that was created approximately 60 years ago. In the unlikely event of an archeological find during construction, standard procedures would be followed to protect any assets.

Cumulative impacts and outstanding issue: The 2011 FEIS described that there were no other major projects planned in the vicinity of the site and therefore there should be no significant cumulative impacts. The 2011 FEIS described several outstanding issues, all of which have been addressed since the 2011 FEIS was approved, except the need for a renewed traffic study.

Impact mitigation through low impact development approach

Under both SEIS alternatives, the Lower portion of the site which is close to environmentally sensitive areas would be developed using an array of sustainable building and site preparation technologies. These technologies would follow site development standard of the LEED certification standard; therefore, the site development would be more environmentally friendly than typical light industrial developments. The use of sustainable building and infrastructure strategies would have a positive and significant effect on the efficacy of impact mitigation.

Project Funding

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

Relationship to Plans, Policies and Controls

The Proposed Action would be consistent with all applicable objectives and policies of the Honolulu City and County General Plan, and the Koolau Poko Sustainable Communities Plan.

Honolulu City and County Land Use Districts: The project site has two land use designations for the two land parcels which comprise the project site. The TMKs 4-2-15:013 and 014 are zoned Intensive Industrial (I-2) and Limited Industrial (I-1), respectively. These land zoning allows the use of the two parcels for the intended construction of warehouses.

State Land Use Districts: The entire project site is within the "Urban" district. The intended land use of proposed actions would therefore be consistent with the state "Urban" land use district.

Permits

The Proposed Action would require certain land use and building permits to carry out construction work including but not limited to building, grading, and work on public roads. In addition, all applicable NPDES permits would be required, all but one NPDES already obtained. The project work may possibly also need permits to perform work in streams (stream alteration permit). It must be determined if the Proposed Action would need permits by the U.S. Army Corp of Engineers or the State Department of Health for wetland and surface water related construction.

Remainder of this document

The remainder of this document clarifies the similarities and differences between the approved FEIS from 2011, the currently approved SMA and land use permits for the KLIP development (No-Action Alternative) and the more advanced water treatment systems and land use for the Lower site (Preferred Alternative). In addition, the progress on issues required after the FEIS (outstanding issues) is summarized.

Additional Information provided in this Final SEIS.

In response to the comments received on the Draft SEIS submittal, new technical information is presented in this FSEIS. The technical information presented in this FSEIS describes certain changes to the site development approach, design concepts, impact mitigation measures that need further description, and updated submittals to agencies about impact mitigation.

The technical information is presented in 12 appendices, including Appendix A which was already presented in the DSEIS. Eleven appendices are new. The 12 appendices are named as follows:

Appendix A was presented as in the Draft SEIS and remains part of the FSEIS.

Appendix B – Responses to comments received from agencies and public interest groups: Comments were received from the Accepting Agency, other agencies and several community action groups. For all comments which addressed topics described in the DSEIS, detailed responses were given.

Appendix C - Changes and additions made to the storm water treatment and management system: The Accepting Agency suggested changes to the DSEIS which required some design changes of the storm water system in the lower portion of the project site (Lower site). These changes and additions include adding one drainage area, adding one Manufactured Treatment Device (MTD), and increasing detention vault capacities.

Appendix D - Requirement to increase the finish grade treatment in lower portion of the site to install the storm water and management system: Appendix D describes the technical reasons to increase the finish grade in the lower portion of the site so that sufficient elevation is provided to convey storm water runoff from the site to the storm water system at the Northern site perimeter.

Appendix E – Preliminary storm water system operations and maintenance plan: Appendix E described the preliminary tasks and technologies required to maintain the post-construction storm water BMPs at the project site.

Appendix F – Off street parking and trees inside the project site: Appendix F describes the applicable ordinances about off-street parking and adding trees around warehouses. The appendix discusses how the updated County rules are being met, and proposes the planting of trees while avoiding significant storm water infiltration through the tree planting and landscaped areas.

Appendix G – Visual Impact Mitigation: Appendix G describes visual impact mitigation technologies and practices which will reduce the visual impact from the development, especially the lower portion of the project site. The effectiveness of the vegetation screen and the site perimeter is described. In addition, measures to lower visual impact from long-distance view are discussed.

Appendix H – Light pollution prevention measures: Appendix H presents an updated version of a 2016 submittal to the Accepting Agency and DLNR about site development concepts which mitigate light pollution from the project site. This 2016 submittal was accepted by the reviewing agencies. The appendix describes the light pollution mitigation technologies and practices planned for the development. These include shielded light fixtures, preferred types of light sources and avoiding light trespassing to adjacent land.

Appendix I – Buffer development approach: Appendix L describes development concepts for the vegetated buffer zone around the project site. The development approaches were delineated in a 2016 buffer development plan that was submitted to the Accepting Agency and DLNR. The plan was accepted by the reviewing agencies. With the same mitigation measures considered the 2016 plan was updated to reflect the changed layout pf the project site.

Appendix J – Drainage ditch along the Kapa'a Quarry Road: Appendix J describes the condition of the drainage ditch along the Kapa'a Quarry Road fronting the lower portion of the project site. The changing conditions of the drainage ditch are described over the past two decades, from a ditch with free water surface to ditch overgrown with dense vegetation. A proposed approach to modify the area containing the ditch is presented which includes clearing the now overgrown areas, installation of a new vegetated swale with drainage, and construction of a combined path for pedestrian and bicyclist use.

Appendix K – Status of site development work: Appendix K describes a status of the development efforts completed during the past five years and outstanding development efforts that were required under the conditional zone change awarded in 2013.

Appendix L – Relocation of power lines: Appendix L describes the relocation of 4 kV power line that supply the project site. The current alignment of the 4 kV power line passes through of the lower portion of the site. This alignment must be changed to install the power line poles outside the project site perimeter. Appendix L describe the proposed alignment options, and expected impacts to the environment and the community.

The responses to all comments addressed to the Applicant is presented in Appendix B of this FSEIS document. The list below shows the stakeholders and agencies who were contacted about the availability of the DSEIS document and were invited to submit comments.

No.	Agency / stakeholder	Contacted	Status Responses / comments
1	**Federal Agencies**		
1.1	U.S. Army Corps of Engineers	Notice of DSEIS. 11/23/2020	Did Not respond
1.2	U.S. Fish and Wildlife Service, Pacific Islands Fish and Wildlife Office	Notice of DSEIS. 11/23/2020	Did Not respond
1.3	USDA NRCS, Pacific Islands Area State Office	Notice of DSEIS. 11/23/2020	Did Not respond
2	**State Agencies**		
2.1	**Department of Business, Economic Development and Tourism (DBEDT)**		
A	DBEDT, Strategic Industries Division	Notice of DSEIS. 11/23/2020	Did Not respond
B	DBEDT, Hawaiʻi State Energy Office	Notice of DSEIS. Sent 11/23	Did Not respond
2.2	**Department of Health (DoH)**		
A	Clean Water Branch	Notice of DSEIS. Sent 11/23	Did Not respond
B	DoH, Wastewater Branch	Notice of DSEIS. Sent 11/23	Did respond with comments
C	DoH, Safe Drinking Water Branch	Notice of DSEIS. Sent 11/23	Did Not respond
D	DoH, Clean Air Branch	Notice of DSEIS. Sent 11/23	Responded with Standard Comments for Land Use Reviews
2.3	**Department of Land and Natural Resources (DLNR)**		
A	DLNR, Commission on Water Resources Management	Notice of DSEIS. Sent 11/23	Did Not respond
B	DLNR, Division of Aquatic Resources	Notice of DSEIS. Sent 11/23	Did Not respond
C	DLNR, Division of Forestry and Wildlife	Notice of DSEIS. Sent 11/23	Did Not respond

No.	Agency / stakeholder	Contacted	Status Responses / comments
D	DLNR, Engineering Division	Notice of DSEIS. Sent 11/23	Did Not respond
E	DLNR, State Historic Preservation Division	Notice of DSEIS. Sent 11/23	Did Not respond
2.4	**Office of Hawaiian Affairs**	Notice of DSEIS. Sent 11/23	Did Not respond
2.5	**Office of Environmental Quality Control**		
2.6	Department of Transportation	Notice of DSEIS. Sent 11/23	Did Not respond
2.7	Water Resources Research Center / Environmental Center, University of Hawaii at Manoa	Notice of DSEIS. Sent 11/23	Did Not respond
3	**City and County of Honolulu Agencies**		
	DPP	Notice of DSEIS. Sent 11/23	Responded with comments
3.1	Honolulu Fire Department	Notice of DSEIS. Sent 11/23	Did Not respond
3.2	Honolulu Police Department	Notice of DSEIS. Sent 11/23	Did Not respond
3.3	Department of Environmental Services	Notice of DSEIS. Sent 11/23	Did Not respond
3.4	Department of Parks and Recreation	Notice of DSEIS. Sent 11/23	Did Not respond
3.5	Department of Planning and Permitting	Notice of DSEIS. Sent 11/23	Response came through Zachary Stoddard, POC of Accepting Agency
3.6	Department of Design and Construction	Notice of DSEIS. Sent 11/23	Responded with stating they have no comments
3.7	Board of Water Supply	Notice of DSEIS. Sent 11/23	Did not sent comments. Had responded to SEISPN
3.8	Department of Transportation Services	Notice of DSEIS. Sent 11/23	Responded on February 11, 2021 Sent Comments
3.9	Department of Facility Maintenance	Notice of DSEIS. Sent 11/23	Did Not respond
3.10	Office of Climate Change, Sustainability, and Resiliency	Notice of DSEIS. Sent 11/23	Did Not respond

No.	Agency / stakeholder	Contacted	Status Responses / comments
4	**Other**		
4.1	Senate District 24: Senator Jarrett Keohokalole	Notice of DSEIS. Sent 11/23	Did Not respond
4.2	House District 49: Rep. Scot Z. Matayoshi	Notice of DSEIS. Sent 11/23	Did Not respond
4.3	City Council Member: Alan Kekoa Texeira	Notice of DSEIS. Sent 11/23	Did Not respond
4.4	Oahu Metropolitan Planning Organization	Notice of DSEIS. Sent 11/23	Did Not respond
4.5	Hawaiian Telcom	Notice of DSEIS. Sent 11/23	Did Not respond
4.6	Hawaiian Electric Company	Notice of DSEIS. Sent 11/23	Did Not respond
4.7	Kailua Neighborhood Board No. 31	Notice of DSEIS. Sent 11/23	Responded with comments
4.8	Lani-Kailua Outdoor Circle	Notice of DSEIS. Sent 11/23	Responded with comments
4.9	Hawaii's Thousand Friends	Notice of DSEIS. Sent 11/23	Responded with comments
4.10	Dr. Charles Prentiss	Notice of DSEIS. Sent 11/23	Did Not respond
4.11	HAWAII AUDUBON SOCIETY		Sent comments

GLOSSARY OF ACRONYMS

2011 FEIS	**The previously approved FEIS for the Kapa'a Light Industrial Park; approved in 2011.**
BMP	Best Management Practice
BOD	Biological Oxygen Demand
BWS	Board of Water Supply
CFR	Code of Federal Regulations
CY	Cubic Yard
CZM	Hawaii Coastal Zone management (CZW)
cbft/sec	Cubic Feet per Second
dBA	Decibel (A-weighted measurements)
L_{dn} dB	Decibel (Day-night average sound level)
DBEDT	Department of Business, Economic Development and Tourism, State of Hawaii
DEIS	Draft Environmental Impact Statement
DSEIS	Draft Supplemental Environmental Impact Statement
DoH	Department of Health, State of Hawaii
DoT	Hawai'i Department of Transportation, State of Hawaii
DPP	Department of Planning and Permitting, City and County of Honolulu
E_{T0}	Monthly evapotranspiration rate
E_{TL}	Project-specific rate Evapotranspiration Rate
EPA	U.S. Environmental Protection Agency
FAO	Food and Agriculture Organization of the UN
FEIS	Final Environmental Impact Statement
FIRM	Flood Insurance Rate Map
GIS	Geographical Information System
GPD	Gallons per Day
GPM	Gallons per Minute
HACCP	Hazard Analysis and Critical Control Point Plan

HAR	Hawaiʻi Administrative Rules
HECO	Hawaii Electric Company
IAQ	Indoor Air Quality
IEQ	Indoor Environmental Quality
HECO	Hawaiian Electric Company
HRS	Hawaiʻi Revised Statutes
KLIP	Kapa'a Light Industrial Park
K_L	Landscape coefficient
I-1	Limited Industrial Land Use Zone
I-2	Intensive Industrial Land Use Zone
LEED	Leadership in Energy and Environmental Design
LZ	Lighting Zone
LOS	Level of Service
LUC	Land Use Commission
Makai	in the direction the ocean (Hawaiian language expression)
Mauka	in the direction the mountain (Hawaiian language expression)
MG	Million Gallons
MGD	Million Gallons per Day
MPH	Miles per Hour
MR	Materials & Resources
MSL	Mean Sea Level
MSW	Municipal Solid Waste
MWh	Mega Watt Hours
NEPA	National Environmental Policy Act
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
OEQC	Office of Environmental Quality Control

OMPO	Oahu Metropolitan Planning Organization
P-2	General Preservation Land Use Zone
PSI	Pounds per Square Inch
RP	Regional priority
SCP	Sustainable Communities Plan
SEIS	Supplemental Environmental Impact Statement
SEISPN	Supplemental Environmental Impact Statement Preparation Notice
SHPD	State Historic Preservation Division
SMA	Special Management Area
sqft	Square Feet
SS	Sustainable Sites
SWPPP	Storm water pollution prevention plan
TIAR	Traffic Impact Analysis Report
TMK	Tax Map Key
Total	N Total Nitrogen
TSS	Total suspended solids
UBC	Uniform Building Code
USACoE	U.S. Army Corp of Engineers
USFWS	U.S. Fish and Wildlife Service
V/C	Volume to Capacity (ratio)
VOC	Volatile Organic Compounds
VPH	Vehicles per Hour
WE	Water Efficiency

"Lower site " is used to describe the lower portion of the project site on the lower portion of TMK 4-2-15:014.

"Upper site " is used to describe the upper portion of the project site, which includes land of TMK 4-2-15:013 and the upper portion of TMK 4-2-15:014.

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CHAPTER 1 - PURPOSE AND ORGANIZATION OF THE DRAFT SEIS

This ~~Draft~~ Final Supplemental Environmental Impact Statement (DSEIS) examines potential environmental impacts of developing the Kapa'a Light Industrial Park (KLIP) on a site that consists of two contiguous land parcels TMK (1) 4-2-15:013 and 014. The parcels are located on the windward side of Oahu, near the town of Kailua.

In the 2011 FEIS, the project site was described as consisting of three contiguous parcels TMKs 4-2-15:001 (portion of), 006 and 008. While the physical extent of the project site remains the same, the parcel TMK designations of the parcels making up the project site were changed. First, the parcel TMK 4-2-15:001 (portion of) was changed to 4-2-15:012. Subsequently, the TMKs 4-2-15:012 and 006 were consolidated as parcel TMK 4-2-15:014, and the parcel TMK 4-2-15:008 was reassigned TMK 4-2-15:013. The ownership off the parcels remained the same.
Another change in the site development approach was the administrative act of a Joint Development Agreement between the two owners of parcels TMK 4-2-15:013 and 014.

This FSEIS ~~DSEIS~~ follows up on a FEIS which was accepted in October 2011 (2011 FEIS), by the Accepting Agency, the City and County of Honolulu, Department of Planning and Permitting (DPP). The 2011 FEIS described the environmental impacts of the KLIP as they were delineated in 2011. In the nine years since the approval of the 2011 FEIS the project has gone through several stages of site design which included some changes in the approach of site development, technology, and construction as well as improved impact mitigations.

Based on these changes the DPP determined that a SEIS is required to determine the changes made to the site development, construction, and impact mitigation strategies.

This FSEIS ~~DSEIS~~ is prepared pursuant to Hawaii's environmental impact statement law (HRS 343) and Chapter 11-200.1 Hawaii Administrative Rules (HAR). The law requires that the government considers environmental, social, and economic consequences of developments, which are not exempt under the law. Developments for which an Environmental Assessment (EA) or Environmental Impact Statement (EIS) are prepared require adequate opportunities for the public to participate in the review process.

The following sections of Chapter 1 provide background, purpose, and need of the Proposed Action as well as describe the SEIS process for the Proposed Action and process steps that have been completed.

1.1 Project Background

The Applicant are the owner of two contiguous land parcels on which the Kapa'a Light Industrial Park (KLIP) is developed. With the KLIP site expansion ongoing, more of the project site area has been developed, and more warehouse buildings have been constructed since the 2011 FEIS.

The development of the KLIP started some 30 years ago when the applicant started to offer leasable base yard land and soon after built the first permanent warehouse structure. Currently, there are presently approximately 30 warehouses at the KLIP site, with building footprints ranging between 3,000

sqft to 24,000 sqft. The existing warehouses and those under active development are located within the Upper portion of the KLIP, within the TMK 4-2-15:013 and the Western portion of 4-2-15:014.

The development objective of the proposed KLIP is to provide the Kailua and Kaneohe region with additional industrial space, which is in short supply in this region. The Koolau Poko region, in which the proposed project is located, is significantly undersupplied with industrial space when compared to other markets on Oahu. Due to the shortage of industrial space, businesses that serve the region are often forced to locate within other regions on Oahu, resulting in long commutes and trip for employees and clients, which reside in the Koolau Poko region. Since there is virtually no other land within the Koolau Poko region to provide additional industrial space, the proposed site is an important asset for the region to improve the economic infrastructure.

1.1.1 Project Location

The Kapa'a Light Industrial Park (KLIP) is situated to the West of Kailua town, on the island of O'ahu. The KLIP stretches over 57 acres in the lower stretches of the Kapa'a Valley, which is the watershed of the Kapa'a Stream. The KLIP is located on two contiguous land parcels, TMK 4-2-15:013 and 14, with a total land area of 79 acres. The two parcels are owned by the Applicants, the King family, who are longtime residents of Kailua.

The project site is located on the windward side of the island of Oahu, at the western boundary next to the important Kawainui Marsh. The KLIP site is adjacent to Kapa'a Quarry Road and Kapa'a Quarry Place. (In the 2011 FEIS the referred to Kapa'a Quarry Access Road was recently renamed to Kapa'a Quarry Place). The H3-Freeway passes the project site to the north. The proposed project site and immediate surroundings are shown in Figure 1.1.1.

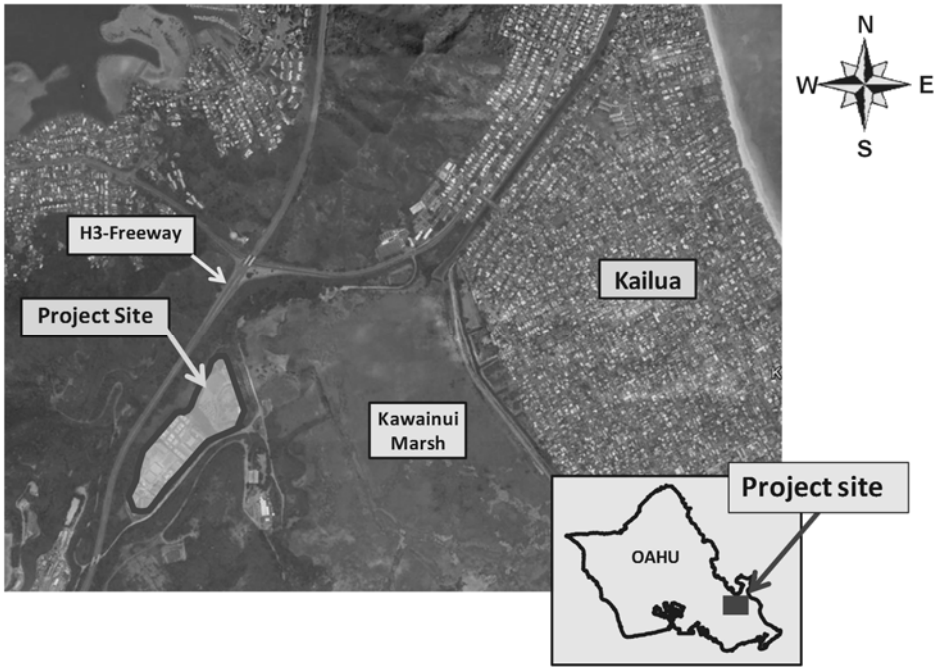


Figure 1.1.1: Project Location Map

1.1.2 Project Site Development Plans

The delineated development plans described in the 2011 FEIS were to add 606,000 square feet of warehouse space (building footprints) to the existing 283,000 square feet of warehouse space at the site. The total planned full build-out warehouse footprint, delineated in the 2011 FEIS, was therefore 889,000 sqft.

With 352,000 sqft of this warehouse space completed at the present time (2020) under the updated site development master plan, the planned additional warehouse footprint is 549,000 sqft to attain full build out. Therefore, the total full build-out warehouse footprint at the site is planned to be 892,000 sqft. This indicates that the presently planned full build-out warehouse footprint is only about 0.3% larger than disclosed in the 2011 FEIS. This means that the full build-out warehouse footprint described in the 2011 FEIS and updated in the present DSEIS is practically the same.

Likewise, the areas considered for the site development have slightly changed from the 2011 FEIS to the current site development master plan. The combined land area in the two parcels TMK -2-15:013 and 014 remains at 79 acres.

In the 2011 FEIS, the sum of the vegetated land and the impervious land at full build-out within the two parcels was itemized as 30.4 and 43.5 acres, respectively. An area of 5.1 acres was designated as "other, in parcel but outside project site". Under the current site development plans the sum of the vegetated land and the impervious land at full build-out is 31.0 and 44.9 acres, respectively, and 3.1 acres designated as "other". (refer to a detail description in Section 2)

A comparison between the planned full build-out area in the two parcels between the 2011 FEIS and the present SEIS indicates that under the updated masterplan, the planned impervious land increases by 3% and the land with vegetation increases by 2%. Therefore, this means that the changes in vegetated land and impervious land, including impervious pavement and building roofs, are small.

1.1.3 Administrative Actions for Site Development after 2011 FEIS

Following the acceptance of the 2011 FEIS there were the following changes in major land use permits:

A. <u>Conditional Zone change:</u> On October 24, 2013, the City and County approved a conditional zone change (Ordinance 13-35), which rezoned 27 acres of the former TMKs 4-2-15:012 and 006 parcels, the current consolidated parcel TMK 4-2-15:014, from General Preservation (P-2) to Limited Industrial (I-1). Figure 1.1.3.1 shows the "Exhibit A" map of the Ordinance 13-35. A portion of the project site is located inside the rezoned land.

The main conditions of Unilateral Agreement of the Zone Change Ordinance are as follows:

1. <u>Transportation:</u>
    a. The conditions included a project timeline with construction and traffic management plans.
    b. An updated Traffic Impact Analysis Report (TIAR) was required before construction of "Phase-D", defined as the Lower portion of the project site within parcel TMK 4-2-15:014.

c. An agreement with the City & County of Honolulu to build and fund frontage road improvements along the Kapa'a Quarry Road and Kapa'a Quarry Access Road (since renamed as Kapa'a Quarry Place).

Points A and C were ~~have been~~ completed and <u>are presently updated on cooperation with County agencies to reflect the changed site development plan</u>. Point B is outstanding and a new TIAR will be commissioned by the Applicants after the final development density is confirmed.

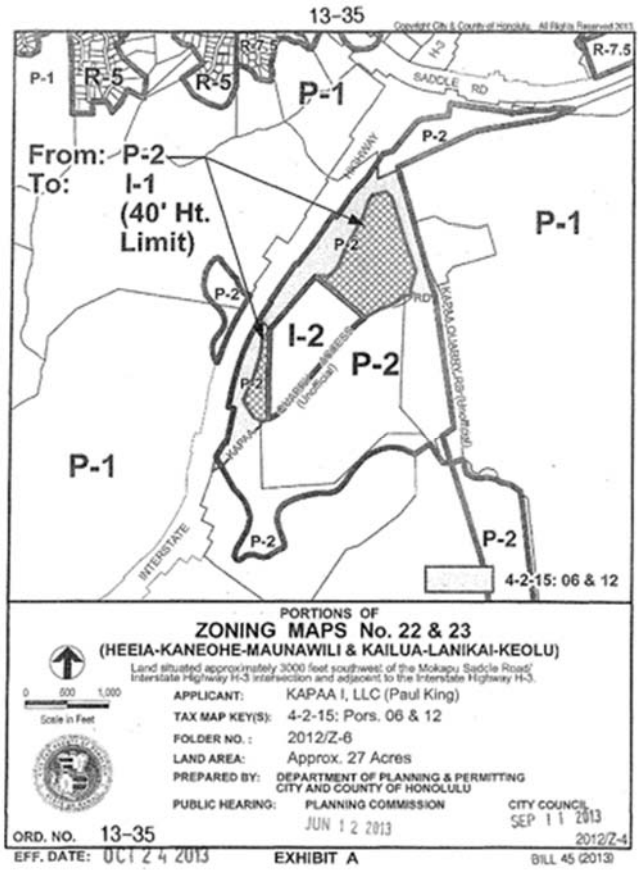


Figure 1.1.3.1:
Zoning Map of the Ordinance 13-35

The zoning map indicates the land that was rezoned from P-2 to I-1.

2. <u>Buffer zone:</u>

   a. A vegetated buffer zone was required around the project site to mitigate noise and visual impact. The buffer zone included earth berms and vegetation, including tall trees and shrubs.
   b. An existing detention basin within the buffer zone could be used for storm water treatment and flood control.

Point A has been completed since a Buffer Development Plan was developed by the Applicants and approved by the DPP in 2016. An updated version of the approved plan is presented in Appendix I. The existing detention basin mentioned under Point B is used for storm water treatment and flood control under the updated site development design.

3. Stormwater Facilities:

   a. Acceptance of off-site storm water drainage from an existing culvert under the Kapa'a Quarry Access Road (renamed as Kapa'a Quarry Place) onto the land.
   b. Development of the Lower portion of the parcel TMK 4-2-15:006 (the current 4-2-15:014) using low impact development (LID) approaches. These approaches include treating storm water runoff on site through underground storage containers while avoiding infiltration of rainwater into the existing landfill body.
   c. Monitoring and maintaining all onsite storm water infrastructure.

   All points A through C are being used in the site development planning and site design.

4. Exterior Lighting:

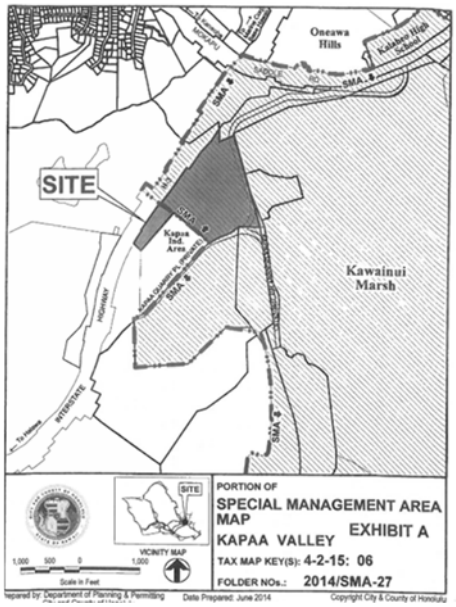
   a. Lighting impact mitigation was required to avoid impacts on migrating seabirds.

   A concept plan for the exterior lighting SDC (2016,A) was developed by the Applicants and approved by the Hawaii State Department of natural Resources (DLNR). An updated version of the approved plan is presented in Appendix H.

B. Special Management Area Use Permit (SMP) (Major): On September 25, 2014, the City and County of Honolulu granted a Special Management Are Use Permit (SMP) (Resolution 14-222, CD1) for the construction of portions of the Kapa'a Light Industrial park. Figure 1.1.3.2 shows the extent of the project site that is inside the Special Management Area (SMA). Figure 1.1.3.3 shows the project site configuration that was approved by the 2014 SMP.

C. Minor Modification for SMP No. 2014/SMA-27, 2016/MOD-68 (NA): In 2016 the DPP approved the SMP Minor Modification (2016/MOD-68 (NA) to allow grading and stockpiling in the Lower portion of the site. Stockpiling of a significant amount of fill was required to commence the first phase of grading. Since grading work was done in phases, fill that was brought to the site was first stored until sufficient fill was accumulated for the phased grading work to commence.

D. Minor Modification for SMP No. 2014/SMA-27, 2017/MOD-37 (MT): In 2017 the DPP approved the SMP Minor Modification (2017/MOD-37 (MT) to allow a redesigned storm water management system. The original storm water management system under the approved SMP No. 2014/SMA27 had an underground detention basin which would detain and subsequently release storm water in controlled above-ground discharges to receiving waters. The redesigned storm water system would replace the approved storm water system with a low impact development infiltration system.



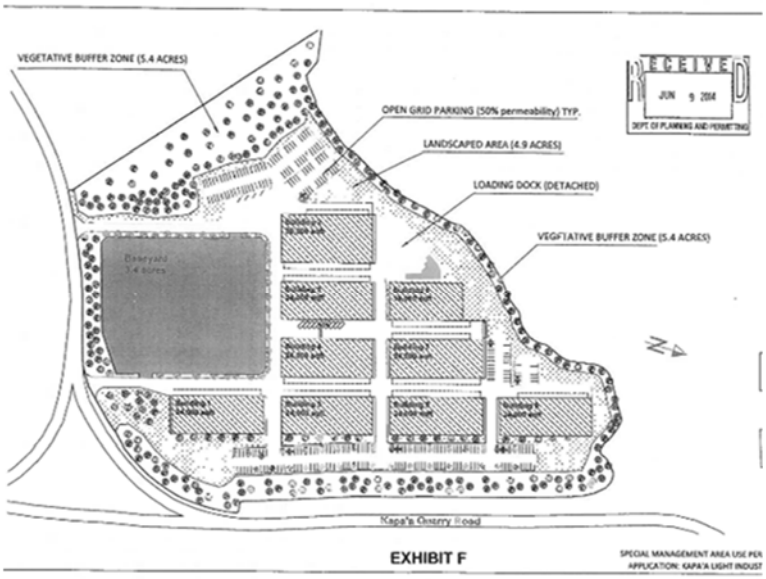


Figure 1.1.3.2: SMA Map (2014/SMA-27) Figure 1.1.3.3: SMP (2014/SMA-27) approved site configuration

Since the zone change did not permit infiltration of rainwater into the existing the landfill body, the revised storm water design under the 2017 SMP Minor Modification would infiltrate water into an added layer of fill adjacent and upstream of the perimeter berm. Under this method, the storm water would infiltrate into added and non-polluted fill. Subsequently, storm water would migrate below the site perimeter berms to the existing drainage swale along the Kapa'a Quarry Road.

E. Joint Development Agreement Conditional Use permit (CUP) No. 2015/CUP-70: In 2016 the DPP approved a joint development agreement for the Kapa'a light Industrial Park (KLIP). This allowed the joint development of the parcels that comprise the KLIP. Therefore, construction and operation of infrastructure and structures across property lines in the KLIP was allowed.

F. Subdivision of three parcels and creation of two lots; 2015/SUB-86: In 2016 the DPP approved a subdivision of the parcels that comprise the KLIP into two lots, Lot 1 of 22.3 acres and Lot 2 of 56.9 acres. The previous TMK 4-2-15:008 was designated Lot 1 and the two TMKs 42-155:006 and 012 were designated Lot 2. New TMK designations were subsequently assigned with TMK 4-2-15:008 changing to 4-2-15:013, and TMKs 4-2-15:006 and 012 changing to 4-2-15:14.

1.2 Purpose and Need for the SEIS

Earlier in 2020, the DOO required this SEIS following a February 2020 SMP Minor Modification Application that was denied, with the DPP letter dated April 8, 2020.

The February 2020 SMP Minor Modification proposed several changes in the site development design. The changes are described in more detail in Chapter 6 of this SEIS document. Among the proposed site development changes, the changed storm water management strategy was of the most concern.

The SMP Minor Modification Application requested the approval of a redesigned storm water management system, since further design work had concluded that the approved storm water system (under 2017/MOD-37 (MT) would cause construction and operational problems. A soil investigation study (Stewart Engineering, 2019) concluded that the intended infiltration of substantial amounts of water close to and upstream of to the site perimeter berms, and the subsequent migration of the infiltrated water through layers of added fill could cause soil stability problems of the earth berms. In addition, the drainage capacity of the ditch ~~swale~~ along the Kapa Quarry road and adjacent to the eastern site perimeter of the Lower portion of the site had deteriorated by significant soil accumulations and overgrowth with vegetation. In fact, the drainage ditch ~~swale~~ basically had ceased to exist in its function of conveying drainage to the Lower reaches of the Kapa'a Stream corridor.

Due to these design constraints, a revised storm water management system was designed that avoided infiltration of water into adjacent to the perimeter berm. The revised storm water management system proposed to collect the site runoff in below ground detention vaults for controlled above ground release through a single outfall to the Kapa'a Stream corridor. The single outfall was in the Lower reaches of the Kapa'a Stream corridor.

To provide sufficient hydraulic flow energy, e.g., hydraulic head, the 2020 SMP Minor Modification Application proposed to increase the finish grade. Increasing the finish grade also required to raise the site perimeter earth berms which stabilize the added fill.

In its denial decision, the DPP stated that a Supplemental EIS was required or warranted ".if modifications may have significant environmental impacts…. and ... when the mitigating measures originally planned will not be implemented, or where new circumstances or evidence have brought to light different or likely increased environmental impacts not previously dealt with." (quoting the April 8, 2020 DPP letter denying the SMP Minor Modification Application).

In due course, this FSEIS ~~DSEIS~~ is being created to address possible changes in environmental impact and the effectiveness of impact mitigation measures that are different from the 2011 FEIS.

The development objective of the proposed KLIP remains the same as delineated in the 2011 FEIS. The overreaching objective remains to provide the Kailua and Kaneohe region with additional industrial space, which is in short supply in this region.

The DPP Letter dated April 8, 2020 in which DPP declined the February 2020 SMP Minor Modification application, stated that submitted information was incomplete because the proposed modification requires an SEIS. The DPP letter is presented on the following three pages:

DEPARTMENT OF PLANNING AND PERMITTING
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET, 7TH FLOOR • HONOLULU, HAWAII 96813
PHONE: (808) 768-8000 • FAX: (808) 768-6041
DEPT. WEB SITE: www.honoluludpp.org • CITY WEB SITE: www.honolulu.gov

FILE

KIRK CALDWELL
MAYOR

KATHY K. SOKUGAWA
ACTING DIRECTOR

TIMOTHY F. T. HIU
DEPUTY DIRECTOR

EUGENE H. TAKAHASHI
DEPUTY DIRECTOR

April 8, 2020

2020/MOD-11(ZS)
2014/SMA-27

Mr. Manfred Zapka
Sustainable Design & Consulting, LLC
P.O. Box 25914
Honolulu, Hawaii 96825

Dear Mr. Zapka:

SUBJECT: Request for Minor Modification
Special Management Area (SMA) Use Permit
No. 2014/SMA-27
Kapaa Light Industrial Park
897 Kalanianaole Highway - Kailua
Tax Map Key 4-2-015: 014

This is in response to your submittal, received February 26, 2020, to modify the subject SMA. We regret to inform you that the submitted information is incomplete because the proposed modifications require a supplemental Environmental Impact Statement (EIS), as explained below.

You propose to modify the approved plans for the site because of design constraints that have arisen since the previous EIS, SMA (File No. 2014/SMA-27) and two subsequent Minor Modifications (File Nos. 2016/MOD-68 and 2017/MOD-37). The modifications proposed in the current application involve the stormwater management system, number of structures and building area, grading, perimeter berms, irrigation system, wastewater system, and roadway access (Pages 1 through 4 of the application). You state that the site has already been graded in accordance with approved plans, but there are no impervious surfaces or structures at this time (Page 9).

According to Hawaii Administrative Rules Chapter 11-200.1-30, a supplemental EIS is required if modifications may have significant environmental impacts. In addition, subsection (b) states, "A supplemental EIS shall be warranted ... when the mitigating measures originally planned will not be implemented, or where new circumstances or

Mr. Manfred Zapka
April 8, 2020
Page 2

evidence have brought to light different or likely increased environmental impacts not previously dealt with."

The proposed stormwater management system is significantly different compared to the stormwater management system described in the EIS. The proposed modifications involve significantly more impervious surface area, significantly less stormwater harvesting capacity and reuse, and a modified treatment system that eliminates infiltration. The proposed modifications no longer include large landscaped areas within the site that were described in the EIS. According to Page 184 of the EIS, pervious, vegetated areas manage a significant portion of stormwater through retention in the topsoil and evaporation. Because the proposed modifications involve less landscaped area to irrigate, the capacity to store and reuse stormwater has been reduced by about half (Page 3 of the modification request). The previously approved stormwater management system allowed stormwater to infiltrate under perimeter berms made of fill material designed to treat the stormwater (according to Minor Modification No. 2017/MOD-37, approved August 25, 2017). Stormwater would then migrate towards an existing ditch along Kapaa Quarry Road. A 2019 geotechnical report has since concluded that this would compromise the berm's stability. Instead, the proposed modifications direct stormwater through a manufactured treatment device and then directly into Kapaa Stream. It is unclear whether these modifications will cumulatively result in an increase in the volume of untreated overflow stormwater, which may have a significant environmental impact. In addition, the mitigating measures originally planned, including stormwater harvesting, pervious surfaces, and infiltration are significantly modified and will not be implemented as described in the EIS.

The proposed site design is also significantly different compared to the site design described in the EIS. The site design described in the EIS involves 15 buildings with a total building area of 337,000 square feet, while the proposed modification involves 14 buildings with a total building area of 373,200 square feet. Additionally, the finish grade must be raised to accommodate proposed changes to the stormwater management system. The previously approved finish grade ranges from 25 to 39 feet, while the proposed finish grade ranges from 40 to 50 feet (Page 42 of the application). The proposed finish grade is an average of 11.6 feet higher than what was previously approved, and will require 390,000 cubic yards of additional fill material. Page 325 of the EIS states a visual impact analysis shows that visual impacts can be mitigated. The proposed modifications significantly elevate the site features, which may result in a significant impact.

The proposed modifications require a supplemental EIS because they may have significant environmental impacts and because mitigating measures will not be implemented as described in the EIS. We will publish this determination in *The Environmental Notice*. The supplemental EIS should include, at minimum, the following:

Mr. Manfred Zapka
April 8, 2020
Page 3

- The percentage of annual stormwater that will overflow and bypass the proposed manufactured treatment device, as compared to the existing conditions and the approved plans under the EIS;
- The impact that treated and untreated stormwater will have on the stream and marsh, as compared to the existing conditions and the approved plans under the EIS;
- An analysis of alternatives, including the alternative of directing stormwater to the basin west of the Project site, and the impacts on water quality in the stream and marsh; and
- The visual impacts that the elevated site will have, as compared to the approved plans under the EIS.

The original application materials, including the $200 check, are enclosed. Should you have any questions, please contact Zack Stoddard, of our Land Use Approval Branch, at (808) 768-8019 or zachary.stoddard@honolulu.gov.

Very truly yours,

for Kathy K. Sokugawa
Acting Director

Enclosure: Check No. 0415

1.3 The SEIS Process Steps of the Proposed Action

Under Hawaii's environmental impact review process, agencies are required to consider the impacts of their proposed major actions on the quality of the human and natural environment. The process is intended to make decisions on developments that are based on the understanding of impacts to the environment and community and identify and assess reasonable mitigation measures to avoid or minimize adverse effects.

The SEIS process is outlined in Chapter 343, Hawaii Revised Statutes (HRS) and Chapter 343, Hawaii Revised Statutes (HRS) system of environmental review at the state and county levels. Hawaii Administrative Rule (HAR) Title 11, Chapter 200.1, Environmental Impact Statement Rules, with procedures and specifications regarding the contents, criteria, and definitions of applying the rules.

The procedures and requirements of creating a Supplemental EIS are stated in HAR §11-200.1-30 "Supplemental environmental impact statements". The applicable subsections of HAR §11-200.1-30 are listed below, with the underlined text highlighting has been added to indicate areas that relate to current project.

(a) An EIS that is accepted with respect to a particular action is usually qualified by the size, scope, location, intensity, use, and timing of the action, among other things. An EIS that is accepted with respect to a particular action shall satisfy the requirements of this chapter and no supplemental EIS for that Proposed Action shall be required, to the extent that the action has not changed substantively in size, scope, intensity, use, location, or timing, among other things. If there is any change in any of these characteristics which may have a significant effect, the original EIS that was changed shall no longer be valid because an essentially different action would be under consideration and a supplemental EIS shall be prepared and reviewed as provided by this chapter. If there is no change in a Proposed Action resulting in individual or cumulative impacts not originally disclosed, the EIS associated with that action shall be deemed to comply with this chapter.

(b*) The accepting authority or approving agency in coordination with the original accepting authority shall be responsible for determining whether a supplemental EIS is required. This determination will be submitted to the office for publication in the periodic bulletin. Proposing agencies or applicants shall prepare for public review supplemental EISs whenever the Proposed Action for which an EIS was accepted has been modified to the extent that new or different environmental impacts are anticipated. <u>A supplemental EIS shall be warranted when the scope of an action has been substantially increased, when the intensity 200.1-49 §11-200.1-31 of environmental impacts will be increased, when the mitigating measures originally planned will not be implemented, or where new circumstances or evidence have brought to light different or likely increased environmental impacts not previously dealt with.</u>*

(c) The <u>contents of the supplemental EIS shall be the same as required by this chapter for the EIS and may incorporate by reference unchanged material from the same</u>; however, in addition, <u>it shall fully document the proposed changes from the original EIS</u>, including changes in ambient conditions or available information that have a bearing on a Proposed Action or its impacts, <u>the positive and</u>

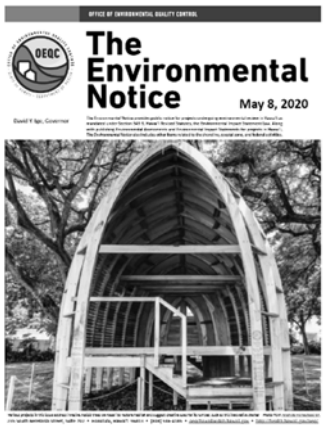
negative aspects of these changes, and shall comply with the content requirements of subchapter 10 as they relate to the changes.

(d) The requirements of the thirty-day consultation, public notice filing, distribution, the forty-five-day public review, comments and response, and acceptance procedures, shall be the same for the supplemental EIS as is prescribed by this chapter for an EIS.

1.4 SEIS Preparation Notice

The SEIS Preparation Notice was coordinated with DPP and was reported in the publication "The Environmental Notice" of the Office of Environmental Quality Control (OEQC).

The May 8, 2020 publication of the OEQC "The Environmental Notice" informed about the DPP decision of requiring a SEIS for the project. Figure 1.4.1 shows the cover sheet of the May 8, 2020 of the OEQC "The Environmental Notice" and the section that describes the DPP determination of requiring a SEIS.



May 8, 2020 — The Environmental Notice

O'AHU (CONTINUED)

Kapa'a Light Industrial Park--(Determination that Supplemental EIS is required)

HRS §343-5(a) Trigger	(6) Propose any amendments to existing county general plans where the amendment would result in designations other than agriculture, conservation, or preservation — MAP UNAVAILABLE
District(s)	Ko'olaupoko
TMK(s)	(1) 4-2-015:014
Permit(s)	Numerous
Approving Agency/ Accepting Authority	Department of Planning and Permitting, City and County of Honolulu Zack Stoddard, (808) 768-8019, zachary.stoddard@honolulu.gov 650 South King Street, Honolulu, HI 96813
Applicant	Kapaa I, LLC; 905 Kalaniana'ole Highway, Kailua, HI 96734 Paul King, (808) 261-8991, sustainableDC@gmail.com
Consultant	Sustainable Design & Consulting, LLC; P.O. Box 25914, Honolulu, HI 96825 Manfred Zapka, (808) 265-6321, sustainableDC@gmail.com
Status	The approving agency has determined that a supplemental EIS is required.

The proposed industrial park would be adjacent to the Kapa'a Stream and mauka of the Kawainui Marsh. Only grading work has been completed so far.

The Final EIS for the project was accepted on 10/11/2011. Since then, the Department of Planning and Permitting approved a major Special Management Area permit (file number 2014/SMA-27) and two minor modifications to that permit (file numbers 2016/MOD-68 and 2017/MOD-37). The applicant is requesting to modify the Special Management Area permit a third time because design constraints have arisen.

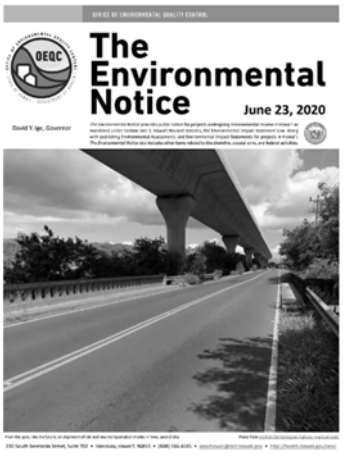
The proposed modifications involve the stormwater management system, the number of structures and building area, grading, perimeter berms, the irrigation system, the wastewater system, and roadway access. As explained in the determination letter, the modifications require a supplemental EIS because they may have significant environmental impacts and because mitigating measures will not be implemented as described in the EIS.

(a) Cover of the May 8, 2020 edition of the OEQC "The Environmental Notice"

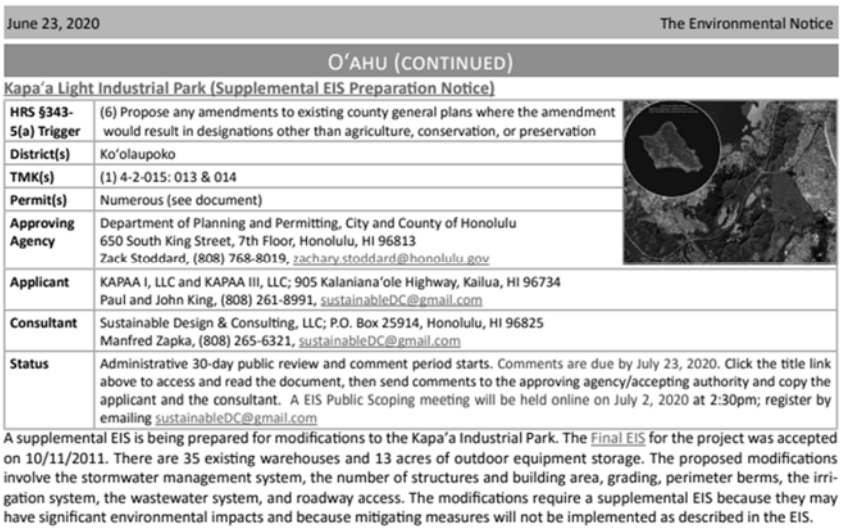
(b) Information of DPP determination requiring a SEIS for the Kapa'a Light Industrial Park

Figure 1.4.1: May 8, 2020 Publication in The Environmental Notice

The June 23, 2020 publication of the OEQC "The Environmental Notice" provided information on the SEIS Preparation Notice (SEISPN) and the public scoping meeting and provided a link to download the SEISPN document. Figure 1.4.2 shows the cover sheet of the June 23, 2020 of the OEQC "The Environmental Notice" and the information presented on the SEISPN.



(a) Cover of the June 23, 2020 edition of the OEQC "The Environmental Notice"



June 23, 2020 The Environmental Notice

O'AHU (CONTINUED)

Kapa'a Light Industrial Park (Supplemental EIS Preparation Notice)

HRS §343-5(a) Trigger	(6) Propose any amendments to existing county general plans where the amendment would result in designations other than agriculture, conservation, or preservation
District(s)	Ko'olaupoko
TMK(s)	(1) 4-2-015: 013 & 014
Permit(s)	Numerous (see document)
Approving Agency	Department of Planning and Permitting, City and County of Honolulu 650 South King Street, 7th Floor, Honolulu, HI 96813 Zack Stoddard, (808) 768-8019, zachary.stoddard@honolulu.gov
Applicant	KAPAA I, LLC and KAPAA III, LLC; 905 Kalaniana'ole Highway, Kailua, HI 96734 Paul and John King, (808) 261-8991, sustainableDC@gmail.com
Consultant	Sustainable Design & Consulting, LLC; P.O. Box 25914, Honolulu, HI 96825 Manfred Zapka, (808) 265-6321, sustainableDC@gmail.com
Status	Administrative 30-day public review and comment period starts. Comments are due by July 23, 2020. Click the title link above to access and read the document, then send comments to the approving agency/accepting authority and copy the applicant and the consultant. A EIS Public Scoping meeting will be held online on July 2, 2020 at 2:30pm; register by emailing sustainableDC@gmail.com

A supplemental EIS is being prepared for modifications to the Kapa'a Industrial Park. The Final EIS for the project was accepted on 10/11/2011. There are 35 existing warehouses and 13 acres of outdoor equipment storage. The proposed modifications involve the stormwater management system, the number of structures and building area, grading, perimeter berms, the irrigation system, the wastewater system, and roadway access. The modifications require a supplemental EIS because they may have significant environmental impacts and because mitigating measures will not be implemented as described in the EIS.

(b) Information of DPP determination requiring a SEIS for the Kapa'a Light Industrial Park

Figure 1.4.1: June 23, 2020 Publication in The Environmental Notice

1.5 SEIS Scoping Process

Upon acceptance of the SEISPN the project team began the environmental review process with conducting the scoping process. A public scoping meeting was conducted on July 6, 2020. The scoping meeting was held online.

A scoping report was written that describes in detail the process and outcome of the scoping process. The scoping report is presented in Appendix A along with presentations that were used in meeting supporting SEIS scoping.

A summary of the process and outcome of the scoping process is presented hereafter:

The scoping process for the Draft EIS was conducted over a period of two months; from July to August 2020. The scoping process included the following communications and interactions:

A. Communication with the DPP, the Accepting Agency
B. Holding one public scoping meeting (held online)
C. Communicating with State and County agencies
D. Communicating with community groups
E. Communicating with individuals
F. Presenting the proposed scope of the SEIS at a public meeting of the Kailua Neighborhood Board.

DPP scope requirements: The DPP stated the following issues to be discussed in the SEIS, since they differ from the approaches described in the 2011 FEIS:

Stormwater Management System: The following issues related to storm water management should be discussed in the SEIS:

- More impervious surface area: The impacts and implications of less landscaped and pervious areas within the site relative to the 2011 FEIS should be discussed in conjunction with the revised storm water management strategy. The site will have more paved and impervious traffic areas adjacent to the warehouse structures.
- Less stormwater harvesting capacity; The impacts implications of having less landscaped area should be discussed relative to the needs for irrigation water. Less area to irrigate would decrease the capacity to store and reuse stormwater.
- Modified storm water management system that eliminates infiltration; The previously approved stormwater management system included stormwater to be detained in underground vaults and subsequently infiltrated into soil that was added inside and adjacent the perimeter berm (according to Minor SMP Modification No. 2017/MOD-37, approved August 25, 2017). Based on a soil study, it was found that infiltrating significant amounts of rainwater upstream of the site perimeter berms and possible below ground water migration underneath the perimeter berms could cause stability problems of the site perimeter berms.
  Therefore, an alternative storm water management strategy has been developed to discharge the runoff to the Kapa'a Stream corridor via the Northern site perimeter. The impact and implications of the new storm water management strategy should be discussed in this SEIS.
- Volume of untreated overflow stormwater; DPP stated the need to investigate impact and implications of discharging storm water that bypassed the proposed water quality treatment system during peak storm events. This discharge would cause an increase in the volume of untreated overflow stormwater, which might cause environmental impact.

Site development: The following issues related to the site development strategies should be discussed.

- Change in number of buildings and total building area; With the number and locations of warehouse buildings changing in the updated site development approach relative to the 2011 FEIS related impacts and implications should be discussed.

- Increased finish grade elevation: Impacts and implications of raising the full build-out finish grade elevation should be discussed. While increasing the finish grade elevation is necessary to install the proposed storm water management system with low impact development strategies, raising the finish grade elevations could have impact and implications on the environment and the community.

- Visual impact due to increased elevation of finish grade; One potential impact of raising the finish grade would be the visual impact caused by higher perimeter berms. Therefore, a visual impact analysis should indicate if the visual impacts can be successfully mitigated.

The DPP concludes that the Supplemental EIS should include, at minimum, the following:

- The percentage of annual stormwater that will overflow and bypass the proposed manufactured treatment device, as compared to the existing conditions and the approved plans under the EIS.
- The impact that treated and untreated stormwater will have on the stream and marsh, as compared to the existing conditions and the approved plans under the EIS.
- An analysis of alternatives, including the alternative of directing stormwater to the basin west of the Project site, and the impacts on water quality in the stream and marsh; and
- The visual impacts that the elevated site will have, as compared to the approved plans under the EIS.

Comments and input received in the scoping process were from governmental agencies, community groups and individuals. Figure 1.5.1 and Table 1.5.1 show the range of issues of concern received in the scoping process. A high frequency of specific issues raised indicated a high level of perceived importance to address related impacts and implications.

As Figure 1.5.1 indicates, the leading concerns and recommendation received during the scoping were storm water and site development related, with 35% and 23% of the sum of received input, respectively. Water supply/non-potable water related issues and onsite wastewater treatment were two other topics raised.

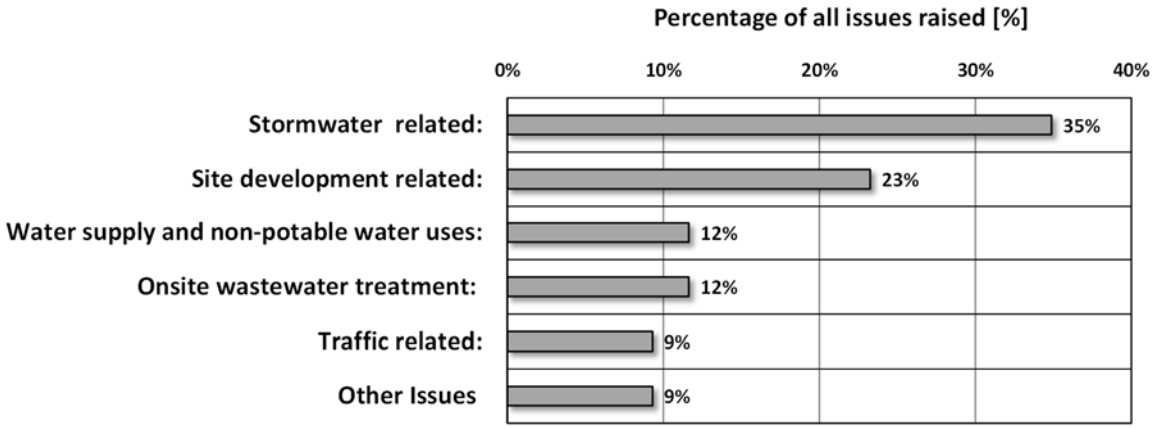


Figure 1.5.1: Frequency diagram of issues and concerns

1.6 Referencing Issues that Have not Changed from the 2011 FEIS

A significant number of issues discussed in the 2011 FEIS have not changed or have negligible changes. In these cases, the DSEIS references applicable Sections of the 2011 FEIS and provides an overview. In the DSEIS, the team indicates if changes from the conditions disclosed in the 2011 FEIS have occurred and if these changes are either small and negligible or warrant a deeper discussion of the impacts and implications of these changes.

Table 1.5.1: Summary and compilation of issues received during the scoping process

No.	Issues raised	DPP Determination (Accepting Agency)	County and State Agencies	During Public Scoping meeting	Community groups
A	**Stormwater water related:**	**X**		**X**	
A.1	More impervious surface area	**X**		**X**	**X**
A.2	Less storm water harvesting	**X**			
A.3	Modified treatment system without infiltration; using MTD	**X**			**X**
A.4	Volume of untrated water	**X**			
A.5	Stormwater overflowing and bypassing the MTD	**X**			
A.6	Impact that treated and untreated stormwater will have on the stream and marsh	**X**			
A.7	Alternative stormwater solution that directs runoff to existing sedimentation basin	**X**			
A.8	Possible flooding of Kapa'a Quarry road				**X**
A.9	Maintaining the stormwater treatment systems				**X**
B	**Site development related:**				
B.1	Change in number of buildings and total building area	**X**			**X**
B.2	Increased finish grade	**X**			**X**
B.3	Visual impact	**X**			**X**
B.4	Project boundaries				**X**
B.5	Current use of the site				**X**
B.6	Effect on wildlife	**X**			**X**
C	**Water supply and nonpotable water uses**				
C.1	Non-potable water for irrigation		**X**		
C.2	Rainwater catchment for irrigation	**X**	**X**		**X**
C.3	Use of low flow fixtures and toilets		**X**		
D	**Onsite waste water treatment:**			**X**	**X**
D.1	Impact of septic system				**X**
D.2	onsite treament versus municipal sewer				**X**
E	**Traffic:**				
E.1	Updated Traffic Impact Analysis Report		**X**		**X**
E.2	External road improvements		**X**		
E.3	Traffic safety				**X**
F	**Other:**				
F.1	Noise and light pollution				**X**
F.2	Market needs for project				**X**
F.3	Inclusion of "No-Build" alternative				**X**
F.4	Clean air concerns		**X**		

1.7 Changes of Site Development Approaches from 2011 FEIS

While the overall development objectives for the KLIP have not changed, certain development strategies have been changed from the 2011 FEIS.

The subject changes in site development can be grouped into three categories:

A. Changed site development strategies that a related to the operation and use of the KLIP.
B. Changed site development strategies that use of new and more effective impact mitigation technologies.
C. Changed site development strategies that are required by evolving governmental requirements.

Table 1.7.1 shows a summary of major differences of site development strategies between the accepted 2011 Final EIS and the proposed site development masterplan presented in this SEIS, grouped into the categories A, B and C.

Table 1.7.1: Summary of major changes of site development strategies between the accepted 2011 FEIS and proposed action

No.	Type of Change in the Site Development Strategy	Reason for Change in the Site Development Strategy
A. Changed site development strategies that a related to the operation and use of the KLIP.		
A.1	Changed site layout affecting buildings and traffic areas in the project site	Improve internal movement, align to traffic flow, and maximize development density.
A.2	Changed site road access: use only one road access	Reduce traffic risks and create simpler traffic flow on adjacent roadways
A.3	Strom water harvesting for irrigation;	Less interior vegetated area to irrigate and adding irrigation of the site perimeter berms.
A.4	Irrigation; changed irrigation needs	Less interior vegetated area to irrigate and adding irrigation of the site perimeter berms.
A.5	Pervious and vegetated areas; reduced	Avoid infiltration of rainwater into the landfill body
B. Changed site development strategies that use of new and more effective impact mitigation technologies.		

Table 1.7.1: Summary of major changes of site development strategies between the accepted 2011 FEIS and proposed action

No.	Type of Change in the Site Development Strategy	Reason for Change in the Site Development Strategy
B.1	Wastewater treatment technology; advanced technology	Efforts to Lower wastewater related impacts through more effective onsite wastewater treatment technologies
C. Changed site development strategies that follow new governmental requirements.		
C.1	Storm water drainage and treatment technology; better pollution control	More stringent storm water permit guidelines design constraints
C.2	Site finish grade elevation; increased site elevation in the Lower portion of the site	Connected to the storm water management systems and required for storm water conveyance to treatment and discharge.
C.3	Site perimeter berms; increased to accommodate increased site grade in the Lower portion of the site.	Connected to the storm water management systems and required to stabilize the increased finish grade at full build-out

Category A Changes in site development strategies that related to the operation and use of the KLIP:

Change A.1 relates to the changes in the site layout, specifically the distribution of buildings and traffic areas. The Applicants decided to allocate more building footprint to the Lower portion of the site than was delineated in the 2011 FEIS. As the amount of building footprint differs less than 1 percent between the 2011 FEIS and the updated site development plan, less building footprint is allocated to the Upper portion of the site.

Change A.2 relates to a new approach of a site access. The new configuration of the roadway access was determined by the Applicants to simplify the traffic patterns and reduce traffic risks due to sight distance problems.

Change A.3 relates to collecting rainwater on designated building roofs for harvesting and subsequent use for irrigation of vegetated areas in the project site and at the site perimeter. With the layout of buildings and the location and extent of vegetated areas changed, the method of rainwater harvesting will change.

Change A.4 is closely related to Change A.3 as it identifies the changed need for irrigation water due to changes in the irrigation approach.

Change A.5 is indirectly related to Changes A.3 and A.4. The Applicants decided to remove larger vegetated areas inside the project from the current site development plan. This caused smaller vegetated areas in the site interior and therefore less need for irrigation water of these interior areas. The need for harvested rainwater increased due to irrigation of the perimeter berms.

Category B - Changed site development strategies that use of new and more effective impact mitigation technologies:

Change B.1 Wastewater treatment technology. The Applicants proposed to use an advanced wastewater treatment technology. This change in technology was made to align the development of the KLIP with innovative environmental technologies, which offer a more effective impact mitigation capacity. This change in onsite wastewater treatment technology was done voluntarily by the applicants and was not dictated by governmental regulations.

Category C - Changed site development strategies that are required by evolving governmental requirements.

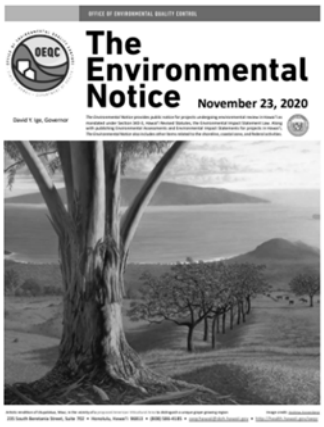
Change C.1 relates to evolving governmental requirements about storm water treatment and management. The standard for storm water treatment and management have been significantly upgraded in 2018. Standards which were in effect at the time the 2011 FEIS was approved are no longer sufficient under changed governmental regulations. Instead, storm water treatment and management strategies will be considered under the updated development masterplan which not only abide by the rules, but which would go beyond and provide enhanced impact mitigation.

Change C.2 is a site development consequence of Change C.1. Design detail, that will be described later in this DSEIS, delineate that the full build-out finish grade elevation must be significantly elevated from earlier plans, to provide the hydraulic flow energy to convey storm water runoff through the subsequent stages of the proposed storm water treatment and management system.

Change C.3 is a logical change as it related to the need of increasing and widening the site perimeter earth berms. The berms are needed to stabilize the added fill to achieve the higher elevation of the full build-out site.

1.8 Publication of the Draft SEIS (New Section)

The Draft SEIS (DSEIS) was published in the November 23, 2020 edition of the "The Environmental Notice" of the Office of Environmental Quality Control (OEQC). Figure 1.8.1 shows the cover of the November 23 edition and the notice of the availability of the DSEIS document.

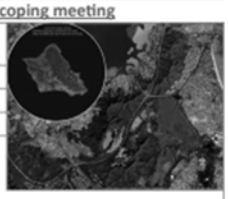


November 23, 2020 The Environmental Notice

O'AHU

Kapaa Light Industrial Park--Draft Supplemental EIS and audio recording of public scoping meeting

HRS §343-5(a) Trigger	(6) Propose any amendments to existing county general plans where the amendment would result in designations other than agriculture, conservation, or preservation
District(s)	Ko'olaupoko
TMK(s)	(1) 4-2-015:013 & 014
Permit(s)	Zone change and numerous others (see document)
Approving Agency/ Accepting Authority	Department of Planning and Permitting, City and County of Honolulu Zack Stoddard, (808) 768-8019, zachary.stoddard@honolulu.gov 650 South King Street, Honolulu, HI 96822
Applicant	KAPAA I, LLC and KAPAA III, LLC; 905 Kalaniana'ole Highway, Kailua, HI 96734 John and Paul King, c/o (808) 265-6321, sustainableDC@gmail.com
Consultant	Sustainable Design & Consulting, LLC; P.O. Box 25914, Honolulu, HI 96825 Manfred Zapka, (808) 265-6321, sustainableDC@gmail.com
Status	Statutory 45-day public review and comment period starts. Comments are due by January 7, 2021. Click the title links above to read the doument and hear the audio recording of the public scoping meeting, then send comments to the approving agency/accepting authority at sustainableDC@gmail.com



A Supplemental EIS is being prepared for modifications to the Kapaa Industrial Park. The Final EIS for the project was accepted on 10/11/2011. There are 35 existing warehouses and 13 acres of outdoor equipment storage. The proposed modifications involve the stormwater management system, the number of structures and building area, grading, perimeter berms, the irrigation system, the wastewater system, and roadway access. The modifications require a supplemental EIS because they may have significant environmental impacts and because mitigating measures will not be implemented as described in the EIS.

(a) Cover of the November 23, 2020 edition of the OEQC "The Environmental Notice"

(b) Information how to access and download the DSEIS and the audio recording of the public scoping meeting.

Figure 1.8.1: November 23, 2020 Publication in The Environmental Notice

1.9 Stakeholders/agencies who Commented on the DSEIS (New Section)

Table 1.9.1 shows the stakeholders / agencies which were consulted and either commented or did not comment on the Draft SEIS (DSEIS). The responses to all comments addressed to the Applicant are presented in Appendix B of this FSES document.

Table 1.9.1: List of stakeholders which were contacted and advised of the availability of the DSEIS and/or which sent comments (the responses to the comments addressed to the Applicant are presented in Appendix B)

No.	Agency / stakeholder	Point of contact	Contacted	Status Responses / comments
1	**Federal Agencies**			
1.1	U.S. Army Corps of Engineers	**To: U.S. Army Corps of Engineers, Honolulu District** Fort Shafter, HI 96858-5440 Sent via email to: CEPOH-PA@usace.army.mil To Whom It May Concern:	Notice of DSEIS. Via email 11/23/2020	Did Not respond
1.2	U.S. Fish and Wildlife Service, Pacific	To: **Pacific Islands Fish and Wildlife Office**	Notice of DSEIS.	Did Not respond

	Islands Fish and Wildlife Office	**U.S. Fish and Wildlife Service** 300 Ala Moana Blvd Rm 3-122 Honolulu, HI 96850 Sent via email to: pifwo_admin@fws.gov	Via email 11/23/2020	
1.3	USDA NRCS, Pacific Islands Area State Office	To: Attn.: Mr. Travis Thomason, Director **USDA Natural Resources Conservation Service (NRCS)** **Pacific Islands Area State Office** P.O. Box 50004 Honolulu, Hawaii 96850-0050 Sent via email to: Travis.Thomason@usda.gov	Notice of DSEIS. Via email 11/23/2020	Did Not respond
2	**State Agencies**			
2.1	**Department of Business, Economic Development and Tourism (DBEDT)**			
A	DBEDT, Strategic Industries Division	Attn.: Mr. Mike McCartney **Dept. of Business, Economic Development & Tourism** **Director's Office** 250 S. Hotel Street, 5th Floor Honolulu, HI 96813 808-586-2355 Sent via email to: dbedt.director@hawaii.gov	Notice of DSEIS. Via email 11/23/2020	Did Not respond
B	DBEDT, Hawai'i State Energy Office	Attn.: Scott J. Glenn, Chief Energy Officer **Hawaii State Energy Office** P.O. Box 2359 Honolulu, Hawaii 96804 Phone: (808) 587-3807 Sent via email to: dbedt.energyoffice@hawaii.gov	Sent 11/23	Did Not respond
2.2	**Department of Health (DoH)**			

A	Clean Water Branch	Attn.: Mr. Alec Wong, P.E., Chief **State of Hawaii Department of Health** **Clean Water Branch** 2827 Waimano Home Rd #225 Pearl City, HI 96782 Sent via email to: CleanWaterBranch@doh.hawaii.gov	Sent 11/23	Did Not respond
B	DoH, Wastewater Branch	Attn.: Mrs. Sina Pruder, P.E. , Chief **State of Hawaii Department of Health** **Wastewater Branch** 2827 Waimano Home Road Hale Ola Building, Room 207 Pearl City, HI 96782-1487 Sent via email to: sina.pruder@doh.hawaii.gov	Sent 11/23	Did respond with comments
C	DoH, Safe Drinking Water Branch	Attn.: Mrs. Joanna Seto, P.E., Chief State of Hawaii Department of Health Safe Drinking Water Branch 2385 Waimano Home Road Uluakupu Building 4, Suite 110 Pearl City, HI 96782-1400 Sent via email to: sdwb@doh.hawaii.gov	Sent 11/23	Did Not respond
D	DoH, Clean Air Branch	Clean Air Branch Hawaii State Department of Health Sent via email to: cab@doh.hawaii.gov		Responded with Standard Comments for Land Use Reviews
2.3	**Department of Land and Natural Resources (DLNR)**			
A	DLNR, Commission on Water Resources Management	Attn.: Suzanne D. Case, Chairperson **DLNR, Commission on Water Resource Management** P.O. Box 621 Honolulu, Hawaii 96809	Sent 11/23	Did Not respond

		Sent via email to: dlnr.cwrm@hawaii.gov		
B	DLNR, Division of Aquatic Resources	Attn.: Brian Neilson, Administrator DLNR, Division of Aquatic Resources 1151 Punchbowl Street, Room 330 Honolulu HI 96813 Sent via email to: DLNR.aquatics@hawaii.gov	Sent 11/23	Did Not respond
C	DLNR, Division of Forestry and Wildlife	Attn.: David Smith, Administrator DLNR, Division of Forestry and Wildlife Kalanimoku Building 1151 Punchbowl St. Room 325 Honolulu, HI 96813 Sent via email to: dlnr@hawaii.gov	Sent 11/23	Did Not respond
D	DLNR, Engineering Division	Attn.: Carty Chang, P.E., Chief Engineer **DLNR, Engineering Division** Kalanimoku Building 1151 Punchbowl Street, Room 221 Honolulu, Hawaii 96813 Sent via email to: dlnr.engr@hawaii.gov	Sent 11/23	Did Not respond
E	DLNR, State Historic Preservation Division	Attn.: Alan Downer, Administrator **DLNR, State Historic Preservation Division** Kakuhihewa Building 601 Kamokila Blvd., Suite 555 Kapolei, HI 96707 Sent via email to: dlnr@hawaii.gov	Sent 11/23	Did Not respond
2.4	**Office of Hawaiian Affairs**	Attn.: Lisa Watkins-Victorino, Ph.D., COO Office of Hawaiian Affairs 560 N. Nimitz Hwy., Suite 200 Honolulu, HI 96817 Sent via email to: info@oha.org	Sent 11/23	Did Not respond

2.5	**Office of Environmental Quality Control**			
2.6	Department of Transportation	Attn.: Jade Butay, Director **Department of Transportation** Aliiaimoku Building, Room 509 869 Punchbowl Street Honolulu, HI 96813 Sent via email to: Grace S. Ichikawa, Executive Aide to the Director Sent via email to: Grace.Ichikawa@hawaii.gov	Sent 11/23	Did Not respond
2.7	Water Resources Research Center / Environmental Center, University of Hawaii at Manoa	Attn.: Prof. Thomas W. Giambelluca, Director Water Resources Research Center University of Hawaii at Manoa 2540 Dole St., Holmes Hall 283 Honolulu, HI 96822 Sent via email to: thomas@hawaii.edu	Sent 11/23	Did Not respond
3	**City and County of Honolulu Agencies**			
	DPP	Attn.: Zachary Stoddard City & County of Honolulu, Department of Planning and Permitting Land Use Branch 650 S King St Honolulu, HI 96813 Sent via email to Zachary.Stoddard@honolulu.gov	Sent 11/23	Responded with comments
3.1	Honolulu Fire Department	Attn.: Manuel P. Neves, Fire Chief Honolulu Fire Department 636 South Street Honolulu, Hawaii 96813 Sent via email to: c.naval@honolulu.gov	Sent 11/23	Did Not respond

3.2	Honolulu Police Department	Attn.: Susan Ballard, Chief of Police Police Department, City and County of Honolulu 801 South Beretania Street, Honolulu, Hawaii 96813 Sent via email to: Captain Brian Lynch blynch@honolulu.gov Emily Ogasawara, eogasawara@honolulu.gov	Sent 11/23	Did Not respond
3.3	Department of Environmental Services	Attn.: Lori M. K. Kahikina, P.E., Director City and County of Honolulu Department of Environmental Services 1000 Uluohia Street, Suite 308 Kapolei, Hawaii 96707 Sent via email to: Lisa Kimura, lkimura1@honolulu.gov	Sent 11/23	Did Not respond
3.4	Department of Parks and Recreation	Attn.: Michele K. Nekota, Director City and County of Honolulu Department of Parks and Recreation 1000 Ulu'ōhi'a Street, Suite 309 Kapolei, Hawai'i 96707 Sent via email to: parks@honolulu.gov	Sent 11/23	Did Not respond
3.5	Department of Planning and Permitting	**City and County of Honolulu, Department of Planning & Permitting** 650 So. King St., Honolulu, HI 96813 • Fax: (808) 768-6743 Sent via email to: Kathy Sokugawa, Acting director Sent through Zachary Stoddard	Sent 11/23	Response came through Zachary Stoddard, POC of Accepting Agency
3.6	Department of Design and Construction	Attn.: Haku Milles, P.E., Deputy Director City and County of Honolulu	Sent 11/23	Responded with stating they have no comments

		Department of Design and Construction 650 South King Street, 11th Floor Honolulu, Hawaii 96813 Sent via email to: ddc@honolulu.gov		
3.7	Board of Water Supply	Attn.: Ernest Y. W. Lau, P.E., Manager and Chief Engineer Honolulu Board of Water Supply 630 South Beretania Street Honolulu, Hawaii 96843 Sent via email to: elau@hbws.org	Sent 11/23	Did not sent comments. Had responded to SEISPN
3.8	Department of Transportation Services	Attn.: Christopher Clark, Chief Planner City and County of Honolulu Department of Transportation Services 650 South King Street, Third Floor Honolulu, Hawai'i 96813-3017 Sent via email to: c.Clark@honolulu.gov	Sent 11/23	Responded on February 11, 2021 Sent Comments
3.9	Department of Facility Maintenance	Attn.: Ross S. Sasamura, P.E., Director and Chief Engineer City and County of Honolulu Department of Facility Maintenance 1000 Uluohia Street, Suite 215 Kapolei, Hawaii 96707 Sent via email to: r.sasamura@honolulu.gov	Sent 11/23	Did Not respond
3.10	Office of Climate Change, Sustainability, and Resiliency	Attn.: Joshua W. Stanbro, Chief Resilience Officer & Executive Director Office of Climate Change, Sustainability, and Resiliency Kapālama Hale 925 Dillingham Boulevard, Suite 257 Honolulu, Hawai'i 96817 Sent via email to: resilientoahu@honolulu.gov	Sent 11/23	Did Not respond

4	**Other**			
4.1	Senate District 24: Senator Jarrett Keohokalole	Senator Jarrett Keohokalole Senate District 24 Hawaii State Capitol, Room 203 415 S Beretania St # 219, Honolulu, HI 96813 Sent via email to: senkeohokalole@capitol.hawaii.gov	Sent 11/23	Did Not respond
4.2	House District 49: Rep. Scot Z. Matayoshi	Representative Scot Z. Matayoshi House District 49 Hawaii State Capitol, Room 331 415 S Beretania St # 219, Honolulu, HI 96813 Sent via email to: repmatayoshi@Capitol.hawaii.gov	Sent 11/23	Did Not respond
4.3	City Council Member: Alan Kekoa Texeira	Councilmember Alan Kekoa Texeira City and County of Honolulu, City Council Honolulu Hale 530 South King Street, Room 100 Honolulu, Hawaii 96813 Sent via email to: alan.texeira@honolulu.gov	Sent 11/23	Did Not respond
4.4	Oahu Metropolitan Planning Organization	Attn.: Alvin Au, Executive Director Oahu Metropolitan Planning Organization 707 Richards Street, Suite 200 Honolulu, Hawaii 96813 Sent via email to: alvin.au@oahumpo.org	Sent 11/23	Did Not respond
4.5	Hawaiian Telcom	Attn.: Su Shin, President and General Manager Hawaiian Telcom 1177 Bishop Street Honolulu, HI 96813 Sent via email to: Kalani Andrade , Kalani.Andrade@hawaiiantel.com	Sent 11/23	Did Not respond

4.6	Hawaiian Electric Company	Attn.: Shelee Kimura, Vice President, Corporate Planning & Business Development Hawaiian Electric Industries Corporate 1001 Bishop Street, Suite 2900 Honolulu, Hawaii 96813. Sent via email to: Shelee.Kimura@hawaiianelectric.com	Sent 11/23	Did Not respond
4.7	Kailua Neighborhood Board No. 31	Attn.: Bill Hicks, Chairperson Kailua Neighborhood Board No. 31 923 Akumu Street Kailua, HI 96734 Sent via email to: billhicksknb@gmail.com	Sent 11/23	Responded with comments
4.8	Lani-Kailua Outdoor Circle	Attn.: Diane Harding, LKOC President Lani-Kailua Outdoor Circle P.O. Box 261 Kailua, HI 96734 Sent via email to: ani-kailua@outdoorcircle.org	Sent 11/23	Responded with comments
4.9	Hawaii's Thousand Friends	Attn.: Donna Wong, Executive Director Hawaii's Thousand Friends 335 Hahani Street #342132 Kailua, HI 96734 Sent via email to: htf3000@gmail.com	Sent 11/23	Responded with comments
4.10	Dr. Charles Prentiss	Dr. Charles Prentiss Kailua, HI Sent via email to: prentissc@outlook.com	Sent 11/23	Did Not respond
4.11	HAWAII AUDUBON SOCIETY	Attn.: Linda M. B. Paul, HAS President HAWAII AUDUBON SOCIETY 850 Richards Street, Suite 505, Honolulu, HI 96813-4709 hiaudsoc@gmail.com		Sent comments

1.10 Changes Made to the DSEIS (New Section)

Significant changes were made to the Draft SEIS (DSEIS). Figure 1.10.1 illustrates the process of preparing the content of the Final SEIS (FSEIS). The DSEIS was published November 23, 2020 for an official 45-day review period. Interested parties could download the about 500-page DSEIS report. The DESIS report had one technical appendix, Appendix A, which described the public scoping meeting and the responses received.

Responses received on the published DSEIS contained a total of about 200 comments. The comments and recommendations prompted several site development design changes and more detailed technical explanations about site development and impact mitigation approaches. It was decided that the best approach to develop the contents of the FSEIS document was to create separate technical appendices, each dedicated to a certain aspect of the site development approach and impact mitigation.

Figure 1.10.1 indicted five additional submittals that were requested by the Accepting Agency. It was agreed that these additional information, referred to as "Referenced technical reports", would be submitted later than submittal of the FSEIS document. The preparation of the "Reference technical reports" required communication with the responsible agency.

The status of the five referenced technical reports are as follows:

1. Updated timeline: An updated project timeline has been developed and will be submitted after the FSEIS is accepted, to implement the final site development plan in the accepted FSEIS.
2. Updated Constructing Management Plan (CMP): An updated CMP has been developed and will be submitted after the FSEIS is accepted, to implement the final site development plan in the accepted FSEIS.
3. Traffic Management Plan (TMP): A new TMP is being developed and will be submitted after the FSEIS is accepted.
4. Traffic Impact Analysis Report (TIAR): An updated TIAR will be developed in coordination with the State Department of Transportation after the FSEIS is accepted.
5. Updated proposed scope of Roadway Improvements: A proposal was submitted to and reviewed by the City and County of Honolulu, Department of Planning and Permitting, Traffic Review Branch (TRB). The cooperation with TRB continues and the final traffic improvements measures are still under development.

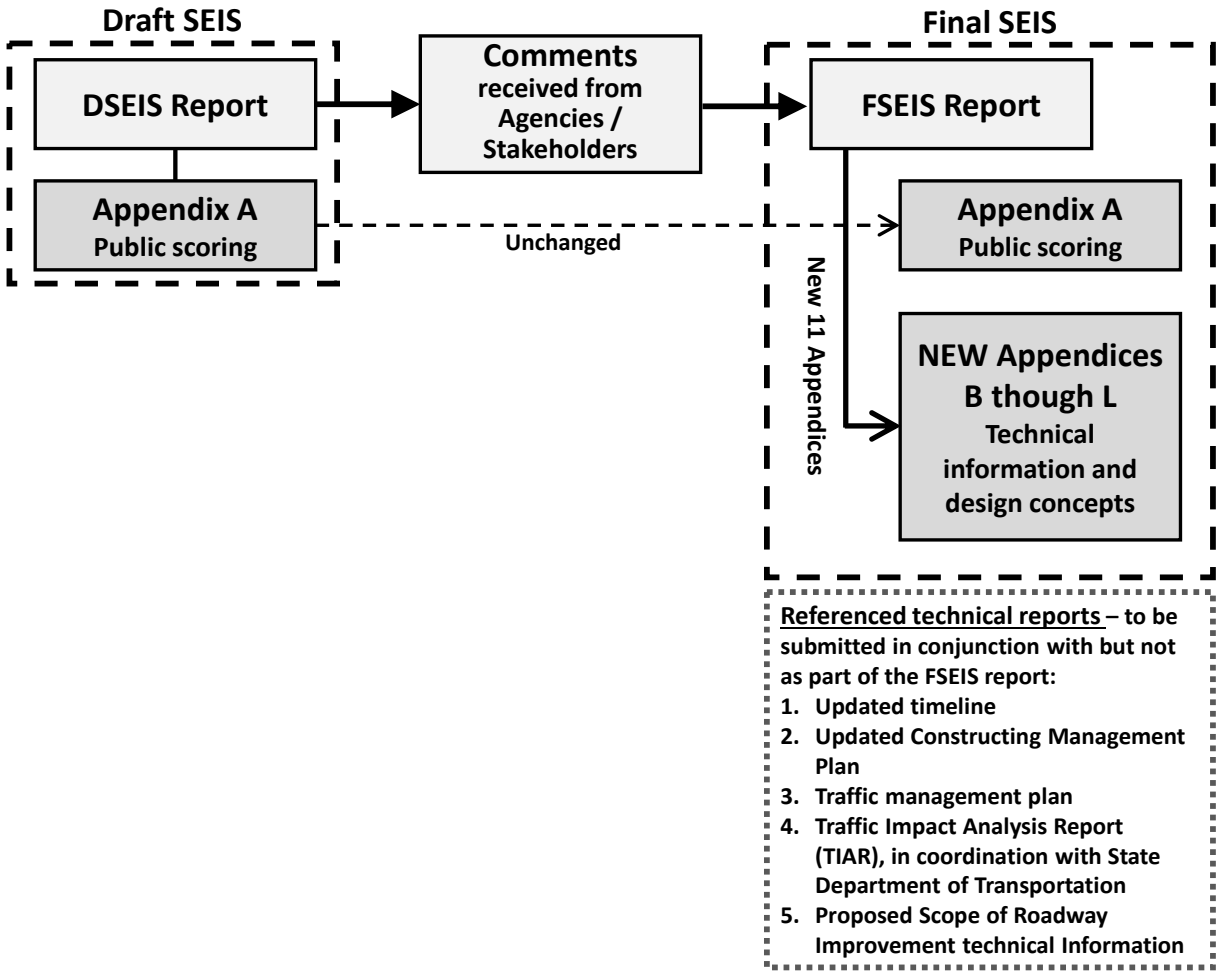


Figure 1.10.1: Changes made to the Draft SEIS to prepare the FSEIS and additional information requested

CHAPTER 2 – PROPOSED ACTION AND ALTERNATIVES

The Proposed Action and alternatives are described in Section 2 of the 2011 FEIS. This section presents brief summaries of the descriptions given in the 2011 FEIS and describes changes relative to the updated site development plans.

2.1 Proposed Action as Defined in the 2011 FEIS

The 2011 FEIS described the proposed project as the planned expansion development of a light industrial park on three contiguous land parcels in the Lower stretches of the Kapa'a Valley on the windward side of Oahu. The expansion created needed industrial zoned space for businesses within the Koolau Poko region.

The 2011 FEIS listed the following measures to implement the Proposed Action. Updates to the 2011 FEIS Proposed Action are briefly discussed as "Updates under this SEIS" following the initial bullets:

1. About 25 acres of newly rezoned land that would support businesses to expand or relocate light industrial activities within the Kailua and Kaneohe regions:

   Update related to this SEIS: This goal of the 2011 Proposed Action to "support businesses to expand or relocate light industrial activities within the Kailua and Kaneohe regions" is still in effect. While the 2011 FEIS was a prerequisite for a subsequent zone change, the rezoning of 25 acres of land occurred in 2013.

2. A new light industrial park that will be developed as an expansion of an already existing industrial warehouse development, taking advantage of already existing infrastructure, and expanding the light industrial land use at the site.

   Update related to this SEIS: The expansion of the already existing industrial warehouse development and taking advantage of already existing infrastructure was facilitated with a Joint Development Agreement between the two landowners who make up the ownership of the Kapa'a Light Industrial Park. The Joint Development agreement allows sharing of infrastructure and the construction of buildings over property lines so that fill synergy can be used to develop the light industrial park.

3. Land for industrial activities that are located on former landfill area. The development of the landfill area will reduce problems of soil erosion and resulting runoff.

   Update related to this SEIS: This element of the 2011FEIS is still in effect and is even more effectively implemented under the updated site development plan than envisioned in the 2011 FEIS. The fact remains that a former land fill is developed and put to good use as the site for an important development. Development on a former landfill requires site development technologies that deviate from developments on land with regular soil. As a condition in the 2013 zone change, infiltration of rainwater into the landfill should be avoided so that potentially harmful leachate is avoided, and with it, related impacts to the environment. Leachate from landfill is defined as

polluted water created by precipitation percolating through the landfill body. The updated site development plan transforms the site to almost completely impervious land, thus eliminating infiltration of precipitation and the creation of leachate in the landfill body.

4. A total of 625,000 square feet of newly constructed industrial zoned space in modern warehouse structures or, as an alternative, several acres of base yard space which would replace a specific amount of warehouse space. Since 19,000 square feet of existing warehouse space planned to be demolished, this results in a net addition of 606,000 square feet of warehouse space at the proposed site.

   Update related to this SEIS: The total full build-out warehouse space in the light industrial park planned under the updated development plan described in this SEIS remains basically the same as the 2011 FEIS, since it is only 0.3 % larger under the updated site development plan.

5. Infrastructure to supply the new industrial space with water and electric power by interconnecting with municipal water and power infrastructure.

   Update related to this SEIS: A reliable supply of electricity and water is supported by implementing energy and water saving technology. The adequate electricity supply to the expanding park will be supported by new power lines which will are planned for installation in 2021 . Savings of potable water will be through the use of harvest rainwater for irrigation.

6. Onsite wastewater treatment. The project site as well as the entire Kapa'a Valley is presently not connected to the municipal sewage system, and a connection would require a forced sewer system.

   Update related to this SEIS: there are still no plans to connect the site to the municipal sewer system. The proposed onsite wastewater treatment technology under the updated site development plan would allow significantly higher pollutant removal than the wastewater treatment systems considered under the 2011 FEIS. Thus, lowering related impacts.

7. A comprehensive stormwater system that avoids high peak discharge rates during heavy storm events and avoids polluted runoff from the site into the receiving waters. The stormwater system would comprise runoff conveyance in swales, channels and pipes, detention ponds, stormwater treatment units to eliminate floatables and significantly reduce sediments, oil and nutrients content in the stormwater, and rainwater harvesting systems. The measures of quality and quantity control of stormwater differ between the parts of the proposed industrial park.

   Update related to this SEIS: The goals of the 2011 FEIS to implement highly effective storm water treatment and management systems are still in effect and the planned storm water system for the site will still include comprehensive treatment and management technologies. While the storm water system that was delineated in the 2011 FEIS was somewhat ahead of governmental

regulations at that time, the governmental guidelines and standard have since been amended to include measures that were already part off the 2011FEIS plans. It remains a main objective of the project to use storm water systems which not only satisfy the prevailing regulatory requirements but go beyond to reduce storm water related impact as much as possible under the development conditions.

8. Sufficient on-site (off road) parking for the additional employees and visitors of the development on site as well as facilities for parking and loading of heavy trucks within the development.

   Update related to this SEIS: This site development goal is still in place.

9. Development of the larger part of the rezoned land in accordance with low impact development technologies and principles. The Lower portion of the proposed site, which comprises the larger part of the land to be rezoned, is near environmentally and culturally important wetland.

   Update related to this SEIS: This site development measure goal is still in place and will be used to develop the Lower site in accordance with low impact development (LID) technologies. This includes implementing LID storm water strategies which will be used throughout the entire site, where technically possible.

10. In accordance with the recognized need for low impact development approaches, the Lower portion of the site would implement design, construction, and operational measures to achieve Leadership in Energy and Environmental Design (LEED) certification upon completion of the project. The LEED development approach for the development involves measures to limit impacts derived from the site, efficient use of water and energy, material reuse and recycling as well as Lowering indoor environmental impacts. The LEED certification is a quantifiable measure for the environmentally friendliness and energy effectiveness of the proposed action.

    Update related to this SEIS: The Applicants are still committed to develop the Lower site in accordance with the LEED green building standard.

2.2 Ability of Region to Absorb Amount of Planned Additional Industrial Space

For the 2011 FEIS a market study was conducted to determine if the region that will be served by the proposed Action, thus the Koolau Poko region, could absorb the planned industrial space, including warehouses and base yards. The main conclusions of the market study corroborated the need for the project to provide industrial zoned space and the ability of the region to absorb the planned amount of added industrial space. The conclusions presented in the 2011 FEIS were as follows:

1. The Koolau Poko region, also characterized as "Greater Kailua/Kaneohe" from the trade area perspective, has a significantly undersupplied industrial sector, when compared with any urban

regions on Oahu. The area currently only supplies about 21 percent of the industrial space demand created by the size of its resident population.

2. The market study predicts that over the next 20 years (through 2030) the Koolau Poko region will readily support an additional about 1,000,000 gross square feet of industrial-type floor area or about 96 acres of vacant industrial zoned. The 606,000 square feet of new floor space that the proposed project will provide would therefore only provide some 63% of the predicted demand. Currently there is limited available land in the region that is appropriately zoned for industrial-type activities and industrial lands in the region are being diminished by ongoing or planned transformation to higher return commercial or residential development. Due to this limited alternative availability of industrial-type floor space in the region, it can be assumed that the proposed project will be able to lease all its planned space.

3. Based on historical trends it is forecasted that it would take from 15 to 17 years for the proposed 606,000 square feet of expanded floor space in the Kapa'a Light Industrial Park to reach full adsorption. For the subsequent analysis in this SDEIS a development time of 15 to 17 years is still assumed.

This project team considered that the basic premises of the 2010 market study is still valid. In the time since the 2011 FEIS more of older industrial space in the Kailua and Kaneohe region has been retired or is scheduled for retirement, without concrete plans to replace the lost industrial space with equally zoned space. A trend in the urban region of Kailua and Kaneohe is the conversion of industrial or commercial space to residential, thus higher revenue generating space.

The Applicants have reported that the average vacancy rate of the KLIP is low, around 4%. Leasable space that becomes available is typically leased out to new tenants within a short period. The Applicant further reported that the demand for smaller industrial zoned spaces remains high, with most of the new tenants coming from within the windward region.

Finally, the Applicants are not increasing the square footage of space significantly from the 2011 FEIS.

<u>The Accepting Agency determined in their response to the DSEIS that the demand for the proposed expansion of the Kapa'a Light Industrial Park was demonstrated in the 2011 FSEIS. The Accepting Agency further indicated that proposed land use had not changed since it was reviewed and accepted by the DPP for the 2011 Final EIS.</u>

2.3 Site Development Alternatives

Alternative site development strategies were discussed in Section 2.3 of the 2011 FEIS. Two 2011 FEIS action alternatives and a No-Action alternative were considered. These two alternatives with proposed actions were identified as the FEIS Preferred Alternative and FEIS Alternative B.

The FEIS Preferred Alternative and FEIS Alternative B differed in their use of construction technologies and the use of the open space that directly surrounds the proposed site.

- Under the FEIS Preferred Alternative, the development of the Lower and Upper portions of the site would be developed. The Lower portion of the site, which means the part of the site adjacent to wetland area, was designed using low impact development practices. The Preferred Alternative proposed sustainable building technologies and the use of open space adjacent to the project site as restored habitat.
- Under the FEIS Alternative B, the Lower and Upper portions of the site would be developed, and all parts of the proposed industrial park would be designed using conventional building technologies.

While the FEIS Alternative B was satisfying basic applicable local, State and Federal codes, the FEIS Preferred Alternative exceeded this basic code requirement to derive a Lower ecological footprint. FEIS Alternative B results in less development costs than the Preferred Alternative, due to the additional costs for sustainable building technologies and site development approaches.

In addition, the FEIS No-Action alternative was evaluated. The FEIS No-Action alternative was required by statute and described impacts at the proposed site and for the region if no additional industrial space is added to the existing space. Under the No-Action Alternative no further addition of warehouse space would occur on the portions of the site covered by the 2011 FEIS.

Of the three alternatives, the FEIS Preferred Alternative was selected as the basis of the subsequent site development work. Design and construction efforts to implement the FEIS Preferred Alternative have been going on since the acceptance of the 2011 FEIS.

Two alternatives are discussed in this DSEIS in relation to their ability to mitigate impacts. These two alternatives do not deviate from the basic development objectives of the FEIS Preferred Alternative, but they differ in approach of how they use specific site development technologies and impact mitigation strategies.

- The **SEIS Preferred Alternative** is described as implementing the proposed changes to the updated site development strategies and using best-in-class impact mitigation measures. These proposed changes were described in Section 1 of this DSEIS document, and they include issues related to mitigating storm water, water, wastewater, and traffic impacts.

- The **SEIS No-action Alternative** is described as NOT implementing these proposed updated site development plan and the more effective impact mitigation measures. Instead, under the SEIS No-Action alternative the site development strategies will be implemented that reflect only the conditions of the 2011 FEIS Preferred Alternative as well as applicable governmental standards that were subsequently enacted.

Figure 2.3.1 shows a flow chart of the alternatives referenced in this SEIS document and describes how the SEIS alternatives relate to the alternatives used in the 2011 FEIS and subsequent design modifications for required permit compliance and shows the differences in the actions of the two SEIS alternatives. The prefixes "FEIS" and "SEIS" are used to distinguish between the 2011 FEIS and the 2021 SEIS alternatives.

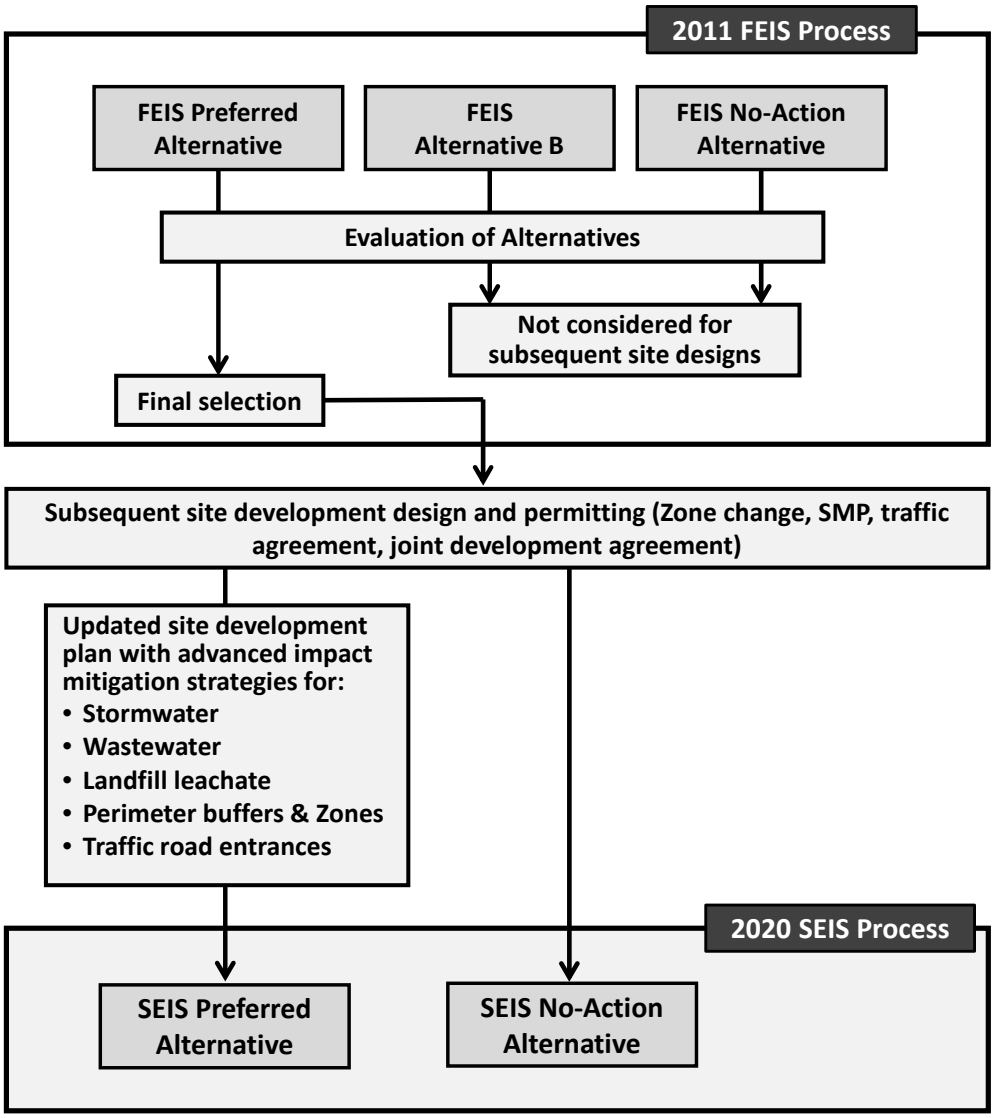


Figure 2.3.1: Flow chart to describe the interrelationship of the two SEIS and three FEIS alternatives

Under the 2011 FEIS Three alternatives were addressed in the 2011 FEIS, (1) the FEIS Preferred Alternative, (2) the FEIS Alternative B, and (3) the FEIS No-Action Alternative. The FEIS alternatives (2) and (3) were not considered further for subsequent site designs. The FEIS Preferred Alternative was selected as the basis for the subsequent, more detailed site development planning.

After the 2011 FEIS was approved, the site development concepts presented in the 2011 FEIS were detailed in design efforts to evaluate the compatibility of the site conditions and the proposed site development design infrastructure, based on detailed engineering site evaluations, and changing land use permitting.

Considering adjustments and refinements of the site design have been an evolving process since the 2011 FEIS was approved. The site design evolved through the 2013 zone change process (Ordinance 13-35) and the 2014 Special management are use permit (SMP) (2014/SMA-27) permitting. Further site development modifications followed with the 2016 and 2017 SMP minor modifications, which were approved to allow grading stockpiling and a new storm water design.

The updated site development plan considered a range of design changes and included new and more efficient impact mitigation measures. The updated site development plan further removed the 3.8-acre base yard, and instead proposes this area for new warehouse developments.

Specifically, the revised storm water design under the approved 2017 SMP modification (2017/MOD-37) used a combined vegetated swale and below ground infiltration vaults approach to use LID technologies for storm water treatment. A geotechnical report completed in 2019 (Stewart Engineering, 2019) in conjunction with planned site grading in the Lower site determined that the storm water treatment and management approach delineated and approved in the 2011 SMP minor modification could not be implemented. The reason was that infiltration and subsequent migration of infiltrated water under the perimeter earth berm would contribute to perimeter berm instability. Consequently, a different storm water treatment and management design was completed which is part of the updated site development plan. This updated storm water plan necessitates an increase of the finish grade elevation to provide the necessary hydraulic energy for gravity flow of storm water runoff to the treatment facilities at the Northern site perimeter.

In addition, the updated site development plan proposed the use of advanced onsite wastewater treatment in the entire project site. This advanced wastewater treatment technology significantly reduces environmental impacts caused by treated wastewater disposal on-site. The advanced wastewater treatment would significantly reduce organic, TSS and nutrient loads in the effluent.

The two SEIS alternatives, the SEIS Preferred Alternative and the SEIS No-Action Alternative, differ from each other by whether the updated site development plan is used. The SEIS Preferred Alternative uses the updated site development plan, while the SEIS No-Action Alternative does not. The SEIS No-Action Alternative uses the site development approach that is based on the design concepts from the 2011 FEIS, the 2013 zone change and the 2014 SMP and the subsequent 2017 SMP minor modification. The issue to consider is that the storm water system approved under the 2017 SMP minor modification is no longer technically viable because of the mentioned berm instability. Therefore, the storm water

treatment and management system proposed under the updated site development would need to be implemented with the required increase of finish grade elevation.

2.4 Siting of Facilities

Section 2.4 of the 2011 FEIS discussed General siting of facility criteria include consideration of compatibility between the functions of the proposed industrial development and the consideration for the environment and the community. Furthermore, siting of facility criteria included land use, adequacy of the site for the function required, proximity to related activities, availability and capacity of roads, efficient use of property and resources, development approaches and special site characteristics, including environmental compatibilities. Section 4 of the 2011 FEIS stated the following siting facility criteria (in alphabetic order):

- Accessibility with alternative transportation
- Acreage/height limitations
- Areas of no-constructability, preservation of open space and habitat
- Building and fire codes
- Business objectives and measures to implement business objectives.
- Disruptions due to construction
- Drainage and stormwater treatments
- Economics (life cycle cost, construction cost, operations, and maintenance costs)
- Environmental aspects
- Historical and cultural considerations
- Impact on endangered species
- Impacts on utilities and resource capacity
- Improvement of regional economic base (tax revenues, added employment, growth
- Land use regulations and considerations
- Local/Regional planning regulations and guidelines
- of regional economy)
- Orientation (i.e. sun and wind exposure)
- Outdoor lighting
- Parking requirements
- Permitting
- Phasing
- Regional, State, and Federal planning
- Restoration of habitat
- Site work
- Soil considerations
- Topography
- Traffic (level of service, emissions, safety, flow capacity)
- Utilities availability
- Visual impact
- Waste management
- Watershed considerations and effects on water quality receiving waters
- Wetlands and Buffer zones (specifically impacts on the adjacent marsh)

The SEIS team concluded that the siting facility criteria were still relevant and adequately addressed in the site development design.

2.5 Comparison of 2011 FEIS and SEIS Preferred Actions

Figure 2.5.1 shows the full build-out layout of the project site delineated in 2011 FEIS Preferred Action. Figure 2.5.1 illustrates the main land use features indicated by the annotations that were added to the original figure of the FEIS (Figure 2-4 in the FEIS). Table 2.5.1 shows the land uses presented in the FEIS.

Table 2.5.1: Land uses as delineated in the 2011 FEIS

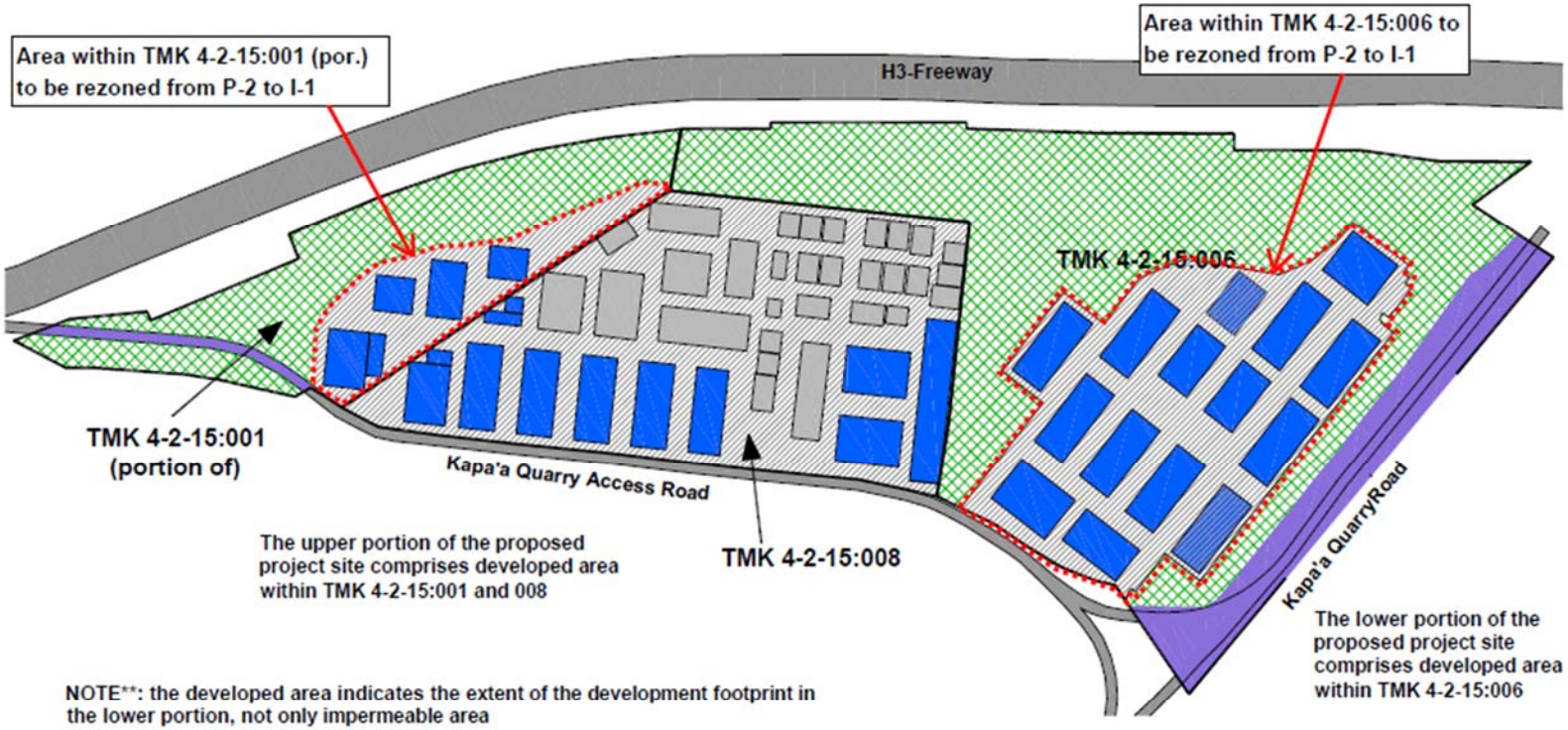
Land use at the project site (delineated in the FEIS)	[acres]	Bldg. footprint [sqft]
Vegetated Land (unimproved)	30.4	
Paved (impervious) area UPPER portion of project site	26.8	
Paved (impervious) area LOWER portion of project site	16.7	
Buildings at Full Build-out, UPPER portion of project site		552,000
Buildings at Full Build-out, LOWER portion of project site		337,000
Other (within parcels but outside project site)	5.1	
Sum of parcels TMK 4-2-15:006, 008 and 012	**79.0**	**889,000**

Figure 2.5.2 shows the full build-out layout of the project site for the SEIS Preferred Action. Figure 2.5.2 illustrates the main land use features indicated by the annotations that were added to the original figure of the FEIS. Table 2.5.2 shows the land uses presented in the FEIS.

Table 2.5.2: Land uses proposed under the updated site development plan described in this SEIS

Land use at the project site at Full Build-out	[acres]	Bldg. footprint [sqft]
Vegetated Land (unimproved)	22.3	
Vegetated buffer zone around the UPPER site perimeter	2.5	
Vegetated buffer zone around the LOWER site perimeter	6.2	
Paved (impervious) traffic area UPPER portion of project site	26.4	
Paved (impervious) traffic area LOWER portion of project site	18.5	
Buildings at Full Build-out, UPPER portion of project site		519,000
Buildings at Full Build-out, LOWER portion of project site		373,000
Other (in parcels but outside project site)	3.1	
Sum of parcels TMK 4-2-15:013 and 014	**79.0**	**892,000**

Note: Parcels TMK 4-2-15:006, 008 and 012 have been renamed TMK 4-2-15:013 and 014



	Open vegetated space, pervious (acres)	Graded non-vegetated, pervious (acres)	Developed non-vegetaed area, impervious (acres)	Existing building footprint (sqft)	Added building footprint (sqft)	Other area; not affected by development (acres)
TMK 4-2-15:001 (port. of)	8.1	0.0	4.4	None	61,000	0.5
TMK 4-2-15:006	22.3	0.0	16.7 (NOTE**)	None	337,000	4.8
TMK 4-2-15:008	0.0	0.0	22.4	283,000	208,000	0.0

Figure 2.5.1: Full build-out layout of the project site under the 2011 FEIS Preferred Action

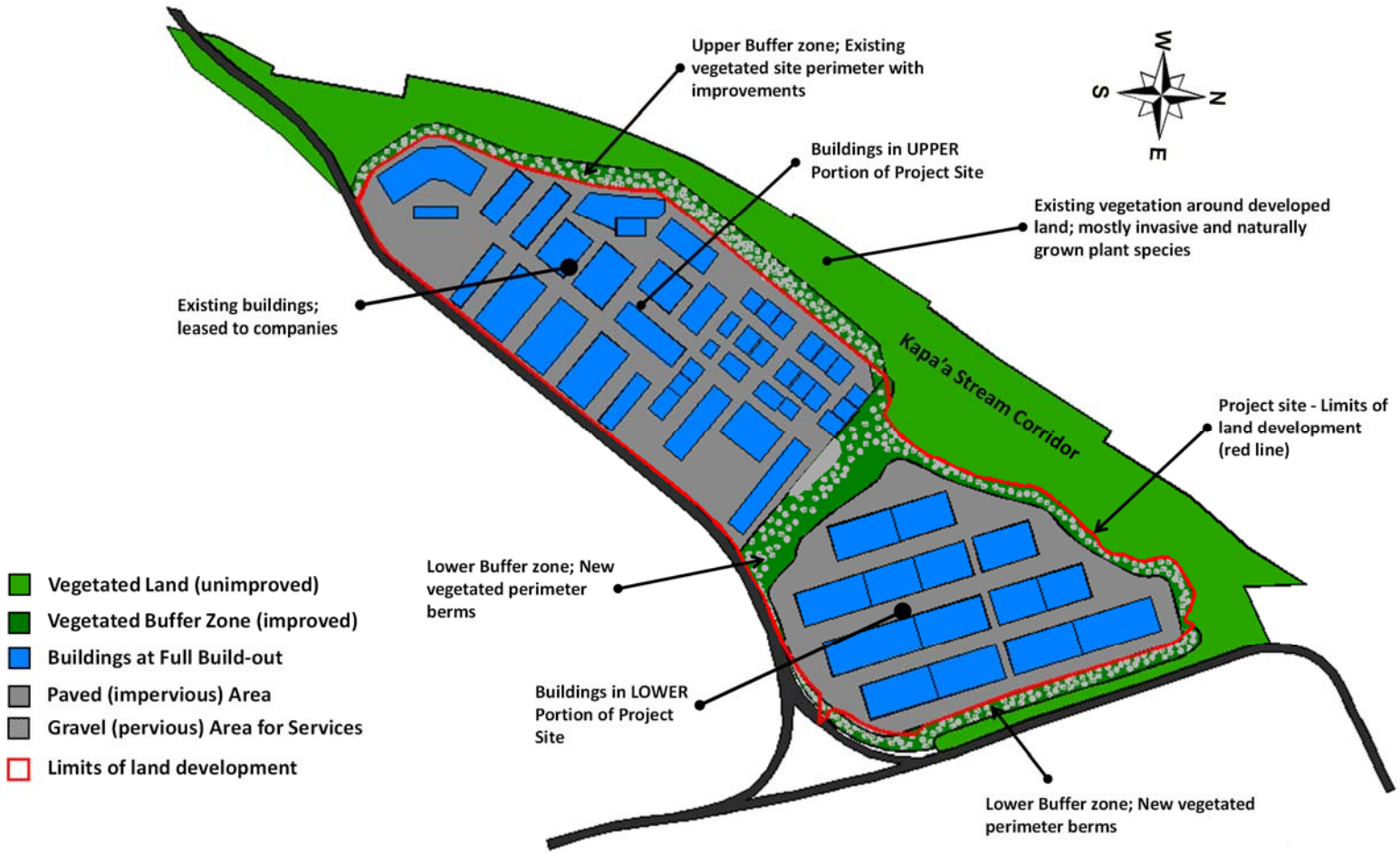


Figure 2.5.2: Full build-out layout of the project site under the SEIS Preferred Action

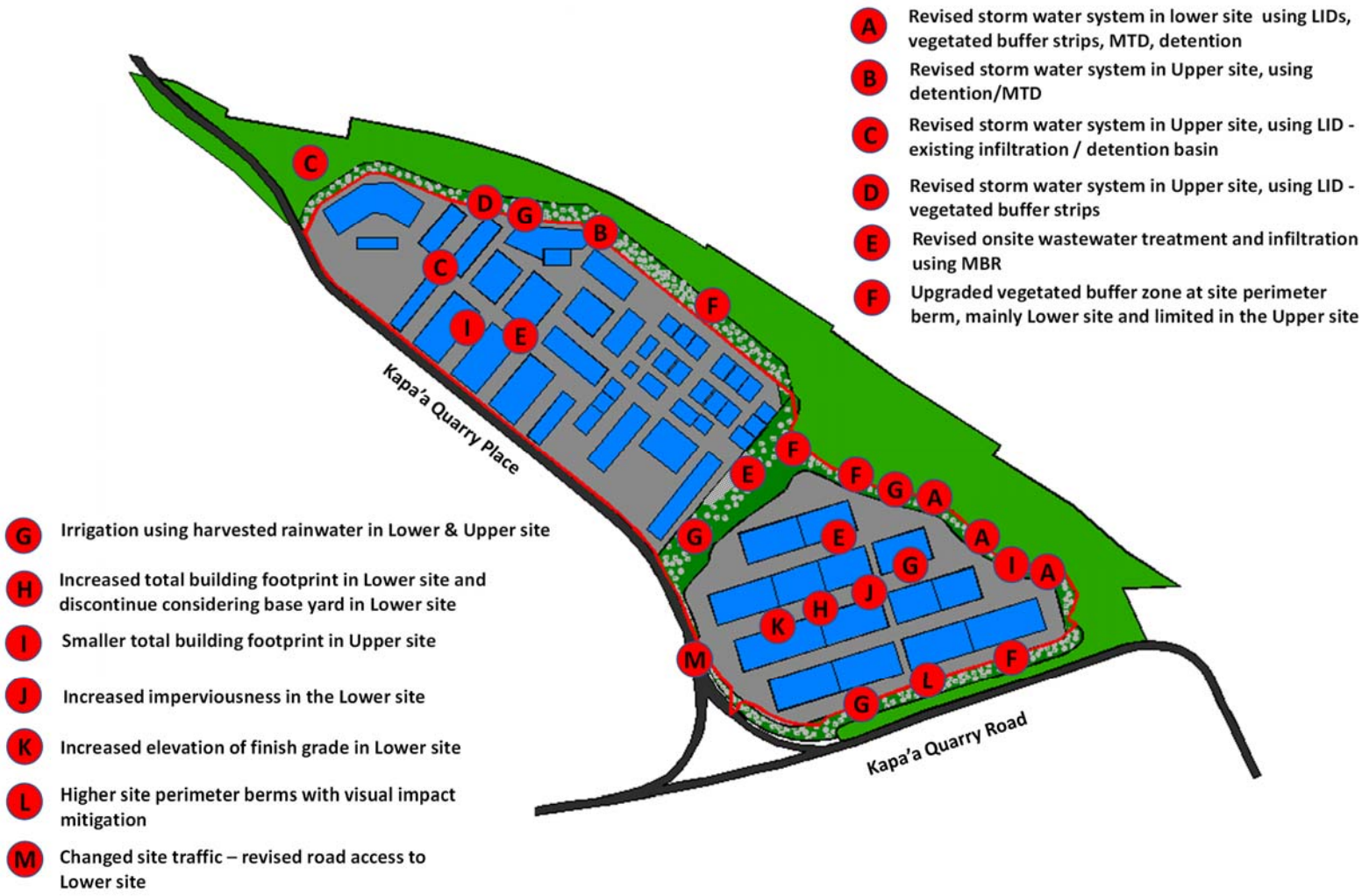


Figure 2.6.1: Illustration of locations of the proposed changes in site development strategies (refer to Table 2.6.1 for description)

2.6 Proposed Changes of Site Development Strategies

Figure 2.6.1 illustrates the locations of the proposed changes in site development strategies. The annotations in Figure 2.6.1 are described below:

Annotations in Fig. 2.6.1	Description	Anticipated Impacts and Impact Mitigation
A	**Revised storm water system in Lower site using LIDs, vegetated buffer strips, MTD, and detention:** The storm water treatment and management system for the Lower site has been altered from the previously disclosed configuration in the 2011 FEIS and applicable SMP No. 2014/SMA-27 and Minor Modification for SMP No. 2014/SMA-27, 2017/MOD-37 (MT) The proposed revised storm water system for the Lower site includes conveyance of storm water runoff through drainpipes, treatment of storm water in vegetated buffer strips and Manufactured Treatment Devices (MTD) and detention in below ground vaults before controlled release through several outlets to the Kapa'a Stream Corridor. <u>The updated storm water system for the Lower site is described in Appendix C.</u>	The impact mitigation strategies include effective storm water runoff treatment and therefore less source contamination as well as less soil erosion in the Kapa Stream corridor. Therefore, impacts to the Kapa'a Stream corridor and the stream as the receiving water will be Lower than the impacts disclosed in the 2011 FEIS.
B	**Revised storm water system in Upper site, using detention/MTD system.** The stormwater treatment and management for five new warehouse structures has been completed. This storm water system includes detention of storm water runoff in below ground drainpipes and one vault. The detained water is controlled released to a Manufactured Treatment Device (MTD) where it is filtered. During heavy storm events, water can overflow the detention vault and be discharged directly to the Kapa'a Stream corridor via a new armored outfall at the sloped site perimeter. The armored outfall	The impact mitigation strategies include effective storm water runoff of the water collected in the detention vault, which is the water quality (WQ) relevant water volume. Soil erosion is minimized through an armored outfall. Therefore, impacts to the Kapa'a Stream corridor and the Kapa'a Stream, the receiving water, will be Lower than the impacts disclosed in the 2011 FEIS.

Annotations in Fig. 2.6.1	Description	Anticipated Impacts and Impact Mitigation
	protects the sloped site perimeter from soil erosion.	
C	**Revised storm water system in Upper site, using LID - existing infiltration / detention basin**: More buildings and traffic area in the Upper site will be connected to an existing infiltration and detention basin, which serves as an effective LID treatment strategy.	With more traffic areas and building connected to the existing infiltration and detention basin, which serves as an effective LID strategy, storm water impacts are lowered relative to the situation that was disclosed in the 2011 FEIS.
D	**Revised storm water system in Upper site, using LID - vegetated buffer strips**: The storm water treatment and management system of two new building in the Upper site will include vegetated strips. (refer also to point G: Harvested rainwater will be used to irrigate the vegetated buffer strips)	Connecting the new buildings and traffic areas to new vegetated strip buffer areas, which serves as an effective LID strategy, will lower impacts relative to the situation that was disclosed in the 2011 FEIS.
E	**Revised onsite wastewater treatment and infiltration using MBR**: A new and advanced onsite wastewater treatment system, which uses a Membrane Bioreactor (MBR) treatment technology has been implemented in the Upper portion of the site as part of a pilot project. The effluent of the advanced wastewater system can be used for unrestricted outdoor recycled water applications, including irrigation, as permitted under the National Sanitation Foundation (NSF) 350 standards. The treated wastewater is infiltrated in drain field that resembles rainwater runoff infiltration. The pollution reduction in the MBR system far exceeds conventional septic system. After the successful completion of the pilot project the advanced wastewater system will also be implements for the onsite sewage management in the Lower site.	With significantly lower organic and nutrient loads in the treated effluent the impacts to the environment are lower than in the 2011 FEIS. The implementation of the advanced wastewater system was done on a voluntary basis by the Applicants. The ongoing pilot project was proposed to and approved by the Department of Health (DoH) as a technology innovation project. <u>The main objective of the pilot project is verification verifies the hydraulic performance of the infiltration field which has a smaller dimension that soil absorption fields used for conventional wastewater systems and delineated in HAR 11-62.</u>

Annotations in Fig. 2.6.1	Description	Anticipated Impacts and Impact Mitigation
F	**Upgraded vegetated buffer zone at site perimeter berm**, mainly Lower site and limited in the Upper site: The vegetated site perimeter will be upgraded to provide impact mitigation for the adjacent land. • In the Lower site: This includes creating a dense vegetation for noise and fugitive dust impact mitigation. Larger trees will be planted on the perimeter berms to provide visual impact mitigation. • In the Upper site: The existing vegetation at the site perimeter, which is a steep sloped berm, will be enhanced to increase soil stabilization. At the locations where vegetated buffer strips are used for storm water runoff treatment new vegetation will be planted. <u>The update of the buffer zone development plan that was submitted to the Accepting Agency is described in Appendix I.</u>	Installing the vegetated buffer at the perimeter of the Lower portions of the site will provide effective impact noise and fugitive dust mitigation. Visual impacts will be mitigated through larger trees which will shield warehouse structure from external views. Installing the vegetated buffer at the Northern perimeter of the Upper site will provide additional soil stabilization and runoff treatment through vegetation filtration. Installing the vegetated buffer at the Southern side of the Upper site provides attractive views and partially shields buildings from external views. <u>The visual impact mitigation is described in the new Appendix G.</u>
G	**Irrigation using harvested rainwater in Lower & Upper site**: Rainwater will be harvested, stored, and used for irrigation in the Lower and Upper site. In the Lower site irrigation will be used for the vegetated buffer on the site perimeter berms as well as for multiple vegetated buffer strips that are used as LID storm water treatment. In both the Lower and Upper sites rainwater will be harvested from the building roofs to only collect cleaner runoff. The runoff will then be stored in below ground vaults and	Harvesting rainwater and using it for irrigation saves potable water and therefore Lowers impact on the municipal water supply. In addition, water that is used for irrigation Lowers the volume of storm water runoff.

Annotations in Fig. 2.6.1	Description	Anticipated Impacts and Impact Mitigation
	pumped to the point of use of the irrigation system.	
H	**Increased total building footprint in and discontinue considering base yard in Lower site**: While the overall building footprint at the project site, thus the sum of building footprint in the Lower and Upper site, remains the same, more building footprint area will be in the Lower portion of the site. The presently approved site layout by the SMP permit No. 2014/SMA-27 featured a 3.7-acre base yard in the Lower portion of the site. This base yard will no longer be part of the updated development plan of the Lower site. Therefore, the added warehouse footprint approximately equals the area that was reserved for the removed base yard.	Impacts associated with the size of buildings will remain approximately the same since the total building footprint in the KLIP will basically remain the same as reported in the 2011 FEIS. Removing the base yard from the site development plans of the Lower site will reduce impacts since impacts are typically Lower from closed buildings than open base yard.
I	**Smaller total building footprint in Upper site**: The building footprint in the Upper site will be Lower than disclosed in the 2011 FEIS.	Analogously to Point H impacts will be lowered with a smaller total building footprint than disclosed in the 2011 FEIS. An impact mitigation strategy that can directly lower impacts of buildings is implementing storm water pollution prevention measures that are associate with the operation of the buildings.
J	**Increased imperviousness in the Lower site**: With eliminating much of the vegetated and pervious areas in the site interior the imperviousness of the Lower site will increase. The typical preferred approach of LID storm	Increasing the imperviousness causes impacts with opposite environmental consequences. Adding impervious cover to the Lower site lowers impacts to the aquatic resources from leachate

Annotations in Fig. 2.6.1	Description	Anticipated Impacts and Impact Mitigation
	water management is infiltrating as much storm water at the site and thereby reducing the quantity of the runoff discharge from the site. Since the site is a former landfill, however, reducing infiltration is a requirement to Lower the formation of harmful leachate. The requirement of avoiding significant infiltration is delineated in the conditional zone change.	created by water percolating through the landfill body. On the other hand, increase imperviousness increases the quantity and the peak flow rates of storm water runoff, which also affect the aquatic resources. In balancing the two impacts, increasing imperviousness while increasing the capacity of the storm water treatment and management system will cause lower overall impacts.
J	**Increased elevation of finish grade in Lower site**: Increasing the elevation of the finished grade in the Lower site by an average of about 11 feet above the previously accepted finish grade grading is required to install the revised storm water system. Raising the finish grade entails the addition of fill that must be brought to the site. Adding elevation to the site body increases the amount of fill which adds added weight on the substratum. Since the landfill body is old it was assumed that the degree of soil consolidation was high and future settling due to the added weight of the fill would be relatively small. <u>The reason for the increase of the finish grade is described in Appendix D. The rational is given why the heights of the proposed buildings in the Lower site should be measured from the proposed finish grade and not from the existing grade.</u>	The impacts associated with increasing elevations of the Lower site finish grade include impacts during construction and operations. Mitigation measures during construction are mainly associated with storm water runoff and traffic of heavy trucks. Mitigation efforts during the operation would follow the same type of mitigation measures that would be taken with a site that has Lower elevations.
K	**Higher site perimeter berms with visual impact mitigation**: Higher site perimeter earth berms are required to contain the added fill of the	Impacts associated with increasing the height of site perimeter berms include impacts during the construction and operations.

Annotations in Fig. 2.6.1	Description	Anticipated Impacts and Impact Mitigation
	increase finish grade (see Point J). Higher berms also have wider widths. Since the outside dimension of the site remain the same as with lower perimeter berms, higher and wider berms reduce the usable land inside the site perimeter since the berms are set back more towards the site interior. Higher berms will require more vegetation added for soil stabilization. Since higher berms are more visible from external view planes visual impact mitigation by adding vegetation and taller trees becomes more important. Appendix G describes added visual impact mitigation measures through applying color schemes for long-distance impact mitigation.	Impact mitigation during operations will mostly be visual impact mitigation and managing heavy-vehicle traffic. Effective visual mitigation efforts would include adding tall trees and a layer of dense Lower vegetation to the exterior sides of the berms.
L	**Changed site traffic – revised road access to Lower site**: The updated site development plan has one roadway access to the Lower site instead of the two road accesses that were part of the site plans in the 2011 FEIS. The single road access is located about 150 yards West, away from the Kapa'a Quarry Road and the existing road triangle in the Lower parts of the Kapa'a Quarry Place roadway. The elevation of the Kapa'a Quarry Place roadway at the location of the new single road access is nearly the same the interior site elevation. This facilitates the construction of the road access. Locating the new single site access away from the existing roadway triangle makes the traffic flow easier and reduces traffic risks because of better sight distance. Instead of a somewhat complicated four-way intersection from the two- road access	Impacts due to the construction of the single new road access will be lower than the previous two road access described in the 2011 FEIS. Impacts after construction would be reduced due to a simpler traffic patterns of the single road access. In addition to the simpler traffic at the intersection, sight distance impacts will be reduced.

Annotations in Fig. 2.6.1	Description	Anticipated Impacts and Impact Mitigation
	scenario of the 2011 FEIS, the new single road access would be a conventional T-intersection.	
M	**Relocation of 4 kV power line:** A 1,500-foot section of the existing 4 kV power line which supplies the KLIP needs to be relocated since it currently passes through the Lower site, which blocks development work inside the Lower site. This section of the power line will be relocated to pass entirely outside the project site.	Impacts are described in detail in Appendix L of this FSEIS. Impacts are both short-term, during construction, and long-term, during operations. Appendix L describes the type of impacts by alternative alignments and proposed impact mitigation measures.

2.7 Conceptual Layouts of the Upper and Lower Site Described in 2011 FEIS

Section 2.7 of the 2011 FEIS described the conceptual layouts of the Upper and Lower portions of the site, e.g., Upper and Lower sites. In this Section, the project team reiterates the planned land use and building density as it was described in the 2011 FEIS.

2.7.1 Conceptual Layouts of the Upper Site as Described in the 2011 FEIS

Figure 2.7.1.1 shows the conceptual layout of the full build-out Upper portion of the site as described in the 2011 FEIS as the Preferred Action. Table 2.7.1.1 shows the planned site land use as described in the 2011 FEIS. Table 2.7.1.2 shows the planned additions of buildings in the Upper portion of the site. These planned buildings were to be added to the 283,000 sqft of the existing buildings at the time of the 2011 FEIS.

Table 2.7.1.1: Land use in the Upper portion of the site as described in the 2011 FEIS

Decsription of areas contributing to 2011 FEIS Preferred Alternative	Sum acres	pervious acres	impervious acres
TMK 4-2-15:014 (portion of)	13.0	8.1	4.9
Former TMK 4-2-15:001 portion of and 012 TMK 4-2-15:013	22.3	0.0	22.3
Former TMK 4-2-15:008			
Sum of TMK 4-2-15:013 and 014 (portion of.) in Upper Site	**35.3**	**8.1**	**27.2**

Table 2.7.1.2: Planned additions of buildings in the Upper portion of the site.

ID	Building footprint sqft.	Sqft in parcel TMK 4-2-15:001 (por.)	Sqft in parcel TMK 4-2-15:008
UP 1	23,400		23,400
UP 2	23,400		23,400
UP 3	15,600		15,600
UP 4	0		0
UP 5	21,600		21,600
UP 6	24,000		24,000
UP 7	24,000		24,000
UP 8	24,000		24,000
UP 9	24,000		24,000
UP 10	22,700		22,700
UP 11	23,800	23,800	
UP 12	11,000	11,000	
UP 13	6,000		6,000
UP 14	16,000	16,000	
UP 15	9,900	9,900	
sum **	**269,000**	**61,000**	**209,000**

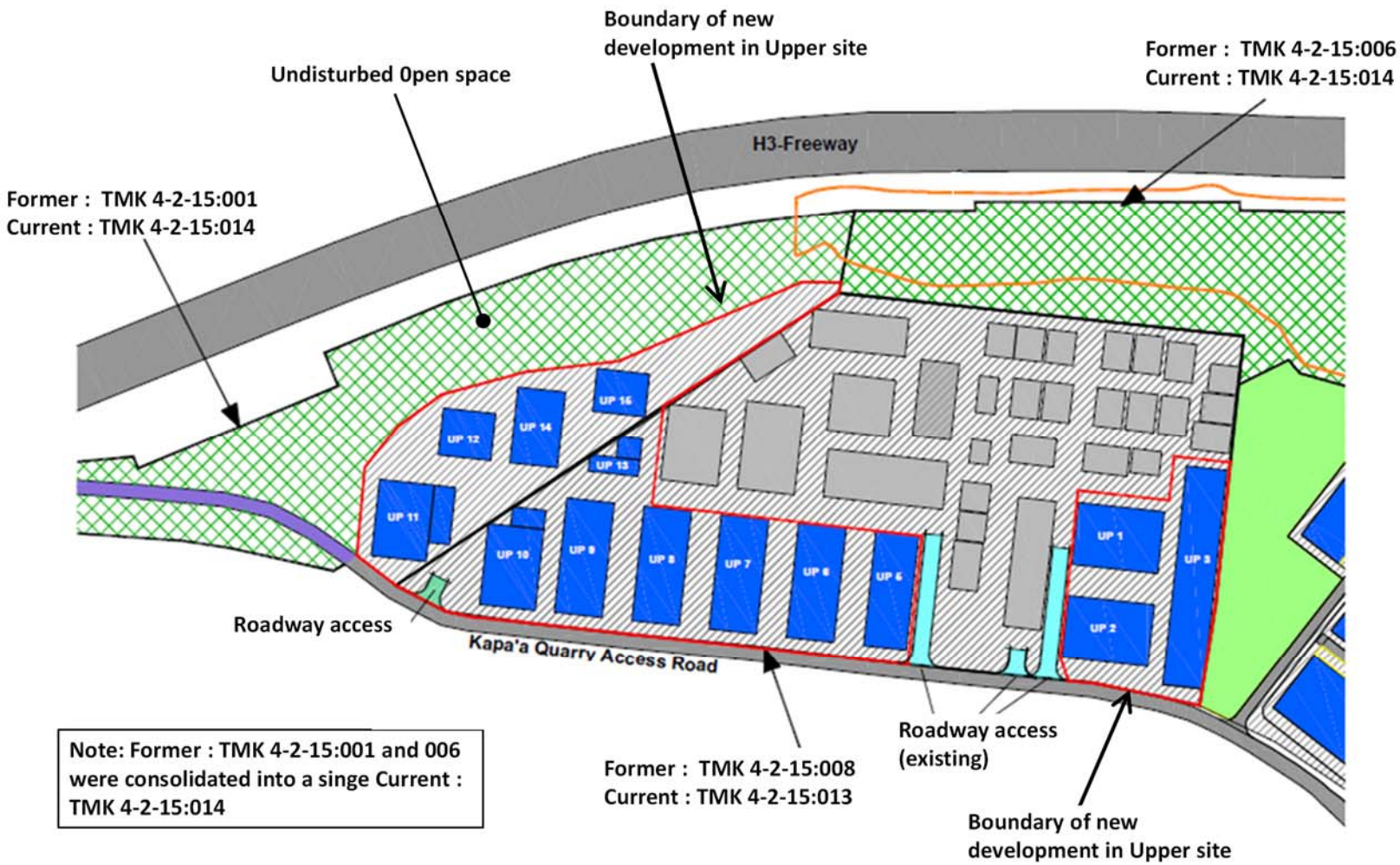


Figure 2.7.1.1: Conceptual layout of the full build-out Upper portion of the site **as described in the 2011 FEIS** as the Preferred Action

2.7.2 Conceptual Layouts of the Lower Site as Described in the 2011 FEIS

Figure 2.7.2.1 shows the conceptual layout of the full build-out of the Lower portion of the site as described in the 2011 FEIS as the Preferred Action.

Table 2.7.2.1 shows the planned land use of the Lower portion of the site as described in the 2011 FEIS.

Table 2.7.2.1: Planned land use of the Lower portion of the site as described in the 2011 FEIS

Decsription of areas contributing to **2011 FEIS Preferred Alternative**	Sum acres	pervious acres	impervious acres
TMK 4-2-15:014 (lower portion of)			
Former TMK 4-2-15:006			
Open space remaining (outside of designated project site)	14.6	14.6	
Designated project site	24.4	11.7	12.7
Other land inside inside parcel but outside the project site.	4.8	4.1	0.7
Sum of TMK 4-2-15:013 and 014 (portion of.) in Lower Site	**43.8**	**30.4**	**13.4**

ID	Building footprint sqft.
LO 1	26,600
LO 2	20,900
LO 3	24,000
LO 4	24,000
LO 5	24,000
LO 6	24,000
LO 7	24,000
LO 8	18,000
LO 9	18,000
LO 10	24,000
LO 11	24,000
LO 12	15,000
LO 13	24,000
LO 14	24,000
LO 15	22,400
sum **	337,000

Table 2.7.2.2: Planned building footprint in the Lower portion of the site as described in the 2011 FEIS.

The 2011 FEIS described the number of planned warehouses and the planned total footprint in the Lower site as 15 and 337,000 sqft.

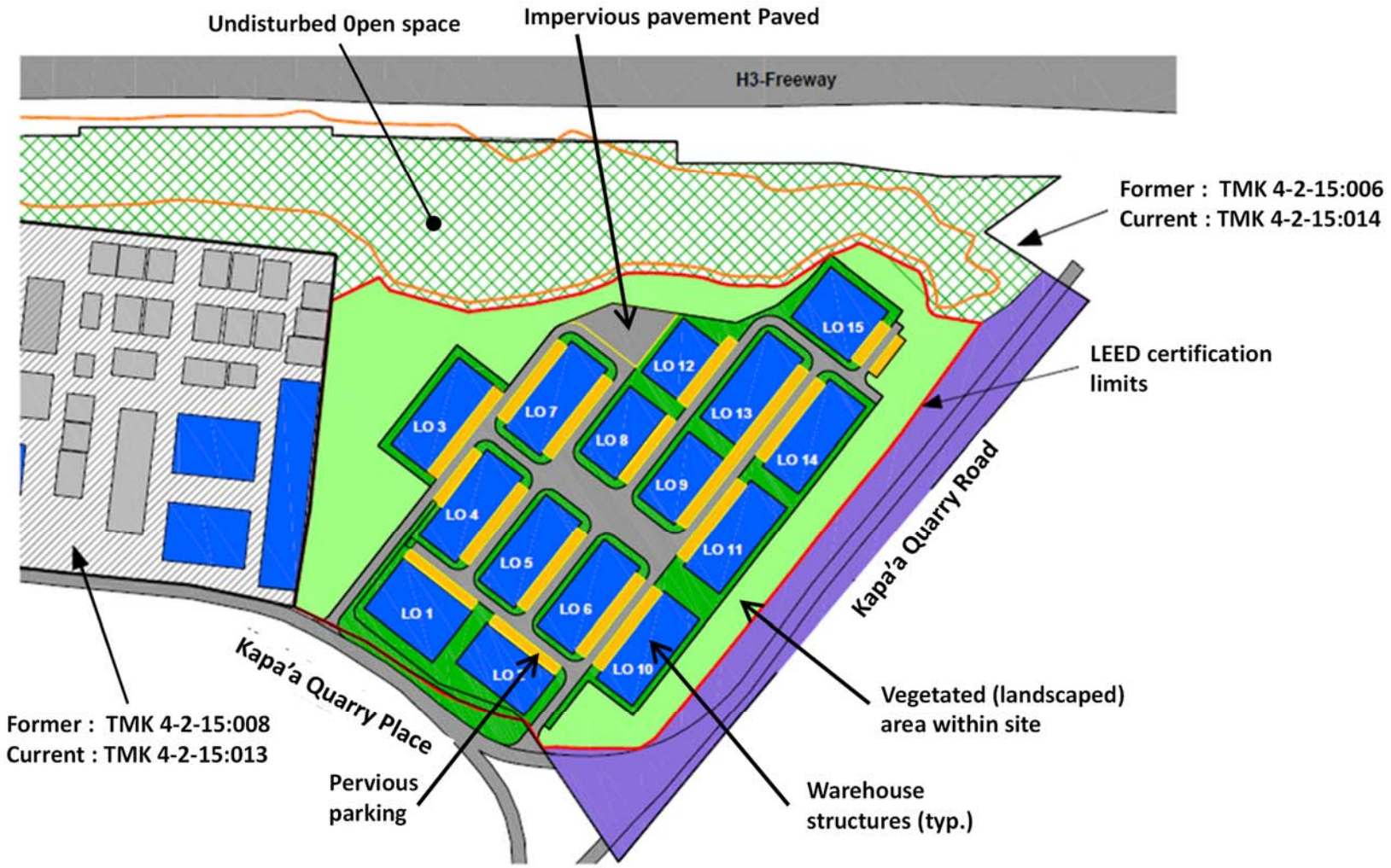


Figure 2.7.2.1: Conceptual layout of the full build-out Lower portion of the site **as described in the 2011 FEIS** as the Preferred Action

2.8 Conceptual Layouts of the Upper and Lower Site Under the 2021 SEIS

This section describes the conceptual layout of the Lower portion of the site under the updated site development plan as described in this FSEIS ~~DSEIS~~.

2.8.1 Conceptual Layouts of the Upper Site Under the 2021 SEIS

Figure 2.8.1.1 shows the conceptual layout of the Upper portion of the site (Upper site) under the updated site development plan.

Tables 2.8.1.1 and 2.8.1.2 show the planned land use within the Upper portion of the site and the planned addition of building footprint, respectively, under the updated site development plan.

Tables 2.8.1.1: Planned land use within the Upper portion of the site under the updated site development plan

Description of areas contributing to **2020 SEIS**	Sum acres	pervious acres	impervious acres
TMK 4-2-15:014 (portion of)	13.0	8.1	4.9
Former TMK 4-2-15:001 portion of and 012 TMK 4-2-15:013	22.3	0.0	22.3
Former TMK 4-2-15:008			
Sum of TMK 4-2-15:013 and 014 (portion of.) in Upper Site	**35.3**	**8.1**	**27.2**

Planned Bldg.	**Building footprint** [sqft.]
24 B	17,000
24 C	14,000
32	29,000
33	29,000
34	29,000
35	12,000
sum	**130,000**

Table 2.8.1.2: Planned buildings and their footprints within the Upper portion of the site under the updated site development plan

Note: In the years after the 2011 FEIS was accepted the following buildings have been added to the Upper site:
Bldgs. 24A, 31, 45, 50, 51, 45 with a total building footprint of 97,000 sqft.

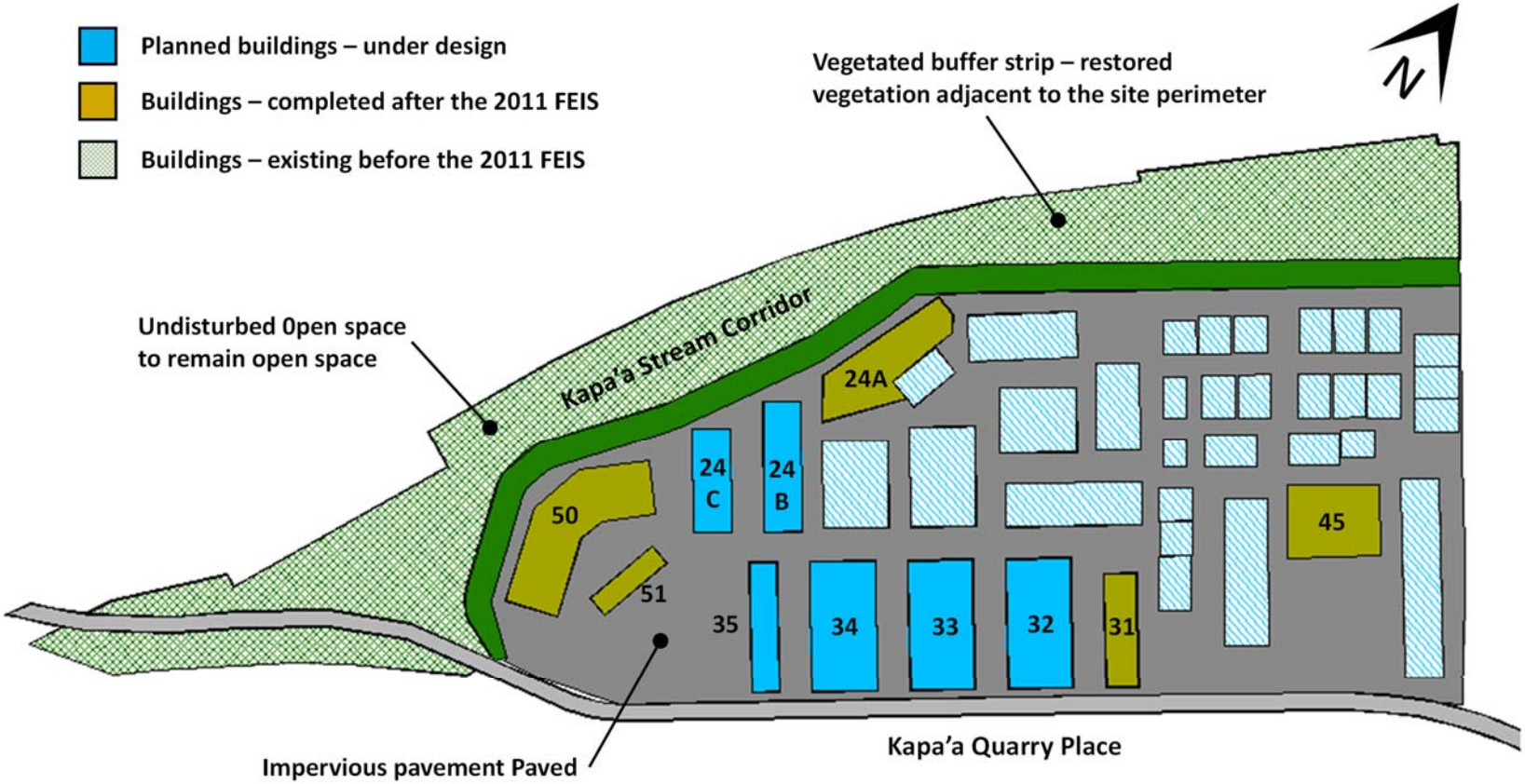


Figure 2.8.1.1: Conceptual layout of the Upper portion of the site (Upper site) **under the updated site development plan (2021 SEIS**)

2.8.2 Conceptual Layouts of the Lower Site Under the 2021 SEIS

Figure 2.8.2.1 shows the conceptual layout of the Upper portion of the site (Upper site) under the updated site development plan.

Tables 2.8.2.1 and 2.8.2.2 show the planned land use within the Upper portion of the site and the planned addition of building footprint, respectively, under the updated site development plan.

Tables 2.8.2.1: Planned land use within the Lower portion of the site under the updated site development plan

Decsription of areas contributing to **2011 FEIS Preferred Alternative**	Sum acres	pervious acres	impervious acres
TMK 4-2-15:014 (lower portion of) Former TMK 4-2-15:006 Open space remaining (outside of designated project site)	14.6	14.6	
Designated project site	24.4	11.7	12.7
Other land inside inside parcel but outside the project site.	4.8	4.1	0.7
Sum of TMK 4-2-15:013 and 014 (portion of.) in Lower Site	**43.8**	**30.4**	**13.4**

Bldg. No	length	width	area
1	220	120	26,000
2	200	120	24,000
3	240	120	29,000
4	180	120	22,000
5	180	120	22,000
6	200	120	24,000
7	320	120	38,000
8	240	120	29,000
9	160	120	19,000
10	160	120	19,000
11	240	120	29,000
12	240	120	29,000
13	240	120	29,000
14	280	120	34,000
		sum	373,000

Table 2.8.2.1: Planned buildings and their footprints within the Lower portion of the site under the updated site development plan

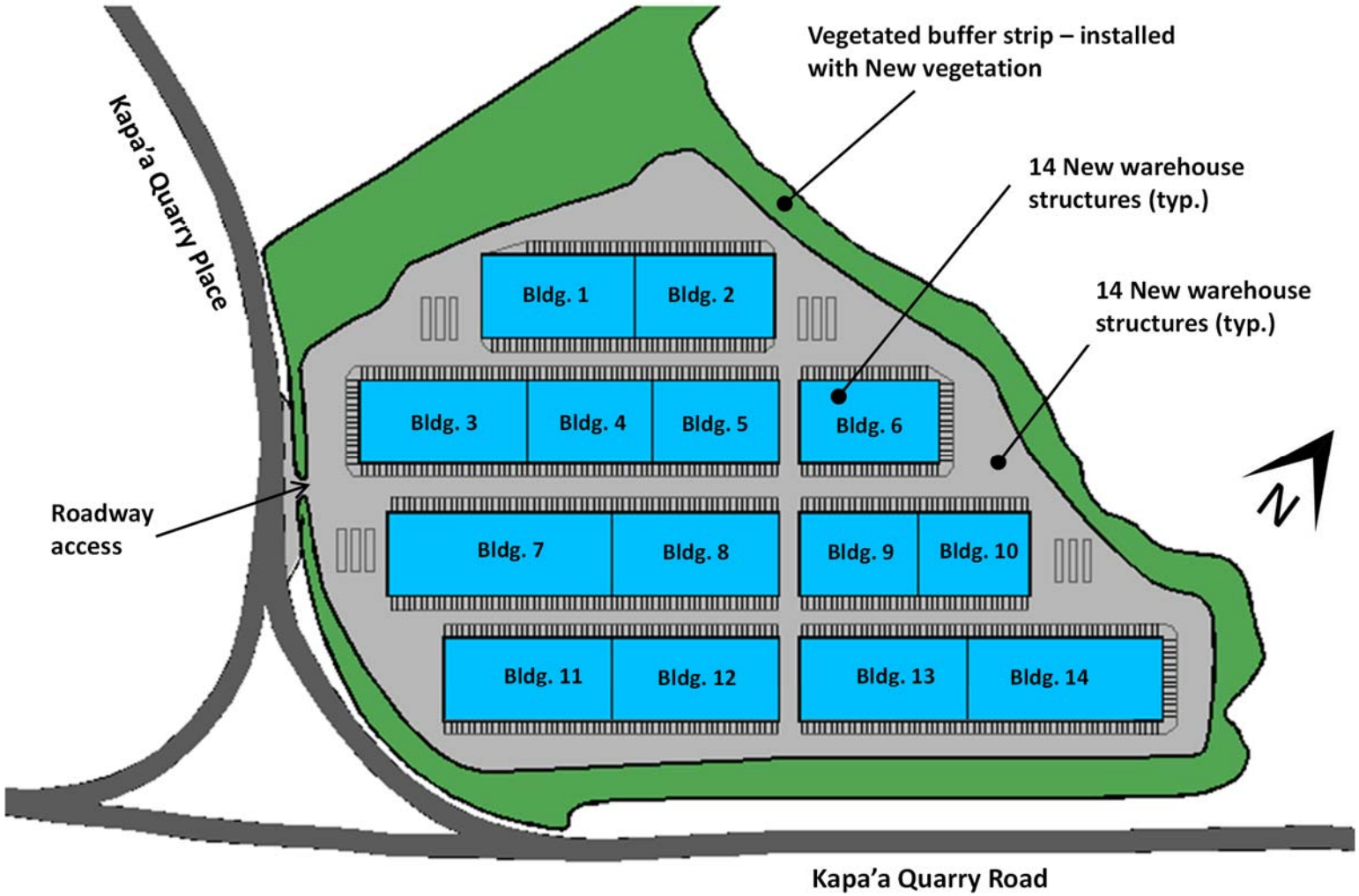


Figure 2.8.2.1: Conceptual layout of the Upper portion of the site (Upper site) **under the updated site development plan (2021 SEIS)**

2.9 Comparison of Planned Land Use and Buildings Between 2011 FEIS and 2021 SEIS

This section of the SEIS describes the differences of the land use and building sizes at the full build-out project site for the 2011 FEIS and the 2021 SEIS conditions.

Table 2.9.1 shows full build-out land use as described in the 2011 FEIS, including the contributions of the Lower and Upper portions of the site. The pervious and impervious land contributions in the two parcels and in the delineated project site, which indicates the limits of the KLIP developments, are indicated. Under the planned full build-out conditions of the 2011 FEIS the total areas of the two parcels TMK 4-2-15:013 and 014 would have approximately the same pervious and impervious land. The 2011 FEIS full build-out project site, within the limits of development, on the other hand would have approximately three quarters as impervious and one quarter as pervious land.

Table 2.9.1: Planned Full build-out Land use for the 2011 FEIS Preferred Alternative

Description of areas contributing to **2011 FEIS Preferred Alternative**	**Sum** [acres]	**Pervious** [acres]	**Impervious** [acres]
Upper portion of the site TMK 4-2-15:014 (portion in Upper Site)	13.0	8.1	4.9
Former TMK 4-2-15:001 portion of and 012 TMK 4-2-15:013	22.3	0.0	22.3
Former TMK 4-2-15:008			
Sum of TMK 4-2-15:013 and 014 (portion in Upper Site)	35.3	8.11	27.2
Lower portion of the site TMK 4-2-15:014 (portion in Lower Site)	43.8	30.4	13.4
Former TMK 4-2-15:006			
Total land area of TMK 4-2-15:013 and 014	**79.1**	**38.5**	**40.6**
	100%	49%	51%

Description of areas contributing to **2011 FEIS Project site**	**Sum** [acres]	**Pervious** [acres]	**Impervious** [acres]
Upper portion of the site	27.2	0.0	27.2
Lower portion of the site	24.4	11.7	12.7
Sum in Project Site - Upper and Lower site	**51.6**	**11.7**	**39.9**
	100%	23%	77%

Table 2.9.2 shows the same full build-out data as Table 2.9.1, but for the conditions under the updated site development presented in this 2021 SEIS. As Table 2.9.2 indicates the 2021 SEIS full build-out has more impervious land than the full build-out conditions described in the 2011 FEIS.

Tables 2.9.2 and 2.9.3 compares the magnitudes of changes in land use and the building footprints between conditions described in the 2011 FEIS and the 2021 SEIS. The comparison indicates that the full build-out project site under the updated site development described in the 2021 SEIS would increase slightly by not more than 1%. The pervious fraction of the project site would significantly decrease relative to the 2011 FEIS. The full build-out building sizes of the updated site development of the 2021 SEIS would slightly decrease relative to the 2011 FEIS. The Upper site would have less and the Lower site more warehouse footprint relative to the 2011 FEIS.

Table 2.9.2: Comparisons of the magnitudes of changes in land use between 2011 FEIS and the 2021 SEIS.

					Changes relative to 2011 FEIS			
Description of Land use	**Sum** [acres]	**Pervious** [acres]	**Impervious** [acres]		**Pervious** [acres]	%	**Impervious** [acres]	%
Overall land in 2 parcels; Tmk 4-2-15:013 and 014								
2011 FEIS	79.1	38.5	40.6					
2020 SEIS	79.1	33.1	46.0		(5.4)	-14%	5.4	**13%**
Project site in 2 parcels; TMKs 4-2-15:013 and 014								
2011 FEIS	51.6	11.7	39.9					
2020 SEIS	52.2	6.2	46.0		(5.5)	-47%	6.1	**15%**

Table 2.9.3: Comparisons of the magnitudes of changes in building footprints between 2011 FEIS and the 2021 SEIS.

Building space	**Upper site** [sqft]	**Lower site** [sqft]	**Sum** [sqft]
2011 FEIS			
Existing (at time of 2011 FEIS)	283,000		283,000
Planned	269,000	337,000	606,000
Sum	552,000	337,000	889,000
2020 SEIS			
Existing (at time of 2020 SEIS)	380,000		380,000
Planned	130,000	373,000	503,000
Sum	510,000	373,000	883,000

Changes relative to 2011 FEIS	**Upper** [sqft]	**Lower** [sqft]	**Sum** [sqft]
Changes in sqft	(42,000)	36,000	(6,000)
Changes in %	-8%	10%	-1%

2.10 Project Schedule and Milestones

Section 2.7 of the 2011 FEIS described the project schedule and site development milestones.

The 2011 FEIS anticipated that site development would progress at approximately 40,000 sqft of buildings per year. The anticipated completion of the development of the entire KLIP was therefore estimated around the year 2025.

The actual progress of the site development has been slower than anticipated in the 2011 FEIS. This will put the now anticipated completion of the development further into the future than described in the 2011 FEIS.

As was already described in the 2011 FEIS, four major work categories occur for the construction of individual warehouses:

- **Detailed grading** of building footprint and adjoining land: Establishing the finished grade for the buildings and the surrounding traffic areas, parking areas and open space.
- **Foundation**, paving and drainage systems: Installing the foundation for the structures, paving of the parking and traffic area around the buildings and connecting the site drainage system to the overall development stormwater system.
- **Construction** of steel structure and roof: Construction of the outer building envelope.
- **Completion of internal core and shell facilities:** Carrying out all internal building work required for the core and shell building facilities.

In addition to the work categories for individual warehouses the following work will be required for the development of the entire site:

- **Mass grading:** Suitable fill, which will be brought to the site, will be distributed on the site to achieve the desired finish grade. Phasing of grading will be done so that a limited grading area will be exposed to soil erosion. In the areas that are not under actively grading, temporary soil stabilization would be applied for the period between major grading phases. Detail of the requirement for mass grading will be delineated in the grading permit.
- **Construction of the site perimeter berms:** The berms will be installed in conjunction of the mass grading. It would be desirable to establish the vegetation on the berms, especially the planting of taller trees and shrubs for visual impact mitigation, early in the grading process so that the trees have time to grow.
- **Installing the storm water system:** The storm water treatment and management system will serve the completed buildings and adjacent impervious areas. During construction, the stormwater system would have to be protected against entrained soil and the associated construction related runoff.
- **Installing the wastewater system:** The wastewater generated at the site will have to be treated onsite since the site is presently not connected to the municipal sewer system, nor are there plans to install a sewer system for facilities in the Kapa'a Valley. The type of wastewater treatment technology which would be used for yet to be installed wastewater units is more advanced than the preferred treatment technology described in the 2011 FEIS. The proposed

wastewater units would serve multiple buildings and dispose the treated wastewater in infiltration fields at the site perimeter.

- **Installing other utilities:** Electricity and water supply to the site will be below ground within the site boundaries.
- **Traffic areas and road access:** Traffic and parking areas inside the site will be paved areas between buildings and inside the perimeter berms. There will be one roadway access to the Kapa'a Quarry Place.

Section 2.7 of the 2011 FEIS described the project schedule and major project milestones and presented the project schedule in Table 2-8 of the 2011 FEIS. The progress of site development work has been slower than anticipated as disclosed in the 2011 FEIS. Table 2.10.1 shows the updated project schedule with a projected completion of the development of the KLIP, based on a conservative estimate, in 2031.

Table 2.10.1: Comparison between the project schedule described in the 2011 FEIS and the updated site development plan

Item	**Description**	**Projected Completion per 2011 FEIS** [year]	**Updated - Expected schedule** Start [year]	End [year]	**Notes for SEIS**
1	Completion of the environmental review process:	2011	2020	2021	EIS process completed in 2011 - SEIS started in 2020
2	Application for Zone Change:	2011			Completed
3	Special Management Area (SMA) permit:	2011	2014	N/A	Initial SMA Use permit obtained - Outstanding minor modification acceptance pending in 2020
4	Start of construction for proposed KLIP in Upper portion of the site	2011	2011	N/A	The construction in the Upper site started some 30 years ago; construction activities following acceptance of the 2011 FEIS started in 2011
5	Continuous addition of warehouses in the Upper portion of the site:	2017	2011	2022	Anticipated full buildout of Upper site is 2022

Table 2.10.1: Comparison between the project schedule described in the 2011 FEIS and the updated site development plan

Item	Description	Projected Completion per 2011 FEIS [year]	Updated - Expected schedule Start [year]	End [year]	Notes for SEIS
6	Start construction vegetative buffer zones around the Lower portion of the site	2012	2021	2022	Start of perimeter berm construction will be after SMP minor modification is obtained
7	Mass Grading of Lower site	2015	2018	2023	Mass grading has already started under an existing grading permit with Lower finish grade elevations
8	Soil stabilization in Lower portion of the site	2015	2019	2023	Temporary soil stabilization will occur between grading phases, with final stabilization at completion of work.
9	Detailed grading for warehouse construction in Lower portion of the site	2016	2023	2028	Detail grading is following mass grading and is limited in scope of soil disturbance.
10	Electric and water infrastructure installation Lower portion of the site	2016	2023	2026	Electric and water electric and water supply infrastructure installation will be below ground.
11	Onsite wastewater systems Lower portion of the site	2016	2023	2026	There will be a central infiltration field for the treatment units.
12	Installation of paved roadways Lower portion of the site	2016	2023	2026	The roadway and off-street parking pavement will be connected
13	Installation of the stormwater drainage system Lower portion of the site	2016	2023	2028	The installation of the storm water systems will be done in three phases, in accordance with completion of warehouses.
14	Completion of all the warehouses in the	2016		2022	The completion of the warehouse development in

Table 2.10.1: Comparison between the project schedule described in the 2011 FEIS and the updated site development plan

Item	Description	Projected Completion per 2011 FEIS [year]	Updated - Expected schedule Start [year]	End [year]	Notes for SEIS
	Upper portion of the year:				the Upper site is slated for 2022.
15	Start of construction of warehouses in Lower site in	2017	2023		The start of warehouse construction in the Lower site is contingent on the completion of the site development phase, including grading, traffic areas, site infrastructure
16	Continuous addition of warehouses in the Lower portion of the site:	2017 to 2025	2023	2031	A duration of 8 years is conservative estimate of the length of construction of warehouses in the Lower site.
17	Completion of the development	2025		2031	The expected completion of the site development is slated to completed by 2031.

2.11 Sustainable Design Approach for the Lower Portion of the Site

Section 2.8 of the 2011 FEIS described the plans of the Applicants to use sustainable site and building technologies in the development of the Lower portion of the project site. The commitment to use sustainable site development strategies is consistent with the need for effective impact mitigation measures in the part of the site that is adjacent to environmentally sensitive land, especially adjacent aquatic resources.

The 2011 FEIS described plans of the Applicant to develop the Lower site to strategies that are following strategies of the LEED green building standard. The LEED green building standard provides guidelines to mitigate impacts from the built environment, including impacts from buildings consuming energy and water and from infrastructure emitting storm water runoff, wastewater, and other emissions. The standard also addresses impacts and impact mitigation strategies related to traffic and other issues which concern the community, including climate change.

As Section 2.8 of the 2011 FEIS described, by developing in accordance with the LEED, priority was given to satisfy those LEED credit categories which would provide effective impact mitigation for the proposed site. More specifically, from the seven LEED credit categories, two categories, the water efficiency category (WE) and the sustainable site category (SS), were given special attention since they directly

provide the type of impact mitigation that is most important for adjacent aquatic resources, especially the Kawainui Marsh.

The LEED green building standard under which the project is currently developed has the following seven categories:

SS - Sustainable Sites
WE - Water Efficiency
EA - Energy & Atmosphere
MR - Materials & Resources
IEQ - Indoor Environmental Quality
ID - Innovation in Design
RP - Regional priority

The actual measures to be implemented in the updated site development plan will be somewhat different from the sustainable strategies described in the 2011 FEIS. The reason is that the LEED standard is evolving and may require more stringent measure than considered before in the 2011 FEIS.

SS - Sustainable Sites Credit Category: The proposed site is within the State of Hawaii "Urban" land use district and is not a greenfield development. The proposed project will be developed on an area that was formed by landfill. The project therefore meets the goal to conserve previously undeveloped and open land. Land that is either zoned for industrial use or is qualified for converting the industrial zoned land is in short supply in the greater Kailua and Kaneohe region, and consequently the region will benefit from developing land for industrial use at the proposed site.

The mitigation measures under the sustainable sites category that are of significance to the planned site development are as follows:

- Alternative transportation is supported by providing incentives for bicyclists and providing preferred parking for low emitting vehicles and carpools. The goal of this measure is a reduction of individual traffic to and from the project site.
- Constructing a restored habitat on the site perimeter berms by planting native or adaptive plants. This measure will reduce the visual impact on the project and will reduce air pollution and noise propagation to adjacent areas. The new vegetated areas at the site perimeter will receive irrigation water from harvested rainwater and possibly recycled wastewater.
- A comprehensive storm water treatment system will be installed that will control the quality and quantity of the stormwater runoff from the developed site. The storm water treatment and management system will be designed to treat 100% of the runoff before releasing it to the receiving water in the Kapa'a Stream corridor. The goal of this measure is to Lower the impact of storm water to the adjacent aquatic resources from the existing conditions.
- Strategies to reduce light pollution by controlling internal and external light sources within the development will be implemented during nights. This measure will provide important impact mitigation since excessive light can impact the wildlife and migrating birds in the adjacent marsh. A light pollution prevention plan that was required by the conditional zone change was developed and was approved by the Accepting agency.
- Binding guidelines for internal build-out of leased spaces, following sustainable and green practices will be contractually required by the tenants.

WE - Water Efficiency Credit Category: The proximity of the proposed site to important wetland areas emphasizes the high importance of effective mitigation measures for all water related issues. Water relevant issues include stormwater runoff, water use for irrigation, water use in the buildings and wastewater treatment and disposal. While the stormwater control will be treated under the Sustainable Site credit category all the remaining water related credits are grouped under the Water Efficiency credit category. The Water Efficiency (WE) credit category uses the following measures to mitigate impacts of the project:

Water efficient landscaping will be applied through using native and adaptive plants and irrigation with harvested rainwater. Native and adaptive plants have Lower needs for irrigation water, pesticides and fertilizers then introduced plant species. This measure reduces the amount of fertilizer and pesticides which might be entrained in the runoff from landscaped areas. Recent changes: Under the updated site development plan, several vegetated buffer strips will use turf grass as the vegetation cover for the retention of stormwater runoff pollutants. Turf grass typically has higher water demand but has the advantage of being effective for the filtering function of the vegetated buffer strip.

Innovative wastewater technologies will include advanced onsite treatment systems that go far beyond the performance and effectiveness of conventional septic systems. Wastewater is treated onsite because there is no connection to the municipal sewer system. Since the discharge of treated wastewater occurs near important wetlands, advanced treatment steps are added to the septic systems on the site. Aerobic and anaerobic treatment process steps are added to the septic systems to remove significant organic loads and suspended solids. The treatment process also will significantly reduce nutrients from the wastewater before the treated effluents is infiltrated at the site perimeter or in infiltration fields. Recent changes: The wastewater technology disclosed in the 2011 FEIS was a recirculating filter technology. While this technology was already more effective in removal of organic and nutrient loads than conventional septic systems, the new technology planned under the updated site development is the membrane bioreactor (MBR) system. A wider application of the MBR technology is evolving in the US since it offers low residual pollution in the treated effluent and significantly reduces infiltration fields. With the benefits come higher first costs and O&M costs. The first two MBR units are presently being tested in the Upper site under a pilot project that is conducted in cooperation with the Hawaii State Department of Health. Once the pilot project is satisfactorily concluded, the rest of the KLIP will be equipped with this technology. All new onsite wastewater units will use MBR technology and existing conventional septic systems will be refitted with MBR technology when required.

Water use reduction measures will result in a 30% - 40% water use reduction relative to the applicable benchmark standards that were described in the 2011 FEIS. Water reduction measures helps reducing the burden of the project on the municipal water supply and reduces the amount of wastewater generated inside the buildings.

EA - Energy & Atmosphere Credit Category: Measures under the energy and atmosphere credit category will help to reduce energy consumption and therefore will mitigate impacts related to responsible resource consumption. Changes: In the years since the 2011 FEIS the contribution of renewable energies has significantly increased in Hawaii. In 2020 a new energy conservation code (IECC 2015) became mandatory in Hawaii which greatly increases the energy conservation effort. Energy

conservation as well as renewable energies will help the State of Hawaii on its declared effort achieve the clean energy goals. The relevant LEED credits are as follows:

- Optimized energy performance of lighting and other building equipment will save around 30% of the energy costs of an applicable baseline. This measure helps to reduce the burden of the proposed project on the electric supply system and helps reducing burning fossil fuel for electricity generation. Reducing carbon is an important contribution to mitigate effects of climate change.
- Onsite renewable energy will offset energy derived from imported fossil fuel, especially oil. The onsite renewable energy will be derived from solar thermal/waste heat recovery and/or PV energy systems. This measure helps to reduce the burden of the proposed project on the electric supply system and helps to reduce burning fossil fuel for electricity generation.
- Continuous measurement and verification will support the KLIP management as well as tenants to monitor the success of energy savings and intervene if the saving goals are not met.

MR - Materials & Resources: The materials and resources credit category addresses island-wide concerns, since it combines efforts to divert as much construction waste as possible from going to landfill, and to conserve virgin material by reusing and recycling waste. In addition, the credit category advocates the use of locally extracted or manufactured materials in lieu of imported material. The relevant credits that have been chosen for the of the project include:

- Construction waste management will be performed to reuse or recycle construction waste and therefore reduce disposal in landfills.
- Recycled materials will be used in the construction and products will be given preference that have a higher percentage of pre- and post-consumer recycled content. Regionally extracted or manufactured material will be used to support indigenous resources and the economy of Hawaii. These measures will help the environment and help the local economy.

IEQ - Indoor Environmental Quality: The Indoor environmental quality credit category addresses concerns about a healthy indoor environment for building occupants. IEQ impacts and their mitigation have only secondary significance to the exterior environment. In selecting what credits will be attempted, the project endeavors to create synergy between increasing the indoor environmental conditions and to mitigate impacts to the exterior environment. The relevant credits that also mitigate pertinent impacts on the adjacent environment of the proposed project are as follows:

ID - Innovation in Design: The Innovation in Design credit category includes measures to step outside the conventional design paradigm and implement mitigation measures more than the basic LEED credit requirements or use innovative project initiatives that create effective synergies to make the project "more green".

For the project, the Innovations-in-Design issues will include advanced storm water treatment and wastewater treatment, both of which will goes beyond conventional technology application. Furthermore, the Applicants are working with local environmental groups which promote environmental education.

RP - Regional priority: The credits of the regional priority category represent bonus points for the project to implement those credits that are most attractive to the region. These issues include energy consumption, storm water management, wastewater management and locally derived or recycled materials.

CHAPTER 3 - CURRENT ENVIRONMENT

The project site is located on the windward site of the Island of Oahu. The project site is composed of two contiguous land parcels, TMK 4-2-15:013 and 014, both owned by the Applicants, in the Lower stretches of the Kapa'a Valley, directly adjacent to the H3-Freeway and the Kapa'a Quarry Road. The environmentally and culturally important Kawainui Marsh is located to the east and adjacent of the project site. Figure 3.1 shows the vicinity map of the project site. The following sections evaluate and discuss the existing environment at the proposed project site.

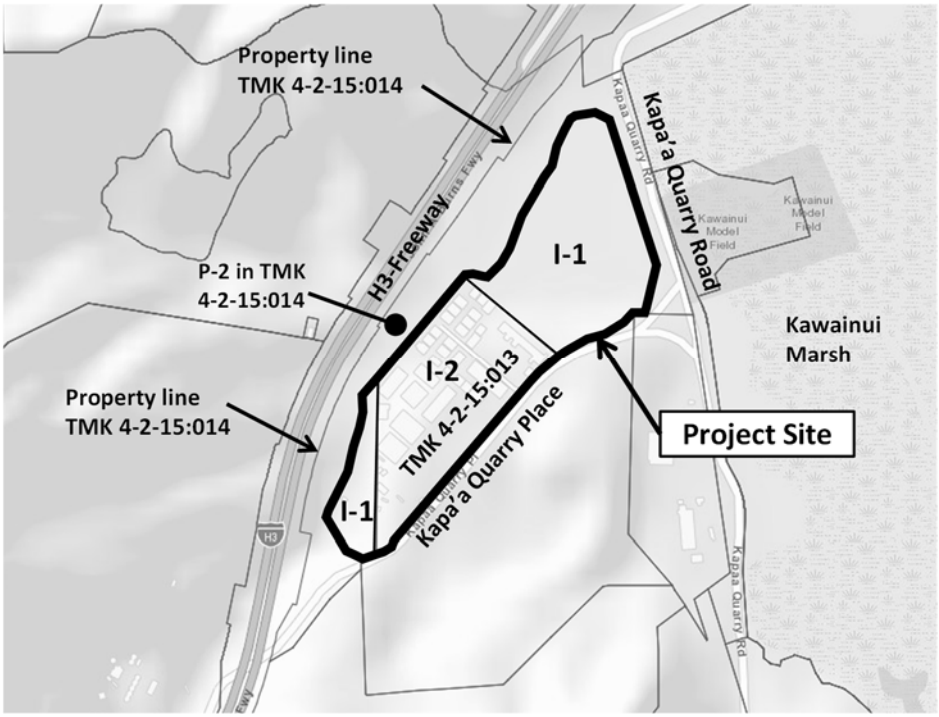


Figure 3.1: Project Site – Vicinity Map

The project site stretches over portions of parcels TMKs 4-2-15:013 and 014. While the project site within TMK 4-2-15:014 was rezoned to I-1, the remainder of the parcel 4-2-15:014, remains open land zoned as P-2.

3.1 Geology, Topography, and Soils Existing Environment

Section 3.1 of the 2011 FEIS described the geology, topography, and soils at the project site.

3.1.1 Geology and Topography

Section 3.1.1 of the 2011 FEIS described the existing geology and topography at the project site. The basic geology at the project site has not changed. Although some grading has been done at the project which affected the site topography, the basic topography remains essentially unchanged.

The Kapa'a Light 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 origin. A geologic map of Oahu depicted in Figure 3.1.1.1 shows that at higher elevations, the geology is mostly defined by volcanic rock of Kailua volcanic series characterized by massive basaltic flows which contain numerous dike structures filled with secondary minerals. In contrast, in the proposed project site,

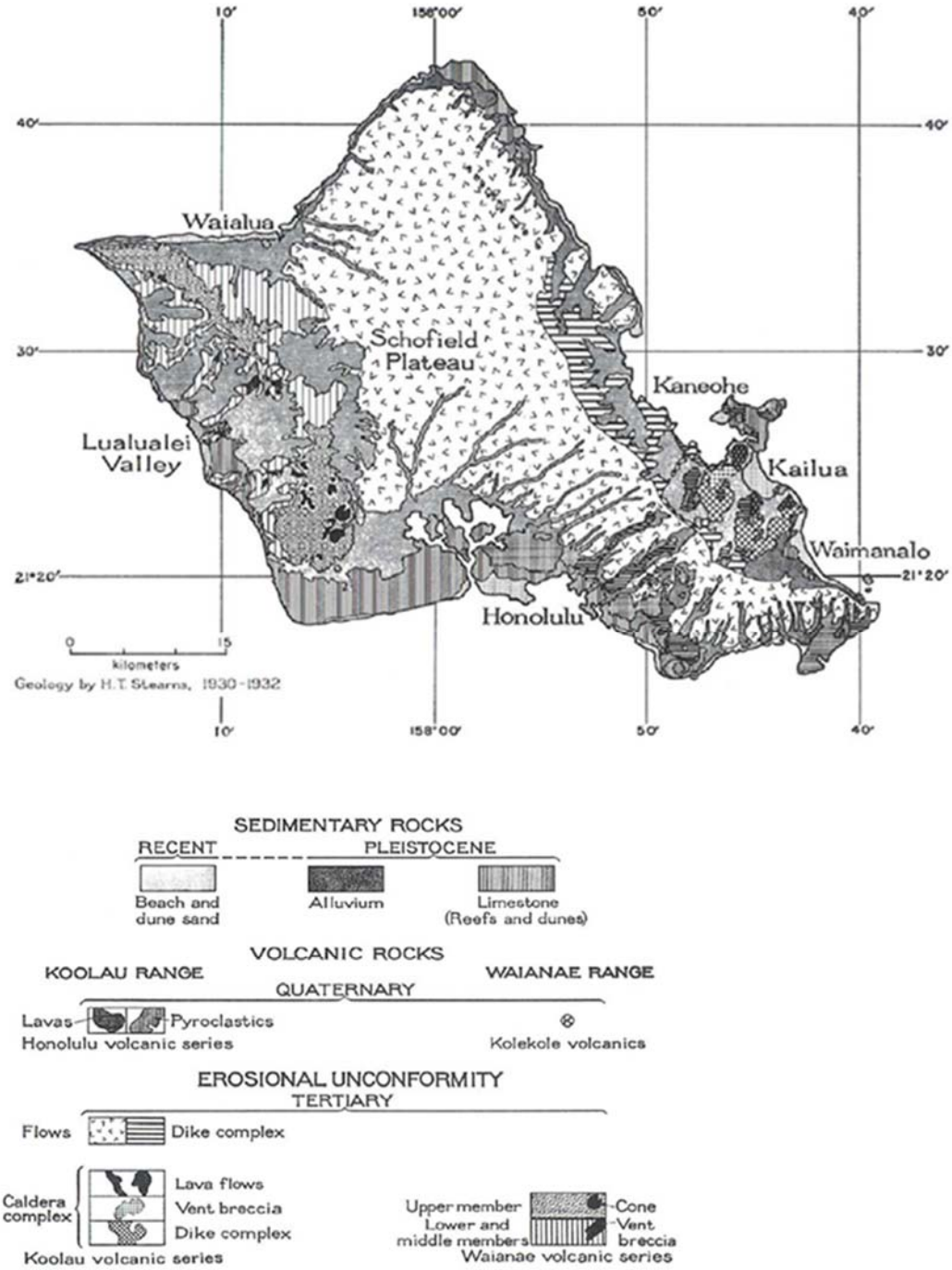


Figure 3.1.1.1: Main geological formations of Oahu (source 2011 FEIS Figure 3-2)

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 deposits of more than 20 feet of quarry tailings and municipal solid wastes.

Before the development of the project started the original topography was characterized by gently sloping terrain from southwest to the northeast and towards the Kapa'a Stream. The original topography at the site was heavily impacted by quarry and landfill operations spanning from the 1950's through the 1970's.

The topography at the project is characterized by the relatively flat section of the Upper site separated from the Lower section by a narrow-sloped section with an average 35-foot drop. Ground elevations in the Upper section of the site range from 83 to 95 feet above Mean Sea Level (MSL), and gently slope towards the Kapa'a Stream. The Lower section of the site is formed by a relatively flat plateau bounded in the North by Kapa'a Stream and in the East by a drainage ditch which runs along Kapa'a Quarry Road and drains into the stream. Ground elevations in the Lower site range between 20 and 50 feet above MSL with a gentle slope in the easterly direction.

While the topography of the Upper site has basically remained the same as described in the 2011 FEIS, the topography of the Lower site has changed due to site grading work that started in 2015, after the initial SMP (2014/SMA-27) was approved. The topographic map of the proposed site is depicted in Figures 3.1.1.2 and 3.1.1.3, for the current topographies of the Upper and the Lower portions of the project site, respectively.

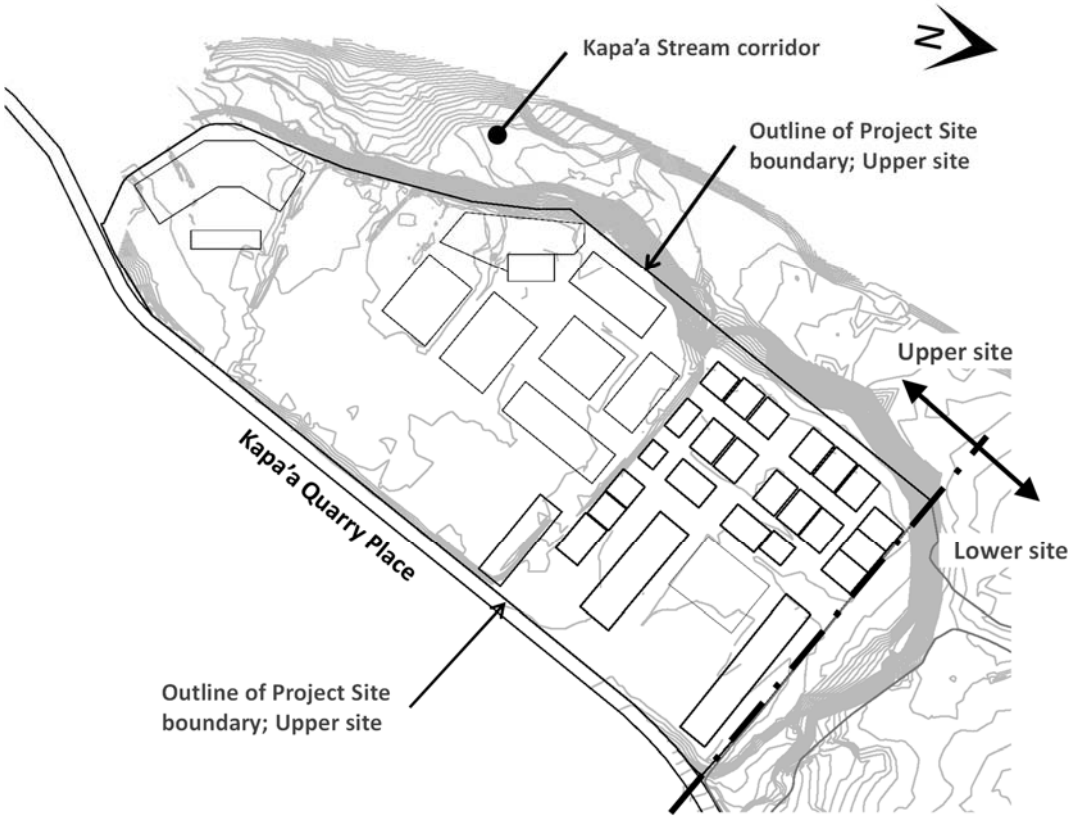


Figure 3.1.1.2 Current topography of the Upper site

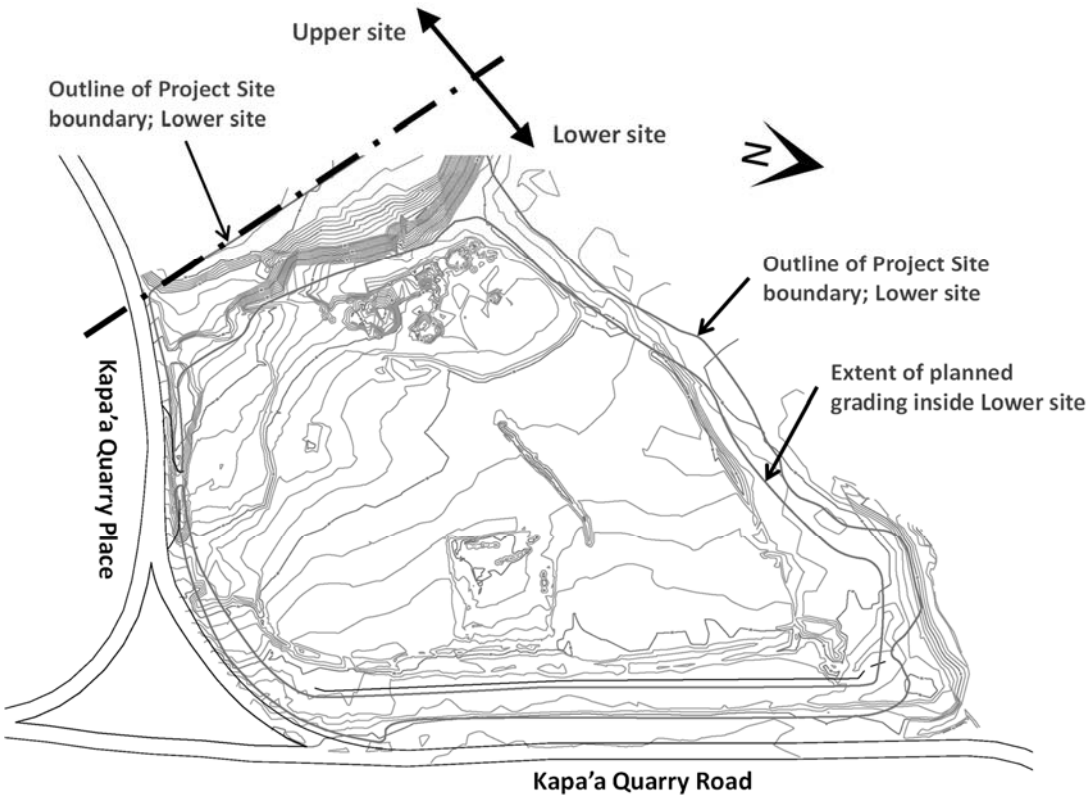


Figure 3.1.1.3 Current topography of the Lower site (note the image shows the last topographic survey conducted in 2017)

3.1.2 Soils

Section 3.1.2 of the 2011 FEIS described the soils found at the project site. The team concluded that soils have not changed since the 2011 FEIS was approved.

A description of the soils within the project area was obtained by using the web Soil Survey of the U.S. Natural Resources Conservation Service (NRCS). (http://websoilsurvey.nrcs.). The soil map obtained represents an area dominated by one or more major kinds of soil. A map unit is identified and named according to the taxonomic classification of the dominant soils. In the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all-natural phenomena. Soils with profiles that are almost alike make up a soil series. All the soils of a series have major horizons that are similar in composition, thickness, and arrangement. Soils of a given series can differ in the texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics.

The following soils are represented at the proposed site:

ALF—Alaeloa silty clay:

Parent material: Basic igneous rock

Properties and qualities; Slope: 15 to 35 percent; depth to restrictive feature > 80 inches; Well drained; Permeability moderately low to moderately high (0.06 to 0.20 in/hr.); depth to water table > 80 inches

KlaB—Kawaihapai stony clay loam:

Landform: Alluvial fans; Parent material: Basic igneous rock

Properties and qualities: Slope: 2 to 6 percent; Depth to restrictive feature > 80 inches; Well drained; Permeability moderately high to high (0.60 to 6.00 in/hr); depth to water table > 80 inches; Occasional flooding; no ponding.

Ph—Pearl Harbor clay

Landform: Coastal plains; Parent material: Alluvium

Properties and qualities: Slope: 0 to 2 percent; depth to restrictive feature > 80 inches; Poorly drained; Permeability Very low to moderately low (0.00 to 0.06 in/hr); depth to water table: About 18 to 48 inches; occasional flooding: frequent ponding.

QU—Quarry:

No description for generic quarry soil

rSY—Stony steep land:

Landform: Valleys; Parent material: Mass movement deposits

Properties and qualities; Slope: 40 to 70 percent; Depth to restrictive feature > 80 inches; Well drained; Permeability High (2.00 to 5.95 in/hr); Depth to water table > 80 inches; no flooding; no ponding.

Table 3.1.2.1 shows the areas of representative soils for the three contiguous land parcels (TMK 4-2-15:001 (portion of), 006 and 008), within the development boundary of the Upper portion of the project site (development TMK 4-2-15:001 (portion of), 006 and 008) and within the development boundary of the Lower portion of the project site (TMK 4-2-15:006). The intensive quarry and landfill operations in the area dating back to early 1950s have resulted in significant changes from the original soils at the site. Extensive deposits of quarry tailings and overburden materials, as well as residential solid wastes, have significantly changed the original soils at the site.

Table 3.1.2.1 Areas of representative soils for the three contiguous land parcels (source Table 3-1 of 2011 FEIS)

Map symbol	Map unit name	Three parcels of site TMK 4-2-15:001 (p.o.), 006 & 008		Upper portion of the site TMK 4-2-15:001 (p.o.) & 008		Lower portion of the site TMK 4-2-15:006	
		acres	% of total	acres	% of total	acres	% of total
AFL	Alaeloa silty clay	1.1	1.3%	0.0	0.0%	0.0	0.0%
KlaB	Kawaihapai stony clay loam	19.2	24.3%	4.4	16.2%	0.3	1.0%
Ph	Pearl Harbor clay	30.0	37.9%	0.2	0.6%	20.9	85.6%
QU	Quarry	11.4	14.4%	10.7	40.1%	0.6	2.4%
rSY	Stony steep land	17.5	22.1%	11.5	43.0%	2.7	11.0%
	sum	79.2	100.0%	26.8	100.0%	24.5	100.0%

3.2 Water Resources Current Environment

Section 3.2 of the 2011 FEIS described existing aquatic resources at the project site. Some of the basic parameters of the aquatic resources described in the 2011 FEIS must be updated based on information acquired or observations made subsequently of the 2011 FEIS.

The following sub-sections provide a description of the general conditions and characteristics of water resources found at the project site. Types of water resources investigated include surface water, wetlands, floodplains, watershed considerations and current stormwater management.

3.2.1 General Climate and Rainfall

Section 3.2.1 of the 2011 FEIS described the general climate and rainfall at the project site. While the general climate information is still valid a new rainfall estimate was used for this Draft SEIS. The site of the Kapa'a Light Industrial Park is located on the windward side of Oahu, approximately one mile from the ocean. Except for a few months in the winter, like most areas of 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 can dip into 60's °F.

Figure 3.2.1.1 shows the annual distribution of mean monthly precipitation values at the project site. The Figure is based on data obtained from the Rain Atlas of Hawaii (UHM, 2011). Figure 3.2.1.2 shows the rainfall map of Oahu, showing the annual precipitation rates. The map depicts the spatial distribution of mean annual precipitation on Oahu. The figure indicates mean annual precipitation for the Koolau Poko region ranging between 60 and 120 inches. 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 is due mostly to non-thermally induced trade wind showers or large weather systems over the entire island. Figure 3.2.1.2 indicates the mean annual rainfall at the project site is around 50 inches.

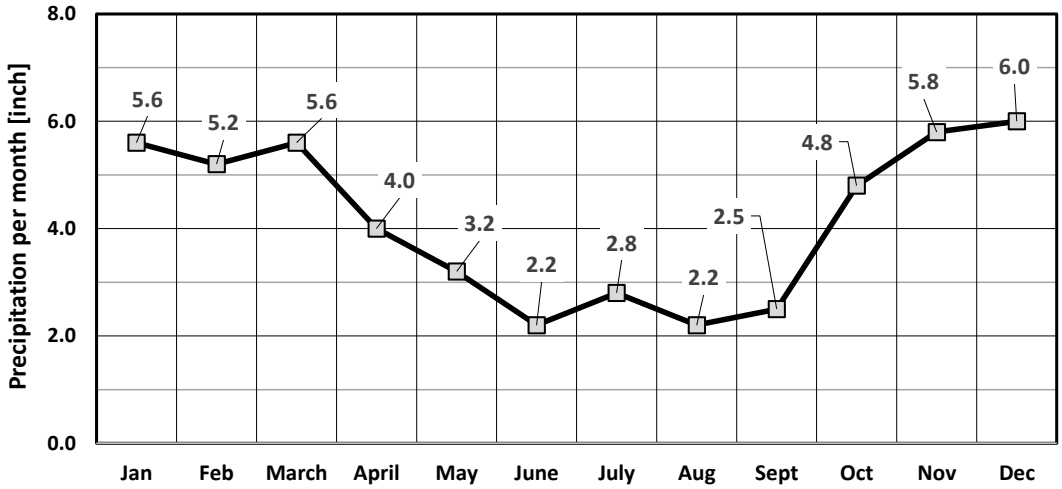


Figure 3.2.1.1: Annual rainfall at the project site

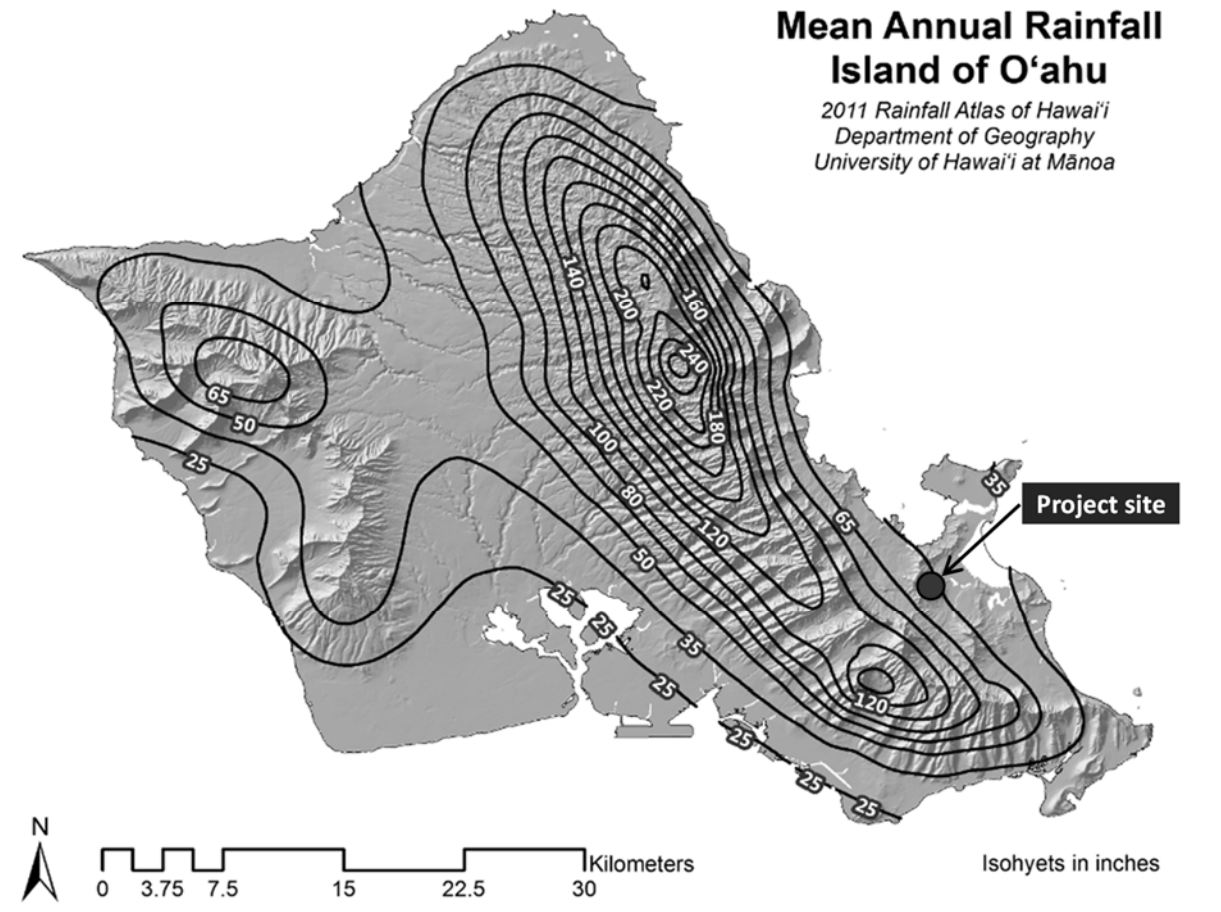


Figure 3.2.1.2: Annual distribution of mean monthly precipitation values

3.2.2 Surface Waters

Section 3.2.2 of the 2011 FEIS described four main surface water features on or adjacent to the project site.

There are four main surface water features on or adjacent to the project site. Except for drainage culvert discharging to a percolation field on the site, all the surface water features are outside the development boundary and are therefore not directly affected by the proposed action. The four identified main surface water features are as follows:

1.Kapa'a Stream: The relatively short Kapa'a Stream is the main drainage way for the Kapa'a Valley watershed. The stream drains into Kawainui Marsh and ultimately to the Pacific Ocean via Oneawa Canal and Kailua Beach. The stream's total length is approximately 1.9 miles, of which the stream flows through the property of the Applicants for 0.7 miles. As reported in the 2011 FIS the average base flow at the confluence of the stream with the Kawainui Marsh is 1.2 cbft/sec during the wet season (Nov. 1 to April 30) and .9 cbft/sec during the dry season (May 1 to Oct. 30). During the rainy

season and after heavy storms, the base flow increases significantly and during rare storm events, the stream level raises high enough to inundate the quarry road in the vicinity of the culvert under the quarry road. Kapa'a Stream is on the List of Impaired Waters of Hawaii. The list was prepared under provisions of the Clean Water Act §303(d). The Kapa'a Stream exceeds the dry season turbidity standard and nutrients; where turbidity, suspended solids and metals are stated as predominant pollutants. Figure 3.2.2.1 shows the lower reaches of the Kapa'a Stream with the only wider perennial stream sections (just upstream of the culvert under the quarry road through which the stream flows into the Kawainui Marsh). For a significant part of the year the stream is covered with Salvinia Molesta and has none, or small patches of free water surface. Recent observations have shown that the Kapa'a Stream is covered also with other vegetation, such as tall grasses which penetrate the free water surface.

Figure 3.2.2.1: Lower Reach of Kapa'a Stream corridor covered with salvinia molesta.

(source Figure 3.9 of the 2011 FEIS)

2. Wet land area: An area of about 10 acres within the parcel TMK 4-2-15:014 can be described wetland following the criteria of wetland soil, vegetation, and flooding conditions. The wetland area is adjacent to the Lower portion of the project site. At present, the wetland area has a dense cover with California grass and no apparent larger open water surfaces.

3. Drainage ditch along Kapa'a Quarry Road: There are two drainage ditches along a section of Kapa'a Quarry Road which is immediately adjacent and to the Eastern perimeter of the Lower site, one on each side of the quarry road. Only the mauka (e.g., on the mountainside) drainage ditch is considered at this point. The mauka drainage ditch is typically stagnant water, which originates from surface runoff and seepage of water from the Lower portion of the proposed site. For much of the year the ditch is completely covered with algae and/or water plants.

Figure 3.2.2.2 shows the drainage ditch on the mauka side of the quarry road around 2010, as described in the 2011 FEIS. In Figure 3.2.2.2 the drainage ditch is shown with a continuous cover of Salvinia Molesta (green water plants floating on the water surface). At that times it was observed that during severe stormwater events the drainage ditch would convey storm water runoff to the Kapa'a Stream and subsequently into the Kawainui Marsh.

Figure 3.2.2.2: Existing drainage canal alongside Kapa'a Quarry Road

The photo shows the mauka (mountainside) drainage ditch along the Kapa'a Quarry Road around 2010.

Figure 3.2.2.3 (a) through (d) show the drainage ditch around 2008. Figure (a) indicates the locations and views of the photos in Figures 3.2.2.3 (b) though (d). Free surfaces are noticeable on drainage ditches on both sides of the quarry road.

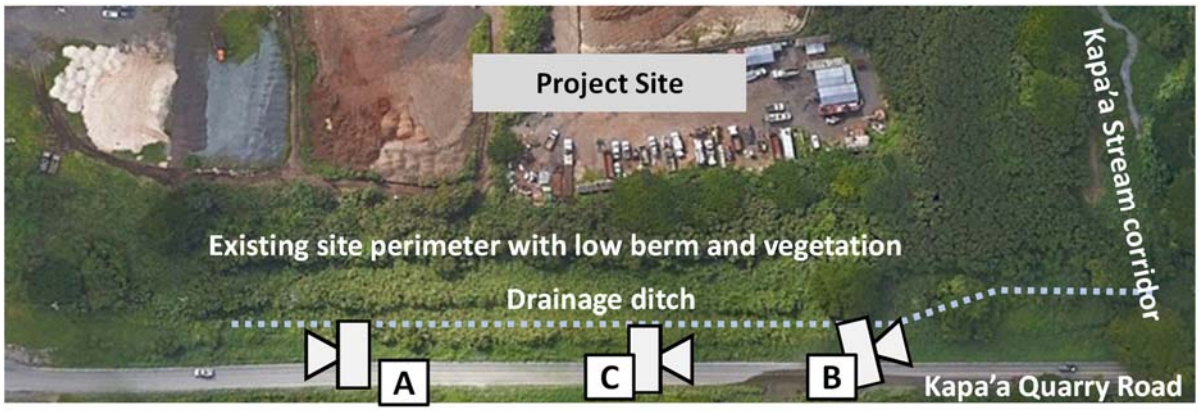


Figure 3.2.2.3 (a): Locations and orientations of views (A) through (C) in Figure 3.2.2.3 (a) through (c)

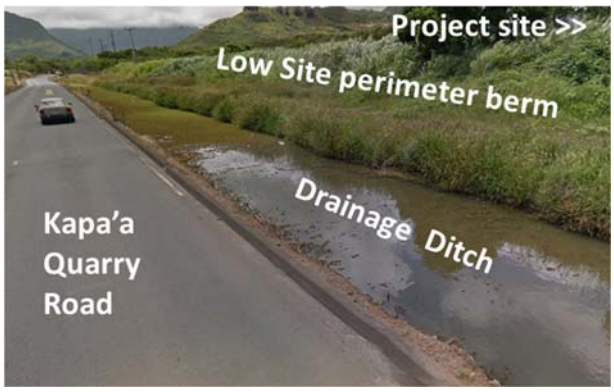


Figure 3.2.2.3 (b): View A of the drainage ditch on the mauka side of the quarry road. Photo describes condition in the year around 2008.

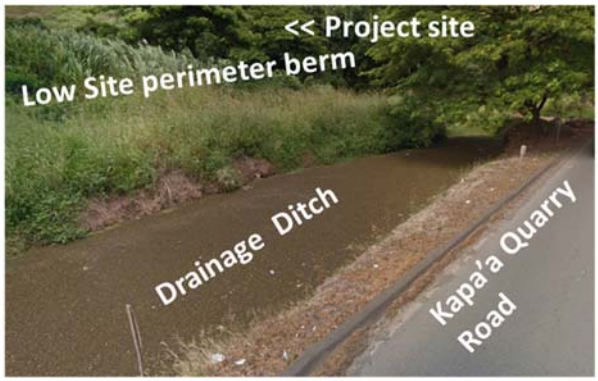


Figure 3.2.2.3 (c): View B of the drainage ditch on the mauka side of the quarry road. Photo describes condition in the year around 2008.

Figure 3.2.2.3 (d): View A of the drainage ditches on both side of the quarry road. The project site is to the left of the road. Photo describes condition in the year around 2008.

In the years following the 2011 FEIS, the stream bed conditions of the drainage ditch changed significantly. Figures 3.2.2.4 (b) through (d) show three views of the conditions of the drainage ditch in early 2020. At present the mauka drainage ditch can hardly be distinguished from the surrounding dense vegetation. A site visit in early 2020 revealed that the drainage ditch basically has ceased to exist with soil accumulated and dense vegetation growing in the area that was once a free surface.

The changed conditions of the drainage ditch with a dense vegetation cover and a former stream bed filled with soil have significant effects on the drainage capability of the ditch. It has been observed that during strong storm events water accumulates on the quarry road, creating traffic hazards.

Comments received regarding the DSEIS addressed several aspects of the drainage ditch. Some comments called for a redevelopment of the areas of the drainage ditch. Appendix J describes changes of the drainage ditch over a period of approximately 20 years, and provides illustrations of what changes have happened to the bed. Appendix J provides a proposed modification of the area around the drainage ditch. The proposed changes would improve the storm water situation, improve traffic safety on the adjacent Kapa'a Quarry Road, and provide room for the installation of a pathway for pedestrians and bicyclists.

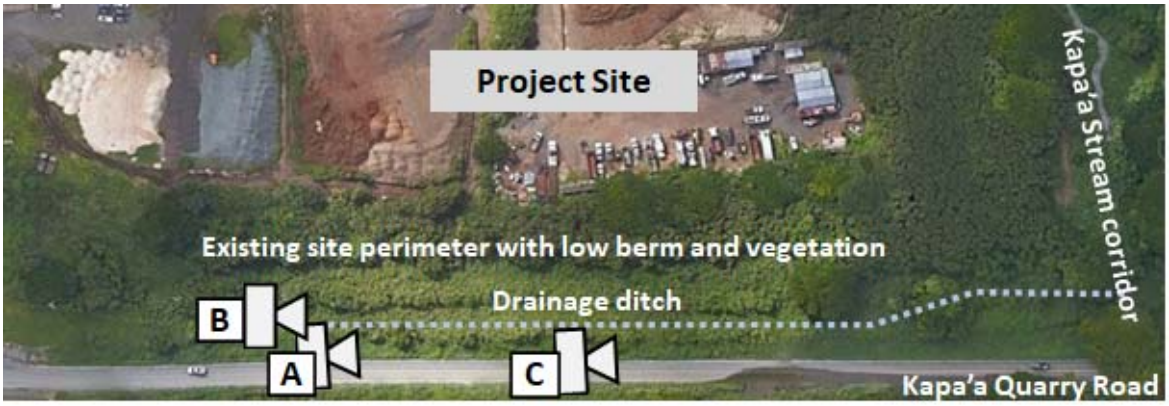


Figure 3.2.2.4 (a): Locations and orientations of views (A) through (C) in Figure 3.2.2.3 (a) through (c)

Figure 3.2.2.4 (b): View A of the drainage ditch on the mauka side of the quarry road. Photo describes condition early in 2020.

Figure 3.2.2.4 (c): View B of the drainage ditch on the mauka side of the quarry road. Photo describes condition early in 2020.

<<< Figure 3.2.2.4 (d): View A of the drainage ditches on both side of the quarry road. The project site is to the left of the road. Photo describes condition early in 2020.

4. Vegetated swale along Kapa'a Quarry Place with discharge on to the Lower site: The drainage flow in the vegetated swale along the Kapa'a Quarry Place roadway enters the Lower portion of the project site through a culvert under the roadway. At the time when the 2011 FEIS was approved, the storm water flowing through the culvert was released into a vegetated ditch within the Lower site at the foot of the sloped area that separates the Lower and the Upper sites. The storm water typically infiltrated

into the landfill body during average rain events. During heavy storm events the storm water would flow through the Lower site, along the sloped are that separated the Lower and Upper sites and would enter the Kapa'a Stream corridor. In 2019 a drainpipe was installed by the Applicants that captures the storm water discharge from the culvert exist and conveys it to the Kapa'a Stream corridor, thus no infiltration occurs in the Lower site.

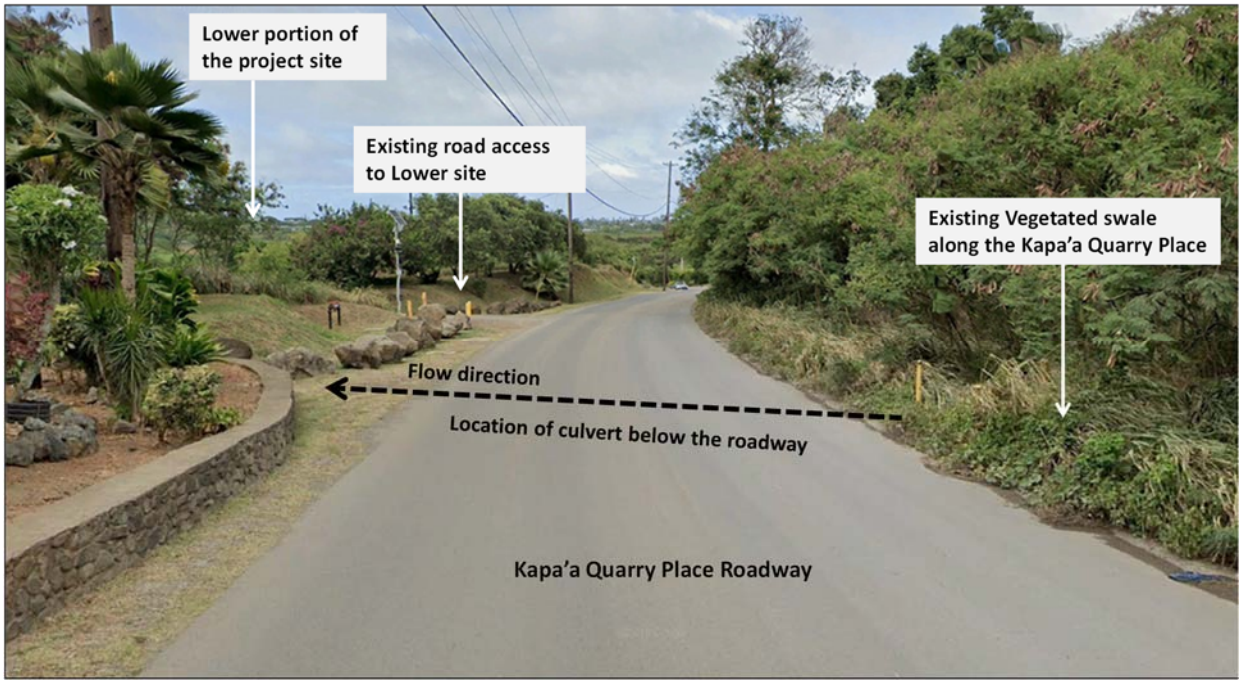


Figure 3.2.2.5: View of Kapa'a Quarry Road looking East ; at the location where the storm water flowing in the vegetated swale enters a culvert below the Kapa'a Quarry Place roadway

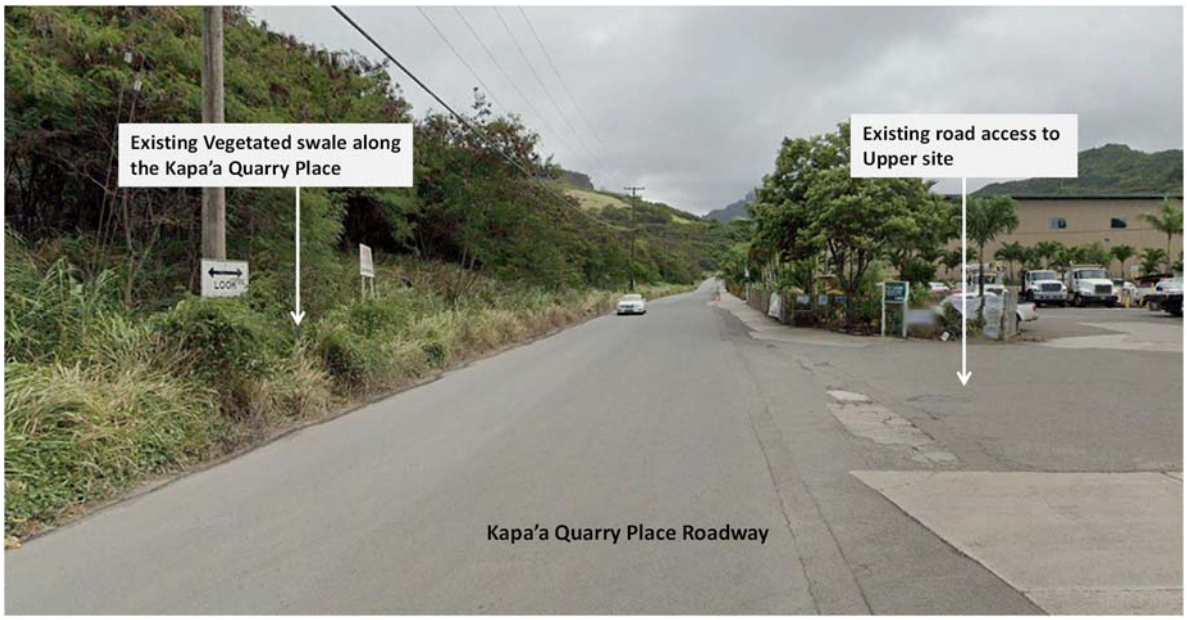


Figure 3.2.2.6: View of Kapa'a Quarry Road looking West; at the location of the existing road access to the Upper site from the Kapa'a Quarry Place roadway

3.2.3 Kapa'a Watershed Considerations

The 2011 FEIS described consideration of the Kapa'a Stream watershed in respect to the project site.

The 2011 FEIS described a watershed model published by the Hawaii Department of Health (DoH) and the water quality consideration that were assessed in the 2011 FEIS based on the DoH model. The conditions basically have not changed since the 2011 FEIS. The only change is that the drainage of the Lower portion of the site, subbasin "K" in the DoH model, might somewhat deviate from the DoH discharge model.

The Kapa`a watershed is an area of approximately 850 acres on the windward side of the Island of Oahu. Figure 3.2.3.1 illustrates the location of the Kapa'a watershed. Figure 3.2.3.1 shows Oahu divided into six districts. Based on early Hawaiian land division and governance, the islands of Hawaii are divided into *moku*, or separate districts. Mokus are further subdivided into smaller sections called *ahupua'a,* which are fundamental unit of community subsistence and political organization. An ahupua'a basically indicates a section of land running from the mountain (mauka) into the sea (makai). With resources extending from the mountains to the ocean, an ahupua'a provided the community with the life's essentials such as wood for canoes and housing, food grown in irrigated fields in the valley and seafood obtained from the near shore waters. Streams formed the center of many ahupua'a. Streams are the most important and protected resource of the ahupua'a, revered as sustainers of life and sacred to the land. The Kapa'a watershed is in the Koolau Poko district.

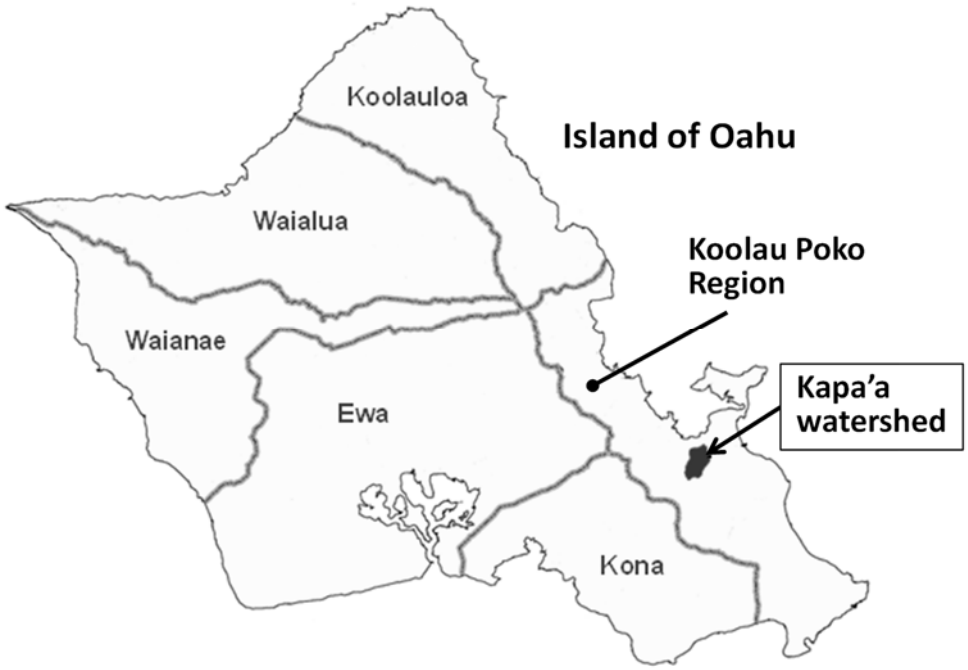


Figure 3.2.3.1 Location of Kapa'a watershed on the windward side of the Island of Oahu

(Source 2011 FEIS Figure 3-11)

The Kapa'a Stream is the main drainage pathway for the Kapa'a watershed and drains directly to Kawainui Marsh, while infiltrated water from the Kapa'a watershed drains indirectly to the marsh. The Kawainui Marsh, with a total area of about 1,000 acres, is the largest freshwater wetland in the State,

habitat for four of Hawaii's endemic and endangered water birds, and a place sacred to Native Hawaiians. Kawainui, with its adjacent Hamakua Marsh, is a designated "Wetland of International Importance".

The Kapa'a Stream has a total length of approximately 1.9 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 pools until the stream enters a perennial stream section not far from where it flows into the Kawainui Marsh.

In 2007 the Hawaii State Department of Health (DoH) published an evaluation of the water quality in the Kapa'a Stream (DOH, 2007). The evaluation involved a 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 3.2.3.2 shows the extent of the Kapa'a watershed, and the location and size of the 13 sub-basins used in the DoH model.

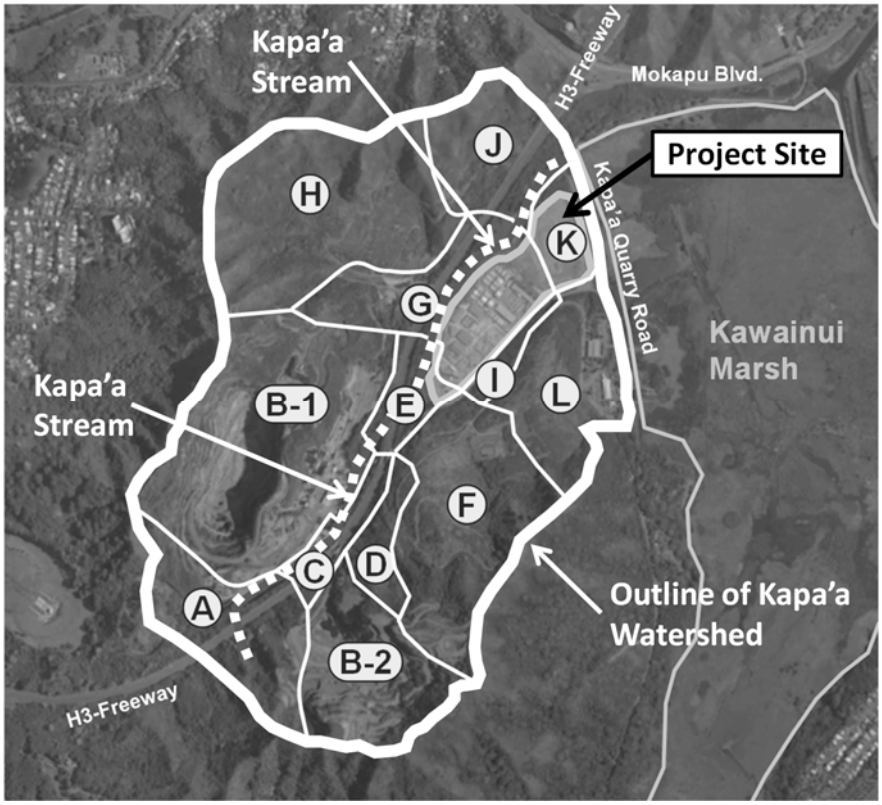


Figure 3.2.3.2 : Kapa'a Watershed with sub-basin definition for DoH 2008 hydrological model

(source 2011 FEIS Figure 3-12)

Ⓧ **Kapa'a Sub-basin of watershed area in DOH 2007 study**

Table 3.2.3.1 indicates the 13 sub-basins used in the DoH hydraulic model. In the DoH model all sub-basins, except for sub-basin L, drain into the Kapa'a Stream, where the stream discharges into the Kawainui Marsh through a culvert under the Kapa'a Quarry Road. 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 Stream and the different direct outlets into the Kawainui Marsh, underground flow contributes to the total drainage of the watershed to the marsh.

Table 3.2.3.1 describes the subbasins in the DoH watershed model. Figure 3.2.3.2 shows the flow chart of the subbasins discharging into the Kapa'a Stream.

Table 3.2.3.1: Description of sub-basins used in DoH Kapa'a watershed model (source 2011 FEIS Table 3-2)

Sub-basin ID	**Area** (acre)	**Avg. Impervious-ness** (%)	**Description of Sub-basin**
A	96	3%	Sub-basin A is the headwater tributary drainage area for Kapa'a Stream.
B (I) and B(II)	218	9%	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 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	13%	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	3%	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	25%	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	2%	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	41%	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 G is divided into an eastern and western part. The western part drains through several culverts under the freeway. The eastern part includes a part of the proposed Kapa'a Light Industrial Park.

Table 3.2.3.1: Description of sub-basins used in DoH Kapa'a watershed model (source 2011 FEIS Table 3-2)

Sub-basin ID	**Area** (acre)	**Avg. Impervious-ness** (%)	**Description of Sub-basin**
H	126	1%	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'a 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	23%	Sub-basin I is a small area that drains into the Kapa'a Stream through a pipe that passes under the Kapa'a Quarry Access Road and terminates in Sub-basin K.
J	59	5%	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	2%	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	33%	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	**825**	**10%**	Total area of Kapa'a watershed considered in the model; with 763 acres of sub-basins A through K draining into the Kapa'a Stream through Kapa'a Stream and 62 acres draining through sub-basin L into the Kawainui Marsh.

The 2011 FEIS described an assessment of the DoH data for the water quality implications in the Kapa'a Stream. The sub-basins in the DoH model were further subdivided into areas of different land uses, such as forest/brush, industrial, roads, highway, quarry, and landfill. The area with different land uses within the sub-basins had their individual impervious factors, such as roads, highways and industrial, with respective imperviousness factors of 0.4 to 0.75, 0.57 and 0.80.

Furthermore, each sub-basin had its own dry and wet season and annual precipitation rate, with the Lower stretches of the valley having somewhat Lower precipitation rates than the Upper end of the valley, which had higher elevations.

Of the 825 acres of the Kapa'a watershed considered in the DoH model, 94 acres of land within the sub-basins have imperviousness greater than 40%, and about 20 acres are connected to existing drainage systems at the project site. Table 3.2.3.1 lists the average imperviousness of the entire watershed and the individual sub-basins, which were calculated as the weighted mean of the areas with different land uses. The model suggested that the project site, which is represented by portions of sub-basins E, G and K, has a compound imperviousness of 42%

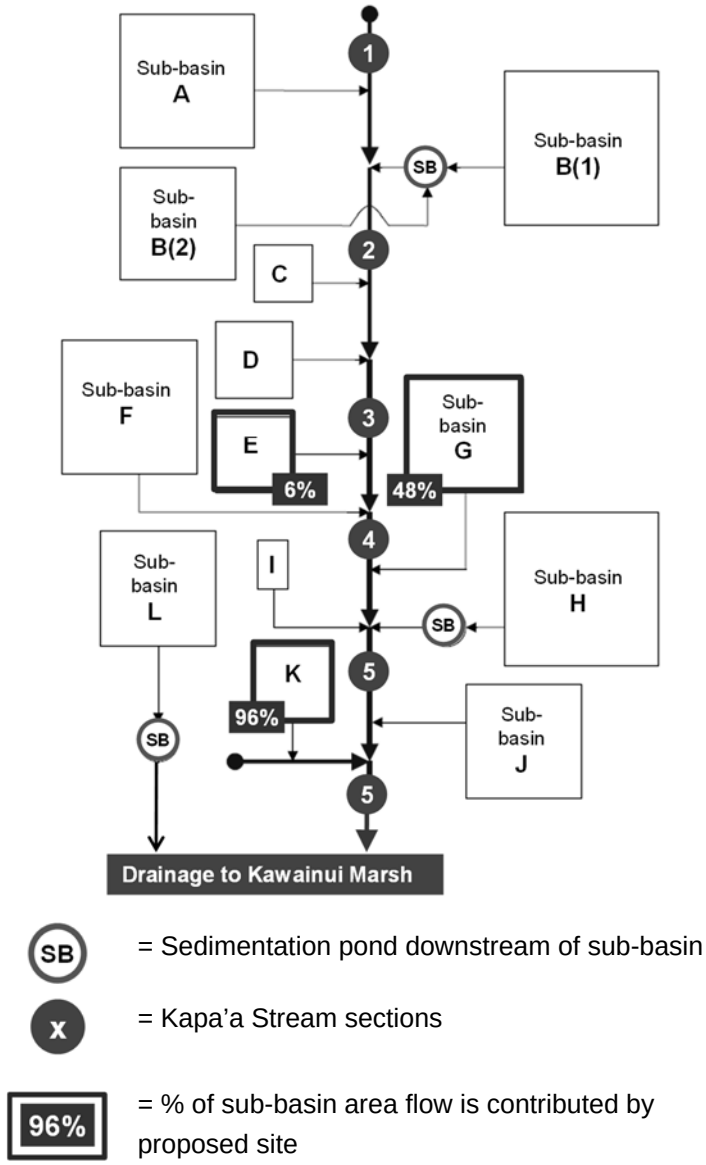


Figure 3.2.3.3: Flow chart of the DoH subbasins discharging into the Kapa'a Stream

The subbasins E and G represent the Upper site and the subbasin K the Lower site.

The Lower site, subbasin K in the DoH model, was predicted to it dischrage into the existing drainage ditch along the Kapa'a Quarry Road. The drainage ditch would then discharge into the Lower reaches of the Kapa'a Stream, just upstream of the culvert under the quarry raod, through which the Kapa'a Stream dischrages into the Kawainui marsh.

The DoH analysis considered a wet season baseline scenario and a 2% flow event scenario, with the resulting flow rates and pollutant load levels in the Kapa'a Stream. The baseline case referred to drainage conditions, where the flow rate and resulting pollutant load level in the stream were caused by

the release of groundwater from the watershed. The 2% event refers to the highest 2% of the average rainfall events in the dry or wet season. The 2% data suggests water quality effects due to high flow rates and resulting high loads of pollutants discharged into the Kapa'a Stream.

Using wet season flow rates and pollutant loads in the Kapa'a Stream provides a conservative representation of the contribution of the proposed project site to the overall water quality of the Kapa'a Stream. The amount of total suspended solids (TSS) is used to describe the water quality of the stream in different scenarios. The resulting flow rates and pollutant load rates for the wet season baseline and 2% event were presented for the existing conditions at the proposed site. Twelve of the 13 sub-basins contributed to the water quality of the Kapa'a Stream; Sub-basin L did not drain into the Kapa'a Stream but drained directly into the Kawainui Marsh through culverts under the Kapa'a Quarry Road.

Figure 3.2.3.3 illustrates the estimated average flow rates and Total Suspended Solids (TSS) loads for the wet season as percentages of total flow and loading. Under the baseline conditions, Sub-basins B (sum of B(I) and B(II)) combined are the largest contributors 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, though sub-basin A contributes less TSS than the other three sub-basins 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 4-2-015:013 and 014 (the Upper site) and the sub-basin K, which is the Lower site in TMK 4-2-15:014.

Figure 3.2.3.4 illustrates the 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 because 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 is greatly reduced, respectively. Sub-basin D is by far the biggest contributor regarding TSS loading, followed by Sub-basin F. The proposed site, in the present condition, contributes more water flow than TSS. This is partly since in the 2%-event, the industrial part of sub-basin G discharges more flow than TSS. 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 a main contributor of TSS loading to the Kapa'a Stream from land that represents the proposed project site.

The assessments in Figures 3.2.3.4 and 3.2.3.5 represent the conditions of the project site at the time of the 2011 FEIS.

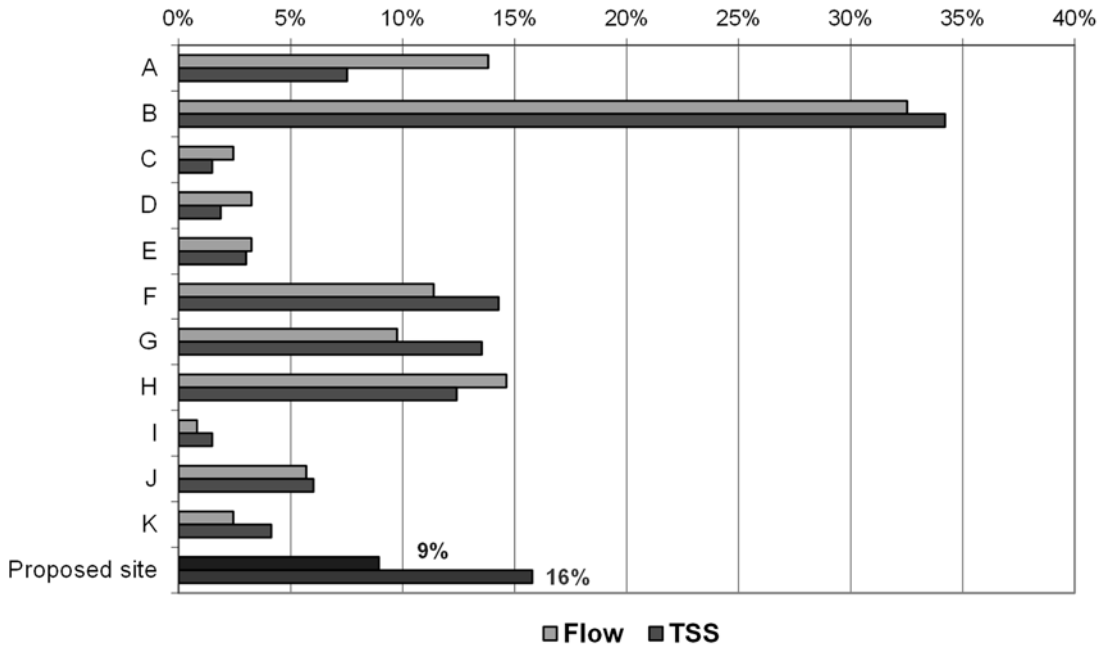


Figure 3.2.3.4: Wet Season Base flow and Pollutant Load (source data from 2011FEIS)

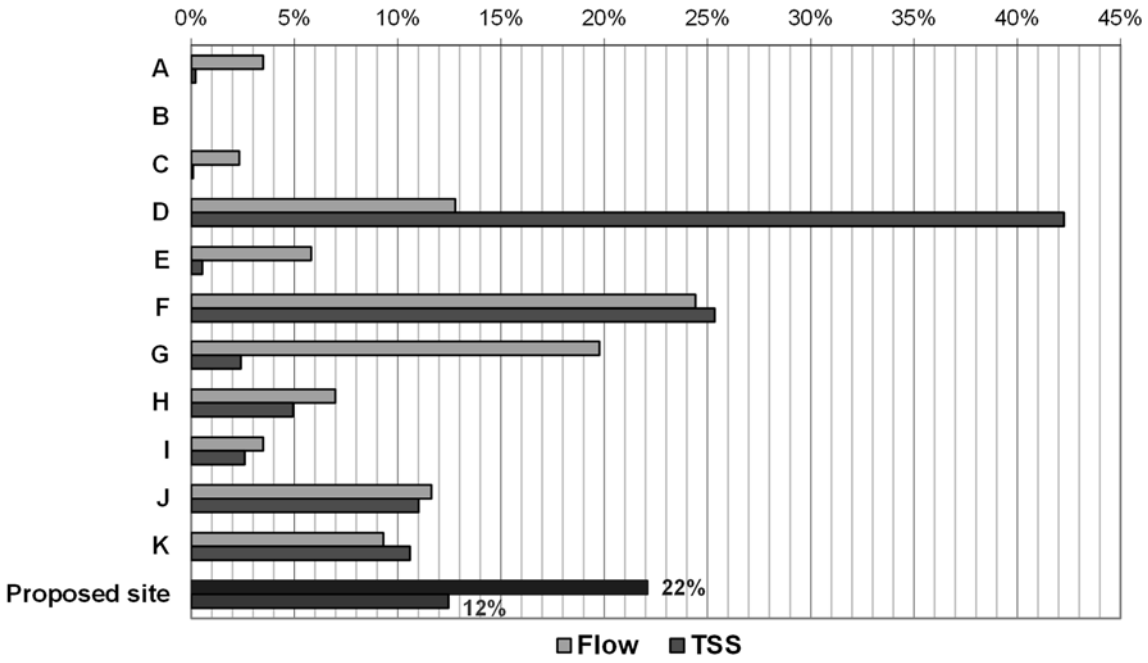


Figure 3.2.3.5: Wet Season 2% Event and Pollutant Load (source data from 2011FEIS)

3.2.4 Existing Drainage System at Project Site

Section 3.2.4 describes the existing drainage system at the project site of the 2011 FEIS, and the significant changes that have been made in the years since the 2011 FEIS was approved.

Figure 3.2.4.1 illustrates the site drainage as described in the 2011 FEIS. Most of the onsite storm runoff flowed to the Kapa'a Stream corridor by means of surface flow and was discharged from the site either through one existing detention pond or through a series of drain outlets. This site drainage also included runoff from off-site sources (Subbasin I depicted in Figure 3.2.3.2 and described in Table Figure 3.2.3.1) which entered the Lower portion of the site through an existing 30-inch drainage culvert under the Kapa'a Quarry Place roadway (refer to Figure 3.2.2.5 which describes the location of the drainage culvert).

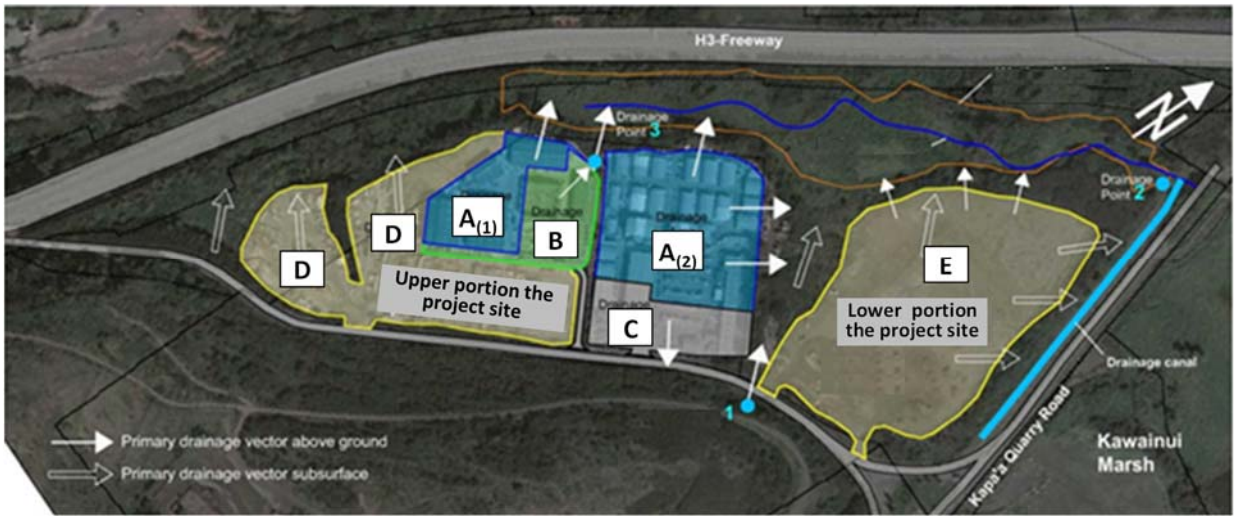


Figure 3.2.4.1: Project site drainage as described in the 2011 FEIS

Figure 3.2.4.1 distinguishes between five types of drainage areas that were present at the time the 2011 FEIS was approved. Four types of drainage areas were described in the 2011 FEIS and one drainage area was added:

<u>Drainage Area A</u> was the of the drainage of the Upper portion of the project site that drained to the Kapa'a Stream corridor either through drain inlet structures or by simple site runoff over the edge of the pavement into the pervious and vegetated site perimeter. The total size of drainage area A, composed of two separate areas, was 9.4 acres. Drainage area A(2) represent the "older" portion of the existing warehouses, with warehouses constructed about 30 years. Drainage area A (1) includes warehouse structures which were built between 15 and 10 years ago. The entire drainage Area had an impervious surface, either roof area of the warehouses or concrete pavement between the warehouses. Therefore, the entire area contributed to the runoff volume, including the runoff from the warehouse roof surfaces.

Drainage Area B drained through an existing small detention pond. The detention pond's main function was flood control and primary treatment before discharge to the stream corridor. The outfall of the small detention pond was an armored spillway to curb erosion of the downward slope to the stream corridor. The entire 2.5-acre Drainage Area B contributed to the runoff volume, including the runoff from the warehouse roof surfaces. The stormwater collected by sheet flow flowed towards shallow swales formed within the concrete pavement. A portion of the drainage flow was conveyed to an existing 400-feet vegetated swale, which discharged into the small detention pond.

Drainage Area C represented a 2.8-acre part of the Upper portion of the project site, which drained into the existing drainage system of the quarry access road. The entire area had an impervious surface, either roof area of the warehouses or concrete pavement between the warehouses. Therefore, the entire area contributed to the runoff volume. The stormwater collected by sheet flow towards shallow swales which were formed within the concrete pavement surfaces and which convey the stormwater to the drainage of the quarry access road. The main drainage of the Kapa'a Quarry Place roadway was a vegetated swale along the Southern side of the road. The runoff within the drainage ditch flowed towards the east towards a drain intake structure of an existing 30"-culvert under the quarry access road. The culvert conveyed the entire runoff from the vegetated swale to Lower portion of the project site.

Drainage Area D represented graded and partially pervious areas within the Upper site which had no existing drainage infrastructure, only surface runoff to adjacent areas. Percolation tests conducted after the 2011 FEIS indicated poor percolation rates in the soil layers an 18-inch top layer of gravel. Consequently, only a smaller portion of precipitation infiltrated during heavy rain events until the top layer became saturated and the residual precipitation left the site as surface runoff. Runoff left the site via the North and West and flowed to the Kapa'a Stream corridor. Runoff left the site over the Southern perimeter, flowed towards the vegetated swale along the Kapa'a Quarry Place and from there towards the Lower portion of the site.

Drainage Area E was the drainage from the Lower portion of the project site. The same runoff mechanisms were observed as for drainage area D, with portions of the precipitation infiltrating into the topsoil and the remainder leaving the site as surface runoff. The runoff left the via the Eastern and Northern site perimeter, towards the drainage ditch along the Kapa'a Quarry Road and toward the Kapa'a Stream corridor, respectively.

Since the 2011 FEIS was approved, some of the storm water drainage approaches have significantly changed for Drainage areas, where the storm water impacts have been significantly reduced through structural BMPs. The improved storm water management measures have either been installed or are planned for installation.

Improvement for the drainage areas A through D is described as follows:

Both drainage area A(1) and A(2) have been fitted with improved drain inlets.

In drainage area B, a manufactured treatment device (MTD) has been installed as part of a larger storm water management system. The MTD filters the portion of the storm water runoff that is defined as the water quality (WQ) relevant base flow.

Drainage area C has basically the same storm water management system as before.

The storm water management in Drainage area D, which was previously graded and not paved, has been divided into three areas with different storm water treatment and management methods.

- A 4-acre portion of drainage area D, where five new warehouses are being constructed, will have an impervious cover and a new drainage system comprised of an underground detention vault, one MTD to treat the WQ relevant flow and a new armored outfall.
- A 3.5-acre portion of drainage area D has two warehouses which were completed in 2015. The areas were paved, and the drainage runs towards an existing detention and infiltration basin, which is located to the West of the largest warehouse (Building 50). The basin functions as a low impact development (LID) storm water management system.
- A 2.5-acre portion of drainage area D is currently under development. Drainage will be through the existing detention and infiltration basin and a vegetated buffer strip.

The drainage area E remains in the same condition as was described above. The area is under development and will receive a comprehensive storm water management system, which will include multiple underground detention vaults, vegetated buffer strips, MTDs and armored outfalls to the Kapa'a Stream corridor.

For the Upper portion of the site, with its diverse storm water treatment systems, NPDES Non exposure exemptions certifications were obtained. This means that within the warehouse development, effective source controls have been implemented and are maintained which lower the storm water pollution through proactive procedures. The storm water pollution prevention is being actively managed by Kapa'a management.

In Section 6.2 of this Draft SEIS, the storm water management approach for the entire site is described in detail. <u>An updated description of the storm water treatment and management system is described in Appendix C. The updates of storm water systems were requested by the Accepting Agency to lower the storm water impacts by adding one drainage area in the Lower site, and increase detention vault capacity.</u>

3.2.5 Wetlands

Section 3.2.5 of the 2011 FEIS described the wetland areas in the vicinity of the site. No changes have occurred in respect to the location and sizes of these wetlands.

Wetlands are defined by the United States Army Corps of Engineers (USACoE) and the United States Environmental Protection Agency (EPA) 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 vegetation 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 additional 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 Kawainui Marsh, the stream's flow conditions, and water quality directly affect the marsh. Figure 3.2.51 shows the vicinity map to the proposed site the adjacent wetland areas which was presented in the 2011 FEIS. Figure 3.2.5.1 illustrates that the project site will be located entirely outside of wetland areas.

While the Kawainui marsh is listed in the National Wetlands Inventory, the wetland inside the Kapa'a Stream corridor is not listed. The National Wetlands Inventory is maintained by the US Fish and Wildlife Service (USFWS), which is the principal US Federal agency tasked with providing information to the public on the status and trends of our Nation's wetlands. The US FWS National Wetlands Inventory (NWI) is a publicly available resource that provides detailed information on the abundance, characteristics, and distribution of US wetlands.

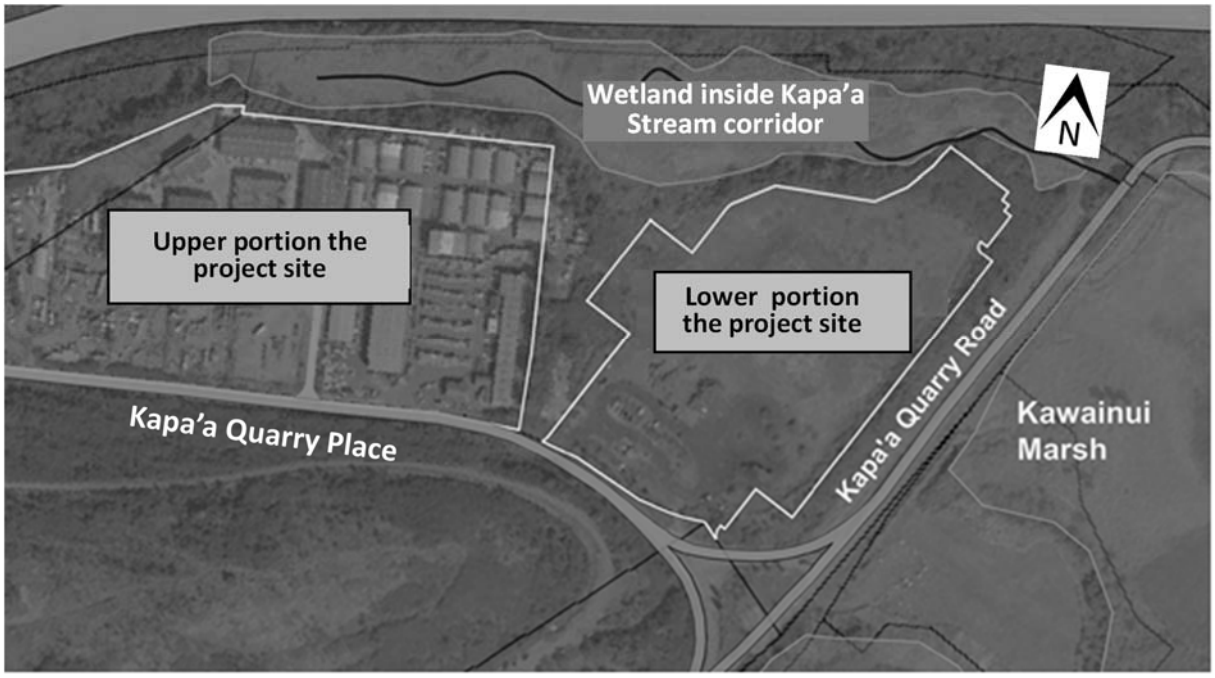


Figure 3.2.5.1: Wetland areas in vicinity to the proposed site (source Figure 3-20 of the 2011 FEIS)

3.2.6 Flood and Tsunami Hazards

Section 3.2.6 of the 2011 FEIS described the flood and tsunami related impacts to the project site. No changes have occurred since the 2011 FEIS was approved.

The project site is located outside of any potential tsunami inundation area. Figure 3.2.6.1 shows a portion of the Flood Insurance Rate Maps (FIRM) for the vicinity of the proposed project site. FIRM maps

are used to determine the vulnerability of land to flooding. 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 events. During such periods of flooding, the Kapa'a Quarry road was be closed for traffic.

Most of the land within the proposed site is in Flood Zone D, which indicates areas with possible but undetermined flood hazards. Figure 3.2.6.1 indicates that some low-lying areas of the Lower portion of the project site adjacent to the Kapa'a Quarry Road are located 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. 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 less than the 0.2-percent-annual-chance or 500-year flood.

Land inside the property and inside flood zones A and X is limited to the existing drainage channel adjacent to the Kapa'a Quarry Road and to the mouth and Lower sections of the Kapa'a Stream. No portion of the proposed development footprint is within flood zones A and X.

It must be noted that the proposed grading will significantly increase the elevation of the Lower portion of the site in such a way that no flood threat will remain.

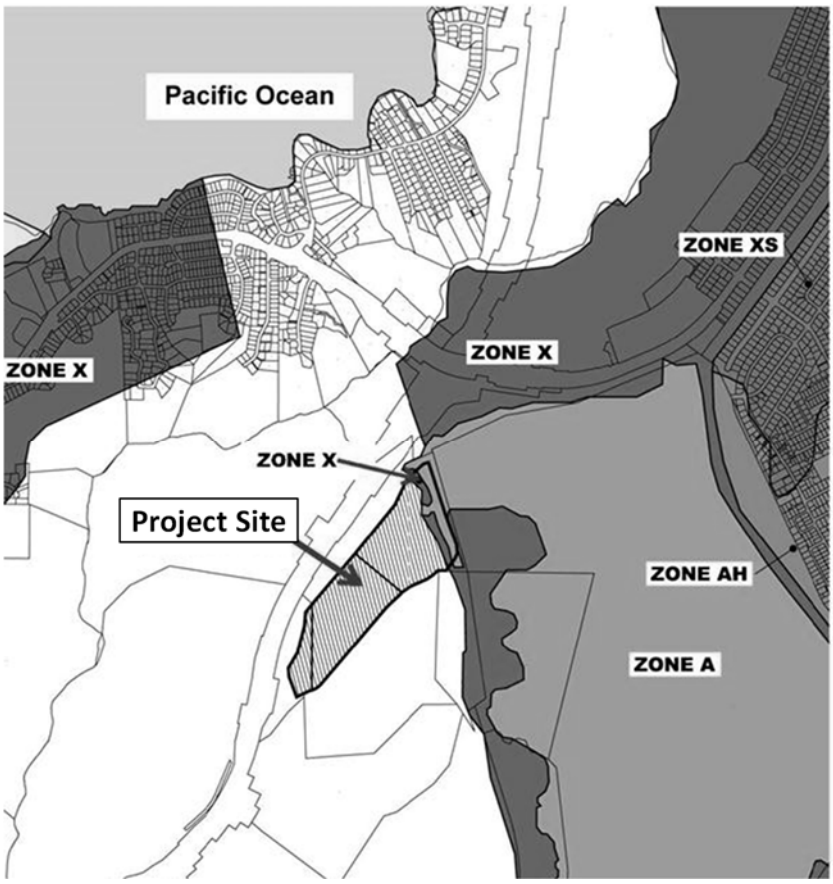


Figure 3.2.6.1: Map of flood zones in the vicinity of the proposed site

(Source Figure 3-21 of the 2011 FEIS)

Description of Flood zones:

- Zone A -100 Year flood zone; no base flood elevation determined
- Zone AH -100 Year flood zone; with 1 to 3 feet of ponding
- Zone D - Possible but undetermined flood hazards
- Zone X - Beyond 500 years flood plain
- Zone XS -500 years flood plain

Figure 3.2.6.2 shows a portion of the current tsunami evacuation map for the vicinity of the project site. The O'ahu Tsunami Evacuation Map is published by the City and County of Honolulu and defines the Evacuation Zone (TEZ) or an Extreme Tsunami Evacuation Zone (XTEZ), and provides guidelines for safety actions to take. Figure 3.2.6.2 illustrates that a portion of the project site is inside the XTEZ. No specific evacuation guidelines have been distributed to the current tenants, which occupy only the Upper site and are therefore outside the XTEZ.

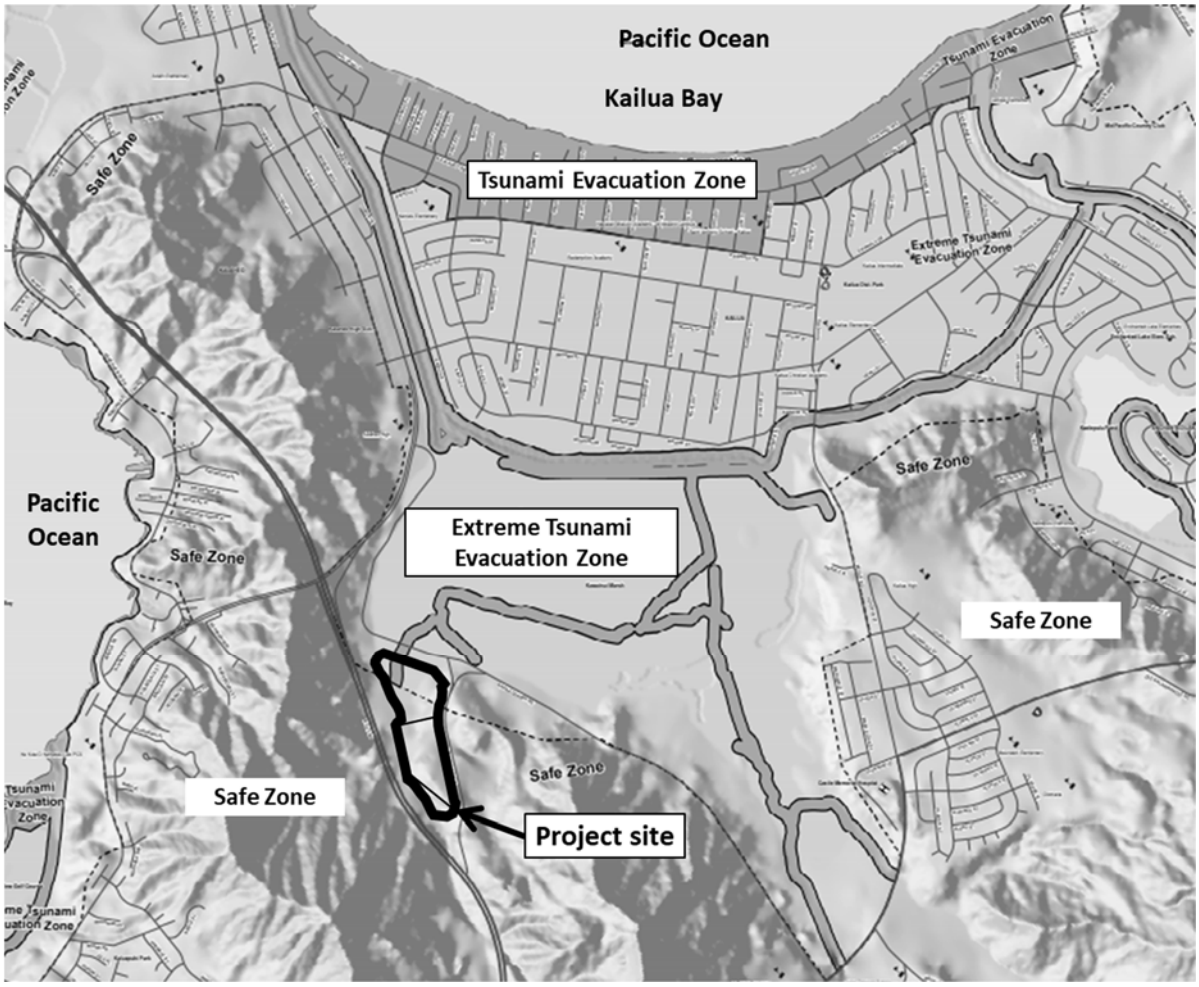


Figure 3.2.6.2: Portion of project site inside extreme tsunami evacuation zone (source: https://cchnl.maps.arcgis.com/apps/webappviewer/index.html?id=39a9e07068a14d01a85b437adcf50beb annotated) (this figure was added to the DESIS document)

3.3 Biological Resources Current Environment

Section 3.3 of the 2011 FEIS described the biological resource of the existing environment on and adjacent to the project site. Only small changes have occurred in the biological resource environment since the 2011 FEIS was approved.

The core of the proposed project site consists of developed land, which comprises approximately 55 percent or 43 acres of the total 79-acre property (combined TMK 4-2-1:013 and 014). The project site has basically not changed since the 2011 FEIS. Presently, only the Upper portion of the proposed site is developed with warehouse structures and base yards. There are basically no landscaped areas in the interior, save a few narrow strips with trees around warehouses. There are some landscaped areas at the perimeter of the Upper portion of the project site.

The Lower portion of the site is unpaved land covered with a pervious gravel surface and the land is used for a variety of low impact activities, such as storage of new vehicles, on areas that are not actively graded. The graded part of the Lower portion of the site does not have any permanent or landscaped vegetation. Sections of the Kapa'a Quarry Road and the Kapa'a Quarry Place are within the property and contribute about 3 acres of impervious area that is outside the project site.

Most of the vegetation of the properties is within the undeveloped land surrounding the site and within the adjacent Kapa'a Stream corridor. These lands include natural areas and bodies of water, such as forested areas, stream beds and wetland areas. The forested areas can be further divided into forested buffers and some mature, contiguous sections of forest in the Kapa'a Stream corridor. Forested buffers occur along the site perimeter and adjacent roads. Aquatic resources on the property consist of the Kapa'a Stream, approximately 10 acres of wetland area and a drainage ditch along the quarry road. The vegetated and undeveloped land provides some habitat for a population of urbanized birds and small mammals.

3.3.1 Vegetation

<u>Landscaped areas</u>

The current landscaped area is less than two acre of the developed area. The landscaped areas are located along the site perimeter facing the Kapa'a Quarry Place roadway and the existing detention and infiltration basin. The landscaped areas include turf lawns, flower beds, individual shrubs, hedges, groundcover areas and landscaped trees. Presently, maintenance crews mow and trim the lawn throughout the growing season, apply a pre- and post-emergent herbicide, and fertilize. Leaves are raked and or blown. Flowers are sprayed, fertilized, and pruned. Beds are weeded, planted, and mulched. Where needed the landscaped areas are irrigated with permanent sprinklers. The landscaped vegetated areas provide aesthetic beauty to the existing development, as well as habitat to wildlife occurring in the area.

<u>Natural Vegetation Areas</u>

Areas of natural vegetation areas are situated around the project site and in the Kapa'a Stream corridor, which is located on the property and directly adjacent to the north of the proposed site. The existing vegetation in these areas includes overgrown vegetation and shrubberies of:

- Haole koa (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)

Figure 3.3.1.1 illustrates the natural vegetated areas around the project site as described in the 2011 FEIS. Of the areas A through G in Figure 3.3.1.1 only areas E has changes since the 2011 FEIS. A portion of area E was a vegetated strip with a shallow berm protruding into the site. This portion of area E area within the project site has been removed and replaced with a retaining wall that separates two areas of the Upper site with a 4 to 6-foot elevation differential.

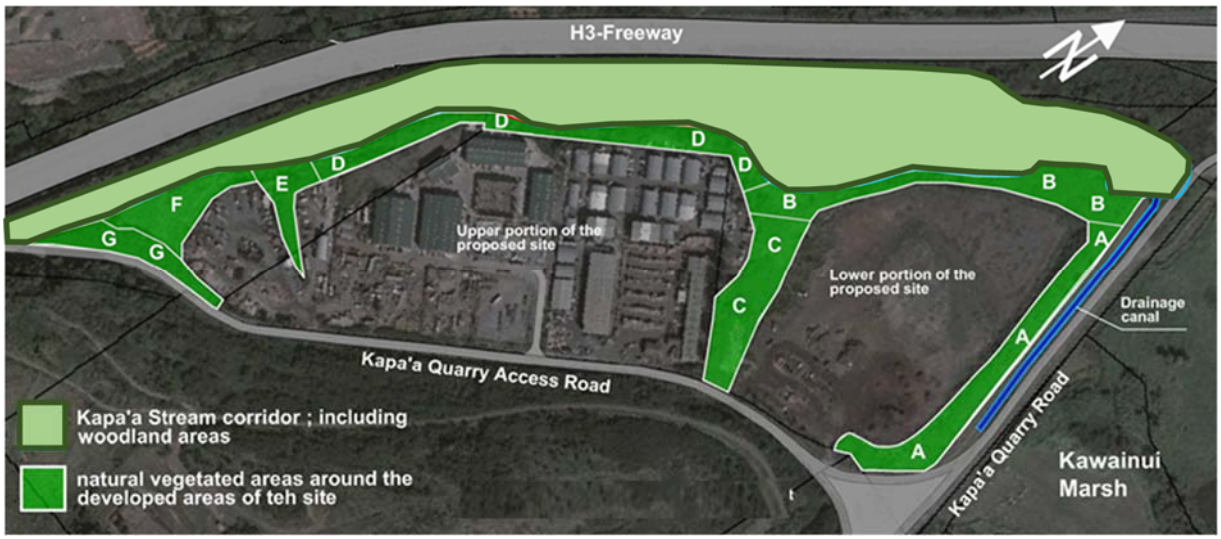


Figure 3.3.1.1: natural vegetated areas around the project site as described in the 2011 FEIS (source Figure 3-22 of the 2011 FEIS)

Table 3.3.1.1: Natural vegetated areas found adjacent to the proposed site

Type of vegetated area: Subzones		Total size acres	Subtotal acres
Kapa'a Stream corridor		19.5	
Delineated wetland (approximate)			15.0
rest of stream corridor			4.5
Vegetated area with mixed vegetation:		12.7	
A	On earth berm along the quarry road and drainage canal		2.5
B	Woodland along upland boundary of wetland area		2.5
C	Sloped area between upper and lower portion of the site		2.1
D	Woodland on sloped areas between upper portion of site and stream corridor		2.4
E	Vegetated earth dike within and at perimeter of upper portion of the site		0.8
F	Former siltation pond vegetated with grass and shrubs		1.3
G	Mature woodland along the quarry access road		1.1
Drainage canal		0.5	

The natural vegetated areas as depicted in Figure 3.3.1.1 are briefly described in the following:

Kapa'a Stream corridor: The stream corridor is located within the property, between the H3-Freeway and the developed areas, and has a total area of approximately 20 acres. The flow path of the Kapa'a Stream through the property has a length of approximately 3,800 feet, entering the property at the culvert under the H3-Freeway and leaving the property through the culvert under the Kapa'a Quarry Road, where the Kapa'a Stream flows into the Kawainui Marsh. The stream meanders through the stream corridor and is at length as an intermittent stream and becomes a perennial stream in the last approximately 6,000 feet before the stream ends at the culvert under the quarry road. The width of the stream corridor increases towards the end of the stream and ranges from 150 to 250 feet, being the widest in the wetland areas in the Lower stretches of the stream. The stream corridor has mixed vegetation, including mature trees, which are more frequently located on the northern side of the stream corridor (e.g., away from the development footprint), shrubs and dense stretches of wetland vegetation.

Natural vegetated area – Section A: Section A is situated at the Eastern perimeter of the Lower portion of the project site, along the Kapa'a Quarry Road. This vegetated section has an approximate length of 1,200 feet, an average width of 100 feet and an area of about 2.5 acres. Within Section A an earth dike with a width of approximately 20 to 40 feet and a height ranging between two and four feet accommodates smaller trees, a variety of shrubs and a range of invasive grasses. The foot of the earth dike starts approximately 20 feet from the mauka bank of the drainage canal, creating a maintenance road. The maintenance road was used until several years ago to maintain the drainage ditch. For the past several years, no regular maintenance has been done to the drainage ditch and the ditch as well as the maintenance road are now overgrown with dense vegetation.

Natural vegetated area – Section B: Section B is located at the Northern perimeter of the Lower portion of the site facing the Kapa'a Stream corridor. Section B is the 2.5 acres upland of the adjacent wetland. Section B stretches from the drainage canal to the foot of the sloped area which separates the Upper and Lower portions of the project site. The section has a length of approximately 1,200 feet and ranges in width between 200 feet in the north east to 60 feet in the west of the section. The section has a variety of smaller trees, shrubs, and invasive grasses.

Natural vegetated area – Section C: Section C is located on a sloped area that separates the Lower and Upper portions of the project site. The 2.1-acre vegetated land section has an approximate length and width of 600 and 150 feet, respectively. In the steepest areas in the section slopes range between 50% and 90%. The vegetation consists of several larger trees, shrubs of different sizes and a variety of grasses. Mature trees are in the Upper part of Section C at the border between parcels TMK 4-2-15:013 and 014.

Natural vegetated area – Section D: Section D is the steeply sloped area that separates the developed Upper portion of the project site from the stream corridor. Section D has a size of 2.4 acres. The natural vegetation on the sloped area starts immediately past the paved and stabilized developed area and merges with the vegetation of the stream buffer. The slopes in this section average about 50 percent. The elevation difference between the developed area on the graded plateau of the Upper site and the stream corridor is between 30 and 60 feet, with the stream corridor loss of elevation about 70 feet from the most South Western point to the most North Eastern point. The section has a thick vegetation of trees, shrubs and bushes and has little stabilizing ground cover over a part of the sloped area.

Natural vegetated area – Section E: Section E is a smaller, less than an acre, natural vegetation area that starts at the site perimeter and stretches approximately 300 feet towards the interior of the developed land within the Upper portion of the site. The former small section is an earth berm with a height of 3 to 5 feet and a width of 10 to 30 feet which held smaller trees and some shrubs was removed in 2016 to make room for site development.

Natural vegetated area – Section F: Section F is a near triangular plateau with a base length of 250 feet and a height of 350 feet. The area measures approximately 1.1 acres. The section is an existing detention and infiltration basin which was previously used as a siltation basin for quarry runoff. This basin no longer receives runoff from the quarry and has presently a thick and dense vegetation. The perimeter berms at the stream side are still in existence and therefore the basin can still be used for storm water management. At present, Section F contains grasses and small shrubs, high grasses, but no trees.

Natural vegetated area – Section G: Section G is an approximately 600-foot stretch of vegetated sloped are that separates the Upper site from a section of the Kapa'a Quarry place roadway. At the time of the 2011 FEIS, this area contained several mature trees along the roadway. The trees were removed in 2015 since they impeded sight distance for the roadway access to the site.

The existing drainage ditch along the quarry road: The function of the ditch was to convey runoff, both seepage from the Lower portion of the site and surface runoff, towards the Kapa'a Stream. The canal had an average width of 12 feet and an approximately length of 1,150 feet, from the beginning at the

intersection of Kapa'a Quarry Road and Kapa'a Quarry Place to the confluence with the Kapa'a Stream. As described in Section 3.2 of this Draft SEIS the drainage ditch no longer serves as a reliable conveyance of storm water runoff, since it is filled and is overgrown with dense vegetation.

3.3.2 Wildlife

Section 3.3.2 of the 2011 FEIS describes the wildlife at the project site. There basically have been no changes since the 2011 FEIS was approved.

Due to historic use of the property for various industrial activities in the past 50 years, the Upper tier of the site has been devoid of 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
Cardinal	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	

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, many 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:

Common name	Scientific name
Cardinal	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

To enhance and restore the natural habitat and encourage re-migration and nesting indigenous fauna to the area, there have been recent initiatives to reintroduce some of the species of birds and restore appropriate habitats within the Kawainui Marsh or on adjacent land.

3.3.3 Threatened & Endangered Species and Species of Special Concern

Section 3.3.3 of the 2011 FEIS described considerations of threatened and endangered species. The situation of the treated and endangered species at the project site has not changes since the 2011 FEIS was approved. The input and recommendations provided by the U.S. Fish and Wildlife Service (USFWS) in conjunction with the 2011 environmental review is still being followed for the site development approach.

In 2011 the U.S. Fish and Wildlife Service (USFWS) stated that the project site is in the vicinity of the Kawainui Marsh and the Kapa'a Stream, which are both habitat for the federally endangered Hawaiian stilt (Himantopus mexicanus knudseni), Hawaiian moorhen (Gallinula chloropus sandvicensis), Hawaiian coot (Fulica alani) and Hawaiian duck (Anas wyvilliana) as well as populations of migratory waterfowl and shorebirds protected under the Migratory Bird Treaty Act as amended (MBTA). While endangered

species find habitat in the vicinity of the proposed site, the site is currently not a habitat for federally listed water birds or for listed migratory waterfowl and shorebirds. There is no designated critical habitat within the proposed project site.

The USFWS recommended structure and organizational measures to ensure that water birds attracted to the site were not exposed to predators. For the site development planning in 2010 through 2011, the USFWS suggested that surface detention ponds might attract breeding water birds, although the design had called for "dry" detention ponds. By using large volume underground vaults that will retain stormwater permanent body inside the detention ponds will be avoided.

3.4 Cultural Resources Existing Environment

Section 3.4 of the 2011 FEIS described the existing cultural resources in the vicinity of the project site. The existing environment of cultural resources has not changed since the 2011 FEIS.

The project site and the Kapa'a Valley have been heavily impacted by industrial activities in the past fifty years. The project site is devoid of any archaeological or cultural resources and the project site is exclusively located on land that was covered by layers of landfill from quarry operations or municipal waste several decades ago. A comprehensive archaeological survey conducted by Cultural Surveys Hawaii, Inc. (CSH) (Cultural Survey Hawaii, 2000) indicated that most of the historical or culturally significant sites in the vicinity of the project were found around the southern perimeter of Kawainui Marsh.

Figure 3.4.1 indicates locations of significant historical discoveries close to the Kawainui Marsh, as presented in the CSH study. The Pahukini Heiau is the closest major historical site to the project site. The Pahukini Heiau is a 120 by 180 feet stone structure and is on the site of a former landfill within TMK 4-2-15:003, adjacent to the project site. According to the website of the Office of Hawaiian Affairs the Pahukini Heiau was built by the Chief Olopana and was used in important state functions. The Heiau was surrounded by landfill operations and was 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 3.4.1 and are briefly described in Table 3.4.1. The column indicated as "State Site #" in Table 3.4.1 refer to the Hawaii State Register for Historic Places.

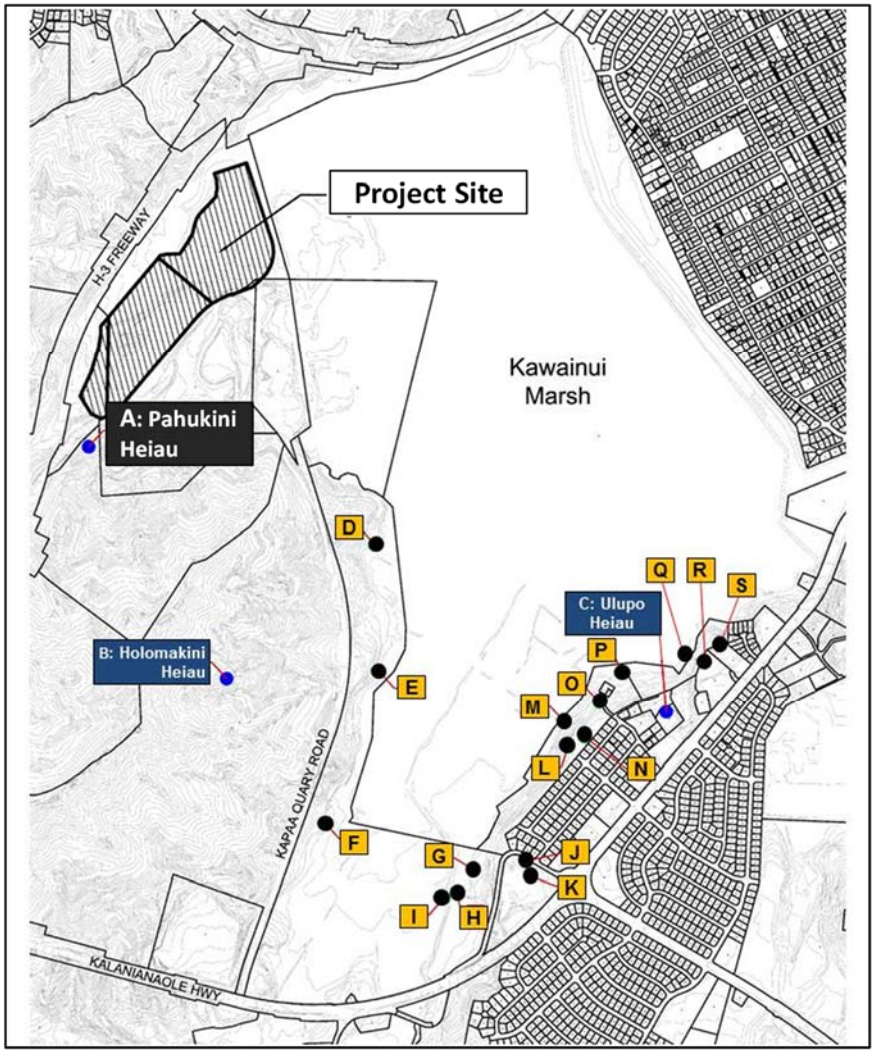


Figure 3.4.1: Cultural resources existing environment

The identifiers "A" trough "S" are described in detail in Table 3.4.1.

Table 3.4.1: Historical state sites around the Kawainui Marsh; refer to Figure 3.4.1 for the locations of the cultural resource indicators "A" through "S" (source Table 3-7 of 2011 FEIS)

ID of State site in Figure 3-24	State Site #	Site Description
A	50-80-11-359	Pahukini Heiau; in the middle of landfill in Kapa'a Quarry. Heiau also 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.

Table 3.4.1: Historical state sites around the Kawainui Marsh; refer to Figure 3.4.1 for the locations of the cultural resource indicators "A" through "S" (source Table 3-7 of 2011 FEIS)

ID of State site in Figure 3-24	State Site #	Site Description
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

Table 3.4.1: Historical state sites around the Kawainui Marsh; refer to Figure 3.4.1 for the locations of the cultural resource indicators "A" through "S" (source Table 3-7 of 2011 FEIS)

ID of State site in Figure 3-24	State Site #	Site Description
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

3.5 Air Quality

Section 3.5 of the 2011 FEIS described existing air quality conditions at project site. There have been minor changes in air quality.

The 2011 FEUS stated that air pollution in the vicinity of the proposed site could be attributed to anthropogenic and natural sources. Air quality impacts due to human activities mainly resulted from various commercial and industrial activities and from traffic. Recent changes in the land use and activities at the project site caused some source of potential air pollution to cease and other impacts to be added:

- Motor vehicles, cars, and trucks on the adjacent Kapa'a Quarry place roadway and inside the project site. Besides light vehicles there are a considerable number of heavy vehicles that serve the quarry operations in the Upper portion of the Kapa'a valley, the refuse transfer station, the existing warehouse development, and other industrial activities in the area.
- Commuters from Kailua and Kaneohe and service trucks use the Kapa'a Quarry Road to travel to and from the central part of Oahu, between the Mokapu Avenue and the Kalanianaole Highway.
- Over the past two years, a segment of the Lower portion of the site has been used to store new cars on areas that have been graded and received a gravel surface. The cars were intermittently brought to and removed from the Lower site the site. These cars add to the traffic emissions.
- 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 operations in the Upper portions of the Kapa'a valley are noticeable on days when strong trade winds from the North-East are absent. Based on conversations with tenants of the Kapa'a Light Industrial Park, there seems to be a considerable dust problem originating from the quarry operations in the Upper Kapa'a valley.

- Some dust is set free by the outdoor equipment storage and building material processing activities which are presently ongoing on within the existing warehouse development in parcels TMK 4-2-15:013.
- Potential organic waste decomposition in the landfills could generate methane. We express "potential" since methane emissions from the Upper or Lower portions of the project site have not been confirmed.
- Periodic fugitive dust from intermittent grading operations in the Upper and Lower sites.
- Fumes from paint, varnish, aerosol sprays and other solvents used in industrial and commercial activities in the Kapa'a Valley.

Relevant natural sources of air pollution in the area include dust emitted from areas of land with little or no vegetation cover. Past land use in the area has resulted in extensively denuding the site of 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 attributed to 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 proposed 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 warehouse development with environmentally friendly construction and operation.

3.6 Noise Characteristics

Section 3.6 of the 2011 FEIS described noise characteristics at the site. There have been minor changes in the type and scope of noise generated by different sources.

The 2011 FEIS defined noise pollution as displeasing human or machine-created sound that has negative effects on human beings or animal life. The main current sources of noise at/near the proposed site have been vehicular traffic, industrial and commercial activities and noise generated by recreational activities, mainly from model airplanes operated from the Kawainui Model Airplane Field. In the past six years, noise from construction activities have added to the noise environment.

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 at the site are caused by traffic passing the site on the Kapa'a Quarry Road and the Kapa'a Quarry Place roadways. Additional sources of noises are caused by light industrial activities and the operation of heavy vehicles for construction related tasks.

The main recreational activities in the vicinity of the proposed project site are associated with operating model airplanes, an activity that inherently produces a certain level of noise since small, high-pitched engines are used in the model planes.

Wildlife can be affected by elevated noise levels through interference with their use of sounds in communication and by causing stress. The main result of elevated noise on the animal world might be a reduction of usable habitat. Elevated noise levels could cause migration of animals away from the source of noise. Habituation, a behavioral pattern that causes animals to become familiar with noise levels and activities, might mitigate the migration of animals away from the source, especially if the noise levels are at background levels and not sharp noise peaks.

3.7 Utility Infrastructure Existing Environment

Section 3.7 of the 2011 FEIS describes the existing infrastructure. In the past nine years parts of the infrastructure that serves the project site have been updated.

Figure 3.7.1 shows the existing infrastructure at the time the 2011 FEIS was approved. Figure 3.7.1 shows identifier (1) through (5) which indicate the major infrastructure components of the site. The infrastructure components are described and the changes relative to the 2011 FEIS are indicated below.

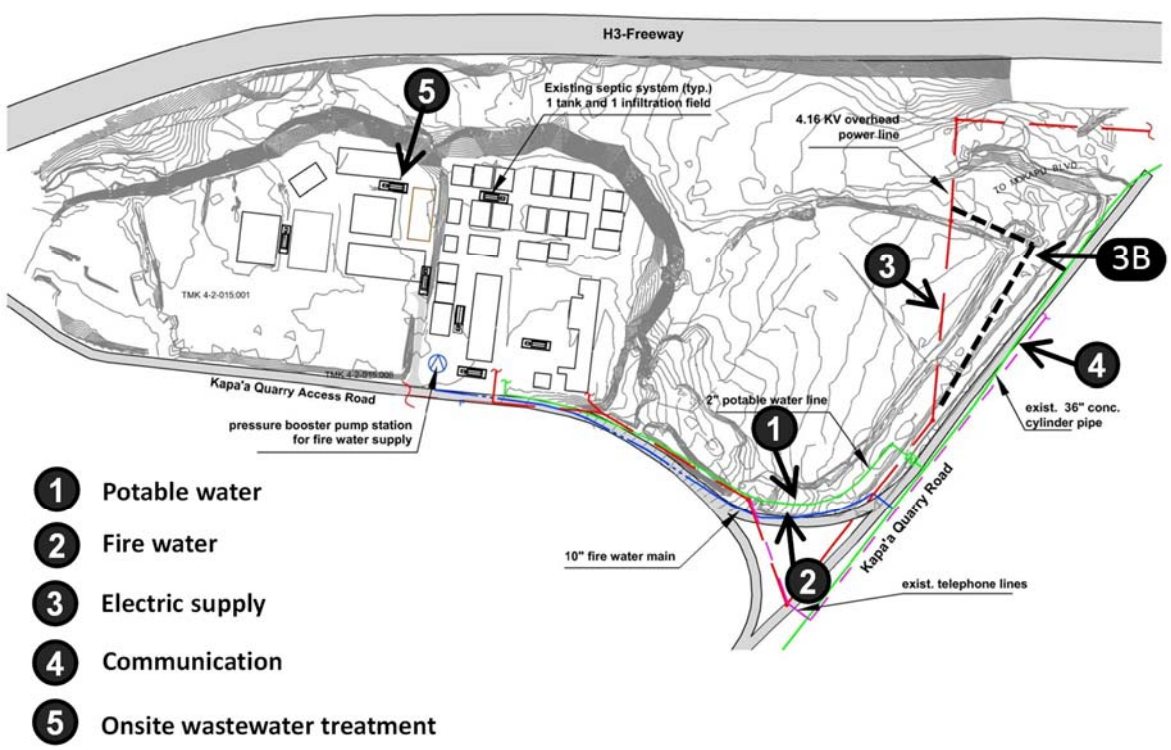


Figure 3.7.1: Utility infrastructure at the project site (source Figure 3-25 of the 2011, with annotations added)

The electric supply as indicated as (3) in Figure 3.7.1 needs a change in alignment. Currently the 4 kV powerline passes through the Lower site and needs to be removed and replaced with new poles outside the project site. The work of relocating the poles and conductors will be carried out by the Hawaiian Electric Company (HECO), including design, permitting and construction. Since the relocation project of the power line is an integral part of the project, the optional design concepts and the expected impacts to the environment and community are described in Appendix L of this FSEIS.

3.7.1 Existing Water System

The potable water infrastructure supplying potable water and firefighting water to the site was refurbished in 2018. Figure 3.7.1 indicates (1) the 2-inch potable water supply pipe and (2) the 10-inch fight fighting water pipes, which were both described in the 2011 FEIS. These two water supply pipes were connected to the existing 36-inch water main which runs along Kapa'a Quarry Road was removed.

In 2018 these two supply pipes were removed and replaced by a 12-inch water supply pipe that provides both potable water and firefighting water to the Upper site. The new 12-inch water supply pipe terminates at the Upper site perimeter and connects to the existing potable pipe distribution system as well as to the existing firefighting distribution system. The previous fire pump station remains in place. The fire pump boosts the water pressure if firefighting water is needed in the Upper site. The firefighting water demand is 4,000 gallons per minute for a three-hour fire.

3.7.2 Existing Wastewater System

The 2011 FEIS stated that project site was not connected to the municipal sewer system since there is no gravity sewer or forced wastewater main serving the property or along the Kapa'a Quarry Road. At the present, the project site remains disconnected to the sewer system and there are no plans to create a sewer connection in the future. The possibility of connecting the project site to the nearest sewer under the Mokapu Avenue with an approximately 2-mile-long small sewer pressure line was investigated during an earlier environmental review, but it was found that such a solution would not be feasible. Beside the technical obstacles of installing and maintaining the pressure line through third-party land, the end of line sewer pipe which would have to accommodate the sewage generated at the project site did not have the capacity to accommodate the quantity of sewage.

Figure 3.7.1 indicated as (5) the onsite wastewater treatment system at the time the 2011 FEIS was approved. As illustrated in Figure 3.7.1 there were seven conventional septic systems installed in the Upper site, each having one 1,250 gallons septic tank and one infiltration field (leach field) with average dimensions of 60 feet in length, 20 feet in width and 4 feet in depth. The sludge collected in the septic tanks was removed by private service companies semiannually, on average. In the years since the 2011 FEIS two more conventional septic system were added. All the nine conventional septic systems currently existing were permitted as Individual Wastewater Systems (IWS).

Changes in the onsite wastewater regulations promulgated by the State of Hawaii Department of Health (DoH) made it compulsory to connect only one building to one IWS. With a maximum number of 15 IWS for a project site an alternatives to conventional septic systems as IWS had to be selected. The selection was made to use a Water Treatment Work system composed of multiple Membrane Bioreactor (MBR)

units. Each MBR system can be connected to multiple buildings. The MBR technology that was selected is a National Sanitation Foundation (NSF) 350 standard certified technology which treats the wastewater to such a degree of residual pollutants that the effluent can be used as recycled water for external uses, such as irrigation.

At the present time, a pilot project is being conducted in cooperation with the DoH to test the first two MBR units at the site. The treated wastewater effluent from the two MBR units is disposed of in two new infiltration fields. The two infiltration fields have the capacity to accommodate all the wastewater generated in the Upper site once the conventional septic systems are converted to the advanced MBR technology and discharge into the two infiltration fields. Presently there are no onsite wastewater systems within the Lower portion of the site. For the full build-out wastewater system in the Lower site it is planned to use multiple units with NSF 350 certified MBR technology. It is planned to either use the treated wastewater effluent for irrigation or infiltrate it at the site perimeter.

3.7.3 Existing Electricity and Communication

Figure 3.7.1 shows the electricity and communication infrastructure (3) and (4) that was in place at the rime off the 2011 FEIS. The same infrastructure components are still in place, but it is planned to reroute the electric power line (3) to an alignment that goes outside of the Lower site perimeter site. The rerouting will be required to continue with the development of the Lower site. The future planned alignment of the power line is indicated as (3B) in Figure 3.7.1.

At present, existing users of electricity within the project site as well as other industrial users in the Kapa'a Valley are supplied via a HECO 4.16 kV line that connects to one circuit on Mokapu Blvd. Figure 3.7.1. shows the alignment of the 4.16 kV line. From Mokapu Boulevard, the power line first runs southwest parallel to the H3-Freeway and then changes direction to the southeast. The line crosses the Lower portion of the project site 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 power line again changes direction and runs westward along the Kapa'a Quarry Access Road to serve 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. Communications with HECO about the rerouting of the power line suggested that with installation of newer power supply technology with more capacity can be brought to the project site so that future increases in demand can be satisfied. Section 3.7 states that the concept design and related impacts to the environment and the community are described in more detail on Appendix L of this FSEIS.

3.8 Existing Transportation Environment

Section 3.8 of the 2011 FEIS described traffic related conditions. In the time since the 2011 FEIS there have been several traffic related changes.

This section 3.8 of this SEIS describes the existing transportation system serving the proposed project site, including the local roadway network, traffic conditions, public transportation, parking and pedestrian and bicycle circulation.

3.8.1 Roadway Network

Figure 3.8.1.1 illustrates the roadway network that connects the project site to the Kailua and Kaneohe regions. The project site is situated just south of John A. Burns Freeway (H3 Freeway) within Koolau Poko district of the Island of Oahu. The Kapa'a Quarry Road, a County road, connects the Kapa'a Valley with the State highways Mokapu Blvd. and Kalanianaole Highway. The Kapa'a Quarry Place is a dead-end road which connects the industrial land uses in the Kapa'a Valley, including the project site, with the Kapa'a Quarry Road.

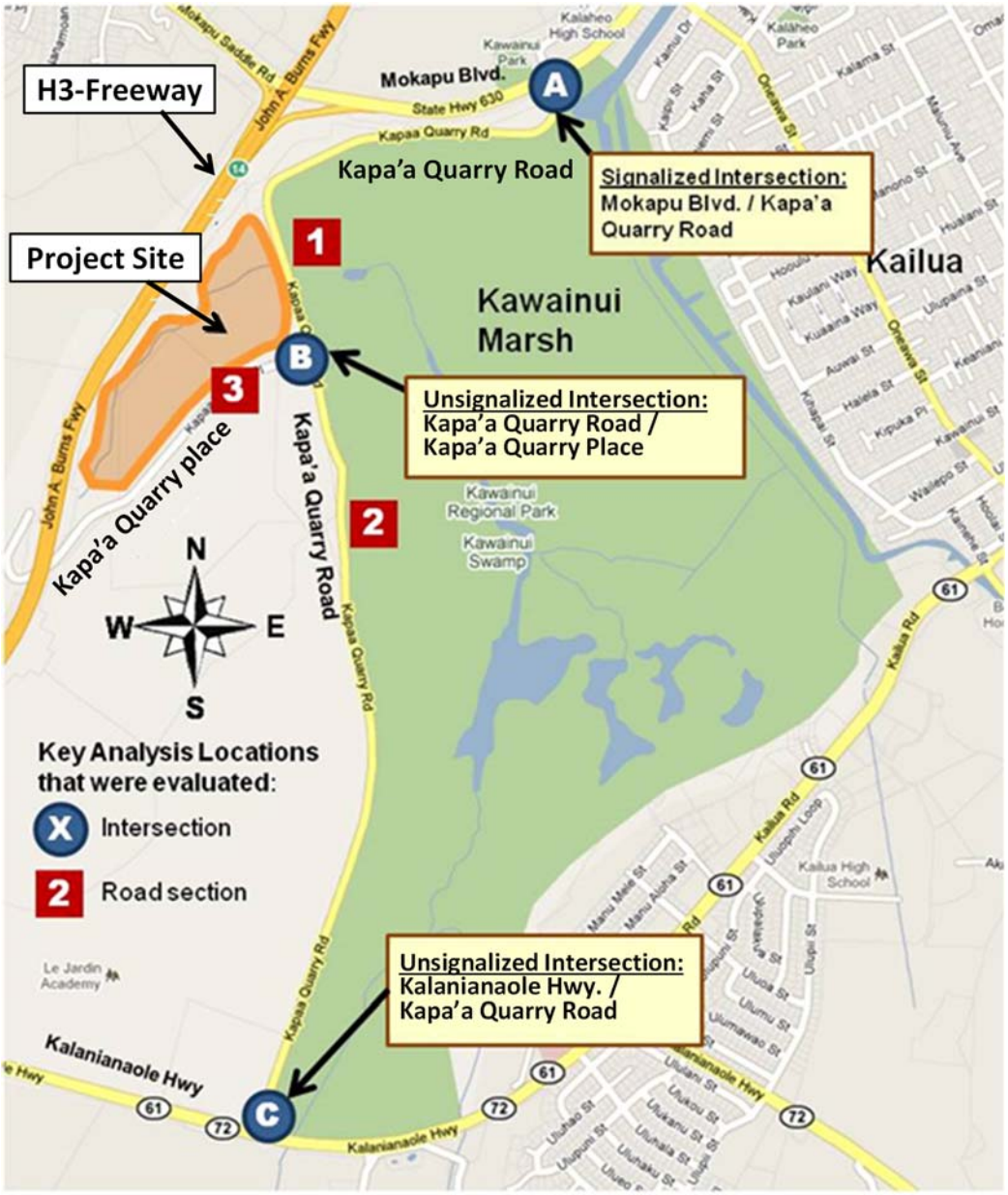


Figure 3.8.1.1: Illustration of the roadway network that connects the project site to the Kailua and Kaneohe regions.

The Kapa'a Quarry Road is a Class II roadway. The length of the two-lane road is 2.5 miles, and the lane-width is 12 feet, on average. The road connects the proposed site and other facilities in the Kapa'a Valley to the regional roadway network South and North of the Kawainui Marsh. The Kapa'a Quarry Road runs along the western boundary of the Kawainui Marsh. Besides providing access to the Kapa'a Valley, the road is also a popular shortcut road, 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 roads in Kailua and Kaneohe.

The Kapa'a Quarry Place is a Class II roadway. The length of the two-lane road is 0.7 miles, from the intersection with Kapa'a Quarry Road to the terminus of the road, which is the gate to the Ameron quarry. The lane-width is 12 feet, on average. The road intersects with the Kapa'a Quarry Road and connects the installations in the Kapa'a Valley with the Kapa'a Quarry Road. (Note the present Kapa'a Quarry Place is the former Kapa'a Quarry Access Road):

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

- Ongoing quarry and landfill operations (heavy truck traffic)
- Kapa'a Refuse Transfer Station (heavy truck traffic)
- Existing warehouses on parcel TMK 4-2-015:013 and 014 (Upper site)
- Equipment storage on parcel TMK 4-2-015:014 (Lower site)
- Model Plane Recreational Park (opposite the intersection of Kapa'a Quarry Road and Kapa'a Quarry Access Road

3.8.2 Key Analysis Locations

Figure 3.8.1.1 indicates the key analysis locations used in a traffic impact assessment report that was conducted for the 2011 environmental review. The TIAR evaluated the existing traffic conditions at the site and predicted the future increase in traffic resulting from the proposed project.

Table 3.8.2.1 describes three intersections located in the vicinity of proposed site. As described in Figure 3.8.1.1 two intersections are signalized and one is unsignalized. Table 3.8.2.2.describes the three roadway segments, two on the Kapa'a Quarry Road and one on the Kapa'a Quarry Access Road. (Note the present Kapa'a Quarry Place is the former Kapa'a Quarry Access Road):

Table 3.8.1.1: Three intersections which are affected by the project site (source table 3-8 of the 2011 FEIS)

ID	Intersection location	signalized	unsignalized	jurisdiction
A	Mokapu Blvd. & Kapa'a Quarry Road	X		State
B	Kapa'a Quarry Road & Kapa'a Quarry Access Road		x	County
C	Kalanianaole Hwy & Kapa'a Quarry Road	X		State

Table 3.8.2.2: Roadway sections evaluated (source Table 3-9 of 2011 FEIS)

Nr.	Roadway sections locations	length [miles]	jurisdiction
1	Northern section of the Kapa'a Quarry Road; between the intersection with Kapa'a Quarry Access Road and Mokaupu Blvd.	1.0	County
2	Southern section of the Kapa'a Quarry Road; between the intersection with Kapa'a Quarry Access Road and Kalanianaole Hwy.	1.5	County
3	Kapa'a Quarry Access Road between intersection with Kapa'a Quarry Road and roadway entrance to the existing warehouse development.	0.3	County

3.8.3 Traffic Volume Assessment Based on a 2010 TIAR

A 2010 Traffic impact assessment was conducted for the 2011 FEIS. The Applicants have committed to conduct a new TIAR once the site development plans for the entire project site have been approved. The results of the TIAR were reported in the 2011 FEIS.

The following is a brief summary of the 2010 TIAR for the Level of Service:

- The level of service for the three intersections is shown in Table 3.8.3.1.
- The level of service for the three roadway sections in Table 3.8.3.2.

Table 3.8.3.1: Level of service for the three intersections (source Table 3-10 of 2011 FEIS)

ID	Intersection location	type of signal	Level-of-service LOS	
			AM Peak	PM Peak
A	Mokapu Blvd. & Kapa'a Quarry Road	signalized	B	C
B	Kapa'a Quarry Road & Kapa'a Quarry Access Road	unsignalized	B**	B**
C	Kalanianaole Hwy & Kapa'a Quarry Road	signalized	B	B

Note B**: The LOS for the unsignalized intersection reflects the minimum of LOS for the movements of the intersection

<u>The Level-of-Service Concept:</u> Level of service (LOS) is a common way of defining intersection and roadway capacity. In this approach, LOS ratings range from A to F, where A represents minimal delays and F represents roadways and intersections that operate over capacity, resulting in excessive delays with longer queues due to over-saturated conditions. Generally, LOS ratings of A – D are acceptable while E, which is approaching capacity, is either acceptable or not depending on the jurisdiction. Level F, which represents severe congestion and is thus over capacity, is always unacceptable. Level D is typically

considered acceptable for peak hour conditions in urban areas; the proposed site is located within the urban distinct.

Table 3.8.3.2: Existing level-of-service for roadway sections (source Table 3-9 of 2011 FEIS)

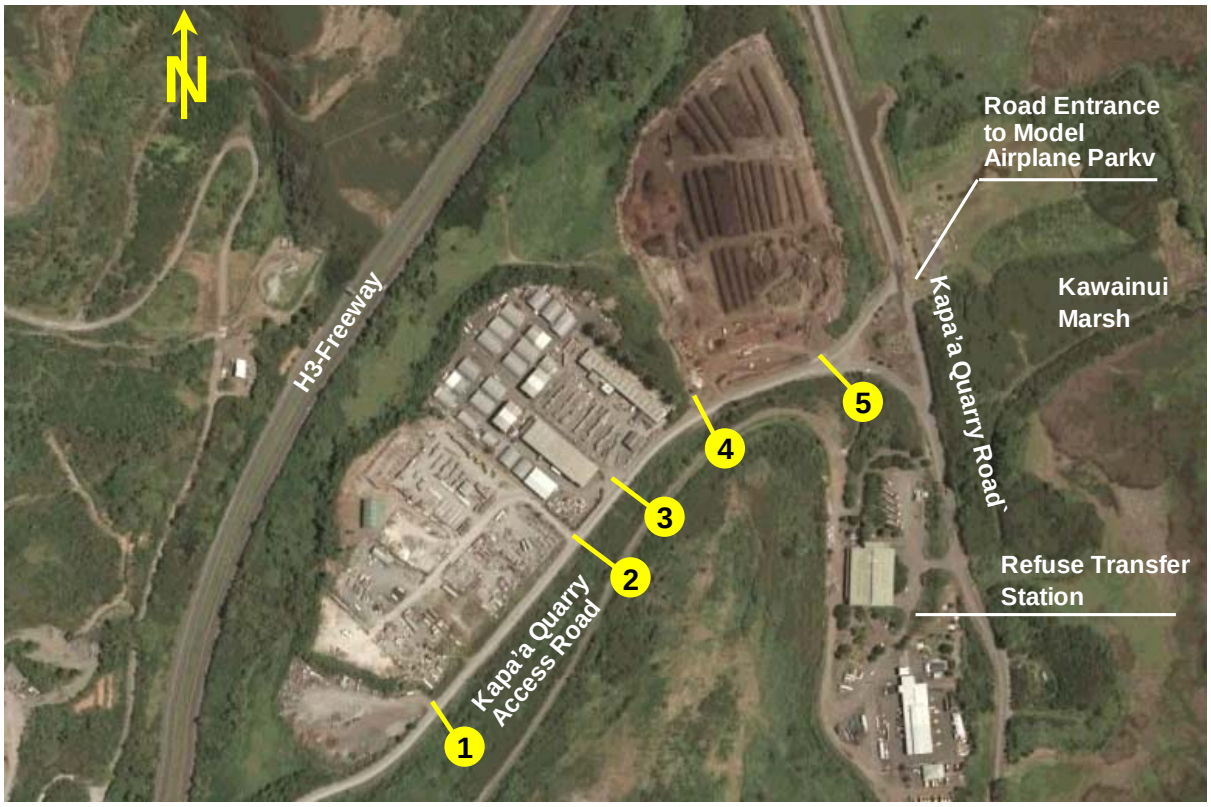
Nr.	Roadway sections locations	Level-of-service LOS	
		AM Peak	PM Peak
1	Northern section of the Kapa'a Quarry Road; between the intersection with Kapa'a Quarry Access Road and Mokaupu Blvd.	C	B
2	Southern section of the Kapa'a Quarry Road; between the intersection with Kapa'a Quarry Access Road and Kalanianaole Hwy.	B	B
3	Kapa'a Quarry Access Road between intersection with Kapa'a Quarry Road and roadway entrance to the existing warehouse development.	B	B

3.8.4 Existing Roadway Access to the Proposed Site

Section 3.8.7 of the 2011 FEIS described the existing road entrances to the project site. Figure 3.8.4.1 shows the five road entrances which existing at the time the 2011 FEIS was approved. The locations of the five roadway accesses are still the same. One of the road accesses, Entrance No. 1, has been upgraded since the 2011 FEIS was approved. The five road entrances as shown in Figure 3.8.4.1 are describes as follow: (Note the present Kapa'a Quarry Place is the former Kapa'a Quarry Access Road):

At the present, the project site is accessed from Kapa'a Quarry place roadways with five road entrances, as shown in Figure 3.8.4.1 .

- Entrance No. 1 provides access from the Kapa'a Quarry Access Road to parcel TMK 4-2-015:014 (Upper site). This was an unpaved entrance at the time the 2011 FEIS was approved. This road entrance was improved after the 2011 FEIS was approved and is now a wide and paved entrance.
- Entrance No. 2 provides access from the Kapa'a Quarry Access Road to parcel TMK 4-2-015:013. This is a paved entrance. This paved entrance provides access to existing warehouses and outdoor equipment storage areas in the south-western part of parcel TMK 4-2-015:013.
- Entrance No. 3 provides access from the Kapa'a Quarry Access Road to parcel TMK 4-2-015:013.
- Entrance No. 4 provides access from the Kapa'a Quarry Access Road to parcel TMK 4-2-015:014 (Lower site). This is an unpaved entrance.
- Entrance No. 5 provides access from to the Kapa'a Quarry Access Road to parcel TMK 4-2-015:014 (Lower site). This is an unpaved entrance.



X = No. of Present Road Entrance to Proposed Site

Figure 3.8.4.1: Road entrances to the proposed site (source Figure 3-28 of the 2011 FEIS)
(Note the present Kapa'a Quarry Place is the former Kapa'a Quarry Access Road)

3.8.5 Public Transportation

Section 3.8.8 of the 2011 FEIS described the publication transportation system that served the project site. The bus routes have changed since the 2011 FEIS.

At the present there is still no public transportation service to the project site. The nearest bus stop is on Kalanianaole Highway at the intersection with Auloa Street, for both westbound and eastbound buses. This bus stop is 1.3 miles from the proposed site. This bus stop is served by one lines of TheBus.

3.8.6 Off-street Parking

Section 3.8.9 of the 2011 FEIS described the off-street parking at the site. The approach of providing off-road parking at the project site has not changed since the 2011 FEIS. Parking at the projects is entirely on off-street parking spaces provided by the Applicants for the warehouse development. The number of parking spaces is concurrent with the applicable city ordinances of one parking space per 1,500 square feet of industrial space. (Revised Ordinances of Honolulu (ROH) Chapter 21 "Land Use Ordinance", Article 6 "Off-Street Parking and Loading")

3.8.7 Pedestrian and Bicycle Facilities and Circulation

Section 3.8.10 of the 2011 FEIS described issues related to pedestrian and bicycles traffic to and from the project site. The conditions in the 2011 FEIS remain in place and there are no changes.

The 2011 FEIS stated that there was negligible pedestrian activity around the proposed site. The Kapa'a Quarry Road does not have dedicated sidewalks or even shoulders and therefore walking of biking along the roadway is not considered pleasant or safe.

The Kapa'a Quarry Road is, in sections, fringed by trees with thick foliage which produce shade and sometimes dim lighting conditions. Furthermore, the road has several turns and dips, which affect visibility.

The potential Kawainui marsh perimeter pathway, possible under the present planning for the march improvements could provide a safe and pleasant venue for both bikers and pedestrians to reach the proposed site from Mokapu Blvd. and Kalanianaole Hwy. But plans related development plans have been in the planning for many years without concrete construction plans being made.

Plans by the Applicant for 2,500-foot roadway frontage improvements on the Kapa'a Quarry Place along the project site were approved by the DPP. The improvements include 8-foot-wide sidewalks separating the project site from the roadway. Of these 2,500 feet 1,300 feet have already been completed. The remaining 1,200 feet will be completed in conjunction with the development of the Lower portion of the project site.

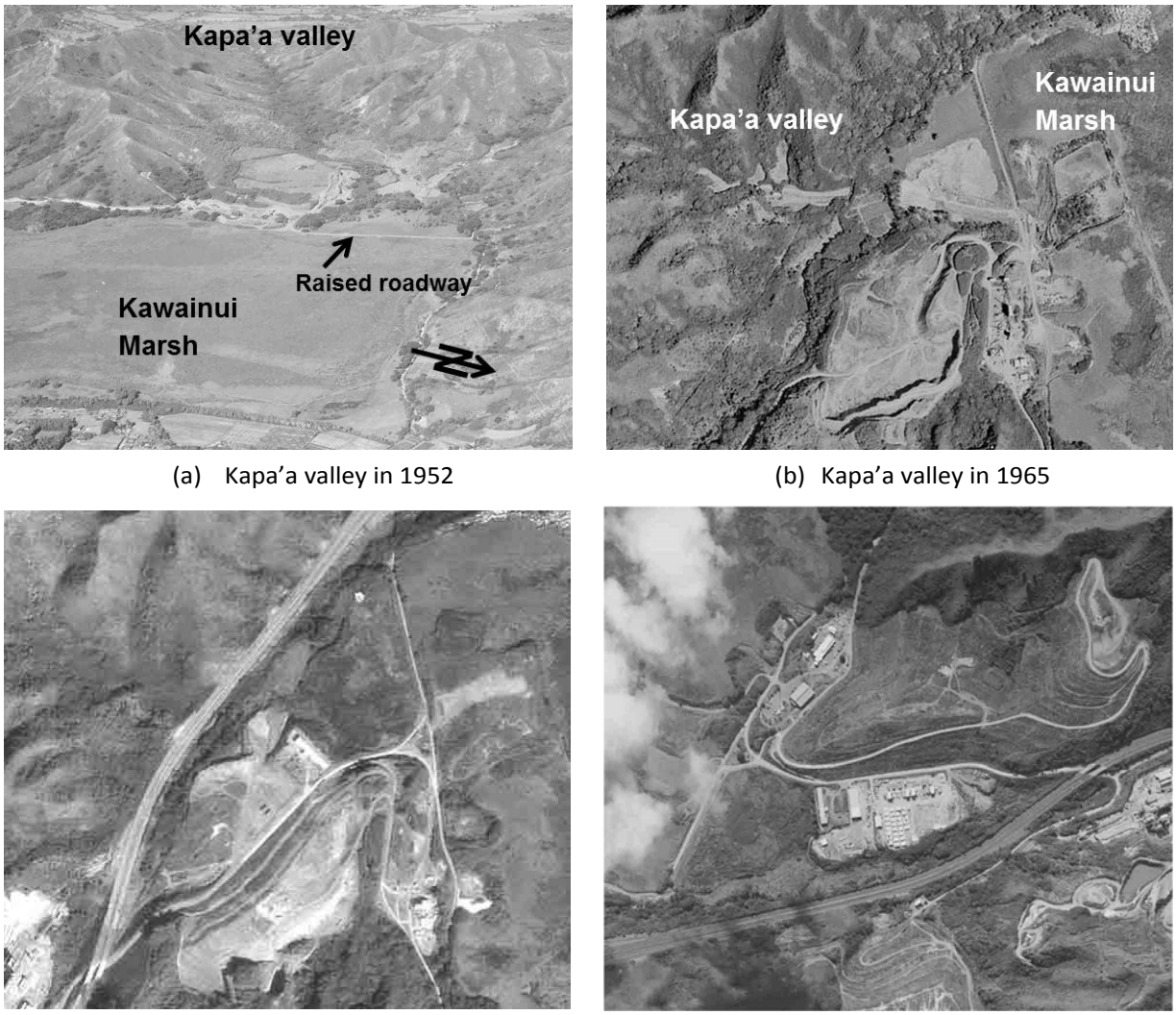
3.9 Existing Views of Proposed Site

Section 3.9 of the 2011 FEIS described existing views at the project site. External views have since then changed as more vegetation cover around the project site has grown obstructing direct views on the project from various locations. A comprehensive visual impact assessment of the project site using recent photographic and line-of-sight drawings is presented in Section 6.6 of this Draft SEIS.

The 2011 FEIS stated that Industrial and commercial activities had significantly affected the appearance of the Kapa'a Valley where agriculture and cattle ranching once thrived until the late 1940s. The topography of the valley has been significantly affected by quarry and landfill operation, which started about 60 years ago. The deep changes in the appearance of the valley included large quantities of earth moving, exposed rock formations, large quarry or landfill equipment, warehouse structures and the refuse transfer station in the Lower and southern. Construction of the H3-Freeway further resulted in major changes in the appearance of the valley.

Several views of the site and adjacent land are presented hereafter to exemplify the appearances of Kapa'a Valley and the project site the proposed site. Significant portions of the valley have been converted from agricultural land use to industrial land use. These industrial operations have contributed to changes in topography in the valley, with vegetation of larger parts of the valley being removed and converted to quarries and landfills. A series of aerial photos, Figure 3.9.1 (a) through (d), portrays changes in land use and character of the Kapa'a Valley over the past six decades. Figure 3.9.1 (a) shows Kapa'a valley in 1952. The main land use in the Lower reaches of Kapa'a valley was agriculture. A raised roadway, being built in the 1940s, separated the Kapa'a Valley from the Kawainui Marsh. Figure 3.9.1 (b)

shows Kapa'a valley in 1965. Significant land area in the valley was converted to quarries and landfills. Agricultural land, stream channel and wetland areas were covered with refuse and/or quarry tailings and overburden. Figure 3.9.1 (c) shows the valley in the year 1976. The landfill and quarry operations had expanded and occupied more land. Some of the landfill operations were completed. Figure 3.9.1 (c) shows the work on the H3-Freeway underway. Figure 3.9.1 (d) shows the valley in the year 1993, when parts of the former quarry and landfill areas in the Lower parts of the valley were completed, and vegetation can again be seen covering parts of the former disturbed land areas.



(a) Kapa'a valley in 1952 (b) Kapa'a valley in 1965

(c) Kapa'a valley in 1976 (d) Kapa'a valley in 1993

Figure 3.9.1: Four views of the Kapa'a Valley showing the change in appearance over the years

Figure 3.9.2 shows the Lower portion of the Kapa'a Valley in its appearance at the time the 2011 FEIS was approved. The former quarries and landfills have been either vegetated or converted to other land uses. This figure shows the proposed project site, with the existing warehouse development and graded land areas in the Upper and Lower portions of the site. Figures 3.9.3 shows four adjacent views of the project site at the present.

Figure 3.9.2: Lower portion of the Kapa'a Valley at the time the 2011 FEIS

(a) View from Kapa'a Quarry Road, the Lower portion of the project site is on the left

(b) View from Kapa'a Quarry, the Lower portion of the project site is on the left

(c) View from Kapa'a Quarry Place, the Lower portion of the project site is on the right

(d) View from Kapa'a Quarry Road, the Upper portion of the project site is the right

Figure 3.9.3: Four adjacent views of the project site at the present

3.10 Land Use and Zoning Existing Environment

Section 3-10 of the 2011 FEIS described historical and existing land uses and the existing land use zoning of the proposed site and surrounding land. There have been minor changes, mostly project related issues.

3.10.1 Land Use

The 2011 FEIS described that the Kapa'a Valley where the project site is located has been subject to significant commercial and industrial developments during the past fifty to sixty 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 1900's. For example, cattle ranching operations were important in Kapa'a Valley until the late 1940's.

Quarry operations started in the valley in the early 1950's. This significantly changed the primary land use and the general appearance of the valley. The lower plateaus of the valley significantly changed appearance as the quarry operations expanded. While the lower stretches of the valley were agricultural landscapes, this land was converted to serve industrial uses. Significant deposits of quarry tailings and overburden altered the topography of the valley. One of the overall changes of the valley was a raised roadway that subsequently became the Kapa'a Quarry Road. The roadway ran across the valley mouth of the Kapa'a valley 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 landfill plateau created by landfill deposits and the H3-Freeway raised roadway. It has been observed in even current geographic maps that the streambed of the Kapa'a Stream is still shown going through the Lower portion of the project site, although the stream bed has been shifted towards the North by several hundred feet.

The 1960's and 1970's 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 in the valley through 1990. Today, there are still municipal waste related activities going on in the valley, though not in the form of landfills but in form of the Kapa'a Refuse Transfer Station, where waste collected in windward communities is transferred to larger transfer vehicles and is then transported to the leeward site of Oahu. 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 1970's.

In the mid-1970's, the development of an industrial park in the Lower stretches of the valley started with the construction of several warehouses on land that was created by landfill deposits. This land is now the Upper portion of the project site. The number of warehouses has continuously increased over the years in response to a strong demand for industrial warehouse space in the Kailua and Kaneohe regions.

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 and industrial 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 expand the existing warehouse development by about twice the present size, the proposed warehouse park would not significantly increase the general industrial characteristics of the entire Kapa'a Valley.

3.10.2 City and County of Honolulu Land Use Zone Designation

The 2011 FEIS described the zoning of the project site as three contiguous parcels of land. Two of which, TMK 4-2-015:001 (portion of) and 4-2-015:006 were classified as General Preservation District (P-2). The third parcel, the then TMK 4-2-015:008 was classified as Intensive Industrial District (I-2). Figure 3.10.2.1 shows the Location Map of the proposed site as described in the FEIS. Figure 3.10.2.2 illustrates the County land use zoning designations in the vicinity of the proposed site as shown in the 2011 FEIS.

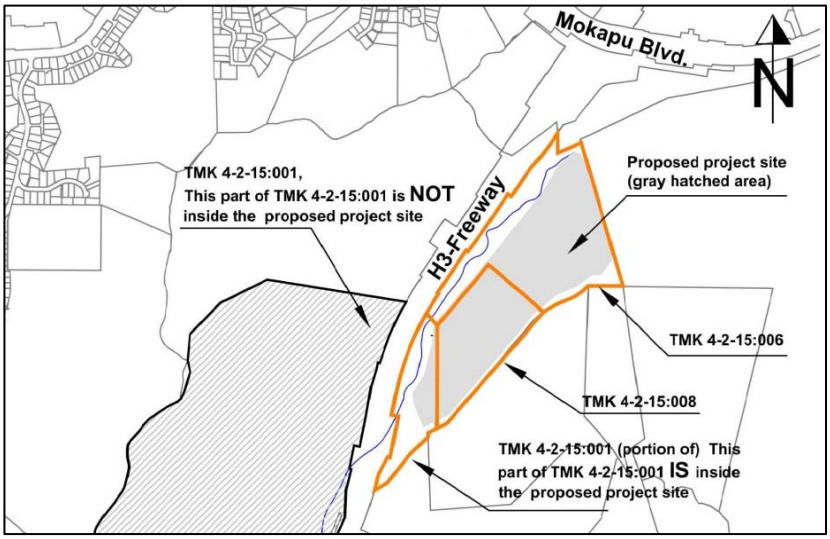


Figure 3.10.2.1: Location Map of the proposed site as described in the FEIS (source Figure 3-37 of the 2011 FEIS)

Note: Land Use Zoning Designations have been changed since the 2011 FEIS was approved .

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).

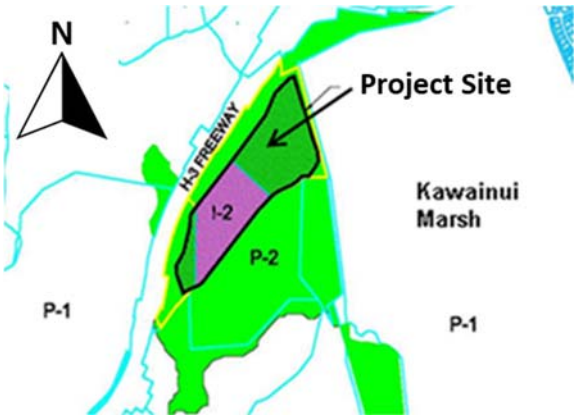


Figure 3.10.2.2: County land use zoning designations in the vicinity of the proposed site as shown in the 2011 FEIS
(source Figure 3-38 of the 2011 FEIS, new annotations added and size of imager changes)

Note: The 2011 FEIS described the project site to be inside the P-2 and I-2 County land use designations.

The City and County of Honolulu Zone Change ordinance 13-83 changed the land use designations for two of the three parcels which create the current project site from P-2 to I-1 (limited Industrial). The two land parcels which were rezoned also changed their TMK designation. These two parcels were (1) the TMK 4-1-15:001 (portion of) which was subsequently rezoned as 4-2-15:012 and a portion of the 4-2-15:014 and, (2) the TMK 4-2-15:006 was rezoned to 4-2-15:014 (portion of). The presently valid TMK designations of the parcels are depicted in the Figure 3.10.2.3.

The rezoning of the two parcels did not change the entire parcel land use designation - only the land that would finally become the project site was rezoned. The boundaries of the rezoning followed the topographic conditions at the project site, where the rezoned land only included that land that was former landfill area. The land inside the two parcels that had dense vegetation and included the Kapa'a Stream corridor was not rezoned.

Figure 3.10.2 .3shows the current County land use designations of the TMKs 4-2-15:013 and 014.

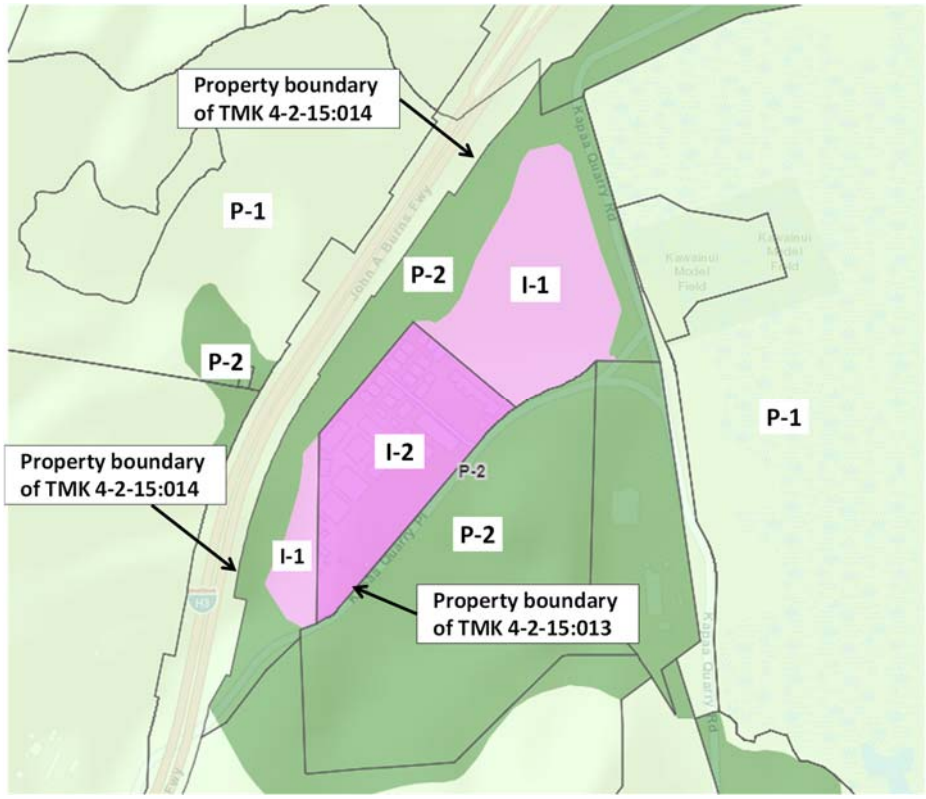


Figure 3.10.2.3: Current land use designation of the project site and adjacent land

(source DPP GIS)

3.10.3 State Land Use Classification of Proposed Site

Section 3.10.3 of the 2011 FEIS described the State land use districts at the project site. There have been no changes to the limits of these State land use district boundaries. Figure 3.10.3.1 shows the current State land use district boundaries at the project 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 in urban land use or

represent a sufficient reserve area for foreseeable urban growth. Urban districts allow certain land use activities which are regulated by ordinances of the counties. The project site is within State Urban District. A small, less than one-acre portion in the southwest of parcel TMK 4-2-015:014 is within the State "Conservation" District. This small portion of parcel TMK 4-2-015:014, however is not part of the project site and has remained open space.

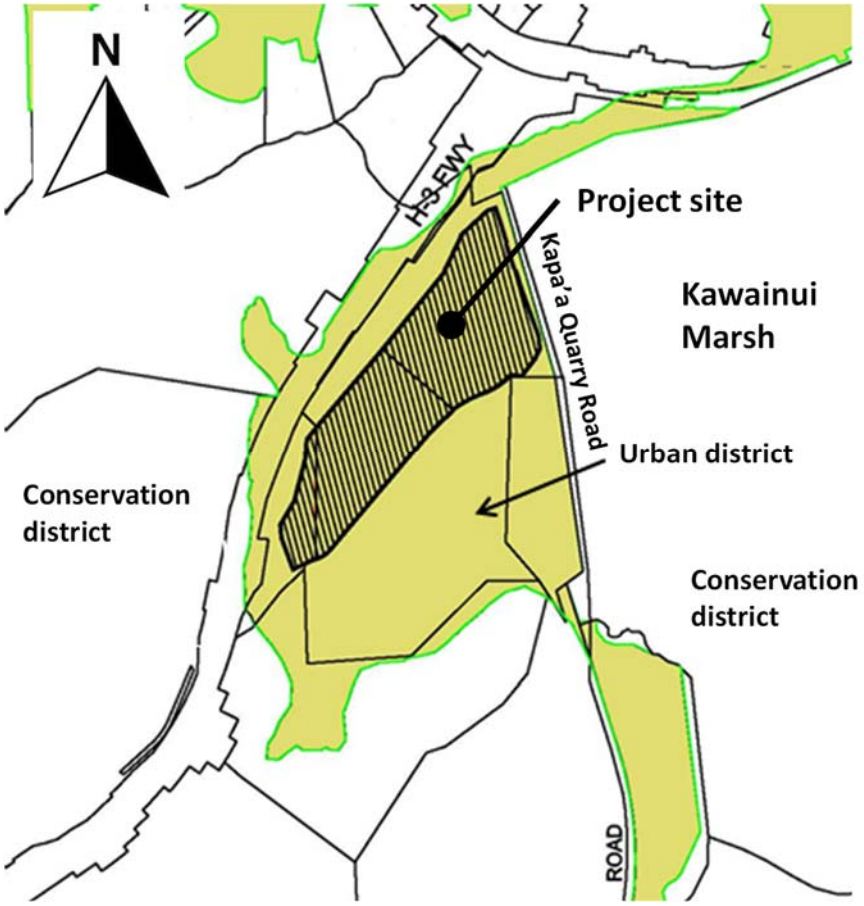


Figure 3.10.3.1 State land use district boundaries at the project site.

(source Figure 3-39 of the 2011 FEIS, new annotations added and size of imager changes)

Legend:

	Within Urban District
	Within Conservation District

3.10.4 Special Management Area

Section 3.10.4 of the 2011 FEIS described the Special management Are (SMA) boundaries. There have been no changes in the SMA boundaries since the 2011 FEIS was approved.

Hawaii Revised Statutes (HRS) Chapter 205-A regulates land use in Special Management Areas (SMA). As depicted in Figure 3.1.0.4.1, the Lower portion of TMK 4-2-15:014, including all the project site, is within the SMA District. Therefore, the proposed development is subject to regulatory procedures, permit requirements, and review under the City's SMA regulations. Specifically, special management area use permit (SMP) coverage, must be obtained for any development work. For the project site, SMP permit No. 2014/SMA-27 as well as two minor modifications have been obtained.

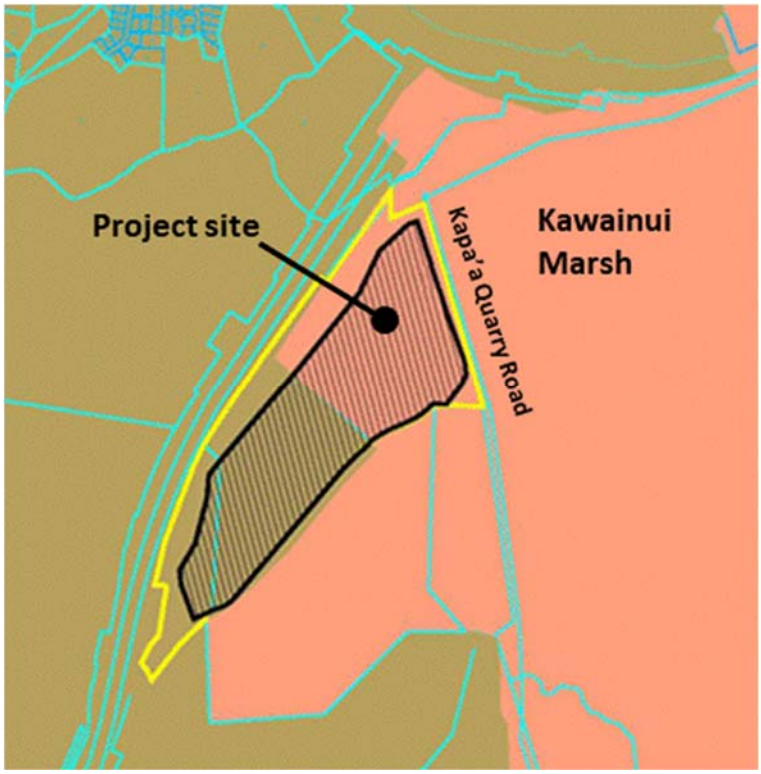


Figure 3.10.4.1 Special Management Area (SMA) district in vicinity of project site

(source Figure 3-40 of the 2011 FEIS, new annotations added and size of imager changes)

Legend:

Area inside the SMA boundary

Area outside the SMA boundary

3.10.5 Land Uses Surrounding the Proposed Site - Kawainui Marsh

Section 3.10.5 of the 2011 FEIS described the Kawainui Marsh is the largest wetland in the Hawaiian Islands with a total area of the marsh and associated wetland areas of approximately 850 acres. The cultural and ecological importance of the Kawainui March has not changed, and the community has supported planning and actual implementation of initiatives to support the cultural and ecological health of the Kawainui Marsh. In the time since the 2011 FEIS was approved, the Applicants have supported community efforts by either providing financial assistance or actively contributing to clean-up efforts at the marsh perimeter.

In 2005 the Kawainui 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 resources, which supplied the life essentials of the Hawaiian population.

The marsh played an important role in the Hawaiian culture. It supported a 400-acre fishpond and an agricultural field system that provided to the people. Several heiaus and other gathering places were constructed in the area. Several of them are preserved to date and provide a rich educational and cultural experience to the people living and visiting the area. Most of the cultural assets are located in the southern part of the marsh, approximately 2 miles away from the site, on average.

A rich diverse wildlife of birds, fish and aquatic animals use the Kawainui Marsh as their natural habitat. 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. 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 non-wetland vegetation. Measures to restore important wetland throughout the marsh have been ongoing, though at various levels of scope and intensity. The goal of such efforts is restoring the capacity of the marsh to serve as quality wildlife 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 surface.

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 rim 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 scenic views of wetlands and mountains.

3.10.6 Land Uses Surrounding the Proposed Site - Kawainui Marsh Development Plans

Section 3.10.6 of the 2011 FEIS described efforts to develop features which would make the Kawainui Marsh more accessible. Specifically, the 2011 FEIS described the possible construction of a multifunctional pathway, e.g., a combined pedestrian walkway and bikeway around the perimeter of the Kawainui Marsh. Efforts are ongoing to install such a pathway. Regarding benefits to the project site a pathway would support the accessibility of the project site via other means than individual vehicles, thus making the site more accessible through pedestrian and bicycle traffic.

Currently, the State of Hawaii Department of Land and Natural Resources (DLNR), Division of Forestry and Wildlife (DOFAW) is updating the Master Plan for the Kawainui-Hamakua marsh Complex. The 1,000-acre project area was acquired by the State of Hawaii. The master plan is slated to support sustaining and enhancing its natural and cultural resources.

3.10.7 Land Uses Surrounding the Proposed Site - Kapa'a Valley

Section 3.10.6 of the 2011 FEIS described land uses in the Kapa'a Valley. There are minimal changes in the land use in the Kapa'a Valley, and changes have been due to the continuing development at the project site. But the basic premise of land use in the Kapa'a Valley has not changed since the 2011 FEIS was approved.

The 2011 FEIS described that the Kapa'a Valley had gone through many significant 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 expanded 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 landfill area that today is used, among others, for the Model Airplane Park and a City & County of Honolulu base yard.

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 streambed changed, 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 26 acres of the area generated by landfill was converted to industrial land use and industrial warehouses over the past three decades.

3.10.8 Land Uses Surrounding the Proposed Site - Federal H3-Freeway

Section 3.10.6 of the 2011 FEIS described the background or the John A .Burns Freeway (H3-f=Freeway).

The H3-Freeway connects central Oahu with the windward side 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 one-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, the 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 1997, almost four decades after being proposed, the H3 opened. The H3-Freeway has become an important part of Oahu's freeway system. The construction of the H3-Freeway though the Kapa'a Valley has had considerable impact on 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 increased noise and light. The H3-Freeway is located directly adjacent to the project site.

3.10.9 Land Uses Surrounding the Proposed Site - Le Jardin Academy

As the 2011 FEIS described 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. The Le Jardin School adds to traffic volume on the Kapa'a Quarry Road.

3.10.10 Land Uses Surrounding the Proposed Site - Kapa'a Refuse Transfer Station

Section 3.10.10 described the Kapa'a Transfer Station as a disposal and recycling facility for residential waste. The transfer station is located at the Kapa'a Quarry Road, south of the project site.

Type and capacities of the refuse facility have not changed significantly to date. There, however, have been plans to expand the facilities.

In 2019, the City and County of Honolulu started a project to improve green waste handling at the Kapa'a Transfer Station.

The transfer station serves the function of consolidated and transferred refuse 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.

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.

3.11 Population and Community Services and Facilities Existing Environment

Section 3.11 of the 2011 FEIS described socioeconomic characteristics of the existing environment within the Koolau Poko region.

3.11.1 Population Characteristics

Section 3.11.1 of the FEIS described population distribution and expected trends. Some of the data presented in the 2011 FEIS has been updated in recent governmental publications.

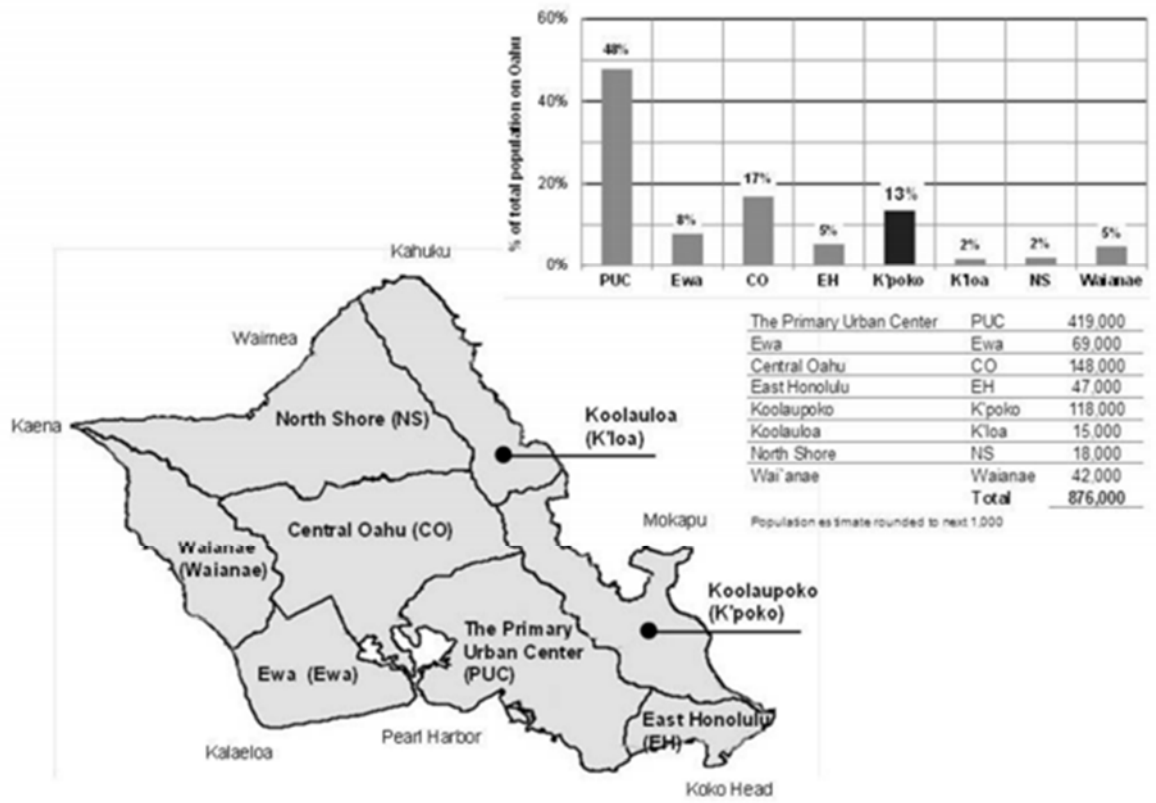
The 2011 FEIS reported that the Koolau Poko region had the third largest population among the seven main districts of the City & County of Honolulu. Figure 3.11.1.1 indicates the 2011 FEIS distribution of population on Oahu. As indicated, about 13.5 percent of the Oahu population lives in the Koolau Poko region. The 2011 FEIS described that the main population centers in the Koolau Poko region are the Kailua and Kaneohe subareas, which together account for approximately 70% of the population of the Koolau Poko region.

The 2011 FEIS described existing policies and future visions of the region to retain a constant population density in the Koolau Poko region and discourage significant population growth in the region. For the period from 1980 through 2000, the 2011 FEIS reported that the Koolau Poko region had experienced little growth. While the total population within the City & County of Honolulu was growing from 1990 to 2000, the population in the Koolau Poko regions had remained essentially constant.

The following is excerpted from the updated Koolau Poko Sustainable Communities Plan (2017):

The 2010 resident population in Ko'olau Poko was 115,164 persons, 2,835 persons fewer than the 2000 Census figure of 117,999 people. The region experienced an average annual population decline of approximately 0.2 percent, in contrast to an estimated island-wide annual population increase of 0.9 percent. Consequently, the region's share of Oahu's total population has declined from about 13 percent to about 12 percent. This declining trend is projected to continue through 2035.

Furthermore, given Ko'olau Poko's declining population, there has been only modest growth in the demand for commercial land uses to support the communities of this region. Nevertheless, the continued viability of existing commercial districts and institutions are an important part of the vision for Ko'olau Poko because they provide a significant number of jobs for residents within the region and play an integral part in the region's social and cultural life.



The Primary Urban Center	PUC	419,000
Ewa	Ewa	69,000
Central Oahu	CO	148,000
East Honolulu	EH	47,000
Koolaupoko	K'poko	118,000
Koolauloa	K'loa	15,000
North Shore	NS	18,000
Wai'anae	Waianae	42,000
	Total	876,000

Population estimate rounded to next 1,000

Figure 3.11.1.1: Population distribution in City & County of Honolulu (2000 estimate, source DPP) (source Figure 3-42 of the 2011 FEIS)

The 2011 FEIS reported that the urban areas of Kailua and Kaneohe were generally categorized as "bedroom" communities. The bulk of the population in these two regions commuted every day to employment centers in the central part of Oahu. The development of the labor force on Oahu showed that it has been growing at a faster rate than the population, suggesting that Oahu provides a favorable employment environment.

3.11.2 Police and Fire Department

Section 3.11.2 described the locations of police and fire department stations that would serve the project site. The locations have not changed since the 2011 FEIS.

<u>Fire stations:</u> 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 from the proposed site,
(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 miles from the proposed site.

3.11.3 Medical Facilities

As describe in Section 3.11.3 of the 2011 FEIS there are two major medical facilities within five miles of the project site. The location and services offered by the two facilities have not changed since the 2011 FEIS. .

Castle Medical Center - 2.5-mile 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 160-bed primary health care facility is located next to 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 is located at a 5.0-mile distance from the project site, at 45-710 Ke'aahala Rd., Kaneohe, HI. The Hawaii State Hospital is a 202-bed hospital located in Kaneohe on the windward side of Oahu. The hospital 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. It is slated for expansion in 2021 .

3.11.4 Recreational Facilities

Section 3.11.4 of the 2011 FEIS described that there was one community park within a one-mile distance from the proposed site, the Kawainui Model Airplane Park, which is still in operation and has not changed in operation and size.

The Kawainui Model Airplane Park is located on the Western perimeter of the Kawainui Marsh and directly adjacent to the Lower project site. The Kapa'a Quarry Road separates the "airplane" park from the proposed site of the Kapa'a Light Industrial Park.

The 2011 FEIS reported that there were plans of potential two future recreational venues, one park and one trail system, but these projects remain in the planning phase and no construction has been completed.

3.11.5 Schools

Section 3.11.5 of the 2011 FEIS described that there were several public and private schools within a two-mile distance from the proposed site. The locations and operations of these schools have not changed since the 2011 FEIS.

The closest public-school campus is the Kalaheo High School & Windward Community School, approximately 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 students would not normally walk past the proposed site.

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

3.11.6 Refuse Collection and Disposal

As the 2011 FEIS described that was no municipal refuse collection at the project site. The conditions for the refuse collection and disposal have not changed.

Refuse was collected and disposed of by private waste management companies. The City and County of Honolulu solid waste transfer station is less than a quarter of a mile from the proposed development site.

3.12 Existing Supply and Demand for Industrial Space in the Region

Section 3.12 of the 2011 FEIS described a market study that was conducted to evaluate the existing supply of industrial space in the Koolau Poko region and the ability of the region to absorb the planned expansion of planned additional industrial warehouse space of approximately 600,000 square feet of. This area was planned to be added by the expansion of the Kapa'a Light Industrial Park.

As reported in the 2011 FEIS the market study suggested the following conclusions about the existing supply and demand of industrial space in the Koolau Poko region:

(1) A comparison of the four counties of the State of Hawaii indicated that the supply of industrial space in the state differs significantly between the islands. The City & County of Honolulu had a per capita allowance of industrial space, e.g., the available industrial space in each county divided by the county population, of 39.3 square feet per capita, which is slightly below the statewide average of 44.9 square feet per capita.

(2) The comparison of per capita allowances for industrial space in the major trade areas on Oahu, urban Honolulu, Ewa/Waianae, and Central Oahu with the Koolau Poko region suggested that the Koolau Poko region contains only approximately 21 percent of the industrial space demand created by the resident population. Therefore, the region was significantly undersupplied with industrial space.

(3) In another comparison between regions, while urban Honolulu had 54 percent of the population, it had 59 percent of the industrial space of Oahu. In contrast, the Koolau Poko region had 13 percent of Oahu's population but only 3 percent of the industrial space.

(4) Historically, most of the demand created by windward (including Koolau Poko region) areas had been oriented to other areas of the island, notable Honolulu, for industrial uses. While the lack of industrial space, notably those of intensive industrial uses and those that serve

island wide market, was in accordance with development plans for Koolau Poko, the region was also significantly undersupplied with industrial space that accommodated neighborhood/ local and sub-regional industrial types of services, such as neighborhood-oriented contractors, suppliers, repair shops, craftsmen/woodworking businesses.

(5) This lack of suitable space for local businesses in the Koolau Poko region resulted in increasing time and costs for serving the windward side of Oahu from locations elsewhere in the island. Furthermore, providing the needed services from locations outside the region resulted in escalating traffic.

(6) Due to the significant problems with commuting to urban Honolulu, for example, small business owners were looking to relocate their business operations closer to their residences, employees and/or tenants.

(7) At the time of the 2011 FEIS the Koolau Poko region contained about 992,000 square feet of finished floor space, which represented 3 percent of Oahu's total industrial space. The 2011 FEIS quoted the market study that the region can readily absorb approximately 832,000 square feet of industrial space in the planned duration of project full build-out. This addition of 832,000 to the then existing 992,000 square feet of finished floor space would have still only represented only about 40 percent of the average allowance for the region. In other words, even with the addition of 140 percent of the planned maximum capacity of the proposed Kapa'a Light Industrial Park, the Koolau Poko region would have remained significantly undersupplied with industrial space when compared with the island-wide Oahu supply of industrial space. It should be noted that the prediction of the region's ability to absorb the planned amount of space was based on providing industrial space and land businesses to businesses that would serve the local and sub-regional market and not the Oahu island-wide market.

(8) In addition, a significant amount of industrial space was lost in the region due to conversion of industrial zoned land to commercial and other uses, i.e., the rezoning of industrial lands in Kailua Town to more profitable mixed-uses. The adds to the long-term undersupply of industrial space in the Koolau Poko region.

(9) Excluding the proposed project site, the market study suggested that the amount of available industrial space/land that is extremely limited in Koolau Poko. There is truly little suitable land within Koolau Poko that offers the same favorable site conditions, including being centrally located within the Kailua and Kaneohe trade area, good access to the regional roadway, being located within the State "urban" land use district and therefore designated for urban development and the existing industrial uses within the Kapa'a Valley. Therefore, the proposed site is uniquely suited to the proposed use.

(10) The character of the businesses using future space in the region would not be intensive but limited industrial land uses. This was consistent with the long-term development plans for the region.

The projections and findings of the 2010 market study support the function of the Kapa'a Light Industrial park to provide present as well as future demands for industrial zone space in the Koolau Poko region. The findings under point (4) above suggest the significant demand for with industrial space that accommodated neighborhood/ local and sub-regional industrial types of services, such as neighborhood-oriented contractors, suppliers, repair shops, craftsmen/woodworking businesses. A tenant survey conducted at the site after the 2011 FEIS was approved indicated that many of the tenants at the project site have demands described under point (4) above.

A trend not mentioned in the 2010 market study, but observed in the past years, is that former industrial zoned or operated developments in the Koolau Poko regions have been transferred to different land uses, such as upscale residential developments. This trend, most likely to be continued in the future, would exacerbate the loss of industrial space, and therefore support the need for more industrial space in the Koolau Poko regions.

3.12.1 Future Supply and Demand for Industrial Space in the Region

Based on the updated Koolau Poko Sustainable Communities Plan (SCP) published in 2017, despite the declining population expected, continued viability of commercial activity is important.

"*Furthermore, given Koolau Poko's declining population, there has been only modest growth in the demand for commercial land uses to support the communities of this region. Nevertheless, the continued viability of existing commercial districts and institutions are an important part of the vision for Koʻolau Poko because they provide a significant number of jobs for residents within the region and play an integral part in the region's social and cultural life.*

Most of Koolau Poko's industrial land is within the Kapaʻa light industrial subdivision. The designated industrial land and building inventory is expected to be capable of meeting future demand, especially considering the declining island-wide demand for industrial space and no windward airport or harbor to generate or sustain high demand in the area. Industrial activities and future opportunities are likely to be limited to small service and repair operations, storage facilities, and other service business uses that are oriented to the needs of the region's suburban and rural communities.

The anticipated demand for industrial space in this region will be more light industrial uses and can be accommodated within the existing industrial or mixed-use zones of the town centers of Kailua and Kāneohe and in the vicinity of the Kapaʻa quarry." Section 3-46.

Therefore, the Koolau Poko SCP acknowledges the demand for light industrial uses in the vicinity of the Kapa'a quarry, and the KLIP fits the type of service and repair shops and storage facilities envisioned in that plan.

CHAPTER 4 - ENVIRONMENTAL IMPACTS AND MITIGATIONS

Chapter 4 of the 2011 FEIS described the various impact by the Proposed Action and impact mitigation measures that were proposed in the approved 2011 FEIS. As was described before in this 2021 Draft SEIS, there have been significant changes in the site development approaches since the 2011 FEIS was approved. This section therefore describes changes in the site development and evaluates changing impacts and the proposed impact mitigation measures.

The differences will be clarified between the SEIS Preferred Alternative and the SEIS No-action alternative. The SEIS Preferred Alternative includes the proposed changes in site development strategies and the impact mitigation measures proposed to Lower impacts to the environment and the community than those disclosed in the 2011 FEIS or other governmental permitting actions.

The SEIS "No-Action Alternative" does not show proposed changes in site development strategies and therefore does not include the proposed impact mitigation measures. As a result, the SEIS "No-Action Alternative" would cause impacts predicted to be more severe than those under the Preferred Alternative. The SEIS "No-Action Alternative" is not to be confused with a typical "no-Action" alternative that would eliminate any development on the project site.

The discussion in this Section will include current SEIS relevant alternatives, and not the two 2011 FEIS alternatives. However, where appropriate, direct references to impact mitigation comparisons between the current SEIS and the 2011 will be made.

4.1 Impact Mitigation though Low Impact Development for Lower Portion of the Site

2011 FEIS Commitments Still in Force

Section 4.1 of the 2011 FEIS describes a central premise by the Applicants that goes to the heart of the overall site development approach of the Kapa'a Light Industrial Park. This premise is the assertion by the Applicants will use sustainable and low impact development strategies for the development of the project site.

In the 2011 FEIS, the Applicants made a commitment to use green building strategies to develop the Lower portion off the project site which are consistent with the LEED Green building standards. The goal is to obtain LEED certification for the Lower site.

The proposed development in the Lower site will therefore be designed and constructed to conform to requirements under the Leadership in Energy and Environmental Design (LEED) green building certification system of the U.S. Green Building Council. The LEED green building certification program recognizes sustainable green building and development practices and awards levels of compliance to projects that implement strategies for better environmental and health performance.

Under the LEED certification a project must qualify, confirmed by a third-party audit, to achieve a certain number of points, in accordance with different levels of certification. The goal is to achieve a Silver certification of the Lower portion of the site.

In the time since the 2011 FEIS was approved. the LEED standard has gone through changes and the certification requirements have become more stringent.

The sustainable development plan for the Lower portion of the site, described in the 2011 FEIS, is still valid. The plan emphasized those LEED credit categories which would effectively mitigate impacts causing the largest concern for the project site. Consequently, the mitigation of water-related impacts was emphasized by attempting and surpassing the maximum LEED credit points for water efficiency. In addition, the Applicants decided to pursue all relevant Sustainable Sites category credits. Some credits were not readily achievable due to the location of the proposed site (not close to existing residential areas, high density developments or connected to public transportation), therefore these credit points were not attempted. Under the credit area Sustainable Sites, however, important mitigation of stormwater runoff and light pollution was implemented.

Table 4.1.1. shows the LEED credits that were selected in the 2011 FEIS for implementation to make recognizable steps for effective impact mitigations and describes any changes in the LEED credit strategy since that time. **All mitigation strategies planned to be attempted also are consistent with the 2017 Koolau Poko Sustainable Communities Plan**.

Table 4.1.1 LEED credits to mitigate significant impacts to the environment and community as delineated in the 2011 FEIS, with current changes added and underlined (source Table 4-1 of 2011 FEIS)

Type of LEED credit / prerequisite		Types of environmental impact that are mitigated
LEED Credit Category - Sustainable sites		
	Alternative Transportation - Bicycle	2011 FEIS Lowering the amount of traffic on the roadways to the project and directly adjacent to the marsh by promoting the use of bicycles to commute. The present traffic situation on the quarry road is not conducive to bikers; the proposed marsh perimeter pathway would provide an excellent approach to combine bicycle friendly traffic condition with making the marsh more accessible regarding recreation and enjoyment of nature. Current SEIS This LEED credit will still be attempted. The realization of sizable pedestrian or bicycle traffic to the site would be greatly supported by the construction of a Kawainui Marsh perimeter trail.

Table 4.1.1 LEED credits to mitigate significant impacts to the environment and community as delineated in the 2011 FEIS, with current changes added and underlined (source Table 4-1 of 2011 FEIS)

Type of LEED credit / prerequisite		Types of environmental impact that are mitigated
	Restore Habitat	2011 FEIS The areas around the development footprint are restored with native or adapted plants, and the present invasive vegetation will be removed. These areas will serve as vegetative buffer zones around the development site, thereby mitigating visual impact, noise impact and air pollution. Furthermore, the buffer zones will provide some habitat for wildlife and will serve as infiltration areas for stormwater and treated wastewater, thereby mitigating runoff, and providing for better onsite wastewater treatment. Current SEIS This LEED credit will still be attempted. The new site perimeter berms will have a dense vegetation cover primarily for visual impact mitigation, but also for noise and fugitive dust mitigation. The vegetation cover will provide habitat for wildlife and will serve as infiltration areas for storm water and possibly also for recycled wastewater if applicable.
	Maximize Open Space	2011 FEIS The areas within and at the perimeter of the development footprint will contain the maximum amount of open space which is achievable for the planned layout of the warehouse development. The open space will be vegetated and pervious; open space also includes open grid pavement, which contains some vegetation and has a perviousness of at least 50 percent. Current SEIS This LEED credit will still be attempted. The open space outside of the project site will remain open space.
	Stormwater Design - Quantity	2011 FEIS The installation of detention ponds will act as flood control and will mitigate high runoff volume that could cause erosion impacts on the stream beds and associated sedimentation in the receiving waters. The design of detention ponds will consider measures to avoid attracting endangered water birds

Table 4.1.1 LEED credits to mitigate significant impacts to the environment and community as delineated in the 2011 FEIS, with current changes added and underlined (source Table 4-1 of 2011 FEIS)

Type of LEED credit / prerequisite		Types of environmental impact that are mitigated
		to the open water within the detention ponds, which could expose the birds to enhance predator threats. The use of stormwater recycling and rainwater harvesting will furthermore mitigate the frequency of runoff event that will fill the detention ponds. Current SEIS This LEED credit will still be attempted, and in fact the credit requirements will be exceeded. Underground storm water detention vaults will be used in lieu of extended detention ponds, since ponds with free water surface must not be used to avoid attraction of water birds to the project site. Attraction of water birds to the project site could enhance predator risks and traffic-related risks for the birds.
	Stormwater Design – Quality	2011 FEIS The stormwater runoff will be treated at an enhanced standard by using a comprehensive treatment approach that will contain stormwater filter units and one extended detention pond. The filter units are located upstream of the detention pond and serve as settlement tanks that remove all floatable debris, sediments and oil and grease from the runoff. The extended detention ponds have a design residence time of 24 to 48 hours and provide treatment capacities to further remove sediments, nutrients, and suspended solids. The combined pollutant removal rate of the filter units and detention ponds is estimated of well over 80 percent, which is the required threshold for this LEED credit. With implementing this comprehensive stormwater treatment system impacts from stormwater runoff to the receiving waters, e.g., the Kapa'a Stream, the adjacent wetland area, the Kawainui marsh and the drainage canal along the quarry road can be effectively mitigated. Current SEIS This LEED credit will still be attempted, and in fact the credit requirements will be exceeded. An advanced stormwater treatment system will be installed that will include low impact (LID) technologies as well as manufactured treatment devices

Table 4.1.1 LEED credits to mitigate significant impacts to the environment and community as delineated in the 2011 FEIS, with current changes added and underlined (source Table 4-1 of 2011 FEIS)

Type of LEED credit / prerequisite		Types of environmental impact that are mitigated
		(MTDs). The proposed storm water BMPs under the 2011 FEIS will be replaced by storm water BMPs which are more effective in treating the storm water runoff.
	Heat Island Effect – Non-roof	2011 FEIS The use of pavement with high Solar Reflectance Index (SRI) material, the planting of trees and the use of open grid pavement decreases the heat island effect within the development, therefore improving the thermal performance of the buildings. The use of trees inside the development will also mitigate visual impacts. Current SEIS This LEED credit will still be attempted. The updated site design has changed to remove landscaped areas inside the site from the site development plans. Therefore, trees will not be planted throughout the interior of the site, but only at the building walls in relatively narrow plant beds. The use of high Solar Reflectance Index (SRI) pavement will still be used to Lower heat island effects.
	Light Pollution Reduction	2011 FEIS Light pollution, or excessive lighting that can impact wildlife in the adjacent wetlands, diminishes night sky enjoyment and produces glare, which could be detrimental to motorists passing the development. Implementing effective reduction of exterior and interior lighting are effective measures to mitigate this impact. Current SEIS This LEED credit will still be attempted. Reducing light pollution for the new site development has been described in a Light Pollution Reduction Plan that was approved by the accepting agency.
Credit category WE - Water Efficiency		
	Water Use Reduction	2011 FEIS

Table 4.1.1 LEED credits to mitigate significant impacts to the environment and community as delineated in the 2011 FEIS, with current changes added and underlined (source Table 4-1 of 2011 FEIS)

Type of LEED credit / prerequisite		Types of environmental impact that are mitigated
		The reduction of water use by at least 30 % reduces the impact on the municipal infrastructure and reduces the amount of wastewater that needs to be treated onsite. The mitigation of all water related impacts resulting from the proposed development are a high priority for the proposed project. Current SEIS This LEED credit will still be attempted. Reducing potable water consumption is an important site development strategy. The water reduction strategies will include selected water conserving fixtures. In the time since 2011 FEIS, significant water conserving technology has become widely available and is now a recognized building approach.
	Water Efficient Landscaping	2011 FEIS Avoiding potable water for irrigation reduces the impact on the resources of the municipal water supply and reduces impacts of runoff, since stormwater can evaporate from plants and infiltrate into the ground rather than be discharged directly into the receiving waters. The use of native and adaptive plants within the development and in the buffer, zones surrounding the developments reduces the demand for irrigation water, but also reduces the requirements for fertilizers and pesticides. Current SEIS This LEED credit will still be attempted. Storm water will be harvested and use to irrigate the vegetated site perimeter berms, the vegetated buffer strips (a LID technology) and planters adjacent to buildings. The proposed irrigation system will significantly reduce potable water use for irrigation.
	Innovative Wastewater Technologies	2011 FEIS The use of advanced onsite wastewater treatment effectively reduces the emissions of biological oxygen demand (BOD), total suspended solids, nutrients, metals, and harmful bacteria in the effluent of the development. The advanced

Table 4.1.1 LEED credits to mitigate significant impacts to the environment and community as delineated in the 2011 FEIS, with current changes added and underlined (source Table 4-1 of 2011 FEIS)

Type of LEED credit / prerequisite		Types of environmental impact that are mitigated
		treatment furthermore makes it possible to use the treated wastewater for below ground irrigation, furthering the treatment of the wastewater, and producing a sewage effluent that will surpass the typically achievable pollution removal rates in domestic and commercial sewages effluent. The removal of high amounts of pollutants from the effluent of the development is effectively reducing impacts on the receiving waters and is protecting the adjacent wetlands. Current SEIS This LEED credit will still be attempted, and in fact significantly exceeded. The selected wastewater technology currently implemented at the site significantly surpasses conventional wastewater treatment technology. The selected wastewater treatment technology is based on Membrane Bioreactor (MBR) processes. The selected MBR process has been certified under the NSF 350 standard, which endorses the onsite wastewater technologies to use the treated effluent for irrigation and other external applications.
Credit category - Energy & Atmosphere		
	Optimize Energy Performance	2011 FEIS The planned significant reduction of energy consumption, at least 30 percent, and power demand in the proposed development will mitigate impacts on the energy supply of the state. By providing modern, environmentally friendly and energy efficient warehouses to replace older inefficient industrial buildings has an important benefit for the environment and for Hawaii's residents. At the present, Hawaii obtains about 80 percent of its electricity from imported oil, making it one of the most oil dependent locations in the developed world. Saving electricity equates to saving importing oil which mitigates impact on the environment and the economy.

Table 4.1.1 LEED credits to mitigate significant impacts to the environment and community as delineated in the 2011 FEIS, with current changes added and underlined (source Table 4-1 of 2011 FEIS)

Type of LEED credit / prerequisite		Types of environmental impact that are mitigated
		Current SEIS This LEED credit will still be attempted. Reducing energy consumption is an important green building applications for the project site.
	On-Site Renewable Energy	2011 FEIS Implementing renewable energies to power the proposed development reduces the energy consumption and reduces the peak power demand. By reducing the power demand, the public utilities are less burdened by the new development and thus less new infrastructure must be built and maintained, thereby directly reducing impacts on the environment and the community. Current SEIS This LEED credit will still be attempted. The Applicants have already installed a significant capacity of photo-voltaic system on the roof of warehouses. If permits allow, the Applicant plan to install significantly more PV capacity at the project site in the future.
	Measurement & Verification	2011 FEIS Verification that the ambitious energy and power reduction plans are met by the tenants is important to continuously assure that the environmentally friendly and energy efficient design goals are met during operation of the proposed industrial park. Current SEIS This LEED credit will still be attempted. Some of the applicable requirements an already spelled out in the new Honolulu Energy Code.
Credit category - Materials & Resources		
	Storage and Collection of Recyclables	2011 FEIS The handling of waste will be an important aspect of environmentally friendly operation of the proposed industrial park. Well planned and maintained waste management and

Table 4.1.1 LEED credits to mitigate significant impacts to the environment and community as delineated in the 2011 FEIS, with current changes added and underlined (source Table 4-1 of 2011 FEIS)

Type of LEED credit / prerequisite		Types of environmental impact that are mitigated
		recycling programs will increase the awareness of the occupants to engage in responsible handling of waste and avoid littering, thus mitigating the possibility that waste can pollute the adjacent wetland and other environmentally important areas. Current SEIS This LEED credit will still be attempted. Since the project site has no municipal waste collection, refuse is collected and disposed of by contractors.
	Construction Waste Management	2011 FEIS Construction waste management will reduce the amount of waste that has to be transported to landfills. Traffic impacts are reduced by Lowering the amount of construction related heavy truck traffic and impacts on the community are reduced by avoiding dumping into municipal landfills. Current SEIS This LEED credit will no longer be attempted.
	Recycled Content	2011 FEIS Recycled and reused content reduces the impacts on the community and the transportation energy demand on the islands. Current SEIS This LEED credit will still be attempted. Collecting recyclables at the project site has been going on for several years. These efforts will be continued in the future.
	Regional Materials	2011 FEIS The use of regional material reduces the need to import materials to the state and supports the community by supporting local businesses. Current SEIS This LEED credit will still be attempted to the extent possible.

Table 4.1.1 LEED credits to mitigate significant impacts to the environment and community as delineated in the 2011 FEIS, with current changes added and underlined (source Table 4-1 of 2011 FEIS)

Type of LEED credit / prerequisite		Types of environmental impact that are mitigated
Credit Category - Indoor Environmental Quality The warehouses will be constructed in a "core-and-shell" manner, meaning only common areas will be constructed by the Applicants and the tenants will be responsible for their interior build-out. Therefore, IEQ related impact mitigation strategies will only apply to the common areas.		
	Construction IAQ Management Plan - During Construction	2011 FEIS By using strict rules about construction material handling and the use of low emitting materials impacts on the indoor and outdoor environment can be Lowered. Current SEIS This LEED credit will not be attempted because the warehouses are constructed in a "Core and Shell" manner.
	Low-Emitting Materials	2011 FEIS By using only adhesives & sealants as well as paints & coatings with low concentration of harmful components, a good indoor and outdoor environment is maintained. In addition, there will be active encouragement to the occupants to use only environmentally friendly adhesives, sealants, paints, or cleaning agents helps to mitigate further impacts to the environment during operation of the proposed industrial park. Current SEIS This LEED credit will still be attempted. Reducing material that emits harmful air pollutants is an important measure to protect tenants.
	Daylight & Views	2011 FEIS The use of daylighting will reduce the electricity demand and related impacts on public infrastructure. By implementing the extensive use of daylighting, the building design needs to address mitigating measures for light pollution from internal lighting that might arise when building openings (e.g., those used for daylighting) can transmit light at night and thus contribute to light pollution. Current SEIS

Table 4.1.1 LEED credits to mitigate significant impacts to the environment and community as delineated in the 2011 FEIS, with current changes added and underlined (source Table 4-1 of 2011 FEIS)

Type of LEED credit / prerequisite		Types of environmental impact that are mitigated
		This LEED credit will still be attempted. Providing daylight through skylights has been used for previous warehouses at the site.
Credit category - Bonus credits from Innovation & Design, Exemplary Performance and Regional Priorities		
	Educational Program	2011 FEIS The applicant will develop and implement an educational program about the environmentally and culturally important Kawainui Marsh. The program will endeavor cooperation with schools and environmental groups to develop, produce and maintained the educational program. This effort will increase community involvement and will assist to identify and mitigate concerns of the community. Current SEIS This LEED credit will still be attempted. The initial idea was to erect some form of educational kiosk adjacent to the project site that describes how industrial developments which adopt green building measures can coexist with environmentally sensitive areas. The updated approach would be to support community-planned educational facilities at the marsh perimeter.
	Electric Vehicles for Maintenance Vehicles	2011 FEIS The use of electric vehicles for maintenance of the proposed park helps to Lower noise and air pollution. The use of renewable energy for the maintenance vehicles (either through onsite renewable energy generation or through tradable renewable energy certificates) will reduce impacts on the environment and the community. Current SEIS This LEED credit will still be attempted if <u>there is sufficient photovoltaic capacity available.</u>
	Legally Binding Performance Criteria for Tenants	2011 FEIS

Table 4.1.1 LEED credits to mitigate significant impacts to the environment and community as delineated in the 2011 FEIS, with current changes added and underlined (source Table 4-1 of 2011 FEIS)

Type of LEED credit / prerequisite		Types of environmental impact that are mitigated
		Making provisions of the sustainable development approach contractually binding, rather than voluntary, will help to achieve the goals for an environmentally friendly and energy efficient industrial park. Current SEIS This LEED credit will not be attempted
	Exemplary Performance for Stormwater System	2011 FEIS The project will implement a comprehensive stormwater treatment system that goes beyond conventional stormwater treatment technologies. In doing so, the project will qualify for exemplary performance credits. By using advanced stormwater treatment to treat 100 percent of the stormwater runoff, environmental impacts associated with runoff will be effectively and greatly mitigated, thus significantly reducing impacts on important water resources adjacent to the project, including the Kawainui Marsh. Current SEIS This LEED credit will still be attempted. The storm water treatment and management approach for the Lower site significantly exceeds credit requirement.
	Exemplary Performance in innovative wastewater technologies	2011 FEIS Adding advanced sewage treatment process steps to the conventional septic systems (such as aerobic biological treatment, denitrification by conversion of nitrates to atmospheric nitrogen, phosphate removal through absorption in the filter bed, sand filters and below ground irrigation fields), results in high removal rates of harmful pollutants in the wastewater effluent. The effective removal of a high portion of harmful pollutants significantly reduces environmental impacts. Current SEIS

Table 4.1.1 LEED credits to mitigate significant impacts to the environment and community as delineated in the 2011 FEIS, with current changes added and underlined (source Table 4-1 of 2011 FEIS)

Type of LEED credit / prerequisite		Types of environmental impact that are mitigated
		This LEED credit will still be attempted. The wastewater treatment and management approach for the Lower site significantly exceeds credit requirement.
	Regional Priorities	2011 FEIS By implementing design and construction measures and technologies that are deemed important for the region, the project contributes to Lowering impacts to the environment and the community. Current SEIS This LEED credit will still be attempted. Storm water and wastewater treatment and management is of high regional importance.

4.2 Geology, Topography, and Soils Existing Environment

Section 4.3 of the 2011 FEIS describes impacts on geology, topography, and soil at the project site.

4.2.1 Impacts on Geology and Mitigation

The SEIS Preferred Alternative and SEIS "No-Action Alternative" would be developed within previously disturbed soil areas and thus the project would not impact local geology.

No mitigation measures would be required under both actions, e.g., the SEIS Preferred Alternative and SEIS "No-action Alternative".

4.2.2 Impacts on Topography and Mitigation

The present topography within the proposed project areas is generally flat, as a result of past landfill operations, which created two distinct topographic features. The Upper portion of the site is practically flat, with an average elevation of 85 feet and a maximum height difference of 10 feet between the western and eastern boundaries of the Upper portion of the site. The height difference of 10 feet occurs at one location where a 5 to 8 feet high berm separates the "older" from the "newer" Upper site

The Lower portion of the site has a slight elevation gradient towards the North-east. The elevations at the opposite site perimeter are about 45 feet.

SEIS Preferred Alternative – implementation would result in negligible alterations of existing topography in the Upper portion of the site and significant alterations for the Lower site. All the land in the Upper

portion of the site has been previously graded and has a topography that is suitable for the planned development. Under the SEIS preferred Alternative, the full build-out finish grade elevation in the Lower site would increase by an average 12 feet.

SEIS No-Action Alternative – Implementation would likewise result in negligible alterations of existing topography in the Upper portion of the site and significant alterations for the Lower site. Under the SEIS No-Action Alternative, the full build-out finish grade elevation in the Lower site would increase by an average 5 feet. Under both alternatives, the topography of the sloped areas between the Upper and Lower portions of the site would not be altered, except for some grading to accommodate the landscaped areas and some minor structures or infiltration fields for the treated wastewater.

Expected impacts due to the presence of the added fill and increased full build-out site perimeter berms would be somewhat higher for the SEIS Preferred Alternative than for the SEIS No-Action Alternative. This is since more erosion of un-stabilized slopes can be expected with higher berms. Higher impacts from fugitive dusts and soil transported to and distributed on the site can also be expected for the SEIS Preferred Alternative because of the higher finish grade elevation and the larger volume of fill that must be brought to the project site and distributed during grading. The latter would impose higher traffic impacts during construction.

The elevated finish grade would pose visual impacts of the perimeter berms which would be similar under both alternatives but would be more pronounced under the SEIS Preferred Alternative, because of the higher perimeter berm elevations.

Mitigation efforts to curb fugitive dust would have to be more effective and would have a wider scope for the SEIS Preferred Alternative. Likewise, impact mitigation during construction would have to be more effective and more applied under the SEIS Preferred Alternative. Visual impact mitigation would be similar for both SEIS Alternatives with planting a dense vegetative cover on the perimeter berms, with large trees on or near the crown of the perimeter berms.

Important Differentiator- The SEIS Preferred Alternative has one important differentiator compared to the SEIS No-Action Alternative - the elevation of the full build-out finish grade in the SEIS Preferred Alternative is the height that is required for the proposed storm water treatment and management system. **Therefore, the elevated finish grade of the SEIS Preferred Alternative is an important enabler for effective storm water impact mitigation.**

4.2.3 Impacts on Soils and Mitigation

This section evaluates potential effects of the SEIS Preferred Alternative and the SEIS No-Action Alternative on soil resources at the proposed site and the potential for soil characteristics to affect proposed uses.

Both alternatives would directly affect soils because of construction/demolition activities (i.e., grading, excavation, placement of fill, compaction, mixing, and augmentation) on approximately 10 and 19 acres in the Upper and Lower portion of the site, respectively. Of the estimated 29 acres (combined), all construction would occur on currently graded and pervious land.

All land that is being used for the development of the proposed industrial park is presently graded and no open space, outside the land created by former landfills, will be used for the development.

The presently graded surfaces used for the development are not vegetated and are either practically flat or have small slopes, therefore impacts from erosion and associated sedimentation would be limited.

SEIS Preferred Alternative - land inside the site perimeter both the Upper and Lower portions of the site would be converted from pervious and graded land to developed and impervious land (including impervious roadway pavement, roofs, concrete pavement between buildings) Soil productivity, (i.e., the capacity of the soil to produce vegetative biomass), would be eliminated in disturbed areas that are converted to impervious surfaces.

SEIS No-Action- about 10 acres of land in the Upper portion of the project site would be converted from pervious and graded land to developed and impervious land (including impervious roadway pavement, roofs, concrete pavement between buildings). In the Lower site about 19 acres would become impervious land and the remaining 6 acres of land inside the site perimeter would be landscaped and therefore pervious land.

Under both alternatives:

- As part of the sustainable development approach, rainwater and stormwater runoff would be collected from selected rooftops and be used for irrigation, thus converting these impervious surfaces to quasi pervious areas.
  For the SEIS Preferred Alternative, about 35 %of the total 373,000 sqft roof tops within the Lower portion of the site would be used for rainwater harvesting, thus about 3.0 acres would be converted to quasi pervious area.
  For the SEIS No-Action alternative, a similar amount of roof top area would be used for rainwater harvesting.
- Heavy machinery would be used to prepare the site for construction of the proposed buildings and facilities and for digging trenches for utility lines. As a result, soils would be compacted, the soil layer structure would be disturbed and modified, and soils would be exposed, increasing the overall potential for erosion. Potential building limitations for soils at the proposed project site might include limitations to the load-supporting capacity of soil within the Lower portion of the site and the ease and amount of excavation required for the proposed construction. The soil layers found within the landfill area of the Lower portion of the site might contain municipal waste from previous landfill operations.
- Soil engineering studies would be conducted prior to grading in the Lower portion of the site. This assures good soil foundations for the construction of structures. Prior to construction, a sediment and erosion control plan will be developed for the proposed development, in accordance with the governing local ordinances and the requirements of the sustainable development approach (which goes beyond the measures required by local code).
- The development and implementation of a Storm Water Pollution Prevention Plan (SWPPP) was required to obtain NPDES permits for the release of construction related strong water. Several of these SWPPP have already been developed and submitted in conjunction of NPDES Notice of

Intent applications for construction related release of storm water, both for the Upper and the Lower portions of the site.

The sediment and erosion control plans and SWPPP define, among other things, appropriate site-specific Best Management Practices (BMPs) for controlling runoff, erosion, and sedimentation during construction activities. Site-specific BMPs are typically developed based on proper run-off calculations, slope factors, soil type, topography, construction activities involved, and proximity to water bodies. BMPs could include but are not limited to protective devices preventing surface drainage flows, erosion control matting, riprap, and sediment traps.

The application of any or all these BMPs, or other appropriate BMPs, would depend upon precise, specific ground conditions in the areas disturbed by construction. Areas disturbed inside the site would be stabilized with permanent pavement. Areas at the site perimeter, specifically the earth berms, will be planted preferably with native or adaptive vegetation following construction activities. This will decrease the overall erosion potential of the site and improve soil productivity. With soil erosion and sediment control measures, the actions proposed under this alternative would likely result in minor adverse impacts to soils from construction occurring in open areas.

Two soil investigations were conducted for the lower portion of the project in conjunction with site development planning. One investigation was concluded in 2012, and the other more recently in 2019. The following is a summary of the main findings and recommendations:

Site Preparation

- The site should be stripped of all vegetation, tree roots, and organically contaminated soils.
- Debris, rubbish, large organics, and other deleterious materials revealed in stripping work should be segregated and disposed.
- Trees, brush, roots, and organic-laden muck should be removed as much as feasible from existing marshy areas to receive fill, but excessively deep excavations should be avoided.
- The excavated soils can be used as fill on other areas of the site that are adequately prepared.
- Filled should compacted with appropriate heavy equipment.
- Water should be available onsite for dust control and keeping the exposed soils in a moist condition for effective compaction.

Excavations

- Some excavations might encounter large boulders, large chunks of concrete, and other unknown oversized materials that will require special efforts.
- Permanent cut slopes should be constructed no steeper than 2.0H:1V in stiff to dense soils.
- Slopes can be cut as steep as 1.5H:1V if stabilized with geogrid reinforcement.
- All cut and fill slopes should be provided with erosion protection and a complete cover of heavy vegetation as soon as possible after being constructed.
- Rows of deep-rooted vegetation such as vetiver grass can be considered to supplement the other fast-growing vegetation on the slopes. All slopes must be entirely covered with a healthy growth of protective vegetation.
- Slope benches should be provided in accordance with the grading code.

Fill

- All engineered fill should be free of deleterious materials, toxic or hazardous substances.
- Rocks greater than 6 inches in dimension should be deeper than 3 feet below finished mass graded elevations.
- Care must be given for the construction of the site perimeter berms.
- There is relatively soft to medium stiff imported clayey soils and rubbish underlain by deep, thick deposits of soft, saturated, organic laden silty to clayey marsh soils with a shallow groundwater table.
- It is stated that the impacts of seismic activity on the site are unpredictable. Generally, impacts might be more pronounced site locations where fill thicknesses are thinner and the soft, saturated marsh soils are closest to the surface.

Storm water Runoff

- It is especially important to keep water from ponding at the tops of slopes or infiltrating into slopes, which could significantly reduce their stability.
- Runoff must also be prevented from accelerating to a high rate wherever possible. The faster water is allowed to flow, the greater the erosion risk.
- Future construction must be designed to mitigate the impact of runoff on the graded site.
- Prevention of runoff onto the perimeter slopes is especially important.
- The clayey soils found at the site to have slow to very slow permeability.

Other considerations

- The perimeter berms could remain prone to creep and sliding, and require good completion of mass grading.
- It is estimated that the settlement (compression) of the underlying NATURAL soils is more than 90 percent complete under the current site condition. Therefore, ground settlement due to compression of the underlying NATURAL soil under the current condition should be minimal.
- The amount and rate of settlement of the existing FILL material is difficult to estimate and will vary according to the thickness of the FILL at a particular location, and the decomposition rate of the organics within the FILL.
- Support for new structures, pavement areas and other infrastructure will require special design and construction detailing to minimize the possible adverse effects from settlement (see the Support for Building and Infrastructure section below).
- Placement of additional fill over the site will result in additional ground settlement. It is estimated that the settlement will be on the order of 3 to 5 inches per 5-feet of fill.
- Except for the perimeter areas, the site topography is generally flat to gently sloping.

4.2.4 Special Considerations of Developing on the Former Landfill of the Project Site

Section 4.2.4 of the 2011 FEIS described considerations of construction on former landfills. The project site is a former landfill area. Based on information reviewed after the 2011 FEIS, the Lower and Upper portions of the site differ in the soil composition and their ability to support buildings. This affects the type of construction that has been used in the Upper site and will be used in the Lower site.

The considerations discussed hereafter apply for **both** the SEIS Preferred Alternative and the SEIS No-Action Alternative. Environmental impacts are similar between the two alternatives and impact mitigation measures are also similar and do not have to be differentiated.

The Upper site contains mostly inert fill that originated from quarry tailings and overburden. Soil exploration conducted after the 2011 FEIs was approved revealed that there is a high portion of clay below a 2-foot top layer of gravel. Based on soil studies, the soil can be assumed as fully consolidated.

In the Lower portion of the project site, soil studies have revealed quantities of municipal solid waste (MSW), including organic material, in the landfill body. It was reported in soil studies that the land fill body can be assumed to be nearly consolidated, with some more settling being expected once weight is added to the land fill.

Redevelopment of landfill areas that consist mostly of inert material, such as the Upper site, represents the easiest type of landfill to redevelop, as environmental problems are usually minimal and conventional geotechnical ground improvement techniques can be used.

Landfills that contain MSW, such as the Lower site, are the most common forms of landfill and redevelopment of this type of landfill needs to consider more engineering and environmental aspects, including special requirements for foundations due to differential settlement, and decomposition of organics which result in gaseous and liquid agents that leave the landfill, and therefore need to be mitigated with appropriate measures.

Redevelopment of landfills, both for inert and MSW, can utilize a wide range of established building and development technologies, depending on the type of land uses, such as soft (i.e., landscaping, parks, etc.) and hard uses (i.e., buildings, infrastructure), or the amount of gas and leachate generated in the landfill, among other design considerations.

The right foundation technology is dependent on the vertical and lateral load bearing capacity of the land fill material and whether landfill gas might migrate out of the landfill body. As a rule of thumb, redevelopment of closed landfills for hard use, such as that intended for the proposed project, should not start within 10 years of the closure of the land fill operations.

For the proposed project, landfill operation was discontinued more than 40 years ago, and therefore the landfill should have reached a degree of stability that is necessary to substantially mitigate the engineering and health and safety concerns associated with waste degradation. In general, there are two types of foundations used in landfill redevelopment: deep and shallow foundations. The proposed warehouses are relatively light structures that could use shallow foundations, such as raft foundations. If found to be necessary, some form of deep foundation might be considered for selected buildings,

though deep foundations using piles are not anticipated to be extensively used for the proposed site, if at all.

The soil bearing capacity in the Upper portion of the site has been investigated, and the experience with the existing buildings at the site indicates that normal foundations can be used on the structurally stable land. In contrast to the Upper portion of the site, where substantial structures have been built and show adequate foundation support, there are no existing large structures within the Lower portion of the site. The soil bearing capacity within the Lower portion of the proposed site and the most suitable type of foundation will be determined before construction of the structures begins.

The most appropriate foundation approach will be determined for the planned traffic areas and warehouse buildings. In addition to selecting an appropriate foundation approach for building structures, an appropriate load bearing approach must also be applied for the paved traffic areas to avoid possible problems arising from differential settling. Even if differential settling might occur, tested and state-of-the-art construction and building methods are available to manage unfavorable site conditions. These conditions are not expected given the experiences with the existing use and structures within the Upper portion of the site.

It should be noted that the intended use of the proposed site will be warehouse structures. The site development plan does not include any high-rise buildings or process facilities, which would require advanced load bearing capability, such as deep foundations with longer piles.

The intended structures for the proposed site will use conventional foundations, such as slab on- grade foundation. The present use of the site has indicated that the sub-grade represents a stabilized body that is deemed suitable for the intended type of structures.

It should be noted that construction on landfills typically requires more effort in design, construction and operation, and that redevelopment of landfills is more costly that developing regular construction sites. The benefit to the community is that redeveloped landfill area can free more valuable land for other developments in the community, and potentially reduce urban sprawl and related ecological stress to the environment.

4.3 Impacts on Water Resources

Section 4.3 of the 2011 FEIS discussed impacts and impact mitigation related to water resources for the alternatives presented in the 2011 FEIS. This SEIS section 4.3 describes impacts and impact mitigation for the SEIS preferred Alternative and the SEIS No-Action Alternative.

Assessing impacts on water resources adjacent to the project site and developing effective impact mitigation is of high importance for the site development approach because of the proximity of the project site to Kawainui Marsh and other wetland areas.

The fundamental differences between the SEIS Preferred Alternative and the SEIS No-Action Alternative in conjunction with water resources impacts is that the SEIS Preferred Alternative would implement advanced storm water and wastewater technologies while the No-Action Alternative would not.

Under the SEIS No-Action Alternative, storm water treatment and management strategies would be applied that reflect strategies that were presented in the 2011 FEIS, or strategies that would implement basic strategies that were compliant with governmental requirements, without pursuing site development strategies that are capable of more advanced impact mitigation.

The 2011 FEIS described basic storm water treatment and management concept designs that were not based on detailed design assessments to ascertain benefits and challenges of these design concepts. In the time since the 2011 FEIS was approved, more detailed engineering assessments have been performed.

These engineering assessments concluded that the storm water impact mitigation proposed in the SEIS Preferred Alternative would be the most viable options for the Lower portion of the site. This is because the discharge of storm water runoff requires a significant hydraulic head, or hydraulic energy, to drive the flow of the storm water runoff, to initiate and sustain the flow of storm water runoff through the treatment process. Therefore, the SEIS No-Action Alternative would not be considered for the storm water management system in the Lower portion.

The storm water treatment and management in the Upper site has minor differences between the SEIS Preferred Alternative and the SEIS No-Action Alternative. The only difference is that the SEIS Preferred Alternative would use vegetated buffer strips for three new buildings.

The onsite wastewater treatment technology used at the project site differs significantly between the SEIS Preferred Alternative and the SEIS No-Action Alternative. Under the SEIS Preferred Alternative, advanced onsite wastewater treatment would be used. Under the SEIS No-Action Alternative, conventional septic systems would be used. The significant difference between these two wastewater technologies is the degree of impact, which is significantly smaller with the waste wastewater treatment under the SEIS Preferred Alternative.

The following sections describe the potential effects of the alternatives on water resources at and surrounding the proposed site. Such water resources include surface and ground waters and consider impacts of the proposed project on the Kapa'a watershed, floodplains, and wetlands. Possible impacts by the drainage system, construction activities and leaching of the landfill are also considered.

4.3.1 Impacts on Surface Water and Mitigation

Section 4.3.1. of the 2011 FEIS described impacts of the Proposed Action under the 2011 FEIS on surface water resources both on and downstream of the project site. Storm water runoff is a leading cause of water quality impairment to receiving waters. Storm water management reduces or eliminates negative impacts of storm water runoff.

This section 4.3.1 describes effects of the two SEIS alternatives on surface water. Effects described hereafter include increased impervious surfaces and stormwater flows and their potential effects on surface water quality. The type of storm water impacts causes by the development of the project site is similar for the two SEIS alternatives. The type and effectiveness of impact mitigation is different between the two alternatives.

Storm water related impacts from new developments are distinguished between the construction related impacts and impacts during regular operation.

During construction, soils would be exposed, which could create increased potential for erosion and/or transport of surface pollutants into adjacent water bodies. A sediment and erosion control plan, or storm water pollution prevention plan, would be developed, as part of the permit requirements, to reduce surface erosion and control runoff of pollutants, slow the rate at which water leaves the site, and capture eroded soils and concentrated nutrients before they enter the downstream receiving waters. Site conditions typically determine the most suitable and effective Best Management Practices (BMPs) to reduce potential impacts to adjacent land and waters. These construction related BMPs typically would include the following measures:

- Erosion containment such as silt fencing and sediment traps to avoid runoff of sediment from the site.
- Utilizing sedimentation basins to allow for settling of sediments from stormwater volumes,
- Covering disturbed soil or soil stockpiles with suitable cover material, i.e. , plastic sheet, place hay, grass, woodchips, straw, or gravel on the soil surface to cover and hold soils Scheduling the construction progress and applying the BMPs so that soil exposure remains minimal.
- Regular inspection of the erosion and sediment control BMPs and especially after each rainfall.
- Preventive measures to avoid exposure of hazardous materials, i.e., fuel or chemicals used in the construction and contain all rainwater that has been in contact with such material.
- Using a stabilized entry/exist to the construction site use stabilization gravel to avoid soil and dirt to be carried onto public roadways.
- One especially effective BMP for construction storm water pollution prevention for the construction in the Lower project site will be the construction of the earth berms before the grading of the Lower portion of the site commences. The berms are configured to be about 2 feet higher than the full build-out interior site finish grade. Therefore, the berms crowns will serve as effective containment in addition to the other containment measures.
- The planned BMPs and other measures of the sediment and erosion control plan, which will be implemented during construction, would effectively mitigate impacts to the water quality of the receiving waters surrounding the site. If impacts would occur from construction activities, these are expected to be minor and of short duration, occurring primarily during storm events.

Post-construction storm water pollution prevention measures, or BMPs must be installed and maintained during the lifetime of the project. These BMPs include structural and non-structural BMPs.

Structural BMPs are defined as stationary and permanent BMPs which are designed, constructed, and maintained to prevent or reduce the discharge of pollutants in storm water runoff. Since the project site is a former land fill where infiltration of precipitation contributed to the formation of landfill leachate, infiltration at the project site must be avoided, thus pervious cover must be avoided or minimized.

Non-structural BMPs focus on preserving open space, protecting natural systems and incorporate source control measures. One typical non-structural BMP is the reduction of impervious cover to promote infiltration of rainwater and thus retaining the storm water within the site.

The SEIS Preferred Alternative would have the following BMPS:

Structural BMPs:

- Drain inlets with debris screens to hold back larger floatable items.
- Vegetated buffer strips, to remove nutrients, sediments, and suspended solids, as potentially some heavy metals, through the filtering effects of vegetation, typically grasses.
- Rooftop runoff capture and reuse, for irrigation of the vegetated buffer zones, the vegetated buffer strips, and smaller plant beds inside the site.
- Water quality filters which are run-through treatment units for the water quality relevant flow, which for the project site is the controlled release of the dry detention vaults.
- Dry detention vaults below ground to temporarily detain run off and subsequently release the detained water controlled over a time between 25 - 36 hours. Controlled release of detained water shaves off high peak flow rates and mitigates potential stream bed erosion.
- Infiltration basin, the existing and vegetated infiltration and detention basin to the West of the Upper site boundary will be used to accommodate runoff from about 5 acres of the Upper site.
- Armored outfalls to the receiving water avoid soil erosion - the Upper project site has sloped site perimeters where the armored outfall avoids soil erosion of the slopes. In the Lower site, several armored outfalls avoid soil erosion of the vegetated areas in the Kapa'a Stream corridor. Although the vegetated area in the Kapa'a Stream corridor at the points of discharge of the outfalls is relatively flat, a riprap soil cover will dissipate flow energy and distribute the discharged water to a larger area, rhus mitigating soil erosion and associate impacts.
- Landscape restoration of the site perimeter zones.

Nonstructural BMPs:

- Protect riparian areas and natural flow pathway through effective pollution prevention. Protection of the adjacent wetlands and the Kapa'a Stream would be protected against runoff pollution and stream bed erosion.
- Revegetate the site perimeter zone as restored habitat.
- Rooftops disconnect - about 35% of the roof tops in the Lower site are collecting rainwater and harvesting it for irrigation and potentially other custodial applications.
- Source control - several No Exposure Certifications for Exclusion from NPDES Stormwater Permitting have been obtained for the existing warehouses and new No Exposure Certifications will be obtained for all new warehouse buildings. The No Exposure certifications (renewed every five years) require specific storm water pollution prevention measures which significantly improve source control.

Note that the SEIS No-Action Alternative could only implement the before mentioned structural BMPs in the Upper portion of the site, except for the vegetated buffer strips. The previous storm water treatment and management strategy for the Lower site, which was endorsed by the Accepting agency, suggested a combination of vegetated swale and infiltration vaults upstream of the perimeter berms at the Eastern site boundary. The infiltration would be located below the vegetated swales and receive treated runoff for temporary detention and subsequent infiltration. Infiltration from the underground

pervious detention vaults would have initiated sub surface water migration under the new earth berm at the Eastern site perimeter and towards the drainage ditch along the Kapa'a Quarry Road. The overflow of the vegetated swales and therefore the detention vaults would have been conveyed through drainpipes and discharged into the drainage ditch.

A soil engineering report commissioned by the Applicant in conjunction with a mass grading permit for the Lower site ruled that infiltration of significant water upstream and adjacent to the perimeter berms should not occur to avoid berm instability. (Refer to geotechnical recommendations restated Section 4.2.3). Furthermore, observation of the current conditions of the existing drainage ditch along the Kapa'a Quarry Road have revealed that the drainage capacity of the ditch is severely impaired due to soil filling the ditch and dense vegetation growing inside the ditch. For these reasons, the previously endorsed storm water treatment and management strategy can no longer be implemented.

A subsequent engineering redesign of the storm water treatment and management in the Lower site would collect the stormwater throughout the site, convey it through large diameter drainpipes to the Northern site perimeter, where the storm water would pass through a combination of vegetated buffer strips, below ground detention and manufactured treatment devices (MTD). The treated runoff would then be released at multiple locations via armored outfalls to vegetated areas inside the Kapa'a Stream corridor. The proposed storm water treatment and management system in the Lower site could only function if the full build-out finish grade could be elevated to overcome the approximate 20 feet of hydraulic energy head (e.g., hydraulic flow energy) required to convey runoff through the storm water system.

In the Lower portion of the project site, the SEIS No-Action Alternative would not provide the required elevated finish grate that is required to convey the runoff through the proposed storm water treatment and management systems. **Therefore, under the SEIS No-Action Alternative, the storm water treatment and management system would not have all the required structural BMPs which must be added to effectively mitigate storm water related impacts.**

The proposed storm water treatment under the SEIS Preferred Alternative represents a significant change from the storm water related site development and impact mitigation strategies disclosed in the 2011 FEIS. The proposed storm water strategies would have a higher efficacy of mitigating negative impacts of the runoff than the previously disclosed.

The proposed strategies for storm water treatment and management and irrigation with harvested rainwater are presented in Section 6.2 and 6.8 in this Draft SEIS document, respectively.

4.3.2 Impacts on Ground Water and Leachates from the Landfill Body

Section 4.3.2 of the 2011 FEIS described impacts on ground water and leachate from the landfill. The basic environmental processes and impacts remain the same under the Proposed Action described in this Draft SEIS. Impact mitigation measures, however, differ from the conditions disclosed in the 2011 FEIS.

Groundwater is an accumulation of water within underground soil structures. Groundwater recharge results from infiltration of surface water through surface layers and into underlying aquifers. The

capacity of aquifer recharge is typically affected by a variety of factors such as rainfall, topography, soil types, geologic structure, and ground surface cover. In the absence of significant disturbances to soil and topography resulting from construction, the capacity to recharge is usually affected by changes of ground surface cover, specifically resulting from the conversion of pervious to impervious surface cover.

While, in general, groundwater recharge is desirable, there are instances when groundwater quality can be negatively affected from leaching of material that is either deposited or is exposed due to excavation. The landfill area which will serve as development area for the proposed industrial park was created several decades ago by deposits of quarry overburden and tailings and some quantity of municipal waste. The landfill at the project site thus predates more recent standards of landfill development that protects the groundwater from landfill leachate by means of a sealing agent, either soil with low permeability, plastic filter membranes or other installed impervious barrier between the land fill body and the underlying groundwater. At the present state of the project site, a significant amount of rainwater could infiltrate within the pervious and non-paved areas into the landfill body.

This water volume therefore enters the landfill body, and it is assumed that groundwater movement is controlled by the indigenous soil composition, below the landfill material, since there is no seal below the landfill body. The groundwater movement in the Upper portion of the site is assumed to be towards the Kapa'a Stream corridor. The groundwater movement within the Lower portion of the proposed site is assumed to occur towards the East, following the natural slope, where the groundwater eventually flows underground towards the Kawainui Marsh or seeps into the existing drainage ditch and flows as surface flow to the Kapa'a Stream and further into the Kawainui Marsh.

The impacts of leaching of the landfill material to the groundwater depends on the type and age of deposits, the residence time of the water in the landfill body and the amount of water that infiltrates into the landfill body. Absorption of pollutants from buried material occurs when the surface of the material is not in equilibrium with the surrounding water, e.g., when there are physical or chemical processes that promote the release of material into the water. With time, equilibrium conditions are attained under which driving forces are not effective enough to promote the release of pollutants from the material particles to the water that seeps through the landfill. In the case of organic material, an equilibrium condition occurs when enough organic material is decomposed. In the case of organically inert materials, the equilibrium condition is attained when the capacity of the water to dissolve and entrain organic material has diminished under a certain threshold level.

At the project site, most of the landfill material was observed to be from organically inert material and thus is not subject to decomposition of organic material. Furthermore, the deposits of municipal waste are several decades decomposition of organic material should have already occurred over a long time period, where enough water was available through infiltration into the landfill body.

It is the position of the Applicants that sealing of the landfill areas is beneficial to reduce potential groundwater contamination from landfill material. For the Proposed Action, this would mean that the advantages of sealing the landfill surface area and avoiding water percolation into the ground outweigh the disadvantages of groundwater recharge with potentially contaminated water and the subsequent

flow of the groundwater towards the Kawainui Marsh or the receiving water in the Kapa'a Stream corridor.

Under the two SEIS alternatives, impacts to ground water and leachate from land fill would be the same for the Upper site. Under both alternatives, the Upper site would be nearly completely sealed with impervious pavement, save about a 0.3-acre vegetated swale upstream of an open detention pond.

These impacts from the two SEIS alternatives however differ for the **Lower portion** of the site.

The SEIS No-Action Alternative would have about 4 acres of vegetated and pervious area in the interior of the project site. This vegetated and impervious area could add to significant infiltration of rainwater and therefore cause harmful leachate generation with the described negative impacts.

The SEIS Preferred Alternative would seal almost the entire surface. The minor vegetated and pervious areas in the Lower site would be several vegetated buffer strips that would be used for LID storm water treatment and smaller plant beds along the building walls for decorative plants. Therefore, the SEIS Preferred Alternative would have fewer negative impacts on groundwater at and around the project site.

4.3.3 Floodplain Impacts

Section 4.3.3 of the 2011 FEIS described floodplain impacts of the proposed action. The impact conditions of the floodplains have not changed since the 2011 FEIS.

Potential impacts to the floodplains were evaluated using floodplain information and criteria established by the Federal Emergency Management Agency (FEMA).

Under both the SEIS No-Action Alternative and the SEIS Preferred Alternative, no parts of the proposed development footprint would be located within the designated 100-year floodplain zone. As a result, no adverse impacts to floodplains would occur from the actions proposed under this alternative.

4.3.4 Impacts of Proposed Site Drainage System and Mitigation Measures

Section 4.3.4 of the 2011 FEIS described the existing site drainage and the planned site drainage. This Section 4.3.4, of the SEIS, describes the new drainage system, related impacts, and impact mitigation. While the basic approaches of the drainage system remain, the actual design of the systems and the efficacies of the impact mitigations have significantly changed.

The 2011 FEIS described the basic function of drainage systems as collecting storm water from impervious surfaces and convey the storm water to discharge location to the receiving water. Drainage systems safeguard the avoidance of flooding on developments and are designed to handle so called "design rain event". These rain events assume certain recurrence intervals and rain durations, such as a . a "10 year" storm event. The 10-year recurrence interval implies that statistically there is a 10% chance per year that the design event will occur.

At the time, the 2011 FEIS was approved, the drainage infrastructure on the project site consisted of grass and concrete swales, drain inlets and two conventional, but small detention ponds. This infrastructure was limited to portions of parcel TMK 4-2-015:013 (former TMK 4-2-15:008) where all

existing warehouses were located at that time. The rest of the project site was primarily pervious gravel cover and lacked structural drainage system components. During heavy rain event storm water runoff from these areas left the project site via sheet flows over the vegetated site perimeter or via runoff over the Kapa'a Quarry Place roadway to a vegetated swale along that roadway.

The 2011 FEIS reported that the proposed drainage system for the proposed warehouse development expansion at the project site would differ from the then present system by adding drainage system components which would minimize the impact of runoff to receiving surface waters. The proposed drainage system expansion would incorporate structural and non-structural stormwater management strategies and would collect and treat all stormwater from impervious surfaces before discharge to the receiving waters. Under the 2011 FEIS the storm water design approach of the proposed drainage system was also to include some pervious surfaces, preferably vegetated pervious areas, to stimulate infiltration and loss of stormwater through evapotranspiration.

The Figure 4.3.4.1 below is also presented as Figure 6.2.2.2 in Section 6.2 of this SEIS document. Figure 4.3.4.1 shows the schematic storm water management of the site at the time the 2011 FEIS was accepted.

Identifier	Upper / Lower site	Description
A	Upper	The combined runoff from the paved traffic areas and building roofs discharged to the sloped and vegetated site perimeter through 6 drain inlets.
B	Upper	The runoff from the gravel areas discharged as surface sheet flows over the edge of the sloped and vegetated site perimeter
C	Upper	The combined runoff from the paved traffic areas and building roofs discharged as surface sheet flow over the edge of an existing 0.75-acre infiltration and detention basin.
D	Upper	A smaller portion of the gravel areas discharged runoff towards the roadway, overflowing the perimeter wall the runoff flowed across the road pavement and finally discharged to a vegetated swale along the Kapa'a Quarry Place. The vegetated swale also collects runoff from a portion of an adjacent land parcel as well as from Kapa'a Quarry Place roadway itself.
E	Lower	Runoff from the gravel areas discharged as surface sheet flows over the edge of site perimeter to the Kapa'a Stream corridor.
F	Lower	Runoff from the gravel areas discharged as surface sheet flow over the edge of site perimeter to an existing drainage ditch along the Kapa'a Quarry Road.
G	Lower	The runoff in the vegetated swale along the Kapa'a Quarry Place entered a pipe conduit under the Kapa'a Quarry Place roadway and flows through a 300-foot drainpipe and was discharged to a vegetated swale inside the Lower site, downstream of the drainpipe terminus. In the vegetated swale the runoff flows towards the Kapa'a Stream corridor.

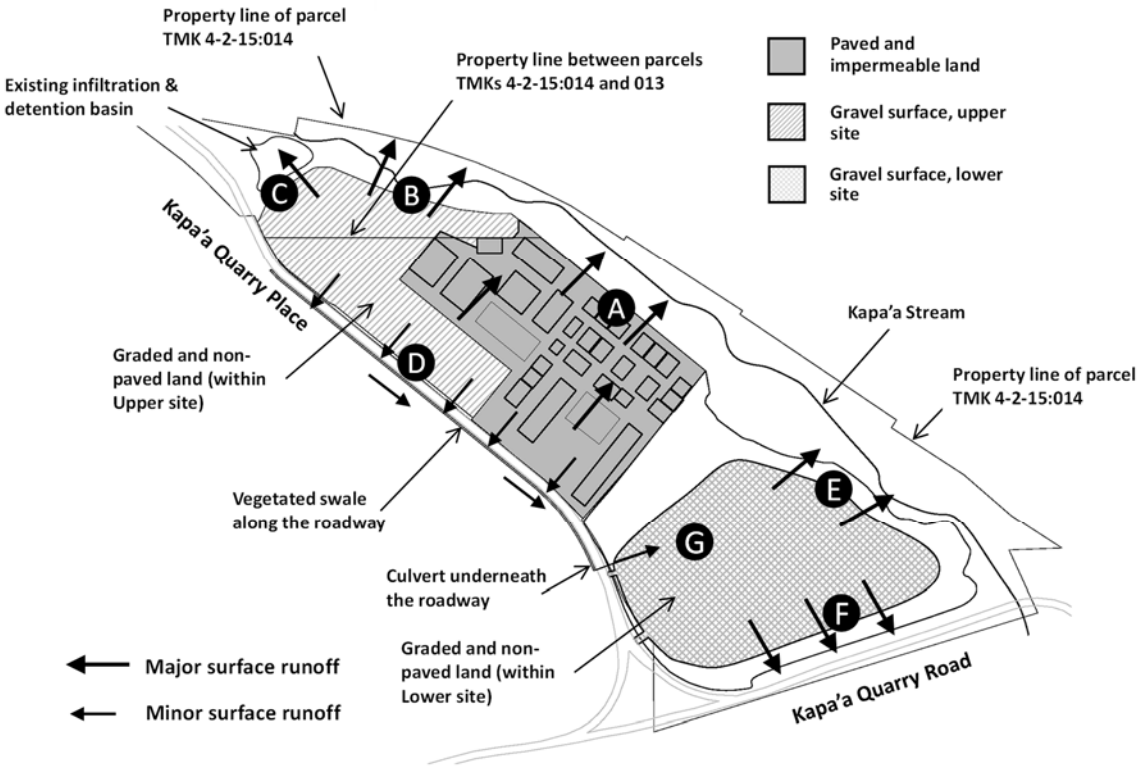


Figure 4.3.4.1: Schematic storm water management if the site at the time the 2011 FEIS was accepted. (Figure 4.3.4.1 is identical to Figure 6.2.2.2 in Section 6.2 of this SEIS document)

The 2011 FEIS described the preferred storm water treatment and management approach for the new development at the project site as follows:

The proposed drainage system strategies in the Upper and Lower portions of the site differed. The drainage system in the Upper portion of the site would collect all stormwater from impervious surfaces and convey the stormwater to detention ponds which served as treatment devices, and to a lesser extent for flood control, before the water would be discharged to the Kapa'a Stream corridor through armored spillways. An alternative drainage strategy in the Upper portion of the site would incorporate discharge into an existing infiltration and detention basin located at the Western boundary of the development footprint in parcel TMK 4-2-15:014 (portion of) and directly adjacent to the planned development.

The benefit of discharging the drainage collected from the new development in the Upper portion of the site to an existing infiltration and detention basin would be an increased LID treatment capacity of the basin. In the existing infiltration and detention basin solids would be eliminated before the stormwater eventually flowed underground or as surface discharge to the Kapa'a Stream. The 2011 FEIS stated that a detailed engineering study was required to confirm the assumptions of the design concepts.

The 2011 FEIS described that drainage from the Upper site would be conveyed in a combination of shallow swales in the paved areas or concrete channels which would collect the drainage of shallow

swales. The storm water system in the Upper site would then either enter one or more detention ponds before being discharged to the Kapa'a Stream corridor or would be discharged to the existing infiltration and detention basin at the Western boundary of the proposed development, as described before. In the final design, the selected drainage system might include the installation of stormwater debris separation units, which would be located upstream of the detention ponds or the drainage basin. The debris separation units would be able to remove from the stormwater all floatable, a percentage of suspended solids, sediments and oil and grease.

The 2011 FEIS described the drainage system in the Lower site as having a high efficacy in reducing possible impacts. Drainage from the impervious areas would be collected in swales and concrete channels and be conveyed to one extended detention pond from which the drainage eventually would flow into the existing drainage canal, at a location that would be near the confluence of the canal with the Kapa'a Stream. As part of the sustainability development strategy, stormwater would be collected from selected rooftops and stored for subsequent use in irrigation of the restored habitat areas on the vegetated site perimeter berms.

Several underground storm water harvesting vaults would be constructed at the site perimeter to take advantage of gravity flow of the stormwater to the storage locations, and to decrease the length of the irrigation lines and required pumping energy for the irrigation pumps. **Details of the proposed irrigation system is presented in Section in 6.8 of this SEIS document.**

As part of the 2011 FEIS storm water approach, during heavy storm events, when more stormwater runoff would occur than could be accommodated in the underground rainwater storage vaults, overflow would be conveyed to the detention ponds. The runoff in the detention ponds would then be discharged along with the portion of the stormwater that runs off areas that were not connected to the rainwater harvesting system.

The 2011 FEIS stated that 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, and timed release of the flood waters would result in effective flood control and better effluent quality. Therefore, this storm water approach 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 extended detention ponds and ensure 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.

In the 2011 FEIS proposed type of "detention" system was a "dry extended detention pond", which would provide two basic functions, stormwater flood control and removal of pollutants in the stormwater. The proposed extended detention pond system had the following components:

- Pre-treatment: Pre-treatment units would be installed upstream of the extended detention pond, e.g., stormwater would run through the pre-treatment units before entering the detention pond. The pre-treatment units would remove a significant portion of sediments, nutrients and oil-grease contained in the stormwater.

- Treatment inside the detention pond: Treatment features of the vegetation inside the extended detention ponds could remove quantities of pollutants and settleable agents from the stormwater.
- Conveyance of the stormwater in detention pond: The proposed "dry" extended detention pond was designed to accommodate and store a "design storm event", according to County rules. For smaller flows of runoff stormwater from lesser storm events, the detention ponds had "pilot channels" that ensures adequate conveyance into, through and out of the detention pond.
- 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.

For the Lower site, the storm water treatment and management system under the updated site development plan would pursue the same goal of significant reduction of negative impacts for storm water discharges as presented in the 2011 FEIS. The new storm water system under the updated site development would still treat all runoff from impervious surfaces before release to the receiving water, would use harvested rainwater for irrigation, and would detain quantities of runoff for controlled release to lower stream bed erosion.

But the details of the updated storm water system for the Lower portion of the project site would have significant differences from the storm water system described in the 2011 FEIS and the 2017 Minor Modification to the 2014 SMA (2014/SMA-27). The main differences are described below:

- The new storm water system would have to treat storm water runoff from a larger impervious area than the storm water systems described in the 2011 FEIS and approved under the 2014 SMP. The updated site development plan has less landscaped area in the interior site.
- The new proposed storm water system would not have above ground extended detention ponds. Concerns expressed by the US Fish and Wildlife Service of attracting listed water birds to open water surfaces within the project site have caused all detention volumes to be underground.
- The new storm water system would not have vegetated swales but below ground drainpipes. Vegetated swales require a minimum slope that is larger than the slopes of large diameter drainpipes. Therefore, drainpipes require less hydraulic head for the water conveyance from the inlets to the treatment and detention vaults.
- The New storm water system would have treatment units that include several vegetated buffer strips (a LID treatment strategy) and several manufactured treatment devices (MTD). The combined treatment efficacy of the vegetated buffer strips and the MTDs would significantly surpass the treatment capacity of the older storm water system.
- The new storm water drainage system would provide more detention volume than the previously approved system. The new approach would use below ground vaults that have impervious walls and bottom. The previously approved storm water system had pervious vaults because infiltration of the detained water adjacent to the site perimeter berms was the preferred approach.
- The previously approved storm water system had a vegetated swale upstream of the detention vaults; therefore, all storm water runoff was first passed through a LID treatment process before being detained or directly discharges as peak flow during heavy rain events. With the proposed

vegetated buffer strips the New storm water system similarly would have a LID treatment process upstream of the detention vaults and filtering treatment of the MTD.

- For the reasons mentioned above, the treatment efficacy of the new storm water would better than the storm water system disclosed under the 2011 FEIS and the one approved under the 2017 SMP Minor Modification.

Figure 4.3.4.2 is an example for the description of the New storm water system of the Lower site. It illustrates the comprehensive New storm water treatment and management system for the Lower site. (Figure 4.3.4.2 is also presented as Figure 6.2.4.8, in Section 6.2). Note: The updated storm water system for the Lower site has four instead of the previously three drainage areas. Figure 4.3.4.2. displays the three drainage areas. Since Figure 4.3.4.2 only serves as an example, the figure was not changed.

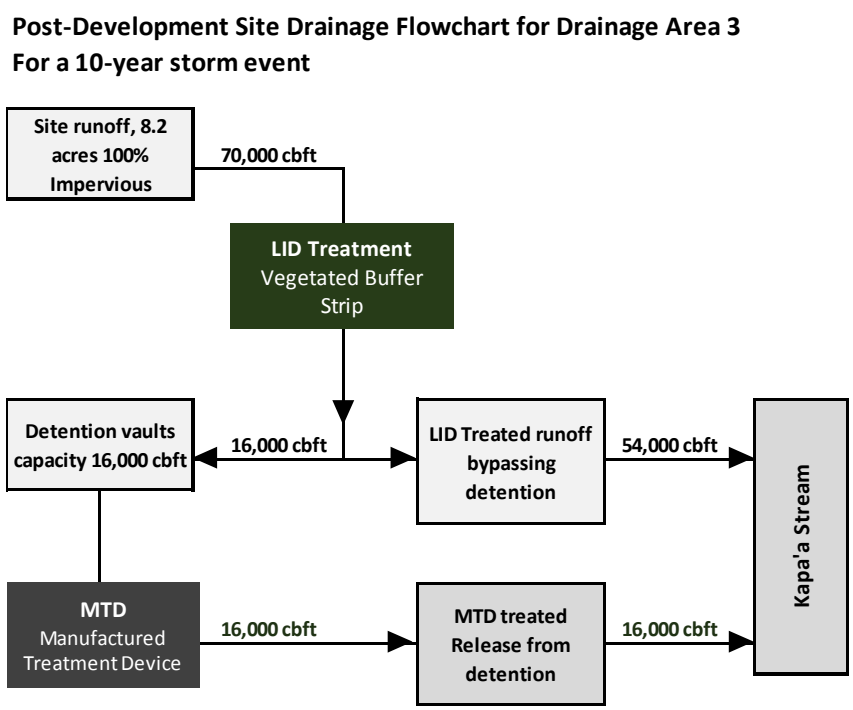


Figure 4.3.4.2: Flow diagram for Drainage Area 3; used for illustration
(Figure 4.3.4.1 is identical to Figure 6.2.4.8 in Section 6.2 of this SEIS document; Note: this figure portrays the old drainage area 3)
Figure 4.3.4.2 is presented as an example of the New storm water treatment and management system for the Lower portion of the project site.
The flow chart describes the different elements of the integrated storm water system. More design details of the New storm water system are presented in Section 6.2 of this SEIS document.

Impact to construction related storm water discharge from the site would be mitigated through effective construction BMPs to avoid entrainment and erosion of significant amounts of exposed soils on the site.

Construction stormwater BMPs would include the following:

- Pre-construction planning to determine scope of erosion control: development of an erosion and sediment control plan (would be required for permit). Preserving existing vegetation wherever possible - established populations of trees, bushes, and grass could help keep erosion to a minimum.
- Limiting 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, would be placed around any storage tanks.
- Installing clean water diversions, sediment traps/ basins and stabilizing 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.
- Installing construction entrances and controlling dust to avoid mud tracked on paved roads. Mud on roadways that originates from construction is annoying and unsafe.
- Installing vegetated buffers around the construction site to avoid volume sheet flows from moving across cut or fill areas and helping to filter and trap sediment before it can move into ditches, channels, and streams, respectively.
- Protecting exposed 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 to avoid sediments from escaping the construction sites and flowing into downhill areas of receiving waters.
- Using temporary down drains using plastic pipe or rock lined drain channel should be used to stabilize sloped faces of temporary channels that carry water down slopes.
- Using 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.

4.3.5 Wetland Impacts

The 2011 FEIS described that the Proposed Action would not result in loss of wetlands, since the development footprint was entirely outside wetlands boundaries. Only the Lower portion of the project site bordered at wetland areas in the Kapa'a Stream corridor. This observation was based on a wetland reconnaissance at the time of the 2011 FEIS.

Following the 2011 FEIS, parts of the former parcels TMK 4-2-15:06 and 012 (the parcel 4-2-15:012 was designated as 4-2-15:001 (portion of) in the 2011 FEIS) were rezoned from P-2 to I-1. The boundaries of the rezoned land were selected to coincide with the physical boundaries of the landfill to ensure that previously vegetated and open space would remain in its natural state. For the Lower portion of the site this meant that the boundary of the project site, which is the boundary of the rezoned land, would coincide with the limits of the Lower landfill area, and therefore remain outside wetland areas.

The 2011 FEIS stated that if wetlands were impacted, according to the Department of the Army, Section 404 Clean Water Act, an Individual Permit or Nationwide Permit issued by the Corp of Engineers would be required for unavoidable impacts.

Wetlands are defined as those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support vegetation that is typically adapted to life in saturated

and/or partially anaerobic soil conditions. The determination if an area is described as a wetland is based on three criteria: the presence of hydric soils, the frequency of inundation or other wetland hydrology features, and the presence of typical hydrophytic vegetation.

Under the updated site development plan the project site boundaries would be outside the wetland areas of the Kapa'a Stream corridor. Both the SEIS Preferred Alternative and the SEIS No-Action Alternative have the same boundary. Grading would have to occur inside the rezoned land and the limits of grading would need to be protected to avoid soil being spilled into wetland areas.

Main types of negative impacts on the wetland, originating from the development in the project site, include the following:

1. Filling and grading inside wetland areas
2. Removal of vegetation
3. Changes in water levels or drainage patterns
4. Pollutant discharge through storm water, including storm water contamination by excess nutrient, organic matter and TSS
5. Pollutant discharge

Of these main negative impacts, all would be avoided or at least effectively mitigated. At present surface runoff from the Lower Site to the Kapa'a Stream corridor occur over a distance of about 800 feet along the Norther site perimeter. A wetland reconnaissance indicated that the proposed outlets for the new storm water system in the Lower site would discharge the treated storm water to upland and not wetland area. Since conditions are changing inside the Kapa'a Stream corridor, a more detailed wetland delineation would have to determine that the assumptions of discharging into upland and not wetland area are still valid.

The original Lower site topography, before the landfill was created, formed a gentle slope under the project site towards the North-East corner. With much of the original soil under the landfill having low permeability, it can be assumed that leachate formed in the land fill would migrate towards the North-East of the site, toward the wetland areas. With the near complete impervious cover of the project site, no or significantly less leachate would be created. Therefore, this potential harmful impact to the wetland would be avoided under the upgraded site development.

The FEIS 2011 described recommended Standard Best Management Practices that followed the U.S. Fish and Wildlife recommendations. These recommendations still are valid and will be followed under the updated site development and storm water system:

- Turbidity and siltation from project-related work shall be minimized and contained within the vicinity of the site through the appropriate use of effective silt containment devices and the curtailment of work during adverse tidal and weather conditions.
- Dredging/filling in the marine environment shall be scheduled to avoid coral spawning and recruitment periods and sea turtle nesting and hatching periods.
- Dredging/filling in the marine/aquatic environment shall be designed to avoid or minimize the loss of special aquatic site habitat (beaches, coral reefs, wetlands, etc.) and the function of such habitat shall be replaced.

- All project-related materials and equipment (dredges, barges, backhoes, etc.) to be placed in the water shall be cleaned of pollutants prior to use.
- No project-related materials (fill, revetment rock, pipe, etc.) should be stockpiled in the water (intertidal zones, reef flats, stream channel, wetlands, etc.) or on beach habitats.
- All debris removed from the marine / aquatic environment shall be disposed of at an approved upland or ocean dumping site.
- No contamination (trash or debris disposal, non-native species introductions, attraction of non-native pests, etc.) of adjacent habitats (reef flats, channels, open ocean, stream channels, wetlands, beaches, forests, etc.) shall result from project-related activities. This shall be accomplished by implementing a litter control and developing a Hazard Analysis and Critical Control Point Plan.
- Fueling of project related vehicles and equipment should take place away from the water and a contingency plan to control petroleum products accidentally spilled during the project shall be developed. Absorbent pads and containment booms shall be stored onsite, if appropriate, to facilitate the clean-up of accidental petroleum releases.
- Any under-layer fills used in the project shall be protected from erosion with stones and/or core-loc units as soon after placement as practicable.
- Any soil exposed near water as part of the project shall be protected from erosion (with plastic sheeting, filter fabric etc.) after exposure and stabilized as soon as practicable (with native or non-invasive vegetation matting, hydroseeding, etc.).

Figure 4.3.5.1 shows a portion of the National Wetland Inventory (NWI) map for the vicinity of project site. The map indicates the Kawainui Marsh as the only wetland in the vicinity of the marsh which is listed in the NWI map.

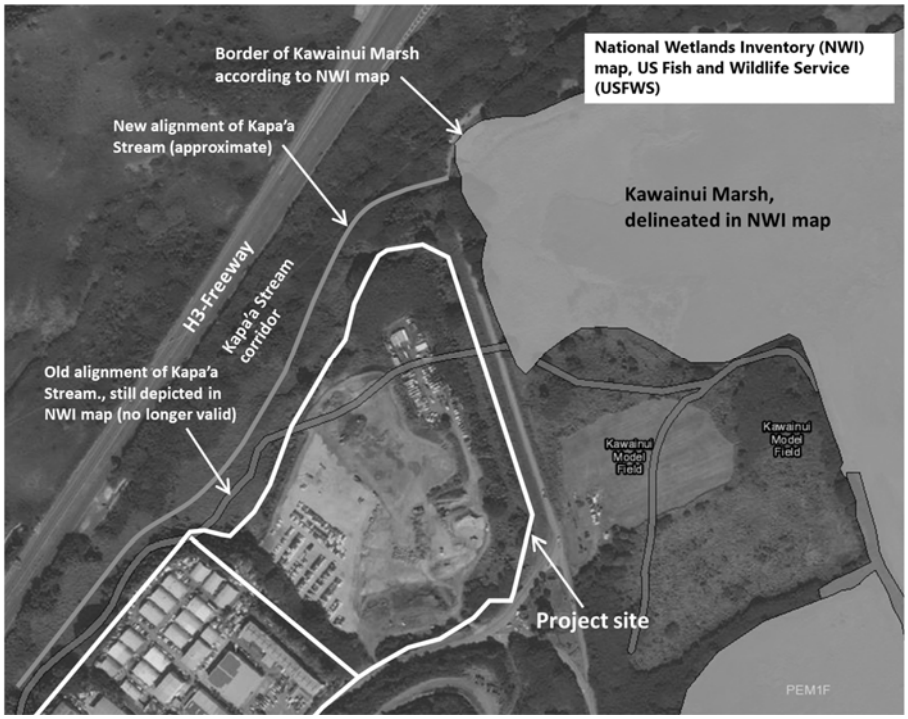


Figure 4.3.5.1: Depiction of the location of the delineated wetland in the vicinity of the project site (New Figure)

Note: in the NWI map the old Kapa'a alignment is still shown although the stream bed was shifted to the north by the creation of the landfill in the Lower site approximately 60 years ago.

4.3.6 Impacts on Kapa'a Watershed

Section 4.3.6 of the 2011 described impacts on the Kapa'a Watershed through the contribution of TSS load from the project site. The 2011 FEIS used a Kapa'a watershed water quality report by the State of Hawaii Department of Health report (DoH, 2007) to quantify TSS impacts on the watershed.

The 2011 FEIS, measures were described to significantly lowered the amount of TSS in the stormwater runoff from the project site. Under this 2011 FEIS approach, it was predicted that the proposed storm water mitigation measures would reduce the TSS load of the runoff between 60 percent and 80 percent for the Upper and the Lower portions of the site, respectively.

The 80 percent reduction of the TSS load for the Lower site was considered a conservative estimate, since the 2011 FEIS stated that the actual TSS of the two-tiered storm water could be higher than 80%. The average 60 %removal rate for the Upper site was also considered somewhat conservative, assuming the use of the existing infiltration and detention basin for an area of about 5 acres would be well above 60% while discharge from other parts of the would be somewhat less.

Figure 4.3.6.1. reprinted from the 2011 FEIS, illustrates a direct comparison of predicted magnitudes removal rates of TSS under two flow conditions in the Kapa'a water shed. These two flow conditions represent the baseline flow and the peak (2%) conditions. Figure 4.3.6.1. suggests that the predicted reduction rates were 69% and 79% for the baseline and the peak (2%) flows, respectively.

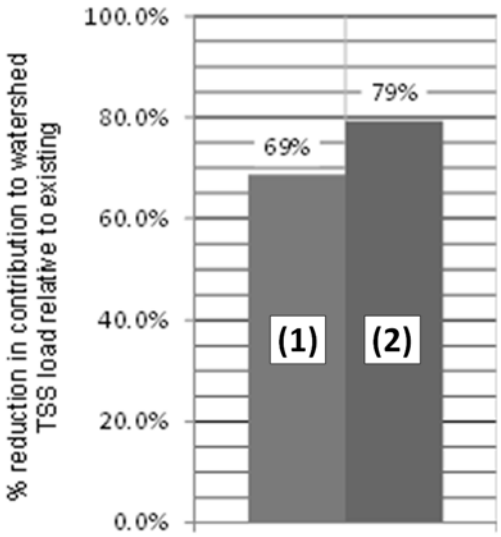


Figure 4.3.6.1: Comparison of alternatives for magnitude of reductions in TSS discharge from the proposed site

(source Figure 4-6 of the 2011 FEIS)

Legend

(1) Reduction in base TSS

(2) Reduction in peak TSS

For both SEIS alternatives, the removal rates are expected to be at least as good as the predicted removal rates described in the 2010 FEIS. The storm water treatment and management technologies to be used in the new storm water systems would have a higher treatment efficacy than the system described in the 2011 FEIS. Therefore, considering all the benefits of the new storm water system described in earlier sections on mitigating impacts, **negative impacts on the Kapa'a Watershed should be less or at least as low as described in the 2011 FEIS.**

4.4 Impacts on Biological Resources and Proposed Mitigation Measures

Section 4.4 of the 2011 FEIS described possible impacts of the Proposed Action on vegetation, wildlife and threatened and endangered species. Under the 2011 FEIS site development plan, the site development footprint would only use land that was created by landfill and which at the time of the 2011 FEIS had no or little vegetation.

4.4.1 Impact on Vegetation

Section 4.4.1 of the 2011 FEISI described that the landscaped areas at that time would not be affected by the proposed action. Only impact on natural vegetation was evaluated under the 2011 FEIS. Figure 4.4.1.1 shows 7 natural vegetation areas, as described in the 2011 FEIS. The 2011 FEIS described impact on these seven natural vegetation areas as described below:

The natural vegetation areas A, B, C and D, with a combined area of some 8.0 acres, would be affected by the proposed development. A portion of area E, located in the Upper portion of the site, would be converted to impervious developed land, with that portion of area E represented a vegetated berm that was removed since the 2011 FEIS. The sections A, B and C, all located at the perimeter of development footprint in the Lower portion of the site, would be restored with native or adaptive plants. Using native and adaptive plants in lieu of introduced plants has the significant advantage that typically less irrigation is used as well as less fertilizer and pesticides.

In the Lower site under the 2011 FEIS, the earth berm within area A would be increased in size and height to function as effective vegetative buffer zones separating the Lower portion of the site from the quarry road and the western parts of the Kawainui Marsh. The improved earth berm in Section A would be replanted with native or adaptive plants, including larger trees to provide a wind break on the new earth berms, which would also mitigate visual impacts. Area B would be augmented with native and adaptive plants to form an effective buffer between the adjacent wetland area in the stream corridor and the development footprint. Area C, which was a sloped area that separated the Lower from the Upper portions of the would be improved by restoring the area with native and adaptive plants. The larger trees within area C, which would be preserved in the habitat restoration effort.

Area F included the existing infiltration and detention basin. Area G included several large trees along the Kapa'a Quarry Place roadway. The 2011 FEIS stated that no significant adverse effects to vegetation would be expected from development of the Proposed Action. Rather, planting native shrub and tree species in the areas of habitat restoration efforts would provide a positive impact on the vegetation around the proposed site.

Figure 4.4.1.1: 7 natural vegetation areas that surrounded the proposed (source Figure 4-7 of the 2011 FEIS, annotated)

Under the updated site development, and for both the SEIS Preferred Alternative and the SEIS No-Action Alternative plan, the areas A through F would have the same small impacts on the vegetation. Some of the larger trees in area G were removed after the 2011 FEIS was approved to follow the recommendation of the DPP to improve sight distance for the Upper roadway entrance to the Upper portion.

The planned vegetation restoration for areas A through C differ between the two SEIS alternatives. The new vegetated berms in areas A and B would be higher and wider under the SEIS Preferred Alternative, thus covering more area and newly planted vegetation. Area C would be somewhat smaller under the SEIS Preferred Alternative and would involve more grading on the sloped land; therefore, more removal and restoration of vegetation within that area would be needed.

4.4.2 Impacts on Wildlife

Section 4.4.2 of the 2011 FEIS stated that the proposed project site was not considered to have important wildlife habitat value, since the project site had been previously developed, graded and was practically void of existing vegetation. The conditions under the updated site development plan would stay the same.

The 2011 FEIS described that a small population of urbanized small mammals and birds could be found within or at the perimeter of the proposed development, mostly inside vegetated areas. It was expected that birds or small mammals would be temporarily displaced during the construction but would return after construction was completed and when the open space would again be available as habitat.

The area around the Lower portion of the site would be restored with native and adapted shrubs and tree species and the vegetation density would be increased. The vegetative buffer zones which would be developed within the areas A, B and C (see Figure 4.4.1.1) would serve as improved habitat for wildlife that is presently found on the site. It was projected that wildlife would be attracted to these newly

created natural vegetation areas at the site perimeter. No forested or natural vegetation area would be converted to developed land and therefore impacts to migratory birds are not expected.

The 2011 FEIS stated the fact that waterfowl might be attracted to wet ponds with free water surfaces needed to be considered in the design of the planned stormwater detention ponds. Communication with the U.S. Fish and Wildlife Service had indicated the possibility of an impact on the water bird community, especially attracting endangered water bird species to water ponds, even to those ponds which have only intermittent free water surfaces. In the 2011 FEIS, it was pointed out that the final design of the detention ponds would consider mitigation and avoidance measures to oppose attraction to the detention ponds.

Under the updated site development plan, and for both the SEIS Preferred Alternative and the SEIS No-Action Alternative, impact to wildlife is also predicted to be small. Under both SEIS alternatives the site perimeter would provide habitat after completion of the perimeter berms. Also, under both SEIS alternatives, light pollution mitigation measures would be implemented to reduce negative impacts specially to migrating birds.

Under the SEIS Preferred Alternative, there would not be sizable, landscaped areas within the site interior. Therefore, less wildlife would be attracted to the site and thus less impacts on wildlife would occur.

4.4.3 Impacts on Aquatic and Wetland Habitat

As described under the 2011 FEIS, by implementing the proposed stormwater management practices, no significant adverse impacts to aquatic and wetland habitat would be expected. The project sites would not develop any portion of wetland areas, the Kapa'a Stream or the drainage canal along the quarry road, all surface water features that provide habitat for aquatic species. The proposed low impact development approach in the Lower portion of the site would generally provide ample buffer zones between the development footprint and the aquatic habitat.

Since the Lower site is converted from presently pervious and graded to future impervious area, the runoff rates and the amount of sediments and pollutants transported to the receiving waters could affect aquatic habitat conditions. These potential adverse impacts must be mitigated by appropriate stormwater management practices, which were considered for the proposed action. The construction of the vegetative buffer zones around the Lower portion of the site would occur before grading of the site. The buffers, which include earth berms and dense vegetation, would serve as organic filter which would effectively diminish the amount of sediment that is transported to the receiving waters during construction, and during operation of the proposed industrial development.

During construction, soil would be exposed and there would be an increased potential for erosion and transport of sediments into the adjacent receiving water, which could negatively affect aquatic habitat conditions. Under the Preferred Alternative comprehensive erosion and sediment control plans would be implemented to significantly reduce erosion of exposed soils, slow the stormwater discharge rate, and capture and contain eroded soils and concentrated nutrients before they enter the receiving waters.

The 2011 FEIS stated possible attraction of water birds to ponds with free surface had to be addressed in the design of the detention volumes Lower portion of the site.

Under the updated site development plan and under both SEIS alternatives, effective storm water pollution measures would be implemented during construction to mitigate negative impacts from polluted storm water runoff on the aquatic resource and the wetland habitat.

Under the SEIS Preferred Alternative, the storm water treatment and management would significantly reduce negative impacts of the runoff relative to water quality and stream bed erosion. As described earlier in this document, the previously approved stormwater system for the Lower portion could not be installed under the SEIS No action Alternative. The reason is the fact that not enough hydraulic head would be available with the full build-out finish grade of the SEIS No-Action Alternative.

4.4.4 Impacts on Endangered Species

Section 4.4.4 of the 2011 FEIS described that possible impacts to federally listed or endangered species requires communication with the U.S. Fish and Wildlife Service (USFWS), as well as mitigation measures.

As the 2011 FEIS reported the project site was not considered habitat for endangered species, but the USFWS has determined that four federally listed water birds have a habitat in the adjacent Kawainui marsh and the wetland area in the Kapa'a Stream corridor. The four endangered water birds are the Hawaiian stilt, Hawaiian moorhen, Hawaiian coot, and Hawaiian duck. The USFWS has communicated that recommended mitigation measures should be considered in the DEIS to minimize negative impacts to water birds.

The Applicants were in communication with the USFWS about earlier plans for the site development at the project site. The USFWS recommended several measures to avoid adverse impacts to water birds. All but one of the USFWS recommendations were concerned with the previously planned 15-acre wildlife habitat project that was planned in conjunction with the wetland restoration. The wildlife habitat project was not pursued further by the Applicants at the time of the 2011 FEIS, and therefore these three mitigation measures no longer apply.

The remaining measure required by USFWS addresses possible adverse impacts to water birds from open detention ponds or other water bodies within the project site with open water surfaces which might feature permanent or intermittent water ponds. Water birds might be attracted to these water features, which would make them more prone to predators at the project site. The conclusions of the 2011 FEIS indicated that the USFWS recommendation would be considered in the final design of the detention ponds and include incorporate suitable avoidance measures.

Under the updated site development, both SEIS alternatives do not include open detention ponds but plan underground detention vaults instead. With this modification of the site design the USFWS concerns were followed.

Also, under both SEIS alternatives, possible light pollution impacts on endangered species would be mitigated. After the 2011 FEIS was approved an external lighting design concept for the Lower site was approved by the Accepting Agency (SDC,2016,A). The selected lighting design described in the report

was consistent with the sustainability plan of the Lower project site. The lighting plan suggested to install shielded light and preferably low-pressure sodium lamps which have advantages to mitigate light related impacts on wildlife because of the specific mono-chromatic light spectrum.

4.5 Impacts to Cultural Resources

Section 4.5 of the 2011 FEIS described that prior communication with the State Historic Office has established the fact that no places of cultural or archeological significance are within the development footprint of the proposed project. The project site is a landfill area that was established several decades ago, and the construction of buildings and the development of the industrial park on these man-made areas will therefore not have directly adverse effects on historical places.

As delineated in Section 3. of this SEIS document, most of the sites of historical and cultural significance in the vicinity of the proposed site are in the southern part of the Kawainui Marsh, with most of these identified sites being more than one mile away from the proposed site. Therefore, the proposed project would have no adverse effect on these sites.

The only site of historical and cultural significance that is near the project site is the Pahukini Heiau. Figure 4.5.1. illustrates the vicinity map of the Pahukini Heiau to the project site. The Pahukini Heiau was built under the auspices of the High Chief Olopana in the 12th century. The Pahukini Heiau is a Luakini or state-class Heiau, where important state matters, including preparation for war, were conducted.

The Heiau is located on the site of a now closed landfill belonging to the City and County. The access to the Heiau is restricted but a visit can be arranged through the office of the Kapa'a Refuse Transfer Station where the access gate is located. The closest distance from the Heiau to the project site is approximately 700 feet. The representative distances to the centers of the Upper and Lower portions of the project site are 1,400 feet and 2,600 feet , respectively. The proposed project would not limit access to the Heiau nor would in any way affect the physical site of the Heiau.

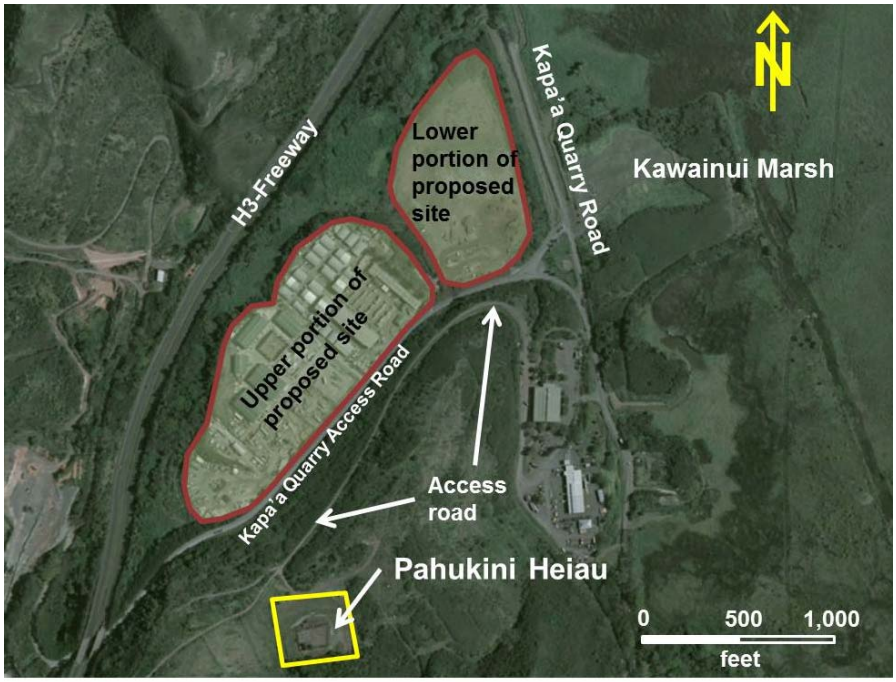


Figure 4.5.1: Vicinity map of Pahukini Heiau

(source Figure 4-8 of 2011 FEIS)

As reported by the 2011 FEIS, the project site cannot be seen from the site of the Pahukini Heiau, since the project site is hidden behind a screen of mature trees and a dense vegetation of shrubs.

The appearance of the planned warehouse structures would not have to conform to any historical buildings at or near the site. The appearance of the valley is determined by the ongoing industrial activities, and the planned warehouse development or industrial park would fit in the established surrounding.

Under the updated site development plan, no changes in visual impact of the project site on the Pahukini Heiau would occur.

4.6 Impacts to Air Quality

Section 4.6 of the 2011 FEIS described impacts to air quality. The basic premises of air quality impacts and related mitigation efforts at the site have not changed under the updated site development plans.

Air quality impacts typically can be categorized as follows:

- Air quality impacts during construction
- Air quality impacts during operation
- Indoor air impacts

<u>Air quality impacts during construction</u> would vary with the scope and length of construction activities. Typical air quality impacts during construction would primarily be from exhaust of heavy machinery used in excavation, grading and other activities, from exhaust by construction-related heavy truck traffic

on adjacent roadways, and from added dust during earth moving and periods when lighter soil fractions are exposed to wind-born entrainment and transport.

The construction schedule for the development features activities that stretch over several years, with periods of more intensive construction efforts during site development. The periods of more intensive construction efforts for grading, roadway construction and installation of all infrastructures would be followed by the construction of the individual warehouse structures.

The most adverse impact would occur during a short duration of site development. Impacts on air quality associated with construction of the individual warehouse structures would include the time that is needed to build the outer shell of the warehouses, followed by finishing of the interior work inside the buildings. For this SEIS, the following are air impact mitigation measures which would be implemented:

- Control dust (e.g., fine water sprays), avoid entrainment of dust by wind through appropriate means such as fine water sprays or placing of fine mesh screening close to the dust source, or cover piles of building materials like cement, sand, and other powder.
- Continuously inspection of sources of dust from exposed earth and building materials and implement targeted mitigation.
- Cover trucks loaded with construction materials.
- Prevent spills and exposed surfaces of agents which could generate air impacts, especially from hazardous agents such as VOCs.
- Proactive measures to prevent site contamination by and atmospheric exposure of fuel, solvents, and other agents.
- Vegetative buffer zones with berms around the proposed site can mitigate air quality impacts since they act as wind breaks that reduces the probability of stronger winds entraining and transporting dust and hazardous particles from the site.
- Use low-emission diesel fuel and construction vehicles that incorporate particulate filters and catalytic converters; ensuring that engines are well-tuned and other maintenance is carried out to limit unnecessary burning of fuel.
- No burning of any materials on site.
- Implement waste management control to limit the heavy truck traffic required to transport waste off the site and deliver material that could also be reused at the site.
- Recycle organic waste in form of green waste to produce topsoil for the restored habitat or landscaped areas, thus avoiding the removal of organic waste or marginal topsoil from the site and transport of topsoil to the site.
- Contractors to offer shuttles of employees during construction rather solely relying on individual transport of all construction personnel.

By implementing the proposed construction plan and schedule, it is expected that adverse impacts on the air quality from the site during construction is limited.

<u>Air impacts during operations</u> of the proposed industrial park would be limited and the primary contributor of adverse air quality impacts would be through increased traffic on the adjacent roadways,

where heavy truck traffic is expected to add most of the new air quality impact. Other air quality impacts would be through release of harmful agents such as solvents, paints, and other agents, especially those containing VOCs. The proposed industrial development will not burn any fuel on the site to power machines or generate electricity or process heat, except for the diesel operated fire pump in the fire water booster pump house.

Measures to mitigate air impacts during operation would include advising businesses leasing space in the new industrial development about maintaining and tuning the engines of their vehicles (e.g., heavy trucks, forklifts). The amount of discharge of exhaust in heavy trucks is a function of the power applied and the duration of operation. The amount of exhaust from internal combustion engines can be reduced if engines are not idling unnecessarily and if trucks avoid strong acceleration and high speeds. Air impacts from cars and light trucks can equally be reduced by advising the occupants of the park and customers not to idle the engine unnecessarily and keep their engines well-tuned.

Since the SEIS Preferred Alternative would add more warehouse space in the Lower site than the SEIS No-Action Alternative, and under the assumption that impacts are proportional to the total size of the warehouse footprints, impacts would be bigger under the SEIS Preferred Alternative.

Effective impacts mitigation would be as follows:

- Attune and educate occupants of the proposed industrial development to follow low impact development and operation in an effort endeavor the lowest air quality.
- Prevent open burning of any material on the site.
- Prevent the exposure of harmful agents that could be released to the atmosphere.
- Prevent the inappropriate and unsafe handling of any fuels, solvents, and any other harmful agents.
- Advise businesses that lease space to operate their commercial cars vehicles with well-tuned engines in and encourage employees to do the same with private vehicles.
- Promote the use of low emitting cars by providing incentives such as preferred parking.
- Use electric operated maintenance vehicles.

Indoor air quality impacts are an often neglected or insufficiently considered feature in the construction and operation of commercial and industrial developments. The importance of indoor air quality has been gaining more attention within the past few years, and indoor air mitigation is becoming a more important issue. Effective impact mitigation measures have become more accessible such as avoiding pollutant emitting materials in furniture and building interior and increasing ventilation rates.

4.7 Impacts from Noise and Noise Mitigation

Section 4.7 of the 2011 FEIS described impacts of noise at the project site and noise mitigation measures.

The type of noise impacts considered in the SEIS Section 4.7 are the same as described under the 2011 FEIS. Noise impacts are categorized as construction noise and noise during operation. Noise impacts and sources are similar between the two SEIS alternatives, since both alternatives require site development work using heavy equipment and delivery of construction materials to the proposed site. The 2011 FEIS

stated a requirement that was expressed by the Accepting Agency stating that "Project activities shall comply with the Administrative rules of the Department of Health; Chapter 11-46 Community Noise Control".

Noise impact during construction: The planned construction work would see two primary phases of noise impact. First, the site development activities would be carried out as the initial work that would include the use of heavy machinery such as backhoes and trucks for clearing, grading and excavation. Once the entire site, or parts of the site, is/are prepared, individual warehouse structures would be erected. The construction of the warehouse structure would also include the use of heavy equipment, such as cranes and trucks, but the noise level created by these activities would be significantly less than during the first phase of construction.

It is expected that the first phase of the construction, the site preparation, would be completed within approximately 3-4 months. The follow-on phases of construction of the individual warehouses and the traffic areas and utilities in the immediate vicinity of the warehouses would be carried out over a long duration of several years. Warehouse space would be added to the development in accordance with the absorption of the available warehouse space by the local market. This does not imply that construction noise would occur continuously over a span of several years. Rather it is expected that construction noise from individual warehouses would only be noticeable during about 20 weeks of the year.

It should be noted that the noise receptors – occupied buildings – are in an industrial park where the occupants are used to noise levels, which are higher than in residential areas.

The type of noise sources that would be used during construction at the proposed site would involve heavy equipment such as backhoe, trucks, graders, and other equipment. These types of equipment are typically generating maximum equipment noise level and noise levels 50 feet from the source of between 80 and 70dBA, depending on the equipment used . With increasing distance from the noise source, the noise level declines. As a general rule, the noise level decreases approximately 6 dBA with the doubling of the distance; this means that as an example a truck that generates 72 dBA at a distance of 50 feet generates 66 dBA at a distance of 100 feet. Table 4.7.1 suggests expected noise levels for heavy equipment that would likely be used in construction at the proposed site.

Since the construction site is not located near a residential area or other locations with sensitive noise receptors, the anticipated noise levels are expected to be within allowable levels. If it is deemed that the construction-related noise would be high enough to warrant noise reduction measures, the following actions could be considered:

- Limit the type of noise to certain times during the day
- Temporary noise barriers to shield sensible receptors or noises sources that are operating close to occupied buildings
- Schedule operations that are especially noisy operations to occur at the same time during the day
- Use low noise emission equipment, such as encapsulated compressors.

Table 4.7.1: Expected noise levels of heavy construction equipment (Source Table 4-1 in 2011 FEIS)

Type of construction equipment	**Noise Levels at 50 feet, dBA** hourly equivalent	**Noise Levels at 100 feet, dBA** hourly equivalent
Backhoe	78	72
Front loader	76	70
Bulldozer	79	73
Heavy dump truck	73	67
compressor	75	69
Vibrator roller	77	71
Concrete pump	78	72
Flatbed truck	72	66

Since the construction would occur adjacent to environmentally sensible area, wildlife might be affected by elevated noise levels. It is expected that urbanized wildlife that is presently finding habitat at the proposed site would temporarily leave the area where the construction takes place and would return once the construction noise stops.

Traffic related noise: The impact due to traffic related noise would occur in an area that is already experiencing traffic related noise. The representative location to compare adverse impacts between existing traffic noise levels and future increase noise levels is at the Kapa'a Quarry Road North of the intersection with the Kapa'a Quarry Place.

The 2011 FEIS described traffic noise projections that differentiated between background traffic and project related traffic. Projections of the background traffic included forecast of the traffic volume on the roads adjacent to the project site, but without the proposed expansion off the proposed additions of warehouses. Projections of project related traffic estimated traffic volumes as a function of the total size of the project.

Under the updated site development plans the SEIS Preferred Alternative would cause a higher traffic volume than under the SEIS No-Action Alternative, because more warehouse space would be added in the Lower site than under the No Action Alternative. Since the traffic noise from heavy trucks exceed the noise created by cars, and the SEIS No-Action Alternative would have a base yard which inherently creates more heavy truck traffic than warehouses, the traffic noise impacts would somehow balance out between the two SEIS alternatives.

The 2011 FEIS projections for the background traffic saw a 23% increase by the year 2026, and the project-related traffic was predicted to grow by about 100% relative to the condition in 2016.

The increase of traffic volume can be used to assess the anticipated increase in traffic noise impact. As a general rule, traffic volume must double to produce a three dBA increase in traffic related noise. The level of 3 dBA is the level that is discernable to the human ear. Applying the general rule of an increase in traffic noise with doubling of the traffic volume and an increase of about 3 dBA being within the

threshold for perception of increase in noise, the 2011 FEIS concluded that slight adverse noise level changes might be noticeable after the completion of the entire project.

The 2011 FEIS estimated the traffic induced noise at about 60 dBA. Applying the general rule, the noise level at project full build out after 2026 was predicted to be equal to about 63 dBA. This level of noise is about average for urban traffic conditions. At the time of completion of the development in the Upper portion of the site, no adverse traffic noise would be discernable to the human ear.

The 2011 FEIS pointed out that the traffic impact assessment study used a trip generation rate that did not consider possible reduction of traffic due to efforts to promote alternative transportation. Both SEIS alternatives would implement sustainability recommendation which included incentivizing carpooling, shuttle service and the use of bicycles to visit the proposed industrial park. The actual traffic volume at project full build out could therefore be somewhat less than expected under the traffic impact assessment report (TIAR) which was referenced in the 2011 FEIS.

The 2011 FEIS expected that the traffic related noise level of about 63 dBA would not require mitigation measures since the proposed location is not close to residential areas and sensitive noise receptors. If noise mitigation measures would seem necessary as the project approaches completion, the following measures proposed in the 2011 FEIS be appropriate to Lower any traffic related adverse noise impacts:

- Lowering the speed limit on the quarry road since traffic noise increases rapidly with speed.
- Implementing sound adsorbing surfaces along the road (e.g., a line of trees along the makai side of the quarry road to mitigate propagation of sound towards the marsh).
- Resurfacing the road.
- Implementing dedicated left turn lanes on the quarry road to the quarry access road to avoid deceleration and subsequent acceleration for northbound traffic on the quarry road.

In addition to the primary noise sources, the traffic noise generated on the quarry road and quarry access road, the 2011 FEIS described other noise sources during industrial park operation which might affect people and animals. The proximity of the Lower portion of the proposed site to the Kawainui Marsh could exacerbate the impact of additional noise generated by the proposed development on the environment. Therefore, responsible noise reducing construction and operations would be especially important for the Lower portion of the site.

The following suggested noise abatement measures that could mitigate impacts of noise sources for activities in the Lower portion of the site and reduce the propagation of noise:

- Install vegetated buffer zones berms to reduce the noise that is a normal byproduct of industrial and commercial activities.
- Orient warehouse structures in such a way that direct emission of indoor noise (e.g., through large, rolled gates) is directed away from the areas that are sensitive to noise.
- Promote the use of low noise emitting machinery (e.g., shielding noise sources).
- Promote that all vehicles operating in the park 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. The planned detached loading dock for trucks in the vicinity of the wetland area could be surrounded by sound absorbing vegetation and/or a sound absorbing wall. In addition to noise abatement these measure would also aid in mitigating visual impacts and Lower impacts of avoidance.
- Mandate enforcement of guidelines and procedures to reduce noise levels such as guidelines against unnecessary idling engines. This would also mitigate air quality impacts.
- 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.
- Educate tenants in the importance of acting proactively to Lower noise generation and implement noise abatement.

One important differentiator between noises of the two SEIS alternatives is that the SEIS Preferred Alternative would not have a base yard and therefore, **noise levels associated with base yard operations would be avoided under the SEIS Preferred Alternative**. Since noise emitted from base yard operations are typically more severe than noise emitted from warehouse operations, noise impacts under the SEIS Preferred Alternative are expected to be less.

4.8 Impacts on Utility Infrastructure

Section 4.8 of the 2011 FEIS described anticipated impacts of the proposed project on the utility infrastructure that was serving the existing warehouse development at the time the 2011 FEIS was approved.

Under the updated site development plan, the premises of impacts on the utility infrastructure, as outlined under the 2011 FEIS, are still valid. Details of the site development approach have, however, changed to some extent under the updated site development.

One of the basic assumption is that impacts on the utility infrastructure are proportional with the total warehouse space to be added. Here the two SES alternatives differ, since more warehouse space would be added in the Lower site, under the SEIS Preferred Alternative .

4.8.1 Impact on Water Supply

The 2011 FEIS described that the proposed project would increase the amount of water needed for the operation of warehouses. The estimated increase in water use at the site would not necessarily be the same increase in water use on an island-wide level. Tenant surveys conducted after the 2011 FEIS was accepted revealed that most of the commercial and industrial tenants are not engaged in processes that require high water use. There are no food processing tenants, and much of the light industrial activities are concerned with general warehousing. There are, however, some tenants who might use more potable water.

Tenants in the Kapa'a Light Industrial Park typically do not have high water use, and water use generally is limited to typical sinks and related washing. There are no showers installed in the warehouse development. For the design of wastewater facilities, a design water use per occupant of warehouse

space is 20 gallons per day (gpd), while a typical residential water use is about 80 gpd, according to the Honolulu Board of Water Supply. This daily water consumption reflects a significant drop of water use of the past couple of decades.

Since the SEIS Preferred Alternative would have more warehouse space than the SEIS No-Action Alternative water consumption inside the latter warehouses would be less. The SEIS No-Action Alternative would, however, have a base yard, and the water use of the base yard would have to be added to the water consumption in the warehouses.

The 2011 FEIS assumed that about 20 percent of the water use for the entire project site would be for irrigation. For the two SEIS alternatives, the water use for irrigation would approximately the identical. In Section 6.8 of this SEIS document newer assessment of irrigation needs in the Lower were made indicating that irrigation needs for the updated site development plan, thus the conditions associated with the SEIS Preferred Alternative, would be like the SEIS No-Action Alternative. Irrigation needs in the Upper site would be approximately the same under both alternatives.

4.8.2 Impacts on Wastewater Systems

Section 4.8.2 of the 2011 FEIS described the onsite wastewater treatment at the project site. Under the updated site development plan the selection of wastewater treatment technologies and the impacts they cause would change significantly from this described in the 2011 FEIS.

Under the 2011 FEIS, the existing onsite wastewater system was described as multiple conventional septic systems being installed in the Upper portion of the site. Since the Lower site did not have any warehouse developments at that time at the time the 2011 FEIS was approved, no septic systems were installed in the Lower site.

On planning the future wastewater treatment, the 2011 FEIS considered foremost, that the project site, as well as all installations and buildings in the Kapa'a valley, were not connected to the municipal sewer system. There were and still are no plans to connect the Kapa'a Valley to the municipal sewer. Connecting the proposed site to the Kailua sewer system would require the installation of a forced sewer line of about 1.2 miles in length, measured between the Upper portion of the site and the assumed take-over-point of the existing sewer system in Mokapu Boulevard. The expected comparatively low quantity of the wastewater, the long distance of the forced sewer and the required pumping power render a connection of the proposed site to the existing sewer system as not advantageous, both in economic and ecological terms.

The 2011 FEIS concluded that the proposed project would have to rely on the use of onsite wastewater treatment units. In selecting onsite wastewater treatment processes for the new development, the 2011 FEIS concluded that two alternative technologies would be available. These two options were conventional and alternative septic systems. According to the U.S. Environmental Protection Agency (EPA), about 25 percent of households in the U.S. dispose of their wastewater through septic systems. The EPA indicates that septic systems, when adequately installed and operated as decentralized wastewater systems, are a cost-effective and long-term option for meeting public health and water quality goals, particularly in less densely populated areas.

The conventional septic system consists of a two-stage treatment process. The wastewater first flows into a septic tank where solids are separated from the water by settling or by floating in a foamy scum layer at the surface of the water inside the tank. Anaerobic decomposition of organic matter reduces the amount of sludge that accumulates in the tank. The tank must be pumped, e.g., the sludge must be removed from the tank periodically when the storage volume of the tank is reduced by the sludge. The liquid effluent, after initial treatment in the anaerobic septic tank overflows. The effluent typically passing through a filter, and then flows to an underground infiltration field, the so-called leach field. In the leach field aerobic decomposition of the organic matter occurs. The treatment process also includes filtration and absorption processes, as the water percolates into the ground. Figure 4.8.2.1 shows a typical configuration of a septic system, comprised of a septic tank followed by a subsurface infiltration system (e.g., leach field).

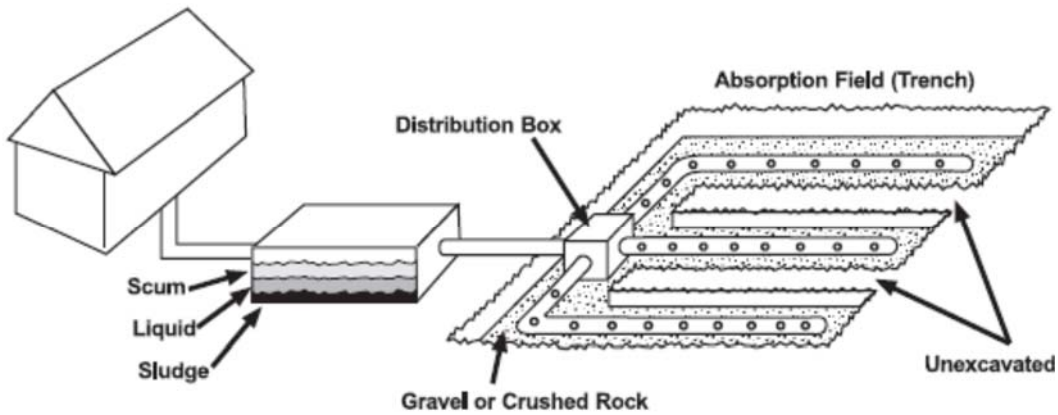


Figure 4.8.2.1: Conventional subsurface wastewater infiltration system (EPA, 2002) (source Figure 4-9 of the 2011 FEIS)

In establishing a well performing septic system, the design of the septic tank system is as important as the design of the infiltration field. The septic tank must avoid leakage of raw sewage due to corrosion, uneven settling, or other failure modes of the tank. Leaking septic tanks can lead to a catastrophic failure of the entire septic system. The failure of the leach fields in conventional septic systems is typically more often the responsible mechanism that determines total or partial failures of onsite treatment and disposal systems of wastewater. A leach field must be designed and sized in conformance with the design flow and organic loading. While the sizing of the leach field based on hydraulic loading rates is typically used to assess the required size of the leach field, the sizing of the field size based on organic load is a more conservative design assumption, since it results in larger leach field dimensions for wastewater with higher biological oxygen demand (BOD) concentrations.

The leach field is an indispensable part of the treatment process in the conventional septic system. Typically, the anaerobic septic tank contributes 40 to 50% of the treatment capacity, and the rest of the treatment occurs in the aerobic soil absorption field (e.g., leach field). In the leach field the septic tank effluent experiences filtration, micro straining, and aerobic biological decomposition processes in the

biomat of the leach field. The septic system, thus the combination of the septic tank and the leach field zone can remove between 80 to 90 % of organic load and suspended solids.

Leach fields can fail in their intended function if the distribution of the effluent is not uniform, the organic loads are too high to stimulate clogging by a proliferating biomat (e.g., bacteria overpopulations) or when the leach field has a tight surface cover, e.g., resulting in insufficient aeration to maintain aerobic treatment processes and to allow water loss through evaporation. If the pollutant concentration of the septic tank is too high for the configuration of the leach field, sewage infiltration and treatment in the field might be insufficient and sewage with too high concentration of pollutants can reach the ground water. Furthermore, if the distance between the bottom of the infiltration field (e.g., the point of injection) and groundwater table is too small, treatment in the wastewater infiltration field does not occur in saturated (e.g., saturated or flooded with water) soil conditions and therefore the treatment capacity of the leach field is compromised.

At locations close to important surface or groundwater resources, the effectiveness of conventional onsite sewage systems might not be sufficient to treat and dispose of wastewater enough to effectively mitigate all adverse impacts. Similarly, if the water table is too high, septic systems do not work properly since there might not be sufficient unsaturated soil below the soil absorption field.

The 2011 FEIS concluded that both of the above conditions apply for the Lower portion of the project site and therefore a type of wastewater treatment is required that goes beyond conventional septic systems. Onsite wastewater treatment systems in the Lower portion of the proposed site would be closer to surface and ground water than such systems in the Upper portion of the site. The infiltration points of leach fields in the Lower portion of the site would have short vertical and horizontal distances to travel, and there would be a probability of insufficiently treated wastewater reaching the ground water table and/or seeping into the Kapa'a Stream corridor or drainage ditch.

The Upper portion of the site, on the other hand, had significant vertical distances between infiltration points and water resources, e.g., the underground path of the injected wastewater is longer, and renders more time for effective removal of pollutants until the effluent reaches the groundwater table to seep out into the stream corridor and enter the wetland or Kapa'a stream.

While conventional septic systems as onsite wastewater systems typically can achieve reasonable removal rates of biological oxygen demand (BOD), total suspended solid (TSS) and pathogens, most conventional septic systems have a limited capacity to reduce the organic load to such low concentration as is required for larger treatment facilities, Additionally, conventional septic systems typically have a limited capacity to reduce nutrients. The conventional process of removal of nitrogen requires anaerobic process conditions for effective denitrification.

In cases where higher removal rates of nutrients are required, such as in the Lower portion of the project, alternatives to conventional system are required. The 2011 FEIS concluded that for the Lower site, an alternative wastewater system should be used which has a high removal capacity for organic, TSS and nutrients.

The 2011 FEIS proposed the recirculating sand filter treatment technology as a suitable alternative to conventional septic systems in the Lower site. The recirculating sand filter includes aerobic (recirculating) sand filter, anaerobic recirculation pump chamber and subsurface infiltration field. Aerobic treatment and the removal of organic load occurs in the aerobic sand filter. After passing through the sand filter the wastewater flows back to the recirculating pump chamber, which is anaerobic and provide suitable process conditions for denitrification, e.g., the removal of nitrogen as the most prominent nutrient in the wastewater. The excess effluent is then pumped to soil absorption fields where the effluent infiltrates into the soil.

What made the recirculating sand filter a good candidate as an alternative way of treating wastewater was the low residual pollution of the treated effluent and the low operational costs. The 2011 FEIS described average pollution reduction rates for the recirculating sand filter as 95% of BOD, 98% of TSS and 60% of Total Nitrogen. These rates compared favorably against recommended value promulgated by the EPA for receiving water such as the wetland areas adjacent to the Lower site.

The EPA recommendations reported in the 2011 FEIS were as follows:

Assumed water resource value:	Surface water resource which is nutrient sensitive, such as lakes, ponds, rivers, wetlands etc. where surface water are sensitive to eutrophication or loss of shellfish or finfish nursery area due to nutrient input
Vulnerability rating:	High
Vertical separation distance between point of release and water table or impermeable soil layer:	1 – 3 feet (it must be considered that the total depth of the infiltration field is in the order of 4 to 6 feet below surface). The considered range of 1-3 feet is a conservative estimate.

Proposed onsite system treatment performance standards for Lower portions of proposed site:

BOD (mg/L)	: <= 10
TSS (mg/L)	: <= 10
Total N (% removed)	: >=50%

Figure 4.8.2.1 shows the basic flow and process diagram which compares conventional septic system to the recirculating system. The flow system depicted in Figure 4.8.2.1 is using a so-called STEP system, Septic Tank Effluent Pump system approach, where the wastewater first enters a conventional septic tank for primary treatment. The effluent of the septic tank is then pumped to the advanced treatment in the recirculating sand filter. The resulting system is elaborate but provides results which are suitable in accordance with the above EPA recommendations.

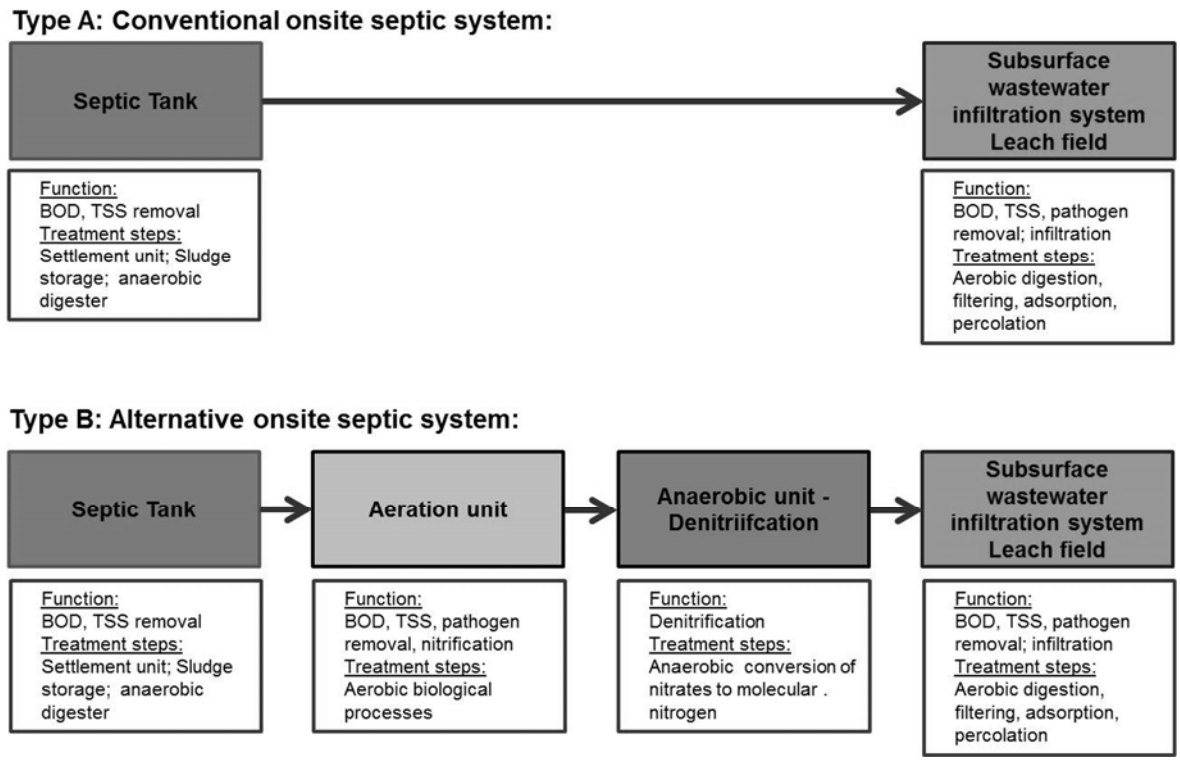


Figure 4.8.2.1: Comparison between candidate alternative septic systems and conventional septic systems (source Figure 4-10 on the 2011 FEIS)

For the Upper portion of the site, the 2011 FEIS assumed that conventional septic systems would be sufficient, since the vertical distance between point of release and saturated soil layers is in the range of at least 10 to 15 feet and the point of release is further separated from the wetland areas in the Kapa'a stream corridor and the Kawainui Marsh. This substantial vertical and horizontal distance between point of release of effluent at the leach fields in the Upper portion of the project site and sensitive water resources would provide a wide enough safety envelope for the use of conventional septic systems.

Under the SEIS Preferred Alternative, and thus under the updated site development plan, the EPA recommendations for advanced onsite wastewater treatment were followed in selecting the preferred onsite wastewater technology. The selected treatment technology for the new development is the membrane bioreactor (MBR) technology. This MBR technology has high treatment efficacy for organic load (BOD), TSS and nutrients, which surpass the performance of the recirculating sand filter.

Under the SEIS No-Action Alternative, the recirculating sand filter, or equivalent, would be used in the Lower site and conventional septic system would be used in the Upper site.

In the MBR technology, all treatment occurs in the first and only process vessel. Raw wastewater enters the MBR process vessel in a settling chamber, which is like a septic tank, where part of the treatment occurs. The overflow from the settling tank flows into the process chamber where aeration occurs with activated sludge. Effluent is extracted from the process chamber by means of a low flow extraction pump that forces the effluent through a membrane for final disposal. Higher denitrification performance of the MBR system is achieved by using a 3-chamber configuration where a part of the process chamber

is held anaerobic, thus providing favorable process conditions for extended denitrification. The effluent from the MBR process vessel either flows to a soil absorption field directly downstream of process vessel or is pumped to a field at a distance.

Under the SEIS Preferred Alternative several MBR process vessels will be located within the Lower site and their effluent will be pumped to a location that has a higher elevation, to ensure sufficient distance to the ground water below the bottom of the soil absorption.

The specific MBR technology that will be used is one of the first to obtain certification under the new National Sanitation Foundation (NSF) standard 350. The NSF 3590 standard was developed to exemplary onsite wastewater treatment with the goal of producing a treated effluent that can be used as recycled led water. The basic aim of the new NSF 350 standard is to produce treated effluent that resembles storm water and thus can be used as a resource at the project site.

While under the updated site development plan, the focus for the use of advanced wastewater treatment is the Lower portion of the project site, advanced wastewater technology will also be used in the Upper portion of the site. At the present, the Applicants are conducting a pilot installation of the first two MBR process vessels in the Upper portion of the site. The pilot project is being conducted with the endorsement by the Hawaii State Department of Health (DoH).

Upon satisfactory completion of the pilot project, the Applicants plan to equip all new developments with the MBR technology, in the Upper and the Lower portions of the project site. This move will significantly improve the quality of the onsite wastewater treatment at the project site. Section 6.10 of this Draft SEIS document describes the proposed MBR technology.

It should be noted that the onsite wastewater pilot project does not examine the efficacy of the advanced MBR wastewater treatment, which has been widely tested. The main objective of the pilot project is to test the infiltration characteristics of the treated effluent, and if the smaller infiltration field sizes can successfully dispose of the treated wastewater effluent.

Summarizing, the selection of the MBR technology represents a significant effort to improve the onsite wastewater treatment at the project site. Having effluent that basically resembles water quality of storm water opens new opportunities to use the onsite treated wastewater as a valuable resource.

4.8.3 Impact on Telecommunications

Section 4.8.3 of the 2011 FEIS describes that the Proposed Action alternatives would increase the demand for telecommunication services at the proposed site. Under both the SEIS Preferred Alternative and the SEIS No-Action Alternative these assumptions are still valid, and there is no significant change from the 2011 FEIS.

The 2011 FEIS described that some new infrastructure would be required in some parts of the Upper portion of the site, and within the entire Lower portion of the site. Installing these improvements on the site would not likely result in a significant impact. At the time, the 2011 FEIS was approved, the telephone service to the Kapa'a Valley was provided by an above-ground telephone line that runs along Kapa'a Quarry Road towards Mokapu Blvd. It was expected that the existing line would have sufficient

capacity for the expansion of services. If required, new conduits could be installed at the utility pole to increase capacity. This installation is not expected to pose significant problems or impacts.

4.8.4 Impacts on Electricity Supply

Section 4.8.3 of the 2011 FEIS described that the Proposed Action would increase the current electric demand and energy consumption as more industrial space is added. Under the 2011 FEIS it was expected that the existing power system was able to handle the load increase in the Upper portion of the site. For the Lower portion of the site an entire new distribution system would be required.

Under the SEIS Preferred Alternative, more load demand would occur in the Lower site than under the SEIS No-Action Alternative since more warehouse space would be added in the Lower site. The 2011 FEIS projected an increase in electricity demand and annual electric energy consumption of about 150 percent relative to the demand and usage at the time the 2011 FEIS was approved. The 150% increase reflected the conditions of development density that would also be used under the SEIS Preferred Alternative.

Both SEIS alternatives would implement energy savings through energy conservation and the installation of renewable energies. The Applicant has the intention of adding a significant amount of photovoltaic (PV) capacity to the warehouse development. In essence the goal would be to make the warehouse development a Net-zero development, with generating the same amount of electric energy as is consumed. There are approximately 650 kW of PV installed at Upper site. An expansion of the PV capacity would require the consent of HECO and other permitting agencies.

A change in the electricity supply to the project site will be planned, relocating of some section of power lines that supply the Kapa'a Valley. The existing electricity supply occurs through a 4.16 kV transmission line from Mokapu Boulevard. Since the power lines passes through the Lower site a 2,000-foot section of the power line must be replaced to run outside of the site development boundaries of the Lower site. Communication with Hawaii Electric Company (HECO) indicates that the project of rerouting the power lines would also include conversion to a newer power transmission technology, which would solve the supply condition for the expansion of the Kapa'a Light Industrial park under the updated site development plan.

Appendix L describes alternative alignments of the rerouted power lines which supply the project site and expected impacts on the environment and community.

4.8.5 Impacts on Solid Waste Disposal and Mitigation

Section 4.8.5 of the 2011 FEIS described that the project site was not served by the municipal solid waste service, but that the Applicants had contracted a private company for the solid waste disposal at the project site. Waste receptacles is collected periodically (e.g., weekly), and the solid waste is disposed of at an offsite landfill. The contractual terms with the waste management company ensures that the waste is disposed of in an environmentally responsible way and in accordance with local codes and standards.

Under both SEIS alternatives, the solid waste disposal would continue as described in the 2011 FEIS.

A comprehensive recycling program would still be implemented for the Lower portion of the site, in accordance with the sustainable design approach and LEED certification requirements. There would be several easily accessible dedicated areas for the collection and storage of the recycled materials. Recyclable materials would include, at a minimum, paper, corrugated cardboard, glass, plastic, and metals. The separate collection of bottles and aluminum cans which carry a refundable deposit would be provided in each building. While the comprehensive recycling effort would be organized and verified only for the Lower portion of the site, collection and storage of recyclable material would also be offered in the Upper portion of the site, to take advantage of synergy and increase the volume of recyclable material for the waste management company.

Littering and non-conforming disposal of waste could result in a range of impacts, from simple annoyance to direct adverse impact. Waste that is improperly disposed of or abandoned can result in the release of hazardous agents that can directly impact the environment, human beings, or wildlife, or could accumulate in terrestrial or aquatic soil and could pose a long-term threat when released, due to elevated concentration.

Littering and non-conforming disposal of waste will be mitigated during the construction and operation of the Kapa'a Light Industrial Park. The presence of ample waste receptacles and the education of tenants and their employees to refrain from any littering and assist in the avoidance would be effective mitigation measures.

In addition, the management of the industrial park would safeguard that no waste would be disposed of in a non-conforming and environmentally harmful way. The propagation of waste into the adjacent wetland areas and the Kapa'a Stream corridor would be mitigated by the fence at the perimeter fence of the property. Periodic survey and controls of the perimeter of the development footprint would also assist in maintaining the proper appearance of the proposed development and reduce the chance that wildlife and plant life are adversely affect by inappropriate waste disposal.

4.9 Impacts on Traffic and Mitigation

Section 4.9 of the 2011 FEIS described impacts of increase traffic on roadway sections that were adjacent to project site and on three intersections which would be affected by the Proposed Action. The 2011 FEIS used three roadway sections that were adjacent to the project site and three intersections that were affect by traffic associated with the project site. Tables 4.9.1 and 4.9.2 show the three adjacent roadway sections and the three intersections.

Figure 4.9.1 illustrates the locations of the roadway sections adjacent to the project site, 1 through 3, and the three intersections, A though C, referred to in Table 4.9.1 and 4.9.2.

Table 4.9.1: Three roadway section adjacent to the project site (Source Table 4-7 of the 2011 FEIS)

Nr.	Roadway sections locations	length [miles]	jurisdiction
1	Northern section of the Kapa'a Quarry Road; between the intersection with Kapa'a Quarry Access Road and Mokaupu Blvd.	1.0	County
2	Southern section of the Kapa'a Quarry Road; between the intersection with Kapa'a Quarry Access Road and Kalanianaole Hwy.	1.5	County
3	Kapa'a Quarry Access Road between intersection with Kapa'a Quarry Road and roadway entrance to the existing warehouse development.	0.3	County

Table 4.9.2: Three intersections which are affected by the project site (Source Table 4-78 of the 2011 FEIS)

ID	Intersection location	signalized	unsignalized	jurisdiction
A	Mokapu Blvd. & Kapa'a Quarry Road	X		State
B	Kapa'a Quarry Road & Kapa'a Quarry Access Road		x	County
C	Kalanianaole Hwy & Kapa'a Quarry Road	X		State

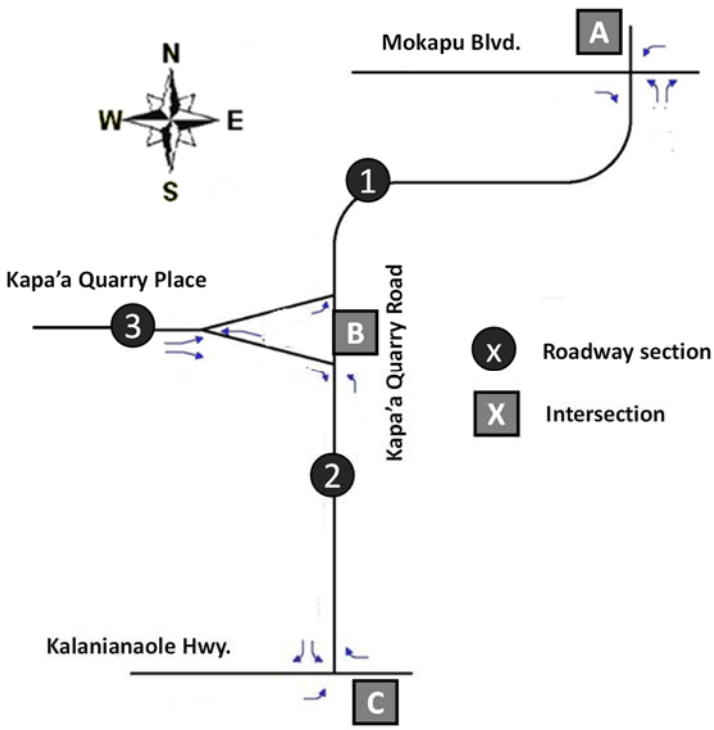


Figure 4.9.1: Locations of the roadway sections adjacent to the project site, 1 through 3, and the three intersections, A though C.

The 2011 FEIS used a Traffic Impact Analysis Report (TIAR) to assess the levels of service on the three adjacent roadways and the three intersections. The TIAR was conducted during an early phase of the environmental review.

Since the development of the project site predicted ongoing and new site developments pending at the time the 2011 FEIS was approved, the decision was made that an updated TIAR would have to be performed at a later time in the project. Specifically, the State Department of Transportation (DoT) review of the TIAR had indicated areas of analysis that should be reevaluated. The DoT assessment was that the LOS values reported in the current TIAR might be too optimistic. Specifically, the DoT stated that the re-analysis of LOS at the two intersections under state jurisdiction (e.g., the intersections of the Quarry Road with Kalanianaole Hwy. and Mokapu Blvd.) using additional traffic analysis parameters and a reassessment of the anticipated traffic growth in the region was warranted. If the reevaluation would determine LOS levels that are were significantly higher (e.g., less favorable) than in the referenced TIAR, the traffic improvement recommendations might have to be revised.

4.9.1 Expected Impacts from Background Traffic

The 2011 FEIS described the selected growth rate of the background traffic over the development schedule of the proposed project, e.g., from the time the 2011 FEIS was approved to the expected time of completion of the project development. As stated, before in this Draft SEIS document, the site development of the Proposed Action is being phased in at a slower schedule.

The 2011 FEIS predicted the growth of the background traffic and the expected resulting LOS on the three roadway sections and three intersections. These 2011 FEIS predictions are presented in Table 4.9.1.1 The results indicated the expected level of service (LOS) for the background traffic volume at the three intersections and three roadway segments that are considered for the analysis. The results of the projection of the background traffic suggested that by the year 2016 no mitigation would be required at the intersections as well as on the roadways since the intersections and roadways would operate at a LOS level of C or better. By the year 2026, or at the completion of the proposed project it is expected that traffic impact mitigation would be required for the intersection of Kapa'a Quarry Road and Mokapu Blvd. Possible mitigation measures are discussed later in this section. As stated, before in this Draft SEIS document, the <u>site development of the Proposed Action is being phased in at a slower pace than projected in the 2011FEIS</u>. Therefore, the traffic projections are not applicable at this time and a new TIAR should be completed once the updated site development plan is approved.

4.9.2 Projected Trip Generation and Project Generated Traffic Volume

Section 4.9.2 of the 2011 FEIS described the method of trip generation that was used for the TIAR that was referred to in the 2011 FEIS.

For the warehouse development at the time the FEIS was approved, a traffic count was conducted that determined the movement in and out of the project site for the AM and PM peak periods. The identified traffic movements were than normalized to a trip rate per 1,000 square feet of space in the existing warehouse development. The resulting existing trip generation rates per 1,000 sq. ft. for the AM and PM peaks were calculated as 0.87 and 0.84, respectively. A comparison with the standard trip generation

rates for warehouses under the Institute for Transportation Engineers (ITE) Trip Generation Manual (ITE, 2003) suggested that the existing trip generation rates are Lower than the ITE AM and PM peak standard trip generation rates of 0.92 and 0.98, respectively. Since it was assumed that the occupancy type of the proposed industrial development at full build-out would be the same as at the time of the traffic assessment, the existing trip generation rates at the project site were used for the subsequent analysis.

Table 4.9.1.1: Expected LOS for background traffic based on expects project completion (source Table 4-10 of the 2011 FIES).

Intersection / roadway segments	signalized / unsignalized	backgorund traffic w/o proposed project 2016		backgorund traffic w/o proposed project 2026	
		AM peak LOS	PM peak LOS	AM peak LOS	PM peak LOS
Intersections:					
Kapa'a Quarry Road & Mokapu Blvd.	signalized	C	C	C	F
Kapa'a Quarry Road & Kalanianole Hwy.	signalized	C	B	C	D
Kapa'a Quarry Road & Kapa'a Quarry Access Road	unsignalized	B	B	B	B
Roadway segments					
Kapa'a Quarry Road; **North** of quarry access road intersection	N/A	C	C	C	C
Kapa'a Quarry Road; **South** of quarry access road intersection	N/A	B	B	C	C
Kapa'a Quarry Access Road	N/A	B	B	B	B

LOS level requires mitigation as unsatisfactory taffic conditions occur

The 2011 FEIS described that the Northern segment of Kapa'a Quarry Road, section, (1) in Figure 4.9.1. and the portion of the quarry road between Mokapu Blvd. and the quarry access road intersection, would experience more traffic volume than the southern roadway section (2) in Figure 4.9.1. The identified asymmetric distribution of the trips between northbound and southbound traffic on the quarry road would suggest that northern portion of the quarry road would cause the larger proportion of traffic impacts.

4.9.3 Expected Future Traffic Volumes and Impacts

The 2011 FEIS described the future traffic volumes by adding the project related traffic (e.g., from the trip generation analysis) to the projected background traffic volumes for the different phases of the proposed project. Table 4.9.3.1 shows the expected level of service (LOS) for the project's future traffic volume at the three intersections and three roadway segments. Based on the results, the 2011 FEIS suggested that by the year 2016 no mitigation would be required at the intersections as well as on the roadways since the intersections and roadways would operate at a LOS level of D or better. Under urban

area traffic conditions, which apply for the proposed site, mitigation measures are required when intersections and roadways are operating at LOS levels Lower than D, e.g., at LOS E or F. For the traffic conditions in 2026, which implied the time of project full build-out, LOS levels were expected for all three intersections that would be above a LOS level of D. **This findings in the 2011 FEIS therefore suggested that traffic mitigation measures would be required at the time the project reaches full build-out.**

As pointed out before in this SEIS document, the SEIS Preferred Alternative would reflect the same future traffic volumes as the conditions presented in the 2011 FEIS since the SEIS Preferred Alternative would have the same full build-out warehouse space as presented in the 2011 FEIS. The SEIS No-Action Alternative would have somewhat smaller future traffic prediction since the total warehouse space would be smaller than the SEIS Preferred Alternative.

Table 4.9.3.1: Expected LOS for background traffic plus project related traffic (source Table 4-12 of the 2011 FEIS)

Intersection / roadway segments	signalized / unsignalized	Future traffic volumes background + project 2016		Future traffic volumes background + project 2026	
		AM peak LOS	PM peak LOS	AM peak LOS	PM peak LOS
Intersections:					
Kapa'a Quarry Road & Mokapu Blvd.	signalized	C	D	C	F
Kapa'a Quarry Road & Kalanianole Hwy.	signalized	B	B	E	D
Kapa'a Quarry Road & Kapa'a Quarry Access Road	unsignalized	C	C	D	E
Roadway segments					
Kapa'a Quarry Road; **North** of quarry access road intersection	N/A	C	C	D	C
Kapa'a Quarry Road; **South** of quarry access road intersection	N/A	C	C	C	C
Kapa'a Quarry Access Road	N/A	C	C	C	C

LOS level requires mitigation as unsatisfactory taffic conditions occur

4.9.4 Expected Traffic Conditions at Proposed Project Roadway Entrances

Section 4.9.4 of the 2011 FEIS described traffic conditions at three main roadway entrances based on the referred to TIAR. The result of the assessment suggested that all three roadway entrances would operate at LOS levels of C or better, and therefore traffic conditions would be satisfactory. In addition,

sight distance analyses were conducted for the three roadway accesses. Findings suggested that all sight distances for right-turn and left-turn maneuvers at the three roadway accesses were adequate and there would be no adverse traffic impacts due to insufficient sight distances.

The planned roadway accesses to the project site described under the 2011 FEIS were subsequently changed, and two permanent roadway accesses were added, one road entrance for the Upper and one for the Lower sites.

This total of five-access scenarios would remain under the SEIS No-Action Alternative. Under the SEIS Preferred Alternative, one roadway access for the Lower portion of the project site would be removed from the site development plan, and therefore a total of four would remain.

The proposed single roadway access to the Lower site is described in Section 6.9 of this SEIS document. This single roadway access scenario to the Lower site reflects the SEIS Preferred Alternative. Section 6.9 presents a sight distance analysis for the single to the Lower site. The results indicate that adequate sight distance is available for this roadway access.

4.9.5 Traffic Impact Mitigation Measures

Section 4.9.4 of the 2011 FEIS describes that the traffic conditions in the year 2016 would not warrant mitigation measures since all intersections and roadway segments that would be affected by the proposed project would be operating at LOS levels equal or better than D. LOS D is the lowest LOS level that does not automatically carry the requirements of mitigation.

The expected traffic conditions in the year 2026, which represented the completion of the development in the Lower portion of the project site and the full build-out of the proposed industrial park, would require mitigation measures, since the three intersections would operate at a LOS levels Lower than D.

The 2011 FEIS suggested that an updated TIAR, reflecting the newest development plans, should be conducted to select the most appropriate traffic impact mitigation.

4.9.6 Consideration of Impacts from Heavy Vehicle Traffic

Section 4.9.6 of the 2011 FEIS described the expected increase in heavy vehicle traffic on the Kapa'a Quarry Road. The percentage of heavy vehicle of total traffic was assessed for the existing traffic conditions at the time the 2011 FEIS was approved. As stated earlier, there is no updated TIAR available at this time and therefore the conditions described in the 2011 FEIS serve as indicators of expected traffic impact from heavy vehicles.

In the 2011 FEIS, the assessment of the expected increase of heavy vehicle traffic on the quarry road was done at two locations, for both the AM and the PM peak. The traffic levels on the southbound and northbound traffic were added to give the total, bidirectional traffic volume as the representative traffic volume. The locations "A" and "B" are defined in Figure 4.9.6.1, where "A" represents the northern segment of Kapa'a Quarry Road, between the intersections with the quarry access road and Mokapu Blvd and "B" represents the southern road segment between the quarry access and Kalanianaole Hwy.

The results for the assessment of impacts due to heavy vehicles indicated that such traffic volume would grow most on the Northern segment of the Kapa'a Quarry Road, represented by (A) in Figure 4.9.6.1. It was therefore expected that the northern segment of the quarry road would experience most of the possible impacts of heavy vehicle traffic. A comparison of the project related rates of increase between total traffic and heavy vehicle traffic suggests a 36 percent increase in total traffic volume versus 70 percent increase in heavy vehicle traffic. Therefore, the traffic impact assessment suggested that the heavy vehicle traffic generated by the project would result in a twice as large increase in traffic volume than that of the total traffic.

The 2011 FEIS conclusions were that it was beneficial to validate these projections in a new TIAR to be conducted later in the project. A later TIAR would be helpful to plan mitigation measures with a better understanding of the actually occurring increases in heavy vehicle traffic volumes.

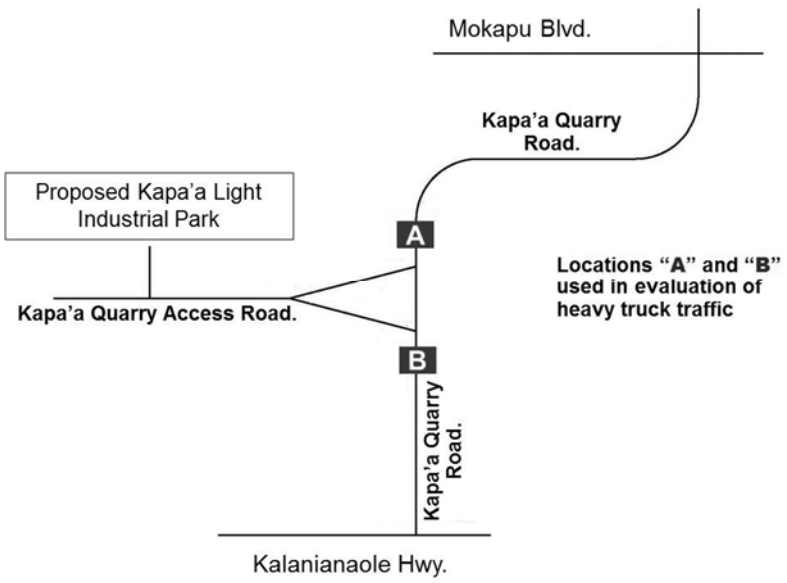


Figure 4.9.6.1: Location of point A and B for heavy truck impact evaluation

The 2011 FEIS suggested that the increase in heavy vehicle traffic could adversely affect the environment and the community, such as through traffic congestion, increase in noise and air pollution, increased highway maintenance costs, increase or wildlife collisions, and other safety issues. The 2011 FEIS described some of the potential impacts as following:

<u>Impacts due to weight:</u> Heavy vehicles contribute more to roadway damage than light vehicles. There is a correlation between weight of trucks and buses and the amount of anticipated damage to bridges and roadway pavement. Hawaii limits the maximum weight and length of heavy vehicles to 65 feet for truck-tractors and semi-trailers and 80,000 pounds for any vehicle that operates or moves on any public road, street, or highway within the state. But the weight of trucks on certain roads could be limited to significantly Lower allowable weights, especially on roads that were built decades ago and have bridges that cannot accommodate modern day heavy vehicles. While road damages generally increase with heavier vehicles the individual axial weight is also important to consider.

Trends that favor larger and heavier trucks might reduce the number of trips and lower the axial loads since these larger vehicles usually distribute the weigh on more axles, thereby reducing the impacts to roadway pavements.

Impacts due to noise: Noise impacts from heavy vehicles result from two main parameters, the traffic stream, and the individual noise from the heavy vehicle.

Noise levels resulting from the traffic stream increases with vehicle speed of individual vehicles on the road. The increase of noise with the vehicle speed follows a function that is specific for the type of vehicles. As an approximation, Figure 4.9.6.2 suggests a comparison between the typical generated noise by smaller cars and by heavy vehicles with three of more axles traveling at the same speed.

As Figure 4.9.6.2 suggests, the noise level emitted by heavy vehicles is significantly higher than for cars, therefore a reduction in speed related noise is more readily accomplished with cars than with heavy vehicles. Reducing actual driving speed can result in significant noise reduction. Enforcing speed limits can be a challenge and typically requires the buy-in of drivers. Enforcing speed limits through simple static signs is most often not effective; but controls as well as dynamic variable signs and those informing drivers of their speed can result in significant speed reduction and noise mitigation. As a rule of thumb, doubling or halving traffic volume results in noise changes of about 3 dBA, which is the level of noise change discernible to the human ear.

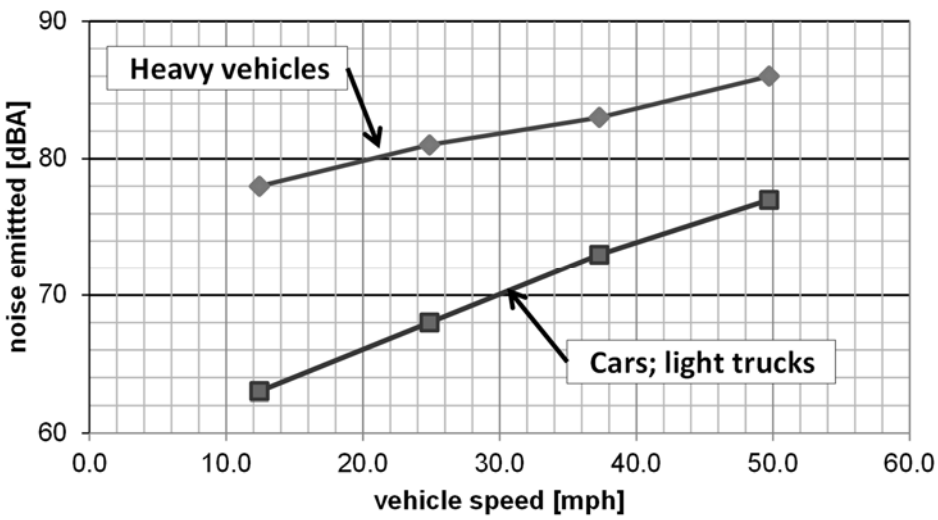


Figure 4.9.6.2: Comparison between typical speed dependent noise level generated by cars and heavy vehicles

Noise resulting from the operation of an individual heavy vehicle can be strongly attributed to the driving patterns of the operator. The noise emitted from the vehicle is a strong function of the rpm of the engine. Driving the vehicle in low gear can contribute to higher noises. Furthermore, frequent deceleration and acceleration can result in higher noises than for vehicles traveling at a constant speed. Avoidable noise is generated from idling large engines unnecessarily and there are recent laws and ordinances forbidding unnecessary engine idling. Another source of noise in the operation

of heavy vehicles is pneumatic brakes, which suggests that heavy vehicles driving at a constant speed can reduce noise levels.

Safety issues: Accidents involving heavy vehicles are always risky due to the large kinetic energy coming to an abrupt halt or deflecting on other vehicles. As rule of thumb, human error is the biggest contributor to accidents, not size or weight of the vehicle. For about two thirds of accidents involving heavy vehicles, the drivers of light vehicles are "at fault". Operators of heavy vehicles are professionals who know the capacity and limits of their vehicles often better than operators of private cars. The most common contributors to driver impairment in heavy vehicle are fatigue, drug taking (including drinking) and medical conditions.

The most effective mitigation of accidents involving heavy vehicles is a more effective general road safety deterrence, which includes regulating traffic issues on the roads that are most responsible for unsafe mixing of significant traffic volume of heavy vehicles, cars, light trucks, and motorcycles. Beside human error, ineffective roadways can contribute to a less than desirable safety situation on the roads, such as reduced lane width, sharp curves, insufficient visibility, high speed limits and missing visual indicators, to name a few. Mitigation could include such measures as clearance of roadside hazards or use of barriers to reduce such hazards, improvement and widening of shoulders, audible edge lining, night-time delineation, passing lanes (where appropriate), and replacement of intersections by roundabouts.

Wildlife collisions: Impacts of significance for the project site are possible wildlife collisions, due to the proximity to the marsh. Avoidance is easier and potentially safer for a car than for a heavy vehicle, given the mass of a heavy vehicle. Elevated speed is a major contributor to wildlife collisions since reaction time and avoidance maneuvers are more difficult at higher speeds. The frequency of wildlife collisions is further dependent on the time of day, with night contributing most of the collisions since wildlife is more active at night and can be blinded by headlights of approaching vehicles. Since heavy vehicle traffic resulting from the proposed project would be almost exclusively during the daytime there would be a significant reduction in related impacts. Studies have shown that informative dynamic signs, such as "*drive slowly to protect our wildlife*" or *"# of birds were killed last year on this road; drive with caution*" are more effective in promoting better and slower driving than static signs. Considering such dynamic signs for the quarry road and in the vicinity of the marsh might have a positive effect on the reduction of animals killed on the road.

Impacts on air quality: Heavy-duty diesel engines of trucks and buses release unburned hydrocarbons, carbon monoxide (CO), sulfur oxides, nitrogen oxides (NOx), particulate matter, and other toxic compounds. While the emission of hydrocarbon emissions and carbon monoxide from heavy vehicles represent only a small fraction of the overall traffic related emission of these agents, heavy vehicles contribute significant amounts of NOx and particulates. NOx and particulate matter both contribute to public health problems in the United States. NOx emissions from diesel vehicles play a major role in ground-level ozone formation. Ground-level ozone, more commonly known as "smog," is a respiratory irritant that is most problematic in the summer months. It causes a range of health problems related to breathing, including chest pain, coughing, and shortness of breath. Diesel particulate matter (soot) is a fine particulate matter that is easily inhaled and deposited deep in the

lungs and is a probable human carcinogen. Particulate matter can be linked to increased respiratory symptoms and disease. Children and the elderly are most at risk of ozone and particulates. In addition, ozone , NOx, and particulate matter can adversely affect the environment through damage to vegetation, impacts to the aquatic environment and visibility impairment.

Harmful emission levels from heavy vehicles are a function of the weight and size, and therefore of the engine power of the vehicles, and naturally more vehicles with more powerful engines emit more. What seems to be a more important determinant, however, are the ages and the state of operational readiness of the vehicles. Stricter standards for new trucks, originating back some 20 years and having become applicable standards recently, have resulted in significant reductions of emissions, and have Lowered the emission of heavy diesel-powered vehicles by more than 90% under those of vehicles built only 30 years ago. Emissions reductions can be achieved using pollution control devices (e.g., catalytic converters) and low sulfur diesel content, which has reduced the sulfur content of road diesel from 500 ppm to 15 ppm. The overall clean air impacts of these rules have contributed to a significant reduction in emissions from diesel operated heavy vehicles.

Excess smoke generation indicates diesel engines require maintenance and dark smoke is a sign of insufficient combustion, resulting in wasting fuel and producing excess emissions. From the public's perspective, smoking trucks symbolize significant health concerns which need to be mitigated. Suitable mitigation efforts include promoting regular tune-ups and maintenance. Enforcement to reduce excess smoke can use tests to determine the opacity of smoke being emitted from the exhaust pipe. An engine that is not emitting any smoke or emits little smoke is probably operating efficiently and will pass the opacity test.

The 2011 FEIS suggested the following generic mitigation measures to limit impacts from heavy vehicle traffic. While these mitigation measures will help to significantly Lower traffic impact, heavy truck traffic is a special case that would require extensive and comprehensive mitigation measures to reduce impacts to below significant levels.

a. Increasing the safety on the quarry road by enforcing or promoting the speed limit, experience has shown that static signs are not as effective as dynamic signs and active enforcing the speed limit.
b. Clearance of roadside hazards or installation barriers to reduce such hazards, as an example a roadside hazard is the present state of the drainage canal directly adjacent to the quarry road and a missing shoulder separating the road from the canal, over sections of the road.
c. Improvement and widening of shoulders, possibly also implementing a shared bicycle or sidewalk at sections of the quarry road.
d. Audible edge lining and night-time delineation to increase traffic safety during nighttime. Streetlamps are not installed along the quarry road and therefore nighttime visibility remains difficult. However, streetlights would add to light pollution along the marsh and might not be advisable.
e. Passing, acceleration or deceleration lanes (where appropriate) to allow a more effective merging of the heavy vehicles into the quarry road. As have been shown in the TIAR, the AM peak left turn from the quarry access road would require mitigation before planned completion of the proposed industrial park, die to unacceptable level of service (LOS).

f. Noise impacts mitigation by avoiding an unsteady traffic flow with frequent decelerations and accelerations. Noise reductions can also be achieved by such measures as Lowering the speed on the quarry road, improving the pavement quality, and installing noise barriers, e.g., a tree line at the Mauka side of the quarry road (this would also help in reducing the visual impact and the probability of wildlife collisions.
g. Air impact mitigation is best achieved by promoting the use of newer heavy vehicles in the proposed development and by promoting avoidance of unnecessary idling, strong acceleration, and decelerations. The operator of the proposed industrial park could identify inefficient vehicles driving in the development by the amount of excess dark smoke and require maintenance and engine tune-ups as a condition to operate in the industrial development.

Since the 2011 FEIS was approved, the Applicants commissioned a traffic safety study. The study was performed to investigate the need and feasibility of possible safety improvement on the Kapa'a Quarry Road. The findings of the traffic engineering study suggested, among other improvement measures, improved clearances on the roadway shoulders to improve sight distance and to remove larger objects to avoid collisions.

In response to the scoping for this SEIS document, the State Department of Transportation suggested that traffic impact mitigation measure needed to be designed and implement before full build-out of the project is achieved.

4.9.7 Off-street Parking

Section 4.9.7 of the FEIS described that parking would be exclusively on-site and public roads would not be used for parking by employees and visitors of the proposed industrial park. Therefore, there would be no adverse impacts on roadway parking. Both alternatives would provide sufficient parking and loading space in accordance with county land use ordinances. Under both SEIS alternatives parking spaces close to entrances would be preferably offered to drivers of low emitting vehicles and car- and vanpools.

The provisions for parking described under the 2011 FEIS would still be followed under the two SEIS alternatives.

<u>Appendix F of this FSEIS describes the County off-street parking rules which will be followed in the site development. Appendix F also describes the configuration of trees which will be added in accordance with these rules. The County rules for adding tress to parking areas suggest using the tree wells also as a LID storm water treatment BMP, which typically promotes significant infiltration of runoff. Since infiltration of runoff as a storm water BMP cannot be used at the project site, the trees will have curbs to avoid runoff from adjacent traffic areas running into the tree wells. The trees will instead be irrigated with harvested rainwater. The proposed design concept of the trees planted in engineered soil is described in Appendix F.</u>

4.9.8 Public Transportation

Section 4.9.8. of the 2011 FEIS described that the proposed site was not served by public transportation and no plans have been identified by public transportation authorities to start serving the proposed site in the foreseeable future. This conditions are still valid under the updated site development plan.

In Section 3 of this Draft SEIS document it was described that the nearest bus stop is at the Kalanianaole Highway. Employees and visitors who wish to walk to the project site find it hard and possibly unsafe to walk along the Kapa'a Quarry Road due to missing or insufficient shoulders and completely missing sidewalks.

In the 2011 FEIS, the Applicants raised the possibility of implementing a private shuttle that would connect the project site with parts of Kailua or Kaneohe or with the nearest public transportation service locations. The implementation of a private shuttle was not committed to in the sustainable design approach and no credit points under the LEED sustainable site credit categories are attempted at this point. The implementation of a shuttle service would be contingent on the identified need for employees and visitors of the development. Connecting the proposed site to the public transportation system would be a positive step in promoting the low impacts development goals of the proposed development.

4.9.9 Alternative Modes of Transportation

Section 4.9.9 of the 2011 FEIS describes alternative modes of transportation to reach the project site. The goal of alternative mode of transportation is a reduction of individual car uses and the related impacts on air emissions. Under the updated site development plan the basic premise of the alternative modes of transportation described in the 2011 FEIS is still valid. Plans of a walkway or bike way to connect the project site with the regional road system have not been realized in the time since the 2011 FEIS was approved.

The possible private shuttle service if no public transportation service to the proposed site, as described in the 2011 FEIS, is still a possibility at full build-out of the development. With a private shuttle service between, at least, the closest public transportation service points (e.g., bus stops), the occupancy of the affected bus lines on Kalanianaole Highway and Mokapu Boulevard would increase. It is anticipated that the added demand for public transportation would be within the capacity of the existing public transportation system.

Both SEIS alternatives promote the use of bicycles as a contribution to the low impact development approach for the Lower site. The use of bicycles would be incentivized by secured bicycle storage and shower facilities, in accordance with LEED requirements. The largest deterrent from employees and visitor to reach the project site by bicycle, or to walk, remains the missing bikeway or walkway along the Kapa'a Quarry Road. A segment of the envisioned Kawainui Marsh perimeter path could be used to connect the project site to the regional road system. But these plans, although in the Koolau Poko SCP of 2017, have not yet been realized.

4.10 Impacts on Existing Views

Section 4.10 of the 2011 FEIS described the visual impact of the project site at the time of the 2011 FEIS and provided an assessment of the expected visual impact of future expansions.

In the time since the 2011 FEIS was approved the existing visual impact from distant views have basically stayed the same whereas the visual impact from adjacent views has changed. The changes in the visual impact from adjacent views is mainly due to the growth of vegetation along the perimeter of the Lower portion of the project site. **Section 6.6 of this SEIS document presents a comprehensive visual impact study portraying the current (2020) conditions.** This visual impact study suggests that an observer looking to the updated site development from the distant locations as well as from a locations adjacent to the project site would not experience significant adverse visual impacts. The expected low visual impact assumes implementation off proposed visual impact mitigation measures, such as planting a dense vegetation cover and larger trees on the site perimeter berms.

Appendix G of this FSEIS describes a range of visual impact mitigation measures which would be used for the project. In addition to the visual impact mitigation by the vegetation screen on the site perimeter, berm color applied to the buildings will be used to blend the new building into the background. Appendix G describes the efficacy of visual impact mitigation by color schemes for long-distance views, such as views from Kailua or across the Kawainui Marsh.

4.11 Impacts on Land Use and Zoning

Section 4.11 of the 2011 FEIS describes expected impacts on land use and zoning for the proposed site and the vicinity. The 2011 FEIS concluded that the proposed project would change existing land use and zoning at the proposed site. While the land use under the two SEIS alternatives would be different from the existing land use, the 2011 FEIS stated that the proposed land use would not be incompatible with the existing land uses. The proposed industrial development would be in an area that is already characterized by light industrial land uses, and the Proposed Action could effectively mitigate environmental impacts with a low development approach that stresses a development that is responsible towards the environment and the community.

Several issues concerning land use have changed since the 2011 FEIS was approved. These changes are described in the following sections.

4.11.1 Impacts on Land Ownership

As was stated in the 2011 FEIS and what is still valid, the proposed development would be built on land that is already under the ownership of the Applicants and therefore no changes in ownership would be required.

4.11.2 Impacts on County Land Use Designation

The 2011 FEIS described that rezoning was needed to develop the portions of the project site for light industrial uses. The zone changes for a portion of the current TMK 4-2-15:014 from General Preservation (P-2) to Limited Industrial (I-1) was finalized in 2013.

4.11.3 Impacts on State Land Use Districts

As the 2011 FEIS stated and that is still valid the project site was within the Urban state land use district and there would be no changes were required.

4.11.4 Impact on Special Management Area

As the 2011 FEIS stated and that is still valid, the Lower portion of the site was within the Special Management Area (SMA). The required Special Management Area Use permit (SMP) was obtained in 2014 and amended in 2016 and 2017 to allow for certain changes in the site development approach.

The development in the Lower site will

4.11.5 Impacts on Land Use for the Surrounding Environment

Section 4.11.5 of the 2011 FEIS described several land uses that would be affected by the proposed action:

The existing land use in the Kawainui Marsh would be affected by both SEIS alternatives. Since impact on the Kawainui Marsh holds a significant importance, potential impacts and impact mitigation are discussed in Section 4.14 of this document.

- The Proposed Action would affect the planned marsh perimeter trail system. The 2011 FEIS expected that positive effects of the proposed project would outweigh possible adverse impacts. Adverse impacts on the perimeter path were described as increased traffic on the Kapa'a Quarry Road, associated increases in noise and possibly slightly affected air quality. The Applicants offered the use of about 1,500 feet along the Eastern site perimeter for the planned trail alignment. Possible positive impacts would arise from employees and/or visitors of the trail to commute by bicycle of walking from the bus stops on Mokapu Blvd. or Kalanianaole Highway. +As discussed earlier in tis SEIS document, plans for a marsh perimeter trail have not been realized in the years since the 2011 FEIS was approved.

  Appendix J of this FSEIS describes a proposed modification of the drainage ditch along the Kapa'a Quarry Road, fronting the Lower site. The proposed modification includes the construction of a 1,500-foot section of the marsh perimeter path on land that would be donated by the Applicant for this purpose.

- The industrial operations in the Upper part of the valley would be affected by the increased traffic on the quarry road and quarry access road. The project would increase the water and electricity consumption and thus would impact the associated supply situation of the valley. The 2011 FEIS predicted that the capacity of electric supply to the Kapa'a Valley would likely have to

be increased during the development of the project. The potable and fire water supply were expected to be adequate for the area, even with the added increase in demand created by the park expansions. Municipal wastewater systems would not be affected since the Kapa'a valley is not connected to the municipal sewer system and wastewater treatment and disposal occurs within the project site.

- The traffic on the Federal John A. Burns (H3) Freeway would be affected by the project. Project bound traffic from and to the project site would use the northern segment of the Kapa'a Quarry Road. This would mean an increase of traffic coming from and going to the Mokapu Boulevard exit of the H3-Freeway. It is expected that the number of additional trips resulting from the proposed project would not constitute a significant increase of traffic on the H3-Freeway.
- The Le-Jardin Academy is located about 1.5 miles from and to the South of the project site. It is expected that students of the Le Jardin Academy and their relatives would be affected by the increased traffic volume generated by Proposed Actin. But it is expected that related impacts would be small, and that traffic mitigation would be able to reduce the impacts to non-significant levels. It is expected that both SEIS alternatives would affect the traffic volume on the entire length of the Kapa'a Quarry Road.

  Based on the 2010 traffic analysis, it is anticipated that the Northern segment of the Kapa'a Quarry Road between the project site and Mokapu Blvd. would have higher increments in traffic volume than the Southern segment. The School is located at the Southern-most segment of the Kapa'a Quarry Road, and therefore the school is likely less directly affected by traffic conditions related to the project. Besides traffic and associated impacts, no other impacts of the proposed project on the school are expected under both action alternatives.
- The Kapa'a Refuse Transfer Station is in close proximity to the proposed project. It is expected that under both SEIS alternatives, the transfer station would be affected by increases of electricity and water demand by the project, as well as increases in traffic volume. Since the transfer station is located on the Southern segment of the quarry road, the traffic impacts are Lower than on the Northern quarry road segment, where most of the additional project generated traffic would occur. The water supply to the transfer facility and other users in the affected area appears to be adequate for the anticipated increase in demand. Electricity supply would be adequate since the power supply is slated for upgrades within the next couple of months (basis November 2020).

4.12 Impacts on Population and Community services

Section 4.12 of the 2011 FEIS described the positive effects off the Proposed Action on the economic development in the Koolau Poko region and associated possible impacts on the community services. A market study, which was conducted for the 2011 environmental review, suggested that positive impacts of stimulating economic development in the region would most likely outweigh adverse socioeconomic impact.

It is anticipated that the basic findings of the market study are still valid under the updated site development plan.

4.12.1 Economic Development Impacts

Section 4.12.1 of the 2011 FEIS described main economic impacts of the proposed project using a market study that was conducted in conjunction of the 2011 FEIS and a tenant survey that was conducted by the applicants in 2010. While some site details of the development plans have changed, the basic findings of the market study are is still considered valid.

The market study suggested that through 2030, it was estimated that the Koolau Poko region would readily support about 1,000,000 square feet of additional industrial-type floor area, which included about 170,000 square feet of demand that will be created via dislocation and conversion of land use. Although an additional one million square feet would represent a doubling of the currently available industrial space in the region, the resulting leasable industrial space would still only supply about 40 percent of the average per capita allowance when compared to other major Oahu and State markets. The market study estimated that it would take about 15 to 17 years for the proposed the new industrial space to reach absorption. Since the market study referenced conditions in 2010 with a development horizon of 15 to 17 years, full build-out was projected for 2025 to 2027. Full build-out is now expected by 2030.

The market study assumed that approximately 60 to 70 percent of current tenants at the existing warehouse development were relocations of newer and existing small businesses; some upgrading from their home or non-conforming locations, seeking better value by leaving their more expensive locations to industrial developments in the Koolau Poko region, or being encouraged to locate the businesses closer to home in the Koolau Poko region. The remaining 30 to 40 percent are assumed to be new businesses, such as newly formed companies or branch locations of already existing leeward companies. For the future, the market study assumed that the newly developed industrial floor space would be about equally occupied by relocating companies as new companies. The main reason for businesses to lease space in the proposed light industrial park was to serve the windward market without incurring extra cost associated with long distances service operations to the market.

The 2011 FEIS concluded that besides the proposed project, there was limited land within the Koolau Poko region that could be converted to industrial land use. This emphasized the importance of creating industrial-type capacity by implementing the proposed action. There were and still are no viable alternatives to the proposed site for planned expansion of industrial space within the Koolau Poko Region. The 2017 Koolau Poko Sustainable Communities Plan discourages the development of any further industrial subdivisions in the region but supports the existing enterprise types in the Kapa'a valley. The market study demonstrated that the region could absorb the planned expansion of the existing warehouse area, especially with a pace of build out that matches local business demand. Leasing experience by the Applicants support the fact and that the demand for industrial space in the region remains high.

The 2011 FEIS estimated that the proposed project would generate about $50 million in new capital investment during the length of the proposed project. It is expected that total construction wages would be around $12 million. Taxes that would be generated by the operating industrial park were estimated

by the 2011 FEIS between $1.8 - $8 million for the City & County of Honolulu and the State of Hawaii, respectively.

A tenant survey conducted by the Applicants determined that of businesses leasing space at the Kapa'a Light Industrial Park approximately 57 percent of their employees resided in the Kailua and Kaneohe area. It is expected that in the future under the proposed project, this proportion would remain similar. The 2011 FEIS estimated that of the 600 full time equivalent workers to be employed at the proposed site at full build out, approximately 340 employees would come from areas in proximity to the proposed project, and the remaining 260 employees would come from other parts of Oahu, and either commute or relocate to the region.

While at this present time the market study is almost 10 years old, it is assumed that its basic premises of the benefits of the proposed project to the Koolau Poko regions are still valid, and most likely the benefits have increased. During the past decade industrial land within the Koolau Poko regions has been lost due to new developments that replaced the former industrial land use with residential of commercial space. But the demand for light industrial services within the Koolau Poko region is still there and alternatives to such services fond in the region would require ling commutes and trips for the windward residents. In addition, the SEIS does not add any new land to the industrial park but reconfigures the site already approved in the FEIS.

4.12.2 Impact to Demographics and Public Services

Section 4.12.2 described the population of the Koolau Poko region as somewhat stable. A slight decrease of about three 0.8 percent from its current 118,000 or 3,500 was anticipated through the year 2030. Current estimates are a flat to small declining population between now and 2035.

While in-migration of a certain number of new employees and their families to the Koolau Poko region was be assumed, the expected number of people would most likely be smaller than or equal to the projected decline in population people who are assumed to move out of the region by 2035. Therefore, it is expected that the net in-migration to the region in the next two decades would be essentially negative, e.g., the proposed project would not generate as many people moving into the region as people who are expected to move out of the region.

Considering site-specific consequences on public services, the 2011 FEIS anticipated the following:

Police department: It was anticipated that the Proposed Action would not result in significant added demand on the police department. The industrial development would maintain its own security service, and the development would be secured by structural (e.g., perimeter fence, security lighting, security locks) and operational measures (e.g., surveillance cameras, frequent patrols). The strict security maintained within the proposed site would also have beneficial effects on the surrounding area, since the security service would cooperate with the police department to report any unlawful acts and possible security risks in the vicinity of the park.

Fire department: The new development would be constructed following strict fire codes and using appropriate building material and the new warehouse would be equipped with sprinkler systems. The security and maintenance staff would be trained in basic fire-fighting procedures and potential fires

would be reported directly to the fire department in unchanged from the existing conditions. Since the adjacent roadways would operate at a level of service of C or better, it is expected that fire and rescue vehicles would be able to proceed as swiftly and without delay as they can do so presently.

Medical facilities: Possible consequences of the Proposed Action on medical facilities could be occasional increased work-related accidents or traffic accidents on the adjacent roads as a result in increased project-related traffic. The expected type of businesses which would lease space in the proposed project would exclude those involving hazardous materials, products, or manufacturing processes. Adding new workers in the proposed project would undoubtedly increase the potential of accidents and other incidents that may require medical intervention, but it is expected that there would be no significant adverse consequence on medical services. As indicated for the police and fire department the response time to medical emergencies at the proposed site would not be increased.

Since the updated site development plan under the SEIS Preferred Alternative would develop the same warehouse space as delineated under the 2011 FEIS it is assumed that the impacts on demographics and public services would remain negligible as delineated in the 2011 FEIS.

4.14 Impact on the Kawainui Marsh and Planned Mitigation

Section 4.14 of the 2011 FEIS described the impacts on the Kawainui Marsh. The Kawainui Marsh is a designated Wetland of International Importance (established 2005) which has a total area of approximately 830 acres of land. The Kawainui Marsh is the largest remaining wetland in the State of Hawaii and represents a site of significant environmental and cultural importance.

The marsh is an important habitat for endangered and listed water birds and numerous species of migratory seabirds and waterfowl. The marsh features several historic sites, having cultural significance dating back to the early days of Hawaiian settlements in the area. The marsh has a significant importance as a flood control for the community of Kailua immediately adjacent to the marsh. A flood control levee was built several decades ago along the Eastern side of the marsh to improve flood control after several floods in the past had caused significant damages. The marsh also serves as a natural filter to contain sediments and trap pollutants upstream of the Kaneohe Bay.

Efforts by the community and governmental agencies are underway to restore areas of the marsh, reverse various negative impacts on its natural environment, and improve habitat conditions for wildlife. The goals of these initiatives are that the marsh can function as a cultural, educational, and recreational asset for the residents of Oahu, especially the communities closest to the marsh and to visitors as well.

The proposed project is located at the North Western perimeter of the marsh and could directly impact it due to its proximity. The following subsections of Section 4.14 describe possible impacts on the marsh by the proposed action. The following sub sections also describe a range of mitigation measures that could be implemented to reduce unavoidable impacts so that the negative impacts would no longer represent significant impact potential. The fact that the Lower portion of the project site would be developed with low impact development strategies would further support impact mitigation.

While most of the considerations hereafter explicitly address impacts on the Kawainui Marsh, such analysis and mitigation measures would also apply to the wetland area in the Kapa'a Stream corridor.

Furthermore, the marsh spans approximately 1.3 and 2.0 miles in the east-west and north-south direction, respectively. Due to the considerable dimensions of the marsh, the environmental consequences of the Proposed Action would only affect a small part of the marsh. The impacts and mitigation measures discussed hereafter are therefore only limited to an area of the marsh that is directly adjacent to the proposed site.

4.14.1 Impact on Water Resources

Impacts on water resources, both surface water and groundwater, have immediate consequences and potentially the most significant impacts on the marsh. The marsh is the receiving water for the Kapa'a watershed. The main surface drainage of the Kapa'a watershed is the Kapa'a Stream, which has a total length of about 1.9 miles, approximately 0.7 miles of which is on the property of the applicant. Additional minor surface drainage from the Kapa'a watershed into the marsh occurs through some drain outlets in the vicinity of the project site. Some drainage of the watershed also flows underground following the original soil horizons. An existing drainage ditch, which is located directly mauka of the quarry road, receives seepage and occasionally surface runoff from the project site and other surrounding drainage areas. The drainage ditch is connected to the Kapa'a Stream and the confluence of drainage ditch and the Kapa'a stream is just upstream of a culvert under the quarry road, which represents the end of the Kapa'a Stream and the beginning of the marsh. As was stated earlier in the SEIS document, the conditions of the drainage ditch have significantly changed since the 2011 FEIS was approved. The drainage ditch is presently filled with soil and has a dense vegetation cover. This has caused the drainage capacity of the ditch to be impaired.

Impacts of the surface water runoff into the marsh include sediments, nutrients, suspended solids, organic loads, and other water pollutants, such as metals.

Sediments that enter the marsh primarily originate from erosion of the stream bed during high flow events and from runoff from land missing suitable soil stabilization. While the normal flow rates in the Kapa'a Stream are in the range of one to two cubic feet per second, a strong storm event can result in significantly higher flow rates. High flow rates can result in entrainment and transport of sediments to lower elevation. When the hydraulic energy of turbulent flow in the stream is no longer present, e.g., when the flow becomes less turbulent, the entrained sediments settle and result in the accumulation of sediments and in the volume reduction of water basins and flood channels in the marsh. Erosion, which means entrainment and transport of sediments, and subsequent sediments are natural occurrences in stream and receiving water and are not necessarily adverse effects. Problems arise when a watershed releases water at high peak flow rates. In case of high peak flows rainwater cannot be percolated into pervious surfaces and be consumed by vegetation covers, so drainage flows from increasingly impervious surfaces. In general, area that were converted to a higher imperviousness can cause higher peak flow rates. The Proposed Action would convert land from pervious to impervious surface and therefore would add adverse effect from high peak runoff rates if no mitigation measures were taken.

Excess sedimentation in the marsh and associated growth of vegetation on areas that are created by sedimentation could turn wetland into upland, thereby destroying habitat for aquatic fauna and water birds. Sedimentation could furthermore result in death or debilitation of sedentary organisms. In

addition to the effect of wildlife sedimentation creating upland in the marsh, sedimentation decreases the flood control function of the marsh, since a wetland area with free surface is no longer available to retain flood water in the marsh.

Mitigating flood control measures would shave off high flow rates through detention of stormwater and controlled release to the receiving water. Consequently, high runoff rate and associated erosion can be mitigated and the release of the detained water to the stream would occur when the high flow rates in the stream during and after a storm event have abated. Other measures to control high runoff rates from the project site would include collection of rainwater for subsequent use in irrigation of landscaped and restored habitat areas at the site perimeter.

Irrigation promotes the percolation of stormwater and recharging of aquifers. Evapotranspiration from plants furthermore returns the stormwater to its natural environment without contributing to site runoff and associated erosion. The existing wetland area in the lower reaches of the Kapa'a Stream functions as a natural filter that removes sediments from the stream flow and converts the organic components of sediment. The conservation of the wetland area in the stream corridor is therefore an important function that needs to be ensured to mitigate impacts to the marsh.

Nutrients in the surface drainage from the watershed can impair the water quality in several ways. The two primary impacts of excess nutrients in the water are as a potentially toxic substance, and indirectly through a process called eutrophication. Eutrophication is the accelerated growth of algae in the water stimulated by the presence of excess nutrients, nitrogen, and phosphorus. The result of runaway eutrophication is the depletion of oxygen and the release of substances that toxic to the aquatic environment. Sources of nutrients can be from entrained natural deposits or organic matter, or from anthropogenic sources, such as from wastewater. Excess nutrients can have a significant adverse consequence on the marsh.

Mitigation of nutrient release from the proposed project would be to remove nutrient sources from the runoff through wastewater treatment units. Advanced wastewater treatment and the ability to remove more nutrient than conventional septic systems could add to mitigation because of the proximity to wetland area and the Kawainui Marsh. By implementing the proposed mitigation measures, the impacts of nutrients from the proposed site to the marsh would be effectively mitigated.

Suspended solids are created by dissolving material from solid surfaces and transporting the particles downstream. Suspended solids usually cannot be separated from water through sedimentation since the particles are too small and do not readily settle when the kinetic energy of the water diminishes. The removal of suspended solids relies more on filtering and absorption mechanisms than on settling. Suspended solids contribute to high turbidity and result in degradation of the water quality in the marsh. The concentration of suspended solids in the runoff can be reduced by filtering mechanisms in the soil, biomat or dense aquatic vegetation, or by manufactured treatment devices (MTD) which feature filter processes.

Mitigation measures of suspended solids in surface water include reducing the sources of suspended solids (e.g., reduction in erosion and leaching of particles from materials) and filtering

functions in soil and vegetation as well as process of treatment equipment. Stabilizing exposed soil with vegetation reduces erosion and improves removal of suspended solids through filtering. The proposed storm water treatment system for the Lower portion of the site has an active filter process, which treats storm water runoff that is released from the detention vaults.

Organic load in water can result in adverse effects if the decomposition of organic matter surpasses the ability of the receiving water to effectively break it down. In the presence of sufficient oxygen in the water, organic matter is decomposed by aerobic processes. If the replenishment of oxygen in the water cannot keep up with the rate at which oxygen is consumed for natural aerobic processes, the oxygen concentration can get too low to sustain aquatic life. The decomposition processes would then shift to anaerobic processes which are not as productive as aerobic processes, and which can generate substances that are toxic to aquatic life. Anaerobic processes are a natural component of a wetland in which vegetation and soil naturally exist in partly anaerobic environments. Problems arise when aerobic and anaerobic processes are out of balance and anoxic environments prevail. The marsh is negatively affected by an oxygen concentration which is too low.

Mitigation measures planned for the Proposed Action would include the advanced wastewater treatment to substantially lower the organic load in the effluent where the point of release of treated wastewater is close to surface water, e.g., in the Lower portion of the project site.

Additional impacts on water resources of the marsh could originate from the release of harmful agents to the water, either directly or indirectly. For example, runoff could be polluted by leaking equipment if such equipment is operated or installed in a non-conforming fashion. Another example is the use of unsuitable herbicides or fertilizer products near or in water that could introduce toxic discharge in the water.

Mitigation measures could include the avoidance of leaking equipment or the runoff of contaminated stormwater from such equipment. Furthermore, only certified, and environmentally friendly herbicides and fertilizers should be used at the project site. The choice of vegetation used in landscaping, could also improve mitigation in an indirect manner since native and adaptive plants have a significantly Lower demand for fertilizer and herbicides than typical plants used in landscaping.

Impacts to water resources during construction and site development require comprehensive and thorough mitigation, since significant impacts typically occur during construction when larger areas of the project site do not yet have soil stabilization and therefore soil erosion and sediment loaded runoff can occur.

Mitigation measures must be implemented in accordance with local codes and state and federal laws, such as the requirements to conform to provisions of the Clean Water Act (such as the National Pollutant Discharge Elimination System (NPDES)). For the various construction projects on both the Upper and the Lower sites, storm water pollution prevention plans (SWPPP) have been developed and implemented as a prerequisite to obtain NPDES permits for the release of storm water runoff related to construction activities.

4.14.2 Impact on Vegetation

Wetland vegetation is specifically adapted to the living conditions within wetland areas and can exist and thrive in saturated soil for extended periods of time. Wetlands are characterized by applying three criteria: type of soil, periods of inundation and specific vegetation. Changes in wetland can cause changes in vegetation. For example, wetland vegetation could make way for woody or wood-forming plants, which then would nurture the conversion of wetland to upland. The growth of undesirable plants in wetlands areas could require intervention, especially when undesirable plants encroach to the wetland.

Mitigation of undesired changes of vegetation in the marsh would include controlling the encroachment of unsuitable plants to the marsh. Mitigation measures would further involve avoidance of the conversion of wetland to upland area and the restoration of wetland where needed. Avoidance of excess sedimentation would not only improve the hydrological condition of the marsh but would also help to conserve the unique wetland vegetation.

4.14.3 Impact on Wildlife

Without planned mitigation measures, the Proposed Action could contribute to adverse impacts on wildlife living in the Kawainui Marsh. Some important potential consequences are briefly discussed:

The marsh is a habitat for several endangered and listed water birds and a population of migratory seabirds and waterfowl. The U.S. Fish and Wildlife Service (USFWS) have voiced concerns that water birds could be attracted to open water surface at the project, such as the panned open detention ponds, and therefore be exposed to increased predator risks. Since formerly planned open detention ponds will be avoided in the updated site development approach, this type of attraction of water birds to the project site would be avoided.

One of the proposed options for alignment of the relocated 4 kV Kapa'a power line would be installed on the Makai side of the Kapa'a Quarry Road. The power line might pose collision risks for birds.

Mitigation measures will be implemented in accordance with recommendations and requirements of the U.S. Fish and Wildlife Service (USFWS), avoiding open detention ponds and instead using underground detention vaults.

The owner and operator of the power line, HECO, suggested to use a horizontal conductor placement, which in accordance with HECO's assessment mitigates collision risks for birds.

The proposed project might attract non-native predators such as feral cats, rats, or mongooses. These predators could be attracted by human activities and by trash stored in open containers or carelessly spread. These non-predators are a threat to ground breeding birds and other wildlife.

Mitigation measures will include continuous predator removal and control, e.g., through trapping methods. Other mitigations include removal of all sources of food for these predators from the development and instructing occupants and visitors of the warehouse development not to feed these animals.

The potential of wildlife collisions typically increases with higher traffic volume and with higher vehicle speed when effective avoidance maneuvers could become dangerous for motorists and are therefore not executed by the motorists. The Proposed Action would increase the traffic volume on the quarry road, directly causing adverse effects on wildlife collisions.

> Mitigation measures would include the development and implementation of site-specific avoidance measures for federally listed endangered species and migratory birds in cooperation with the USFWS. The reduction of the average speed of vehicles on the quarry road would reduce wildlife collision potential. (Lowering the speed on the Kapa'a Quarry Road would also decrease impact from air pollution, noise, and increase traffic safety).

Light pollution can have a significant impact on wildlife, since excess light can impair navigation of migrating birds and can reduce the food source by attracting insects and thus causing an undersupply of food for birds in areas close to bright light sources. Light pollution also impacts humans as it affects dark sky experiences.

> Mitigation of measures will be implemented in accordance with an approved light pollution study for the project site (SDC, 2016). Mitigation measures would include the control of external and internal light sources. Avoidance of "over lamping", or installation of more luminance than required for the function, would mitigate light pollution impacts. Likewise, the use of monochromatic lamps, such as low-pressure sodium lamps, has lower impacts on wildlife than brighter wide spectrum light sources.
>
> Appendix H of this FSEIS is an updated version of the accepted 2016 Light Pollution Prevention plan. Appendix H uses the same basic design principles as the 2016 accepted version and includes the new layout of the Lower site.

4.14.4 Air and Noise Impact

The primary source of air and noise pollution would be from increased traffic on Kapa'a Quarry Road.

Air impacts, the most immediate and quantitatively largest impact potential on the marsh, would come from increased vehicle exhaust, with exhaust originating from diesel powered vehicles typically being the largest impact. The direction of the prevailing trade winds is generally from the Northeast. This would primarily send the exhaust away from the marsh and would thus naturally mitigate related impacts. Other impacts on wildlife and vegetation would be the discharge of agents that could be directly harmful to living organisms, or those which could cause indirect adverse effect through adverse environmental and habitat conditions because of accumulation and of changing chemical composition in water and soil.

> Mitigation to air impacts from increased traffic would be through reduction of vehicle speed and driving habits of motorists on the quarry road. While speed is the main determinant for increased traffic related air pollution, the types of vehicles and their operational conditions are also important mitigation measures.

Active mitigation measures would include implementation of lower speed limits through appropriate signaling, enforcement and information about the merits to protect our nature through good driving, respectively. Other mitigation measures could be improvements of the quarry road to make the traffic flow more effective, by lowering the instances of frequent accelerations and decelerations, and making the traffic flow more smoothly, thereby lowering fuel consumption and reducing the exhaust of harmful agents.

Noise impacts, the largest noise potential on the marsh would originate from increased traffic volume on the quarry road. Noise can affect the marsh primarily through affecting wildlife and the resulting reduction in habitat, as wildlife retreats from areas in the vicinity to the roads. While it is generally true that noise causes loss of habitat and avoidance, habituation occurs when wildlife get used to the noise level of the environment and newer generations of animals grow up accustomed to the elevated noise level.

Noise can have a somewhat beneficial side effect of causing wildlife to leave the area next to the roads and thereby decrease the number of deaths or injuries of animals when they collide or are otherwise adversely affected by vehicles. Habituation bears the risk that wildlife re-approach the roads and thereby get endangered by increased risk of colliding with vehicles. With the direction of the dominant trade winds, noise propagates more efficiently downwind, which means away from the marsh, thereby mitigating the noise impacts via natural conditions. In addition to adverse impact on wildlife, noise is an annoyance and sometimes harmful to human beings.

Mitigation measures of noise impacts from traffic address similar mechanisms as air impacts. Noise is a strong function of the speed of vehicles and decreases measurably with lower speed. Heavy vehicles produce significantly more noise than cars at lower speeds, because of less wind generated sound energy and more audible engine noise. Noise levels are higher on streets with rough and damaged pavement than on roads with smooth asphalt. Noise is attenuated in the presence of sound absorbing surfaces, such as vegetation close to the road, which reduces multiplying sounds caused by reflection on hard surfaces.

4.14.5 Impacts through Litter and Non-conforming Waste Disposal

Litter and unsuitable and unlawful waste disposal adversely affect the appearance of the environment and cause harm to flora and fauna. Generally, increasing human activity in an area increases the potential of littering and unlawful waste disposal, especially when law enforcement is challenging, and the area is remote.

Mitigation of littering and unlawful waste disposal can be achieved through two types of measures - avoidance of littering and unlawful disposal, and swift removal. Avoidance of littering can be achieved through better education, combined with encouragement to report on cases of exceptional unlawful disposal activities. Much of the littering is due more to carelessness than malice, and educational signs and campaigns can be an effective mitigation measure.

Unlawful disposal of larger and possibly harmful objects is almost always perpetrated with intent and could only be mitigated by strict enforcement and significant fines and penalties. Over many years, the Applicants have removed substantial amounts of debris and litter from the perimeter of the proposed site and from the shoulder of the Kapa'a Quarry Road. The proposed project would continue the strict management of litter and debris from the area that surrounds the proposed site.

4.14.6 Cultural Impacts

Within and around the Kawainui Marsh there are several archeological and cultural sites of importance which are listed in the Hawaii State Register for Historic Places. Almost all sites are located at the Southern side of the Marsh, and the distance between the proposed project and these sites is between one and two miles. Given the distances, there are no direct impacts of the proposed project to these sites. One site that is located adjacent to the proposed site is the Pahukini Heiau, which is located about 2,000 feet west of the closest wetland area.

Mitigation measures are not expected to be required due to the lack of adverse impacts of the proposed project on archeological and cultural sites in and around the Kawainui Marsh. One mitigation measure is the responsible handling of cultural artifacts if found during construction. The construction would be stopped until a cultural resources manager has determined the required course of action. Communication with State agencies has indicated that no cultural and archeological sites and assets are expected at the proposed site.

4.14.7 Visual Impacts on the Marsh

Visual impacts can affect long-distance and near distance view planes in and around the marsh. A comprehensive visual impact assessment was created for this DSEIS and is presented in Section 6.6 of this SEIS document. The study concluded that the project would not significantly affect most long distance and panoramic views of the marsh. The proposed project is located within an area that has existing industrial uses and visible structures. The Upper portion of the project site is effectively shielded from direct line of sight from almost all view planes within and around the marsh. The Lower portion of the site is visible from view planes at a higher elevation in the north western area around the marsh, for example form the adjacent H3-Freeway, but is not visible from locations around and within the marsh that are at equal elevations as the project site.

One of the several proposed options for alignment of the relocated 4 kV Kapa'a power line would be installed on the Makai side of the Kapa'a Quarry Road. The power line might cause visual impact for people traveling on the Kapa'a Quarry Road.

Mitigation measures for visual impacts are the construction of vegetative buffer zones around the Lower portion of the site. The Upper portion of the site does not adversely affect the view planes around the marsh that were investigated in the visual impact assessment. Visual impact mitigation would include planting trees and shrubs around the perimeter of the site.

Appendix G of this FSEIS describes a range of visual impact mitigation measures which will be used for the project. In addition to the vegetation screen on the site perimeter berms,

appropriate color schemes will be applied to the façades of building in the Lower site to lower the visual impact from long-distance view. Appendix L describes the several alternative alignments of the relocated 4 kV power line and the visual impact mitigation which would be available.

4.14.8 Impacts on Recreational and Educational Uses of the Marsh

Conservation efforts of the Kawainui Marsh have recently gained increased support by community groups and governmental agencies to protect and enjoy the Kawainui March as an asset to the community. Appendix L of this FSEIS describes the relocation of the power line that supply the project site with electricity. Appendix L also describes expected impact of several options for the relocated power line on the environment and the community. Possible impacts could include impacts on the recreational model airplane park.

Mitigation measures to reduce impacts that would lower the recreational and educational value include lowering traffic-induced noise and air impacts on the marsh. Traffic impact mitigation measures have already been addressed earlier in this section. HECO, the owner and operator of the future relocated power line, plans to install aerial marker balls on the power lines to provide help in navigating of the model planes. The operation of model airplane on adjacent properties and public right of way is prohibited and therefore the model airplane operators should keep a safe distance from the power lines.

4.14.9 Impact to Infrastructure

The perimeter of the marsh that borders the project site features electric power lines and telecommunication cables installed on utility poles along the Kapa'a Quarry Road and the Kapa'a Quarry Place. Project related consequences to the marsh would mainly be through short term impacts to add cables to the existing utility poles and install new poles, if required, or through visual impact. Appendix L of this FSEIS describes several options for the relocation of the power line that supply the project site with electricity. Appendix L also describes expected impact of the relocated power line on the environment and the community.

Mitigation measures would address these short-term effects, such as possible replacement of utility poles along the Quarry Road. Depending on the option approved, longer-term impacts caused by the relocated 4 kV Kapa'a power line could cause visual impact and possibly traffic impact, from poles installed close to the roadway.

4.14.10 Miscellaneous Impacts

One possible miscellaneous impact to the marsh would be the danger of fire in the marsh. Historically, the marsh has been subjected to several fires in the past decades, some more serious than others. A widespread fire could significantly damage marsh vegetation. An indirect elevated fire risk could arise through increased traffic on the Kapa'a Quarry Road. Since the proposed project would greatly increase

the presence of security and protective surveillance in the area, it is expected that fire risks from arson and self-ignition of unlawfully disposed waste would be reduced.

Mitigation measures to reduce fire risks in the marsh would be surveillance and the removal of unauthorized or abandoned objects that could pose a fire hazard.

CHAPTER 5 RELATIONSHIP TO LAND USE PLANS POLICIES AND CONTROLS

Chapter 5 of the 2011 FEIS described the relationship of the Proposed Action to land use polices and controls. The discussion in this Chapter 5 updates the findings of the 2011 FEIS in accordance with the proposed changes in site development plan.

The proposed expansion of the Kapa'a Light Industrial Park (Proposed Action) needs to be consistent with the main principles of existing land use visions, policies, and guidelines for Oahu and the Koolau Poko region. This section discusses compliance of the updated site development plan of the Proposed Action with the City and County of Honolulu General Plan and the Koolau Poko Sustainable Communities Plan.

5.1 State Land Use Districts

A change of State Land Use Districts is not required. All land that would be used for the Proposed Action is presently located within the state's Urban district.

5.2 Compliance with General Plan

The following categories of the General Plan apply the proposed action:

- Economy
- Natural Environment and Resource Stewardship
- Policies of Transportation & Utilities
- Energy
- Public Safety

Sections 5.2.1 through 5.2.5 of this SEIS document describe how the Proposed Action would be consistent with the policies, visions and guidelines of the General Plan delineated in the five chapters.

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 Action would be consistent with this policy, since the approved FEIS square footage and the Proposed Action are nearly the same. The Proposed Action would continue to provide important infrastructure prerequisites for the growth and diversification of Oahu's economic base, built out over time and as interest and demand grow. The Koolau Poko region remains undersupplied with small service provider and light industrial space. To reach businesses which serve the Koolau Poko region from other locations on the island, customers or employees living in Koolau Poko communities such as Kaneohe and Kailua must travel considerable. Time, natural resources, and travel costs for businesses, employees and customers are saved by having modern, sustainably developed light industrial small service providers. 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 Action would be consistent with this policy, since it would provide opportunity specifically to small businesses in the Koolau Poko area to work or establish service businesses in modern, sustainably designed space. Industrial space in the Koolau Poko region will not grow significantly and yet, having the opportunity to run locally owned and operated businesses close to home is needed for both their own cost management and for the good of the community. A survey conducted for the 2011 EIS indicated that 85 % of the businesses leasing space in the existing Kapa'a Light Industrial Park are smaller companies with less than ten employees. Seventy percent of the employees of such companies reside in the greater Kailua and Kaneohe region. And the current tenants of the Kapa'a Light Industrial Park reflect these statistics.

Policy 3: Encourage the development in appropriate locations on Oahu of trade, communications, and other industries of a nonpolluting nature:

The Proposed Action 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 2013 executed zone change (City and County of Honolulu, Ordinance 13-35) to Limited Industrial (I-1) land for portions of the TMK 4-2-15:014 disqualified intensive industrial operations, which could potentially emit harmful pollutants. Since the Proposed Action is zoned limited Industrial, the nature of the proposed "light industrial" land use by means of warehouses would significantly curb potential pollutant emissions.

The Proposed Action includes sustainable design, construction, and operational methods, thereby decreasing emissions that typically accompany industrial activities. While the sustainable core and shell development approach for the warehouses would be fostered by the developer, tenants would be encouraged to streamline their businesses along the low impact development approach of the development. In certain cases, tenants would be contractually obligated to adopt low impact development strategies where required to mitigate impact that extends past the leased area. For example, tenants would need to abide by light pollution reduction and energy and water saving strategies as part of their lease agreements. The fact that the Kapa'a Light Industrial Park Lower site would be developed in accordance with LEED and would, upon completion, likely 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 Action 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 Action would be consistent with this policy, since it would provide the infrastructure means for existing and new businesses to grow or to provide a better long-term basis for their businesses. The capacity of the Proposed Action would be able to accommodate replacement 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 Action would be consistent with this policy since it would provide space for safe and sustainably designed commercial and light industrial activities to help ensure a favorable business climate on O'ahu. Oahu's 2050 Sustainability Plan calls on businesses to operate differently for the good of our overall shared future. KLIP supports these broad goals.

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 Action would be consistent with this policy, by developing in a manner that is environmentally responsible. The low impact development approach of 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 Action would be consistent with this policy, since it would be built on land that has been significantly impacted and impaired by industrial activities over the past decades. Developing the Proposed Action would improve land that has been impaired by landfill operations. The proposed project would decrease harmful runoff and would actively engage in restoring natural resources.

Policy 3: Retain the Island's streams as scenic, aquatic, and recreation resources:

The Proposed Action would be consistent with this policy, since it would implement impact mitigation that protects aquatic resources from polluted runoff conditions. The specific conditions of the Proposed Action would improve existing water quality in the Kapa'a Stream since harmful emission by leachate from the former landfill would be avoided.

Policy 4: Require development projects to give due consideration to natural features such as slope, flood and erosion hazards, water-recharge areas, distinctive landforms, and existing vegetation:

The Proposed Action would be consistent with this policy, since it would consider important natural features such as slope, flood and erosion hazards, water-recharge areas, distinctive landforms, and existing vegetation. The development of the Kapa'a Light Industrial park would follow low impact development standards of environmentally friendly and energy efficient buildings and the development would be designed and constructed in such a manner to qualify for LEED certification upon completion of the project.

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: Rainwater would be collected from selected warehouse roof and some segments of roadways. After storage in underground taverns, the collected rainwater would be used for irrigation, thus significantly reducing potable water use for irrigation.
- Distinctive landforms would be retained within the proposed site. The existing site is a landfill area that was formed about 60 years ago. The landfill area would be graded and transform from the currently exposed soil to a surface that is resistant to soil erosion and thus avoid related impacts due to runoff that contains entrained soil.
- Existing vegetation at the site perimeters would not only be conserved but vegetation would be improved by using native and adaptive plants for landscaping and open space restoration in lieu of existing invasive plant species.

Policy 6: Design surface drainage and flood-control systems in a manner, which will help preserve their natural and cultural resources.

The Proposed Action would be consistent with this policy, since it would use an array of Best Management Practices (BMP) to create environmentally friendly drainage and flood-control systems. The stormwater management system would include the following components:

- A portion of the warehouse roofs would collect rainwater. Harvested rainwater would then be stored in underground cisterns for subsequent use of irrigation; therefore, converting impervious roof area to "semi-pervious area."
- All stormwater would be collected and treated in a comprehensive storm water system. No stormwater would be released directly to the receiving water without being treated in some form.
- The storm water system at the site includes several treatment processes. Older sections of the Kapa'a Light Industrial Park have the storm water treatment systems installed up to 25 years ago, when drainage standards were not as stringent as the current standards. Newer sections of the industrial park are designed following newer standards with significantly more stringent standards. The proposed development in the Lower portion of the project site would have storm

water systems which would surpass government standards and offer comprehensive impact mitigation.

- In the entire Lower portion of the site, as well as in portions of the Upper site with new developments, storm water detention basins are included to lower peak flow discharge rates.
- In the Upper site upstream of the detention vaults, 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.
- In the Lower site upstream of the detention vaults, runoff would flow through vegetated buffer strips which are low impact development (LID) strategies which filter the runoff through vegetation.
- In the Lower portion and in parts of the Upper portions with new buildings, runoff that is released from the detention vaults would run through manufactures treatment devices (MTD) which filter the runoff before discharging off-site.
- The stormwater would remain in underground detention basin vaults for flood control. The detained stormwater would be released in a controlled manner to shave off high peak runoff flow rates which could result in streambed erosion and subsequent sedimentation in the marsh.
- For a 5-acre portion of the Upper project site, storm water would enter an existing infiltration and detention basin which was built several decades ago and has now a dense vegetation cover. This basin served earlier industrial activities in the Upper Kapa'a valley and is now available to be used. Therefore, run off from this 5-acre areas would be treated with low impact development strategies.

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

The Proposed Action would be consistent with this policy, since it would incorporate active and passive measures to limit air, water, and noise pollution. Some examples of effective measures would include:

- Landscaping with native or adaptive plants within and at the perimeter of the development footprint.
- Using vegetative buffer zones at the site perimeter to mitigate 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 pollution preventing onsite wastewater treatment in the form of advanced membrane bioreactor treatment (MRB) would increase the treatment effectiveness and significantly reduce organic loads, nutrient and suspended solids compared to conventional septic systems.

Policy 8: Protect plants, birds, and other animals that are unique to the State of Hawaii and the Island of O'ahu:

The Proposed Action would be consistent with this policy. The low impact development approach of the Proposed Action would create habitat and vegetative buffers zones between the development and surrounding wetland areas. The existing site is not considered a habitat for endangered species but features a population of urbanized birds and small mammals. This population would find an expanded habitat in the perimeter areas of the project.

Policy 9: Protect mature trees on public and private lands and encourage their integration into new developments:

The Proposed Action would be consistent with this policy since efforts would be made to preserve mature trees at the project site. Mature trees are mainly located in stream corridor and in the eastern side of the property, but not within the interior project area. The area containing mature trees would not be negatively impacted by the new development, thus most of the mature trees 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 project site. The vegetative buffer zones would feature native or adaptive plants and would have densely planted windbreaks 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 Action would be consistent with this policy since the proposed development would be designed and built based on sustainability concepts. Part of the actions under the proposed sustainability development plan, such as following LEED certification, are to support initiatives to promote awareness about the Kawainui Marsh and sustainable development.

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 Action would be consistent with this policy, since it would be developed using a range of impact mitigation strategies 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 an improved watershed and water quality in the Kapa'a Stream. The comprehensive stormwater treatment and management system of the Proposed Action 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. 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 biodiversity of the area.

Policy 2: Protect Oahu's scenic views, especially those seen from highly developed and heavily traveled areas:

The Proposed Action would be consistent with this policy since it would utilize visual impact mitigation measures to protect scenic views. The new warehouses would be built in an attractive style that blends into the surrounding area. Trees would be planted around the buildings within development to provide "green cover" for large warehouse walls. Trees planted in the vegetative buffers around the perimeter of the Lower portion of the site would provide effective visual impact mitigation. External lighting design would avoid light pollution. 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 industrial development would implement visual impact mitigation.

Appendix G describes a range of visual impact mitigation measures which would assist in preserving visual resources.

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 Action would be consistent with this policy since it may provide educational opportunities about environmentally friendly commercial and industrial developments as part of the sustainability development approach.

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 Action would be consistent with this policy since the sustainable development approach would promote the use of alternative transport modes. As part of the sustainability development approach alternative transport may include public transportation, private shuttles, bicycles, carpools, and other measures. Preferred parking would be offered for carpools and low-emitting vehicles. There would be secured bicycle racks and a locker-shower opportunity for bicycle users. At the present there are no 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

Applicants would support plans to build a 1,500 feet section of the proposed perimeter pathway on their property. Portions of such ab marsh perimeter pathway could be used to reach the project site safely and comfortably 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 Action 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 Applicants are currently working with the State of Hawaii Department of Health under a technology pilot project to implement an advanced wastewater treatment technology. This new wastewater technology offers significantly higher impact mitigation and therefore has higher pollution prevention capabilities than conventional onsite wastewater treatment processes.

The proposed industrial development would make 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. Part of the sustainability development approach would be a comprehensive construction waste management plan under which significant part of material from the site would be reused or recycled.

Policy 4: Encourage a lowering of the per-capita consumption of water and the per-capita production of waste.

The Proposed Action would be consistent with this policy, since it would actively incorporate measures to lower water consumption by recycling water and harvesting rainwater that can be used for irrigation or other grey water applications. A portion of onsite treated wastewater would be infiltrated on the site or reused for irrigation. As part of the low impact development approach, occupants of the light industrial park would be encouraged to recycle and to responsibly use resources, and facilities would be provided to make these efforts easy and convenient.

Policy 5: Provide safe, efficient, and environmentally sensitive waste-collection and waste- disposal services:

The Proposed Action would be consistent with this policy, since it would incorporate safe, efficient, and environmentally sensitive waste-collection and waste-disposal services. The Proposed Action would be consistent with LEED and implement plans that construction waste management, material reuse, recycled content of both pre- and post-consumer content, preferred use of regional material, rapid renewable material, and certified woods.

Policy 6: Support programs to recover resources from solid-waste and recycle wastewater.

The Proposed Action would be consistent with this policy since wastewater would be treated and infiltrated on site. Wastewater disposal in areas that are close to sensitive areas would include advanced treatment capabilities to significantly lower the concentration of organic loading, nutrients, and suspended solids in ten effluent. The effluent of the onsite wastewater treatment would be such a high quality to allow its use for irrigation.

Policy 7: Require the safe disposal of hazardous waste.

The Proposed Action would be consistent with this policy since it would safely collect and dispose of any hazardous waste. The type of land use in the proposed industrial development would not include industries using or manufacturing hazardous materials.

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

Policy 1: Maintain existing utility systems to avoid major breakdowns:

The Proposed Action 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 use of recycled rainwater 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 Action would be consistent with this policy since it would incorporate load demand 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 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 Action would be consistent with this policy since it would place all improved utilities underground within the proposed site. The future owner and operator of the relocated 4 kV power line (refer to Appendix L), HECO, plans to install the conductors on poles, since installation underground seems to be unlikely because the proposed alignment would be next to a drainage ditch, with an existing high-water table.

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 Action 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 Lower portion of the site would apply for LEED certification upon completion, which requires the implementation of a wide range of for sustainable technologies, including energy savings of at least 30 percent under the baseline of 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 Action 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 below design baseline performance prescribed in conventional building codes. Effective energy savings directly helps reducing Hawaii's dependency on petroleum. The proposed development would install 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 Action would be consistent with this policy, since it would incorporate energy generation technology to provide electricity, heat, and cooling from renewable resources. The low impact development approach of the proposed project uses a wide range of active and passive building technologies to reduce energy consumption and promote renewable energies.

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 Action would be consistent with this policy since it makes capital investments in energy efficiency and renewable energy sources. The integrated sustainability 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 Action would be consistent with this policy since it would follow the sustainability project development approach and would make energy conservation and renewable energy important design and development goals.

Policy 2: Provide incentives and, where appropriate, mandatory controls to achieve energy efficient siting and design of new developments:

The Proposed Action would be consistent with this policy, since it would incorporate energy efficiency in the proposed development as per the LEED green building standard, or equivalent. The sustainable building and site development standards could entail the following measures:

- 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 use energy more efficiently in existing buildings and outdoor facilities:

The Proposed Action 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 Action would be consistent with this policy since it would encourage 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 and shower facilities. Preferred parking would be offered low-emitting cars, and alternative fuel cars. The Applicants promote the extension of public transportation to the proposed site, although at the moment such extension is not planned by the City & County traffic authorities. If no public transportation would be offered to serve the proposed site with public transportation in the future, the Applicants consider offer private shuttle service at a point in the development, if 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 Action would be consistent with this policy since it has been actively promoting and installing commercially available solar energy systems.

Policy 2: Support the increased use of operational solid waste energy recovery and other biomass energy conversion systems.

The Proposed Action would be consistent with this policy, since it would 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 waste incendiary facilities. The Applicants have experience in biomass conversion at the project site.

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 insulation.
b. Biomass energy conversion.
c. Wind energy conversion.
d. Geothermal energy; and
e. Ocean thermal energy conversion.

The Proposed Action would be 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 part of the LEED Silver certification plan. At the present, the Applicants are working with the Hawaii State Department of Health on a pilot project to prove an innovative onsite wastewater treatment technology at the project site.

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 Action would be consistent with this policy since it would make efforts to engage the occupants of the light industrial 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 Action 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 conventional 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 prerequisite of the LEED certification plan.

Policy 3: Keep consumers informed about available alternative energy sources and their costs and benefits:

The Proposed Action would be consistent with this policy since it would engage users of the park about implementing energy conservation and using renewable energy.

Policy 4: Provide information concerning the impact of public and private decisions on future energy use:

The Proposed Action would be consistent with this policy, since it would encourage participation in energy issues of users of the proposed warehouse park, which are not only relevant to the warehouses but also of 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 Action 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 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 Action 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 Action would be 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 Action 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 Action 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 Action 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 Koolau Poko Sustainable Communities Plan

This section describes how the Proposed Action would support the visions, guidelines and planning principles set forth in the Koolau Poko Sustainable Communities Plan.

5.3.1 Consistency with the Role of Koolau Poko on Oahu

The Koolau Poko Sustainable Community Plan calls for sustaining quality of life in the region by balancing and integrating environmental, economic, social, and cultural objectives. The Proposed Action would positively affect economic and social aspects of the region, while providing an attractive place of operation for commercial and light industrial businesses within a development that would be environmentally friendly and respectful to cultural concerns and the natural surroundings.

Goals for the future land use in the Koolau Poko region are shaped by the region's role to provide only flat or limited growth, preserving the nature of the area in commercial centers, and supporting single family homes, while future significant residential growth is directed instead to Oahu's Primary Urban Center and Ewa Development Plan Areas in accordance with the General Plan. The future role of the Proposed Action would be to attract beneficial new employment opportunities for residents of the Koolau Poko region, while providing modern and environmentally friendly warehouse space for light industrial and commercial uses in the region.

As was identified in the most recent update (2017) of the Koolau Poko Sustainable Communities Plan, the region acknowledges the current light industrial space near the Kapa'a Quarry.

5.3.2 Consistency with the Visions of the Sustainable Community Plan

The vision of the Koolau Poko 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 Action would affect the first two resource categories of the above list, namely natural and scenic resources, and cultural and historical resources. Appropriate measures for the design, construction, outfitting and operation of the industrial 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 Action would provide small service business and light industrial space which is modern, environmentally friendly and energy efficient, built out in a phased manner that matches the business demand and community need. Both environmental protection and an efficient and responsible use of energy are increasingly important and fundamental challenges for Hawaii.

Enhance existing commercial and civic districts; The Proposed Action would be an expansion of an already existing warehouse development. The future warehouse constructions would be a consistently planned development and 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 define the land use of the proposed warehouse park would include service companies, light industrial facilities, 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 at the project site.

General Policies indicate that light and extractive industry activities in the Kapa'a Valley are accepted land uses. Therefore, the Proposed Action 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 action, such as:

- The Proposed Action would promote alternative modes of transportation, such as bicycles and car-pooling. Though at the moment, the site is not served by public transportation, the

developer of the proposed industrial park would promote public transportation or private shuttles to serve the expanded industrial development in the futures.

- The buildings in the proposed industrial development would be built in such a manner to respect the natural surroundings.
- Landscaping features at the site perimeters would use native and adaptive plants, which offer many advantages over other plants, such as less irrigation requirements, less fertilizer, and less maintenance, to name a few.
- 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.
- 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 following planned measures of the Proposed Action would be consistent with the Implementation Guidelines for light and extractive industry, set forth in the Koolau Poko Sustainable Community Plan, including:

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 a vegetative buffer zones.
- Visual impact from large buildings and solid walls would be mitigated by planting trees around the buildings.

Drainage and Waste Material:

- A comprehensive stormwater management plan would mitigate water quality impacts from peak runoff from the site. The stormwater management plan would contain a range of Best Management Practices (BMPs), such harvesting of rainwater, collecting all stormwater in below ground detention vaults for controlled release to the receiving waters and removing at least 80 percent of main pollutants from the stormwater before discharge to the receiving waters. With the implementation of the proposed comprehensive stormwater management system the proposed development would result in no direct discharge of stormwater runoff into receiving water.
- Leachate from the landfill, which is a result of the landfill prior uses, would be avoided by sealing the surface of the site with impervious cover, collecting the stormwater runoff into detention vaults, and treating it efficiently before discharging it into the receiving waters.
- Litter and other waste material would be prevented from encroaching into adjacent open space using proper maintenance of the site.

5.3.4 Consistency with Infrastructure Policies and Principles

The Proposed Action would be consistent with the following policies and principles regarding public infrastructure.

Water system development: The general policies on conserving precious water resources would be adopted through planned design and operational measures:

- The sustainability development plan of the Proposed Action calls for significant water savings of 30 to 40 % compared to conventional industrial developments excluding irrigation needs.
- The proposed build-out 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; significant quantity of potable water would be saved with harvested rainwater being used for irrigation.

Wastewater treatment systems: The Proposed Action would minimize impacts from wastewater discharge to conserve natural resources and to alleviate current capacity problems of public wastewater systems.

The Proposed Action would be consistent with the following General Policies:

- Within the newly developed area, wastewater effluent would be treated and recycled onsite. The treated wastewater effluent would be used for irrigation, where feasible, as a water conservation measure.
- 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 Action 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.

Electrical and communication systems: The Proposed Action would be consistent with the applicable guidelines:

- Electrical and communication cables in the proposed development would be placed underground inside the KLIP project site.
- 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 from a normal baseline amount.
- 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 Action would be consistent with the general policies of the Koolau Poko Sustainable Communities Plan, regarding to waste reduction, reuse, and recycling as well as the efficient disposal of waste.

- The design, construction and operational approach of the proposed development would follow the LEED certification.
- 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, and certified wood.

Drainage systems: The sustainable development approach of the Proposed Action would be consistent with drainage related policies of the Koolau Poko Sustainable Communities Plan. Due to the proximity and upstream location to important wetland area (e.g., Kawainui Marsh), the Proposed Action is committed to implement and operate a comprehensive stormwater treatment and management system to mitigate all possible adverse drainage effects.

The planned stormwater management and drainage system for the Proposed Action 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 detention of storm water on-site; the proposed system would collect all stormwater runoff from impervious surfaces and convey it to treatment facilities and detention vaults, where the runoff would be temporarily detained and then controlled released after the storm event.
- The entire development footprint would continue to be outside the Kapa'a Stream set-back. This ensures that the natural drainage capacity of the Kapa'a Stream would not be negatively affected by the development.
- Storm water is recognized as an important source of non-potable water that should be retained for recharge of the aquifer or irrigation rather than quickly moved to coastal waters. The planned drainage strategy would collect stormwater in detention ponds and release it in a controlled way. Rainwater would also be harvested from roof areas of warehouses and selected roadway sections, stored in underground cisterns, and subsequently used for irrigation and, if possible, other graywater applications in the buildings.
- The Proposed Action would implement structural and operation measures to control non-point source pollutants.
- The Proposed Action would utilize several stormwater detention vaults of different sizes for gradual release of retained stormwater into the receiving waters. This mitigates possible stream bed erosion impacts.

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 use such types 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 at the site perimeter, planting of trees within the vegetated buffer zones, and the avoidance of light pollution emanating from the site. The Proposed Action would therefore be consistent with the planning principles and guidelines for urban design of the Koolau Poko Sustainable Community Plan.

5.4 County Special Management Area

Approximately 70 percent of the land parcel designated as TMK 4-2-015:014, which is part of the site, is within the County Special Management Area. A Special Management Area Use permit must be obtained from the City and County of Honolulu to allow the development of the Kapa'a Light Industrial Park on that portion of the Lower portion of the parcel TMK 4-2- 015:014.

Special management areas (SMA) are regulated on the County level as part of Hawaii's Coastal Zone management (CZM) program, under Chapter 205A, Hawaii Revised Statutes (HRS). The SMA Permit system regulates development within geographically defined areas that extend from the shoreline inland as delineated in zoning maps. Aspects of development covered within SMA program guidelines include:

1. Placement or erection of any solid material or any gaseous, liquid, solid, or thermal waste
2. Grading, removing, dredging, mining, or extraction of any materials
3. Change in the density or intensity of use of land, including but not limited to the division or subdivision of land
4. Change in the intensity of use of water, ecology related thereto, or of access thereto, and
5. Construction, reconstruction, demolition, or alteration of the size of any structure

In 2014 the Applicants obtained a SMP permit for the Lower portion of the project site (Reference 2014/SMA-27).

Table 5.4.1 delineates which specific SMA guidelines, described under HRS 205D-26, apply to the proposed action, how the site is complying with the requirements since 2014, and how the Applicants will implement future mitigation measures to minimize possible adverse impacts delineated in the guidelines.

The proposed project does not qualify as a SMA minor permit, and therefore County procedures under the Special Management Area Use Permit apply. The SMP process included a thorough review by the agencies involved and public hearings is required. The public was given sufficient opportunity to be involved in the SMA permit process and is asked to provide input in possible improvements of the design approach of the project.

The SMP process included an agency review and public hearing, followed by a report to the City Council. The City Council then reviewed the case and acted in form of a resolution, which includes a public hearing.

Table 5.4.1: Compliance of Proposed Action with HRS 205A-26 SMA Guidelines

No. in HRS §205A-26	Description of SMA guidelines	Proposed Action Compliance	Comments or proposed measure to minimize impacts
1	**Reasonable terms and conditions set by the authority to ensure compliance:**		
1(A)	Adequate access, by dedication or other means, to publicly owned or used beaches, recreation areas, and natural reserves is provided to the extent consistent with sound conservation principles.	Proposed action conforms	The Proposed Action will not alter access to public owned or used recreation areas or natural reserves.
1(B)	Adequate and properly located public recreation areas and wildlife preserves are reserved.	Proposed action conforms	The Proposed Action will reserve public recreation areas and wildlife preserves.
1(C)	Provisions are made for solid and liquid waste treatment, disposition, and management which will minimize adverse effects upon special management area resources.	Proposed action conforms	Measures are taken under the design approach to manage solid and liquid waste in an environmentally friendly way and minimize impacts.
1(D)	Alterations to existing landforms and vegetation, except crops, and construction of structures shall cause minimum adverse effect to water resources and scenic and recreational amenities and minimum danger of floods, wind damage, storm surge, landslides, erosion, siltation, or failure in the event of earthquake.	Proposed action conforms and provides measures to provisions that apply	The Proposed Action will implement, among other measures: • A comprehensive system of measures to decrease the visual impact • A comprehensive stormwater management system to improve the existing drainage situation and effectively control and minimize adverse runoff effect on adjacent water bodies • A comprehensive soil stabilization effort to minimize erosion and siltation. This effort will include the improvement of vegetated land around the site perimeter to restored habitat under the sustainable design approach
2	The authority, e.g., county planning commission, needs to ascertain that:		

Table 5.4.1: Compliance of Proposed Action with HRS 205A-26 SMA Guidelines

No. in HRS §205A-26	Description of SMA guidelines	Proposed Action Compliance	Comments or proposed measure to minimize impacts
2(A)	That the development will not have any substantial adverse environmental or ecological effect, except as such adverse effect is minimized to the extent practicable and clearly outweighed by public health, safety, or compelling public interests. Such adverse effects shall include, but not be limited to, the potential cumulative impact of individual developments, each one of which, taken by itself, might not have a substantial adverse effect, and the elimination of planning options.	Proposed action conforms	The applicable design measures will be described in the updated project Masterplan and the sustainable design approach that is formulated to acquire LEED certification upon completion of the project.
2(B)	That the development is consistent with the objectives, policies, and special management area guidelines of this chapter and any guidelines enacted by the legislature.	Proposed action conforms	The Proposed Action is consistent with objectives, policies, and special management area guidelines, as well as other legislated guidelines.
2(C)	That the development is consistent with the county general plan and zoning. Such a finding of consistency does not preclude concurrent processing where a general plan or zoning amendment may also be required.	Proposed action conforms	The Proposed Action is consistent with the general plan. Portions of the project site have been rezoned in 2013, as required for the intended type of land use.
3	The authority, e.g., county planning commission, shall seek to minimize, where reasonable		
3(A)	Dredging, filling or otherwise altering any bay, estuary, salt marsh, river mouth, slough, or lagoon.	Proposed action conforms	The Proposed Action will not dredge or place fill into or adjacent to bay, estuary, saltmarsh, river mouth, slough or lagoon, the entire development will not include any water bodies in designated wetland areas.

Table 5.4.1: Compliance of Proposed Action with HRS 205A-26 SMA Guidelines

No. in HRS §205A-26	Description of SMA guidelines	Proposed Action Compliance	Comments or proposed measure to minimize impacts
3(B)	Any development which would reduce the size of any beach or other area usable for public recreation.	Proposed action conforms	The Proposed Action will not reduce any beach or other area usable for public recreation.
3(C)	Any development which would reduce or impose restrictions upon public access to tidal and submerged lands, beaches, portions of rivers and streams within the special management areas and the mean high tide line where there is no beach.	Proposed action conforms	The Proposed Action will not restrict public access to portions rivers and streams; the public access to the Kapa'a Stream corridor will not be altered from the existing condition.
3(D)	Any development which would substantially interfere with or detract from the line of sight toward the sea from the state highway nearest the coast; and	Proposed action conforms	The Proposed Action will not interfere or detract for any line of sight towards the sea. Appendix G of this FSEIS describes a range of visual impact mitigation strategies for the project.
3(E)	Any development which would adversely affect water quality, existing areas of open water free of visible structures, existing and potential fisheries and fishing grounds, wildlife habitats, or potential or existing agricultural uses of land.	Proposed action conforms	The Proposed Action will not adversely affect water quality in adjacent water bodies and designated wetland areas; the site is not on or within designated wetland areas or wildlife habitats.

CHAPTER 6 – SIGNIFICANT CHANGES IN SITE DEVELOPMENT STRATEGIES

Chapter 6 provides design details of site development strategies, including technology and process applications, which have changed significantly relative to the 2011 FEIS and previously approved permits. While details of these site development strategies have changed, the overall project approach and the commitment to use environmentally friendly technologies and processes have not.

In Chapter 6, previously disclosed or approved the subject site development strategies are briefly reviewed and subsequently the updated site development strategies are described in more detail.

The following site development strategies and their changes from previously approved technologies and construction approaches are described:

Section	Description of changed site development strategy	Brief description of changes and expected impacts.
6.1	Changed Project Site layout	While the overall warehouse space would stay the same (the actual change is about 0.3%) the distribution of warehouse space between the Lower and Upper portions of the site changed. The approved building layout under the SMP Minor Modification 2014/MOD-37 included a 3.4-acre base yard. The base yard was removed for the new layout under the updated site development plan, and warehouse buildings were included instead.
6.2	Storm water treatment and management	Low Impact Development (LID) strategies were added, and multiple subsystems and discharge points were used. Impacts due to non-treated storm water were reduced, as well as impact of peak flow discharges.
6.3	Full build-out finish grade of the project site	The elevation of full build-out finish grade was increased to provide required hydraulic energy for gravity from the storm water to the treatment facilities and discharge to the Kapa'a Stream corridor.
6.4	Interrelationship of the storm water system and proposed finish grade	Increased elevation of the full build-out finish grade to provide the initial elevation required to overcome hydraulic flow losses as storm water flows through the differ storm water systems.
6.5	Site perimeter berms typical cross sections	The heights of site perimeter berms were increased to provide lateral stability for the added fill.
6.6	Assessing the visual impact of the increased site perimeter berms	A visual impact study was conducted to determine what type of vegetation could serve as visual impact mitigation strategy.

Section	Description of changed site development strategy	Brief description of changes and expected impacts.
6.7	Vegetated areas inside the project site	Vegetated areas inside the site, including areas around buildings and traffic areas, were reduced. Therefore, rainwater infiltration into the landfill body and the related generation of harmful leachate was reduced.
6.8	Irrigation using harvested rainwater	Irrigation was changed from vegetated areas within the interior of the site to the site perimeter. The amount of irrigation would stay the same.
6.9	Changes of the Roadway access to the Lower project site	The roadway access to the Lower site was reduced from two access points to a single roadway access. The single road access reduced traffic by providing better visibility and a simpler traffic pattern.
6.10	Onsite wastewater treatment	A more advanced onsite wastewater treatment technology would be used that significantly improves the water quality of the treated effluent.
6.11 NEW	Relocation of the existing 4 kV power in the Lower site.	A 1,500-foot section of the 4 kV power line which supplies the KLIP passes through the Lower site and must be relocated since this section hinders the development of the Lower site. Appendix L describes several options, along with impacts.

6.1 Changed Project Site Layout

After the 2011 FEIS was approved, the layout of the project site has undergone several changes. The changes were caused by changes in building and site development technologies as well as alignment of the sizes and configuration of the warehouses to respond to customer needs. While the building configuration in the Upper portion of the project site has undergone some changes, changes have been more pronounced in the Lower site.

6.1.1 Stages in Changes of the Project Site – Lower site

This section describes changes in the site layout in the Lower portion of the site (Lower site). Three distinct stages in the design of the site layout illustrate the relevant changes.

- Stage 1 – Site Layout concept as of 2011 FEIS: The initial layout of the Lower site was described in the 2011 FEIS.
- Stage 2 - Site Layout concept as of 2014 SMP: The more detailed site layout was described in the approved 2014 Special Management Area Use Permit (SMP) (No. 2014/SMA-27 (Major)).
- Stage 3 - Site Layout concept as of 2021 SEIS: This present SEIS presents the site layout of the updated site development plan.

Sections 6.1.2. through 6.1.4 describe the configurations of the different site layout concepts described in Stages 1 through 3, respectively.

6.1.2 Stage 1 – Lower Site Layout Concept as of 2011 FEIS

Figure 6.1.2.1 illustrates the initial site layout concept as described in the 2011 FEIS. Table 6.1.2.1 shows the distribution of land uses for the initial Lower site layout concept. The sizes of the 15 buildings shown in Figure 6.1.2.1 are shown in Table 6.1.2.1.

Elements of Project Site	Building Footprint		Land area	
Buildings	337,000	sqft	7.7	acres
Vegetated area			11.7	acres
Paved traffic area			5.0	acres
Sum	**337,000**	sqft	**24.4**	acres

Table 6.1.2.1: Distribution of land uses for the initial Lower site layout concept

Lower site layout concept as described in the 2011 FEIS

Building No. as described in Figure 6.1.2.1	Building Footprint [sqft]
1	27,000
2	21,000
3	24,000
4	24,000
5	24,000
6	24,000
7	24,000
8	18,000
9	18,000
10	24,000
11	24,000
12	15,000
13	24,000
14	24,000
15	22,000
Sum	**337,000**

Table 6.1.2.2 : Sizes of the 15 buildings in the Lower site shown in Figure 6.1.2.1

The sum of the warehouse building footprints in the Lower site were **337,000 sqft** under the 2011 FEIS.

While the 2011 FEIS delineated the preferred total size of warehouses, other elements of the site layout were defined at an initial concept design stage. Notably the vegetated land within the Lower site did not differentiate vegetated buffer zone at the site perimeter and landscaped areas inside the site.

6.1.3 Stage 2 – Lower Site Layout Concept as of the 2014 SMP

The more detailed Lower site layout was described in the approved 2014 Special Management Area Use Permit (SMP) (No. 2014/SMA-27 (Major)). This Lower site layout was based on a more detailed engineering analysis that included site full build-out finish grading, details of the site perimeter berms, landscaped areas, paved traffic areas and roadway accesses, as well as site stormwater and wastewater infrastructure. Notably, this site design added a 3.4-acre base yard to the site layout, which was not described in the 2011 FEIS. At the time these changes were made there seemed to be a strong demand for base yard space. Adding a base yard to the site layout removed space for warehouse buildings, therefore the total size of warehouses in the Lower site was significantly reduced.

Figure 6.1.3.1 illustrates the Lower site layout concept as described in the 2014 SMP. Table 6.1.3.1 shows the distribution of land uses for the initial site layout concept. The sizes of the 15 buildings shown in Figure 6.1.3.1 are shown in Table 6.1.2.1.

Elements of Project Site	Building Footprint		Land area	
Buildings	217,000	sqft	5.0	acres
Baseyard			3.4	acres
Vegetated area			10.3	acres
Paved traffic area			6.3	acres
Sum	**217,000**	sqft	**25.0**	acres

Table 6.1.3.1: Distribution of land uses for the Lower site layout concept as described the 2014 SMP

Building No. as described in Figure 6.1.3.1	**Building Footprint** [sqft]
1	24,000
2	30,000
3	24,000
4	24,000
5	24,000
6	19,000
7	24,000
8	24,000
9	24,000
Sum	**217,000**

Table 6.1.3.2 : Sizes of the 15 buildings shown in Figure 6.1.3.1

The sum of the warehouse building footprints in the Lower site was **217,000 sqft** under the 2014 SMP.

6.1.4 Stage 3 – Lower Site Layout Concept as of 2021 SEIS

The present SEIS presents the updated Lower site development plan which removes the base yard and changes the land use of the former base yard back to land use for warehouse building space. The pervious landscaped areas in the interior of the site were removed and replaced with impervious pavement. One roadway access replaced the previously approved two roadway accesses. The full build-out finish grade elevations were increased to allow installation of a modified storm water system. The site perimeter berms were increased in concert with the increased elevation of the site finish grade.

Figure 6.1.4.1 illustrates the Lower site layout concept as described in this 2021 SEIS. Table 6.1.3.1 shows the distribution of land uses for the Lower site layout concept. The sizes of the 14 buildings shown in Figure 6.1.4.1 are shown in Table 6.1.4.1.

Elements of Project Site	Building Footprint		Land area	
Buildings	373,000	sqft	8.6	acres
Vegetated area			6.4	acres
Paved traffic area			10.0	acres
Sum	**373,000**	sqft	**25.0**	acres

Table 6.1.4.1: Distribution of land uses for the updated site layout concept described in this 2021 SEIS

Building No. as described in Figure 6.1.2.1	Building Footprint [sqft]
1	26,000
2	24,000
3	29,000
4	22,000
5	22,000
6	24,000
7	38,000
8	29,000
9	20,000
10	19,000
11	29,000
12	29,000
13	28,000
14	34,000
Sum	**373,000**

Table 6.1.4.2 : Sizes of the 14 buildings shown in Figure 6.1.4.1

The sum of the warehouse building footprints in the Lower site is **217,000 sqft** under the 2021 SEIS.

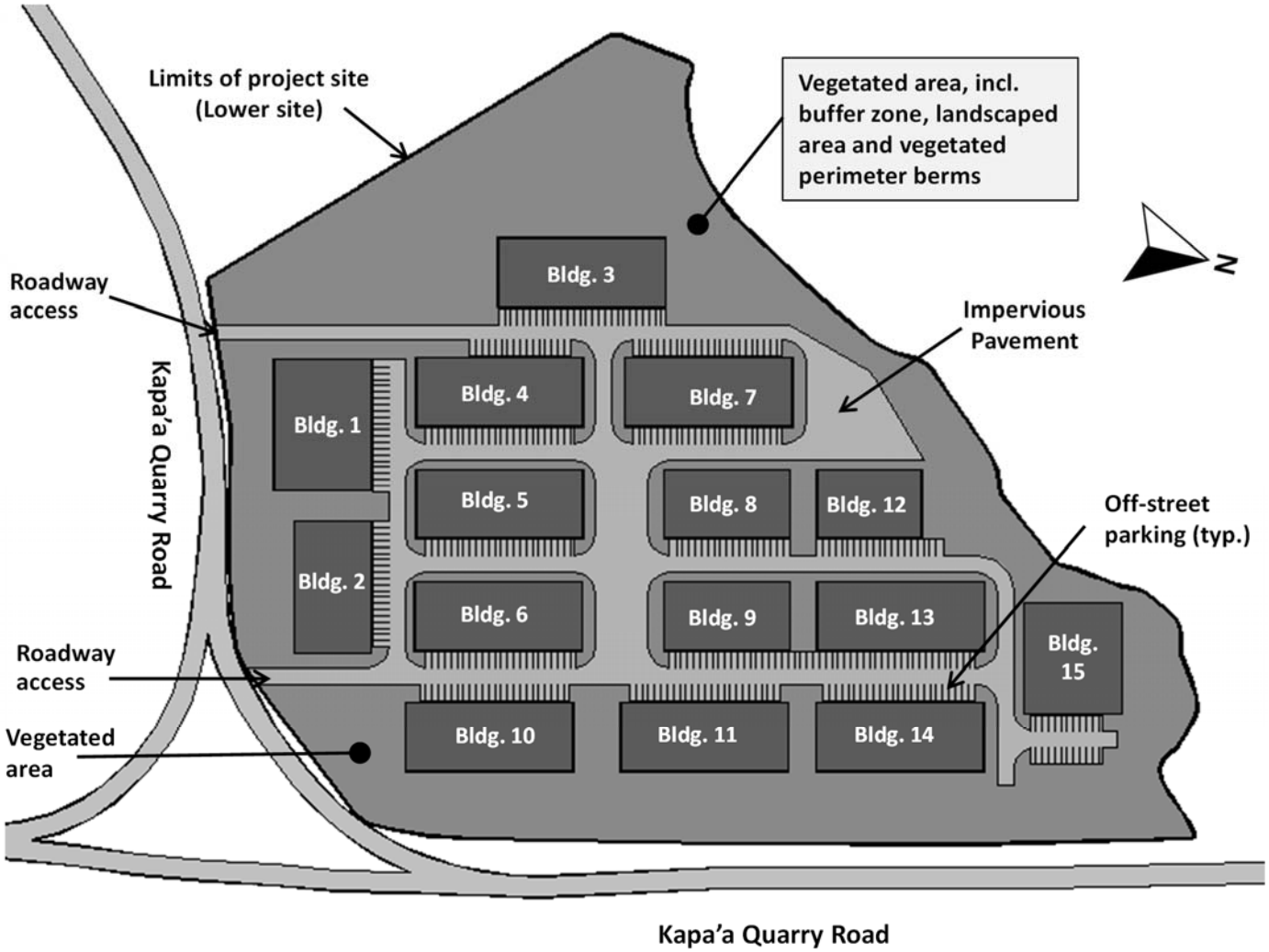


Figure 6.1.2.1: Initial site layout concept as described in the 2011 FEIA

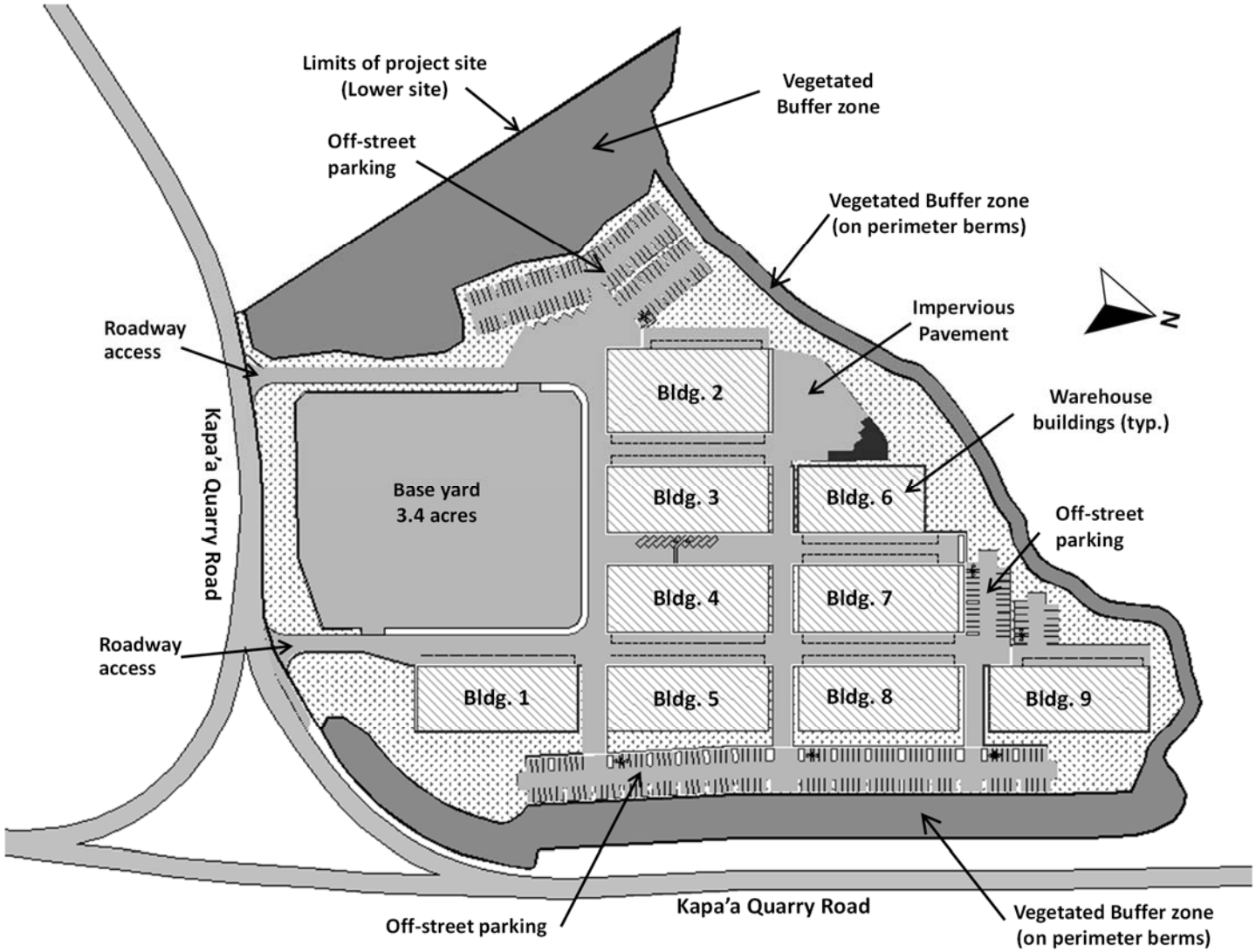


Figure 6.1.3.1 Updated site layout concept as described in the 2014 SMP

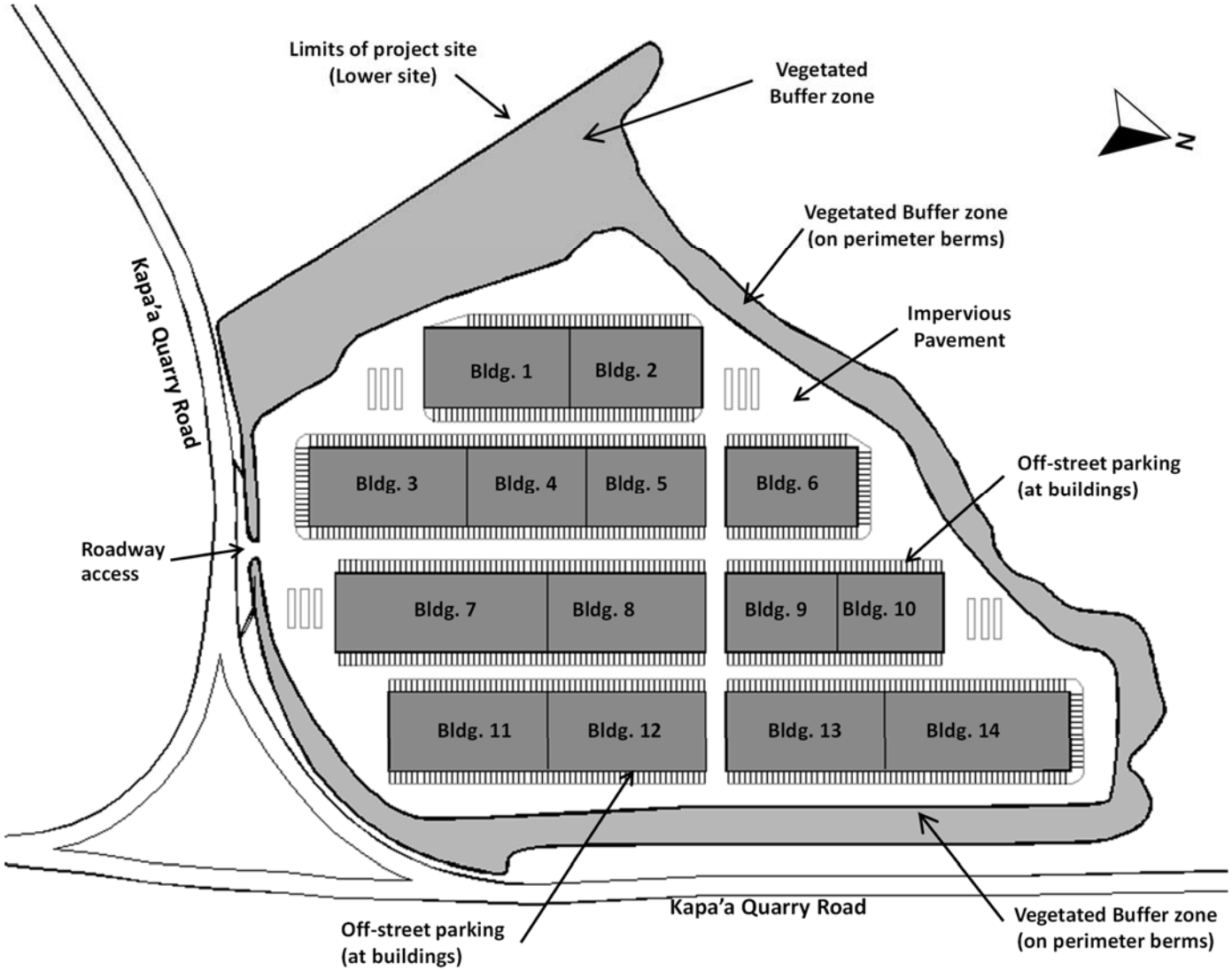


Figure 6.1.4.1 Updated site development layout concept as described in this 2021 SEIS

6.1.5 Land Use Changes from 2014 SMP to Updated Site Development Plan of 2021 SEIS

The updated site development plan presented in this 2021 SEIS incorporates several land use changes relative to the 2014 SMP land use approach. These changes are illustrated in Figure 6.1.5 and described in Table 6.1.5.1.

Changes in warehouse building footprints between the three stage are described in the following Section 6.1.6.

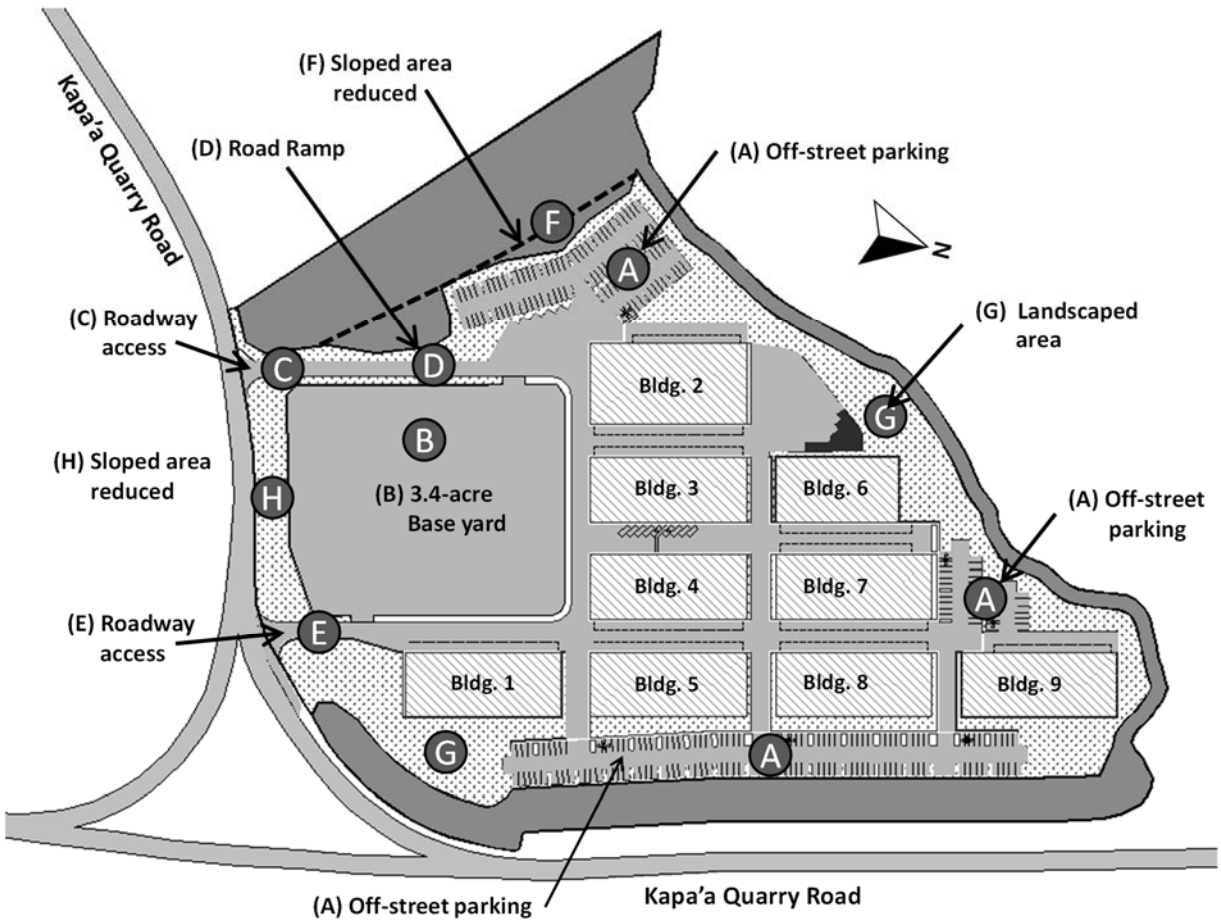


Figure 6.1.5 1: Illustration of land use changes within the Lower site between the 2014 SMP and 202 SEIS; Identifiers A through H are described in Table 6.1.5.1

Table 6.1.5.1: Descriptions of identifiers for land use changes in Lower site (refer to Figure 6.1.5.1)

Label	Description of changes and rationale for changes from 2014 SMP to the 2021 SEIS site development approach	
	Element of site development in 2014 SMP	Updated site development plan in 2021 SEIS
(A)	The 2014 SMP site plan had three larger **designated parking areas** that were separated from traffic area and buildings.	The separated parking areas will be removed under the updated site development plan. Parking will be next to the buildings throughout the project site.
(B)	The 2014 SMP site plan had a 3.4-acre **base yard.**	The base yard will be removed under the updated site development plan. The 3.4-acre area will be used to construct warehouse buildings.
(C)	The 2014 SMP site plan had a **road access** to the site that was at the Southern site perimeter, in the Western corner of the site.	The road access will be removed under the updated site development plan. Instead, a single road access will be installed.
(D)	The 2014 SMP had a **road ramp** that led from the site interior to the road access (C). A steep road ramp was required to overcome the difference in elevations of the ramp foot to the top of the ramp.	The road ramp will be removed under the updated site development plan. The ramp will not be needed since the road access (C) will be removed.
(E)	The 2014 SMP site plan had a **road access** to the site that was at the Southern site perimeter, in the middle of the site.	The road access will be removed under the updated site development plan. Instead, a single road access will be installed.
(F)	The **sloped area** at the Western site perimeter was configured to accommodate the off-street separate parking area (A) and the road ramp (D).	Under the updated site development, the sloped area at the Western site perimeter will be shaped to provide a blended transition from the finish grade to the sloped area that separates the Upper and Lower portions of the project site.
(G)	The 2014 SMP site plan had **landscaped area** within the interior of the site – e.g., inside the site perimeter buffer zone.	Under the updated site development plan all landscaped areas inside the site will be removed and replaced with paved traffic areas around the buildings.
(H)	The 2014 SMP had a sloped area between the Kapa'a Quarry Place roadway and the base yard area. .	Under the updated site development plan this sloped area will be significantly narrower since the elevation difference between the roadway and the adjacent site will be smaller.

6.1.6 Changes in Building Sizes in the Lower Site Between the Three Site Development Stages

The warehouse building individual sizes and the overall amount of building footprint in the Lower site are different in the three site development stages. Table 6.1.6.1 shows the warehouse footprints under the three site development stages.

Table 6.1.6.1 Warehouse footprints under the three site development stages

Site development stage	Approved or presented in	Building footprint In Lower site [sqft]	Building footprint Total for project site [sqft]
Stage 1	2011 FEIS	337,000	889,000
Stage 2	2014 SMP (2014/SMA-27)	217,000	769,000 (*)
Stage 3	2021 SEIS (updated site development plan)	373,000	883,000

Note (*): Site under the 2014 SMP had a 3.4-acre base yard.

The significant change in site layout between the approved 2014 SMP and the proposed updated site development plan under this 2021 SEIS is the removal of the 3.4-acre base yard. Under the updated site development plan the 3.4-acre area will be used to build warehouse structures. Figure 6.1.6.1 illustrates the extent of a 3.4-acre equivalent base yard area filled with warehouse structures under the updated site development layout.

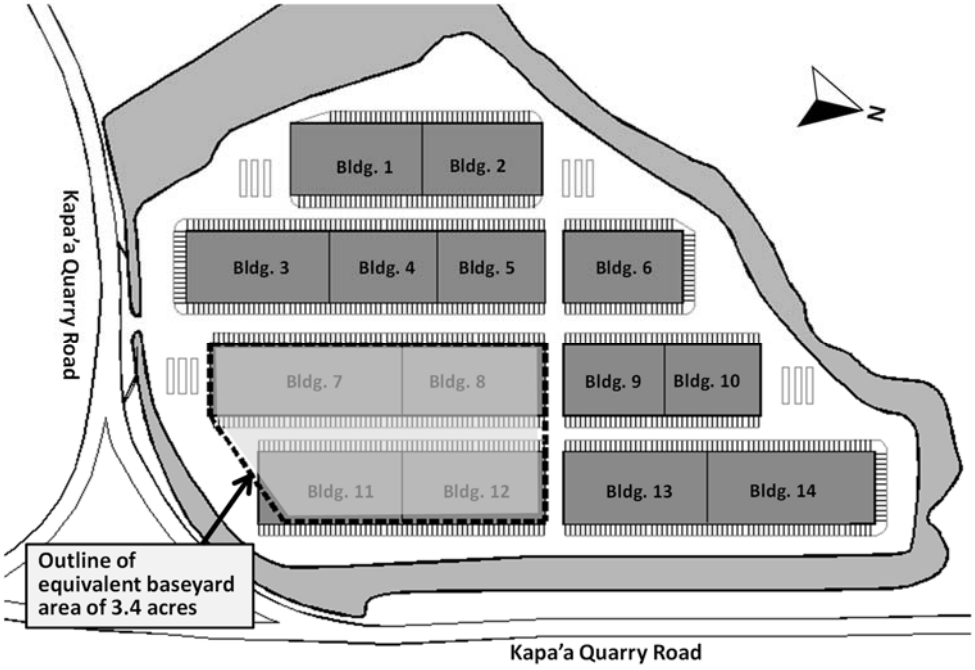


Figure 6.1.6.1: 3.4-acre area equivalent to the basyard

Figure 6.1.6.1 illustrates that the warehouse buildings 7, 8, 11 and 12 would occupy the 3.4-acre space of the former base yard area. These four buildings 7, 8, 11 and 12 would have a combined footprint of 125,000 sqft, under the building configuration of the new Lower site layout. While the planned total warehouse footprint in the Lower site is 373,000 sqft, subtracting the 125,000 sqft would leave remaining warehouse building footprint of 248,000 sqft outside the 3.4-acre area.

This 248,000 sqft footprint compares with the 217,000 sqft of warehouse buildings besides the base yard in the 2014 SMP. Applying this 31,000 sqft difference to the 248,000-sqft Lower site layout under the updated site development plan would be a 13% please increase relative to the approved building density under the 2014 SMP. This 13% increase of warehouse footprint would be a relatively small increase in building density.

6.2 Storm Water Treatment and Management

The storm water treatment and management system under the updated site development plan differs significantly and in an improved way from the approach delineated in the 2011 FEIS and subsequent plans approved under the special management area permit process. The storm water treatment and management approach are significant to the site development because effective storm water treatment and peak flow management will mitigate possible runoff problems at the source, and before storm water reaches the aquatic resources around the project site.

Perhaps no site development strategy has gone through such significant changes as storm water treatment and management. Current storm water regulations require much more stringent impact mitigations to assure good water quality than at the time the 2011 FEIS and 2014 SMP was approved. This is specifically important for locations such as the project site, which is adjacent to sensible aquatic resources, including the important Kawainui Marsh and other wetland areas.

This section will briefly review the latest storm water treatment and management approach, which was approved in the SMP Minor Modification 2017/MOD-37. Based on recent engineering findings, this approved storm water system approach can no longer be implemented because of soil stability concerns of the site perimeter berms due to the proposed infiltration of storm water upstream and close to the earth berms.

Following this engineering guidance, a new storm water approach was designed to avoid the indicated problems and offer effective impact mitigation. This section briefly describes previously approved storm water system and the reasoning why it is no longer pursued. Following this review, the new storm water approach will be described in more detail.

6.2.1 Previously Approved but Abandoned Storm Water Treatment and Management Approach

The storm water treatment and management approach under the 2014 SMP used specific low impact development (LID) strategies to treat storm water and control peak flow events. This represented an innovative step relative to the original storm water concepts described in the 2011 FEIS:

- In adopting Low Impact Development (LID) Stormwater strategies, infiltration was adopted in lieu of the detention and subsequent surface release of the detained stormwater without further treatment.
- Infiltration of stormwater was to occur in infiltration trenches at the site perimeter. This approach was consistent with the Applicant's commitment of avoiding infiltration of precipitation in the land fill body and within the inner site area.
- Infiltration of stormwater was planned through below-ground infiltration tanks which were structurally supported by plastic modular elements with a high void ratio. The void ratio of the modular tanks was significantly higher than conventional rock filled infiltration trenches resulting in a smaller footprint and less susceptibility to structural loads due to differential settling.
- The infiltration tanks were to be installed at the site perimeter in newly added fill, using soil specifically mixed with good infiltration characteristics, thus avoiding the generation of harmful leachate.
- Pretreatment units were added upstream of the infiltration tanks to reduce suspended solids as well as oil and grease.
- A vegetated swale, a LID stormwater strategy, was located above infiltration tanks. Water in the vegetated swale was to infiltrate and collect in the infiltration tank from where it would eventually infiltrate in the adjacent substrate and migrate downstream towards an existing drainage canal.
- A rainwater harvesting system was integrated into the stormwater management system. Rainwater harvesting was planned from rooftops of selected building. The rainwater was then planned to be stored in underground tanks. When the rainwater tank overflowed the runoff from the roofs would be discharged to the stormwater discharge area, from where the runoff would be conveyed to the vegetated swales and stormwater infiltration tanks at the site perimeter.
- The type of the rainwater harvesting tank design was like the infiltration tanks, with the difference that an impermeable liner would confine the collected water and avoid losses through infiltration.
- The sizing of the rainwater harvesting tanks was based on precipitation and evaporation rates for a representative windward region near the project site.

The working principle of the storm water approach is illustrated in figures 6.2.1.1 and 6.2.1.2. Figure 6.2.1.1 shows a representative cross section of the combination of the vegetated swale and below-ground infiltration tank. Figures 6.2.1.2 illustrates the working principle of the system. Storm water flows through vegetated swales and percolates through the substate to fill vaults which are located below the vegetated swales. The vaults would serve as a combination of storm water detention tanks and infiltration vaults.

The proper working order of this combination of storm water detention and infiltration vaults depends on the satisfactory performance of two processes:

First, the effectiveness of percolation of the storm water and migration through the soil below the site perimeter berms toward the existing drainage trench, and second, the capacity of the existing drainage trench along the Kapa'a Quarry Road to convey the water that accumulates in the trench, both the

water that migrated through the berms and water that overflowed the infiltration tank. Both processes have been rendered uncertain through subsequent observation and engineering design assessment.

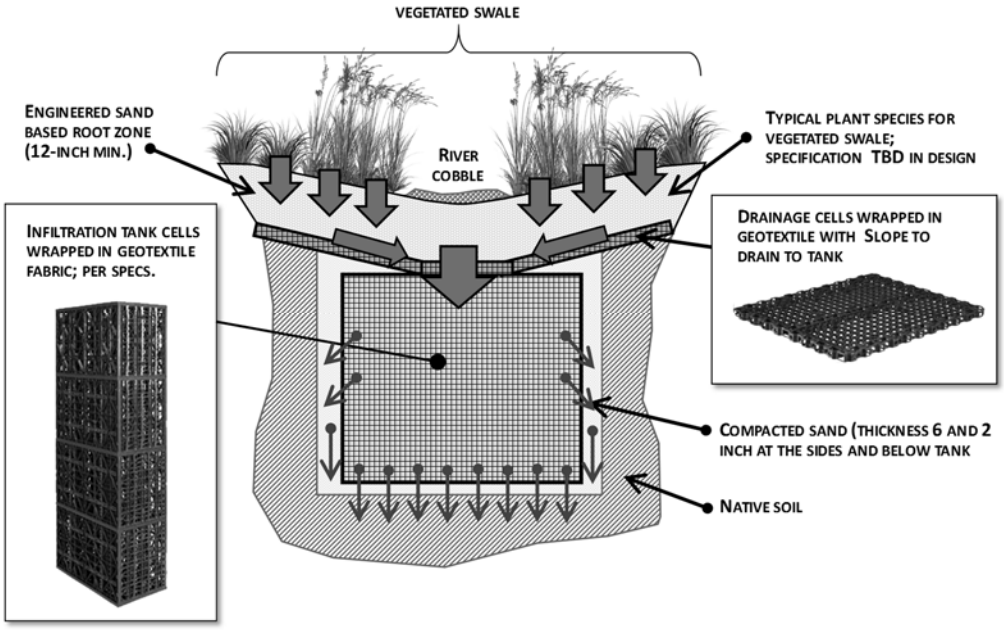


Figure 6.2.1.1: Representative cross section of the vegetated swale and below-ground infiltration tank

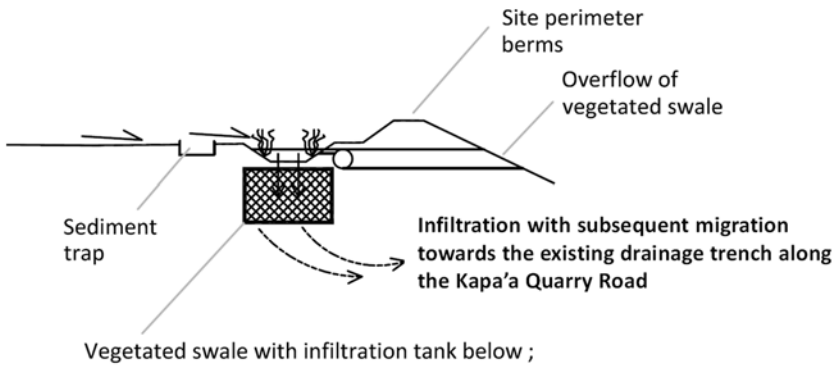


Figure 6.2.1.2 (a): Working principle illustration of the previously approved storm water treatment and management system

Infiltration and underground migration of water

(a) After storm water infiltrated it would migrate under the site perimeter berms and toward the existing drainage trench.

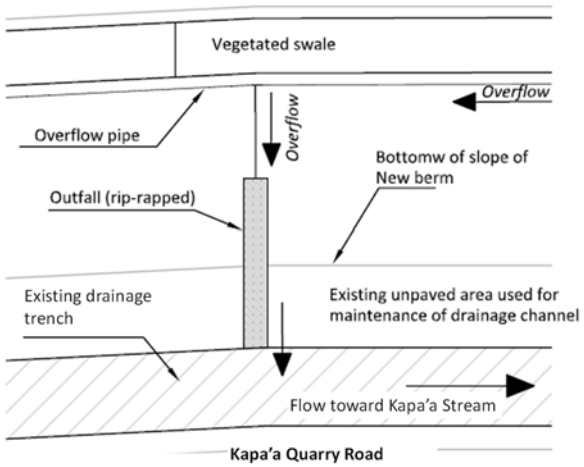


Figure 6.2.1.2 (b): Working principle illustration of the previously approved storm water treatment and management system

Overflow when detention vaults are filled.

(b) When the infiltration tanks were filled to capacity, the overflowing water would be conveyed through the perimeter berm and discharged into the existing drainage trench along the Kapa'a Quarry Road.

The following two reasons challenged the satisfactory functioning of the two necessary functions described above in Figure 6.2.1.2 (a) and (b:)

<u>Infiltration of storm water upstream and close to the site perimeter berm:</u>

A geotechnical report commissioned by the Applicants (Stewart Engineering, 2019) in support of a mass grading permit application indicated that there are possible soil instability concerns of the perimeter berms caused by water percolating below the berms. The following quotes are from that geotechnical study:

"*Prevention of runoff onto the perimeter slopes is especially important.*

It is especially important to keep water from ponding at the tops of slopes or infiltrating into slopes, which could significantly reduce their stability. Final grades and facilities must prevent surface runoff from running onto the faces of all slopes, especially fill slopes, and to minimize water erosion of any exposed soil on the slopes.

In addition, sumps and seepage pits are not recommended near slopes since infiltration and percolation of runoff into the slopes can significantly reduce the stability of the slopes. Many of the existing clayey perimeter slopes are considered marginally stable and additional water could generate localized slope failure or accelerate slope creep." Quotes from Stewart Engineering (2019) "Geotechnical Exploration Report, Kapa'a Light Industrial Park, Mass Grading, Phases 1 and 2, 21.7-Acre Portion of 43-Acre Parcel, Kailua, Oahu, Hawaii, TMK: 4-2-015: 006", by Stewart Engineering, Inc., Kailua, Hawaii, dated September 5, 2019.

<u>Using the existing infiltration trench to convey larger volumes of water drainage:</u>

Observation of the existing drainage trench over the past couple of years have revealed that the existing drainage trench has become filled with sediments and that vegetation is covering the previous trench. No free surface can be observed in the trench. With the existing deteriorating trench conditions

significant amounts of drainage water from the project site could not be readily conveyed to the Kapa'a stream corridor.

Consequently, the previously approved storm water treatment and management approach was no longer considered, and a new storm water system was designed.

6.2.2 Storm Water Treatment and Management Approach at the Time of the 2011 FEIS

Figure 6.2.2.1 shows the Kapa'a site conditions at the time of the 2011FEIS. At that time there were 30 warehouses within the Upper site and within parcel TMK 4-2-15:013. The warehouses were surrounded by paved and impervious traffic area. The remainder of the Upper site was graded land that was used by land tenants. Figure 6.2.2.2 shows the drainage patterns of the project site at the time the 2011 FEIS was approved. The identifiers A through F used in Figure 6.2.2.2 are described the following:

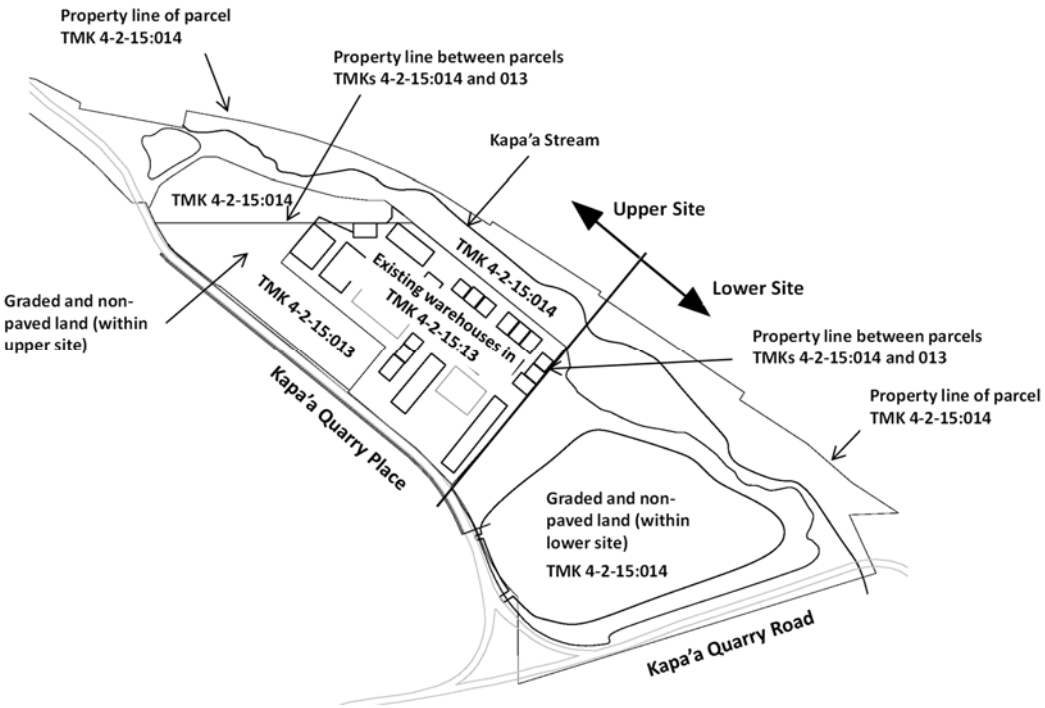


Figure 6.2.2.1 : Project site at the time the 2011 FEIS was accepted (under 2011 FEIS)

Identifier	Upper / Lower site	Description
A	Upper	The combined runoff from the paved traffic areas and building roofs discharged to the sloped and vegetated site perimeter through 6 drain inlets.
B	Upper	The runoff from the gravel areas discharged as surface sheet flow over the edge of the sloped and vegetated site perimeter
C	Upper	The combined runoff from the paved traffic areas and building roofs discharged as surface sheet flow over the edge of an existing 0.75-acre infiltration and detention basin.

Identifier	Upper / Lower site	Description
D	Upper	A portion of the gravel areas discharged runoff towards the roadway. During heavy rain events runoff flowed across the road pavement and finally discharged to a vegetated swale along the Kapa'a Quarry Place. The vegetated swale also collected runoff from a portion of an adjacent land parcel as well as from Kapa'a Quarry Place roadway itself.
E	Lower	Runoff from the gravel areas discharged as surface sheet flow over the edge of site perimeter to the Kapa'a Stream corridor.
F	Lower	Runoff from the gravel areas discharged as surface sheet flow over the edge of site perimeter to an existing drainage ditch along the Kapa'a Quarry Road.
G	Lower	The runoff in the vegetated swale along the Kapa'a Quarry Place entered a pipe conduit under the Kapa'a Quarry Place roadway and flowed through a 300-foot drainpipe and was discharged to a vegetated swale inside the Lower site, downstream of the drainpipe terminus. In the vegetated swale the runoff flowed towards the Kapa'a Stream corridor.

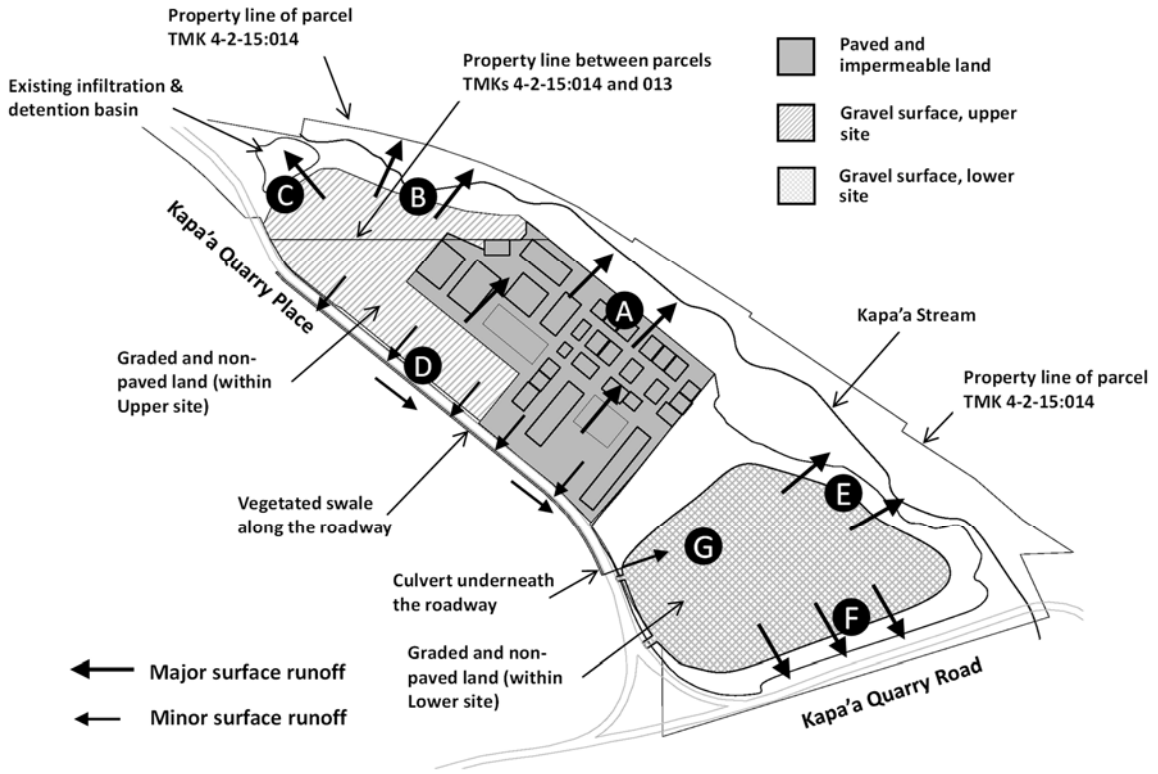


Figure 6.2.2.2: Schematic storm water management if the site at the time the 2011 FEIS was accepted

Figure 6.2.2.3 shows a schematic of the runoff from the Upper site which enters the vegetated swale along the Kapa'a Quarry Place roadway. The runoff flowed Eastward through the 1,400-foot vegetated swale until the runoff entered a drainpipe conduit below the roadway and was conveyed to the Lower site. At the terminus of the drainpipe the runoff entered a wider vegetated area. While some quantity of the runoff infiltrated, some runoff entered the Kapa'a Stream corridor as surface runoff.

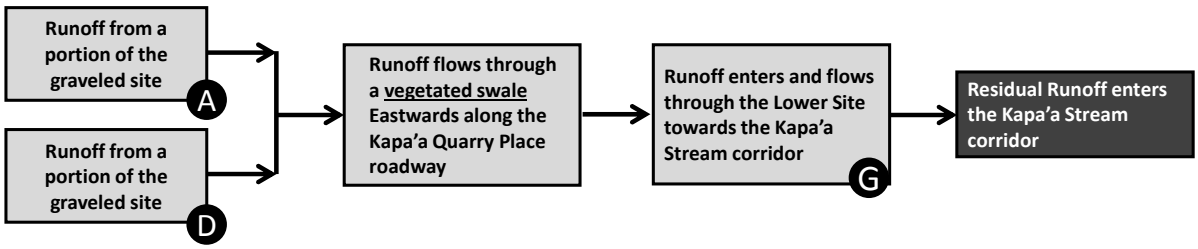


Figure 6.2.2.3: Diagram of the runoff discharge through the vegetated swale along the Kapa'a Quarry Place roadway

6.2.3 Storm Water Treatment and Management under the Updated Site Development

Appendix C describes the updated storm water system. The Accepting Agency requested several changes to the storm water system of the Lower site, which were described in the DSEIS. Appendix C provides a comprehensive description of the updated storm water system for the Lower site and presents an undated analysis of the storm water flows, including an assessment of how much flow bypasses the detention vaults. The applicable figures and tables are changed in this section and changes are indicated in the text.

The approach to treat and manage the storm water runoff from the site at full build-out conditions differs significantly from the approach that was used at the time the 2011 FEIS was accepted. In general, the treatment and flood control approach of the storm water runoff for most of the portions of the full build-out site will be significantly more effective than the storm water approach at the time of the 2011 FEIS. This increase in effective treatment was applied to areas which were developed since the 2011 FEIS and which will be developed until full build-out of the project site is reached.

Figure 6.2.3.1 shows the proposed project site development with the main development elements at full build-out. From the 30 warehouses in the Upper site at the time of the 2011 FEIS, 10 warehouses will be added in the Upper site and 14 in the Lower site at full build-out. The existing infiltration and detention basin adjacent to the TMK 4-2-15:014 in the Upper site will be used to provide Low Impact Development (LID) storm water treatment and flood control.

It should be noted that a storm water treatment and management strategy that was proposed by an agency was to discharge storm water from the Lower site to the existing infiltration and detention basin adjacent to the TMK 4-2-15:014 in the Upper. Due to the higher elevation of the existing infiltration and detention basin relative to the Lower site this strategy would not be feasible.

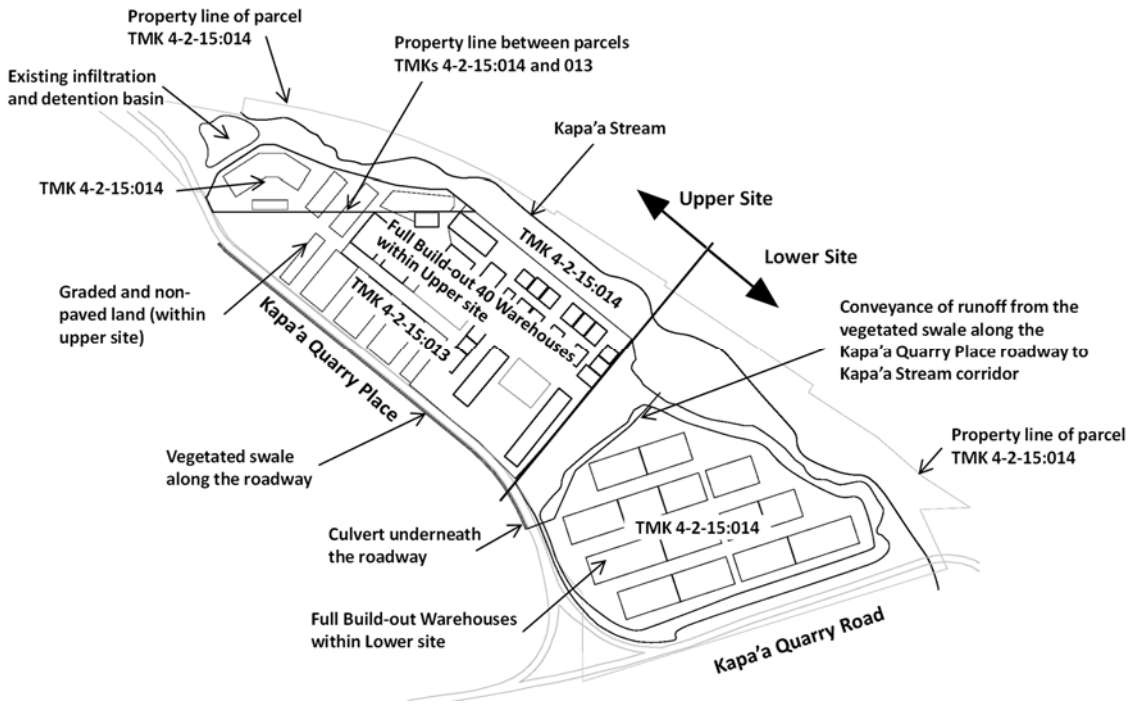


Figure 6.2.3.1: Project site at Full Build-out

Under the revised site development approach of the storm water systems for the entire project site, six distinct drainage areas 1 through 6 areas can be distinguished, which have their own specific storm water treatment and management process. These six distinct drainage areas are described in the following:

<u>Drainage area 1 – Upper site:</u> Figures 6.2.3.2 and 6.2.3.3 illustrate the storm water runoff patterns of the shaded portion of the full build-out project in the Upper site with **limited changes** in the stormwater treatment and management strategies relative to the 2011 FEIS. This portion of the project site has warehouses that were built before the 2011 FEIS. The entire area has impervious pavement and warehouse roofs.

Annotations used in Figures 6.2.3.2 and 6.2.3.3

Identifier	Description of the stormwater treatment approach
A	The four existing drain inlets have been improved by catchment baskets
B	The existing below ground outfall from one existing drain inlet is still being used. The drain inlet has been improved by adding pretreatment screens
C	A small portion of the site still discharges runoff to the existing vegetated swale along the Kapa'a Quarry Place roadway
D	The runoff that enters the Lower site is conveyed through a below ground drainpipe to an armored outfall structure at the site perimeter

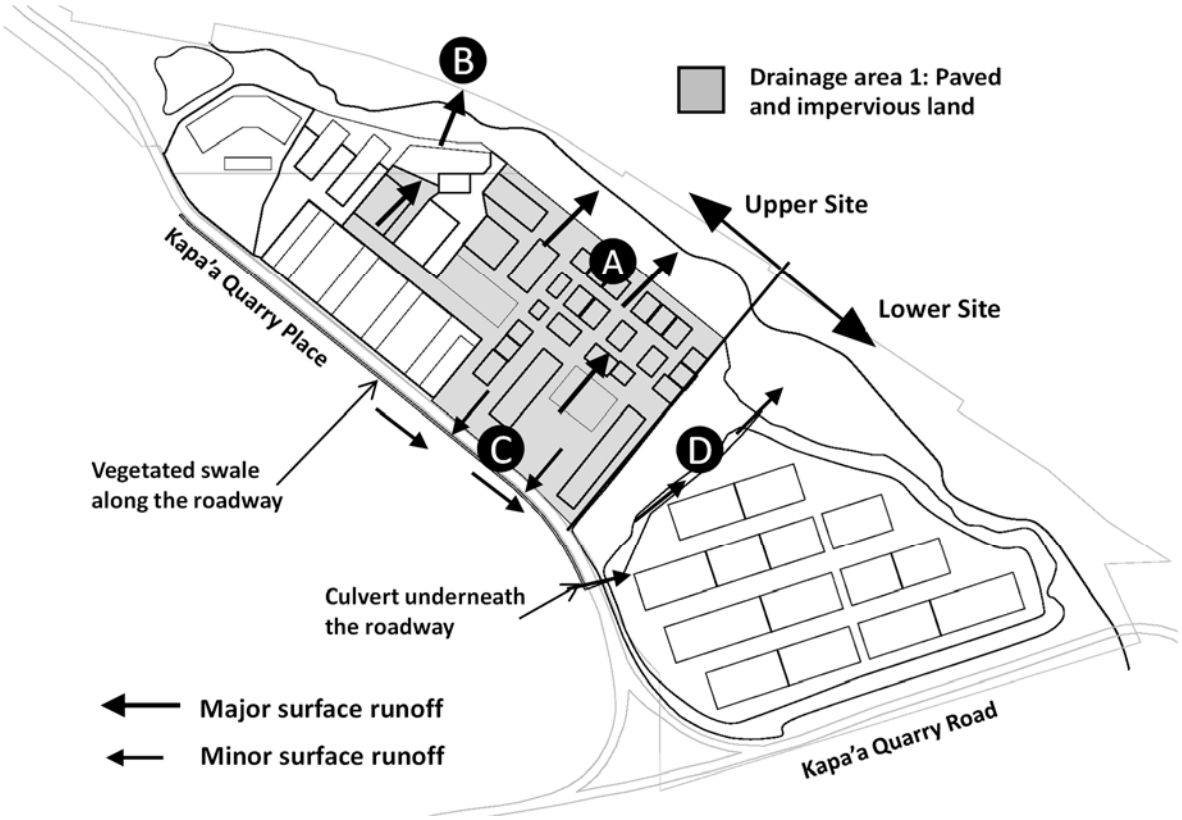


Figure 6.2.3.2: Drainage area 1 with limited changes in the storm water treatment strategy

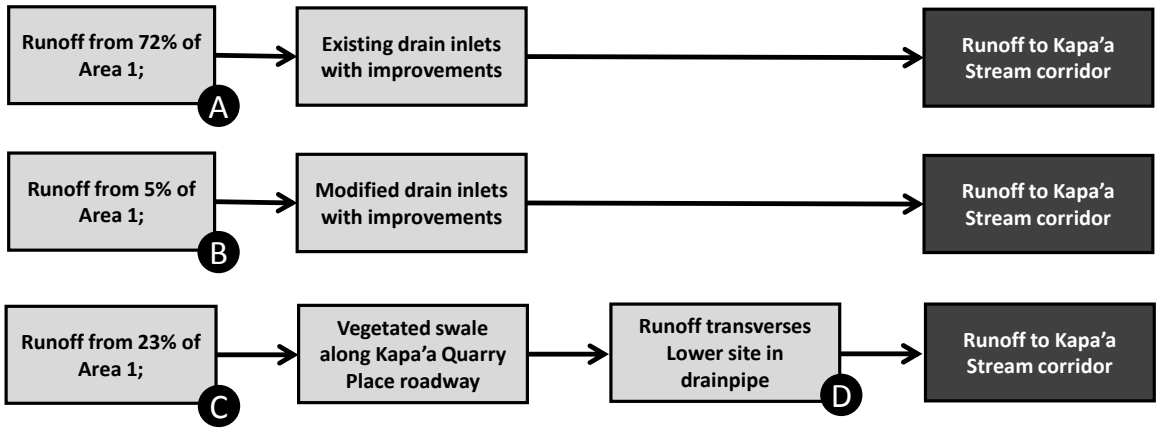


Figure 6.2.3.3: Flow diagram of the storm water runoff from Drainage area 1

<u>Drainage area 2 – Upper site</u>: Figures 6.2.3.4 and 6.2.3.5 illustrate the shaded portion of the full build-out project in the Upper site with **significant improvements** of the existing stormwater treatment and

management strategies. Drainage area 2 includes existing warehouse structures. The existing drain inlet and simple downstream outfall was replaced by a new manufacture treatment device (MTD) which filters the runoff before discharging it (A). The discharge of Area 2 occurs via a new armored outfall structure. Using the storm water filtration device (MTD) and the new outfall structure is possible since the stormwater treatment of Area 3 (see below) was designed with reserve capacity to accommodate Area 2. This storm water treatment strategy is a significant improvement over the existing treatment.

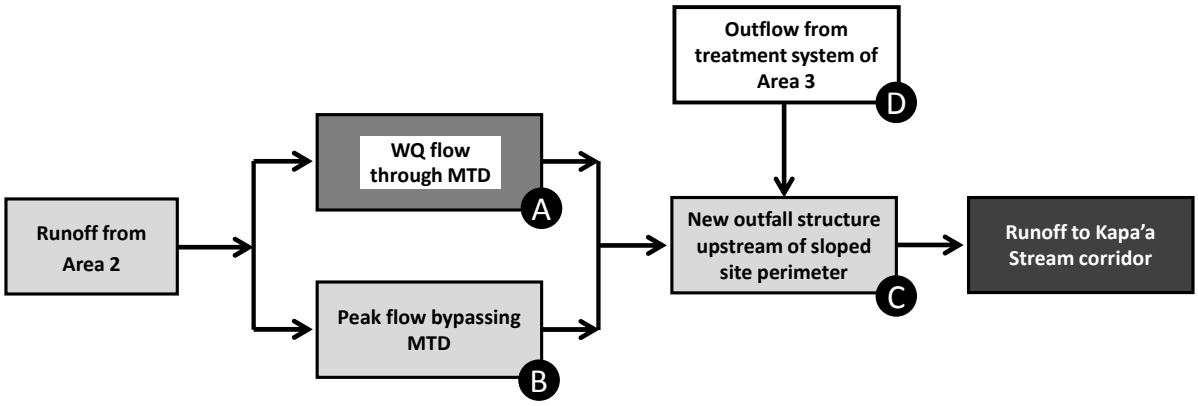


Figure 6.2.3.4: Flow diagram of the stormwater runoff from Drainage area 2

Annotations used in Figure 6.2.3.4

Identifier	Description of the stormwater treatment approach
A	The portion of the runoff from Area 2 which is designated the water quality (WQ) flow enters a drain inlet that connects to the MTD unit. The MTD units is a filtration devise which treats the entire WQ flow.
B	During heavy rain events the runoff exceeds the WQ flow rate. The exceeding runoff flow bypasses the MTD and discharges over a new outfall .
C	A new and armored outfall was constructed to safely guide the runoff down the vegetated site perimeter slope.
D	The MTD unit and the new outfall were designed to accommodate the flow from Drainage area 2 as well as from Drainage area 3.

Figure 6.2.3.5 indicates the location of the Drainage area 2 in the Upper site.

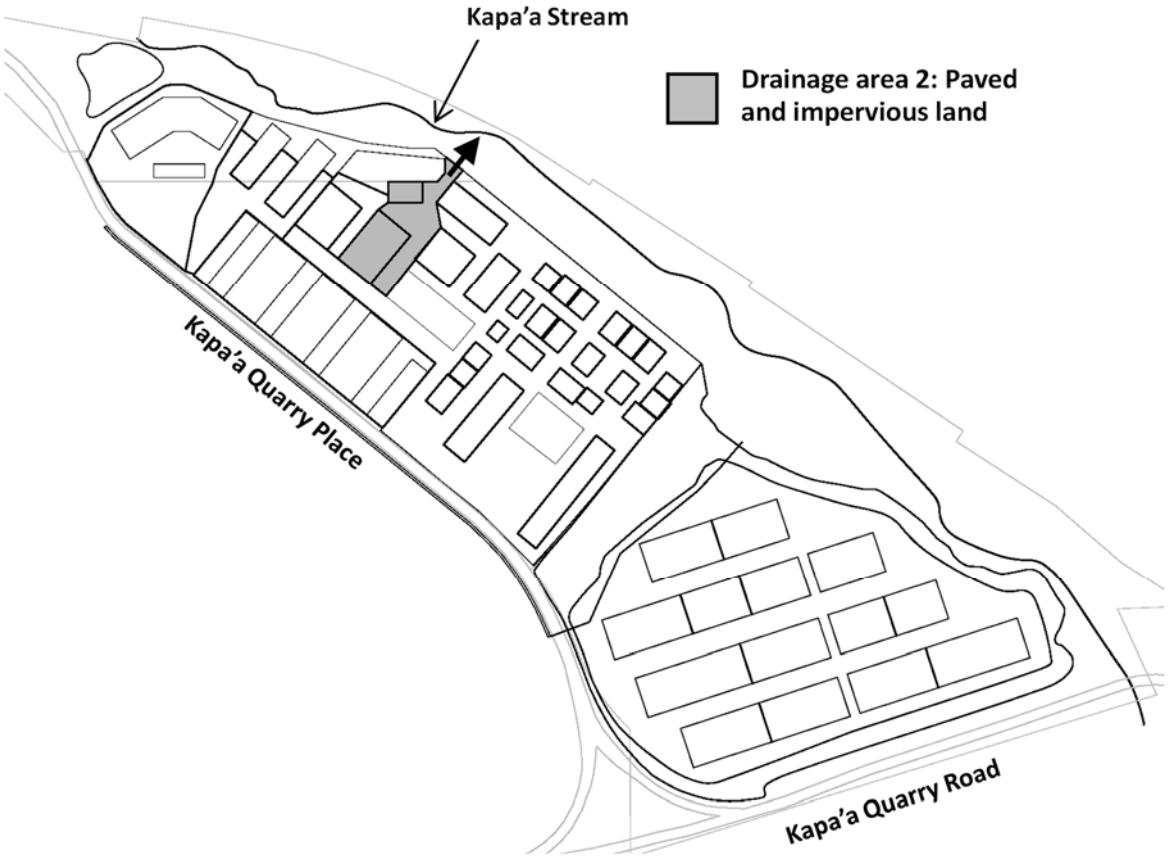


Figure 6.2.3.5: Area 2 with significant upgrades of the exiting stormwater strategies

<u>Drainage area 3 – Upper site:</u> Figures 6.2.3.6 and 6.2.3.7 illustrate the shaded portion of the full build-out project in the Upper site with buildings. The development area in the Upper site is presently (as of September 2020) under construction and slated for completion by 2022. At full build-out Drainage area 3 will be a 4-acre drainage area comprised of paved traffic area and five warehouses. The project was designed and will be completed under new 2018 storm water ordinances. This requires storm water treatment of the designated WQ flow and detention for flood control.

The detention volume is provided by a system of large diameter drainpipes and a water reservoir with an overflow weir. The storm water runoff in the detention vault is released during of a minimum period of 24 hours so that high peak flow rates are avoided.

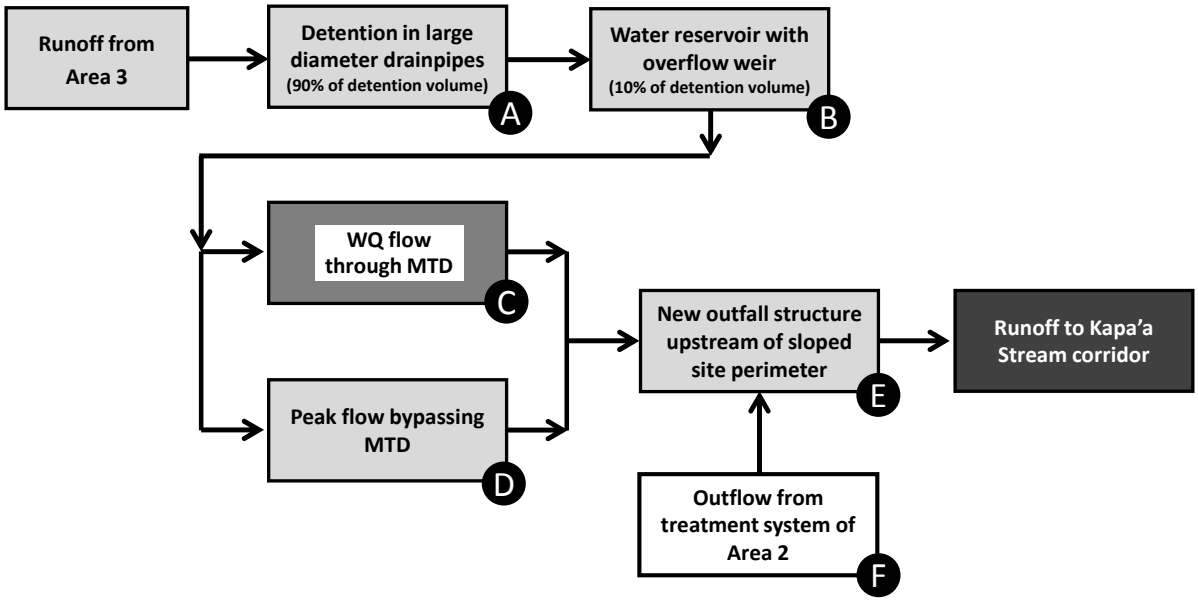


Figure 6.2.3.6: Flow diagram of the stormwater runoff from Area 3

Annotations used in Figure 6.2.3.6 and 6.2.3.7

Identifier	Description of the stormwater treatment approach
A	The runoff from Drainage area 3 enters a series of drain inlets which are connected to a system of large diameter drainpipes (max. diameter 48 inches). The large diameter drainpipes provide 90% of the required detention volume (7,500 cbft).
B	The terminus of the large diameter drainpipes is a water reservoir with a free surface and an overflow weir. The overflow weir is designed to accommodate the applicable peak flow event.
C	Under normal drainage conditions the detained storm water volume is released over a period of 24 to 36 hours. The released runoff volume flows through the manufactured treatment device (MTD), which is a filtration unit with significant pollutant removal capacity.
D	During heavy rain events the maximum detention capacity could be exceeded, and the detained runoff could overflow the weir.
E	A new and armored outfall was constructed to safely guide the runoff down the vegetated site perimeter slope.
F	The MTD unit and the new outfall were designed to accommodate the combined flow from Drainage areas 2 and 3.

Figure 6.2.3.7 shows the location of the storm water management system that serves Area 3. The identifier A indicates the detention volume contributed by the large diameter, 2,000 feet long drainpipes. The system parts with the identifiers B through F are located close together at the site perimeter.

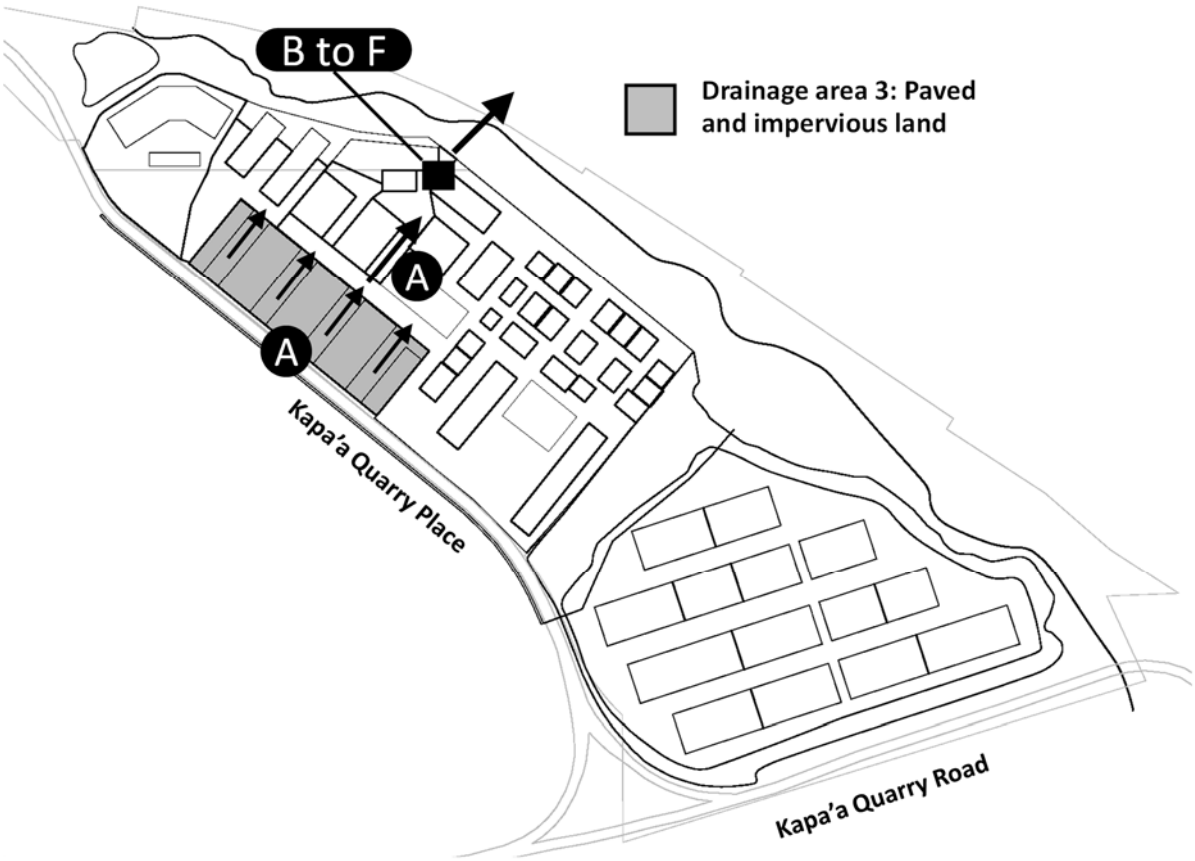


Figure 6.2.3.7: Area 3 with significant upgrades of the exiting stormwater strategies

<u>Drainage area 4 – Upper site:</u> Figures 6.2.3.8 and 6.2.3.9 illustrate the shaded portion of the full build-out project in the Upper site which will drain through an existing vegetated infiltration and detention basin. There are two drainage areas which drain to the existing infiltration basin. First the 3.3-acre paved traffic area and roof areas around and of the existing buildings 50 and 51, and second, the 1.9-acre paved traffic area around the planned buildings 24B and C.

Both areas collect surface storm water runoff and discharge it to the existing 0.75-acre infiltration and detention basin. This basin was originally built to receive runoff from an uphill quarry site. This basin no longer receives the runoff that it was designed to do and its use for the Proposed Action was approved in the Zone Change ordinance 13-35.

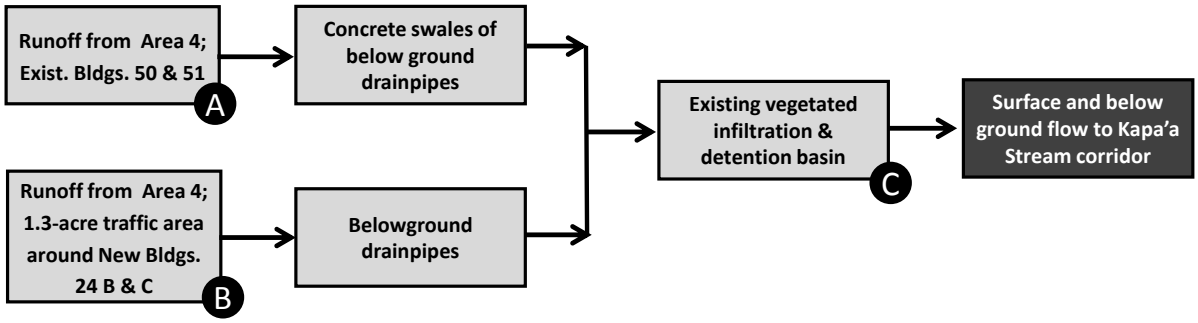


Figure 6.2.3.8: Flow diagram of the stormwater runoff from Drainage area (Area) 4 which is discharged to the existing infiltration and detention basin

Annotations used in Figure 6.2.3.8 and 6.2.3.9

Identifier	Description of the stormwater treatment approach
A	The portion (A) of Area 4 is the 3.3-acre drainage area that includes the existing building 50 and 51 and the traffic area around these 2 warehouses. The runoff flows to an existing outfall structure upstream of the existing vegetated infiltration and detention basin through a series of concrete swales and drainpipes.
B	The portion (B) of Area 4 is the 1.3-acre drainage area that includes traffic area around the two planned warehouses Buildings 24 B and C. The runoff flows to an existing outfall structure upstream of the existing vegetated infiltration and detention basin through a series of underground drainpipes.
C	The 0.75-acre existing vegetated infiltration and detention basin presently receives the runoff from the 3.3-acre (A) portion of Area 4 and will receive the future surface runoff from the 1.3-acre (B) portion of Area 4. The combined runoff volume will stay below the maximum treatment capacity of the existing vegetated infiltration and detention basin.

Figure 6.2.3.9 shows the location of the storm water treatment system that serves Drainage area 4.

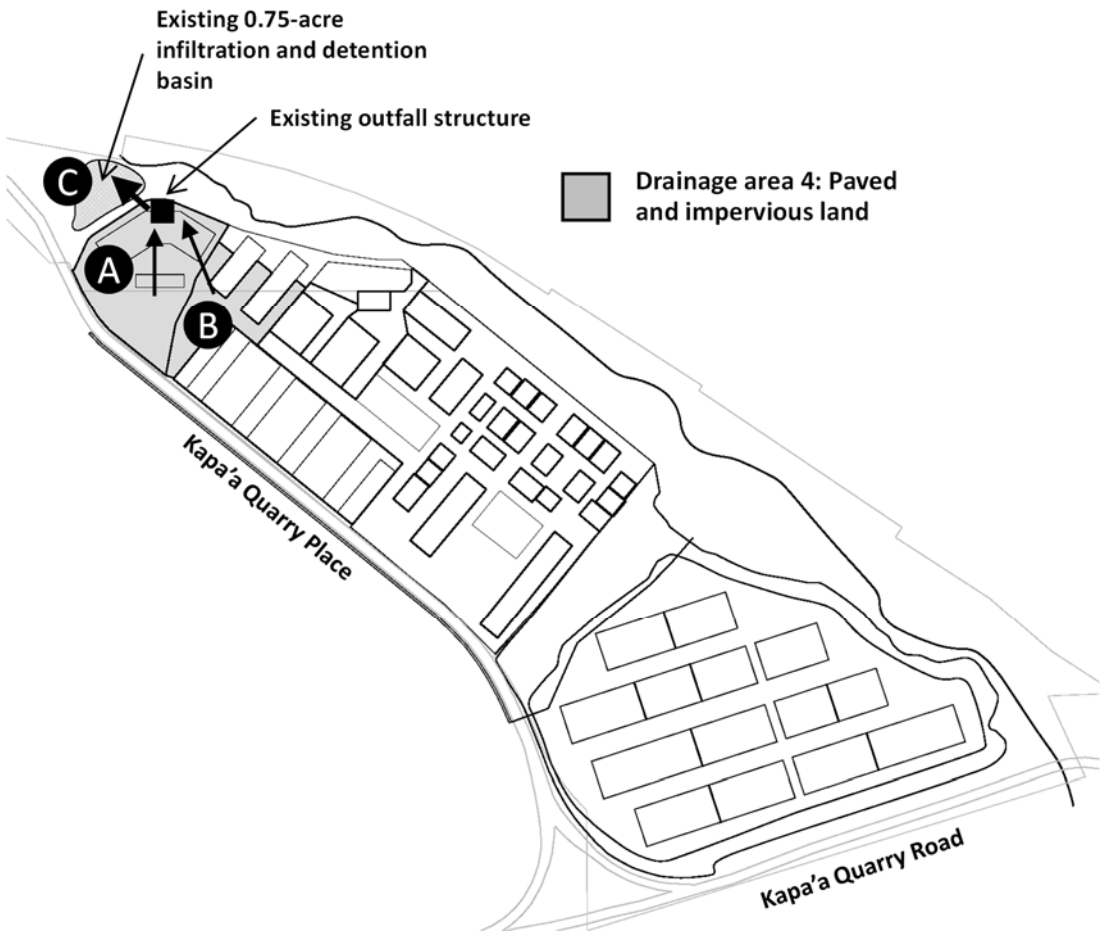


Figure 6.2.3.9: Drainage area 4 discharges to an existing 0.75-acre vegetated infiltration and detention basin

<u>Drainage area 5 – Upper site:</u> Figures 6.2.3.10 and 6.2.3.11 illustrate the shaded portion of the full build-out project in the Upper site which will drain through two existing vegetated buffer strips. There are three areas which drain to the two vegetated buffer strips. First, the 0.5-acre paved traffic area around the planned buildings 24B and C. Second, the 0.7-acre roof areas of the planned buildings 24B and C are draining to the vegetated buffer strip. Third, the roof of the new building 24 A (to be completed in December 2020) drains to the other vegetated buffer strip.

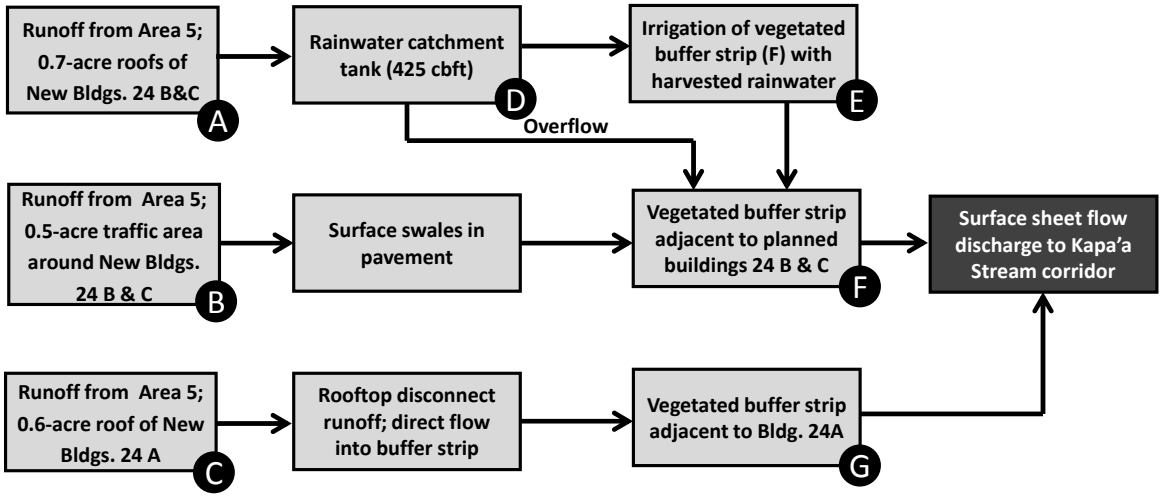


Figure 6.2.3.10: Flow diagram of the stormwater runoff from drainage area 5 which is treated by a vegetated buffer strip

Annotations used in Figure 6.2.3.10 and 6.2.3.11

Identifier	Description of the stormwater treatment approach
A	The portion (A) of Drainage area 5 is the 0.7-acre roof drainage area of the New building 24 B and C. The roof run off is disconnected from the surface runoff from the traffic areas and is conveyed to a new 425-cbft rainwater harvesting tank. The harvested rainwater is used to irrigate the 1,500-sqft vegetated buffer strip (F).
B	The portion (B) of Drainage area 5 is the drainage of the 0.5-acre traffic area around the two planned warehouses Buildings 24 B and C. The runoff flows though surface swales in the pavement to the vegetated buffer strip.
C	The portion (C) of Drainage area 5 is the drainage of the 0.6-acre roof of the new building 24A. traffic area around the two planned warehouses Buildings 24 B and C. The roof runoff flows directly into the 150-foot vegetated buffer strip section that is adjacent to building 24A.
D	The roof runoff from the planned buildings 24 B and C is disconnected from the traffic area runoff and flows directly into a 425-cbft rainwater catchment tank. The overflow of the irrigation tank is conveyed through the vegetated buffer strip.
E	The harvested rainwater is used to irrigate the 1,500-sqft vegetated buffer strip (F) which is located adjacent to the planned buildings 24 B and C (F)
F	The 1,500-sqft vegetated buffer strip is located adjacent to the planned buildings 24B and C . It receives the combined runoff from the portions (A) and (B) of Area 5.
G	The 1,000-sqft vegetated buffer strip is located adjacent to the planned buildings 24A. The buffer strip receives the roof runoff of Bldg. 24A.

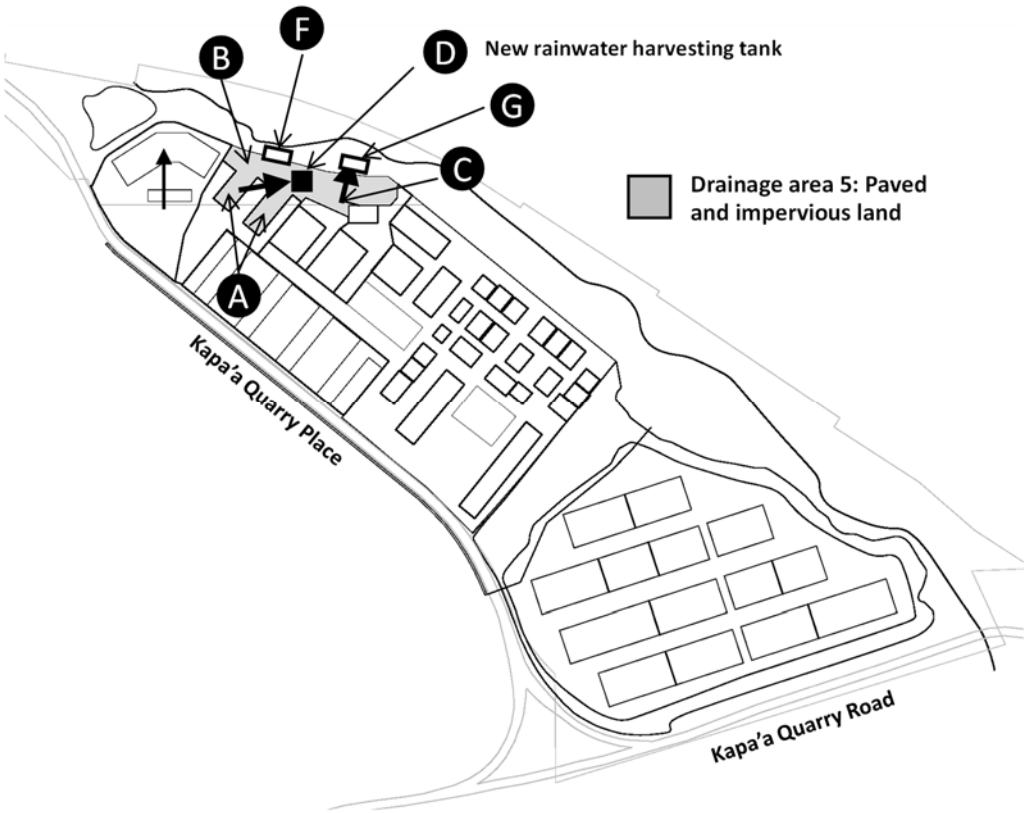


Figure 6.2.3.11: Drainage area 5 drains towards two vegetated buffer strips upstream of the site perimeter

Drainage Area 6 - Lower site: Figures 6.2.3.12 and 6.2.3.13 illustrate the shaded area of the full build-out project in the Lower site. The Lower site itself is divided into ~~3~~ 4 separate drainage area, each of which has its own discharge (outfall) to the Kapa'a Stream corridor. By using four ~~three~~ outfall structures instead of one the discharge is more evenly distributed along the Northern site perimeter which borders to the Kapa'a Steam corridor.

Annotations used in Figure 6.2.3.12 and 6.2.3.13

Identifier	Description of the stormwater treatment approach
A	Storm water runoff from traffic areas around the buildings and most of the building roofs will be collected by drain inlets. The drain inlets are connected to a series of below ground drainpipes. The drain inlets are equipped with screens that avoid intrusion of larger debris and finer sediments.
B	The storm water will enter drainpipes which convey the runoff towards the treatment system, which includes vegetated buffer strips, detention vaults and the MTD units. Just upstream of the vegetated buffer strip is a distribution swale which also serves as a settling basin to remove larger settables before they enter the vegetated buffers trip.
C	The vegetated buffer strips will have a minimum length of 15 feet and a width that will be selected for the specific drainage area of the Lower site. The sizing of the vegetated buffer strip area allows the flow depth and flow velocities through the vegetated strip to remain under the critical design flow rate. After the runoff flows over the vegetated buffer strip it collects in swale and flows from there to the inlets to the detention vault (D).
D	The detention vaults capacities to detain storm water runoff will be sized in accordance with the drain areas. The detention vaults will be constructed with storage modules with a high void ration. The vegetated buffer strips will be constructed above the detention vaults. The detained runoff will be released to the MTD units over a period of 24 to 36 hours. When the detention vaults have reached full capacity, the runoff bypasses the detention vaults and is conveyed to the new outfall structure (F).
E	The storm water that is released from the detention vaults over a period of 24 to 36 hours flows to the MTD unit, where it is filtered before releasing it to the Kapa' a Stream corridor.
F	One new outfall structure per drainage area of the Lower site will be constructed. A large diameter drainpipe will pass through the perimeter berm discharging the runoff to the adjacent stream corridor. An energy dissipation structure will reduce hydraulic energy as the runoff enters the stream corridor. A downstream rip-rap layer will be constructed in addition to add to the avoidance of soil erosion.
G	Rainwater from selected roofs of the buildings in the Lower site will be collected for irrigation. These roof discharges will be connected to rainwater harvesting tanks (H).
H	The harvested rainwater will be used for irrigation. The storm water that overflows is conveyed to the drainage conveyance upstream of the vegetated buffer strip inlets.
I	The harvested rainwater will be used to irrigate sections of the vegetated site perimeter buffer.
J	The harvested rainwater will be used to irrigate of the vegetated buffer strips.

Figure 6.2.3.12 shows the generic flow diagram which applies to all four ~~three~~ drainage areas of the Lower site. Figure 6.2.3.13 shows the location of the four ~~three~~ outfall structures along the site perimeter that borders to the Kapa'a Stream corridor. The location of the treatment system comprised of vegetated buffer strips, detention vaults, and MTD unit is indicated with an icon for all four ~~three~~ drainage areas. All other system components shown in the flow diagram of Figure 6.2.3.12 are at different locations within the drainage areas. The stormwater treatment and management system in the Lower site is of special importance since the Lower site is within the SMA. In addition, the runoff from the Lower occurs closer to the wetland areas than the drainage of the Upper site.

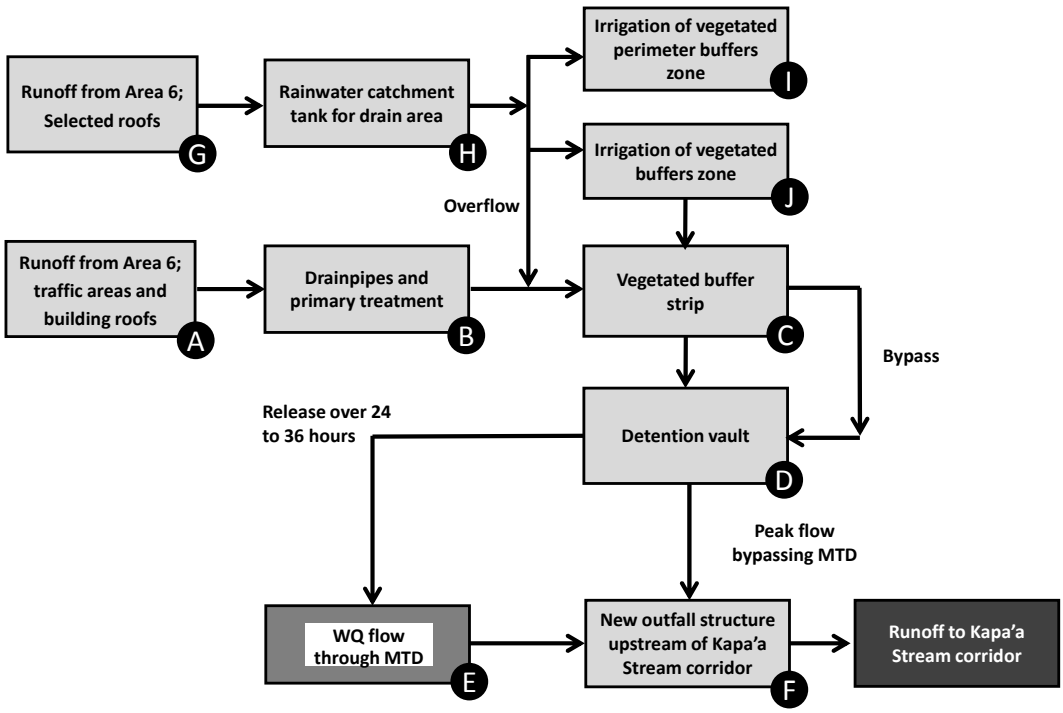


Figure 6.2.3.12: Generic flow diagram for Drainage are 6 – the storm water systems in the Lower site development

The Figure 6.2.3.13 has been changed to show four storm water treatment systems located at the Northern site perimeter. The Accepting Agency request that the Lower site be divided into four instead of three drainage areas. Appendix C describes the changes to the storm water treatment and management systems made in response to the request. Several comments received from community groups identified the "treatment systems" in Figure 6.2.3.12 as wastewater treatment systems. But they are four separate **storm water** treatment systems which remove a significant portion of pollutants from the storm water runoff before the water is released to the Kapa'a Stream corridor.

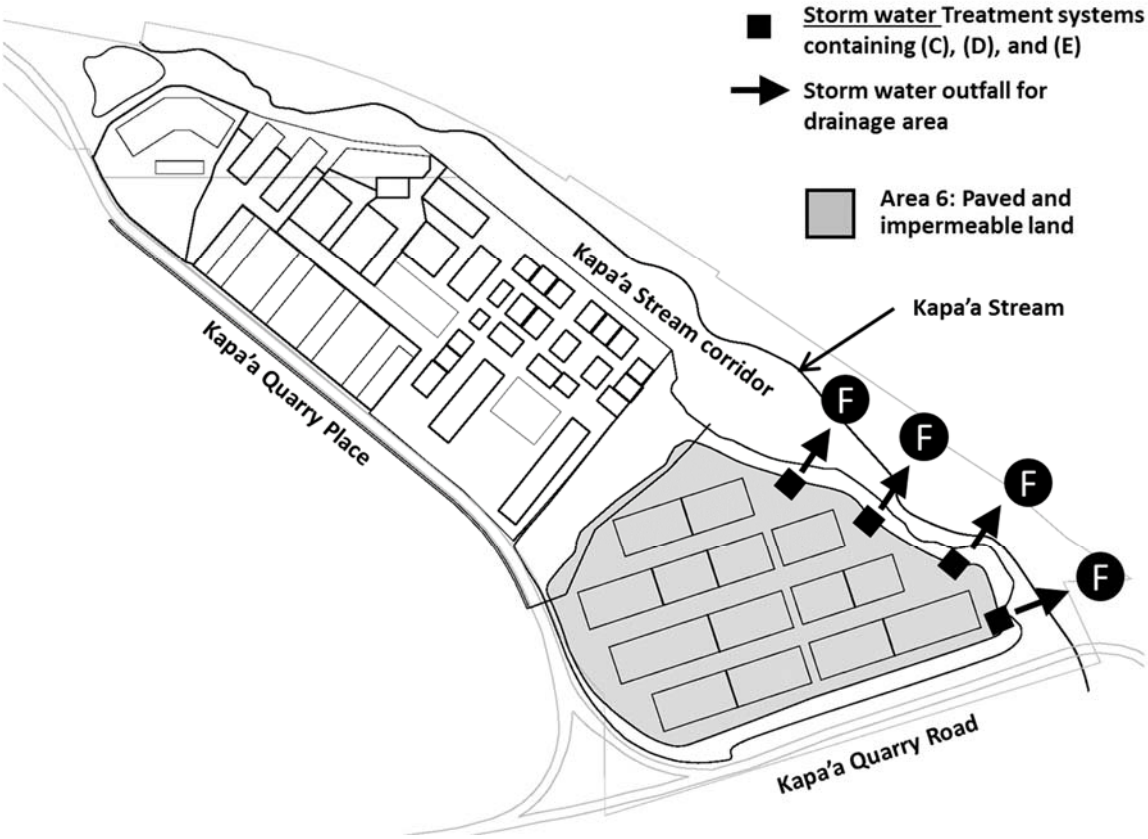


Figure 6.2.3.13: Locations of treatment systems in drainage Area 6 - the storm water systems in the Lower site development (Note: This figure has been changed)

6.2.4 Rainfall Data used for the Project Site

The 2011 Rain Atlas of Hawaii, Department of Geography, University of Hawaii (2011) was used to determine the precipitation at the projects site. Figure 6.2.4.1 illustrates the annual expected rainfall at the project site. Figure 6.2.4.2 shows the yearly distribution of the monthly rain fall. These monthly rainfall values are used in the drainage assessment and water quality treatment processes.

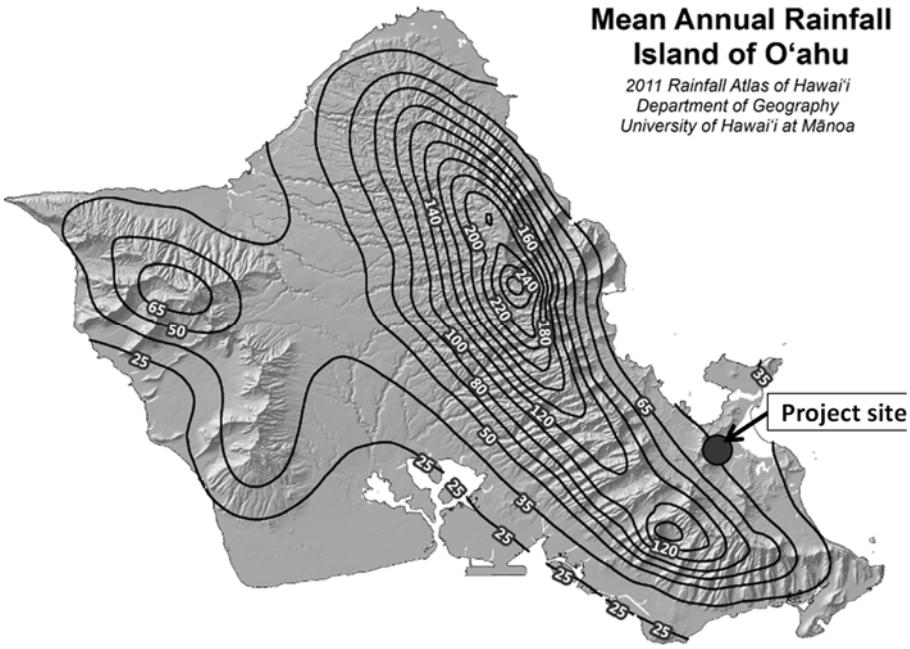


Figure 6.2.4.1: Mean annual rainfall at the project site

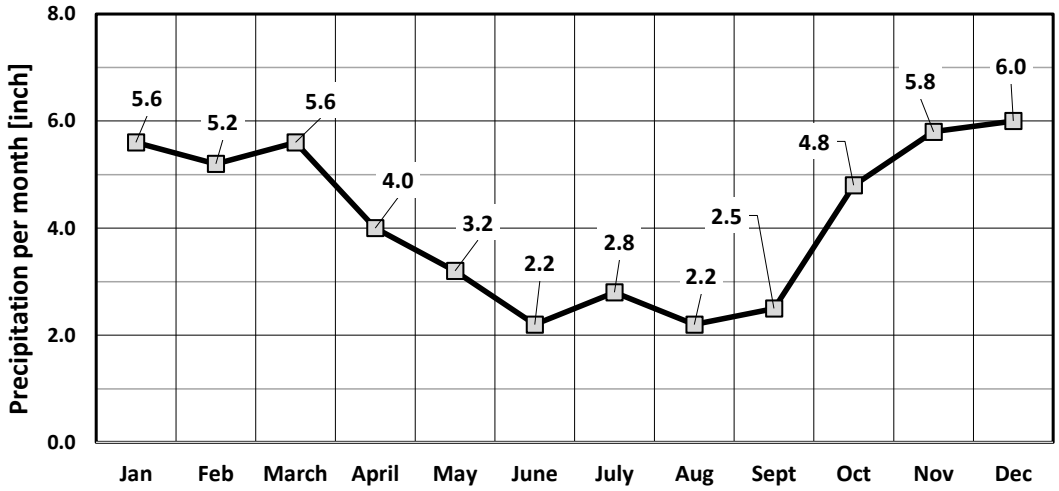


Figure 6.2.4.2: Mean monthly rainfall at the project site

6.2.5 Drainage of the Lower Site and Assessment of Site Drainage Volume

The Lower site is within the SMA area while the Upper site is not. This means that impact mitigation in the Lower site must be more thorough than in the Upper site. This is especially relevant to impact related to storm water treatment and management. The Lower site is adjacent to the lower stretches of the Kapa'a Stream corridor and closer to the important Kawainui Marsh.

This section elaborates on the proposed storm water treatment and management strategies and technologies for the Lower site. Under the storm water design the Lower site is divided into four ~~three~~ drainage areas. Each of the four ~~three~~ drainage areas has its own discharge outfall to the Kapa'a Stream corridor. Figures 6.2.5.2 through 6.2.5.4 show the four ~~three~~ drainage areas in the Lower site.

An earlier impact assessment compared the multiple outfall scenario with a single outfall scenario. It was concluded that the multiple outlet scenario has less impact on the stream bed and wetland areas adjacent to the Northern site perimeter than a single outfall discharging all the runoff from the Lower site.

Figure 6.2.5.1 shows the layout of the Lower site superimposed on the topography before the start of grading. While the topography inside the site obviously changing with the progress of grading, the topography of the adjacent Kapa'a Stream bed remains unchanged.

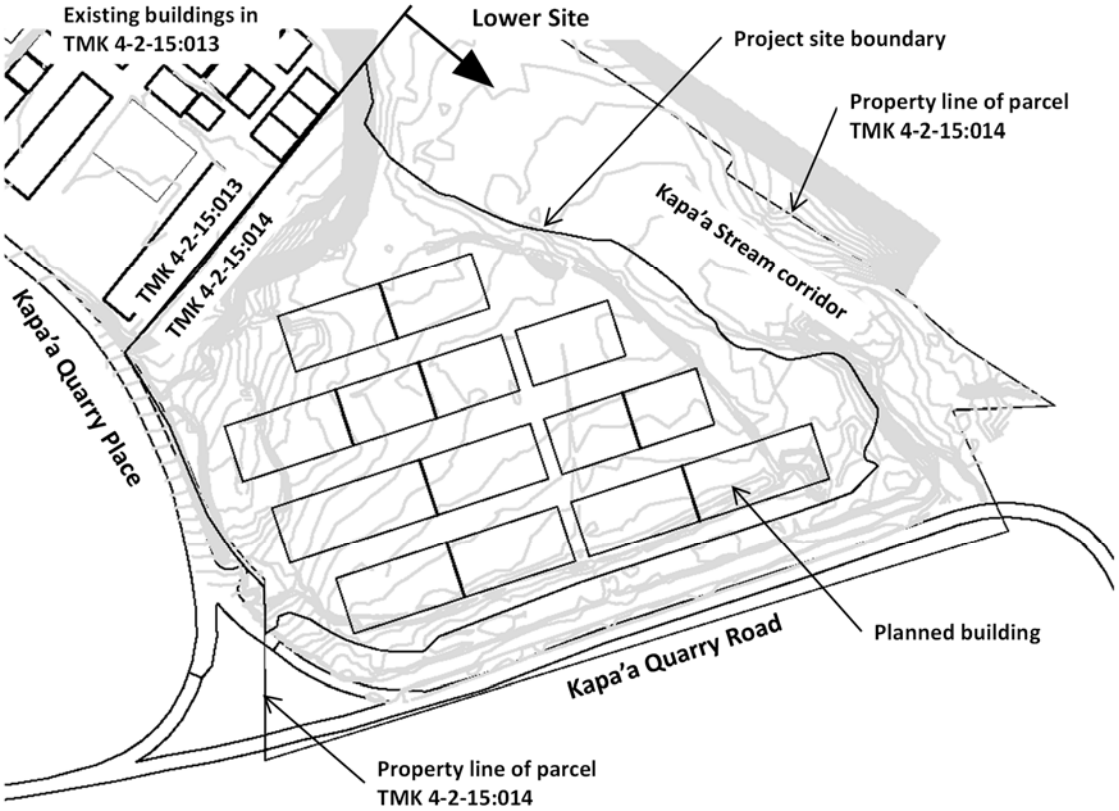


Figure 6.2.5.1: Development layout of Lower site – superimposed with topography prior to grading

Lower site – Updated Drainage area 1: Figure 6.2.5.2 shows the extent and the configuration of drainage area 1. The 5.6-acre drainage area 1 extends for about 1,100 feet in the North South direction. Drainage occurs through 8 drain inlets with debris screens as primary treatment. The drainpipes have a total length of 1,450 feet with the longest distance of pipes of 850 feet to the treatment system at the

site perimeter. The approximately 200-foot belowground detention vault and the above vegetated buffer strip with the same width ~~length~~ are located upstream of the Northern site perimeter. The sizes of drainage areas from building roofs and traffic areas are 2.3 and 3.3 acres, respectively.

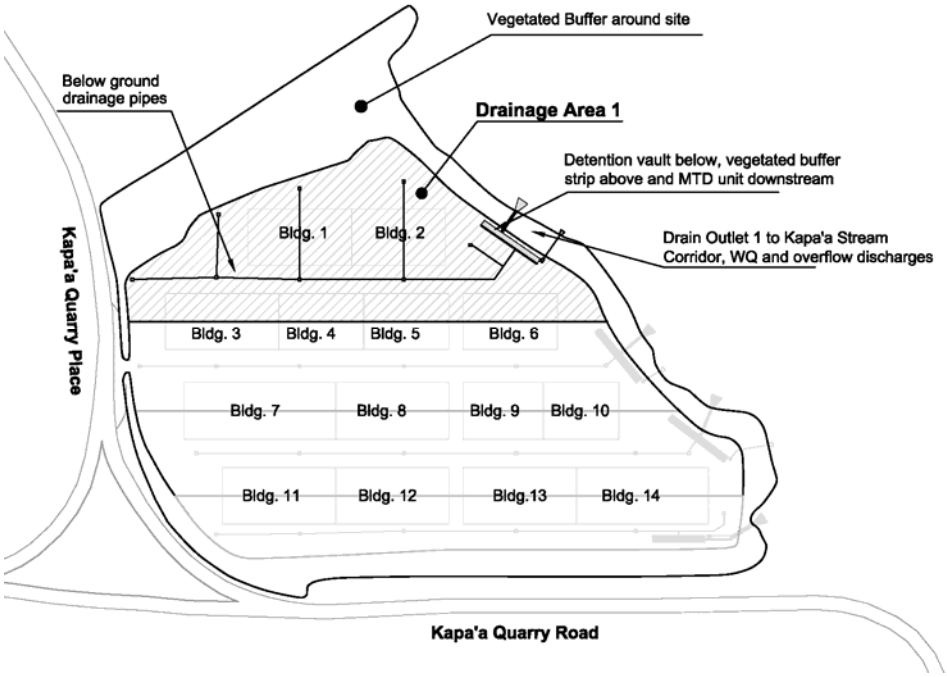


Figure 6.2.5.2: Drainage area 1 of the Lower site

This is a New image, refer to Appendix C

Lower site – Updated Drainage area 2: Figure 6.2.5.3 shows the extent and the configuration of drainage area 2. The 4.7-acre drainage area 2 extends for about 1,200 feet in the North South direction. Drainage occurs through 6 drain inlets with debris screens as primary treatment. The drainpipes have a total length of 1,000 feet with the longest distance of pipes of 950 feet to the treatment system at the site perimeter. The approximately 140-foot belowground detention vault and the above vegetated buffer strip with the same width ~~length~~ is located upstream of the Northern site perimeter. The sizes of drainage areas from building roofs and traffic areas are 2.3 and 2.4 acres, respectively.

Lower site – Updated Drainage area 3: Figure 6.2.5.3 shows the extent and the configuration of drainage area 3. The 5-acre drainage area 3 extends for about 1,300 feet in the North South direction. Drainage occurs through 11 drain inlets with debris screens as primary treatment. The drainpipes have a total length of 1,000 feet with the longest distance of pipes of 950 feet to the treatment system at the site perimeter. The approximately 160-foot belowground detention vault and the above vegetated buffer strip with the same length is located upstream of the Northern site perimeter. The sizes of drainage areas from building roofs and traffic areas are 2.6 and 2.4 acres, respectively.

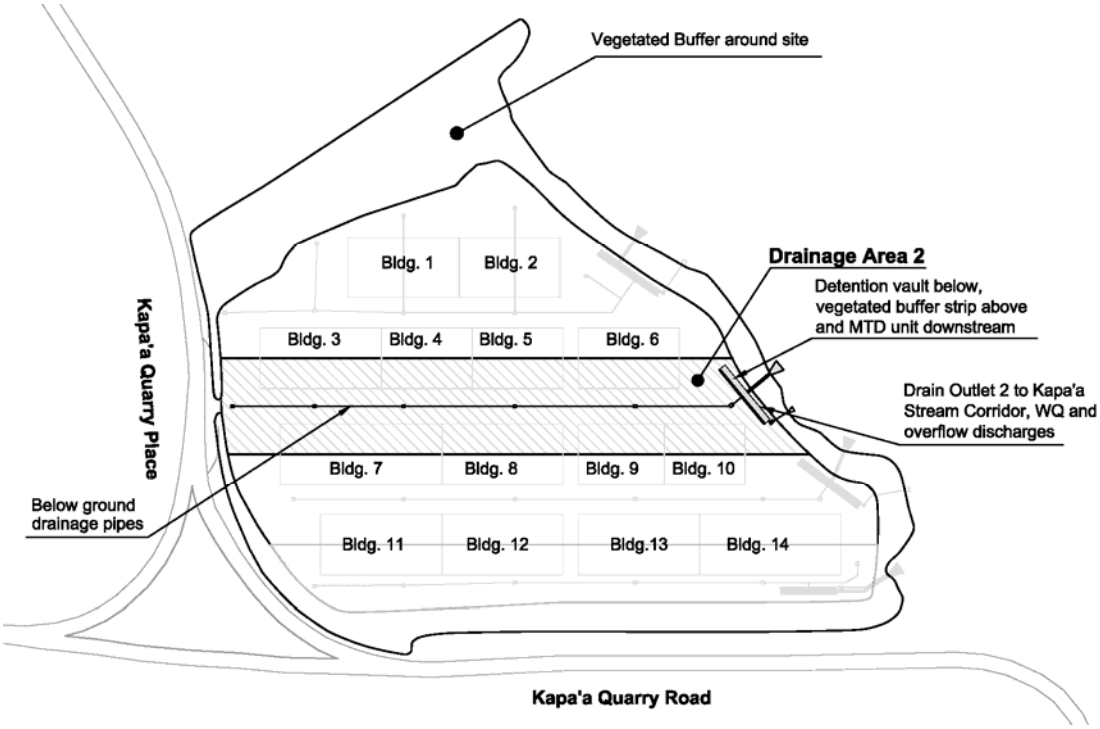


Figure 6.2.5.3: Drainage are 2 of the Lower site This is a New image, refer to Appendix C

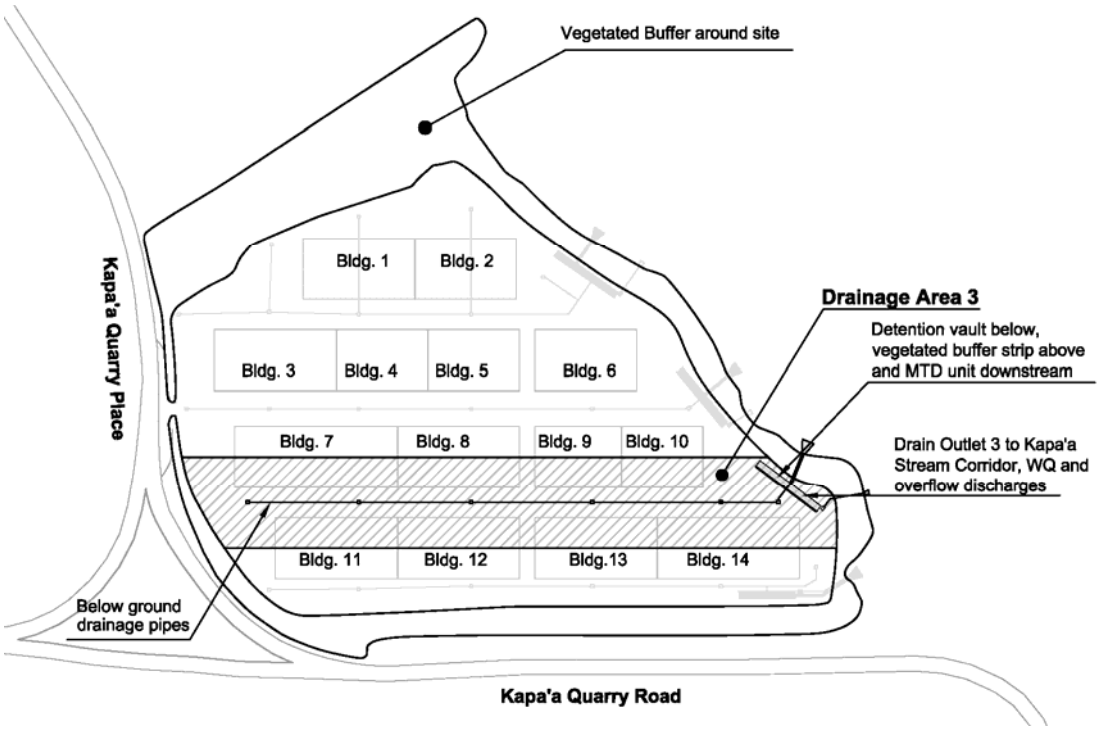


Figure 6.2.5.4: Drainage are 3 of the Lower site This is a New image, refer to Appendix C

Lower site – Updated Drainage area 4: New Figure 6.2.5.4.B shows the extent and the configuration of drainage area 4. The 3.1-acre drainage area 3 extends for about 1,000 feet in the North South direction. Drainage occurs through 6 drain inlets with debris screens as primary treatment. The drainpipes have a total length of 950 feet to the treatment system at the site perimeter. The approximately 120-foot belowground detention vault and the above vegetated buffer strip with the same length is located upstream of the Northern site perimeter. The sizes of drainage areas from building roofs and traffic areas are 1.4 and 1.6 acres, respectively.

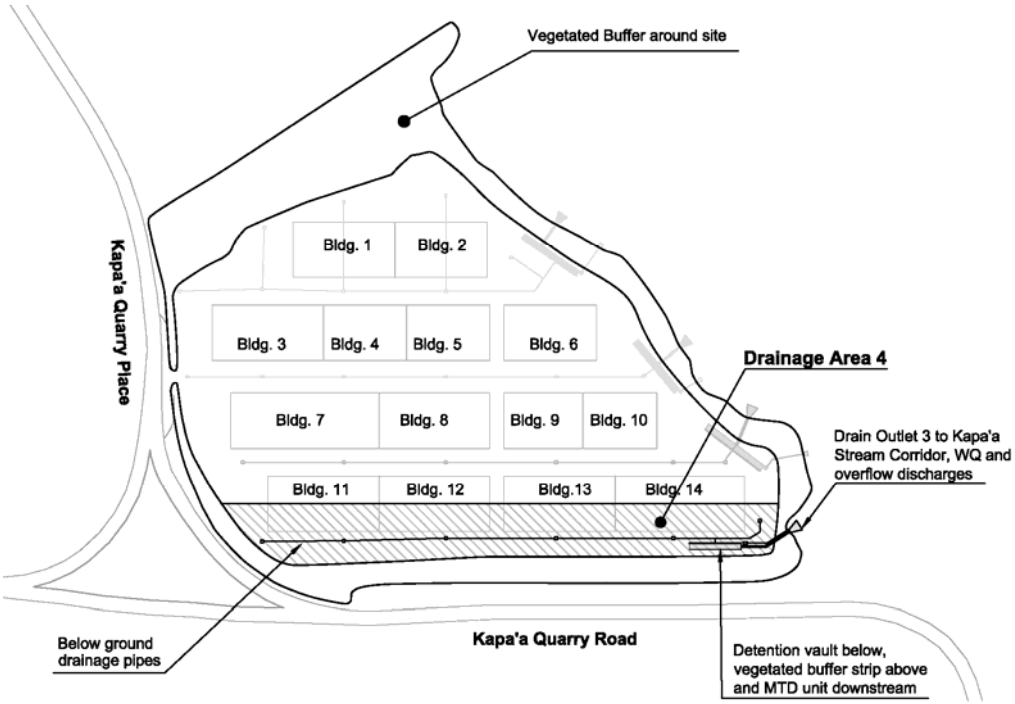


Figure 6.2.5.4.B: Drainage are 4of the Lower site This is a New image, refer to Appendix C

The Simple Method was used to estimate the runoff volume of the site and drainage areas. The difference between the pre- and post-development runoff from the site determined the volumes of the runoff must be detained for flood control.

Table 6.2.5.1 shows results of the calculations using a 10-year design storm reoccurrence interval. The required volumes of the underground detention vaults are determined as 11,400, 9,600, 10,300 and 6,400 cbft for the drainage areas 1,2,3 and 4, respectively. As requested by the Accepting Agency, the volumes of the detention vaults were increased. Appendix C describes the procedure of applying an amplification factor to the required detention vault volumes to arrive at the selected detention vault sizes for the four drainage areas.

The detention vaults will be built from a large number of drainage modules with a high void ratio of 98%. The resulting lengths of the detention vaults are 200, 140 and 300 cbft for the drainage areas 1,2 and 3, respectively. The vegetated buffer strips will be built above detention vaults and the buffer strips will have the same overall widths.

Table 6.2.5.1: Calculation results of the drainage, total runoff volume and detention volume ; This is a New Table, refer to Appendix C

Runoff calculations:	Units	**Drain area 1**	**Drain area 2**	**Drain area 3**	**Drain area 4**
Detention basin calculation					
size of project area	acres	5.6	4.7	5.0	3.1
10 year storm event	inch	2.5	2.5	2.5	2.5
Percentage of impervious area		100%	100%	100%	100%
Pre development:					
Rv for runoff		73%	73%	73%	73%
Post development					
Rv for runoff		95%	95%	95%	95%
Runoff					
Pre development:	cbft	37,000	30,900	33,200	20,600
Post development	cbft	48,400	40,500	43,500	27,000
Difference (required detention)	cbft	**11,400**	**9,600**	**10,300**	**6,400**
Detention vault:					
Amplification Factor for detention volume	[-]	100%	108%	115%	120%
Selected Detention volume	cbft	**11,400**	**10,400**	**11,800**	**7,700**
Preliminary dimensions: (rounded)					
Width	ft	13	13	13	12
Height	ft	6	6	6	6
Length	ft	140	140	150	110

Figure 16.2.5.5 shows the flow diagrams of the storm water runoff for the four ~~three~~ drainage areas for **pre-development** site conditions. The stormwater leaves the site as untreated runoff and enters the Kapa'a Stream Corridor as well as an existing drainage ditch along the Kapa'a Quarry Road.

Figures 6.2.5.6, 6.2.5.7 and 6.2.5.8 and the New Figure 6.2.5.8.B show the flow diagrams of the **full build-out** storm water systems for the drain areas 1 through 3 for the 10-year design storm event. The drainage runoff from each drainage area flows through a vegetated buffer strip where amounts of water pollutants are removed. Downstream of the buffer strip the runoff enters the detention vaults. The runoff captured in the detention vaults is released over a minimum period of 24 hours and flows through the MTD unit where the runoff water passes through filters. If the detention vault is filled to capacity the runoff overflows and therefore bypasses the detention vault. The overflow runoff is discharged to the Kapa'a Stream corridor.

By locating the vegetated buffer strip upstream of the detention vaults and MTDs all the runoff, including the runoff volume that bypasses the detention vault, is treated in normal operation.

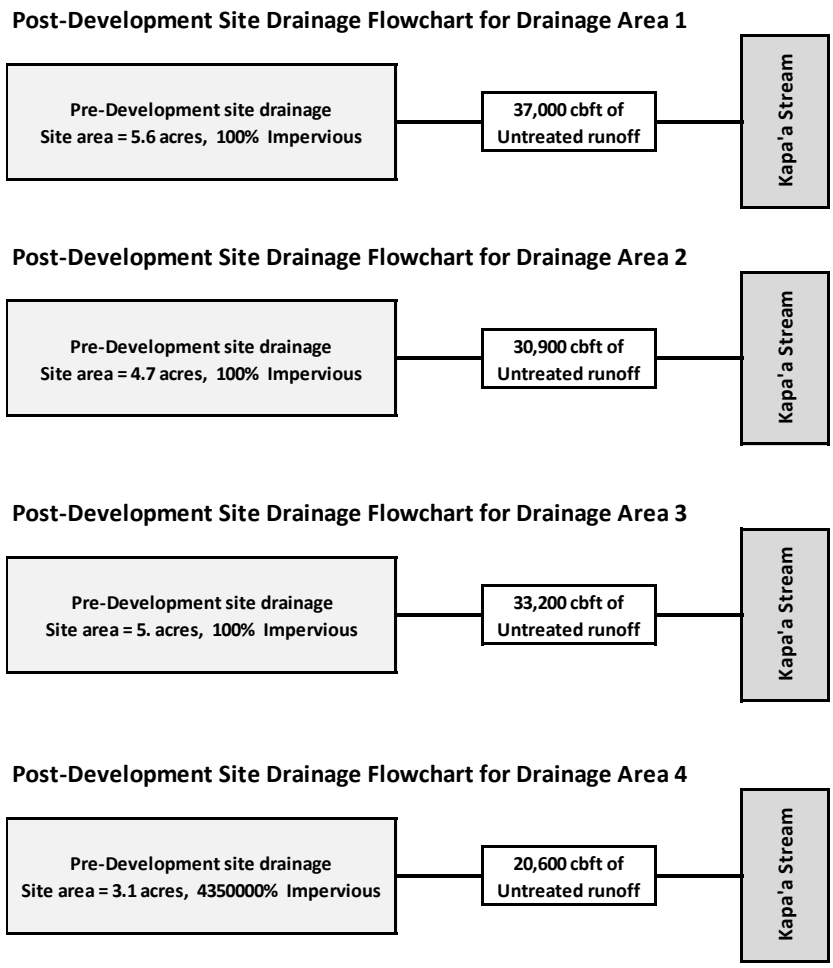


Figure 6.2.5.5: Flow diagram of pre-construction total surface runoff for four post-construction drainage areas assuming 10-year design storm event

This is a new Figure; refer to Appendix C

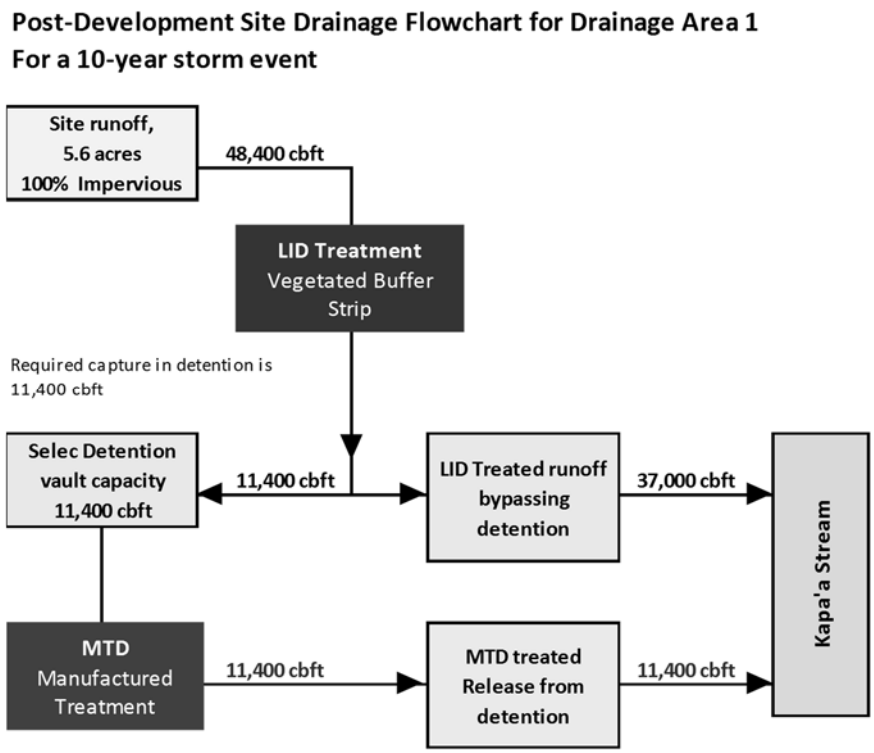


Figure 6.2.5.6**:** Flow diagram for Drainage Area 1 - Lower site

This is a new Figure; refer to Appendix C

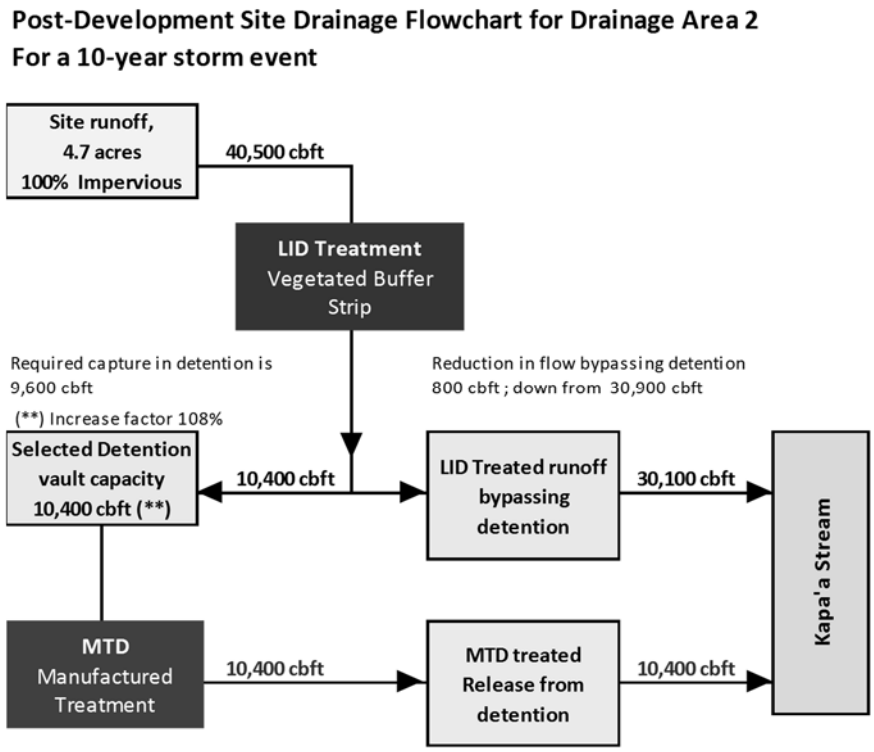


Figure 6.2.5.7: Flow diagram for Drainage Area 2 - Lower site

This is a new Figure; refer to Appendix C

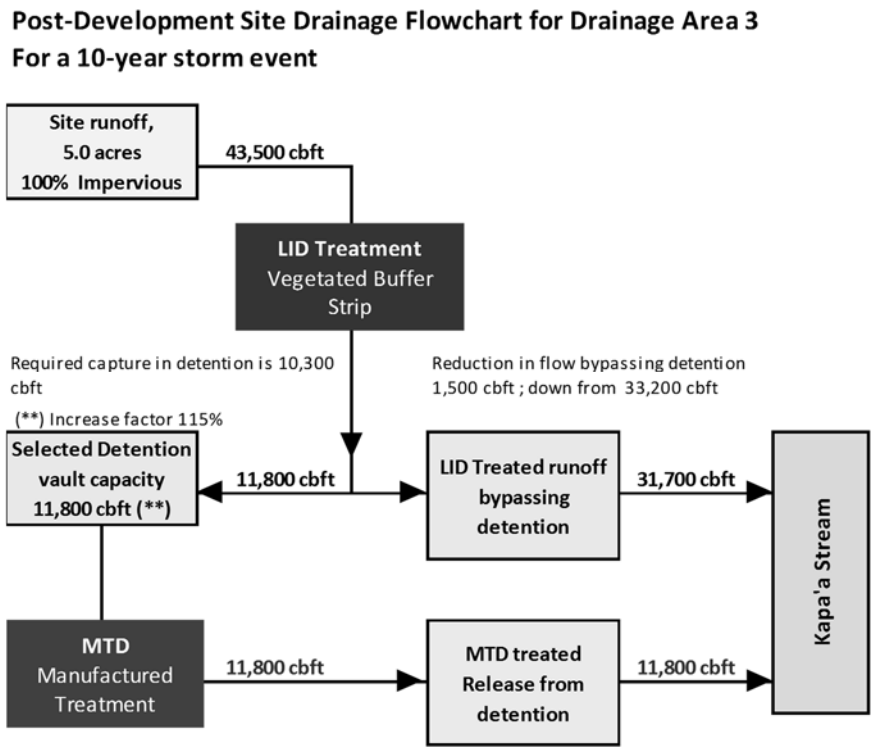


Figure 6.2.5.8**:** Flow diagram for Drainage Area 3 - Lower site

This is a new Figure; refer to Appendix C

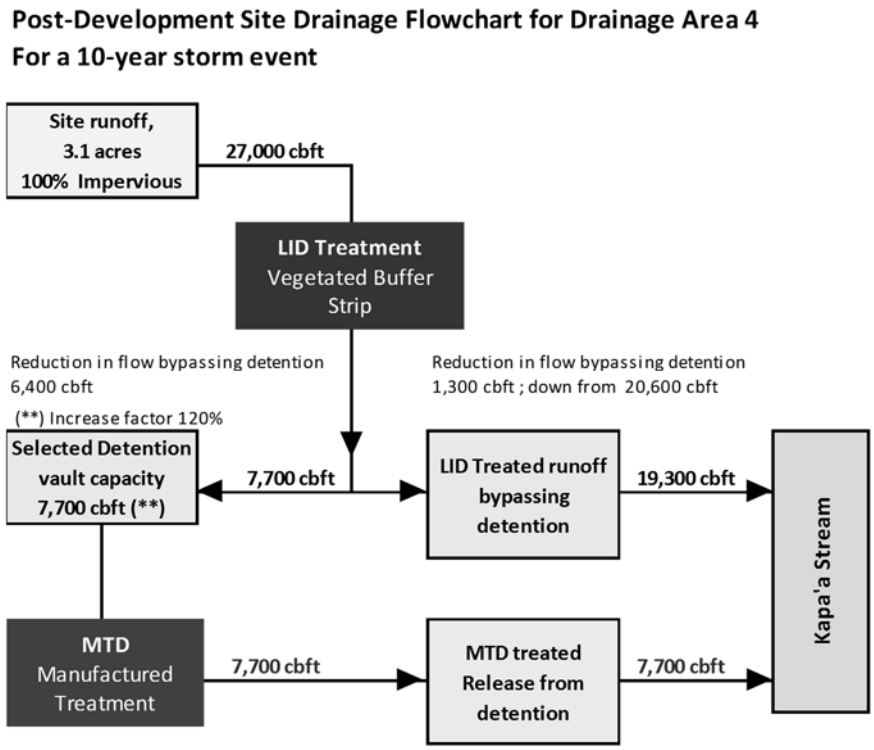


Figure 6.2.5.8.B**:** Flow diagram for Drainage Area 4 - Lower site

This is a new Figure; refer to Appendix C

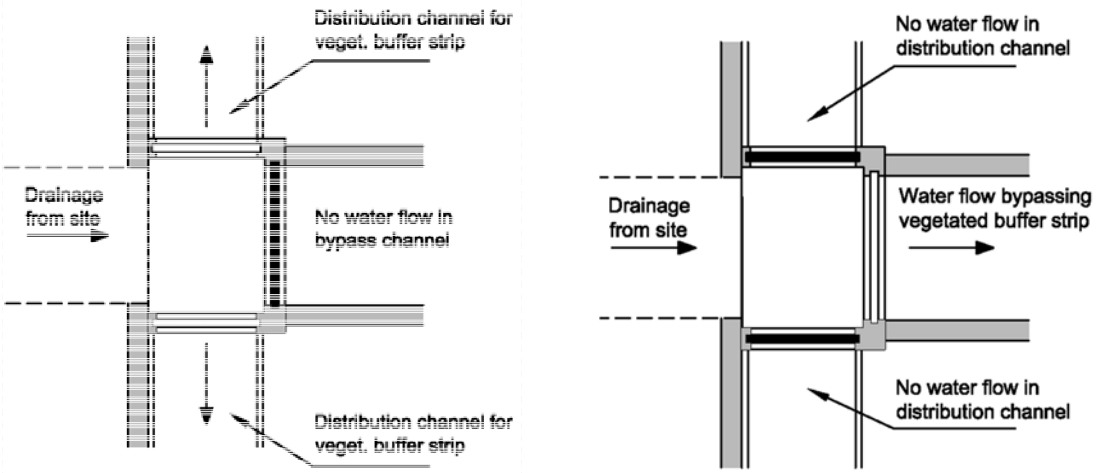
6.2.6 Details of Storm Water Systems of the Lower Site

This section describes the preliminary design of the proposed storm water treatment and management systems in the Lower site. The storm water treatment was designed to implement Low Impact Development (LID) treatment, flood control detention, multiple manufactured treatment devices (MTD) , rainwater harvesting for irrigation and controlled release of the storm water discharge to the adjacent Kapa'a Stream Corridor. The storm water treatment and management process equipment are described in the order of process, with figures referenced illustrating the process systems,

No.	Description of Storm Water Management System Component
1	**Drain inlets:** The runoff from traffic areas and building roofs are collected by multiple drain inlets inside the three drainage areas. Pre-treatment devices are used in the inlets, such as debris deflecting colleting screens, to eliminate debris and smaller floatable.
2	**Drainpipes:** The runoff collected in the drainage areas is conveyed to the site perimeter through a series of drainpipes.
3	**Distribution weir:** The distribution weir upstream of the vegetated buffer strip allows directing the runoff to the distribution swale of the vegetated buffer swale or to bypass the vegetated buffer strip, if required. At times it will be necessary to bypass the vegetated buffer strip, such as during establishing or maintaining the turf grass surface of the vegetated buffer strip.
4	**Distribution swale:** The distribution runoff water is distributed to the grassy surface of the vegetated buffer strip. The distribution swale has multiple outlets to the buffer strip to achieve even distribution.
5	**Vegetated buffer strip:** Turf grass is used as vegetation of the buffer strip. Water flow through the grass is induced by a slope of approximately 5 degrees. Irrigation water is provided by the harvested water collected in the Lower site.
6	**Collection swale:** After flowing through the vegetated buffer strip the water enters a swale that collects the discharge over the length of the vegetated swale and guiles the flow to the intakes of the detention vaults.
7	**Detention vaults:** The detention vaults are located below the vegetated buffer strip. The water enters the detention vaults through multiple inlets. The water that is released from the detention vaults flow to the MTD unit When the storage capacity of the detention vaults is reached the water in the collection swale overflows into larger diameter discharge pipes. The water in the detention vaults is released over a minimum period of 24 hours, to avoid stream erosion and associated impacts due to peak discharge outflow.

No.	Description of Storm Water Management System Component
8	**Manufactured Treatment Device (MTD):** The MTD provides water quality (WQ) flow treatment of the water detained in the detention vaults. The MTD unit receives water from the detention vaults. Since the water is released over a period of minimum 24 hours the resulting flow rates are small enough to be treated in a single MTD unit per drainage ware.
9	**WQ flow discharge:** The treated water that passes through the MTD is discharged through dedicated outfalls through the site perimeter berm. The discharge water is released to the vegetated area inside the Kapa'a Stream corridor through a riprapped area to avoid soil erosion impacts. The low discharge flow rate without peak flow rates does not necessitate a dedicated energy dissipation device.
10	**Peak flow discharge:** In heavy storm events the detention overflow of the detention vaults can attain flow rates that requires hydraulic energy dissipation upstream of the release of discharge water to the Kapa'a Stream corridor.

Figures 6.2.6.9 through 6.2.5.12 show the preliminary design of the proposed storm water treatment system in the Lower site.



A: Distribution weir directing water flow to distribution channel upstream of vegetated buffer strip

B: Distribution weir directing water flow to bypass the vegetated buffer strip

Figure 6.2.6.9: Distribution weir upstream of the vegetated buffer strip

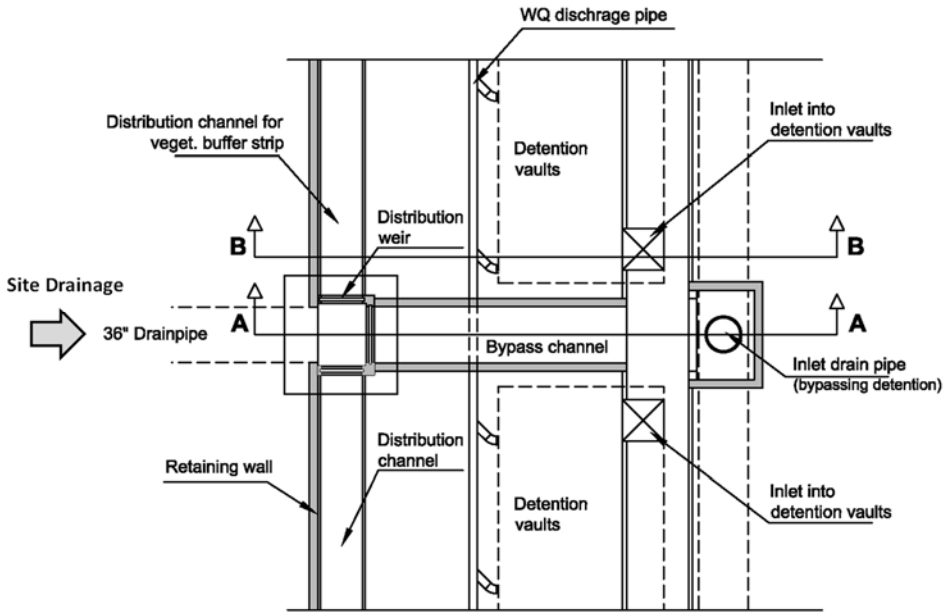


Figure 6.2.6.10: Overview of storm water treatment system components – definition of sections

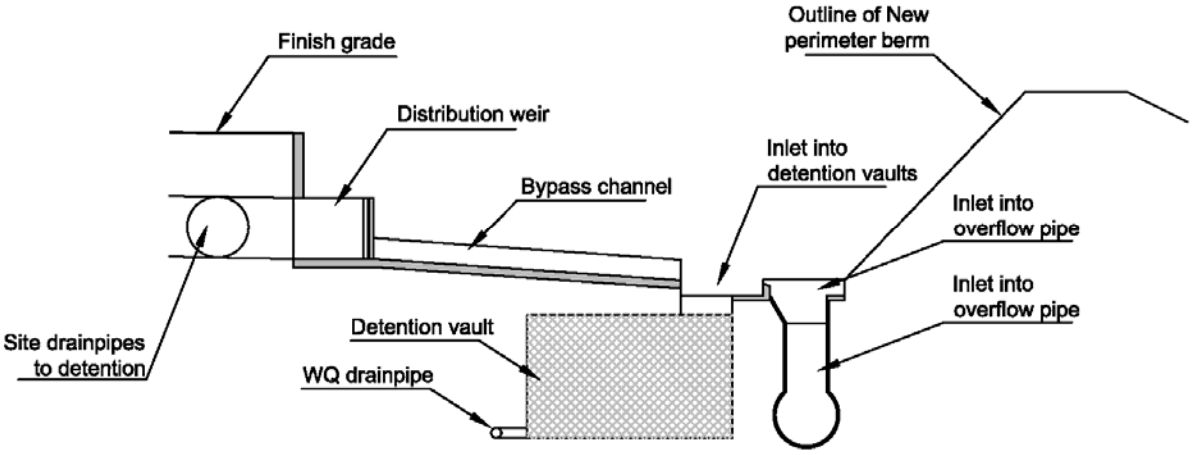


Figure 6.2.6.11: Section A-A defined in Figure I – typical cross section with bypass of vegetated buffer strip

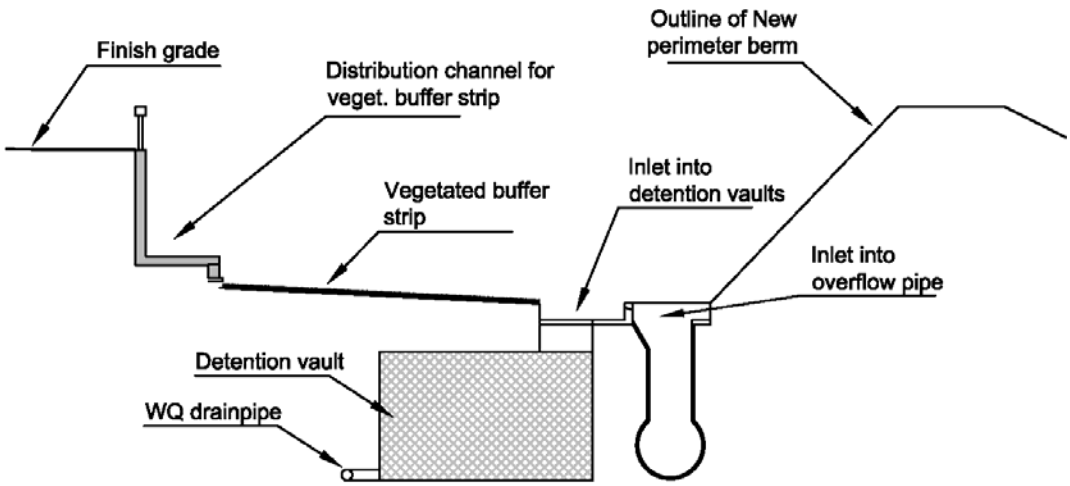


Figure 6.2.6.12: Section B-B defined in Figure I – typical cross section with flow through the vegetated buffer strip

6.2.7 Estimate of Storm Water Quantity Bypassing the Detention Vaults

The detention vaults were sized to accommodate about 23% of the 10-year storm event. This 23% portion of the estimated runoff was the difference between the pre- and post-development, considering the effect that the conversion of the site to impervious surface has on the amount off runoff. While the consideration of the peak flow event is important for the sizing of the detention vaults, the overflowing of the detention vaults in normal operation is of equal importance.

For the estimation of the frequency and intensity of overflowing, a probabilistic numeric model was developed to determine missing mean daily precipitation data at the project site based on monthly precipitation and number of rain days. The mean daily rain fall intensity is needed to estimate how much rainfall occurs at the project and how much of the resulting runoff can be captures and detained in the detention vaults.

To develop representative daily precipitation, the model predicted mean monthly rainfall intensity was taken from the Rain Atlas of Hawaii and combined with the recorded mean days with rainfall in the Kailua area. A random distribution of expected days with resulting rainfall intensity was normalized to yield the expected monthly rainfall intensity. This yielded a daily distribution of expected precipitation with the correct total rain fall intensity for the month. For the model, the release flow from the detention vaults was assumed to empty the detention volumes within the 24-hour duration of the day with rainfall.

The results are depicted in Figures 6.2.7.1 and 6.2.7.2. As an example, for the four ~~three~~ drainage areas Figure 6.2.7.1 shows the results for drainage area 1. Per month of the year, Figure 6.2.7.1 shows the mean values of the runoff from drainage area 1, the runoff volume detained and the volume bypassing, or overflowing the detention vaults. The results suggest that the detention vault of drainage area 1 is

only overflowing during five months of the so called "rainy season". Appendix C presents the results for all four drainage areas.

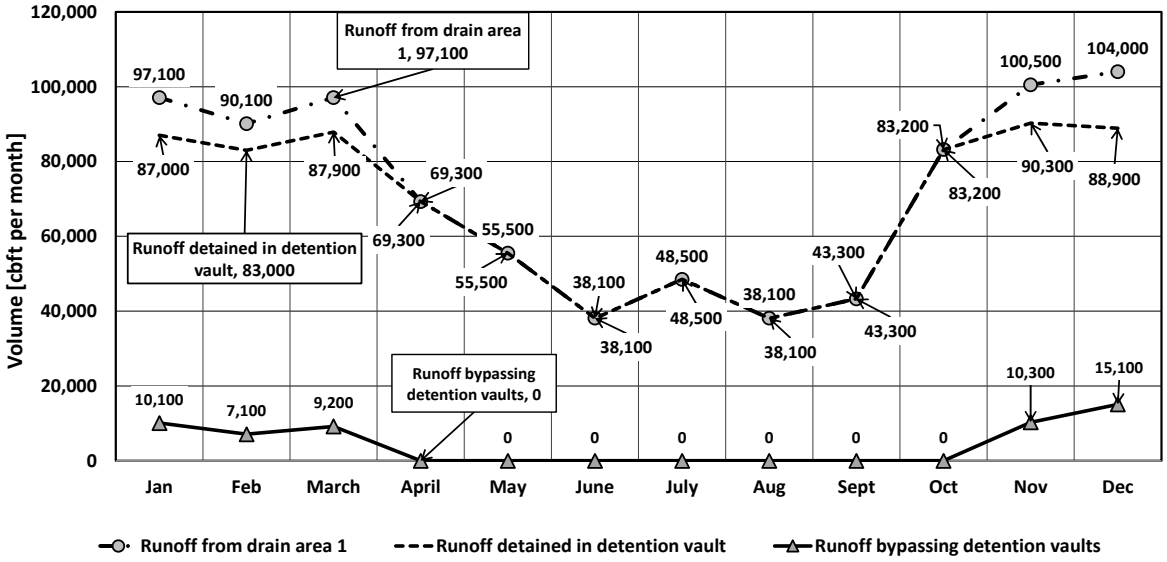


Figure 6.2.7.1: Assessment of runoff detained and overflowing the detention vaults – Values shown are for Drainage Area 1

The rainfall model suggests that the detention vaults would overflow on average on 35 days in the year, which is 10% of the time. While the frequency of the overflow is of importance, the amount of the overflow per occurrence is more important since it indicates the impact on the stream corridor.

Figure 6.2.7.2 shows a frequency distribution of the amount of expected overflow which would bypass the three detention vaults. The data indicate that the centroid of the frequency distribution is within the range of 1,000 to 2,000 cbft of runoff. Normalizing the data, we can state that the mean runoff volume that overflows the detention vaults is around 1,900 cbft, or 16% of the average detention volume of 12,000 cbft.

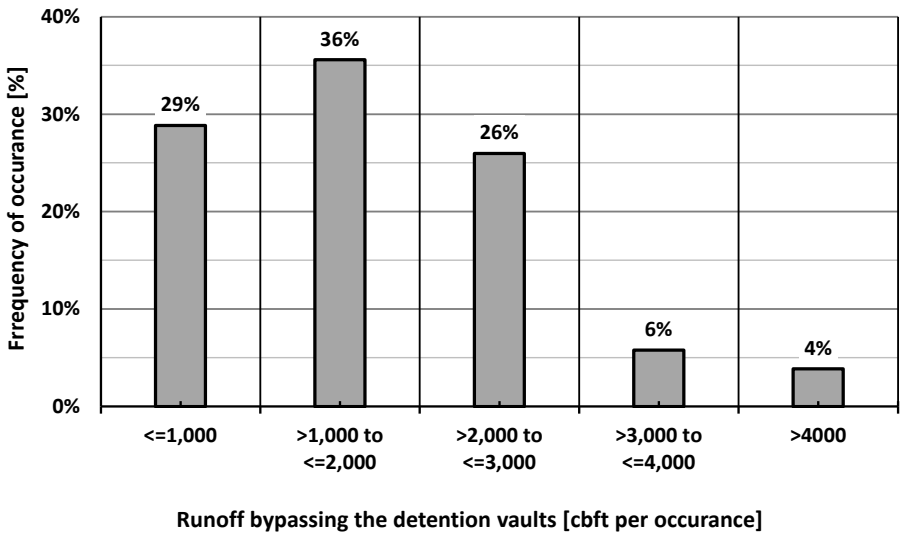


Figure 6.2.7.2: Frequency diagram of the run off colums bypassing the detention vaults

For all four ~~three~~ drainage aras of the Lower site

6.3 Full Build-out Finish Grade of the Project Site

Figure 6.3.1 shows the project site with the pre-development topography. The "pre-development" stage is defined as the time before the 2011 FEIS, about the time the topographic map depicted in Figure 6.3.1 was created.

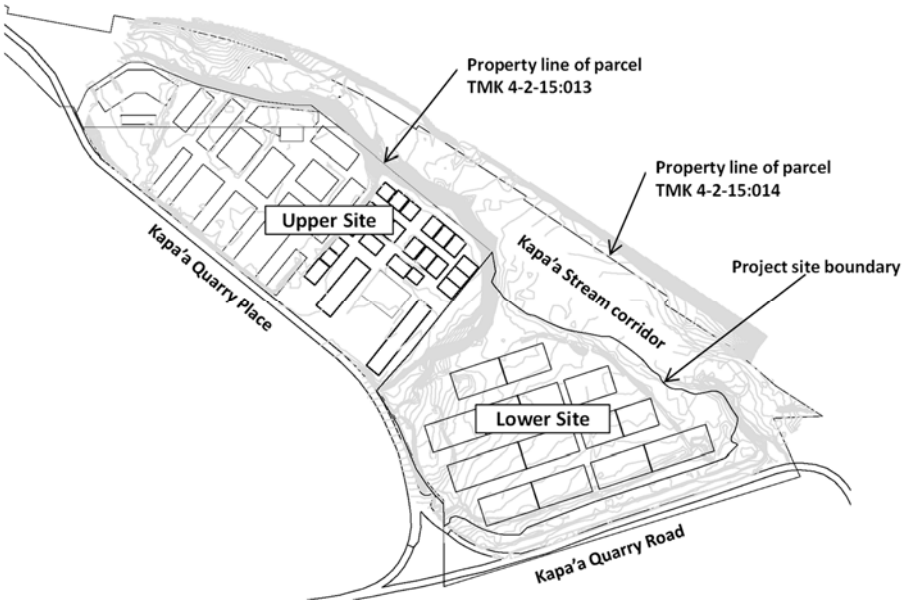
As can be seen in Figure 6.3.1, the project site is differentiated between the Upper and Lower site. At the time of the 2011 FEIS the Upper site had portions with relative flat surfaces with elevations that range between 85 and 96 feet. The Lower site had a more pronounced elevation gradient that slopes towards the North East, with elevations ranging between 70 and 20 feet. The buildings within the Lower site are overlaid with the pre-development topography.

The post-development, or Full Build-out, finish grade in the Lower site differs significantly more from the pre-development grade than in the Upper site. Figures 6.3.2 and 6.3.3 compare the topographies of the pre- and post-development grade of the Lower site in more detail.

Figure 6.3.2 shows the topography of the Lower site in 2017, after initial and limited grading was completed in the Lower site. Figure 6.3.4 shows the full build-out finish grade, with the contour line running parallel to the Kapa'a Quarry Road section directly adjacent to the Lower site. Figure 6.3.4 also indicates the location of the planned 14 warehouses in the Lower site.

Longitudinal and transvers sections were developed to compare the pre-development and the full-build-out grades. Figure 6.3.4 shows the locations of the axes of the longitudinal and transverse sections.

Figure 6.3.1: Topography of the project site



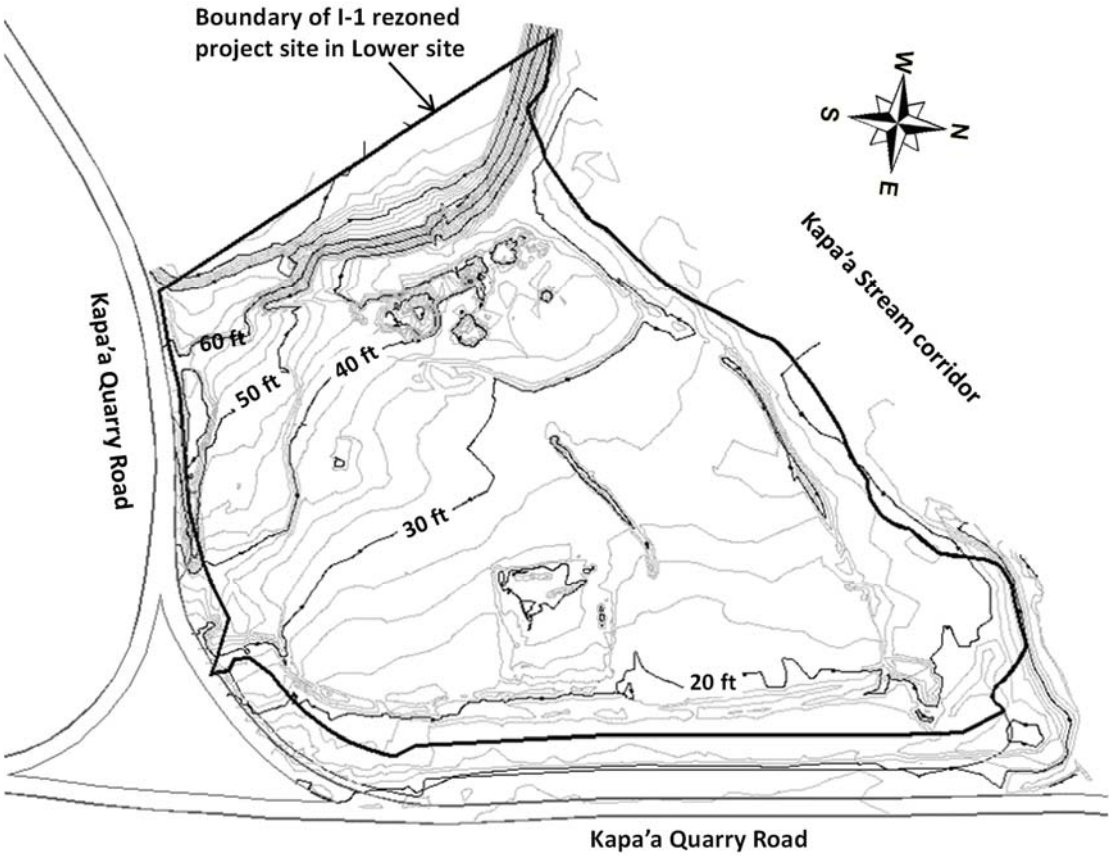


Figure 6.3.2: Lower site with grading recorded in 2017 (this Figure has been changed from the DSEIS)

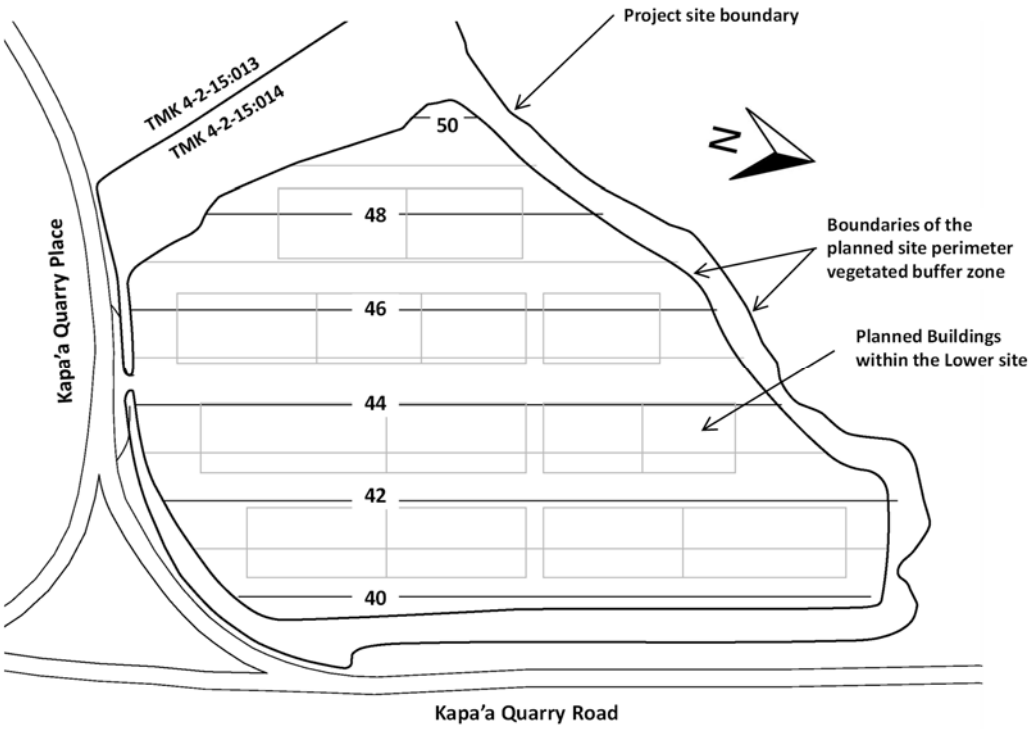


Figure 6.3.3: Lower site with proposed finish grade at full build-out

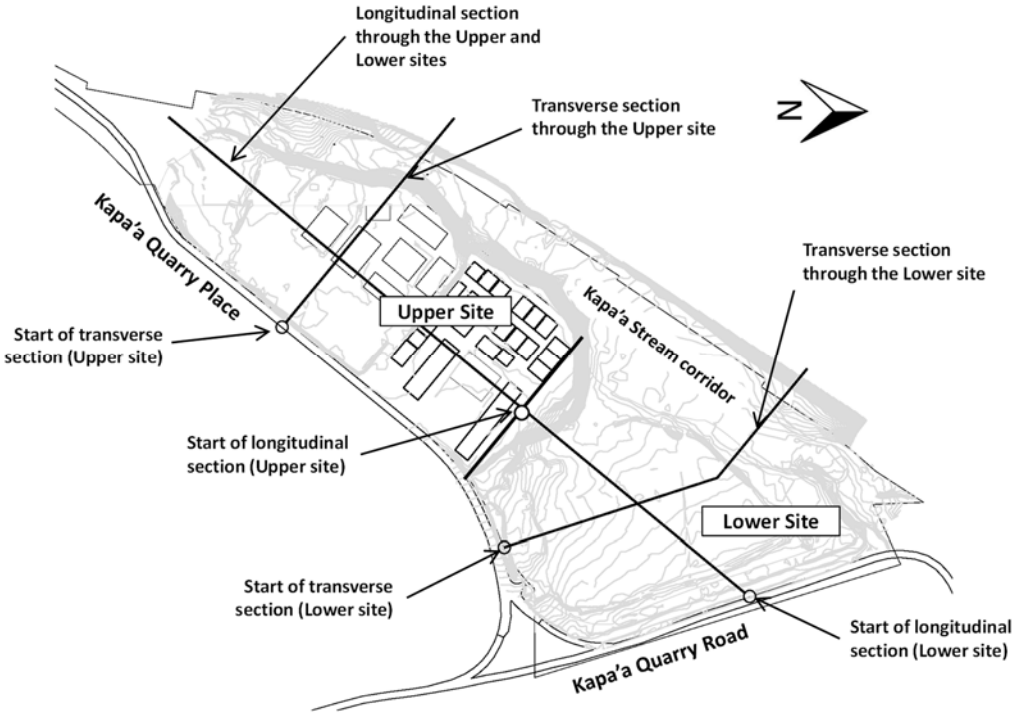


Figure 6.3.4: Locations of the axes of the longitudinal and transverse sections

The following figures illustrate the pre- and post-development (Full Build-out) topography of the project site:

Figures 6.3.5 shows the longitudinal section through the Upper and Lower sites. The elevation of the cross-section of the pre-and post-development is compared. The pre-development condition is from the time of the 2011 FEIS. Figure 6.3.5 emphasizes the different elevations of the Lower and Upper sites.

Figures 6.3.6 and 6.3.7 show the longitudinal sections through the Lower site, for the pre-development (conditions at 2011 FEIS) and the full build-out conditions. The four building cross sections indicate the planned four rows of buildings.

Figures 6.3.8 and 6.3.9 show the longitudinal sections through the Upper site, for the pre-development (conditions at 2011 FEIS) and the full build-out conditions. The building cross sections indicate the existing (E) and the planned (P) buildings.

Figures 6.3.10 through 6.3.13 show the transverse sections for the Upper and Lower transverse sections. The existing and planned buildings are indicated.

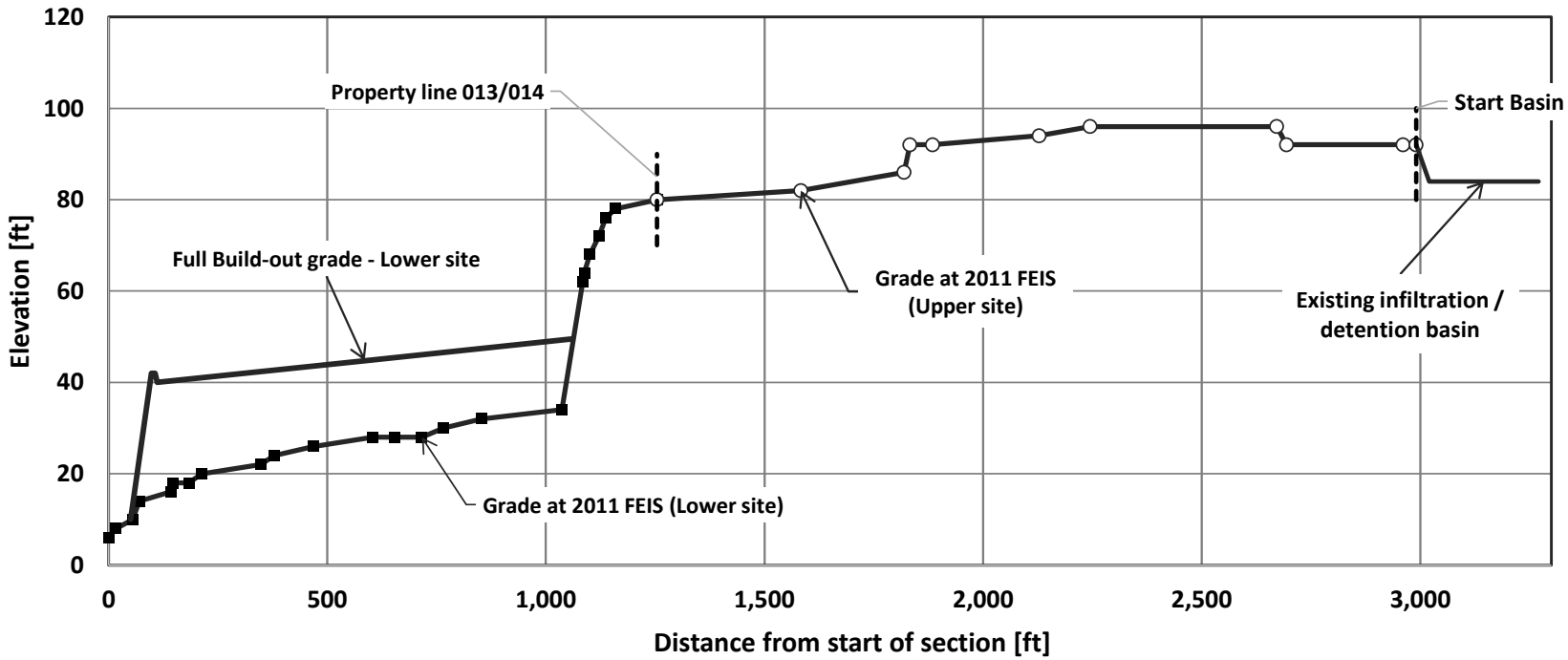


Figure 6.3.5: Longitudinal cross-section through the Upper and Lower sites- Comparison of the Pre- and Post-development

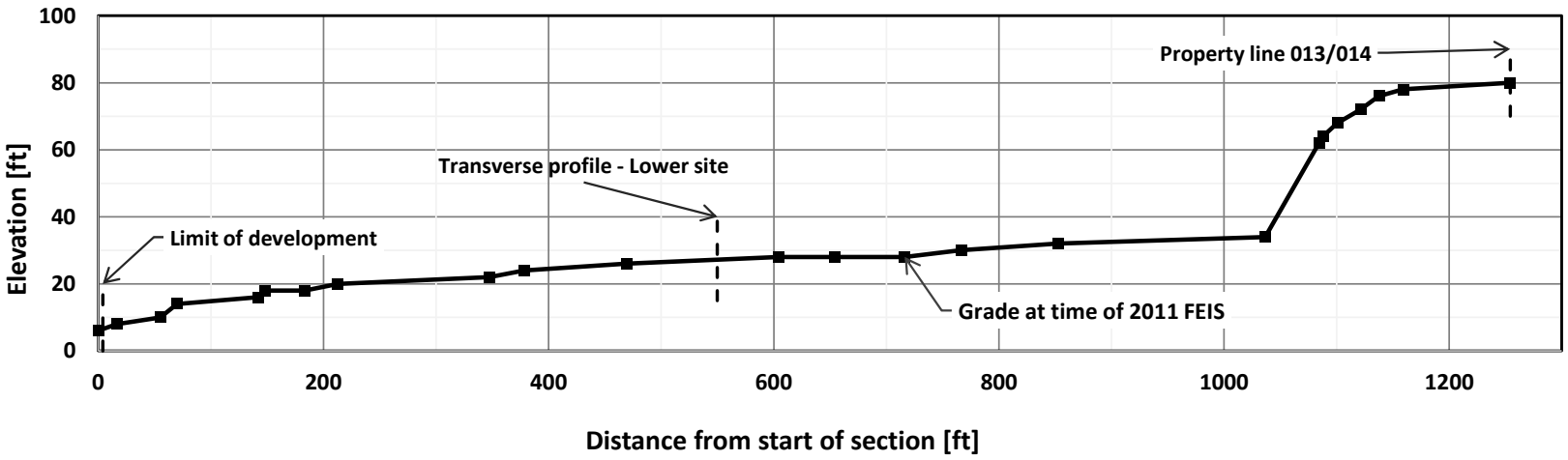


Figure 6.3.6: Longitudinal cross-section through the Lower site – Pre-development situation

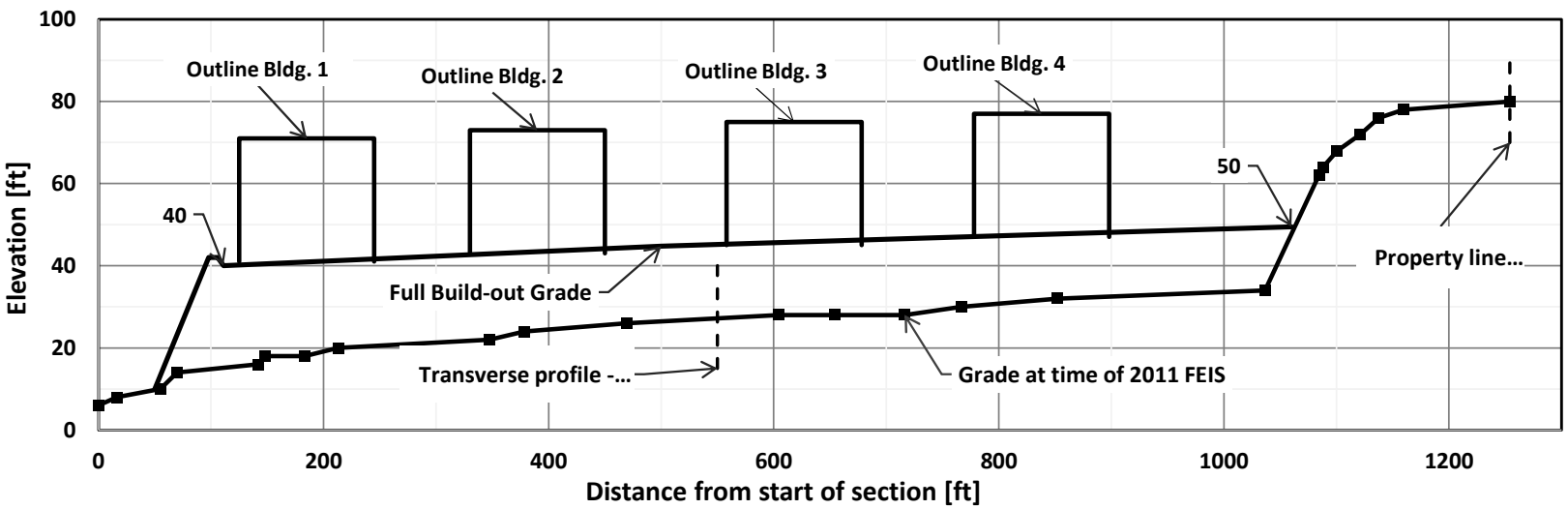


Figure 6.3.7: Longitudinal cross-section through the Lower site – Comparison of Pre-development and Post-development situation

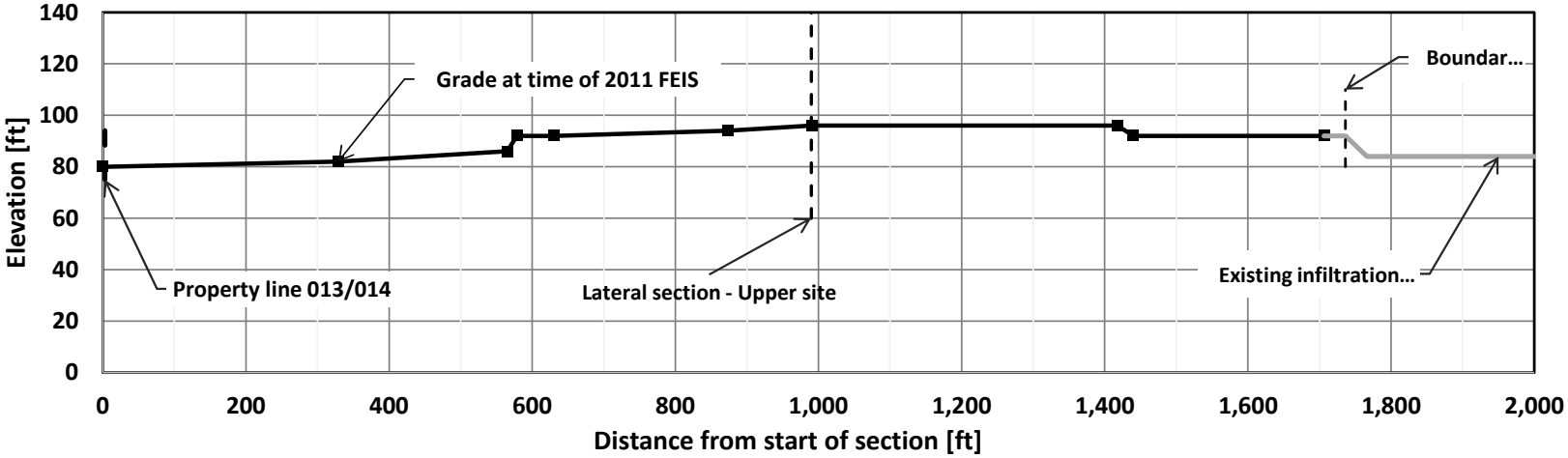


Figure 6.3.8: Longitudinal cross-section through the Upper site – Pre-development situation

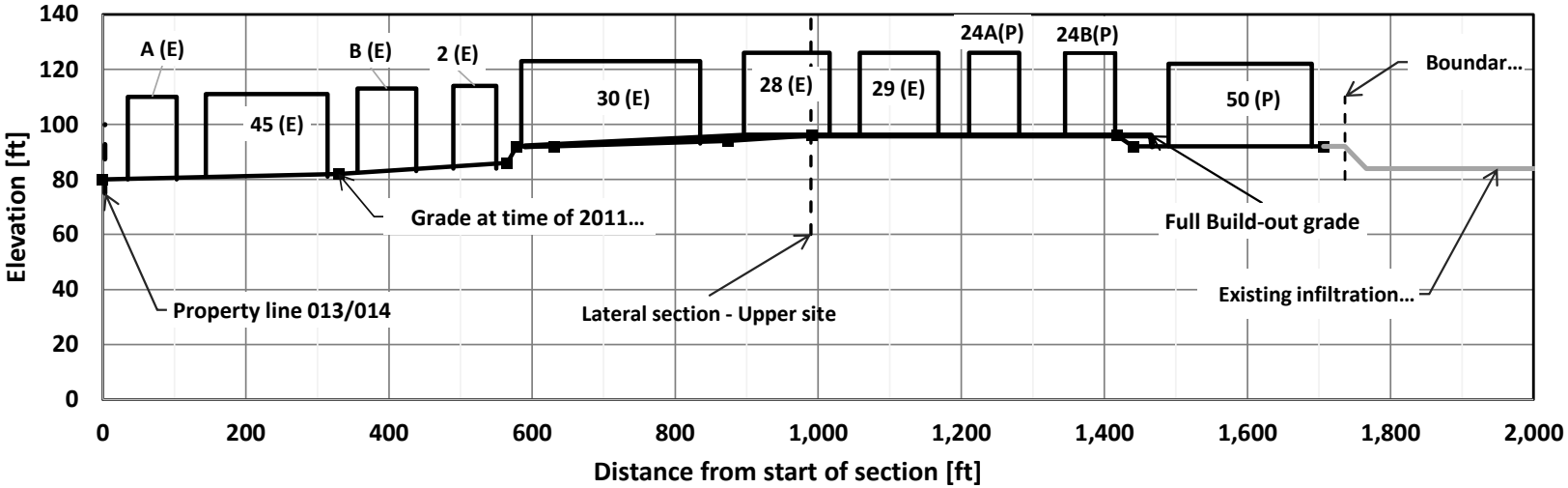


Figure 6.3.9: Longitudinal cross-section through the Upper site – Comparison of Pre-development and Post-development situation

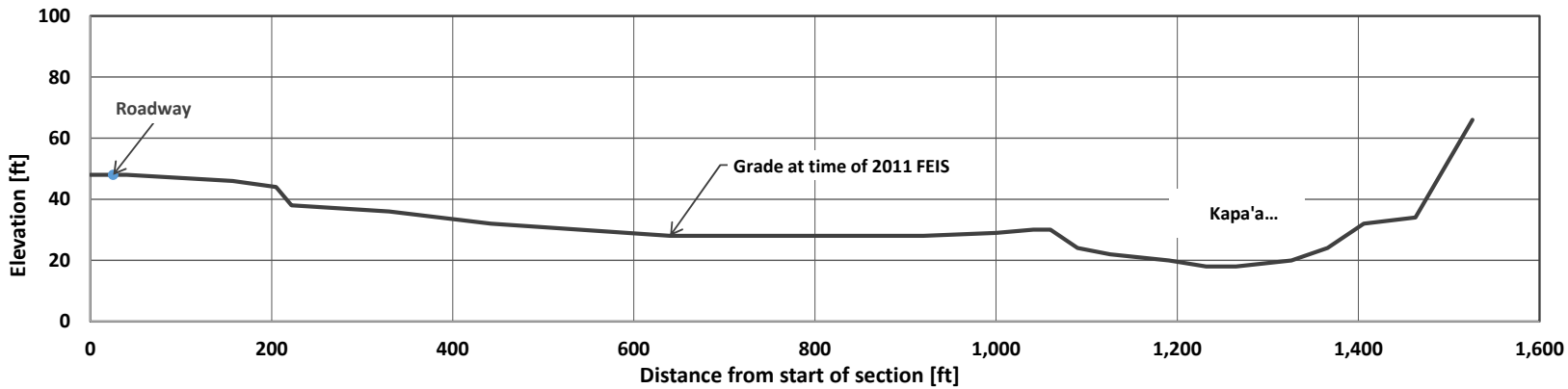


Figure 6.3.10: Transverse cross-section through the Lower site – Pre-development situation

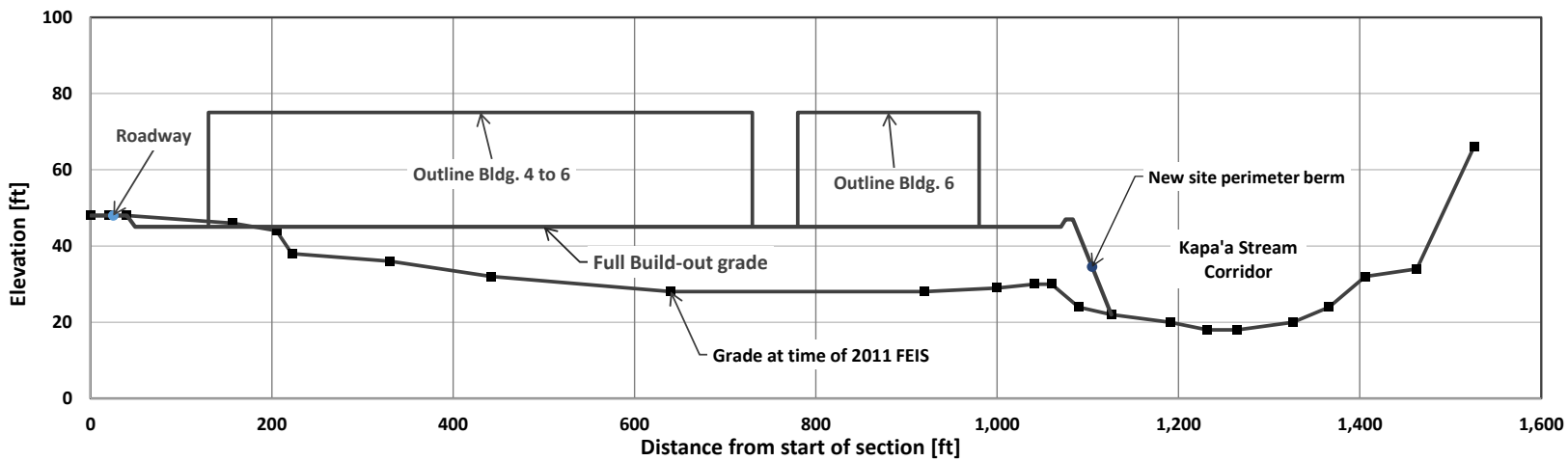


Figure 6.3.11: Transverse cross-section through the Lower site – Comparison of Pre-development and Post-development situation

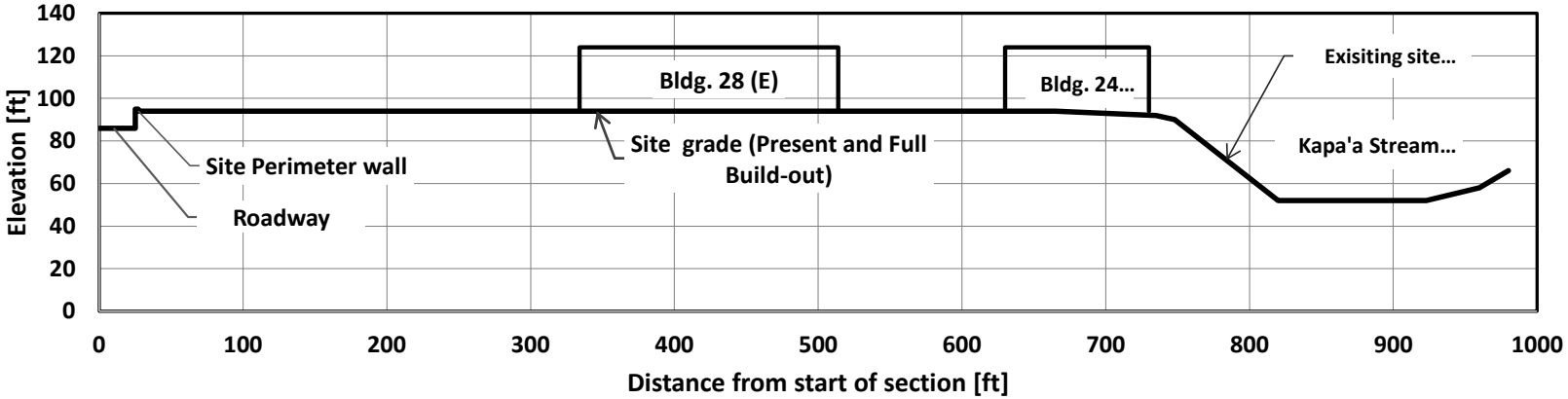


Figure 6.3.12: Transverse cross-section through the Upper site – Pre-development situation

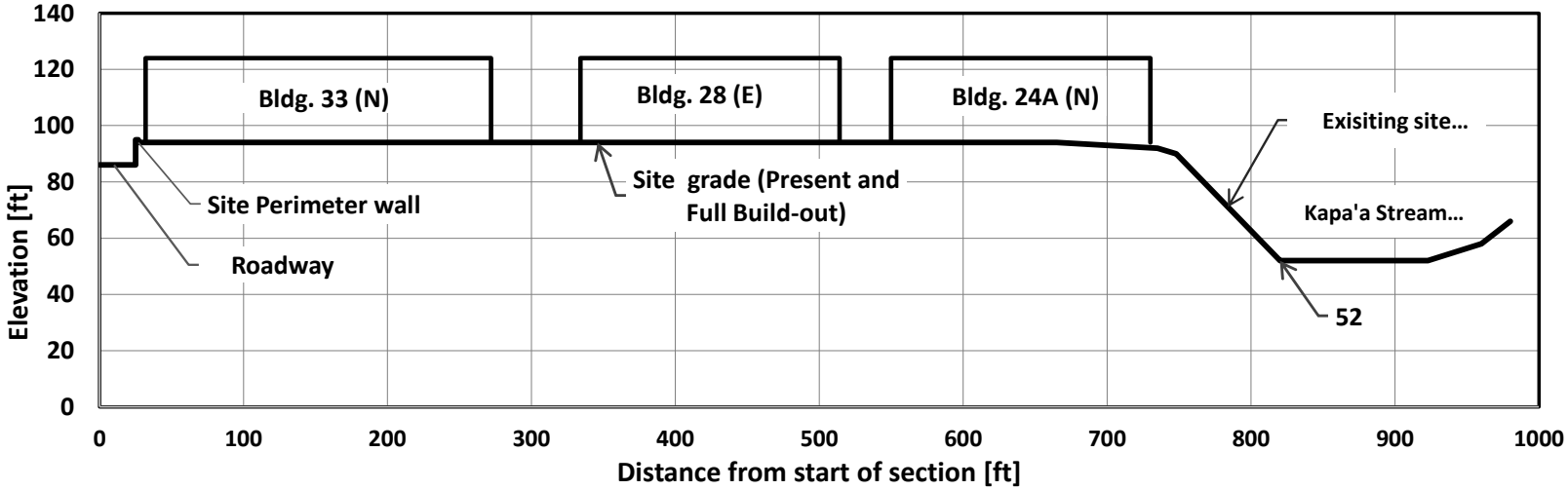


Figure 6.3.13: Transverse cross-section through the Upper site – Comparison of Pre-development and Post-development situation

6.3B Removal Efficiency of the Type of Manufactured Treatment Device Used (New Section)

This section 6.3B has been added to the DSEIS document to respond to a comment by the Accepting Agency about the removal efficiency of the type of Manufactured Treatment Device (MTD) used. This information is also presented in Appendix B of this FSEIS.

The one MTD, which is already in use at the Upper portion of the project site and the four MTDs planned for implementation in the Lower portion are filtration MTD, which remove pollutants by passing water through a membrane filter. The particular MTD used at the project site is the Bio Clean Kraken™ Filter unit. If there are changes in the type of MTD offered from different vendors, a system with equivalent treatment performance would be used.

This Kraken MTD has been approved by the DPP for use as an Alternative Compliance BMP. The approval of the DPP is based on whether the MTD has passed tests based on either of two test protocols:

- Certification in accordance with the Washington State Department of Ecology Emerging Stormwater Treatment Technologies (TAPE) test protocol.
- Certification in accordance with New Jersey Department of Environmental Protection (NJDEP) test protocol.

Both test protocols are widely used as the basis for local certification of MTDs.

The Kraken MTD Filter unit utilizes membrane filtration, this ensures a high level of removal for not only TSS, but also metals, trash, nutrients, and hydrocarbons. The Kraken MTD Filter unit has received NJDEP and TAPE certifications for TSS removal rate at 80% and 89%, respectively. Table 6.3B.1 shows a list of storm water pollution removal efficacy of the Kraken filtration MTD unit as tested under the TAPE protocol.

Table 6.3B.1: Pollutant removal efficiency of the Kraken MTD in accordance with TAPE protocol

Pollutant type	Average influent concentration mg/l	Average effluent concentration mg/l	Removal efficacy
Total Suspended Solids	73.1	7.0	89%
Total Phosphorus	0.151	0.034	72%
Suspended Solids Conc.	151.3	6.9	89%
Nitrogen (TKN)	1.5	1.0	31%
Fecal Coliform	692	355	60%
Motor Oil	4.6	0.7	81%
Total Zinc	0.158	0.054	54%
Total Copper	0.042	0.017	52%
Diesel Range Organics	1.2	0.4	65%

Table 6.3B.2 shows an excerpt of a list that DPP has published to endorse the MTD "Kraken" as "Alternative Compliance BMP".

Table 6.3B.2: Excerpt of DPP table endorsing the Kraken MTD unit

Description in DPP table	Performance
Manufacturer	Bio Clean Environmental Services, Inc.
Product	The Kraken
Treatment type	Basic
Washington State Department of Ecology Emerging Stormwater Treatment Technologies (TAPE)	
Treatment type	Basic
Additional Treatment Type	Phosphorus
Use level	Conditional Use Level
New Jersey Department of Environmental Protection (NJDEP)	
Certified TSS Removal Rate	80%
City and County of Honolulu	
Device Type	Alternative Compliance BMP

Kapa'a Stream - 303-listed Stream:

The Kapa'a Stream Is a "303-listed" inland water as defined under the Clean water Act (CWA) §303(d).

The background of the listing of Kapa'a Stream can be found in the Department of Health publication "The 2018 STATE OF HAWAII WATER QUALITY MONITORING AND ASSESSMENT REPORT: Integrated Report to the U.S. Environmental Protection Agency and the U.S. Congress, Pursuant to §303(d) and §305(b), Clean Water Act (P.L. 97-117)". The reported values for the Kapa'a Stream (Oahu) are found in Appendix B – 15 in this document. Table 6.3B.3 shows the values for the Kapa'a Stream.

Table 6.3B.3: Excerpt of the 2018 State of Hawaii WQ Monitoring and Assessment

Description in the table	Reported values
Assessed Water Body	**Kapa'a Stream**
Water Body Type	Stream
Water Body ID	3-2-13-Kapaa
TN	V_T
NO3+NO2	V
TP	V_T
Turbidity	V
TSS	V_T
Other Pollutants	Metals, Lead
Category	3,4a,5
TMDL Priority	TMDLs approved, 2007, (TN, TP & TSS)

The entries in Table A.3 are defined as follows:

- V = visual listing from 2001 - 2004
- VT = visual listing from 2001 - 2004 (TMDL approved for parameter)
- 3 = not enough data to evaluate
- 4a = TMDL approved
- 5 = at least one use not attained, TMDL needed

In accordance with TMDL priorities in TN,TP and TSS, the type of MTD used has the following removal efficiencies."

TN = 31% removal

TP = 72% removal

TSS = 89% removal

Other pollutants could be identified as an average of approximately 50% removal.

6.4 Interrelationship of the Storm Water System and Proposed Finish Grade

This section describes the interrelationship of the storm water system and the finish grade in the Lower site. The proposed storm water system has four ~~three~~ drainage outlets from the project site to the Kapa'a Stream corridor. Figure 6.4.1 shows the four ~~three~~ drainage systems and outlets 1 through 4~~3~~, serving the drainage areas 1 through 4~~3~~. The conveyance of storm water through drainpipes from the farthest drain inlet close to the southern site perimeter to the storm water treatment and detention facilities at the Northern site perimeter requires significant hydraulic head to overcome flow and elevation losses. Therefore, the finish grade elevation must be adequately high to provide the required hydraulic gradient.

Appendix D describes the relationship between the updated storm water system of the Lower site and the proposed finish grade. Instead of three drainage areas, the updated storm water drainage in the Lower site has now four drainage areas. Appendix D describes the required elevation of the full build-out finish grade to discharge the runoff from the drain inlets to the treatment facilities as the Northern site perimeter.

In the comments about the DSEIS, the issue was raised that the rooftops of the buildings in the Lower site had too much height from the existing grade. As stated, in accordance with ROH 21 the allowable height of buildings must be measured from existing not the finish grade. Appendix D presents the response that an exception in ROH is given. If the site requires the finish grade to be raised to build essential infrastructure, such as site drainage, the height of the buildings should be measured from the finish grade.

6.4.1 Elevations Along the Storm Water Drainage Facilities

This section discusses the elevations along the various storm water treatment and management system components. To safeguard good drainage of the site and discharge of the runoff to the adjacent stream corridor there must be a sufficient hydraulic gradient between the furthest point of the storm water drainpipes and the treatment and management system, as well as the outlets.

It is evident that the elevation of the drain outlets of the four ~~three~~ drainage areas must be at the same height or above the elevation of the adjacent stream corridor at the points of discharge. Figure 6.4.1.1 shows the horizontal location of the station line along the Northern site perimeter, which borders at the Kapa'a Stream corridor. The station numbers of the four ~~three~~ discharge points for the four ~~three~~ drainage areas - the distances from the start of the station line - are indicated in the Figure 6.4.1.1.

Figure 6.4.1.1 shows a cross-section along the station line defined in Figure 6.4.1.1. The cross-section depicts the elevations of the site at the inside boundary of the site perimeter buffer zone and the elevations at the foot of the site perimeter berms.

As the storm water runoff flows through the drainage systems of the four ~~three~~ drainage areas of the Lower site, various elevation losses are incurred. These losses are due to hydraulic losses which are associated with the flow through pipes, distribution in swales, inlets into the various process components, flowing over the grassy vegetated buffer strip surface, exit from various process components, and flowing through filter media. For the four drainage areas 1 through 4 four ~~three~~ cross section illustrations are presented in Figures 6.4.1.3, 6.4.1.4, 6.4.1.5 and 6.4.1.4.B. These figures show the type and the magnitude of the elevation losses along the storm water drainage process.

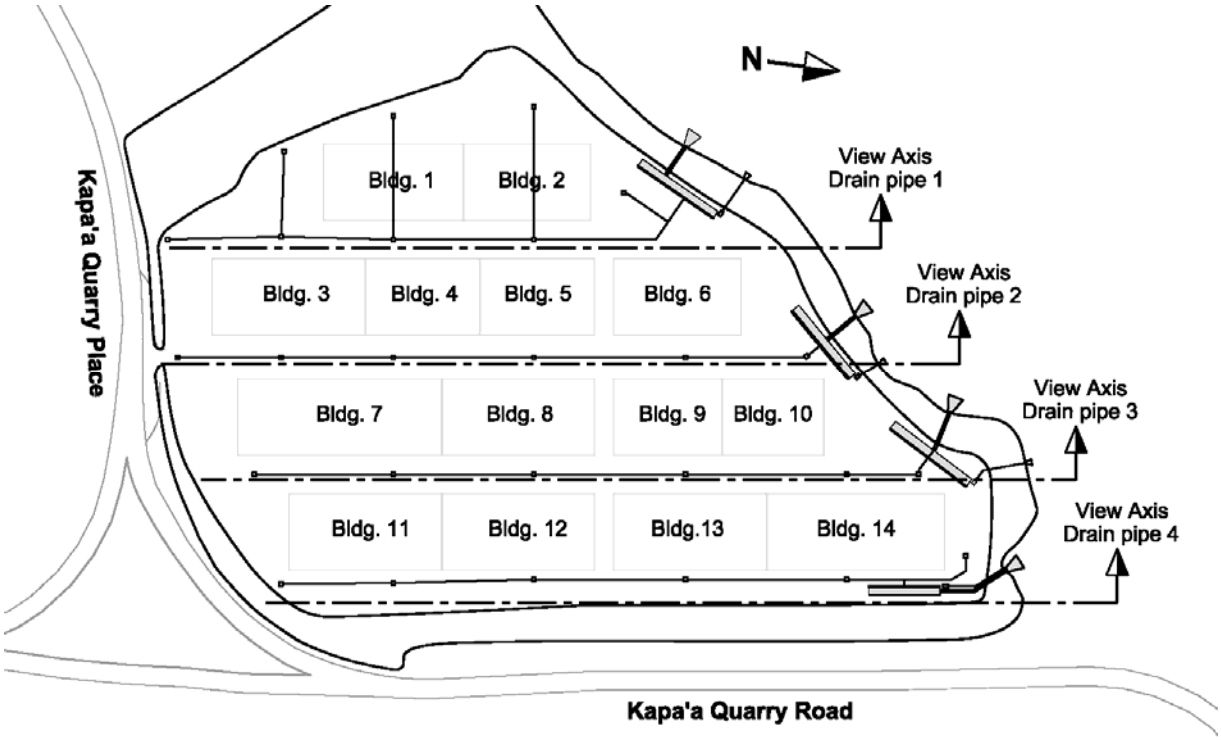


Figure 6.4.1.1: Station line along the Northern site perimeter, (this Figure has been changed from the DSEIS), refer to Appendix D

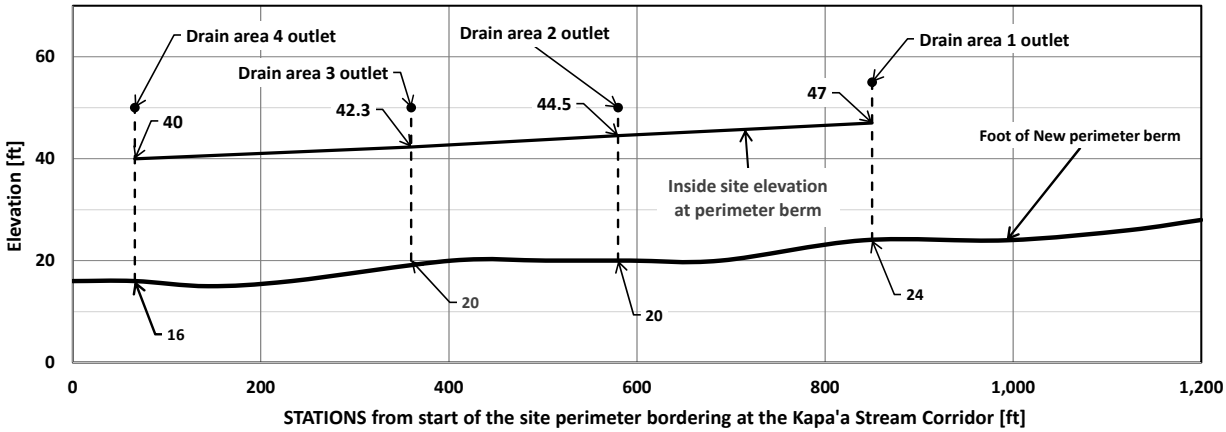


Figure 6.4.1.2: Cross-section along the station line shown in Figure A; (this Figure has been changed from the DSEIS), refer to Appendix D

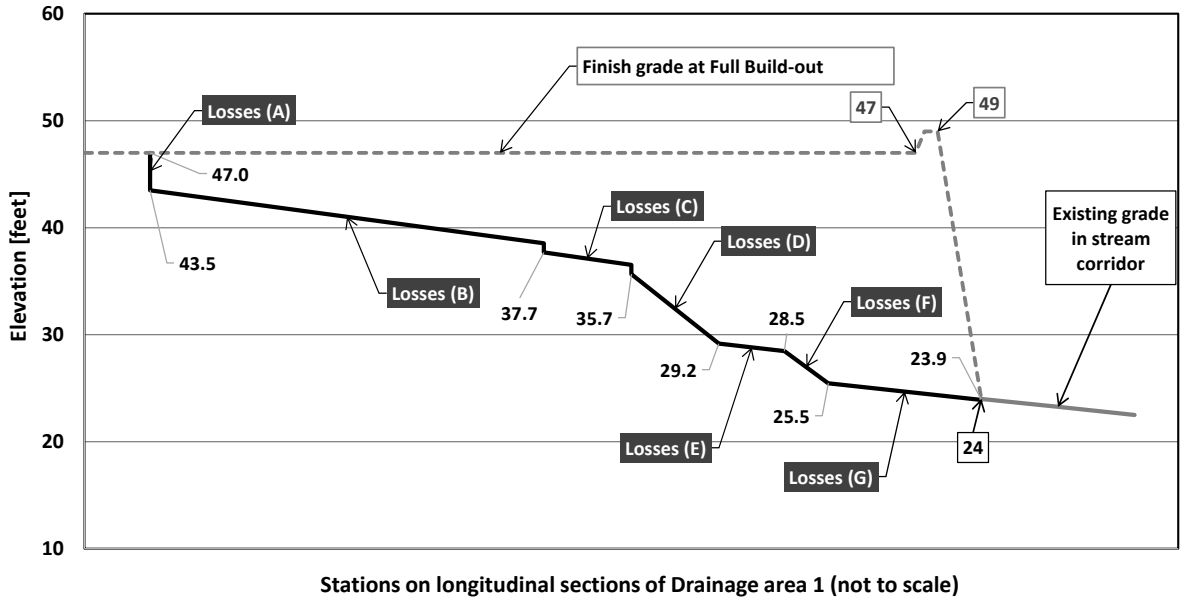


Figure 6.4.1.3: Cross section illustrations showing the magnitude of the elevation losses along the drainage process in **Drainage Area 1 – Lower site** (this Figure has been changed from the DSEIS; Refer to Appendix D)

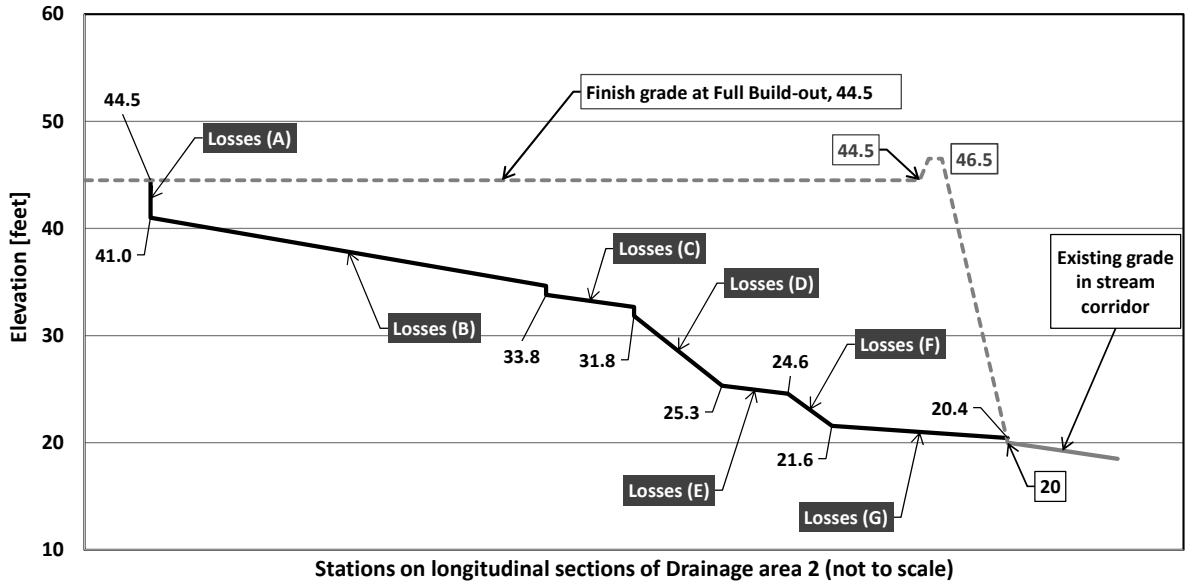


Figure 6.4.1.4: Cross section illustrations showing the magnitude of the elevation losses along the drainage process in **Drainage Area 2 – Lower site;** (this Figure has been changed from the DSEIS; Refer to Appendix D)

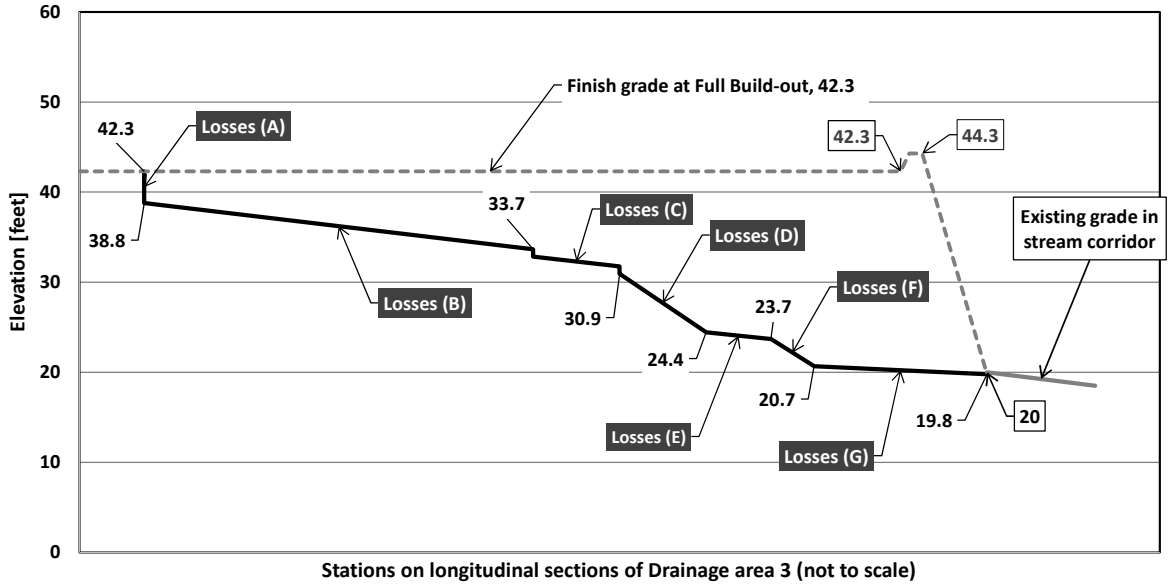


Figure 6.4.1.5: Cross section illustrations showing the magnitude of the elevation losses along the drainage process in **Drainage Area 3 – Lower site;** (this Figure has been changed from the DSEIS; Refer to Appendix D)

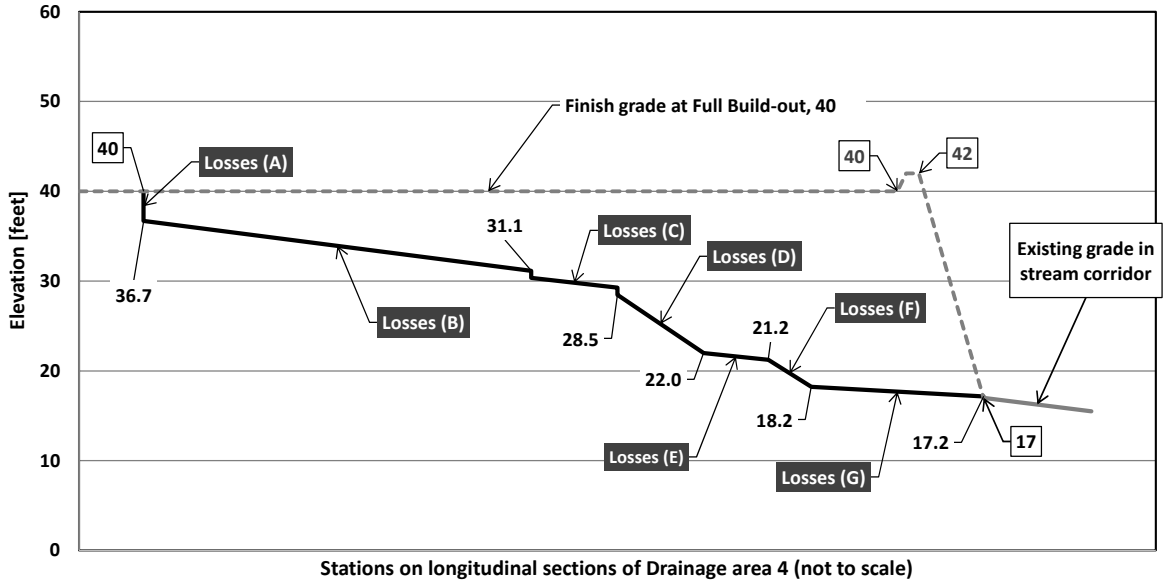


Figure 6.4.1.5.B: Cross section illustrations showing the magnitude of the elevation losses along the drainage process in **Drainage Area 4 – Lower site;** (this Figure has been added to the FSEIS from the DSEIS; Refer to Appendix D)

The elevation losses for the three drainage areas are listed in Table 6.4.1.1

Table 6.4.1.1: Description of the elevation losses in the drainage process for the three drainage areas 1 through 3 in the Lower site; (this Table has been changed from the DSEIS; Refer to Appendix D)

Losses ID	Description of losses in the drainage process	Drainage areas in Lower site							
		Drainage area 1		Drainage area 2		Drainage area 3		Drainage area 4	
		data [units]	Losses [feet]	data [units]	Losses [feet]	data [units]	Losses [feet]	data [units]	Losses [feet]
Losses (A)	**Elevation loss in drain inlet**		3.5		3.5		3.5		3.3
	Invert below finish grade	3.5		3.5		3.5		3.5	
Losses (B)	**Elevation losses in drain pipe**		5.0		6.4		5.2		5.6
	Drain pipe length:	900		1060		1,030		1,010	
	Drain pipe slope:	0.55%		0.60%		0.50%		0.55%	
Losses (C)	**Elevation losses in vegetated buffer strip**		2.9		2.8		2.7		2.7
	Losses include distribution loss, entry loss, loss of flow through the buffer, exit loss to collection								
Losses (D)	**Elevation losses in detention vault**		6.5		6.5		6.5		6.5
	Losses include inlet losses, elevation of detention vault to empty completely, exit losses								
Losses (E)	**Elevation losses pipe to MTD**		0.7		0.8		0.8		0.8
	Losses from connection pipe to MTD								
Losses (F)	**Elevation losses in MTD**		3.0		3.0		3.0		3.0
	Losses in MTD include entry losses, losses from hydraulic head above filters, exit losses								
Losses (G)	**Elevation losses from MTD to outfall point**		1.6		1.1		0.9		1.1
	Losses include entry losses, flow losses, losses due to energy dissipation (riprap)								
	Sums of elevation losses along drainage process flow		**23.1**		**24.1**		**22.5**		**22.9**
	Finish grade at the start of the drainage process flow		**47**		**44.5**		**42.3**		**40**
	resulting elevation at WQ discharge invert at site perimeter		**23.9**		**20.4**		**19.8**		**17.2**
	Approximate elevation of existing grade in Kapa'a Stream corridor		**24**		**20**		**20**		**17**

6.4.2 Why the Accepted Grade is Insufficient to Install the Preferred Storm Water System

The full build-out finish grade in the Lower site was accepted in the SMP Minor Modification 2017/MOD-37 (MT) to the Special Management Area Use Permit No. 2014/SM-27. The accepted grade is depicted in Figure 6.4.2.1. The accepted grade under the 201 4SMP minor modification would create a flat project site with a 0.75% slope towards the North-East corner of the site.

Figures 6.4.2.2 through 6.4.2.4.B show elevation losses for the proposed drainage system with the previously accepted grade (in SMP 2017/MOD-37) superimposed. Figure 6.4.2.2 includes the accepted full build-out finish grade ("accepted grade") in the cross-sectional depiction of the Drainage areas 1. The proposed grade has elevation contours which are parallel to the Kapa'a Quarry Road and therefore the proposed grade appears as a horizontal line in the figure. The accepted grade has a slope in the figure due to the fact of the North-East slope of the finish grade. Figures 6.4.2.2 through 6.4.2.4.B indicate that the accepted grade would not provide sufficient elevation to convey storm water runoff from the first inlet to the discharge point to the stream corridor. Figures 6.4.2.2 through 6.4.2.4.B

illustrate that the accepted grade would not provide the sufficient elevation to install the preferred storm water treatment and detention system in all four drainage areas.

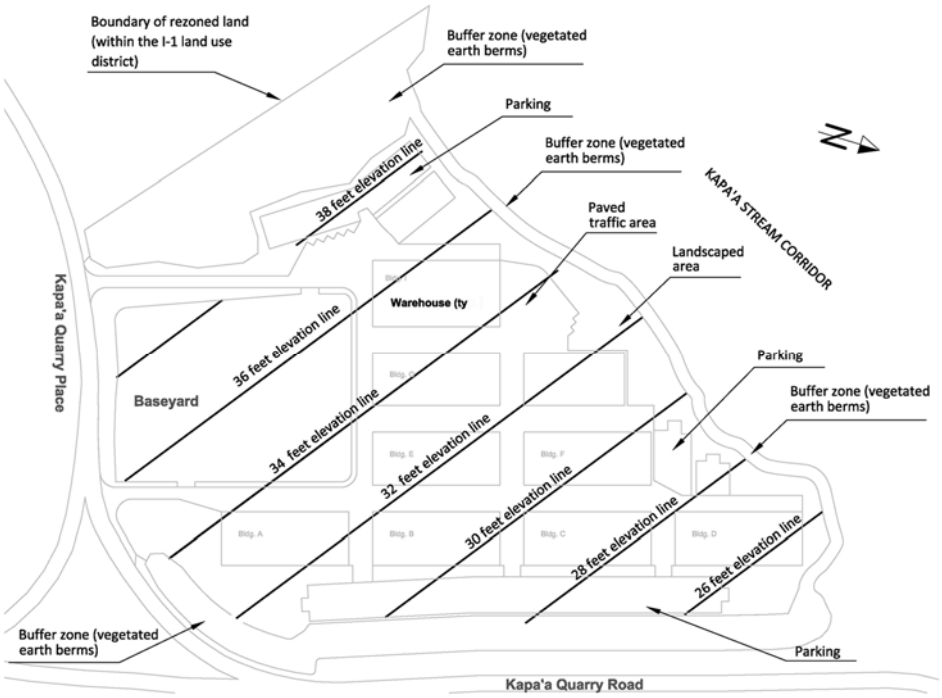
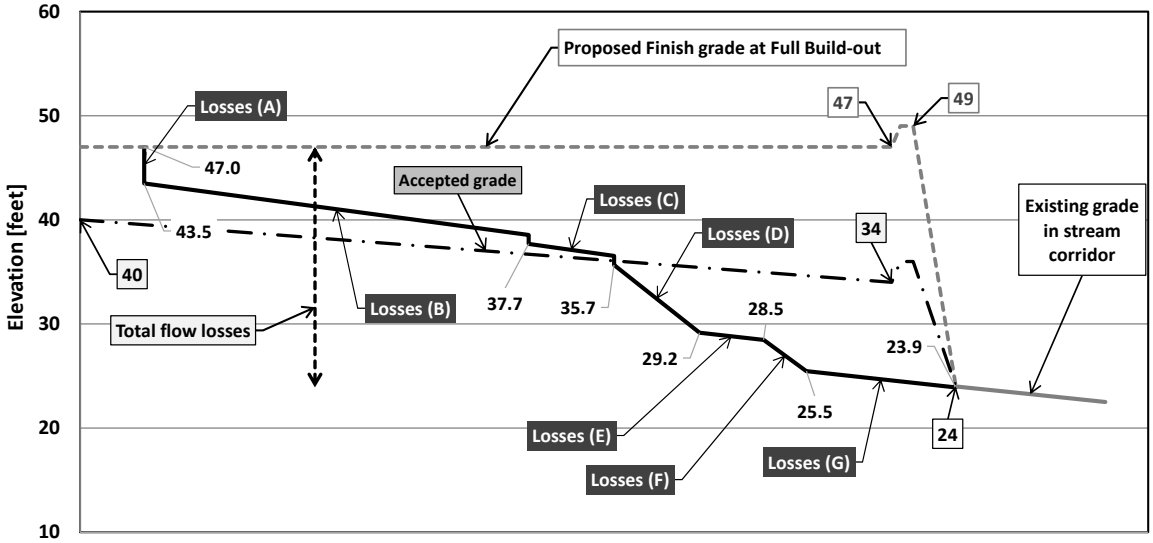


Figure 6.4.2.1: Finish grade at full build-out of project site

(source 2017/MOD-37 written statement, Figure 3.2.1)

This is the **Accepted Grade**



Stations on longitudinal sections of Drainage area 1 (not to scale)

Figure 6.4.2.2: Proposed storm water treatment process with proposed and accepted grade for **drainage areas 1** (Total elevation losses from first inlet to discharge to Stream corridor = 24 feet); (this Figure has been changed from the DSEIS; Refer to Appendix D)

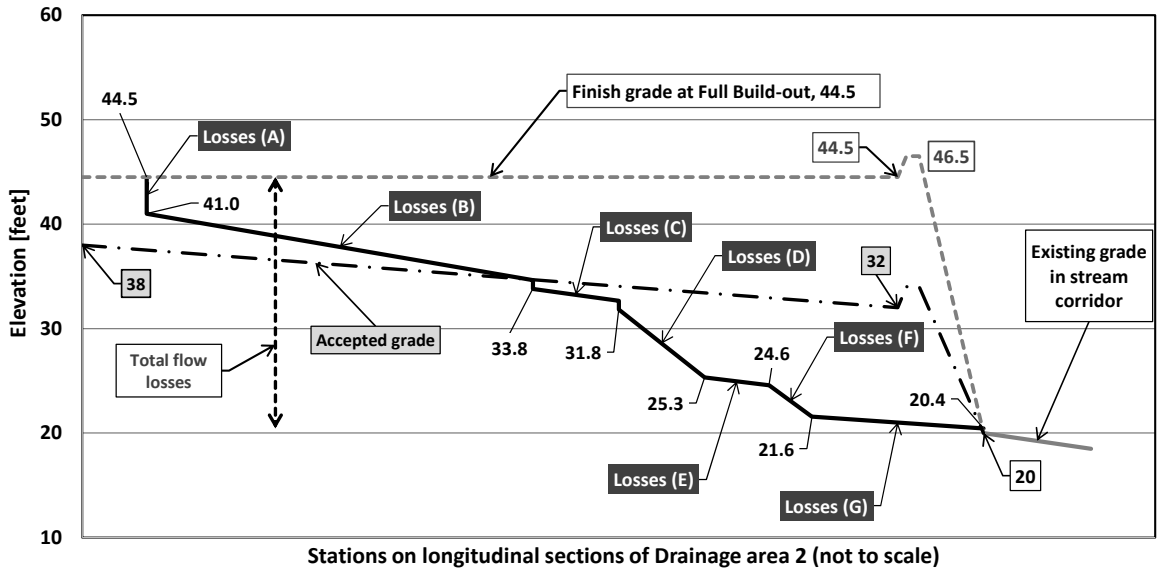


Figure 6.4.2.3: Proposed storm water treatment process with proposed and accepted grade for **drainage area 2** (Total elevation losses from first inlet to discharge to Stream corridor = 24.1 feet); (this Figure has been changed from the DSEIS; Refer to Appendix D)

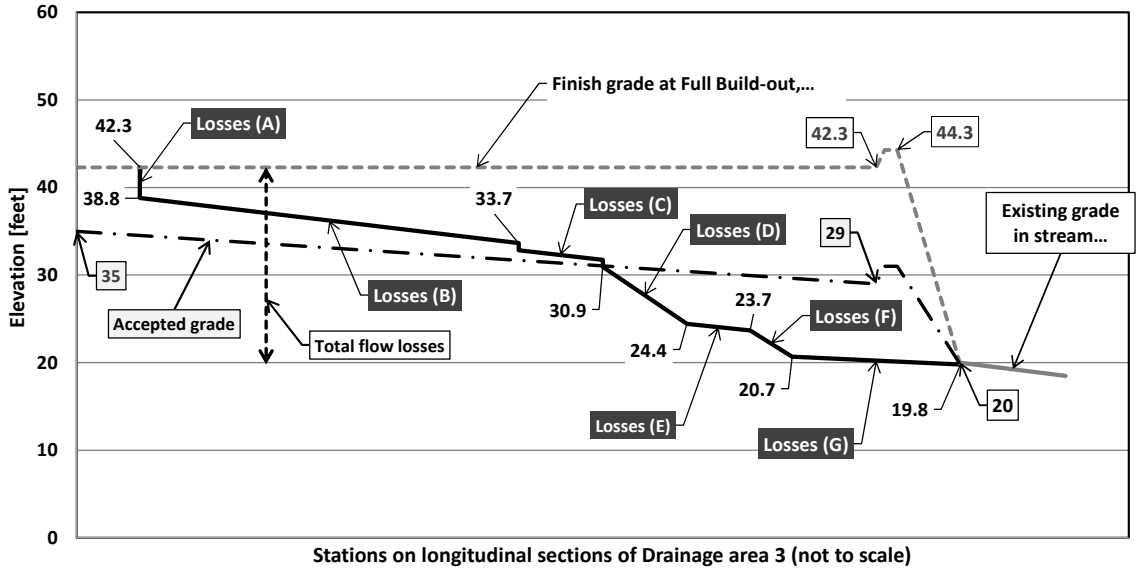


Figure 6.4.2.4: Proposed storm water treatment process with propose and Accepted grade for **drainage area 3** **(**Total elevation losses from first inlet to discharge to Stream corridor = 22.5 feet); (this Figure has been changed from the DSEIS; Refer to Appendix D)

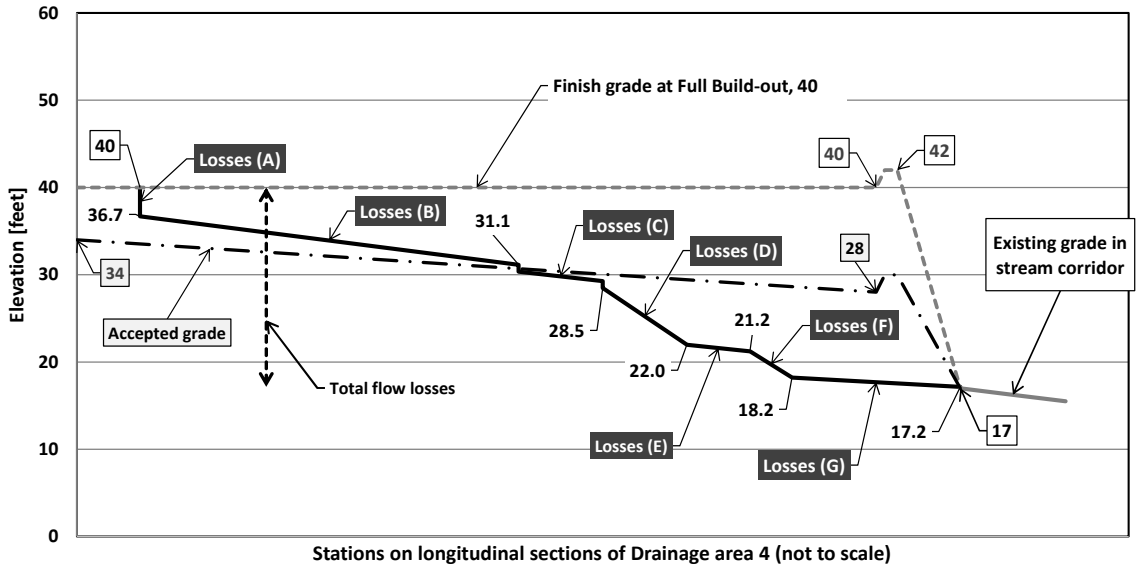


Figure 6.4.2.4.B: Proposed storm water treatment process with propose and Accepted grade for **drainage area 3** **(**Total elevation losses from first inlet to discharge to Stream corridor = 22.9 feet); (this Figure has been added; Refer to Appendix D)

6.5 Site Perimeter Berms Typical Cross Sections

This section describes the new site perimeter berms which have higher elevations than the berms approved under the SMP Minor Modification 2017/MOD-37. The higher elevation of the berms is required to provide lateral stability for the finished grade of the upgraded site development plan, which also has higher elevation than the finish grade approved in 2017 the SMP Minor Modification.

6.5.1 Locations of Representative Cross Section

Using 9 representative cross sections, the new site perimeter berms under the updated site development plan will be compared to the perimeter berms which were approved under the SMP Minor modification 2017/MOD-37. Figure 6.5.1.1 shows the locations of the 9 representative cross sections S-1 through S-9.

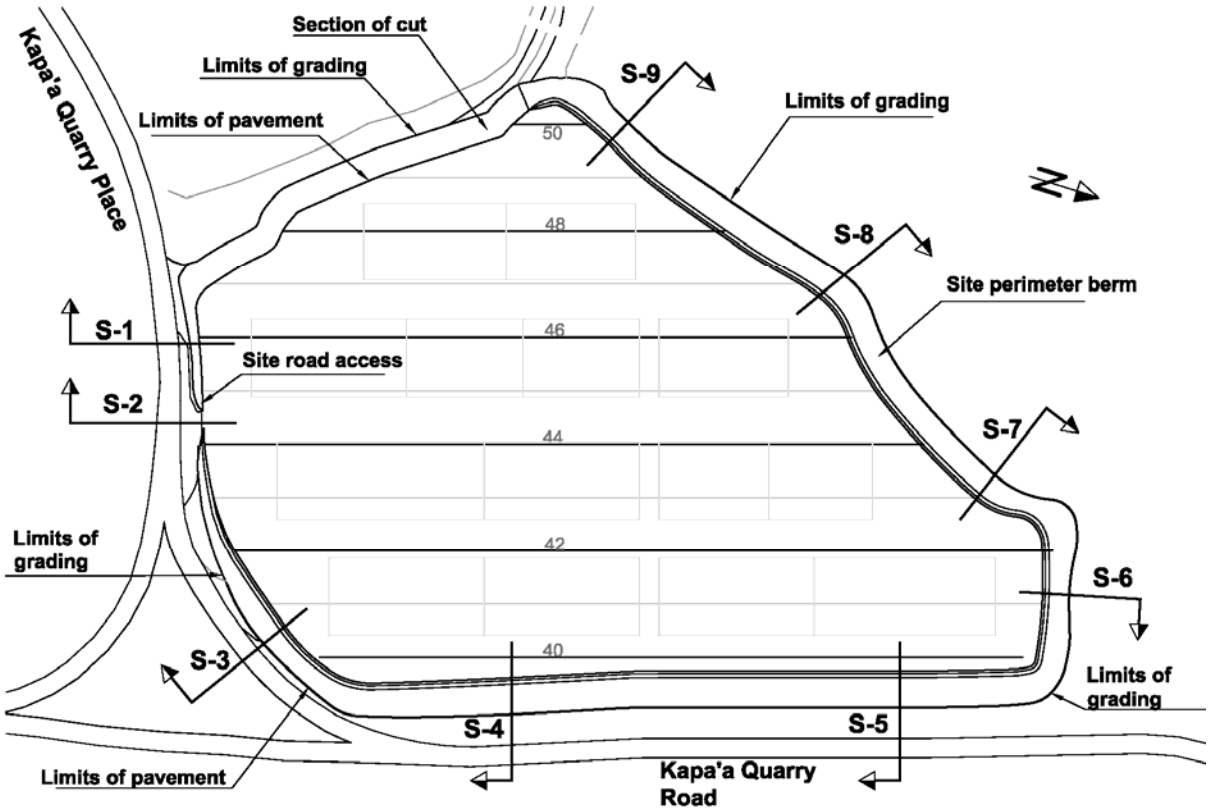


Figure 6.5.1.1: Locations of the 9 representative cross sections of the perimeter berms (S-1 through S-9)

6.5.2 Representative Cross Section

Figure 6.5.2.1 through 6.5.2.9 shows the representative cross sections S1 through S9.

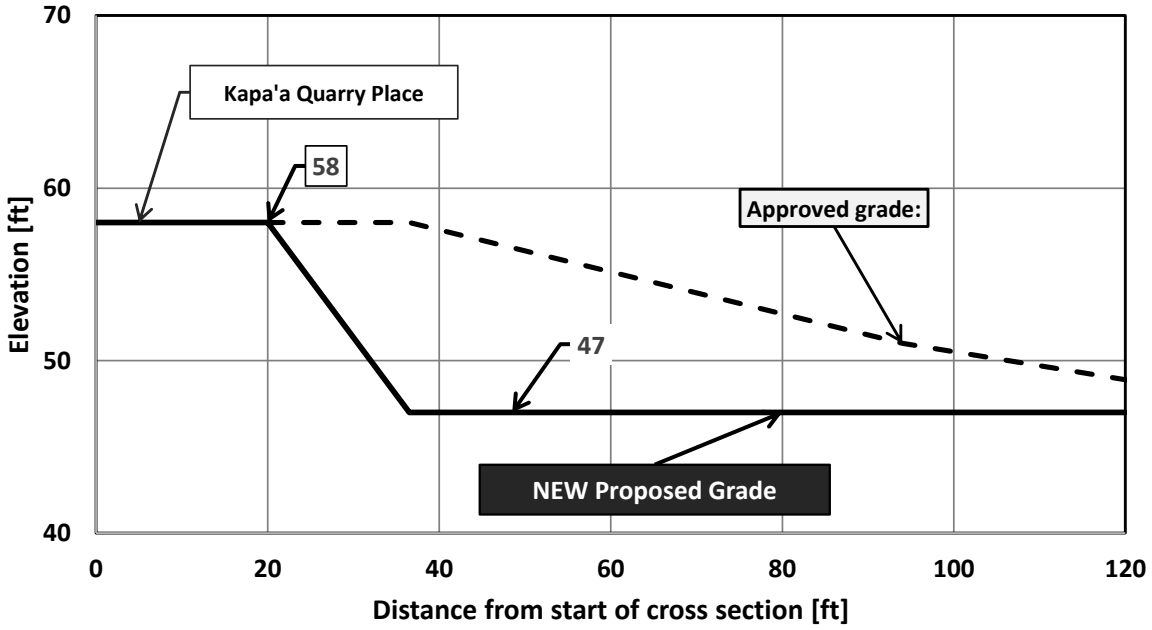


Figure 6.5.2.1: Cross section S-1

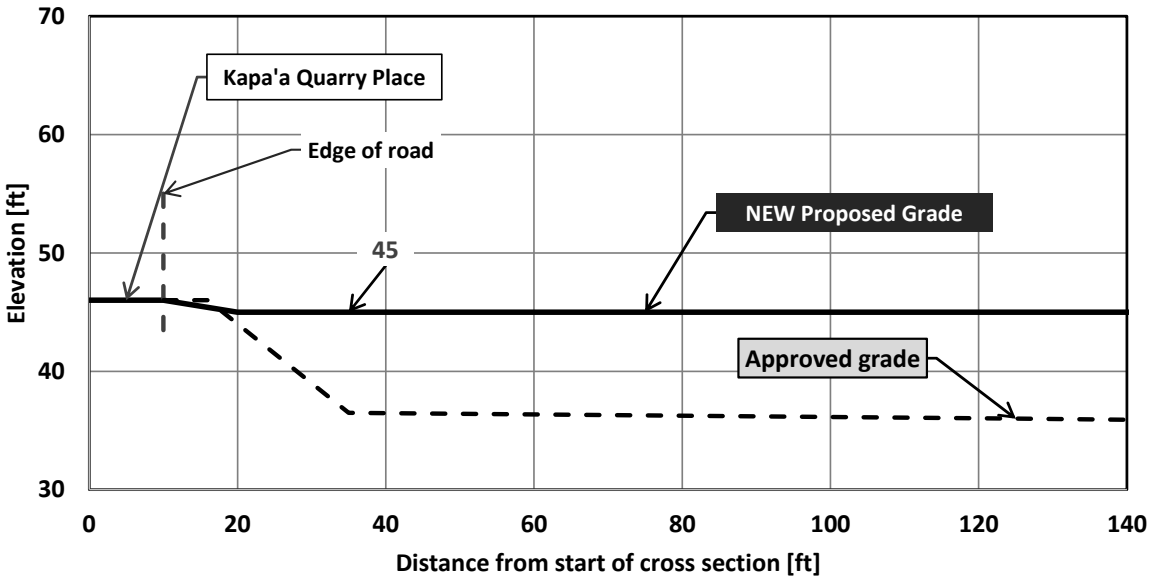


Figure 6.5.2.2: Cross section S-2

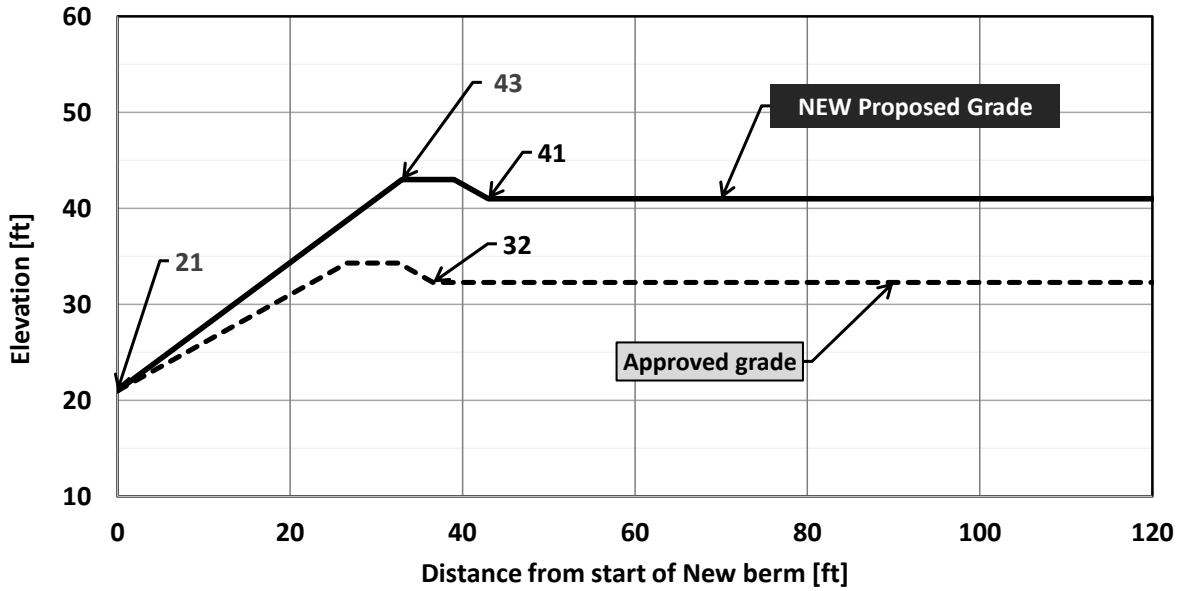


Figure 6.5.2.3: Cross section S-3

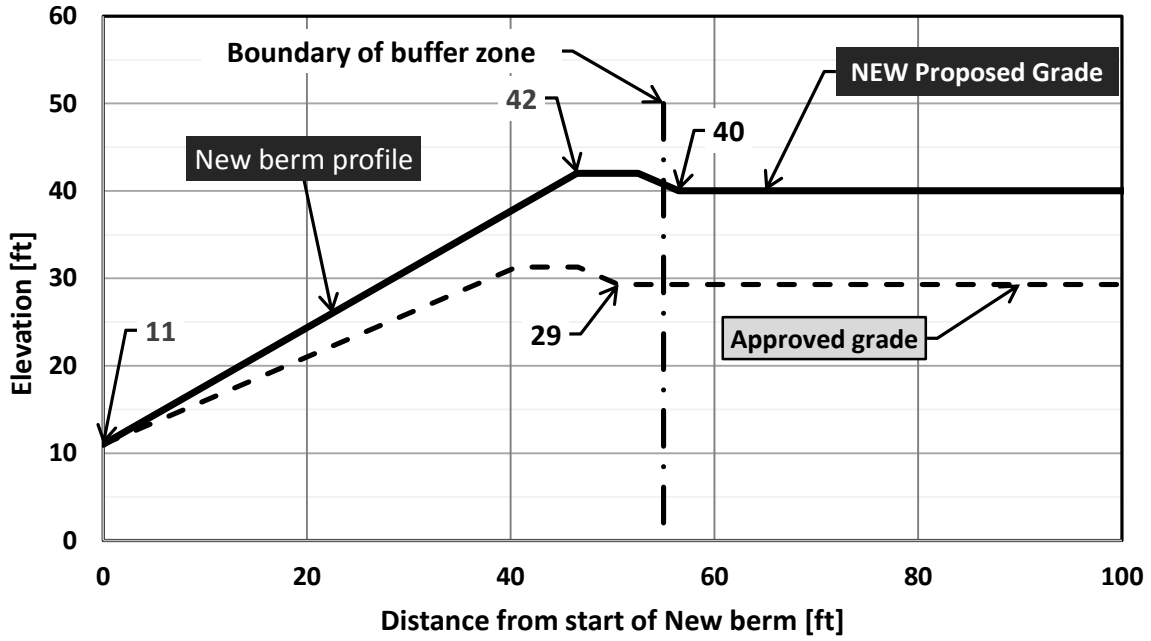


Figure 6.5.2.4: Cross section S-4

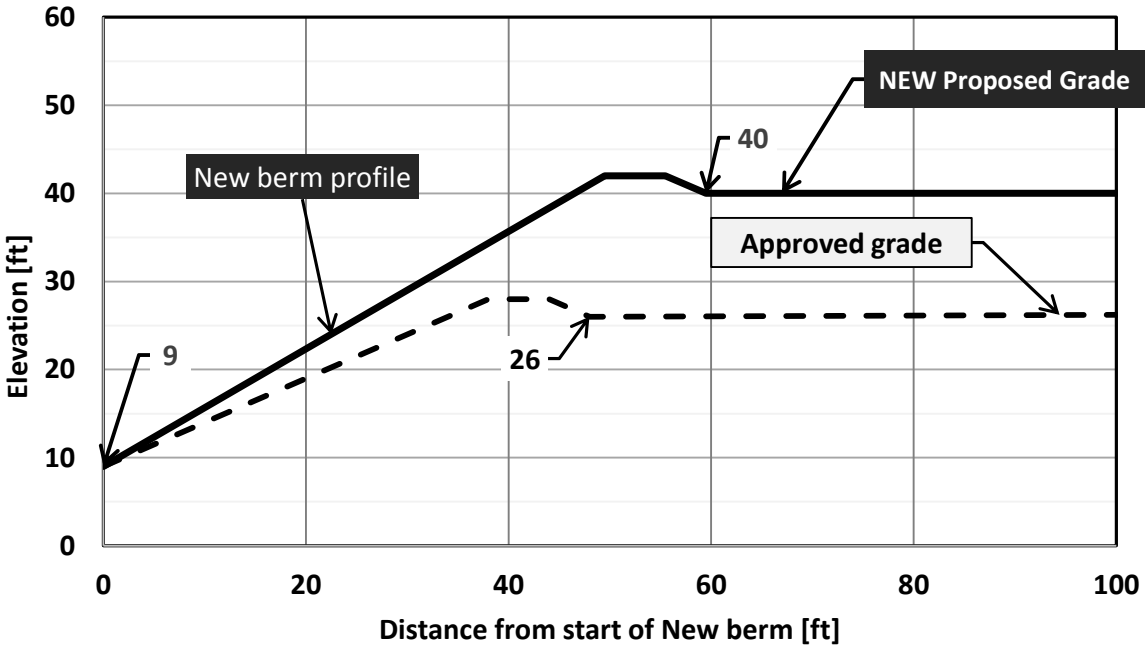


Figure 6.5.2.5: Cross section S-5

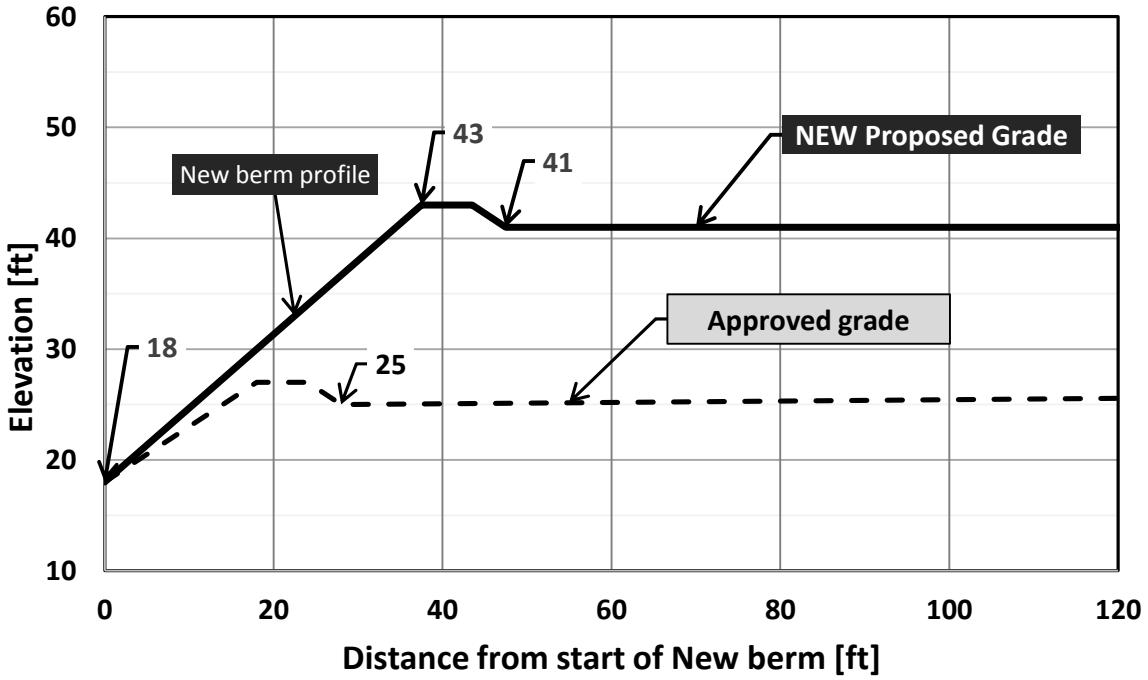


Figure 6.5.2.6: Cross section S-6

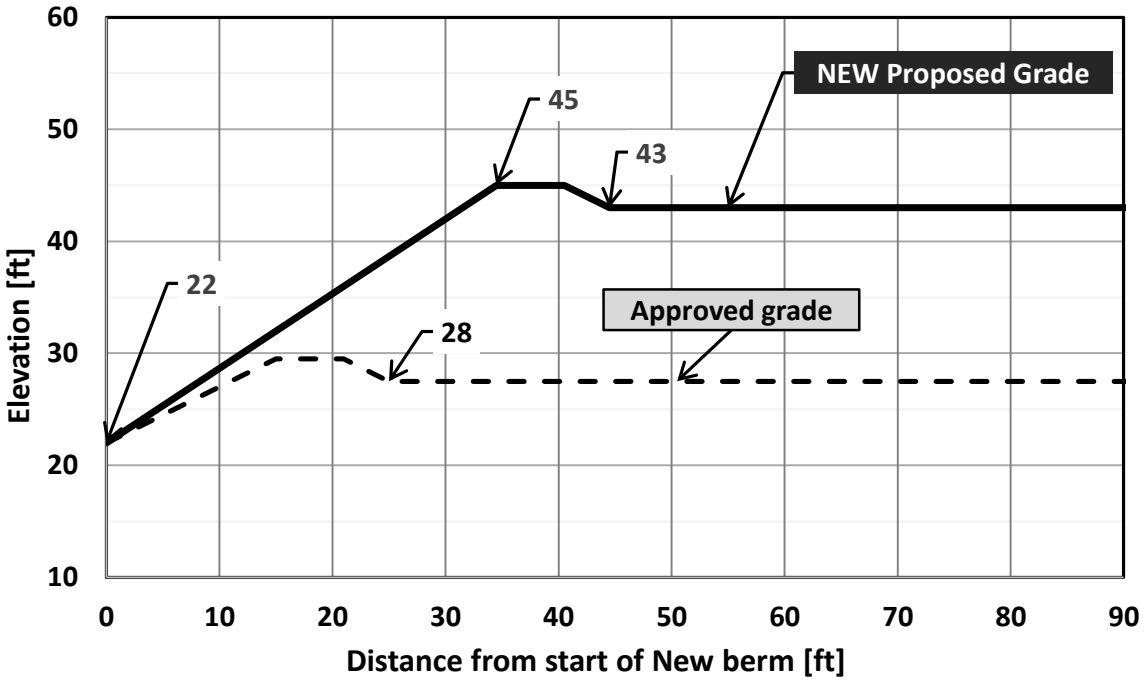


Figure 6.5.2.7: Cross section S-7

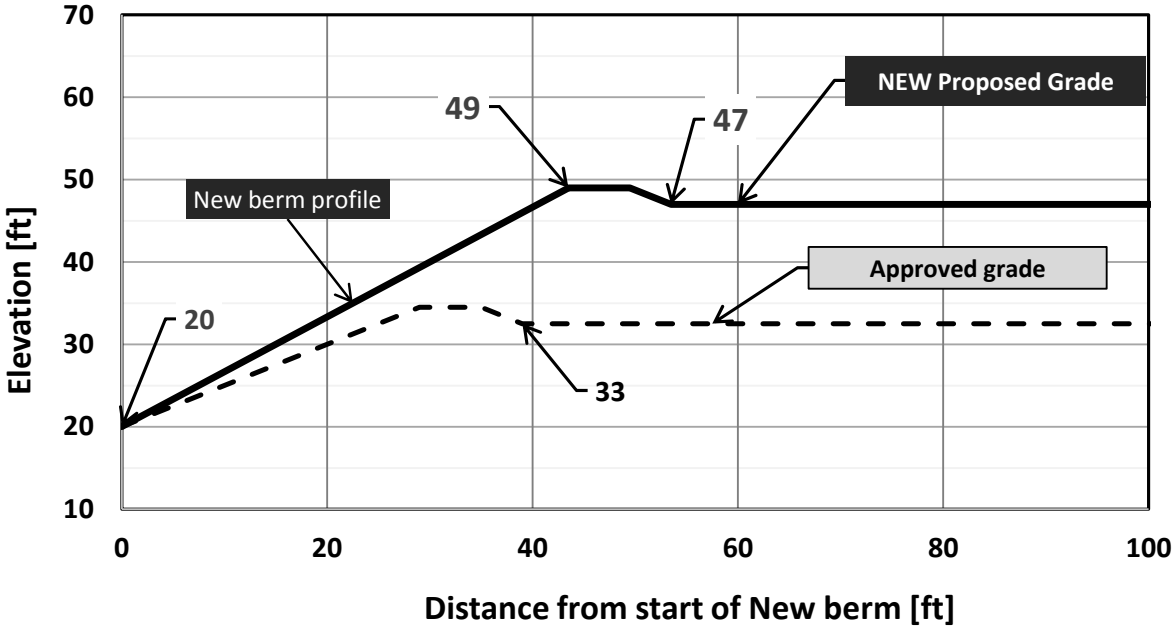


Figure 6.5.2.8: Cross section S-8

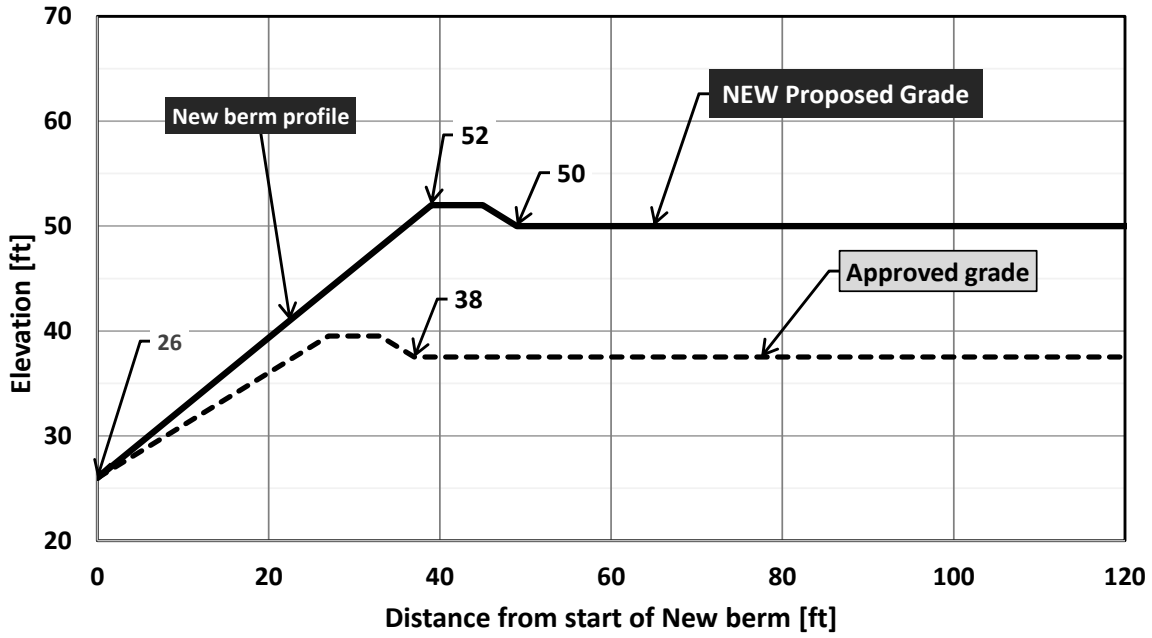


Figure 6.5.2.9: Cross section S-9

6.6 Assessing the Visual Impact of the Increased Site Perimeter Berms

Visual impact from the site perimeter berm has been mentioned in the scoping as a pertinent impact to consider. A comprehensive visual impact study was conducted for the Lower portion of the site under the updated site development plan. This visual impact study is presented hereafter.

The potential visual impact of the proposed development was mentioned in several comments, and is therefore described in more detail. Appendix G of the FSEIS elaborates on visual impacts the proposed development could cause. Appendix G describes different visual impact mitigation measures which are mentioned in the literature. These visual impact mitigation measures use vegetative screens around the development and facilities, but also use color schemes to support facilities and buildings to blend into the background. Applicable visual impact mitigation strategies and technologies would be used for the Lower site.

6.6.1 Background and Previous Visual Impact Examination under the 2011 FEIS

A visual impact study was performed for the 2011 FEIS. The study described the visual impact by the proposed project for two types of view planes:

- Distant view planes: These views are experienced by observers from a larger distance. These larger distance visual experiences accentuate how the proposed facility blends into or stands out from the backdrop of the Koolau mountain range. These views are typically from points across the Kawainui Marsh towards the Kapa'a Valley.
- Adjacent view planes : These views are experienced by observers who pass close by the site, typically driving on the Kapa'a Quarry Road or the Kapa'a Quarry Place or spend time in a recreational area directly to the East of the Lower portion of the site.

In this visual impact study describes visual experience from both distant and adjacent view planes. This visual impact study uses photographic images to illustrate distant and adjacent view planes as well as line drawing representing cross-sections through the site perimeter berms.

One of the major considerations of this study is the future visual impact triggered by the proposed increase in elevation of the full build-out finish grade project site, and especially the increase in height of the New site perimeter berms.

The 2011 FEIS concluded that the previously proposed site development plan described under the 2011 FEIS did not have significant visual impact from distant view planes. The 2011 FEIS further concluded that visual impacts from adjacent view planes did not have adverse impact due to the visual impact mitigation of vegetation planted around the project site perimeter.

6.6.2 Visual Impact Assessment of Distant View planes using Photographic Images

This section assesses visual impressions of observers prompted by views on the Proposed Action by using photographic images. This section presents eight representative distant view planes, which have significance since they may affect observers from Kailua and the H3- John Burns Freeway which passes the project site along the Northern site perimeter.

Table 6.6.2.1 describes depictions of view planes that are shown in in Figures 6.6.2.1 through 6.6.2.8. Table 6.6.2.1 provides short descriptions of the expected visual experiences of observers.

Conclusions: The distant views illustrated in Figures 6.6.2.1 through 6.6.2.8 suggest that the present project site is visible from some distant view planes. Views across the Kawainui Marsh towards the project site show that there are no adverse visual impacts of the project site. In general, warehouse structures on the Upper portion of the site can be seen, but blend into the towering Koolau mountain range. The existing warehouses also appear small compared to existing structure structures of the Kapa'a Transfer Station, thus eliciting less attention than the existing transfer station.

Perhaps the most obvious views an observer can experience the project site, the Kapa'a Light Industrial Park, is when travelling South-West bound on the H3-Freeway. Parts of the project site appear visible behind a screen of scrubs and trees which were planted on the Southern perimeter of the H3-Freeway. This vegetated screen on the Southern side is, however, very dense, and totally obstructs views of the project site.

The proposed development in the Lower site will not significantly or negatively affect the distant views beyond the visual impacts caused by the existing project site.

Table 6.6.2.1: Description and discussion of Figures 1 through 8 showing visual impacts pf the Proposed Action using photographic material

Figure	Description of views	Expected visual impact and proposed visual impact mitigation
1	View 1 - From the flood control levee at the East side of Kawainui Marsh towards the project site: The view plane reflects the visual impression of looking Eastwards across the Kawainui Marsh towards the project site. The figure indicates the location of the project site. Several white buildings indicate warehouses in the Upper site.	It is expected that portions of new development in the Lower portion will be somewhat noticeable but the visual impact from new warehouses in the Lower site will not significantly change the current visual impact. It is expected that further addition of trees at the Eastern perimeter of the Upper site will effectively shield warehouses from distant views.
2	View 2 - From the flood control levee at the East side of Kawainui Marsh towards the project site: The view plane reflects the visual impression of looking Eastwards across the Kawainui Marsh towards the project site. The figure indicates the location of the project site and the structures of the Kapa'a Solid waste Refuse Station.	The view 2 shows that the project site has a minor visual impact, and less than the structures of the Kapa'a Transfer station, which dominate structures in the backdrop of the Koolau mountain range.
3	View 3 - From the South-West bound H3-Freeway towards the project site: The view plane reflects the visual impressions of an observer traveling South-West bound on the H3-Freeway. The Upper site is visible as a group of warehouses structures. Behind the project site is the exposed rocks of the towering quarry, and further back the Koolau mountain range.	The view 3 shows that the project site is visible for a South-East observer passing the highest point of the H3-Freeway traveling has a minor visual impact. While the project site is noticeable, the visual impact is considered small, since the project site is not the dominate features.
4	View 4 -From the Mokapu Avenue towards the project site: The view plane reflects the visual impression of an observer travelling West bound on the Mokapu Avenue, while approaching the H3-onramp.	The view 4 shows that the project site is hidden behind vegetation planted on the Southern side of the Mokapu Avenue.

Table 6.6.2.1: Description and discussion of Figures 1 through 8 showing visual impacts pf the Proposed Action using photographic material

Figure	Description of views	Expected visual impact and proposed visual impact mitigation
5	View 5 - From the South-East bound H3-Freeway at the Mokapu Avenue offramp towards the project site: The project site is almost not visible from the view plane. The location from where the photo was taken has a less dense vegetation along the edge of the roadway than other location nearby.	The view 5 illustrates that the project site is virtually hidden from the view of the observer. The location where the photo was taken has a denser vegetation at the Southern roadside than the rest of the offramp. Typically, the observer would not have a longer chance of looking in the direction of the project site, since cars are moving in the direction to the left.
6	View 6 – From the North-East bound H3-freeway towards the project site: The project site is to the right behind a dense vegetation screen.	The view 6 illustrates the visual experience of an observer traveling North-East bound on the H3-Freeway. The project site is hidden to the right behind a dense screen of tall trees.
7	View 7 – From the North-East bound H3-freeway towards the project site: The project site is to the right behind a dense vegetation screen.	The view 7 illustrates the visual experience of an observer traveling North-East bound on the H3-Freeway. The project site is hidden to the right behind a dense screen of tall trees. Both Figures 6 and 7 imply that the project site is not visible by observers passing the site on the H3-Freeway.
8	View 8 – View from South bound Kailua Road towards the project site: The project site can be seen across the Kawainui Marsh with the project site being about 1.5 miles away.	The view 8 shows the visual experience of an observer from the Kailua Road, which is about 1.5 miles from the project site. The project site is slightly visible and to the right of the structures belonging to Kapa'a Transfer station. The changes in the site development approach, especially the elevated grade and site perimeter berms would not impose a significantly different visual distant impact.

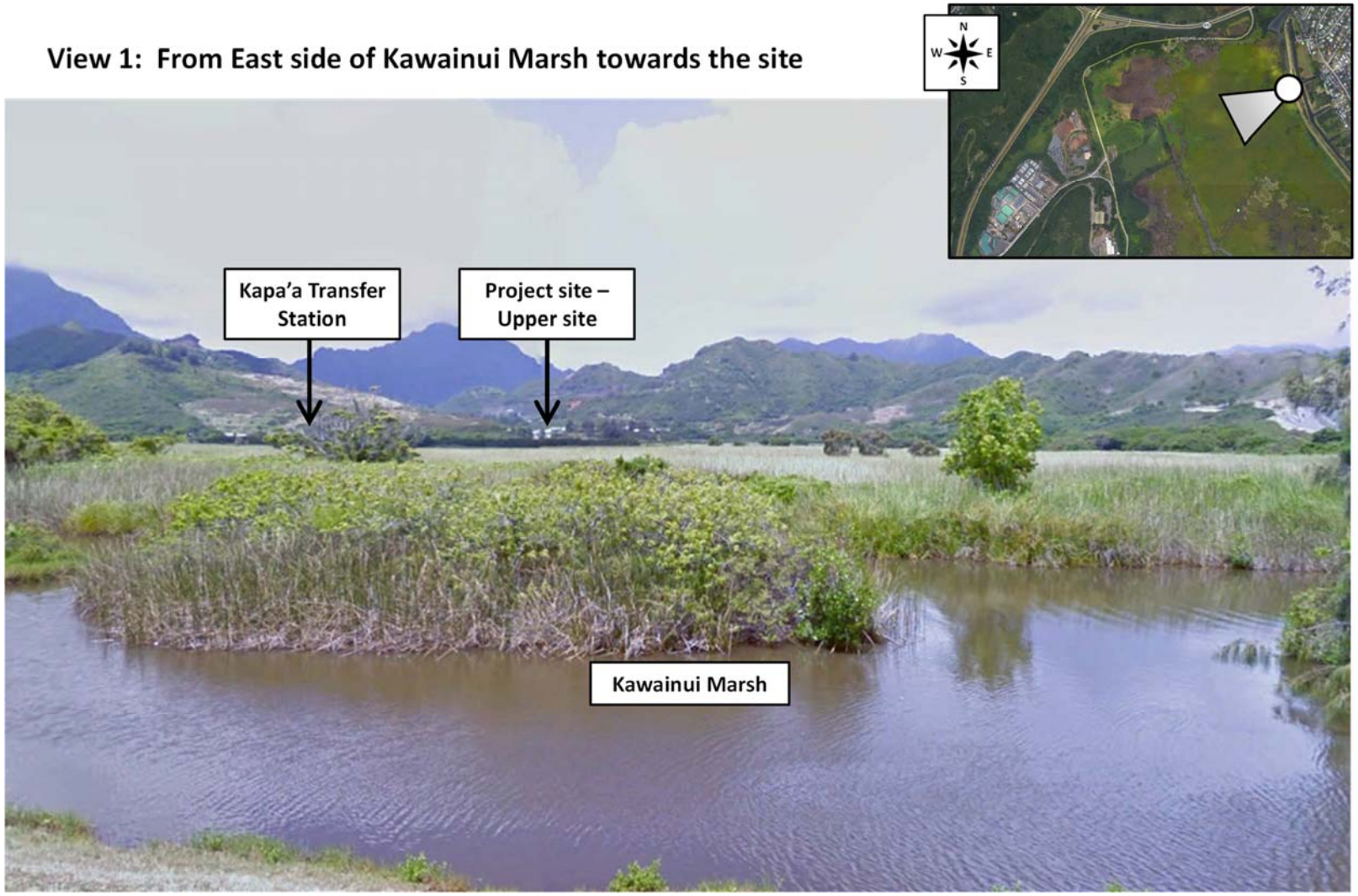


Figure 6.6.2.1: View 1 - From the flood control levee at the East side of Kawainui Marsh towards the site

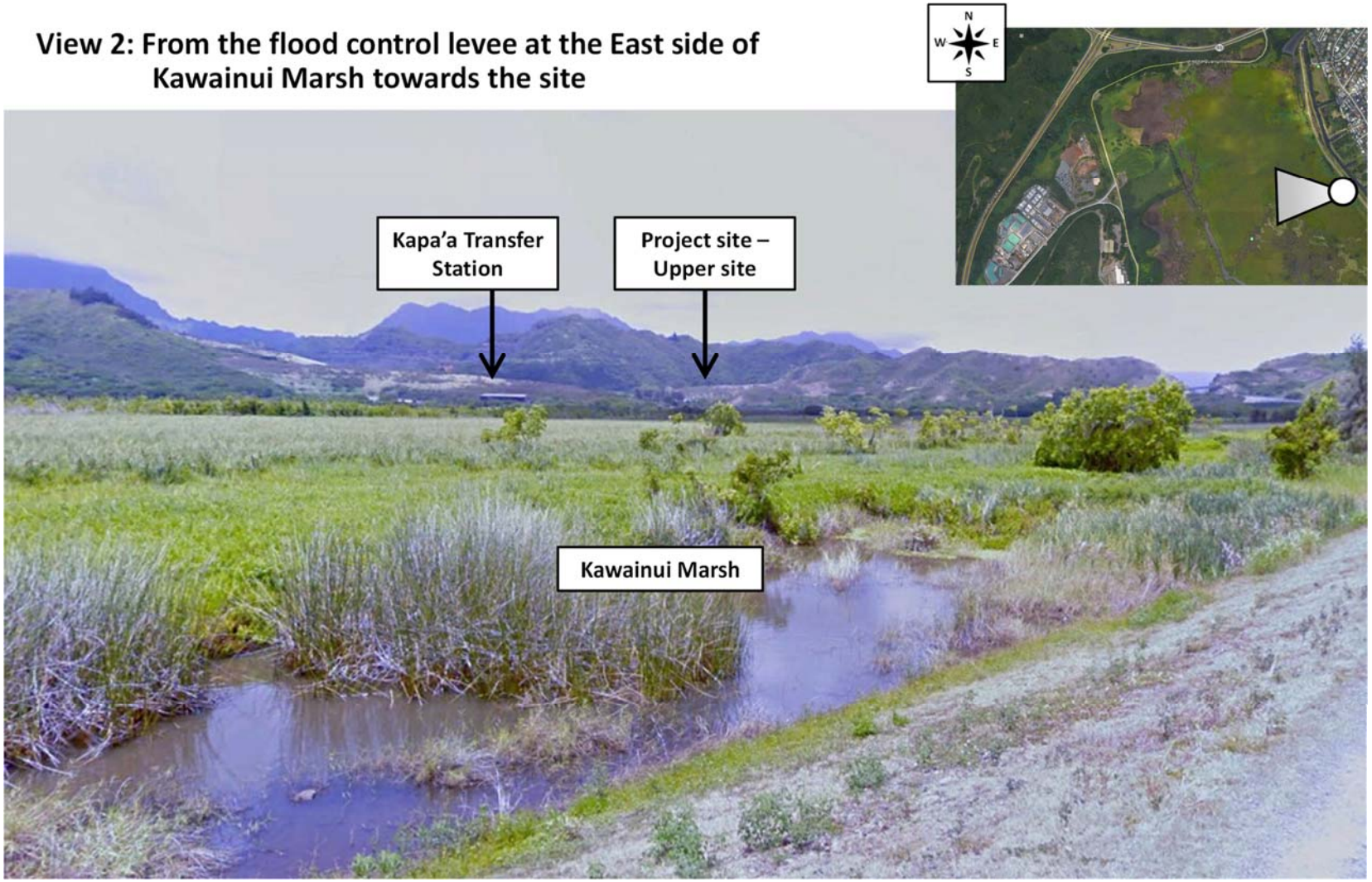


Figure 6.6.2.2: View 2 - From the flood control levee at the East side of Kawainui Marsh towards the site

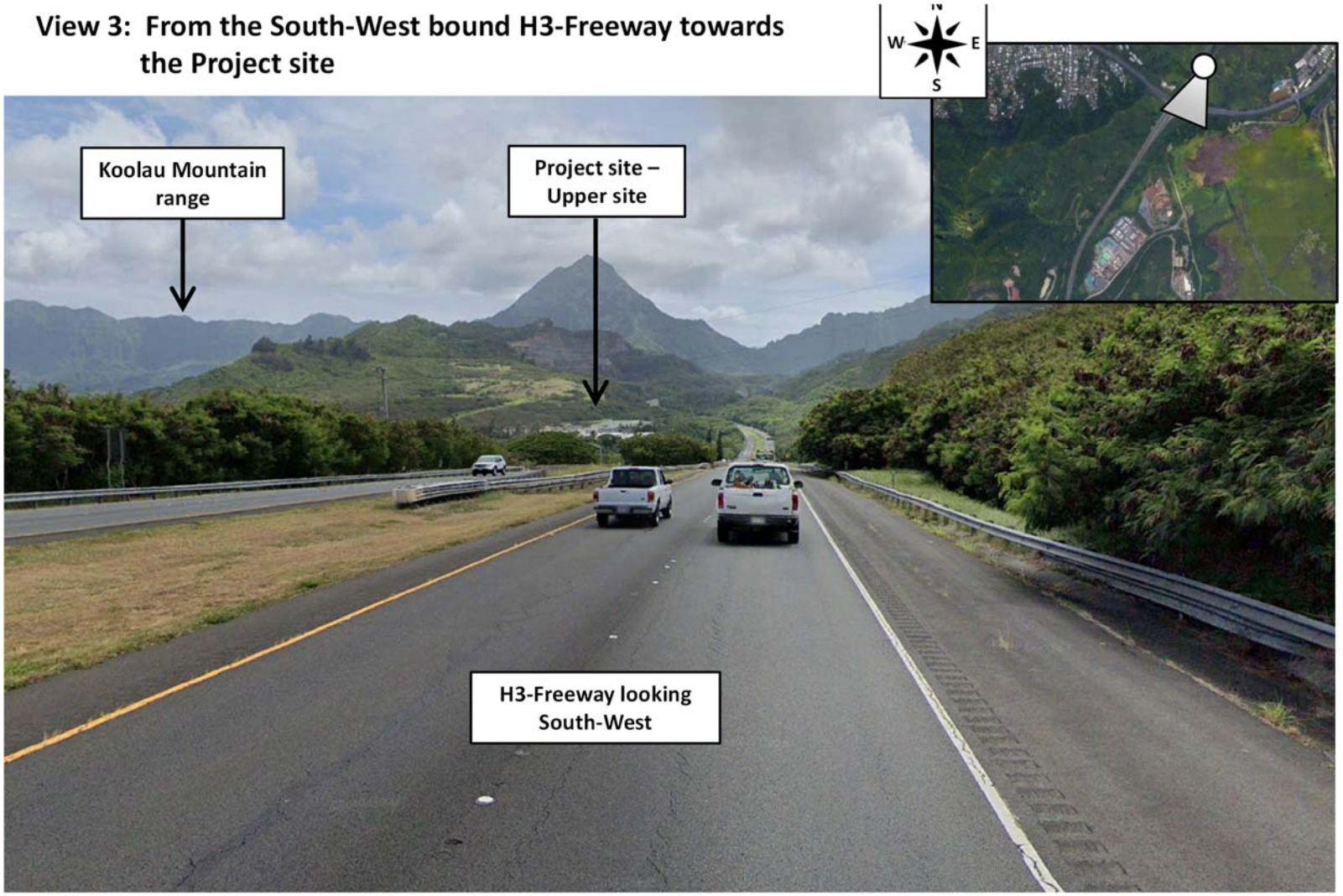


Figure 6.6.2.3: View 1 From East side of Kawainui Marsh towards the site

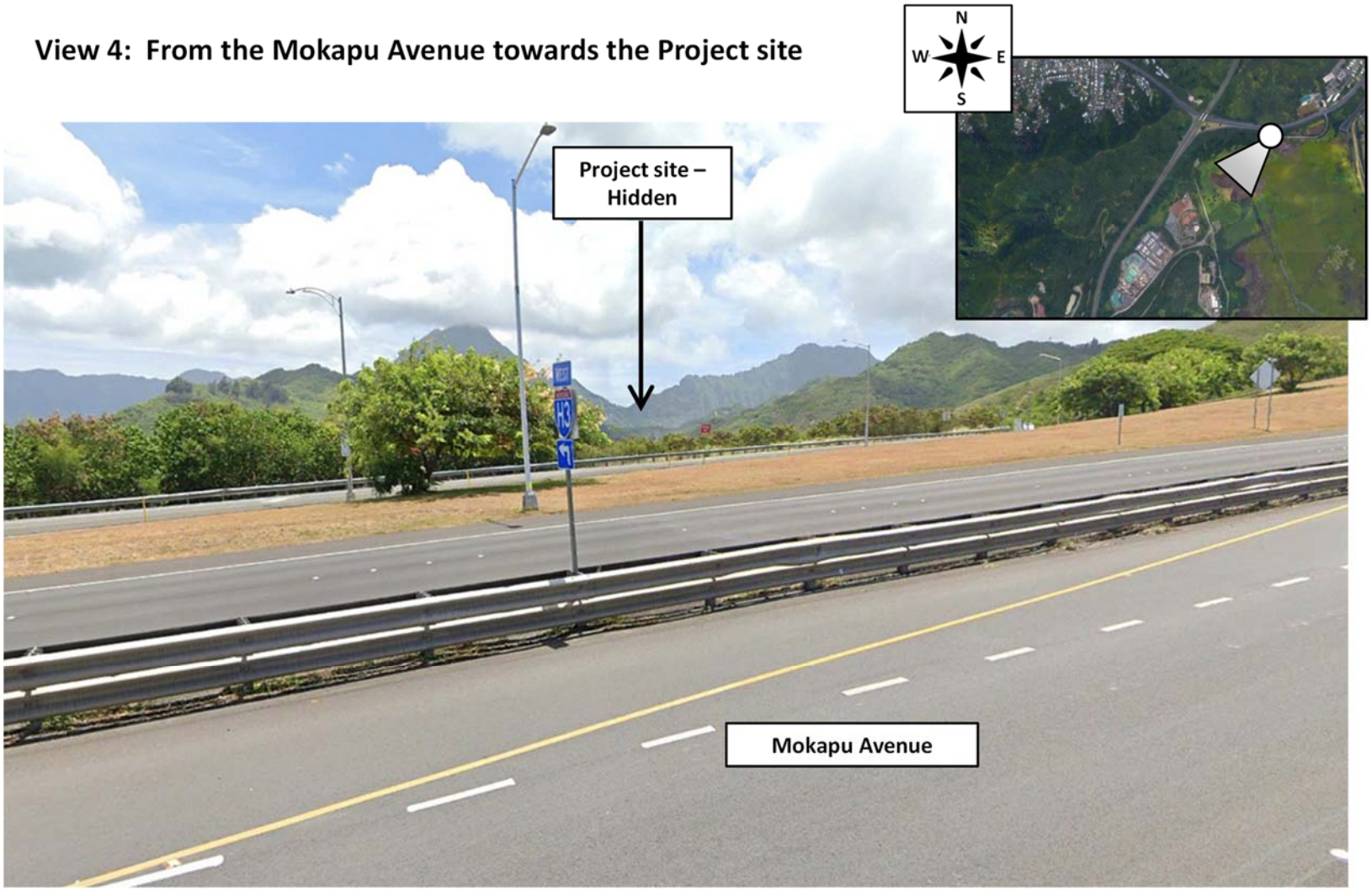


Figure 6.6.2.4: View 4: From the Mokapu Avenue towards the Project site

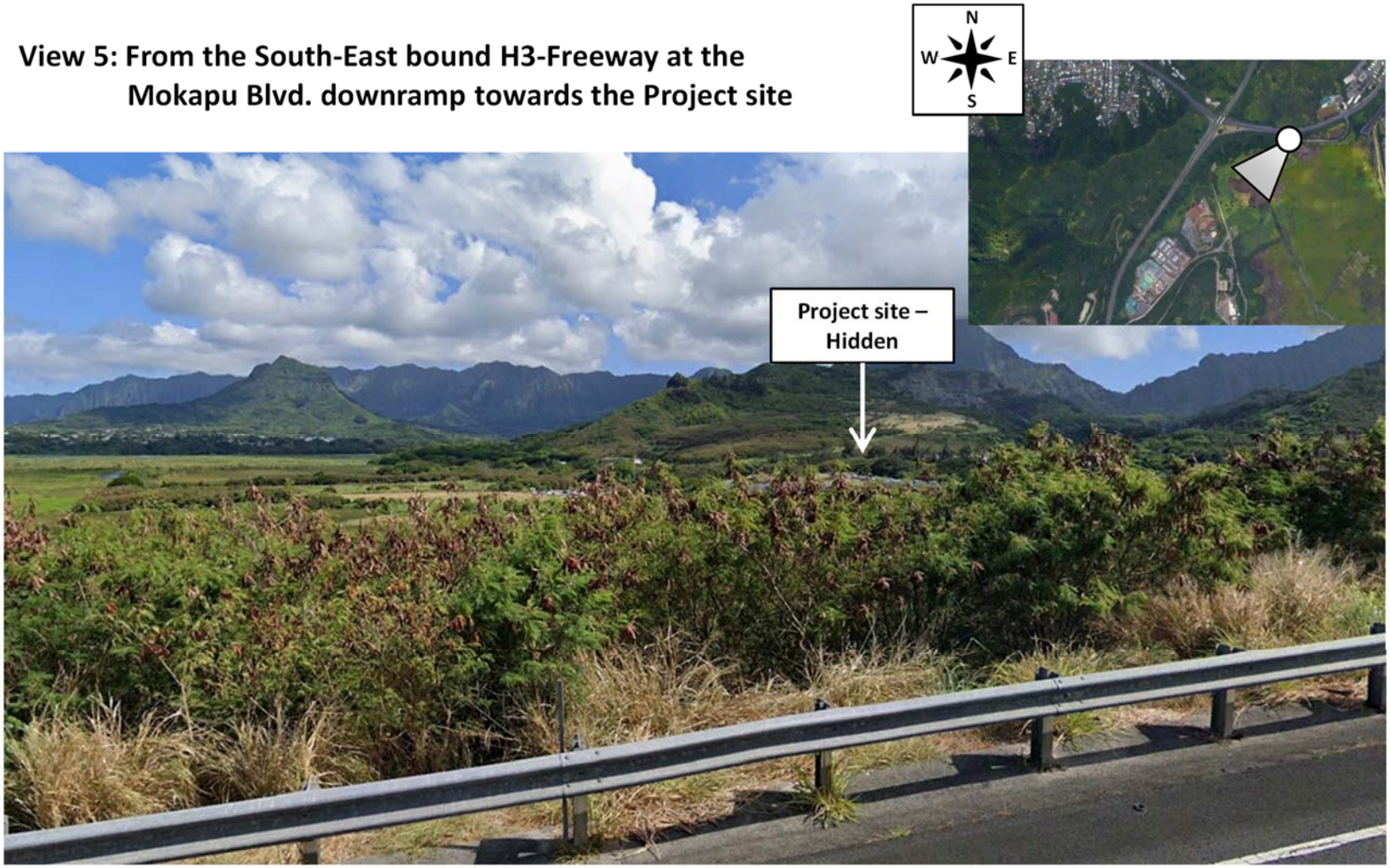


Figure 6.6.2.5: View 5 - From the South-East bound H3-Freeway at the Mokapu Avenue offramp towards the project site:

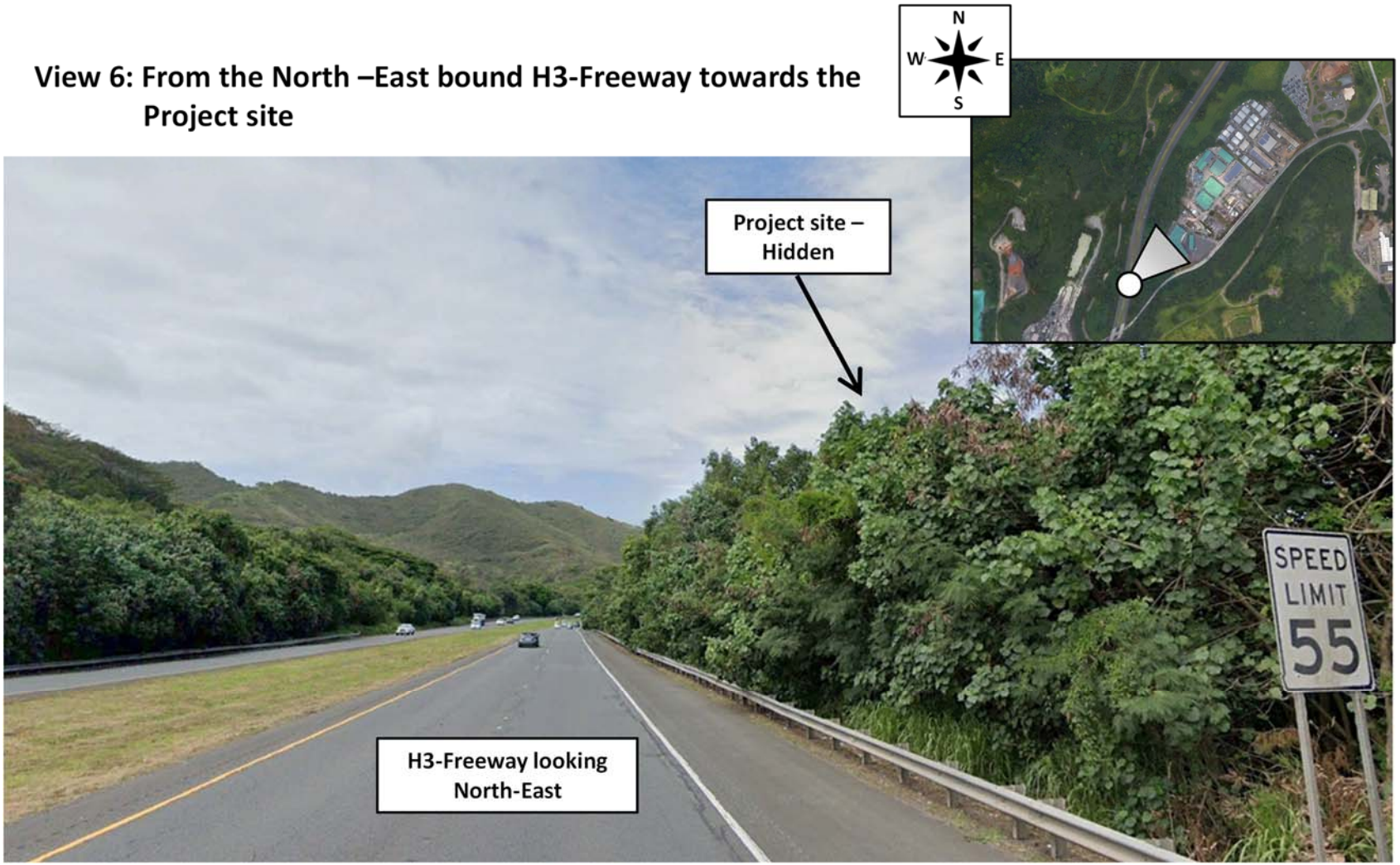


Figure 6.6.2.6: View 6 – From the North-East bound H3-freeway towards the project site

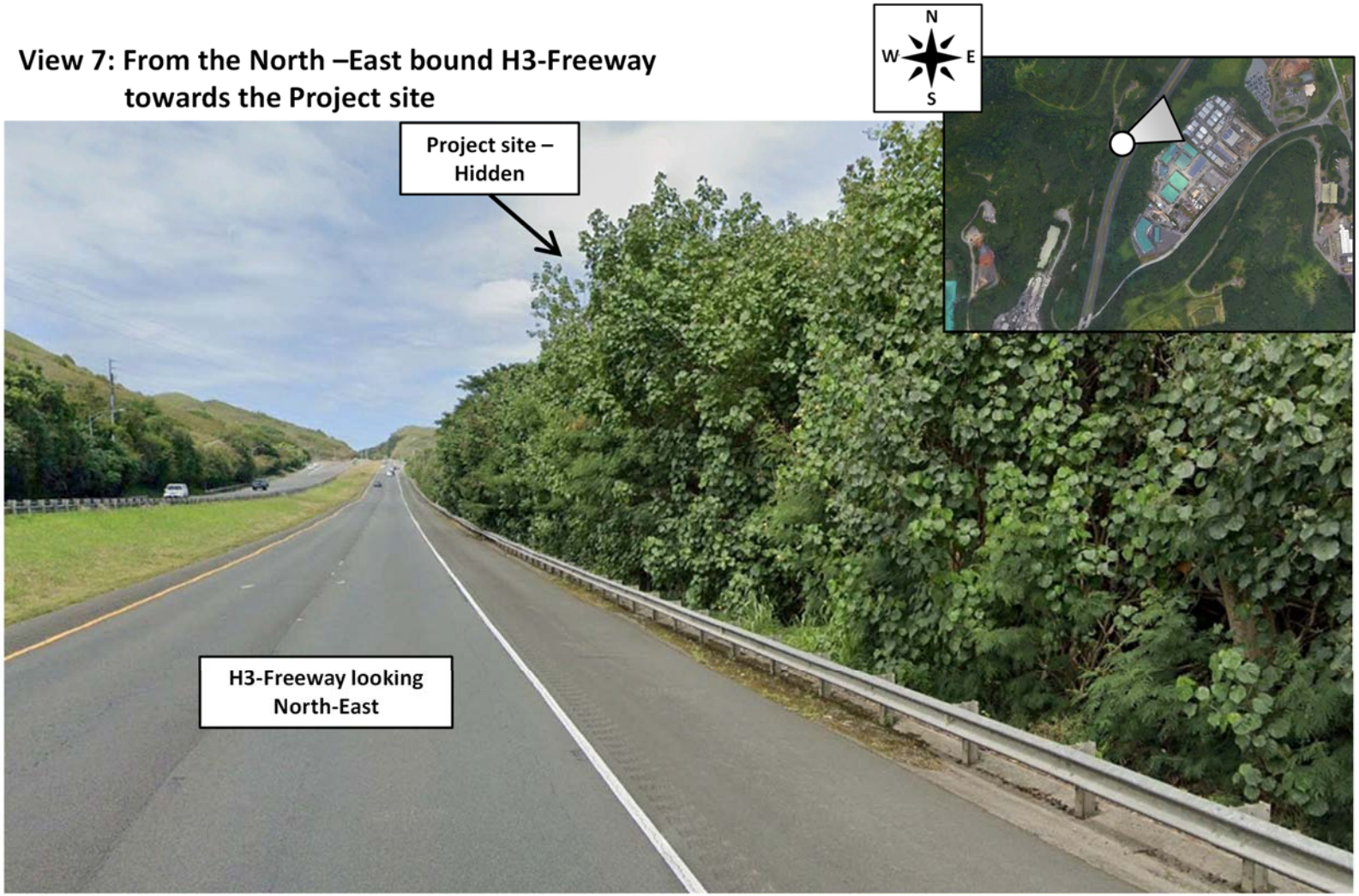


Figure 6.6.2.7: View 7 – From the North-East bound H3-freeway towards the project site

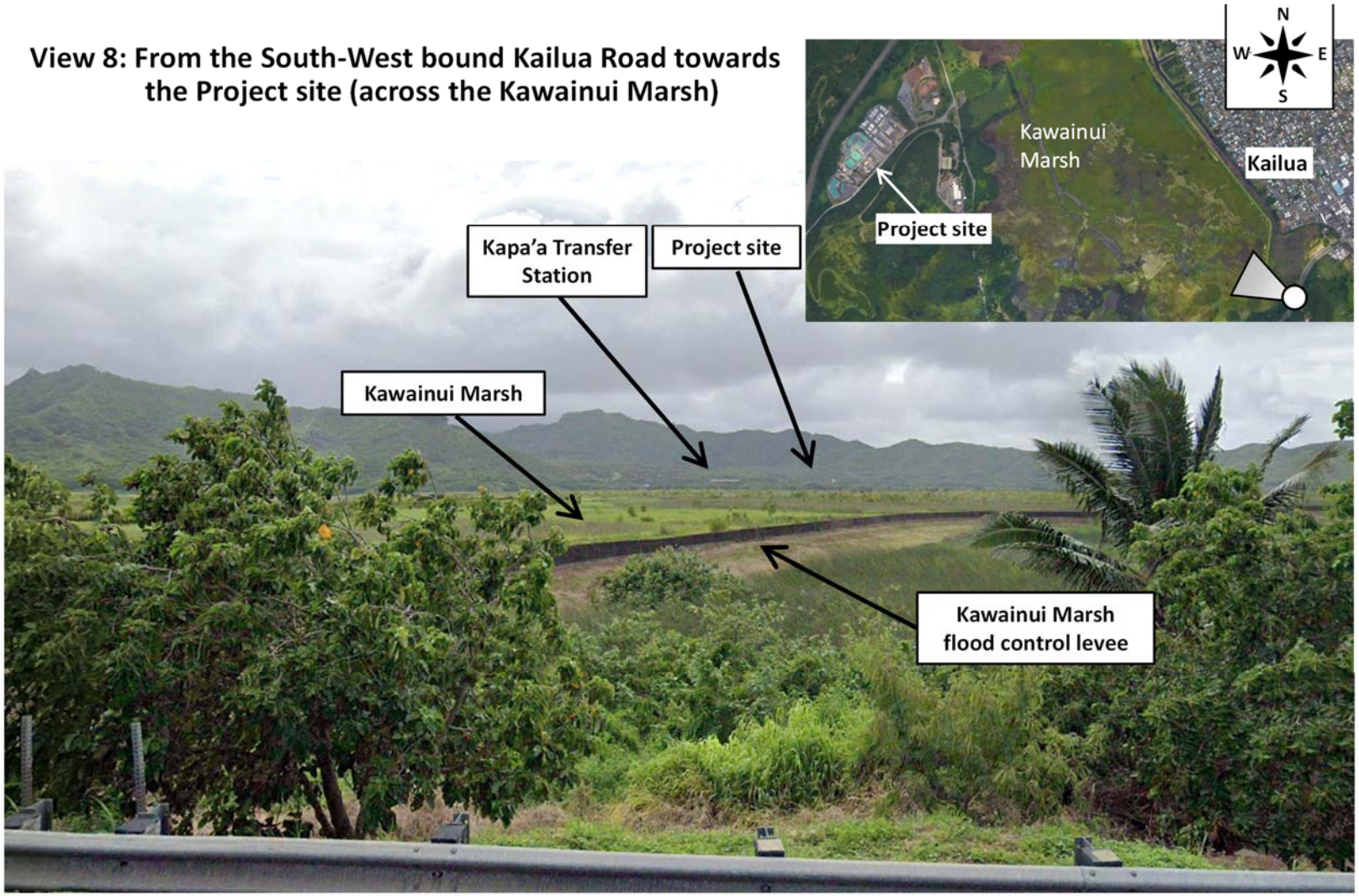


Figure 6.6.2.8 – View 8 from South bound Kailua Road towards the project site

As an example of effective visual impact mitigation for long-distance views using color scheme is presented in Appendix G. Examples of the effectiveness of using color schemes are presented in Figures 6.6.2.9 and 6.6.2.10.

The effectiveness of using color to hide buildings across the Kawainui Marsh is illustrated by looking at the impression of the existing Kapa'a Transfer Station. Figure 6.6.2.9 shows the existing appearance of the transfer station building façade and roof, with roof and façade clearly visible. In comparison, Figure 6.6.2.10 shows a simulated color scheme for the building façade and roof color, with colors selected from the surrounding land. The comparison of Figures 6.6.2.9 and 6.6.2.10 shows the effectiveness of using color to reduce visual impact for distant views by blending the building within the landscape.

Figure 6.6.2.9: View across the Kawainui Marsh toward the Kapa'a Transfer Station building – **A = Existing colors** for the building façade and roof (This figures was added to the DSESI; refer to Appendix G)

Figure 6.6.2.10: View across the Kawainui Marsh toward the Kapa'a Transfer Station building – **B = Simulated colors** for the building façade and roof; single color schemes for façade and roof were chosen to blend into the background (R,G,B values were taken from the vegetated background) (This figures was added to the DSESI; refer to Appendix G)

6.6.3 Visual Impact Assessment of Adjacent View planes Using Photographic Images

This section assesses visual impressions of observers experienced by adjacent views on the Proposed Action. This visual impact assessment uses photographic images showing the current condition. This section presents 15 representative adjacent view planes, which have significance since they may affect observers travelling past the project site on the Kapa'a Quarry Road and Kapa'a Quarry Place roadways. Table 6.6.3.1 describes depictions of view planes that are shown in in Figures 6.6.3.1 through 6.6.3.16. Table 6.6.3.1 provides short discussions about the expected visual impressions of observers.

Conclusions: The adjacent views A through H illustrated in Figures 6.6.3.2 through 6.6.3.10 suggest that the present Lower portion of project site is mostly hidden from views by observers passing the site by an existing dense vegetated screen of scrubs and trees of various heights. Views I through N illustrated in Figures 6.6.3.11 through 6.6.3.12 show visual impressions of the Upper site. The existing Upper site has a smaller site perimeter with plants and has no vegetated berms. Observers passing the Upper site on the Kapa'a Quarry Place represent a small fraction of the traffic passing the project site, since they typically include only those observers who visit businesses in the Upper sites or drive to the Ameron quarry farther uphill in the Kapa'a valley.

It is projected that by constructing vegetated perimeter berms around the New development in the Lower site, the visual impact will be mitigated effectively. It is further projected that the future visual impression of the Lower site will not significantly deviate from the present impressions, provided that a suitable vegetated screen is planted on the site perimeter berms.

The new development in the Upper site will be more visible from the immediate surrounding than before, due to the New buildings Nos. 32 through 35 to be constructed right next to the Kapa'a Quarry Place roadway. View J showing the recently completed Building No. 31 provides an idea of the future visual impression.

Table 6.6.3.1: Description and discussion of View plans A through N showing adjacent view plane impressions of the Proposed Action using photographic material

Figure	Description of views	Expected visual impact and proposed visual impact mitigation
6.6.3.1	Overview of adjacent view planes located at the East side of the Lower site. Definition of the view planes A through F	The adjacent view planes 6.6.3.2 to 6.6.3.7 show the visual impressions an observer has traveling North bound on the Kapa'a Quarry Road. The views 6.6.3.2 to 6.6.3.7 are representative for traffic between Mokapu Avenue and Kalanianaole Blvd., which represents the main portion of traffic using the Kapa'a Quarry Road.
6.6.3.2	View A – From the North bound Kapa'a Quarry Road towards the Project site: The	Figure 6.6.3.2 gives the visual impression of an observer approaching the site coming

Table 6.6.3.1: Description and discussion of View plans A through N showing adjacent view plane impressions of the Proposed Action using photographic material

Figure	Description of views	Expected visual impact and proposed visual impact mitigation
	project site (Lower site) is straight ahead, hidden behind a dense screen of larger trees.	from Kalanianaole Blvd. The Lower portion of the site is indicated behind existing tall trees, straight ahead.
6.6.3.3	View B – From the North bound Kapa'a Quarry Road towards the Project site: The project site (Lower site) is straight ahead to the left, hidden behind a dense screen of larger trees.	Figure 6.6.3.3 shows the visual impression of an observer passing the road triangle of the Kapa'a Quarry coming from Kalanianaole Blvd. with the project site on the left. The Lower portion of the site is indicated behind existing tall trees, straight ahead.
6.6.3.4	View C - From the North bound Kapa'a Quarry Road towards the Project site: The project site (Lower site) is to the left, hidden behind a dense screen of medium height trees.	Figure 6.6.3.4 shows the visual impression of an observer passing the Lower site North bound on the Kapa'a Quarry Road. The project site is hidden behind a screen of medium height trees on the left.
6.6.3.5	View D - From the North bound Kapa'a Quarry Road towards the Project site: The project site (Lower site) is to the left, hidden behind a dense screen of medium height trees.	Figure 6.6.3.5 shows the visual impression of an observer passing the Lower site North bound on the Kapa'a Quarry Road. The project site is hidden behind a screen of medium height trees on the left. In the foreground, as indicated is a previous drainage ditch which is now overgrown and filled with soil.
6.6.3.6	View E - From the South bound Kapa'a Quarry Road towards the Project site: The project site (Lower site) is to the right, hidden behind a dense screen of medium height trees.	Figure 6.6.3.6 shows the visual impression of an observer passing the Lower site South bound on the Kapa'a Quarry Road. The project site is hidden behind a screen of medium height trees on the right. To the right and at a larger different from the road than shown in Figure 6.6.3.5, as indicated, is a previous drainage ditch which is now overgrown and filled with soil.
6.6.3.7	View F - View F: From the North-West bound Kapa'a Quarry Place towards the Project site: The project site (Lower site) is straight ahead, hidden behind existing perimeter berms. The existing perimeter	Figure 6.6.3.7 shows the visual impression of an observer approaching the project site on one the Southern leg of the traffic triangle of the Kapa'a Quarry Place. The existing

Table 6.6.3.1: Description and discussion of View plans A through N showing adjacent view plane impressions of the Proposed Action using photographic material

Figure	Description of views	Expected visual impact and proposed visual impact mitigation
	berms have vegetation of short trees and scrubs.	Eastern roadway access to the Lower site is straight on.
6.6.3.8	Overview of adjacent view planes located at the East side of the Lower site. Definition of the view planes G through N	The adjacent view planes 6.6.3.8 to 6.6.3.16 show the visual impressions an observer has traveling South West bound on the Kapa'a Quarry Place. Typically, traffic on the Kapa'a Quarry Place is to access the Kapa'a Light Industrial Park of the Ameron Quarry further uphill n Kapa'a Valley.
6.6.3.9	View G - From the South-West bound Kapa'a Quarry Place towards the Project site: The project site (Lower site) is straight ahead to the right, hidden behind existing perimeter berms. The existing perimeter berms have vegetation of short trees and scrubs.	Figure 6.6.3.9 shows the visual impression of an observer passing the Lower site South-West bound on the Kapa'a Quarry Road, driving towards the Upper site. The Lower site is hidden behind an existing perimeter berm.
6.6.3.10	View H - From the South-West bound Kapa'a Quarry Place towards the Project site: The project site (Lower site) is to the right, hidden behind existing perimeter berms.	Figure 6.6.3.10 shows the visual impression of an observer passing the Lower site South-West bound on the Kapa'a Quarry Road, driving towards the Upper site. The Lower site is to the right hidden behind an existing perimeter berm with vegetation. The Western road access to the Lower site to the right, as indicated.
6.6.3.11	View I - From the South-West bound Kapa'a Quarry Place towards the Project site: The project site (Upper site) is to the right, hidden behind an existing landscaped site perimeter berm.	Figure 6.6.3.11 shows the visual impression of an observer South-West bound on the Kapa'a Quarry Road, passing the beginning of the Upper site. A landscaped perimeter berm which surrounds the Upper site is on the right. The landscaping offers a welcoming view of the Kapa'a Light Industrial Park.
6.6.3.12	View J - From the South-West bound Kapa'a Quarry Place towards the Project site: The project site (Upper site) is to the	Figure 6.6.3.12 shows the visual impression of an observer travelling South-West bound on the Kapa'a Quarry Road, passing the Upper site with the New Building No. 31 on

Table 6.6.3.1: Description and discussion of View plans A through N showing adjacent view plane impressions of the Proposed Action using photographic material

Figure	Description of views	Expected visual impact and proposed visual impact mitigation
	right. The new Building No. 31 and a landscaped perimeter is to the right.	the right. A recently upgraded landscaped perimeter strip has been recently filled with emerging plants.
6.6.3.13	View K - From the South-West bound Kapa'a Quarry Place towards the Project site: The project site (Upper site) is to the right.	Figure 6.6.3.13 shows the visual impression of an observer travelling South-West bound on the Kapa'a Quarry Road, passing the Upper site on the right. On the right side is a retaining wall, made of natural stones, with a landscaped perimeter strip between the wall and the road.
6.6.3.14	View L - From the South-West bound Kapa'a Quarry Place towards the Project site: The project site (Upper site) is to the right with the existing roadway access connecting Buildings 50 and 51 with the roadway.	Figure 6.6.3.14 shows the visual impression of an observer travelling South-West bound on the Kapa'a Quarry Road, passing the Upper site on the right. On the right side is the Western end of the retaining wall. The existing roadway access is on the right side, which provides access to the buildings 50 and 51. The roadway access was upgraded by removing quantities of vegetation to provide a better sight distance situation.
6.6.3.15	View M: From the South-West bound Kapa'a Quarry Place towards the Project site: The Upper site with Buildings 50 and 51 is on the right.	Figure 6.6.3.15 shows the visual impression of an observer travelling South-West bound on the Kapa'a Quarry Road, passing existing buildings 50 and 51.
6.6.3.16	View N: From the South-West bound Kapa'a Quarry Place towards the Project site: The Western border of the Upper site with Building 50 is on the right.	Figure 6.6.3.16 shows the visual impression of an observer travelling South-West bound on the Kapa'a Quarry Road, passing existing Buildings 50. The existing infiltration and detention basin are indicated adjacent and to the West of Building 50.

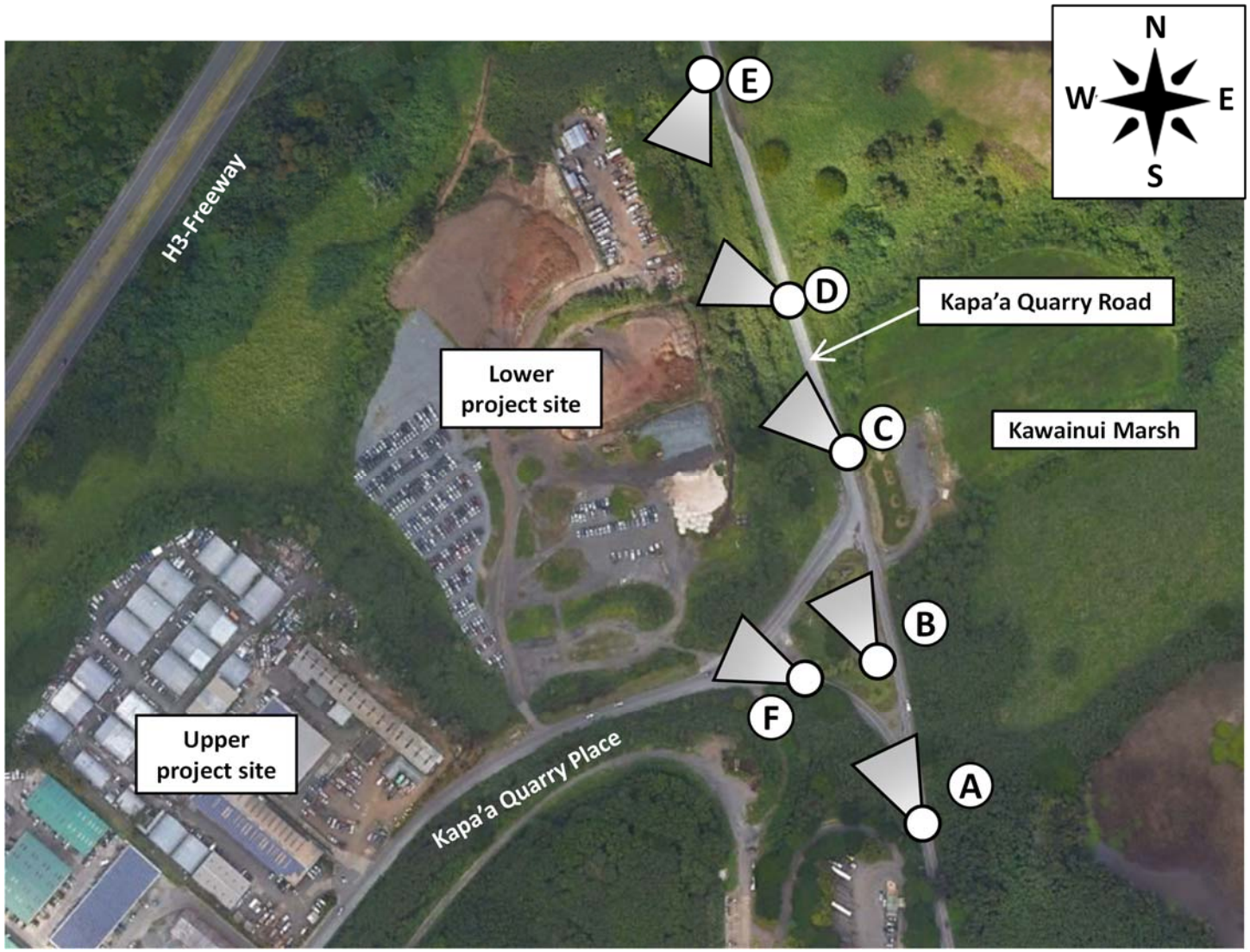


Figure 6.6.3.1: Overview of adjacent view planes located at the East side of the Lower site. Definition of the view planes A through F

View A: From the North bound Kapa'a Quarry Road towards the Project site

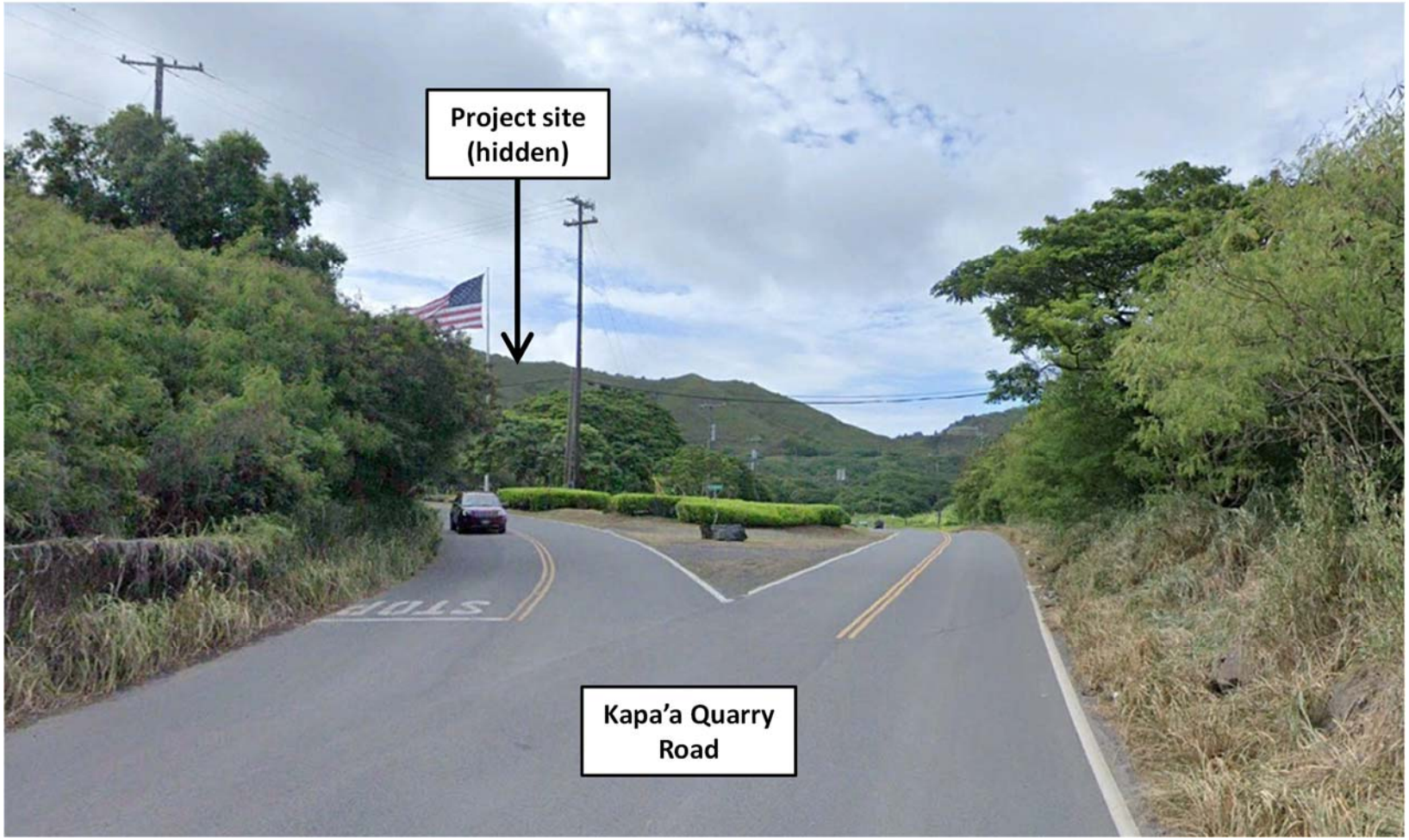


Figure 6.6.3.2: View A – From the North bound Kapa'a Quarry Road towards the Project site:

View B: From the North bound Kapa'a Quarry Road towards the Project site

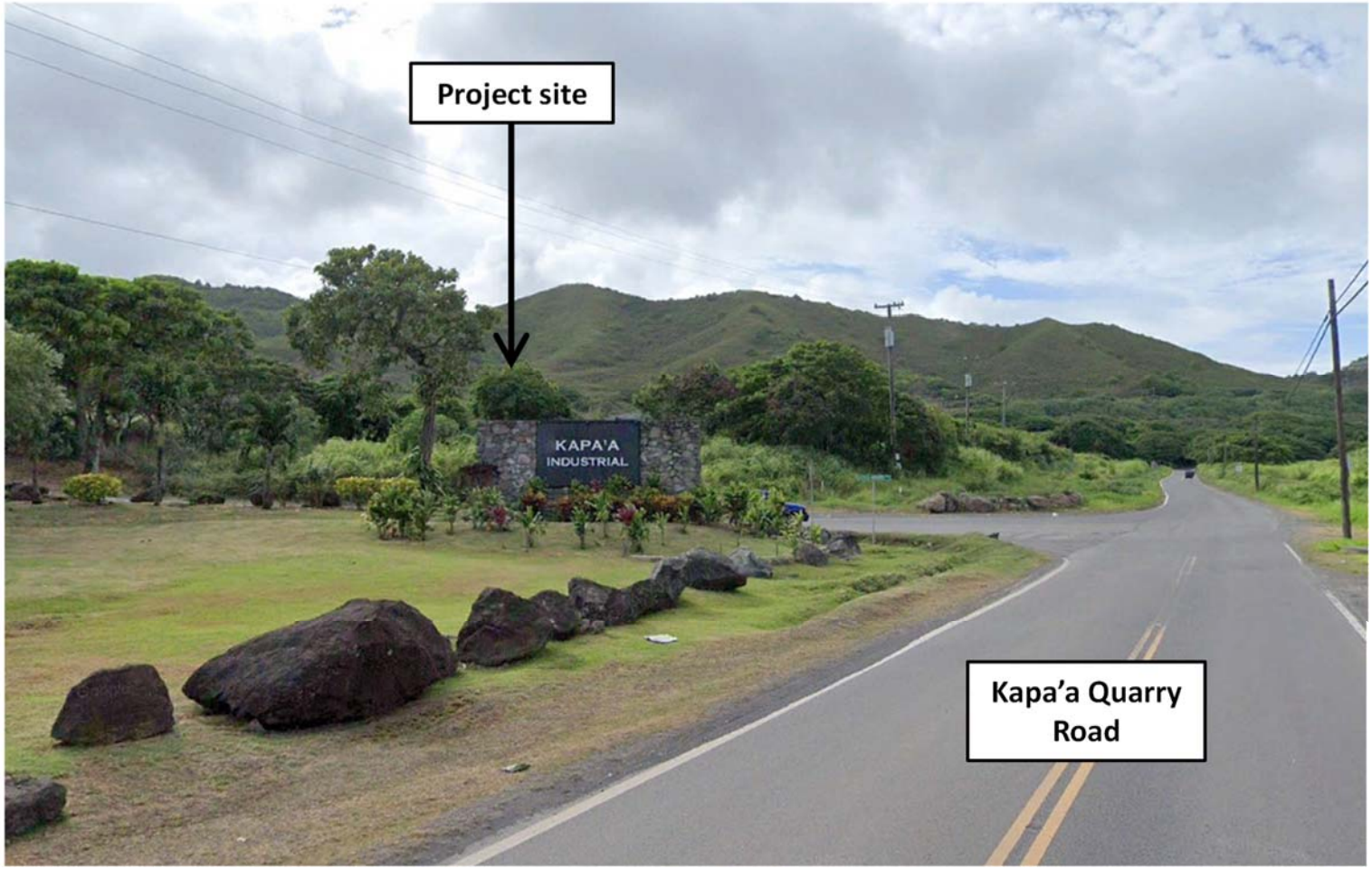


Figure 6.6.3.3: View B – From the North bound Kapa'a Quarry Road towards the Project site

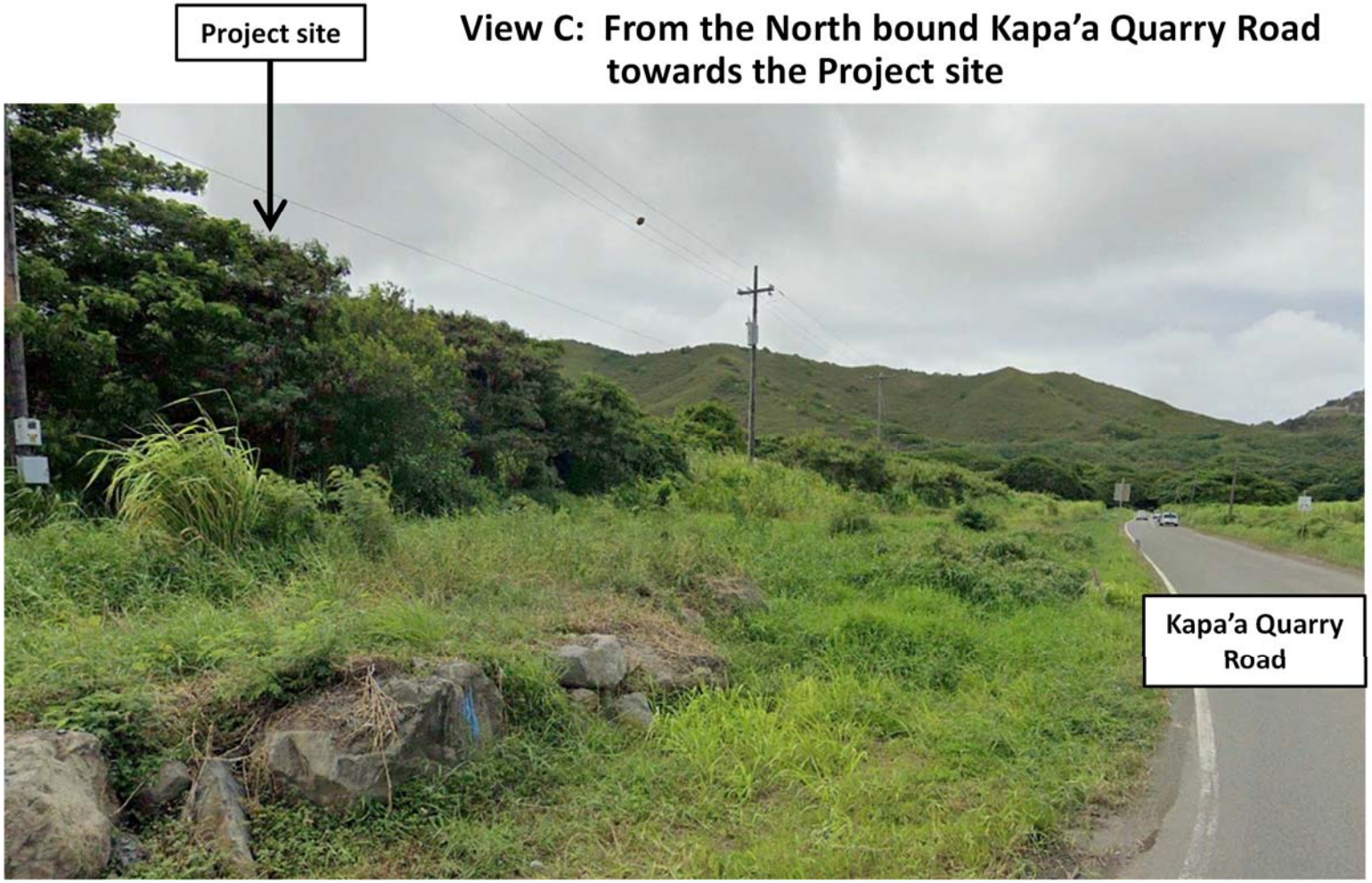


Figure 6.6.3.4: View C - From the North bound Kapa'a Quarry Road towards the Project site

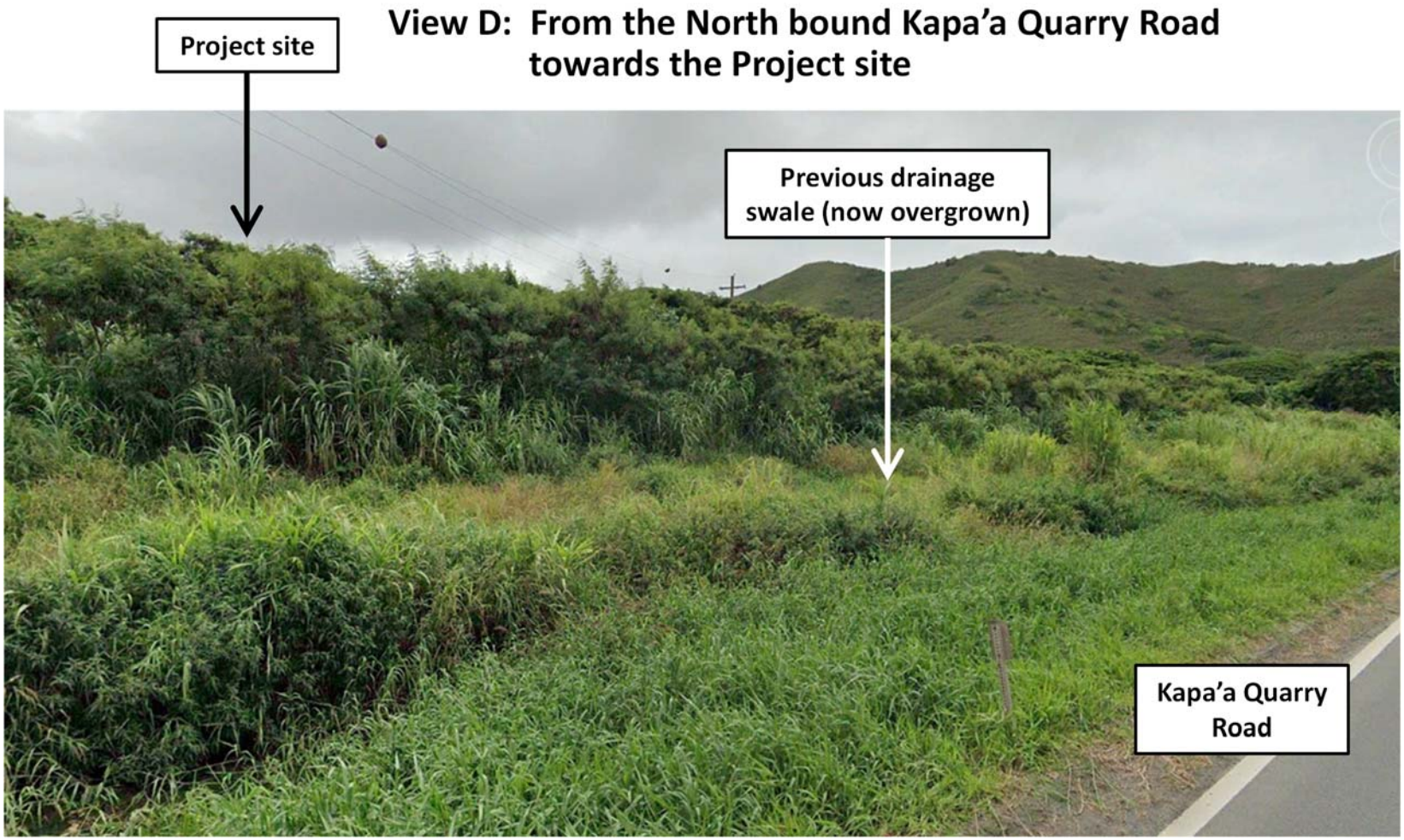


Figure 6.6.3.5: View D - From the North bound Kapa'a Quarry Road towards the Project site

View E: From the South bound Kapa'a Quarry Road towards the Project site

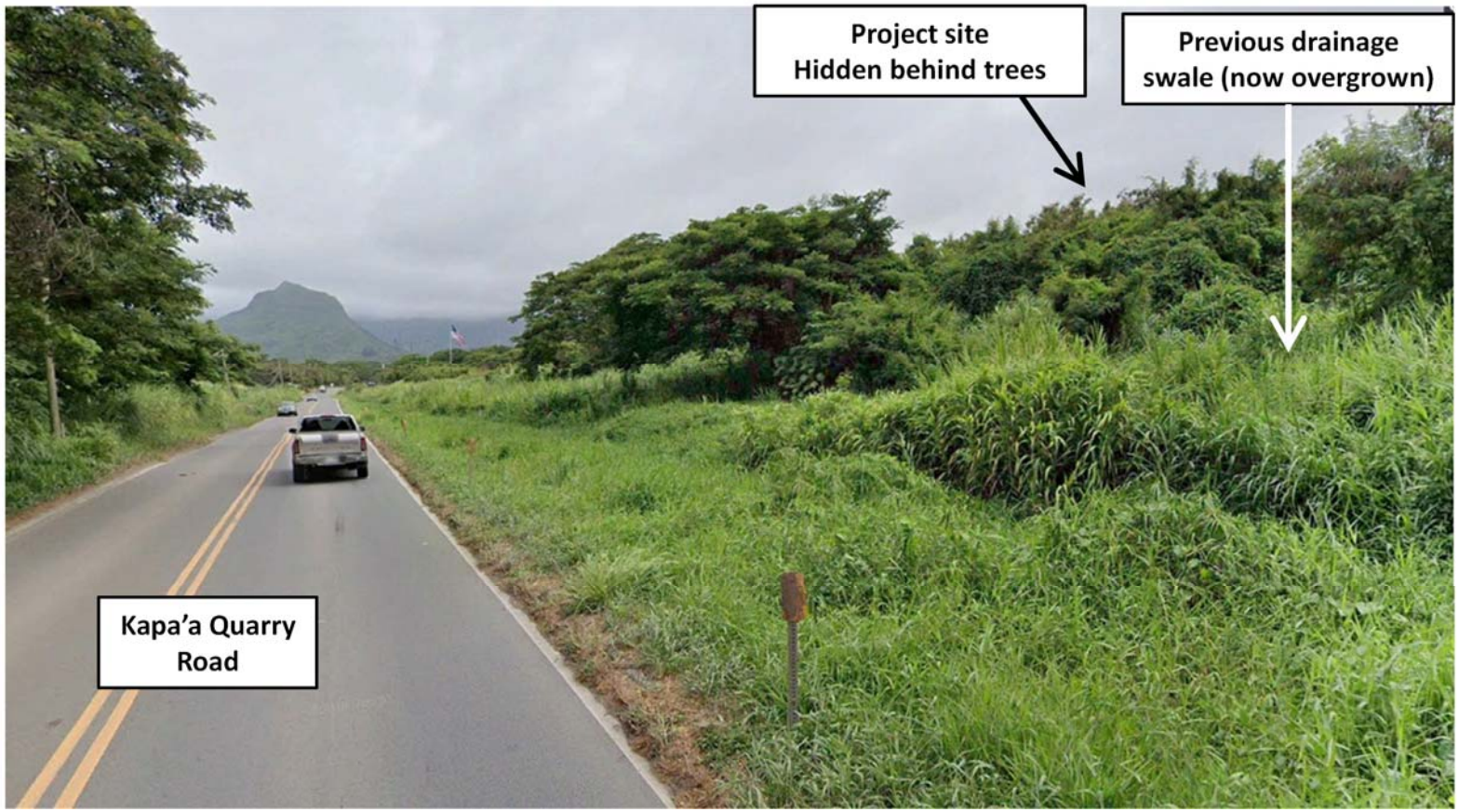


Figure 6.6.3.6: View E - From the South bound Kapa'a Quarry Road towards the Project site

View F: From the North-West bound Kapa'a Quarry Place towards the Project site

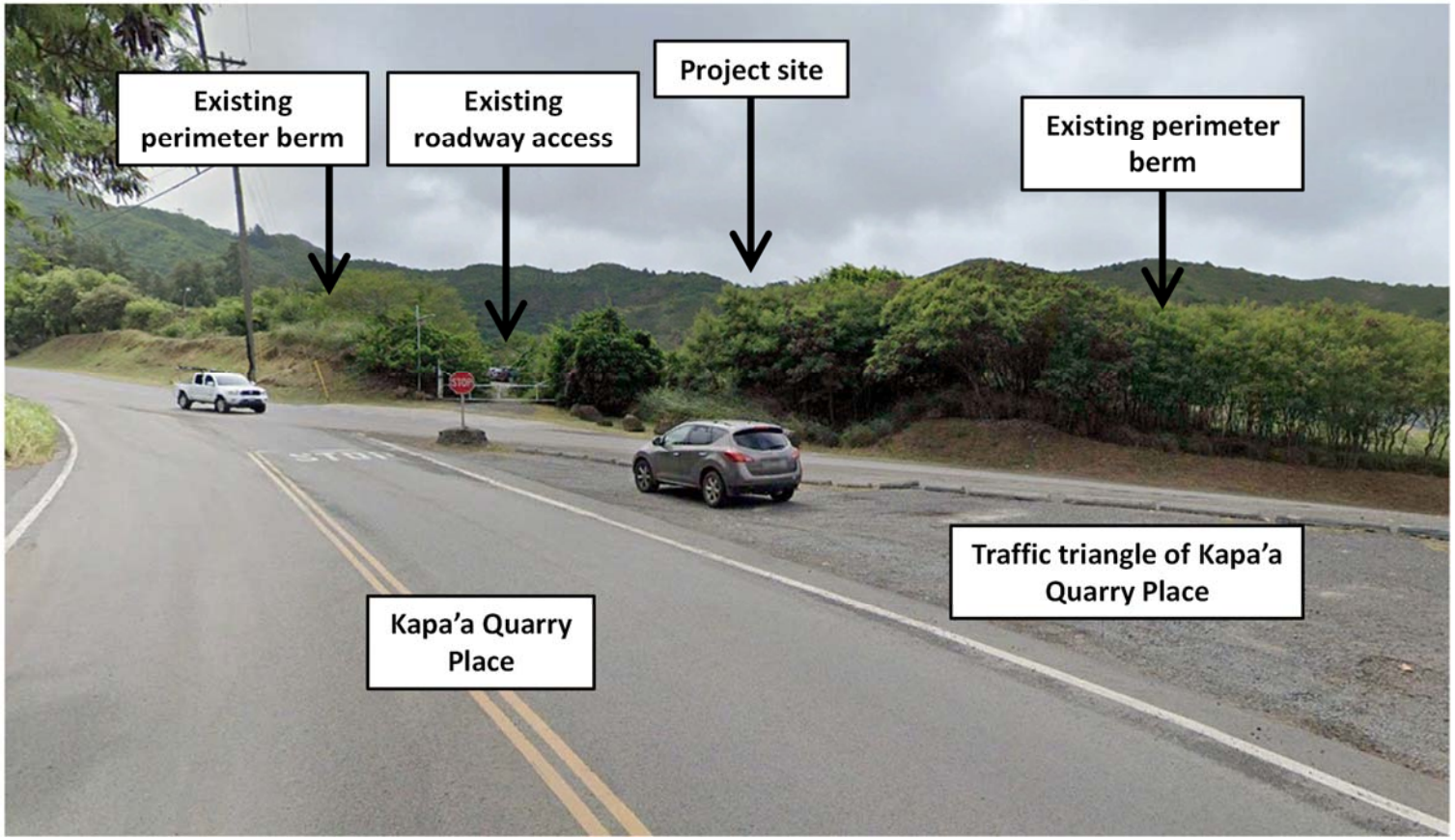


Figure 6.6.3.7: View F - View F: From the North-West bound Kapa'a Quarry Place towards the Project site

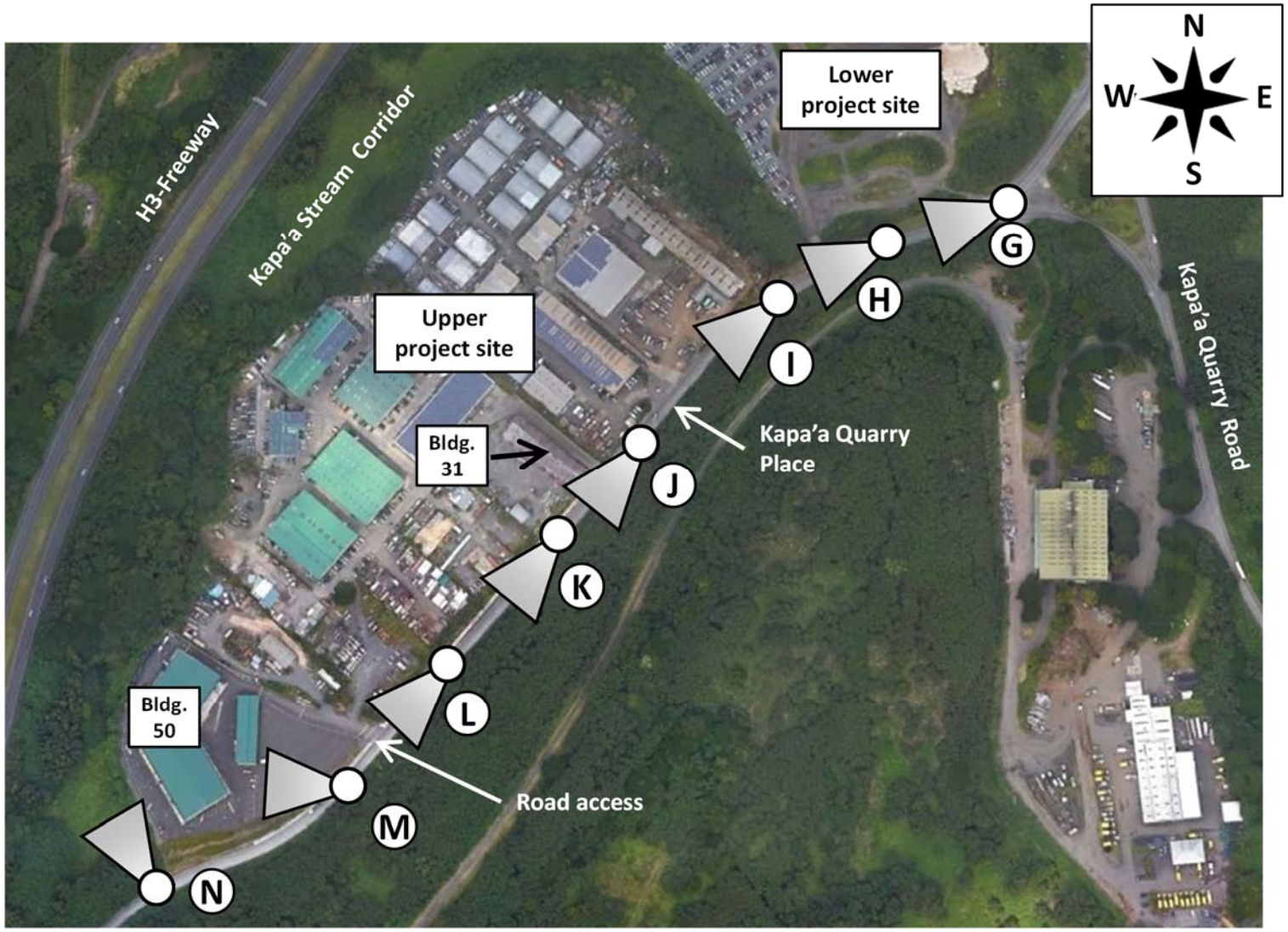


Figure 6.6.3.8: Overview of adjacent view planes located at the East side of the Lower site. Definition of the view planes G through N

View G: From the South-West bound Kapa'a Quarry Place towards the Project site

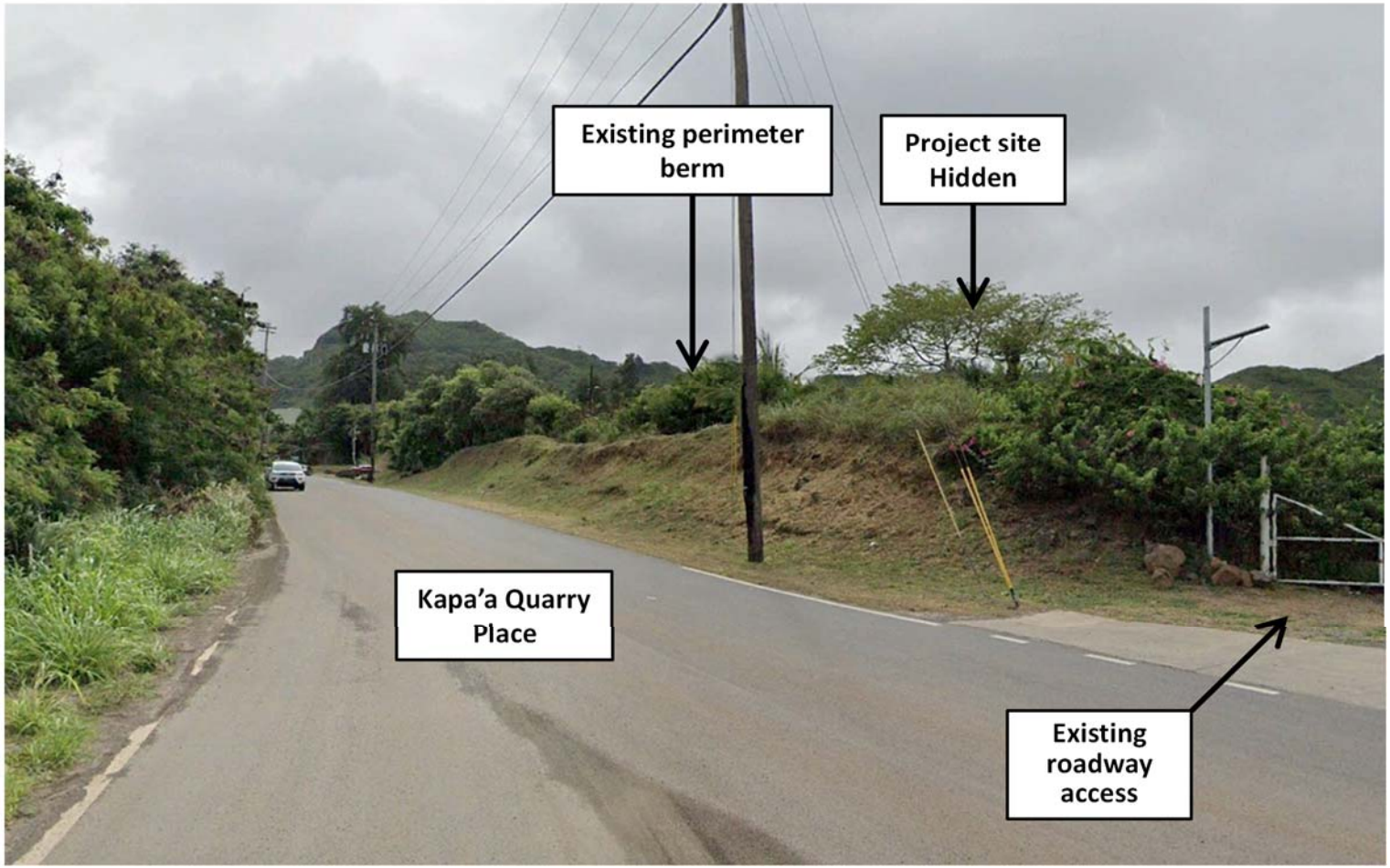


Figure 6.6.3.9: View G - From the South-West bound Kapa'a Quarry Place towards the Project site

View H: From the South-West bound Kapa'a Quarry Place towards the Project site

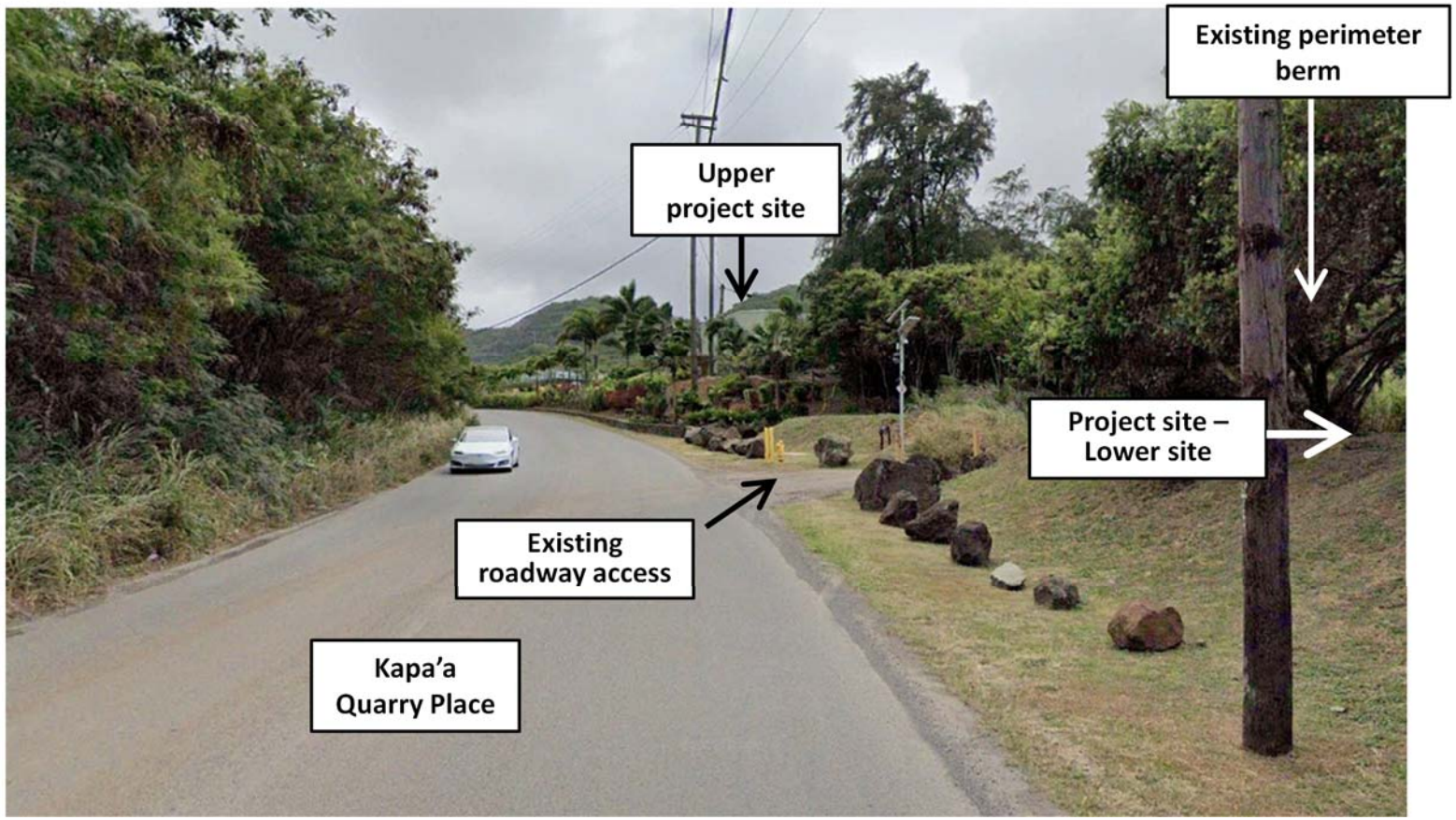


Figure 6.6.3.10: View H - From the South-West bound Kapa'a Quarry Place towards the Project site

View I: From the South-West bound Kapa'a Quarry Place towards the Project site

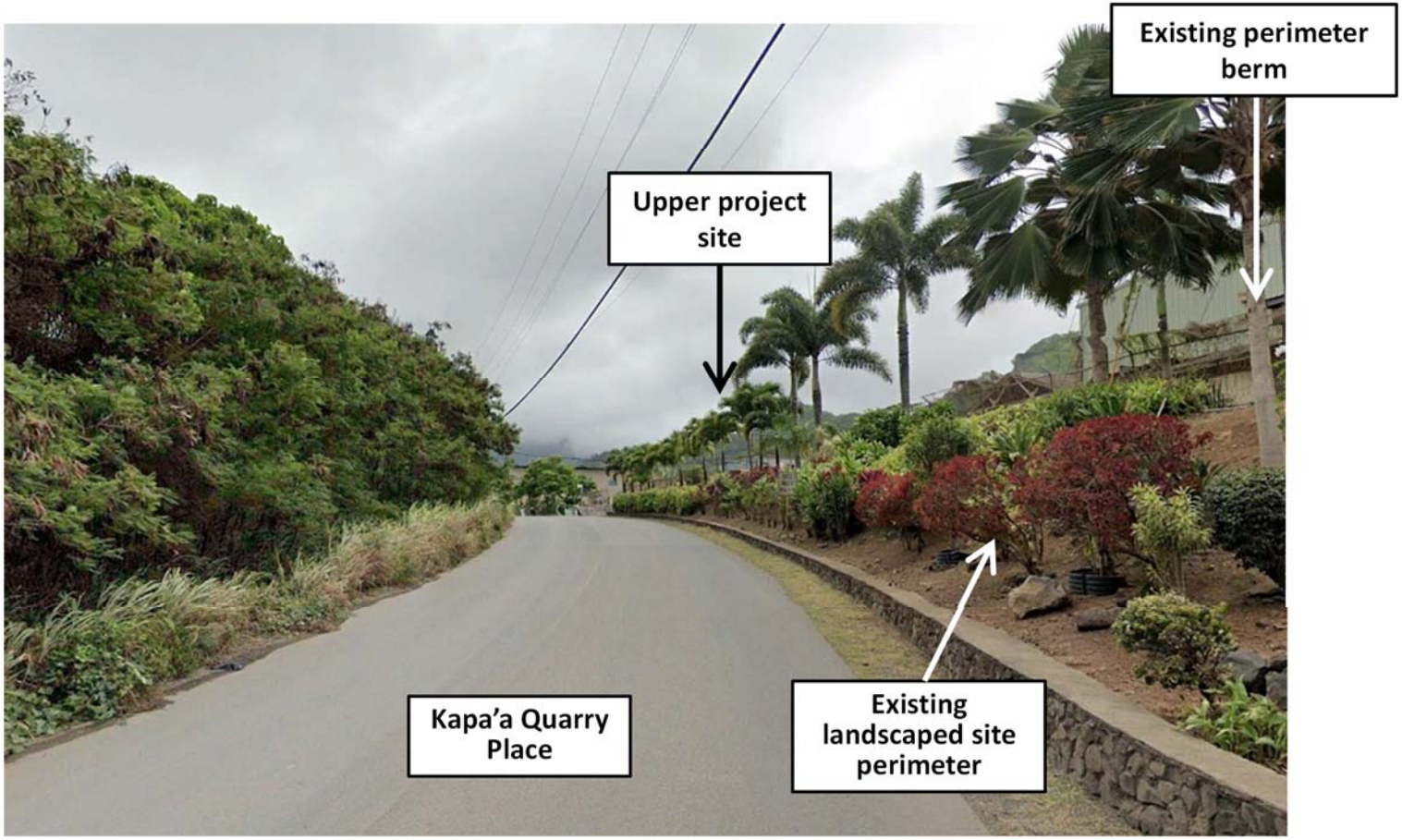


Figure 6.6.3.11: View I - From the South-West bound Kapa'a Quarry Place towards the Project site

View J: From the South-West bound Kapa'a Quarry Place towards the Project site

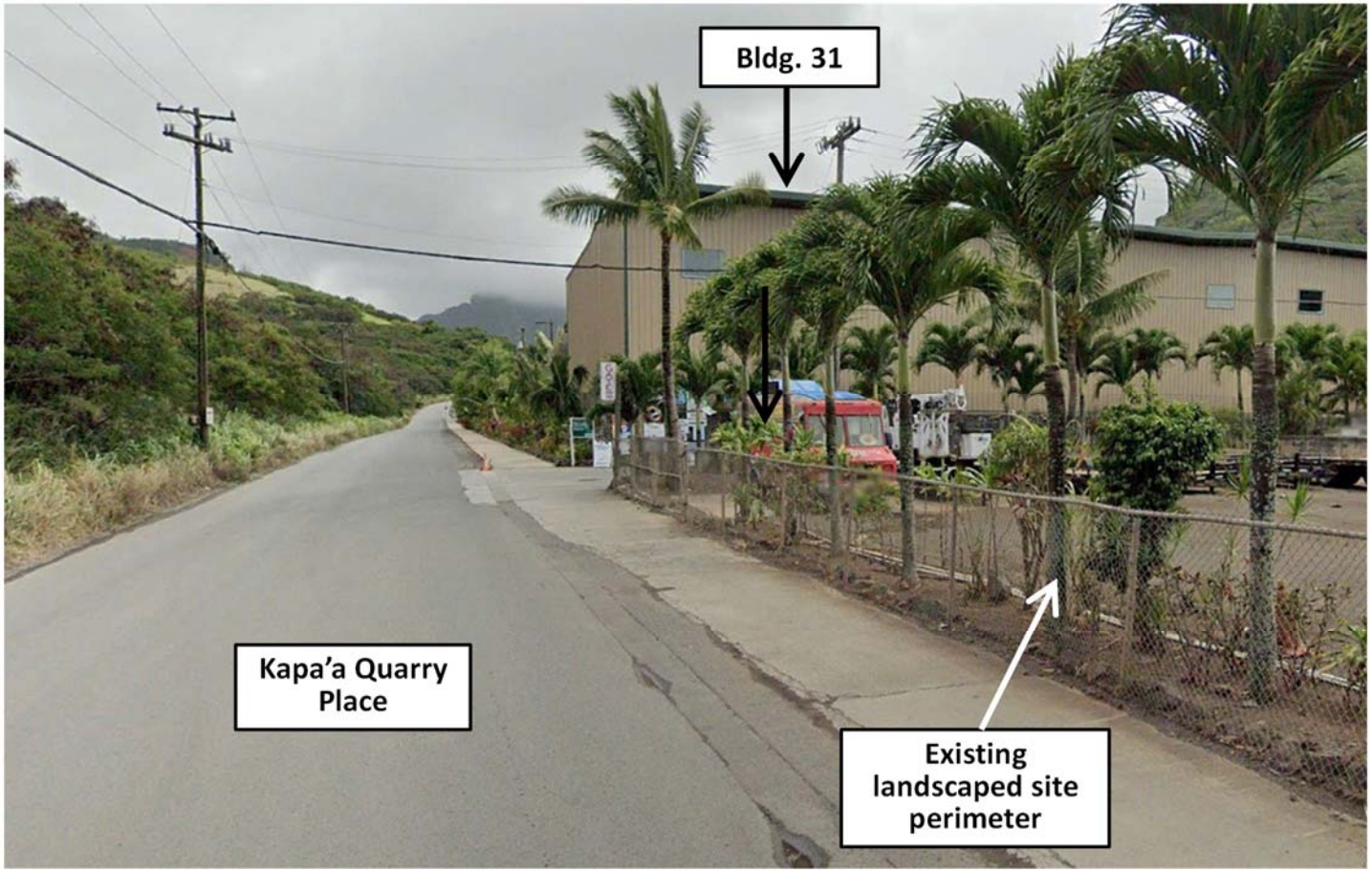


Figure 6.6.3.12: View J - From the South-West bound Kapa'a Quarry Place towards the Project site

View K: From the South-West bound Kapa'a Quarry Place towards the Project site

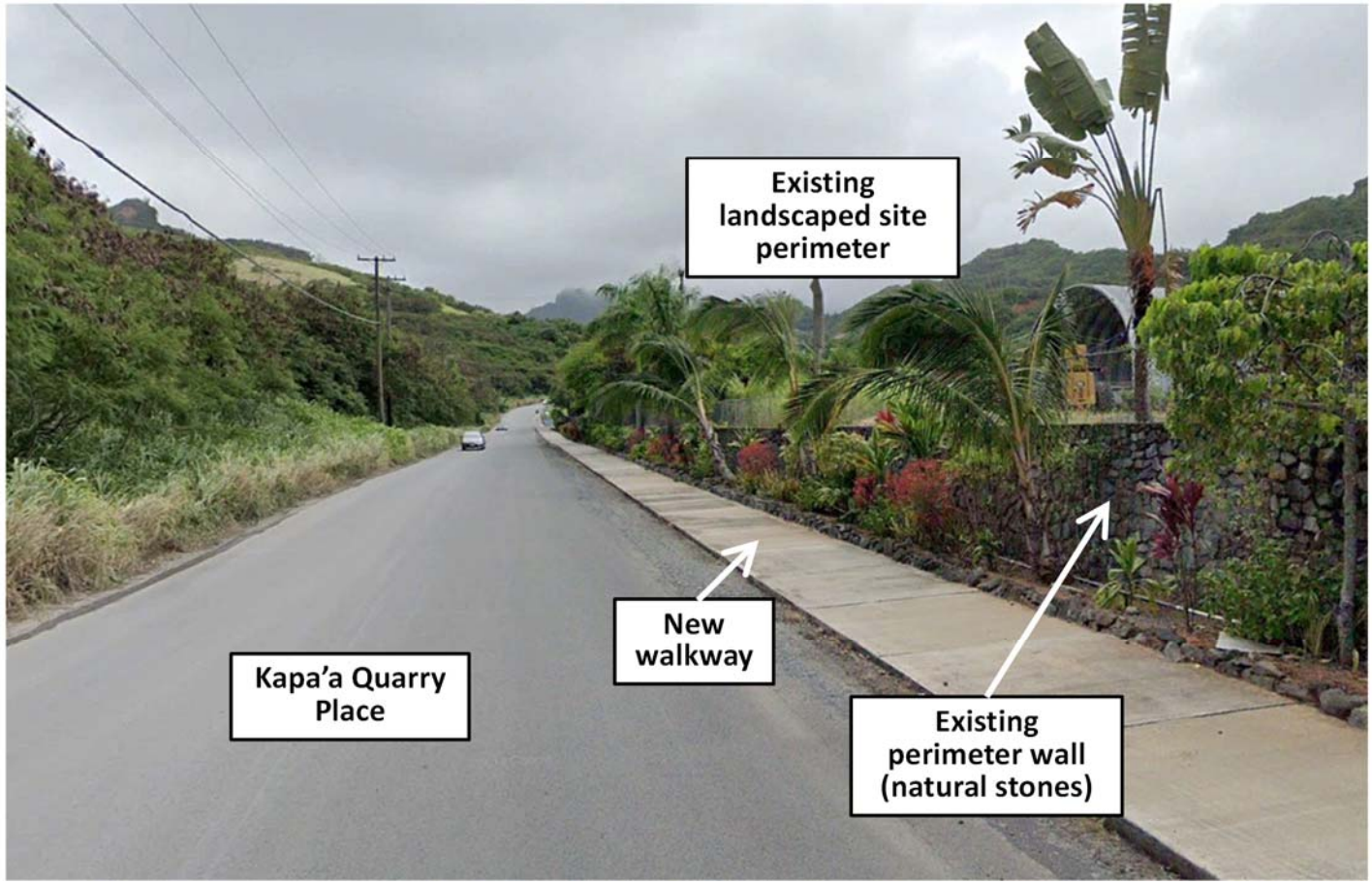


Figure 6.6.3.13: View K - From the South-West bound Kapa'a Quarry Place towards the Project site

View L: From the South-West bound Kapa'a Quarry Place towards the Project site

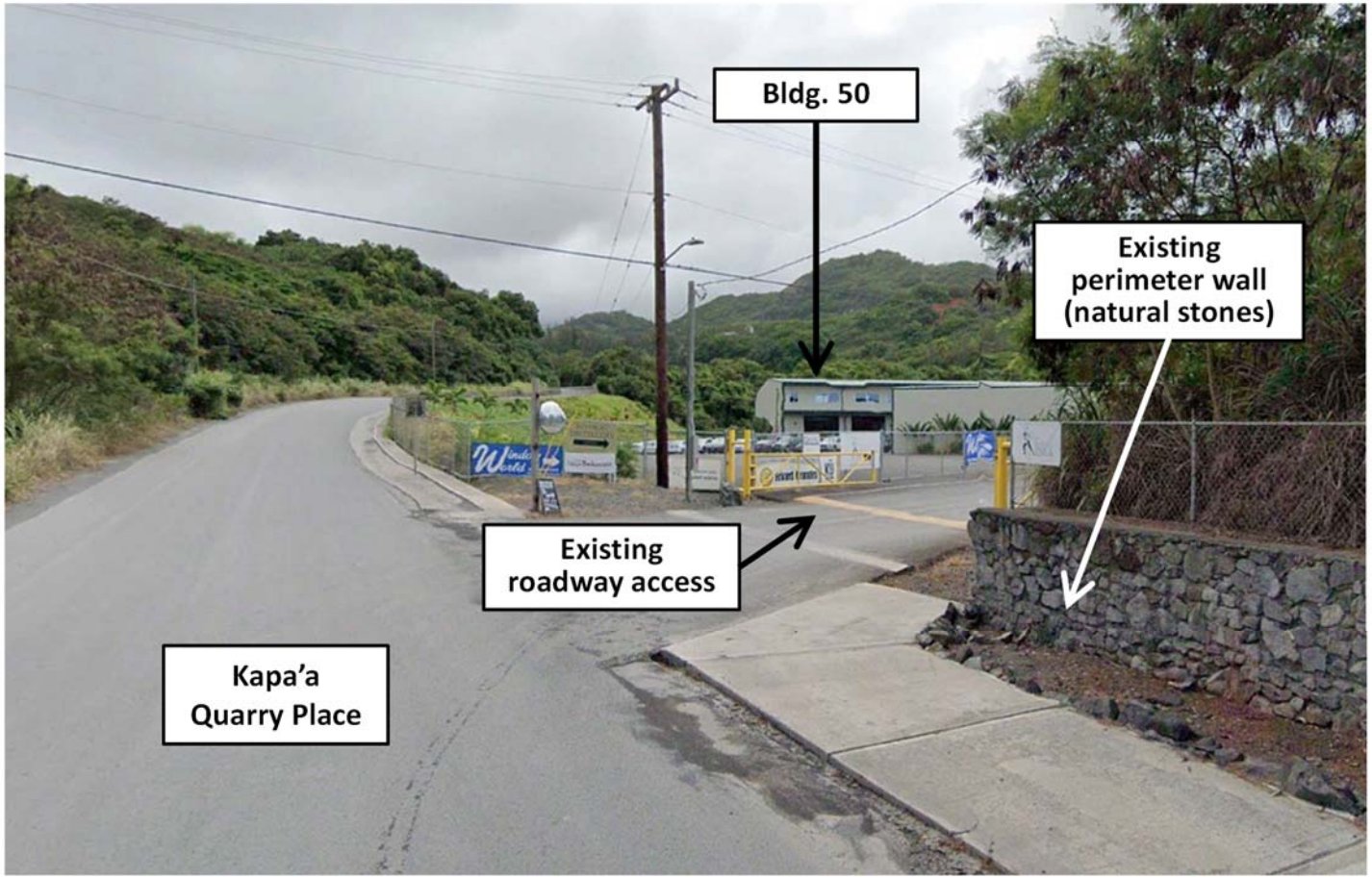


Figure 6.6.3.14: View L - From the South-West bound Kapa'a Quarry Place towards the Project site

View M: From the South-West bound Kapa'a Quarry Place towards the Project site

Figure 6.6.3.15: View M: From the South-West bound Kapa'a Quarry Place towards the Project site

View N: From the South-West bound Kapa'a Quarry Place towards the Project site

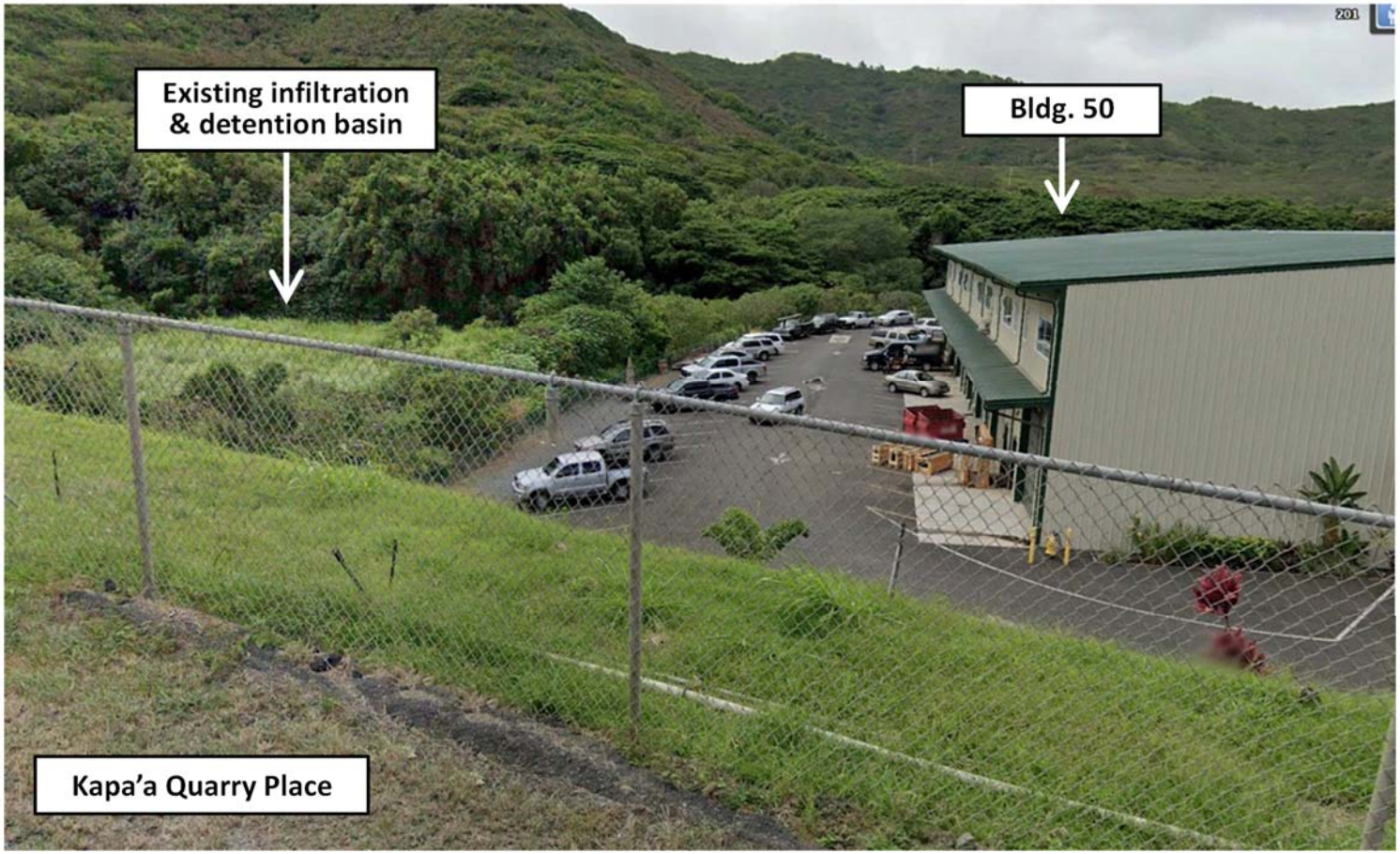


Figure 6.6.3.16: View N: From the South-West bound Kapa'a Quarry Place towards the Project site

6.6.4 Visual Impact Assessment of Adjacent View Planes Using Line Drawings of Lines of Sight

This section shows 6 representative cross sections through the site perimeter berms under the new development in the Lower site. The line drawings illustrate the expected lines of sights of an observer inside a car passing the Lower site on the Kapa'a Quarry Road. The line-of-sight assessment illustrates how the views should be affected by the New site perimeter berms and how effective the planned trees and shrubs on the top and exterior side of the site perimeter berm will likely be in shielding the new warehouses form exterior view. Generally, if the warehouse structure is below the line of sight, the warehouse would be visible to the observer.

For this analysis of line-of-sight illustrations three sample trees with different heights are used to indicate the effectiveness of obstructing lines of sight by these trees. The line of sight that passes above a particular type of a sample tree indicates the minimum height of visual obstructions that is required to completely hide warehouse structures from observers on the Kapa'a Quarry Road and the Lower portion of the Kapa'a Quarry Place. While the cross sections show trees as visual barriers, it is understood that shrubs are equally important to be planted in the perimeter berm to establish the desired dense vegetation cover. And while the vegetation will be effective to provide visual impact mitigation, a dense vegetation cover will also mitigate noise and fugitive impact mitigation, as well as provide good soil erosion prevention.

Conclusions: The 6 representative cross sections A through F indicate that visual impact mitigation is possible by adding trees of different on the New site perimeter berms. For three cross sections along the Kapa'a Quarry Road and one cross section on the Lower portions of the Kapa'a Quarry Place 10 feet high trees will obstruct line of sights on the warehouses in the Lower site closest to the roadways. For the most northern cross section 15-foot trees would be required for complete visual impact mitigation. For this cross section there are existing trees between the roadway and the new perimeter berm which already provide good visual impact mitigation.

Appendix G presents a visual impact assessment using cross-sections in more detail.

Figure	Description of visual impact cross sections and effectiveness to visual impact mitigation measures
6.6.4.1	Overview of the visual impact sections A through F of the perimeter berms around the Lower site
6.6.4.2	Visual impact section A: The cross section shows the lines of sight of an observer passing the New Lower site development on the East bound Kapa'a Quarry Place. The New site perimeter berm is low at this location, with the finish grade some 4 feet below the elevation of the Kapa'a Quarry Place roadway. As indicated in Figure 6.6.4.2, trees with a crown height of at least 15 feet planted on the new site perimeter berm would shield the view on a 35-foot-high warehouse structure. Trees with heights below 15' would only provide partial visual shielding .
6.6.4.3	Visual impact section B: The cross section shows the lines of sight of an observer passing the New Lower site development on the East bound Kapa'a Quarry Place. The New site perimeter berm has a height of 14 feet at this location, with the finish grade of the site at an

Figure	Description of visual impact cross sections and effectiveness to visual impact mitigation measures
	elevation of 42 feet. As indicated in Figure 6.6.4.3 trees with a crown height of at least 10 feet planted on the new site perimeter berm would shield the view on a 35-foot-high warehouse structure. Without trees planted on top of the site perimeter berm, the top 50% of the warehouse structure would be visible from a car passing the location on the road.
6.6.4.4	Visual impact section C: The cross section shows the lines of sight of an observer passing the New Lower site development on the North bound Kapa'a Quarry Road. The New site perimeter berm has a height of 34 feet at this location, with the finish grade of the site at an elevation of 40 feet. As indicated in Figure 6.6.4.4 , trees with a height of at least 10 feet planted on the new site perimeter berm would shield the view on a 35-foot-high warehouse structure. Without trees planted on top of the site perimeter berm, the top 25% of the warehouse structure would be visible by the observer.
6.6.4.5	Visual impact section D: The cross section shows the lines of sight of an observer passing the New Lower site development on the North bound Kapa'a Quarry Road. The New site perimeter berm has a height of 34 feet at this location, with the finish grade of the site at an elevation of 40 feet. The New site perimeter berm is set back farther from the roadway with the former drainage ditch and a maintenance dirt road between the roadway and perimeter berm. As indicated in Figure 6.6.4.5, trees with a height of at least 10 feet planted on the new site perimeter berm would shield the view on a 35-foot-high warehouse structure. Without trees planted on top of the site perimeter berm, the top 50% of the warehouse structure would be visible by the observer.
6.6.4.6	Visual impact section E: The cross section shows the lines of sight of an observer passing the New Lower site development on the North bound Kapa'a Quarry Road. The New site perimeter berm has a height of 34 feet at this location, with the finish grade of the site at an elevation of 40 feet. The New site perimeter berm is set back farther from the roadway with the former drainage ditch and a maintenance dirt road between the roadway and perimeter berm. As indicated in Figure 6.6.4.6, trees with a height of at least 10 feet planted on the new site perimeter berm would shield the view on a 35-foot-high warehouse structure. Without trees planted on top of the site perimeter berm, the top 50% of the warehouse structure would be visible by the observer.
6.6.4.7	Visual impact section E: The cross section shows the lines of sight of an observer passing the New Lower site development on the North bound Kapa'a Quarry Road. The New site perimeter berm has a height of 34 feet at this location, with the finish grade of the site at an elevation of 40 feet. The New site perimeter berm is set back farther from the roadway than illustrated in Figure 6.6.4.6. The former drainage ditch and a maintenance dirt road is located between roadway and perimeter berm. As indicated in Figure 6.6.4.7, trees with a height of at least 15 feet planted on the new site perimeter berm would shield the view on a 35-foot-high warehouse structure. Without trees planted on top of the site perimeter berm, the top 50% of the warehouse structure would be visible from a car passing the location on the adjacent roadway. There are several tall trees along the roadway, as illustrated in Figure 6.6.4.7.These existing trees would offer significant visual impact mitigation and would shield the warehouse structure from views at this location.

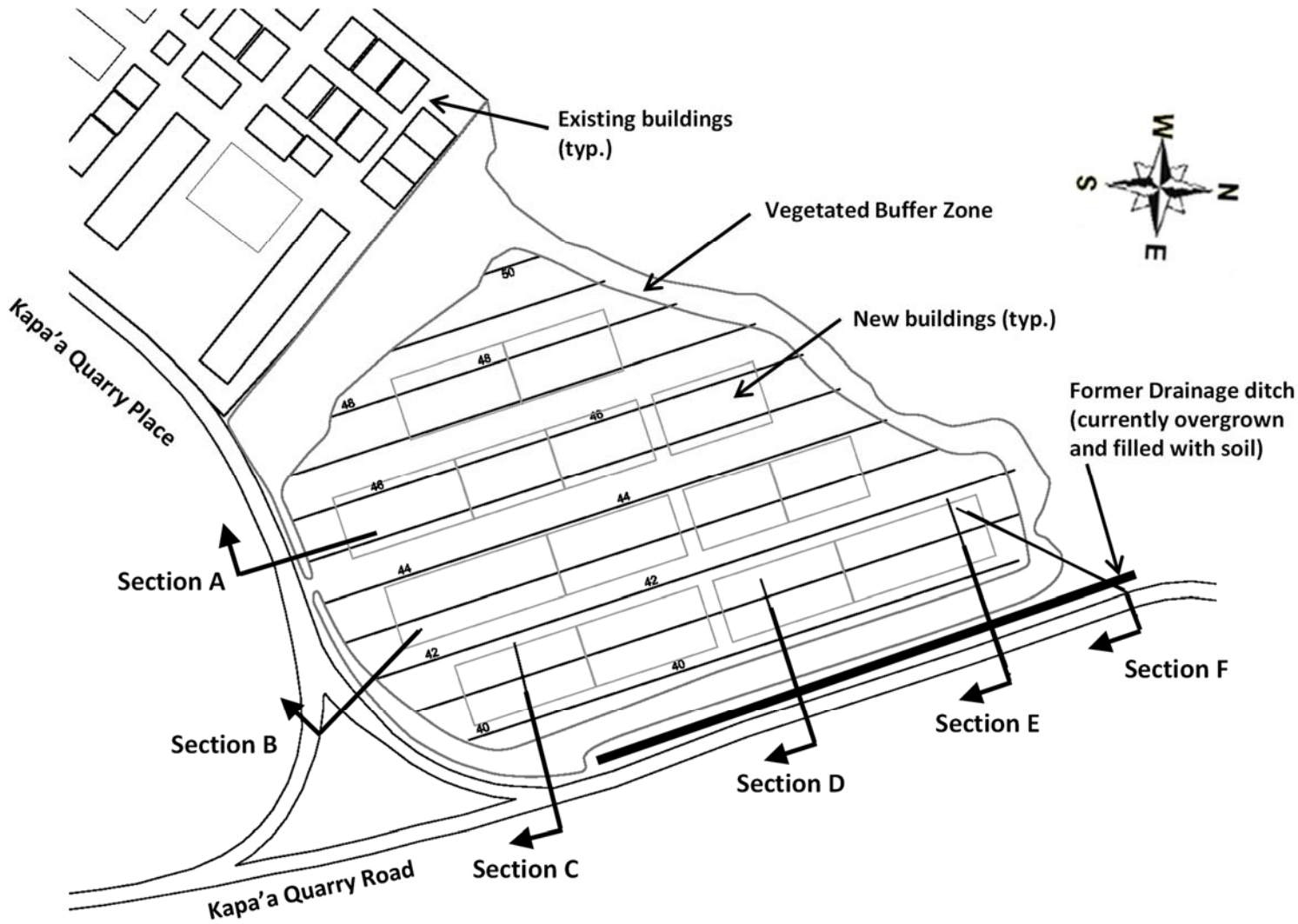


Figure 6.6.4.1: Overview of the visual impact cross sections A though F of the perimeter berms around the Lower site

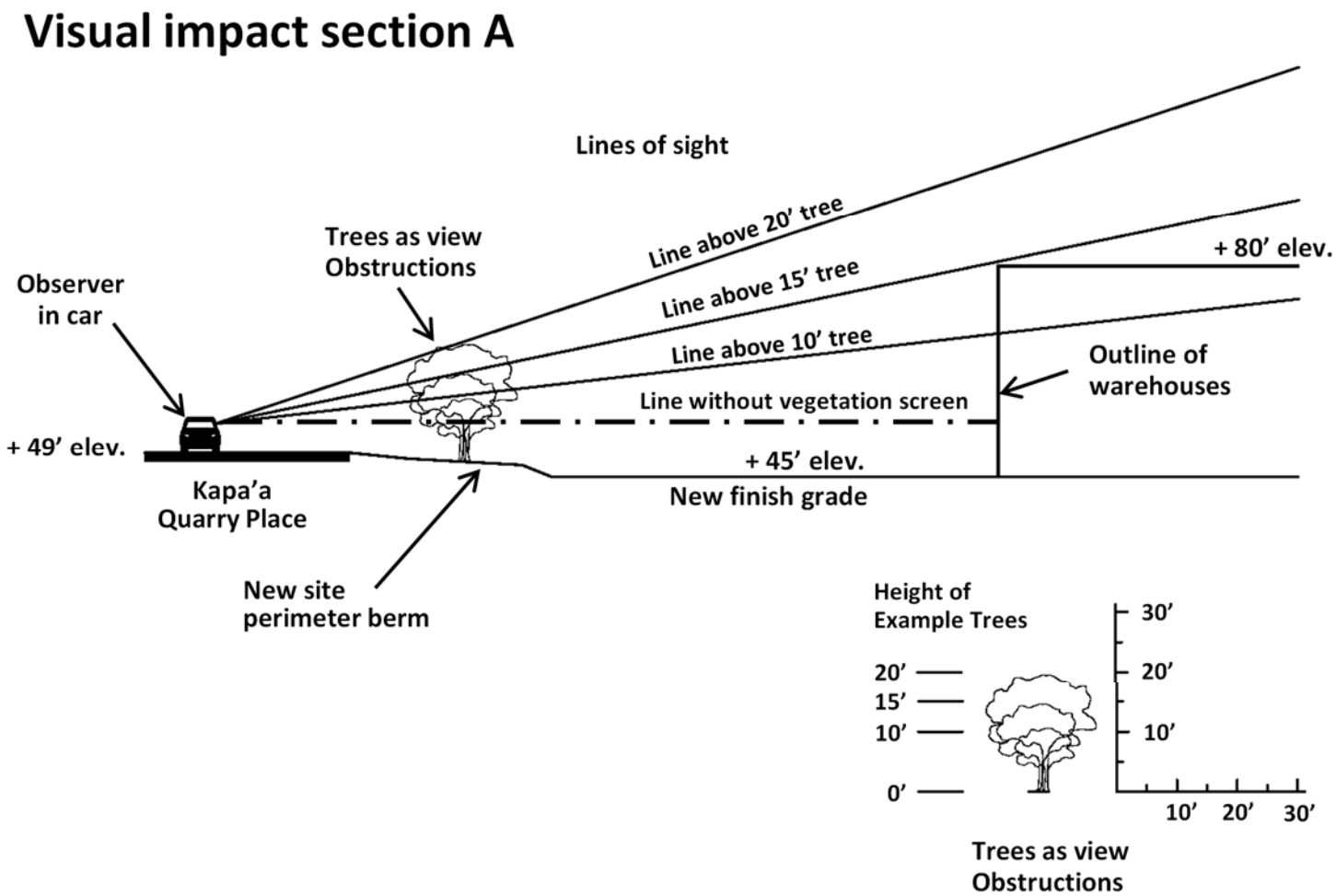


Figure 6.6.4.2: Visual impact cross section A

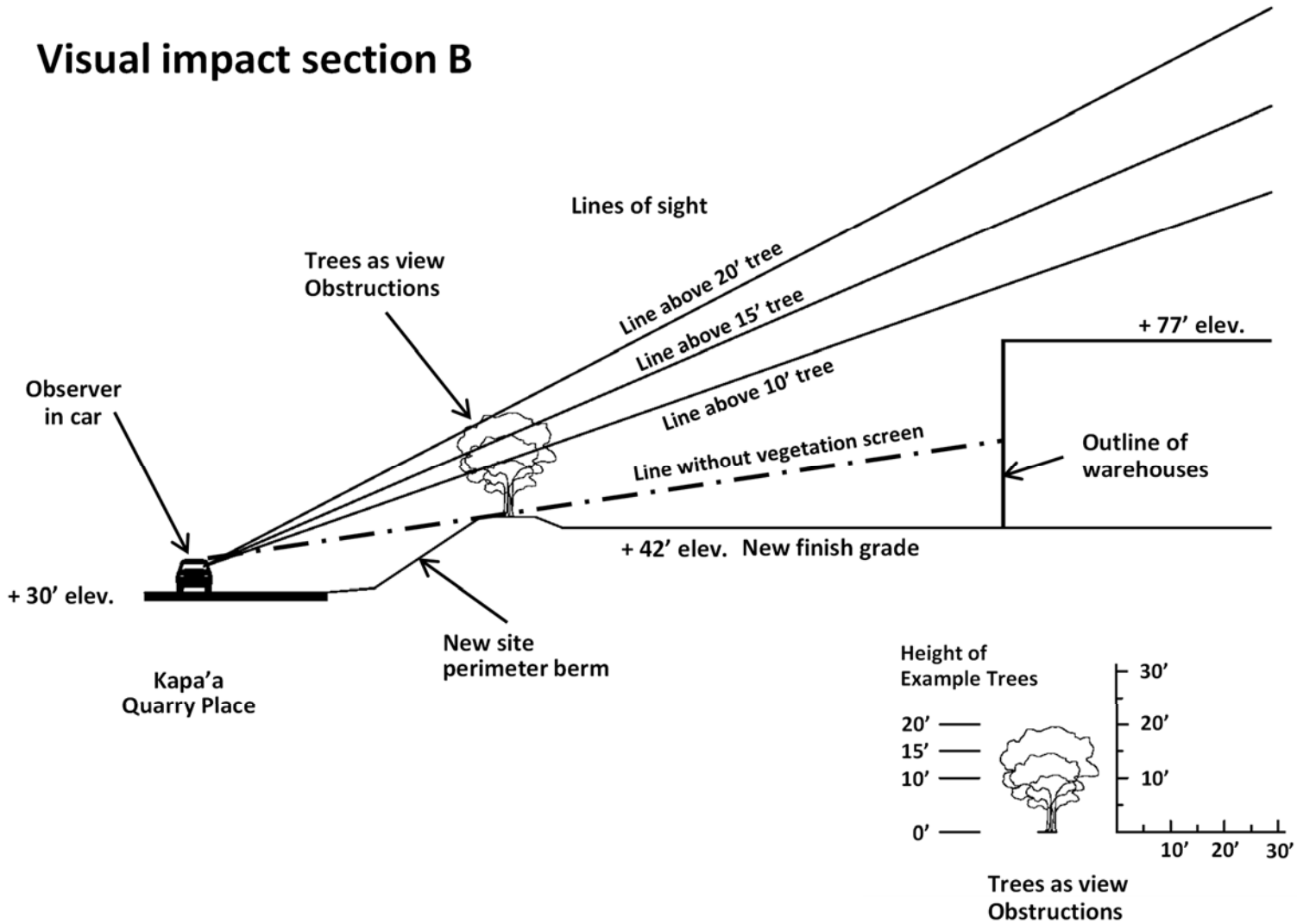


Figure 6.6.4.3: Visual impact cross section B

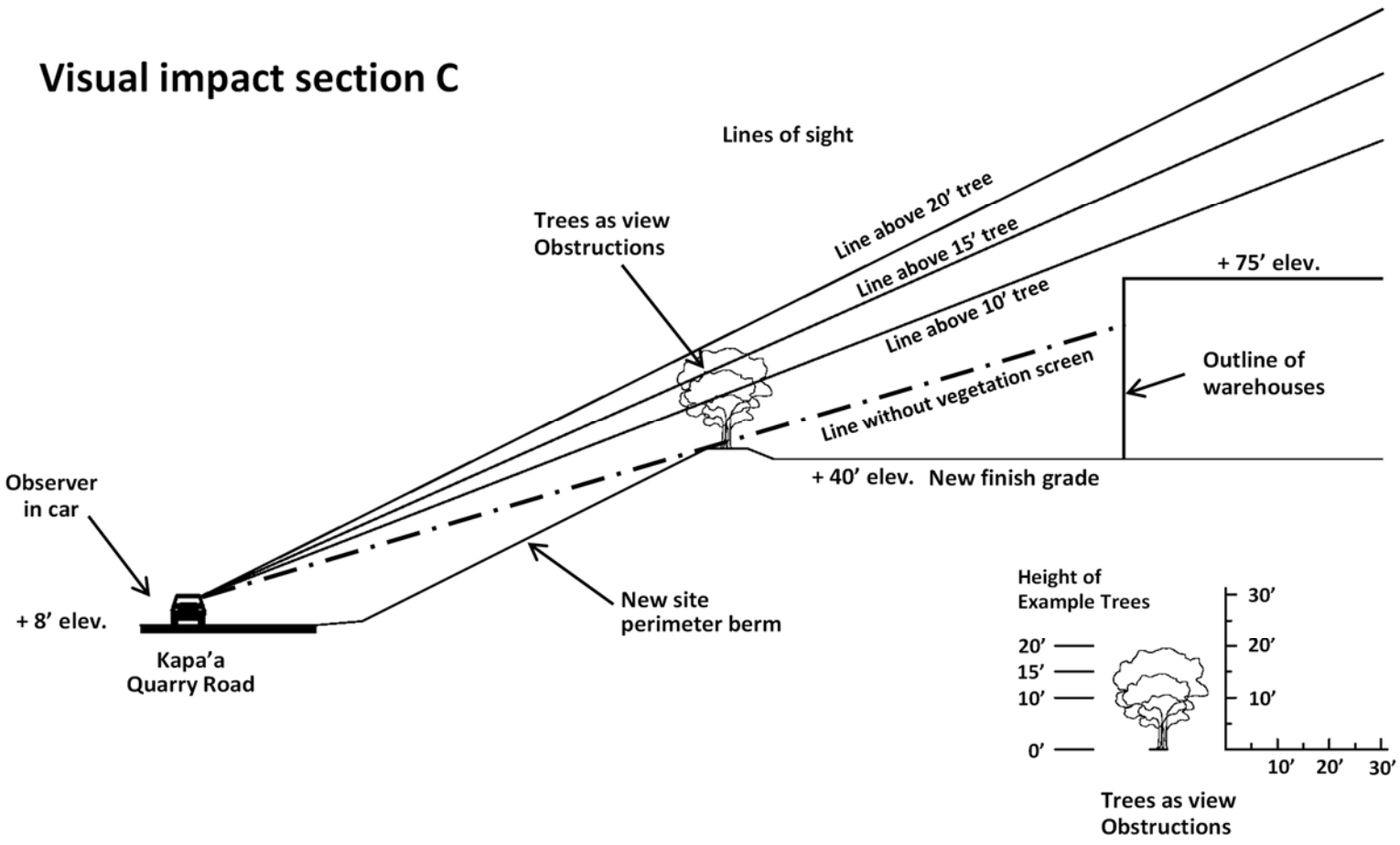


Figure 6.6.4.4: Visual impact cross section C

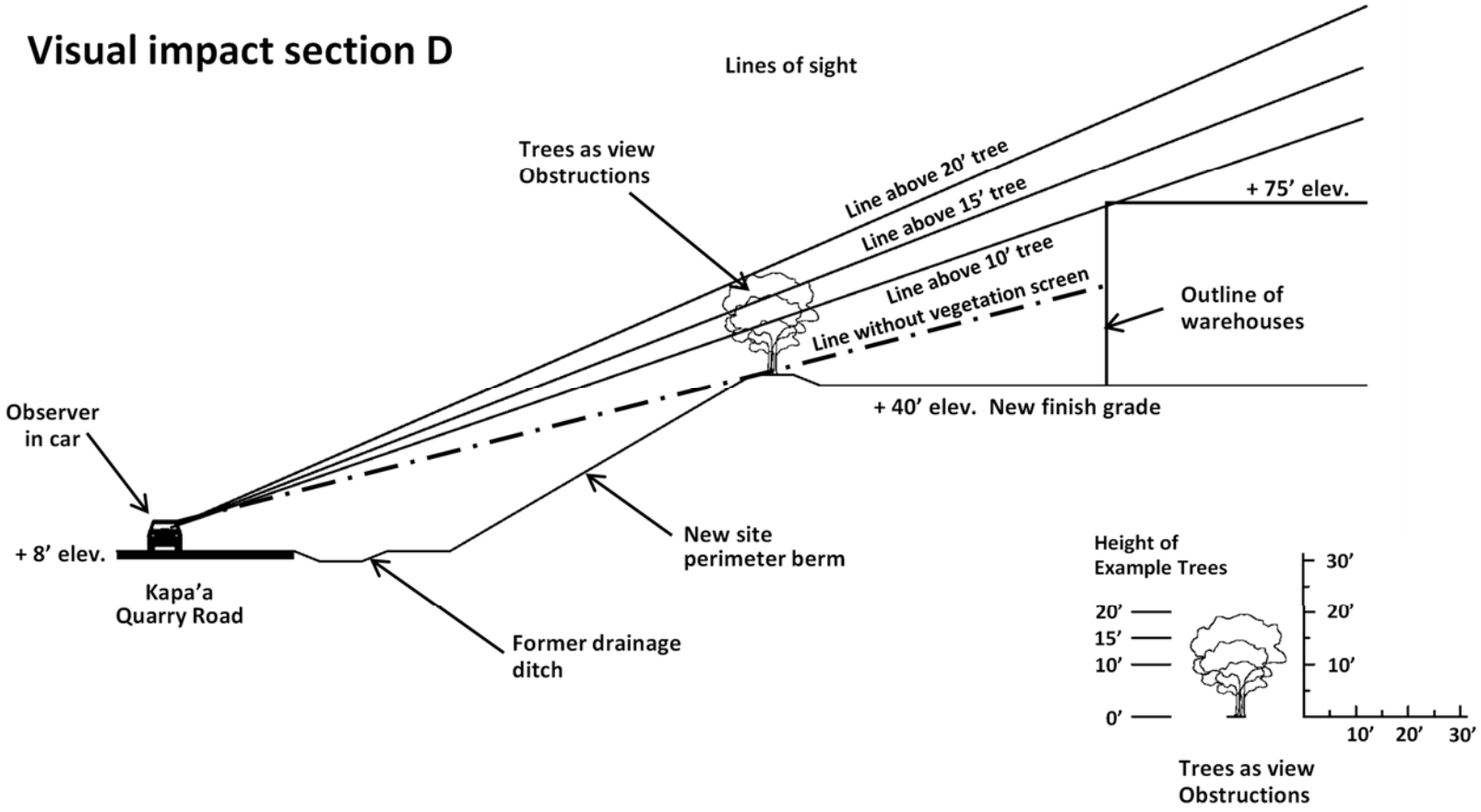


Figure 6.6.4.5: Visual impact cross section D

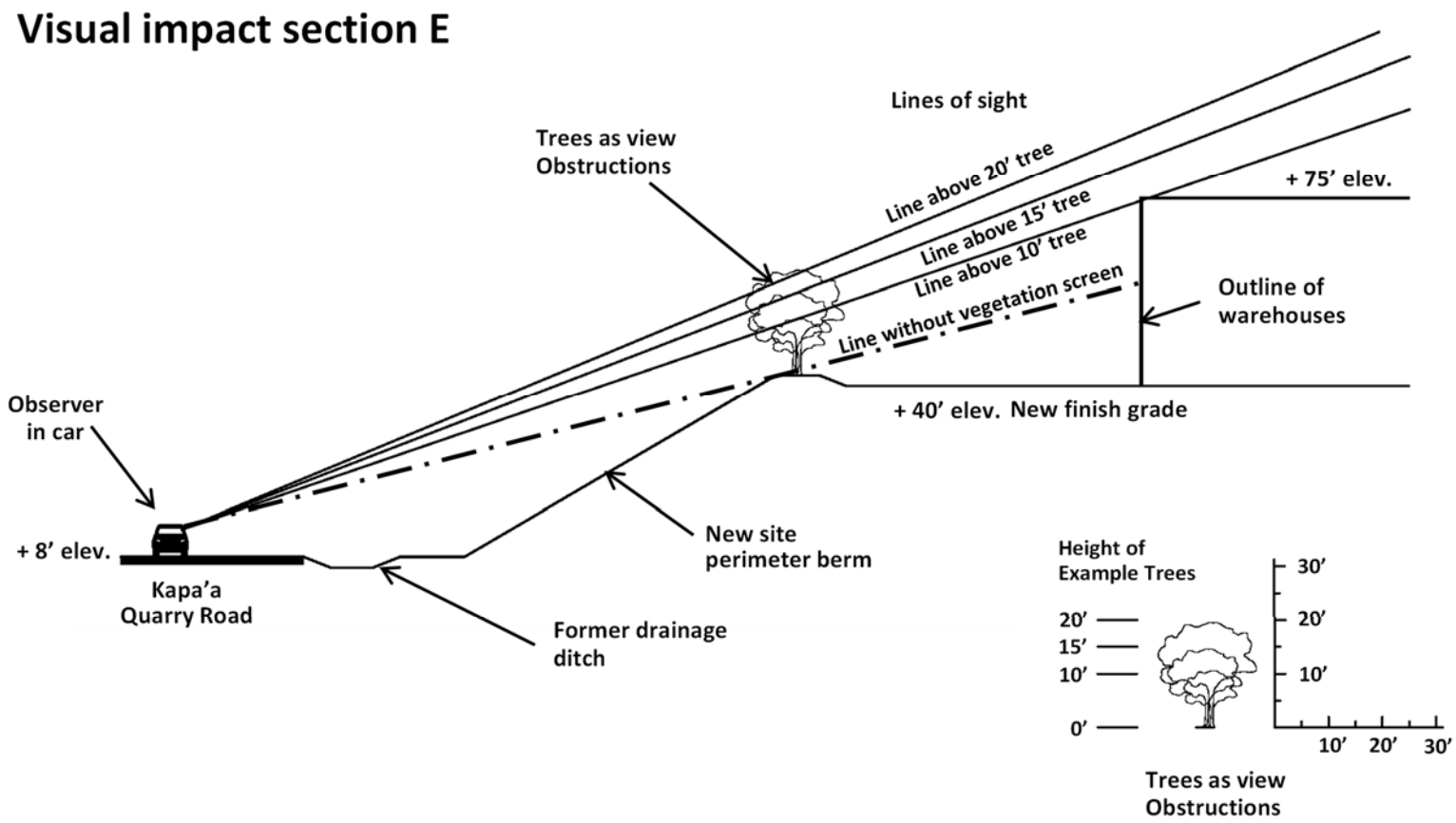


Figure 6.6.4.6: Visual impact cross section E

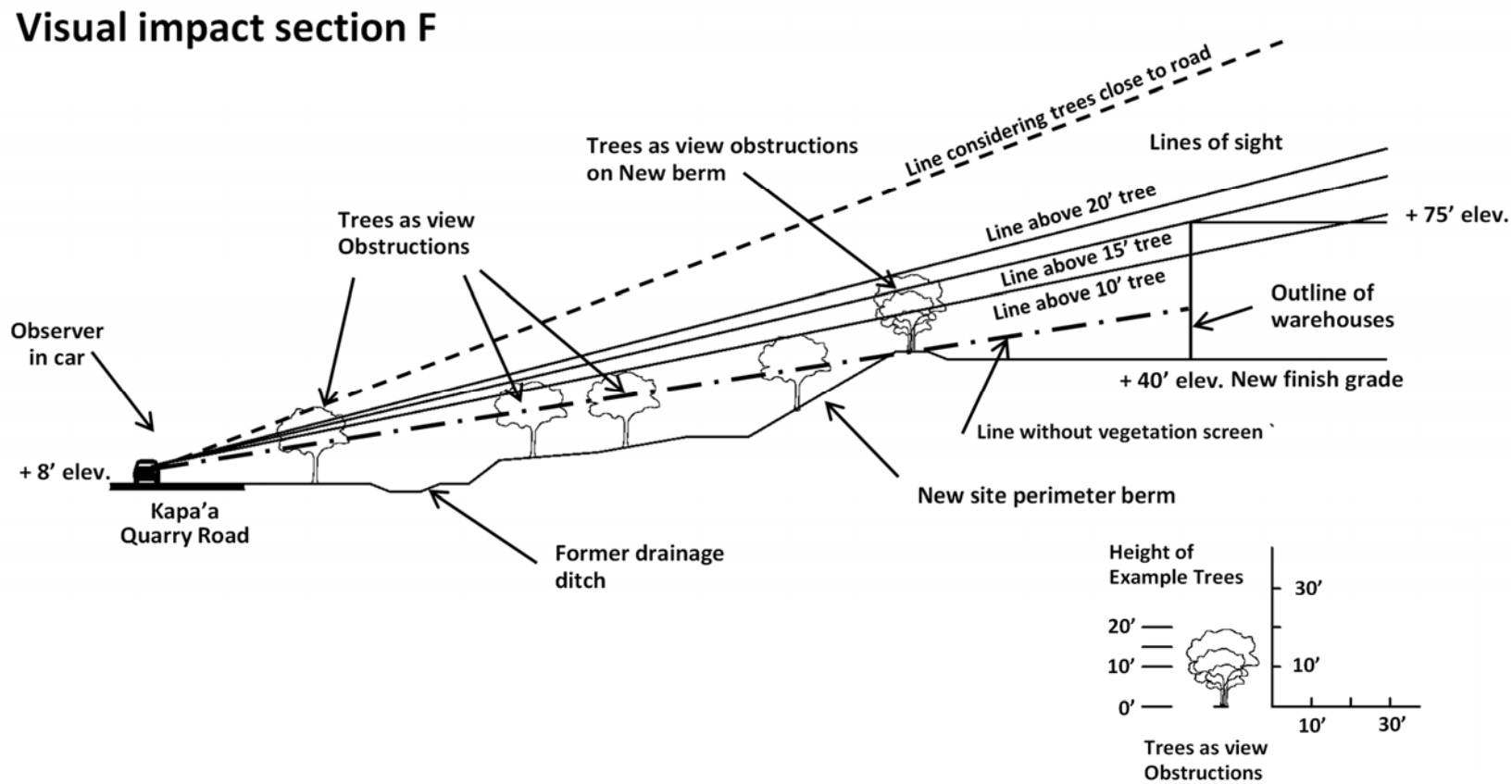


Figure 6.6.4.7: Visual impact cross section F

6.7 Vegetated Areas Inside the Project Site

This section describes the distribution of pervious to impervious areas inside the project site for the three stages in site development, (1) the 2011 FEIS, (2) the 2014 SMP and (3) the updated site development plan described under the 2021 SEIS.

6.7.1 Comparison Between the Three Stages of Site Development

Table 6.7.1.1 shows the distribution of pervious and impervious for the three site development stages. The impervious area listed in Table 6.7.1.1 includes all buildings and the sum of all pavements. The pervious area includes all vegetated area including landscaped areas within the site perimeter and the vegetated buffer zone and berms at the site perimeter. Figure 6.7.1.1 through 6.7.1.3 illustrate the locations and extents of the pervious and impervious areas for the three site development stages.

Table 6.7.1.1: Distribution of pervious and impervious for the three site development stages

		Project Site		Project Site	
No.	**Approved or presented under**	**Pervious** [acre]	**Impervious** [acre]	**Pervious** [% of total]	**Impervious** [% of total]
1	2011 FEIS	13.1	13.1	46%	54%
2	2014 SMP (2014/SMA-27)	9.7	15.3	39%	61%
3	2020 SEIS	6.4	18.6	26%	74%

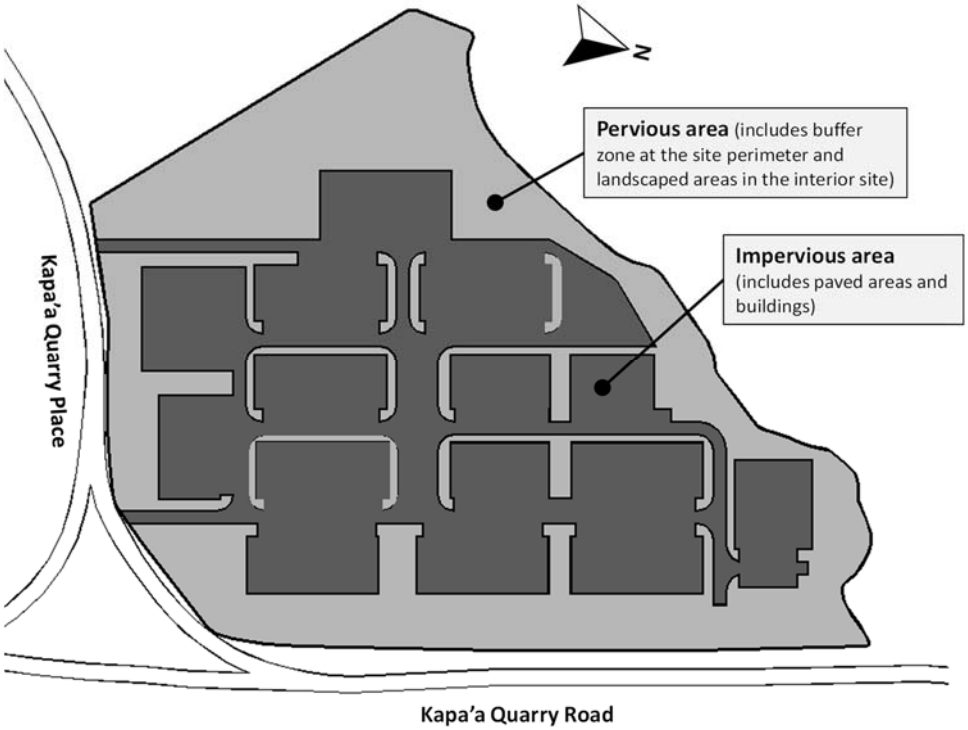


Figure 6.7.1.1: Distribution of pervious and impervious land under site Development stage of **2011 FEIS**

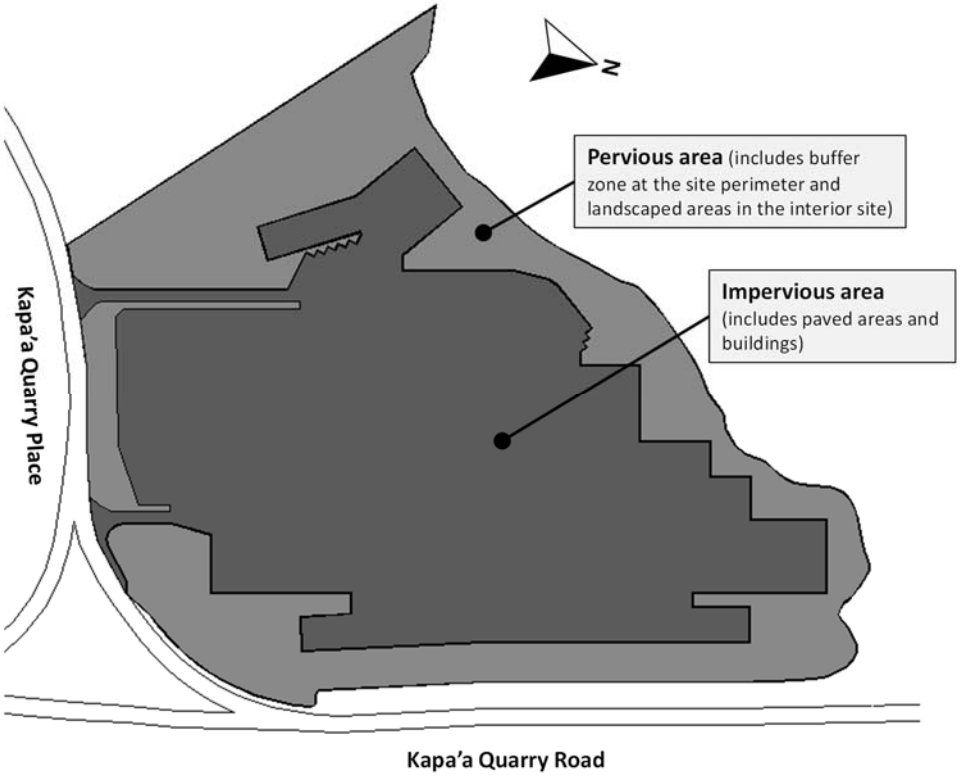


Figure 6.7.1.2: Distribution of pervious and impervious land under site development stage of **2014 SMP**

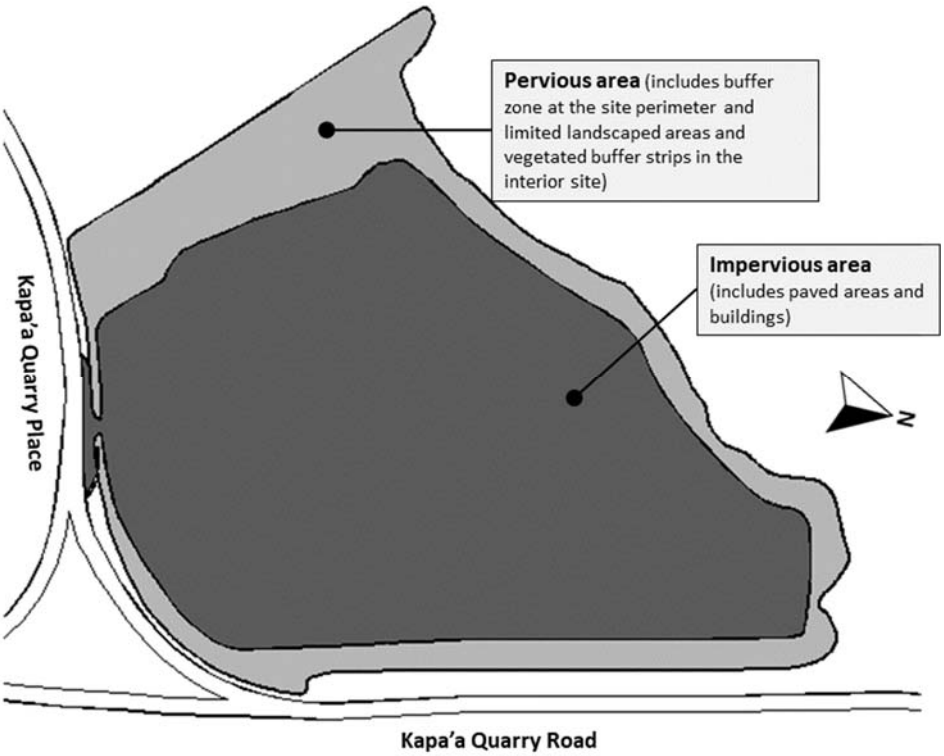


Figure 6.7.1.3: Distribution of pervious and impervious land under site development stage of **2021 SEIS**

Figure 6.7.1.4 illustrates the distribution of pervious and impervious land as percentages of the entire project site, for the three site development stages. Figure 6.7.1.4. shows that the impervious land areas increase from 2011, when the 2011 FEIS was approved through the present.

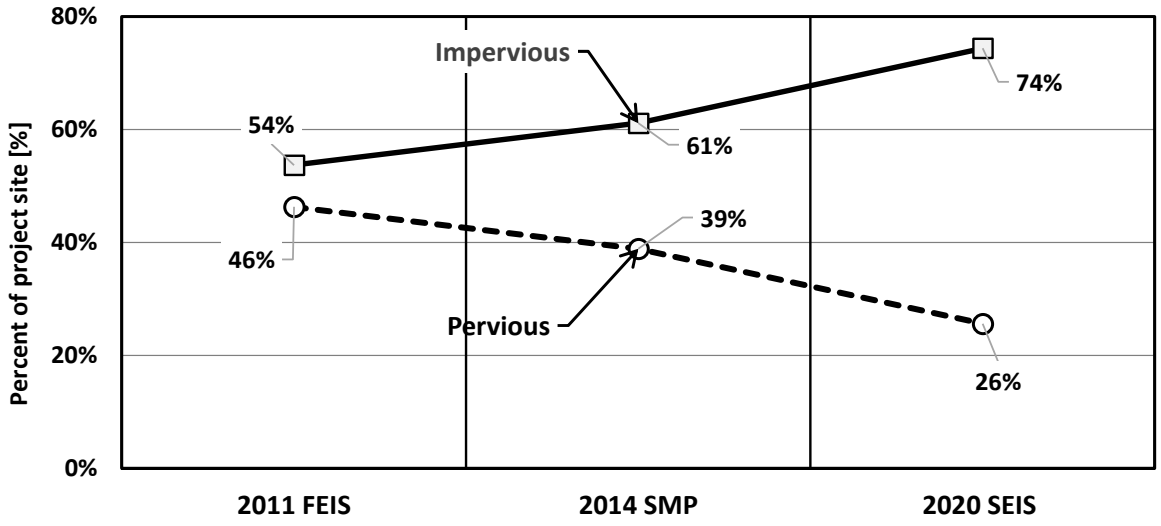


Figure 6.7.1.4: Comparison between impervious and impervious

6.7.2 Discussion about Impervious Versus Pervious Land Inside the Project Site

The conventional approach of developing a site in a sustainable way is to provide as much pervious land as possible. This approach provides for rainwater to infiltrate into the soil, which as a range of benefits. The infiltrated rainwater recharges the soil and underlying aquifers. Since less storm water runoff is created less runoff leaves the site and lower peak flow rates occur. Peak flows of runoff can create problems with streambed erosions and contribute to impacts to the aquatic resources.

The project site is, however, a former landfill, which in accordance with our research was not installed with an impermeable liner to hold back leachate from entering the groundwater. Leachate is created from infiltrated rainwater as it percolates through the landfill body and entrains potentially hazardous material. Leachate has a potentially significant adverse impact on the environment. By sealing the cover of the landfill, the amount of leachate is significantly reduced.

Therefore, since the project site is a former landfill and an impermeable seal below the landfill is missing, sealing the cover of the landfill is an essential impact mitigation strategy. In due course, establishing an impervious cover through pavement and buildings on a large portion of the project site , as being proposed, is a positive site development strategy.

<u>Implementing an impervious cover is also a condition imposed by the zone change</u> (City and County of Honolulu, Ordinance 13-35) , " … while avoiding infiltration into the existing landfill body … ", Condition 3.B of Ordinance 13-35, Stormwater Facilities. Therefore, increasing the impervious areas within the project site is a beneficial site development strategy.

6.8 Irrigation Approach Using Harvested Rainwater

This section describes the irrigation system using harvested rainwater which is part of the updated site development plan.

6.8.1 Changes from the Previously Approved Irrigation System Approach

Under the updated site development plan, irrigation areas and the process of irrigation will be changed relative to the previously accepted irrigation approach (SMP 2017/MOD-37)

The approved irrigation strategy was to collect rainwater to irrigate landscaped areas within the core areas of the site, inside the site perimeter berms. The perimeter berms, on the other hand, were not part of the irrigation plan.

Figure 6.8.1.1 shows an example of the previously approved strategy to irrigate vegetated areas within the site interior using harvested rainwater. Figure 6.8.1.1 shows area B of the previously approved irrigation system. The with the irrigated landscaped land which was located between the paved traffic area with buildings and the site perimeter berm. Rainwater was collected on a designated roof and flowed to a below ground storage tank for harvested rainwater. The harvested rainwater was then applied as irrigation water.

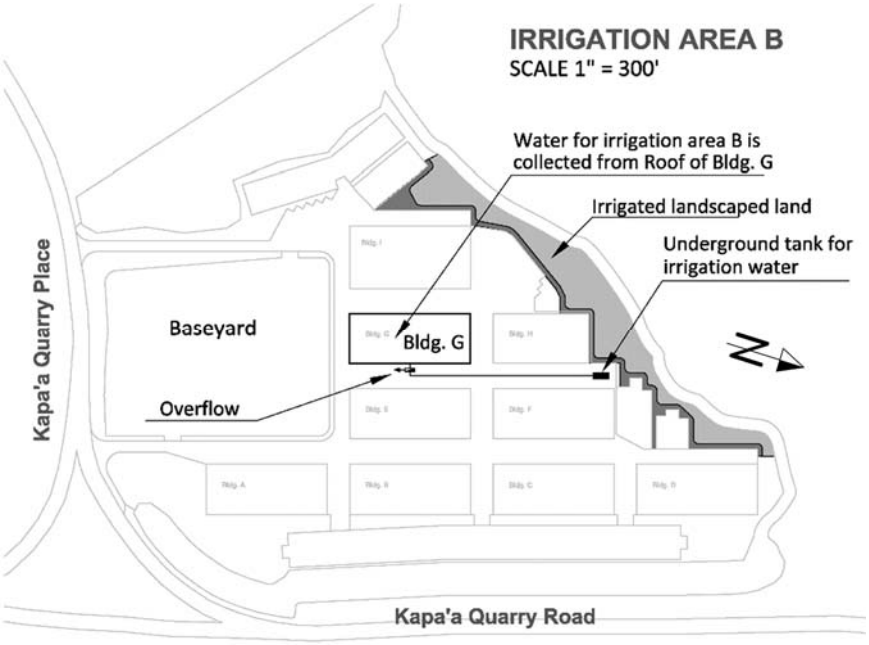


Figure 6.8.1.1: Example drawing of the previously approached irrigation approach for the site under the 2017 SP minor modification.

Source: Figure 2.4.3: Irrigation area B from the SMP Minot Modification (2017/MOD-37) Application Written Statement

Under the updated site development plan, larger landscaped areas within the site will not be used. Instead, smaller vegetated strips around buildings will be installed to provide attractive features.

Differently from the previously accepted irrigation strategies, the site perimeter berms will be irrigated to allow a dense vegetation cover made of by trees, shrubs, and ground cover. The dense vegetation will provide added protection against erosion of the berms, which is important since the berm heights and widths were increased relative to the accepted perimeter berms under the 2017 SMP minor modification permit. The dense vegetation on the perimeter berms will also provide the important functions of visual impact mitigation as well as noise and fugitive dust reduction.

Figure 6.8.1.2 illustrates the irrigation approach of the updated site development plan, using five irrigation areas at the site perimeter. Figure 6.8.1.2 shows the vegetated buffer strips.

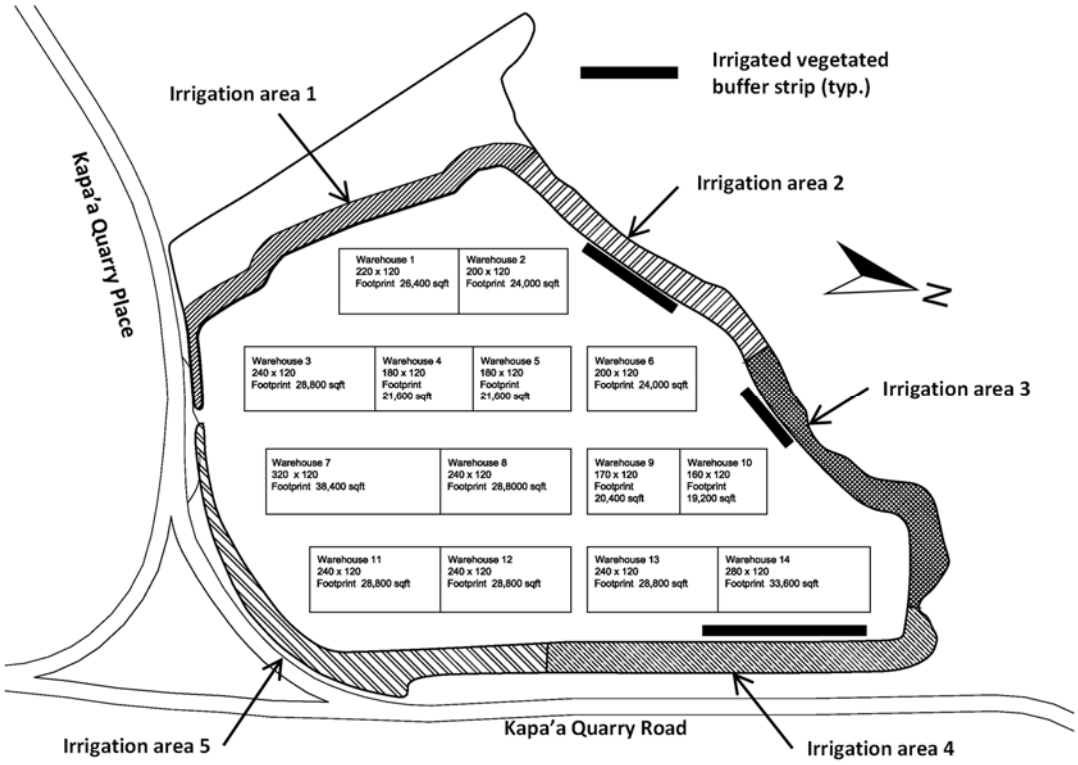


Figure 6.8.1.2: Updated irrigation approach using 5 irrigation areas at the site perimeter under the 2021 SEIS

6.8.2 Method of Calculating the Rainwater Storage Tank Sizes

The assessment of irrigation needs and therefore on the required volumes of rainwater harvesting storage tanks was done using the following assumptions:

1. Irrigation water will be applied to three types of vegetated areas, as follows:

    1.1 Portions of the vegetated berms: The type of vegetation on the site perimeter berms is a mix of larger and smaller trees, shrubs, and ground cover. The size is determined by their horizontally projected area. Limits of irrigated areas on the site perimeter berms are drawn approximately to divide the entire area of irrigated berms into five subareas 1 through 5.

1.2 Vegetated buffer strips: Turf grass is used for the three vegetated buffer strips, because of the high effectiveness of turf grass to filter our pollutants. Turf grass, however, has a relative high irrigation demand and therefore will require more irrigation water than other groundcover-plants.

1.3 Vegetated decorative strips around buildings: These vegetated strips around buildings are for aesthetics and will mostly have smaller trees and shrubs, and some groundcover for water retention.

2. Precipitation rate: The monthly rainfall rates for the site were obtained from the Rainfall Atlas of Hawaii website maintained by the Geography Department of the University of Hawaii.

3. Effective precipitation: The effective precipitation, referred to hereafter as the effective rainfall, is the portion of the precipitation that is stored in the root zone and can be used by the plants. The effective rainfall basically is the rainfall minus the deep percolation water and the runoff. Evaluating of effective rainfall involves several measures which are related to site specific soil and topography. The Food and Agriculture Organization of the UN (FAO) suggest that the effective rainfall is typically between 0.5 and 0.8. For this preliminary assessment of irrigation an average of 0.65 is used.

4. Reference Evapotranspiration Rate E_{T0} for the region: The monthly evapotranspiration rate E_{T0} for the project site were obtained from the Evapotranspiration pf Hawaii website maintained by the Geography Department of the University of Hawaii. These rates are measurements of the total amount of water needed to grow a reference plant in the given period, given in inches for this assessment.

5. Project-specific rate Evapotranspiration Rate E_{TL} : The monthly evapotranspiration rates for the irrigation areas were determined by multiplying E_{T0} by the landscape coefficient factor KL.

6. Landscape coefficient KL: The landscape coefficient K_L indicates the volume of water lost through evapotranspiration. The landscape coefficient varies with the plant species, microclimate, and planting density. The coefficient K_L is calculated by multiplying three terms:

   - The plant species factor accounts for variation in water needs of plants by different plant species.
   - The density factor accounts for the number of plants and the total leaf area of a landscape. Densely planted areas have more evapotranspiration than sparsely planted areas.
   - The microclimate factor accounts for local environmental conditions specific to the landscape, including temperature, wind, and humidity.

   For the present assessment, the three factors, plant, density, and microclimate, were obtained from tables provided by the LEED green building standard.

7. Irrigation efficiency (IT): This coefficient includes the type of irrigation system to be used. Sprinklers have a lower efficiency that drip irrigation.

The calculation of the expected irrigation needs, and the preferred sizes of harvested rainwater storage tanks included applying the assumptions 1 through 7 to the 5 irrigation areas within the Lower portion of the project site. Three different plant species were considered, trees, shrubs, and ground cover, which had different landscape factors. The net irrigation needs were expressed in inches and were applied to the irrigation area. The results were the monthly distribution of irrigation needs for the irrigation areas in cubic feet. As the final step to select the sizes of the storage tanks for rainwater harvesting percentages were applied to the maximum monthly value. These values expressed the portion of the irrigation needs that would be served by the harvested rainwater. For example, if the maximum monthly irrigation need were 1,000 cubic feet (cbft) and the percentage of irrigation provided was selected as 50%, the resulting size to the storage tank would be 500 cbft.

6.8.3 Layout of Five Irrigation Area

Figures 6.8.3.1 through 6.8.3.5 illustrate the location and extend of the five irrigation areas. Figure A through E furthermore indicate which building roof was harvesting rainwater for irrigation and where the approximate location of the underground rainwater storage tank would be.

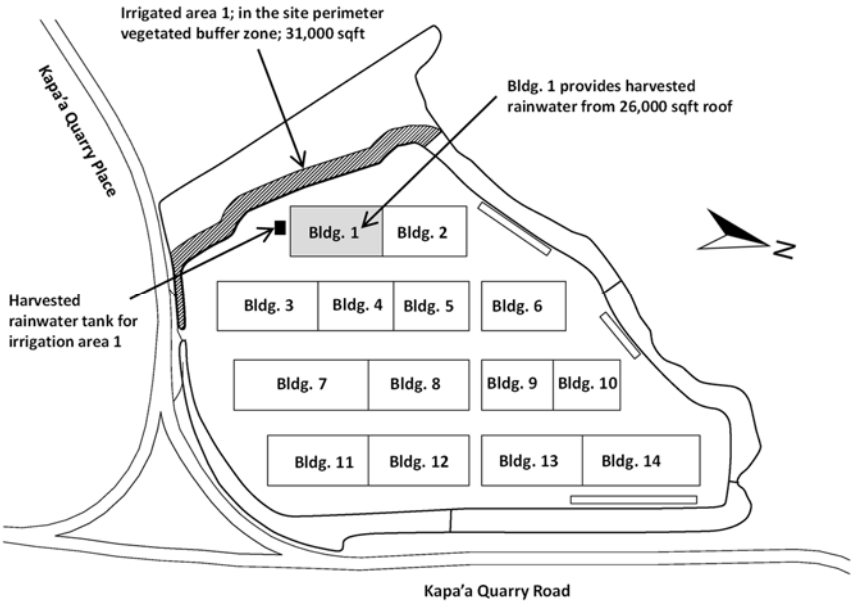


Figure 6.8.3.1: Location and extend of irrigation area 1

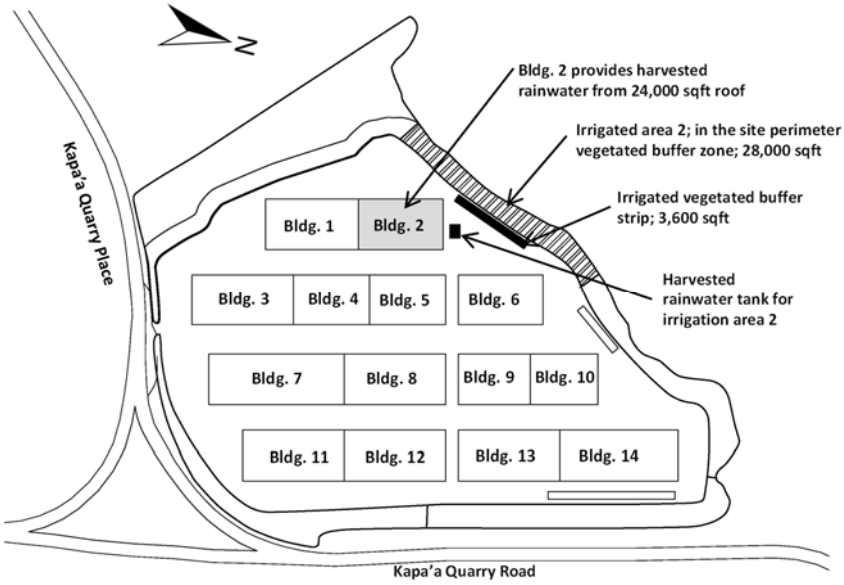


Figure 6.8.3.2: Location and extend of irrigation area 2

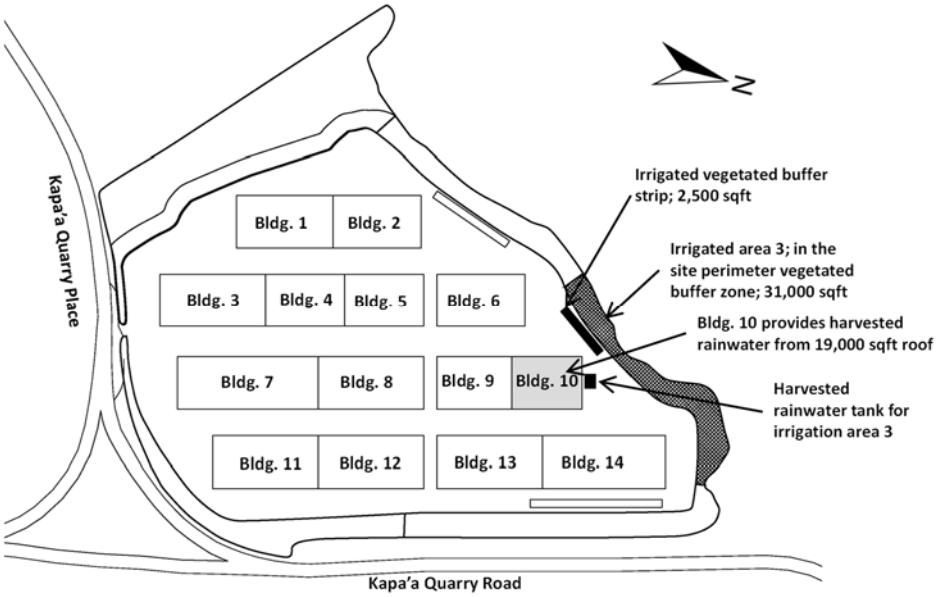


Figure 6.8.3.3: Location and extend of irrigation area 3

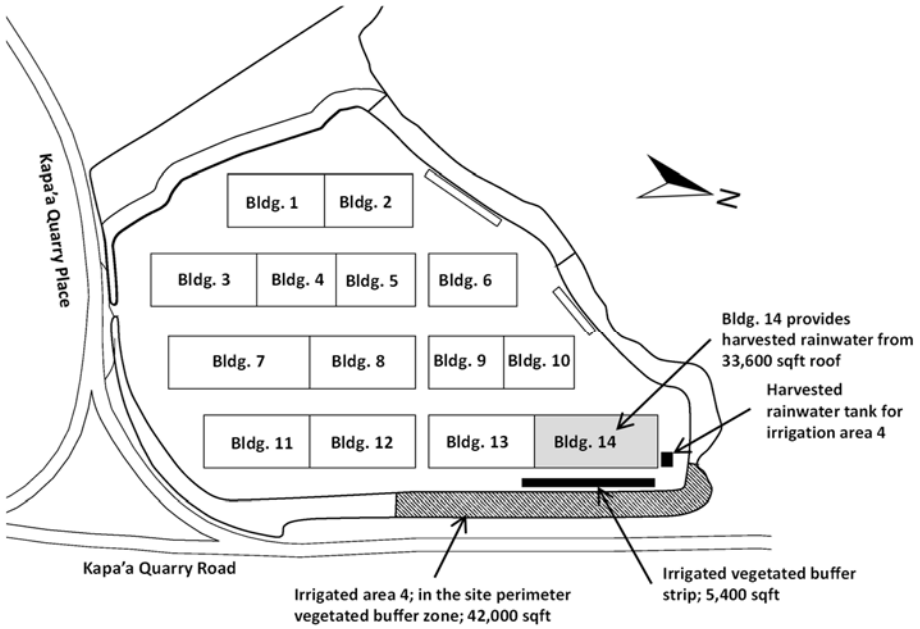


Figure 6.8.3.4: Location and extend of irrigation area 4

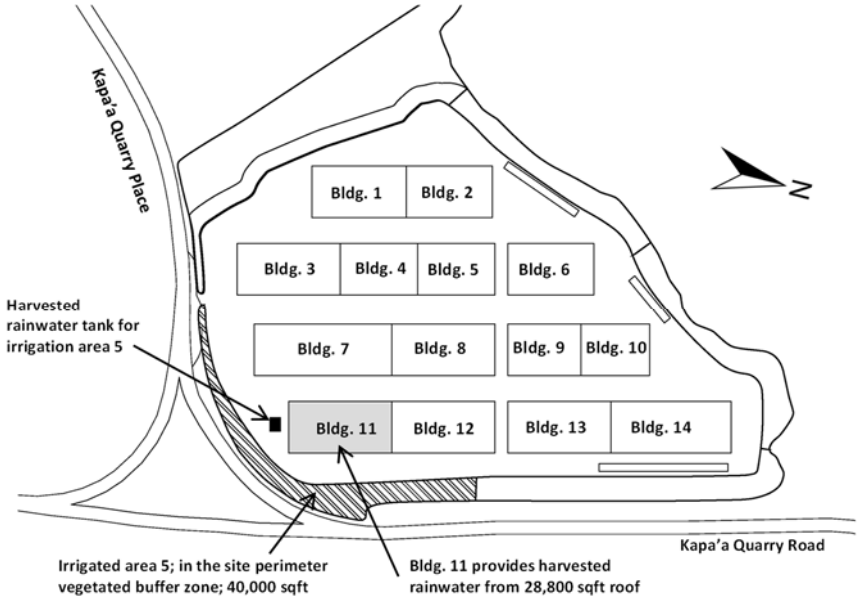


Figure 6.8.3.5: Location and extend of irrigation area 5

6.8.4 Results of the Irrigation calculations

Table 6.8.4.1 shows the results of the irrigation calculations.

Table 6.8.4.1: Results of the irrigation calculations

Irrigation areas	Areas to irrigate				Bldg. to collect rainwater		selected storage volume Note (1)
	Perimeter berm	effective are at perimeter	Vegetated Buffer strip	Plants around bldgs			
No.	sqft		sqft	sqft	Bldg. No.	Roof sqft.	cbf
Area 1	31,000	70%	0	1,400	1	26,000	1,300
Area 2	28,000	70%	3,600	2,400	2	24,000	2,200
Area 3	31,000	70%	2,500	1,700	10	19,200	2,000
Area 4	42,000	80%	5,400	1,400	14	33,600	3,300
Area 5	40,000	80%	0	1,900	11	28,800	2,000
							10,800

Note (1): Selected storage volume considers net irrigation needs for the subareas:

Type of irrigation area:	Percentage of irrigation needs served by the storage tank
Perimeter buffer	**50%**
Vegetated buffer strip	**70%**
Irrigated strip at bldgs.	**70%**

The selected storage volumes for harvested rainwater for the five irrigation areas consider different percentages of the net irrigation needs that will be provided, on average, for the respective irrigation areas. For the perimeter buffer berms, the percentage value is lower than for the vegetated buffer strips and the irrigated vegetated strips along the buildings. With smaller percentage values, the storage tanks for the harvested rainwater will be smaller since the probability that not all irrigation needs can be satisfied with harvested rainwater increases and likewise more potable water might be needed to substitute for harvested rainwater.

The irrigation needs would be reduced when native or adapted plants are used for the vegetated buffer zone on the perimeter berms. The quantitative effects of using native or adapted plants for the perimeter berms have not been included in the irrigation calculation, since the calculations used generic assumptions. But it can be expected that irrigation needs would be lower by using native or adapted plants. Figure 6.8.4.1 shows an example of the monthly distribution of net irrigation needs and the capacity of collecting rainwater to be stored. Figure 6.8.4.1 shows the example of irrigation area 4, which has the highest irrigation demand and the largest selected storage tank for the harvested rainwater. The size of the selected tank is 3,300 cbft, which is the aggregate volume for the three types of irrigated areas for the month of June, which has the maximum mean net irrigation needs of the design year.

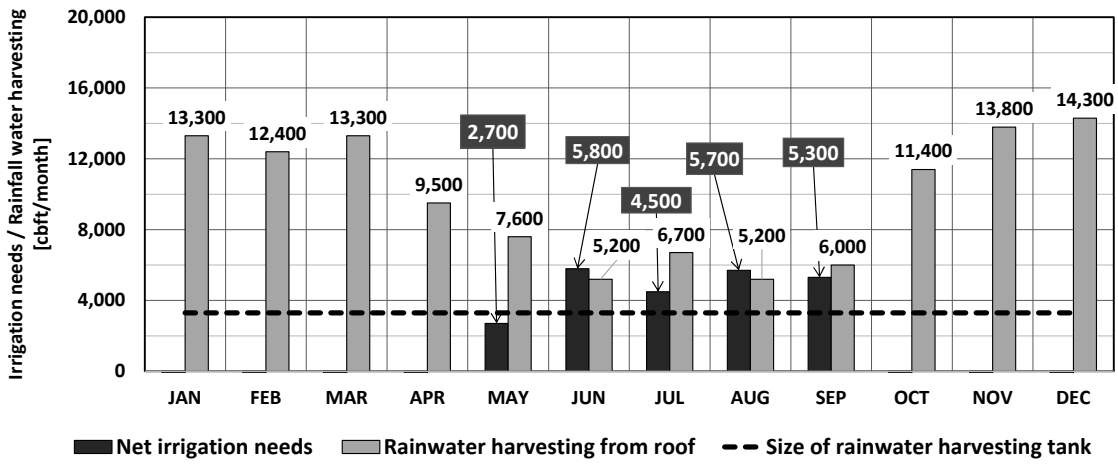


Figure 6.8.4.1: Monthly distribution of net irrigation needs and the capacity of collecting rainwater to be stored

6.8.5 Irrigation System

The preliminary design of the irrigation system is shown in Figure 6.8.5.1. Rainwater from the rooftop will be conveyed to the below-ground rainwater storage tank. If the tank is filled to capacity the tank overflows and the overflowing water is discharged to the site storm water collection system.

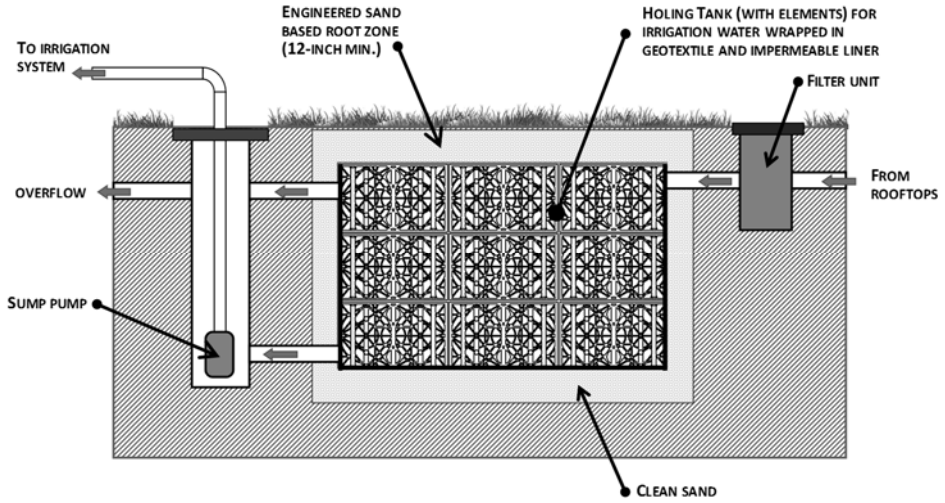


Figure 6.8.5.1: Below-ground rainwater storage tank with external irrigation pump

(source Figure 2.3.1 of the 2017/MOD-37 SMP minor modification report)

6.8.6 Comparison to Previous Irrigation Design Concepts

Table 6.8.6.1 shows a comparison of different irrigation system which have been proposed for the Lower portion of the Kapa'a Light Industrial Park. Table 6.8.6.1 indicates previous reports and concept designs

for the irrigation system for the Lower portion of the project site and the proposed total storage volume for the harvested rainwater.

Table 6.8.6.1: Comparison of different irrigation system for the Lower site

No.	Report title – or description of concept designs for irrigation system	Proposed total storage volume for Lower site
1	2011 FEIS – Final Environmental Impact Statement	Not specified – Irrigation storage was not quantified
2	2014 Written Statement and Project Description for SMP application; application was approved as 2014/SMA-27 permit	17,000 cbft
3	2017 Written Statement and Project Description for second SMP Minor Modification application; application was approved as 2017/MOD-37 permit	10,000 cbft
4	2021 This Supplemental EIS – The updated site development plan presented in this SEIS	10,800 cbft

6.9 Changes of the Roadway access to the Lower project site

This section describes the proposed modifications of the roadway access to the project site. The main difference between the approved roadway access configuration and the roadway access under the updated site development plan is the change from two road entrances to one entrance.

6.9.1 Description of the Previously Approved Roadway Access

The accepted roadway access design was developed to respond to one condition of the zone change ordinance. This requirement required the Applicants to work with the City & County Traffic Department on an agreement about road frontage improvements. For the Lower portion of the site this agreement included the construction of two roadway entrances. The agreement further requires the owner to construct an 8-foot sidewalk along the frontage of the site.

Figure 6.9.1.1 shows the proposed road access to for the Lower portion of the Kapa'a Light Industrial Park. Figure 6.9.1.1 illustrates the location and configuration of the two previously approved roadway entrances and intersections at the Southern site perimeter of the Lower site. The traffic agreement called for dedicated left turns into the Lower site for the East-bound traffic on the Kapa'a Quarry Place. The approved post-construction roadway accesses were planned at approximately the same locations as the two presently unpaved roadway accesses to the Lower site. The Figure shows the roadway accesses designs No. 1 and 2 which are superimposed on a background image of the existing Kapa'a Quarry Road and portions of the Lower site.

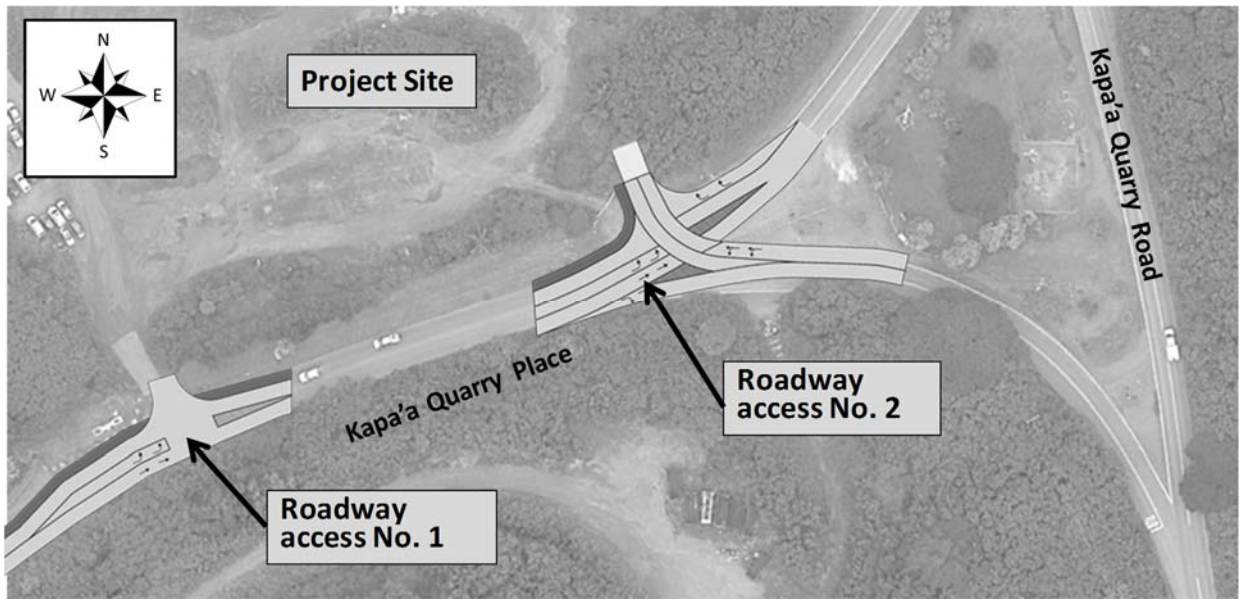


Figure 6.9.1.1: Two previously approved post-construction roadway accesses to the site (source Figure 9.2.1 of SMP the Minor Modification written statement 2017/MOD-37)

Under the approved plans the two road entrances and intersections were planned as follows:

Roadway access No. 1 was planned as a simple T-intersection. The intersection had a dedicated left turn lane for the East-bound traffic. The dedicated left turn avoided traffic interference for East-bound traffic on Kapa'a Quarry Place entering the site. The West-bound and the East-bound traffic had through-lanes.

Roadway access No. 2 was planned as a four-leg irregular cross intersection. The intersection had a dedicated left turn lane for the East-bound traffic on Kapa'a Quarry Place. The dedicated left turn avoids traffic interference for East-bound traffic entering the site. The West-bound and the East-bound traffic have through-lanes. The West-bound traffic had a deceleration lane. The North-West bound traffic had a combined through- and left-turn lane. The South-East bound traffic leaving the site had a dedicated through lane.

Figure 6.9.1.3 through 6.9.1.5 show three views of the existing traffic pattern adjacent to the existing unpaved and unimproved road entrance that is nearest to the Kapa'a Quarry Road. The existing road access is located near the Y-intersection that joins the two Lower portions of the Kapa'a Quarry Place roadway. Figure 6.9.1.2 shows the locations of the depicted views A through C.

Under the approved roadway design, access was planned to use the location of the existing road access for the post-construction road access. The visual inspection of the views A through C illustrates that the

traffic situation at the planned road access to the site has sight distance challenges and a complex traffic pattern. These traffic concerns have prompted the redesign of the roadway access to the site.

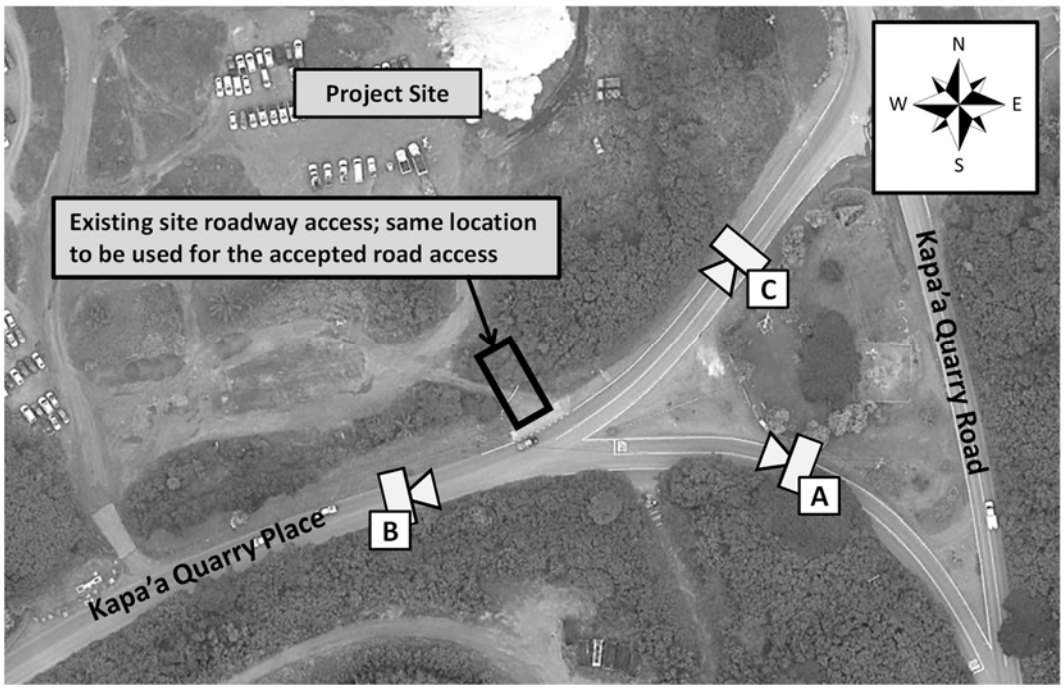


Figure 6.9.1.2: Locations of the view planes A through C at the existing unimproved roadway access

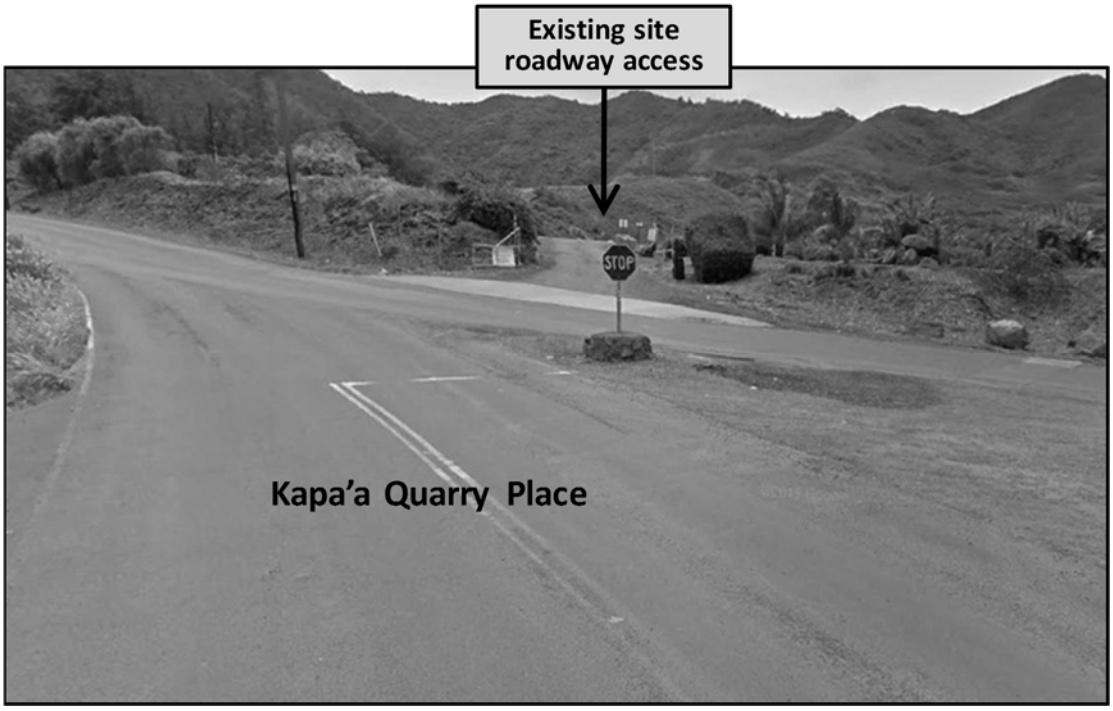


Figure 6.9.1.3: **View plane A**: traffic direction is **North-West** bound

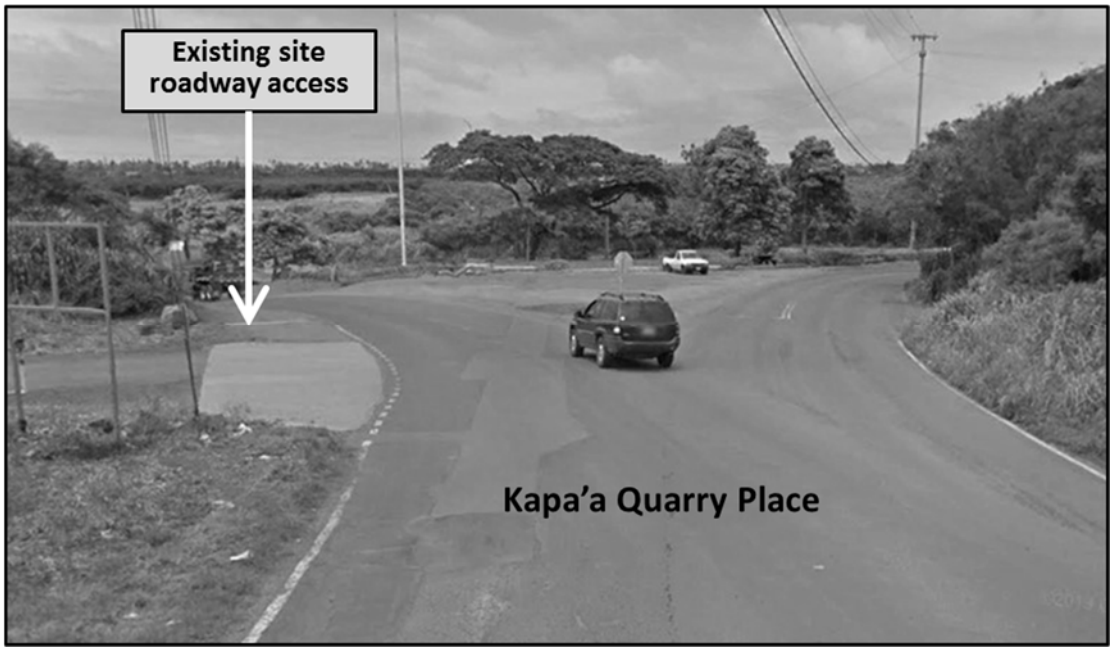


Figure 6.9.1.4: **View plane B**: traffic direction is **East** bound

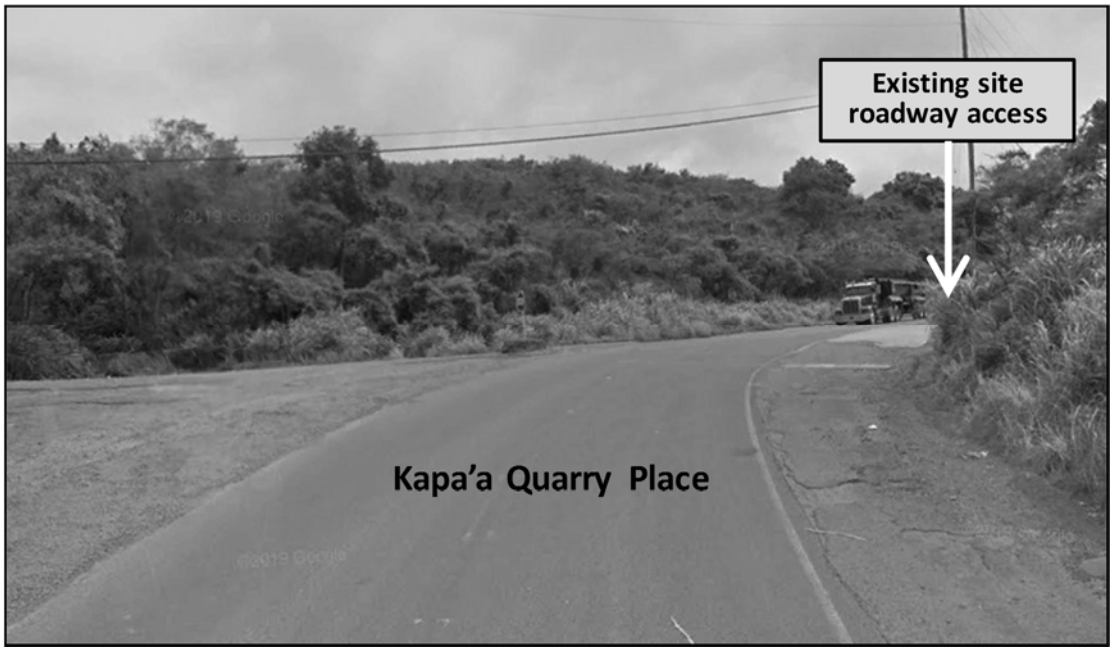


Figure 6.9.1.5: **View plane C**: traffic direction is **South-West** bound

6.9.2 Proposed Modified Roadway Access to the Lower Site

The proposed roadway access under the updated site development plan would be a single road entrance to the Lower site. The single roadway entrance would be located some 450 feet uphill and to the West from the approved roadway access No. 2. (refer to Figure 6.9.1.1). Figures 6.9.2.1 and 6.9.2.2 illustrate the location of the proposed roadway access. Figure 6.9.2.3 shows a detail of the proposed roadway access to the site.

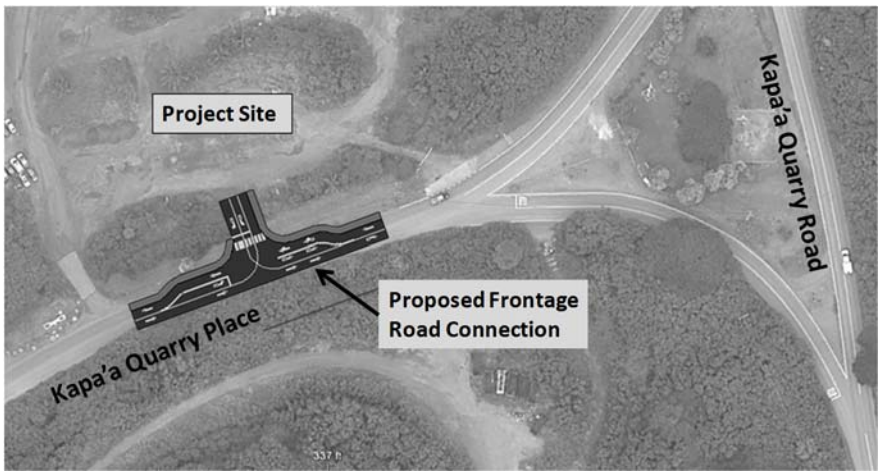


Figure 6.9.2.1: Location of the modified roadway access under the updated site development plan

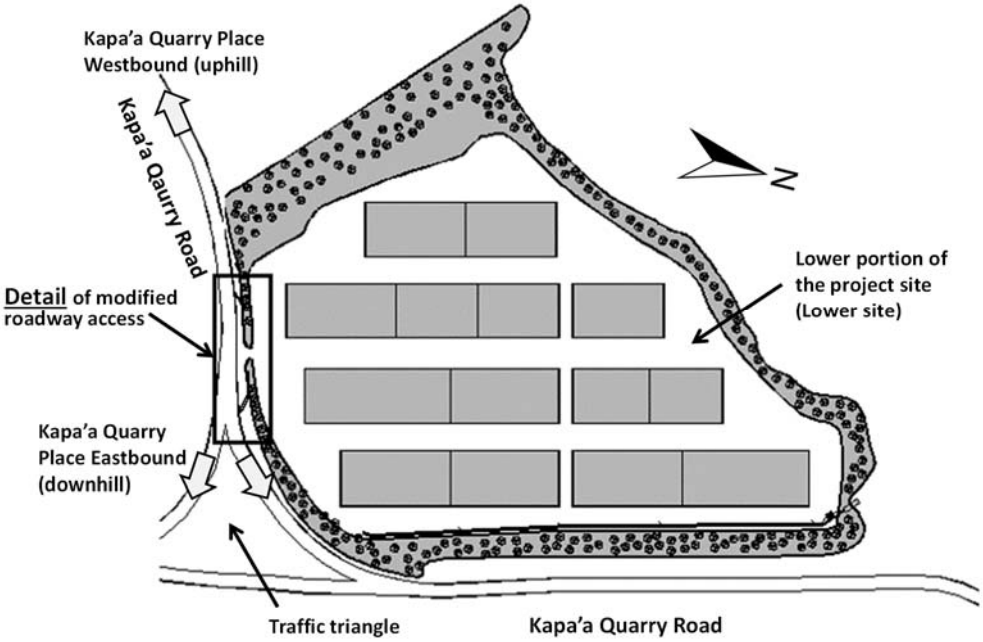


Figure 6.9.2.2: Location of the modified roadway access under the updated site development plan

Figure 6.9.2.3 shows the proposed configuration of the new intersection and roadway access to the Lower site with more of the surrounding area. Figure 6.9.2.3 indicates the location of the existing unpaved and unimproved roadway accesses to the Lower site.

In initial review, the Traffic Review Branch (TRB) accepted the concept of the single roadway access to the Lower site to substitute for the previous two roadway accesses. The final configuration of the intersection will be determined by the results of the Traffic Impact Analysis Report (TIAR) and ongoing communication with the TRB and the State Department of Transportation.

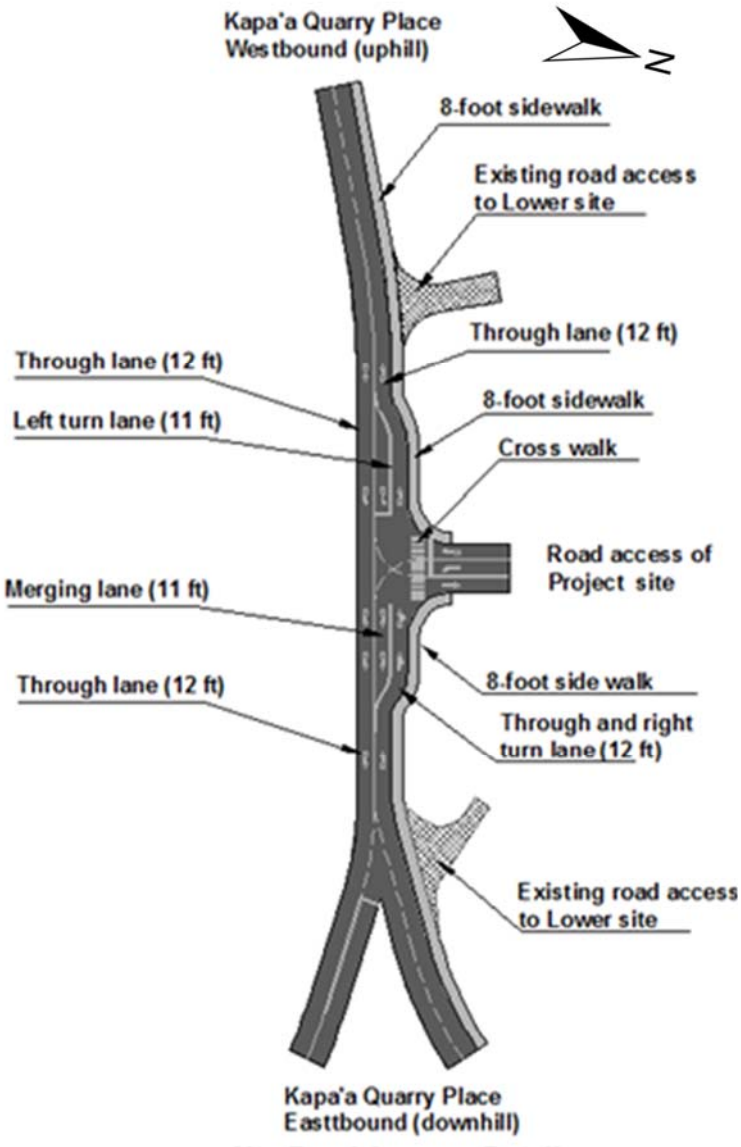


Figure 6.9.2.3: Detail of the **proposed** roadway access to the project site under the updated site development plan

Eastbound traffic has a dedicated left-turn lane and a through lane.

Westbound traffic has a combined right-turn and a through lane.

Traffic leaving the project site making a left turn has a dedicated left-turn lane and an acceleration lane to merge with the through lane for the East-bound traffic.

An **8-foot-wide sidewalk is shown,** which will be installed along the roadway is a requirement of DPP.

Upon initial review by TRB the configuration of the single roadway entrance configuration , depicted in Figure 6.9.2.3 will have to be adjusted to conform with the findings of the New TIAR.

Figure 6.9.2.4 illustrates the existing and planned traffic regulations on the Kapa'a Quarry Place, which are conveyed by existing and planned signs traffic. A 25-mph speed limit is in effect, which is posted by several traffic signs. An existing stop sign signals the merging eastbound traffic from the South on the Lower reaches of the Kapa'a Quarry place to yield to traffic on the Northern leg of the Kapa'a Quarry Place.

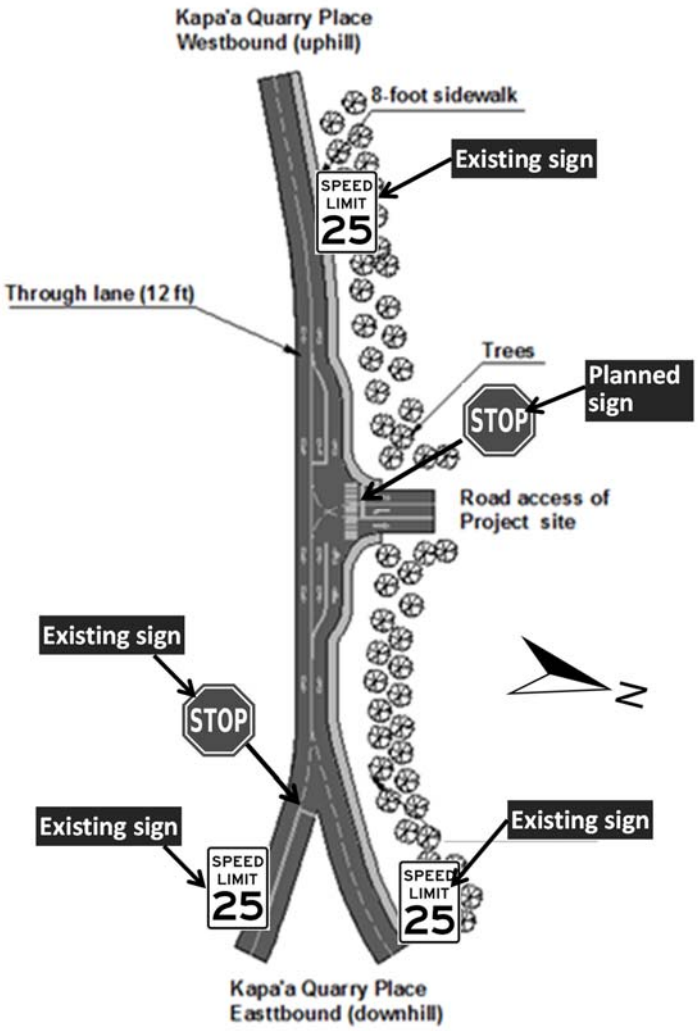


Figure 6.9.2.4: Existing and planned traffic regulation of the modified roadway access

Figure 6.9.2.4 illustrates the approximate locations of the existing and planned traffic signs.

The figure shows the approximate location of trees planted at the Southern of the Lower site perimeter for visual impact mitigation. While the trees are effective to block views of the warehouses inside the site, trees can be obstacles for traffic relevant views.

Therefore, the trees will be planted outside the clear sight triangles of the sight distance assessments.

Sight distance assessment for intersection with stop sign control.

Figures 6.9.2.5 and 6.9.2.6 show the sight distance assessments for the modified roadway access to the Lower site. The sight distance assessment was done for the traffic leaving the site. The vehicles leaving the site stop at the stop sign posted and must have sufficient sight distance to permit safe departure. For this assessment, the vehicles either make a left or a right turn maneuver.

The right turn maneuver requires first clearing the traffic coming from the vehicle's left and then entering the traffic coming from the vehicle's right. The required sight distance for this left turn is determined by the amount of time it takes the stopped vehicle making the left turn while clearing the traffic and reaching average running speed, without affecting the speed of the approaching vehicle. The right turn maneuver must have sufficient sight distance to permit safe entrance onto the intersecting roadway and then accelerate to the posted speed limit.

The assessment confirms that:

- For the left turn maneuver, the available sight distance is larger than the recommended sight distance of 280 feet for the speed limit of 25 mph. Therefore, the left turn sight distance is adequate. (Figure 6.9.2.5)
- For the right turn maneuver, the available sight distance is larger than the recommended sight distance of 240 feet for the speed limit of 25 mph. Therefore, the right turn sight distance is adequate. (Figure 6.9.2.6).

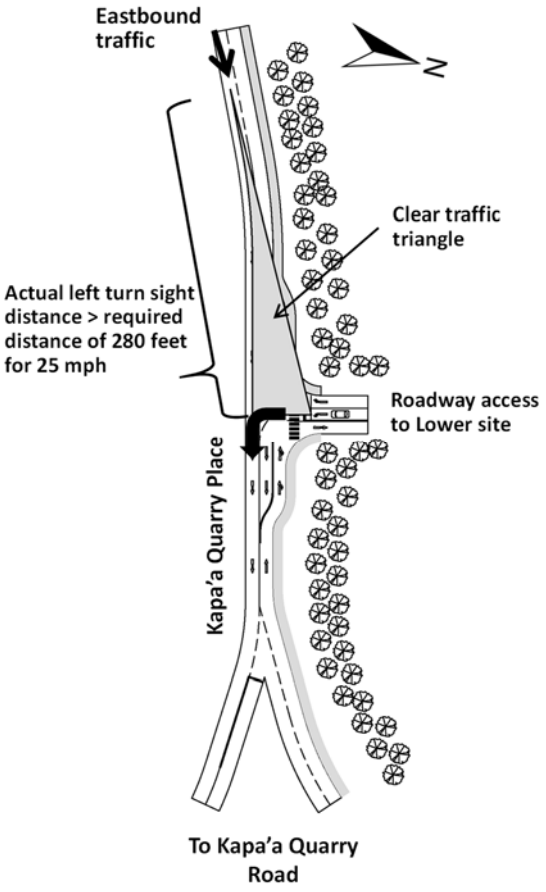


Figure 6.9.2.5: Sight distance assessment for **left turn** maneuver with Stop Sign Control

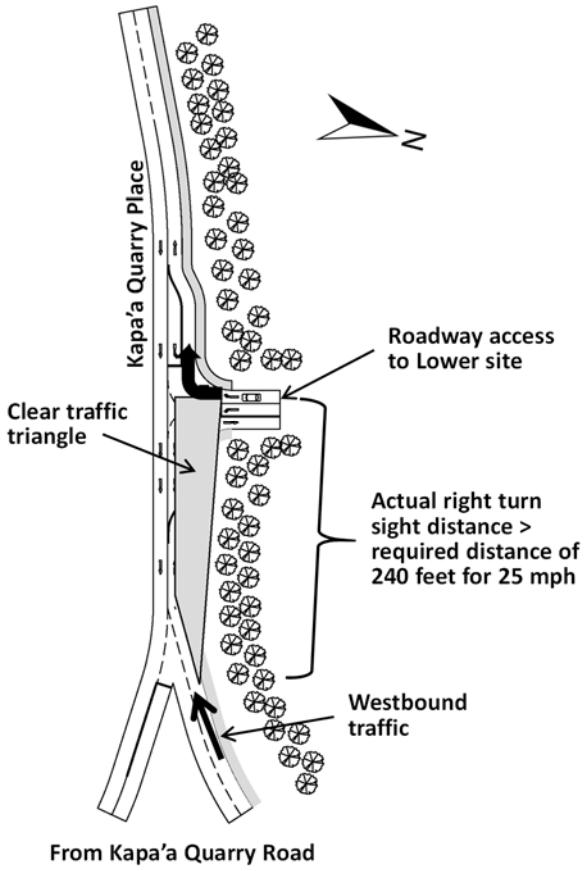


Figure 6.9.2.6: Sight distance assessment for **right turn** maneuver with Stop Sign Control

6.10 Modification of the Onsite Wastewater Treatment

This section describes the proposed modification of the onsite wastewater treatment and management system. The "approved onsite wastewater treatment system" refers to the conditions accepted in the "Special Management Area Use Permit No. 2014/SMA-27".

6.10.1 Approved Onsite Wastewater System

Under the approved onsite wastewater system, a Septic Tank Effluent Pumping (STEP) system was used. The STEP system is comprised of interconnected conventional septic tanks where the effluent of these conventional septic tanks is pumped to a centralized wastewater treatment facility rather than being discharge to conventional leach fields directly downstream of individual septic tanks.

Figure 6.10.1.1 shows the basic process diagram of the proposed STEP system. The wastewater treatment occurs in two process steps. The first treatment process step in the STEP system is a conventional septic tank, thus is like that of a conventional septic system. What is different in the STEP system is that conventional soil absorption fields (e.g., leach fields) which are located directly downstream of the septic tank are omitted. Instead, the septic tank effluent is pumped to a centralized treatment and disposal facility. The centralized treatment facility provides the second treatment process step.

The approved STEP system would utilize a recirculating sand filter as the centralized treatment. The treated effluent from the recirculated sand filter flows to either infiltration drain fields or, alternatively to irrigation, if irrigation is accepted as an additional treatment step.

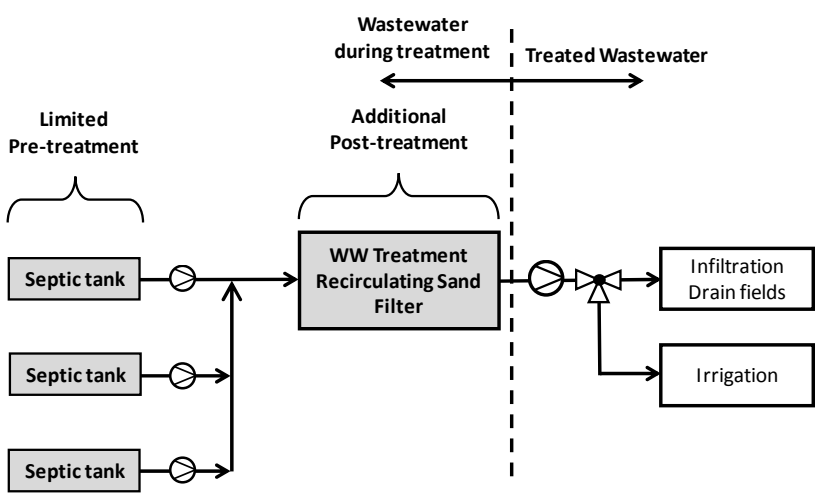


Figure 6.10.1.1 : Basic process diagram of a STEP system.

Figure 6.10.1.2 illustrates the STEP system layout under the accepted design approach. There were several septic tanks within the site. Multiple warehouse buildings were connected to different septic tanks. The central treatment system was a recirculating sand filter.

Figure 6.10.1.3 illustrates a basic working model of the proposed recirculating sand filter. The effluent from several septic tanks is pumped to the source tank of the recirculating sand filter units. Since the effluent that enters the system is only partially treated and without active aeration, the source tank is anaerobic. The water is pumped from the source tank to the top of the sand filter, where it is sprayed on the sand surface and percolates through the sand. The underdrain below the sand layer catches the flow and guides it back to the source tank from where it is recirculated. With the source tank being anaerobic denitrification process occurs. The treated water which is periodically withdrawn from the system is either infiltrated in a conventional leach field or used for drip irrigation, if possible, under the local jurisdiction. In accordance with the EPA typical residual pollutant level of the effluent from a recirculating sand filter is around BOD_5 10 to 20 mg/L. Higher BOD_5 levels indicate higher residual pollutant level in the treated effluent water.

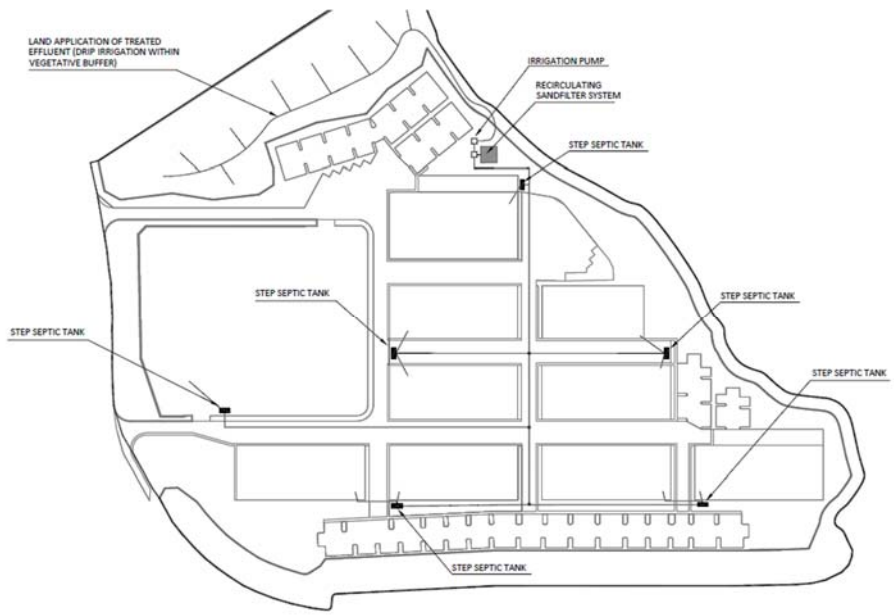


Figure 6.10.1.2: STEP system layout under the accepted design approach

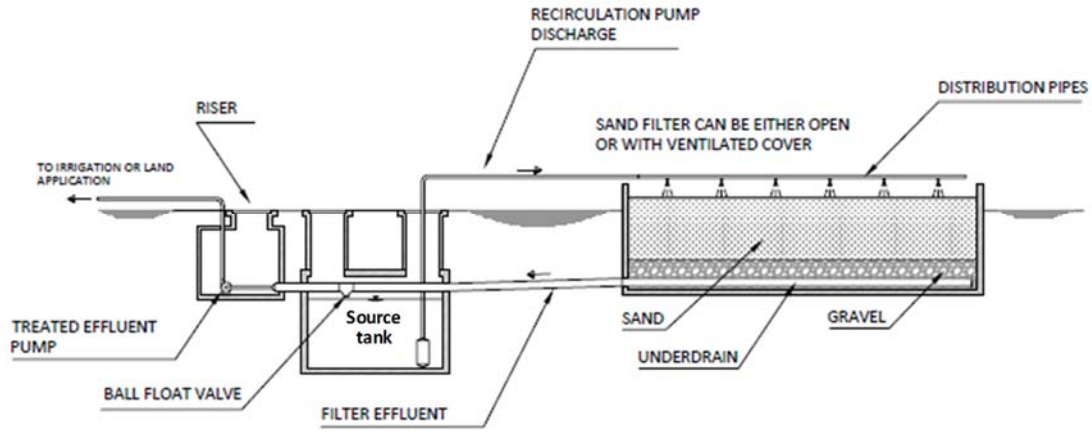


Figure 6.10.1.3: Illustration of the recirculating sand filter working model

6.10.2 Proposed Onsite Wastewater System

Several comments received on the DSEIS addressed the wastewater onsite treatment pilot project which is presently carried out in the Upper site in cooperation with and under supervision of the State Department of Health (DoH). The pilot project examines the Membrane Bioreactor (MBR) technology used for the KLIP in a specific project setting. The main objective of the pilot project is to verify that the treated effluent from the MBR system can be safely disposed of in infiltration fields which are smaller than the prescribed field size in HAR 11-62. The viability of using infiltration fields that are significantly smaller than soil absorption fields used for conventional septic systems has been proven in numerous applications on the US mainland.

The efficacy of using smaller infiltration fields for the MTD effluent is rationalized by the superior pollution reduction performance of MBR technologies, which produce a type of effluent which is significantly lower in residual pollutants than conventional septic system. Under conventional onsite wastewater treatment approaches, the overall treatment process efficiency incorporates treatment in unsaturated soil below the drain field. This treatment efficiency is added to the treatment in the process vessel. Since the treatment efficiency in the MBR system already surpasses that of entire multiple stage conventional onsite wastewater treatment systems, smaller disposal fields for the effluent are required. These smaller disposal fields for the MBR are designed for the hydraulic capacity of infiltrating water, similar to storm water infiltration.

Success of the pilot project will be to verify that smaller infiltration fields are sufficient to perform satisfactorily with the treated effluent from the MBR process units.

The proposed onsite wastewater system under the updated site development plan would use a treatment system that is certified under the New National Sanitary Foundation (NSF) standard 350. The NSF 350 standard allows certified system to use the treatment effluent for limited indoor and unlimited outdoor use. Recycling treated wastewater assumes a significant benefit of reducing valuable potable water for non-potable uses, such as irrigation or external cleaning of pavement, and other applications.

The NSF 350 compliant technology that would be used for the proposed onsite wastewater system is a Membrane Bioreactor (MBR) treatment unit. The typical residual effluent pollution level of the proposed system is equal or below BOD_5 5 mg/l, which is significantly Lower than the accepted effluent quality of BOD_5 from the recirculating sand filter.

Figure 6.10.2.1 illustrates the working process of the MBR treatment technology. The entire treatment process occurs inside the process vessel. The geometry of the MBR process vessel resembles a conventional septic system, but the tank volume is about 30% larger. The MBR process vessel contains a membrane unit with integrated effluent pump. As Figure 6.10.2.1 indicates, the effluent of the MBR system is treated water and can be directly pumped to infiltration trenches or to irrigation, when irrigation is applicable. It can basically be assumed that the effluent from the MBR system is equal in quality to treated stormwater runoff, but the difference is that disinfection of the treated wastewater must occur if there could potentially direct contact to humans, such as using sprinklers for irrigation.

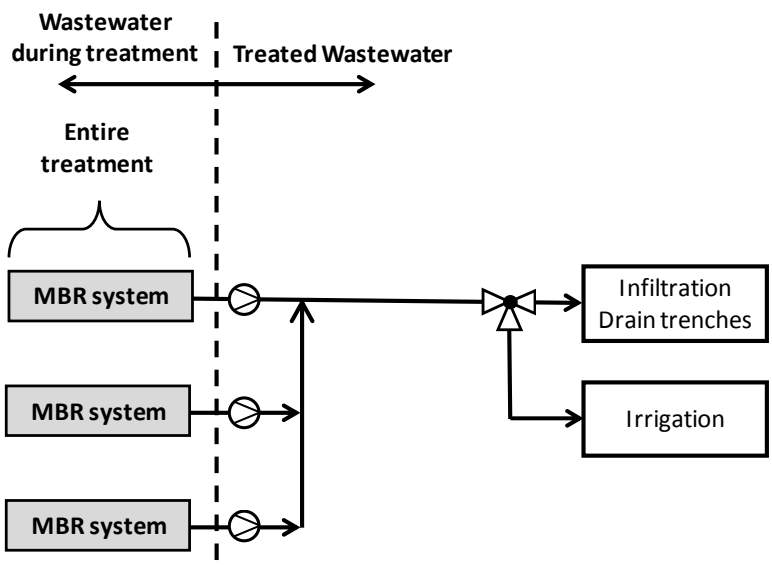


Figure 6.10.2.1: Basic process diagram of the MBR system at the site

One of the significant advantages is the reduction of soil absorption fields relative to conventional septic systems.

The reduction of soil absorption fields is since all treatment occurs in the MBR process vessel and that additional aerobic treatment such as in unsaturated and conventional soil absorption fields

Figure 6.10.2.2 shows a preliminary site map with six MBR systems distributed within the Lower site. Each MBR system would serve multiple buildings.

The effluent of each MBR system would be pumped batchwise to a central infiltration field or be used for irrigation, if applicable. Figure 6.10.2.3 shows a depiction of typical three compartment process vessel of a MBR system. The depicted MBR process vessel has three compartments, a pretreatment compartment (A), an anaerobic compartment for denitrification (B) and an aerobic aeration compartment (C). After aeration and recirculation within the anaerobic and aerobic compartments the treated water is pumped across a membrane and leaves the process vessel as an effluent with exceptionally low residual pollutant impurities.

The MBR technology for the proposed onsite wastewater treatment is presently tested by the owner at the project site to confirm performance under Hawaii condition. The testing at the project site is under a **pilot test program, which is endorsed by the Hawaii State Department of Health (DoH).**

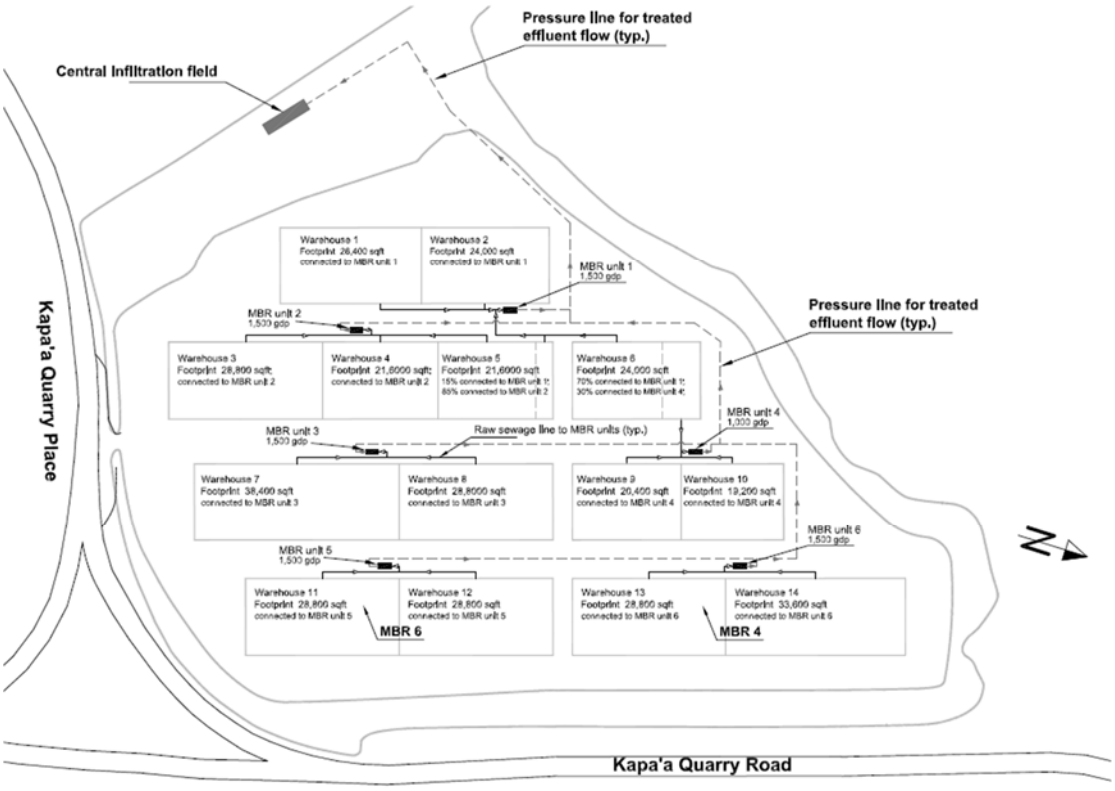


Figure 6.10.2.2: MBR system layout under the proposed design approach

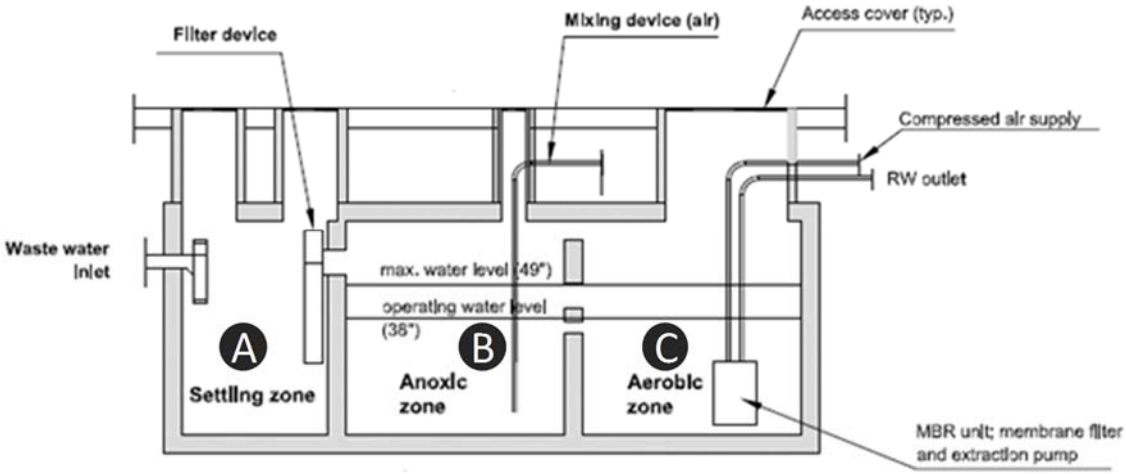


Figure 6.10.2.3: Illustration of the MBR technology used for the proposed onsite wastewater treatment

Conclusions:

The proposed onsite wastewater system uses a Membrane Bioreactor (MBR) treatment technology which is more advanced and more effective in pollutant removal than the wastewater treatment technology used for the accepted onsite wastewater system.

The treated effluent from the MBR system can be compared to treated stormwater runoff and has a low residual impurity level.

At the present time, the proposed MBR technology is being tested under a pilot project at the project site to verify favorable treatment results from previous mainland installations. The focus of the pilot project is the performance of the After successful completion of the pilot project the MBR technology would be used for all future onsite wastewater treatment installations.

Under the proposed wastewater management system, the treated water from the MBR systems would be pumped to a centralized infiltration field. The sizes of the infiltration field for the MBR effluent is significantly smaller than conventional soil absorption fields.

6.11 Assessing Impacts of Relocation a Powerline in the Lower Site (New Section)

This Section 6.11 is added to the DSEIS document.

This Section 6.11 describes the need to change the alignment of power lines that currently pass through the Lower site, several options for how this realignment could be accomplished, and the relevant impacts and associated mitigations which such a change in alignment would cause to the environment and the community.

6.10.1 Existing Alignment of the Power Line

The existing alignment of the 4 kV power line which supplies the project site with electricity (Kapa'a 4kV power line) passes through the Lower site is shown in Figure 6.11.1.1. The Kapa'a 4kV power line connects to an existing power line at the pole that is indicated as "A". From pole A, the Kapa'a 4kV power line crosses the Lower site to a point where it intersects the Eastern site perimeter. From this point the Kapa'a 4kV power line runs to the pole B. The Kapa'a 4kV power line continues from pole B to run Westwards along the Kapa'a Quarry Place towards the existing warehouse development in TMK 4-2-15:013 and 014 (upper portion of).

The approximately 1,400-foot section of the Kapa'a 4kV power line which needs to be rerouted runs between pole A and pole B. The existing Kapa'a 4kV power line will stay in operation until a new alignment will be installed that bypasses the section from A to B. The new alignment of the Kapa'a 4kV power line will run outside the buffer zone, and thus outside the site perimeter berms.

Figures 6.11.1.3 through 6.11.1.6 show close views of the existing Kapa'a 4kV power line. Figure 6.10.1.2 indicates the locations and directions of the viewpoints.

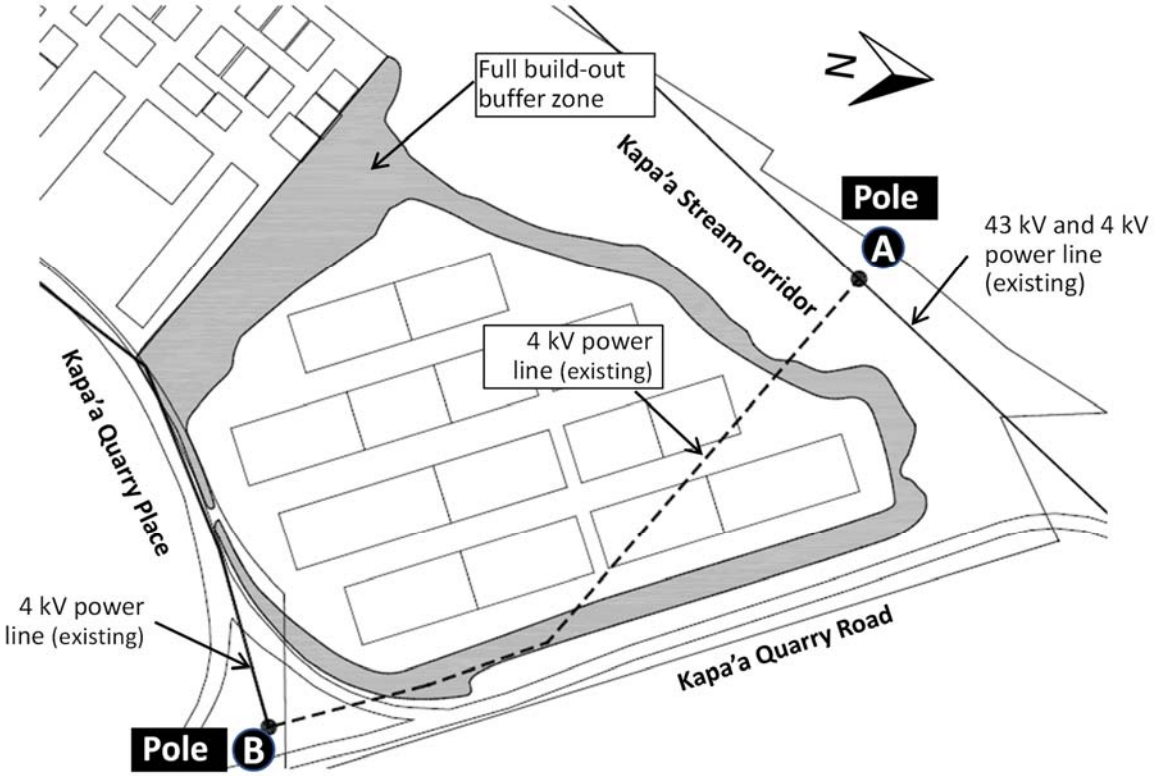


Figure 6.11.1.1: Existing Kapa'a 4kV power line (this Figure has been added to the DSEIS; refer to Appendix L)

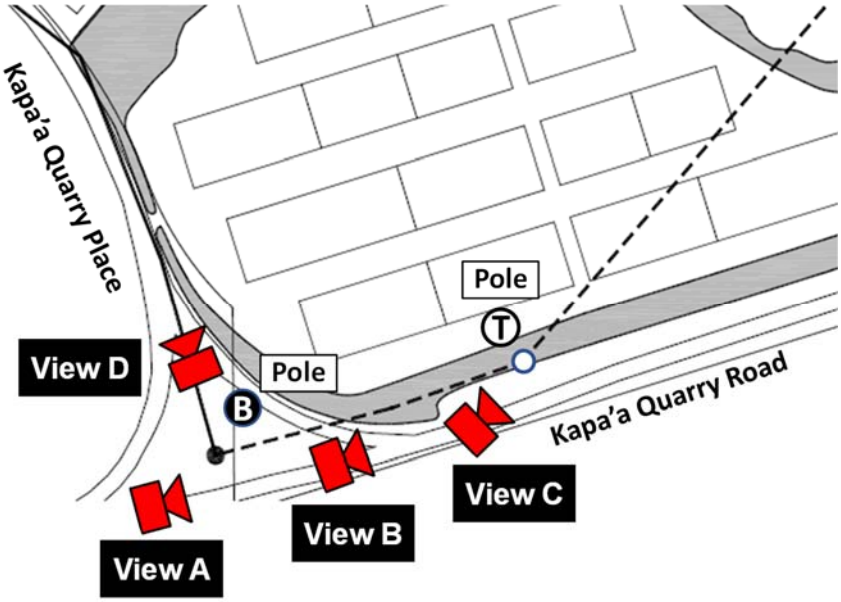


Figure 6.11.1.2: Views of the existing Kapa'a 4kV power line

The indicated camera positions A through D show the locations and direction of the viewpoints shown in Figure 6.10.1.3 through 6.10.1.6

(this figure was added to the DSEIS; refer to Appendix L)

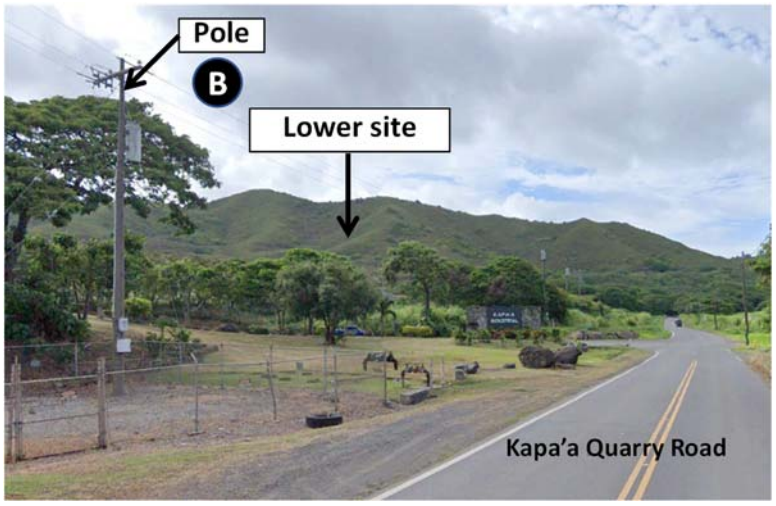


Figure 6.11.1.3: View A of the existing Kapa'a 4kV power line

The view is to the North along the Kapa'a Quarry Road. The Pole B is readily accessible.

(this figure was added to the DSEIS; refer to Appendix L)

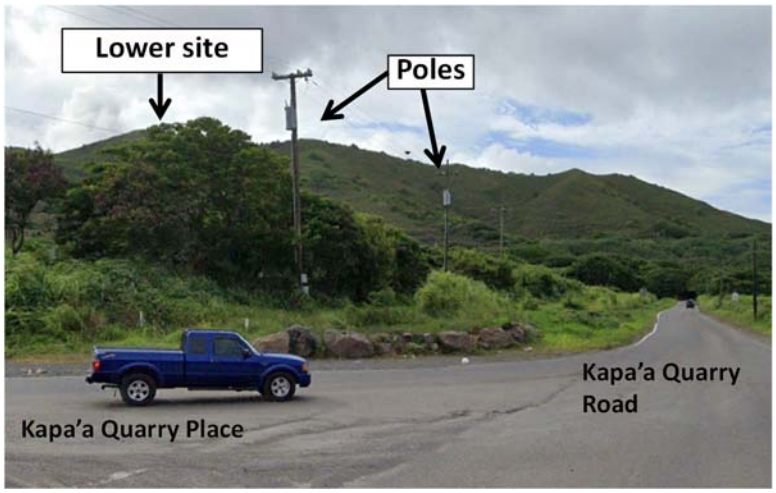


Figure 6.11.1.4: View B of the existing Kapa'a 4kV power line

There are two intermediate poles between the Pole "B" and "T".

(this figure was added to the DSEIS; refer to Appendix L)

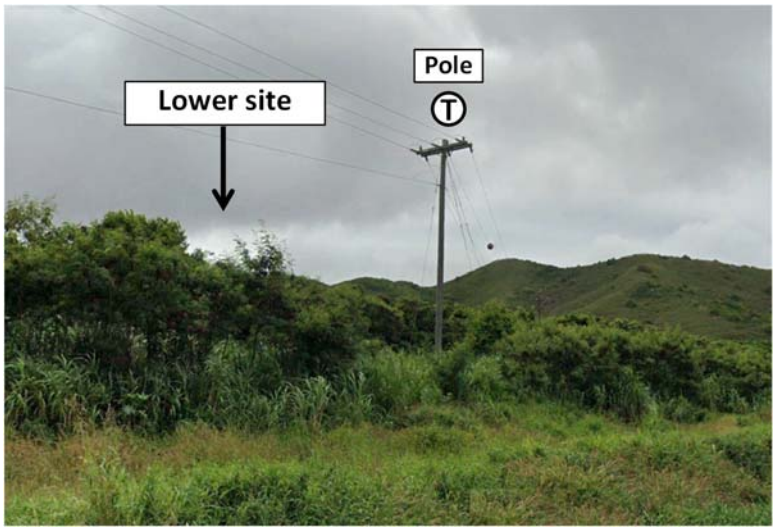


Figure 6.11.1.5: View C of the existing Kapa'a 4kV power line

The Pole T is the point where the alignment of the 4 kV power changes direction from parallel to the Kapa'a Quarry Road to passing over the Lower site.

(this figure was added to the DSEIS; refer to Appendix L)

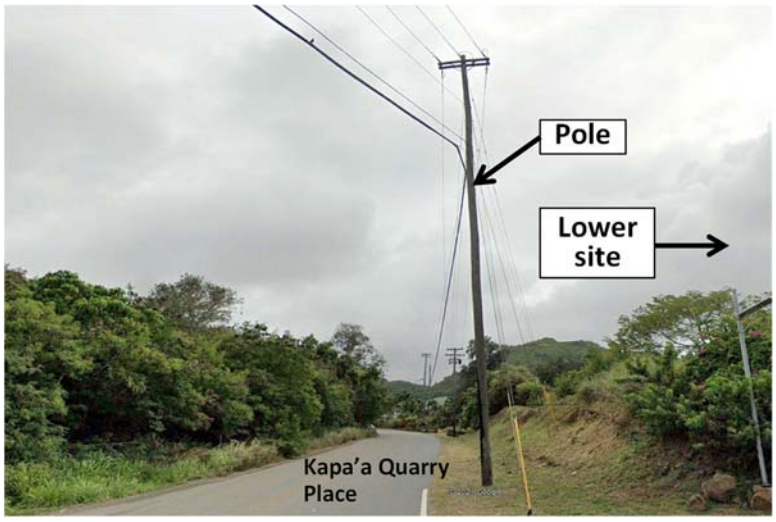


Figure 6.11.1.6: View D of the existing Kapa'a 4kV power line

The portion of the 4 kV power line to the West of Pole B will basically remain the same. The pole indicated in the foreground will have to be moved by approximately 50 feet to make space for the new road entrance to the Lower site.

(this figure was added to the DSEIS; refer to Appendix L)

6.10.2 Several Alternative Alignments Considered

Figure 6.11.2.1 shows three alternative alignments which are considered. In addition, the No Action alternative is shown as the current 4kV Kapa'a power line alignment.

No-Action Alternative: Under the No-action alternative the power supply to the Kapa'a Light Industrial Park, the 4 kV Kapa'a power line, would remain the same. The section of the 4 kV Kapa'a power line which passes through the Lower site would remain in places. Under the No-action alternative, the Lower site could not be developed. Therefore, the No-action alternative is not considered as a viable option.

Alternative A: Under Alternative A the 4 kV Kapa'a power line would connect to the Pole A of the existing 4 kV power line outside the Lower site. This means that the Alternative A of the 4 kW Kapa'a power line would connect to the same Pole A as the existing 4 kV Kapa'a power line. From Pole A, the power line would cross the Kapa'a Stream corridor and run in the East direction to change in direction to the South, along the Eastern boundary of the Lower site toward Pole B.

Alternative B: Under Alternative B the 4 kV Kapa'a power line would connect to the Pole C of the existing 4 kV power line outside the Lower site. This means that the Alternative B of the 4 kW Kapa'a power line would connect to a different pole as the existing 4 kV Kapa'a power line. From Pole C, the power line would cross the lower reaches of the Kapa'a Stream corridor and run to the South, along the Eastern boundary of the Lower site toward Pole B.

Alternative C: Under Alternative C the 4 kV Kapa'a power line would connect to the Pole C of the existing 4 kV power line outside the Lower site. This means that the Alternative C of the 4 kW Kapa'a power line would connect to a different pole as the existing 4 kV Kapa'a power line. From Pole C, the power line would cross the Kapa'a Quarry Road and run to the South, along the Eastern side of the Kapa'a Quarry Road toward Pole B.

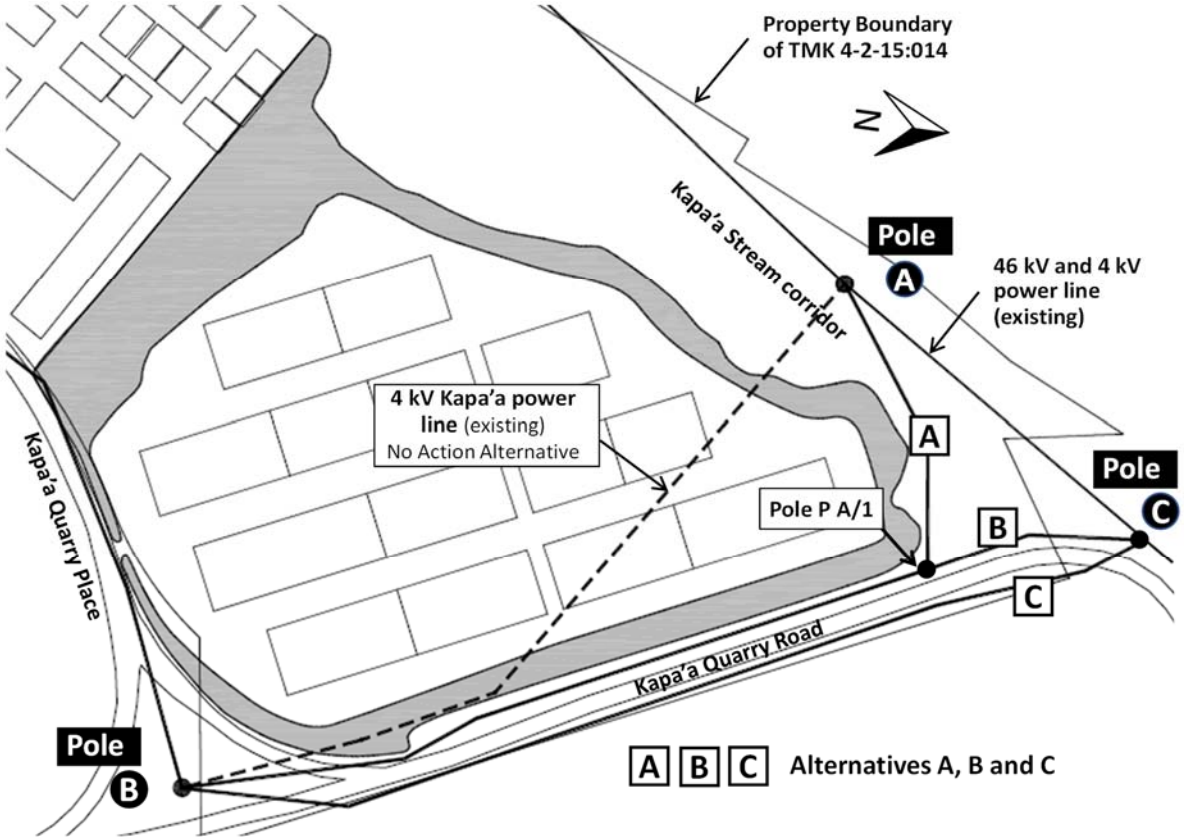


Figure 6.11.2.1: Alternative alignments A, B and C of the 4 kV Kapa'a power line to Pole B; (this figure was added to the DSEIS; refer to Appendix L)

6.10.3 Assessment of Impacts

Appendix L presents a comprehensive impact assessment. A summary of the main findings include:

The existing section of the 4 kV power line that supplies the KLIP and the Kapa'a Transfer Station with electricity that passes through the Lower site must be removed from the Lower site and substituted with a new section of the power line that is outside of the Lower site.

Appendix L refers to choosing one of the options for proposed relocation of the 4 kV Kapa'a power lines as the "proposed action". Appendix L describes the expected impact of each of the several options for the proposed relocation of the 4 kV Kapa'a power lines, including:

- Air Quality
- Geology and Soils
- Aquatic Resources
- Botanic Resources
- Wildlife Resources
- Historical and Cultural Resources

- Visual and Aesthetic Resources
- Traffic Impacts

In Appendix L, a detailed environmental impact and mitigation review of the proposed 4 kV Kapa'a power line relocation was performed for alternatives B and C. The findings include:

- Air Quality: There would be no long-term adverse impacts to air quality under both alternatives. have Temporary impacts to air quality from construction as well as cumulative impacts would be negligible.
- Geology and Soils: No significant long-term impacts are expected, and impacts would be temporary during construction.
- Aquatic Resources: Under Alternative C, possible minor impacts could exist with aquatic resources in the Makai drainage ditch during installation of poles. Under Alternative B, the likelihood of such impacts would be smaller. Under both alternatives, the Proposed Action would have short-term impacts and no long-term impacts would be expected.
- Botanic Resources: Under both alternatives, the effects on botanical resources would be short-term during installation of the poles and the conductors. The Proposed action is not expected to cause significant long-term effect on botanic resources. Some trees would require long-term maintenance to keep branches away from the power lines.
- Wildlife Resources: Effects on wildlife during construction are expected to be small and only last a short time. Avoidance would contribute to lower direct impacts. Long-term effect could cause impacts to birds colliding with electric lines, which would be more pronounced under Alternative C. Some mitigation measures could be used to lower the incidence of bird collision through suitable line marking and placing the conductor in a horizontal position thereby lowering the lateral impact area.
- Historical and Cultural Resources: Under both alternatives, historical and cultural resources would technically not be affected. It must be mentioned, though, that Alternative C is closer to the delineated boundaries of the Kawainui Marsh, a state treasure..
- Visual and Aesthetic Resources: Under both alternatives, there will be some level of visual impact, with the long-term impacts more pronounced. The short-distance visual impacts caused by the Alternative C would be more noticeable than under Alternative B due to the different distances of the poles from the roadway. Long-distance visual impacts will be comparable, since under both alternatives the poles will blend into the background of the new vegetated site perimeter berms. Visual impact-mitigation measures will be available to lower possible negative visual experiences.
- Traffic Impacts: Under Alternative C, there would be short term and long-term impacts on the traffic flow and safety on the Kapa'a Quarry Road. The short-term impacts would be traffic impacts due to closure of one traffic lane. Long-term effects would be impacts on traffic safety due to installing poles close to the roadway. The short-term impacts would be mitigated by traffic controls and the long-term impacts would be mitigated by keeping the poles a far away from the edge of the roadway as is possible considering the limited width of the Makai shoulder. Under Alternative B, only some short-term traffic impacts would occur and no long-term impacts. These short-term impacts are considered unavoidable and minimal.

CHAPTER 7 - CUMULATIVE & UNAVOIDABLE IMPACTS, SHORT-TERM USES TO LONG-TERM PRODUCTION , UNRESOLVED ISSUES

Chapter Six of the 2011 FEIS described cumulative and unavoidable impacts, short-term uses to long-term production and unresolved issues. This SEIS document updates these issues and describes developments of the Proposed Action to resolve them.

7.1 Relationship between Short-term Uses and Long-term Productivity

Section 6.1 of the 2011 FEIS described that site development and construction of buildings on the proposed site would require short-term uses of land and other resources. The description included how short-term uses of the Proposed Action would affect the long-term productivity of the natural and human resources.

The terms "short-term" refers to temporary impacts during construction and site development of the proposed project and "long-term" refers to the impacts of the proposed project during its operational life. The relationship between short-term uses and long-term productivity would not be appreciably different between the two SEIS alternatives.

7.1.1 Short-term and Related Impacts

Section 6.6.1 of the 2011 FEIS described that the site development and construction of buildings of the proposed light industrial park would result in short-term construction-related impacts. Such impacts would be caused by interference with traffic on the affected roads and intersections, increased air emissions through the generation of limited dust and the use of construction equipment, increase in ambient noise levels by the increased traffic and construction activities, disturbance of wildlife as well as increased stormwater runoff. These impacts would be temporary and would occur only during construction and site development work of the proposed park. These impacts were not expected to alter the long-term productivity of the natural environment. Impacts during the construction are also described in Chapter 4 of this Final ~~Draft~~ SEIS.

The planned site development approach of the Proposed Action can be divided into two different categories or phases of short-term impacts:

> Phase 1 - impacts from work associated with site preparation: These impacts would include grading, construction of roadways, parking areas and other traffic areas, installation of utilities, landscaping, and construction of vegetated perimeter berms of the project site. Since most of the soil disturbance would occur during Phase 1, most of the related impacts would happen during this phase. The relocation of the 4 kV Kapa'a power line would occur in this phase, since the existing poles have to be removed from the site to allow operation of heavy grading equipment and the fill to build up to the full build-out elevation.

Phase 2 - impacts from the construction of individual warehouses and ancillary structures: These impacts would include construction of the building shell, the development of the area in immediate vicinity of buildings and the build-out of the interior of the warehouse to fit the tenant's needs. While the construction of individual warehouses would require about 3-4 months each, warehouses are installed one after the other, with periods of no construction activities between. The 2011 FEIS estimated the time for all buildings to be added to the proposed development of about approximately 15 to 17 years. The actual duration would be subject to the rate at which industrial space is absorbed in the region. With an estimated 15 to 17 years, the 2011 FEIS predicted completion date would be around 2028 the latest. Since the time of the FEIS approval, the project has been phasing in according with community demand. As a result, the completion date may be beyond 2028.

7.1.2 Long-term Productivity Benefits to the Local Economy

Section 6.1.2. of the 2011 FEIS described long-term benefits of the proposed action.

The Proposed Action would increase long-term productivity of the Koolau Poko region by strengthening the economic infrastructure and assist in diversifying the local economy. The 2017 Koolau Poko Sustainable Communities Plan acknowledges the need for small light industrial spaces in the Kapa'a Quarry area. Based on the planned future site development data of the 2011 FEIS the proposed project would create about 600 additional new full-term positions to the region. Based on the market study referenced in the 2011 approximately 60% - 70% of the new positions in the proposed light industrial would be filled by residents of the region. The 2011 FEIS estimated County and State taxes was $1.9 million and $8.8 million, respectively.

An important objective for a more sustainable Hawaii is the reduction of miles travelled to save petroleum, and thus carbon that accelerates climate change. Locating the place of employment, commerce, and recreation closer to the residents is one measure that is regarded as effective to lower traffic volume on an island wide level. The proposed project would provide industrial space to businesses, especially smaller local businesses, so they can grow while relocating to more cost-effective places of doing business within the region.

Any discussion about long-term productivity would need to consider the important goal for Hawaii of implementing more sustainability, including building sustainably. Important foundations of a sustainable Hawaii include the diversification of the local economy, increasing local production of food and goods, conserving energy, and water as well and imports of petroleum.

The low-impact development of the Proposed Action would serve as an important example that industrial development can occur in an environmentally friendly way, and in a manner that is supportive and respectful to the community and its cultural values.

7.1.3. Relationship between Short-term Uses and Long-term Productivity of the Environment

Section 6.1.5 of the 2011 FEIS described the relationship of short-term uses and long-term productivity of the environment for several areas of significance.

Land Use: Under the SEIS Preferred Alternative, construction of the proposed project would convert land from pervious to impervious area. The 26 acres of land that will be converted to impervious land is entirely located on former and not redeveloped landfill area, so no presently open space with vegetation, agricultural land or land with mature trees will be lost. Furthermore, no aquatic resources or wetland areas would be converted to impervious and non-vegetated land. Part of the sustainable design approach of the Proposed Action would be the conversion of approximately six acres of the proposed site to restored habitat at the perimeters of the project site.

In the restored habitat, the current invasive plant species would be removed and replaced by native or adaptive plants. The net result of the long-term productivity of the environment would be positive since the quality of the restored habitat at the site perimeter would be increased from the present conditions.

Water Resources: Construction of the Proposed Action would result in short-term disturbances to surface water and ground water resources. There would be no disturbances to floodplains, designated wetland areas and water bodies. There would be no long-term loss of functions, such as erosion and flood control, water-quality protection, aquatic habitat, recreational uses and aesthetic appearance of adjacent wetland areas and water bodies. No major construction activities would be inside or adjacent to water bodies and the only construction activity planned near water bodies would involve the installation of several outfalls for treated stormwater discharges to the Kapa'a Stream corridor.

This limited construction could involve minor modification of the stream banks or boundaries of wetland areas, and any fill to be deposited into stream beds or wetland areas will be only incidental. The size of the areas near water bodies that might be affected by construction would be small in relation to the overall area of adjacent wetland area and water bodies and would therefore not affect long-term productivity of the area.

Under the SEIS Preferred Alternative, the proposed stormwater treatment and management system would result in a long-term improvement of the runoff to the receiving waters - with resulting improvements of current impacts on water quality, stream bed erosion and subsequent sedimentation in the downstream marsh. This would improve the long-term productivity of the water bodies directly affected by the proposed project.

Biological Resources: The construction of the Proposed Action would result in some short-term and long-term impacts to some vegetation and wildlife resources. During construction, some vegetated areas at the perimeter of the site (mostly those containing invasive plant species) would be removed and replaced with a wider buffer zone on the new site perimeter berms. The berms would be panted with native and adaptive species. Efforts would be made to leave mature trees at the perimeter of the site and not remove them. Measures would be taken that these trees would not be damaged during construction.

The time to replenish the size of vegetation that would be removed at the site perimeter is estimated at about 3 to 5 years; therefore, no long-term loss of habitat would occur. There is

currently a population of non-native wildlife on the not yet developed portions of the site, such as feral cats and domesticated birds, which make a home primarily within the existing unimproved site perimeter. During construction, this wildlife population would likely avoid the location, but it is expected that the domesticated bird population would soon return and find a more extensive habitat in the restored habitat at the site perimeter. The Applicants' plan to control the feral and non-native wildlife populations with predator management programs that would be designed and implemented following guidelines of the U.S. Fish and Wildlife Service (USFWS).

The project site is adjacent to the Kawainui Marsh, which is home to several federally listed water birds. The proposed site itself, especially the land that would be used as the development footprint for new warehouses, is presently not identified as habitat for endangered species. The design approach would implement measures to avoid attraction of endangered water birds to the developed land. Such measures, which have been proposed by the USFWS, would include site design approaches avoiding open water surface ponds within the proposed project site. Implementing such measures would avoid attracting endangered wildlife to the project site where they could be subjected to increased predator threats.

Concluding, the long-term productivity for biological resources would not be adversely affected by the proposed action.

Traffic related impacts: During construction there would be traffic due to trucks transporting construction material or equipment to and from the project site as well as from construction personnel driving to and from the site. Grading within the Upper portion of the site would be minimal since this part of the site is already formed as a near even plateau. Grading in the Lower site would be significant, due to an increase of finish grade elevation of the site by an average of 11 feet.

After full build-out, the Proposed Action would result in increases of traffic on the adjacent roadways and affected intersections. A TIAR that was used for the 2011 FEIS estimated that for the immediate future the increase in traffic to remain under the level of service (LOS) threshold that would imply significant traffic impacts on the adjacent Kapa'a Quarry Road. The increased traffic volume would cause some long-term impacts regarding traffic-generated air quality and noise impacts, as well as increased incidences of accidents and wildlife collisions.

Furthermore, in its current condition, the Kapa'a Quarry Road could cause some problems relative to road safety. The increased traffic volume generated by the Proposed Action might increase the magnitude of these road safety problems if not mitigated. Long-term loss of productivity of the environment caused by increased traffic would include avoidance of wildlife resulting in loss of habitat. Chapter 4 of this SEIS document suggested some traffic impact mitigation measures, which included measures to control the speed on the quarry road and raising the awareness of drivers to drive responsibly to avoid accidents and incidences of wildlife killed by traffic.

Air quality and noise: During construction there would be impacts on the air quality, such as fugitive dust and engine exhaust, caused by soil disturbance and construction equipment. There also might be potential impacts from accidental leaks or spills from hazardous substances, such as fuel.

Measures will be implemented to minimize impacts of any leaks or spills by using appropriate mitigation measures.

Emission from harmful paints and solvents would be minimized by selecting only those paints and other construction material that are low in volatile organic compounds (VOC), in accordance with the sustainable design approach and the LEED certification goals. After construction there would be increased air quality impacts resulting from the increase in traffic, as delineated in Chapter Four.

During construction, there would be short-term noise generated by construction equipment and activities as well as by construction related traffic. The level of noise generated during Phase 1, Site Development, (e.g., from heavy equipment), would be higher than noise during Phase 2, Construction, when individual warehouses would be built on the prepared site. Therefore, the most noticeable short-term level noise would occur during a period of approximately three to four months for each warehouse. Short-term noise during construction of the individual warehouses would be exclusively generated during the construction of the building shell, which would take about two months per warehouse structure.

The build-out of the interior of warehouses, which follows the construction of the building shell, would result in marginal increases of short-term noise levels. Long-term noise during operations could be mitigated through several measures that include orienting large warehouse doors away from the marsh, installing noise barriers to shield adjacent areas that are most sensitive, housing noisy equipment indoors or under noise attenuating containments, and avoiding unnecessary idling of heavy trucks.

Concluding, the long-term beneficial effects of the proposed project would outweigh potentially significant yet short-term noise impacts resulting primarily during initial construction and site preparation. Appropriate mitigation measures could significantly Lower related negative impacts. Since there would be more site development, including grading, and more warehouse space to construct, related impacts would be higher under the SEIS Preferred Alternative than under the SEIS No-Action Alternative.

7.2 Irreversible and Irretrievable Commitment of Resources

Section 6.2 of the 2011 FEIS described irreversible and irretrievable commitment of resources for the proposed action.

An irreversible commitment of resources indicates a loss of future options, such as consumption of a non-renewable resource or of a resource which is only renewable over a long time. On the other hand, an irretrievable commitment of resource indicates functions of a resource that cannot be exercised for the duration of the project. For the sake of brevity, it is assumed that irreversible and irretrievable commitments of resources would not significantly differ between the SEIS alternatives. In cases where there are significant differences between the two action alternatives, the SEIS Preferred Alternative is described directly.

The development of the Proposed Action would result in commitments of resources. Some resources committed could be recovered in a relatively short period of time, while in other cases, resources would be both irreversibly and irretrievably committed by virtue of being consumed or by the long of period that resources would be committed to the proposed action. Resources expended for the development of the proposed project would be offset by the creation of needed facilities and the resulting benefits to the region. Benefits of the Proposed Action would augment the economic viability of the Koolau Poko region and would provide urgently needed industrial space for light industrial activities.

Land use: The conversion of pervious to impervious land could be considered irreversible commitment. Measures would be implemented to reverse some of the adverse impacts by implementing rainwater harvesting and use of collected rainwater for irrigation. The portion of the project site that would be converted from pervious to impervious land is not of environmentally high value. The land that will be used to construct the proposed project was created by landfill and no previously undeveloped open space, agricultural land or wildlife habitat would be used. The proposed industrial park would be developed in accordance with sustainable project development. The project team would implement building approaches that would be consistent with the intent and objectives of sustainable site development.

Biological resources: Biological resources lost during the development are expected to be minimal and not irreversibly lost. Rather, the biological resources would be irretrievable for the duration that it takes for the vegetation to regenerate. The types of wildlife found at the project site before site development would leave the project site during site development and construction of warehouse buildings and would mostly return afterwards. It is expected that the vegetation reintroduced at the site perimeter would require approximately five years to reach the comparable size and structure of the current average vegetation at the site perimeter. The restoration of currently sparsely vegetated land at the site perimeter would augment biological resources and diversity at the site.

Surface water and groundwater resources: Changes in site drainage and harvesting of rainwater for subsequent use in irrigation could be considered as irretrievable commitment of water resources. To offset this, capturing rainwater used for irrigation would result in a reduction of storm water runoff because of evapotranspiration.

Energy and materials: Construction and operation of the proposed project would result in irreversible commitments of energy and materials. The Proposed Action would require energy in form of electricity and transportation fuel, mainly diesel fuel. Since, on average, approximately 80% of electricity on Oahu is generated by fossil fuel, most of the electricity used during construction and operation would be considered irreversibly committed. Under the SEIS alternatives, a significant amount of renewable energy would be generated onsite; therefore, this portion of energy used would be considered irretrievably committed. The construction of the proposed project would require an irreversible commitment of various construction materials, such as aggregate, concrete, steel, wood, and other building materials. Some of building material might be recyclable or represent rapidly renewable material, but these materials would still be considered irreversibly committed.

Construction waste: The disposal of construction and demolition debris in landfill can be considered as irreversible commitment of landfill area. As part of the low impact development approach and LEED certification goals, a portion of the construction and demolition debris would be reused or recycled. Therefore, the scope of irreversible use of landfill would be reduced.

Transportation Fuel: The construction and operations phases of the proposed project would result in irreversible commitment of fossil fuels such as diesel fuel and gasoline for the transport of goods and for transporting people to and from the proposed site. The proposed project would also reduce the number of miles travelled by avoiding long commutes and trips between windward and leeward Oahu by employees and customers of businesses that relocate to the project site. Therefore, the irreversible commitment of transportation fuel and greenhouse gas emissions associated would be reduced to some extent on an island wide level.

Visual Impact: The construction of the Proposed Action would cause irreversible and irretrievable changes in near and distant views from view planes around the Kawainui marsh, Kailua town, H3-Freeway, and roads adjacent to the project site. The proposed visual impact mitigation, such as the vegetative buffer zones around the site perimeter along the Kapa'a Quarry Road would significantly reduce the intensity of the visual impact from view planes on the adjacent roads and around the Kawainui Marsh. The reduction of visual impacts would be to such an extent that the proposed project would essentially be camouflaged behind a screen of thick vegetation and earth berms. The proposed visual impacts mitigation measures could not, however, completely mitigate the visual impact from portions of the adjacent H3-Freeway.

7.3 Significant and Unavoidable Impacts

Section 6.3 of the 2011 FEIS described aspects of significant and unavoidable impacts from the proposed action. These significant and unavoidable impacts would be effects on natural resources and humans by the proposed action. The significant impacts would be mitigated using the most effective measures that could be considered practical. Most of the significant adverse impacts could be reduced to a less-than-significant levels, but some unavoidable impacts would remain even after using mitigation measures.

The following describes significant impacts and to what extent these could be mitigated. Some impacts would have consequences that are identified as unavoidable, to some extent, even with mitigation measures. Most of the unavoidable adverse impacts would not vary substantially between the two SEIS action alternatives, though the SEIS Preferred Alternative would offer a more comprehensive and effective range of mitigation measures.

Different types of significant adverse impacts and unavoidable consequences are summarized in the following:

Soils: During construction, a fraction of the topsoil that would be graded, stockpiled, and replaced would be mixed, buried, or lost from the site because of wind and water erosion, which could result in a significant impact if not mitigated properly. It is the responsibility of the contractor to implement and maintain comprehensive erosion control strategies to properly mitigate the impact to less-than-

significant levels. While the grading and stockpiling of soil would result in impacts, the final soil condition would improve and reduce longer-term impacts.

Before development, the surface soil condition at the project site consisted of graded layers of coarse gravel. There was a limited vegetation cover within the area of the Lower portion of the site that would be used for site development and the construction of warehouses. This current vegetation cover is not a permanent and continuous cover and therefore is not an effective soil stabilization method. The vegetation cover consists of invasive plant species that grow on parts of the site which are not used for outdoor storage or stockpiling of inert material. With the stated mitigation measures impacts on soil would be reduced to less-than-significant levels.

Traffic: Construction and operation of the proposed light industrial park would cause increased traffic volume and would therefore affect traffic volume on two adjacent roadways and at three intersections that are directly affected. Based on a traffic impact analysis report (TIAR) conducted for the 2011 environmental review, the level-of-service (LOS) on the adjacent Kapa'a Quarry Road and the Kapa'a Quarry Place roadways as well as at three affected intersections would remain at a less-than-significant level through the mid-point of development schedule for the proposed project, even without mitigation measures. With the projected growths in background traffic and traffic volume generated by the proposed project, at the time of full build-out, the LOS would, however, fall below a threshold value and would result in adverse traffic impacts, if no mitigation measures were taken. Properly designed mitigation measures would be implemented at a time after the mid-point of the development to reduce the impacts to less-than-significant levels. Heavy-truck traffic would require extensive mitigation measures to reduce impacts below significant levels.

To have more up-to-date information for the selection of future traffic impact mitigation measures Applicants have agreed to carry out a follow-up TIAR. As stated earlier, the DoT had requested in the 2011 FEIS that the current TIAR be revised later in the project.

Air Quality: Construction of the Proposed Action could cause significant impacts to air quality. During the construction, especially the site development of the Lower portion of the site, soil disturbance and vehicle traffic on unpaved roads would produce short-term fugitive dust emissions. Construction equipment would emit tailpipe emissions, including particulate matter from equipment and vehicles with diesel engines. The general contractor would be required to reduce emissions through good operational practices, which would include, but would not be limited to:

- watering or chemical stabilization of unpaved roads and disturbed soil areas,
- avoiding soil track out on adjacent roadways through a dedicated tire wash installation and other additional means,
- posting speed limits, discourage equipment idling, establish speed limits, using well maintained equipment and
- scheduling construction activities to reduce multiple emission sources occurring simultaneously.

With the stated mitigation measures, the air emissions generated during construction would be effectively limited in time and intensity to less-than-significant levels.

During the operations phase of the proposed light industrial park, impacts to the regional air quality would be caused primarily by traffic at the proposed project and on adjacent roadways. Mitigation measures would be implemented to reduce such impacts to less-than-significant levels. Some minimal air emissions caused by operations at the project site could result in adverse impacts, which should be properly mitigated. The type of industrial activities under land use category Limited Industrial (I-1), would exclude any business activity that will generate significant sources of air emissions through the release of harmful air borne agents.

Noise: During construction, there would be an increase in ambient noise. This would be a short-term adverse impact because of the temporary nature of the construction phase. During normal operations of the light industrial park, standard levels of noise impact from heavy truck and vehicle traffic would create noise impacts. Traffic noise would adversely impact unpopulated areas at the Western perimeter of the Kawainui marsh.

Residential areas would not be affected since increased traffic, especially heavy truck traffic, would not traverse residential areas. Noise could affect wildlife, which might increasingly avoid the area close to areas with high noise. The increase in traffic generated by the operation would be gradual, however, and be linked with the rate at which new buildings are constructed. Noise associated with the operation of the light industrial park levels would therefore increase gradually which would limit the degree of wildlife avoidance from the area. Habituation to noise typically occurs when wildlife gets accustomed to noise.

Native Vegetation/Wildlife habitats at the project site: Clearing existing vegetated land at the perimeter of the site would result in short-term changes in the composition and structure of the vegetation and therefore could result in adverse impacts. The development plans include restored habitat at the site perimeter, which would replace the existing earth berms and its invasive vegetation.

It is an unavoidable impact that the protective function of the existing earth berms and vegetation thereon would be lost for the duration of 3 to 5 years until the native and adaptive plant species of the restored habitat at the site perimeter could offer the same extent of visual impact mitigation. After the 3 to 5-year period, the restored habitat would offer better habitat and visual impact mitigation than under the existing conditions. While the vegetative buffer zone at the perimeter of the site is regenerating, some domesticated birds at the site would be disrupted to a certain extent and the existing population of birds at the site would be reduced. After the restored habitat can provide the required basic habitat conditions for domesticated birds, the population would be expected to return and thrive more than at the present, because a planned control program would remove a part of the feral predators (i.e., feral cats, rats, etc.).

Impacts to endangered species: At the present time, the proposed site is not a habitat for endangered water birds which use the adjacent Kawainui Marsh as habitat. Under earlier site development strategies, there was a risk that endangered water birds could be attracted to open water ponds within the proposed project, and, as a result, could face increased predator risks. Consequently, the

Proposed Action has changed the configuration of detention ponds to underground detention vaults. Upon communication with the U.S. Fish and Wildlife Service, these mitigations will reduce the impacts to endangered species to less-than-significant levels.

Light pollution: Light pollution is defined as a significant adverse impact associated with light from the site shining into adjacent areas or up into the sky. Light pollution can adversely affect wildlife by reducing their ability to navigate and move effectively, reduction in habitat through avoidance and, indirectly, reduction in food supply (insects). Light pollution can adversely affect humans by glare and sky-glow, which can cause adverse impacts on traffic and night sky access.

As part of the sustainable design approach, the proposed project would implement measures to control interior and exterior lighting to achieve effective light pollution mitigation, especially within the Lower portion off the site that is adjacent to the Kawainui Marsh and wetland areas in the Kapa'a Stream corridor. The exterior lighting would adopt the most stringent standard "Dark", which is recommended, for example, in national parks, and exterior light density would only be used for safety and comfort with negligible amounts of light trespassing the site boundary. With the appropriate mitigation, light pollution impacts can be reduced to less-than-significant.

Land Use – Conversion to impervious land: At full build-out, about 46 acres of former landfill area would be utilized to develop the proposed action. Under the SEIS Preferred Alternative, approximately 19 acres of the Lower site would be converted from pervious to impervious land, through construction of impervious roadways and building rooftops. The rest of the approximately six acres within the development footprint would remain pervious and vegetated landscaped area. While mitigation would reduce impacts, the conversion from pervious to impervious land would be an unavoidable impact.

Although sealing the surface of the former landfill with impermeable surface layers and restricting the infiltration of surface water into the landfill would cause unavoidable impacts, the results of this action would be positive.

Sealing the cover of redeveloped landfills significantly reduces the generation of harmful leachate in the landfill body, thus reduces impacts to the aquatic resources.

Land Use – Conversion to industrial land uses: Portions of one of the two contiguous land parcels on which the Proposed Action would be built, TMKs 4-2-15:013 and 014, were rezoned after the 2011 FEIS was approved. Rezoning of these approximately 30 acres was from General Preservation (P-2) and Limited Industrial (I-1) land use. The land area that was rezoned was approximately 38% of the combined area of the two land parcels. The conversion of preservation land to industrially zoned land was an unavoidable impact to implement the industrial park.

Water Quality Impacts from stormwater runoff: Significant adverse and short-term impacts to water quality could occur during site development, especially within the Lower portion of the proposed site, because of the extent of soil disturbance. Turbidity and sedimentation could be temporarily

increased during the period when the Lower site is graded, internal roadways are built, and limited utility trenching occurs.

Effective best management practices (BMPs) would significantly minimize the extent of impacts on the adjacent water bodies and wetland areas. The impacts from stormwater runoff on the water quality during normal operation of the project would be minimal . After site preparation, a comprehensive storm water treatment system would be implemented that reduced high runoff rates and related adverse impacts, such as a reduction of streambed erosion and subsequent sedimentation. Effective treatment units would remove at least 80% to 90% of the suspended solids and virtually all floatables and entrained oil and grease.

While even the best treatment system cannot eliminate all impacts from residual peak runoff rates and pollutants contained in the storm water discharge, the removal rates of the proposed drainage system would drastically improve the existing runoff conditions relative to the pre-construction conditions. With implementing the proposed mitigations under the SEIS Preferred Alternative, adverse quantity and quality of storm water impacts would be reduced to less-than-significant levels.

Water impacts from onsite wastewater treatment: Significant adverse impacts from on-site wastewater treatment could occur when untreated wastewater or wastewater effluent with none or only partial treatment would reach surface water or groundwater water or otherwise affects natural or human resources. The project site is not connected to the municipal sewer system and therefore on-site wastewater treatment is required to accomplish the degree of treatment that is necessary to reduce significant impacts to less-than-significant levels.

For both SEIS alternatives, there would be two types of on-site wastewater treatment systems at the proposed site: (1) conventional septic systems and (2) advanced wastewater treatment. A conventional septic system comprises one septic tank and one leach field, to treat wastewater. This system of treatment is effective for the Upper portion of the project site because of its relatively large horizontal and vertical distance between point-of-injection and the receiving water bodies and the thick layers of unsaturated soil. These large vertical and horizontal distances reduce impacts. In the Upper site there are presently eight conventional septic systems, which are connected to warehouse buildings.

Since the Lower portion of the project site is closer to environmentally sensitive areas and would result in situations where the point-of-injection would be close to water bodies or saturated soil layers, an advanced wastewater technology has been selected that has higher removal rates than conventional septic systems. Therefore, the on-site wastewater treatment for the Lower portion of the site would use more effective wastewater treatment than conventional septic systems, including aeration, filtering, and adsorption processes. These mitigation measures would reduce wastewater related impacts to less-than-significant.

Furthermore, the EPA has released guidelines which suggest the expected (average) treatment efficiency of the selected advanced onsite wastewater systems to be higher than conventional

central wastewater plants. Therefore, on regional level, impacts of advanced on-site wastewater systems would be lower than wastewater treatment in a central wastewater treatment plant.

Water and Energy use: Construction and operation of the proposed project would result in use and consumption of energy and water. Trenching for below ground utility installation could result in significant impacts through fugitive dust and some quantity of stormwater runoff containing elevated TSS. But the proposed mitigation measures would significantly reduce any such impacts to less-than-significant levels.

Upon completion of the proposed project and under the low impact site development approach of the SEIS Preferred Alternative, energy and water consumption would be reduced relative to conventional warehouse designs.

The Applicants have installed a significant capacity of onsite renewable energy generation in the Upper portion off the project site. This presently supplies a considerable part of the project's electricity needs, thus decreasing the supply of energy needed from the island-wide electricity grid. Because of permitting issues, it is not known how much more renewable energies the Applicants can add to the warehouse development in the future. But the Applicants would be willing to invest more in onsite renewable energy production.

The proposed project would implement significant water saving in comparison to conventional warehouses. Therefore, the water consumption at the proposed site would decrease relative to other warehouse developments which do not use sustainable development strategies with water conservation measures. The amount of increased water use that would result from the additional floor space developed under the Proposed Action would therefore be less than conventional warehouse designs would require.

Waste, by-products, and hazardous materials: Unintentional or accidental release of waste, by-products and hazardous materials could cause significant adverse impacts. With a comprehensive plan to avoid dangerous spills and without the need to store and handle significant volumes of such agents on the construction site, the associated impacts could be reduced to less-than-significant. Similarly, the generation of solid waste, such as construction and demolition waste, plastics, cardboard, paper, metal, wood, and other inorganic solid waste, could cause significant adverse impacts at the site if not properly mitigated. The planned mitigation measures would manage solid waste in such a manner that impacts will be reduced to less-than-significant levels.

A construction waste management program would part of the sustainable design approach of the Proposed Action. Construction and demolition debris that cannot be either reused or recycled would be diverted to permitted solid waste facilities on Oahu. The use of landfill area and volume for the deposit of waste represents an island-wide impact that cannot be avoided. The traffic impacts from removing waste from the site could be mitigated through scheduling the resulting heavy truck traffic in times of off-peak hours to less-than-significant levels.

A comprehensive recycling and waste management program would be implemented during operation of the light industrial park. This would lower the risk of uncontrolled disposal of solid waste at the site. Special care would be exercised by the park operator that no litter and waste was discarded on the adjacent land, especially in the adjacent Kapa'a Stream corridor or the adjacent Kawainui Marsh. Furthermore, during operation, any hazardous material and byproduct as well as solid waste which cannot be recycled would be collected and properly disposed of at active and permitted facilities.

The uncontrolled discharge of stormwater associated with industrial activities could be a significant adverse impact. The Applicants have obtained NPDES No Exposure certifications for the existing warehouses. The no exposure certifications certify that the facilities covered under the certification have implemented strict source control rules for storm water pollution prevention. For the new developments under both SEIS alternatives, new no exposure certifications would be obtained. This would implement good source control and significantly Lower adverse impacts.

Visual Impact: The development of the light industrial park would cause aesthetic impacts, especially early in the project when the site would be exposed to observers until the vegetation in the vegetative buffer zones around the site perimeters was established and created a dense screen. This short-term visual impact would be an unavoidable impact that all developments face when new landscaping replaces older vegetation.

After reestablishing the vegetation at the site perimeter, the visual impact of the warehouse structures and roadways within the proposed site would be mitigated and only a small visual impact would remain from distant and possibly adjacent view planes. This would reduce impact to less-than-significant levels. A certain degree of visual impact from short sections of adjacent H-3 Freeway might remain unavoidable, even with the proposed extensive visual impact mitigation. A recent site visit, however, has revealed that vegetation along the H3-freeway sections that are adjacent to the project site have grown into a dense cover screen since the 2011 FEIS was approved.

Appendix G describes visual impacts measures which have shown efficacy in addition to establishing a vegetation screen around the Lower site. These measures would include applying certain color schemes to the façades of the buildings in the Lower site. Experience with using color schemes for visual impact mitigation have shown that appropriate color helps blending building into the surrounding environment.

Public Safety: Construction activities would result in some degree of unavoidable potential impact regarding public safety, due to transport of construction material to and from the proposed site. The level of risk could be lowered if construction related traffic was scheduled to arrive or depart the site during off-peak hours. Appropriate mitigation such as traffic controls during the movement of large loads on the road would help to Lower the risks.

Socioeconomics: The construction and operation of the proposed light industrial park would affect population, housing, employment, and public services in the Koolau Poko region. Since the main construction activities are associated with site preparation, which would occur during a relatively

short period of the entire project, it is unlikely that a significant number of construction workers would move to the region to reside there permanently. Once site preparation is complete, subsequent construction of the warehouses themselves would represent less construction activity and would be spread over a longer time frame. Therefore, impacts from construction workers moving into the region are expected to be minimal.

During operation of the light industrial park, it is anticipated that at least 600 full time employees would find work in the newly developed light industrial park in addition to the present employment level. It is expected that a small portion of these new employees would move to the region, thereby directly affecting housing and public services. There are two aspects that would limit the impacts from new employees moving into the region. First, the possible influx of new employees, some with families, would occur over a period of about 15 to 17 years. Thereby the local housing market and public services will have adequate time to adjust to new residents. Second, it is predicted that the population in the Koolau Poko region will decline slightly over that time frame due to relocations, deaths, etc.

Health and safety of work force: A potential for injuries or fatalities to construction workers and employees during operation of the proposed project are unavoidable occurrences. Even the best safety programs and best management practices would limit, yet not eliminate, potential injuries or fatalities. Consequently, an increase in traffic volume, either the increased traffic volume generated by the proposed project or the background traffic that is predicted to grow independently of the proposed project, would typically result in a higher number of traffic incidents.

7.4 Summary of Mitigation Measures to Lower Significant Adverse Impacts

Section 6.4 of the 2011 FEIS described mitigation measures that were suggested to reduce most impacts identified to less-than-significant levels. Table 7.4.1 describes these mitigation measures as well as impacts that cannot be mitigated below a less-than-significant level, even with mitigation measures, thus rendering these impacts "unavoidable".

The significant impacts are similar between the two SEIS alternatives. The SEIS Preferred Alternative would have a broader range and more effective mitigation measures than the SEIS No-action alternative. Table 7.4.1 only describes mitigation measures under the SEIS Preferred Alternative.

Table 7.4.1: Summary of impacts and mitigation measures under the SEIS Preferred Alternative, to Lower level of impact significance and remaining unavoidable impacts

Description of significant impacts	Mitigation measures under SEIS Preferred Alternative	Significance with mitigation
		LTS=Less than significant ; UAI = unavoidable impact
Soil A total of about 27 acres of soil area would be directly affected from the demolition and construction through grading, excavation, placement of fill, mixing, and	Prior to construction, a sediment and erosion control plan would be developed in accordance with local ordinances and the further goals of the sustainable design approach of the project.	**LTS**

Table 7.4.1: Summary of impacts and mitigation measures under the SEIS Preferred Alternative, to Lower level of impact significance and remaining unavoidable impacts

Description of significant impacts	Mitigation measures under SEIS Preferred Alternative	Significance with mitigation
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soil augmentation. The resulting impacts would be loss of topsoil, fugitive dust, soil erosion, entrainment and runoff and sedimentation. Further impacts would include compaction of soil and resulting disturbance of soil structure, increasing risk of erosion.	The sediment and erosion control plan would include BMPs to control runoff erosion and sedimentation. BMPs could be generic and site-specific; examples of mitigation measures are protective devices to control drainage flow, erosion control matting, riprap, sedimentation traps and temporary and permanent reseeding. The proposed mitigation measures are discussed in more detail in Chapter 4 of this SEIS document.	
Traffic Impact before the midpoint of the project development is reached. The traffic volume on adjacent roads and intersections that are affected by the Proposed Action would increase, thereby. impacting the traffic conditions. The level of service (LOS), however, would stay better than D and E for affected roadway sections and intersections, respectively.	Based on the TIAR used in the 2011 FEIS process, no traffic impact mitigation measures would be required by midpoint of development to keep LOS above the critical threshold. This would signify a satisfactory condition. A revised TIAR will be developed after the final building density at the project site has been confirmed by the Accepting Agency.	**LTS** (without mitigation)
Traffic Impact at full build-out of the project The prediction of traffic volume at full build-out used in the 2011 FEIS review indicated that there would be significant impacts on (at least) three intersections that are affected by the project. Based on the TIAR used in the 2011 FEIS, the predicted LOS without mitigation would reach E and F, a significant impact.	Based on the TIAR used in the 2011 FEIS process, some traffic impact mitigation measures were required at full buildout development to keep LOS above the critical threshold to avoid an unsatisfactory condition. A revised TIAR will be developed after the final building density at the project site has been confirmed by the Accepting Agency.	**LTS**
Traffic impact from the relocated 4 kV power line:	The poles would be located as far away from the roadway, depending on the	**LTS**

Table 7.4.1: Summary of impacts and mitigation measures under the SEIS Preferred Alternative, to Lower level of impact significance and remaining unavoidable impacts

Description of significant impacts	Mitigation measures under SEIS Preferred Alternative	Significance with mitigation
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Depending on the alternative alignment of the relocated 4 kV power line chosen, there could be impact from new poles on the traffic because of the proximity of the poles to the roadway.	available shoulder alongside the Kapa'a Quarry Road.	
Air quality impacts during construction Possible significant impacts to air quality would be possible during construction if these impacts were not mitigated. Specifically, fugitive dust and emission from tail pipe emissions would need mitigation.	Mitigation measures would follow good operational practices. With these mitigation measures in place, the impacts would be reduced to less-than-significant. Mitigation measures are described in Chapter 4 of this SEIS document.	**LTS**
Air quality impacts during operation Possible significant impacts to air quality could occur during operation, if not effectively mitigated. Specifically, emission from tail pipe emissions and the use of products containing VOCs should be mitigated.	Mitigation efforts would be directed to Lower tail pipe emissions, especially from heavy trucks and other diesel fuel powered equipment that can discharge quantities of particulate matter. With these mitigation measures in place, the impacts would be reduced to less-than-significant. Mitigation measures are described in Chapter 4 of this SEIS document.	**LTS**
Noise during construction Possible significant impacts due to noise can occur during construction, if not mitigated. There are two phases in the construction that create different types of noise, the site preparation work and the construction of individual warehouses.	Mitigation efforts during site preparation would be mainly to reduce noise from heavy machinery and trucks. With these mitigation measures in place the impacts would be reduced to less-than-significant. Mitigation measures are described in Chapter 4 of this SEIS document.	**LTS**
Noise during operations Possible significant noise impacts could occur during operation, if not mitigated.	Mitigation efforts during operation would include measures to attenuate noise levels from traffic and noise from machinery used in the business operations of companies in the park. With these mitigation measures in place,	**LTS**

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Description of significant impacts	Mitigation measures under SEIS Preferred Alternative	Significance with mitigation
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	the impacts would be reduced to less-than-significant levels. Mitigation measures are described in Chapter 4 of this SEIS document.	
Native Vegetation/Wildlife Habitats at the project site: short-term impacts The existing vegetation at the site perimeter would be cleared to make space for the restored habitat at the site perimeter. This would result in an unavoidable short-term impact reducing wildlife habitat.	Since the significant impact is a result of clearing vegetation at the site perimeter, which is necessary to install the higher and wider earth berms and vegetative buffer zones, this clearing cannot be avoided. The existing vegetation at the site perimeter consists mostly of invasive plant species. The new vegetated buffer zones would replace the old and existing vegetation of invasive plants with native and adapted plant species. These plants would offer a higher quality of vegetation cover and wildlife habitat than the existing, mostly invasive vegetation on the project site.	**UAI**
Impacts to endangered species Significant Impacts could arise when endangered water birds were attracted to open water ponds in the proposed park. The adjacent Kawainui marsh is home to four federally listed water birds and any impact must be mitigated. <u>The addition of new power lines in proximity of Kawainui Marsh could create a risk of birds striking the power cables.</u>	Mitigation measures would be implemented to avoid attraction of water birds. The most effective mitigation would be to place the storm water detention and rainwater catchment volumes underground. These mitigation measures would be implemented under both SEIS alternatives. With these mitigation measures in place, the impacts will be reduced to less-than-significant levels. <u>Impact mitigation measures against bird collisions against power line would be to place colored visual marker balls on the lines.</u>	**LTS**
Light pollution	The light pollution mitigation strategy of the proposed project is part of and is	**LTS**

Table 7.4.1: Summary of impacts and mitigation measures under the SEIS Preferred Alternative, to Lower level of impact significance and remaining unavoidable impacts

Description of significant impacts	Mitigation measures under SEIS Preferred Alternative	Significance with mitigation
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Light pollution could adversely affect natural and human resources and could represent a significant adverse impact on the environment and community. The proposed site is adjacent to the important Kawainui Marsh. This location requires effective impact mitigation measures.	delineated in the sustainable design approach. A comprehensive light pollution mitigation strategy was submitted to and approved by the Accepting Agency. (SDC, 2016) The mitigation measures would include lowering the lighting density and light trespassing for interior and exterior light sources. With these mitigation measures in place the impacts would be reduced to less-than-significant levels. Mitigation measures are described in Chapter 4 of this SEIS document.	
Land Use – conversion to impervious land The conversion of approximately 27 acres from pervious land to impervious land, through construction of impervious roadways and building rooftops, would be a significant impact. This impact is an unavoidable impact, which is lessened by low impact development storm water strategy of the project.	The conversion of land use from pervious to impervious land cannot be completely mitigated. The conversion of land to imperviousness is an explicit act to change the perviousness of a significant area. Therefore, it is an unavoidable impact. However, since the project site is a former landfill, sealing the surface and reducing water infiltration into the landfill body and therefore reducing the amount of leachate can have positive environmental benefits.	**UAI**
Water Quality impacts from stormwater runoff during construction Significant impacts from storm water runoff could occur during construction through soil exposure, increased risk of soil erosion, entrainment, and transport to water bodies. The presence of important and environmentally sensitive aquatic habitats	Mitigation measures would include best management practices (BMPs) which reduce erosion, entrainment of soil in water drainage from the site, and subsequent release of entrained soil to the water bodies. With these mitigation measures in place, the impacts would be reduced to less-than-significant levels.	LTS

Table 7.4.1: Summary of impacts and mitigation measures under the SEIS Preferred Alternative, to Lower level of impact significance and remaining unavoidable impacts

Description of significant impacts	Mitigation measures under SEIS Preferred Alternative	Significance with mitigation
		LTS=Less than significant ; UAI = unavoidable impact
downstream of the proposed site emphasizes the importance of mitigating these significant impacts.		
Water Quality impacts from stormwater runoff during operation Significant impacts from stormwater runoff can occur during operation of the industrial park. Changing pervious to impervious land increases the runoff flow rates and result in streambed erosion and subsequent sedimentation. Soil, debris, and hazardous material could be entrained in the runoff and enter the natural environment. The presence of important and environmentally sensitive aquatic habitats downstream of the proposed site emphasizes the importance to mitigate these significant impacts.	The Proposed Action would have a comprehensive system to manage storm water impacts. High runoff rates would be reduced by temporarily detaining the stormwater on the site and releasing the water at a Lower flow rate after the storm event. Part of the stormwater would be collected and used together with harvested rainwater from rooftops for irrigation. Pollutants in the stormwater would be removed to a high degree through an integrated treatment system. Soil erosion would be reduced through stabilization of the soil and extensive vegetation cover. With these mitigation measures in place, the impacts would be reduced to less-than-significant levels.	**LTS**
Water impacts from onsite wastewater treatment Significant adverse impacts could occur if wastewater is released to the environment without receiving a satisfactory degree of treatment to remove organic matter, nutrients, harmful bacteria, and other harmful agents. The project site is not connected to the municipal sewage system and therefore an effective on-site treatment system must be installed to mitigate any significant impacts. The water bodies and aquatic habitats that are adjacent to the site are susceptible to discharge of polluted water and require a	The Proposed Action would have a comprehensive system of wastewater treatment that treated wastewater to a satisfactory level so that it can be released to the environment without resulting in significant impacts: • The Upper portion of the site has horizontal and vertical distances to the receiving waters which are favorable for the installation of a series of conventional septic systems. The Applicants are in the process of replacing the septic systems in the Upper site through advanced wastewater treatment systems. All	**LTS**

Table 7.4.1: Summary of impacts and mitigation measures under the SEIS Preferred Alternative, to Lower level of impact significance and remaining unavoidable impacts

Description of significant impacts	Mitigation measures under SEIS Preferred Alternative	Significance with mitigation
	LTS=Less than significant ; UAI = unavoidable impact	
thorough and comprehensive treatment of wastewater generated on the site.	new warehouses build in the Upper site would use advanced wastewater treatment in lieu of conventional septic systems. • The Lower portion of the project site is immediately adjacent to sensitive water bodies and wetland areas. This and other site conditions require the use of more advanced treatment processes than conventional septic systems. Consequently, wastewater systems would use aerobic, filtration and adsorption processes, therefore significantly increasing the removal rates of organic matter, nutrients, suspended matter, and bacteria. The effluent of the advanced wastewater treatment would be used for below-ground irrigation and infiltration in a leach field. The mitigation measures would reduce the significant impacts to less-than-significant levels.	
Increased electricity and water use The addition of a significant amount of floor space would affect energy and water demand and cause local and regional impacts. Effective energy and water saving measures would be used to mitigate the impacts.	The addition of approximately 500,000 additional sqft of leasable floor space would result in an increase in energy and potable water demand at the project site. The low impact development approach for the proposed project would implement effective measures to save electricity and water. The proposed project would implement energy savings technologies to Lower the electricity demand by approximately 30%	**LTS**

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Description of significant impacts	Mitigation measures under SEIS Preferred Alternative	Significance with mitigation
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	below the level of conventional warehouses. The Applicants have started to install a sizable capacity of on-site renewable energy (photovoltaic panels) on existing warehouses to provide a portion of the demand. The Proposed Action would decrease the water demand in the buildings by at least 30% using water saving fixtures. The proposed project would significantly reduce potable water for irrigation using recycled wastewater or harvested rainwater for irrigation. As a result, the project could reduce the impacts resulting from higher demand to less-than-significant levels.	
Solid waste and hazardous material during construction Significant impacts could occur when solid waste and hazardous material are released into the environment. Effective disposal and control measures are required to mitigate any resulting impacts.	A comprehensive waste management program would be implemented during construction to significantly reduce construction and demolition debris through recycling and reuse. It would be an unavoidable impact that the remaining construction debris was transported to active landfills, thereby creating impact on the use of landfills. Any unintentional and accidental spills or release of hazardous material would be reduced by implementing best management procedures. Hazardous waste material would be collected and properly disposed of at active facilities that are permitted to receive such waste.	**UAI**
Waste, byproducts, and hazardous material during operation Significant impacts occur when solid waste, production byproducts and hazardous material are released into the environment.	Recyclable material will be collected by means of a recycling system. The rest of the waste and production byproducts waste will be disposed of in active landfills. Hazardous waste material would	**UAI**

Table 7.4.1: Summary of impacts and mitigation measures under the SEIS Preferred Alternative, to Lower level of impact significance and remaining unavoidable impacts

Description of significant impacts	Mitigation measures under SEIS Preferred Alternative	Significance with mitigation
		LTS=Less than significant ; UAI = unavoidable impact
Effective disposal and control measures are required to mitigate any resulting impacts.	be collected and properly disposed of at active facilities that are permitted to receive such waste. It is an unavoidable impact that landfill capacity would be used for waste disposal.	
Visual Impact during construction The presence of the Proposed Action would cause significant aesthetic impacts during construction, when the existing vegetation at the site perimeter of the Lower portion of the site is removed, thereby exposing the site to observers on the quarry road.	During construction, the Lower portion of the site would create more visual impacts than the Upper portion since the Upper portion is farther away from the Kapa'a Quarry Road and hidden behind an effective screen of high trees. At present the Lower portion of the proposed site is surrounded by a simple vegetated buffer zones along the site perimeter, which is adjacent to the Kapa'a Quarry Road and the Kapa'a Quarry Place. For the construction of the permanent and improved vegetated buffer at these locations, the existing invasive vegetation would be removed. This would expose the Lower portion of the site to direct views , especially to motorists who pass the site on the Kapa'a Quarry Road. Therefore, this short-term visual impact could be considered unavoidable.	**UAI**
Visual Impact during operation The presence of the proposed light industrial park could cause aesthetic impacts during operation. The addition of a significant number of warehouses would be noticeable from near and distant view plane and requires comprehensive mitigation.	Trees would be added to the existing screen of tall trees at the eastern boundary of the Upper portion of the site. This would reduce any remaining visual impact from near and distant views. A new vegetative buffer zone, with taller trees and higher earth berms than in the existing buffer zone, would be constructed around the Lower portion of	**LTS**

Table 7.4.1: Summary of impacts and mitigation measures under the SEIS Preferred Alternative, to Lower level of impact significance and remaining unavoidable impacts

Description of significant impacts	Mitigation measures under SEIS Preferred Alternative	Significance with mitigation
		LTS=Less than significant ; UAI = unavoidable impact
	the site. A comprehensive visual impact analysis in Chapter 6 of this SEIS document shows that visual impacts could be mitigated to less-than-significant levels for most of the near and distant view planes.	
Public safety during construction Construction related to the project would result in some impacts on public safety, which cannot be avoided.	Even with mitigating measures such as traffic controls and scheduling of transport to and from the site, some degree of impact would remain and is therefore unavoidable.	**UAI**
Health and safety of workforce Injuries and fatalities to construction workers and employees of companies in the completed park cannot be completely mitigated and could cause adverse impact.	The Applicants would use best safety programs and best management practices to limit any health and safety risks. However, the potential for injuries or fatalities can never be completely eliminated. Therefore, some degree of impact would remain and would therefore be unavoidable. The nature of the proposed light industrial park, however, does not include industries that might have a higher accident level.	**UAI**
Socio-economic Though unlikely, an influx of employees to the Koolau Poko region could cause significant impact to public services and housing in the region.	Only a small number of the estimated approximately 600 new employees would relocate to the Koolau Poko region and would therefore create only small additional demand on public services and housing as the project is phasing in over several years. Since the population in the Koolau Poko region is likely declining slightly over the next 15 years, the net result of the immigration and the declining population would reduce the impacts to less-than-significant levels.	**LTS**

7.5 Justification for Proceeding with the Project Despite Selected Unavoidable Impacts

Section 6.5 of the 2011 FEIS described the justification for proceeding with the project despite selected unavoidable impacts. Despite the unavoidable impacts disclosed above, the Proposed Action should be implemented because potentially adverse impacts would be localized, temporary and mitigated to less-than-significant levels. The type and scope of consequences of unavoidable impacts identified for this project are not of such significance that they would warrant interruption of the Proposed Action.

But some impacts could not be entirely mitigated. The visual impact mitigation, for example, would reduce the adverse visual impact for most of the near and distant views, but one remaining view on the proposed project from the H3-freeway could not be completely mitigated and remains unavoidable. The traffic impact would be another important impact that is important to the public, but which could only be mitigated to the extent possible. While most traffic impact from cars and light trucks could be readily mitigated, heavy truck traffic is a special case that would require extensive mitigation measures to reduce impacts below significant levels.

The proposed project would offset the level of impacts that remain after comprehensive mitigation measures with the following benefits:

- Economic and sustainability benefits would occur from construction and operation of modern, energy efficient and environmentally friendly facilities that reduce landfill-related leachate to environmentally sensitive areas.
- Continuation of well-planned build-out of needed small service businesses that match the needs of the market and local community.
- Opportunities for windward companies close to the place of residence of owners and employees, within the Koolau Poko region.
- A way to ensure light industrial facilities which are built on sustainable development principles, and responsible use of resources, assets that will be indispensable in a future sustainable Hawaii.
- Completion of redevelopment of a former landfill area to offer small service and light industrial space in the region, thereby providing an opportunity for older industrial zoned older facilities to relocate from land that can be use more beneficially for the community, such as single-family housing or commercial space that follows the Koolau Poko sustainable communities plan.

7.6 Cumulative Impacts

Section 6.6 of the 2011 FEIS described cumulative impacts related to the proposed action. In accordance with environmental guidelines and regulations, cumulative impacts are defined as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions ..." (40 CFR 1508).

The cumulative impact analysis for the Proposed Action evaluates the following aspects of the analysis:

- **Transportation infrastructure in the area:** The proposed project would increase traffic on adjacent roadways and intersection, resulting in impacts on the environment (air quality, noise effect of

wildlife, wildlife collision, etc.) and the community (potential reduction in level-of-service, increased congestion, increased incidences of accidents)

- **Water quality:** The proposed project would affect the water quality through activities during construction and operation; water quality would be affected through stormwater runoff, and positively impacted by onsite treatment of wastewater.
- **Visual impact:** The proposed project would add a significant number of structures and would affect the aesthetic condition at the site temporarily.

Geographic Region - where impacts have significant effect or consequences:

- Areas close to the proposed project site: The most direct impacts of the Proposed Action would be near the project site, which is in the Lower part of the Kapa'a Valley. Since the valley boundaries also delineate the watershed boundaries, related consequences include the entire Kapa'a watershed.
- Regional area: The regional area that is most significantly affected by cumulative impacts is the Kawainui Marsh and the Kailua town. Some types of impacts affect the environment and community on a larger geographic scope and might include island-wide consequences.

Time Horizon: Establishing the time frame in which impacts must be considered:

- **Past actions:** The appropriate time frame for past actions is about 15 years ago, when the rate of growth of new warehouses in the Upper portion of the project site started to accelerate. Other activities that precede these past actions are also considered.
- **Present actions:** Present actions describe pertinent impacts as they are active at the present.
- **Reasonably foreseeable future actions:** Future actions are those that can be assumed to happen within the next 10 years.

How this Proposed Action relates concerning Hawaii's future and natural and human resources:

- Hawaii's important move towards more sustainable resource consumption: The need for Hawaii to align its future visions and developments towards more sustainability has never been greater. While there have been numerous initiatives to move Hawaii towards sustainability over the past 30 years, some notable recent initiatives underline the urgency to commit to sustainable development principles. These two recent sustainability initiatives are the Hawaii Clean Energy Initiative and the Hawaii 2050 Sustainability Plan. The proposed project would contribute to achieving some goals of these important initiatives.
- By using low impact development strategies, the proposed project would contribute to the goals of the Hawaii 2050 Sustainability Plan, since the Proposed Action will ensure natural resources are used responsibly and respectfully. By operating the light industrial park in a sustainable fashion, the Proposed Action would be one prototype of making sustainability a part of our daily practice doing business in Hawaii.
- The Hawaii Clean Energy Program emphasizes the need to provide up to 70% of the predicted energy needs of Hawaii in the year 2030 with clean energy technologies, which means through renewable energies and energy conservation. Developments with significant long-term investments, such as the proposed project, should significantly reduce energy and water use,

increase the amount of electricity generated by renewable technologies, and reduce transportation fuel to the extent possible, by bringing the location of employment, commerce, and recreation closer to the consumer and resident.

- The Proposed Action would contribute to such goals by providing the residents of Koolau Poko with employment opportunities and services by companies that can find industrially zoned space within the region, reducing the carbon footprint and unnecessary commutes of employees, owners, and customers/clients.

Tables 7.6.1 through 7.6.3 present a description of significant cumulative impacts on the transportation infrastructure of the area, on water quality as well as on the aesthetic appearance. The discussion of cumulative impacts in Tables 7.6.1 through 7.6.3 correlates geographic scope and time frame for every significant cumulative impact

Cumulative impacts on the transportation infrastructure in the area: Adverse impacts of increased traffic volume could result in decrease of level-of-service, thus increases in congestions, incidences of traffic accidents, and wear and tear on the road infrastructure.

Associated impacts from traffic are adverse effects to air-quality, noise, wildlife, and runoff from roadways.

Table 7.6.1 Cumulative impacts on the transportation infrastructure in the area

	Geographic Scope of Listed Significant Cumulative Impacts	
Time frame of cumulative impacts	**Areas affected that are close to the proposed project site**	**Regional area that is affected**
Transportation Infrastructure Description	Affected areas or environment: Kapa'a Quarry Road and Kapa'a Quarry Access Road, 3 intersections of the Kapa'a Quarry Road with (1) Kalanianaole Hwy. (2) Mokapu Blvd. (3) Kapa'a Quarry Place	Affected areas or environment: On a regional level the Kapa'a Quarry Road is used by windward residents to connect between Mokapu Blvd. and Kalanianaole Hwy. This traffic volume represents the background traffic that must be considered to assess the future traffic volume.
Past Actions	The local sources of traffic (within the Kapa'a valley) have been as follows: • The older warehouse development on the project site started approximately 30 years ago and has grown in a phased manner to its present size. These facilities generate heavy-truck and light vehicle traffic. • The quarry, further West in the Kapa'a Valley, under various past owners, has been mining rock and producing ready-mix concrete. These facilities generate mostly heavy-truck traffic. • The former landfill generated heavy-truck traffic volume until its closure in the 1980s. • The Kapa'a Refuse Transfer Station transfers waste from locally operating garbage collection to trucks for the	In the past, the background traffic has been increasing on the quarry road. • The route over the Kapa'a Quarry Road can avoid some congested roads in Kailua. • Developments that have directly affected the traffic on the Kapa'a Quarry Road in the past decade include the Le Jardin Campus at the south end of the Kapa'a Quarry Road and the construction of a small number of natural habitat developments and trails by community groups along the marsh side of the Kapa'a Quarry Road.

Table 7.6.1 Cumulative impacts on the transportation infrastructure in the area

	Geographic Scope of Listed Significant Cumulative Impacts	
Time frame of cumulative impacts	**Areas affected that are close to the proposed project site**	**Regional area that is affected**
	transport of the waste to active leeward landfill and waste incineration facility; the facility generates heavy-truck, car, and light truck traffic. • The Kapa'a Refuse Transfer Station also serves the residents, who can drop quantities of domestic waste and recyclable waste; heavy-trucks and vehicles and light trucks. • The model airplane park, adjacent to the East of the project site is a popular recreational destination; This facilities generates only vehicle or light truck traffic.	
Present Actions	The local sources of traffic (within the Kapa'a valley) have been as follows: • The warehouse development on the project site has been growing and the facilities generate higher heavy-truck and vehicle traffic rates. • Traffic generated by the remaining land uses in the Kapa'a valley includes the quarry, refuse transfer station and model Airplane Park. These land uses have been relatively stable in the past couple of years.	The traffic situation within the affected regional areas has been growing slowly in concert with overall increasing traffic volumes on Oahu's roads. The traffic rate on the Kapa'a Quarry Road has been steady growing over the past couple of years.
Reasonably Foreseeable Future Actions	The reasonably foreseeable development of local sources of traffic (within the Kapa'a valley) have been as follows: • Based on present state of the site development the Proposed Action would add about 500,000 sqft. of warehouse footprint. This would generate an increase in	The following trends are expected to affect the volume of background on the quarry road and affected intersections: • It is expected that the background traffic on the Kapa'a Quarry Road will either grow slightly or stay constant. The Koolau Poko region is expected to have a slightly

Table 7.6.1 Cumulative impacts on the transportation infrastructure in the area

	Geographic Scope of Listed Significant Cumulative Impacts	
Time frame of cumulative impacts	**Areas affected that are close to the proposed project site**	**Regional area that is affected**
	heavy truck and light vehicle traffic. The project would promote alternative modes of transportation to reduce the traffic volume. • Upon consultation with Ameron, there is no planned expansion or reduction in plant facilities and mining operations at the quarry; therefore, the traffic volume should remain stable in the foreseeable future. • Traffic generated by the Kapa'a Transfer Station is expected to remain constant for the foreseeable future. The volume and type of waste might be changing with the increase of recycling in the community, but this is not expected to change the traffic to and from the facility appreciably. • The traffic volume to the model airplane park is expected to remain constant for the foreseeable future since no known additions to the park are known at this time.	shrinking population of the next decades resulting in less traffic generated. • The increasing trend towards sustainability will somewhat reduce the individual traffic and foster alternative modes of transportation, thereby slightly Lowering traffic. • In the foreseeable future there would be the following developments along the quarry road: - Construction of the Kawainui Marsh Restoration project, a joint project of DLNR and U.S. Army Corp of Engineers started in 2011. Upon completion most of the visitors to the new park would approach the Kawainui Marsh Restoration project on the quarry road from the Kalanianaole Hwy. direction, therefore not impacting traffic volume on Northern part the Kapa'a Quarry Road, thus not close to the project site. - Possible, but not confirmed, is the development of a Hawaiian cultural and educational center in the southern section of the quarry road. This facility would generate some construction related heavy-truck traffic and vehicle traffic during operations.

Cumulative impacts on water quality: Adverse impacts to water quality would include effects from increased runoff volumes from impervious areas potentially resulting in streambed erosion and subsequent sedimentation, discharges of entrained solids and other pollutants contained in runoff to receiving water, discharges of treated wastewater that migrates to the receiving waters, and diversion of water from runoff into the receiving water thereby Lowering the water flow in streams and other water bodies.

Associated impacts from impaired water quality would cause adverse effects to aquatic resources due to an increase in organic loading, increase of eutrophication, increased toxicity from other water pollutants, reduction of aquatic habitat due to sedimentation, and reduction of functions of downstream wetland areas and water bodies for flood control and reduction in pollutants.

Table 7.6.2 Cumulative impacts on the water quality

	Geographic Scope of Listed Significant Cumulative Impacts	
Time frame of cumulative impacts	**Areas affected that are close to the proposed project site:**	**Regional area that is affected**
Water Quality Description	Affected areas or environment: Areas include the Kapa'a Stream corridor and the drainage ditch along the Kapa'a Quarry Road directly adjacent of the project site.	Affected areas or environment: On a regional level water quality would be affected by contribution of several land uses upstream of the proposed site, and within the Kapa'a watershed. Water quality in the Kawainui Marsh is affected by the water quality in the Kapa'a Stream, which is the main drainage for the Kapa'a watershed and directly drains into the marsh.
Past Actions	The land on which the project site is located was once a wetland area that was connected to the Kawainui Marsh. Landfill developments some 60 years ago resulted in the creation of a landfill area of approximately 45 acres, consisting of mostly quarry overburden and tailings and some quantity of solid municipal waste. The landfill body is on top of indigenous soils and is not sealed by an artificial impermeable seal. A drainage ditch	The Kapa'a watershed has been significantly altered over the past decades. The watershed was once directly connected to the adjacent Kawainui Marsh until an elevated roadway was built across the Lower stretches of the watershed, thereby separating the direct drainage pathways of the watershed to the marsh. The main land use of the Kapa'a watershed remained agricultural and cattle ranching until the start of quarry and landfill

Table 7.6.2 Cumulative impacts on the water quality

	Geographic Scope of Listed Significant Cumulative Impacts	
Time frame of cumulative impacts	**Areas affected that are close to the proposed project site:**	**Regional area that is affected**
	was constructed downstream of the site along a portion of the Kapa'a Quarry Road. This drainage ditch was supposed to function as a drainage conduit that conveys surface runoff and seepage to the Kapa'a Stream. Surface runoff and seepage from the Lower portion of the site landfill reached the Kapa'a Stream and the wetland area that formed in the lower stretches of the Kapa'a Stream corridor. After the warehouses were added and impermeable pavement was installed on parts of the Upper portion of the site, the quantity of surface runoff increased. Over the years, drainage inlets were installed that collected and conveyed runoff to the stream corridor. One small detention pond with an armored spillway was installed, which avoided scouring in the slopes at the perimeter of the Upper portion of the site. The drainage situation at the Lower portion of the site has not changed markedly over the years, and site drainage occurs through direct runoff and infiltration and subsequent seepage. Wastewater treatment has been carried out with onsite conventional septic systems.	operations. These intensive quarry and landfill activities as well as the construction of the H3-Freeway have adversely affected the Kapa'a watershed. The Kapa'a Stream has been significantly affected through changes of the stream bed to its present location and form and causing impacts due to high TSS and other water pollutants from increase runoff. The drainage system of the Kawainui Marsh was affected by the changed drainage from the watershed and the changed stream bed of Kapa'a Steam. The marsh received significant qualities of sediments that were eroded and entrained solids from the Kapa'a watershed. The Kapa'a valley has not been connected to the municipal sewer system, due to the limited quantity of wastewater produced and the fact that no gravity sewer system is available and feasible. Septic systems and cesspools have been used in the valley to treat wastewater onsite.
Present Actions	Drainage at the present site consists of: • In parcel TMK 4-2-15:014 (Upper portion of): The 4.4 acres of rezoned land has presently three new	The drainage situation in the watershed is characterized by the closure and redevelopment (some quantity of vegetation and resulting soil stabilization) of the landfill

Table 7.6.2 Cumulative impacts on the water quality

	Geographic Scope of Listed Significant Cumulative Impacts	
Time frame of cumulative impacts	**Areas affected that are close to the proposed project site:**	**Regional area that is affected**
	warehouses with a combined footprint of approx. 60,000 sqft. These warehouses are surrounded by impervious pavement. The rest of the parcel is graded area. The runoff of land with warehouses uses LID storm water treatment and a flood basin at the Eastern boundary of the rezoned land. • In parcel TMK 4-2-15:013: Drainage from 15 acres of impermeable area occurs through several drainage catch basins and one detention pond to the Kapa'a Stream corridor. There are new warehouses built at the present time which would be drained though detention vaults, manufactured filtration devises and vegetated buffer strips. • In parcel TMK 4-2-15:014 (Lower portion): Drainage from about 19 acres of graded land occurs through runoff to the Kapa'a Stream corridor and through some infiltration into the landfill body. Some quantity of seepage flows to the drainage ditch along the quarry road. • At present there are eight conventional septic systems each with a septic tank and leach field, all within the Upper portion of the site. There are no active cesspools on the property. • Presently two advanced wastewater systems are installed in the Upper site as part of a pilot project that	areas and expansion the warehouse development at the proposed site. In its present condition the proposed project site contributes about 16% and 15% of the entire Kapa'a watershed as TSS baseload and TSS 2% event load, respectively. At present the water quality of the Kapa'a Stream is primarily affected from a high TSS content. This causes related consequences of higher turbidity also in the Kawainui Marsh. During periods of intensive storm events water levels in the stream increase and can cause the transport of sediments and other pollutants to the downstream wetland and marsh. There are a limited number of septic systems installed at the active land uses in the Kapa'a valley, which include the quarry, the transfer station, the model airplane park and the existing warehouse development. The existing septic systems are considered to result in less-than-significant cumulative impacts.

Table 7.6.2 Cumulative impacts on the water quality

	Geographic Scope of Listed Significant Cumulative Impacts	
Time frame of cumulative impacts	**Areas affected that are close to the proposed project site:**	**Regional area that is affected**
	will proof the effectiveness of the advanced wastewater technology.	
Reasonably Foreseeable Future Actions	Under the SEIS Preferred Alternative the drainage systems will be expanded, and the quality and quantity of the stormwater runoff will be improved: In the 4.4-acre rezoned land within parcel TMK 4-2-15:014 (Upper portion): All drainage from the impervious areas (rooftops and roadways) will be collected and treated before being discharged to the Kapa'a Stream corridor. All drainage from the land will use LID storm water treatment. In parcel TMK 4-2-15:013: All drainage from the newly formed impervious areas (rooftops and roadways) will be collected and treated before being discharged to the Kapa'a Stream corridor. One existing detention pond and several drain inlets at the site perimeter will be used. A recently constructed storm water drainage system includes an underground detention vault and a manufactured treatment device (MTD). In parcel TMK 4-2-15:014 (Lower portion): All drainage from the newly formed impermeable areas (rooftops and roadways) would be collected and treated before being discharged through several detention vaults (below ground), several vegetated buffer strips and several MTDs.	In the foreseeable future, no changes in the land use are identified that would significantly alter the overall drainage condition of the watershed, except the new drainage system at the project site. The drainage system of the project site would improve the overall drainage condition in the watershed and would therefore improve the water quality in the Kapa'a Stream and the downstream marsh and wetland areas. Since the proposed site represents only a relatively small area of the entire watershed, cumulative impacts from the proposed project would be limited. An overall improvement of the water quality in the Kapa'a watershed will require a determined effort to improve the land that contributes most of the adverse impacts on the water quality, which are areas outside the project site. The Applicants are convinced that the comprehensive storm treatment and management approach, with its sustainable design elements, would represent a positive example for possible improvements in the watershed. In the foreseeable future no additional wastewater treatment systems are anticipated in the Kapa'a watershed, other

Table 7.6.2 Cumulative impacts on the water quality

	Geographic Scope of Listed Significant Cumulative Impacts	
Time frame of cumulative impacts	**Areas affected that are close to the proposed project site:**	**Regional area that is affected**
	Rainwater from the 5 warehouse roofs would be collected and stored in below-ground cisterns for subsequent irrigation of the restored habitat at the site perimeter. Summary: The stormwater runoff quality would be improved through the installation of comprehensive treatment units that remove sediments, oil/grease, and floatable debris. Stormwater quantity would be improved by retaining stormwater in a system of rainwater harvesting and detention vaults. The volume of water seeping into the drainage ditch along the Kapa'a Quarry Road would be significantly reduced since less water would infiltrate into the impervious cover of the Lower site. The onsite wastewater systems would install several advanced treatment systems in the Upper and the Lower portions of the project site. Over time the existing conventional septic systems in the Upper site would be replaced by the advanced wastewater systems.	than those planned in conjunction with the proposed action. Therefore, with the planned onsite technologies outlined for the proposed site, cumulative impacts from the discharge of treated wastewater in the watershed will remain at less-than significant levels.

Cumulative impacts on the visual impacts: Effects on the aesthetics of the area around the proposed site, observed from near and distant view planes, are due to the presence of various industrial structure in the Kapa'a Valley. The Kapa'a Valley has an open space appearance, although at present, there are several industrial facilities in the valley. The impacts on aesthetics are not clearly quantifiable, because of their subjective nature to the observer.

Table 7.6.3 Cumulative impacts on the visual appearance

	Geographic Scope of Listed Significant Cumulative Impacts	
Time frame of cumulative impacts	**Areas affected that are close to the proposed project site:**	**Regional area that is affected**
Visual Appearance Description	**Affected areas or environment:** View planes in the immediate vicinity are from the Kapa'a Quarry Road, Kapa'a Quarry place and the model airplane park.	**Affected areas or environment:** More distant view planes on the project site are from the H3- Freeway, the Mokapu Boulevard, The Kailua Road as well selected public places or parks around the Kawainui Marsh.
Past Actions	• Before the start of quarry and landfill operation in the Kapa'a Valley, approx. 60 years ago, the proposed site was a pasture and forested land and with continuous vegetation cover. • After the quarry and landfill operation commenced the views of the site changed to exposed soil and landfill. • Around the mid-1970s the landfill activities stopped at the project site. The Upper portion of the site remained an area of graded soil surface with intermittent vegetation. The Lower portion of the site was not in use and invasive vegetation covered the surface of the landfill. • Starting in the 1990, the existing warehouse development expanded in the Upper portion of the project site with vegetation present only at the site	During quarry and landfill operations, the distant views of the valley from Kailua and the adjacent roads were characterized by large portions of exposed rock and soil. The quarry operation at the top of the valley was visible including tall process equipment. The project site had views of exposed soil but the view on the proposed site was somewhat less pronounced in comparison with the exposed area on the flanks of the mountains and hills surrounding the Kapa'a valley. After the completion of the landfill operations the land was replanted at the exposed hills and at the Lower portion of the project site. The restored landfill areas started to blend into the surrounding vegetation of the valley. During the late 1990s and early 2000s, the industrial development in the Upper portion of the project site expanded slowly, while the site remained graded but

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Table 7.6.3 Cumulative impacts on the visual appearance

	Geographic Scope of Listed Significant Cumulative Impacts	
Time frame of cumulative impacts	**Areas affected that are close to the proposed project site:**	**Regional area that is affected**
	perimeter. At the eastern boundary of the Upper portion, a row of taller trees was added to shield the view on the Upper portion and create a wind break for the prevailing trade winds. The Lower portion of the site was used for green waste processing and was surrounded by a narrow screen of vegetation that shielded views.	without vegetation. During the same time, the Lower portion of the project site was used for green waste processing. This resulted in a varying extent of vegetation in the Lower portion. Vegetation was cleared on parts of the Lower portion of the site that were used for green-waste processing. The construction of the refuse transfer station added one landmark that could be observed from adjacent as well as distant view planes.
Present Actions	The appearance of the project site has not changed significantly over the past several years. Within the Upper portion of the site more warehouses are added to the development within a compact portion of the site, thereby not altering the characteristic view of this industrial development from the Kapa'a Quarry Place roadway. The warehouse structures and other installations of the Upper portion of the site are visible from the Kapa'a Quarry Place roadway and from a short stretch on the H3-Freeway, through breaks in the otherwise dense buffer zone on the Southern side of the H3-Freeway. The Lower portion of the project site has only vegetation at the site perimeter which hides views from the Kapa'a Quarry Road and Kapa'a Quarry Place by a perimeter buffer of smaller trees and shrubs and an approximately 5- to 15-foot-high earth berm.	The distant views of the Kapa'a valley have not noticeably changed over the past years, except for the appearance of the Lower portion of the proposed site.

Table 7.6.3 Cumulative impacts on the visual appearance

	Geographic Scope of Listed Significant Cumulative Impacts	
Time frame of cumulative impacts	**Areas affected that are close to the proposed project site:**	**Regional area that is affected**
Reasonably Foreseeable Future Actions	The adjacent views of the project site will be improved by the addition of vegetation at the perimeter facing the quarry road and quarry access road. • The existing tree line at the Eastern boundary of the Upper portion would be expanded with several new trees to mitigate the remaining long distant visual impacts resulting from the warehouses. • The existing buffer zone around the Lower portion of the site would be modified by increasing the height and widths of the earth berms and planting them with native and adaptive shrubs and higher trees. This new buffer would reduce the near visual impacts of the new development in the Lower portion of the project site to a less-than-significant levels.	For the foreseeable future the distance views of the Kapa'a valley would not change significantly and the Kapa'a Valley would remain characterize by open space and vegetated hill sides. • The visual impacts from the quarry and the refuse transfer station would remain unchanged. • There are no indications about using parts of the valley in the foreseeable future as a new landfill. Therefore, the vegetation cover on the Southern side of the valley should remain unchanged. • The development of the Upper portion of the project site would be entirely hidden by the added line of trees at the Eastern perimeter of the Upper site. • The Lower portion of the project site would have several structures interwoven with roadways, parking areas and some limited vegetation surrounding the warehouses. • The visual impact assessment in Section 6.6 of this SEIS document indicates that practically all distant view would be mitigated by the added vegetation at the site perimeter. <u>In addition, the use of appropriate color schemes to be applied to the facades of buildings would be used to reduce long-distance view impacts. The only view that could not be fully mitigated is the distant view from a short section of the H3- Freeway. Over the past</u>

Table 7.6.3 Cumulative impacts on the visual appearance

	Geographic Scope of Listed Significant Cumulative Impacts	
Time frame of cumulative impacts	**Areas affected that are close to the proposed project site:**	**Regional area that is affected**
		couple of years the vegetated buffer on the Southern side of the roadway has been growing denser and larger. This contributes to blocking of views on the project site and is therefore a beneficial visual impact mitigation.

7.7 Unresolved Issues in the 2011 FEIS and Actions Taken or Proposed

Section 6.7 of the 2011 FEIS described several unresolved issues at the time the 2011 FEIS was approved. Table 7.7.1 itemizes the unresolved issues and describes status and actions proposed under the SEIS Preferred Alternative.

Table 7.7.1: Unresolved issues and describes status and actions proposed under the SEIS Preferred Alternative.

No.	Description / as mentioned in the 2011 FEIS	Status / Action proposed under the SEIS Preferred Alternative
1	**Updating the Project Masterplan**	
	The site development concepts described in the 2011 FEIS needed to be defined in more details in the following process for the zone change and the SMP. The 2011 FEIS mentioned the following main task to be completed:	
1.A	Updating the layout of the proposed light industrial park:	**Completed**
	The updated site development plan needed to delineate all pertinent information about sizes and locations of structures, roads, off-street parking, drainage system, gray water/harvest rainwater systems, utilities, onsite wastewater treatment systems with leach fields/ subsurface irrigation, landscaped area, and restored habitat.	An updated site development plan was completed and is presented in this SEIS document. The updated site development plan includes design updates on storm water systems, wastewater systems, finish grade and site perimeter berms, new road access as well as several other design updates.
1.B	Updating the drainage system:	**Completed**
	The updated drainage system needed to outline all low impact development technologies that were mentioned in the 2011 FEIS and produce technical drawings and calculations so that system components such as runoff conveyance using pipes, culverts, swales, and overflow discharge as well as all process vessels could be configured.	Site drainage plans were updated. Drainage design concepts which were previously approved could no longer be implemented, because of certain technical site development issues revealed in recent engineering investigations. The updated drainage implements LID technologies and require increased finish grade elevation in the Lower portion of the project site to provide sufficient hydraulic head for gravity flow of storm water to the testament and detention facilities at the site perimeter.
1.C	The rainwater harvesting systems and irrigation system:	**Completed**
	The system of the rainwater harvesting, and irrigation system needed to be delineated in	Updated site irrigation plans were completed to implement the new irrigation approach of

Table 7.7.1: Unresolved issues and describes status and actions proposed under the SEIS Preferred Alternative.

No.	Description / as mentioned in the 2011 FEIS	Status / Action proposed under the SEIS Preferred Alternative
	more detail, including the required capacity of the below-ground catchment basins	providing harvested rainwater for irrigation of the site perimeter berms.
1.D	Assessing of onsite renewable (photovoltaic) energy generation to be installed. The photovoltaic (PV) capacity targeted to be installed on the warehouse roof over the future years needed be assessed and delineated in the updated site development plan.	~~Not completed~~ Completed. The Applicant has determined that he would like to add as much PV capacity as needed to provide the electric energy needs of the planned development. The Applicant is presently not planning to provide energy for external uses but might reconsider to generate PV based energy to be fed into the grid if conditions by HECO change in the future.
2	**Revisions and Updates to the Traffic Impact Analysis Reports (TIAR)**	**Remaining Work**
2.A	A new TIAR needs to be carried out to incorporate the new site layout.	**Remaining to be done;** The Applicants have agreed to complete a new TIAR once the updated site development plan presented in the SEIS document is approved.
2.B	Potential improvements of intersections in accordance with new TIAR	**Remaining to be done:** The State Department of Transportation (DoT) indicated possible required improvements of intersections based on a new TIAR.
3	**Traffic conditions on Kapa'a Quarry Road:**	
	Concerns were raised about potential unsafe traffic conditions on the Kapa'a Quarry Road. Two aspects were mentioned that needed consideration to address unresolved issue:	
3.A	Needed road improvements: An assessment of traffic problems and possible mitigation should be completed.	**Completed** A traffic engineering assessment of traffic problems report was completed by the Applicants and submitted to DPP. The report pointed out physical obstacles that were close to the roadway as possible collision hazards and impediments to slight distances.
3.B	Determining responsibility for upgrades as mitigation measures: An assessment of who is	**Completed**

Table 7.7.1: Unresolved issues and describes status and actions proposed under the SEIS Preferred Alternative.

No.	Description / as mentioned in the 2011 FEIS	Status / Action proposed under the SEIS Preferred Alternative
	responsible for the identified traffic mitigation measures.	A traffic agreement between the DPP and the Applicants was finalized in 2014 , which determined the scope of traffic improvements the Applicants would have to initiate and fund. The approved improvements were roadway frontage measures along the project site on the Kapa'a Quarry Place, including 8-foot sidewalks and road entrances to the project site. In communication with the City & County of Honolulu, the change from two roadway entrances to the Lower site to a single entrance has been approved. The proposed configuration of the single roadway entrance which is depicted in Section 6.9 will have to be modified depending on the results of the new TIAR.
4	**Requests for more environmental precautions**	
4.A	Water quality monitoring stations	**No action taken**
	Suggestions about water quality monitoring to be defined by agencies.	The suggestions have not been part of the design and were not permit requirements.
4.B	Total Maximum Daily Loads (TMDL)	**No action taken**
	Suggestions about Total Maximum Daily Loads (TMDL) Waste Load Allocation (WLAs) to be defined by agencies.	The suggestions have not been made part of the design and were not permit requirements. No new TMDL information have been released by agencies, and the 2007 information is still in effect. The storm water treatment efficacy would far exceed pre-construction condition.
4.C	Drainage canal along the quarry road:	**No action taken**
	Suggestions to line the drainage canal along the Kapa'a Quarry Road.	Jurisdiction of the drainage ditch along the Kapa'a Quarry Road is with the City & County of Honolulu. Several years ago, the Applicants made improvement suggestions for the

Table 7.7.1: Unresolved issues and describes status and actions proposed under the SEIS Preferred Alternative.

No.	Description / as mentioned in the 2011 FEIS	Status / Action proposed under the SEIS Preferred Alternative
		drainage ditch. These suggestions were not supported by agencies and the community. New proposed modifications to the drainage ditch have been made by the Applicant (see Appendix J of this FSEIS). These modifications would improve water quality, by implementing a maintained vegetated swale, and would improve traffic safety on the Kapa'a Quarry Road by providing a new road shoulder. In addition, the proposed modifications of the area around the drainage ditch would provide space for a combined pedestrian and bicycle pathway.
5	**Rare failures of mitigation measures**	
5.A	Inability of comprehensive low impact development approach to control forces of nature.	**No action taken.** It is understood that site development using low impact development (LID) technologies could be overburden by extreme natural events, such as extreme floods or earthquakes.
5.B	Mitigation measures that are based on innovative low impact technologies (LID) and processes might prove less effective than intended since they are new and unproven.	**No action taken.** It is understood that LID technologies and practices have entered mainstream design practices. In fact, LID strategies are now part of the permitting requirements and can significantly mitigate adverse impacts.
5.C	Responsiveness of mitigation measures to changes in progress of project action implementation	**Actions taken.** The proposed mitigation measures have been designed to offer flexibility regarding adjusting to the speed of progress in the development of the Proposed Action. The storm water and wastewater treatment and management systems would use smaller units that would be installed in a flexible fashion as needed and serve the areas that are under active development. The smaller

Table 7.7.1: Unresolved issues and describes status and actions proposed under the SEIS Preferred Alternative.

No.	Description / as mentioned in the 2011 FEIS	Status / Action proposed under the SEIS Preferred Alternative
		units are designed to work within a larger infrastructure system.
5.D	Dangers due to accidents, fires, human errors, faulty design or construction and people not following rules.	**Actions taken.** Though the inevitability of accidents, fires, human errors, faulty design or construction and people not following rules always exists, the Applicants are committed to responding to such rare events in the most practical and effective way. Emergency response plans and preventive strategies would be developed and maintained through cooperation of park management and tenants would be engaged to participate impacts mitigation.

CHAPTER 8 - LIST OF PERMITS AND APPROVALS

Permits and approvals that are either required or might be required, pending a decision by the Accepting Agency, are as follows:

Permit description	Permitting agency	Description
Permits related to water resources management: Stream Channel Alteration Permit Well abandonment permit	State Department of Land and Natural Resources Commission on Water Resource Management	Permit required 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. Permit might be required prior to sealing an unused well.
National Pollutant Discharge Elimination System (NPDES): Storm Water Runoff Hydrotesting Dewatering Permit	State Department of Health Clean Water Branch	Permit is required for storm water discharges from construction activities including clearing, grading and excavation activities Discharge of non-polluted hydrotesting water Discharge of dewatering effluent from construction activities.
Construction related permits. Building Permit Grading Permit City Trenching Permit	Department of Planning and Permitting City and County of Honolulu	Permits are required for the construction of any building or structure. Permit required for grading which changes drainage patterns with respect to properties abutting the construction site. Permit required for trenching any public facility
Road construction related permits: Road construction related permits. Right-of-Way Permit Street Usage Permit	Department of Transportation Services City and County of Honolulu	Permit is required for any construction activities within the City and County of Honolulu right-of-way. Permits needed for work within City and County roadways and State roadways.

Permit description	Permitting agency	Description
Noise Variance Permit	State Department of Health	Permit may be required for unusually loud construction activities or night work.
Underground Injection Control (UIC) permit	State Department of Health Safe Drinking Water Branch	Permit for injection well for sewage, industrial/commercial, or aquaculture-related wastewaters.
Individual Wastewater System (IWS)	State Department of Health Wastewater Branch	Permit required for wastewater works
Special Management Area (SMA) permit	Department of Planning and Permitting City and County of Honolulu	Major Special Management Area (SMA) permit is required for the development of the Lower portion of the proposed site
Permits for work in navigable waters of the US Section 10 Rivers and Harbors Act Section 404 of Clean Water Act	U.S. Department of the Army Corps of Engineers	Permit needed prior for any construction in, over or under navigable water of the U.S. Permit needed for discharge of dredge and/or fill material into waters of the U.S, including wetlands
Section 401 of Clean Water Act (Water Quality (401) Certification)	State Department of Health Clean Water Branch	Certification is required if seeking a Federal license or permit for activities involving the possibility of discharge into navigable waters (certification required for Section 10 and Section 404 permits)
Section 10 Endangered Species Act	United States Department of the Interior Fish and Wildlife Services	Incidental take permit may be required if aspects of the project endanger listed species

CHAPTER 9 - AGENCIES, ORGANIZATIONS AND INDIVIDUAL CONTACTED

The following agencies, organizations and individuals were contacted in the preparation of this ~~Draft~~ Final Supplemental EIS

Federal Agencies

- U.S. Army Corps of Engineers, Honolulu District
- U.S. Fish and Wildlife Service, Pacific Islands Fish and Wildlife Office
- USDA NRCS, Pacific Islands Area State Office

State Agencies

- Department of Business, Economic Development and Tourism (DBEDT)
  - DBEDT, Strategic Industries Division
  - DBEDT, Hawai'i State Energy Office
- Hawaii Department of Health (DoH)
  - DoH, Environmental Management Division
  - DoH, Wastewater Branch
  - DoH, Safe Drinking Water Branch
- Department of Land and Natural Resources (DLNR)
  - DLNR, Commission on Water Resources Management
  - DLNR, Division of Aquatic Resources
  - DLNR, Division of Forestry and Wildlife
  - DLNR, Engineering Division
  - DLNR, State Historic Preservation Division
- Office of Hawaiian Affairs
- Office of Environmental Quality Control
- Department of Transportation
- Water Resources Research Center / Environmental Center, University of Hawaii at Manoa

City and County of Honolulu Agencies

- Honolulu Fire Department

Honolulu Police Department

Department of Environmental Services

Department of Parks and Recreation

Department of Planning and Permitting

Department of Design and Construction

Board of Water Supply

Department of Transportation Services

Department of Facility Maintenance

Office of Climate Change, Sustainability, and Resiliency

Other

Senate District 24: Senator Jarrett Keohokalole

House District 49: Rep. Scot Z. Matayoshi

City Council Member: Ikaika Anderson

Oahu Metropolitan Planning Organization

Hawaiian Telcom

Hawaiian Electric Company

Kailua Neighborhood Board No. 31

Lani-Kailua Outdoor Circle

Hawaii's Thousand Friends

Charles Prentiss, Ph.D.

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APPENDICES

List of 12 appendices to this FSEIS document. With the exception of Appendix A all appendices are new.

APPENDIX A: SCOPING REPORT (WAS ALREADY PART OF THE DRAFT SEIS)

APPENDIX B: RESPONSES TO COMMENTS (NEW APPENDIX)

APPENDIX C: DESIGN CHANGES TO THE STORMWATER SYSTEM (NEW APPENDIX)

APPENDIX D: RELATIONSHIP OF FINISH GRADE AND STORM WATER SYSTEM (NEW APPENDIX)

APPENDIX E: PRELIMINARY O&M PLAN FOR STORM WATER BMPS (NEW APPENDIX)

APPENDIX F: OFFSTREET PARKING AND TREES ADJACENT TO WAREHOUSES (NEW APPENDIX)

APPENDIX G: VISUAL IMPACT MITIGATION(NEW APPENDIX)

APPENDIX H: LIGHT POLLUTION MITIGATION (NEW APPENDIX)

APPENDIX I: BUFFER ZONE DEVELOPMENT PLAN (NEW APPENDIX)

APPENDIX J: DRAINAGE DITCH ALONG KAPA'A QUARRY ROAD (NEW APPENDIX)

APPENDIX K: STATUS OF PROJECT SITE DEVELOPMENT WORK (NEW APPENDIX)

APPENDIX L: RELOCATION OF POWER LINES OVER LOWER SITE (NEW APPENDIX)

Appendix A:

SUPPLEMENTAL

ENVIRONMENTAL IMPACT STATEMENT

FINAL

Kapa'a Light Industrial Park

SCOPING REPORT
(APPENDIX WAS PART OF DSEIS)

Appendix B:

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RESPONSES TO COMMENTS
(NEW APPENDIX)

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STATUS OF PROJECT SITE DEVELOPMENT WORK (NEW APPENDIX)

Appendix L:

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OPTIONS FOR RELOCATION OF POWER LINES OVER LOWER SITE (NEW APPENDIX)