GROUP 70
INTERNATIONAL

September 5, 2012

Subject: **Kīhei High School**
Final Environmental Impact Statement

Dear Participant:

On behalf of the State of Hawai'i, Department of Education, please find the enclosed Final Environmental Impact Statement (EIS) for your review. This Final EIS was prepared pursuant to the EIS law (Chapter 343, HRS and Chapter 11-200, HAR).

Name of Project:	Kīhei High School
Island and District:	Island of Maui, Makawao District
Tax Map Key (s):	2-2-2-002: 81, 2-2-2-002: 83
Proposing Agency:	State of Hawai'i, Department of Education, Facilities Development Branch
Address:	P.O. Box 2360, Honolulu, Hawai'i 96804
Contact:	Robert Purdie, Jr., (808) 586-0408
Accepting Authority:	Governor, State of Hawai'i
Consultant:	Group 70 International, Inc.
Address:	925 Bethel Street, 5th Floor, Honolulu, Hawai'i 96813
Contact:	Christine Ruotola, (808) 523-5866

Notice of Availability for the Kīhei High School Final EIS will be published in the September 8, 2012 OEQC Environmental Notice.

Thank you for your participation in the environmental review process.

Sincerely,
GROUP 70 INTERNATIONAL, INC.

Christine Mendes Ruotola

Christine Mendes Ruotola, AICP, LEED AP
Principal

Kīhei High School

State of Hawai'i, Department of Education
Kīhei, Maui, Hawai'i

~~Draft~~ Final Environmental Impact Statement

DOE No. Q00017-06

GROUP 70
INTERNATIONAL

~~FEBRUARY~~ SEPTEMBER 2012

~~DRAFT~~ FINAL ENVIRONMENTAL IMPACT STATEMENT

KĪHEI HIGH SCHOOL

Kīhei-Mākena Region, Island of Maui
Tax Map Keys: 2-2-2-002:081; 2-2-2-002:083

Applicant:
State of Hawai'i
Department of Education
Facilities Development Branch

Accepting Authority:
Governor, State of Hawai'i

Prepared by:
Group 70 International, Inc.
Architecture • Planning • Interior Design • Environmental Services
925 Bethel Street, 5th Floor, Honolulu, Hawai'i 96813 (808) 523-5866

~~**December 2011**~~
September 2012

~~DRAFT~~ FINAL ENVIRONMENTAL IMPACT STATEMENT

KĪHEI HIGH SCHOOL

Kīhei-Mākena Region, Island of Maui
Tax Map Keys: 2-2-002: ~~Por.~~081; 2-2-002: ~~Por.~~ 083

Applicant:
State of Hawai'i
Department of Education
Facilities Development Branch

This Document is prepared pursuant to Chapter 343, Hawai'i Revised Statutes, as amended, and Chapter 200 of Title 11, State of Hawai'i Department of Health Administrative Rules, Environmental Impact Statement

This document and all other ancillary documents were prepared under my direction.

Responsible Official: _____ Date: August 28, 2012
Duane Y. Kashiwai, Administrator
State of Hawai'i, Department of Education
Facilities Development Branch

Prepared By:

GROUP 70
INTERNATIONAL

Group 70 International, Inc.
Architecture • Planning • Interior Design • Environmental Services
925 Bethel Street, Fifth Floor, Honolulu, HI 96813
~~December 2011~~
September 2012

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GLOSSARY OF ACRONYMS AND ABBREVIATIONS

AAI	All Appropriate Inquiry
AIS	Archaeological Inventory Survey
ALISH	Agricultural Lands of Importance to the State of Hawai'i
AMSL	Above Mean Sea Level
ASTM	American Standard for Testing and Materials
BMPs	Best Management Practices
CDP	Census Designated Place
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
cfs	cubic feet per second
CIA	Cultural Impact Assessment
CML	Central Maui Landfill
CWRM	State of Hawai'i Commission on Water Resource Management
CY	Calendar Year
CZM	Coastal Zone Management
DB	Design-Build
DEM	County of Maui Department of Environmental Management
DLNR	State of Hawai'i Department of Land and Natural Resources
DNL	Day-Night Average Sound Level
DOA	State of Hawai'i Department of Agriculture
DOE	State of Hawai'i Department of Education
DOH	State of Hawai'i Department of Health
DOT	State of Hawai'i Department of Transportation
DWS	County of Maui Department of Water Supply
EDSPECS	Education Specifications
EIS	Environmental Impact Statement
EISPN	Environmental Impact Statement Preparatory Notice
ESA	Environmental Site Assessment
F	Fahrenheit
FADS	Facilities Assessment Development Schedule
FIRM	Flood Insurance Rate Map
FTE	Full-time Equivalent
GPD	Gallons Per Day
GPCD	Gallons per Capita Day
GPM	Gallons per Minute
gsf	Gross Square Footage/Feet
HAR	Hawai'i Administrative Rules
HCM	Highway Capacity Manual
HRS	Hawai'i Revised Statutes
HTel	Hawaiian Tel
KCA	Kīhei Community Association
LCA	Land Commission Award
LEED	Leadership in Energy and Environmental Design
LOS	Level of Service
LSB	Land Study Board
LUC	Land Use Commission

m	meters
MECo	Maui Electric Company
MGD	Millions of Gallon per Day
mg/L	Milligrams per Liter
MIP	Maui Island Plan
mph	Miles per Hour
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
NRCS	U.S. Department of Agriculture Natural Resources Conservation Service
NRHP	National Register of Historic Places
OEQC	Office of Environmental Quality Control
OHA	Office of Hawaiian Affairs
PSI	Pounds per Square Inch
RCRA	Resource Conservation and Recovery Act
RFP	Request for Proposal
SCS	Scientific Consultant Services, Inc.
SHPD	State Historic Preservation Division
SIHP	State Inventory of Historic Properties
SMA	Special Management Area
SSS	Site Selection Study
TIR	Traffic Impact Report
TMK	Tax Map Key
UH	University of Hawai‘i
USDA	Unites States Department of Agriculture
USFWS	United States Fish and Wildlife Service
USGBC	United States Green Building Council
WWRF	Wastewater Reclamation Facility

Chapter 1
Project Summary

1.0 PROJECT SUMMARY

1.1 PROJECT SUMMARY

Project Name:	Kīhei High School
Applicant:	State of Hawai'i Department of Education (DOE) Facilities Development Branch P.O. Box 2360 Honolulu, Hawai'i 96804 Contact: Robert Purdie, Jr., Project Manager Phone: (808) 586-0408
Accepting Authority:	Governor, State of Hawai'i
Planning/Environmental Consultant:	Group 70 International, Inc. 925 Bethel Street, 5th Floor Honolulu, Hawai'i 96813 Contact: Christine Mendes Ruotola, AICP, LEED AP Phone: (808) 523-5866 ext. 121
Project Area:	77.2 acres
Project Location:	Island of Maui, Makawao District, Kīhei-Mākena region, Kīhei, east of Pi'ilani Highway, between the Kūlanihāko'i and the Waipu'ilani gulches, adjacent to and mauka of the intersection of Pi'ilani Highway and Kūlanihāko'i Road *(Figure 1-1, Figure 1-2)*
Tax Map Key (TMK):	TMK 2-2-2-002:081 and TMK 2-2-2-002:083 *(Figure 1-3)*
Landowner(s):	State of Hawai'i, Board of Land and Natural Resources ~~Parcel 081: Kaonoulu Ranch LLP~~ ~~Parcel 083: Haleakala Ranch Company~~ ~~(Note: Land in process of being acquired by the State of Hawai'i~~)
Existing Use(s):	Undeveloped land that has been used as pasture land for domestic cattle
Proposed Use(s):	High School
State Land Use District:	Agricultural *(Figure 1-4)*
Special Management Area:	Not in Special Management Area or Shoreline Setback Area (*Figure 1-5*)
Maui Island Plan (MIP) General Plan 2030 Draft:	Proposed Public High School
County of Maui Zoning:	Agricultural *(Figure 1-6)*
Kīhei-Mākena Community Plan:	Public/Quasi-Public; Agriculture *(Figure 1-7)*
Permits Required:	State Land Use District Boundary Amendment, Change in Zone, Community Plan Amendment, Final Subdivision and Consolidation Approval, National Pollutant Discharge Elimination System (NPDES), Grading and Grubbing Permit, Driveway Permit, Building Permit, Wastewater Discharge Permit
Flood Zone:	Flood Insurance Rate Maps (FIRM) Zone X (outside of 100 year flood plain) (*Figure 1-8*)
Environmental Impact Statement (EIS) Trigger:	Hawai'i Revised Statutes (HRS) 343 triggers are ~~U~~use of State funds and State lands for construction of a high school, and the proposed amendment to the Kīhei-Mākena Community Plan. ~~will allow purchase of lands for educational purposes.~~

Proposed Project: The DOE proposes to develop a new high school in Kīhei on approximately 77 acres mauka of Piʻilani Highway between Kūlanihākoʻi and Waipuʻilani Gulches. The high school will be designed for 1,650 students and associated staff for grades 9-12.

1.2 PROJECT LOCATION AND SITE

The proposed Kīhei High School project site encompasses 77.2 acres of undeveloped land on the mauka side of Piʻilani Highway across from the Piʻilani Village residential subdivision in the Kīhei-Mākena region, Kīhei, Maui, Hawai'i *(Figure 1-2)*. The site is bordered on the south by the Waipuʻilani Gulch and on the north by the Kūlanihākoʻi Gulch. The site slopes from east to the west/southwest, at an elevation of about 110 feet above mean sea level (AMSL) at the northeastern boundary to approximately 30 feet AMSL at the southwestern boundary bordering Piʻilani Highway. The affected TMK parcels are listed in *Table 1-1*, and shown in *Figure 1-3*.

Table 1-1 PROJECT AREA TMK PARCELS, LANDOWNER AND ACREAGE

TMK Parcels	Landowner	Acres
2-2-2-002:081	~~Kaonoulu Ranch LLLP~~ State of Hawaiʻi	29.2
2-2-2-002:083	~~Haleakala Ranch Company~~ State of Hawaiʻi	48.0
Total Project Area		**77.2**

Figure 1-4 through *Figure 1-6* illustrate State Land Use, Special Management Area, and County zoning designations in the area. While all the subject land is presently designated and zoned Agricultural by the State and County, the Kīhei-Mākena Community Plan designates the land underlying the project site as Agriculture and Public/Quasi-Public (*Figure 1-7*).

The project area has been assessed by the Land Study Bureau and Agricultural Lands of Importance to the State of Hawaiʻi (ALISH). The Kīhei High School project site does not have high capacity for agricultural production. The entire 77.2 acres of the Kīhei High School project site has been given a land classification of "E" (Lowest Rating) by the Land Study Bureau. The ALISH identifies 1.70 acres in the northwest corner of the project site (2% of the total site area), as "Prime" agricultural land (refer to *Figure 1-9)*.

1.3 APPLICANT AND LANDOWNER

Kaonoulu Ranch LLLP (TMK 2-2-2-002:081, totaling 29.2 acres), and Haleakala Ranch Company (TMK 2-2-2-002:083, totaling 48 acres) ~~are the current~~ were the former landowners of the project site. The lands were historically used for ranching. ~~The landowners~~ Kaonoulu Ranch and Haleakala Ranch Company are presently engaged in a master planning process for their adjacent properties. Discussion with DOE regarding location and siting of the proposed high school has been part of the ~~landowners~~ ranches' master planning efforts. The State ~~is in the process of acquiring~~ acquired the two parcels for the high school in January 2012 and ~~consolidating~~ will consolidate them into a single lot for development of the high school.

Figure 1-1
Regional Map

Figure 1-2
Location Map

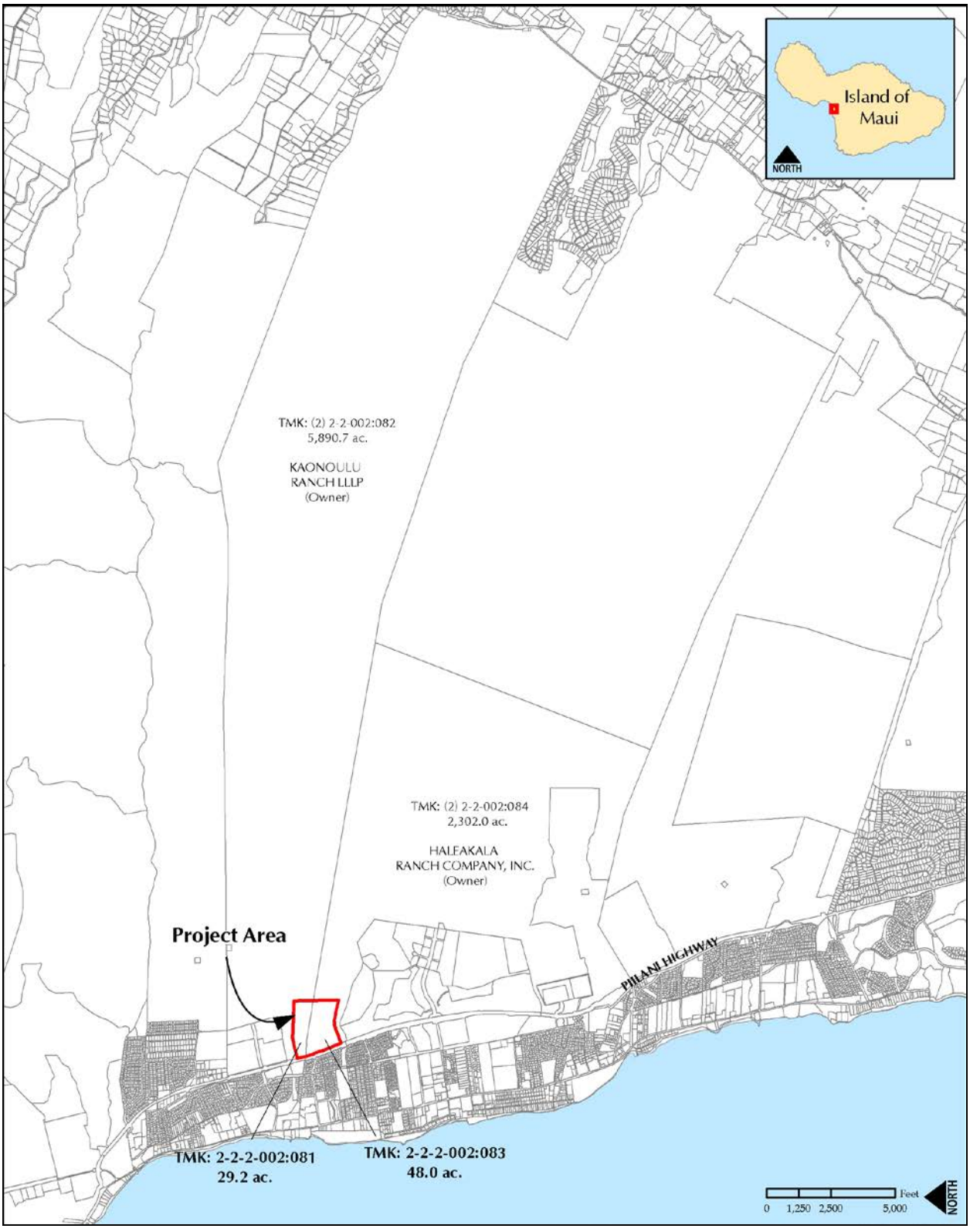


Figure 1-3
Tax Map Key Parcels Map

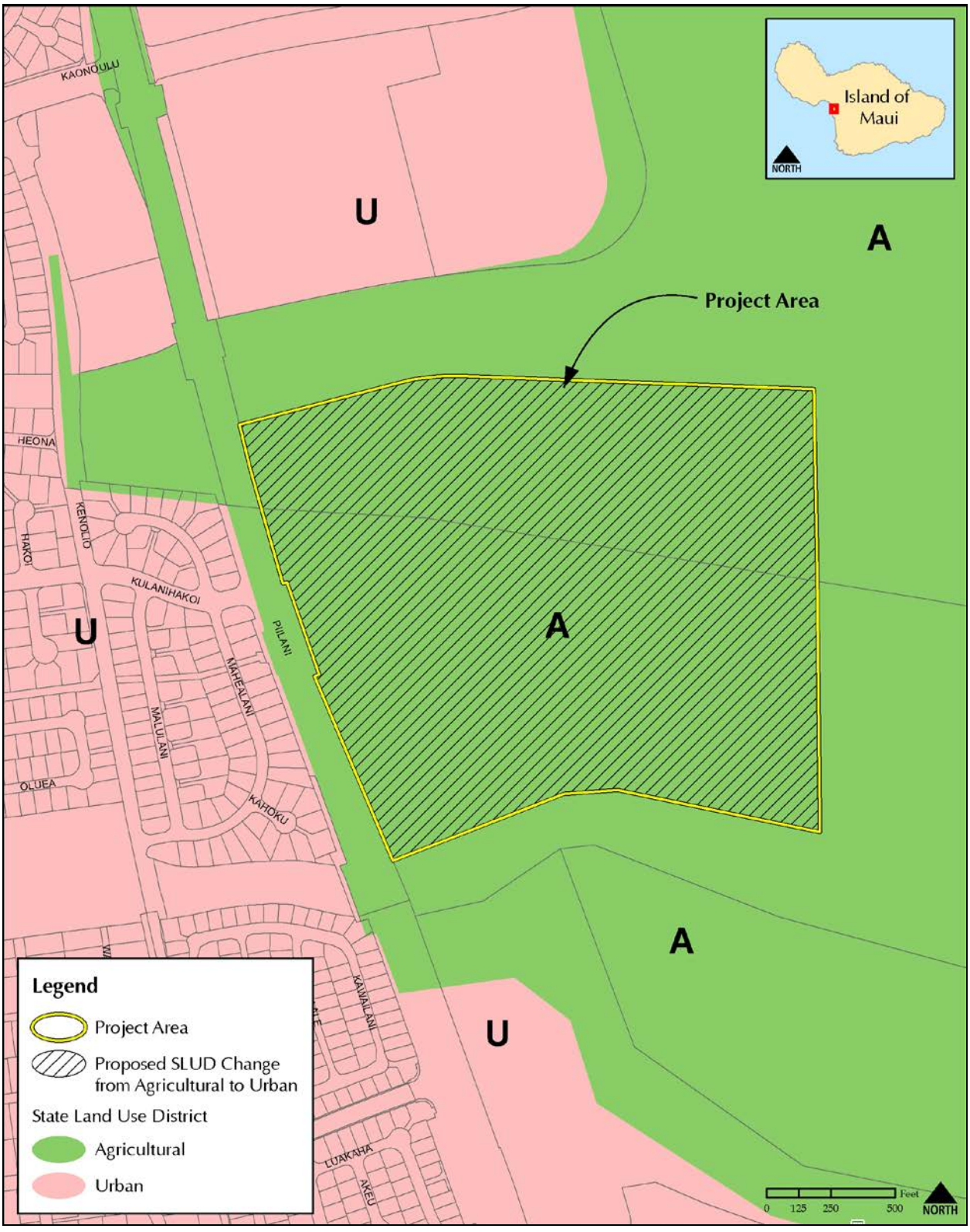


Figure 1-4
State Land Use District Classifications Map

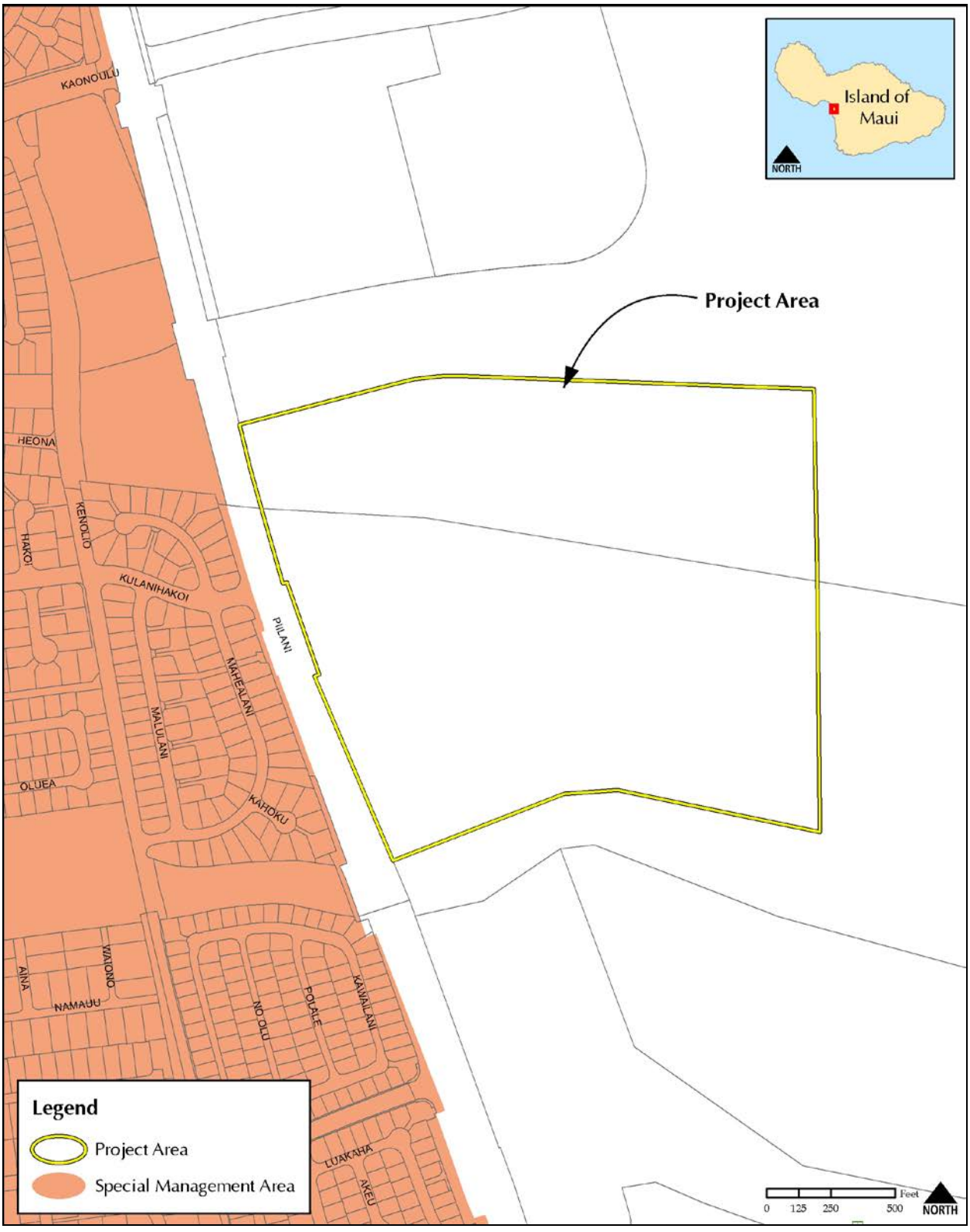


Figure 1-5
Special Management Area Map

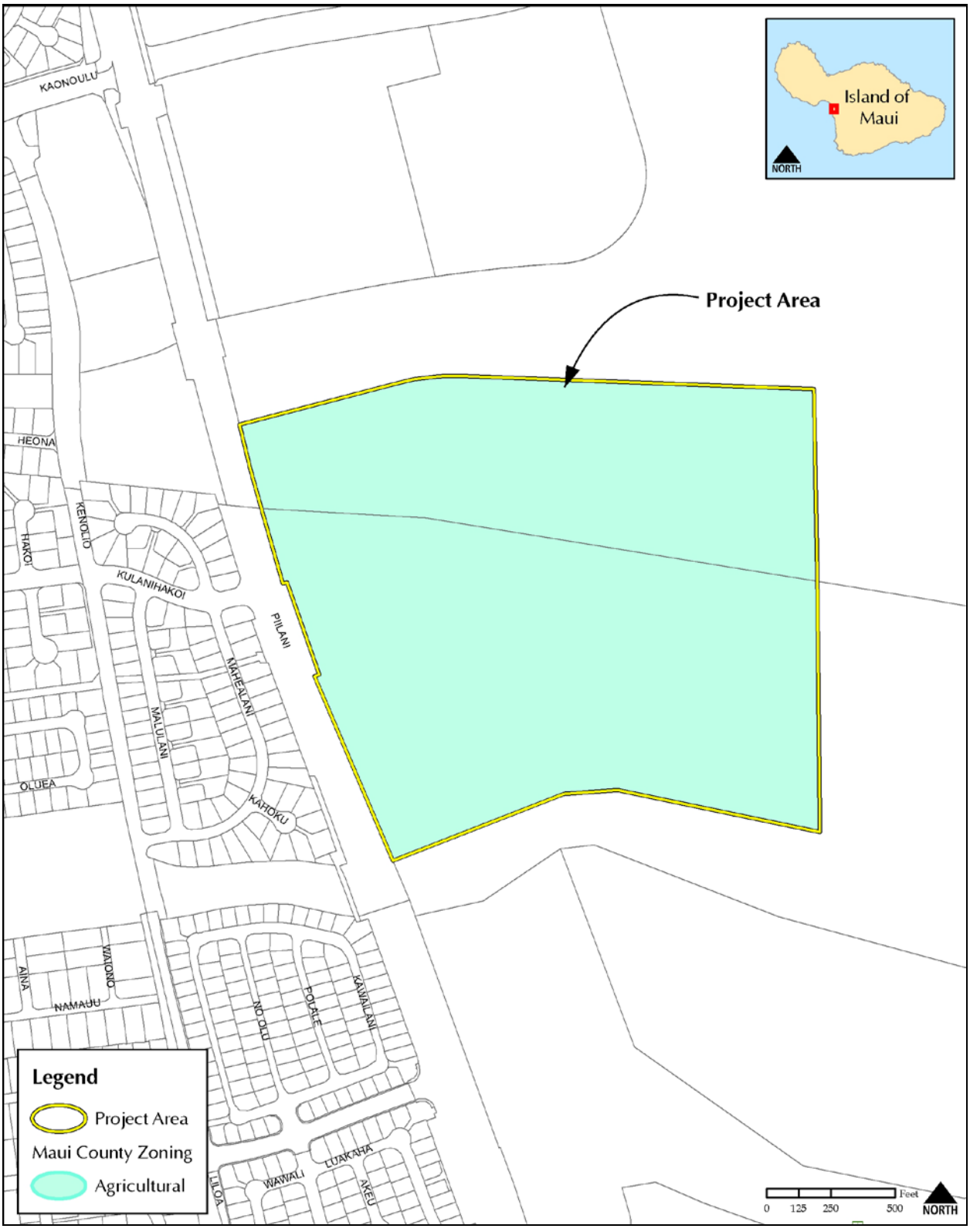


Figure 1-6
County of Maui Zoning Map

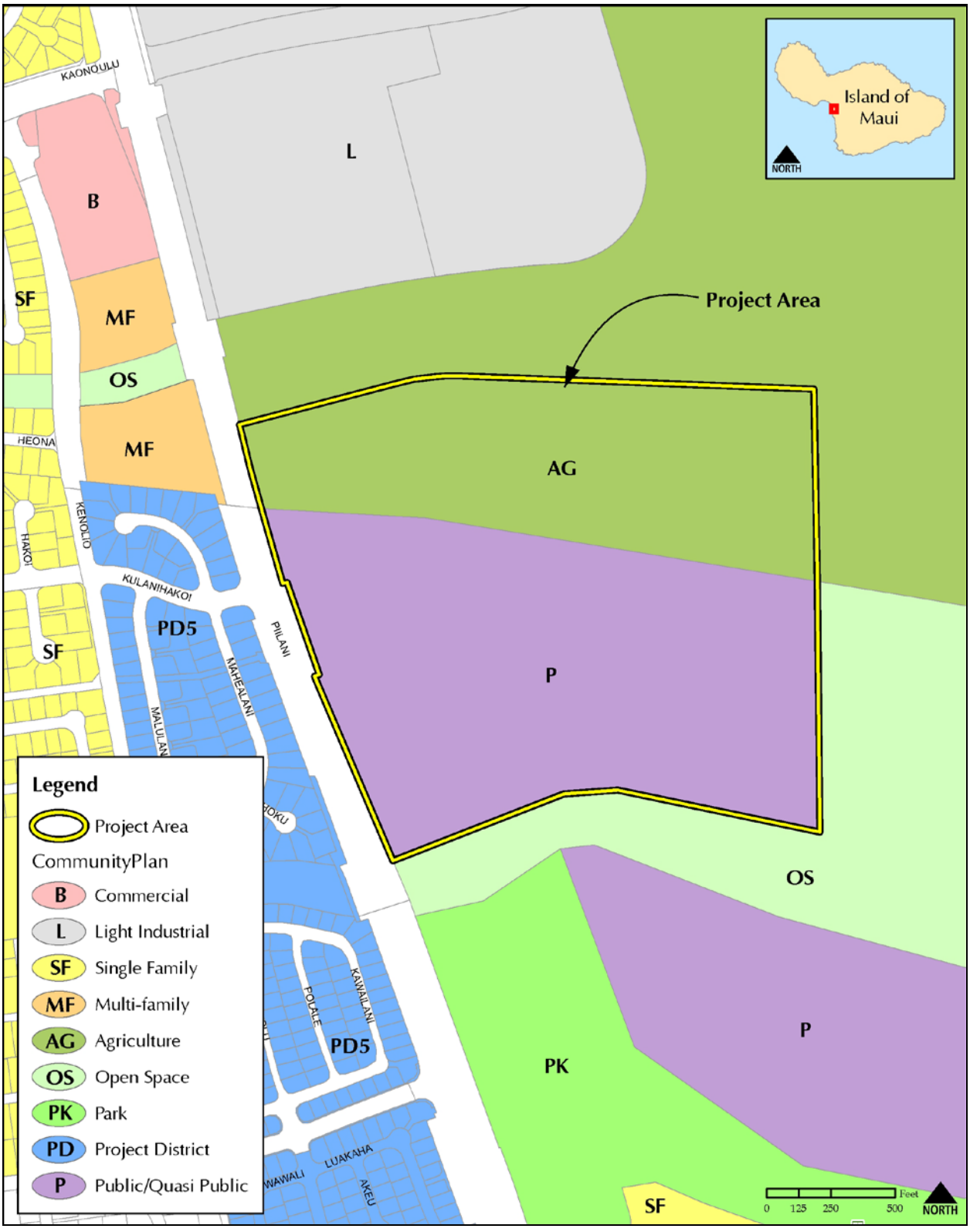


Figure 1-7
Kīhei-Mākena Community Plan Map

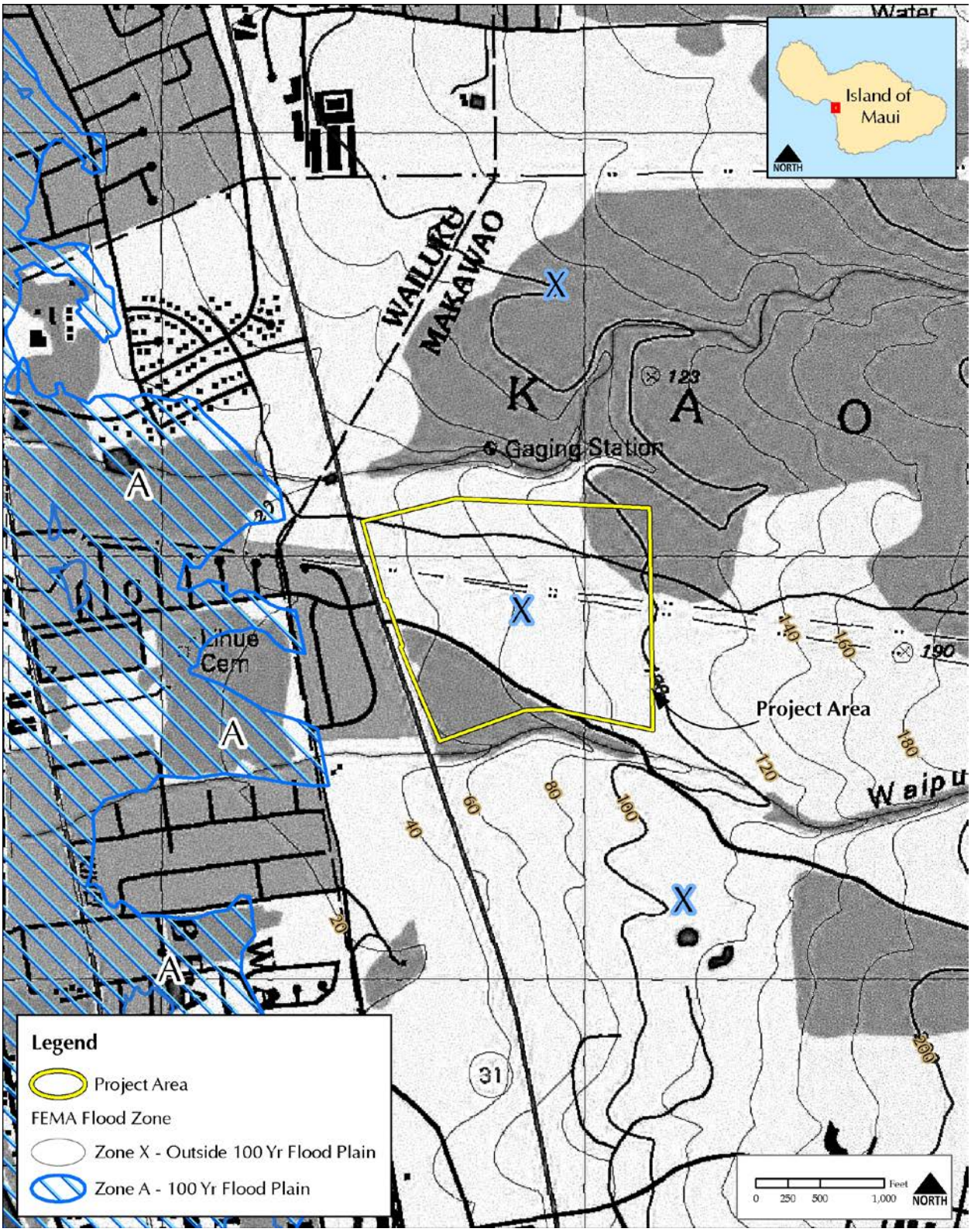


Figure 1-8
Flood Insurance Rate Map

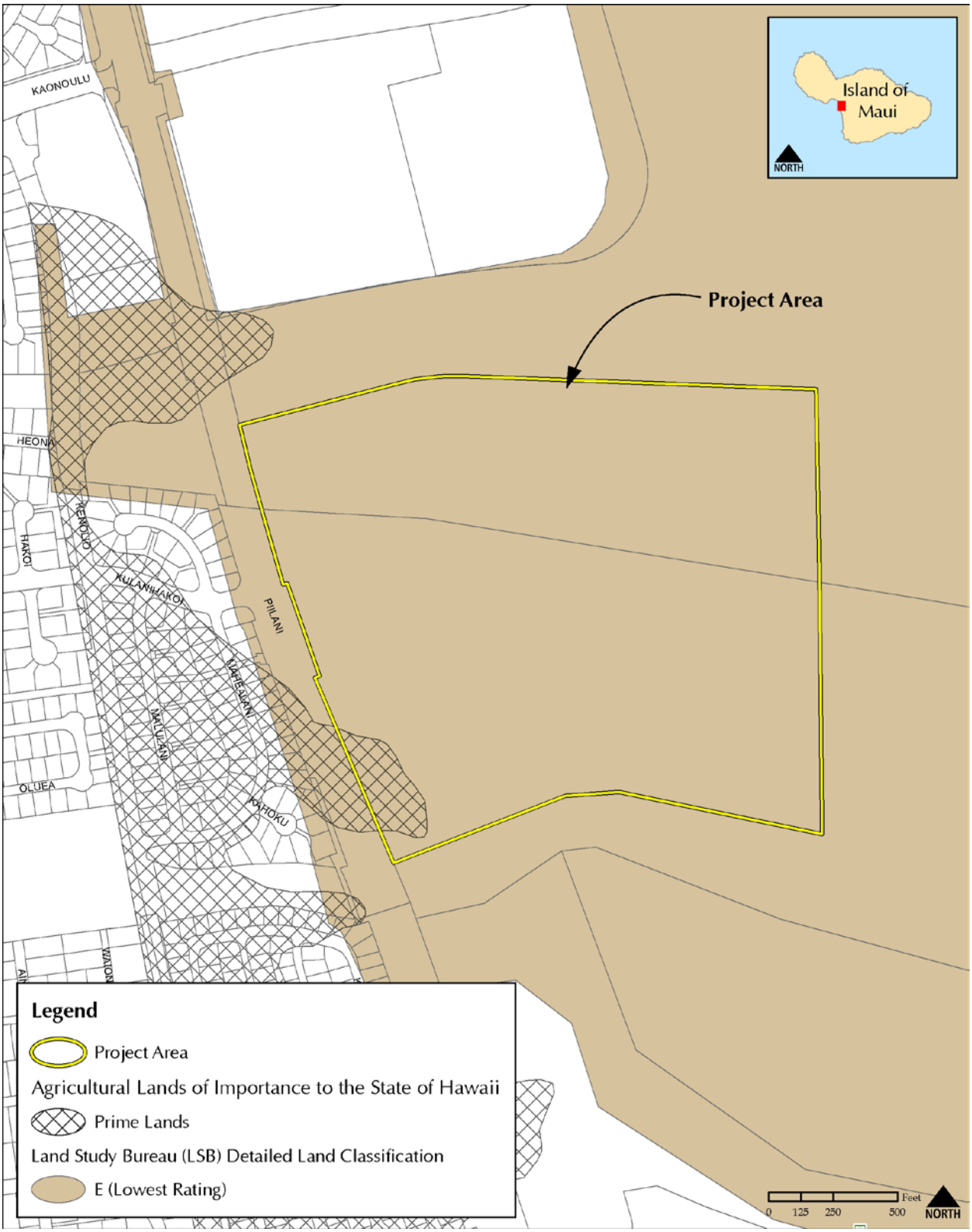


Figure 1-9
Agricultural Lands of Importance to the State of Hawai'i and Land Study Bureau Map

1.4 PROPOSED ACTION

The DOE proposes to develop a new high school campus in Kīhei on 77.2 acres of undeveloped land mauka of Piʻilani Highway between Kūlanihākoʻi and Waipuʻilani Gulches on the island of Maui (*Figure 1-1*). The proposed school will serve grades 9-12 in the South Maui Region. Site improvements would include construction of approximately 215,000 SF of buildings to support an enrollment capacity of 1,650 students and approximately 206 supporting faculty and staff. The high school will be constructed to meet or exceed the United States Green Building Council (USGBC) Leadership in Energy and Environmental Design (LEED) Silver certification, or comparable rating system. The campus also will include athletic fields (e.g., tennis, track and field, football, soccer, baseball and softball fields, and swimming pool) and associated infrastructure improvements (e.g., new roadways, utilities, drainage, wastewater and water systems). An extension of Kūlanihākoʻi Street mauka of Piʻilani Highway will serve as the main campus access road.

The Kīhei High School project requires land use entitlements including a State Land Use District Boundary Amendment from Agricultural to Urban, an amendment to the County of Maui's Kīhei-Mākena Community Plan from Agriculture and Public/Quasi-Public to Public/Quasi-Public, a change in Maui County Zoning from Agricultural to P-1 Public/Quasi-Public, and final subdivision and consolidation approval to allow for the development of the 77.2-acre high school campus. It is a goal of the proposed development that the school will not only serve the enrolled youth, but be a center for the Kīhei community. Kīhei High School will provide opportunities for employment (both short and long-term) within the Kīhei-Mākena area.

1.5 REASONS FOR PREPARING THE EIS

The Kīhei High School project ~~requires use of State funds to purchase the project site and develop the proposed high school, which~~ triggers the environmental review process mandated under ~~Hawai'i Revised Statutes (~~HRS~~)~~ Chapter 343. Expenditure of State funds, use of State lands and the proposed amendment to the Kīhei-Mākena Community Plan are triggers. This EIS is being prepared pursuant to Chapter 343, HRS and Chapter 11-200 Hawai'i Administrative Rules (HAR).

An EIS Preparation Notice was published in the Office of Environmental Quality Control's (OEQC) Environmental Notice on November 8, 2009. This Draft EIS was filed with OEQC, and copies have been distributed to interested parties *(Section 8.0)*. Briefly, the purpose of the EIS is to disclose the probable environmental effects of the proposed development; describe measures to minimize adverse effects; and discuss alternatives to the proposed development.

This document is organized into nine ~~(9)~~ sections.

- *Section 1.0* contains a project summary.
- *Section 2.0* contains the project description with site attributes and project elements.
- *Section 3.0* describes the purpose and need for the change in zoning.
- *Section 4.0* describes existing conditions, probable impacts and mitigative measures.
- *Section 5.0* identifies the consistency with applicable public plans and policies.
- *Section 6.0* considers project alternatives.
- *Section 7.0* identifies references.
- *Section 8.0* identifies the agencies and parties consulted.
- *Section 9.0* identifies the preparers of the EIS.

The following technical appendices are also provided:

- *Appendix A* Preliminary Geotechnical Investigation
- *Appendix B* Kīhei High School Impacts on Agriculture
- *Appendix C* Groundwater Resources and Supply
- *Appendix D* Biological Surveys Conducted for the Proposed New Kīhei High School
- *Appendix E* Archaeological Inventory Survey
- *Appendix F* Cultural Impact Assessment
- *Appendix G* Traffic Impact Report and Traffic Signal Warrant Study
- *Appendix H* Air Quality Study
- *Appendix I* Acoustic Study
- *Appendix J* Phase I Environmental Site Assessment
- *Appendix K* Preliminary Civil Engineering Report
- *Appendix L* Kīhei High School Economic and Fiscal Impacts
- *Appendix M* Nonpotable Water System Alternatives Analysis
- *Appendix N* Kihei High School Project Pedestrian and Bicycle Analysis

1.6 SUMMARY OF ANTICIPATED IMPACTS

Anticipated beneficial and adverse impacts of the Kīhei High School project are briefly discussed below. Detailed analysis of beneficial and adverse impacts is provided in *Section 4.0* of this EIS.

1.6.1 Potential Beneficial Impacts

Education

Construction of the proposed Kīhei High School is a long-envisioned community goal which will decrease travel distances for students who must now travel to other schools in the region, and will help to address overcrowding at other Maui high schools.

Land Use

Completion of the project will fulfill the goals and objectives of the Countywide Policy Plan, Draft MIP (December 2009), and the Kīhei-Mākena Community Plan, to provide a high school educational facility in the Kīhei region.

Economic Factors

In the short-term, build-out of the Kīhei High School campus will boost the economy by providing design and construction-related employment during the phases of campus construction. The project is anticipated to provide approximately 120 permanent jobs at full build-out and occupancy. The jobs will include teachers, librarians, counselors, grounds maintenance staff, and administrators. The project will also result in indirect jobs supplying goods and services to construction companies and their employees and families. Construction of the project will provide considerable tax revenues for the County and State.

1.6.2 Potential Adverse Impacts

The following is a summary of potential adverse impacts that may result from the implementation of the project. Mitigation measures are discussed in *Section 4.0* of the EIS.

Topography and Soils

The project will involve land disturbance, such as grading and grubbing, to develop the infrastructure and high school campus. There will be a short-term impact on soils, with the potential for erosion during construction.

Water Resources

The new community at Kīhei High School will generate demand for potable water and require expansion of the existing potable water system. Development of the new project will increase potable demand in the region by 37,450 gallons per day (GPD). There will also be demand for approximately 185,000 GPD of non-potable water for landscape irrigation throughout the campus. Although the project will create demand for additional water resources, it is estimated that 11 millions of gallons per day (MGD) of groundwater can be developed within the Kamaʻole Aquifer System on a sustainable basis, and the project would not impact the sustainable yield of the aquifer.

Wastewater

There are no existing wastewater facilities currently within the project site. The project will generate an estimated average of 0.05 MGD of wastewater by 2025. Wastewater management facilities will include an on-site sewage collection system to convey wastewater to off-site transmission facilities leading to the Kīhei Wastewater Reclamation Facility (WWRF). The Kīhei WWRF is anticipated to have adequate capacity for flows generated by the project site.

Roadways and Traffic

Construction activities will create some short-term impacts primarily from trucks, heavy equipment and other vehicles that will use existing roads - primarily Piʻilani Highway - in the vicinity of the project site. While construction vehicles are relatively slow and difficult to maneuver, it is anticipated that they will only marginally affect overall traffic flow. Commuting construction workers will slightly increase traffic levels, although their effect is anticipated to be negligible.

The project will have long-term impacts on surrounding areas resulting from new traffic circulation patterns, increases in traffic volumes, and installation of a traffic signal at Piʻilani Highway and Kūlanihākoʻi Street.

Pedestrian and Bicycle Facilities

Along with an increase in automobile traffic to the high school, the project will increase the number of students traveling to school by foot or bicycle. The safety of walking and bicycling students is a concern due to a lack of comprehensive pedestrian and bicycle facilities in the project vicinity. Specific infrastructure improvements are recommended to minimize potential

safety concerns and provide continuous, safe pedestrian and bicycle infrastructure to access the high school campus.

Archaeological Resources

An archaeological site consisting of a mound complex will be adversely impacted through project construction. Although designated eligible under Criterion D for the National Register of Historic Places (NRHP), it is believed that the features have been adequately documented and additional research focused on the site would not contribute to the interpretation of the area, region or Hawaiian prehistory and/or history.

Visual Resources

A majority of the project site is currently open space and there are broad panoramic views across the site and from makai locations. The construction of a high school campus will introduce low-rise structures into the landscape and will affect some existing view planes from Piʻilani Highway. Views of the site from shoreline areas are currently limited by existing residential developments makai of Piʻilani Highway. Panoramic views of Haleakala may be impacted but will not be obscured by the project.

Air Quality

Short-term impacts from fugitive dust may occur during the project construction phase. To a lesser extent, exhaust emissions from stationary and mobile construction equipment, from the disruption of traffic, and from workers' vehicles, may also affect air quality during the period of construction.

After the proposed project is fully occupied, carbon monoxide concentrations in the project area will likely increase due to emissions from project-related motor vehicle traffic, but worst-case concentrations are projected to remain within both the State and the National ambient air quality standards.

Noise

Construction activities at the project site will generate noise impacts that are temporary in nature. Other than the construction workers, who must abide by occupational health and safety standards for hearing protection, the nearest receptors will be residential areas located well away from the property boundary. The noise generated during construction will not be a health risk but could be a nuisance. Long-term property maintenance activities and traffic noise are anticipated to have minimal adverse noise impacts to the neighboring residential areas.

Agriculture

Utilization of this land for a high school forecloses the land's future option for agriculture. This school, however, supports existing growth policies of the MIP General Plan 2030 Draft and the Kīhei-Mākena Community Plan. The majority of the soils in the project area are considered poor by the U.S. Soil Conservation Service's ALISH map series. Only two ~~(2)~~ percent of the project area is designated as Prime soils for agricultural use.

Solid Waste

Solid waste will be generated during the construction phases. No significant short-term or long-term impacts on the existing solid waste collection and disposal system are anticipated as a result of the proposed development.

1.7 SUMMARY OF MITIGATIVE MEASURES

Topography and Soils

The project grading operations will be conducted in compliance with the dust and erosion control requirements of the County. A grading permit will be obtained from the County for all related construction activities. During construction, soils erosion control measures will follow NPDES permit requirements. Long-term soil erosion protection and Best Management Practices (BMPs) will be established at Kīhei High School with extensive planting and slope management measures. Specific attention will be made to avoid disturbance to steep slope areas. The existing topography will be altered only to the extent necessary for the construction of the proposed improvements.

Water Resources

In order to mitigate impacts to the island's potable water supply, the school's non-potable water requirement of 185,000 GPD is proposed to be met by two new on-site brackish wells, which will provide a long-term basal groundwater source from the underlying Kamaʻole Aquifer System. To further reduce impacts on potable water, the project will incorporate sustainable design ~~n~~ features for water efficiency throughout the facilities such as low-flow plumbing fixtures. Potable water is to be provided by the County of Maui Department of Water Supply.

Wastewater

The Kīhei High School project area will be served by a new sewage collection system. Wastewater from the project areas will be conveyed to the Kīhei WWRF. The project will be responsible for its fair share of facilities improvements related to the additional wastewater flows of the new high school.

Drainage

There are no existing drainage improvements in the project area. Drainage improvements are planned for the project area that will manage storm water runoff on the project site. These improvements will include an on-site drainage system of grassed swales, roadway catch basins/manholes and pipe culverts. Surface runoff will be conveyed to the gulches through a series of on-site drainage channels and detention features. Runoff will be managed on-site to avoid adverse off-site drainage conditions.

Roadways and Traffic

Construction and operation of Kīhei High School will modify circulation patterns in the vicinity of the project. The actions proposed to mitigate project traffic impacts include the addition of a driveway off Piʻilani Highway (extension of Kūlanihākoʻi Street), internal campus circulation roadways, turning lanes and installation of a traffic signal at Piʻilani Highway and Kūlanihākoʻi Street.

Visual Resources

To mitigate adverse visual effects, the planning for Kīhei High School considered the project area's topography and panoramic views. The project design will maintain visual standards of the area by meeting County height and design requirements. To mitigate potential visual impacts, the campus will include open space and landscaped areas throughout the development. Landscaping and playing fields are planned fronting Piʻilani Highway to maintain a setback for reduction of visual and noise impacts and maintain a park-like open visual corridor.

Air Quality

Implementing any air quality mitigation measures for long-term traffic-related impacts is unnecessary and unwarranted since worst-case carbon monoxide concentrations are projected to remain well within air quality standards. The impact of construction activities on air quality will be mitigated by conforming to dust control measures which must be implemented to ensure compliance with State regulations. Fugitive dust emissions will be controlled by watering active work areas, using wind screens, keeping adjacent paved roads clean, and covering open-bodied trucks. Other dust control measures include limiting the area that can be disturbed at any given time and stabilizing inactive areas. Paving and landscaping of project areas will reduce dust emissions. Exhaust emissions will be mitigated by moving construction equipment and workers to and from the project site during off-peak traffic hours.

Noise

Construction activities will meet State Department of Health (DOH) standards for noise. Equipment mufflers and construction curfew periods will mitigate noise impacts. Particular attention will be given to noise mitigation in areas closest to nearby existing residential areas. Construction activities will be limited to daytime hours. A Community Noise Permit will also be obtained for the project.

Solid Waste

Waste reduction and recycling will be integrated into the construction and operation phases of the Kīhei High School project. During the construction of the proposed project, cleared vegetation will be transported to the County's green waste recycling facility at the Central Maui Landfill for disposal. There will be no demolition waste, as the property is currently undeveloped. During school operation, recycling programs will be emphasized to reduce waste collected and disposed of in landfills. Additionally, in order to achieve LEED or similar certification, one of the requirements of the project will be to divert a certain percentage of construction waste.

1.8 COMPATIBILTY WITH LAND USE POLICIES AND PLANS

The proposed action is compatible with existing State policy documents (i.e. Hawai'i State Plan and Functional Plans). The proposed action is also compatible with the Kīhei-Mākena Community Plan and County of Maui General Plan 2030 which consists of the recently adopted Countywide Policy Plan and MIP General Plan 2030 Draft (December 2009). In planning for future facilities, the DOE and the County have recognized the need for Kīhei High School to meet the needs of the expanding Kīhei region and to provide a balanced city range of urban services, including jobs and public facilities.

1.9 SUMMARY OF ALTERNATIVES TO THE PROPOSED PROJECT

The potential benefits and impacts of three ~~(3)~~ alternative development schemes for a new Kīhei High School were evaluated, including a no-action alternative. These analyses and summaries are provided in *Section 6.0* of this document.

1.9.1 No-Action Alternative

The no-action alternative would involve no changes to the existing site. This alternative assumes the development of the land in accordance with the current agricultural zoning of the site. Under this alternative, the land would probably remain undeveloped, and be used for cattle grazing, or possibly go unused.

1.9.2 Alternative Sites

After evaluation of 11 total sites, two ~~(2)~~ sites in addition to the project site were explored for development of the high school campus in Kīhei. These sites were evaluated in the Site Selection Study (Munekiyo and Hiraga, 2008) to determine their suitability for development. All three ~~(3)~~ finalist sites, including the project site, would have a similar level of environmental impact as they all involve the conversion of undeveloped land. In comparison, the Kīhei High School project site received the most points and therefore determined to be the best location for development and to have the least anticipated environmental impacts.

1.9.3 Reduced Campus Size

Under this alternative, a 50-acre campus was evaluated at the selected project site. Due to site configuration constraints and land requirements to provide facilities to support a design enrollment of 1,650 students, the 50-acre alternative would not support the objectives of the proposed project.

1.10 SUMMARY OF UNRESOLVED ISSUES

At the time of publication of this document, there are several unresolved issues for this project. Final parking requirements must be determined in collaboration with the County. Continued discussions with County authorities are also necessary regarding provision of potable water and non-potable irrigation water to the project site. Finally, detailed project design information, such as the specific architectural and landscape design for the campus, has not been completed. Final project design will be determined by the project developer during the Design-Build (DB) process.

A further discussion of unresolved issues is provided in *Section 4.4.5*.

1.11 SUMMARY OF REQUIRED APPROVALS, PERMITS AND PLANS

Development of the Kīhei High School project requires a number of permits and approvals from State and County agencies. All permits and approvals, including ministerial permits, such as grading and building, will be obtained in the appropriate sequence as required for planning, site development, infrastructure and the construction of project elements. See *Table 2-4* for a detailed list of approvals and permits.

Chapter 2
Project Description

2.0 PROJECT DESCRIPTION

The project description section will discuss the Kīhei High School's conceptual site plan and program, as well as open space, parking, infrastructure, sustainable concepts, phasing, permits, schedule and cost.

2.1 SITE PLAN AND PROJECT SUMMARY

2.1.1 Community Consultation and Project Design

The Kīhei High School project process included a series of development charrettes intended to involve community stakeholders in the planning and concept design of the new Kīhei High School. Each charrette was intended to address a particular aspect of the project and appropriate parties were invited by the DOE and encouraged to attend and participate in the decision-making process.

The goals of the charrette process were to:

1. Provide an opportunity for all involved to develop a common vested interest in the project and its vision.

2. Make prudent decisions based on input of all players so costly redesigns and delays will be minimized.

3. Promote teamwork among stakeholders to produce a set of documents that addresses all design aspects.

4. Create a better project more efficiently and more cost effectively through collaboration.

The development charrettes were conducted over a period of four months which began in August 2008 and concluded in November 2008. The charrette series included eleven two and one-half-hour sessions from 3:00 PM to 5:30 PM on pre-scheduled days. All charrette meetings were held at Pomaika'i Elementary School on Maui.

The schedule for the Development Charette sessions and their focus areas was:

Session I – Introduction & Orientation
Session II – Visioning Activity
Session III – Initial Concepts
Session IV – Instructional Spaces
Session V – Specialty Classrooms
Session VI – Specialty Classrooms
Session VII – Library/Media Center
Session VIII – Admin & Student Center
Session IX – Physical Education (PE), Athletics & Music
Session X – Cafeteria & Food Kiosk
Session XI – Final Presentation & Recap

Participants included a team of interested stakeholders. DOE administrators, teachers and staff, Kīhei community members, local business owners, Maui High School students and technical consultants all provided important input during the charrette sessions.

Themes that emerged from charrette sessions include:

- Enhance Kīhei Pride through Athletic Events and Sports
- Science and Technology Focus
- Center of the Community – It Takes A Village to Educate A Child
- Partnerships with the Community
- Health, Wellness and Healthy Foods Focus
- Celebrate Kīhei diversity
- The future of learning – supports life-long learners
- Performing Arts Center
- Focus on ocean activities

The Kīhei High School project team also presented to the Kīhei Community Association on November 17, 2009. The team shared an overview of the proposed campus design, an overview of the planning process, and provided the audience with comment forms and instructions for accessing and commenting on the EIS Preparation Notice.

2.1.2 Site Plan

The following description of the high school campus is based on the conceptual site plan and does not necessarily reflect the final project design. The high school will be constructed through a Design-Build (DB) process. Detailed project design will be determined by DOE and the Kīhei High School DB developer chosen through the Request for Proposal (RFP) process.

The conceptual site plan (*Figure 2-1*) was conceived to respond to DOE space program requirements, preferred school design strategies, desired functional relationships for campus facilities, site topography and climate. The gently sloping 77-acre Kīhei High School campus site will be graded with several tiers. As shown in *Figure 2-1*, academic buildings are clustered on the upper-level; the stadium, athletics and physical education facilities are located on the mid-level; and the lower-level adjacent to Piʻilani Highway features athletics fields, landscaping and open space.

The upper campus is the area mauka of the stadium and is conceived to include two ~~(2)~~ primary zones, the Campus Green and Academy Mall. The Campus Green, with support buildings such as the Administration/Student Center, Cafeteria and possible future Auditorium, is envisioned as the more "public" part of the upper campus, accessible to parents and the community. The Academy Mall focuses on instruction and will potentially include classroom buildings, the Tech/Electives Center and Library.

The lower campus will potentially accommodate indoor and outdoor physical education and athletics facilities. The Physical Education Locker Building, grassed playfield, outdoor basketball

courts, and tennis courts would support the physical education program. The Athletics Locker Facility, Gymnasium, sports stadium, softball, baseball, practice fields, and space for a possible future pool also support the physical education program and the athletics program.

As shown on the conceptual site plan, the softball, practice and baseball fields are situated on the lowest part of the gently sloping lower campus. The sports stadium, bleachers, and Athletic Locker Facility are shown at the center of the lower campus at a slightly higher elevation than the practice fields. To the north of the stadium is the Gymnasium and Events Plaza.

The Kīhei High School campus is envisioned as a place for the community to gather. Athletic fields on the lower campus will potentially be accessible for public use during non-school hours. For example, local sports teams could use the fields for practice and games, or local organizations could use the open space for meetings and picnics.

Figure 2-1
Conceptual Site Plan

2.1.3 Space Program

The design of each new DOE high school is based on educational criteria and floor areas described in the DOE's Facilities Assessment Development Schedule (FADS), which provides consistent space standards for all public school facilities.

Based on the FADS analysis prepared for Kīhei High School, the total school program includes ~~212,955~~ 209,435 net square feet of building area. The FADS analysis also indicates approximately 575,660 SF of outdoor PE and Athletic facilities components to be provided on campus.

Table 2-1 CAMPUS COMPONENT AREAS	
Instructional and Support Components	
Classroom houses	85,640 SF
Technology/Electives	21,820 SF
Music Building	7,830 SF
Administrative Center	5,675 SF
Student Center	6,130 SF
Cafeteria/Kitchen/Custodial	18,510 SF
Library Media Center	9,790 SF
Physical Education/Locker Shower	11,140 SF
Junior Reserve Officer Training Corps	2,840 SF
Athletic Locker/Shower	10,340 SF
Gymnasium	22,520 SF
Future Auditorium	TBD
Portables	7,200 SF
Total Instructional and Support	**~~212,955 SF~~ 209,435 SF**
Outdoor Athletics Facilities	
Grassed Playfield	75,000 SF
Tennis Courts	28,800 SF
Paved Playcourt	20,736 SF
Track and Field, Bleachers	161,400 SF
Practice Field	57,600 SF
Baseball Field	144,400 SF
Softball Field	70,230 SF
Misc. Athletics	4,995 SF
Future Swimming Pool and Headhouse	12,499 SF
Total Athletics Facilities	**575,660 SF**

2.1.4 Phasing

The Kīhei High School project is anticipated to be constructed in two ~~(2)~~ phases to accommodate current enrollment projections. Phase I consists of development of the entire Kihei High School campus and includes construction of all essential classrooms and other buildings. Phase II will involve campus expansion.

Phase I involves construction of all on-site and off-site backbone infrastructure improvements for the entire campus site, including the campus driveways, fire lanes, parking and walkways, and Piʻilani Highway improvements including traffic signalization, grading, drainage and utilities. Phase I will include complete facilities for the high school campus to serve a student population of approximately 800 students. The major features are two classroom houses, administrative/student center, library, cafeteria, selected elective buildings and selected athletics facilities.

Current plans contemplate developing Phase I utilizing a design-build contract that combines design and construction of the campus under a single entity. Although the design-build contract will specify the development program for the campus, the exact location of buildings and improvements will be determined during the design phase. Assuming approval of necessary entitlements and appropriation of sufficient funds, design and construction may be anticipated to take approximately two years to complete, prior to school opening projected for 2016, providing funds are available.

Phase II would consist of additional classroom houses and other amenities to be constructed when enrollment increases justify the improvements and funding is available. Completion of Phase II would increase the school's capacity to a maximum student population of 1,650 students.

Phase II facilities could include construction of two additional classroom houses, additional electives buildings, an auditorium, a swimming pool and remaining athletics facilities. The buildings and the potential future facilities comprising Phase II will be integrated in the campus master plan. Phase II facilities and future improvements may not be located in a single contiguous area.

The design and construction schedule for Phase II will not be predetermined, but will also be based on enrollment increases and availability of State funding. Subject to approval of the Legislature and release of funds by the Governor, individual elements of Phase II could be constructed separately, with projected completion of Phase II construction scheduled to be approximately 10 years after the completion of Phase I. Backbone infrastructure and facilities for the entire campus site will be developed across the entire parcels during Phase I. Therefore the entire project site should be reclassified to the Urban district at one time rather than in increments.

~~Phase I is anticipated to take approximately two (2) years to complete prior to school opening projected for 2016. Construction of Phase I would allow for a student capacity of approximately 800 students. Current plans for Phase I include two (2) classroom houses, administrative/student center, library, cafeteria, selected elective buildings and selected athletics facilities. Phase I would also include on-site and off-site infrastructure improvements for the entire site, including the Kūlanihākoʻi Street extension, campus driveways, fire lanes, parking and walkways, and Piʻilani Highway improvements including traffic signalization, grading, drainage and utilities.~~

~~Phase II would be developed when enrollment increases justify the improvements and based on availability of State funding. Anticipated completion of Phase II construction would be approximately 10 years after the completion of Phase I. The design and construction schedule will be subject to approval of the Legislature and release of funds by the Governor. Phase II includes construction of the final two (2) classroom houses, remaining electives buildings and remaining athletics facilities. Construction of Phase II would increase the school to its maximum student capacity of 1,650 students.~~

~~Potential future plans include construction of an auditorium and swimming pool. There is no set timeframe for construction of these buildings.~~

~~Although the Project may be constructed in Phases, the buildings scheduled to be constructed in Phase II and the potential future facilities are integrated in the campus master plan, without regard to locating all of Phase II and future improvements in a single contiguous area. Thus it would not be appropriate for the Land Use Commission or the County of Maui Project to approve this school project in increments.~~

The anticipated phasing is depicted graphically in *Figure 2-2* below.

2.1.5 Staff, Student and Visitor Population

Approximately 930 people are anticipated on campus at the end of Phase I, including 800 students, 120 staff and 10 visitors per day. With the construction of Phase II, the campus population is expected to total 1,941 people, including 1,650 students, 206 staff and 85 visitors.

Table 2-2 PROJECT POPULATION DURING PHASES

	Phase I (2016)	**Phase II (2025)**
Students	800	1,650
Staff	120	180-206
Visitors	10	85
Total Students, Staff and Visitors	**930**	**1,941**

Estimates provided for planning purposes only.

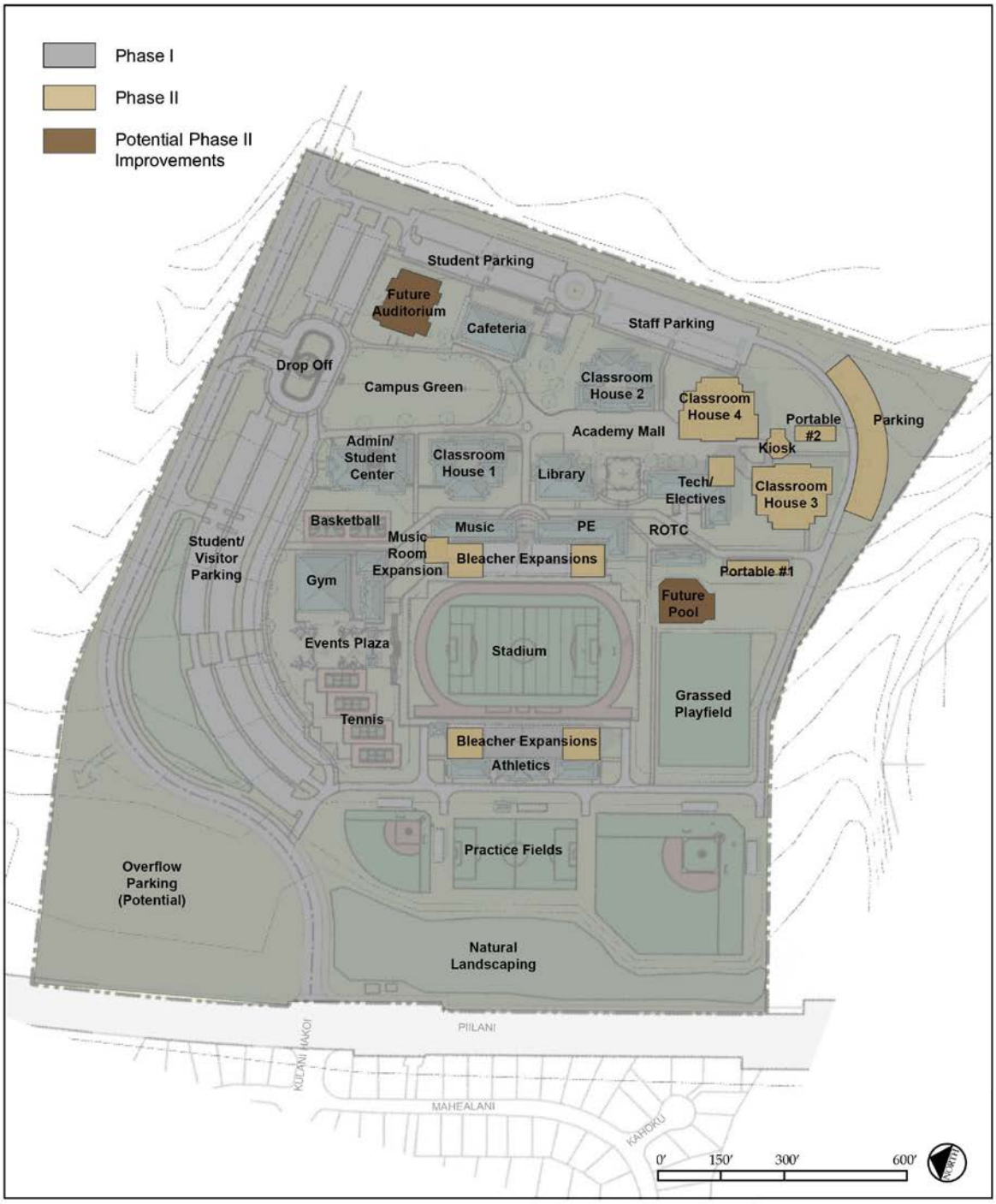


Figure 2-2
Conceptual Phasing Plan

2.1.6 Project Operations

School operations are anticipated to follow typical DOE administration and academic schedules. DOE administration hours are typically from 7:00 AM to 4:30 PM, Monday through Friday. Student academic hours range from approximately 8:00 AM to 2:00 PM, Monday through Friday. Wednesdays are typically shorter with classes ending between 12:00 PM and 1:30 PM. The specific bell schedule and student hours are set by each school to fit their needs. Activities for school entities such as clubs, band practice, football practice and choral practice are normally held after school hours during the work week.

There are no administration or student operation hours on weekends. Weekend activities must be coordinated with the requesting entity and the school administration. Some student entities and public entities use the available school facilities after hours per HAR Title 8, Chapter 45 during hours permitted by the school. After hours activities typically are not permitted past midnight.

2.2 OPEN SPACE

The proposed Kīhei High School conceptual campus plan offers extensive and diverse open spaces for student use, landscaping, outdoor physical education, athletics, circulation and infrastructure requirements. Each individual campus area has an open or green space as a focal point. Two ~~(2)~~ prominent open spaces, an open lawn and a central plaza, are planned in the upper campus. The lower campus is dominated by programmed and natural open space. The "Events Plaza" is a proposed open space located near the entrance to the sports complex. As open space, the Events Plaza serves as the iconic entrance and courtyard area to the Stadium. Another potential function for the plaza is an outdoor venue and gathering place for community events. The athletic fields, overflow parking and landscaping areas adjacent to Piʻilani Highway comprise the majority of open space on the lower campus. These open areas reveal mauka-makai views to and from the highway, stadium and the upper campus buildings.

In the conceptual site plan, approximately 68% of the campus is planned for open space.

Table 2-3 PRELIMINARY OPEN SPACE CALCULATION

Instructional Spaces (all phases)	281,245 GSF
Outdoor Facilities (athletics and physical education)	144,680 GSF
Paved Vehicular Areas	658,300 GSF
Total Obstructed Space	**1,084,225 GSF**
Project Site Area (77.2 acres)	3,362,832 SF
Total Obstructed Space	(1,084,225) SF
Total Open Space	**2,278,607 SF**
Percent Open Space	**68%**

2.3 ACCESS, INTERNAL CIRCULATION, EMERGENCY ACCESS AND PARKING

Access

As depicted in the conceptual site plan (*Figure 2-1*), access to the campus will be provided by an extension of the existing Kūlanihāko'i Street across Pi'ilani Highway. The street extension will be located between Kūlanihāko'i Gulch and the north boundary of the campus. Driveways along the new Kūlanihāko'i extension will allow ingress to the campus. Installation of a traffic signal at Pi'ilani Highway and Kūlanihāko'i Street is to be constructed by the year the school opens.

Internal Vehicular Circulation

The access roadway for the proposed Kīhei High School will connect to the east side of the intersection of Pi'ilani Highway and Kūlanihāko'i Street, creating a four ~~(4)~~ way intersection. After the connection is completed, the westbound approach of the access road is expected to have two ~~(2)~~ westbound lanes that serve left-turn, through, and right-turn traffic movements. In addition, northbound deceleration and acceleration lanes are expected to be constructed along Pi'ilani Highway to facilitate entering and exiting traffic at the school's access. The access driveway will connect with internal circulation roads, a drop off area, and parking areas. As shown on the conceptual site plan, internal circulation consists of a looped road and parking areas that wrap the perimeter of the campus.

Emergency Access

Emergency access to the main portions of the campus (upper and mid-level) is shown on the conceptual site plan as a perimeter fire lane/walkway. An interior fire lane/walkway crosses through the upper-level campus. Wide landscaped pedestrian malls through the campus could also potentially function as service access and fire lanes for emergency vehicles.

Parking

Parking requirements are to be determined in consultation with the County. Parking for students, staff and visitors will be provided in parking lots adjacent to the campus. Core parking lots will support the school functions during the day and extra-curricular functions during non-school hours. Overflow parking for events will potentially be accommodated on a seven-acre portion of the campus located across the Kūlanihāko'i Street extension.

2.4 INFRASTRUCTURE

2.4.1 Water

Preliminary water demands are based on the conceptual site plan and DOE's anticipated growth in enrollment for the proposed school. In recognition of Maui's water shortage, dual water systems are being planned for the proposed Kīhei High School. It is anticipated that potable water will be supplied by the County's Central Maui Water System and that brackish water wells to be located at the school site would serve as the non-potable source of irrigation water.

The nearest water facility to the project site is the 8-inch water line at the intersection of Kūlanihāko'i and Mahealani Street in the Pi'ilani Village Subdivision. Further down Kūlanihāko'i Street at the intersection with Līloa Drive is a 36-inch concrete pipe transmission main and 18-inch ductile iron distribution main. The 18-inch distribution main is connected to both reservoirs in the area but is primarily served by the Hale Kīhei Reservoir at elevation 220 feet AMSL. Construction of a booster pump station will be necessary to maintain adequate fire flow pressures.

Potable water demand projections were developed based on use of low-flow and other water conservation fixtures throughout the various buildings. Project sustainability practices will address water efficiency criteria in accordance with the LEED rating system.

2.4.2 Wastewater

It is anticipated that sewer service will be provided by the extension of the County system from an existing drop manhole in the intersection of Kūlanihāko'i Street and Mahealani Street in the Pi'ilani Village subdivision approximately 300 feet from the proposed Kīhei High School. The proposed sewer line would extend across Pi'ilani Highway to an on-site property sewer service manhole. Wastewater would ultimately be conveyed to the Kīhei WWRF.

2.4.3 Drainage

The Kīhei High School project site is currently undeveloped and consists of dry rolling foothills on west-facing lowland slopes of Haleakalā. Because the property is vacant there is no existing drainage system serving the site except for drainage infrastructure in Pi'ilani Highway, which is owned and maintained by the State of Hawai'i Department of Transportation (DOT). The majority of the existing runoff at the site drains towards a 72-inch diameter culvert under Pi'ilani Highway. The remainder of the runoff drains into either Kūlanihāko'i Gulch or Waipu'ilani Gulch. Both gulches cross under Pi'ilani Highway. These gulches are generally dry except after significant rainfall events.

Development of the Kīhei High School project will replace undeveloped land with pervious and impervious surfaces. The proposed conceptual drainage plan will consist of on-site and off-site improvements. The off-site drainage improvements will divert runoff generated above the proposed Kīhei High School into the neighboring Waipu'ilani Gulch. The on-site drainage system will be designed to safely convey on-site runoff into a basin and prevent runoff from entering Pi'ilani Highway. The basin should be designed to reduce post-development flow rates and quantity to below pre-development levels.

2.5 SUSTAINABLE DESIGN

Kīhei High School will achieve a minimum of Silver certification under the LEED program developed by the USGBC, or a comparable rating system such as HiCHPS.

Sustainable design strategies that will be considered in the design process are summarized in this section.

- Sustainable Sites: The Kīhei High School project design may support alternative modes of transportation, low-emitting and fuel efficient vehicles, reduction of heat island effect, reduction of light pollution, joint-use of facilities, maximizing open space, and on-site storm water retention and treatment for storm water quantity and quality control.
- Water Efficiency: The project design may incorporate water efficient plumbing fixtures, such as high efficiency or drip irrigation systems, and drought tolerant landscaping.
- Energy and Atmosphere: The Kīhei High School project plans to gain credits in this category through optimizing energy performance, providing on-site renewable energy, commissioning energy audits and by using ozone-friendly refrigerants.
- Materials and Resources: Credits in this area may be achieved through construction waste management and selection of materials with high recycled content.
- Indoor Environmental Quality: Credits in this area may be achieved through managing indoor air quality during construction and before occupancy, using low-emitting materials, controlling indoor chemicals and pollutants, providing lighting control, meeting thermal comfort criteria, and providing day-lit areas and outside views.

During an eco-charrette for the concept plan, participants identified 65 possible points under the LEED for Schools v3.0 scoring system. Achieving all of these points would earn the project a Gold certification and exceed DOE's minimum standard of achieving Silver. Credits will need to be vetted through studies, computer modeling, cost assessment and collaboration with the developer's design team. The formal LEED accreditation process or certification under a comparable system will occur during the design-build process.

2.6 REQUIRED PERMITS, APPROVALS AND PLANS

Development of the proposed project will require a number of permits and approvals from State and County agencies. All permits and approvals, including ministerial permits such as grading and building, will be obtained prior to construction. The following is a preliminary list of required approvals, which is subject to change. Additional permit requirements are provided in *Appendix K* will be disclosed in the Final EIS if needed.

Table 2-4 REQUIRED PERMITS, APPROVALS AND PLANS

Permit or Approval Required	Authority
Section 404 Clean Water Act Permit	Department of the Army
Final EIS	State of Hawai'i, DOE
State Land Use District Boundary Amendment	State of Hawai'i, Land Use Commission
Air Pollution Control Permit	State of Hawai'i, DOH
Community Noise Permit	State of Hawai'i, DOH
NPDES Permit	State of Hawai'i, DOH
Section 401 Clean Water Act	State of Hawai'i, DOH
Well Construction and Pump Installation Permit	State of Hawai'i, DLNR-CWRM

Table 2-4 REQUIRED PERMITS, APPROVALS AND PLANS	
Permit or Approval Required	**Authority**
Stream Channel Alteration Permit	State of Hawai'i, DLNR-CWRM
Permit to Perform Work within a State ROW	State of Hawai'i, DOT
Community Plan Amendment	Maui County Planning Commission and County Council
Change in Zone	Maui County Planning Commission and County Council
Final Subdivision Approval	Maui County, Public Works, Development Services Administration Department
Grading and Grubbing Permit	Maui County, Public Works, Development Services Administration Department
Driveway Permit	Maui County, Public Works, Development Services Administration Department
Building Permit	Maui County, Public Works, Development Services Administration Department
Variance Permit	Maui County, Department of Planning
Wastewater Discharge Permit	Maui County, Department of Environmental Management, Wastewater Division
Drainage Approval	Maui County Department of Public Works
Easements as required for Utilities and Roadways	Various
Flood Development Permit	Department of Planning

2.7 ANTICIPATED DEVELOPMENT SCHEDULE AND EXPENDITURES

Project development and implementation is scheduled to begin immediately following approvals of necessary land use permits, selection of a project developer through the RFP process, and available funding.

Construction of Phase I improvements is expected to occur between 2014 and 2016, with school opening anticipated in 2016, provided funds are available. The DOE expects the school to open with a capacity for approximately 800 students. Timing for construction of Phase II improvements will be based on student population. For the purposes of the EIS and the traffic study analysis, horizon years were established for completion of Phase II construction in 2025, about nine years after the completion of the first phase. ~~The timeframe for the "future" projects phase is unknown at this time.~~

The preliminary project budget for Phase I improvements is $120~~,000,000~~ million. The preliminary construction cost estimate for Phase II is $30 million. Cost estimates for the potential future improvements have not been developed.

Chapter 3
Purpose and Need for the Project

3.0 PURPOSE AND NEED FOR THE PROJECT

Significant population growth in the Kīhei-Mākena region, coupled with the geographical separation from existing crowded central Maui high schools, has created the need for the proposed Kīhei High School. The proposed high school has been planned for in County planning documents such as the adopted Kīhei-Mākena Community Plan (1998), adopted Countywide Policy Plan (March 2010) and the MIP General Plan 2030 Draft (December 2009).

3.1 POPULATION GROWTH

~~From April 1, 1990 to April 1, 2000,~~ According to the 2011 Maui County Data Book, the residential population on the County of Maui grew from ~~100,504 to 128,241,~~ 128,899 in 2000 to 154,834 in 2010, a ~~29~~ 20 percent change over the span of a decade. The resident population of the Kīhei-Mākena region in particular experienced significant growth in the same decade from ~~15,365 to 22,870~~, 16,749 to 20,881, a ~~49~~ 24.7 percent increase. The 2025 population estimate for the Kīhei-Mākena region is 35,962 persons, or a 57 percent increase from 2000 (County Planning Department, June 2006).

3.2 EXISTING SCHOOLS AND CAPACITY

Central Maui schools currently serve students from the South Maui region with Kīhei students traveling long distances to attend high school. These central schools are Maui High School in Kahului which serves ~~eastern~~ South Maui communities including Kīhei, Mākena and Wailea, and Baldwin High School in Wailuku, which serves Wailuku, Waiehu, Waikapū, Waihe'e and Mā'alaea communities. *Table 3-1* below provides design capacity, existing enrollment, and enrollment projections for each Central Maui high school.

Table 3-1 CAPACITY AND PROJECTED ENROLLMENTS OF CENTRAL MAUI HIGH SCHOOLS

	Maui High	Baldwin High
Design Capacity	1,580	1,669
School Year		
2011 Projected	1,719	1,641
2011 Actual	1,826	1,612
2012	1,744	1,659
2013	1,743	1,672
2014	1,757	1,690
2015	1,764	1,670
2016	1,755	1,677

Source: DOE Facilities Branch, 2011

In 2011 Maui High exceeded its design capacity by over 200 students and Baldwin had capacity for an additional 50 students. At this time, South Maui students may apply for a Geographic Exemption to attend Baldwin High School.

The only school in South Maui that serves students in grades 9 through 12 is Kīhei Charter School. In the 2011-2012 school year, Kīhei Charter School had 248 students in grades 9 through 12. Kīhei Charter School does not meet regional needs for a high school complex (DOE, Facilities Branch, 2011).

3.3 KĪHEI-MĀKENA COMMUNITY PLAN (1998)

The Kīhei High School site is located within the boundary of the County's Kīhei-Mākena Community Plan (1998) region. This County plan identifies a shortage of existing educational facilities and the long-term need for a new high school to serve the Kīhei-Mākena region. The Community Plan identifies the lack of a high school in the region as a ~~major~~ problem. An Education Objective of the Community Plan is to build a high school to accommodate growth in the Kīhei-Mākena region. An Education Implementing Action is to plan and locate a site for a high school to serve the Kīhei-Mākena region. The project meets this objective and implements the action.

3.4 COUNTY OF MAUI 2030 GENERAL PLAN

Countywide Policy Plan (March 2010)

The Countywide Policy Plan, the first component of the Maui County General Plan update, was adopted in March 2010 as a comprehensive policy framework for the islands of Maui County to the year 2030. The Countywide Policy Plan provides broad goals, objectives, policies, and implementing actions that portray the desired direction of the County's future, including the goal to provide residents with access to lifelong formal and informal educational options (Part C). The project will meet the goals of the County to provide quality education opportunities for the people of Maui.

Draft Maui Island Plan (December 2009)

Chapter 8 of the MIP General Plan 2030 Draft (December 2009) presents a Directed Growth Plan for each of the Island's regions. The Directed Growth Plan for South Maui recommends Kīhei High School as a new regional facility and depicts the high school site in *Figure 8-4: Kīhei-Mākena Planned Growth Areas*. The same figure shows the new "Kīhei Mauka" planned growth area adjacent to the proposed Kīhei High School site. "Kīhei Mauka" is approximately 500 acres of existing undeveloped ranch land planned for mixed use development, including approximately 1,500 single-family and multi-family residential units. Features of the project area includes proximity to the highway, the adjacent Maui Research and Technology Park, low agricultural suitability and few infrastructure constraints, making these locations ideal for a future high school and mixed-use community. The high school site is included inside the Planning Department's North Kīhei Directed Growth Map urban growth boundary (MIP General Plan 2030 Draft, Planning Department, Directed Growth Map, North Kīhei S1) and is shown in *Figure 3-1* below. The MIP General Plan 2030 Draft's Public Facility/Infrastructure Improvements Map (MIP General Plan 2030 Draft, Map 6-3) also shows a proposed High School symbol on the project site, illustrated in *Figure 3-2* below. The proposed Kīhei High School is clearly supported at the County level in the MIP General Plan 2030 Draft.

The purpose of the Kīhei High School project is to meet regional needs for an educational facility. The proposed Kīhei High School has been planned for by the County and will serve growing populations in the Kīhei-Mākena region. The new school will alleviate long travel distance for families driving their children back and forth to school in Central Maui and for students who ride the bus to Central Maui and back. It will also alleviate the current overcrowding experienced at one Central Maui high school and provide opportunities for short and long-term employment within the Kīhei-Mākena region.

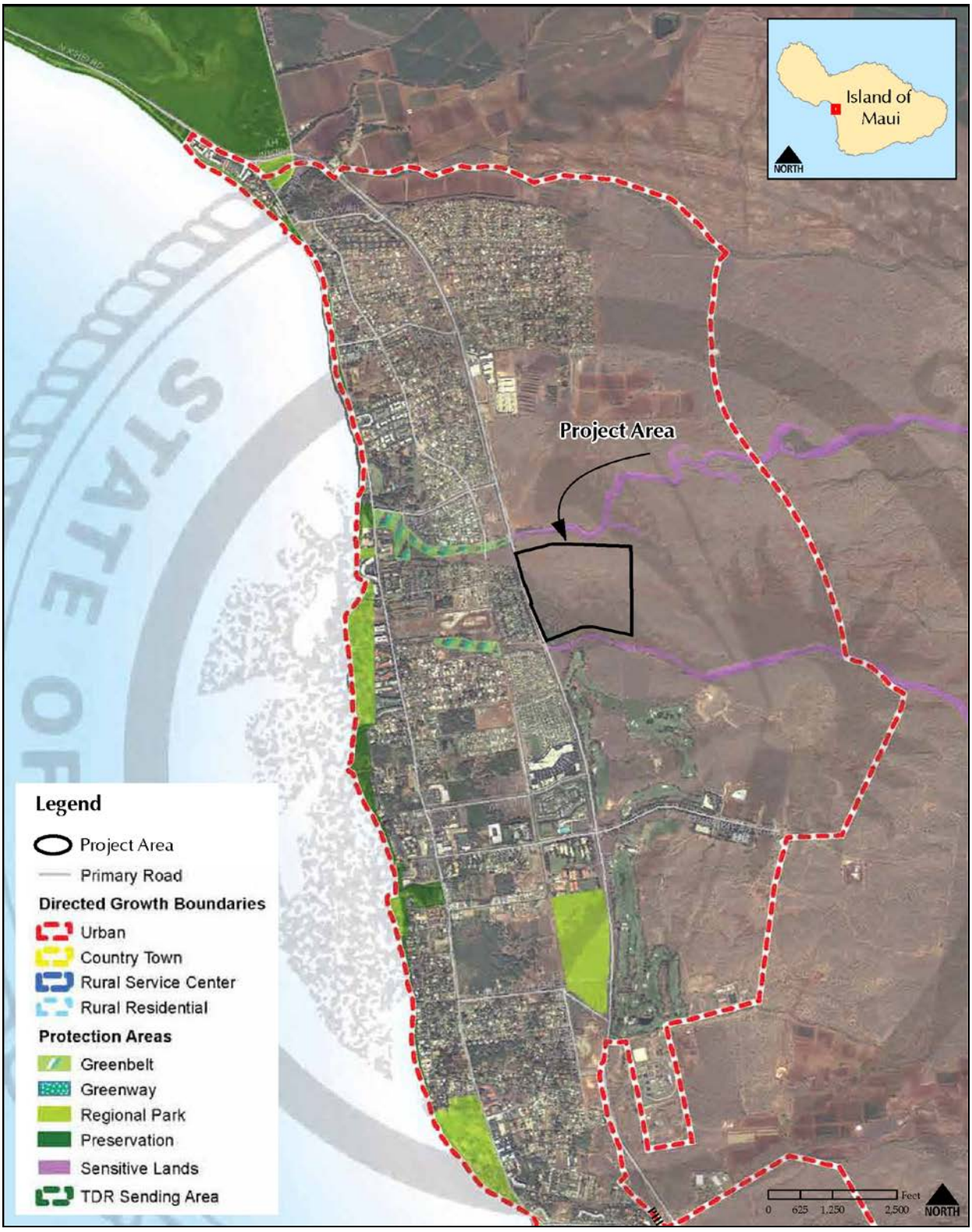


Figure 3-1
Maui Island Plan, Directed Growth Map, North Kīhei (Draft)

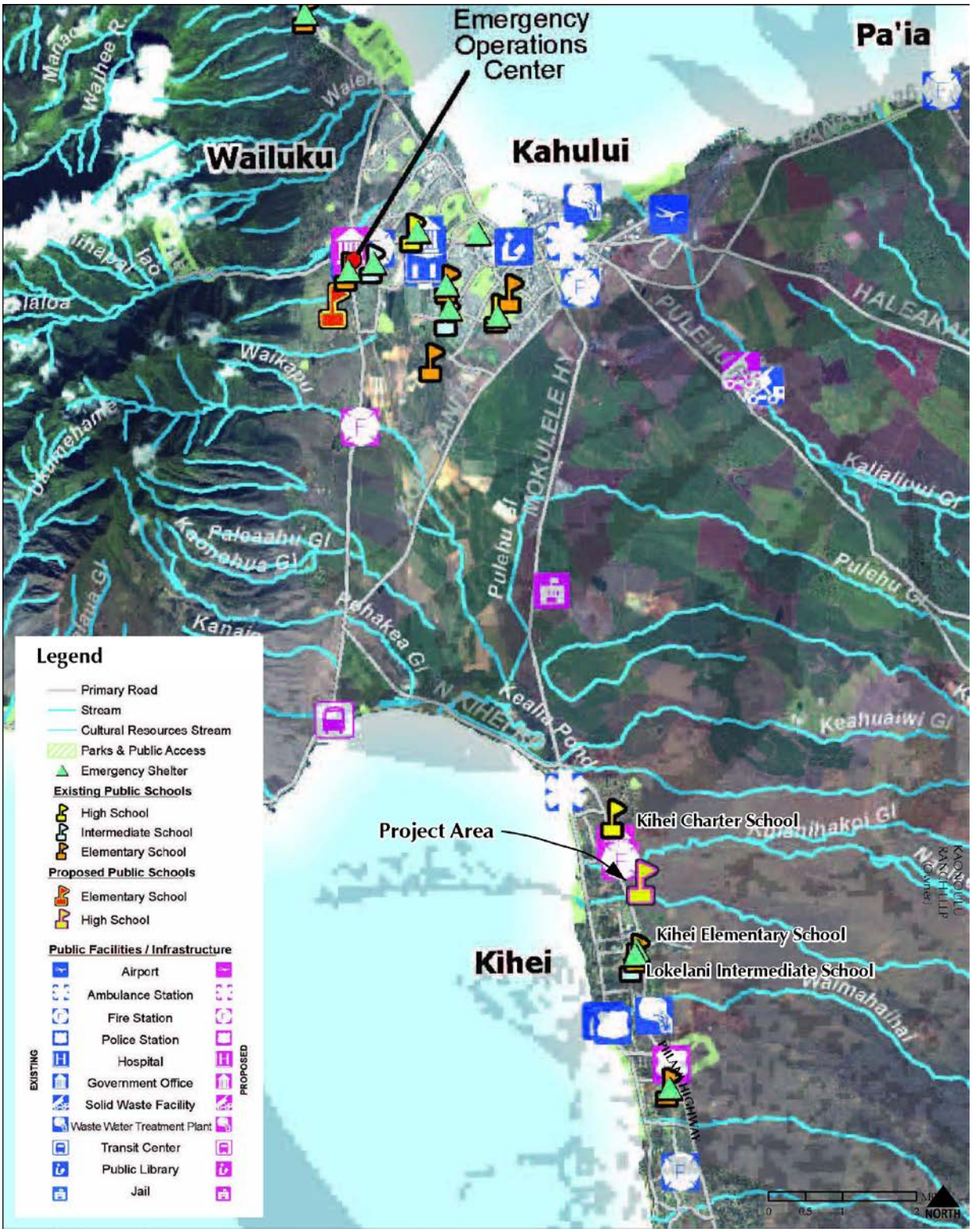


Figure 3-2
Maui Island Plan, Public Facility/Infrastructure Improvements Map (Draft)

Chapter 4
Existing Conditions, Potential Impacts and Mitigation Measures

4.0 EXISTING CONDITIONS, POTENTIAL IMPACTS AND MITIGATION MEASURES

Existing conditions and potential impacts associated with the development and operation of the Kīhei High School project are discussed in this section. Also described are mitigation measures that are proposed to minimize anticipated adverse impacts.

4.1 NATURAL ENVIRONMENT

4.1.1 Climate

Maui's climate varies by terrain but is relatively uniform year-round with mild temperatures, moderate humidity, and relatively consistent northeasterly trade winds. Regional topography and climatic conditions attribute to the variety of weather found across the island. The Kīhei High School site is located in the semi-arid Kīhei-Mākena region.

The mean annual temperature of the Island of Maui near sea level is approximately 75 degrees Fahrenheit (°F). The Kīhei coast is known to be sunny, warm, and dry throughout the year. Annual temperatures for the Kīhei region average in the mid to high 70s. During the summer months and dry season, average daily temperatures in Kīhei range from 77.0°F to 77.6°F (Maui County Data Book 2009).

Average rainfall distribution in the Kīhei-Mākena region varies from under 10 inches per year along the coastline to more than 20 inches per year in the higher elevations. Rainfall in the Kīhei-Mākena region is highly seasonal with most precipitation occurring during the winter months between November and March. Annual rainfall in the project area ranges between 8.6 and 13 inches annually and is the lowest on Maui (R.W. Armstrong, 1983). Annual rainfall recorded in the year 2006 for the Kīhei region was 16.5 inches.

Northeast trade winds prevail in the Hawaiian Islands during the spring and summer months; during the fall, trade winds tend to give way to light and variable winds throughout the winter. Trade winds out of the northeast average 10 to 15 miles per hour (mph) in the Kīhei-Mākena region during the afternoon. Typically, lighter winds are felt during the morning and evening. Storms are infrequent and generally occur during the winter months in Hawai'i, although tropical storms and hurricanes occasionally approach the island between June and November.

Potential Impacts and Mitigation Measures

The Kīhei High School project would not involve significant impacts with respect to climate.

4.1.2 Geology, Topography and Erosion

The Island of Maui was formed by the merging of two ~~(2)~~ volcanoes, the East Maui volcano, known as Haleakalā, and the West Maui volcano, Maui Komohana. The merging of these volcanoes created the second largest island in the Hawaiian island chain measuring 48 miles long, 26 miles wide, and comprising 465,920 acres. Maui Komohana is a deeply dissected volcano rising 5,788 feet. Canyons and steep ridges comprise the central area of West Maui

making it not easily accessible. Dominating East Maui, Haleakalā is a dormant volcano rising 10,025 feet AMSL. The last eruption of Haleakalā occurred around 1790. The western and northern slopes are relatively smooth but are sloping to moderately steep. The land is rough and rocky near the summit of Haleakalā Crater and on the eastern and southwestern slopes. The proposed Kīhei High School project site resides on the southernmost slopes of Haleakalā.

Topography over the majority of the site is composed of gently sloping smooth terrain with occasional weathered basalt outcrops. The major geomorphic features on the proposed project site are two ~~(2)~~ major gulches, Kūlanihāko'i Gulch and Waipu'ilani Gulch, which create its northern and southern boundaries. The existing site generally slopes downward to the west and southwest with onsite ground elevations ranging from approximately 40 feet AMSL in the southwest to an elevation of approximately 110 feet AMSL in the northeast boundary with an average slope of approximately 11%. (*Appendix A*)

A preliminary geotechnical investigation was prepared for the proposed project site by Hirata and Associates, Inc. in 2009. Underlying the surface soils, weathered basalt was found to be present ranging from highly to slightly weathered conditions with occasional moderately weathered sections. Boring logs confirmed the presence of weathered basalt to a depth of one-half ~~(0.5)~~ to six and one-half ~~(6.5)~~ feet below existing grade. The preliminary investigation found no significant geological hazards associated with the Kīhei High School project site. Cut depths, excavations, and building foundation recommendations were made based on these findings. A more detailed investigation of the site, including additional exploratory test borings, laboratory testing, and analysis, should be performed in the design phase. Please refer to the Preliminary Geotechnical Investigation included as *Appendix A*.

Potential Impacts and Mitigation Measures

Erosion During Construction

The construction of the project will involve land disturbing activities that result in erosion, such as the removal of existing vegetation (clearing and grubbing) and leveling, removing, and replacing soil.

During construction, erosion will be minimized through compliance with the County's grading ordinance and the applicable provisions of the DOH's Water Quality Standards (Title 11, Chapter 54, HAR) and Water Pollution Control requirements (Title 11, Chapter 55, HAR). Additionally, standard best management practices will be employed to minimize impacts. These BMPs will be detailed in subsequent construction plans and may include limiting site grading to increments of not more than 15 consecutive acres at a time, the use of temporary sprinklers in non-active construction areas, stationing water trucks onsite during construction to provide immediate sprinkling in active construction zones, use of temporary berms and cut-off ditches, use of temporary silt fencing and screens, thorough watering of graded areas after construction activity has ceased for the day and on weekends, and sodding or planting slopes immediately after grading work has been completed. With implementation of BMPs, potentially significant impacts will be mitigated.

Grading

Although moderate earth movement will be required in order to implement the plan, the geology and topography of the area will not be significantly affected. Efforts will be undertaken to balance the earthwork quantities of cut and fill. This will also minimize the amount of construction traffic in the region. Grading operations will be in conformance with the applicable ordinances by the DOH and the County. Mitigation will consist of implementing grading and construction period erosion control BMPs.

Kūlanihākoʻi Gulch and Waipuʻilani Gulch are major drainageways in the Kīhei High School project area and mitigation will be implemented to minimize grading-related erosion infiltration to these natural drainage paths.

To minimize runoff and erosion associated with the topography of the site, the following BMPs will be suggested: constructing of detention basins to capture sedimentation to minimize the quantity of sediment leaving the site; protecting of natural vegetation; using wind erosion controls; intercepting runoff above disturbed slopes; and using seeding and fertilizing or other soil erosion control methods.

Grading and erosion control plans will be prepared in compliance with Chapter 20.08 Soil Erosion and Sedimentation Control of the Maui County Code. An application for a NPDES permit will be submitted to the DOH for review and approval. Further, the contractor will be required to perform all grading and stockpiling operations in conformance with the applicable provisions of Chapter 54 (Water Quality Standards) and Chapter 55 (Water Pollution Control) of Title 11 HAR of the DOH.

4.1.3 Soils and Agriculture

The Kīhei High School: Impacts on Agriculture report (July 2011) was prepared for the Kīhei High School project by Plash Econ Pacific, LLC, to identify and assess potential impacts of the project on agriculture. This report is included as *Appendix B*. Current on-site land uses include grazing and ranching.

Four ~~(4)~~ studies, which describe the physical attributes of soils and evaluate the relative productivity of different soil types for agricultural production purposes, have been prepared for Hawaiʻi: (1) the U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) Soil Survey, (2) USDA NRCS Rating - Land Capability Grouping (3) the State Department of Agriculture's (DOA) ALISH, and (4) the University of Hawaiʻi (UH) Land Study Bureau (LSB) Overall Productivity Rating.

The Kīhei High School project site consists of lands having poor agronomic conditions. The area is characterized by site soils belong to the Alae series and the Waiakoa series. Most of the soils have poor agricultural productivity. Rainfall in the area is typically low and water is not available for crop farming. Additionally, there are no existing irrigation improvements. Agricultural activities are not taking place on the project site as the overall site is poorly suitable for growing commercial field crops.

USDA NRCS Soil Survey: The soils on the project site are classified as Waiakoa extremely stony silty clay loam (WID2), and Alae sandy loam (AaB) by the USDA NRCS (*Figure 4-1*).

- **Waiakoa extremely stony silty clay loam (WID2) (76.2 acres).** Waiakoa extremely stony silty clay loam developed from weathered basic igneous rock, with the upper soils influenced by volcanic ash. Although the slopes are generally 7% to 15%, some small areas have steeper slopes. In a representative profile, the surface layer is silty clay loam about two ~~(2)~~ in. thick. The subsoil is about 23 inches thick, and consists of silty clay loam that has a prismatic structure or is massive. The substratum is silty clay loam and hard, basic igneous rock. In places, roots penetrate to bedrock. The soil is eroded and stones cover 3% to 15% of the surface. In most areas about 50% of the surface layer has been removed by erosion. Permeability is moderate, runoff is medium, and the erosion hazard is severe. The soil is neutral in the surface layer and slightly acid to neutral in the subsoil. This soil type is used for pasture and wildlife habitat.

- **Alae sandy loam (AaB) (1.1 acres).** Alae sandy loam occurs on smooth alluvial fans that developed from volcanic ash and basic igneous rock. Although the slopes are generally 3% to 5%, some small areas are nearly level. In a representative profile, the surface layer is about seven ~~(7)~~ in. thick, and consists of sandy loam with a granular structure. There are no cobblestones on the surface. In some places, there are many pebble size rock fragments in the surface layer. The substratum extends to a depth of 48 inches or more, and consists of sandy loam as well as coarse sand. In some places roots penetrate to a depth of 4 feet or more. Permeability is rapid, runoff is slow, and the erosion hazard is slight. The soil is neutral or mildly alkaline in the surface layer and mildly to moderately alkaline in the substratum. Most of this soil type is used for sugarcane and pasture, but some is used for truck crops.

Land Capability Grouping (USDA NRCS Rating): The 1972 Land Capability Grouping by the NRCS rates soils according to eight ~~(8)~~ levels, ranging from the highest classification level "I" to the lowest "VIII."

Soil type WID2 (76.2 acres) has a rating of VIIs. Class VII soils have very severe limitations that make them unsuitable for cultivation and restrict their use largely to pasture or range, woodland, or wildlife habitat. In this case, the sub-classification "s" indicates that the soils have an unfavorable texture, or are extremely rocky or stony.

Soil type AaB (1.1 acres) has a rating of IVs if irrigated. Class IV soils have very severe limitations that reduce the choice of plants, require very careful management, or both. The sub-classification "s" indicates that the soils are stony, shallow, have unfavorable texture, or have low water-holding capacity.

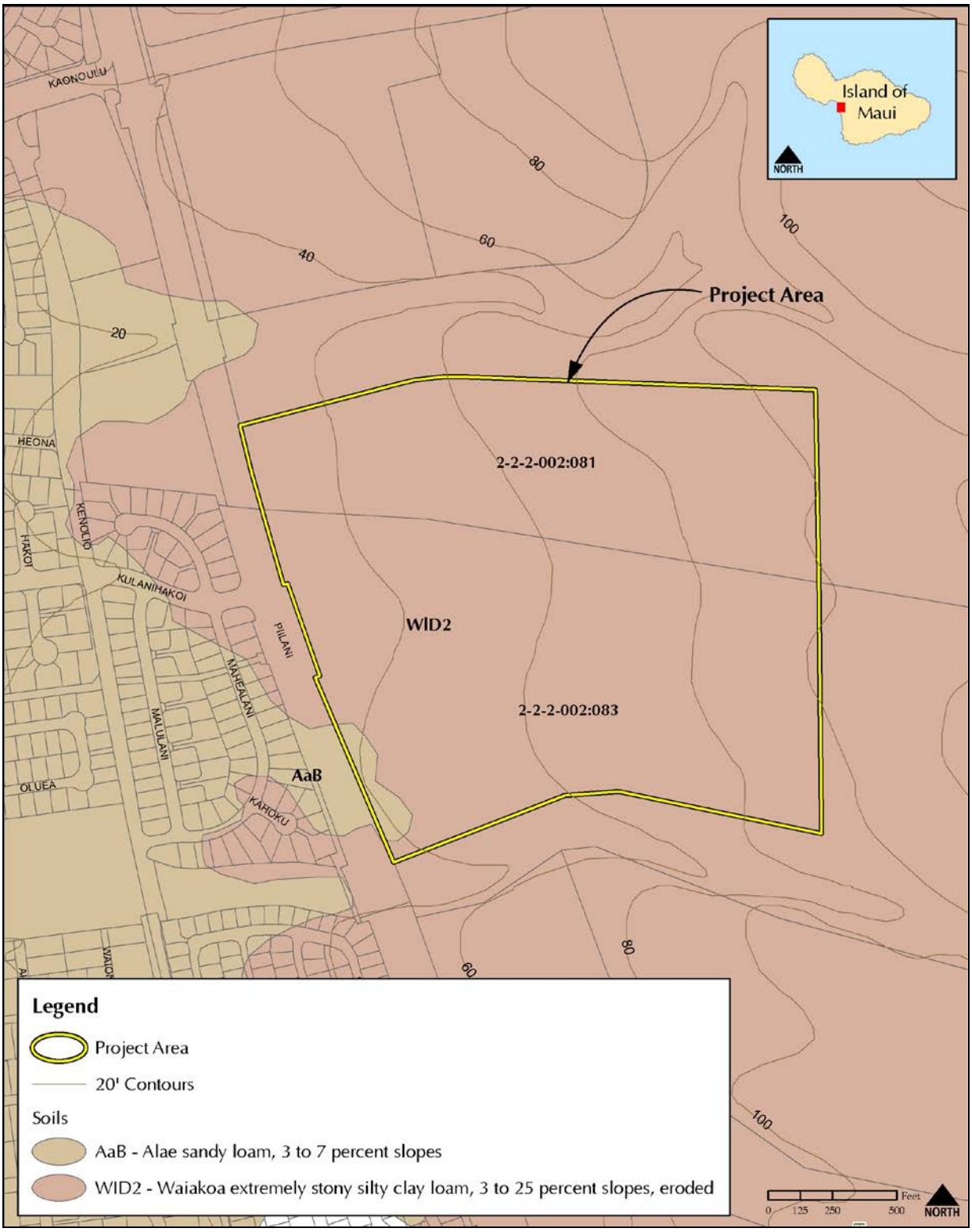


Figure 4-1
Topography and Soils Map

Agricultural Lands of Importance to the State of Hawai'i: The ALISH ratings were developed in 1977 by the NRCS, the UH College of Tropical Agriculture and Human Resources, and the State DOA. The ALISH rating characterized the Agricultural lands in the State of Hawai'i according to their importance as follows:

- **Prime Agricultural Land** - Best suited for the production of crops because of its ability to sustain high yields with relatively little input and with the least damage to the environment;

- **Unique Agricultural Land** - Non-Prime agricultural land used for the production of specific high-value crops (e.g., coffee and taro);

- **Other Important Agricultural Land** - Non-Prime and non-Unique agricultural and that is important to the production of crops;

- **Unclassified** – Lands that are not rated.

Based on the available maps of ALISH, the vast majority (75.6 acres) of the project site is "Unclassifed" and a portion (1.7 acres) is rated as "Prime" (*Figure 4-2*).

Land Study Bureau Detailed Land Classification: In 1972, the UH LSB developed the Overall Productivity Rating which classifies soils according to five ~~(5)~~ levels of productivity - A, B, C, D, and E – with the letter A representing the highest class of productivity. The proposed project site is classified as Class E soils which have the lowest agricultural productivity rating (*Figure 4-2*).

Potential Impacts and Mitigation Measures

Impacts on Diversified Crop Farming

The project site is unsuitable for most commercial field crops grown in Hawai'i. While the site has high solar radiation, it consists of poor soils having low soil ratings, and lacks irrigation water. Nevertheless, high-value crops could be grown on the project site provided that the land is cleared of rocks, kiawe, grasses and weeds; the soil is amended; and water is obtained. Crops that do not require good soil, such as hydroponic crops and algae, could also be grown provided that water is available. It should be noted, however, that Kīhei has a large supply of low-quality agricultural land similar to that of the proposed school site. High-quality farmland is also available in Central and West Maui due to past closures of sugarcane and pineapple plantations.

Farmers in Central Maui are well-situated to supply the Maui Island market because of the short trucking distance to Kahului, the island's commercial, industrial, distribution and transportation center. While the Maui Island market is significant, it is comparatively small with a 2009 de factor population of about 181,050 (*Appendix B*). Compared to farmers on O'ahu, Maui farmers are at a disadvantage in supplying the Honolulu market due to inter-island shipping costs, delays and extra handling. Furthermore, they are also at a disadvantage in supplying mainland markets due to competition with low-cost producers, and particularly if their products have short shelf-lives and must be shipped by air.

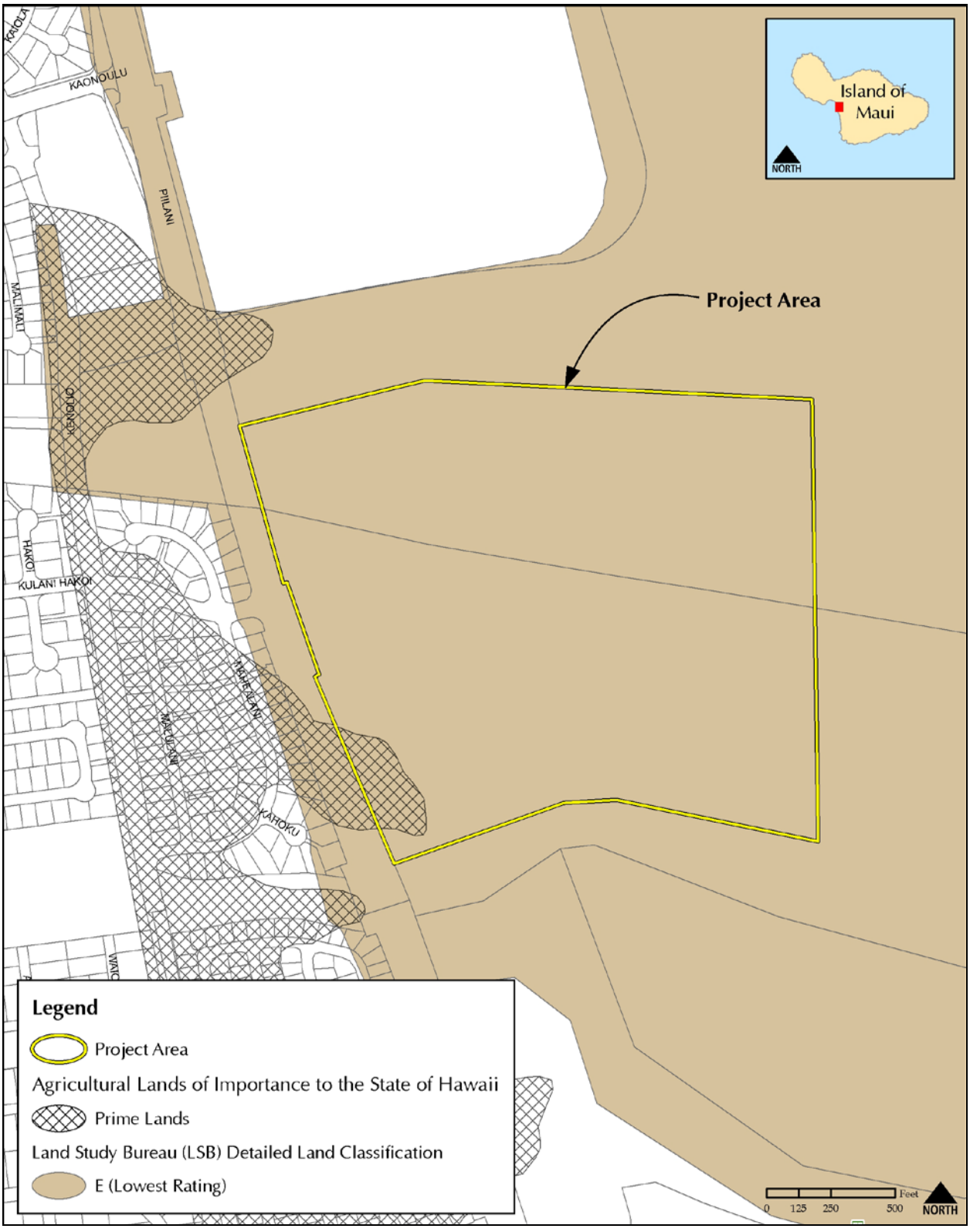


Figure 4-2
Agricultural Lands of Importance to the State of Hawai'i and Land Study Bureau Map

The project will commit approximately 77 acres of land currently in the Agricultural District, for a non-agricultural type use. However, as detailed above, the land is poorly suited for growing commercial field crops due to poor soils and the lack of water for irrigating crops.

Maui has a large supply of low-quality agricultural land, including about 20,000 acres mauka of Kīhei that is similar in quality to the proposed site. Additionally, with the contraction and eventual closure of Pioneer Mill (sugarcane) and Maui Pineapple Company over 19,000 acres of high-quality farmland was released in Central and West Maui. While some of this former plantation land was planted in other crops (e.g., seed corn and coffee) and some was developed for homes, most of it remains available for farming.

A small percentage of low-quality agricultural lands will be lost with the implementation of the Kīhei High School project. However, there will be no affect on the supply of available high-quality farmland. Consequently, the School will have no impact on the growth of diversified crop farming. No mitigation measures are recommended.

Impacts on Ranching Operations

The school site is currently used for grazing cattle by Haleakala Ranch and Kaonoulu Ranch. As discussed below, the proposed high school, in combination with other projects, will result in insignificant impacts to the cattle operations of Haleakala Ranch and Kaonoulu Ranch. As such, no mitigation measures are required or recommended.

Haleakala Ranch

Incorporated in 1888, Haleakala Ranch is the oldest and largest cattle ranch on Maui. This family-owned ranch has approximately 23,000 acres used for grazing cattle, 1,~~7~~200 breeding cows, and ~~3~~10 employees involved with its cattle operation. To increase the available feed, the Kīhei lands were planted in drought-resistant buffelgrass in the early 1900s. ~~Cattle grazing on Kīhei pastures occur in the winter when the grass is more plentiful following winter rains.~~ The number of cattle and the duration of their grazing depend upon rainfall.

Development of the Kīhei High School will remove approximately 44 acres of grazing land from Haleakala Ranch, or 0.2% of its total 23,000-acre supply of grazing land. The corresponding reduction in feed produced will be approximately 0.1%. While Kīhei pastures are important for seasonal ~~winter~~ cattle grazing, Haleakala Ranch anticipates that this relatively small reduction in feed will have no significant effect on its cattle operation, including no significant impact on the size of its herd, production, revenues, employment or payroll. Haleakala Ranch has sufficient land to move its cattle to other pastures. Over the next 20 years, planned and proposed projects could result in the development of approximately 415 acres at Haleakala Ranch which is currently used for cattle grazing. All of this land is located in Kīhei within the Urban Growth Boundary. This loss amounts to about 1.8% of the Haleakala Ranch grazing land, or about 0.9% of its available feed. Haleakala Ranch regards a 0.9% loss in feed as too small to have a significant effect on its cattle operations. In addition, the Ranch has sufficient lands to move its cattle to other pastures. Even if Haleakala Ranch was operated at its maximum carrying capacity and replacement pastures were not available, the impact would be small and insignificant. Refer to *Appendix B* for additional details.

Kaonoulu Ranch

Kaonoulu Ranch is a family-owned and operated cattle ranch that comprises most of the Kaʻonoʻulu Ahupuaʻa which was purchased by the family in 1916. Kaonoulu Ranch has approximately 10~~9~~,000 acres used for grazing cattle, 1,100 breeding cows on average, and 4.5 employees involved with its cattle operation.

Development of the proposed school site will remove approximately 32 acres of grazing land from Kaonoulu Ranch, or 0.3 ~~0.4~~% of the 10~~9~~,000 acres of their grazing land. The corresponding reduction in feed produced from its grazing land will be approximately 0.15 ~~0.2~~%. While Kīhei pastures are important for seasonal ~~winter~~ cattle grazing, Kaonoulu Ranch anticipates that this relatively small reduction in feed will have no significant effect on its cattle operation, including the size of its herd, production, revenues, employment or payroll. Kaonoulu Ranch has sufficient land to move its cattle to other pastures.

Over the next 20 years, planned and proposed projects could result in the development of approximately 347 acres that Kaonoulu Ranch currently uses to graze cattle. All of this land is located in Kīhei within the Urban Growth Boundary. This loss amounts to approximately 3.5 ~~3.9~~% of its grazing land, or 1.8 ~~2~~% of its available feed. Kaonoulu Ranch views a 1.8 ~~2~~% loss in feed as an insignificant effect on its cattle operations. In addition, the Ranch has sufficient lands to move its cattle to other pastures. Even if Kaonoulu Ranch was operated at its maximum carrying capacity and replacement pastures were not available, the impact would be small and insignificant. Refer to *Appendix B* for additional details.

Recommendations

The development of the Kīhei High School project is not expected to have a significant impact on existing and future agricultural activities such as farming and ranching operations.

With regard to diversified crop farming, there are no existing or recent farming activities taking place on the site. While the project will result in a small loss of low-quality agricultural land of which there is a large supply on Maui, the large supply of good farmland on the island will not be affected. Consequently, the Kīhei High School project will not result in significant impacts to the growth of diversified crop farming. No mitigation is proposed.

With regard to ranching operations, approximately 76 acres of the proposed school site across Haleakala Ranch and Kaonoulu Ranch is currently used for grazing cattle, however, feed production is low, due to arid conditions. While the project will result in a loss of land for ranching operations, the overall acreage loss will be too small to effect cattle operations of Haleakala Ranch and Kaonoulu Ranch. In view of this finding, mitigation measures are not recommended.

4.1.4 Natural Hazards

Natural hazards that may occur in and affect the Kīhei High School project area include floods, tsunamis, hurricanes, earthquakes, and other natural events.

Flood

The Federal Emergency Management Agency Flood Insurance Rate Map (FIRM) flood zone designations are:

- A – Areas of 100-year flood, base flood elevations not determined
- AE – Areas of 100-year flood, base flood elevation determined
- XS – Areas of 500 year flood; areas of 100-year flood with average depths of less than one ~~(1)~~ foot or within the drainage area less than one ~~(1)~~ square mile, and areas protected by levees from 100-year flood
- X – Areas determined to be outside the 100-year flood plain
- D – Areas in which flood hazard is undetermined
- VE – Areas of 100-year coastal flood with velocity (wave action), base flood elevations determined (Coastal High Hazard District)

The proposed Kīhei High School site is located in an area designated Zone X, outside the 100-year flood plain (*Figure 1-8).* The site is flanked by Kūlanihāko'i Gulch and Waipu'ilani Gulch. These gulches are generally dry except after significant rainfall events. Due to the topography of the land, flooding is not expected within the project site.

Tsunami

Tsunamis are a series of destructive ocean waves generated by seismic activity that could potentially affect shorelines of Hawai'i. Tsunamis affecting Hawai'i are typically generated in the waters off South America, the west coast of the US mainland, Alaska, and Japan. Local tsunamis have also been generated by seismic activity on the Island of Hawai'i.

The O'ahu Civil Defense Agency establishes tsunami evacuation zones and maps for all coastal areas in Hawai'i. Tsunami maps for the Island of Maui indicate that the Kīhei High School project area is not within the tsunami evacuation zone.

Hurricane

The Hawaiian Islands are seasonally affected by Pacific hurricanes from June to November. These storms generally travel toward the islands from a southerly or southeasterly direction and can deposit large amounts of rain with high winds on the Hawaiian Islands. The storms generally contribute to localized flooding and coastal storm surges. Coastal storm surges would not impact the Kīhei High School project area. The buildings associated with Kīhei High School will be designed to withstand lateral winds of up to ~~150~~ 105 mph.

Earthquake

Because Maui is an older Hawaiian island with dormant volcanic activity, it is not particularly prone to seismic activity. Seismic activity usually occurs on the Island of Hawai'i, and has been felt as far away as O'ahu. The Uniform Building Code seismic provisions contain six ~~(6)~~ seismic zones, ranging from 0 (no chance of severe ground shaking) to 4 (10% chance of severe shaking in a 50-year interval). Maui is listed in Seismic Zone 2B under the Uniform Building Code of 1997 (ICBO 2000). Zone 2B indicates a location that has low potential for ground motion created by seismic activity (USGS, 2001).

Potential Impacts and Mitigation Measures

The proposed project would be constructed in compliance with applicable building codes and DOE standards in regards to preparation for natural hazards. The Kīhei High School gymnasium could also be used as a temporary shelter for the Kīhei community if a natural hazard were to occur.

4.1.5 Groundwater Resources and Supply

An assessment of existing surface and groundwater resources in the project area was prepared by Water Resources Associates (May 2011) and is included as *Appendix C*.

Kama'ole Aquifer System

The Kīhei High School project site is located in the northern part of the Kama'ole Aquifer System approximately three-quarters of one ~~(0.75)~~ mile inland from the coast. The aquifer system consists of a triangular-shaped area of approximately 90 square miles. It is bounded on the south by the Southwest Rift Zone, which extends from the coast near La Perouse Bay to the top of Haleakalā summit and back to the coast just north of Kīhei. Although the Kama'ole Aquifer System ranges from low coastal areas to steep mountain slopes, the system has an average annual rainfall of only 28 inches per year, primarily due to its location on the leeward side (leeward of Trade winds) of East Maui. Within the aquifer system, annual rainfall ranges from 10 inches a year at the Kīhei coast to 40 inches a year at elevations of 5,000 to 6,000 feet.

The State Commission on Water Resource Management (CWRM) has estimated the groundwater recharge from rainfall in the Kama'ole Aquifer System to be 25 MGD (*Appendix C*). Of the estimated 25 MGD of groundwater recharge, it is estimated that 11 MGD of groundwater can be developed within the Kama'ole Aquifer System on a sustainable basis (*Appendix C).*

Existing water use within the Kama'ole Aquifer System is approximately 1.859 MGD (*Appendix C*). This water use is primarily for golf course and landscape irrigation purposes from brackish wells located near the coast. These wells yield non-potable water with chloride concentrations ranging from approximately 300 milligrams per liter (mg/L) and higher.

There are a number of existing wells in the Kama'ole Aquifer System (*Appendix C*). Most of the existing wells in the Kama'ole Aquifer System have been drilled near the coast to develop brackish groundwater or to dispose of waste effluent and storm runoff into the underlying aquifer. A few wells have been drilled further inland at higher elevations in search of potable or less brackish water. In the Kīhei area, most of the existing wells have been drilled makai of Pi'ilani Highway. Data from these wells indicate that wells located in the Kīhei coastal area can be expected to yield small quantities of brackish water with varying chloride salinities.

Potential Impacts and Mitigation Measures

Total Water Requirement (Potable and Non-Potable Water)

The project's total water requirement, which includes potable water for domestic use from the Maui Department of Water Supply's (DWS) Central System and non-potable water for irrigation use from two ~~(2)~~ new onsite brackish water wells, amounts to 189,900 GPD in the opening year (2015) of the high school. In subsequent years as student enrollment increases, potable water use will increase, while non-potable water use for irrigation will remain unchanged. Consequently, the total project water requirement is estimated to increase slightly each year, from an average 189,900 GPD in 2015 to 222,450 GPD in the year 2025. Refer to *Table 4-1*.

Table 4-1 ESTIMATED TOTAL PROJECT WATER REQUIREMENT (AVERAGE DAY DEMAND)

Year	Potable Water Requirement (GPD)	Non-Potable Water Requirement (GPD)	Total (GPD)
2015	4,900	185,000	189,900
2016	9,000	185,000	194,000
2017	14,300	185,000	199,300
2018	18,800	185,000	203,800
2025*	37,450	185,000	222,450

Source: Gray, Hong, Nojima and Associates, Inc., August 2011
* Design capacity at year 2025

Water Availability and Supply (Potable and Non-Potable Water)

Potable Water

There are no potable water resources, either surface or groundwater, available within a two-mile radius of the project site that could be developed for the proposed high school. With no prospect for potable water development within a two-mile radius of the project site, the proposed Kīhei High School project will request potable water service for the proposed project from DWS. Although DWS does not currently provide service to the project site, an existing water system (Central Water System) is located in the vicinity. This system serves the Kīhei area (as well as others) and has an 18-inch transmission main located directly makai of the project site, across Pi'ilani Highway.

The project will seek necessary approvals from DWS to supply potable water for both domestic and fire flow requirements, in accordance with the County's water system standards. The potable water system will include a main pipeline connecting to the County's 18-inch transmission main, booster pumps, storage tanks, and other appurtenances as may be required by the DWS. When completed, the potable water system leading to the school property will be dedicated to DWS.

In order to reduce project potable water demand, the project design may incorporate water efficient plumbing fixtures, such as low-flow fixtures.

For additional information, refer to *Section 4.2.10.1, Appendix C, and Appendix K*.

Non-Potable Water

A separate non-potable water supply will be developed to meet the project's irrigation water needs. This planned source of water will be the brackish basal aquifer that underlies the project site. It is estimated that the aquifer, although thin, will yield brackish water of a quality suitable for irrigation use.

The proposed non-potable water system will include two ~~(2)~~ brackish wells, transmission and distribution pipelines, control valves, and other appurtenances, but is not proposed to include a storage tank. The suggested location for the first well is in the northeast corner of the school property at an elevation of approximately 90 feet. A second well is proposed as a standby or supplemental source for the non-potable water system. This second well is proposed in the southeast corner of the school property, also at an elevation of approximately 90 feet. Construction of the second well will depend on the results of the first well. See *Figure 4-3*.

Each well is projected to have a pump capacity ranging from 250 to 350 gallons per minute (GPM) while producing suitable brackish water in the salinity range of 400 to 500 mg/L chlorides. Since the proposed non-potable system will operate as a pressurized system without a storage tank, the system's wells must produce at least 385 GPM to supply the estimated daily requirement of 185,000 GPD within an irrigation period of eight ~~(8)~~ hours. However, the pumping rate required can be decreased by increasing the irrigation period, and vice versa.

Alternative consideration is also being given to the use of surplus R-1 effluent from the County's Kīhei WWRF located approximately one ~~(1)~~ mile south of the project site. The feasibility of using this alternative source of water to meet the project's irrigation water requirement is being explored. For additional information, refer to *Section 4.2.10.1, Appendix C, and Appendix K*.

Probable Impacts and Mitigation Measures (Potable and Non-Potable Water)

Potable Water

The proposed Kīhei High School will require an estimated average of 37,450 GPD of potable water at full build out. The potable water requirement for the school is expected to be provided by DWS by connecting to an existing 18-inch transmission main located near the project site located on Līloa Drive situated makai of the project site across Pi'ilani Highway. The project's potable water requirement represents less than one percent of the County's Central Water System sources of supply which include wells located in a five ~~(5)~~ mile stretch of windward West Maui, extending from Wailuku to north of Waihe'e Valley.

DOE and its representatives will continue to work with DWS to provide potable water supply for the proposed Kīhei High School project. Necessary approvals will be obtained in accordance with the County's water system standards. Adverse impacts to existing potable water supplies are not anticipated.

Non-Potable Water

The proposed Kīhei High School will require an estimated average of 185,000 GPD of non-potable water. The project's non-potable water requirement will be met from two ~~(2)~~ new onsite wells which will be fed by basal groundwater from the underlying Kama'ole Aquifer System. The 185,000 GPD withdrawal of brackish water from the two ~~(2)~~ new onsite wells represents 1.7 percent of the 11 MGD sustainable yield. The proposed withdrawal of brackish groundwater for the proposed project is not expected to have adverse impacts on the recharge or sustainable yield of the underlying Kama'ole Aquifer System.

Based on an assessment of existing wells in the Kīhei coastal area (including comparative distances between existing wells, and evaluation of groundwater withdrawals from nearby wells), the project's proposed brackish wells and withdrawal of an average 185,000 GPD for landscape irrigation are not expected to have any adverse effect on existing wells located nearby or in the general vicinity of the project. In addition, the proposed development of the non-potable wells and the withdrawal of brackish groundwater are not expected to have adverse impacts on the existing water quality of the Kama'ole Aquifer at Kīhei. The project's anticipated non-potable water requirement of 185,000 GPD is also not expected to have adverse impacts on the brackish water quality of any existing wells and their existing primary use for landscape irrigation.

Since no adverse impacts on water resources are expected from the withdrawal of brackish groundwater from two ~~(2)~~ new wells located in the project site, no direct mitigation measures are proposed. However, the proposed project will indirectly mitigate impacts on Maui's water resources in the following ways:

- Utilizing brackish groundwater for irrigation purposes, instead of potable water.
- Designing the brackish wells for optimum water withdrawal from a thin basal aquifer.
- Designing the irrigation system for efficient operation to conserve water resources.
- Utilizing efficient irrigation practices to conserve water resources.
- Utilizing drought and brackish-water tolerant plants appropriate for water conservation and Kīhei's dry climate.

Development of the project's proposed non-potable wells will require permits for well construction and pump installation from CWRM. Construction and testing of the wells and installation of pumps will conform to the Hawaii Well Construction and Pump Installation Standards. Based on a preliminary discussion, the CWRM currently has no particular concerns regarding the project's proposed brackish wells, and it was noted that others in the Kīhei area are utilizing non-potable wells for landscape irrigation.

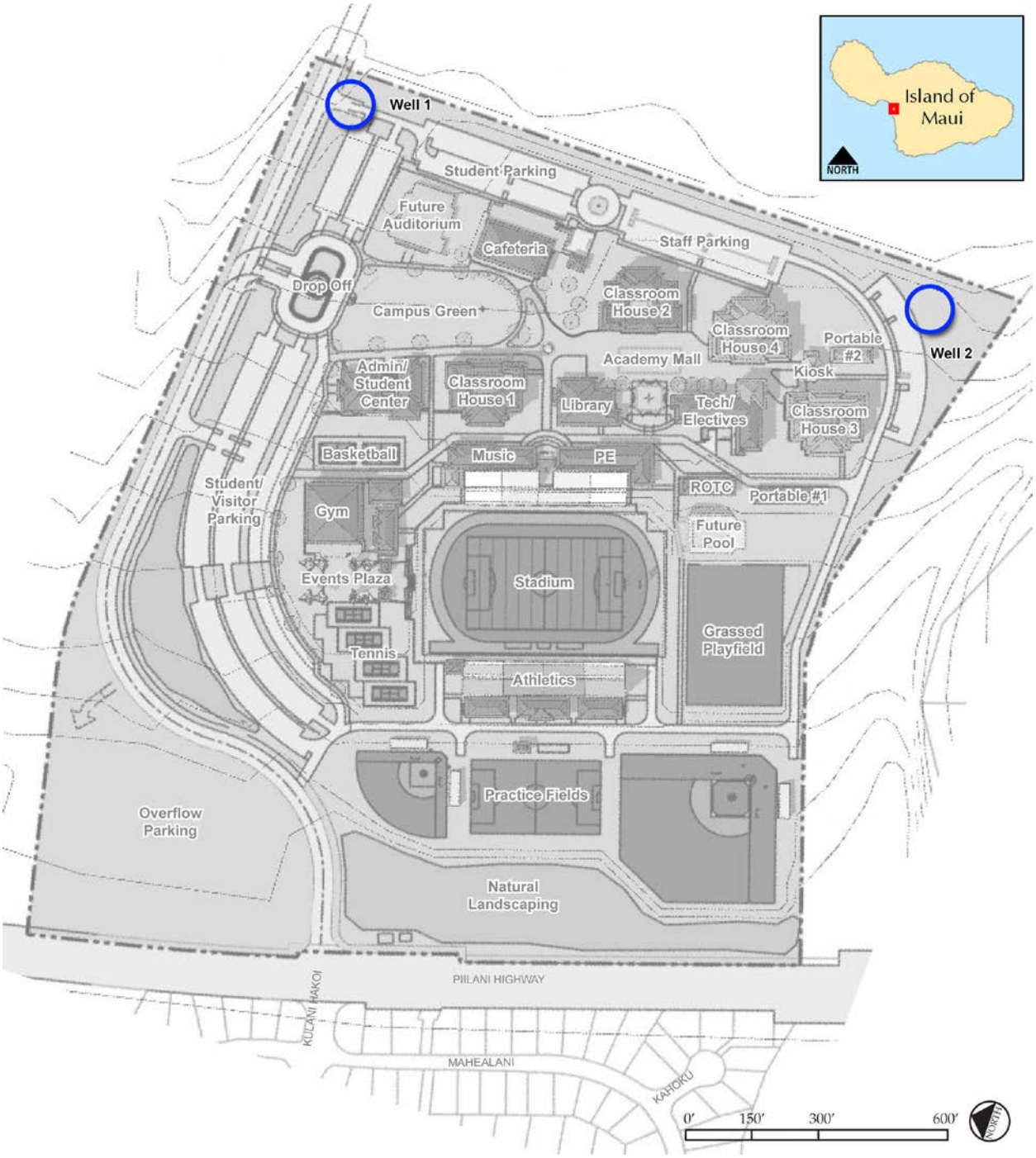


Figure 4-3
Proposed Kīhei High School Well Locations

4.1.6 Flora

Rana Biological Consultants, Inc. conducted botanical, mammalian and avian surveys on the Kīhei High School project site and summarized the findings in their report, Biological Surveys Conducted for the Proposed New Kīhei High School (December 2009). The report is included as *Appendix D*. The primary purpose of these surveys was to determine if there were any botanical, avian or mammalian species currently listed, or proposed for listing as endangered or threatened under either the Federal or the State's endangered species programs on, or within the immediate vicinity of the project site. Results are summarized below.

The site is currently being used for cattle pasturage and is highly degraded. The vegetation on the site is best described as a savanna: grassland with scattered trees. There are ample signs of past wildfires on the site.

The botanical survey was undertaken on November 17 and 18, 2009 utilizing wandering transects that traversed all parts of the subject parcel. A plant checklist *(Table 4-2)* was compiled from the field observations, with entries arranged alphabetically under plant family names. The Kīhei High School project area supports two ~~(2)~~ basic vegetation types: grassland and savanna.

Excluding the observation of a fungal fruiting body, the total number of species recorded for the property (all flowering plants) was six ~~(6)~~. This is an astoundingly low number for the size of the property and the number of hours spent conducting the survey. Only *ʻuhaloa* (*Waltheria indica*) counted as a native species, but the low number of all species results in a respectable (for lowland, disturbed sites) ratio of natives of 17%.

Although the survey area was considered to be *mauka* of the fence along the highway and back away from the upper margins of the gulches on the north and south, the land between the fence and the highway was surveyed on the premise that the project could have some impacts in this area, even if limited to access roadways. This area added an additional six ~~(6)~~ species of plants to the listing in *Table 4-2* (see Note 1). These are, with one ~~(1)~~ exception, ruderal weeds typical of a highway verge. The exception is Hawaiian cotton or *maʻo* (*Gossypium tomentosum*). *Maʻo* is an endemic species. Combining the surveys yields a total of 12 recorded flowering plants (still a very low number), no ferns, and includes one ~~(1)~~ each of indigenous and endemic Hawaiian plant species (17% native).

The entire Kīhei High School project site is highly disturbed from a natural vegetation perspective, strongly influenced by low amounts of rainfall and grazing by deer and pasture animals. No plants of interest or concern were observed on the property. However, two ~~(2)~~ specimens of Hawaiian cotton or *maʻo* were observed along the top of the road cut fronting the property. These are in a location unlikely to be used for construction access. *Maʻo* was at one time considered for listing as an endangered species by the USFWS, but this status was downgraded (candidate status withdrawn) when it was established that the species was more widespread than originally believed. Presently the plant has no status under the endangered species act (*Appendix D*).

Table 4-2 LIST OF BOTANICAL SPECIES

Species Listed by Family	Common Name	Status	Abundance	Notes
FUNGI				
LYCOPERDACEAE				
Vascellum sp. Or Bovista sp.	Puffball Fungus	Nat	R	-
DICOTYLEDONES (FLOWERING PLANTS)				
EUPHORBIACEAE				
Chamaesyce hyssopifolia (L.) Small	-	Nat	-	1
FABACEAE				
Acacia farnesiana (L.) Willd.	Klu	Nat	O	-
Indigofera hendecaphylla Jacq.	Prostrate Indigo	Nat	-	1
Leucaena leucocephala (Lam.) de Wit	Koa Haole	Nat	-	1
Prosopis pallida (Humb. and Bonpl. Ex Willd.) Kunth	Kiawe	Nat	AA	-
MALVACEAE				
Gossypium tomentosum Nutt. Ex Seem.	*Ma'o,* Hawaiian Cotton	End	-	1
Sida rhombifolia L.	-	Nat	-	1
STERCULIACEAE				
Waltheria indica L.	'Uhaloa	Ind.	O	-
MONCOTYLEDONES				
POACEAE				
Cenchrus ciliaris L.	Buffelgrass	Nat	AA	-
Chloris sp.	Finger Grass	Nat	A	2
Cynodon dactylon (L.) Pers.	Bermuda Grass	Nat	-	1
Eragrostis pectinacea (Michx.) Nees	Carolina Lovegrass	Nat	AA	2

STATUS - distributional status for the Hawaiian Islands:
End - Native only to the Hawaiian Islands.
Ind - indigenous; native to Hawai'i, but not unique to the Hawaiian Islands.
Nat - naturalized, exotic, plant introduced to the Hawaiian Islands since the arrival of Cook Expedition in 1778, and well-established outside of cultivation.

ABUNDANCE - occurrence ratings for plants by area:
R - Rare seen in only one or perhaps two locations.
O - Occasional seen with some regularity
A - Abundant found in large numbers; may be locally dominant.
AA - Very abundant and dominant; defining species for vegetation type.

NOTES:
1 - Observed only outside the property along the highway verge fronting the site.
2 - Specimens encountered lacked fruit or flowers; dead material; species determination uncertain.

Potential Impacts and Mitigation Measures

A primary goal of the survey was to determine if there were any federal or State listed endangered, threatened, proposed, or candidate botanical resources on or in the immediate vicinity of the project site; none were found. The results of the botanical survey indicate there are no special concerns related to botanical resources in the Kīhei High School project area. No adverse short-term or long-term direct or indirect impacts to flora are anticipated.

4.1.7 Fauna

The project area was surveyed for avian and mammalian species in November 2009; the associated study is included as *Appendix D.*

4.1.7.1 Avian Resources

The findings of this survey are consistent with the extremely xeric nature and the habitat present on the site. During the course of this survey a total of 11 avian species were recorded during the time spent within the Kīhei High School project area (*Table 4-3*). One ~~(1)~~ of the species recorded, Pacific Golden-Plover is a native species. Pacific Golden-Plover is an indigenous migratory shorebird species that nests in the high Arctic during the late spring and summer months, returning to Hawai'i and the Tropical Pacific to spend the fall and winter months each year. One ~~(1)~~ species detected, Red Junglefowl (*Gallus gallus*), is a domesticated alien species. Red Junglefowl are currently not considered to be established in the wild on the Island of Maui, so the two ~~(2)~~ birds heard were likely domestic birds, which may have escaped from their owners. The remaining nine ~~(9)~~ species detected are considered to be alien to the Hawaiian Islands (*Table 4-3*). Avian diversity and densities were in keeping with the habitat present within the Kīhei High School project area and its location. No species currently listed, or proposed for listing under either the federal or the State endangered species programs were detected during the course of this survey.

Although not detected during this survey, it is possible that small numbers of the endangered endemic Hawaiian Petrel (*Pterodroma sandwichensis*), and the threatened Newell's Shearwater (*Puffins auriculars newelli*), fly over the project area between the months of May and November (*Appendix D*). Recent surveys using ornithological radar have recorded these species flying inland along Maui's southern and western facing shores (*Appendix D*). There is no suitable nesting habitat within or close to the Kīhei High School project site for either of these pelagic seabird species.

Table 4-3 LIST OF AVIAN SPECIES

Common Name	Scientific Name	Status	Relative Abundance
GALLIFORMES			
PHASIANIDAE – Pheasants and Partridges			
Phasianinae – Pheasants and Allies			
Gray Francolin	Francolinus pondicerianus	A	1.78
Black Francolin	Francolinus francolinus	A	1.22
Red Junglefowl	Gallus gallus	A	0.22
CHARADRIIFORMES			
CHARADRIIDAE – Lapwings and Plovers			
Charadriinae – Plovers			
Pacific Golden-Plover	Pluvialis fulva	IM	0.78
COLUMBIFORMES			
COLUMBIDAE – Pigeons and Doves			
Spotted Dove	Streptopelia chinensis	A	0.67
Zebra Dove	Geopelia striata	A	5.11

PASSERIFORMES			
ZOSTEROPIDAE – White-eyes			
Japanese White-eye	Zosterops japonicus	A	1.89
STURNIDAE – Starlings			
Common Myna	Acridotheres tristis	A	1.00
CARDINALIDAE – Cardinals and Allies			
Northern Cardinal	Cardinalis cardinalis	A	0.67
FRINGILLIDAE – Fringilline and Carduleline Finches and Allies			
Carduelinae – Carduline Finches			
House Finch	Carpodacus mexicanus	A	3.78
ESTRILDIDAE – Estrildid Finches			
Estrildinae – Estrildine Finches			
Nutmeg Mannikin	Lonchura punctulata	A	1.56

Status:
A – Alien, introduced to the Hawaiian Islands by humans
IM - Indigenous Migratory Species, native to Hawai'i, but also found elsewhere naturally, does not nest in Hawai'i
Relative Abundance - Number of birds detected divided by the number of count stations (9)

4.1.7.2 Mammalian Resources

Seven ~~(7)~~ mammalian species were detected during the course of this survey (*Table 4-4*). Only two ~~(2)~~ of these: humans (*Homo sapiens*) and axis deer (*Axis axis*) were seen alive. The findings of this survey are consistent with the habitat present on the site, its location on Maui, and its current usage as cattle pasturage.

All of the other mammalian species recorded during the course of this survey are commonly occurring species in pastures in the Kīhei area. All of the quadrupeds recorded are considered to be alien to the Hawaiian Islands, and none are protected under either the federal or the State endangered species statutes.

Table 4-4 LIST OF MAMMALIAN SPECIES

Common Name	Scientific Name	Detection Type
PRIMATES - LEMURS, LORISIDS, GALAGOS, TARSIERS MONKEYS AND ALLIES		
Hominidae - Great Apes and Humans		
Human	Homo sapiens	V, A, Si
CARNIVORA - FLESH EATERS		
Canidae - Wolves, Jackals and Allies		
Domestic dog	Canis f. familiaris	A, T, Si
Felidae - Cats		
House cat	Felis catus	T, Si
PERISSODACTYLA - ODD-TOED UNGULATES		
Equidae - Horses, Asses and Zebras		
Domestic horse	Equus c. caballus	T, Si
ATRIODACTYLA - EVEN-TOED UNGULATES		
Suicidae - Old World Swine		

Pig	Sus s. scrofa	T, Si
Cervidae - Antlered Ruminants		
Axis deer	Axis axis	V, A, Si
Bovidae - Hollow-horned Ruminants		
Domestic cattle	Bos taurus	Sk, T, Si

Detection Type:
V Visual – at least one live animal was seen
A Audio – animals were heard
Si Sign – rubbing, rut marks, dust wallows were seen on the site
T Tracks – foot prints were seen
Sk Skeletal – skeletal remains were encountered on the site

Potential Impacts and Mitigation Measures

The development and operation of the Kīhei High School project is not expected to result in deleterious impacts to any avian or mammalian species currently listed or proposed for listing under either the federal or the State endangered species statutes.

Avian Resources Protected Under the Endangered Species Act

The principal potential impact that construction and operation of the Kīhei High School project poses to Hawaiian Petrels and Newell's Shearwaters is the increased threat that birds will be downed after becoming disoriented by lights associated with the project during the nesting season. The two ~~(2)~~ main areas that outdoor lighting could pose a threat to these nocturnally flying seabirds is if, 1) during construction it is deemed expedient, or necessary to conduct nighttime construction activities, 2) following build-out the potential operation of streetlights and athletic field lighting.

If nighttime construction activity or equipment maintenance is proposed during the construction phases of the Kīhei High School project, all associated lights should be shielded, and when large flood/work lights are used they should be placed on poles that are high enough to allow the lights to be pointed directly at the ground.

If streetlights or facility lighting is installed in conjunction with the school, it is recommended that lights be shielded to reduce the potential for interactions of nocturnally flying Hawaiian Petrels and Newell's Shearwaters with external lights and man-made structures (Reed et al. 1985, Telfer et al. 1987). This minimization measure would serve the dual purpose of minimizing the threat of disorientation and downing of Hawaiian Petrels and Newell's Shearwaters, while at the same time complying with the Maui County Code § 20.35 *et seq.* that requires that exterior lights on Maui be shielded.

Hawaiian Hoary Bat Habitat

Although no critical habitats were identified within the project area, the potential for Hawaiian hoary bat roosting and foraging habitat exists on the site. If trees and shrubs are cleared during breeding season, there is a risk that young bats could be inadvertently killed or harmed. In order to minimize potential harm to young bats, trimming and removal of woody plants greater than 15 feet tall should not occur between June 1 and September 15.

4.2 BUILT ENVIRONMENT

4.2.1 Planned Projects within the Region

A number of potential projects are being planned within the vicinity of the proposed Kīhei High School. These potential projects include Kīhei Mauka, Piʻilani Promenade and Maui Outlet Centers, Maui Research and Technology Park, and Honuaʻula Development (*Figure 4-4* and *Figure 4-5*). Although the development plans and implementation schedules for these projects are currently unknown; descriptions of each proposed project are provided below.

Kīhei Mauka

The agricultural lands surrounding the proposed Kīhei High School project site are owned by Kaonoulu Ranch and Haleakala Ranch. The ranches have future plans to develop these lands (currently referred to as "Kīhei Mauka") as a community that will include residential, commercial, and industrial uses. The DOE will coordinate with Kaonoulu Ranch and Haleakala Ranch through the DB process to ensure coordinated planning.

Piʻilani Promenade and Maui Outlets Center

The Piʻilani Promenade and Maui Outlets Center will be located adjacent to Piʻilani Highway north of the Kīhei High School project. The two ~~(2)~~ projects are expected to include over 703,000 SF of retail and restaurant space and include the extension of Kaʻonoʻulu Street further east.

Maui Research and Technology Park

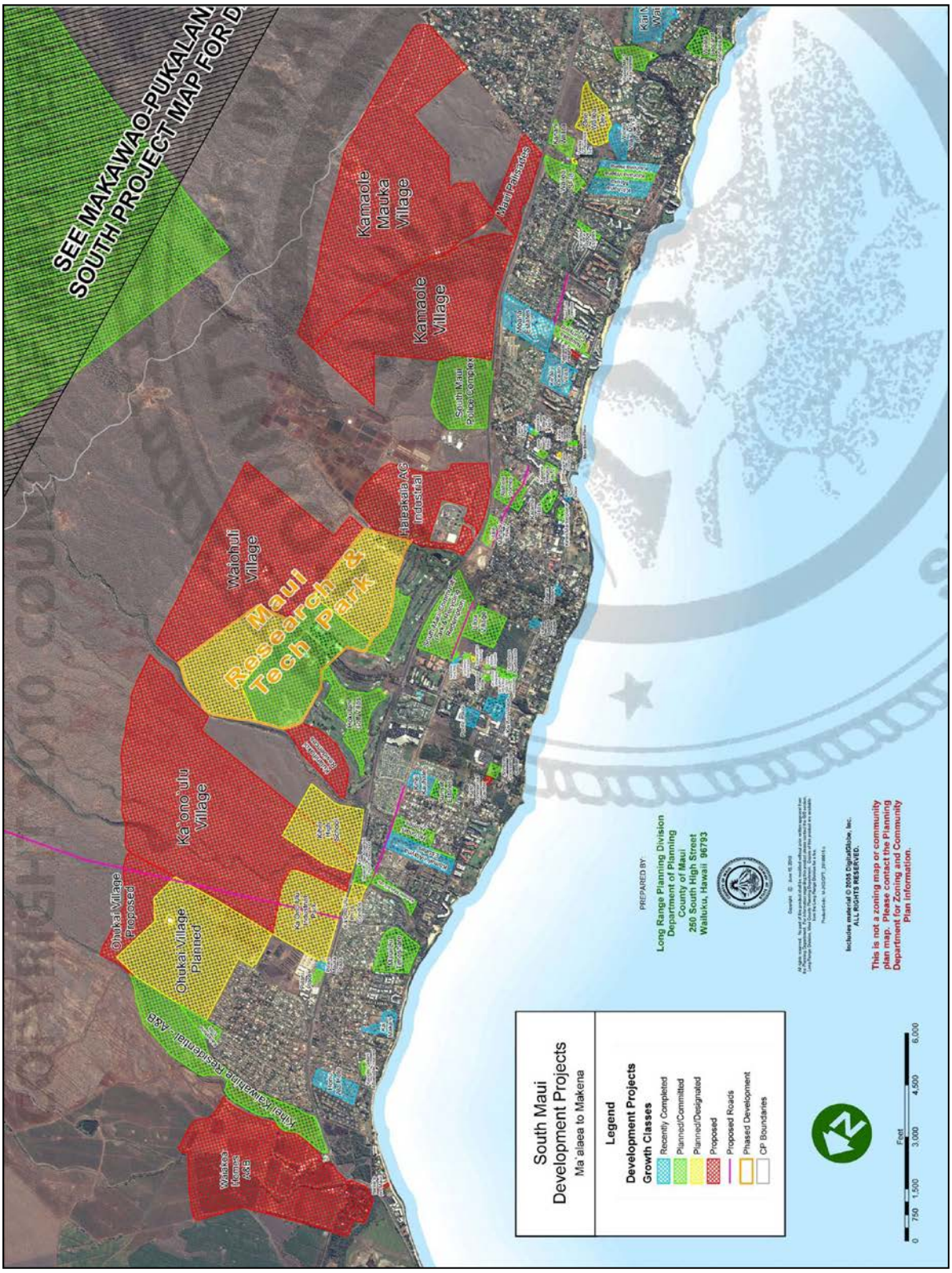
The existing Maui Research and Tech Park is located east of Piʻilani Highway near the intersection with Līpoa Street. The proposed project will include the expansion of the existing technology park, as well as development of other residential and commercial uses in the surrounding areas.

Honuaʻula Development (Wailea 670)

The Honuaʻula Development will be located on an approximately 670 acre parcel near the southern end of Piʻilani Highway in Mākena. The proposed development will include a maximum of 1,400 residential units (mix of single- and multi-family units), mixed use areas including 100,000 SF of commercial development, two ~~(2)~~ golf courses, and a variety of public and private amenities. The project also proposes approximately 250 off-site affordable residential units in North Kīhei.

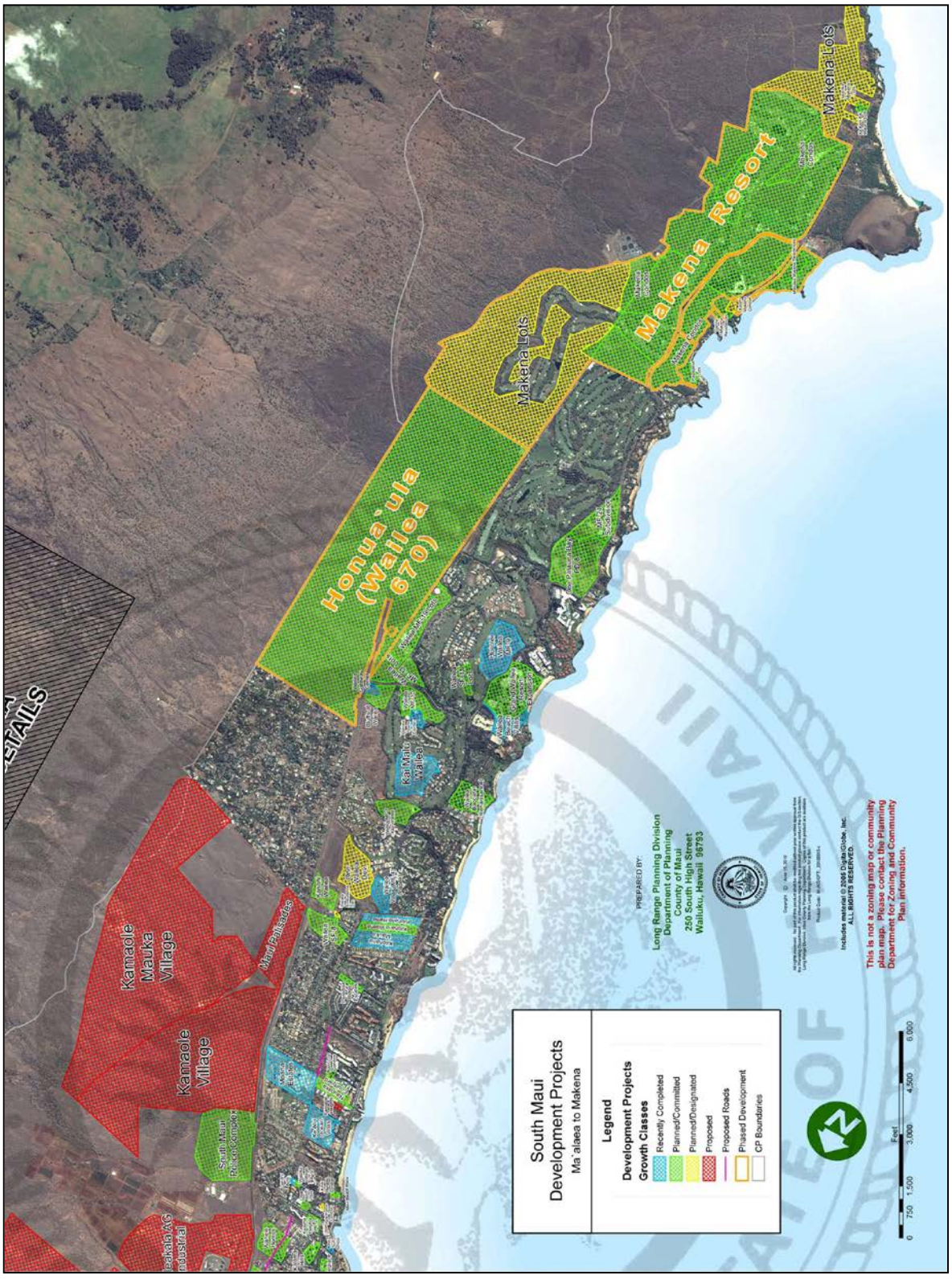
Alexander & Baldwin (A&B) North Kīhei Mauka Residential & Commercial

A&B's 94-acre North Kīhei Mauka Residential and Commercial project is located in north Kīhei, mauka of Piʻilani Highway and north of the intersection with Kaiwahine Street. A&B is proposing construction of approximately 600 units of single and multi-family residential units and approximately 1.4 acres of commercial development.



Source: County of Maui, Department of Planning, Long Range Planning Division, 2010

Figure 4-4
South Maui Development Projects (North)



Source: County of Maui, Department of Planning, Long Range Planning Division, 2010

Figure 4-5
South Maui Development Projects (South)

4.2.2 Current Land Uses and Regulations

Land Regulation

The Kīhei High School project site is 77.2 acres of undeveloped land in the Kīhei-Mākena region. The project area encompasses two ~~(2)~~ land parcels, TMKs 2-2-2-002:081 and 2-2-2-002:083. The project site is currently used by the ranches for cattle grazing. There are no other on-site land uses. The site lies within the State Agricultural district and is designated Public/Quasi-Public and Agriculture by the Kīhei-Mākena Community Plan. County zoning is Agricultural district.

Table 4-5 and *Figures 1-4, 1-6* and *1-7* summarize the State and County land use designations.

Table 4-5 STATE AND COUNTY LAND USE DESIGNATIONS

Jurisdiction	Existing Designation(s)	Proposed Designation(s)
State Land Use District	Agricultural	Urban
County Zoning	Agricultural	P-1 Public/Quasi-Public
Kīhei-Mākena Community Plan	Public/Quasi-Public; Agriculture	Public/Quasi-Public

Adjacent Land Use

Land uses adjacent to the project site are summarized below:

North: The Kūlanihāko'i Gulch forms the northern site boundary. Beyond the gulch to the north are undeveloped Kaonoulu Ranch lands.

West: Immediately adjacent to the site on the west is Pi'ilani Highway. Across Pi'ilani Highway is the Pi'ilani Village residential subdivision.

South: Immediately south of and adjacent to the site is the Waipu'ilani Gulch and Elleair Golf Course. The Maui Research and Technology Park is located to the southeast and the Pi'ilani Shopping Center is located to the southwest. The Kīhei Wastewater Reclamation Facility is located south of the Elleair Golf Course.

East: Undeveloped lands owned by Kaonoulu Ranch and Haleakala Ranch. These lands to the east are part of the Kīhei Mauka future growth area designated by the Maui Island Plan General Plan 2030 Draft.

Potential Impacts and Mitigation Measures

Land Regulation

The Kīhei High School development is not consistent with existing State Land Use classification and County zoning, and is only partially consistent with current County Community Plan designations.

The applicant is pursuing a State Land Use District Boundary Amendment, Amendment to the Kīhei-Mākena Community Plan, and Rezoning to allow development of the Kīhei High School project.

The proposed State Land Use classification change from Agricultural to Urban, County zoning change from Agricultural to P-1 Public/Quasi Public, and the proposed Kīhei-Mākena Community Plan designation change from Agriculture to Public/Quasi Public would have beneficial long-term impacts on public services as described in *Section 4.3.5*. The project is not anticipated to have adverse long-term significant impacts on agriculture, as described in *Section 4.1.3*.

Adjacent Land Uses

Ranching activities north and east of the Kīhei High School project area are not expected to be adversely impacted by the proposed development. The proposed high school is compatible with and supportive of existing residential areas to the west of the project site. Piʻilani Highway will provide separation between the high school and residential areas. No impacts are anticipated with the golf course and Research and Tech Park to the south. Waipuʻilani Gulch serves as a natural divide between the school and these areas.

Current Land Uses

Approximately 77 acres of ranching lands will be replaced by the project. The ranching activities are anticipated to relocate offsite onto adjacent ranch lands. It is anticipated that the ranching activities will relocate with no significant impact to ranching employment and operations. The island-wide impact on ranching would be minor.

In light of the relatively small adverse impact to loss of agricultural and ranching land, no mitigation is proposed. No mitigation is proposed for the reduction of two ~~(2)~~ acres of prime land from the Maui agricultural land inventory.

4.2.3 Archaeological and Historic Environment

The proposed Kīhei High School project is classified as a "State project", and subject to a historic preservation review process under the HRS, Chapter 6E-8. Under Chapter 6E-8(a), before the State can commence with this project, it needs to afford the Department of Land and Natural Resources (DLNR), State Historic Preservation Division (SHPD) an opportunity to review the effect of the Kīhei High School project on known or potential historic properties. In December 2009, an *Archaeological Inventory Survey* (AIS) *for the Proposed Construction of Kīhei High School* was completed by Scientific Consultant Services, Inc. (SCS). The AIS report is included as *Appendix E*. The findings of this AIS report identified several past studies around and within the vicinity of the Kīhei High School project site.

Previous Archaeological Research in the Vicinity

A substantial number of archaeological investigations have been conducted over the past few years near the present project site. Despite a large number of studies, relatively few significant sites have been documented.

Previous archaeological research has documented a fairly limited degree of human settlement in the Kīhei area. Within the "barren zone", archaeological reconnaissance and inventory surveys adjacent to and nearby the project area have yielded a modest amount of evidence of both historical and traditional human activities. Based on over 30 years of archaeological study in the "barren zone" of the former Kula District (presently Makawao), it is clear that the area was not a desirable location for either a permanent population or for large scale agricultural endeavors that were undertaken in locales further upland. Whether this pattern was the result of poor soil development, low precipitation, or lack of population pressure that would have forced individuals to seek new areas to settle, it is likely that previous archaeological studies would have identified at least remnants of any permanent habitation or agricultural complexes, like those that can be found in the more inland reaches of Kula. As such, archaeological structures associated with permanent habitation sites and/or ceremonial sites were not expected within the Kīhei High School project area prior to the inventory survey.

Archaeological Inventory Survey

Archaeological work in the project area was conducted to determine the presence or absence of archaeological deposits in surface and subsurface contexts through a thorough survey and representative subsurface testing. The goal of the survey was to determine if significant cultural or historic resources, and/or human burials occurred on the parcel; and, to provide significance assessments and recommendations to SHPD.

A 100% pedestrian survey of 77 acres and limited subsurface testing re-documented one ~~(1)~~ site located in the northeastern portion of the project area. State Inventory of Historic Properties (SIHP) No. 50-50-10-6393 consists of eight ~~(8)~~ features (seven ~~(7)~~ mounds and one ~~(1)~~ alignment) (*Figure 4-46*). The site is located on Kaonoulu Ranch lands on a relatively level portion of the project area, approximately 300 meters (m) from Piʻilani Highway at an elevation of 20 m AMSL. The eight ~~(8)~~ features consist of a series of low mounds and one ~~(1)~~ alignment constructed of basalt cobbles and boulders. A portion of this site was previously documented by SCS (*Appendix E*) and was described as consisting of "three features, all of which are rock mounds that were likely constructed during bulldozer activities on the lot, due to the angular, broken up condition of stones in the features and the presence of a bulldozed area (possibly an old road) just north of Feature three ~~(3)~~ (*Appendix E*).

SIHP No.: 50-50-10-6393

Site Type: Mound Complex

Function: Agriculture/Ranching

Feature (#): eight ~~(8)~~

Age: Historic

Condition: Poor

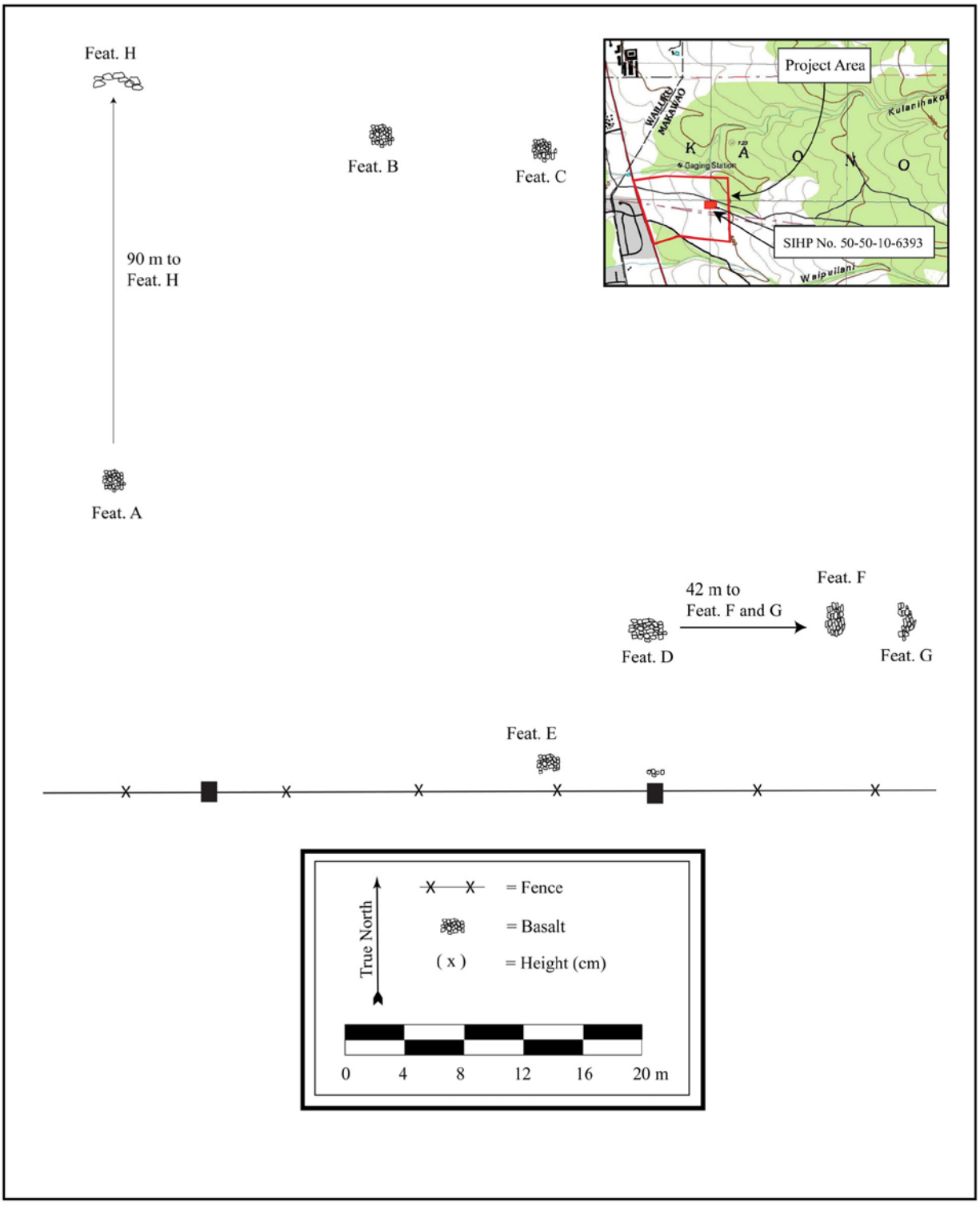


Figure 4-46
Plan View of SIHP No. 50-50-10-6393

Previous archaeological investigations and historic documentation in the vicinity of the project site suggests that the area was marginally utilized in pre-contact times and has been used in the historic era primarily for ranching activities and World War II military training exercises. The site re-identified during this survey is associated with the historic period activities.

The site has been evaluated for significance according to the criteria established for the State and NRHP. SIHP No. 50-50-10-6393 is (and was previously) designated under Criterion D as a site that has yielded or has the potential to yield information important in prehistory or history. The eight ~~(8)~~ features have been thoroughly documented with photographs, scale plan view maps and written descriptions, and three ~~(3)~~ of the features were manually tested to gather additional information.

No further work was recommended for SIHP No. 50-50-10-6393. This recommendation follows a previously accepted recommendation made during other archaeological investigations (Appendix E). It is believed that the features have been adequately documented and additional research focused on the site would not contribute to the interpretation of the area, region or Hawaiian prehistory and/or history. It is therefore recommended that no further archaeological work is warranted within the project area.

The findings of the AIS did not recommend archaeological monitoring during the proposed construction for the new Kīhei High School. However, should the inadvertent discovery of significant cultural materials and/or burials occur during construction, all work in the immediate area of the find must cease and the SHPD be notified to discuss mitigation.

Potential Impacts and Mitigation Measures

SIHP No. 50-50-10-6393

SIHP No. 50-50-10-6393 will be adversely impacted through project construction. Although designated eligible under Criterion D for the NRHP, it is believed that the features have been adequately documented and additional research focused on the site would not contribute to the interpretation of the area, region or Hawaiian prehistory and/or history.

The SHPD accepted the AIS in their letter dated February 12, 2010. SHPD stated that while continuous monitoring did not appear to be necessary, a program of intermittent monitoring during the initial phases of ground preparation and build out should be implemented. SHPD requested to reserve further recommendations and final comment pending review of project related permit applications and plans.

Per the SHPD-approved AIS, SIHP No. 50-50-10-6393 has been documented to the fullest extent and no further mitigation for this site is recommended. Intermittent monitoring will be conducted during the initial phases of ground disturbing activities.

Inadvertent Finds during Construction

Potential exists for inadvertent cultural or archaeological finds during the course of construction. Should significant cultural materials and/or burials be inadvertently discovered during construction, all work in the immediate area of the find must cease and SHPD must be notified.

Contractors working in the project area will be advised that, should any significant cultural deposits or human skeletal remain area be encountered, work shall stop in the immediate vicinity and SHPD shall be promptly contacted to determine the appropriate course of action.

4.2.4 Cultural Resources

A Cultural Impact Assessment (CIA) for the proposed construction of Kīhei High School was completed by SCS in April 2010. The Kīhei High School project requires compliance with Act 50 Session Laws of Hawai'i 2000 and the State of Hawai'i environmental review process under Chapter 343, HRS, which requires consideration of a proposed Kīhei High School project's effect on traditional cultural practices. The CIA report is included as *Appendix F*.

The area of potential effect consists of the project area in the context of the Waiohuli Ahupua'a and other places on Maui that may be traditionally associated or connected with Kīhei, Ka'ono'ulu, Kōheo and/or the Kīhei High School project area.

Traditional Settlement Patterns

Trails extended from the coast to the mountains, linking the two ~~(2)~~ for both economic and social reasons. A trail known as the *alanui* or "King's trail" built by Kihapi'ilani, extended along the coast passing through all the major communities between Lāhainā and Mākena, including Kīhei. Kolb noted that two ~~(2)~~ traditional trails extended through Kēōkea. One ~~(1)~~ trail, named "Kekuawaha'ula'ula" or the "red-mouthed god", went from Kīhei inland to Kēōkea. Another, the Kalepolepo trail, began at the Kalepolepo fishpond and continued to upland Waiohuli. These trails were not only used in the pre-contact era, but were expanded to accommodate wagons bringing produce to the coast in the 1850s (*Appendix F*).

Western Contact

Early descriptions of this portion of Maui are brief and infrequent and usually refer to coastal activities. Captain King, Second Lieutenant on the *Revolution* during Cook's third voyage briefly described what he saw from a vantage point of "eight or ten leagues" (approximately 24 miles) out to sea as his ship departed the islands in 1779 (*Appendix F*). He mentions Pu'u Ōla'i south of Kīhei and enumerates the observed animals, thriving groves of breadfruit, excellence of the taro, and almost prophetically, says the sugar cane is of an unusual height. Seen from this distance and the mention of breadfruit suggest the uplands of Kīpahulu-Kaupo and 'Ulupalakua, and not the lower regions, were his focus.

In the ensuing years, LaPérouse (1786), Nathaniel Portlock and George Dixon (also in 1786), sailed along the western coast, but added little to our direct knowledge of Kīhei. During the second visit of Vancouver in 1793, his expedition becalmed in Ma'alaea Bay close to the project area.

Archibald Menzies, a naturalist accompanying Vancouver stated, "…we had some canoes off from the latter island [Maui], but they brought no refreshments. Indeed, this part of the island appeared to be very barren and thinly inhabited." According to Kahekili, then chief of Maui, the extreme poverty in the area was the result of the continuous wars between the Island of Maui and Island of Hawai'i causing the land to be neglected and human resources wasted.

The Great Mahele

The Great Mahele of 1848 divided Hawaiian lands between the king, the chiefs, the government, and began the process of private ownership of lands. The subsequently awarded parcels were called Land Commission Awards (LCAs). Hewahewa, Kamehameha's Kahuna Nui, was awarded Ka'ono'ulu (LCA3237).

As western influence grew, Kalepolepo in Kīhei became the important provisioning area. Europeans were now living or frequently visiting the coast and several churches and missionary stations were established. A Mr. Halstead's residence and store situated at Kalepolepo landing was known as the Koa House having been constructed of koa logs brought from the uplands of Kula. The store flourished due to the whaling and successful upland potato industry, and provided an accessible port for exported produce. A landing was built at Kīhei around 1890. Several of Hawai'i's ruling monarchs stayed at the Koa House, including Kauikeaouli (Kamehameha III), Kamehameha the IV, Lot Kamehameha (V), and Lunalilo. Wilcox, giving a glimpse of the surroundings before abandonment stated, "…Kalepolepo was not so barren looking a place. Coconut trees grew beside pools of clear warm water along the banks of which grew taro and ape…" (*Appendix F*). However, by 1887 this had changed. Wilcox continues:

> *"…the Kula mountains had become denuded of their forests, torrential winter rains were washing down earth from the uplands, filling with silt the ponds at Kalepolepo…ruins of grass huts [were] partly covered by drifting sand, and a few weather-beaten houses perched on the broad top of the old fish pond wall at the edge of the sea, with the Halstead house looming over them dim and shadowy in the daily swirl of dust and flying sand…"*

Ranching was present prior to the 1840s and large sections of Crown Lands were leased for grazing cattle. By the 1880s, the lower Kula lands, including the project area, consisted primarily of pasture land for ranching. Large portions of Ka'ono'ulu Ahupua'a were used for cattle by the Kaonoulu Ranch Company Limited and by Ulupalakua Ranch, Incorporated.

Agricultural development on the leeward side of Maui was likely to have begun early in what is known as the Expansion Period (AD 1200-1400). The present project area is located in what has been referred to as the "barren zone." The barren zone is perceived as dry and antagonistic to permanent habitation. This zone was an intermediary region between verdant upland regions and the coastline. In the transitional/barren zone, agriculture endeavors were practically non-existent and tool procurement materials, such as basalt rock and wood, were selected from other locales. Sediment regimes in the area are shallow, most often overlying bedrock, and perennial water sources are virtually non-existent. In addition, the immediate slope in back of the coast receives less than 30 inches of rainfall annually, which is needed for productive cultivation.

Scattered amongst the few habitation sites along the coast were places of cultural significance to the kamaʻāina of the district including at least two ~~(2)~~ heiau. In ancient times, there was a small village at Kalepolepo, supported primarily by marine resources. Several fishponds were also located in the vicinity of Kīhei; Waiohuli, Kēōkea-kai, and Kalepolepo Pond (also known by the ancient name of Kōʻieʻie Pond). Constructed on the boundary between Kaʻonoʻulu and Waiohui Ahupuaʻa, these three ponds were some of the most important royal fishponds on Maui. The builder of Kalepolepo and two other ponds (Waiohuli and Kēōkea-kai) has been lost in antiquity, but they were reportedly rebuilt at least three ~~(3)~~ times through history, beginning during the reign of Piʻilani.

Cultural Impact Assessment

Through document research and cultural consultation efforts, the CIA report provided information that was applicable to the assessment of the Kīhei High School project and its potential impacts to cultural practices. Hawaiian organizations, agencies, and community members have been contacted for this study in order to identify potentially knowledgeable individuals with cultural expertise and/or knowledge of the Kīhei High School project area and its vicinity.

Consultation letters were sent to organizations whose jurisdiction included knowledge of the area. Consultation was sought from Phillis (Coochie) Cayan, History and Culture Branch Chief with SHPD; Office of Hawaiian Affairs (OHA), Oʻahu Branch; Thelma Shimaoka, OHA Maui Branch; Charles Maxwell, Maui Island Burial Council; Kimokeo Kapahulehua; Department of Planning, Cultural Resources Commission; Hinano Rodrigues, DLNR; Kīhei Community Association; and Central Maui Hawaiian Civic Club.

In addition, a CIA Notice was published on March 28, 30, and 31, 2010 in *The Honolulu Advertise*r and *The Maui News*, and in the April 2010 issue of the OHA newspaper, *Na Wai Ola*. These notices requested information of cultural resources or activities in the area of the proposed Kīhei High School project.

Two ~~(2)~~ responses were received from the above listed organizations or news periodical announcements. Neither contained additional information concerning on-going cultural activities or resources in the Kīhei High School project area. This would be expected from an area known for its general lack of pre-contact usage. One ~~(1)~~ letter was from the Oʻahu Branch of the OHA acknowledging receipt of the letter if inquiry. The other letter was from Phillis (Coochie) Cayan, History and Culture Branch Chief with SHPD, also acknowledging receipt of the letter of inquiry and suggesting several contacts, many of whom had already been contacted with no results.

An interview was also conducted in 2000 with Mr. Henry Rice, owner of Kaonoulu Ranch (containing the present Kīhei High School project area) by SCS pertaining to another CIA (*Appendix F*). Mr. Rice is descended from a kamaʻāina family and, at the time of the interview, the ranch consisted of approximately 9,000 acres of land that had been held by the Rice family since 1916. Mr. Rice stated that land was used for pasturage and the cattle were rotated according to vegetation growth, up and down the slope. Mr. Rice did not know of any old trails, traditional properties, or cultural activities occurring on his Kaonoulu Ranch lands. He did mention that in the late 1800s people living in the Kula region were still obtaining fish from the Kaʻonoʻulu fishpond in Kīhei. With the introduction of a dependable water supply in 1952 to the dry Kīhei region, came overseas investment and development for the tourist industry, which has continued up to, and including, this time.

Historical and cultural source materials were extensively used and can be found in more detail in *Appendix F*. In addition, an archaeological report specific to the project vicinity was reviewed. Early archaeological investigations and historic documentation in the vicinity of the project area suggested that the area was marginally utilized in pre-contact times and had been used in the historic era primarily for ranching activities and World War II military training exercises. An AIS was conducted in 2010 (*Appendix E*) which included a 100% pedestrian survey, limited subsurface testing and documentation of one ~~(1)~~ site (SIHP No.0-50-10-6393) consisting of eight ~~(8)~~ features. After analysis, it was decided the features were historic and associated with ranching activities. No new sites were identified during the recent inventory survey.

Potential Impacts and Mitigation Measures

The information presented in the CIA report for the project site reveals no notable cultural activities took place at the specific project areas (*Appendix F*). There was no additional information from the contacted organizations, newspapers, and archival research. Therefore, it is reasonable to conclude that, pursuant to Act 50, the exercise of native Hawaiian rights, or any ethnic group, related to gathering, access or other customary activities will not be affected by the activities of the proposed Kīhei High School. Adverse effects are not anticipated since no cultural activities were identified to occur at the project area.

4.2.5 Traffic and Circulation

A Traffic Impact Report (TIR) (May 2011) was prepared for the Kīhei High School project by Wilson Okamoto Corporation to identify and assess potential impacts of the project on existing roadways and traffic conditions. This report is included as *Appendix G*. A Pedestrian and Bicycle Analysis was prepared by Stantec Consulting Inc. (Stantec) to evaluate access, community connectivity and safety for bicycles and pedestrians (*Appendix N*).

4.2.5.1 Area Roadway System

In the vicinity of the Kīhei High School project, Piʻilani Highway is a predominantly four-lane, two-way roadway oriented in the north-south direction that provides access through Kīhei. At the intersection with Kūlanihākoʻi Street, the northbound approach of the highway has an exclusive left-turn lane and two ~~(2)~~ through lanes while the southbound approach has two ~~(2)~~ through lanes and an exclusive right-turn lane. Kūlanihākoʻi Street is oriented in the east-west direction and serves as a connector roadway between South Kīhei Road and Piʻilani Highway. At the intersection with Piʻilani Highway, the Kūlanihākoʻi Street approach has two ~~(2)~~ stop-controlled lanes that serve left-turn and right-turn traffic movements. See *Figure 4-5*7.

The access roadway for the proposed Kīhei High School will connect to the east side of the intersection creating a four ~~(4)~~ way intersection. After the connection is completed, the westbound approach of the access road is expected to have two ~~(2)~~ westbound lanes that serve left-turn, through, and right-turn traffic movements. In addition, northbound deceleration and acceleration lanes are expected to be constructed along Piʻilani Highway to facilitate entering and exiting traffic at the school's access.

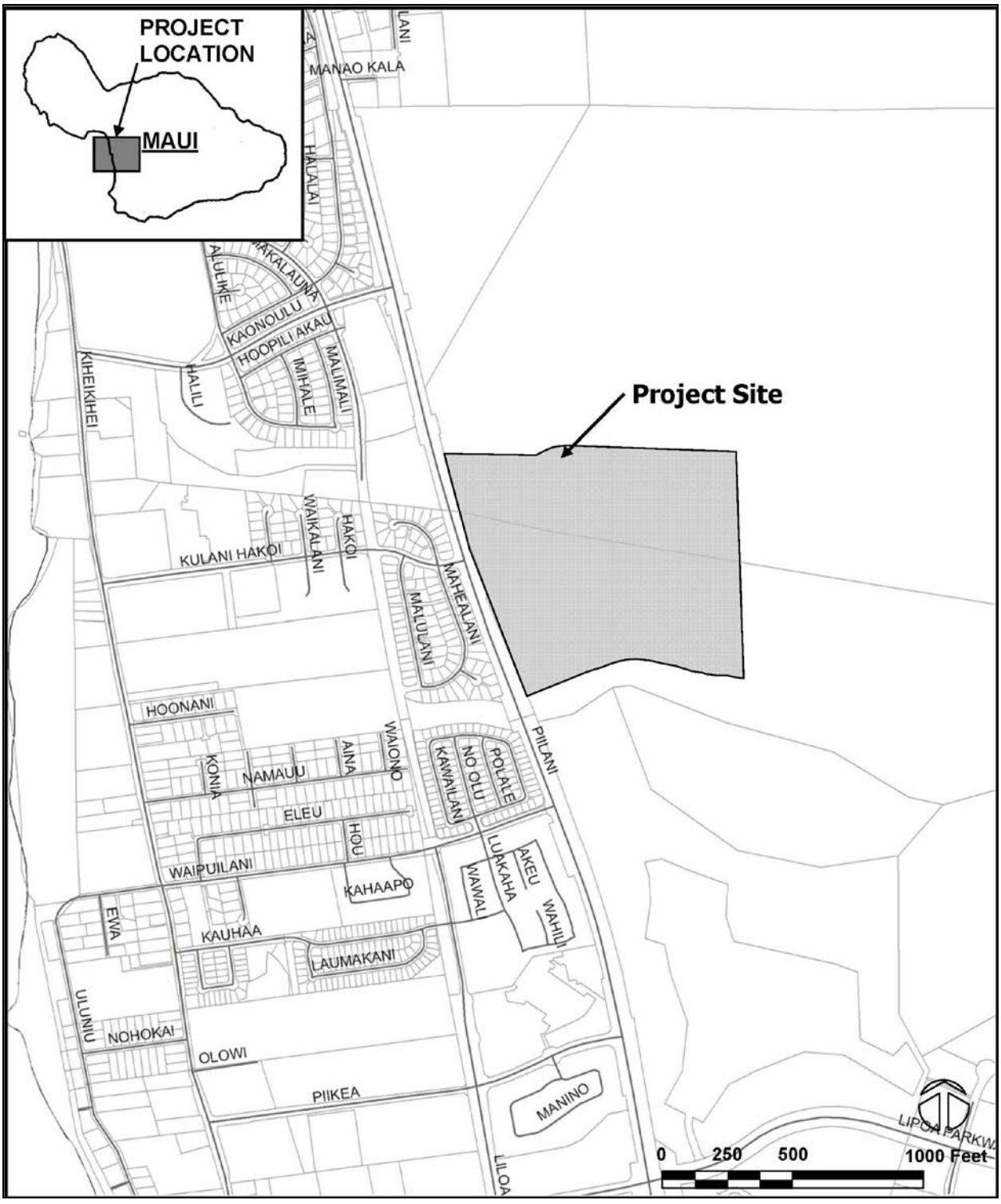


Figure 4-~~5~~7
Area Roadways and Project Site Map

Existing Traffic Volumes and Levels of Service

Morning and afternoon peak hour traffic counts were conducted at each of the five ~~(5)~~ analyzed intersections in January 2011. The AM peak hour of traffic generally occurs between the hours of 7:15 AM and 8:15 AM. During the afternoon, the PM peak hour of traffic generally occurs between the hours of 3:45 PM and 4:45 PM. *Figure 4-~~6~~8 (1)* and *Figure 4-~~6~~8 (2)* illustrate the existing traffic study area for each of the following intersections:

- Piʻilani Highway and Kaʻonoʻulu Street
- Piʻilani Highway and Kūlanihākoʻi Street
- Piʻilani Highway and E. Waipuʻilani Road
- Piʻilani Highway and Piʻikea Avenue
- Kūlanihākoʻi Street and South Kīhei Road

The highway capacity analysis performed for the TIR is based upon procedures presented in the Highway Capacity Manual (HCM) (2000), Transportation Research Board and the Synchro software, developed by Trafficware. Level of Service (LOS) is a quantative and qualitative assessment of traffic operations. LOS are defined by LOS "A" through "F"; LOS "A" represents ideal or free-flowing traffic operating conditions and LOS "F" represents unacceptable or potentially congested traffic operating conditions. *Table 4-6* below summarizes the results of the level of service analysis for each of the five ~~(5)~~ study intersections.

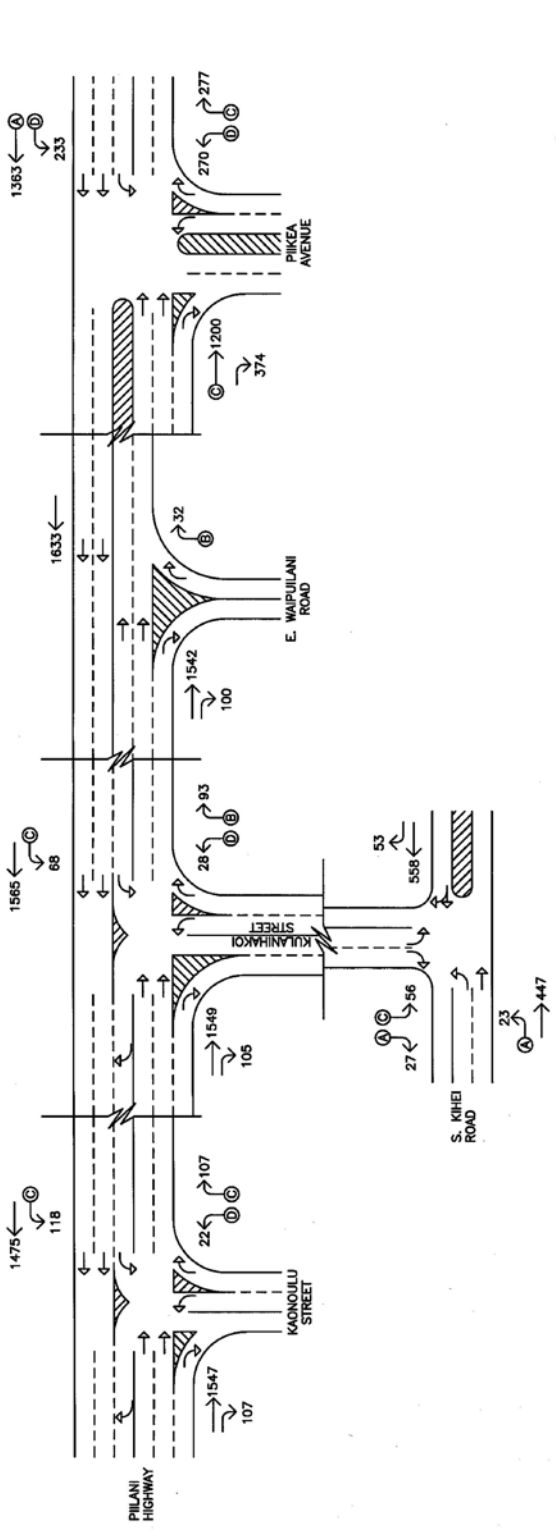


Figure 4-~~6~~8 (1)
Existing AM Peak Hour of Traffic

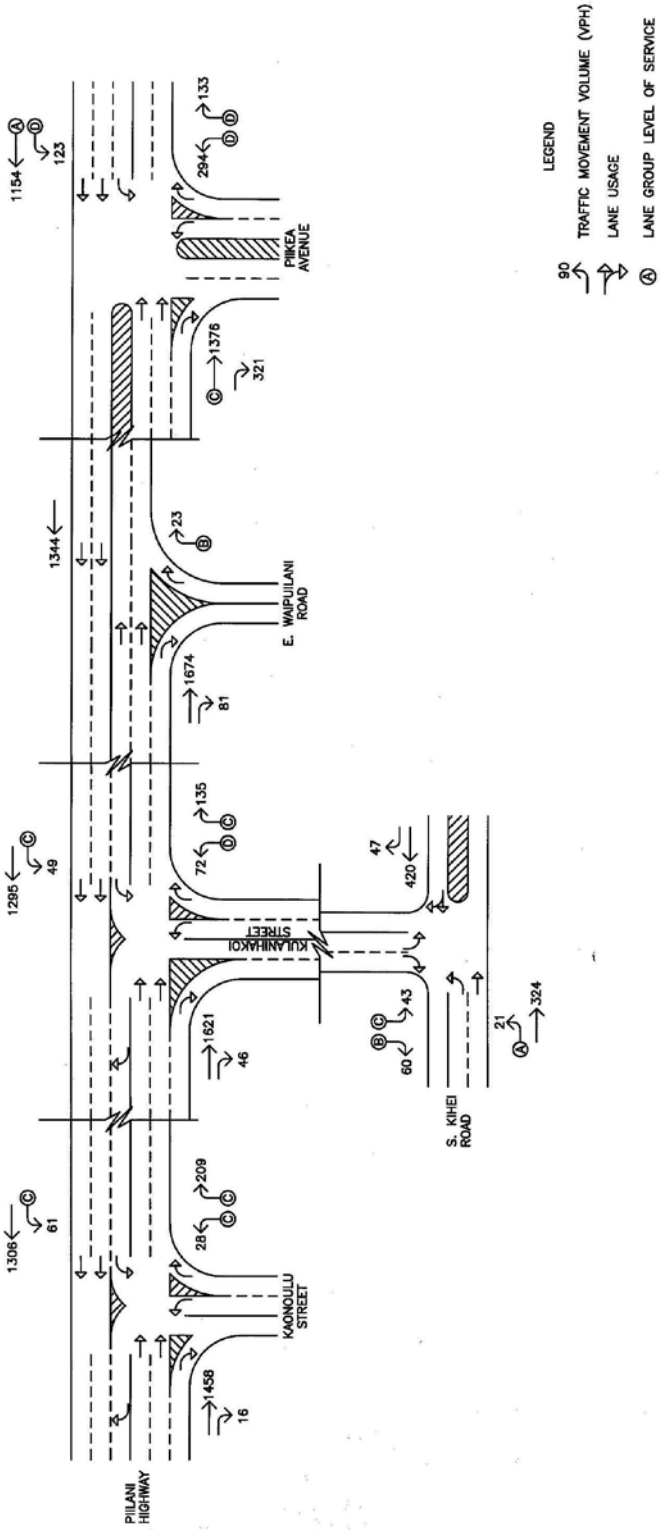


Figure 4-~~6~~8 (2)
Existing PM Peak Hour of Traffic

Table 4-6 EXISTING AND PROJECTED YEAR 2015 (WITHOUT PROJECT) LOS TRAFFIC OPERATING CONDITIONS						
Intersection	Critical Traffic Movement		AM		PM	
			Existing	2015 w/o	Existing	2015 w/o
Piʻilani Highway/ Kaʻonoʻulu Street	Eastbound	LT	C	C	D	D
		RT	C	C	C	C
	Northbound	LT	C	C	C	C
Piʻilani Highway/ Kūlanihākoʻi Street	Eastbound	LT	D	D	D	D
		RT	C	C	B	C
	Northbound	LT	C	C	C	C
Piʻilani Highway/ E. Waipuʻilani Road	Eastbound	RT	B	B	B	B
Piʻilani Highway/ Piʻikea Avenue	Eastbound	LT	D	D	D	D
		RT	D	D	C	D
	Northbound	LT	D	D	D	D
	Southbound	TH	C	C	C	C
Kūlanihākoʻi Street / South Kīhei Road	Westbound	LT	C	C	C	C
	Southbound	LT	B	B	A	A

Potential Impacts and Mitigation Measures

The trips generated by the Kīhei High School project are expected to be associated with the existing and new high school students. High school students from Kīhei currently attend high schools in Kahului and Wailuku and these students are expected to transfer to the new high school once it is opened. As provided by the DOE, there are currently 704 students from Kīhei attending high schools in other regions. *Table 4-7* summarizes the project site trip generation characteristics applied to the AM and PM peak periods of traffic.

Table 4-7 PEAK HOUR TRIP GENERATION CHARACTERISTICS						
		Projected Trip Ends				
		Year 2015			Year 2025	
		Existing Students	New Students	Subtotal	New Students	Existing and New Students
		704 Students	96 Students	800 Students	850 Students	1650 Students
AM Peak	Enter	201	27	228	243	471
	Exit	95	13	108	114	22
	Total	296	40	336	357	693
PM Peak	Enter	43	6	49	52	101
	Exit	49	6	55	59	114
	Total	92	12	104	111	215

A number of potential residential and commercial projects are being considered within the vicinity of the proposed Kīhei High School. These potential projects include Kīhei Mauka, Piʻilani Promenade and Maui Outlet Centers, Maui Research and Tech Park, and Honuaʻula Development. The project development plans and implementation schedules for these projects are unknown; therefore, they have not been incorporated into projected traffic scenario conditions for the proposed project.

Future Traffic Volumes without the Project

Projected traffic operations in year 2015 without the project are expected to deteriorate slightly from existing conditions due to ambient growth in traffic along the surrounding roadways (*Table 4-8*). The eastbound right-turn traffic movement at the intersection of Piʻilani Highway and Kūlanihākoʻi Street is expected to deteriorate from LOS "B" to LOS "C" during the PM peak period while the eastbound right-turn traffic movement at the intersection of Piʻilani Highway and Piʻikea Avenue is expected to deteriorate from LOS "C" to LOS "D" during the PM peak period. The remaining traffic movements at this intersection as well as the other study intersections are expected to operate at levels of service similar to existing conditions.

Future Traffic Volumes with the Project

The Year 2015 cumulative AM and PM peak hour traffic conditions with the Kīhei High School project are summarized in *Table 4-8,* and shown in *Figure 4-~~7~~9 (1)* and *Figure 4-~~7~~9 (2)*. With the anticipated increases in traffic due to ambient growth in traffic and the inclusion of the proposed access for the high school, a Traffic Signal Warrant Study (*Appendix G*) was completed for the intersection of Piʻilani Highway and Kūlanihākoʻi Street. Based on existing and projected traffic volumes, the study recommended the installation of a traffic signal system. As such, a traffic signal system is assumed to be installed in conjunction with the Kīhei High School project by school opening, anticipated in the Year 2015.

Traffic operations in Year 2015 with project conditions are expected to remain similar to without project conditions despite the addition of site-generated vehicles to the surrounding roadways. Along Piʻilani Highway, the traffic movements at the intersection with Kaʻonoʻulu Street are expected to continue operating at LOS "C" or better during the AM peak period and LOS "D" or better during the PM peak period, while the intersection of Piʻilani Highway and Piʻikea Avenue are expected to continue operating at LOS "D" or better during both peak periods. The eastbound approach of E. Waipuʻilani Road and Piʻilani Highway is expected to continue operating at LOS "B" during both peak periods, while traffic movements at the intersection of Kūlanihākoʻi Street and South Kīhei Road are expected to continue operating at LOS "C" or better during both peak periods. The intersection of Piʻilani Highway and Kūlanihākoʻi Street is expected to operate at LOS "D" or better during both peak periods primarily due to the installation of the traffic signal system.

Table 4-8 PROJECTED YEAR 2015 (WITHOUT AND WITH PROJECT) AND YEAR 2025 (WITH PROJECT) LOS TRAFFIC OPERATING CONDITIONS

Intersection	Critical Traffic Movement		AM			PM		
			2015 w/o	2015 with	2025 with	2015 w/o	2015 with	2025 with
Pi'ilani Highway/ Ka'ono'ulu Street	Eastbound	LT	C	C	D	D	D	E
		RT	C	C	C	C	C	C
	Northbound	LT	C	C	C	C	C	D
Pi'ilani Highway/ Kūlanihāko'i Street*	Eastbound	LT	D	D	D	D	D	D
		TH	-			-		
		RT	C	D	D	C	D	D
	Westbound	LT-TH	-	D	E	-	D	E
		RT	-	D	D	-	D	D
	Northbound	LT	C	D	E	C	D	E
		TH	-	B	C	-	A	A
	Southbound	LT	-	D	E	-	D	E
		TH	-	B	C	-	B	A
Pi'ilani Highway/ East Waipu'ilani Road	Eastbound	RT	B	B	C	B	B	B
Pi'ilani Highway/ Pi'ikea Avenue	Eastbound	LT	D	D	E	D	D	E
		RT	D	D	D	D	D	D
	Northbound	LT	D	D	E	D	D	E
	Southbound	TH	C	C	C	C	C	C
Kūlanihāko'i Street/ South Kīhei Road	Westbound	LT	C	C	C	C	C	C
	Southbound	LT	B	B	B	A	B	B

*Traffic signal system installed in conjunction with the proposed high school

Projected traffic operations in Year 2025 with the Kīhei High School project are expected to deteriorate slightly from Year 2015 with project conditions primarily as a result of ambient growth in traffic along the surrounding roadways (*Table 4-8*). Along Pi'ilani Highway, the traffic movements at the intersection with Ka'ono'ulu Street are expected to operate at LOS "D" or better during the AM peak period and LOS "E" or better during the PM peak period, while traffic movements at the intersections with Kūlanihāko'i Street and Pi'ikei Avenue are expected to operate at LOS "E" or better during both peak periods. At the intersection of Pi'ilani highway with E. Waipu'ilani Road, the eastbound approach is expected to operate at LOS "C" and LOS "B" during the AM peak periods, respectively. Along South Kīhei Road, the critical movements at the intersection with Kūlanihāko'i Street are expected to operate at LOS "C" or better during both peak periods. *Figure 4-~~8~~10* (1) and *Figure 4-~~8~~10* (2) illustrate the projected traffic volumes with the Kīhei High School project and other development projects in the vicinity proposed for completion in the Year 2025.

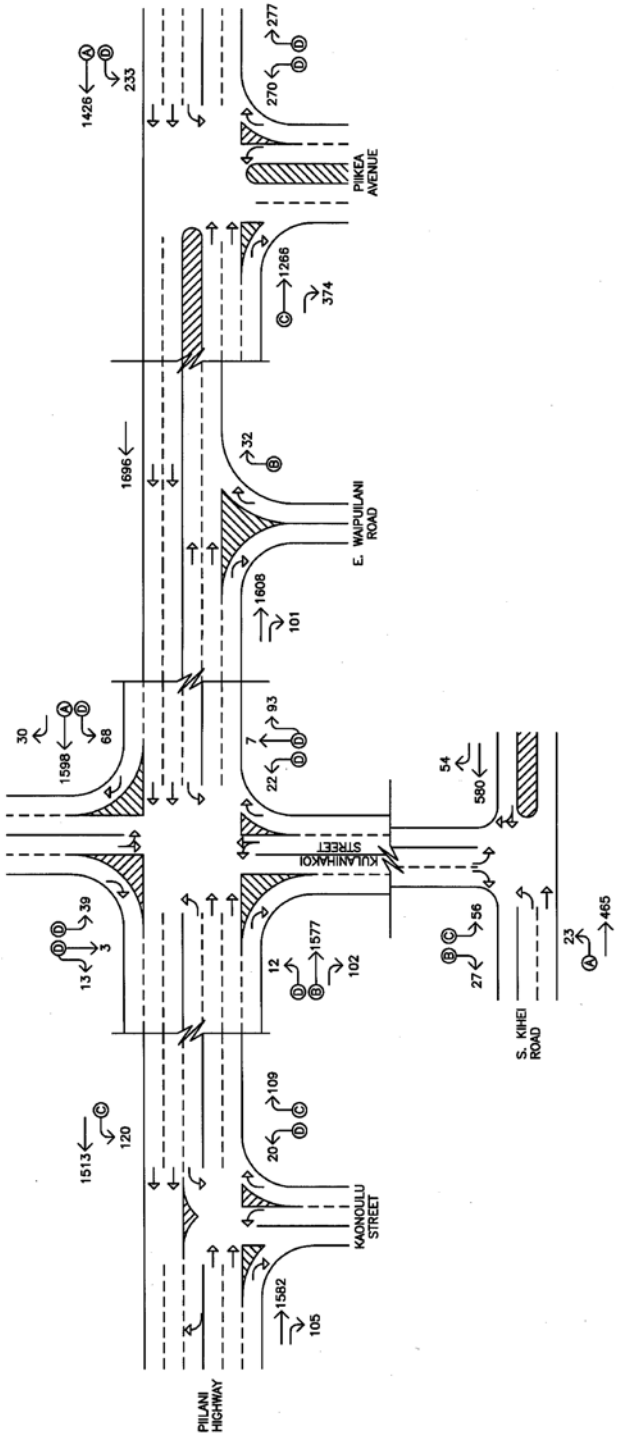


Figure 4-~~79~~ (1)
Year 2015 ~~AM~~ PM Peak Hour of Traffic With Project

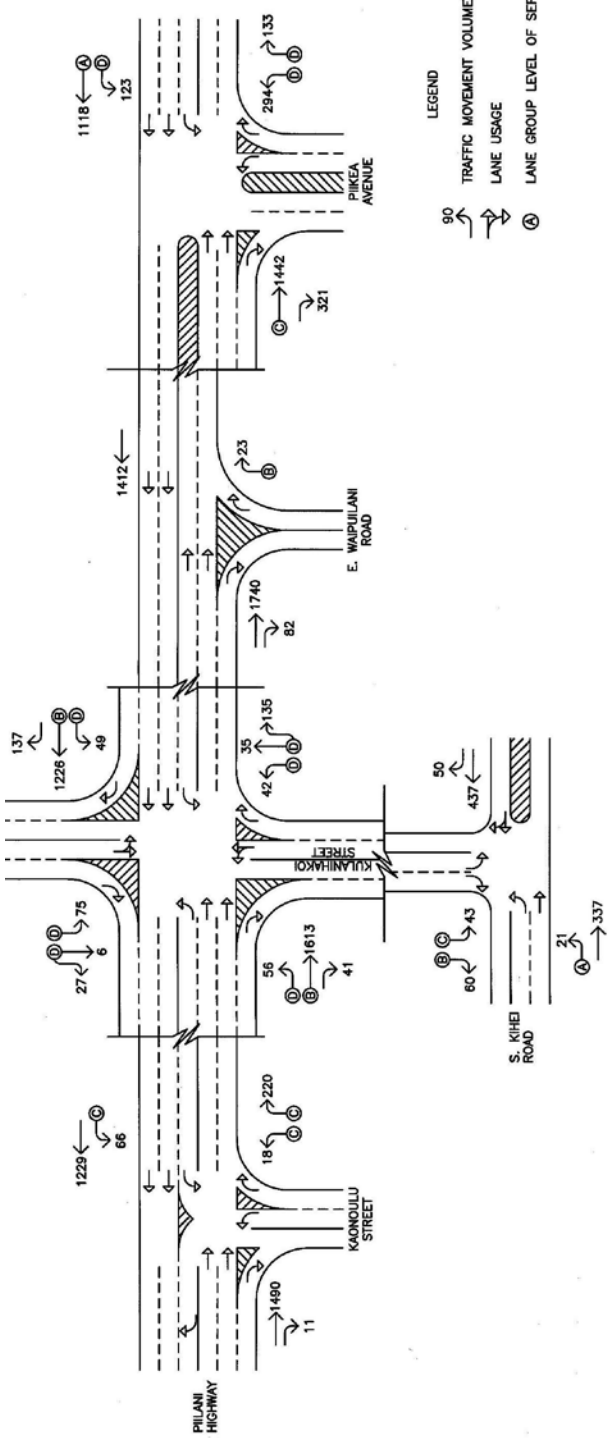


Figure 4-~~79~~ (2)
Year 2015 ~~PM~~ AM Peak Hour of Traffic With Project

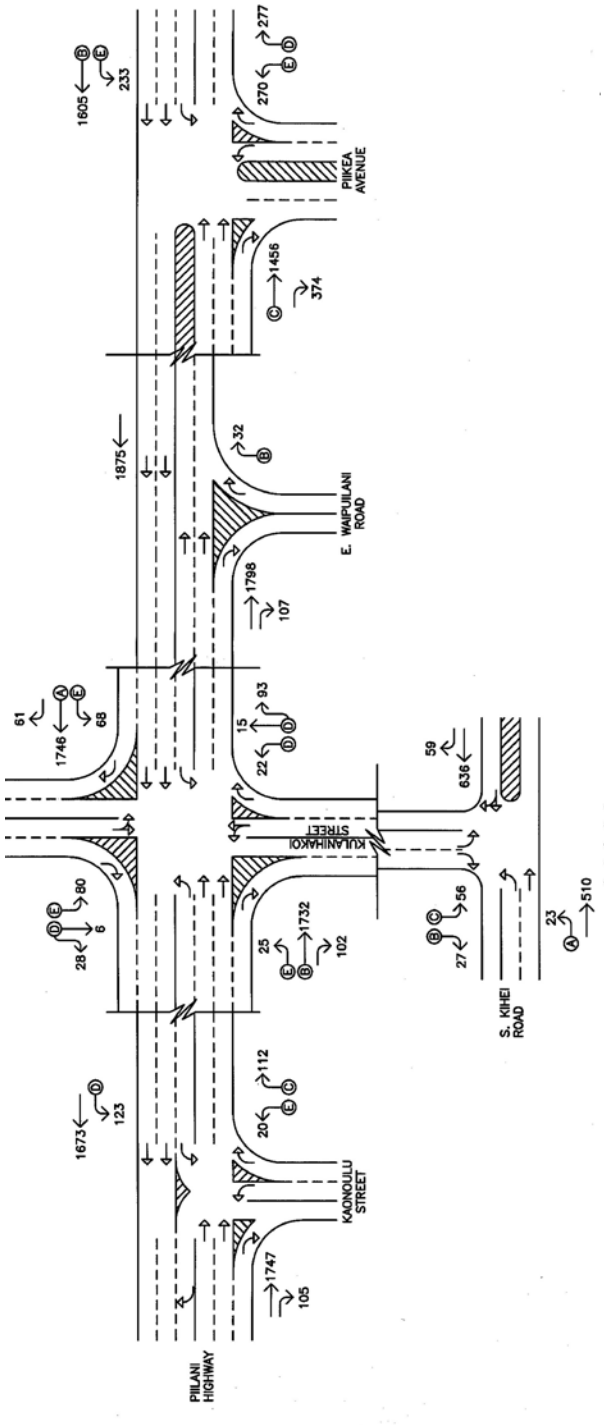


Figure 4-~~8~~10 (1)
Year 2025 PM Peak Hour of Traffic
With Project

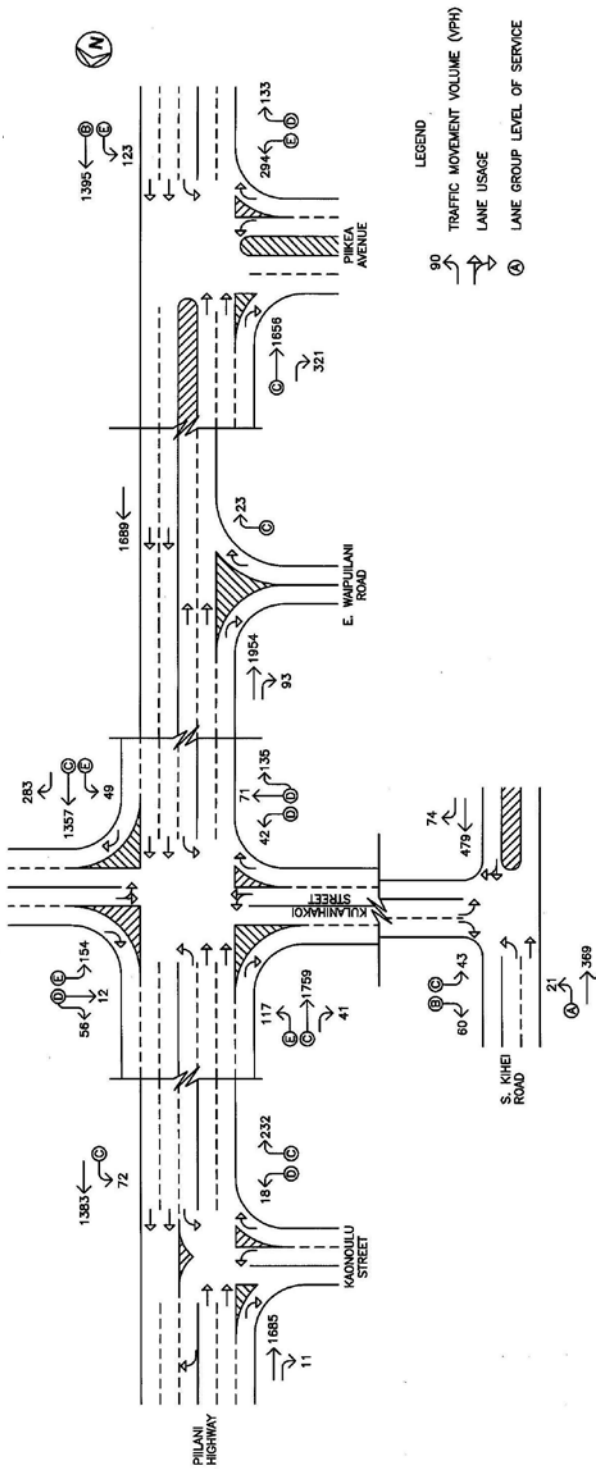


Figure 4-~~8~~10 (2)
Year 2025 AM Peak Hour of Traffic
With Project

Recommendations

The development of the Kīhei High School project is not expected to have a significant impact on traffic operations in the project vicinity. This is primarily due to the provision of turning lanes and a traffic signal system at the intersection of Piʻilani Highway with Kūlanihākoʻi Street and the access road for the high school. Mitigation measures considered for the project include:

- Maintain sufficient sight distances for motorists to safely enter and exit all project roadways.
- Provide adequate on-site loading and off-loading service areas and prohibit off-site loading operations.
- Provide adequate turn-around area for service, delivery, and refuse collection vehicles to maneuver on the project site and avoid vehicle-reversing maneuvers onto public roadways.
- Provide sufficient turning radii at all project roadways to avoid or minimize vehicle encroachments to oncoming traffic lanes.
- Provide an exclusive right-turn lane, shared left-turn lane and through lanes on the access road approach from the high school at the intersection with Piʻilani Highway. The layout and dimension of these lanes should be determined during the design phase of the project.
- Provide a channelized northbound deceleration lane and acceleration lane along Piʻilani Highway at the intersection with the access road for the high school. The layout and dimension of these lanes should be determined during the design phase of the project.
- Provide an exclusive southbound left-turn lane along Piʻilani Highway at the intersection with the access road for the high school. The layout and dimension of these lanes should be determined during the design phase of the project.
- Provide two ~~(2)~~ eastbound departure lanes along the access road for the high school from the intersection with Piʻilani Highway. The layout and dimension of these lanes should be determined during the design phase of the project.
- Modify the eastbound approach of Kūlanihākoʻi Street at the intersection with Piʻilani Highway and the access road for the high school to provide an exclusive right-turn lane and a shared left- turn and through lane. The layout and dimension of these lanes should be determined during the design phase of the project.
- Install a traffic signal system at the intersection of Piʻilani Highway and Kūlanihākoʻi Street, and the access road for the high school. The layout and dimension of these lanes should be determined during the design phase of the project.
- Prepare a Traffic Management Plan for the high school to minimize the impact of school related vehicles on the surrounding roadways. This plan should address daily school and special event traffic.
- Consider preparing Traffic Assessment Reports periodically once the high school is opened to verify projected traffic conditions in the vicinity and assess the effectiveness of traffic management strategies implemented by the proposed high school.

Plans to mitigate the construction period traffic impacts include scheduling off-peak movement of equipment and materials to minimize the disruption to traffic flow and inconvenience to the motoring public, bicyclists and pedestrians. Dust and noise pollution will be contained through job-site construction management practices and adherence to State and County laws which pertain to construction dust management and noise control. A Construction Traffic Management Plan will be prepared to minimize conflicts with traffic along roadways during construction.

With the implementation of the above mitigation measures, traffic impacts are not expected to be significant.

~~***Pedestrian Safety***~~

~~The location of the high school is within walking distance to existing and future residential areas, thereby encouraging students to walk and bike to and from school. Safe walking and bicycling opportunities will be integrated into the overall project design. The installation of a traffic signal system at the intersection of Piʻilani Highway and Kūlanihākoʻi Street, and the access road for the high school, will provide for safe crossing and pedestrian travel to and from the campus.~~

4.2.5.2 Pedestrian and Bicycle Facilities

Concern has been expressed for the safety of students traveling to the proposed high school via bicycle or as pedestrians on local roadways. Stantec prepared a pedestrian and bicycle analysis for the project site *(Appendix N)*. The following information summarizes their findings.

The study addresses existing roadways in Kīhei, regional bicycle and pedestrian planning, predicted traffic volumes, planned future development, and current practices in bicycle and pedestrian facilities. Based on their research, the following major observations, recommendations and conclusions were made. Recommendations in this study seek to maximize connectivity and access to the site and to ensure provision of appropriate safety measures for bicycles and pedestrians.

Existing Conditions

The study evaluated existing circulation in the vicinity including Kūlanihākoʻi Street, Piʻilani Highway, the Kīhei Greenway, Liloa Drive and South Kīhei Road.

Kūlanihākoʻi Street is a residential collector street that runs in an east-west direction and meets Piʻilani Highway at a T intersection across from the Kīhei High School project site. Kūlanihākoʻi Street is anticipated to be a common travel route to the new high school. Currently, there are nearly continuous sidewalks on Kūlanihākoʻi Street from Piʻilani Highway to Kīhei Road. There is an approximately 50-foot gap in the sidewalk on the south curb east of Hakoi Hema Place. There are no bicycle facilities on Kūlanihākoʻi Street makai of Malulani Street to Kīhei Road.

Piʻilani Highway is a four-lane limited access State highway that runs north-south adjacent to and makai of the project site. There are eight-foot wide shoulders along Piʻilani Highway that were designated as bicycle lanes, however, they are not readily utilized by bicyclists due to the high speeds of vehicular travel on Piʻilani Highway. Piʻilani Highway does not provide sidewalks or pedestrian facilities.

The Kīhei Greenway is a partially constructed bike path that is located between approximately 600 to 1,000 feet west of Piʻilani Highway in the project vicinity. The State's Bike Plan Hawaiʻi indicates that the Kīhei Greenway is a linear park, running through the middle of Kīhei, with 12-foot wide asphalt paved paths. The Greenway was recently constructed from Waipuʻilani Road south to Lipoa Street, however, the north and south extensions of the path remain unfinished. Liloa Drive is a three-lane roadway that runs adjacent to and east of the new Greenway.

South Kīhei Road is a two-lane arterial regional thoroughfare located along the Kīhei coastline. It serves as the community's "Main Street" and provides access to shopping centers and beaches. There are significant gaps in the sidewalk network on South Kīhei Road, and it is not a desirable pedestrian environment. Bicycle lanes are provided on approximately 90% of the length of South Kīhei Road. Despite some gaps in the bicycle lane, the South Kīhei Road bicycle facilities are used frequently and appear to be meeting community needs.

Several plans govern the planning of bicycle and pedestrian facilities in the State of Hawaii and on Maui. The State of Hawaiʻi completed its Bike Plan Hawaii in 2003 as a tool to integrate bicycle facilities into the State's transportation network. The County of Maui Long Range Planning Division has published a Regional Transportation Map which includes existing and proposed bike paths. The South Maui Region Parks & Open Space Master Plan, prepared in 2006 by Chris Hart and Partners, provides a vision for open space corridors and an integrated system of bicycle and pedestrian paths. In this plan, the North Kīhei map shows Kaʻonoʻulu Gulch and Waipuʻilani Gulch as secondary off-road connections in the vicinity of the project site. Piʻilani Highway and the North South Collector Road are shown as Primary Open Space Corridors for bicycle and pedestrian users.

Major Observations

Stantec documented the following major observations concerning existing infrastructure, bicycle facilities and pedestrian safety.

Increased Automobile Traffic on Kūlanihākoʻi Street

Kūlanihākoʻi Street may experience increased traffic demands with the school project due to school related traffic and due to the proposed traffic signal at Piʻilani Highway. Because the intersection is not currently signalized, it is lightly used to turn left onto Piʻilani Highway today. In comparison, intersections with signalized accesses experience higher flows.

Increased Pedestrian and Bicycle Traffic on Kūlanihākoʻi Street

Kūlanihākoʻi Street will also experience significant demand for school related pedestrians and bicyclists. It would be desirable to provide improvements that facilitate school usage, while discouraging undesirable traffic increases. Bicycle lanes already exist for the block nearest Piʻilani Highway. They could be provided for the rest of the segment, but this would require loss of parking. Alternatively, the roadway would be appropriate for designation as a bicycle route featuring bike route signs, Share the Road or Bikes Allowed Full Use of Lane (BAFUL) signs, and sharrow markings. However, these measures will not be optimal for managing potential increases in automobile traffic. A bicycle boulevard treatment may be appropriate. Low cost bicycle boulevards can be provided through placement of traffic control devices such as speed humps that now exist on Waipuʻilani and other roadways in the community.

The sidewalk gap along Kūlanihākoʻi Street near the site of the Kīhei Greenway will be an obstruction to pedestrian traffic walking from the school to the greenway and should be corrected.

Kīhei Greenway

Extension of the Kīhei Greenway bikeway from Kūlanihākoʻi Street south to the existing bikeway at Waipuʻilani Road would be a very attractive improvement for the school and the larger Kīhei community. It bypasses the bike lane gaps on Kīhei Road and provides a direct route to the shopping area at Piʻikea Avenue, likely to become a popular destination for students after school. While a treatment comparable to the newly opened bikeway would be desirable, this would be a costly project. A more spartan improvement consisting of a paved bike trail from Kūlanihākoʻi Street to Waipuʻilani Road, including a low flow dip crossing of the watercourse could be constructed for about $200-300,000. If provided, this facility would likely serve 70-80% of bicycle traffic for the high school. If funds become available in the future, additional improvements such as landscaping, an all-weather bridge, and security features could be added.

Extension of the bike trail to the north from Kūlanihākoʻi Street is a desirable improvement for bicycling in the community in general, the potential student population to the north is not as large, and the Kīhei Road bike lanes serve most of this area effectively.

Kīhei Road

As a community-wide matter, it would be desirable to address the segments of missing bicycle lanes on Kīhei Road from Kūlanihākoʻi Street to Waipuʻilani Road; however this is not feasible based upon existing width, travel lanes, and the need to maintain a two way left turn lane to serve major driveways and intersections. In the short term, it would be appropriate for posting of bike route signs, sharrow markings, and special signage.

Traffic Signal at Kūlanihākoʻi Street and Piʻilani Highway

The traffic signal and required additional improvements for Kūlanihākoʻi Street and Piʻilani Highway associated with development of the high school should be carefully designed to maximize safety and bicycle friendliness. The proposed Kūlanihākoʻi Street approach roadway should provide a left turn lane, a through lane, and a right turn lane at the highway. Crosswalks should be provided across both the north and south legs of Piʻilani Highway. Also, since turning vehicles will conflict with through pedestrians and bicyclists along Kūlanihākoʻi Street, the traffic signal should be designed to serve left turn vehicles and through vehicles/pedestrians/bicyclists separately. This could be accomplished through various measures; however, it is recommended that a separate left turn phasing be provided for Kūlanihākoʻi Street, so that left turns do not turn through pedestrian or vehicle streams. Provision of left turn phasing for Kūlanihākoʻi Street also provides a slight safety benefit, since the left turns would normally be served right after the high speed through phases of Piʻilani Highway. This reduces the potential of a high speed vehicle running the fresh red and colliding with pedestrian or bicyclist. While this potential is considered remote, the precaution is justified on the basis of a heavily used high school crossing.

Pedestrian Crossing

Concerns have been heard that traffic signals may not provide the highest level of safety for pedestrians desiring to cross Piʻilani Highway to access the school site. Calls for grade separation via tunnels or overpasses have been suggested. Professional experience with grade separations

does not suggest that they are superior treatments to traffic signals. Pedestrians will avoid bridges due to the effort to climb three flights of stairs to an elevation high enough to bridge across the highway and to return to street grade on the other side. Also such a bridge needs to be handicap accessible, requiring very long ramps to serve wheelchair users. Use of such a facility is virtually always disappointing. Tunnels have less construction issues, but they can result in security issues related to darkness and require maintenance to prevent accumulation of broken glass and litter. They are often closed due to security and maintenance issues following construction. A more appropriate grade separation treatment may be the development of a greenbelt bikeway and recreational trail that would follow the watercourse that passes under Piʻilani Highway south of the intersection. This would be a facility appropriate for consideration in evaluating plans for a bikeway network west of Piʻilani Highway for the entire community, and is a community-wide planning issue.

Also, although there can be no guarantee that a pedestrian involved collision would never occur, the provision of a traffic signal is considered an adequate counter-measure. It is not appropriate to call for provision of traffic signals to address pedestrian issues at some locations while dismissing them at other locations. There are numerous locations in Hawaiʻi where similar conditions have been addressed as proposed.

Right Turn Lane on Piʻilani Highway

The right turn lane treatments common along Piʻilani Highway should also be evaluated carefully. It would be preferable for the right turns to be served by the traffic signal, with right turn lanes that are provided separately and to the right of the suggested through bicycle lanes. Figure 4.1 in *Appendix N* shows the suggested channelization. This treatment is also suggested for the existing leg of Kūlanihākoʻi Street which will require change when the signal is constructed.

Bicycle Lanes on Kīhei High School Driveway (Mauka of Piʻilani Highway)

The planned Kīhei High School driveway should also be designed carefully with the expectation that it could be used by many bicyclists. The bicycle lanes should be at least six feet wide from curb to stripe, wider than most lanes found in Kīhei today. The downhill lane will experience significant speeds by bicyclists. The uphill lane will experience more swerving as cyclists pedal up the hill. The additional width will be an amenity. Also the seam between the gutter and the pavement should be carefully treated to minimize the potential for pinching the bicycle wheels. Some communities have used asphalt paving over concrete to the curb face to maximize the effective width for bicycling, since most bicyclists do not like to ride on the narrow gutter. Other communities are exploring the use of colored pavement or a rolled curb at the boundary between the bikeway and the vehicle lane.

The driveway bicycle lanes should also be extended further mauka when the roadway is extended. They will become important for bicycle access to new developments whenever they occur. Also the community's bikeway master plan should be modified to show the proposed improvements for Kūlanihākoʻi Street and the driveway associated with the school.

Bicycle Parking on Campus

The most important on-campus infrastructure to support bicycling is bicycle parking. It should be located in a convenient area closer to school buildings than student parking. It is important for students who drive to see that students who don't drive are receiving the small favor of convenient parking. Bike racks should be provided in a semi fenced area (a bike corral) so that access is controlled and locks can provide basic security. It should be noted that about 16 bicycles can park in the space occupied by one vehicle parking stall. Placement of a closed circuit TV security camera aimed at the bike corral will deter thefts, a common problem with bicycle parking.

Bicycle racks that provide optimum features should also be considered. The designer should consult with a bicycle planning expert for proper ideas, which can be found in an excellent publication, *Bicycle Parking,* published by the Association of Pedestrian and Bicycle Professionals.

Bike Plan Hawai'i

It would be appropriate to initiate a community process to modify the State's Bike Plan Hawai'i to reflect planned developments inland from Pi'ilani Highway. This should include consideration of the establishment of greenbelts providing recreational trails suitable for walking and bicycling. One of the potential corridors is along the watercourse south of the school site. It is suggested that the school be planned to provide a corridor for a potential connection to a greenbelt along this watercourse. The process to update the bikeway plan generally needs to be a community-wide effort.

Potential Impacts and Mitigation Measures

The proposed Kīhei High School will place new demands on roadways in the vicinity of the school for pedestrians and bicycling. This increased demand, coupled with deficiencies in existing pedestrian and bicycle infrastructure, could result in potential safety impacts to pedestrians and bicyclists.

The bicycle lanes along Pi'ilani Highway are not expected to serve much school traffic, but Kūlanihāko'i Street will become a very desirable route for pedestrians and bicycles. At minimum, bike route improvements, including sharrows and signs should be considered for Kūlanihāko'i Street, from Mahealani Street to South Kīhei Road. (There are already bicycle lanes from Pi'ilani Highway to Mahealani Street). Further improvements for traffic calming for a bicycle boulevard may also be appropriate.

A sidewalk gap on Kūlanihāko'i Street near Pi'ilani Highway should be addressed. While it is used negligibly at this time, this segment will experience significant walking activity upon opening of the High School.

Improvement of the primitive trail from Kūlanihāko'i Street south to Waipu'ilani to link up with the new bike trail will be desirable. This route, if improved, would likely be used by up to 80% of school bicycle traffic. It would also bypass a significant gap in the Kīhei Road bike lanes south of Kūlanihāko'i Street. If possible, it would be desirable to provide this improvement on a schedule that is compatible with school development. It will also greatly reinforce the community's commitment to bicycling and investment in the newly completed Kīhei Greenway trail.

The school, the campus access roadway, and the intersection with Piʻilani Highway should be planned and constructed with the expectation that bicycle traffic is expected and desirable facilities should be provided for bicyclists and pedestrians. These include signal phasing, crosswalks, and channelization improvements, as specified in *Appendix N*.

The Pedestrian and Bicycle Analysis recommends the following infrastructure improvements for the High School to mitigate potential impacts for pedestrians and bicyclists:

- Design features for the proposed intersection and traffic signal at Kūlanihākoʻi Street and Piʻilani Highway to provide optimum service and the highest level of protection for bicycles and pedestrians
- High quality and direct access from the school to the pedestrians and bikeway networks
- Bicycle friendly improvements on the school campus

Recommended community-wide improvements that would provide community connectivity and continuity of pedestrian/bicycle infrastructure include:

- Bicycle lane or bicycle boulevard improvements for Kūlanihākoʻi Street from Piʻilani Highway to Kīhei Road
- Construction of sidewalk on Kūlanihākoʻi in the short gap east of the proposed Kīhei Greenway
- Completion of the Kīhei Greenway from Kūlanihākoʻi Street south to connect with the existing trail
- Completion of the Kīhei Greenway from Kūlanihākoʻi Street north to connect with the northern portions of the community
- Provision of bicycle lanes continuously along Kīhei Road throughout the community
- Preparation of a plan for pedestrian enhancements to encourage walking throughout Kīhei
- Modification of bikeway plans to suggest facilities appropriate for planned communities east of Piʻilani Highway.
- Provision of sidewalks continuously along Kīhei Road throughout the community.

The locations of recommended off-site improvements discussed in this section are shown in *Figure 4-11*. The DOE and Design-Build entity will discuss recommended improvements with appropriate County and State agencies.

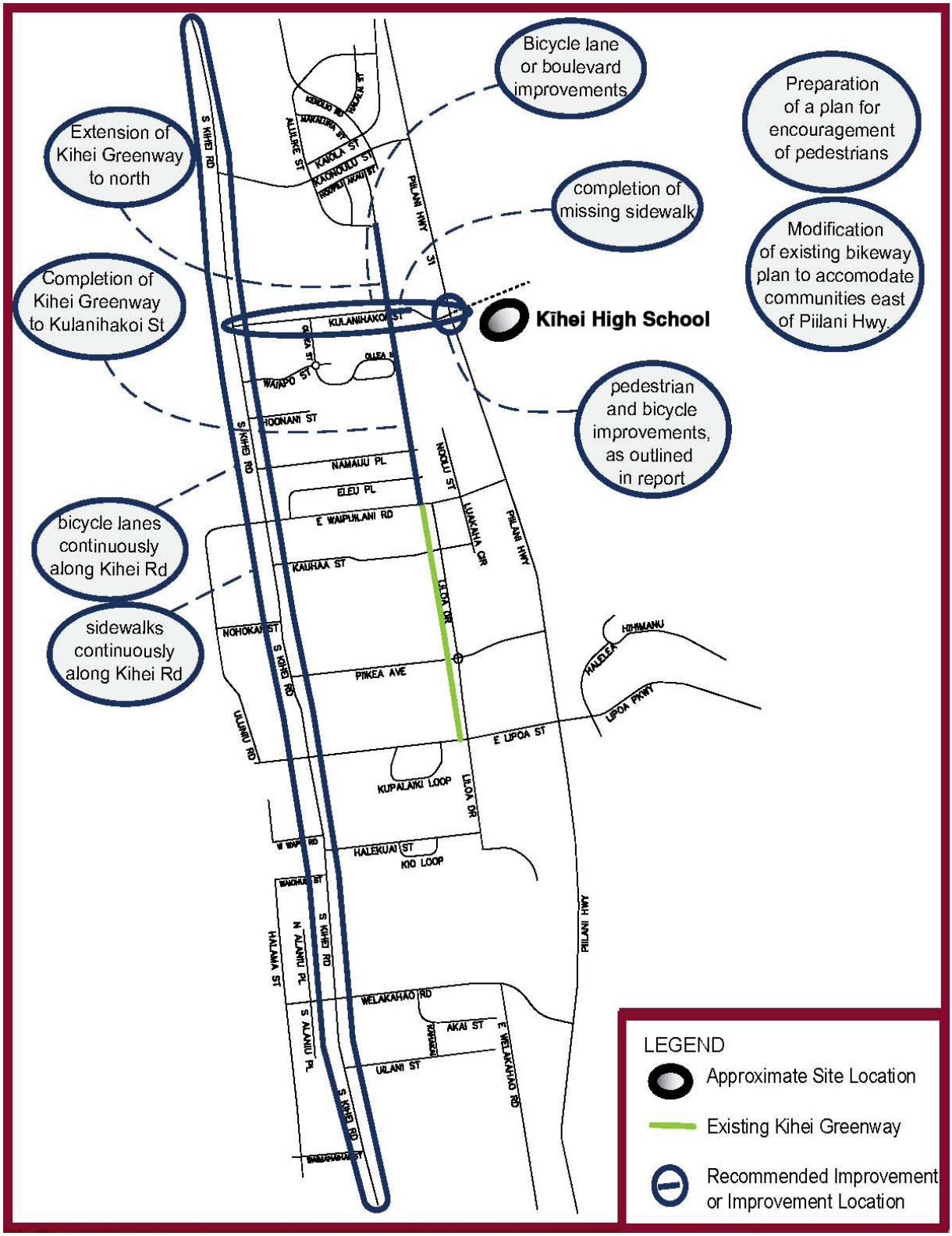


Figure 4-11
Recommended Off-Site Pedestrian and Bicycle Improvements

4.2.5.3 Parking and Loading

Parking for students, staff and visitors will be provided in parking lots adjacent to the campus. A school bus loading/parking area will be provided to allow loading and parking for up to 15 buses. During normal school days, buses will unload and pick up students here. Buses can unload and park here during events such as football games. Overflow parking for events will potentially be accommodated on a seven-acre portion of the campus located across the Kūlanihākoʻi Street extension. A Conceptual Parking Plan is provided below (*Figure 4-~~9~~12*).

Parking requirements for the proposed high school are determined from several different regulations. DOE standards for faculty and visitors are part of the FADS system. DOE has determined 226 stalls are required to support faculty and visitors to the campus.

The County of Maui Zoning Code has age-based requirements for student parking based on total number of classrooms. According to the Zoning Code, approximately 560 stalls will be required for student parking. The Zoning Code also requires parking spaces to accommodate component facilities such as the future auditorium, football / soccer stadium, library, the future swimming pool, gymnasium and cafeteria. The 5,000-seat football/soccer stadium will be the largest single component use, requiring 833 parking spaces per code. Under the Zoning Code, the total number of parking spaces required for the campus is approximately 1,941.

Loading spaces will be provided as necessary throughout the campus per the requirements of the Maui County Code.

The DOE will continue discussion of parking and loading requirements with the County of Maui, and, if needed, will request a Variance for the project.

Potential Impacts and Mitigation Measures

Campus parking requirements per the Maui County Zoning Code are very high due to student and staff parking requirements in addition to parking requirements for the 5,000-seat stadium. Because sporting events at the stadium are not anticipated during school hours, it is possible that some of the student and staff parking can serve as stadium parking during sporting events. The conceptual site plan currently shows 948 total parking spaces, which does not meet the 1,941 spaces required by the County Zoning Code, but would serve to meet the school's parking needs during normal school hours or during sporting events at the stadium. This issue remains unresolved and will need to be determined between DOE and the County.

Figure 4-~~9~~12
Conceptual Parking Plan

4.2.6 Air Quality

An Air Quality Study was conducted for the proposed Kīhei High School project by B.D. Neal and Associates in September 2011 (*Appendix H*). The study examines the potential short- and long-term air quality impacts that could occur as a result of construction and use of the proposed facilities and suggests mitigative measures to reduce potential air quality impacts.

Both federal and State standards have been established to maintain ambient air quality. At the present time, seven parameters are regulated including: particulate matter, sulfur dioxide, hydrogen sulfide, nitrogen dioxide, carbon monoxide, ozone and lead. Hawai'i air quality standards are generally comparable to the national standards although the state standards for carbon monoxide are more stringent than the national standards.

Regional and local climate together with the amount and type of human activity generally dictate the air quality of a given location. The climate of the project area is very much affected by its elevation near sea level and by nearby mountains. Haleakala shelters the area from the northeast trade winds, and local winds (such as land/sea breezes and upslope/downslope winds) affect the wind flow in the area much of the time. Temperatures in the project area are generally very consistent and warm with average daily temperatures ranging from about 63°F to 86°F. Rain-fall in the project area is minimal with an average of only about 12 inches per year.

The largest sources of air pollution in the immediate project area are likely agricultural operations and automobile traffic using local roadways. Emissions from these sources consist primarily of particulate, carbon monoxide and nitrogen oxides. Power plants burning diesel fuel are located several miles away. These sources mostly emit sulfur dioxide, nitrogen oxides and particulate. Volcanic emissions from distant natural sources on the Big Island also affect the air quality at times during kona wind conditions. By the time the volcanic emissions reach the project area, they consist mostly of fine particulate sulfate.

Potential Impacts and Mitigation Measures

Except for periodic impacts from volcanic emissions (vog) and possibly occasional localized impacts from traffic congestion and local agricultural sources, the present air quality of the project area is believed to be relatively good. There is very little air quality monitoring data from the State DOH for the project area, but the limited data that are available suggest that concentrations are generally well within State and National air quality standards.

If the proposed project is given the necessary approvals to proceed, it may be inevitable that some short- and/or long-term impacts on air quality will occur either directly or indirectly as a consequence of project construction and use. Short-term impacts from fugitive dust will likely occur during the project construction phase. To a lesser extent, exhaust emissions from stationary and mobile construction equipment, from the disruption of traffic, and from workers' vehicles may also affect air quality during the period of construction. State air pollution control regulations require that there be no visible fugitive dust emissions at the property line. Hence, an effective dust control plan must be implemented to ensure compliance with state regulations. Fugitive dust emissions can be controlled to a large extent by watering of active work areas, using wind screens, keeping adjacent paved roads clean, and by covering of open-bodied trucks. Other dust control measures could include limiting the area that can be disturbed at any given time and/or

mulching or chemically stabilizing inactive areas that have been worked. Paving and landscaping of project areas early in the construction schedule will also reduce dust emissions. Monitoring dust at the project boundary during construction could be considered as a means to evaluate the effectiveness of the project dust control program. Exhaust emissions can be mitigated by moving construction equipment and workers to and from the project site during off-peak traffic hours.

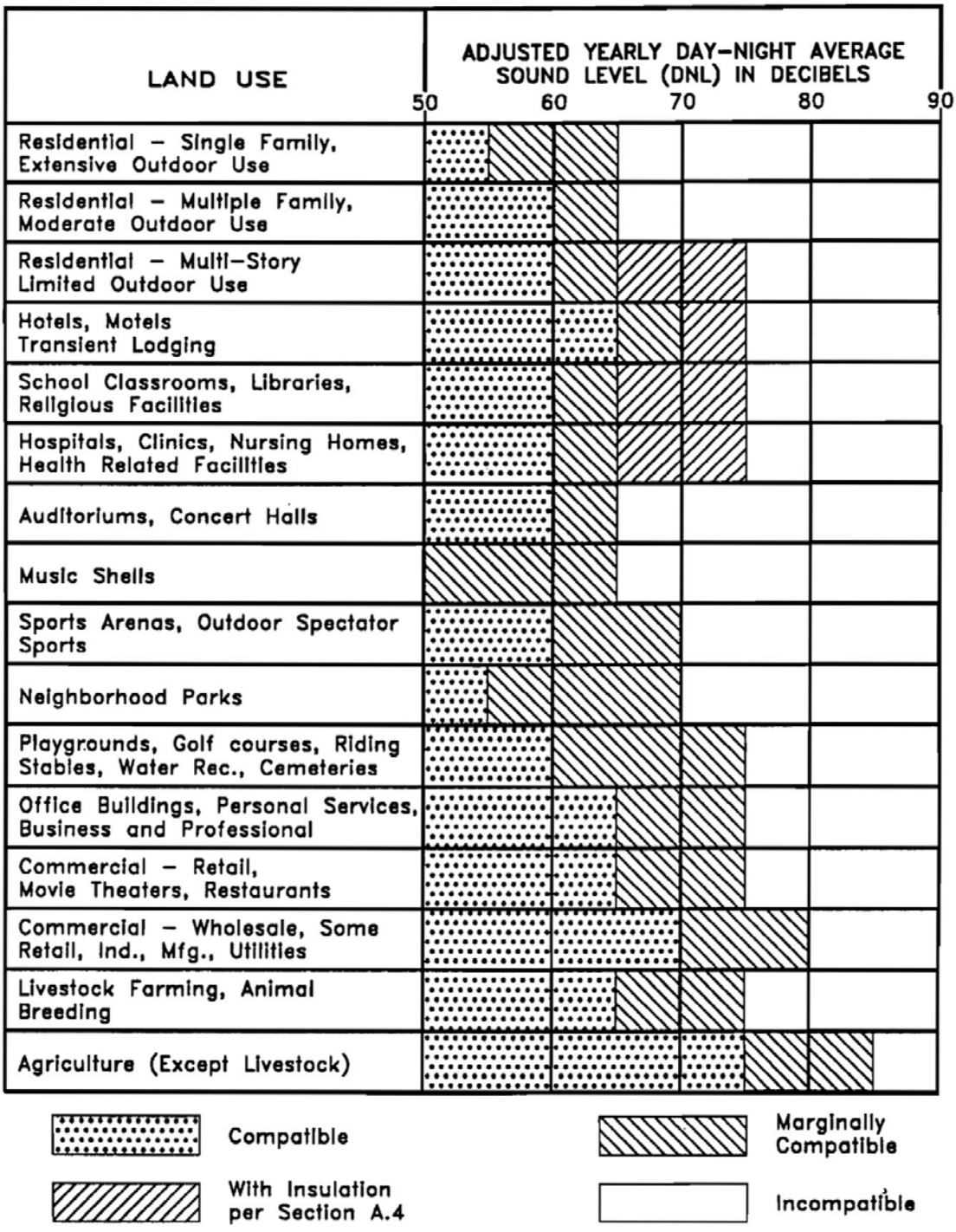
After construction, motor vehicles coming to and from the proposed development will result in a long-term increase in air pollution emissions in the project area. To assess the impact of emissions from these vehicles, a computer modeling study was undertaken to estimate current ambient concentrations of carbon monoxide at intersections in the project vicinity and to predict future levels both with and without the proposed project. During worst-case conditions, model results indicated that present 1-hour and 8-hour carbon monoxide concentrations are well within both the state and the national ambient air quality standards. In the year 2015 without the project, carbon monoxide concentrations were predicted to decrease (improve) somewhat in the project area, and worst-case concentrations should remain well within air quality standards. With the project in the year 2015, carbon monoxide concentrations compared to the without-project case were projected to remain nearly unchanged, and worst-case concentrations should remain well within air quality standards. This would continue to be so in the year 2025 when full enrollment is reached. With or without the project, carbon monoxide concentrations in the project area during the next 15 years will likely decrease (improve) somewhat compared to existing concentrations. Implementing mitigation measures for traffic-related air quality impacts is probably unnecessary and unwarranted.

4.2.7 Noise

Y. Ebisu and Associates conducted an Acoustic Study for the Kīhei High School project in September 2011 (*Appendix I*). The study describes the existing and future noise environments in the vicinity of the proposed Kīhei High School site and provides recommendations for mitigating noise impacts associated with the project.

Noise is defined as unwanted sound. Sound may be classified as noise when it damages hearing ability, causes other bodily effects detrimental to health and safety, disturbs sleep and rest, interferes with conversation or other forms of communication.

The Day-Night Average Sound Level (DNL) method, developed by the Environmental Protection Agency, is the most widely used to describe environmental noise. The measurement is weighted so that late night noises are penalized, on the assumption that these noises are more objectionable because they can disturb sleep. Current federal noise standards and acceptability criteria for residential land uses is presented in the following *Figure ~~4-10~~13*. An exterior noise level of 65 DNL or less is considered acceptable for residences. This standard is applied nationally, including Hawai‘i.



LAND USE COMPATIBILITY WITH YEARLY AVERAGE DAY - NIGHT AVERAGE SOUND LEVEL (DNL) AT A SITE FOR BUILDINGS AS COMMONLY CONSTRUCTED.
(Source: American National Standards Institute S12.9-1998/Part 5)

Figure 4-~~10~~13
Land Use Compatibility Day-Night Average Sound Level Guideline Chart

In Hawai'i, the State DOH regulates noise from fixed mechanical equipment and construction activities. State DOH noise regulations are expressed in maximum allowable noise limits rather than DNL. Although they are not directly comparable to noise criteria expressed in DNL, State DOH noise limits for single family residential lands equate to approximately 55 DNL. For multifamily residential, commercial, and resort lands, the State DOH noise limits equate to approximately 60 DNL. For light and heavy industrial lands, the State DOH noise limits equate to approximately 76 DNL. Construction activities, which are typically noisier than the State DOH noise limits, are regulated through the issuance of permits for allowing excessive construction noise during limited time periods.

Traffic and background ambient noise measurements were obtained in September 2011. Calculations of existing traffic noise levels during the AM and PM peak traffic hours and hourly equivalent sound level contribution from each roadway section in the project environs were provided for comparison with forecasted traffic noise levels in calendar year (CY) 2025 with and without the project.

The existing background ambient noise levels within the project site are relatively low at the mauka (east) end and relatively high on the makai (west) end of the site. Traffic along Pi'ilani Highway controls the background noise levels at the makai end of the project site, noise levels diminish to relatively low levels at the mauka end of the project site. On the makai side of Pi'ilani Highway, existing traffic noise levels also diminish with increasing distances from Pi'ilani Highway, and are controlled by the traffic on connector roads and South Kīhei Road in areas between Pi'ilani Highway and the shoreline.

The existing background noise levels at the school site were estimated to range from approximately 56 to 62 DNL near the proposed Practice Fields to approximately 45 DNL at the mauka end of the project site. These estimates were based on traffic noise model calculations of existing noise levels along Pi'ilani Highway. According to federal noise standards, the existing traffic noise levels in the project environs along Pi'ilani Highway are in the "Significant Exposure, Normally Unacceptable" category, and at or greater than 65 DNL at the first row of existing homes on the makai side of the highway. The existing traffic noise levels in the project environs along South Kīhei Road are in the "Significant Exposure, Normally Unacceptable" categories, and at or greater than 65 DNL within 50 feet of the roadway's centerline. Along the lower volume connector streets, existing traffic noise levels are in the "Moderate Exposure, Acceptable" category, and less than 65 DNL at 50 feet or greater distance from the roadways' centerlines.

Potential Impacts and Mitigation Measures

Predictions of future traffic noise levels were made using the traffic volume assignments of 2025 with the proposed project. The dominant traffic noise sources in the project environs will continue to be traffic along Pi'ilani Highway and South Kīhei Road, with the increases in future traffic noise levels being relatively small along these two roadways and primarily associated with non-project traffic.

Very small changes in traffic noise levels (0.0 to 0.1 DNL) are expected along Pi'ilani Highway in the project environs between CY 2010 and 2025 as a result of project traffic. The growth in non-project traffic by CY 2025 is predicted to result in traffic noise level increases of 0.5 to 0.6 DNL along Pi'ilani Highway.

Along Kūlanihāko'i Street, makai of Pi'ilani Highway, increases in future traffic noise levels of 0.7 DNL are predicted by CY 2025, primarily as a result of project traffic. Traffic noise level increases on the mauka side of the Pi'ilani Highway along the future entrance road to the project site are associated only with project traffic. Noise increases on the Kūlanihāko'i future entrance road mauka of Pi'ilani Highway are anticipated to increase to 62 DNL in CY 2025 due to project traffic, a level considered Acceptable per Federal noise guidelines.

Future traffic noise levels on the proposed school site from forecasted traffic along Pi'ilani are anticipated to range from 45 DNL near the mauka property line to 63 DNL near the makai edge of the Practice Baseball Field. The future campus of Kīhei High School is planned so that the noise sensitive buildings and classrooms are set back at least 650 feet from Pi'ilani Highway, where future traffic noise levels are predicted to be "Acceptable" at less than 55 DNL. The terracing of the school grounds plus the noise shielding effects from buildings which are closest to the highway should further reduce traffic noise levels from Pi'ilani Highway.

Potential short-term and long-term noise impacts are discussed below.

Short-term Impacts

General Construction Noise: Temporary, unavoidable noise impacts may occur during construction activities within the project area, particularly during the excavation and earth moving activities on the project site. Construction activities are predicted to be audible within the project site and at nearby properties, therefore, the quality of the acoustic environment may be degraded to unacceptable levels during periods of construction. Mitigation measures to reduce construction noise to inaudible levels will not be practical in all cases, but the use of quiet equipment and compliance with State DOH construction noise regulations are recommended as standard mitigation measures.

Long-Term impacts

Traffic Noise: Along Pi'ilani Highway fronting the school site, traffic noise levels are expected to increase from approximately 70 to 71 DNL at 100 foot distance from the centerline by CY 2025 as a result of project and non-project traffic. The 0.7 DNL increase is relatively small due to the relatively high existing traffic volumes on the highway when compared to the projected increases in future traffic volumes along the highway by CY 2025. Project traffic will account for approximately 0.1 of the 0.7 DNL units of noise increase along Pi'ilani Highway in the immediate vicinity of the project. Along Kūlanihāko'i Street, west of Pi'ilani Highway, traffic noise levels are expected to increase by 0.7 DNL by CY 2025 as a result of project traffic. Along South Kīhei Road north and south of Kūlanihāko'i Street, traffic noise levels are expected to increase by 0.5 to 0.6 DNL by CY 2025 as a result of non-project traffic. These levels of traffic noise increases resulting from non-project and project generated traffic are not considered to be significant. The predicted increases in project generated traffic noise levels are not expected to generate adverse noise impacts by CY 2025.

The conceptual campus site plan is designed such that noise sensitive buildings of the school are situated at very large setback distances from Pi'ilani Highway, where existing and future traffic noise levels are predicted to be less than 55 DNL. The large buffer distances to the highway will allow for the use of naturally ventilated buildings on the school campus.

On-Site Noise Sources: The potential noise from playground, practice field, pool, and athletic stadium activities could disturb neighboring residences. Noise levels associated with these outdoor facilities tend to be high due to the shouting and screaming which occur during these outdoor activities and play periods. The neighboring properties to the south and across Piʻilani Highway to the west are the most likely areas to experience the highest noise levels (53 to 65 decibels A-weighted) from these outdoor activities. In addition, potential noise levels from the school's central plant equipment may also cause adverse noise impacts if the noise levels are not controlled.

Noise mitigation measures which limit the noise from fixed mechanical equipment to those allowed by the State Department of Health (DOH) should be incorporated into the project. In addition, public address systems installed at the outdoor facilities should be designed to minimize sound spillover into adjacent properties.

4.2.8 Hazardous Materials

A Phase I Environmental Site Assessment (ESA) was prepared by Group 70 International, Inc., in August 2011 for the proposed Kīhei High School project site comprised of TMK (2) 2-2-002: 081 and TMK (2) 2-2-002: 083 (*Appendix J*). The Phase I ESA was conducted at the request of the DOE to meet requirements of the Innocent Landowner Defense identified in the requirements for All Appropriate Inquiry (AAI) under Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), for disclosure within an EIS being prepared in association to the proposed Kīhei High School project, to acquire the property, and to achieve a prerequisite for LEED for Schools Certification.

The purpose of the Phase I ESA is to identify any recognized environmental conditions (specifically, evidence as to the presence or likely presence of any hazardous substance or petroleum product under conditions that indicate an existing release, a past release or a material threat of a release into property structures or to ground, groundwater or surface water) on the subject parcels. The Phase I ESA complies with the American Standard for Testing and Materials (ASTM) Standard E 1527-05 Standard Practice for ESA: Phase I ESA Process; and includes a historical review, regulatory agency and document reviews, site reconnaissance, interviews and identification of environmental concerns.

The term hazardous materials or hazardous wastes means those substances defined by the Comprehensive Environmental Response, Compensation, and Liability Act, 42 U.S.C. Sections (§§) 9601 et seq., and Resource Conservation and Recovery Act (RCRA), 42 U.S.C. §§ 6901–6992. In general, these include substances that, because of their quantity, concentration, or physical, chemical, or toxic characteristics, may present an unreasonable risk to health, safety, and the environment when released.

Upon completion of the Phase I ESA of the subject property, no evidence of current or historical use or storage of hazardous and/or regulated materials or wastes was identified on the subject property or adjacent properties. At the time of the site investigation, site activities included vacant undeveloped pasture land. RCRA regulated hazardous waste was not observed to be generated, stored, accumulated, transported, or disposed on the project site.

Potential Impacts and Mitigation Measures

Based on the information gathered for the Phase I ESA, no adverse environmental impacts to the subject property resulted from past activities. As defined by ASTM, the assessment revealed no evidence of recognized environmental conditions in connection with the subject property.

Short-term construction-related impacts are not anticipated with the implementation of the proposed action. The new Kīhei High School will not require demolition or removal of existing facilities where hazardous materials such as asbestos typically occur. While the accidental release of hazardous materials into the environment associated with the use of construction equipment and vehicles may be possible, impacts are not anticipated. Preparation of a hazardous materials spill response plan prior to commencement of construction activities would greatly reduce the likelihood of significant impacts resulting from any spill.

Hazardous materials may be used on the project site in relationship to ongoing building maintenance operations, such as fluorescents, ballasts, latex paint, solvents, gas, oil, lubricants. These materials will be stored in appropriate designated areas on the property and disposed of in accordance with applicable regulatory controls.

Site-specific BMPs, including procedures for hazardous material storage, handling, and staging; spill prevention and response; waste disposal; and good housekeeping should be developed and implemented by the construction contractor. Spill control measures would entail minimization of hazardous materials on the project site and rapid spill response in the event of a release. Material management practices would also be used to reduce the risk of spills or other accidental release of materials and substances into the environment. No significant long-term impacts are anticipated to occur as a result of hazardous materials.

4.2.9 Scenic and Visual Resources

The Kīhei High School project site is located in the Kīhei-Mākena region on the south side of Maui. The site is characterized by open, undeveloped grazing land dotted with scrub brush and rock outcroppings. The site is located from approximately 20 to 100 feet AMSL elevation and slopes gently upward to the east toward the summit of Haleakalā. The West Maui Mountains are located to the northwest.

The Site Photo Key is provided in *Figure 4-~~11~~14* below, and Figures *4-~~11~~14 (1) through 4-~~11~~14 (7)* depict existing conditions on the project site.

According to the County of Maui 2030 General Plan and the Kīhei-Mākena Community Plan, the major visual assets in the region are the South Maui sandy beaches, coastal views, expansive open spaces on the leeward slopes of Haleakalā, views from Kīhei-Mākena to Upcountry and Central Maui, and significant views of agricultural land. The Kīhei-Mākena Community Plan also advocates for landscaped buffer areas adjacent to Piʻilani Highway to reduce noise, reduce visual impacts of development, and maintain a parkway character. The Kīhei High School project site is not located in a designated scenic corridor.

Due to the geographic separation caused by sloping terrain, the Kīhei High School campus site concept includes terracing at increasing elevations. Academic and administrative buildings are anticipated on the upper levels, and the sports stadium, supporting athletic facilities, outdoor play courts, and practice fields are anticipated on the lower levels. Campus structures will generally range from one ~~(1)~~ to two ~~(2)~~ stories, and the stadium bleachers and broadcast booth are anticipated to reach approximately 40 feet in height.

Potential Impacts and Mitigation Measures

Construction of the proposed high school would result in potential impacts to mauka views from Piʻilani Highway. Development of the project site will replace vegetated land with a high school campus, playing fields, landscaping, and related infrastructure such as internal roadways.

Kīhei High School will be visible from Piʻilani Highway and existing neighboring developments. The project design will maintain visual standards of the area by meeting County height and design requirements. To mitigate potential visual impacts, the campus will include open space and landscaped areas throughout the development. Landscaping and playing fields are planned fronting Piʻilani Highway to maintain a setback for reduction of visual and noise impacts and maintain a park-like open visual corridor. The project is not anticipated to significantly impact mauka views of Haleakala or coastal views. See *Figure 4-~~12~~15* for an illustrative view of the conceptual campus layout, and *Figure 4-16* for a conceptual viewshed study of potential changes to views of Haleakala from Piʻilani Highway. Final site design will be determined by the project developer and DOE.

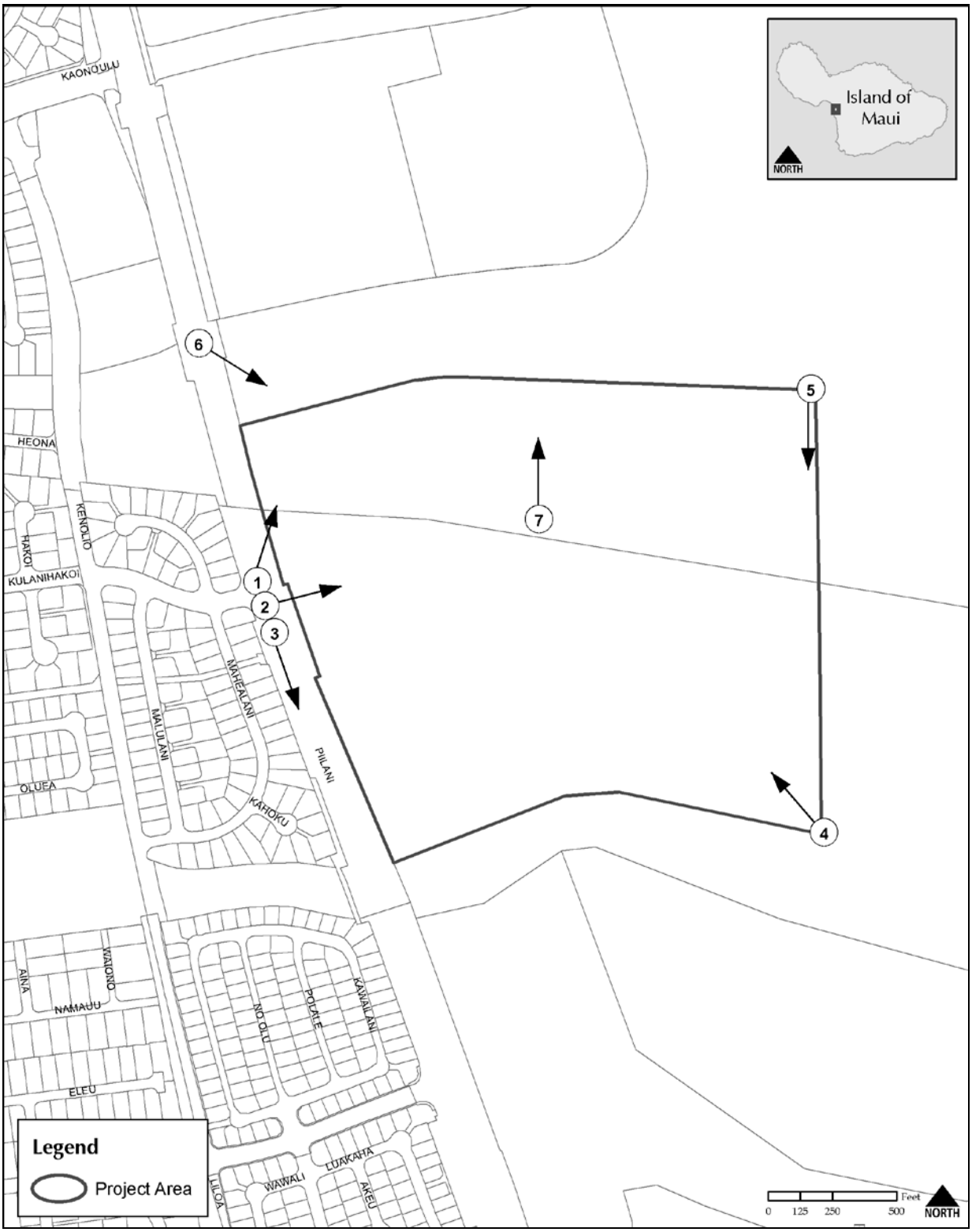


Figure 4-~~11~~14
Site Photo Key

Figure 4-~~11~~14 (1)
View From Piʻilani Highway at Kūlanihākoʻi Street, Looking North

Figure 4-~~11~~14 (2)
View From Piʻilani Highway, Looking East

Figure 4-~~11~~14 (3)
View From Piʻilani Highway, Looking South

Figure 4-~~11~~14 (4)
View from Southeast Corner of Site, Looking Northeast

Figure 4-~~11~~14 (5)
View from Northeast Corner, Looking South

Figure 4-~~11~~14 (6)
Looking Northwest from Piʻilani Highway at Southeast Corner of Site

Figure 4-~~11~~14 (7)
Northern Portion of Site Taken from Center of Property

Figure 4-~~12~~15
Conceptual Perspective Rendering

Figure 4-16
Conceptual Plan View Mauka from Kulanihākoʻi Street/Piʻilani Highway

4.2.10 Infrastructure

Gray, Hong, Nojima and Associates, Inc. conducted a Preliminary Civil Engineering Report for the Kīhei High School project in ~~October 2011~~ March 2012 (*Appendix K*). The study evaluates the existing and future infrastructure systems required to support the proposed project.

4.2.10.1 Water System

Water Resource Associates studied the existing hydrogeological conditions of the Kīhei area and concluded "…there are no potable water resources, either surface or groundwater, available within a two-mile radius of the project site that could be economically or feasibly developed for the proposed high school" (2011). Therefore, potable water is proposed to be provided by the DWS Central Maui Water System. According to available information, the Central Maui Water System does not extend to Piʻilani Highway or the Kīhei High School project site. The nearest water facility to the project site is the 8-inch water line at the intersection of Kūlanihākoʻi Street and Mahealani Street in the Piʻilani Village Subdivision. Further south on Kūlanihākoʻi Street at the intersection with Līloa Drive is a 36-inch concrete pipe transmission main and 18-inch ductile iron distribution main. The 18-inch distribution main is connected to both reservoirs in the area, but is primarily served by the Hale Kīhei Reservoir at elevation 220 feet AMSL. According to DWS staff the water pressure at fire hydrant 763 located on Mahealani Street near to the intersection of Kūlanihākoʻi Street in the Piʻilani Village subdivision is 82 pounds per square inch (PSI) at elevation 33 feet AMSL.

The DOE will eventually conduct a final subdivision to consolidate the properties acquired from Haleakala Ranch and Kaonoulu Ranch into the proposed Kīhei High School project site. In the past the water availability policy (a verification of long-term reliable water source for developments) per Title 14 of the Maui County Code would be a condition for subdivision approval. The recent passing of Ordinance 3818, effective April 5, 2011, amends the Maui County Code exempting public developments within the Central Maui Water System from the water availability policy.

Water Demand Estimate

Conceptual site plans for the proposed school were developed through a design charrette process with input from a variety of stakeholders. Based on the charrette discussions and the DOE's anticipated growth in enrollment for the proposed school, preliminary water demands have been projected as shown in *Table 4-9*. In recognition of Maui's water shortage, dual water systems are being planned for the proposed Kīhei High School. It is anticipated that potable water will be supplied by the County's Central Maui Water System and brackish water wells will be constructed at the school site to serve as the non-potable source of irrigation water.

Potable consumption rates used in the water demand projections were developed on the basis of incorporating low-flow and other water conservation fixtures throughout the various buildings. A sustainable design approach will take into account the water efficiency criteria in accordance with the LEED rating system. In working with the DOE, the project team estimated an average potable demand of 20 gallons per capita day (GPCD) for students and staff. A corresponding 10 GPCD average demand for visitors was used. At full build-out, the average daily potable demand is projected at 37,450 GPD. In addition, due to the hot arid climate of Kīhei, the non-potable irrigation demand, estimated to be at 185,000 GPD, is significantly higher than typical high school campuses. The total projected potable and non-potable demand is 224,450 GPD at full build out.

Table 4-9 PROJECTED WATER DEMAND								
Year	No. of Students and Staff	GPCD	No. of Visitors	GPCD	Potable (GPD)			Non-Potable (GPD)
					Average Day	Max Day	Peak Hour	
2015	240	20	10	10	4,900	7,350	14,700	185,000
2016	440	20	20	10	9,000	13,500	27,000	185,000
2017	700	20	30	10	14,300	21,450	42,900	185,000
2018	920	20	40	10	18,800	28,200	56,400	185,000
2025	1,830	20	85	10	37,450	56,175	112,350	185,000

Proposed Infrastructure

There are no on-site public or private water systems serving the property. The domestic water and fire supply would be supplied through the Central Maui Water System by connecting to the existing 18-inch water main on Līloa Drive and upgrading the existing 8-inch water main in the Piʻilani Village Subdivision. A booster system will be required to meet required fire flow pressure. Irrigation water will be supplied via on-site brackish wells. The domestic, fire, and irrigation lines will consist of separate looped distribution systems following the main roadways and sidewalks throughout the campus.

Potable Supply

The proposed on- and off-site domestic water facilities must comply with DWS Water System Standards and are proposed to be supplied through the Central Maui Water System. Preliminary indications by the DWS are that the proposed Kīhei High School Campus would be served off an existing 18-inch ductile iron water main on Līloa Drive makai of the Piʻilani Village subdivision. Although there is an existing 8-inch main in Kūlanihākoʻi Street connected to the 18-inch main, DWS will require that the DOE install a larger diameter water main in Kūlanihākoʻi Street to service the proposed school. In addition, because Kūlanihākoʻi Street is narrow and shares the right-of-way with other utilities, DWS requests that DOE connect any existing services to the proposed larger diameter water main and abandon the existing 8-inch main. The proposed larger diameter main will cross Piʻilani Highway and connect to water meters near the project site. The new water main will be situated in both State and County right-of-ways and will be dedicated to the County. DWS will also require separate meters and on-site water mains for domestic and fire purposes, of which the fire meter should be a double-check detector assembly per Water System Standards Detail M-23 for the fire line. The fire main will be sized for fire flow (2,000 GPM) with a residual pressure of 20 PSI at the critical fire hydrant. Hale Kīhei Reservoir is at elevation 220 feet AMSL while the highest elevation at the site is approximately 110 feet AMSL, giving an elevation head of 110 feet AMSL or 48 PSI static pressure. Since 20 PSI is needed for fire flow, the fire line can only have a maximum loss of 28 PSI until a booster system is required. It should be noted that per Ordinance 3819 effective April 5, 2011, the requirements for adequate fire protection for building permit applications for all non-residential units or structures will be transferred from DWS and administered by the Maui Department of Fire and Public Safety.

The domestic water supply will be served by a compound meter. The size of the compound meter would be dependent on the domestic demand. Once the potable demand is established by the ~~Design-Build~~ DB team, the domestic line will be sized per the Uniform Plumbing Code, which stipulates a minimum 15 PSI pressure per plumbing fixture. Assuming the critical fixture is in a multi-story building at elevation 150 feet AMSL, the static head from the Hale Kīhei Reservoir is approximately 70 feet or 30 PSI. Since 15 PSI is needed for domestic flow, the line can only have a maximum loss of 15 PSI until a booster system is required.

Water pressure calculations should be submitted to the DWS by the ~~Design-Build~~ DB team to ensure adequate pressures can be attained in both fire and domestic lines. If adequate pressure is unavailable, DWS will require installation of a tank and pump, with an air gap off each meter. The air gap will separate the proposed Kīhei High School water and fire mains from the Central Maui Water System. The tank and pump must be designed to have sufficient capacity and pressure to provide the proposed Kīhei High School the required domestic and fire flow. Per the County Code §14-04-50, the DOE "shall agree to; and shall execute a written release in favor of the department for all claims on account of any inadequacy in the department's system or inadequacy of water supply to the premise."

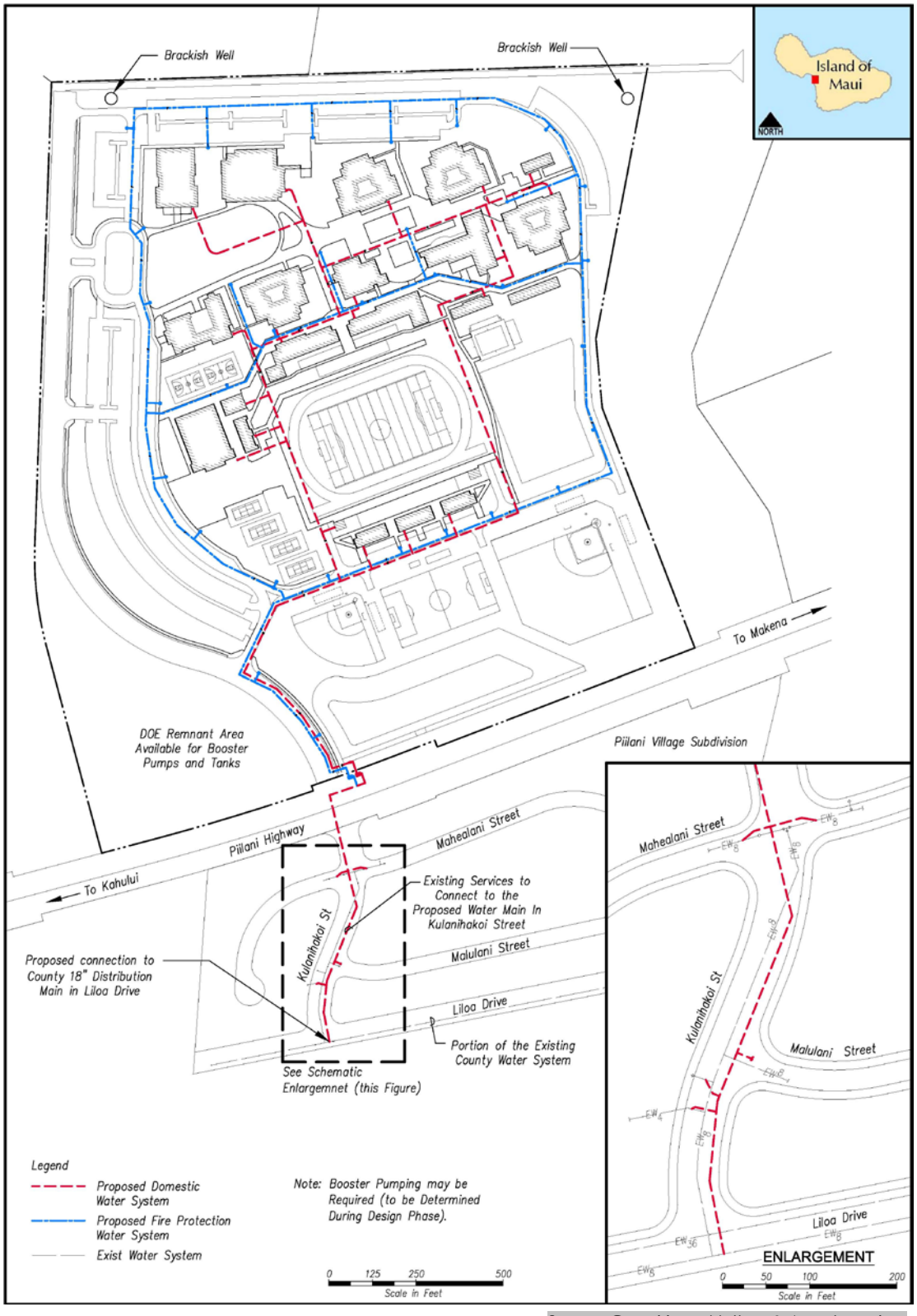
DWS will also require fire hydrants on Piʻilani Highway fronting the school. The fire hydrants would feed off the proposed County water main system upstream of the proposed meters. The fire hydrant and corresponding water main would be transferred to the County.

Refer to *Figure ~~4-13~~17* for a conceptual water system plan and *Appendix K* for conceptual construction costs.

The project should qualify for an exemption to the Maui Department of Water Supply's Water Availability Policy per Maui County Code §14.12.030. The project is a public development project and is anticipated to be exempt per the definitions below.

> §14.12.030G states: This chapter shall not apply to, "Public or quasi-public development projects as defined in section 19.03.040 of this code and related subdivisions, and are within the service area of the department's central or west Maui water system".
>
> §19.03.040 defines "public" as "a use conducted by, or a facility or structure owned or managed by, the government of the United States, the State of Hawaii, or the County of Maui which provides a governmental function, activity, or service for public benefit."

Please note that the actual wording used in the code is "public facility" or "public use." There is no definition of "public development project" §19.03.040 (exact wording may be verified at http://library.municode.com/index.aspx?clientId=16289). Written confirmation of the project's exemption should be obtained from the Maui Department of Water Supply.



Source: Gray, Hong, Nojima & Associates, Inc.

Figure 4-~~13~~17
Conceptual Domestic and Fire Water System

Non-potable – ~~Brackish Groundwater~~ Water

A *non-potable* water system will be developed to irrigate the campus landscaping and athletic fields. In the warm and arid climate of Kīhei, the estimated non-potable irrigation demand is projected at 185,000 GPD. It is expected that irrigation will take place daily within a 9 to 12 hour watering period.

A *Non-potable Water System Alternatives Analysis* report was prepared by Gray, Hong, Nojima & Associates, Inc. in March 2012 (*Appendix M*) to analyze potential non-potable water system improvements, non-potable water sources, and provide recommendations based a life cycle cost comparison, among other factors. Two alternatives for non-potable water were identified in the report:

- Brackish Water System: Onsite brackish groundwater wells
- Effluent Reuse System: R-1 recycled water from the County of Maui's Kīhei Wastewater Reclamation Facility

Brackish Water System: Onsite Brackish Groundwater Wells

Under this alternative, irrigation water would be supplied by brackish wells located on the campus grounds. Brackish water would be pumped from the underlying basal aquifer's lens or transition zone between the salt water and the fresh water into the campus irrigation system. The entire system would be owned and operated by the DOE.

The non-potable water system for irrigation of the school site would include two brackish wells, pumps, motors, discharge assemblies (piping, valves, water meter, water sampling spigot, etc.), and electrical controls. The pressurized distribution lines, control valves, and other appurtenances would be configured to service the campus landscaping plan and various athletic fields. A primary well would be located at the northeast corner of the site at an elevation of approximately 90 feet AMSL (Water Resources Associates, 2011, *Appendix C*). The second well would serve as a supplemental/standby well located at the southeast corner of the property at roughly the same elevation as the first well (*Figure 4-17*).

~~According to the project's Groundwater and Resources Report prepared by Water Resources Associates (2011),~~ It is projected that each well will have a capacity in the range of 250 to 350 GPM while producing suitable brackish water in the salinity range of 400 to 500 mg/L chlorides. Actual pumping capacities will be determined during well tests when the wells are drilled. Therefore, pending the test results, the system may run under alternating or simultaneous operation of the wells in order to meet the estimated demand of 185,000 GPD within a 9 to 12 hour irrigation period. According to Water Resources Associates (2011), the wells are not expected to have any adverse impact on the existing water supply (fresh and brackish) and nearby wells. Refer to *Appendix K.*

~~Irrigation water will be provided by on-site brackish (fresh/salt mixture) wells drilled into the groundwater lens below the site. Brackish water would be pumped from the "lens" between the salt water and the fresh water. The lens is a transition zone of brackish water that separates the fresh water from the salt water. The lens forms because the weight of the rain water that~~

~~percolates into the ground depresses the salt water beneath it. Due to the high salinity of the brackish water, project landscaping should consist of salt tolerant species.~~
~~The proposed non-potable water system for irrigation of the school site will include two brackish wells, pressurized transmission and distribution lines, control valves, and other appurtenances, but will not include a storage tank. A primary well would be located at the northeast corner of the site at an elevation of approximately 90 feet MSL (*Appendix K*). The second well would serve as a supplemental/standby well located at the southeast corner of the property at roughly the same elevation as the first well (*Figure 4-1315*).~~

Effluent Reuse System: R-1 Recycled Water from the County of Maui's Kīhei WWRF

The Kīhei WWRF is located approximately 2 miles south of the proposed high school site serving the area extending from Kīhei to Wailea (refer to *Figure 4-18*). The facility has a treatment capacity of 8.0 MGD and produces R-1 quality effluent. R-1 water represents the highest grade of recycled water designated by DOH standards (Fukunaga and Associates, 2005) suitable for landscape irrigation.

In December 2009, the Department of Environmental Management (DEM) reported that the daily average demand for Kīhei's R-1 recycled water or reclaimed effluent was 1.38 MGD which represented 38% of the total R-1 production.

Based on recent studies by other engineering consultants and discussions with the DEM it is surmised that the Kīhei WWRF treatment, effluent pumping and storage facilities can adequately handle the additional non-potable water demand associated with the new high school without requiring further improvements and upgrades. However, these assumptions are subject to review and verification by the DB Entity, if the R-1 alternative is pursued, for the following reasons:

(1) The proposed school's non-potable irrigation requirements can only be finalized once the overall campus landscaping plan is designed.

(2) Demand for R-1 recycled water in the service area continues to increase among present users and new developments.

Proposed R-1 Water System Improvements

To service the proposed Kīhei High School, an approximate 3,100 foot extension of the existing 12-inch R-1 main would be required (See *Figure 4-18*). The existing R-1 main currently terminates at the intersection of Waipuʻilani Road and the North-South Collector Road. The extension must cross Piʻilani Highway, which is a State of Hawaiʻi right-of-way under the jurisdiction of the DOT, Highways Division. A possible route for the Piʻilani Highway crossing would be at the Kūlanihākoʻi Street intersection. One other onsite improvement would include adding an onsite booster pumping system.

According to the DEM (December 2009), during winter months, wastewater flow rates to the Kīhei WWRF are typically higher due to the influx of tourists in the South Maui area. Unfortunately, this also corresponds to the wetter months of the year when irrigation demands are lower, resulting in an excess of R-1 water supply. Conversely, during the hotter and drier summer months, properties with large irrigated areas demand more R-1 water than can be produced at the Kīhei WWRF (DEM, December 2009). The users in closer proximity to the facility tend to use most of the R-1 water produced, thus, other users must have alternate sources or back-up

provisions available to provide irrigation water during this drier period. Backup/alternate sources are also necessary during other periods of the year when the WWRF is not able to provide R-1 water. Occasional plant upsets occur due to the nature of the biological treatment processes in use at the WWRF. This can happen a few times a year and typically last a few days to a week. In addition, there are occasional plant shutdowns to accommodate maintenance and/or cleaning of equipment. Therefore, under this alternative, an onsite brackish well could serve as the R-1 water system backup when there is a shortage from the WWRF. The well pump would be manually activated as needed by DOE personnel and should also be tested on a routine basis to ensure that the system can be operated when the shortages occur. Depending on the severity of the situation, the single well may be operating on a daily basis until R-1 water becomes available.

Comparison of Non-Potable Water System Alternatives

The following section evaluates key considerations in the comparison of the two non-potable water system alternatives, including life cycle cost, source reliability, management of resources and construction schedule.

Life Cycle Costs

Based on the life cycle cost data below, brackish water produced onsite is less expensive as a long-term source of non-potable irrigation water than R-1 water from the Kīhei WWRF. Over a 40 year period, an R-1 water system is expected to cost $8 million, with the majority of costs from construction costs and water charges. A brackish water system is estimated to cost $2.2 million over the same period, with energy costs as the largest component of total life cycle cost. Based on these estimates, the DOE will save close to $6 million over 40-year period, or approximately $150,000 per year.

Table 4-10 40-YEAR LIFE CYCLE COST COMPARISON

	R-1 WATER WITH BRACKISH WELL BACKUP/ALTERNATE	**BRACKISH WATER SYSTEM (2 WELLS)**
Average power in kilowatts (R-1)	13	0
Average power in kilowatts (Brackish)	30	30
Average operating hours/year (R-1)	3,204	0
Average operating hours/year (Brackish)	81	3,285
PRESENT VALUES:		
Construction Cost	$2,160,860	$856,400
Energy Cost	$520,220	$1,163,007
Routine Operation & Maintenance Cost	$32,000	$0
Replacement Cost	$178,200	$210,000
R-1 Water Charge (Fees to County)	$5,125,761	$0
TOTAL LIFE CYCLE COST (Present Value)	**$8,000,000**	**$2,200,000**

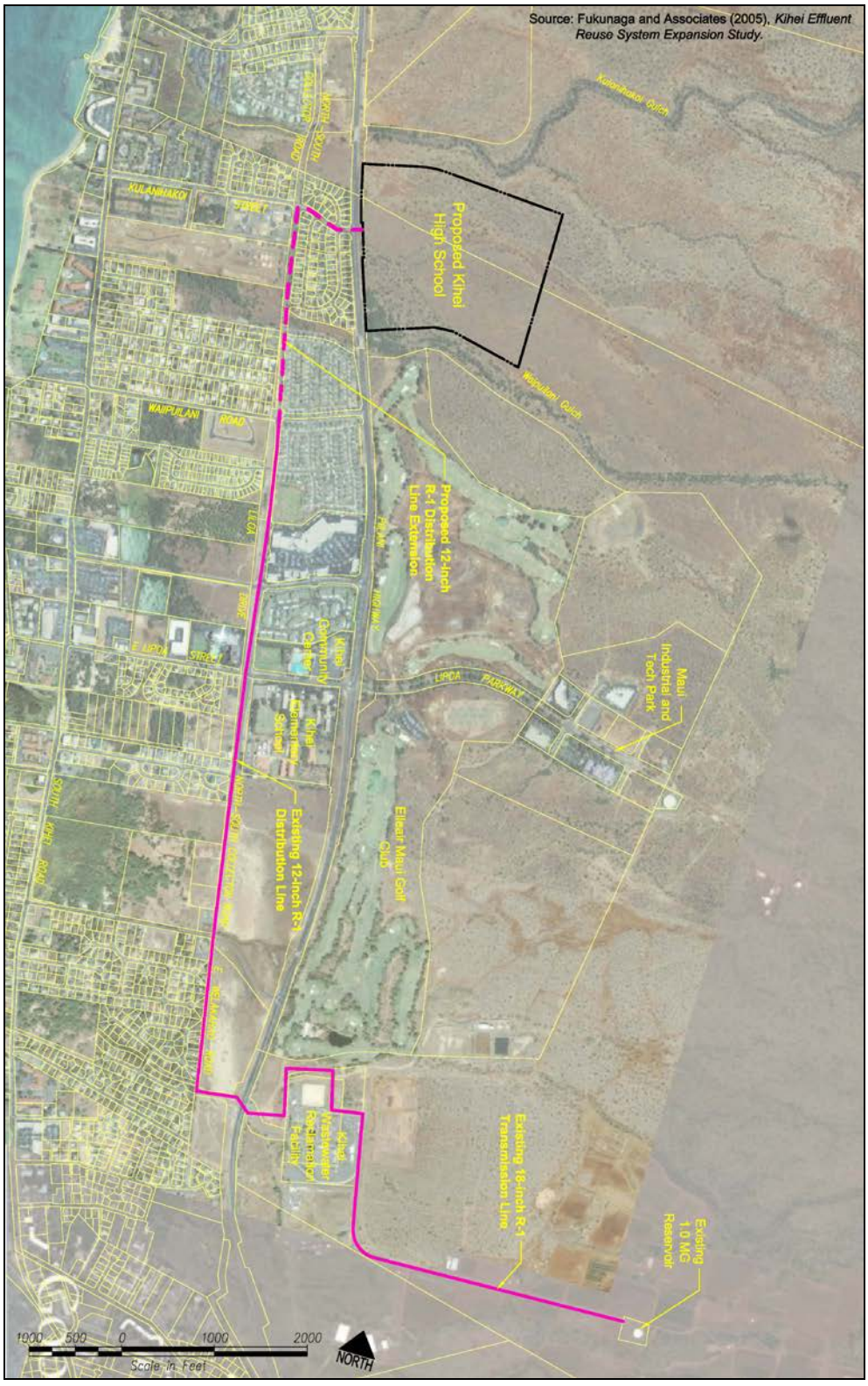


Figure 4-18
R-1 Water System

Source Reliability

According to Water Resources Associates (2011), the proposed daily withdrawal of 185,000 gallons of brackish groundwater is not expected to have adverse impact on the recharge or sustainable yield of the underlying Kama'ole Aquifer System. Except during periods of power outages or equipment maintenance and repairs, the brackish water wells should provide a reliable non-potable water source for irrigation of the campus landscape and athletic fields.

Reliability of the R-1 water supply cannot be guaranteed throughout the year. As mentioned previously, sporadic plant upsets are inevitable due to the nature of the biological treatment processes in use at the Kīhei WWRF. This can happen a few times a year and may typically last a few days. In addition, there will be occasional plant shutdowns to accommodate maintenance and/or cleaning of equipment. Of great concern would be the shortage of R-1 water during the warmer and drier summer months when user irrigation demands are at their peak. This is exacerbated by the fact that users in closer proximity to the plant have the heaviest irrigation demands. Demand for R-1 water may exceed the supply produced at the Kīhei WWRF.

Therefore, if the R-1 water alternative is selected, an alternate/backup source such as an onsite brackish water well must be provided to cover periods when the WWRF cannot produce a sufficient supply of R-1 water to meet the school's non-potable water needs.

Management of Resources

A brackish non-potable water system would be entirely owned and operated by the DOE. Department personnel or contractors would be responsible for routine maintenance and necessary repairs of pumps, motors, and control systems.

In the case of an R-1 system, DOE would be responsible for normal operation and maintenance of the R-1 booster pumping system, as well as the backup/alternate brackish system. In the short-term there are two systems to become familiar with during the initial start-up. Although the brackish wells will not be operating on a continuous basis, routine maintenance will have to be performed in order to ensure that the backup system is fully functional when R-1 water is unavailable. Both systems must be operated and maintained on a permanent basis.

Construction Schedule

DOE anticipates opening Kīhei High School in time for the 2016-17 academic year providing funds are available, requiring planting of the campus landscape and athletic fields in advance of school opening. Moreover, timely completion of the non-potable water system is desirable, since the DB Entity must identify and obtain its own water source for all construction activities, including irrigation of plantings for the campus landscape and athletic fields.

Relying solely on brackish water for onsite irrigation will require permitting, drilling, and testing of two brackish wells located entirely onsite within DOE property. Construction of other offsite infrastructure improvements will not be required prior to start-up of the irrigation system or opening of the school.

Use of an R-1 system will require improvements on- and off-site of the high school campus. The DOE will be relying on the County of Maui to fund and construct the extension of the existing R-1 system from the end of the existing 12-inch main at the intersection of Waipu'ilani Road and the North-South Collector Road in time to support school campus construction and landscaping. The proposed R-1 water main extension would need to cross Pi'ilani Highway to reach the campus,

requiring approvals and an easement from the State Department of Transportation. Additional easements may be required depending on the route selected for the R-1 line extension. On-campus systems will need to be constructed and linked to off-site improvements.

Elevated Salinity Levels in Non-potable Irrigation Water

It should be noted that levels of salinity in the irrigation water, both from R-1 water and brackish water, can lead to a number of problems if the irrigation system is developed without careful consideration during the design and construction phases. In addition to the selection of salt tolerant species in the campus landscaping plan, use of corrosion-resistant materials will allow for longer system life and better performance of brackish pumping and irrigation system equipment.

Public Health and Best Management Practices

Protection of public health is the most important consideration in the distribution and use of recycled water for irrigation purposes because human contact with recycled water will take place. Reuse of treated wastewater effluent is governed by the DOH under the *Guidelines for Treatment and Use of Recycled Water* (2002). Prior to construction of a reuse system, the guidelines specify that an Engineering Design Report must be approved by the DOH for all projects involving areas greater than 5 acres. The report must also incorporate the following BMPs Plans to address site-specific mitigative measures and controls:

- Irrigation Plan
- Management Plan
- Public Education Plan
- Employee Training Plan
- Vector Control Plan
- Monitoring Plan

There are no specific regulations governing brackish water irrigation systems in public places.

Recommended Non-potable Alternative

While cost has significant implications on the DOE's capital improvement budget, it is not the only factor to be considered selecting the recommended alternative. *Table 4-11* offers a side by side comparison of the various factors considered for each alternative.

Table 4-11 COMPARISON OF ALTERNATIVES

FACTOR/CONSIDERATION	R-1 WATER	BRACKISH WATER
Life Cycle Cost (40-year)	$8,000,000	$2,200,000
Source Reliability	Subject to WWRF output	Rechargeable/sustainable aquifer
Long-Term Resource Management	Two onsite systems	Single onsite system
Control of Construction Schedule	County and DOE	DOE
Salinity Level	200 mg/L	400+ mg/L
Public Health and Safety	R-1 use governed by DOH (Engineering design report required)	No governance

Of the two alternatives, brackish wells will provide a more reliable source and will not require an additional backup/alternate source. As such, school personnel can focus their efforts on the operation and maintenance of a single non-potable water system. In addition, there may be more uncertainty in the school construction project schedule if the R-1 alternative is selected, since funding for design and construction of the distribution line extension would need to be secured by the County of Maui. The use of R-1 recycled water would also require further approvals of BMPs by the DOH which could add to the project delivery schedule. Therefore, there is the possibility that the campus landscape and athletic fields may not be completed prior to the scheduled opening of the school. A disadvantage of using brackish groundwater for irrigation is that its projected salinity is expected to be about double the level in the R-1 water from the Kīhei WWRF. More careful consideration must be given to the following issues during the design phase:

- Selection of salt-tolerant species in campus landscaping plan
- Use of corrosion-resistant materials in pumping and irrigation equipment
- Quality of top soil or import material

Based on the findings of the Non-potable Water System Alternatives Analysis (2012), DOE prefers to implement the brackish water system alternative. DOE will continue to discuss the possibility of using R-1 recycled water from the WWRF with the County, and final determination of the non-potable water system will be the responsibility of the DOE and DB team.

Potential Impacts and Mitigation Measures

Potable Water

The Kīhei High School project will require construction and extension of on- and off-site domestic water utilities. Final potable water demand calculations and water supply system design will be prepared by the DB team. Improvements will comply with DWS Water System Standards and are proposed to be supplied through the Central Maui Water System.

Potable water conservation measures will be incorporated into project design. The following DWS recommendations will be taken into consideration for conservation of potable water use indoors:

a. Use the Environmental Protection Agency WaterSense labeled plumbing fixtures.

b. Install flow reducers and faucet aerators in all plumbing fixtures, where-ever possible.

c. Install dual flush toilets with high efficiency models that use 1.28 gallons per flush or less.

d. Install showerheads with a flow rate of 1.5 GPM at 60 PSI or less.

e. Install bathroom sink faucets with fixtures that do not exceed 1 GPM at 60 PSI. Laundry facilities and/or individual unit machines must use Energy Star labeled washers.

f. Limit the distance from the hot water source to the tap early in the design stage.

Final project design, including potable water conservation features and fixture selection, will be the responsibility of the DOE and the DB team.

Non-Potable Water

Two alternatives are presented for provision of non-potable irrigation water, 1) two on-site brackish irrigation wells, and 2) R-1 recycled effluent from the WWRF with brackish well backup system. Based on research conducted by Gray, Hong, Nojima & Associates, Inc. in the Non-potable Water System Alternatives Analysis (2012) (*Appendix M*), DOE prefers to implement the brackish water system alternative. According to Water Resource Associates (2011) (*Appendix C),* the two non-potable wells are not expected to have any adverse impact to the existing water supply (fresh and brackish) and nearby wells.

Implementation of the R-1 Recycled Effluent alternative would require less water withdrawal from the Kamaʻole Aquifer, and would assist in conservation of the island's water resources, however, it would require extension of R-1 infrastructure to the project site at the County of Maui's expense and would be a significantly more costly alternative.

Selection of delivery method for non-potable irrigation water is an unresolved issue and will require additional coordination between the DOE, County of Maui and DB team.

In order to ensure the effectiveness of irrigating with non-potable water, landscaping materials will be selected that are specifically adapted to the anticipated salinity levels of the irrigation source water. Priority will be given to planting drought and salt tolerant canopy trees and groundcovers.

Reduction of demand for non-potable water will be a priority for the Kīhei High School project. The following DWS recommendations will be taken into consideration for conservation of non-potable exterior water use:

a. Use of Smart Approved WaterMark irrigation products such as, ET irrigation controllers, drip irrigation, and water saving spray heads.

b. Avoid plant fertilizing and pruning that would stimulate excessive growth.

c. Time watering to occur in the early morning or evening to limit evaporation.

d. Limit turf to as small an area as possible.

Final project design, including non-potable water conservation features and irrigation product selection, will be the responsibility of the DOE and the DB team. Should R-1 recycled effluent from the Kīhei WWRF be utilized, necessary infrastructure for connecting to the reclaimed water line will be required. DOE and the DB team will work with the County to address infrastructure requirements.

4.2.10.2 Wastewater

According to available information, there are no existing wastewater facilities on-site or sewer connections to the site on Piʻilani Highway. The nearest wastewater connection is a drop manhole at the intersection of Kūlanihākoʻi Street and Mahealani Street in the Piʻilani Village Subdivision. Wastewater is conveyed through a collection system and pump stations to the Kīhei WWRF.

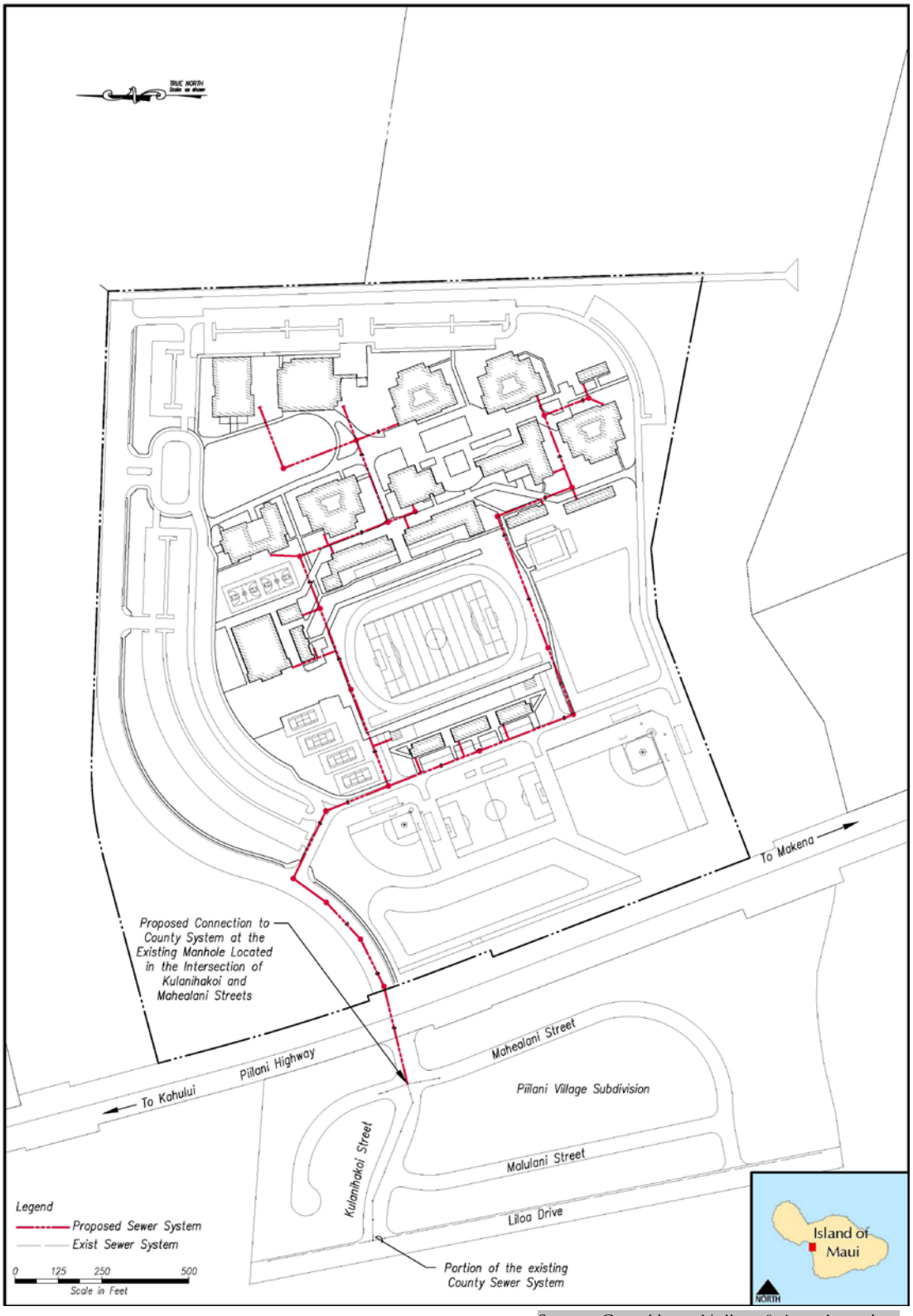
Proposed Infrastructure

Proposed on- and off-site sewer lines will comply with the County standards. The existing collection system (including Kīhei Wastewater Pump Station Nos. 3, 4, 5 and 6) should have adequate capacity for flows generated by the proposed Kīhei High School such that upgrades are not necessary ~~(*Appendix K*)~~. The County will formally determine if any upgrades are required after the Plan Review Application form is submitted. If upgrades are necessary to support the proposed Kīhei High School, the DOE will be required to fund any mandatory off-site improvements to the collection system. It is anticipated that sewer service will be provided by the extension of the County system from an existing drop manhole in the intersection of Kūlanihāko'i Street and Mahealani Street in the Pi'ilani Village subdivision approximately 300 feet from the proposed Kīhei High School. The proposed sewer line would extend across Pi'ilani Highway to an on-site property sewer service manhole. The DOE would be responsible for any required costs to connect to the County system. The on-site system will consist of gravity sewer mains to be located within roadways and sidewalks. The DOE will be responsible for maintenance of the on-site sewers, since the County will not accept sewer easements that traverse private property. The wastewater flow projections for the project are based on land use areas, unit counts, and estimated enrollment using demand rates from the State HAR Chapter 11-62, Appendix F and the County Wastewater Reclamation Division, *Wastewater Flow Standards*. The flow rate estimates in *Table 4-~~10~~12* factor in both wet and dry inflow and infiltration and peak flow factors, including a maximum peak flow factor of five ~~(5)~~.

Table 4-~~10~~12 WASTEWATER FLOW PROJECTIONS

Year	Population (Students, Staff and Visitors)	GPCD	Wastewater Flows (MGD)		
			Average ~~Day~~ Flow	Max ~~Day~~ Flow	Design Peak ~~Hour~~
2015	~~240~~ 250	25	~~4,900~~ 0.01	~~7,350~~ 0.03	~~14,700~~ 0.13
2016	~~440~~ 460	25	~~9,000~~ 0.01	~~13,500~~ 0.06	~~27,000~~ 0.16
2017	~~700~~ 730	25	~~14,300~~ 0.02	~~21,450~~ 0.09	~~42,900~~ 0.19
2018	~~920~~ 960	25	~~18,800~~ 0.02	~~28,200~~ 0.12	~~56,400~~ 0.21
2025	~~1,830~~ 1,915	25	~~37,450~~ 0.05	~~56,175~~ 0.21	~~112,350~~ 0.32

Refer to *Figure 4-~~14~~19* for a conceptual sewer system plan and *Appendix K* for conceptual construction costs.



Source: Gray, Hong, Nojima & Associates, Inc.

Figure 4-~~14~~19
Conceptual Sewer Plan

Potential Impacts and Mitigation Measures

The Kīhei High School project will require construction of on-site wastewater collection facilities and extension of on- and off-site sewer connection. The proposed sewer line will comply with the County of Maui standards. While the existing collection system should have adequate capacity for flows generated by the proposed high school, the County will formally determine if upgrades are required. The DOE will be responsible for costs required to connect to the County System. Significant adverse impacts are not anticipated.

4.2.10.3 Drainage

The Kīhei High School project site is currently undeveloped and consists of dry rolling foothills on west-facing lowland slopes of Haleakalā. The project site ranges in elevation from about 30 feet AMSL at Piʻilani Highway, to an elevation of about 110 feet at the eastern boundary with slopes ranging from two ~~(2)~~ to eight ~~(8)~~ percent.

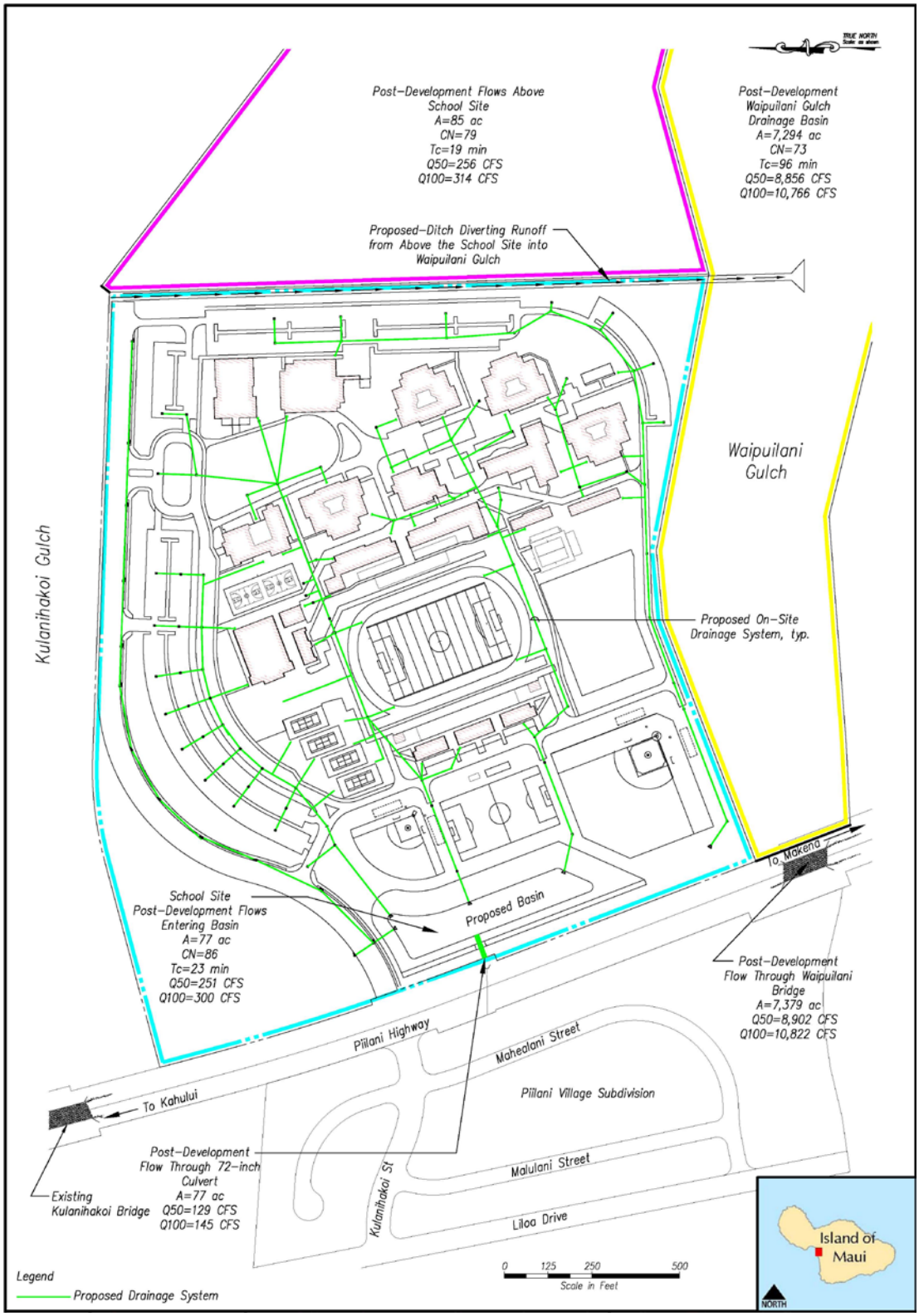
Because the property is vacant there is no existing drainage system serving the site except for drainage infrastructure in Piʻilani Highway, which is owned and maintained by the DOT. The majority of the existing runoff at the site drains towards a 72-inch diameter culvert under Piʻilani Highway. The remainder of the runoff drains into either Kūlanihākoʻi Gulch or Waipuʻilani Gulch. Both gulches cross Piʻilani Highway under bridges spanning the gulches. These gulches are generally dry except after significant rainfall events.

Existing Hydrology

According to the Trans-Meridian Engineers Hydrology report (no date) for the DOT's Piʻilani Highway, the site extends over three ~~(3)~~ drainage basins labeled as 8, 9 and 10 (refer to *Figure 4-~~15~~20*). Basins 8 and 10, which contain Kūlanihākoʻi and Waipuʻilani Gulch, respectively, extend from bridges crossing Piʻilani Highway up to Haleakalā South West Rift Zone. Basin 9 encompasses a small area between the gulches which empties into the existing 72-inch culvert under Piʻilani Highway. Since the report was completed in the 70s, the current Maui Drainage Standards were applied to the basin parameters to obtain updated existing peak flows (refer to *Table 4-~~11~~13*).

Table 4-~~11~~13 PRELIMINARY ANALYSIS OF EXISTING BASINS (NRCS HYDROGRAPH METHOD BASED ON 24-HOUR STORM)

Basin No.	Area (Acres)	CN	Tc (Min.)	Q (50) (cfs)	Q (100) (cfs)	Outlet
8	9,649	73	99	~~9,762~~ 11,489	~~12,330~~ 13,964	Kūlanihākoʻi Bridge
9	143~~2~~	79	26	367	450	72-inch Culvert
10	7,314	73	96	~~7,547~~ 8,881	~~9,532~~ 10,796	Waipuʻilani Bridge



Source: Gray, Hong, Nojima & Associates, Inc.

Figure 4-~~15~~20
Conceptual Drainage Plan

Design Criteria

The proposed drainage system's hydrologic criteria should be in accordance with County Standards with the exception of applying National Oceanic and Atmospheric Administration (NOAA) Atlas 14 Volume 4 Version 2.1 (2009) in lieu of Plates 2, 4 and 7 (Intensity Duration Curves and Rainfall Intensity Maps). The on-site drainage system should be designed for runoff determined by the rational method for 1-hour rainfall with return periods of 10 years or 50 years per the County of Maui Drainage Standards. The rational method is based on the drainage area, runoff coefficient (ground cover conditions), and the rainfall intensity for duration equal to the time of concentration. Since the project site is less than 100 acres and potential sumps in the school site, the 50-year return period should be applied to the project site.

During the design phase, the ~~Design-Build~~ DB entity would review the effects of the proposed school development on neighboring gulches, bridges and downstream properties. It should be noted that the offsite basins' drainage area exceeds 100 acres, therefore the NRCS hydrograph method for the 100-year return period based on 24-hour rainfall should be considered during the design phase. The NRCS hydrograph method uses watershed characteristics (drainage area, time of concentration, rainfall, SCS curve number of the land use or soil group, and a SCS design storm based on geographic locale) to develop a runoff hydrograph (See *Appendix K*).

Since the existing undeveloped site will be replaced with impervious surfaces, an on-site basin is necessary to regulate the increase in runoff into the existing 72-inch culvert under Piʻilani Highway. The basin should be designed in accordance with County Drainage Standards which stipulate that the storage volume of the basin shall be equal to at least the total additional runoff volume for a 50-year return period based on a 1-hour storm. Additionally, the ~~Design-Build~~ DB entity could incorporate the current requirements of the ~~United States Green Building Council (~~USGBC~~)~~ in the basin design which may allow for possible ~~Leadership in Excellence and Environmental Design (~~LEED~~)~~ Site Sustainability credits.

In addition, the Maui County Public Works Engineering Division and R.M. Towill Corporation are preparing a drainage master plan for Kīhei with a draft scheduled for release in 2012. During design, the ~~design-build~~ DB team should prepare a drainage report that that describes the project's overall drainage concept and incorporates the stormwater management strategies in accordance with any recommendations of the forthcoming Kīhei drainage master plan. The drainage report should include but not be limited to the following: analysis of existing conditions, stormwater system sizing criteria, detention/retention analysis, flood analysis, drainage system plans, and hydraulic calculations. As part of the approval process for this project, the drainage report should be submitted to both the County and DOT and include any additional criteria per the respective drainage standards.

Conceptual Drainage Plan

The proposed drainage system will consist of the following improvements:

- The off-site drainage improvements are intended to divert runoff generated above the proposed Kīhei High School into the neighboring Waipuʻilani Gulch.

- Final drainage improvements will seek to minimize diversion of runoff into Kūlanihākoʻi Gulch.

- The on-site drainage system should be designed to safely convey on-site runoff into the basin and prevent runoff entering Piʻilani Highway.

- The on-site basin should be designed to reduce post-development flow rates and quantity to below pre-development levels.

- The 7.7-acre parcel formed by the extension of Kūlanihākoʻi Street will remain vacant; there will not be any drainage improvements constructed within the parcel at this time.

On-site Drainage Concept

The proposed school site occupies portions of Basins 8, 9, and 10 as described above. The majority of the school site is situated within the lower portion of Basin 9. The runoff from the remainder upper portion of Basin 9 and portions of Basin 10 will be intercepted by a proposed ditch constructed along the Kīhei High School upper boundary and diverted into Waipuʻilani Gulch (refer to *Figure 4-~~15~~20*). The proposed ditch should be designed in accordance with County Drainage Standards with appropriate freeboard and velocity dissipation. Based on the conceptual site plan, it is anticipated that the ditch will be a 5-foot wide reinforced concrete channel with an approximate wall height of 8 feet; however, other materials are available such as prefabricated high density polypropylene (HDPE) channels which may be more cost effective. Final design and dimensionings of the ditch and adjacent maintenance access road will be determined by the ~~design-build~~ DB team.

Before the ditch is designed, it is likely that the DOE will need to obtain permission from Haleakala Ranch to grade and construct the ditch in their property. If DOE cannot obtain permission, the runoff from the upper portion of Basin 9 must be conveyed through the proposed Kīhei High School site. The result would increase construction cost due to larger and more extensive on-site drainage infrastructure. The effects of the additional flow into Waipuʻilani Gulch are quantified in *Table 4-~~12~~14* and *Appendix K*. In summary, the increase in off-site runoff will be less than 1% after the school is constructed.

Table 4-~~12~~14 PRELIMINARY ANALYSIS OF WAIPUʻILANI GULCH (NRCS HYDROGRAPH METHOD BASED ON 24-HOUR STORM)

Basin Description	Area (Acres)	CN	Tc (Min.)	Q_{50} (cfs)	Q_{100} (cfs)
1. Post-Development Flows Above School Site	85	79	19	256	314
2. Post-Development Flows Entering Waipuʻilani Gulch	7,294	73	96	~~7,527~~ 8,856	~~9,506~~ 10,766
3. Post-Development Flows Entering Waipuʻilani Bridge	7,379	N/A	N/A	~~7,571~~ 8,902	~~9,561~~ 10,822
4. Pre-Development Flows Entering Waipuʻilani Bridge	7,314	73	96	~~7,547~~ 8,881	~~9,532~~ 10,796

On-site stormwater runoff will sheet flow or be directed by grassed swales/gutters into drain inlets and pipes. Due to on-site sumps, the underground drainage system should be sized to convey the 50-year runoff quantities with a one-foot freeboard allowance. The underground drainage system should drain into a detention basin before entering the existing 72-inch culvert under Piʻilani Highway (refer to *Figure 4-~~15~~20* for a conceptual drainage plan and *Appendix K* for preliminary

cost estimates). On-site grading of the proposed Kīhei High School site near Piʻilani Highway should direct runoff into on-site inlets and/or the detention basin. It is likely that the DOT will not allow any additional runoff on to Piʻilani Highway.

On-site Basin Concept

Based on the conceptual campus site plan, a possible location for the basin is the lower end of the property adjacent to Piʻilani Highway (refer to *Figure 4-~~15~~20*). The final basin location and dimensions will be determined by the ~~design-build~~ DB team. It should be noted that the on-site basin will be designed to meet County Standards. Discharge into existing 72-inch diameter culvert must be regulated and controlled and the basin must be sized to handle the total additional runoff volume or more. The basin could be designed to satisfy LEED Site Sustainability Credit requirements. The conceptual basin geometry and sizing are as follows:

- 90 feet wide/480 feet long
- Overall depth of 10-feet
- Three-feet of permanent storage volume below outlet pipe
- Side slopes at 3H:1V
- Minimum 10-foot overflow weir crest length
- Weir crest above 100-year water surface elevation
- 12-foot wide access road

Potential Impacts and Mitigation Measures

A preliminary hydrologic and hydraulic analysis of the basin based on the above dimensions may be found in *Appendix K*. A summary of the results are shown in *Table 4-~~13~~15 and 16* below; approximate water surface and invert elevations are depicted in *Figure 4-~~15~~20*.

Table 4-~~13~~15 PRELIMINARY BASIN ANALYSIS FOR 24-HOUR STORMS FOR 24-HOUR STORMS AT 1-, 2-, and 50- YEARS (NRCS HYDROGRAPH METHOD BASED ON 24-HOUR STORM)

School Site Condition	CN	Tc (min.)	Q1 (cfs)	Volume$_1$ (cf)	Q_2 (cfs)	Volume$_2$ (cf)	Q_{50} (cfs)
Existing Condition	79	13.5	20	150,428	47	294,327	248
Developed Condition Flow Entering Basin	86	23	35	252,362	64	436,632	251
Flow Leaving Basin	N/A	N/A	3	107,021	10	291,292	129

Table 4-16 PRELIMINARY BASIN STORAGE VOLUME ESTIMATION (NRCS HYDROGRAPH METHOD BASED ON 50-YEAR 1-HOUR STORM)				
School Site Condition	**CN**	**Tc (min.)**	**Q_{50} (cfs)**	**Volume$_1$ (cf)**
Existing Condition	79	13.5	104	183,792
Developed Condition Flow Entering Basin	86	23	143	296,599
Required Storage, Delta	N/A	N/A	N/A	112,807
Approximate Available Storage, 3-Foot Depth	N/A	N/A	N/A	145,314

The preliminary analysis demonstrates that LEED Site Sustainability Credit ~~detention~~ can be ~~provided~~ satisfied based on the approximate basin geometry, since the 1- and 2-year/24-hour ~~such that the~~ post development flows will not exceed existing flows~~.~~. Pursuant to the County Drainage Standards, the geometry could also provide ~~and~~ that the additional runoff volume generated by the ~~two year~~ 50-year/1-hour storm can be adequately retained in the bottom three ~~(3)~~ feet of the basin.

Best Management Practices

The inland waters near the property are designated as Class 2 by the DOH and are not listed in the Clean Water Act §303(d) list (impaired waters bodies that do not meet State Water Quality Standards). According to DOH Water Quality Standards, "The objective of Class 2 waters is to protect their use for recreational purposes, the support and propagation of aquatic life, agricultural and industrial water supplies, shipping, and navigation" (HAR §11-54-03(b)(2)). Discharges into Class 2 inland waters qualify for coverage under NPDES General Permit which calls for the application of permanent and construction BMPs.

BMPs are pollution control measures, applied to nonpoint sources, on-site or off-site, to control erosion and the transport of sediments and other pollutants which have an adverse impact on waters of the state. Construction BMPs are temporary measures installed before construction commences and removed once the site has been stabilized and permanent BMPs are in place. Potential construction BMPs include, but are not limited to gravel entrance, dust screen, silt fence, retention basins, diversion berm/ditches, and grading procedures that conform to Maui County Code Chapter 20.08 – Soil Erosion and Sediment Control.

Unlike construction BMPs, permanent BMPs are designed to remain part of the project features after the site grading operation is completed. The permanent BMPs are intended to reduce storm water pollution typically associated with the increased impervious surfaces. Examples of permanent BMPs include gravity separators before each outlet, grass swales, infiltration trenches, vegetative filter strips, maximize open space, and the use of on-site soil general or yard fill. Permanent BMPs may also qualify for LEED credit if they meet the criteria in Site Sustainability Credit 6.2 – Storm water Design – Quality Control. According to the HDOT's Stormwater Permanent Best Management Practices Manual, permanent BMPs criteria applies "…to projects outside of HDOT Highways provided that the project produces storm water runoff from its site and drains to the HDOT Highways MS4, either by a physical connection or surface runoff" (State of Hawai'i, Department of Transportation, 2007). The proposed Kīhei High School conceptual site plan could involve discharge into the existing HDOT drainage system under Pi'ilani Highway (the

existing 72-inch culvert and Waipu'ilani Bridge), therefore the design build team should provide permanent BMP plans, design report, and other required information to HDOT for review and approval.

In addition, DWS recommends the following BMPs to protect underlying the Kama'ole Aquifer ~~(*Appendix K*)~~:

- Prevent cement products, oil, fuel and other toxic substances from falling or leaching into the water.
- Properly and promptly dispose of all loosened and excavated soil and debris material from drainage structure work.
- Retain ground cover until the last possible date.
- Stabilize denuded areas by sodding or planting as soon as possible. Replanting should include soil amendments and temporary irrigation. Use high seeding rates to ensure rapid stand establishment.
- Avoid fertilizers and biocides, or apply only during periods of low rainfall to minimize chemical runoff.
- Keep run-off on site.
- Use brackish or reclaimed water for irrigation and dust control during construction where available.

Increase in runoff rates resulting from the development will be mitigated by the proposed retention/detention basin and the implementation of BMPs. As a result, the proposed project should not an adversely impact nearshore waters.

4.2.11 Power, Telecommunications and Cable Services

Electrical power on the Island of Maui is provided by Maui Electric Company (MECo). Telephone and cable services in the project vicinity are provided by Hawaiian Tel (HTel), and Oceanic Time Warner Cable, respectively.

Potential Impacts and Mitigation Measures

Construction of the proposed Kīhei High School project will result in the demand for additional electrical, telecommunication, and cable services. The project site is currently undeveloped and utilities will need to be extended on site. Electrical, telephone, and cable television transmission lines will be installed underground and connect with existing systems. This project will incorporate energy efficient technology and design to reduce the project's overall energy consumption. It is anticipated that MECo, HTel and Oceanic Time Warner Cable will provide necessary services to the project site. No significant environmental impacts are anticipated from provision of these services.

4.2.12 Solid Waste

Solid waste collection in the Kīhei-Mākena region is served by ~~County Department of Environmental Management (~~DEM~~)~~, which disposes to the Central Maui Landfill (CML) in Pu'unene, operated by the DEM. The landfill contains contracted recycling and composting facilities which accept green waste and used motor oil. According to the County Integrated Solid Waste Management Plan (2009), approximately 200,000 tons of solid waste is deposited at the landfill every year. The landfill is projected to reach capacity in 2026. The County has diverted around 30% of its waste to recycling, composting, and other beneficial uses per year since 2006. The County Integrated Solid Waste Management Plan (2009) calls for 50% diversion of Maui's waste through waste collection and recycling programs improvement and infrastructure improvements, including consideration of a waste-to-energy facility. This will extend the life of the landfill to 2042. Since 1994, construction and demolition waste has been banned from the Central Maui Landfill. DeCoite Construction and Demolition Landfill is a privately-owned facility near Mā'alaea which is permitted to accept construction and demolition waste for disposal. The Pohakulepo Concrete Recycling Facility accepts concrete from demolition and construction activities, along with solid waste.

The project site is vacant and therefore no solid waste services are currently required.

Potential Impacts and Mitigation Measures

The Kīhei High School project will be served by DEM solid waste collection and disposal services. During the construction of the proposed project, cleared vegetation will be transported to the County's green waste recycling facility at the Central Maui Landfill. There will be no demolition waste, as the property is currently undeveloped. Construction waste will be hauled to the DeCoite Landfill for disposal. After build out, waste collection and disposal will be handled by a private waste collection service. The management of solid wastes generated by the proposed project will emphasize waste diversion and recycling. Additionally, in order to achieve LEED or comparable certification, one of the requirements of the project will be to divert a certain percentage of construction waste from landfills.

A school facility is estimated to generate 0.0013 tons of waste per ~~SF~~ square foot per year (California Department of Resources Recycling and Recovery, Estimated Solid Waste Generation Rates for Institutions, 1999). Therefore, Kīhei High School is estimated to generate 280 tons of waste per year at a full build-out of 215,000 ~~SF~~ square feet. It should be noted that some students will be transferring to Kīhei High School from other high schools, and the waste generated by these students would not be considered "new" waste. The management, diversion and recycling of solid wastes generated by Kīhei High School will be emphasized in operations.

Kīhei High School is expected to achieve a minimum of Silver certification under the LEED program developed by the USGBC, or a comparable rating system. Sustainable design strategies for sustainable sites, water efficiency, energy conservation, materials use, and indoor environmental quality that will be considered in the design process are discussed in this section.

- Sustainable Sites: The Kīhei High School project design may support alternative modes of transportation, low-emitting and fuel efficient vehicles, reduction of heat island effect,

reduction of light pollution, joint-use of facilities, maximizing open space, and on-site storm water retention and treatment for storm water quantity and quality control.

- Water Efficiency: The project design may incorporate water efficient plumbing fixtures, such as high efficiency or drip irrigation systems, and drought tolerant landscaping.

- Energy Efficiency: The Kīhei High School project may achieve energy efficiency through optimizing energy performance, providing on-site renewable energy, commissioning energy audits and by using ozone-friendly refrigerants.

- Sustainable Materials Use: Strategies in this area may be achieved through waste diversion, materials re-use, and conscious product selection. Possible methods include construction waste management, selection of materials with high recycled content, reusing construction material from another site, avoiding the use of new materials, utilizing regionally produced materials, using rapidly renewable materials, and using sustainable sources of construction lumber.

  During the project operations phase, the DOE will be responsible for implementing resource conservation and sustainability into their daily operations. Schools can reduce the amount of waste generated through establishing paper recycling program, including, but not limited to the purchase of recycled paper, purchasing paper with the highest percentage of postconsumer waste, eliminating products from the school's waste stream that are not recyclable. Ultimately, implementation of such a program will be the responsibility of the DOE.

- Indoor Environmental Quality: Strategies in this area include managing indoor air quality during construction and before occupancy, using low-emitting materials, controlling indoor chemicals and pollutants, providing lighting control, meeting thermal comfort criteria, and providing day-lit areas and outside views.

During an eco-charrette for the concept plan, participants identified 65 possible points under the LEED for Schools v3.0 scoring system. Achieving all of these points would earn the project a Gold certification and exceed DOE's minimum standard of achieving Silver. Credits will need to be vetted through studies, computer modeling, cost assessment and collaboration with the developer's design team. The formal LEED accreditation process or certification under a comparable system will occur during the design-build process.

Waste generated by the proposed project is not expected to have a significant adverse impact on the solid waste collection services and disposal facilities.

4.3 SOCIO-ECONOMIC ENVIRONMENT

The Kīhei High School project is planned in response to the regional needs for a new educational facility to support the growing population of the Kīhei-Mākena region. This section examines the socio-economic conditions and trends of Maui County, the Kīhei-Mākena region, and the proposed project area. The socio-economic conditions evaluated include the social settlement pattern (population and housing) and economic resources (employment and economy). In July

2011, Plasch Econ Pacific, LLC, prepared an Economic and Fiscal Impacts assessment for the Kīhei High School project (*Appendix L*). The findings of this report are discussed below.

4.3.1 Regional Setting

The Kīhei High School project site is located within the Kīhei-Mākena Community Plan region, which stretches from Mā'alaea in the north to La Perouse Bay in the south. Urban development in the region consists of residential, commercial, and resort uses. The region has the second highest full-time resident population on Maui and the third highest number of jobs on the island. The region contains a diverse range of physical and socio-economic environments. With its dry and mild climate and proximity to recreation-oriented shoreline resources, the visitor-based economy has continued to grow steadily over the years. The town of Kīhei serves as the commercial and residential center of the region, with Wailea and Mākena serving as the focal points for the majority of visitor activities. A number of luxury hotels and golf courses are also located in Wailea and Mākena.

Potential Impacts and Mitigation Measures

The Kīhei High School project will complement the pattern of development in the Kīhei-Mākena region as envisioned in the Kīhei-Mākena Community Plan. The project will help to support the existing and future residential developments of the surrounding area by providing a new public educational facility. Although the project is not consistent with the existing State Land Use Agricultural District designation, it is consistent with the Kīhei-Mākena Community Plan Public/Quasi Public land use designation. The regional character will be complemented and not be adversely impacted by the development of the Kīhei High School project.

4.3.2 Population

The overall population of the County has exhibited relatively strong growth over the past decade. The ~~2000~~ 2010 United States Census reported that resident population of the County of Maui was ~~128,094~~ 154,834 people ~~in 2000~~. Population projections by the Maui County Planning Department (2006) estimate that the island of Maui's population ~~reached 140,289 people in 2010~~ will reach 176,687 persons in 2030 of which ~~28,124~~ 36,767 people ~~of which were living~~ will live in the Kīhei-Mākena ~~region~~ Community Plan Area.

In addition to the resident population, the County accommodates a large visitor population. For the year 2010, the average visitor census was projected at 49,476 people (Maui County Planning Department 2006). The average visitor census is defined as the average number of visitors on an average day. Of the 49,476 people, approximately 21,621 or 43 percent, of these visitors are in the Kīhei-Mākena region (Maui County Planning Department 2006).

Combining the resident population and the average visitor census, the total population of the County was estimated to be 189,765 people in 2010 of which 49,745 people were from the Kīhei-Mākena region.

The proposed Kīhei High School site is undeveloped and does not contain any residents.

Potential Impacts and Mitigation Measures

By the year 2025, projections indicate that the County population will increase to 174,184, which is a 24 percent increase from the 2010 population projection. In the year 2025, the Kīhei-Mākena region population is expected to increase by 28 percent from the 2010 population to 35,962 people. The average visitor census for the County is projected to increase to 63,482 visitors by the year 2025, which accounts for a 28 percent increase from the 2010 visitor census. Of these visitors, approximately 47 percent or 30,241 will be in the Kīhei-Mākena region. Overall, the total population (including the resident population and the average visitor census) in 2025 is estimated to be 237,666 people of which 66,203 people will be from the Kīhei-Mākena region.

The Kīhei area currently contains a mix of housing types, both multi-and single-family, as well as commercial uses. The proposed Kīhei High School will respond to the existing and future needs of the surrounding area by providing educational facilities to serve a growing population and community. This will have a positive impact by decreasing long travel commutes for families driving their children back and forth to school in Central Maui. In addition, the project will help to relive the overcrowding of Central Maui schools currently serving students from the South Maui region. When fully built out, the total population of the high school is projected to be 1,650 students. Provision of a public high school is supportive of the residential community. No significant impacts to population are anticipated.

4.3.3 Housing

The Kīhei-Mākena region is home to many full-time residents and is also a vacation destination for visitors. In 2010, there was an estimated 11,286 housing units in the Kīhei-Mākena region (Maui County Planning Department, 2006). By 2030, it is projected that the housing demand will reach approximately 22,287 homes (County Planning Department 2006).

From 2000 to 2005, the County experienced a strong demand for housing due to a strong local economy, low mortgage interest rates, and non-resident interest in Maui real estate. The participation by non-resident buyers in the County's real estate market has a great impact on the overall housing demand. In 2004, approximately 37% of all housing sales were to buyers residing outside of the County. This demand by non-resident buyers for general residential units is significant in the Kīhei-Mākena region where 42 percent of all Kīhei-Mākena housing sales were to buyers residing outside of the County (County Planning Department 2006).

In December 2009, the year-end average sales price of a single-family home in the County was $747,891 and the year-end average sales price of a single-family home in Kīhei was $607,327. The year-end average sales price of a condominium in the County was $648,043 and the year-end average sales price of a condominium in Kīhei was $321,966 in December 2010 (Realtors Association of Maui, Inc. 2011).

Potential Impacts and Mitigation Measures

In light of the current and projected housing market conditions, the proposed Kīhei High School will provide a significant community benefit by offering existing and future residents within the surrounding area a new educational facility for children.

The Kīhei High School project is not expected to introduce new residents into Kīhei or any neighboring area once completed. It is possible, however, that a small percentage of development and/or construction workers may relocate into the area during the project development phase, thereby resulting in minimal impacts to existing housing. No negative impacts on housing conditions are anticipated.

4.3.4 Economy and Labor Force

The County's economy is heavily dependent on the visitor industry, particularly in the Kīhei-Mākena region. As a major resort destination area, the Kīhei-Mākena region provides vacation rentals, world-class resorts, and recreational facilities. Numerous retail commercial centers are also located here to provide necessary support services.

In 2011, the State of Hawai'i's economic situation continues to fluctuate. The continued fluctuation is a result of economic weakness from the mainland and softening in a variety of real estate sectors in 2007, the collapse of Aloha and ATA Airlines in 2008, and advent of economic recession on the US mainland and throughout the Pacific Basin. These events have reduced tourism, leading to increasing unemployment, business failures, and modified spending levels island wide.

Traditionally among the lowest in the nation, the unemployment rate of the County has more than doubled since 2008. During the second quarter of 2011, the unemployment rate was 7.4 percent, which actually decreased 1.1 percent from the previous year (8.5 percent). The County saw a net loss of about 600 jobs or 0.9 percent decrease in the second quarter of 2011 from the same quarter of 2010. Job gains were in accommodation, wholesale trade, professional and business services, and financial activities were more than offset by job losses in construction, government, and health care and social assistance (Department of Business, Economic Development and Tourism, 2011).

Tourism indicators have improved since 2008. Total spending by visitors who came to Maui in January 2011 rose 21.1 percent ($323.8 million) from the previous year. Total visitor arrivals to Maui also grew with an increase of 9.2 percent from the previous year (Hawai'i Tourism Authority, 2011).

Potential Impacts and Mitigation Measures

The development of the Kīhei High School will result in significant expenditures that will have a positive impact on the economies of the State and the County on a direct and indirect basis. With significantly increasing capital investment and capital flow in the region, new employment opportunities will arise and an expanded tax base will occur, as such, the proposed project will serve as an economic stimulus for the region.

The Kīhei High School economic and fiscal impacts analysis estimates the effects on the economy that will result from the development of the project, including construction and business employment, wages and income, direct and indirect expenditures, and taxes and fees accruing to the State and the County.

Economic Impacts of Construction

The estimated construction period for Phase I of the School is approximately two ~~(2)~~ years and approximately two ~~(2)~~ years for Phase II. The Phase II construction would be completed approximately 10 years after the completion of Phase I construction.

Phase I construction of the School will provide an average of about 340 construction jobs over the two-year construction period, about 320 indirect jobs on Maui, and about 160 indirect jobs on O'ahu. Thus, total direct-plus-indirect employment associated with Phase I construction activity will average about 820 jobs, of which about 660 jobs will be on Maui. Phase II construction of the School will provide an average of about 82 construction jobs during the two-year construction period, about 80 indirect jobs on Maui, and about 50 indirect jobs on O'ahu. Thus, total direct-plus-indirect employment associated with Phase II construction activity will average about 200 jobs, of which about 160 jobs will be on Maui.

Over the development period, total construction expenditures for the Kīhei High School are estimated at nearly $170 million, including about $140 million for Phase I and about $30 million for Phase II (*Appendix L*). This translates into average construction expenditures of about $62.2 million per year during Phase I, and about $15 million per year during Phase II.

Construction activity will generate indirect sales associated with supplying goods and services to construction companies and to the families of construction workers. Indirect sales are expected to average about $61 million per year during Phase I ($41 million per year on Maui and $20 million on O'ahu) and about $14.7 million per year during Phase II ($9.8 million on Maui and $4.9 million on O'ahu). Construction expenditures plus indirect sales related to construction are expected to average $123 million per year during Phase I and $30 million during Phase II. Profits on construction and indirect sales are estimated to average $15.4 million per year for Phase I, and $3.7 million per year for Phase II (*Appendix L*).

Phase I construction activity is expected to generate a total payroll of about $41.7 million per year. The corresponding figure for Phase II is about $10.1 million. Annual wages will range from about $25,000 to over $100,000 per year.

During the Phase I construction period, direct and indirect jobs provided by construction activity will support about 1,680 residents housed in about 570 homes (*Appendix L*). Construction jobs will support about 690 residents and about 230 homes, while the remainder will be supported by indirect jobs. Most of the residents supported by the direct-plus-indirect jobs are expected to live on Maui: about 1,350 residents housed in about 460 homes. Phase II construction activity will support about 400 residents and 140 homes, of which about 320 residents and 110 homes will be on Maui.

In view of the available construction workers, it is expected that the construction jobs for the Kīhei High School will be filled mostly by workers who are already living on Maui. As other construction projects are completed on the island, Maui construction workers will be hired to work on the various components of the School, then move on to other projects. Thus, the School will help keep Maui's existing construction workers employed.

Economic Impacts of Operation

During Phase I operations, the School will accommodate about 920 students and employees. Phase II operations will increase the on-site population to over 1,850 students and employees.

After Phase I construction is complete (Phase I operations), School operations will provide about 120 jobs at the School, about 47 indirect jobs on Maui, and about 23 indirect jobs on Oʻahu. The total direct-plus-indirect employment associated with Phase I operations will reach about 190 jobs, of which about 167 jobs will be on Maui. Phase II operations will increase these figures to about 206 jobs at the School, about 81 indirect jobs on Maui, and about 40 indirect jobs on Oʻahu. The total direct-plus-indirect employment associated with Phase II operations will reach nearly 330 jobs, of which nearly 290 jobs will be on Maui.

Annual salaries at the School will range from less than $25,000 to over $100,000. Total annual payroll for Phase I direct and indirect jobs is estimated at about $8.4 million, of which about $7.4 million will be on Maui and $1 million on Oʻahu (*Appendix L*). Phase II will increase total annual payroll of indirect jobs to about $13 million for Maui and $1.7 million for Oʻahu, for a total of $14.7 million.

Families of Kīhei High School employees and those who hold indirect jobs generated by Kīhei High School operations will purchase goods and services. For Phase I, consumption expenditures are estimated at $4.6 million annually ($4.1 million on Maui and $500,000 on Oʻahu). For Phase II, consumption expenditures are estimated at $8.1 million annually ($7.1 million on Maui and $900,000 on Oʻahu). For Phase I, profits on annual consumption sales are estimated at about $410,000 on Maui and about $50,000 on Oʻahu, for a total of about $460,000 (*Appendix L).* Phase II will bring annual profits up to over $710,000 on Maui and over $90,000 on Oʻahu, for a total of nearly $810,000.

Direct and indirect jobs provided by operations will support about 240 residents on Maui and about 50 residents on Oʻahu (*Appendix L*) during Phase I. Phase II will bring the supported population to over 410 residents on Maui and over 80 residents on Oʻahu. Housing for the residents supported by Phase I direct and indirect jobs will total about 100 homes (80 on Maui and 20 on Oʻahu). Phase II will bring these figures up to about 170 homes (140 on Maui and 30 homes on Oʻahu). During Phase I, the homes on Maui will have an estimated value of $28.6 million, and the Oʻahu homes will have an estimated value of $7.1 million (*Appendix L*). Phase II will bring these values up to about $49 million for the Maui homes and $12.1 million for the Oʻahu homes.

Once the School becomes operational, experienced faculty, administrators, and professional staff will be recruited from other public and private schools in Hawaiʻi and, to a lesser extent, from mainland schools. Teachers and professional staff who are new to their fields will be recruited from the UH and other institutions.

School operations will create economic benefits for students and their families in the form of reduced travel expenses and time savings after students have been reassigned from Central Maui schools to Kīhei High School. After construction of Phase I, Kīhei High School will reduce transportation costs for families and for the DOE, for a total annual savings of about $1.01 million. At full development of Phase II, transportation costs will decrease for families and for the DOE, for a total annual savings of about $2.08 million. These estimates are based on anticipated

enrollment, bus pass cost and use, DOE transportation costs, and the value of time saved with the reduction in commute to attend high school in Kīhei rather than in Central Maui.

Impacts on State and County Finances

Tax Revenues Generated by Construction Activity

Phase I construction activity will generate about $12.9 million in tax revenues for the State, and Phase II construction will bring total tax revenues up to about $15.7 million. These tax revenues will offset about 9% of the cost of constructing the high school.

The County derives negligible tax revenues from construction activity. However, the School is not expected to require major additional support improvements from the County or State since the School will not add significantly to County's population growth. Also, State and County services for construction workers and their families are, for the most part, already provided since most of the needed construction workers are current residents of Maui.

Tax Revenues Generated by School Operations

At the completion of Phase I construction, families and businesses supported directly and indirectly by Kīhei High School operations will pay about $590,000 per year in tax revenues to the State, and $67,000 per year to the County. Phase II operations will increase the tax revenues to about $1.0 million per year for the State and about $116,000 per year to the County. These revenues will offset the cost of providing State and County services to these families and businesses.

County expenditures to support the high school will include water and sewer service, solid waste disposal, public safety, etc. The DOE will pay service charges for its fair share of water and sewer services, and solid waste disposal. Police and fire services are financed from the County general fund.

4.3.5 Public Services

Social services are the programs that benefit the community. Although most are government run, some, like many hospitals and schools, are privately run.

The County has a variety of services that serve the community. These services include a police department, fire department, schools, medical care facilities, and recreational parks and beaches.

Police Protection and Law Enforcement

The Maui Police Department is the primary service provider to the proposed project area. In the year 2010, the department employed 375 sworn officers as well as 196 support staff. The County averaged 7,690.2 index offenses (murder, forcible rape, robbery, aggravated assault, burglary, larceny-theft, and motor vehicle theft) for the years 1993-2009. In the year 2009 the County reported 6,048 index offenses, its lowest amount in 17 years. (Hawai'i State Data Book 2009 (Updated 2010)).

The Uniformed Services Bureau is responsible for patrol; and has divided the County into six ~~(6)~~ separate districts. The Kīhei High School project area is located within District VI: Kīhei.

The central Maui Police Department station is in Wailuku, approximately 10.5 miles away from the center of the project area. The Maui Police Department station closest to the Kīhei High School project area is located at 1881 South Kīhei Road, in Kīhei Town Center, approximately two and one-half ~~(2.5)~~ miles away from the Kīhei High School project area. In addition to the Uniformed Services Bureau, this station houses the Visitor Oriented Policing, Community Oriented Policing, and Citizens Patrol programs.

Additional law enforcement agencies are located nearby as well; the Federal Bureau of Investigation (Federal) has a branch located in Wailuku and the Public Safety Department Sheriff Division (State) has a branch located in Wailuku.

According to the Proposed Kīhei Police Station Final Environmental Assessment (Munekiyo and Hiraga, June 2009), the County of Maui Police Department is planning a new police station is in Kīhei, approximately two ~~(2)~~ miles south of the project site on the makai side of Piʻilani Highway. This new facility would replace the current police station in Kīhei Town Center.

Fire Protection and Public Safety

Department of Fire and Public Safety protects and preserves life, environment, and property within the County. There are 14 fire stations throughout the County with a combined total of 279 personnel trained to respond to and mitigate a wide variety of emergency situations. Last year the department responded to almost 7,000 emergency situations (www.co.maui.hi.us). The closest Department of Fire and Public Safety station to the proposed project area is located at 11 Waimāhaʻihaʻi Street in Kīhei, approximately two and one-half ~~(2.5)~~ miles from the center of the Kīhei High School project area.

The DOE may coordinate with the Hawai'i State Civil Defense to design a hardened facility such as the gym or cafeteria for use as an emergency shelter.

Education

With the growing population comes a need for schools to serve more students. ~~Kīhei's school-age population generally mirrors the present demographics of the community. Enrollment by race/ethnicity is as follows:~~

- ~~Asian (1,404 students)~~
- ~~White (1,187 students)~~
- ~~Hispanic (158 students)~~
- ~~Total (2,796 students)~~

The Kīhei community is part of the DOE's Maui Complex or "mini-district". The schools that make up this complex are:

- Kahului Elementary School
- Kamali'i Elementary School
- Kīhei Elementary School
- Lihikai Elementary School
- Pomaika'i Elementary School
- Lokilani Intermediate School
- Maui Waena Intermediate School
- Maui High School
- Kīhei Public Charter High School

Kīhei offers two ~~(2)~~ public elementary schools (Kamali'i and Kīhei), one ~~(1)~~ public middle school (Lokelani), and one ~~(1)~~ public charter high school to serve its student population.

Lokelani Intermediate School, which contributes to Kīhei's high school student population, has an enrollment of 597 students in 2011-2012. Kīhei Public Charter High School, with grades PK-12, had a total student enrollment of 509 for 2011-2012. It has 248 high school students enrolled in its 9th through 12th grades. The majority of Kīhei's high school-age population is served by Maui High School in Kahului approximately 10 miles away from central Kīhei.

Some students are anticipated to travel to the new Kīhei High School by walking or bicycling. The DOE provides bus service only to students who live farther than 1.5 miles from the school they are enrolled at. Therefore, students within 1.5 miles from the proposed Kīhei High School may be predisposed to walking or biking as their primary transportation to and from school. *Figure 4-21* shows the locations of the census tracts near the proposed Kīhei High School. *Table 4-16* examines the student aged population within 1.5 miles of the proposed Kīhei High School project site. There were approximately 6,600 persons 20 years of age and under within 1.5 miles of the proposed Kīhei High School project site in 2010 (U.S. Census Bureau 2010 population data). Of those, 983 were between 11 and 15 years of age, and 837 were between 16 and 20 years of age.

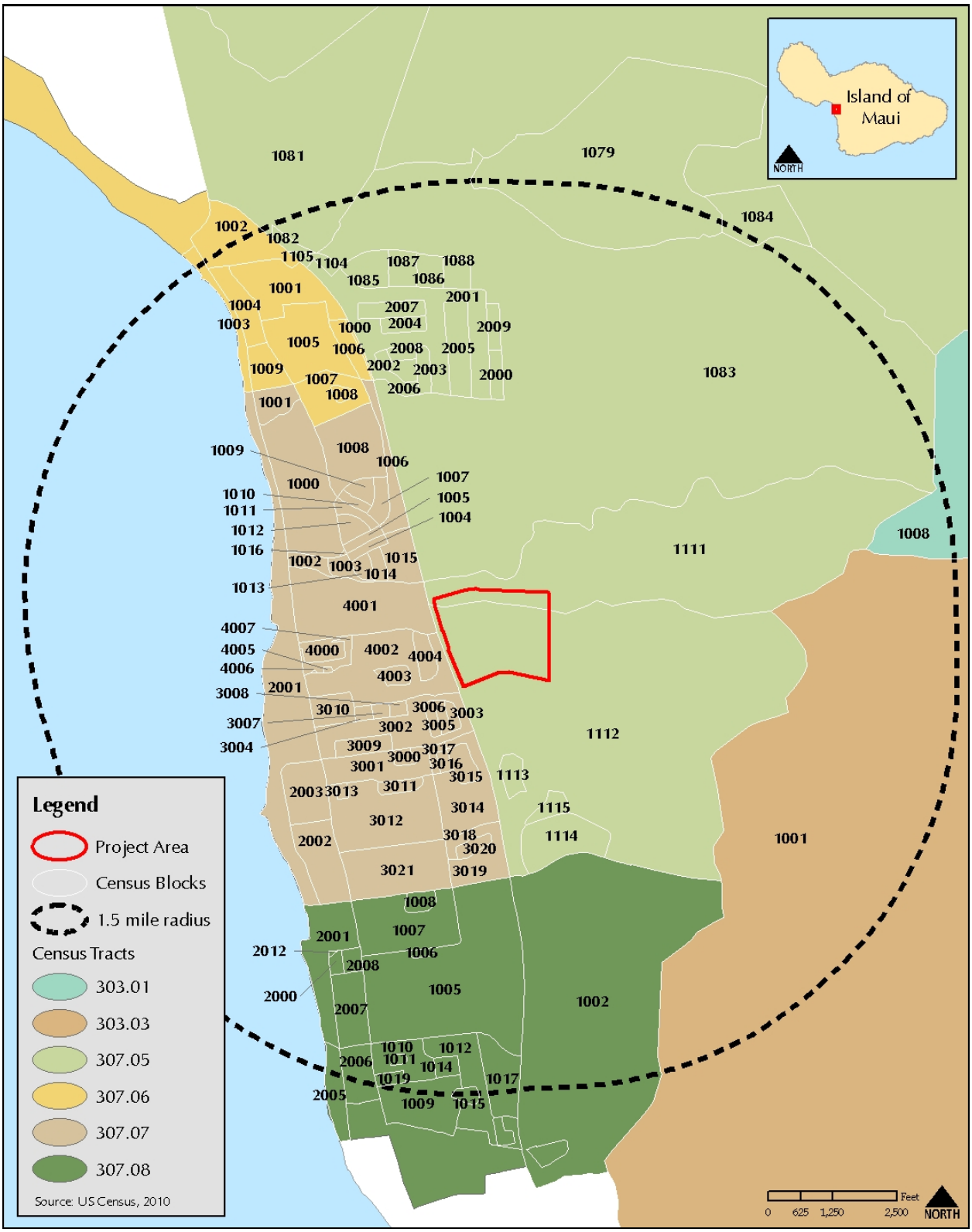


Figure 4-21
Census Tracts and Blocks Near the Proposed Kīhei High School

Table 4-17 POPULATION WITHIN 1.5 MILES FROM THE PROPOSED KĪHEI HIGH SCHOOL SITE				
Tract/Block	Years of Age			
	0-5	6-10	11-15	16-20
Tract 303.01				
1008	0	0	0	0
Sub-total	**0**	**0**	**0**	**0**
Tract 303.03				
1001	0	0	0	0
Sub-total	**0**	**0**	**0**	**0**
Tract 307.05				
1079	0	0	0	0
1081	0	0	0	0
1082	0	0	0	0
1083	39	39	22	36
1084	18	15	17	11
1085	53	16	12	11
1086	57	16	17	11
1087	47	9	15	8
1088	0	0	0	0
1104	25	3	7	4
1105	3	0	0	0
1111	0	0	0	0
1112	0	0	0	0
1113	0	0	0	0
1114	0	0	0	0
1115	7	0	0	0
2000	122	4	6	7
2001	126	116	121	92
2002	124	5	4	2
2003	17	6	7	8
2004	43	8	8	9
2005	52	25	19	15
2006	64	10	5	2
2007	40	15	22	15
2008	37	3	8	7
2009	17	7	16	7
Sub-total	**891**	**297**	**306**	**245**
Tract 307.06				
1000	82	0	0	0
1001	74	45	50	44
1002	74	4	0	2
1003	7	0	0	0
1004	89	5	1	1
1005	92	57	54	34
1006	106	4	3	1
1007	28	19	24	9
1008	27	8	3	7
1009	9	4	3	5
Sub-total	**588**	**146**	**138**	**103**

Table 4-17 POPULATION WITHIN 1.5 MILES FROM THE PROPOSED KĪHEI HIGH SCHOOL SITE				
Tract/Block	Years of Age			
	0-5	6-10	11-15	16-20
Tract 307.07				
1000	71	31	35	42
1001	75	4	4	3
1002	28	4	4	6
1003	21	8	4	1
1004	20	6	3	0
1005	15	2	2	4
1006	26	10	8	4
1007	75	8	8	9
1008	68	37	32	38
1009	57	3	5	6
1010	5	1	5	4
1011	3	4	2	5
1012	4	4	6	7
1013	13	3	3	2
1014	16	7	2	2
1015	14	3	1	3
1016	5	0	0	0
2001	14	9	10	3
2002	22	2	2	2
2003	12	13	11	6
3000	11	0	2	2
3001	69	10	7	11
3002	73	51	47	20
3003	68	2	2	4
3004	17	3	2	3
3005	20	2	3	5
3006	25	2	3	0
3007	22	3	2	5
3008	30	8	5	3
3009	37	20	16	13
3010	40	17	13	17
3011	35	10	14	7
3012	19	11	13	9
3013	28	0	0	1
3014	32	12	14	14
3015	32	5	5	7
3016	22	2	3	1
3017	14	4	2	1
3018	34	5	7	6
3019	40	12	12	6
3020	34	5	6	4
3021	70	0	0	0
4000	123	37	42	41
4001	172	34	31	25
4002	119	37	29	30
4003	61	3	0	2

Table 4-17 POPULATION WITHIN 1.5 MILES FROM THE PROPOSED KĪHEI HIGH SCHOOL SITE				
Tract/Block	Years of Age			
	0-5	6-10	11-15	16-20
4004	12	4	3	6
4005	7	2	0	0
4006	6	0	0	0
4007	33	3	2	2
Sub-total	**1869**	**463**	**432**	**392**
Tract 307.08				
1002	5	0	0	0
1005	1	1	0	2
1006	22	0	0	0
1007	27	18	26	12
1008	50	2	2	4
1009	44	24	19	10
1010	40	11	6	6
1011	46	3	2	0
1012	31	16	14	23
1014	5	2	1	1
1015	5	2	5	7
1017	13	0	0	0
1019	22	8	3	2
2000	12	0	0	0
2001	4	3	2	4
2005	16	2	1	3
2006	29	12	10	14
2007	32	12	12	6
2008	18	1	4	3
2012	3	0	0	0
Sub-total	**425**	**117**	**107**	**97**
GRAND TOTAL	**3,773**	**1,023**	**983**	**837**

Source: 2010 Census, U.S. Census Bureau

Based on U.S. Census Bureau 2010 demographic profile data for the Kīhei Census Designated Place (CDP), the student population is anticipated to have a similar composition to the Kīhei CDP, when the population is categorized by race as follows.

Table 4-18 KĪHEI CDP POPULATION BY RACE	
Race	**Percent of Population**
White	50.7%
Black or African American	1.2%
American Indian or Alaska Native	0.6%
Asian	21.7%
Native Hawaiian and Other Pacific Islander	6.5%
Some Other Race	3.0%
Two or More Races	16.3%

Source: U.S. Census Bureau 2010

Hospitals and Medical Services

Maui Memorial Medical Center, located at 221 Mahalani Street in Wailuku, is the closest hospital facility, located 11.5 miles north of the center of the proposed project area. It is a 231-bed acute and long-term health care hospital; and is equipped with a 24-hour emergency room.

Recreational Resources

There are two ~~(2)~~ County parks within one ~~(1)~~ mile makai of the Kīhei High School project area: Kalepolepo Park and Waipu'ilani/Kīhei Beach Reserve. Various other parks are scattered north of the Kīhei High School project area along Pi'ilani Highway. More County parks lie along the coast south of the project site. There are no national (Federal) or State parks in the immediate vicinity.

The South Maui Region Parks & Open Space Master Plan (Chris Hart and Partners) was prepared in 2006 to inventory parks and open space, create a concept plan for a Kīhei Community Park, and provide a vision for open space in South Maui. The Master Plan establishes an objective for the Kīhei-Makena Community Plan Region to have 10 acres of sub-regional park land per 1,000 persons. A concept plan for a 46-acre future Kīhei Community Park is presented. The future park is planned for between Pi'ilani Highway and the North South Collector Road, between Hale Kuai Street and Welekahao Drive. The Master Plan envisions a network of greenways in urban and natural areas. In the Parks & Open Space Future Vision Plan for North Kīhei in the vicinity of the project site, Kaonoulu Gulch and Waipu'ilani Gulch are shown as secondary off-road connections. Pi'ilani Highway and the North South Collector Road are shown as Primary Open Space Corridors for bicycle and pedestrian users.

Public Libraries

The State Board of Education operates a system of libraries throughout the State. There are six ~~(6)~~ State libraries on the Island of Maui and one ~~(1)~~ bookmobile. There is a public library located approximately two and one-half ~~(2.5)~~ miles south of the center of the Kīhei High School project area, at 35 Waimāha'iha'i Street.

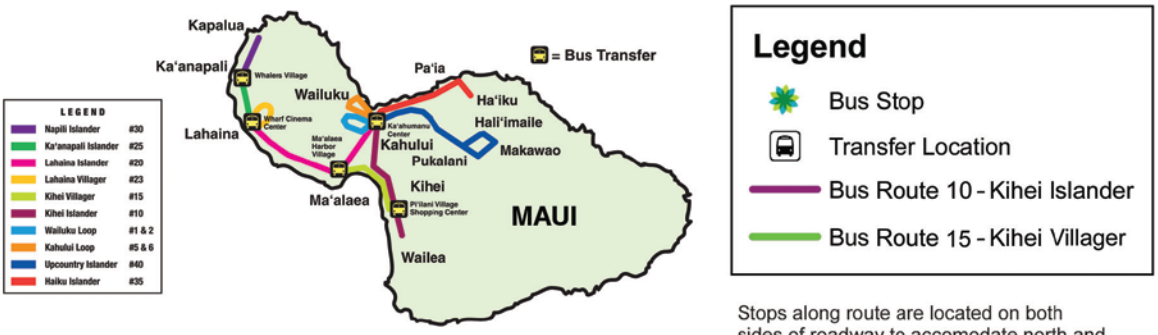
Public Transit Service: Maui Public Bus Transit System

The County currently funds a public bus system that provides service in and between various Central, South, West, Haiku, and Upcountry Maui communities (*Figure 4-22*). All buses run seven ~~(7)~~ days a week. Two ~~(2)~~ routes serve the proposed project area, they are:

- Kīhei Villager #15 – loops hourly from 6:05 A.M.-8:05 P.M., seven ~~(7)~~ days a week, from Pi'ilani Village Shopping Center to Ma'alaea.

- Kīhei Islander #10 – loops hourly from 5:30 A.M.-7:30 P.M., seven ~~(7)~~ days a week, from Ka'ahumanu Center to Wailea Ike Drive.

The County also funds a commuter bus service. One ~~(1)~~ commuter route, the Kīhei-Kapalua Commuter, serves Kīhei. This bus commutes people to and from Kapalua and Kīhei in the morning and again in the evening. The bus stop closest to the project site is located at Kūlanihāko'i Street and South Kīhei Road.



Source: County of Maui, Department of Transportation (2011)

Figure 4-22
Maui Public Bus Routes in the Project Area

Potential Impacts and Mitigation Measures

Police Protection and Law Enforcement

The Kīhei High School project will require additional police protection. This area is currently under police protection, but the Kīhei High School project will add a substantial amount of people and property onto a previously undeveloped lot mauka of Piʻilani Highway. These people will require protection while at the facility and the property will require protection at all times. Although additional police protection is required, the Maui Police Department is prepared to meet this need, and will continue to grow as population and crime rate dictates. The close proximity of the nearest department station will facilitate the proposed project's protection. Additionally the mauka development of Kūlanihākoʻi Street and the on-site roadways will facilitate police patrol and protection on the site.

Significant negative impacts on police protection and law enforcement services are not anticipated and no mitigation measures are necessary.

Fire Protection and Public Safety

The Kīhei High School project will require fire protection during construction and after development is complete. To meet access road and fire flow water requirements, the project will comply with UFC Sections 10.207 and 10.301 (c).

No additional issues are anticipated and further mitigation measures are not necessary.

Educational

The Kīhei High School project is not likely to introduce new residents to the Kīhei area and is not expected to increase the demand on local schools. The Kīhei High School project is a new educational facility and is anticipated to relieve stress from local educational facilities and residents.

Significant negative impacts on educational services are not anticipated and no mitigation measures are necessary.

Medical Services

The proposed project is not expected to increase the demand on local hospitals.

Significant impacts on local medical facilities are not anticipated and no mitigation measures are necessary.

Recreational Resources

The proposed project is not likely to introduce new residents to the Kīhei area and is not expected to increase the demand on public parks. The project is anticipated to provide recreational opportunities and help meet regional demand for athletic facilities. The project is consistent with the open space corridors and off-road connections as envisioned in the South Maui Parks & Open Space Master Plan.

Significant impacts on public parks are not anticipated and no mitigation measures are necessary.

Public Libraries

The proposed project is not likely to introduce new residents to the Kīhei area and is not expected to increase the demand on public libraries.

Significant impacts on libraries are not anticipated and no mitigation measures are necessary.

Public Transit Service: Maui Public Bus Transit System

The proposed project may increase the number of daily passengers in the Kīhei area when the proposed project is complete. It is common for high school students to use a public transportation option to travel to and from school.

Significant impacts on the public transit system are not anticipated and no mitigation measures are necessary.

4.4 SUMMARY OF PROBABLE IMPACTS

4.4.1 Interrelationships and Cumulative Environmental Impacts

This project and other planned projects in the region are likely to have long-term cumulative impacts, such as increased traffic and higher demand on regional infrastructure. However, many of the planned projects are consistent with County plans and will have cumulative long-term beneficial impacts such as reducing commute traffic to distant parts of the County and increasing employment opportunities. The economic development associated with planned projects will provide additional tax revenue to the State and County governments to fund necessary public services. The anticipated net cumulative impact is expected to be positive.

Adverse impacts relating to traffic, increased demand on regional infrastructure and air quality are likely to be expected by the cumulative development of all of the proposed regional projects. Yet, at the same time, the proposed developments involve significant improvements to regional roadways, drainage, water, and sewer facilities. Kīhei High School will compliment the future housing development by providing high school education and recreational opportunities within the region. Finally, the cumulative development of the region's proposed projects will provide additional tax revenue and economic benefits to State and County governments to fund necessary public services.

Potential Secondary Effects

New developments in general, including the proposed Kīhei High School, have the potential to induce growth outside the project area. An example of such a secondary effect is the stimulation of additional development in the region as a result of the construction of public facilities, such as enhanced traffic and utilities infrastructure. The Kīhei High School project aims to provide a new educational facility in the Kīhei area, thereby decreasing travel distance for students attending other schools. Planning in accordance with the Kīhei-Mākena Community Plan serves to reduce adverse secondary impacts from unexpected impacts of unplanned growth.

4.4.2 Relationship between Local Short-term Uses of the Environment and the Maintenance and Enhancement of Long-term Productivity

These relationships are described below in the context of four ~~(4)~~ specific areas of potential concern:

Narrowing the range of beneficial uses of the environment: The proposed project would reduce the amount of land available for ranching but would provide a land use supportive of the community. The project would not adversely affect rights customarily and traditionally exercised for subsistence, cultural and religious purposes, nor would it have a known significant impact on Hawaiian cultural or historic resources.

Long-term risks to health and safety: The project is not expected to pose any such risks. By complying with Federal, State and County regulations pertaining to building codes, environmental health, natural hazard management, etc., risks to health and safety will be limited. No on-site hazardous materials have been identified that pose risks to public health and safety.

Foreclosing of future options: While the proposed project would foreclose future development options for the property, the project would bring a needed public facility to Kīhei, bringing along with it many beneficial impacts to the State and community.

Trade-offs among short-term and long-term gains and losses: Potential short- and long-term environmental impacts would be offset by proposed mitigation measures. The short-term inconveniences caused by construction activity include increased noise, dust and traffic due to construction vehicles. Once construction is completed, Kīhei will have a new high school that is a source of education, employment, and pride for the community. These long-term benefits outweigh the relatively short-term losses anticipated during construction.

4.4.3 Irreversible and Irretrievable Commitments of Resources

The construction and operation of the planned new improvements will involve the irretrievable commitment of land, fiscal resources, labor, construction materials, and energy. There will be a permanent commitment of funds and resources to plan, design, construct and operate the facility.

4.4.4 Adverse Environmental Effects that cannot be Avoided

Implementation of the project will produce unavoidable affects in the short and long term. Short-term effects are generally associated with construction, and prevail only for the duration of the construction periods. Long-term effects generally follow completion of the improvements and relate to net changes to either programs or operations that are permanent. Effects that can be considered both adverse and unavoidable are discussed below.

4.4.4.1 Unavoidable Adverse Short-term Effects

- Disruption of flora/fauna habitat at the site.
- Views of site development and construction activity.

- Temporary increases in soil erosion resulting from construction operations and small amounts of soil may be carried beyond construction sites in surface runoff water and dust.

- Unavoidable, but temporary, noise impacts may occur during construction activities within the project area.

- Impacts to air quality primarily from fugitive dust emissions generated by construction activities.

- Increases in truck traffic associated with removal and redistribution of excavation soil or with imported fill materials and delivery of construction materials.

- Increases in automobile traffic associated with construction workers travelling to and from the site.

- Temporary disruption of traffic patterns at the Piʻilani Highway/Kūlanihākoʻi Street during intersection modifications.

4.4.4.2 Unavoidable Adverse Long-term Effects

- Undeveloped land and existing on-site vegetation will be lost. The site will transition into an developed property. Vegetation will be replaced through the addition of project landscaping, with a preference for native, drought tolerant plants.

- Implementation of the project will result in increased water consumption, wastewater disposal, and solid waste generation.

- There will increased demand for utilities and infrastructure. Where practical and feasible, sustainable design practices and technology will be utilized to reduce energy and natural resource demand requirements.

- There will be some increase in noise as students, staff, visitors and their associated vehicles frequent the area. The High School will periodically generate noise impacts from crowds at athletic events. Event noise will occur over the long term, but each event would be relatively short in duration, lasting only a few hours.

4.4.5 Unresolved Issues

Parking Requirements

The conceptual site plan currently shows 948 total parking spaces which would serve to meet the school's parking needs during normal school hours or during sporting events at the stadium. This total number of parking spaces to be provided is unresolved and will need to be determined by the project developer in consultation with DOE and Maui County.

Potable Water

Potable water demand is an issue of island-wide concern on Maui. Given the island's potable water shortage~~, the school's non-potable water requirement of 185,000 GPD will be met by two new onsite brackish wells, which will provide a long-term basal groundwater source from the underlying Kama'ole Aquifer System~~. Confirmation of potable water service to the project from the DWS is needed.

Non-potable Water

Two alternatives were identified as possible means for delivering non-potable irrigation water to the project site: 1) Brackish water system or, 2) Effluent Reuse system. Selection of the non-potable water system will require additional coordination between the DOE, County of Maui and DB team.

Site Plan and Campus Design

Method of delivery for the construction of Kīhei High School will be ~~Design-Build~~ DB. Site plans, renderings and campus descriptions shown in this EIS are preliminary and subject to change. Final design will be determined by the project developer during the DB process.

Chapter 5
Conformity of the Project to Applicable Plans and Policies

5.0 CONFORMITY OF THE PROJECT TO APPLICABLE PLANS AND POLICIES

In this section, the project's consistency with applicable land use policies set forth in the State's environmental review process, Hawai'i State Land Use law, Hawai'i State Plan, Hawai'i State Functional Plans, Hawai'i Coastal Zone Management Program, Countywide Policy Plan, Draft Maui Island Plan, and Kīhei-Mākena Community Plan are discussed.

5.1 STATE OF HAWAI'I

5.1.1 Environmental Impact Statement, Hawai'i Revised Statutes, Chapter 343

Under HRS Chapter 343 (Environmental Impact Statements), the State legislature found that the quality of humanity's environment is critical to humanity's well being, that humanity's activities have broad and profound effects upon the interrelations of all components of the environment, and that an environmental review process is necessary to integrate the review of environmental concerns with existing planning processes of the State and counties. This process is to alert decision makers to significant environmental effects which may result from the implementation of certain actions. HRS Chapter 343 states that a process of reviewing environmental effects is desirable because environmental consciousness is enhanced, cooperation and coordination are encouraged, and public participation during the review process benefits all parties involved and society as a whole. As such, the State has established a system of environmental review to ensure that environmental concerns are given appropriate consideration in decision making along with economic and technical considerations.

Discussion: *This EIS has been prepared in compliance with environmental requirements outlined in HRS Chapter 343 and Chapter 11-200, HAR. An EIS is required for this project since it will use State funds to purchase the project site and develop the proposed high school. An Environmental Impact Statement Preparation Notice (EISPN) was published in the OEQC The Environmental Notice on November 8, 2009. Comment letters received during the EISPN review period and corresponding response letters are included at the end of Section 8.0.*

5.1.2 Land Use Commission, Hawai'i Revised Statutes, Chapter 205

The State of Hawai'i Land Use Law, Chapter 205, HRS, regulates the classification and uses of lands in the State to accommodate growth and development, and to retain the natural resources in the area. All lands within the State are classified by the State Land Use Commission (LUC), as Urban, Rural, Agricultural, or Conservation. Each district has specific land use restrictions. Any proposed changes to the district boundaries greater than 15-acres in size requires approval by the LUC, whose primary responsibilities are to: (1) administer the law and determine the boundaries for each district; (2) preserve and protect Hawai'i's land; (3) encourage uses to which lands are best suited; and (4) ensure that areas of State concern are addressed in the land-use decision making process. Standards for determining the boundaries for each district and the allowable uses and activities are defined in statute. A discussion of the Kīhei High School project's consistency with the criterion under elements of HRS Chapter 205 and HAR Title 15 and Chapter 15 are discussed in *Table 5-1* and *Table 5-2*.

Table 5-1 ELEMENTS OF HRS Section 205 - Land Use Commission S = Supportive, N/S = Not Supportive, N/A = Not Applicable	S	N/S	N/A
§ 205.2: Districting and classification of lands.			
(a) There shall be four major land use districts in which all lands in the State shall be placed: urban, rural, agricultural, and conservation. The land use commission shall group contiguous land areas suitable for inclusion in one of these four major districts. The commission shall set standards for determining the boundaries of each district, provided that:			X
(1) In the establishment of boundaries of urban districts those lands that are now in urban use and a sufficient reserve area for foreseeable urban growth shall be included;	X		~~X~~
(2) In the establishment of boundaries for rural districts, areas of land composed primarily of small farms mixed with very low density residential lots, which may be shown by a minimum density of not more than one house per one-half acre and a minimum lot size of not less than one-half acre shall be included, except as herein provided;			X
(3) In the establishment of the boundaries of agricultural districts the greatest possible protection shall be given to those lands with a high capacity for intensive cultivation; and			X
(4) In the establishment of the boundaries of conservation districts, the "forest and water reserve zones" provided in Act 234, section 2, Session Laws of Hawaii 1957, are renamed "conservation districts" and, effective as of July 11, 1961, the boundaries of the forest and water reserve zones theretofore established pursuant to Act 234, section 2, Session Laws of Hawaii 1957, shall constitute the boundaries of the conservation districts; provided that thereafter the power to determine the boundaries of the conservation districts shall be in the commission.			X
(a) In establishing the boundaries of the districts in each county, the commission shall give consideration to the master plan or general plan of the county.	X		
(b) Urban districts shall include activities or uses as provided by ordinances or regulations of the county within which the urban district is situated.	X		
(c) Rural districts shall include activities or uses as characterized by low density residential lots of not more than one dwelling house per one—half acre, except as provided by county ordinance pursuant to section 46—4(c), in areas where "city—like" concentration of people, structures, streets, and urban level of services are absent, and where small farms are intermixed with low density residential lots except that within a subdivision, as defined in section 484—1, the commission for good cause may allow one lot of less than one-half acre, but not less than 18,500 square feet, or an equivalent residential density, within a rural subdivision and permit the construction of one dwelling on such lot, provided that all other dwellings in the subdivision shall have a minimum lot size of one-half acre or 21,780 square feet. Such petition for variance may be processed under the special permit procedure. These districts may include contiguous areas which are not suited to low density residential lots or small farms by reason of topography, soils, and other related characteristics. Rural districts shall also include golf courses, golf driving ranges, and golf-related facilities.			X
(d) Agricultural districts shall include activities or uses as characterized by the cultivation of crops, orchards, forage, and forestry; farming activities or uses related to animal husbandry, aquaculture, and game and fish propagation; aquaculture, which means the production of aquatic plant and animal life for food and fiber within ponds and other bodies of water; wind generated energy production for public, private, and commercial use; bona fide agricultural services and uses that support the agricultural activities of the fee or leasehold owner of the property and accessory to any of the above activities, whether or not conducted on the same premises as the agricultural activities to which they are accessory, including but not limited to farm dwellings as defined in section 205-4.5(a)(4), employee housing, farm buildings, mills, storage facilities, processing facilities, vehicle and equipment storage areas, and roadside stands for the sale of products grown on the premises; wind machines and wind farms; small-scale meteorological, air quality, noise, and other scientific and environmental data collection and monitoring facilities occupying less than one-half acre of land, provided that these facilities shall not be used as or equipped for use as living quarters or dwellings; agricultural parks; and open area recreational facilities. For the purposes of this chapter, golf courses and golf driving ranges are prohibited in agricultural districts, except as provided in section 205-4.5(d).		X	

Table 5-1 ELEMENTS OF HRS Section 205 - Land Use Commission S = Supportive, N/S = Not Supportive, N/A = Not Applicable	S	N/S	N/A
(e) Conservation districts shall include areas necessary for protecting watersheds and water sources; preserving scenic and historic areas; providing park lands, wilderness, and beach reserves; conserving indigenous or endemic plants, fish, and wildlife, including those which are threatened or endangered; preventing floods and soil erosion; forestry; open space areas whose existing openness, natural condition, or present state of use, if retained, would enhance the present or potential value of abutting or surrounding communities, or would maintain or enhance the conservation of natural or scenic resources; areas of value for recreational purposes; other related activities; and other permitted uses not detrimental to a multiple use conservation concept.			X

Discussion: *Although the site lies within the Agricultural District, the proposed project site is not considered to be a valued agricultural resource having a capacity for intensive cultivation. The Kīhei High School: Impacts on Agriculture report (July 2011) was prepared for the Kīhei High School project by Plash Econ Pacific, LLC, to identify and assess potential impacts of the project on agriculture. (Appendix B). The findings of the report indicate that because the property has soils with poor agricultural viability and lacks irrigation water, it is unsuitable for most commercial field crops grown in Hawai'i. ALISH designates only 2% (1.7 acres) of the site soils as Prime and the Land Study Bureau has designated all the project site soils as E, the lowest rating. Areas within the property containing higher quality soils are isolated from other suitable agricultural lands and are too small to provide significant agricultural opportunities. It should be noted that Kīhei has a large supply of low-quality agricultural land similar to that of the proposed school site. High-quality farmland is available in Central and West Maui due to past closures of sugarcane and pineapple plantations.*

The applicant will apply for a State Land Use District Boundary Amendment to change the site's Agricultural designation to Urban. The proposed reclassification would support future plans of the County of Maui, which are detailed in the Island Plan. The site is located within the "urban growth boundary" of the County's December 2009 Draft Maui Island Plan Directed Growth Map (Figure 3-1) and is designated for development of a future high school in the County's December 2009 Draft Maui Island Plan Public Facility/Infrastructure Improvements Map (Figure 3-2). The project site is also indicated for development of public facilities in the County's Kīhei-Mākena Community Plan (Figure 1-7). The Kīhei High School project is an appropriate use within the Urban District and would support the educational needs of the growing population in the Kīhei-Mākena region.

§ 205-17: Land use commission decision-making criteria. In its review of any petition for reclassification of district boundaries pursuant to this chapter, the commission shall specifically consider the following:			
(1) The extent to which the proposed reclassification conforms to the applicable goals, objectives, and policies of the Hawaii State Plan and relates to the applicable priority guidelines of the Hawaii state plan and the adopted functional plans;	X		
(2) The extent to which the proposed reclassification conforms to the applicable district standards;	X		
(3) The impact of the proposed reclassification on the following areas of state concern:			
(A) Preservation or maintenance of important natural systems or habitats;			X
(B) Maintenance of valued cultural, historical, or natural resources;			X
(C) Maintenance of other natural resources relevant to Hawaii's economy, including agricultural resources;	X		
(D) Commitment of state funds and resources;	X		
(E) Provision for employment opportunities and economic development; and	X		
(F) Provision for housing opportunities for all income groups, particularly the low, low-moderate, and gap groups;			X
(4) The standards and criteria for the reclassification or rezoning of important agricultural lands in section 205-50; and	X		
(5) The representations and commitments made by the petitioner in securing a boundary change.	X		

Table 5-1 ELEMENTS OF HRS Section 205 - Land Use Commission S = Supportive, N/S = Not Supportive, N/A = Not Applicable	**S**	**N/S**	**N/A**
Discussion: *As detailed in Section 5.1.4 and 5.1.6, the proposed reclassification conforms to applicable goals, objectives, and policies of the Hawai'i State Plan and State Functional Plans. The reclassification would support the development of the proposed Kīhei High School project. As part of this EIS, various environmental surveys and studies (i.e. Botanical, Mammalian and Avian surveys, AIS, CIA, and Agriculture impact report) were conducted to ensure the project would not result in significant impacts on natural or cultural resources on or within the vicinity of the site.* *Rana Biological Consultants, Inc. conducted botanical, mammalian and avian surveys on the Kīhei High School project site. No Federal or State listed endangered, threatened, proposed, or candidate botanical resources were found. In addition, no species currently listed, or proposed for listing under either the federal or the State endangered species programs were detected. Therefore, no significant adverse impacts to natural resources are anticipated. Refer to Section 4.1.6 and 4.1.7.* *An AIS was prepared for the project. One ~~(1)~~ site (SIHP No. 50-50-9-6393) was re-identified within the study parcel consisting of historic era rock piles and one ~~(1)~~ alignment. Although SIHP No. 50-50-10-6393 will be adversely impacted through project construction, it is believed that the features has been documented to the fullest extent. The SHPD accepted the AIS on February 12, 2010. Refer to Section 4.2.3.* *The Kīhei High School: Impacts on Agriculture report was prepared for the Kīhei High School project by Plash Econ Pacific, LLC, to identify and assess potential impacts of the project on agriculture. The findings of the report indicate that although the property is designated as Agricultural, it is not considered to be a viable agricultural resource. The proposed site consists of poor soils and lacks irrigation water; therefore, it is unsuitable for most commercial field crops grown in Hawai'i. Refer to Section 4.1.3* *Educational institutions build strong communities by enhancing the mental and physical well-being of youth. They also provide new opportunities for employment in regions where schools were not previously present. The proposed development will provide opportunities for short and long-term employment to support construction and operations of the project. The new high school will also result in significant expenditures that will have a positive impact on the economies of the State and County. With significantly increasing capital investment and capital flow in the region, economic benefits will result from increased employment and tax revenues.* *Although the project site is currently designated Agricultural, it does not have a high capacity for agricultural production. ALISH designates only 2% (1.7 acres) of the site soils as Prime and the Land Study Bureau has designated all the project site soils as E, the lowest rating. Project lands are contiguous to other agricultural lands that are historically associated with ranching and grazing activity. Sporadic grazing occur on the project site, however, the site is generally not used for agricultural activities. The applicant will apply for a State Land Use District Boundary Amendment to change the site's Agricultural designation to Urban. The project site meets the standards of HAR Section 15-15-18 as it is adjacent to existing "city-like" development, services and infrastructure. The site is designated for development of public facilities in the County's Kīhei-Mākena Community Plan (Figure 1-7) and for a future high school in the County's December 2009 Draft Maui Island Plan Public Facility/Infrastructure Improvements Map (Figure 3-2). The project area is also located within the "urban growth boundary" of the County's December 2009 Draft Maui Island Plan Directed Growth Map (Figure 3-1).*			

5.1.3 Hawai'i Administrative Rules, Title 15, Chapter 15

Table 5-2 ELEMENTS OF HAR TITLE 15, CHAPTER 15 S = Supportive, N/S = Not Supportive, N/A = Not Applicable	S	N/S	N/A
§ 15-15-17 Districts; district maps.			
(a) In order to effectuate the purpose of chapter 205 HRS, all the lands in the State shall be divided and placed into one of the four land use districts: (1) "U" urban district; (2) "A" agricultural district; (3) "C" commercial district; or (4) "R" rural district.	~~X~~		X
(b) The boundaries of land use districts are shown on the maps entitled "Land Use District Boundaries, dated December 20, 1974," as amended, maintained and under the custody of the commission. Not all ocean areas and offshore and outlying islands of the State in the conservation district are shown when deemed unnecessary to do so.	~~X~~		X
Discussion: *The proposed 77.2 acre Kīhei High School site is within the State Agricultural District. The DOE proposes to develop a new high school in Kīhei designed to accommodate 1,650 students and associated staff for grades 9-12. This type of development is not permitted within the State Agricultural District; however, it is permitted in the State Urban District. Therefore, the 77.2 acres designated as Agricultural require a SLUBA from Agricultural to Urban.*			
§15-15-18: Standards for determining "U" urban district boundaries. Except as otherwise provided in this chapter, in determining the boundaries for the "U" urban district, the following standards shall be used:			
(1) It shall include lands characterized by "city-like" concentrations of people, structures, streets, urban level of services and other related land uses;	~~X~~	X	
(2) It shall take into consideration the following specific factors:			
(A) Proximity to centers of trading and employment except where the development would generate new centers of trading and employment;	X		
(B) Availability of basic services such as schools, parks, wastewater systems, solid waste disposal, drainage, water, transportation systems, public utilities, and police and fire protection; and	X		
(C) Sufficient reserve areas for foreseeable urban growth;	X		
(3) It shall include lands with satisfactory topography, drainage, and reasonably free from the danger of any flood, tsunami, unstable soil condition, and other adverse environmental effects;	X		
(4) Land contiguous with existing urban areas shall be given more consideration than non-contiguous land, and particularly when indicated for future urban use on state or county general plans;	X		
(5) It shall include lands in appropriate locations for new urban concentrations and shall give consideration to areas of urban growth as shown on the state and county general plans;	X		
(6) It may include lands which do not conform to the standards in paragraphs (1) to (5)			
(A) When surrounded by or adjacent to existing urban development; and	X		~~X~~
(B) Only when those lands represent a minor portion of this district;			X
(7) It shall not include lands, the urbanization of which will contribute toward scattered spot urban development, necessitating unreasonable investment in public infrastructure or support services; and	X		
(8) It may include lands with a general slope of twenty percent or more if the commission finds that those lands are desirable and suitable for urban purposes and that the design and construction controls, as adopted by any federal, state, or county agency, are adequate to protect the public health, welfare and safety, and the public's interests in the aesthetic quality of the landscape.			X

Table 5-2 ELEMENTS OF HAR TITLE 15, CHAPTER 15 S = Supportive, N/S = Not Supportive, N/A = Not Applicable	S	N/S	N/A
Discussion: *Kīhei High School is consistent with the Urban standards. While areas directly to the east of the project site are surrounded by Agriculture district lands, areas to west are surrounded by Urban district lands that are either being used for residential development or are planned for residential and other urban development. Therefore, the reclassification of the high school site will not contribute to scattered spot urban development.* *The Kīhei High School site is located within the "urban growth boundary" of the County's December 2009 Draft Maui Island Plan Directed Growth Map (Figure 3-1) and is designated for development of a future high school in the County's December 2009 Draft Maui Island Plan Public Facility/Infrastructure Improvements Map (Figure 3-2). The project site is also development of public facilities in the County's Kīhei-Mākena Community Plan (Figure 1-7).* *The project site is proximate to residential neighborhoods, supporting services, employment and businesses in Kīhei; and, is in an area designated for future growth and urban use. While some basic services are already available near the site, the project will develop a high school campus and recreational facilities. Additionally, the applicant will construct on-site and off-site infrastructure to support the project in coordination with the County. The project is exempt from Maui County's water availability policy (Maui County Code Chapter 14.12 and will meet its potable water requirements by applying for a water meter and obtaining necessary approvals from the Maui Department of Water Supply. The proposed high school will help to support the growing population of the Kīhei-Mākena region by providing an additional educational resource for existing and future area residents.* *The Kīhei High School site is developable, with satisfactory topography consistent with urban standards. Topography over the majority of the site is composed of gently sloping smooth terrain with occasional weathered basalt outcrops at ground surface areas throughout the site (Figure 4-1). The existing site generally slopes downward to the west and southwest with onsite ground elevations ranging from approximately 40 feet AMSL in the southwest to an elevation of approximately 110 feet AMSL in the northeast boundary with an average slope of approximately 11%. The site is free of potentially adverse environmental conditions, including flood, tsunami, and unstable soil conditions.*			
§15-15-77: Decision-making criteria for boundary amendments.			
(a) The commission shall not approve an amendment of a land use district boundary unless the commission finds upon the clear preponderance of the evidence that the proposed boundary amendment is reasonable, not violative of section 205-2, HRS, and consistent with the policies and criteria established pursuant to sections 205-16, 205-17, and 205A-2, HRS.	X		
(b) In its review of any petition for reclassification of the district boundaries pursuant to this chapter, the commission shall specifically consider the following:			
(1) The extent to which the proposed reclassification conforms to the applicable goals, objectives, and policies of the Hawai'i state plan and relates to the applicable priority guidelines of the Hawai'i state plan and the adopted functional plans;	X		
(2) The extent to which the proposed reclassification conforms to the applicable district standards;	X		
(3) The impact of the proposed reclassification on the following areas of state concern:			
(A) Preservation or maintenance of important natural systems or habitats;			X

Table 5-2 ELEMENTS OF HAR TITLE 15, CHAPTER 15 S = Supportive, N/S = Not Supportive, N/A = Not Applicable	**S**	**N/S**	**N/A**
(B) Maintenance of valued cultural, historical, or natural resources;			X
(C) Maintenance of other natural resources relevant to Hawai'i's economy including but not limited to agricultural resources;	X		
(D) Commitment of state funds and resources;	X		
(E) Provisions for employment opportunities and economic development; and	X		
(F) Provision for housing opportunities for all income groups, particularly the low, low-moderate, and gap groups;			X
(4) In establishing the boundaries of the districts in each county, the commission shall give consideration to the general plan of the county in which the land is located.	X		
(5) The representations and commitments made by the petitioner in securing a boundary change, including a finding that the petitioner has the necessary economic ability to carry out the representations and commitments relating to the proposed use or development; and	X		
(6) Lands in intensive agricultural use for two years prior to date of filing of a petition or lands with a high capacity for intensive agricultural use shall not be taken out of the agricultural district unless the commission finds either that the action:	~~X~~		X
(A) Will not substantially impair actual or potential agricultural production in the vicinity of the subject property or the county or State; or	~~X~~		X
(B) Is reasonably necessary for urban growth.	~~X~~		X
(c) Amendments of a land use district boundary in conservation districts involving land areas fifteen acres or less shall be determined by the commission pursuant to this subsection and section 205-3.1, HRS.			X
(d) Amendments of land use district boundary in other than conservation districts involving land areas fifteen acres or less shall be determined by the appropriate county land use decision-making authority.			X
(e) Amendments of land use district boundary involving land areas greater fifteen acres or less shall be determined by the commission, pursuant to this subsection and section 205-3.1, HRS.	X		

Discussion: *Kīhei High School is consistent with the goals, objectives, policies, and priority guidelines of the Hawai'i State Plan, State Functional Plans, Countywide Policy Plan, December 2009 Draft Maui Island Plan and Kīhei-Mākena Community Plan. The proposed reclassification conforms to the Urban District standards and would allow the subject property to conform to the County's future plans. The Kīhei High School site is located within the "urban growth boundary" of the County's December 2009 Draft Maui Island Plan Directed Growth Map (Figure 3-1) and is designated for development of a future high school in the County's December 2009 Draft Maui Island Plan Public Facility/Infrastructure Improvements Map (Figure 3-2). The reclassification would accommodate the projected population growth of the County and would support current State land use classifications of the adjacent areas particularly to the east, which is almost entirely within the Urban district.*

Because the project site is vacant and undeveloped, development of Kīhei High School will alter much of the existing landscape. However, technical studies and surveys of the area have been carried out to assess anticipated impacts to the natural environment. No significant natural systems or habitats have been identified within the project area. Additionally, the site is not considered to be a valued agricultural resource due to the poor quality of the soil. A CIA and an AIS were completed for the proposed project. The findings of these studies indicate that the project will not result in significant adverse impacts to cultural resources or historic properties within the site.

Table 5-2 ELEMENTS OF HAR TITLE 15, CHAPTER 15 S = Supportive, N/S = Not Supportive, N/A = Not Applicable	S	N/S	N/A
Costs associated with processing of the Final EIS, proposed district boundary amendment and other land use entitlements is, in part, a joint commitment of State resources through the DOE. The applicant will also coordinate funding sources for site work and the construction of on-site and off-site infrastructure. *Kīhei High School will contribute to the economic development of both the County and the State by creating employment opportunities in the construction field, as well as long-term employment associated with the operations of the school, all of which will increase State and County revenues through real property and personal income taxes. Kīhei High School fulfills State and County objectives of providing new educational opportunities to meet the growing needs of the Kīhei-Mākena region.* *The applicant is committed to securing a SLUBA and will meet all applicable requirements. Kīhei High School will meet the objectives, policies, and guidelines of various State plans, Countywide Policy Plan, December 2009 Draft Maui Island Plan and Kīhei-Mākena Community Plan. The applicability and the extent to which Kīhei High School conforms to these plans are discussed in further detail below.*			
§15-15-78: Incremental districting.			
(a) If it appears to the commission that full development of the subject property cannot substantially be completed within ten years after the date of the commission's approval and that the incremental development plan submitted by the petitioner can be substantially completed, and if the commission is satisfied that all other pertinent criteria for redistricting the premises or part thereof are present, then the commission may:			
(1) Grant the petitioner's request to reclassify the entire property; or	X		
(2) Redistrict only that portion of the premises which the petitioner plans to develop first and upon which it appears that substantial development can be completed within ten years after the date of the commission's approval. At the same time, the commission shall indicate its approval of the future redistricting of the total premises requested by the petitioner, or so much thereof as shall be justified as appropriate therefore by the petitioner, such approval to indicate a schedule of incremental redistricting over successive periods not to exceed ten years each. The commission may reclassify the subject property, if it finds such a change is justified.			X
(b) In reclassifying property on an incremental basis, in addition to standards in this subchapter, the commission may consider projected population growth for the area, other lands reclassified in the area, the availability and impacts on resources, and the desirability of directing growth and development to the area on over a long term basis.			X
(c) Upon receipt of an application for redistricting of the second and subsequent increments of premises for which previous approval for incremental development has been granted by the commission, substantial completion of any offsite and onsite improvements of the development, in accordance with the approved incremental plan, of the preceding increment redistricted will be prima facie proof that the approved incremental plan complies with the requirements for boundary amendment.			X
(d) The following are procedures for processing incremental districting applications:			
(1) The petitioner shall file an original and fifteen copies of an application to approve the second or subsequent increments utilizing the same docket number as the original petition;			X
(2) The petitioner shall serve copies of the application on all parties of record in the original proceeding;			X

Table 5-2 ELEMENTS OF HAR TITLE 15, CHAPTER 15 S = Supportive, N/S = Not Supportive, N/A = Not Applicable	S	N/S	N/A
(3)The application shall include facts, affidavits, and other documentation, including a metes and bounds description and map, in support of the fact that the petitioner has substantially completed offsite and onsite improvements, complied with chapter 343, HRS, where applicable , and complied with conditions of the commission approval in accordance with the approved incremental plan of the preceding increment redistricted;			X
(4) A prehearing conference may be conducted pursuant to section 15-15-57;			X
(5) A notice of hearing shall be published notifying the public of the time and place the application will be considered by the commission and will provide for the admission of the public witnesses;			X
(6) The procedure for hearing the application will be subject to the timeframes presently existing for the district boundary changes, and the provisions of section 15-15-13; and			X
(7) The petitioner shall provide notice of the application to all persons having a property interest in the increment being redistricted.			X

Discussion: *While the Kīhei High School project is planned to be constructed in two phases (Figure 2-2), the applicant will request to reclassify the entire property as part of the SLUBA. The Kīhei High School project is designed as a campus master plan that will accommodate existing and future growth of the Kīhei-Mākena region. Phase I is anticipated to take approximately two ~~(2)~~ years to complete prior to school opening projected for 2016, provided funds are available. Construction of Phase I would include complete facilities for the high school campus to accommodate approximately 800 students, ~~and would include~~ including classroom houses, administrative/student center, library, cafeteria, selected elective buildings and selected athletics facilities. Phase I would also include construction of all on-site and off-site backbone infrastructure improvements for the entire campus site, including the ~~Kūlanihāko'i Street extension,~~ campus driveways, fire lanes, parking and walkways, and Pi'ilani Highway improvements including traffic signalization, grading, drainage and utilities.*

Phase II would be developed when enrollment increases justify the improvements and State funding can be secured. Anticipated completion of Phase II construction would be approximately 10 years after the completion of Phase I. The design and construction schedule will be subject to approval of the Legislature and release of funds by the Governor. Phase II would accommodate an additional 850 students and wcould include construction of the final classroom house(s), remaining electives buildings, and remaining athletics facilities, an auditorium and a swimming pool. Potential future facilities would include construction of an auditorium and swimming pool. No set timeframe has been established for construction of these buildings.

The buildings scheduled to be constructed in Phase II and in the future are integrated in the campus master plan, without regard to locating all of Phase II and future improvements in a single contiguous area. The design and construction schedule for Phase II will not be predetermined, but will be based on enrollment increases and availability of State funding. Subject to approval of the Legislature and release of funds by the Governor, individual elements of Phase II could be constructed separately, with projected completion of Phase II construction scheduled to be approximately 10 years after the completion of Phase I. Backbone infrastructure and facilities for the entire campus site will be developed across the entire parcels during Phase I. Therefore the entire project site should be reclassified to the Urban district at one time rather than in increments.

~~Thus it would not be appropriate for the Land Use Commission to approve this school project in increments.~~

5.1.4 Hawai'i State Plan, Hawai'i Revised Statutes, Chapter 226

In 1978, the Hawai'i State Legislature found a need to improve the planning process in the State, to increase the effectiveness of government and private actions, to improve the coordination among different agencies and levels of government, and to provide for the wise use of Hawai'i's resources to guide the future development of the State. Under HRS Chapter 226 (Hawai'i State Planning Act), the Hawai'i State Plan serves as a guide for the future long-range development of the State. The Hawai'i State Plan identifies the goals, objectives, policies, and priorities for the State; provides a basis for determining priorities and allocating limited resources, such as public funds, services, human resources, land, energy, water, and other resources; improves coordination of Federal, State, and County plans, policies, programs, projects, and regulatory activities; and establishes a system for plan formulation and program coordination to provide for an integration of all major State and County activities.

Act 181, Session Laws of Hawai'i (SLH) 2011, was signed into law on July 5, 2011. Act 181 provides an update to Hawai'i Revised Statutes Chapter 226 by adding a new section to Part III. Act 181 is included in the evaluation below.

Table 5-3 assesses and evaluates how the Kīhei High School project supports the Hawai'i State Plan, as promulgated under HRS Chapter 226 and Act 181 SLH 2011.

Table 5-3 HAWAI'I STATE PLAN, HRS, CHAPTER 226 S = Supportive, N/S = Not Supportive, N/A = Not Applicable		**S**	**N/S**	**N/A**
Section 226-4: State Goals. In order to guarantee, for the present and future generations, those elements of choice and mobility that insure that individuals and groups may approach their desired levels of self-reliance and self-determination, it shall be the goal of the State to achieve:				
(1)	A strong, viable economy, characterized by stability, diversity, and growth, that enables the fulfillment of the needs and expectations of Hawai'i's present and future generations	X		
(2)	A desired physical environment, characterized by beauty, cleanliness, quiet, stable natural systems, and uniqueness, that enhances the mental and physical well-being of the people.	X		
(3)	Physical, social and economic well-being, for individuals and families in Hawai'i, that nourishes a sense of community responsibility, of caring, and of participation in community life.	X		
Discussion: *Educational institutions build strong communities by enhancing the mental and physical well-being of youth. They also provide new opportunities for employment in regions where schools were not previously present. The Kīhei High School campus would be designed for an enrollment of 1,650 Kīhei-Mākena youth who would have an opportunity to attend a school in their region of residence. The high school would also be designed to incorporate athletic facilities and programs, promote physical well-being of youth, and encourage participation by families and the community. The community will be encouraged to utilize the new school as a community resource as Kīhei High School plans on fostering partnerships with the community and the private sector.*				
Section 226-5: Objective and Policies for Population.				
(A)	It shall be the objective in planning for the State's population to guide population growth to be consistent with the achievement of physical, economic, and social objectives contained in this chapter;			
(B)	To achieve the population objective, it shall be the policy of this State to:			
(1)	Manage population growth statewide in a manner that provides increased opportunities for Hawai'i's people to pursue their physical, social and economic aspirations while recognizing the unique needs of each county.			X

Table 5-3 HAWAI'I STATE PLAN, HRS, CHAPTER 226 S = Supportive, N/S = Not Supportive, N/A = Not Applicable		S	N/S	N/A
(2)	Encourage an increase in economic activities and employment opportunities on the neighbor islands consistent with community needs-and desires.	X		
(3)	Promote increased opportunities for Hawai'i's people to pursue their socioeconomic aspirations throughout the islands.			X
(4)	Encourage research activities and public awareness programs to foster and understanding of Hawai'i's limited capacity to accommodate population needs and to address concerns resulting from an increase in Hawai'i's population.			X
(5)	Encourage federal actions and coordination among major governmental agencies to promote a more balanced distribution of immigrants among states, provided that such actions do not prevent the reunion of immediate family members.			X
(6)	Pursue an increase in federal assistance for states with a greater proportion of foreign immigrants relative to their state's population.			X
(7)	Plan the development and availability of land and water resources in a coordinated manner so as to provide for the desired levels of growth in each geographic area.			X
Discussion: *The Kīhei High School project is consistent with the State's goals to develop land resources to meet the level of growth in the Kīhei region. Development of the land will provide necessary educational services to the growing population in the region. From April 1, 1990 to April 1, 2000, the residential population on the County of Maui grew from 100,504 to 128,241, a 29 percent change over the span of a decade. The resident population of the Kīhei-Mākena region in particular experienced significant growth in the same decade from 15,365 to 22,870, a 49 percent increase. The Kīhei-Mākena region was projected to have a 2010 population of 28,124 people. The future 2025 population estimate for the Kīhei-Mākena region is 35,962 persons, or a 28 percent increase over the 2010 population (County Planning Department, June 2006).*				
Section 226-6: Objectives and Policies for the Economy in General.				
(A)	Planning for the State's economy in general shall be directed toward achievement of the following objectives:			
(1)	Increased and diversified employment opportunities to achieve full employment, increased income and job choice, and improved living standards for Hawai'i's people.	X		
(2)	A steadily growing and diversified economic base that is not overly dependent on a few industries, and includes the development and expansion of industries on the neighbor islands.			X
(B)	To achieve the general economic objectives, it shall be the policy of this State to:			
(1)	Expand Hawai'i's national and international marketing, communication, and organizational ties, to increase the State's capacity to adjust to and capitalize upon economic changes and opportunities occurring outside the State.			X
(2)	Promote Hawai'i as an attractive market for environmentally and socially sound investment activities that benefit Hawai'i's people.			X
(3)	Seek broader outlets for new or expanded Hawai'i business investments.			X
(4)	Expand existing markets and penetrate new markets for Hawai'i's products and services.			X
(5)	Assure that the basic economic needs of Hawai'i's people are maintained in the event of disruptions in overseas transportation.			X
(6)	Strive to achieve a level of construction activity responsive to, and consistent with, state growth objectives.	X		
(7)	Encourage the formation of cooperatives and other favorable marketing arrangements at the local or regional level to assist Hawai'i's small scale producers, manufacturers, and distributors.			X
(8)	Encourage labor-intensive activities that are economically satisfying and which offer opportunities for upward mobility.			X
(9)	Foster greater cooperation and coordination between the government and private sectors in developing Hawai'i's employment and economic growth opportunities.			X
(10)	Stimulate the development and expansion of economic activities which will benefit areas with substantial or expected employment problems.			X
(11)	Maintain acceptable working conditions and standards for Hawai'i's workers.			X

Table 5-3 HAWAI'I STATE PLAN, HRS, CHAPTER 226 S = Supportive, N/S = Not Supportive, N/A = Not Applicable		S	N/S	N/A
(12)	Provide equal employment opportunities for all segments of Hawai'i's population through affirmative action and nondiscrimination measures.			X
(13)	Encourage businesses that have favorable financial multiplier effects within Hawai'i's economy.			X
(14)	Promote and protect intangible resources in Hawai'i, such as scenic beauty and the Aloha spirit, which are vital to a healthy economy.			X
(15)	Increase effective communication between the educational community and the private sector to develop relevant curricula and training programs to meet future employment needs in general, and requirements of new, potential growth industries in particular.	X		
(16)	Foster a business climate in Hawai'i - including attitudes, tax and regulatory policies, and financial and technical assistance programs--that is conducive to the expansion of existing enterprises and the creation and attraction of new business and industry.			X
Discussion: *The proposed development will provide opportunities for short and long-term employment within the Kīhei area. It is a goal of the development that the school serves not only youth, but be a center for the community as well. The proposed Kīhei High School project plans on fostering partnerships with the community and private sector.*				
Section 226-7 Objectives and Policies for the Economy – Agriculture.				
(A)	Planning for the State's economy with regard to agriculture shall be directed towards achievement of the following objectives:			
(1)	Viability of Hawai'i's sugar and pineapple industries.			X
(2)	Growth and development of diversified agriculture throughout the State.			X
(3)	An agriculture industry that continues to constitute a dynamic and essential component of Hawai'i's strategic, economic, and social well-being.			X
(B)	To achieve the agriculture objectives, it shall be the policy of this State to:			
(1)	Establish a clear direction for Hawai'i's agriculture through stakeholder commitment and advocacy.			X
(2)	Encourage agriculture by making best use of natural resources.			X
(3)	Provide the governor and the legislature with information and options needed for prudent decision making for the development of agriculture.			X
(4)	Establish strong relationships between the agricultural and visitor industries for mutual marketing benefits.			X
(5)	Foster increased public awareness and understanding of the contributions and benefits of agriculture as a major sector of Hawai'i's economy.			X
(6)	Seek the enactment and retention of federal and state legislation that benefits Hawai'i's agricultural industries.			X
(7)	Strengthen diversified agriculture by developing an effective promotion, marketing, and distribution system between Hawai'i's producers and consumer markets locally, on the continental United States, and internationally.			X
(8)	Support research and development activities that provide greater efficiency and economic productivity in agriculture.			X
(9)	Enhance agricultural growth by providing public incentives and encouraging private initiatives.			X
(10)	Assure the availability of agriculturally suitable lands with adequate water to accommodate present and future needs.			X
(11)	Increase the attractiveness and opportunities for an agricultural education and livelihood.			X
(12)	Expand Hawai'i's agricultural base by promoting growth and development of flowers, tropical fruits and plants, livestock, feed grains, forestry, food crops, aquaculture, and other potential enterprises.			X
(13)	Promote economically competitive activities that increase Hawai'i's agricultural self-sufficiency.			X
(14)	Promote and assist in the establishment of sound financial programs for diversified agriculture.			X
(15)	Institute and support programs and activities to assist the entry of displaced agricultural workers into alternative agricultural or other employment.			X
(16)	Facilitate the transition of agricultural lands in economically non-feasible agricultural production to economically viable agricultural uses.		X	

Table 5-3 HAWAI'I STATE PLAN, HRS, CHAPTER 226 S = Supportive, N/S = Not Supportive, N/A = Not Applicable		S	N/S	N/A
Discussion: *Although the site lies within the Agricultural District, the project site is not considered to be a valued agricultural resource. State and County objectives and policies related to agriculture are typically not applicable to the proposed project because the property has soils with poor agricultural viability. ALISH designates only 2% (1.7 acres) of the site soils as Prime and the Land Study Bureau has designated all the project site soils as E, the lowest rating. Further, areas within the property containing higher quality soils are isolated from other suitable agricultural lands and are too small to provide significant agricultural opportunities. The applicant will be applying for a State Land Use District Boundary Amendment to change the site's Agricultural designation to Urban. The site is designated for development of public facilities in the County's Kīhei-Mākena Community Plan (Figure 1-7) and designated for a future high school in the County's December 2009 Draft Maui Island Plan Public Facility/Infrastructure Improvements Map (Figure 3-2).*				
Section 226-8 Objective and Policies for the Economy - Visitor Industry.				
(A)	Planning for the State's economy with regard to the visitor industry shall be directed towards the achievement of the objective of a visitor industry that constitutes a major component of steady growth for Hawai'i's economy.			
(B)	To achieve the visitor industry objective, it shall be the policy of this State to:			
(1)	Support and assist in the promotion of Hawai'i's visitor attractions and facilities.			X
(2)	Ensure that visitor industry activities are in keeping with the social, economic, and physical needs and aspirations of Hawai'i's people.			X
(3)	Improve the quality of existing visitor destination areas.			X
(4)	Encourage cooperation and coordination between the government and private sectors in developing and maintaining well-designed, adequately serviced visitor industry and related developments which are sensitive to neighboring communities and activities.			X
(5)	Develop the industry in a manner that will continue to provide new job opportunities and steady employment for Hawai'i's people.			X
(6)	Provide opportunities for Hawai'i's people to obtain job training and education that will allow for upward mobility within the visitor industry.			X
(7)	Foster a recognition of the contribution of the visitor industry to Hawai'i's economy and the need to perpetuate the aloha spirit.			X
(8)	Foster an understanding by visitors of the aloha spirit and of the unique and sensitive character of Hawai'i's cultures and values.			X
Discussion: *The Kīhei High School project will not affect the visitor industry economy; therefore, this objective and these policies are not directly applicable to the project.*				
Section 226-9 Objective and Policies for the Economy - Federal Expenditures.				
(A)	Planning for the State's economy with regard to federal expenditures shall be directed towards achievement of the objective of a stable federal investment base as an integral component of Hawai'i's economy.			
(B)	To achieve the federal expenditures objective, it shall be the policy of this State to:			
(1)	Encourage the sustained flow of federal expenditures in Hawai'i that generates long-term government civilian employment.			X
(2)	Promote Hawai'i's supportive role in national defense.			X
(3)	Promote the development of federally supported activities in Hawai'i that respect state-wide economic concerns, are sensitive to community needs, and minimize adverse impacts on Hawai'i's environment.			X
(4)	Increase opportunities for entry and advancement of Hawai'i's people into federal government service.			X
(5)	Promote federal use of local commodities, services, and facilities available in Hawai'i.			X
(6)	Strengthen federal-state-county communication and coordination in all federal activities that affect Hawai'i.			X

Table 5-3 HAWAI'I STATE PLAN, HRS, CHAPTER 226 S = Supportive, N/S = Not Supportive, N/A = Not Applicable	S	N/S	N/A
(7) Pursue the return of federally controlled lands in Hawai'i that are not required for either the defense of the nation or for other purposes of national importance, and promote the mutually beneficial exchanges of land between federal agencies, the State, and the counties.			X
Discussion: *The Kīhei High School project will not affect Federal expenditures; therefore, this objective and these policies are not directly applicable to the project.*			
Section 226-10 Objective and Policies for the Economy - Potential Growth Activities. (A) Planning for the State's economy with regard to potential growth activities shall be directed towards achievement of the objective of development and expansion of potential growth activities that serve to increase and diversify Hawai'i's economic base. (B) To achieve the potential growth activity objective, it shall be the policy of this State to:			
(1) Facilitate investment and employment in economic activities that have the potential for growth such as diversified agriculture, aquaculture, apparel and textile manufacturing, film and television production, and energy and marine-related industries.			X
(2) Expand Hawai'i's capacity to attract and service international programs and activities that generate employment for Hawai'i's people.			X
(3) Enhance and promote Hawai'i's role as a center for international relations, trade, finance, services, technology, education, culture, and the arts.			X
(4) Accelerate research and development of new energy-related industries based on wind, solar, ocean, and underground resources and solid waste.			X
(5) Promote Hawai'i's geographic, environmental, social, and technological advantages to attract new economic activities into the State.			X
(6) Provide public incentives and encourage private initiative to attract new industries that best support Hawai'i's social, economic, physical, and environmental objectives.			X
(7) Increase research and the development of ocean-related economic activities such as mining, food production, and scientific research.			X
(8) Develop, promote, and support research and educational and training programs that will enhance Hawai'i's ability to attract and develop economic activities of benefit to Hawai'i.			X
(9) Foster a broader public recognition and understanding of the potential benefits of new, growth-oriented industry in Hawai'i.			X
(10) Encourage the development and implementation of joint federal and state initiatives to attract federal programs and projects that will support Hawai'i's social, economic, physical, and environmental objectives.			X
(11) Increase research and development of businesses and services in the telecommunications and information industries.			X
Discussion: *The Kīhei High School project will not affect potential economy growth activities; therefore, this objective and these policies are not directly applicable to the project. However, the project may be pursuing collaborative learning partnerships with science and technology firms in the vicinity of the project area.*			
Section 226-10.5 Objectives and Policies for the Economy - Information Industry. (A) Planning for the State's economy with regard to the information industry shall be directed toward the achievement of the objective of positioning Hawai'i as the leading dealer in information businesses and services in the Pacific Rim. (B) To achieve the information industry objective, it shall be the policy of this State to:			
(1) Encourage the continued development and expansion of the telecommunications infrastructure serving Hawai'i to accommodate future growth in the information industry;			X
(2) Facilitate the development of new business and service ventures in the information industry which will provide employment opportunities for the people of Hawai'i;			X
(3) Encourage greater cooperation between the public and private sectors in developing and maintaining a well- designed information industry;			X
(4) Ensure that the development of new businesses and services in the industry are in keeping with the social, economic, and physical needs and aspirations of Hawai'i's people;			X

Table 5-3 HAWAI'I STATE PLAN, HRS, CHAPTER 226 S = Supportive, N/S = Not Supportive, N/A = Not Applicable		S	N/S	N/A
(5)	Provide opportunities for Hawai'i's people to obtain job training and education that will allow for upward mobility within the information industry;	X		
(6)	Foster a recognition of the contribution of the information industry to Hawai'i's economy; and			X
(7)	Assist in the promotion of Hawai'i as a broker, creator, and processor of information in the Pacific.			X

Discussion: *While the applicant supports the State's policies for the economy in regard to the information industry, most are not directly applicable to the proposed project. However, the development of the high school would incorporate the latest telecommunications infrastructure to support the education of the student body and supporting staff. The school will also provide diverse educational opportunities for students helping them to obtain future upward mobility within the information industry.*

Section 226-11 Objectives and Policies for the Physical Environment - Land-based, Shoreline, and Marine Resources.				
(A)	Planning for the State's physical environment with regard to land-based, shoreline and marine resources shall be directed towards achievement of the following objectives:			
(1)	Prudent use of Hawai'i's land-based, shoreline, and marine resources.	X		
(2)	Effective protection of Hawai'i's unique and fragile environmental resources.	X		
(B)	To achieve the land-based, shoreline, and marine resources objectives, it shall be the policy of this State to:			
(1)	Exercise an overall conservation ethic in the use of Hawai'i's natural resources.	X		
(2)	Ensure compatibility between land-based and water-based activities and natural resources and ecological systems.	X		
(3)	Take into account the physical attributes of areas when planning and designing activities and facilities.	X		
(4)	Manage natural resources and environs to encourage their beneficial and multiple uses without generating costly or irreparable environmental damage.	X		
(5)	Consider multiple uses in watershed areas, provided such uses do not detrimentally affect water quality and recharge functions.			X
(6)	Encourage the protection of rare or endangered plant and animal species and habitats native to Hawai'i.			X
(7)	Provide public incentives that encourage private actions to protect significant natural resources from degradation or unnecessary depletion.			X
(8)	Pursue compatible relationships among activities, facilities and natural resources.	X		
(9)	Promote increased accessibility and prudent use of inland and shoreline areas for public recreational, educational and scientific purposes.	X		

Discussion: *The project is land-based and inland, and no direct impacts on shoreline or marine resources are anticipated. Development of the project site as a school would constitute a prudent use of inland resources.*

As discussed in Section 4.1.6 no federal or State listed endangered, threatened, proposed, or candidate botanical resources on or in the immediate vicinity of the project site were found. The results of the botanical survey indicate there are no special concerns related to botanical resources in the Kīhei High School project area.

The development and operation of the project is also not expected to result in deleterious impacts to avian or mammalian species currently listed or proposed for listing under either the federal or the State endangered species statutes. Although not detected during this survey, it is possible that small numbers of the endangered endemic Hawaiian Petrel, and the threatened Newell's Shearwater, travel over the project area between the months of May and November. Therefore, mitigation measures such as the shielding of lights during nighttime construction activity will be implemented. See Section 4.1.7.

Table 5-3 HAWAI'I STATE PLAN, HRS, CHAPTER 226 S = Supportive, N/S = Not Supportive, N/A = Not Applicable		S	N/S	N/A
Section 226-12 Objective and Policies for the Physical Environment - Scenic, Natural Beauty, and Historic Resources.				
(A)	Planning for the State's physical environment shall be directed towards achievement of the objective of enhancement of Hawai'i's scenic assets, natural beauty, and multi-cultural/historical resources.			
(B)	To achieve the scenic, natural beauty, and historic resources objective, it shall be the policy of this State to:			
(1)	Promote the preservation and restoration of significant natural and historic resources.	X		
(2)	Provide incentives to maintain and enhance historic, cultural, and scenic amenities.	X		
(3)	Promote the preservation of views and vistas to enhance the visual and aesthetic enjoyment of mountains, ocean, scenic landscapes, and other natural features.	X		
(4)	Protect those special areas, structures, and elements that are an integral and functional part of Hawai'i's ethnic and cultural heritage.			X
(5)	Encourage the design of developments and activities that complement the natural beauty of the islands.	X		

Discussion: *As discussed in Section 4.2.3, an AIS was prepared for the project. One ~~(1)~~ site (SIHP No. 50-50-9-6393) was re-identified within the study parcel consisting of historic era rock piles and one ~~(1)~~ alignment. Although SIHP No. 50-50-10-6393 will be adversely impacted through project construction, it is believed that the features has been documented to the fullest extent. The SHPD accepted the AIS on February 12, 2010 and stated that while continuous monitoring during construction does not appear to be necessary, intermittent monitoring during the initial phases of ground preparation and build out should be implemented. However, SHPD requested to reserve further recommendations and final comment pending review of permit applications and plans. The potential exists for inadvertent cultural or archaeological finds during the course of construction. Should significant cultural materials and/or burials be inadvertently discovered during construction, all work in the immediate area of the find must cease and SHPD must be notified.*

Rana Biological Consultants, Inc. conducted botanical, mammalian and avian surveys on the Kīhei High School project site. No Federal or State listed endangered, threatened, proposed, or candidate botanical resources were found. In addition, no species currently listed, or proposed for listing under either the federal or the State endangered species programs were detected. Therefore, no significant adverse impacts to natural resources are anticipated. Refer to Section 4.1.6 and 4.1.7.

The Kīhei High School project will not impinge upon significant public scenic view corridors. While the project will be visible from Pi'ilani Highway and existing neighboring developments, structures will be set back from Pi'ilani Highway creating an open space buffer adjacent to the highway. The project will not significantly impact views toward the ocean or Haleakalā. The design objectives of the high school will encourage building forms that fit with the topographic and landscape character of the land. The campus will also include open space and landscaped areas throughout the development. See Section 4.2.9.

Section 226-13 Objectives and Policies for the Physical Environment - Land, Air, and Water Quality.				
(A)	Planning for the State's physical environment with regard to land, air, and water quality shall be directed towards achievement of the following objectives:			
(1)	Maintenance and pursuit of improved quality in Hawai'i's land, air, and water resources.	X		
(2)	Greater public awareness and appreciation of Hawai'i's environmental resources.	X		
(B)	To achieve the land, air, and water quality objectives, it shall be the policy of this State to:			
(1)	Foster educational activities that promote a better understanding of Hawai'i's limited environmental resources.	X		
(2)	Promote the proper management of Hawai'i's land and water resources.	X		

Table 5-3 HAWAI'I STATE PLAN, HRS, CHAPTER 226 S = Supportive, N/S = Not Supportive, N/A = Not Applicable		S	N/S	N/A
(3)	Promote effective measures to achieve desired quality in Hawai'i's surface, ground and coastal waters.	X		
(4)	Encourage actions to maintain or improve aural and air quality levels to enhance the health and well-being of Hawai'i's people.	X		
(5)	Reduce the threat to life and property from erosion, flooding, tsunamis, hurricanes, earthquakes, volcanic eruptions, and other natural or man-induced hazards and disasters.	X		
(6)	Encourage design and construction practices that enhance the physical qualities of Hawai'i's communities.	X		
(7)	Encourage urban developments in close proximity to existing services and facilities.	X		
(8)	Foster recognition of the importance and value of the land, air, and water resources to Hawai'i's people, their cultures and visitors.	X		

Discussion: *The Kīhei High School project will be located in close proximity to many available services and facilities within the region and will provide schooling to residents who currently commute to other locations. The project design incorporates open spaces and landscaping throughout the campus which will help to foster an appreciation of Hawai'i's environmental resources. Although the acoustic environment and surrounding air quality may experience impacts during construction, best management practices and regulatory controls will ensure aural and air quality levels are within acceptable regulatory limits on-site and within the immediate area. While the project is located inland and away from coastal areas, best management practices and other measures such ground stabilization with landscape and hardscape will be implemented to prevent non-point source pollution and other impacts to coastal resources. The applicant will comply with applicable Federal, State, and County regulations relating to land, air and water resources in developing the project.*

Development of the Kīhei High School project will not impact or increase the property's susceptibility or exposure to natural hazards, such as flooding, tsunami inundation, hurricanes, volcanic eruptions, and earthquakes. To protect against natural hazards, including earthquakes, all structures within the campus will be constructed in compliance with requirements of the UBC, and other Federal, State, and County standards. Part of the school facilities may also serve as an emergency shelter.

Section 226-14 Objective and Policies for Facility Systems - In General.				
(A)	Planning for the State's facility systems in general shall be directed towards achievement of the objective of water, transportation, waste disposal, and energy and telecommunication systems that support statewide social, economic, and physical objectives.			
(B)	To achieve the general facility systems objective, it shall be the policy of this State to:			
(1)	Accommodate the needs of Hawai'i's people through coordination of facility systems and capital improvement priorities in consonance with state and county plans.	X		
(2)	Encourage flexibility in the design and development of facility systems to promote prudent use of resources and accommodate changing public demands and priorities.	X		
(3)	Ensure that required facility systems can be supported within resource capacities and at reasonable cost to the user.	X		
(4)	Pursue alternative methods of financing programs and projects and cost-saving techniques in the planning, construction, and maintenance of facility systems.			X

Discussion: *Off-site and on-site improvements to surrounding facility systems (water, wastewater, roadways, solid waste, power, and telecommunications) will be coordinated with the appropriate State and County agencies and/or private utility companies. In addition, Kīhei High School will achieve certification under the USGBC LEED or comparable program. Sustainable design strategies will include features to conserve energy and water.*

Table 5-3 HAWAI'I STATE PLAN, HRS, CHAPTER 226 S = Supportive, N/S = Not Supportive, N/A = Not Applicable		S	N/S	N/A
226-15 Objectives and Policies for Facility Systems - Solid and Liquid Wastes.				
(A)	Planning for the State's facility systems with regard to solid and liquid wastes shall be directed towards the achievement of the following objectives:			
(1)	Maintenance of basic public health and sanitation standards relating to treatment and disposal of solid and liquid wastes.	X		
(2)	Provision of adequate sewerage facilities for physical and economic activities that alleviate problems in housing, employment, mobility, and other areas.			X
(B)	To achieve solid and liquid waste objectives, it shall be the policy of this State to:			
(1)	Encourage the adequate development of sewerage facilities that complement planned growth.	X		
(2)	Promote re-use and recycling to reduce solid and liquid wastes and employ a conservation ethic.	X		
(3)	Promote research to develop more efficient and economical treatment and disposal of solid and liquid wastes.			X
Discussion: *The development of the project will include wastewater system design to meet sewer requirements. Proposed on- and off-site sewer lines will comply with the County standards. The proposed Kīhei High School project will also incorporate green design principles which include re-use and recycling as practicable to reduce solid wastes.*				
226-16 Objective and Policies for Facility Systems - Water.				
(A)	Planning for the State's facility systems with regard to water shall be directed towards achievement of the objective of the provision of water to adequately accommodate domestic, agricultural, commercial, industrial, recreational, and other needs within resource capacities.			
(B)	To achieve the facility systems water objective, it shall be the policy of this State to:			
(1)	Coordinate development of land use activities with existing and potential water supply.	X		
(2)	Support research and development of alternative methods to meet future water requirements well in advance of anticipated needs.	X		
(3)	Reclaim and encourage the productive use of runoff water and wastewater discharges.	X		
(4)	Assist in improving the quality, efficiency, service, and storage capabilities of water systems for domestic and agricultural use.			X
(5)	Support water supply services to areas experiencing critical water problems.			X
(6)	Promote water conservation programs and practices in government, private industry, and the general public to help ensure adequate water to meet long-term needs.	X		
Discussion: *There are no on-site public or private water systems serving the property. The domestic water and fire supply would be supplied through the Central Maui Water System by connecting to the existing water main on Līloa Drive and upgrading the existing water main in the Pi'ilani Village Subdivision. The project team will continue to work with DWS to provide potable water supply for the proposed Kīhei High School project. Necessary approvals will be obtained in accordance with the County's water system standards. Irrigation water will be supplied via on-site brackish wells drilled into the groundwater lens below the site. Conservation measures and best management practices for water use will also be implemented.*				
226-17 Objectives and Policies for Facility Systems - Transportation.				
(A)	Planning for the State's facility systems with regard to transportation shall be directed towards the achievement of the following objectives:			
(1)	An integrated multi-modal transportation system that services statewide needs and promotes the efficient, economical, safe, and convenient movement of people and goods.			X
(2)	A statewide transportation system that is consistent with and will accommodate planned growth objectives throughout the State.			X
(B)	To achieve the transportation objectives, it shall be the policy of this State to:			
(1)	Design, program, and develop a multi-modal system in conformance with desired growth and physical development as stated in this chapter;			X
(2)	Coordinate state, county, federal, and private transportation activities and programs toward the achievement of statewide objectives;			X

Table 5-3 HAWAI'I STATE PLAN, HRS, CHAPTER 226 S = Supportive, N/S = Not Supportive, N/A = Not Applicable		S	N/S	N/A
(3)	Encourage a reasonable distribution of financial responsibilities for transportation among participating governmental and private parties;			X
(4)	Provide for improved accessibility to shipping, docking, and storage facilities;			X
(5)	Promote a reasonable level and variety of mass transportation services that adequately meet statewide and community needs;			X
(6)	Encourage transportation systems that serve to accommodate present and future development needs of communities;			X
(7)	Encourage a variety of carriers to offer increased opportunities and advantages to inter-island movement of people and goods;			X
(8)	Increase the capacities of airport and harbor systems and support facilities to effectively accommodate transshipment and storage needs;			X
(9)	Encourage the development of transportation systems and programs which would assist statewide economic growth and diversification;			X
(10)	Encourage the design and development of transportation systems sensitive to the needs of affected communities and the quality of Hawai'i's natural environment;			X
(11)	Encourage safe and convenient use of low-cost, energy-efficient, non-polluting means of transportation;			X
(12)	Coordinate intergovernmental land use and transportation planning activities to ensure the timely delivery of supporting transportation infrastructure in order to accommodate planned growth objectives; and	X		
(13)	Encourage diversification of transportation modes and infrastructure to promote alternate fuels and energy efficiency.			X
Discussion: *In May 2011, a traffic study was prepared for the Kīhei High School project, and is included as Appendix G. Development of the land will provide a new educational facility in the South Maui region and will alleviate long travel distances for families driving their children to and from school in Central Maui. The project is not expected to have a significant impact on traffic operations in the project vicinity. An extension of Kūlanihāko'i Street will be constructed to provide access from Pi'ilani Highway to the campus. Internal driveways and roads for campus circulation will also be developed. Students will be encouraged to carpool or utilize alternative means of transportation.*				
226-18 Objectives and Policies for Facility Systems - Energy.				
(A)	Planning for the State's facility systems with regard to energy shall be directed toward the achievement of the following objectives, giving due consideration to all:			
(1)	Dependable, efficient, and economical statewide energy systems capable of supporting the needs of the people;			X
(2)	Increased energy self-sufficiency where the ratio of indigenous to imported energy use is increased;	X		
(3)	Greater energy security in the face of threats to Hawai'i's energy supplies and systems; and			X
(4)	Reduction, avoidance, or sequestration of greenhouse gas emissions from energy supply and use.	X		
(B)	To achieve the energy objectives, it shall be the policy of this State to ensure the provision of adequate, reasonably priced, and dependable energy services to accommodate demand.			
(C)	To further achieve the energy objectives, it shall be the policy of this State to:			
(1)	Support research and development as well as promote the use of renewable energy sources;			X
(2)	Ensure that the combination of energy supplies and energy-saving systems is sufficient to support the demands of growth;			X
(3)	Base decisions of least-cost supply-side and demand-side energy resource options on a comparison of their total costs and benefits when a least-cost is determined by a reasonably comprehensive, quantitative, and qualitative accounting of their long-term, direct and indirect economic, environmental, social, cultural, and public health costs and benefits;			X
(4)	Promote all cost-effective conservation of power and fuel supplies through measures including: (A) Development of cost-effective demand-side management programs; (B) Education; and (C) Adoption of energy-efficient practices and technologies;	X		
(5)	Ensure to the extent that new supply-side resources are needed, the development or expansion of energy systems utilizes the least-cost energy supply option and maximizes efficient technologies;			X

Table 5-3 HAWAI'I STATE PLAN, HRS, CHAPTER 226 S = Supportive, N/S = Not Supportive, N/A = Not Applicable		S	N/S	N/A
(6)	Support research, development, and demonstration of energy efficiency, load management, and other demand-side management programs, practices, and technologies;			X
(7)	Promote alternate fuels and energy efficiency by encouraging diversification of transportation modes and infrastructure;	X		
(8)	Support actions that reduce, avoid, or sequester greenhouse gases in utility, transportation, and industrial sector applications; and	X		
(9)	Support actions that reduce, avoid, or sequester Hawai'i's greenhouse gas emissions through agriculture and forestry initiatives.			X

Discussion: *The development of Kīhei High School supports the HRS, Chapter 226 policies related to conservation of energy, energy efficiency and alternative energy sources. The project will contribute to energy efficiency through incorporating green building standards and sustainable features to conserve energy and water usage, and principles of waste minimization and pollution prevention. The project will be designed in accordance with the USGBC's LEED certification requirements or comparable system.*

Development of the land will also provide a new educational facility in the South Maui region and will alleviate long travel distances for families driving their children to and from school in Central Maui. In addition, the location of the high school is within walking distance to existing and future residential areas thereby encourage walking, biking and other alternative means of transportation.

Section 226-18.5 Objectives and Policies for Facility Systems - Telecommunications.				
(A)	Planning for the State's telecommunications facility systems shall be directed towards the achievement of dependable, efficient, and economical statewide telecommunications systems capable of supporting the needs of the people.			
(B)	To achieve the telecommunications objective, it shall be the policy of this State to ensure the provision of adequate, reasonably priced, and dependable telecommunications services to accommodate demand.			
(C)	To further achieve the telecommunications objective, it shall be the policy of this State to:			
(1)	Facilitate research and development of telecommunications systems and resources;			X
(2)	Encourage public and private sector efforts to develop means for adequate, ongoing telecommunications planning;			X
(3)	Promote efficient management and use of existing telecommunications systems and services; and	X		
(4)	Facilitate the development of education and training of telecommunications personnel.			X

Discussion: *The development of the project will incorporate current and efficient telecommunication technologies to the extent practicable.*

Section 226-19 Objectives and Policies for Socio-Cultural Advancement - Housing.				
(A)	Planning for the State's socio-cultural advancement with regard to housing shall be directed toward the achievement of the following objectives:			
(1)	Greater opportunities for Hawai'i's people to secure reasonably priced, safe, sanitary, and livable homes, located in suitable environments that satisfactorily accommodate the needs and desires of families and individuals, through collaboration and cooperation between government and nonprofit and for-profit developers to ensure that more affordable housing is made available to very low-, low- and moderate-income segments of Hawai'i's population.			X
(2)	The orderly development of residential areas sensitive to community needs and other land uses.			X
(3)	The development and provision of affordable rental housing by the State to meet the housing needs of Hawai'i's people.			X
(B)	To achieve the housing objectives, it shall be the policy of this State to:			
(1)	Effectively accommodate the housing needs of Hawai'i's people.			X
(2)	Stimulate and promote feasible approaches that increase housing choices for low-income, moderate-income, and gap-group households.			X

Table 5-3 HAWAI'I STATE PLAN, HRS, CHAPTER 226 S = Supportive, N/S = Not Supportive, N/A = Not Applicable		S	N/S	N/A
(3)	Increase homeownership and rental opportunities and choices in terms of quality, location, cost, densities, style, and size of housing.			X
(4)	Promote appropriate improvement, rehabilitation, and maintenance of existing housing units and residential areas.			X
(5)	Promote design and location of housing developments taking into account the physical setting, accessibility to public facilities and services, and other concerns of existing communities and surrounding areas.			X
(6)	Facilitate the use of available vacant, developable, and underutilized urban lands for housing.			X
(7)	Foster a variety of lifestyles traditional to Hawai'i through the design and maintenance of neighborhoods that reflect the culture and values of the community.			X
(8)	Promote research and development of methods to reduce the cost of housing construction in Hawai'i.			X
Discussion: *The Kīhei High School project will not provide housing opportunities; therefore, this objective and these policies are not directly applicable to the project.*				
226-20 Objectives and Policies for Socio-Cultural Advancement - Health.				
(A)	Planning for the State's socio-cultural advancement with regard to health shall be directed towards achievement of the following objectives:			
(1)	Fulfillment of basic individual health needs of the general public.			X
(2)	Maintenance of sanitary and environmentally healthful conditions in Hawai'i's communities.			X
(B)	To achieve the health objectives, it shall be the policy of this State to:			
(1)	Provide adequate and accessible services and facilities for prevention and treatment of physical and mental health problems, including substance abuse.	X		
(2)	Encourage improved cooperation among public and private sectors in the provision of health care to accommodate the total health needs of individuals throughout the State.			X
(3)	Encourage public and private efforts to develop and promote statewide and local strategies to reduce health care and related insurance costs.			X
(4)	Foster an awareness of the need for personal health maintenance and preventive health care through education and other measures.	X		
(5)	Provide programs, services, and activities that ensure environmentally healthful and sanitary conditions.	X		
(6)	Improve the State's capabilities in preventing contamination by pesticides and other potentially hazardous substances through increased coordination, education, monitoring, and enforcement.			X
Discussion: *Solid waste services and wastewater disposal will meet regulatory requirements to maintain public health standards. The school will also provide support services for all students with physical and mental health disabilities, while emphasizing a healthy lifestyle and preventative care.*				
226-21 Objective and Policies for Socio-Cultural Advancement - Education.				
(A)	Planning for the State's socio-cultural advancement with regard to education shall be directed towards achievement of the objective of the provision of a variety of educational opportunities to enable individuals to fulfill their needs, responsibilities, and aspirations.			
(B)	To achieve the education objective, it shall be the policy of this State to:			
(1)	Support educational programs and activities that enhance personal development, physical fitness, recreation, and cultural pursuits of all groups.	X		
(2)	Ensure the provision of adequate and accessible educational services and facilities that are designed to meet individual and community needs.	X		
(3)	Provide appropriate educational opportunities for groups with special needs.	X		
(4)	Promote educational programs which enhance understanding of Hawai'i's cultural heritage.	X		
(5)	Provide higher educational opportunities that enable Hawai'i's people to adapt to changing employment demands.			X
(6)	Assist individuals, especially those experiencing critical employment problems or barriers, or undergoing employment transitions, by providing appropriate employment training programs and other related educational opportunities.			X

Table 5-3 HAWAI'I STATE PLAN, HRS, CHAPTER 226 S = Supportive, N/S = Not Supportive, N/A = Not Applicable		S	N/S	N/A
(7)	Promote programs and activities that facilitate the acquisition of basic skills, such as reading, writing, computing, listening, speaking, and reasoning.	X		
(8)	Emphasize quality educational programs in Hawai'i's institutions to promote academic excellence.	X		
(9)	Support research programs and activities that enhance the education programs of the State.	X		
Discussion: *The development of the Kīhei High School project will directly support the State's policies for socio-cultural advancement in regard to education. The public high school is planned to support approximately 1,650 Kīhei-Mākena youth, grades 9-12. The core curriculum will be established by the State DOE and will include various educational and research programs relating to personal development, physical fitness, recreation, and culture. Appropriate educational opportunities and facilities will also be provided to groups and individuals with special needs.*				
226-22 Objective and Policies for Socio-Cultural Advancement - Social Services.				
(A)	Planning for the State's socio-cultural advancement with regard to social services shall be directed towards the achievement of the objective of improved public and private social services and activities that enable individuals, families, and groups to become more self-reliant and confident to improve their well-being.			
(B)	To achieve the social service objective, it shall be the policy of the State to:			
(1)	Assist individuals, especially those in need of attaining a minimally adequate standard of living and those confronted by social and economic hardship conditions, through social services and activities within the State's fiscal capacities.			X
(2)	Promote coordination and integrative approaches among public and private agencies and programs to jointly address social problems that will enable individuals, families, and groups to deal effectively with social problems and to enhance their participation in society.			X
(3)	Facilitate the adjustment of new residents, especially recently arrived immigrants, into Hawai'i's communities.			X
(4)	Promote alternatives to institutional care in the provision of long-term care for elder and disabled populations.			X
(5)	Support public and private efforts to prevent domestic abuse and child molestation, and assist victims of abuse and neglect.			X
(6)	Promote programs which assist people in need of family planning services to enable them to meet their needs.			X
Discussion: *The Kīhei High School project will not provide social service opportunities; therefore, this objective and these policies are not directly applicable to the project.*				
226-23 Objective and Policies for Socio-Cultural Advancement - Leisure.				
(A)	Planning for the State's socio-cultural advancement with regard to leisure shall be directed towards the achievement of the objective of the adequate provision of resources to accommodate diverse cultural, artistic, and recreational needs for present and future generations.			
(B)	To achieve the leisure objective, it shall be the policy of this State to:			
(1)	Foster and preserve Hawai'i's multi-cultural heritage through supportive cultural, artistic, recreational, and humanities-oriented programs and activities.	X		
(2)	Provide a wide range of activities and facilities to fulfill the cultural, artistic, and recreational needs of all diverse and special groups effectively and efficiently.	X		
(3)	Enhance the enjoyment of recreational experiences through safety and security measures, educational opportunities, and improved facility design and maintenance.	X		
(4)	Promote the recreational and educational potential of natural resources having scenic, open space, cultural, historical, geological, or biological values while ensuring that their inherent values are preserved.			X
(5)	Ensure opportunities for everyone to use and enjoy Hawai'i's recreational resources.			X
(6)	Assure the availability of sufficient resources to provide for future cultural, artistic, and recreational needs.			X
(7)	Provide adequate and accessible physical fitness programs to promote the physical and mental well-being of Hawai'i's people.	X		

Table 5-3 HAWAI'I STATE PLAN, HRS, CHAPTER 226 S = Supportive, N/S = Not Supportive, N/A = Not Applicable		S	N/S	N/A
(8)	Increase opportunities for appreciation and participation in the creative arts, including the literary, theatrical, visual, musical, folk, and traditional art forms.	X		
(9)	Encourage the development of creative expression in the artistic disciplines to enable all segments of Hawai'i's population to participate in the creative arts.			X
(10)	Assure adequate access to significant natural and cultural resources in public ownership.			X

Discussion: *The development of a new educational facility in the Kīhei-Mākena region will help to foster new programs that support various leisure activities. Educational programs at the school will include classes, programs and activities relating to culture, art, recreation, and humanities. In addition, the lower campus areas will provide athletic fields and open spaces which may be accessible for public and community use during non-school hours.*

226-24 Objective and Policies for Socio-Cultural Advancement - Individual Rights and Personal Well-Being.				
(A)	Planning for the State's socio-cultural advancement with regard to individual rights and personal well-being shall be directed towards achievement of the objective of increased opportunities and protection of individual rights to enable individuals to fulfill their socio-economic needs and aspirations.			
(B)	To achieve the individual rights and personal well- being objective, it shall be the policy of this State to:			
(1)	Provide effective services and activities that protect individuals from criminal acts and unfair practices and that alleviate the consequences of criminal acts in order to foster a safe and secure environment.			X
(2)	Uphold and protect the national and state constitutional rights of every individual.			X
(3)	Assure access to, and availability of, legal assistance, consumer protection, and other public services which strive to attain social justice.			X
(4)	Ensure equal opportunities for individual participation in society.	X		

Discussion: *The applicant supports the individual rights and personal well-being of all staff and students through the implementation of operations policies and practices that will serve as a guideline for the school.*

226-25 Objective and Policies for Socio-Cultural Advancement - Culture.				
(A)	Planning for the State's socio- cultural advancement with regard to culture shall be directed toward the achievement of the objective of enhancement of cultural identities, traditions, values, customs, and arts of Hawai'i's people.			
(B)	To achieve the culture objective, it shall be the policy of this State to:			
(1)	Foster increased knowledge and understanding of Hawai'i's ethnic and cultural heritages and the history of Hawai'i.	X		
(2)	Support activities and conditions that promote cultural values, customs, and arts that enrich the lifestyles of Hawai'i's people and which are sensitive and responsive to family and community needs.	X		
(3)	Encourage increased awareness of the effects of proposed public and private actions on the integrity and quality of cultural and community lifestyles in Hawai'i.			X
(4)	Encourage the essence of the aloha spirit in people's daily activities to promote harmonious relationships among Hawai'i's people and visitors.			X

Discussion: *As an educational facility, students will be immersed in learning about history and culture, particularly relating to Hawai'i. These educational advancements will help students to achieve and understand the varied cultural identities, traditions, values, customs, and arts in Hawai'i.*

A CIA and an AIS were completed for the proposed project. The findings of these studies indicate that the project will not result in significant adverse impacts to cultural resources or historic properties within the site.

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226-26 Objectives and Policies for Socio-Cultural Advancement - Public Safety.				
(A)	Planning for the State's socio- cultural advancement with regard to public safety shall be directed towards the achievement of the following objectives:			
(1)	Assurance of public safety and adequate protection of life and property for all people.	X		
(2)	Optimum organizational readiness and capability in all phases of emergency management to maintain the strength, resources, and social and economic well-being of the community in the event of civil disruptions, wars, natural disasters, and other major disturbances.			X
(3)	Promotion of a sense of community responsibility for the welfare and safety of Hawai'i's people.	X		
(B)	To achieve the public safety objectives, it shall be the policy of this State to:			
(1)	Ensure that public safety programs are effective and responsive to community needs.			X
(2)	Encourage increased community awareness and participation in public safety programs.	X		
(C)	To further achieve public safety objectives related to criminal justice, it shall be the policy of this State to:			
(1)	Support criminal justice programs aimed at preventing and curtailing criminal activities.	X		
(2)	Develop a coordinated, systematic approach to criminal justice administration among all criminal justice agencies.			X
(3)	Provide a range of correctional resources which may include facilities and alternatives to traditional incarceration in order to address the varied security needs of the community and successfully reintegrate offenders into the community.			X
(D)	To further achieve public safety objectives related to emergency management, it shall be the policy of this State to:			
(1)	Ensure that responsible organizations are in a proper state of readiness to respond to major war-related, natural, or technological disasters and civil disturbances at all times.			X
(2)	Enhance the coordination between emergency management programs throughout the State.			X
Discussion: *The DOE takes the responsibility of the wellness and safety of its students and staff very seriously. School staff and security are trained to address a range of situations that require immediate response to emergencies or unlawful activity on-site. Response plans are also in place in the event of natural disaster events, and part of the school facilities may also be designed to serve as an emergency shelter.*				
226-27 Objectives and Policies for Socio-Cultural Advancement - Government.				
(A)	Planning the State's socio-cultural advancement with regard to government shall be directed towards the achievement of the following objectives:			
(1)	Efficient, effective, and responsive government services at all levels in the State.			X
(2)	Fiscal integrity, responsibility, and efficiency in the state government and county governments.			X
(B)	To achieve the government objectives, it shall be the policy of this State to:			
(1)	Provide for necessary public goods and services not assumed by the private sector.	X		
(2)	Pursue an openness and responsiveness in government that permits the flow of public information, interaction, and response.			X
(3)	Minimize the size of government to that necessary to be effective.			X
(4)	Stimulate the responsibility in citizens to productively participate in government for a better Hawai'i.			X
(5)	Assure that government attitudes, actions, and services are sensitive to community needs and concerns.	X		
(6)	Provide for a balanced fiscal budget.			X
(7)	Improve the fiscal budgeting and management system of the State.			X
(8)	Promote the consolidation of state and county governmental functions to increase the effective and efficient delivery of government programs and services and to eliminate duplicative services wherever feasible.			X
Discussion: *The project meets applicable objectives for socio-cultural advancement in government. The DOE is a State (government) agency committed to providing necessary public school services to meet community needs.*				

Hawai'i State Plan - HRS Ch. 226 - Part III. Priority Guideline				
226-101 Purpose. The purpose of this part is to establish overall priority guidelines to address areas of statewide concern.				
226-102 Overall Direction. The State shall strive to improve the quality of life for Hawai'i's present and future population through the pursuit of desirable courses of action in five major areas of statewide concern which merit priority attention: economic development, population growth and land resource management, affordable housing, crime and criminal justice, and quality education, and principles of sustainability.				
226-103 Economic Priority Guidelines.				
(A)	Priority guidelines to stimulate economic growth and encourage business expansion and development to provide needed jobs for Hawai'i's people and achieve a stable and diversified economy:			
(1)	Seek a variety of means to increase the availability of investment capital for new and expanding enterprises. (a) Encourage investments which:			
	(i) Reflect long term commitments to the State;	X		
	(ii) Rely on economic linkages within the local economy;			X
	(iii) Diversify the economy;			X
	(iv) Reinvest in the local economy;	X		
	(v) Are sensitive to community needs and priorities; and	X		
	(vi) Demonstrate a commitment to provide management opportunities to Hawai'i residents.			X
(2)	Encourage the expansion of technological research to assist industry development and support the development and commercialization of technological advancements.			X
(3)	Improve the quality, accessibility, and range of services provided by government to business, including data and reference services and assistance in complying with governmental regulations.			X
(4)	Seek to ensure that state business tax, labor laws, and administrative policies are equitable, rational, and predictable.			X
(5)	Streamline the building and development permit and review process, and eliminate or consolidate other burdensome or duplicative governmental requirements imposed on business, where public health, safety and welfare would not be adversely affected.			X
(6)	Encourage the formation of cooperatives and other favorable marketing or distribution arrangements at the regional or local level to assist Hawai'i's small-scale producers, manufacturers, and distributors.			X
(7)	Continue to seek legislation to protect Hawai'i from transportation interruptions between Hawai'i and the continental United States.			X
(8)	Provide public incentives and encourage private initiative to develop and attract industries which promise long-term growth potentials and which have the following characteristics:			
	(a) An industry that can take advantage of Hawai'i's unique location and available physical and human resources.			X
	(b) A clean industry that would have minimal adverse effects on Hawai'i's environment.			X
	(c) An industry that is willing to hire and train Hawai'i's people to meet the industry's labor needs at all levels of employment.			X
	(d) An industry that would provide reasonable income and steady employment.			X
(9)	Support and encourage, through educational and technical assistance programs and other means, expanded opportunities for employee ownership and participation in Hawai'i business.			X
(10)	Enhance the quality of Hawai'i's labor force and develop and maintain career opportunities for Hawai'i's people through the following actions:			
	(A) Expand vocational training in diversified agriculture, aquaculture, information industry, and other areas where growth is desired and feasible.			X
	(B) Encourage more effective career counseling and guidance in high schools and post-secondary institutions to inform students of present and future career opportunities.	X		
	(C) Allocate educational resources to career areas where high employment is expected and where growth of new industries is desired.	X		
	(D) Promote career opportunities in all industries for Hawai'i's people by encouraging firms doing business in the State to hire residents.			X
	(E) Promote greater public and private sector cooperation in determining industrial training needs and in developing relevant curricula and on- the-job training opportunities.			X
	(F) Provide retraining programs and other support services to assist entry of displaced workers into alternative employment.			X
(B)	Priority guidelines to promote the economic health and quality of the visitor industry:			

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(1)	Promote visitor satisfaction by fostering an environment which enhances the Aloha Spirit and minimizes inconveniences to Hawai'i's residents and visitors.			X
(2)	Encourage the development and maintenance of well- designed, adequately serviced hotels and resort destination areas which are sensitive to neighboring communities and activities and which provide for adequate shoreline setbacks and beach access.			X
(3)	Support appropriate capital improvements to enhance the quality of existing resort destination areas and provide incentives to encourage investment in upgrading, repair, and maintenance of visitor facilities.			X
(4)	Encourage visitor industry practices and activities which respect, preserve, and enhance Hawai'i's significant natural, scenic, historic, and cultural resources.			X
(5)	Develop and maintain career opportunities in the visitor industry for Hawai'i's people, with emphasis on managerial positions.			X
(6)	Support and coordinate tourism promotion abroad to enhance Hawai'i's share of existing and potential visitor markets.			X
(7)	Maintain and encourage a more favorable resort investment climate consistent with the objectives of this chapter.			X
(8)	Support law enforcement activities that provide a safer environment for both visitors and residents alike.			X
(9)	Coordinate visitor industry activities and promotions to business visitors through the state network of advanced data communication techniques.			X
(C)	Priority guidelines to promote the continued viability of the sugar and pineapple industries:			
(1)	Provide adequate agricultural lands to support the economic viability of the sugar and pineapple industries.			X
(2)	Continue efforts to maintain federal support to provide stable sugar prices high enough to allow profitable operations in Hawai'i.			X
(3)	Support research and development, as appropriate, to improve the quality and production of sugar and pineapple crops.			X
(D)	Priority guidelines to promote the growth and development of diversified agriculture and aquaculture:			
(1)	Identify, conserve, and protect agricultural and aquacultural lands of importance and initiate affirmative and comprehensive programs to promote economically productive agricultural and aquacultural uses of such lands.			X
(2)	Assist in providing adequate, reasonably priced water for agricultural activities.			X
(3)	Encourage public and private investment to increase water supply and to improve transmission, storage, and irrigation facilities in support of diversified agriculture and aquaculture.			X
(4)	Assist in the formation and operation of production and marketing associations and cooperatives to reduce production and marketing costs.			X
(5)	Encourage and assist with the development of a waterborne and airborne freight and cargo system capable of meeting the needs of Hawai'i's agricultural community.			X
(6)	Seek favorable freight rates for Hawai'i's agricultural products from inter-island and overseas transportation operators.			X
(7)	Encourage the development and expansion of agricultural and aquacultural activities which offer long-term economic growth potential and employment opportunities.			X
(8)	Continue the development of agricultural parks and other programs to assist small independent farmers in securing agricultural lands and loans.			X
(9)	Require agricultural uses in agricultural subdivisions and closely monitor the uses in these subdivisions.			X
(10)	Support the continuation of land currently in use for diversified agriculture.			X
(E)	Priority guidelines for water use and development:			
(1)	Maintain and improve water conservation programs to reduce the overall water consumption rate.	X		
(2)	Encourage the improvement of irrigation technology and promote the use of non-potable water for agricultural and landscaping purposes.	X		
(3)	Increase the support for research and development of economically feasible alternative water sources.			X
(4)	Explore alternative funding sources and approaches to support future water development programs and water system improvements.			X
(F)	Priority guidelines for energy use and development:			

Table 5-3 HAWAI'I STATE PLAN, HRS, CHAPTER 226 S = Supportive, N/S = Not Supportive, N/A = Not Applicable		S	N/S	N/A
(1)	Encourage the development, demonstration, and commercialization of renewable energy sources.			X
(2)	Initiate, maintain, and improve energy conservation programs aimed at reducing energy waste and increasing public awareness of the need to conserve energy.	X		
(3)	Provide incentives to encourage the use of energy conserving technology in residential, industrial, and other buildings.			X
(4)	Encourage the development and use of energy conserving and cost-efficient transportation systems.			X
(G)	Priority guidelines to promote the development of the information industry:			
(1)	Establish an information network that will serve as the catalyst for establishing a viable information industry in Hawai'i.			X
(2)	Encourage the development of services such as financial data processing, products and services exchange, foreign language translations, telemarketing, teleconferencing, a twenty-four-hour international stock exchange, international banking, and a Pacific Rim management center.			X
(3)	Encourage the development of small businesses in the information field such as software development, the development of new information systems and peripherals, data conversion and data entry services, and home or cottage services such as computer programming, secretarial, and accounting services.			X
(4)	Encourage the development or expansion of educational and training opportunities for residents in the information and telecommunications fields.			X
(5)	Encourage research activities, including legal research in the information and telecommunications fields.			X
(6)	Support promotional activities to market Hawai'i's information industry services.			X
Discussion: *The new high school will result in significant expenditures that will have a positive impact on the economies of the State and the County on a direct and indirect basis. With significantly increasing capital investment and capital flow in the region, economic benefits will result from increased employment and tax revenues. Further, the use of water and energy efficient fixtures and systems will net a cost savings and promote water and energy resource conservation. The site is not currently in diversified agricultural production.*				
226-104 Population Growth and Land Resources Priority Guidelines.				
(A)	Priority guidelines to effect desired statewide growth and distribution:			
(1)	Encourage planning and resource management to insure that population growth rates throughout the State are consistent with available and planned resource capacities and reflect the needs and desires of Hawai'i's people.	X		
(2)	Manage a growth rate for Hawai'i's economy that will parallel future employment needs for Hawai'i's people.			X
(3)	Ensure that adequate support services and facilities are provided to accommodate the desired distribution of future growth throughout the State.	X		
(4)	Encourage major state and federal investments and services to promote economic development and private investment to the neighbor islands, as appropriate.	X		
(5)	Explore the possibility of making available urban land, low-interest loans, and housing subsidies to encourage the provision of housing to support selective economic and population growth on the neighbor islands.			X
(6)	Seek federal funds and other funding sources outside the State for research, program development, and training to provide future employment opportunities on the neighbor islands.			X
(7)	Support the development of high technology parks on the neighbor islands.			X
(B)	Priority guidelines for regional growth distribution and land resource utilization:			
(1)	Encourage urban growth primarily to existing urban areas where adequate public facilities are already available or can be provided with reasonable public expenditures, and away from areas where other important benefits are present, such as protection of important agricultural land or preservation of lifestyles.	X		
(2)	Make available marginal or nonessential agricultural lands for appropriate urban uses while maintaining agricultural lands of importance in the agricultural district.	X		
(3)	Restrict development when drafting of water would result in exceeding the sustainable yield or in significantly diminishing the recharge capacity of any groundwater area.			X

Table 5-3 HAWAI'I STATE PLAN, HRS, CHAPTER 226 S = Supportive, N/S = Not Supportive, N/A = Not Applicable		S	N/S	N/A
(4)	Encourage restriction of new urban development in areas where water is insufficient from any source for both agricultural and domestic use.			X
(5)	In order to preserve green belts, give priority to state capital-improvement funds which encourage location of urban development within existing urban areas except where compelling public interest dictates development of a noncontiguous new urban core.	X		
(6)	Seek participation from the private sector for the cost of building infrastructure and utilities, and maintaining open spaces.			X
(7)	Pursue rehabilitation of appropriate urban areas.			X
(8)	Support the redevelopment of Kaka'ako into a viable residential, industrial, and commercial community.			X
(9)	Direct future urban development away from critical environmental areas or impose mitigating measures so that negative impacts on the environment would be minimized.	X		
(10)	Identify critical environmental areas in Hawai'i to include but not be limited to the following: watershed and recharge areas; wildlife habitats (on land and in the ocean); areas with endangered species of plants and wildlife; natural streams and water bodies; scenic and recreational shoreline resources; open space and natural areas; historic and cultural sites; areas particularly sensitive to reduction in water and air quality; and scenic resources.			X
(11)	Identify all areas where priority should be given to preserving rural character and lifestyle.			X
(12)	Utilize Hawai'i's limited land resources wisely, providing adequate land to accommodate projected population and economic growth needs while ensuring the protection of the environment and the availability of the shoreline, conservation lands, and other limited resources for future generations.	X		
(13)	Protect and enhance Hawai'i's shoreline, open spaces, and scenic resources.	X		

Discussion: *The Kīhei High School project is consistent with the State's goals to develop land resources to meet the level of population growth in the Kīhei region. Development of the land will provide a new educational facility in the South Maui region and will alleviate long travel distances for families driving their children to and from school in Central Maui. The project also supports the goals set forth in the Kīhei-Mākena Community Plan which recognizes the development of the high school as part of the expansion of the Kīhei-Mākena region.*

The applicant will maintain open space within the campus. The applicant recognizes their environmental responsibility and will follow a sustainability platform in the development of this project. The physical design and operations of the Kīhei High School campus will be in harmony with the natural environment by promoting the use of established environmental best practices. No significant impacts to mauka or coastal views are anticipated.

Technical studies and surveys were conducted to identify critical environmental areas. No critical or endangered species, habitat, or cultural or archeological resources, have been identified for preservation within the proposed project area.

There are no on-site public or private water systems serving the property. The domestic water would be supplied through the Central Maui Water System by connecting to the existing water main on Līloa Drive and upgrading the existing water main in the Pi'ilani Village Subdivision. The project team will continue to work with DWS to provide potable water supply for the proposed Kīhei High School project. The project's non-potable water requirement will be met from two ~~(2)~~ new onsite wells which will be fed by basal groundwater from the underlying Kama'ole Aquifer System. The proposed withdrawal of brackish groundwater for the proposed project is not expected to have adverse impacts on the recharge or sustainable yield of the underlying Kama'ole Aquifer System.

Table 5-3 HAWAI'I STATE PLAN, HRS, CHAPTER 226 S = Supportive, N/S = Not Supportive, N/A = Not Applicable		S	N/S	N/A
226-105 Crime and Criminal Justice Priority Guidelines.				
(A)	Priority Guidelines in the Area of Crime and Criminal Justice:			
(1)	Support law enforcement activities and other criminal justice efforts that are directed to provide a safer environment.	X		
(2)	Target state and local resources on efforts to reduce the incidence of violent crime and on programs relating to the apprehension and prosecution of repeat offenders.			X
(3)	Support community and neighborhood program initiatives that enable residents to assist law enforcement agencies in preventing criminal activities.			X
(4)	Reduce overcrowding or substandard conditions in correctional facilities through a comprehensive approach among all criminal justice agencies which may include sentencing law revisions and use of alternative sanctions other than incarceration for persons who pose no danger to their community.			X
(5)	Provide a range of appropriate sanctions for juvenile offenders, including community-based programs and other alternative sanctions.			X
(6)	Increase public and private efforts to assist witnesses and victims of crimes and to minimize the costs of victimization.			X
Discussion: *Policies related to public safety are primarily the responsibility of other government agencies and are not directly applicable to the Kīhei High School project. However, the DOE does ensure the safety of its students with the provision of campus security and emergency response plans, procedures, and training in-place.*				
226-106 Affordable Housing Priority Guidelines.				
(A)	Priority guidelines for the provision of affordable housing:			
(1)	Seek to use marginal or nonessential agricultural land and public land to meet housing needs of low- and moderate-income and gap-group households.			X
(2)	Encourage the use of alternative construction and development methods as a means of reducing production costs.			X
(3)	Improve information and analysis relative to land availability and suitability for housing.			X
(4)	Create incentives for development which would increase home ownership and rental opportunities for Hawai'i's low- and moderate-income households, gap-group households, and residents with special needs.			X
(5)	Encourage continued support for government or private housing programs that provide low interest mortgages to Hawai'i's people for the purchase of initial owner- occupied housing.			X
(6)	Encourage public and private sector cooperation in the development of rental housing alternatives.			X
(7)	Encourage improved coordination between various agencies and levels of government to deal with housing policies and regulations.			X
(8)	Give higher priority to the provision of quality housing that is affordable for Hawai'i's residents and less priority to development of housing intended primarily for individuals outside of Hawai'i.			X
Discussion: *The Kīhei High School project will not provide new housing opportunities; therefore, this objective and these policies are not directly applicable to the project.*				
226-107 Quality Education Priority Guidelines.				
(A)	Priority guidelines to promote quality education:			
(1)	Pursue effective programs which reflect the varied district, school, and student needs to strengthen basic skills achievement.	X		
(2)	Continue emphasis on general education "core" requirements to provide common background to students and essential support to other university programs.	X		
(3)	Initiate efforts to improve the quality of education by improving the capabilities of the education work force.			X
(4)	Promote increased opportunities for greater autonomy and flexibility of educational institutions in their decision-making responsibilities.			X
(5)	Increase and improve the use of information technology in education by the availability of telecommunications equipment for.			

Table 5-3 HAWAI'I STATE PLAN, HRS, CHAPTER 226 S = Supportive, N/S = Not Supportive, N/A = Not Applicable		S	N/S	N/A
	(a) The electronic exchange of information.	X		
	(b) Statewide electronic mail.	X		
	(c) Access to the Internet.	X		
Discussion: *The proposed Kīhei High School project will directly meet this policy by providing accessible educational facilities and services to students living in the Kīhei-Mākena region. Additional details relating to education priority guidelines are discussed in the project's evaluation of the Section 5.1.6, Hawai'i State Functional Plans.*				
226-108 Encourage Programs that Increase the Public's Awareness and Understanding of the Impact of Information Technologies on Our Lives.				
(1)	Pursue the establishment of Hawai'i's public and private universities and colleges as research and training centers of the Pacific.			X
(2)	Develop resources and programs for early childhood education.			X
(3)	Explore alternatives for funding and delivery of educational services to improve the overall quality of education.			X
(4)	Strengthen and expand educational programs and services for students with special needs.	X		
Discussion: *The applicant supports the Hawai'i State Plan Priority Guideline Policy regarding encouraging programs that increase the public's awareness and understanding of the impact of information technologies on our lives. The new high school will provide basic education in computers and technology for students, including those with special needs.*				
Act 181, Session Laws of Hawai'i (SLH) 2011 Priority guidelines and principles to promote sustainability shall include:				
(1)	Encouraging balanced economic, social, community, and environmental priorities;			X
(2)	Encouraging planning that respects and promotes living within the natural resources and limits of the State;	X		
(3)	Promoting a diversified and dynamic economy;			X
(4)	Encouraging respect for the host culture;			X
(5)	Promoting decisions based on meeting the needs of the present without compromising the needs of the future generations;			X
(6)	Considering the principles of the ahupuaa system; and			X
(7)	Emphasizing that everyone, including individuals, families, communities, businesses, and government, has the responsibility for achieving a sustainable Hawaii.	X		
Discussion: *As a State of Hawai'i agency, the DOE is committed to supporting guidelines and principles to promote sustainability. The project will help to balance the economic, social, community and environmental priorities of the Kīhei-Mākena region by providing a new educational facility to support the needs of the growing population in the region. The Kīhei High School project will incorporate sustainable design principles and will be designed to achieve certification under the USGBC LEED program or comparable program.*				

5.1.5 Hawai'i 2050 Sustainability Plan (SB2532 HD1, 2010 Legislative Session)

In 2005, the Hawai'i State Legislature determined that the State of Hawai'i should be responsible not only for resolving current public needs, but should provide guidance to assure that the preferred vision and goals for our future are met. Recognizing that the present generation must address sustainability issues essential to maintaining Hawai'i's quality of life for future generations, the State Legislature enacted Act 8 (SSLH 2005), which provided for the development of a

Sustainability Plan to address the vital needs of Hawai'i through the year 2050. Act 8 then established the Hawai'i 2050 Sustainability Task Force to review the Hawai'i State Plan and the State's comprehensive planning system and promulgated the creation of the Hawai'i 2050 Sustainability Plan (Hawai'i 2050). Hawai'i 2050 has as its main tenants a respect for culture, character, beauty, and history of the state's island communities; balance among economic, community, and environmental priorities; and an effort to meet the needs of the present without compromising the ability of future generations to meet their own needs. Hawai'i 2050 defines five ~~(5)~~ goals intended to lead toward a sustainable future for Hawai'i. These goals are accompanied by specific strategic actions for implementation and indicators to measure the success or failure of these actions over time. *Table 5-4* provides and evaluation and summary of the project's compatibility with Hawai'i 2050.

Table 5-4 HAWAI'I 2050 SUSTAINABILITY PLAN (SB2532 HD1, 2010 Legislative Session) S = Supportive, N/S = Not Supportive, N/A = Not Applicable	**S**	**N/S**	**N/A**
The State's first definition of sustainability: A. Hawai'i that achieves the following: (A) Respects the culture, character, beauty and history of our state's island communities (B) Strikes a balance among economic, social and community, and environmental priorities (C) Meets the needs of the present without compromising the ability of future generations to meet their own needs			
GOAL 1: Living sustainably is part of our daily practice in Hawai'i.			
Develop a sustainability ethic.	X		
Integrate sustainability principles and practices into public and private school curricula.	X		
Develop a statewide marketing and public awareness campaign on sustainability principles and practices.			X
Conduct ongoing forums and cross-sector dialogue to promote collaboration and progress on achieving Hawai'i's sustainability goals.	X		
Continually monitor trends and conditions in Hawai'i's economy, society and natural systems.	X		
Discussion: *The State of Hawai'i has made a commitment to sustainability by establishing the 2050 Sustainability Plan. As a State agency, the DOE will work towards achieving these goals and objectives by designing Kīhei High School as a sustainable development. The high school will achieve certification under the USGBC LEED program or comparable program. Sustainability principles and practices will be encouraged throughout the school campus and incorporated into the daily life and activities of students.*			
GOAL 2: Our diversified and globally competitive economy enables us to meaningfully live, work and play in Hawai'i.			
Develop a more diverse and resilient economy.			X
Provide incentives that foster sustainability-related industries, which include, but aren't limited to renewable energy, innovation and science-based industries, and environmental technologies.			X
Increase production and consumption of local foods and products, particularly agricultural products.			X
Increase commercialization and technology transfer between post-secondary institutions and the business sector.			X
Support the building blocks for economic stability and sustainability.	X		
Recognize and support established industries such as the visitor industry, military, construction and agriculture as strong components of the Hawai'i economy.			X
Provide incentives for industries to operate in more sustainable ways.			X
Attract local and outside capital and investments in Hawai'i's economic activities.			X
Reduce regulations and lower the cost of running a business.			X
Increase the competitiveness of Hawai'i's workforce.	X		
Invest in and improve our public education system to provide for a skilled workforce.	X		
Create incentives and opportunities for workforce skills upgrade training programs, including the availability of remedial education programs.	X		
Increase student enrollment in post-secondary educational programs.	X		
Adopt living wage guidelines and measurements.			X

Table 5-4 HAWAI'I 2050 SUSTAINABILITY PLAN (SB2532 HD1, 2010 Legislative Session) S = Supportive, N/S = Not Supportive, N/A = Not Applicable	S	N/S	N/A
Identify, prioritize and fund infrastructure "crisis points" that need fixing.			X
Discussion: *The proposed Kīhei High School project supports creating a diversified and competitive economy that will help the State and its people to live more meaningful lives. The project will provide a new educational facility and supporting infrastructure to meet the needs of the growing population in the Kīhei-Mākena region. Development of the project will also create new short- and long-term employment related to construction and operation of the school. Once operational, the high school will educate students and provide them with the skills needed to be competitive in Hawai'i's workforce.*			
GOAL 3: Our natural resources are responsibly and respectfully used, replenished and preserved for future generations.			
Reduce reliance on fossil (carbon-based) fuels.	X		
Expand renewable energy opportunities.			X
Increase energy efficiency in private and public buildings, including retrofitting existing buildings.	X		
Improve energy efficiencies and options in transportation.	X		
Encourage the production and use of locally produced bio-fuels.			X
Adopt building codes that encourage "green building" technology.			X
Encourage all government agencies to adopt sustainable practices, including purchasing hybrid cars, buying biodegradable products, and mandating recycling.	X		
Conserve water and ensure adequate water supply.	X		
Reduce water consumption by means of education and incentives.	X		
Encourage greater production and use of recycled water.	X		
Continually review water-conserving technologies for possible incorporation in county building codes.	X		
Encourage price structures for water use that furthers conservation.			X
Require water conservation plans from large private users.			X
Increase recycling, reuse and waste reduction strategies.	X		
Provide greater protection for air, and land-, fresh water- and ocean-based habitats.			X
Strengthen enforcement of habitat management.			X
Fund public and private conservation education.			X
Improve management of protected watershed areas.			X
Incorporate the values and philosophy of the ahupua'a resource management system as appropriate.			X
Establish funding for invasive species control and native ecosystems protection.			X
Conserve agricultural, open space and conservation lands and resources.		X	
Create compact patterns of urban development.	X		
Encourage "smart growth" concepts in land use and community planning.	X		
Research and strengthen management initiatives to respond to rising sea levels, coastal hazards, erosion and other natural hazards.			X
Develop a comprehensive environmental mapping and measurement system to evaluate the overall health and status of Hawai'i's natural ecosystems.			X
Discussion: *The applicant supports the reduction of reliance on fossil fuels and expansion of renewable energy opportunities. As a State of Hawai'i agency, the DOE is committed to the use of renewable energy sources that are proven, viable, cost effective, and environmentally responsible. Kīhei High School will be designed to achieve certification under the USGBC LEED program or comparable program. Sustainable design strategies that will be considered include water conservation measures, general recycling practices, and the use of alternative modes of transportation and fuel efficient vehicles. Provision of a new school in the Kīhei region will contribute to reduced vehicle miles traveled, as some students will no longer be required to travel long distances to attend high school.*			

Table 5-4 HAWAI'I 2050 SUSTAINABILITY PLAN (SB2532 HD1, 2010 Legislative Session) S = Supportive, N/S = Not Supportive, N/A = Not Applicable	S	N/S	N/A
The proposed high school has been planned for in County planning documents such as the adopted Kīhei-Mākena Community Plan (1998) and the MIP General Plan 2030 Draft (December 2009). The high school will be located near existing and future residential areas in Kīhei, and will support compact patterns of urban development and smart land use and community planning concepts. The new educational facility will meet the needs of the growing population of the region and will help to alleviate the existing overcrowding occurring at Central Maui schools who currently serve students from the South Maui region.			
GOAL 4: Our community is strong, healthy, vibrant and nurturing, providing safety nets for those in need. Strengthen social safety nets.			
Increase affordable housing opportunities for households up to 140% of median income.			X
Ensure access to affordable health care for all residents.			X
Reduce crime and violence.			X
Provide access to elderly housing, care-giving and other long-term care services.			X
Invest in greater prevention and treatment of those suffering from substance abuse and mental illness.			X
Increase awareness of and competency in financial literacy and asset building.			X
Strengthen the nonprofit sector, philanthropy and volunteerism.			X
Ensure that persons with disabilities are afforded equal opportunity to participate and excel in all aspects of community life.	X		
Provide after-school and extra-curricular programs to enable Hawai'i's youth to broaden their life experiences.	X		
Improve public transportation infrastructure and alternatives.			X
Reduce traffic congestion.	X		
Encourage and provide incentives for telecommuting.			X
Increase and improve bicycle and pedestrian facilities, including multi-use pathways.	X		
Strengthen public education.	X		
Support parenting, educational and financial literacy initiatives that span early childhood through lifelong learning.	X		
Increase high school graduation rates.	X		
Strengthen career pathways for technical and trade schools that enhance Hawai'i's workforce.	X		
Support post-secondary and distance learning programs that broaden personal and professional learning opportunities.	X		
Provide access to diverse recreational facilities and opportunities.	X		

Discussion: *The Kīhei High School project will help to create a strong, healthy, vibrant, nurturing, and safe community. The project will strengthen public education by providing a new facility and resource for Maui County to serve the needs of the growing population. Overall traffic congestion within the surrounding area will likely decrease with the opening of a new school to serve area residents.*

The high school will provide educational opportunities to all students, including those with disabilities. The DOE's established curriculum will provide students with skills to attend post-secondary and professional programs that will support their success in the workforce. After school and extra-curricular programs may also be provided for the community's youth once in operations. Access to recreational facilities and opportunities will be provided, particularly at the lower campus area where athletic fields can be used by the community.

Table 5-4 HAWAIʻI 2050 SUSTAINABILITY PLAN (SB2532 HD1, 2010 Legislative Session) S = Supportive, N/S = Not Supportive, N/A = Not Applicable	S	N/S	N/A
GOAL 5: Our Kanaka Maoli and island cultures and values are thriving and perpetuated.			
Honor Kanaka Maoli culture and heritage.	X		
Ensure the existence of and support for public and private entities that further the betterment of Kanaka Maoli.			X
Increase fluency in Kanaka Maoli language. It is one of the official languages of Hawaiʻi.			X
Sponsor cross-sector dialogue on Kanaka Maoli culture and island values.			X
Protect Kanaka Maoli intellectual property and related traditional knowledge.			X
Provide Kanaka Maoli cultural education for residents, visitors and the general public.	X		
Celebrate our cultural diversity and island way of life.	X		
Identify and protect the places, features and sacred spaces that give Hawaiʻi its unique character and cultural significance.	X		
Increase the number of educators who teach cultural and historic education.	X		
Enable Kanaka Maoli and others to pursue traditional Kanaka Maoli lifestyles and practices.			X
Provide Kanaka Maoli mentors with opportunities to pass on Hawaiian culture and knowledge to the next generation of Kanaka Maoli and others. The power of wisdom comes from communication.			X
Perpetuate Kanaka Maoli food production associated with land and ocean traditions and practices.			X
Provide support for subsistence-based businesses and economies.			X

Discussion: *The project supports the Kanaka Maoli and island cultures and values. Educators will teach cultural and historic education and language to the extent appropriate for both the school and its student population.*

A CIA and an AIS were completed for the proposed project. The findings of these studies indicate that the project will not result in significant adverse impacts to cultural resources or historic properties within the site.

5.1.6 Hawaiʻi State Functional Plans

Developed in the late 1980s and early 1990s as part of the Statewide Planning System, the State Functional Plans are the primary guidance tools for implementing the Hawai'i State Plan. While the Hawaiʻi State Plan establishes long-term objectives for Hawaiʻi, the purposes of the Functional Plans are to identify major statewide concerns; define current strategies for the functional area; identify major relationships among functional areas; and to provide strategies for departmental policies, programs, and priorities. The Functional Plans provide guidance as to State and County roles and the allocation of resources to fulfill identified activities in the areas of agriculture, conservation lands, education, employment, energy, health, higher education, historic preservation, housing, human services, recreation, tourism, transportation, and water resources. *Table 5-5* assesses and evaluates how the Kīhei High School project supports the objectives of the each State Functional Plan.

Table 5-5 HAWAIʻI STATE FUNCTIONAL PLANS S = Supportive, N/S = Not Supportive, N/A = Not Applicable		S	N/S	N/A
Agriculture Functional Plan				
Objective A:	Achievement of increased agricultural production and growth through cultural and management practices.			X
Objective B:	Achievement of an orderly agricultural marketing system through production promotion and industry organization.			X
Objective C:	Achievement of increased consumption of and demand for Hawaiʻi's agricultural products through consumer education and product quality.			X

Table 5-5 HAWAI'I STATE FUNCTIONAL PLANS S = Supportive, N/S = Not Supportive, N/A = Not Applicable		S	N/S	N/A
Objective D:	Achievement of optimal contribution by agriculture to the State's economy.			X
Objective E:	Achievement of adequate capital, and knowledge of its proper management, for agricultural development.			X
Objective F:	Achievement of increased agricultural production and growth through pest and disease controls.			X
Objective G:	Achievement of effective protection and improved quality of Hawai'i's land, water, and air.			X
Objective H:	Achievement of productive agricultural use of lands most suitable and needed for agriculture			X
Objective I:	Achievement of efficient and equitable provision of adequate water for agricultural use.			X
Objective J:	Achievement of maximum degree of public understanding of agriculture in Hawai'i.			X
Objective K:	Achievement of adequate supply of properly trained labor for agricultural needs.			X
Objective L:	Achievement of adequate transportation services and facilities to meet agricultural needs.			X
Objective M:	Achievement of adequate support services and infrastructure to meet agricultural needs.			X
Discussion: *The lands proposed for development of the new high school currently lie in the Agricultural District. These lands, however, are not considered to be a valued agricultural resource. ALISH designates only 2% (1.7 acres) of the site soils as Prime and the Land Study Bureau has designated all the project site soils as E, the lowest rating. The applicant will be applying for a State Land Use District Boundary Amendment to change the site's Agricultural designation to Urban. The proposed project site meets the standards under HAR Section 15-15-18, as it is located adjacent to existing "city-like" development, services and infrastructure. Additionally, the site is designated for development of public facilities in the County's Kīhei-Mākena Community Plan, and is designated for a future high school in the County's December 2009 Draft Maui Island Plan Public Facility/Infrastructure Improvements Map (February 25, 2009).*				
Conservation Lands Functional Plan				
Objective IA:	Establishment of data bases for inventories of existing lands and resources.			X
Objective IB:	Establishment of criteria for management of land and natural resources.			X
Objective IIA:	Establishment of plans for natural resources and land management.			X
Objective IIB:	Protection of fragile or rare natural resources.			X
Objective IIC:	Enhancement of natural resources.			X
Objective IID:	Appropriate development of natural resources.			X
Objective IIE:	Promotion and marketing of appropriate natural resources designated for commercial development.			X
Objective IIF:	Increase enforcement of land and natural resource use laws and regulations.			X
Objective IIIA:	Develop and implement conservation education programs for the general public and visitors.			X
Objective IIIB:	Increase access to land and natural resource data by the public and increase cooperation between agencies by making access to land and natural resource information more efficient.			X
Discussion: *The proposed Kīhei High School project is not located within the Conservation District.*				
Education Functional Plan				
Objective A(1):	**Academic Excellence.** Emphasize quality educational programs in Hawaii's institutions to promote academic excellence.	X		
Objective A(2):	**Basic Skills.** Promote programs and activities that facilitate the acquisition of basic skills, such as reading, writing, computing, listening, speaking, and reasoning. Pursue effective programs which reflect the varied district, school, and student needs to strengthen basic skills achievement.	X		

Table 5-5 HAWAI'I STATE FUNCTIONAL PLANS S = Supportive, N/S = Not Supportive, N/A = Not Applicable		S	N/S	N/A
Objective A(3):	**Education Workforce.** Initiate efforts to improve the quality of education by improving the capabilities of the education workforce.	X		
Objective A(4):	**Services and Facilities.** Ensure the provision of adequate and accessible educational services and facilities that are designed to meet individual and community needs.	X		
Objective B(1):	**Alternatives for Funding and Delivery.** Explore alternatives for funding and delivery of educational services to improve the overall quality of education.			X
Objective B(2):	**Autonomy and flexibility.** Promote increased opportunities for greater autonomy and flexibility of educational institutions in their decisionmaking responsibilities.			X
Objective B(3)	**Increased Use of Technology.** Increase and improve the use information technology in education and encourage programs which increase the public's awareness and understanding of the impact of information technologies on our lives.	x		
Objective B(4):	**Personal Development.** Support education programs and activities that enhance personal development, physical fitness, recreation, and cultural pursuits of all groups.	X		
Objective B(5):	**Students with Special Needs.** Provide appropriate educational opportunities for groups with special needs.	X		
Objective C(1):	**Early Childhood Education.** Develop resources and programs for early childhood education.			X
Objective C(2):	**Hawaii's Cultural Heritage.** Promote educational programs which enhance understanding of Hawaii's cultural heritage.	X		
Objective C(3):	**Research Programs and [Communication] Activities.** Support research programs and activities that enhance the education programs of the State.	X		
Discussion: *The proposed Kīhei High School project is consistent with the goals and policies of the Education Functional Plan. Significant population growth in the Kīhei-Mākena region, coupled with the geographical separation from existing crowded central Maui high schools has created the need for the proposed Kīhei High School. Once completed, the new school will provide jobs, easier access to education, and new education opportunities within the Kīhei-Mākena region. The proposed high school has been planned for in County planning documents such as the adopted Kīhei-Mākena Community Plan (1998) and the December 2009 Draft Maui Island Plan 2030.*				
Employment Functional Plan				
Objective A:	Improve the qualifications of entry level workers and their transition to employment	X		
Objective B:	Develop and deliver education, training and related services to ensure and maintain a quality and competitive workforce.	X		
Objective C:	Improve labor exchange			X
Objective D:	Improve quality of life for workers and families.			X
Objective E:	Improve planning of economic development, employment and training activities			X
Discussion: *As an educational facility, the Kīhei High School project will provide students access to achieving quality education and skills for improving qualifications as entry level workers. The development of the project will also contribute to overall employment by creating construction-related jobs and long-term employment opportunities to support operations of the high school.*				
Energy Functional Plan				
Objective A:	Moderate the growth and energy demand through conservation and energy efficiency.	X		
Objective B:	Displace oil and fossil fuels consumption through the application of appropriate alternate and renewable energy resources and technologies.	X		
Objective C:	Promote energy education and legislation.	X		
Objective D:	Support and develop an integrated approach to energy development and management.			X
Objective E:	Ensure State's abilities to implement energy emergency actions immediately in event of fuel supply disruptions. Ensure essential public services are maintained and provisions are made to alleviate economic and personal hardships which may arise.			X

Table 5-5 HAWAI'I STATE FUNCTIONAL PLANS S = Supportive, N/S = Not Supportive, N/A = Not Applicable		S	N/S	N/A
Discussion: *The Kīhei High School project will be designed to include energy conservation measures, including efficiency and prospectively renewable energy, in accordance with the USGBC LEED certification requirements or comparable program. Development of the project will also result in shorter vehicle trips to and from school for those families living in South Maui who currently drive to Central Maui school locations. Energy education and practices will be promoted for students and faculty on campus.*				
Health Functional Plan				
Objective 1:	Health promotion and disease prevention. Reduction in the incidence, morbidity and mortality associated with preventable and controllable conditions.	X		
Objective 2:	Prevention and control of communicable diseases. Reduction in the incidence, morbidity, and mortality associated with infectious and communicable diseases.	X		
Objective 3:	Health needs of special populations with impaired access to health care. Increased availability and accessibility of health services for groups with impaired access to health care programs.	X		
Objective 4:	Community hospitals system. Development of a community hospital system which is innovative, responsive and supplies high quality care to the constituencies it serves.			X
Objective 5:	Environmental programs to protect and enhance the environment. Continued development of new environmental protection and health services programs to protect, monitor, and enhance the quality of life in Hawaii.			X
Objective 6:	DOH leadership. To improve the Department of Health's ability to meet the public health need of the State of Hawaii in the most appropriate, beneficial and economical way possible.			X
Discussion: *The DOE takes the responsibility of the wellness and safety of its students and staff seriously. Health services will be provided on campus to service anyone in need.* *In addition, the high school will be constructed following best management practices, and will meet DOH regulations concerning erosion control, fugitive dust, solid waste disposal, and noise controls. The development of the project will include on-site and offsite infrastructure systems that will connect to regional infrastructure systems. Infrastructure will be constructed to applicable State and County standards, rules and regulations, thereby fulfilling the goal of improving environmental health and protection.*				
Higher Education Functional Plan				
Objective A:	A number and variety of postsecondary education institutions sufficient to provide the diverse range of programs required to satisfy individual and societal needs and interests.			X
Objective B:	The highest level of quality, commensurate with its mission and objectives, of each educational, research, and public service program offered in Hawaii by an institution of higher education.			X
Objective C:	Provide appropriate educational opportunities for all who are willing and able to benefit from postsecondary education.			X
Objective D:	Provide financing for postsecondary education programs sufficient to ensure adequate diversity, high quality, and wide accessibility.			X
Objective E:	Increase program effectiveness and efficiency through better coordination of educational resources.			X
Discussion: *The Kīhei High School project does not provide post-secondary education; therefore, objectives of the Higher Education Functional Plan are not applicable.*				

Table 5-5 HAWAI'I STATE FUNCTIONAL PLANS S = Supportive, N/S = Not Supportive, N/A = Not Applicable		S	N/S	N/A
Historic Preservation Functional Plan				
Objective A:	Identification of historic properties.	X		
Objective B:	Protection of historic properties.	X		
Objective C:	Management and treatment of historic properties.	X		
Objective D:	Provision of adequate facilities to preserve historic resources.	X		
Objective E:	The establishment of programs to collect and conserve historic records, artifacts, and oral histories and to document and perpetuate traditional arts, skills, and culture.	X		
Objective F:	Provision of better access to historic information.			X
Objective G:	Enhancement of skills and knowledge needed to preserve historical resources.			X
Discussion: *An AIS and a CIA were prepared for the project by Scientific Consultant Services, Inc. During the AIS, one ~~(1)~~ site (SIHP No. 50-50-9-6393) was re-identified within the study parcel consisting of historic era rock piles and one ~~(1)~~ alignment. Although SIHP No. 50-50-10-6393 will be adversely impacted through project construction, the features have been documented to the fullest extent. The SHPD accepted the AIS on February 12, 2010. Information presented in the CIA for the project site revealed no notable cultural activities took place at the specific project areas. Therefore, no adverse effects are anticipated. Should significant cultural materials and/or burials be inadvertently discovered during construction, all work in the immediate area will cease and SHPD will be notified.*				
Housing Functional Plan				
Objective A:	Homeownership for at least sixty percent, or roughly 248,500 households by the year 2000.			X
Objective B:	Sufficient amount of affordable rental housing units by the year 2000 so as to increase the State's rental vacancy rate to at least 3%, with priority given to increasing the supply of units affordable to very low and lower income households.			X
Objective C:	Increased development of rental housing units for the elderly and other special need groups to afford them an equal access to housing.			X
Objective D:	Preservation of existing public and private housing stock.			X
Objective E:	Acquire and designate land suitable for housing development in sufficient amount to locate the deficit in housing units by the year 2000.			X
Objective F:	Maintain a statewide housing data system for use by public and private agencies engaged in the provision of housing.			X
Discussion: *The Kīhei High School project does not provide housing; therefore, objectives of the Housing Functional Plan are not applicable.*				
Human Services Functional Plan				
Objective A:	To sustain and improve current elder abuse and neglect services.			X
Objective B:	To increase cost-effective, high quality home and community based services.			X
Objective C:	To increase home-based services to keep children in their homes and to increase placement resources for those children who must be temporarily or permanently removed from their homes, due to abuse or neglect.			X
Objective D:	To address factors that contribute to child abuse and other forms of family violence.			X
Objective E:	To provide affordable, accessible, and quality child care.			X
Objective F:	To maximize efforts of self-sufficiency through provision of transitional medical care service.			X
Objective G:	To provide AFDC recipients with a viable opportunity to become independent of the welfare system.			X
Objective H:	To facilitate client access to human services.			X
Objective I:	To eliminate organizational barriers which limit client access to human services.			X

Table 5-5 HAWAI'I STATE FUNCTIONAL PLANS S = Supportive, N/S = Not Supportive, N/A = Not Applicable		S	N/S	N/A
Discussion: *Information on how to access basic human services directly would likely be available at the high school. However, direct human services will not be provided by the project; therefore, objectives of the Human Services Functional Plan are not applicable.*				
Recreation Functional Plan				
Objective I.A:	Address the problem of saturation of the capacity of beach parks and nearshore waters.			X
Objective I.B:	Reduce the incidence of ocean recreation accidents.			X
Objective I.C:	Resolve conflicts between different activities at heavily used ocean recreation areas.			X
Objective I.D:	Provide adequate boating facilities. Balance the demand for boating facilities against the need to protect the marine environment from potential adverse impacts.			X
Objective II.A:	Plan, develop, and promote recreational activities and facilities in mauka and other areas to provide a wide range of alternatives.	X		
Objective II.B:	Meet special recreation needs of the elderly, the disabled, woman, single-parent families, immigrants, and other groups.			X
Objective IIC:	Improve and expand the provision of recreation facilities in urban areas and local communities.	X		
Objective III.A:	Prevent the loss of access to shoreline and upland recreation areas due to new developments.			X
Objective III.B:	Resolve the problem of landowner liability that seriously hampers public access over private lands.			X
Objective III.C:	Increase access to State Forest Reserve lands over federal property, leased State lands, and other government lands.			X
Objective III.D:	Acquire, develop, and manage additional public accessways.	X		
Objective IV.A:	Promote a conservation ethic in the use of Hawaii's recreational resources.	X		
Objective IV.B:	Prevent degradation of the marine environment.	X		
Objective IV.C:	Improve the State's enforcement capabilities.			X
Objective IV.D:	Mitigate adverse impacts of tour helicopters on the quality of recreational experiences in wilderness areas.			X
Objective V.A:	Properly maintain existing parks and recreation areas.			X
Objective V.B:	Promote interagency coordination and cooperation to facilitate sharing of resources, joint development efforts, clarification of responsibilities and jurisdictions, and improvements in enforcement capabilities.			X
Objective V.C:	Assure adequate support for priority outdoor recreation programs and facilities.			X
Objective VI.A:	Increase recreational access and opportunities in Hawaii's wetlands.			X
Objective VI.B:	Develop an adequate information base to assist the County planning departments and other regulatory agencies in make decisions regarding wetlands.			X
Objective VI.C:	Assure the protection of the most valuable wetlands in the state.			X
Discussion: *The Kīhei High School project will provide and maintain indoor and outdoor athletics facilities, including a gymnasium, sports stadium, grassed playfield, outdoor basketball courts, and tennis courts. Athletic fields on the lower campus may be accessible for public use during non-school hours. The campus is envisioned as a place for the community to gather for sports and recreational activities.* *While the project is located inland and away from coastal areas, best management practices and other measures such ground stabilization with landscape and hardscape will be implemented to prevent non-point source pollution and other impacts to coastal resources.*				

Table 5-5 HAWAIʻI STATE FUNCTIONAL PLANS S = Supportive, N/S = Not Supportive, N/A = Not Applicable		S	N/S	N/A
Tourism Functional Plan				
Objective I.A:	Development, implementation, and maintenance of polices and actions which support the steady and balanced growth of the visitor industry.			X
Objective II.A:	Development and maintenance of well-designed visitor facilities and related developments which are sensitive to the environment, sensitive to neighboring communities and activities, and adequately serviced by infrastructure and support services.			X
Objective III.A:	Enhancement of respect and regard for the fragile environment which comprise Hawaiʻi's natural and cultural environment. Increased preservation and maintenance efforts.			X
Objective IV.A:	Support of Hawaiʻi's diverse range of lifestyles and natural environment.			X
Objective IV.B:	Achievement of mutual appreciation among residents, visitors, and the visitor industry			X
Objective V.A:	Development of a productive workforce to maintain a high quality visitor industry.			X
Objective V.B:	Enhancement of career and employment opportunities in the visitor industry.			X
Objective VI.A:	Maintenance of a high customer awareness of Hawaiʻi as a visitor destination in specific desired market segments.			X
Discussion: *Development of the Kīhei High School project will not impact tourism; therefore, the Tourism Functional Plan is not applicable.*				
Transportation Functional Plan				
Objective I.A:	Expansion of the transportation system.			X
Objective I.B:	Reduction of travel demand through zoning and decentralization initiatives.	X		
Objective I.C:	Management of existing transportation systems through a program of transportation systems management (TSM).			X
Objective I.D:	Identification and reservation of lands and rights-of-way required for future transportation improvements.			X
Objective I.E:	Planning and designing State highways to enhance inter-regional mobility.			X
Objective I.F:	Improving and enhancing transportation safety			X
Objective I.G:	Improved transportation maintenance programs.			X
Objective I.H:	Ensure that transportation facilities are accessible to people with disabilities.			X
Objective II.A:	Development of a transportation infrastructure that supports economic development initiatives.			X
Objective III.B:	Expansion of revenue bases for transportation improvements.			X
Objective IV.A:	Providing educational programs.			X
Discussion: *Although the Kīhei High School project does not directly relate to the Transportation Functional Plan's objectives, development of the project will result in traffic-related improvements (see Section 4.2.5). These improvements will address traffic impacts specifically related to the creation of the high school, while also helping to accommodate the general regional population growth of the area. In addition, the proximity of the new high school to Kīhei-Mākena residential areas will reduce the number of trips to schools outside of the region.*				
Water Resources Functional Plan				
Objective A:	Enunciate State water policy and improve management framework.			X
Objective B:	Maintain the long-term availability of freshwater supplies, giving consideration to the accommodation of important environmental values.			X
Objective C:	Improve management of floodplains.			X
Objective D:	Assure adequate municipal water supplies for planned urban growth.			X
Objective E:	Assure the availability of adequate water for agriculture.			X
Objective F:	Encourage and coordinate with other water programs the development of self-supplied industrial water and the production of water-based energy.			X

Table 5-5 HAWAI'I STATE FUNCTIONAL PLANS S = Supportive, N/S = Not Supportive, N/A = Not Applicable		S	N/S	N/A
Objective G:	Provide for the protection and enhancement of Hawaii's freshwater and estuarine environment.	X		
Objective H:	Improve State grant and loan procedures for water program and projects.			X
Objective I:	Pursue water resources data collection and research to meet changing needs.			X

Discussion: *The new high school will require connection to the Central Maui Water System for domestic water and fire supply. The project team will continue to work with DWS to provide potable water supply for the proposed Kīhei High School project. Irrigation water will be supplied via on-site brackish wells drilled into the groundwater lens below the site. In addition, water conservation strategies will be implemented to reduce consumption, conserve resources, and minimize water demands.*

5.1.7 Coastal Zone Management, Hawai'i Revised Statutes, Chapter 205A

~~Under HRS Chapter 205A, the Coastal Zone Management Program (CZM) is a comprehensive nationwide program that establishes and enforces standards and policies to guide the development of public and private lands within the coastal areas.~~ The National Coastal Zone Management (CZM) program is a partnership between the federal government and coastal states and territories which balances coastal resource use and preservation so that people will continue to benefit from the rich resources the coast provides. In the State of Hawai'i, the CZM is articulated in Chapter 205A of the HRS. HRS 205A defines the CZM area as "…all lands of the state extending seaward from the shoreline to the limit of the state's police power and management authority, including the United States territorial seas." The State CZM objectives and policies address the following 10 subject areas: (1) recreational resources, (2) historic resources, (3) scenic and open space resources, (4) coastal ecosystems, (5) economic uses, (6) coastal hazards, (7) managing development, (8) public participation, (9) beach protection, and (10) marine resources. Virtually all relate to potential development impacts on the shoreline, near shore, and ocean area environments. The Hawai'i CZM Law charges the counties with designating and administering Special Management Area (SMA) within the State's coastal areas. A "development", as defined by the CZM Law, that is located within the SMA requires a Special Management Area Use Permit. *Table 5-6* outlines the objectives and policies of HRS Chapter 205A and discusses the applicability to the project.

Discussion: *The Kīhei High School project is not located within the SMA or CZM area, and is not subject to the Hawai'i ~~Coastal Zone Management~~ CZM and County of Maui's SMA policies and controls.*

Table 5-6 COASTAL ZONE MANAGMENT PROGRAM HRS SECTION 205 A- OBJECTIVE AND POLICIES S = Supportive, N/S = Not Supportive, N/A = Not Applicable	S	N/S	N/A
OBJECTIVES AND POLICIES			
Objective (1) Recreational resources;			
Provide coastal recreational opportunities accessible to the public.			
Policy (A) Improve coordination and funding of coastal recreational planning and management; and			X
Policy (B) Provide adequate, accessible, and diverse recreational opportunities in the coastal zone management area by:			
(i) Protecting coastal resources uniquely suited for recreational activities that cannot be provided in other areas;			X

Table 5-6 COASTAL ZONE MANAGMENT PROGRAM HRS SECTION 205 A- OBJECTIVE AND POLICIES S = Supportive, N/S = Not Supportive, N/A = Not Applicable	S	N/S	N/A
(ii) Requiring replacement of coastal resources having significant recreational value including, but not limited to, surfing sites, fishponds, and sand beaches, when such resources will be unavoidably damaged by development; or requiring reasonable monetary compensation to the State for recreation when replacement is not feasible or desirable;			X
(iii) Providing and managing adequate public access, consistent with conservation of natural resources, to and along shorelines with recreational value;			X
(iv) Providing an adequate supply of shoreline parks and other recreational facilities suitable for public recreation;			X
(v) Ensuring public recreational uses of county, state and federally-owned or controlled shoreline lands having recreational value consistent with public safety standards and conservation of natural resources.			X
(vi) Adopting water quality standards and regulating point and non-point sources of pollution to protect	X		
(vii) Developing new shoreline recreational opportunities			X
(viii) Encouraging reasonable dedication of shoreline areas with recreational value for public use as part of discretionary approvals or permits by the land use commission, board of land and natural resources, and county authorities; and crediting such dedication against the requirements of section 46-6.			X
Discussion: *The Kīhei High School project is located upslope and away from the coastline, therefore shoreline recreational opportunities are not provided. However, the project will provide a new recreational resource for the surrounding area, particularly at the lower campus where athletic fields may be accessible for the community use.* *The project will adopt water quality standards and will be constructed and operated in accordance with State and federal water quality regulations.*			
Objective (2) Historic resources;			
Protect, preserve, and, where desirable, restore those natural and manmade historic and prehistoric resources in the coastal zone management area that are significant in Hawaiian and American history and culture.			
Policy (A) Identify and analyze significant archaeological resources;	X		
Policy (B) Maximize information retention through preservation of remains and artifacts or salvage operations; and	X		
Policy (C) Support state goals for protection, restoration, interpretation, and display of historic resources.	X		
Discussion: *The project supports the CZM historic resources objective and policies to protect, preserve, and where desirable, restore those natural and manmade historic and prehistoric resources, particularly in the coastal zone management area that are significant in Hawaiian and American history and culture. An AIS and a CIA were prepared for this EIS. The SHPD accepted the AIS on February 12, 2010. Should significant cultural materials and/or burials be inadvertently discovered during construction, all work in the immediate area of the find must cease and SHPD must be notified.*			
Objective (3) Scenic and open space resources;			
Protect, preserve, and, where desirable, restore or improve the quality of coastal scenic and open space resources.			
Policy (A) Identify valued scenic resources in the coastal zone management area;			X
Policy (B) Ensure that new developments are compatible with their visual environment by designing and locating such developments to minimize the alteration of natural landforms and existing public views to and along the shoreline;	X		
Policy (C) Preserve, maintain, and, where desirable, improve and restore shoreline open space and scenic resources; and			X

Table 5-6 COASTAL ZONE MANAGMENT PROGRAM HRS SECTION 205 A- OBJECTIVE AND POLICIES S = Supportive, N/S = Not Supportive, N/A = Not Applicable	S	N/S	N/A
Policy (D) Encourage those developments that are not coastal dependent to locate in inland areas.	X		
Discussion: *The Kīhei High School project will not impinge upon significant scenic view corridors. While the project is not located in the coastal zone or SMA, considerable amount of scenic open space will be preserved and maintained as part of the overall campus setting. The design objectives of the high school will encourage building forms that fit with the topographic and landscape character of the land.*			
Objective (4) Coastal ecosystems;			
Protect valuable coastal ecosystems, including reefs, from disruption and minimize adverse impacts on all coastal ecosystems.			
Policy (A) Exercise an overall conservation ethic, and practice stewardship in the protection, use, and development of marine and coastal resources;			X
Policy (B) Improve the technical basis for natural resource management;			X
Policy (C) Preserve valuable coastal ecosystems, including reefs, of significant biological or economic importance;			X
Policy (D) Minimize disruption or degradation of coastal water ecosystems by effective regulation of stream diversions, channelization, and similar land and water uses, recognizing competing water needs; and			X
Policy (E) Promote water quantity and quality planning and management practices that reflect the tolerance of fresh water and marine ecosystems and maintain and enhance water quality through the development and implementation of point and non-point source water pollution control measures.	X		
Discussion: *The proposed project is located inland and away from coastal ecosystems. However, the project will enhance water quality through the development and implementation of water pollution control measures. Best management practices and other measures such ground stabilization with landscape and hardscape will be implemented to prevent non-point source pollution and other impacts to coastal resources.*			
Objective (5) Economic uses;			
Provide public or private facilities and improvements important to the State's economy in suitable locations.			
Policy (A) Concentrate coastal dependent development in appropriate areas;			X
Policy (B) Ensure that coastal dependent development such as harbors and ports, and coastal related development such as visitor industry facilities and energy generating facilities, are located, designed, and constructed to minimize adverse social, visual, and environmental impacts in the coastal zone management area; and			X
Policy (C) Direct the location and expansion of coastal dependent developments to areas presently designated and used for such developments and permit reasonable long-term growth at such areas, and permit coastal dependent development outside of presently designated areas when:			X
(i) Use of presently designated locations is not feasible;			X
(ii) Adverse environmental effects are minimized; and			X
(iii) The development is important to the State's economy.			X
Discussion: *The Kīhei High School project is located away from the coast line and will not be a coastal dependent project.*			
Objective (6) Coastal hazards;			
Reduce hazard to life and property from tsunami, storm waves, stream flooding, erosion, subsidence, and pollution.			
Policy (A) Develop and communicate adequate information about storm wave, tsunami, flood, erosion, subsidence, and point and non-point source pollution hazards;	X		

Table 5-6 COASTAL ZONE MANAGMENT PROGRAM HRS SECTION 205 A- OBJECTIVE AND POLICIES S = Supportive, N/S = Not Supportive, N/A = Not Applicable	S	N/S	N/A
Policy (B) Control development in areas subject to storm wave, tsunami, flood, erosion, hurricane, wind, subsidence, and point and non-point source pollution hazards;	X		
Policy (C) Ensure that developments comply with requirements of the Federal Flood Insurance Program; and	X		
Policy (D) Prevent coastal flooding from inland projects.	X		
Discussion: *The project area is designated Zone X, outside the 100-year flood plain and is not in the tsunami inundation zone. The project area is secure from tsunami, storm waves, subsidence or stream flooding. The proposed project will be constructed in compliance with applicable building codes and DOE standards in regards to preparation for natural hazards. The Kīhei High School would also be used as a shelter for the Kīhei community if a natural hazard were to occur.*			
Objective (7) Managing development;			
Improve the development review process, communication, and public participation in the management of coastal resources and hazards.			
Policy (A) Use, implement, and enforce existing law effectively to the maximum extent possible in managing present and future coastal zone development;			X
Policy (B) Facilitate timely processing of applications for development permits and resolve overlapping or conflicting permit requirements; and			X
Policy (C) Communicate the potential short and long-term impacts of proposed significant coastal developments early in their life cycle and in terms understandable to the public to facilitate public participation in the planning and review process.			X
Discussion: *The Kīhei High School project is not located in the designated coastal zone area. Therefore, the project will not impact the development review process, communication, and public participation in the management of coastal resources and hazards.*			
Objective (8) Public participation;			
Stimulate public awareness, education, and participation in coastal management.			
Policy (A) Promote public involvement in coastal zone management processes;			X
Policy (B) Disseminate information on coastal management issues by means of educational materials, published reports, staff contact, and public workshops for persons and organizations concerned with coastal issues, developments, and government activities; and	X		
Policy (C) Organize workshops, policy dialogues, and site-specific mediations to respond to coastal issues and conflicts.			X
Discussion: *While the coastal element of this objective is not primarily relevant to the Kīhei High School project, the public participation aspect is. The applicant supports public participation in the CZM process through assurances that information regarding planned improvements and possible coastal management issues and mitigation strategies are detailed in its documentation and presentations. In accordance with Chapter 343, HRS, this EIS discusses the potential short-term and long-term impacts of the project on the environment. Throughout the HRS Chapter 343 process, public review and comments are welcomed and will be incorporated into the overall environmental review and analysis.*			
Objective (9) Beach protection;			
Protect beaches for public use and recreation.			
Policy (A) Locate new structures inland from the shoreline setback to conserve open space, minimize interference with natural shoreline processes, and minimize loss of improvements due to erosion;			X
Policy (B) Prohibit construction of private erosion-protection structures seaward of the shoreline, except when they result in improved aesthetic and engineering solutions to erosion at the sites and do not interfere with existing recreational and waterline activities; and			X

Table 5-6 COASTAL ZONE MANAGMENT PROGRAM HRS SECTION 205 A- OBJECTIVE AND POLICIES S = Supportive, N/S = Not Supportive, N/A = Not Applicable	S	N/S	N/A
Policy (C) Minimize the construction of public erosion-protection structures seaward of the shoreline.			X
Discussion: *Construction of the high school will not adversely impact beaches since it is located away from designated coastal zone areas.*			
Objective (10) Marine resources;			
Promote the protection, use, and development of marine and coastal resources to assure their sustainability.			
Policy (A) Ensure that the use and development of marine and coastal resources are ecologically and environmentally sound and economically beneficial;			X
Policy (B) Coordinate the management of marine and coastal resources and activities to improve effectiveness and efficiency;			X
Policy (C) Assert and articulate the interests of the State as a partner with federal agencies in the sound management of ocean resources within the United States exclusive economic zone;			X
Policy (D) Promote research, study, and understanding of ocean processes, marine life, and other ocean resources in order to acquire and inventory information necessary to understand how ocean development activities relate to and impact upon ocean and coastal resources; and			X
Policy (E) Encourage research and development of new, innovative technologies for exploring, using, or protecting marine and coastal resources.			X
Discussion: *The project is not located near the coastal area and will not affect marine and coastal resources. The high school will be constructed and operated in accordance with State and federal water quality regulations.*			

5.2 COUNTY OF MAUI

5.2.1 County of Maui General Plan 2030

The Maui County General Plan is a long-term, comprehensive blueprint for the physical, economic, environmental development and cultural identity of the county. The General Plan consists of the Countywide Policy Plan, Draft Maui Island Plan, and Community Plans.

5.2.2 Countywide Policy Plan

The Countywide Policy Plan was adopted in March 2010 and is a comprehensive policy document for the islands of Maui County to the year 2030. The Countywide Policy Plan is the first component of the General Plan update. The Countywide Policy Plan acts as an over-arching values statement and provides a policy framework for the Maui Island Plan and Community Plans. The Countywide Policy Plan provides broad goals, objectives, policies, and implementing actions that portray the desired direction of the County's future. Goals are intended to describe a desirable condition of the County by the year 2030. Objectives are more specific and regarded as milestones to achieve the larger goals. Policies provide a general guideline for County decision makers, departments, and collaborating organizations towards achieving goals and objectives. Implementing actions are specific tasks, procedures, programs, or techniques that carry out each policy. *Table 5-7* describes the goals, objectives, policies, and implementing actions of the Countywide Policy Plan and discusses the applicability to the project.

Table 5-7 COUNTYWIDE POLICY PLAN OBJECTIVES, POLICIES, AND IMPLMENTING ACTIONS S = Supportive, N/S = Not Supportive, N/A = Not Applicable	S	N/S	N/A
PART A: Protect the Natural Environment			
Goal: Maui County's natural environment and distinctive open spaces will be preserved, managed, and cared for in perpetuity.			
Objective (1): Improve the opportunity to experience the natural beauty and native biodiversity of the islands for present and future generations.	X		
Policies:			
(a) Perpetuate native Hawaiian biodiversity by preventing the introduction of invasive species, containing or eliminating existing noxious pests, and protecting critical habitat areas.			X
(b) Preserve and reestablish indigenous and endemic species' habitats and their connectivity.			X
(c) Restore and protect forests, wetlands, watersheds, and stream flows, and guard against wildfires, flooding, and erosion.	X		
(d) Protect baseline stream flows for perennial streams, and support policies that ensure adequate stream flow to support Native Hawaiian aquatic species, traditional kalo cultivation, and self-sustaining ahupua'a.			X
(e) Protect undeveloped beaches, dunes, and coastal ecosystems, and restore natural shoreline processes.			X
(f) Protect the natural state and integrity of unique terrain, valued natural environments, and geological features.	X		
(g) Preserve and provide ongoing care for important scenic vistas, view planes, landscapes, and open-space resources.	X		
(h) Expand coordination with the State and nonprofit agencies and their volunteers to reduce invasive species, replant indigenous species, and identify critical habitat.			X
Implementing Actions:			
(a) Develop island-wide networks of greenways, watercourses, and habitat corridors.			X

Discussion: *No Federal or State listed endangered, threatened, proposed, or candidate botanical resources were located on or in the immediate vicinity of the project site. The results of the botanical survey conducted for the project indicate there are no special concerns related to botanical resources in the Kīhei High School project area. The development of the project is also not expected to result in impacts to avian or mammalian species currently listed or proposed for listing under either the federal or the State endangered species statutes. Although not detected during the avian and mammalian species survey of the area, it is possible that small numbers of the endangered endemic Hawaiian Petrel, and the threatened Newell's Shearwater, travel over the project area between the months of May and November. Therefore, mitigation measures will be implemented as described in Section 4.1.7.*

The project will not impinge upon any significant public scenic view corridors, and will have no significant impacts on views toward the ocean or Haleakalā. The design objectives of the Kīhei High School project will encourage building forms that respect and maintain the unique topographic and landscape character of the land. The campus will also include open space and landscaped areas throughout the development.

Development of the Kīhei High School project will be designed to protect against wildfire, flooding and erosion. To protect against natural hazards, all structures within the campus will be constructed in compliance with requirements of the UBC, and other County, State, and Federal standards.

The Kīhei High School campus will be integrated with open spaces and wide landscaped pedestrian malls. The design of the project will also utilize green corridors to provide connectivity and cohesiveness within the campus.

Table 5-7 COUNTYWIDE POLICY PLAN OBJECTIVES, POLICIES, AND IMPLMENTING ACTIONS S = Supportive, N/S = Not Supportive, N/A = Not Applicable	S	N/S	N/A
Objective (2): Improve the quality of environmentally sensitive, locally valued natural resources and native ecology of each island.	X		
Policies:			
(a) Protect and restore nearshore reef environments and water quality.			X
(b) Protect marine resources and valued wildlife.			X
(c) Improve the connection between urban environments and the natural landscape, and incorporate natural features of the land into urban design.			X
(d) Utilize land-conservation tools to ensure the permanence of valued open spaces.			X
(e) Mitigate the negative effects of upland uses on coastal wetlands, marine life, and coral reefs.	X		
(f) Strengthen coastal-zone management, re-naturalization of shorelines, where possible, and filtration or treatment of urban and agricultural runoff.			X
(g) Regulate the use and maintenance of stormwater-treatment systems that incorporate the use of native vegetation and mimic natural systems.			X
(h) Advocate for stronger regulation of fishing, boating, cruise ship, and ecotourism activities.			X
(i) Restore watersheds and aquifer-recharge areas to healthy and productive status, and increase public knowledge about the importance of watershed stewardship, water conservation, and groundwater protection.			X
Implementing Actions:			
(a) Develop regulations to minimize runoff of pollutants into nearshore waters and reduce nonpoint and point source pollution.			X
Discussion: *The development of the Kīhei High School project will not involve alteration of the shoreline or offshore environments, as the project is located upslope and away from the shoreline. The project will adopt water quality standards and will be constructed and operated in accordance with State and federal water quality regulations.* *As detailed in Section 4.2.10.3, drainage from the project is not expected to have a significant adverse effect on groundwater, downstream properties, or marine waters. Drainage improvements will be designed to result in little or no increase in the peak rate of storm water runoff from existing conditions. Best management practices will be implemented, such as the use of basins, grass swales, infiltration trenches and vegetative filter strips.*			
Objective (3): Improve the stewardship of the natural environment.	X		
Policies:			
(a) Preserve and protect natural resources with significant scenic, economic, cultural, environmental, or recreational value.			X
(b) Improve communication, coordination, and collaboration among government agencies, nonprofit organizations, communities, individuals, and land owners that work for the protection of the natural environment.			X
(c) Evaluate development to assess potential short-term and long-term impacts on land, air, aquatic, and marine environments.	X		
(d) Improve efforts to mitigate and plan for the impact of natural disasters, human influenced emergencies, and global warming.			X
(e) Regulate access to sensitive ecological sites and landscapes.			X
(f) Reduce air, noise, light, land, and water pollution, and reduce Maui County's contribution to global climate change.	X		
(g) Plan and prepare for and educate visitors and residents about the possible effects of global warming.			X
(h) Provide public access to beaches and shorelines for recreational and cultural purposes where appropriate.			X

Table 5-7 COUNTYWIDE POLICY PLAN OBJECTIVES, POLICIES, AND IMPLMENTING ACTIONS S = Supportive, N/S = Not Supportive, N/A = Not Applicable	S	N/S	N/A
(i) Educate the construction and landscape industries and property owners about the use of best management practices to prevent erosion and nonpoint source pollution.			X
(j) Support the acquisition of resources with scenic, environmental, and recreational value, and encumber their use.			X
(k) Improve enforcement activities relating to the natural environment.			X
(l) For each shoreline community, identify and prioritize beach-conservation objectives, and develop action plans for their implementation.			X
Implementing Actions:			
(a) Document, record, and monitor existing conditions, populations, and locations of flora and fauna communities.	X		
(b) Implement Federal and State policies that require a reduction of greenhouse-gas emissions.	X		
(c) Establish a baseline inventory of available natural resources and their respective carrying capacities.			X
Discussion: *The project will not affect natural resources with significant scenic, economic, cultural, environmental, or recreational value. As part of this EIS, various environmental surveys and studies (i.e. Botanical, Mammalian and Avian surveys, AIS, CIA, Air Quality, and Noise Assessment) were conducted to ensure the project would not result in significant impacts on land, air, aquatic and marine environments, or natural resources on or within the vicinity of the site. The findings of these surveys indicate that the construction and operation of the proposed Kīhei High School project will not result in significant adverse impacts. Further, mitigation measures and best management practice will be implemented as appropriate.* *As a State of Hawai'i agency, the DOE is committed to the use of renewable energy sources that are proven, viable, cost effective, and environmentally responsible. Kīhei High School will be designed to achieve certification under the USGBC LEED program or comparable program. Sustainable design strategies that will be considered include water conservation measures and the use of efficient plumbing fixtures, such as drought tolerant landscaping. The project design may also support alternative modes of transportation and low-emitting and fuel efficient vehicles to help reduce greenhouse gas emission. High school students can reduce their overall vehicle miles traveled by attending school locally instead of traveling long distances.*			
Objective (4): Educate residents and visitors about responsible stewardship practices and the interconnectedness of the natural environment and people.	X		
Policies:			
(a) Expand education about native flora, fauna, and ecosystems.	X		
(b) Align priorities to recognize that the health of the natural environment and the health of people are inextricably linked.	X		
(c) Promote programs and incentives that decrease greenhouse-gas emissions and improve environmental stewardship.			X
Discussion: *With a campus designed to meet USGBC LEED or other comparable program requirements, Kīhei High School will promote an environmental awareness among students and faculty that promote the importance of the natural environment and relationship to people.*			
PART B: Preserve Local Cultures and Traditions			
Goal: Maui County will foster a spirit of pono and protect, perpetuate, and reinvigorate its residents' multicultural values and traditions to ensure that current and future generations will enjoy the benefits of their rich island heritage.			
Objective (1): Perpetuate the Hawaiian culture as a vital force in the lives of residents.	X		

Table 5-7 COUNTYWIDE POLICY PLAN OBJECTIVES, POLICIES, AND IMPLMENTING ACTIONS S = Supportive, N/S = Not Supportive, N/A = Not Applicable	S	N/S	N/A
Policies:			
(a) Protect and preserve access to mountain, ocean, and island resources for traditional Hawaiian cultural practices.			X
(b) Prohibit inappropriate development of cultural lands and sites that are important for traditional Hawaiian cultural practices, and establish mandates for the special protection of these lands in perpetuity.	X		
(c) Promote the use of ahupua'a and moku management practices.			X
(d) Encourage the use of traditional Hawaiian architecture and craftsmanship.			X
(e) Promote the use of the Hawaiian language.			X
(f) Recognize and preserve the unique natural and cultural characteristics of each ahupua'a or district.			X
(g) Encourage schools to promote broader incorporation of Hawaiian and other local cultures' history and values lessons into curriculum.	X		
(h) Ensure the protection of Native Hawaiian rights.			X
(i) Promote, encourage, and require the correct use of traditional place names, particularly in government documents, signage, and the tourism industry.	X		
Implementing Actions:			
(a) Establish alternative land use and overlay zoning designations that recognize and preserve the unique natural and cultural characteristics of each ahupua'a or district.			X
(b) Develop requirements for all County applicants to perpetuate and use proper traditional place names in all applications submitted.			X

Discussion: *The project supports the Hawaiian culture and recognizes it at a vital force for the citizen of the Hawai'i. As discussed in Section 4.2.3, an AIS was prepared for the project. One ~~(1)~~ site (SIHP No. 50-50-9-6393) was re-identified within the study parcel consisting of historic era rock piles and one ~~(1)~~ alignment. The SHPD accepted the AIS on February 12, 2010.*

As detailed in Section 4.2.4, a CIA was completed for the proposed project. Consultation was sought from Phillis (Coochie) Cayan, History and Culture Branch Chief with SHPD; Office of Hawaiian Affairs (OHA), O'ahu Branch; Thelma Shimaoka, OHA Maui Branch; Charles Maxwell, Maui Island Burial Council; Kimokeo Kapahulehua; Department of Planning, Cultural Resources Commission; Hinano Rodrigues, DLNR; Kīhei Community Association; and Central Maui Hawaiian Civic Club. The findings of the CIA indicate that the project will not result in significant adverse impacts to cultural resources within the site.

In addition, the applicant and its contractors will comply with all State and County laws and rules regarding the preservation of archaeological and historic sites. The potential exists for inadvertent cultural or archaeological finds during the course of construction. Should significant cultural materials and/or burials be inadvertently discovered during construction, all work in the immediate area of the find must cease and SHPD must be notified.

The core curriculum for Kīhei High School will be established by the State DOE and will include various educational and research programs relating to Hawaiian and other local cultures' history and values to the extent appropriate for both the school and its student population.

Objective (2): Emphasize respect for our island lifestyle and our unique local cultures, family, and natural environment.	X		
Policies:			
(a) Acknowledge the Hawaiian culture as the host culture, and foster respect and humility among residents and visitors toward the Hawaiian people and their practices.	X		

Table 5-7 COUNTYWIDE POLICY PLAN OBJECTIVES, POLICIES, AND IMPLMENTING ACTIONS S = Supportive, N/S = Not Supportive, N/A = Not Applicable	S	N/S	N/A
(b) Perpetuate a respect for diversity, and recognize the historic blending of cultures and ethnicities.	X		
(c) Encourage the perpetuation of each culture's unique cuisine, attire, dance, music, and folklore, and other unique island traditions and recreational activities.	X		
(d) Recognize the interconnectedness between the natural environment and the cultural heritage of the islands.	X		
(e) Protect and prioritize funding for recreational activities that support local cultural practices, such as surfing, fishing, and outrigger-canoe paddling.			X
Discussion: *The proposed Kīhei High School respects the island lifestyle and unique cultures and environment. A CIA and an AIS were completed for the proposed project to ensure protection of environmental, natural, cultural and historic resources. The findings of these studies indicate that the project will not result in significant adverse impacts to cultural resources or historic properties within the site.* *Once the high school is operational, a local culture and respect for diversity will be perpetuated throughout campus. The school will serve area residents of the Kīhei-Mākena region.*			
Objective (3): Preserve for present and future generations the opportunity to know and experience the arts, culture, and history of Maui County	X		
Policies:			
(a) Foster teaching opportunities for cultural practitioners to share their knowledge and skills.	X		
(b) Support the development of cultural centers.			X
(c) Broaden opportunities for public art and the display of local artwork.	X		
(d) Foster the Aloha Spirit by celebrating the Hawaiian host culture and other Maui County cultures through support of cultural-education programs, festivals, celebrations, and ceremonies.	X		
(e) Support the perpetuation of Hawaiian arts and culture.	X		
(f) Support programs and activities that record the oral and pictorial history of residents.			X
(g) Support the development of repositories for culture, history, genealogy, oral history, film, and interactive learning.			X
Implementing Actions:			
(a) Establish incentives for the display of public art.			X
(b) Establish centers and programs of excellence for the perpetuation of Hawaiian arts and culture.			X
Discussion: *Once Kīhei High School is operational, opportunities to present the arts, culture, and history of Maui may be available for students and faculty through curriculum and related activities. As appropriate, educational programs perpetuating the Hawaiian culture and other cultures will also be provided and/or integrated with the school curriculum and activities.*			
Objective (4): Preserve and restore significant historic architecture, structures, cultural sites, cultural districts, and cultural landscapes.	X		
Policies:			
(a) Support the development of an island-wide historic, archaeological, and cultural resources inventory.			X
(b) Promote the rehabilitation and adaptive reuse of historic sites, buildings, and structures to perpetuate a traditional sense of place.			X
(c) Identify a sustainable rate of use and set forth specific policies to protect cultural resources.			X
(d) Protect and preserve lands that are culturally or historically significant.			X

Table 5-7 COUNTYWIDE POLICY PLAN OBJECTIVES, POLICIES, AND IMPLMENTING ACTIONS S = Supportive, N/S = Not Supportive, N/A = Not Applicable	S	N/S	N/A
(e) Support programs that protect, record, restore, maintain, provide education about, and interpret cultural districts, landscapes, sites, and artifacts in both natural and museum settings.	X		
(f) Perpetuate the authentic character and historic integrity of rural communities and small towns.			X
(g) Seek solutions that honor the traditions and practices of the host culture while recognizing the needs of the community.	X		
(h) Support the development of an Archaeological District Ordinance.			X
(i) Protect summits, slopes, and ridgelines from inappropriate development.			X
(j) Support the registering of important historic sites on the State and Federal historic registers.			X
(k) Provide opportunities for public involvement with restoration and enhancement of all types of cultural resources.	X		
(l) Foster partnerships to identify and preserve or revitalize historic and cultural sites.			X
Implementing Actions:			
(a) Identify, develop, map, and maintain an inventory of locally significant natural, cultural, and historical resources for protection.	X		
(b) Prepare, continually update, and implement a cultural-management plan for cultural sites, districts, and landscapes, where appropriate.			X
(c) Enact an Archaeological District Ordinance.			X
(d) Nominate important historic sites to the State and Federal historic registers.			X

Discussion: *As detailed above in Objective (1), a CIA and an AIS were completed for the proposed project to ensure protection of cultural and historic resources prior to the development of the school. The findings of these studies indicate that the project will not result in significant adverse impacts to cultural resources or historic properties within the site.*

As part of the CIA process, Hawaiian organizations, agencies, and community members were contacted to identify potentially knowledgeable individuals with cultural expertise and/or knowledge of the Kīhei High School project area and its vicinity. In addition, a CIA Notice was published in The Honolulu Advertiser, The Maui News, and Na Wai Ola requesting information of cultural resources or activities in the area of the proposed Kīhei High School project.

The applicant and its contractors will comply with all State and County laws and rules regarding the preservation of archaeological and historic sites. Should significant cultural materials and/or burials be inadvertently discovered during construction, all work in the immediate area of the find must cease and SHPD must be notified.

PART C: Improve Education			
Goal: Residents will have access to lifelong formal and informal educational options enabling them to realize their ambitions.			
Objective (1): Encourage the State to attract and retain school administrators and educators of the highest quality.	X		
Policies:			
(a) Encourage the State to provide teachers with nationally competitive pay and benefit packages.			X
(b) Encourage the State to ensure teachers will have the teaching tools and support staff needed to provide students with an excellent education.			X
(c) Explore Maui County district- and school-based decision making in public education.			X

Table 5-7 COUNTYWIDE POLICY PLAN OBJECTIVES, POLICIES, AND IMPLMENTING ACTIONS S = Supportive, N/S = Not Supportive, N/A = Not Applicable	S	N/S	N/A
Discussion: *Through the development of Kīhei High School, the State DOE is will provide a new school facility to support the Kīhei-Mākena region. The school will also hire new teachers and administrators to ensure students are provided with an excellent education.*			
Objective (2): Provide nurturing learning environments that build skills for the 21st century.	X		
Policies:			
(a) Expand professional-development opportunities in disciplines that support the economic-development goals of Maui County.			X
(b) Plan for demographic, social, and technological changes in a timely manner.	X		
(c) Encourage collaborative partnerships to improve conditions of learning environments.			X
(d) Promote development of neighborhood schools and educational centers.	X		
(e) Integrate schools, community parks, and playgrounds, and expand each community's use of these facilities.	X		
(f) Support coordination between land use and school-facility planning agencies.	X		
(g) Encourage the upgrade and ongoing maintenance of public-school facilities.			X
(h) Encourage the State Department of Education to seek reliable, innovative, and alternative methods to support a level of per-pupil funding that places Hawai'i among the top tier of states nationally for its financial support of public schools.			X
(i) Encourage the State to promote healthier, more productive learning environments, including by providing healthy meals, more physical activity, natural lighting, and passive cooling.	X		
(j) Encourage the State to support the development of benchmarks to measure the success of Hawai'i's public-education system and clarify lines of accountability.			X
(k) Design school and park facilities in proximity to residential areas.	X		
(l) Support technology- and natural-environment-based learning.	X		
(m) Encourage the State to support lower student-teacher ratios in public schools.			X
(n) Encourage alternative learning and educational opportunities.			X
Implementing Actions:			
(a) Develop safe walking and bicycling programs for school children.	X		
Discussion: *The proposed Kīhei High School will provide a nurturing learning environment that helps to build skills for future development of students and the community. The proposed Kīhei High School project site is located in the planned growth area of the Draft Maui Island Plan and is listed as a regional facility recommended for development in South Maui. The new school will be located in close proximity to existing and future residential areas and will provide an additional educational resource for the region. By providing the new high school, the project will help to decrease overcrowding occurring at Central Maui schools who currently serve students from the South Maui region. Safe walking and bicycling opportunities will be integrated into the overall project design.*			
Objective (3): Provide all residents with educational opportunities that can help them better understand themselves and their surroundings and allow them to realize their ambitions.	X		
Policies:			
(a) Encourage the State to improve Maui Community College as a comprehensive community college that will serve each community.			X
(b) Broaden the use of technology and telecommunications to improve educational opportunities throughout the County.	X		
(c) Attract graduate-level research programs and institutions.			X
(d) Promote the teaching of traditional practices, including aquaculture; subsistence agriculture; Pacific Island, Asian, and other forms of alternative health practices; and indigenous Hawaiian architecture.			X

Table 5-7 COUNTYWIDE POLICY PLAN OBJECTIVES, POLICIES, AND IMPLMENTING ACTIONS S = Supportive, N/S = Not Supportive, N/A = Not Applicable	S	N/S	N/A
(e) Integrate cultural and environmental values in education, including self sufficiency and sustainability.	X		
(f) Foster a partnership and ongoing dialogue between business organizations, formal educational institutions, and vocational training centers to tailor learning and mentoring programs to County needs.			X
(g) Ensure teaching of the arts to all ages.	X		
(h) Expand and develop vocational learning opportunities by establishing trade schools.			X
(i) Encourage the State to integrate financial and economic literacy in elementary, secondary, and higher-education levels.			X
Implementing Actions:			
(a) Encourage the State to establish a four-year university, and support the development of other higher-education institutions to enable residents to obtain bachelor degrees and postgraduate degrees in Maui County.			X
Discussion: *The project will provide new educational opportunities to students living in the Kīhei-Mākena region. The DOE's established curriculum for high schools in the State will be implemented and will incorporate subjects relating to technology, culture and environment, and art.*			
Objective (4): Maximize community-based educational opportunities.	X		
Policies:			
(a) Encourage the State and others to expand pre-school, after-school, and homebased (parent-child) learning.			X
(b) Support public-private partnerships to develop youth-internship, -apprenticeship, and -mentoring programs.			X
(c) Support the development of a wide range of informal educational and cultural programs for all residents.	X		
(d) Improve partnerships that utilize the skills and talents at Hawai'i's colleges and universities to benefit the County.			X
(e) Support career-development and job-recruitment programs and centers.			X
(f) Attract learning institutions and specialty schools to diversify and enhance educational opportunities.			X
(g) Expand education of important life skills for the general public.			X
(h) Support community facilities such as museums, libraries, nature centers, and open spaces that provide interactive-learning opportunities for all ages.	X		
Discussion: *The project supports community-based educational opportunities. However, the focus of the proposed Kīhei High School will be to serve high school students living in the region. As appropriate, the high school may also participate in coordinating educational opportunities for the larger community and general public. The school will include a library and open spaces as part of the campus design.*			
PART D: Strengthen Social and Healthcare Services			
Goal: Health and social services in Maui County will fully and comprehensively serve all segments of the population.			
Objective (1): In cooperation with the Federal and State governments and nonprofit agencies, broaden access to social and healthcare services and expand options to improve the overall wellness of the people of Maui County.			X
Policies:			
(a) Work with other levels of government and the nonprofit sector to expand services to address hunger, homelessness, and poverty.			X
(b) Support the improvement of opportunities for disadvantaged youth, encourage the tradition of hanai relatives, and support expanded opportunities for foster care.			X

Table 5-7 COUNTYWIDE POLICY PLAN OBJECTIVES, POLICIES, AND IMPLMENTING ACTIONS S = Supportive, N/S = Not Supportive, N/A = Not Applicable	S	N/S	N/A
(c) Support expanded long-term-care options, both in institutions and at home, for patients requiring ongoing assistance and medical attention.			X
(d) Encourage the expansion and improvement of local hospitals, facilitate the establishment of new healthcare facilities, and facilitate prompt and high quality emergency- and urgent-care services for all.			X
(e) Support broadened access to affordable health insurance and health care, and recognize the unique economic challenges posed to families when healthcare services are provided off-island.			X
(f) Encourage equal access to social and healthcare services through both technological and traditional means.			X
Discussion: *The Kīhei High School project does not directly provide social and healthcare services; therefore, this objective and these policies are not directly applicable to the project.*			
Objective (2): Encourage the Federal and State governments and the private sector to improve the quality and delivery of social and healthcare services.			X
Policies:			
(a) Strengthen partnerships with government, nonprofit, and private organizations to provide funding and to improve counseling and other assistance to address substance abuse, domestic violence, and other pressing social challenges.			X
(b) Encourage the State to improve the quality of medical personnel, facilities, services, and equipment.			X
(c) Encourage investment to improve the recruitment of medical professionals and the quality of medical facilities and equipment throughout Maui County.			X
(d) Promote the development of continuum-of-care facilities that provide assisted living, hospice, home-care, and skilled-nursing options allowing the individual to be cared for in a manner congruent with his or her needs and desires.			X
(e) Support improved social, healthcare, and governmental services for special needs populations.			X
(f) Plan for the needs of an aging population and the resulting impacts on social services, housing, and healthcare delivery.			X
(g) Improve coordination among the police, the courts, and the public in the administration of social and healthcare services.			X
(h) Support programs that address needs of veterans.			X
(i) Support programs that address the needs of immigrants.			X
Implementing Actions:			
(a) Invest in programs designed to improve the general welfare and quality of life of Native Hawaiians.			X
(b) Assist and facilitate the State Department of Public Safety and others in efforts to strengthen programs and facilities that will improve the mental and social health of incarcerated people and assist in prison inmates' successful transition back into Maui County communities.			X
Discussion: *The Kīhei High School project does not directly provide social and healthcare services; therefore, this objective and these policies are not directly applicable to the project.*			
Objective (3): Strengthen public-awareness programs related to healthy lifestyles and social and medical services.	X		
Policies:			
(a) Expand public awareness about personal safety and crime prevention.	X		
(b) Encourage residents to pursue education and training for careers in the healthcare, social services, and community-development fields.			X
(c) Expand public awareness and promote programs to achieve healthy eating habits and drug-free lifestyles.	X		

Table 5-7 COUNTYWIDE POLICY PLAN OBJECTIVES, POLICIES, AND IMPLMENTING ACTIONS S = Supportive, N/S = Not Supportive, N/A = Not Applicable	S	N/S	N/A
Discussion: *As an educational institution, the project will help to strengthen public awareness related to healthy lifestyles and social services. The school will teach students general information relating to personal safety and crime, and an awareness of healthy, drug-free lifestyles.*			
PART E: Expand Housing Opportunities for Residents			
Goal: Quality, island-appropriate housing will be available to all residents.			
Objective (1): Reduce the affordable housing deficit for residents.			X
Policies:			
(a) Ensure that an adequate and permanent supply of affordable housing, both new and existing units, be made available for purchase or rental to our resident and/or workforce population, with special emphasis on providing housing for low- to moderate-income families, and ensure that all affordable housing remains affordable in perpetuity.			X
(b) Seek innovative ways to lower housing costs without compromising the quality of our island lifestyle.			X
(c) Seek innovative methods to secure land for the development of low- and moderate-income housing.			X
(d) Provide the homeless population with emergency and transitional shelter and other supportive programs.			X
(e) Provide for a range of senior-citizen and special needs housing choices on each island that affordably facilitates a continuum of care and services.			X
(f) Support the Department of Hawaiian Home Lands' development of homestead lands.			X
(g) Manage property-tax burdens to protect affordable resident homeownership.			X
(h) Explore taxation mechanisms to increase and maintain access to affordable housing.			X
(i) Improve awareness regarding available affordable homeowner's insurance.			X
(j) Redevelop commercial areas with a mixture of affordable residential and business uses, where appropriate.			X
(k) Ensure residents be given priority to obtain affordable housing units developed in their communities, consistent with all applicable regulations.			X
(l) Establish pricing for affordable housing that is more reflective of Maui County's workforce than the United States Housing and Urban Development's median-income estimates for Maui County.			X
(m) Develop neighborhoods with a mixture of accessible and integrated community facilities and services.	X		
(n) Provide alternative regulatory frameworks to facilitate the use of Kuleana lands by the descendants of Native Hawaiians who received those lands pursuant to the Kuleana Act of 1850.			X
(o) Work with lending institutions to expand housing options and safeguard the financial security of homeowners.			X
(p) Promote the use of the community land trust model and other land-lease and land-financing options.			X
(q) Support the opportunity to age in place by providing accessible and appropriately designed residential units.			X
Discussion: *The project will provide a new school to support existing and future residential communities of the Kīhei-Mākena region.*			
Objective (2): Increase the mix of housing types in towns and neighborhoods to promote sustainable land use planning, expand consumer choice, and protect the County's rural and small town character.			X
Policies:			
(a) Seek innovative ways to develop 'ohana cottages and accessory-dwelling units as affordable housing.			X

Table 5-7 COUNTYWIDE POLICY PLAN OBJECTIVES, POLICIES, AND IMPLMENTING ACTIONS S = Supportive, N/S = Not Supportive, N/A = Not Applicable	S	N/S	N/A
(b) Design neighborhoods to foster interaction among neighbors.			X
(c) Encourage a mix of social, economic, and age groups within neighborhoods.			X
(d) Promote infill housing in urban areas at scales that capitalize on existing infrastructure, lower development costs, and are consistent with existing or desired patterns of development.			X
(e) Encourage the building industry to use environmentally sustainable materials, technologies, and site planning.			X
(f) Develop workforce housing in proximity to job centers and transit facilities.			X
(g) Provide incentives to developers and owners who incorporate green building practices and energy-efficient technologies into their housing developments.			X
Implementing Actions:			
(a) Revise laws to support neighborhood designs that incorporate a mix of housing types that are appropriate for island living.			X
Discussion: *The Kīhei High School project will not provide new housing opportunities; therefore, this objective and these policies are not directly applicable to the project.*			
Objective (3): Increase and maintain the affordable housing inventory.			X
Policies:			
(a) Recognize housing as a basic human need, and work to fulfill that need.			X
(b) Prioritize available infrastructure capacity for affordable housing.			X
(c) Improve communication, collaboration, and coordination among housing providers and social-service organizations.			X
(d) Study future projected housing needs, monitor economic cycles, and prepare for future conditions on each island.			X
(e) Develop public-private and nonprofit partnerships that facilitate the construction of quality affordable housing.			X
(f) Streamline the review process for high-quality, affordable housing developments that implement the goals, objectives, and policies of the General Plan.			X
(g) Minimize the intrusion of housing on prime, productive, and potentially productive agricultural lands and regionally valuable agricultural lands.			X
(h) Encourage long-term residential use of existing and future housing to meet residential needs.			X
Implementing Actions:			
(a) Develop policies to even out the peaks and valleys in Maui County's construction demand cycles.			X
Discussion: *The project will not provide new housing opportunities; therefore, this objective and these policies are not directly applicable to the project.*			
Objective (3): Expand access to education related to housing options, homeownership, financing, and residential construction.			X
Policies:			
(a) Broaden access to information about County, State, and Federal programs that provide financial assistance to renters and home buyers.			X
(b) Expand access to information about opportunities for homeownership and self-help housing.			X
(c) Educate residents about making housing choices that support their individual needs, the needs of their communities, and the health of the islands' natural systems.			X
(d) Improve home buyers' education on all aspects of homeownership.			X

Table 5-7 COUNTYWIDE POLICY PLAN OBJECTIVES, POLICIES, AND IMPLMENTING ACTIONS S = Supportive, N/S = Not Supportive, N/A = Not Applicable	S	N/S	N/A
Discussion: *The project will not provide new housing opportunities; therefore, this objective and these policies are not directly applicable to the project.*			
PART F: Strengthen the Local Economy			
Goal: Maui County's economy will be diverse, sustainable, and supportive of community values.			
Objective (1): Promote an economic climate that will encourage diversification of the County's economic base and a sustainable rate of economic growth.			X
Policies:			
(a) Support economic decisions that create long-term benefits.	X		
(b) Promote lifelong education, career development, and technical training for existing and emerging industries.	X		
(c) Invest in infrastructure, facilities, and programs that foster economic diversification.	X		
(d) Support and promote locally produced products and their locally owned operations and businesses that benefit local communities and meet local demand.	X		
(e) Support programs that assist industries to retain and attract more local labor and facilitate the creation of jobs that offer a living wage.			X
(f) Encourage work environments that are safe, rewarding, and fulfilling to employees.	X		
(g) Support home-based businesses that are appropriate for and in character with the community.			X
(h) Encourage businesses that promote the health and well-being of the residents, produce value-added products, and support community values.			X
(i) Foster an understanding of the role of all industries in our economy.			X
(j) Support efforts to improve conditions that foster economic vitality in our historic small towns.			X
(k) Support and encourage traditional host-culture businesses and indigenous agricultural practices.			X
(l) Support public and private entities that assist entrepreneurs in establishing locally operated businesses.			X
Implementing Actions:			
(a) Develop regulations and programs that support opportunities for local merchants, farmers, and small businesses to sell their goods and services directly to the public.			X
(b) Monitor the carrying capacity of the islands' social, ecological, and infrastructure systems with respect to the economy.			X
Discussion: *Developing a new high school in Kīhei will create long-term educational benefits for its students and the overall community. The school is considered an important investment for ensuring the successful and directed growth of the region. New infrastructure will also be built to support the project and surrounding area.* *The new high school will result in significant expenditures that will have a positive impact on the economies of the State and the County on a direct and indirect basis. The project will result in the creation of jobs to support the construction and operations of the high school.*			
Objective (2): Diversify and expand sustainable forms of agriculture and aquaculture.			X
Policies:			
(a) Support programs that position Maui County's agricultural products as premium export products.			X
(b) Prioritize the use of agricultural land to feed the local population, and promote the use of agricultural lands for sustainable and diversified agricultural activities.			X
(c) Capitalize on Hawai'i's economic opportunities in the ecologically sensitive aquaculture industries.			X

Table 5-7 COUNTYWIDE POLICY PLAN OBJECTIVES, POLICIES, AND IMPLMENTING ACTIONS S = Supportive, N/S = Not Supportive, N/A = Not Applicable	S	N/S	N/A
(d) Assist farmers to help make Maui County more self-sufficient in food production.			X
(e) Support ordinances, programs, and policies that keep agricultural land and water available and affordable to farmers.			X
(f) Support a tax structure that is conducive to the growth of the agricultural economy.			X
(g) Enhance County efforts to monitor and regulate important agricultural issues.			X
(h) Support education, research, and facilities that strengthen the agricultural industry.			X
(i) Maintain the genetic integrity of existing food crops.			X
(j) Encourage healthy and organic farm practices that contribute to land health and regeneration.			X
(k) Support cooperatives and other types of nontraditional and communal farming efforts.			X
(l) Encourage methods of monitoring and controlling genetically modified crops to prevent adverse effects.			X
(m) Work with the State to ease the permitting process for the revitalization of traditional fish ponds.			X
Implementing Actions:			
(a) Redirect efforts in the Office of Economic Development to further facilitate the development of the agricultural section and to monitor agricultural legislation and issues.			X
(b) Publicly identify, with signage and other means, the field locations of all genetically modified crops.			X
(c) Create agricultural parks in areas distant from genetically modified crops.			X
Discussion: *The lands proposed for development of the new high school currently lies in the Agricultural District. However, these lands are not considered to be a valued agricultural resource. ALISH designates only 2% (1.7 acres) of the site soils as Prime and the Land Study Bureau has designated all the project site soils as E, the lowest rating. The applicant will be applying for a State Land Use District Boundary Amendment to change the site's Agricultural designation to Urban. The site is designated for development of public facilities in the County's Kīhei-Mākena Community Plan, and is designated for a future high school in the County's Draft Maui Island Plan Public Facility/Infrastructure Improvements Map (February 25, 2009).*			
Objective (3): Support a visitor industry that respects the resident culture and the environment.			X
Policies:			
(a) Promote traditional Hawaiian practices in visitor-related facilities and activities.			X
(b) Encourage and educate the visitor industry to be sensitive to island lifestyles and cultural values.			X
(c) Encourage a spirit of welcome for residents at visitor facilities, such as by offering kamaʻaina incentives and discount programs.			X
(d) Support the renovation and enhancement of existing visitor facilities.			X
(e) Support policies, programs, and a tax structure that redirect the benefits of the visitor industry back into the local community.			X
(f) Encourage resident ownership of visitor-related businesses and facilities.			X
(g) Develop partnerships to provide educational and training facilities to residents employed in the visitor industry.			X
(h) Foster an understanding of local cultures, customs, and etiquette, and emphasize the importance of the Aloha Spirit as a common good for all.			X
(i) Support the diversification, development, evolution, and integration of the visitor industry in a way that is compatible with the traditional, social, economic, spiritual, and environmental values of island residents.			X
(j) Improve collaboration between the visitor industry and the other sectors of Maui County's economy.			X
(k) Perpetuate an authentic image of the Hawaiian culture and history and an appropriate recognition of the host culture.			X

Table 5-7 COUNTYWIDE POLICY PLAN OBJECTIVES, POLICIES, AND IMPLMENTING ACTIONS S = Supportive, N/S = Not Supportive, N/A = Not Applicable	S	N/S	N/A
(l) Support the programs and initiatives outlined in the Maui County Tourism Strategic Plan 2006-2015.			X
(m) Promote water conservation, beach conservation, and open-space conservation in areas providing services for visitors.			X
Discussion: *The Kīhei High School project is not directly related to the visitor industry, therefore, this objective and policies are not directly applicable.*			
Objective (4): Expand economic sectors that increase living-wage job choices and are compatible with community values.			X
Policies:			
(a) Support emerging industries, including the following: • Health and wellness industry; • Sports and recreation industry; • Film and entertainment industry; • Arts and culture industry; • Renewable-energy industry; • Research and development industry; • High-technology and knowledge-based industries; • Education and training industry; • Ecotourism industry; and • Agritourism industry.			X
Discussion: *The Kīhei High School project is not directly aimed at expanding potential emerging industries that serve to increase and diversify Hawai'i's economic base, therefore, this objective and policies are not directly applicable. However, the high school will provide educational opportunities and the development of workforce skills to succeed in emerging industries.*			
PART G: Improve Parks and Public Facilities			
Goal: A full range of island-appropriate public facilities and recreational opportunities will be provided to improve the quality of life for residents and visitors.			
Objective (1): Expand access to recreational opportunities and community facilities to meet the present and future needs of residents of all ages and physical abilities.	X		
Policies:			
(a) Protect, enhance, and expand access to public shoreline and mountain resources.			X
(b) Expand and enhance the network of parks, multi-use paths, and bikeways.			X
(c) Assist communities in developing recreational facilities that promote physical fitness.	X		
(d) Expand venue options for recreation and performances that enrich the lifestyles of Maui County's people.	X		
(e) Expand affordable recreational and after-school programs for youth.	X		
(f) Encourage and invest in recreational, social, and leisure activities that bring people together and build community pride.	X		
(g) Promote the development and enhancement of community centers, civic spaces, and gathering places throughout our communities.	X		
(h) Expand affordable access to recreational opportunities that support the local lifestyle.	X		
Implementing Actions:			
(a) Identify and reserve lands for cemeteries, and preserve existing cemeteries on all islands, appropriately accommodating varying cultural and, faith-based traditions.			X

Table 5-7 COUNTYWIDE POLICY PLAN OBJECTIVES, POLICIES, AND IMPLMENTING ACTIONS S = Supportive, N/S = Not Supportive, N/A = Not Applicable	S	N/S	N/A
Discussion: *The project will provide a range of recreational opportunities, many of which may be carried out in coordination with other groups and organizations. The campus is envisioned as a place for the community to gather for sports and recreational activities that bring people together and build community pride.*			
Objective (2): Improve the quality and adequacy of community facilities.	X		
Policies:			
(a) Provide an adequate supply of dedicated shelters and facilities for disaster relief.	X		
(b) Provide and maintain community facilities that are appropriately designed to reflect the traditions and customs of local cultures.			X
(c) Ensure that parks and public facilities are safe and adequately equipped for the needs of all ages and physical abilities to the extent reasonable.	X		
(d) Maintain, enhance, expand, and provide new active and passive recreational facilities in ways that preserve the natural beauty of their locations.	X		
(e) Redesign or retrofit public facilities to adapt to major shifts in environmental or urban conditions to the extent reasonable.			X
Discussion: *The high school will provide a new recreational resource for the surrounding community. The open spaces and athletic fields integrated in the campus setting will be safe and accessible for people of all ages and physical abilities. The proposed project would also be constructed in compliance with applicable building codes and DOE standards in regards to preparation for natural hazards. The Kīhei High School would also be used as a shelter for the Kīhei community if a natural hazard were to occur.*			
Objective (3): Enhance the funding, management, and planning of public facilities and park lands.	X		
Policies:			
(a) Identify and encourage the establishment of regulated and environmentally sound campgrounds.			X
(b) Manage park use and control access to natural resources in order to rest sensitive places and utilize the resources in a sustainable manner.			X
(c) Ensure that public-recreation facilities are clean and well-maintained.	X		
(d) Develop partnerships to ensure proper stewardship of the islands' trails, public lands, and access systems.			X
(e) Ensure that there is an adequate supply of public restrooms in convenient locations.			X
Implementing Actions:			
(a) Encourage the State to allow for overnight fishing along the shoreline in accordance with management plans and regulations.			X
(b) Develop and regularly update functional plans, including those relating to public facilities, parks, and campgrounds.			X
(c) Develop and adopt local level-of service standards for public facilities and parks.			X
(d) Identify, acquire, and develop lands for parks, civic spaces, and public uses.	X		
Discussion: *Athletic fields and large open spaces will be provided on the lower campus area of the proposed high school. These recreational areas will be cleaned and maintained by school custodians and staff.*			
PART H: Diversify Transportation Options			
Goal: Maui County will have an efficient, economical, and environmentally sensitive means of moving people and goods.			
Objective (1): Provide an effective, affordable, and convenient ground-transportation system that is environmentally sustainable.			X

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Policies:			
(a) Execute planning strategies to reduce traffic congestion.	X		
(b) Plan for the efficient relocation of roadways for the public benefit.			X
(c) Support the use of alternative roadway designs, such as traffic-calming techniques and modern roundabouts.			X
(d) Increase route and mode options in the ground-transportation network.			X
(e) Ensure that roadway systems are safe, efficient, and maintained in good condition.			X
(f) Preserve roadway corridors that have historic, scenic, or unique physical attributes that enhance the character and scenic resources of communities.			X
(g) Design new roads and roadway improvements to retain and enhance the existing character and scenic resources of the communities through which they pass.			X
(h) Promote a variety of affordable and convenient transportation services that meet countywide and community needs and expand ridership of transit systems.			X
(i) Collaborate with transit agencies, government agencies, employers, and operators to provide planning strategies that reduce peak-hour traffic.	X		
(j) Develop and expand an attractive, island-appropriate, and efficient public-transportation system.			X
(k) Provide and encourage the development of specialized transportation options for the young, the elderly, and persons with disabilities.			X
(l) Evaluate all alternatives to preserve quality of life before widening roads.			X
(m) Encourage businesses in the promotion of alternative transportation options for resident and visitor use.			X
(n) Support the development of carbon-emission standards and an incentive program aimed at achieving County carbon-emission goals.			X
Implementing Actions:			
(a) Create incentives and implement strategies to reduce visitor dependence on rental cars.			X
(b) Establish efficient public-transit routes between employment centers and primary workforce residential areas.			X
(c) Establish efficient public-transit routes between employment centers and primary workforce residential areas.			X

Discussion: *The new high school in Kīhei is expected to serve students who currently attend high schools in Kahului and Wailuku. Therefore, the project will alleviate long travel distances for families driving their children to and from school in Central Maui. Specialized transportation systems will also be developed as appropriate, particularly to serve students with disabilities.*

A traffic study was prepared for the Kīhei High School project (Appendix G). The development of the project is not expected to have a significant impact on traffic operations in the project vicinity. An extension of Kūlanihāko'i Street will be constructed to provide access from Pi'ilani Highway to the campus. Internal driveways and roads for campus circulation will also be developed. New roadway infrastructure will be developed to fit the community and existing character of the area. State and County transportation officials will be consulted as the project progresses.

Stantec Consulting Services, Inc. prepared a pedestrian and bicycle analysis for the project site (Appendix N). Recommendations in this report seek to maximize connectivity and access to the site, and to ensure provision of appropriate safety measures for bicyclists and pedestrians. Provision of bicycle and pedestrian infrastructure will encourage students to use alternative forms of transportation and help to reduce peak hour automobile traffic to and from the project site.

Objective (2): Reduce the reliance on the automobile and fossil fuels by encouraging walking, bicycling, and other energy-efficient and safe alternative modes of transportation.	X		

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Policies:			
(a) Make walking and bicycling transportation safe and easy between and within communities.	X		
(b) Require development to be designed with the pedestrian in mind.	X		
(c) Design new and retrofit existing rights-of-way with adequate sidewalks, bicycle lanes, or separated multi-use transit corridors.	X		
(d) Support the development of a countywide network of bikeways, equestrian trails, and pedestrian paths.			X
(e) Support the reestablishment of traditional trails between communities, to the ocean, and through the mountains for public use.			X
(f) Encourage educational programs to increase safety for pedestrians and bicyclists.			X
Implementing Actions:			
(a) Design, build, and modify existing bikeways to improve safety and separation from automobiles.			X
(b) Increase enforcement to reduce abuse of bicycle and pedestrian lanes by motorized vehicles.			X
(c) Identify non-motorized transportation options as a priority for new sources of funding.			X
Discussion: *The new high school in Kīhei is expected to serve students who currently attend high schools in Kahului and Wailuku. Therefore, the project will alleviate long travel distances for families driving their children to and from school in Central Maui. Safe walking and bicycling opportunities will be integrated into the overall project design. The location of the high school is within walking distance to existing and future residential areas, thereby encouraging students to walk and bike to and from school. Students will also be encouraged to carpool or utilize alternative means of transportation.*			
Objective (3): Improve opportunities for affordable, efficient, safe, and reliable air transportation.			X
Policies:			
(a) Discourage private helicopter and fixed-wing landing sites to mitigate environmental and social impacts.			X
(b) Encourage the use of quieter aircraft and noise-abatement procedures for arrivals and departures.			X
(c) Encourage the modernization and maintenance of air-transportation facilities for general-aviation activities.			X
(d) Encourage a viable and competitive atmosphere for air carriers to expand service and ensure sufficient intra-County flights and affordable fares for consumers.			X
(e) Continue to support secondary airports, and encourage the State to provide them with adequate funding.			X
(f) During Community Plan updates, explore the use of the smaller airports.			X
(g) Encourage the State to provide efficient, adequate, and affordable parking and transit connections within and around airports			X
Discussion: *The project is not directly related to air transportation or related facilities, therefore, this objective and policies are not directly applicable.*			
Objective (4): Improve opportunities for affordable, efficient, safe, and reliable ocean transportation.			X
Policies:			
(a) Support programs and regulations that reduce the disposal of maritime waste and prevent spills into the ocean.			X
(b) Encourage the upgrading of harbors to resist damage from natural hazards and disasters.			X
(c) Encourage the State to study the use of existing harbors and set priorities for future use.			X
(d) Explore all options to protect the traditional recreational uses of harbors, and mitigate harbor-upgrade impacts to recreational uses where feasible.			X

Table 5-7 COUNTYWIDE POLICY PLAN OBJECTIVES, POLICIES, AND IMPLMENTING ACTIONS S = Supportive, N/S = Not Supportive, N/A = Not Applicable	S	N/S	N/A
(e) Encourage the upgrading of harbors and the separation of cargo and bulk materials from passenger and recreational uses.			X
(f) Encourage the State to provide for improved capacity at shipping, docking, and storage facilities.			X
(g) Encourage the State to provide adequate parking facilities and transit connections within and around harbor areas.			X
(h) Encourage the redevelopment and revitalization of harbors while preserving historic and cultural assets in harbor districts.			X
(i) Encourage the State to provide adequate facilities for small-boat operations, including small-boat launch ramps, according to community needs.			X
(j) Support the maintenance and cleanliness of harbor facilities.			X
(k) Support the redevelopment of harbors as pedestrian-oriented gathering places, with employee facilities and passengers.			X
Discussion: *The project is not directly related to ocean transportation or related facilities, therefore, this objective and policies are not directly applicable.*			
Objective (5): Improve and expand the planning and management of transportation systems.	X		
(a) Encourage progressive community design and development that will reduce transportation trips.	X		
(b) Require new developments to contribute their pro rata share of local and regional infrastructure costs.			X
(c) Establish appropriate user fees for private enterprises that utilize public-transportation facilities for recreational purposes.			X
(d) Support the revision of roadway-design criteria and standards so that roads are compatible with surrounding neighborhoods and the character of rural areas.			X
(e) Plan for multi-modal transportation and utility corridors on each island.			X
(f) Support designing all transportation facilities, including airport, harbor, and mass-transit stations, to reflect Hawaiian architecture.			X
(g) Utilize transportation-demand management as an integral part of transportation planning.			X
(h) Accommodate the planting of street trees and other appropriate landscaping in all public rights-of-way.			X
Discussion: *The Kīhei High School project is expected to serve students who currently attend high schools in Kahului and Wailuku. Therefore, the project will alleviate families having to travel long distances to take their children to and from school in Central Maui. Development of the high school will also include developing transportation infrastructure and related roadways to support the project.*			
PART I: Improve Physical Infrastructure			
Goal: Maui County's physical infrastructure will be maintained in optimum condition and will provide for and effectively serve the needs of the County through clean and sustainable technologies.			
Objective (1): Improve water systems to assure access to sustainable, clean, reliable, and affordable sources of water.	X		
Policies:			
(a) Ensure that adequate supplies of water are available prior to approval of subdivision or construction documents.	X		
(b) Develop and fund improved water-delivery systems.			X
(c) Ensure a reliable and affordable supply of water for productive agricultural uses.			X
(d) Promote the reclamation of gray water, and enable the use of reclaimed, gray, and brackish water for activities that do not require potable water.			X
(e) Retain and expand public control and ownership of water resources and delivery systems.			X
(f) Improve the management of water systems so that surface-water and groundwater resources are not degraded by overuse or pollution.	X		
(g) Explore and promote alternative water-source-development methods.	X		

Table 5-7 COUNTYWIDE POLICY PLAN OBJECTIVES, POLICIES, AND IMPLMENTING ACTIONS S = Supportive, N/S = Not Supportive, N/A = Not Applicable	S	N/S	N/A
(h) Seek reliable long-term sources of water to serve developments that achieve consistency with the appropriate Community Plans.	X		
Implementing Actions:			
(a) Develop a process to review all applications for desalination.			X

Discussion: *There are no on-site public or private water systems serving the property. The domestic water and fire supply would be supplied through the Central Maui Water System by connecting to the existing water main on Līloa Drive and upgrading the existing water main in the Pi'ilani Village Subdivision. The project team will continue to work with DWS to provide potable water supply for the proposed Kīhei High School project. Necessary approvals will be obtained in accordance with the County's water system standards. Irrigation water will be supplied via on-site brackish wells drilled into the groundwater lens below the site. Conservation measures and best management practices for water use will also be implemented.*

The project will enhance water quality through the development and implementation of water pollution control measures. Best management practices and other measures such ground stabilization with landscape and hardscape will be implemented minimize impacts to surface-water and groundwater resources.

Objective (2): Improve waste-disposal practices and systems to be efficient, safe, and as environmentally sound as possible.	X		
Policies:			
(a) Provide sustainable waste-disposal systems and comprehensive, convenient recycling programs to reduce the flow of waste into landfills.	X		
(b) Support innovative and alternative practices in recycling solid waste and wastewater and disposing of hazardous waste.	X		
(c) Encourage vendors and owners of automobile, appliance, and white goods to participate in the safe disposal and recycling of such goods, and ensure greater accountability for large waste producers.			X
(d) Develop strategies to promote public awareness to reduce pollution and litter, and encourage residents to reduce, reuse, recycle, and compost waste materials.			X
(e) Pursue improvements and upgrades to existing wastewater and solid-waste systems consistent with current and future plans and the County's Capital Improvement Program.	X		
Implementing Actions:			
(a) Establish recycling, trash-separation, and materials recovery programs and facilities to reduce the flow of waste into landfills.	X		
(b) Study the feasibility of developing environmentally safe waste-to-energy facilities.			X
(c) Utilize taxes and fees as means to encourage conservation and recycling.			X
(d) Implement and regularly update the Integrated Solid Waste Management Plan.			X
(e) Phase out the use of injection wells.			X

Discussion: *The sewer requirements of the proposed project will require additional capacity at the existing Kīhei Wastewater Pump Station Nos. 3, 4, 5 and 6. While the existing collection system should have adequate capacity for flows generated by the high school such that upgrades are not necessary, the County will formally determine if any upgrades are required after the Plan Review Application form is submitted. Proposed on- and off-site sewer lines will comply with the County standards. The proposed Kīhei High School project will also incorporate green design principles which include re-use and recycling as practicable to reduce solid wastes. Standard recycling practices will also be implemented once the high school is operational.*

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Objective (3): Significantly increase the use of renewable and green technologies to promote energy efficiency and energy self-sufficiency.	X		
Policies:			
(a) Promote the use of locally renewable energy sources, and reward energy efficiency.	X		
(b) Consider tax incentives and credits for the development of sustainable- and renewable-energy sources.			X
(c) Expand education about energy conservation and self-sufficiency.	X		
(d) Encourage small-scale energy generation that utilizes wind, sun, water, biowaste, and other renewable sources of energy.	X		
(e) Expand renewable-energy production.			X
(f) Develop public-private partnerships to ensure the use of renewable energy and increase energy efficiency.			X
(g) Require the incorporation of locally appropriate energy-saving and green building design concepts in all new developments by providing energy-efficient urban design guidelines and amendments to the Building Code.	X		
(h) Encourage the use of sustainable energy to power vehicles.	X		
(i) Promote the retrofitting of existing buildings and new development to incorporate energy-saving design concepts and devices.	X		
(j) Encourage green footprint practices.			X
(k) Reduce Maui County's dependence on fossil fuels and energy imports.	X		
(l) Support green building practices such as the construction of buildings that aim to minimize carbon dioxide production, produce renewable energy, and recycle water.	X		
(m) Promote and support environmentally friendly practices in all energy sectors.	X		
Policies:			
(a) Provide sustainable waste-disposal systems and comprehensive, convenient recycling programs to reduce the flow of waste into landfills.	X		
(b) Support innovative and alternative practices in recycling solid waste and wastewater and disposing of hazardous waste.	X		
Implementing Actions:			
(a) Adopt an energy-efficiency policy for Maui County government as a model for other jurisdictions.			X
(b) Adopt a Green Building Code, and support green building practices.	X		
Discussion: *As a State of Hawai'i agency, the DOE is committed to the use of renewable energy sources that are proven, viable, cost effective, and environmentally responsible. The development of Kīhei High School supports policies related to conservation of energy, energy efficiency and alternative energy sources. The project will contribute to energy efficiency through incorporating green building standards and sustainable features to conserve energy and water usage, and principles of waste minimization and pollution prevention. The project may also support alternative modes of transportation and low-emitting and fuel efficient vehicles to help reduce greenhouse gas emission. The project will be designed in accordance with the USGBC LEED program or comparable program.*			
Objective (4): Direct growth in a way that makes efficient use of existing infrastructure and to areas where there is available infrastructure capacity.	X		
Policies:			
(a) Capitalize on existing infrastructure capacity as a priority over infrastructure expansion.	X		
(b) Planning for new towns should only be considered if a region's growth is too large to be directed into infill and adjacent growth areas.			X
(c) Utilize appropriate infrastructure technologies in the appropriate locations.	X		
(d) Promote land use patterns that can be provided with infrastructure and public facilities in a cost-effective manner.	X		

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(e) Support catchment systems and on-site wastewater treatment in rural areas and aggregated water and wastewater systems in urban areas if they are appropriately located.			X
Implementing Actions:			
(a) Develop a streamlining system for urban infill projects.			X
(b) Identify appropriate areas for urban expansion of existing towns where infrastructure and public facilities can be provided in a cost-effective manner.	X		
Discussion: *The project will provide a new educational facility and supporting infrastructure to meet the needs of the growing population in the Kīhei-Mākena region. The project will be located adjacent to existing "city-like" development, services and infrastructure. The site is designated for development of public facilities in the County's Kīhei-Mākena Community Plan, and is designated for a future high school in the County's Draft Maui Island Plan Public Facility/Infrastructure Improvements Map (February 25, 2009). The project will develop a high school in an area with a demonstrated need for an educational facility that will serve students currently attending schools elsewhere.*			
Objective (5): Improve the planning and management of infrastructure systems.	X		
Policies:			
(a) Provide a reliable and sufficient level of funding to enhance and maintain infrastructure systems.	X		
(b) Require new developments to contribute their pro rata share of local and regional infrastructure costs.	X		
(c) Improve coordination among infrastructure providers and planning agencies to minimize construction impacts.	X		
(d) Maintain inventories of infrastructure capacity, and project future infrastructure needs.			X
(e) Require social-justice and -equity issues to be considered during the infrastructure-planning process.			X
(f) Discourage the development of critical infrastructure systems within hazard zones and the tsunami-inundation zone to the extent practical.	X		
(g) Ensure that infrastructure is built concurrent with or prior to development.	X		
(h) Ensure that basic infrastructure needs can be met during a disaster.	X		
(i) Locate public facilities and emergency services in appropriate locations that support the health, safety, and welfare of each community and that minimize delivery inefficiencies.	X		
(j) Promote the undergrounding of utility and other distribution lines for health, safety, and aesthetic reasons.			X
Implementing Actions:			
(a) Develop and regularly update functional plans for infrastructure systems.			X
(b) Develop, adopt, and regularly update local or community-sensitive level-of service standards for infrastructure systems.			X
Discussion: *The applicant will be responsible for the cost of new on-site and off-site infrastructure improvements or upgrades are necessary to support the proposed Kīhei High School. Infrastructure will be developed in accordance with applicable County design standards. The project area is not within the tsunami evacuation zone. The proposed project and supporting infrastructure would be constructed in compliance with applicable building codes and DOE standards in regards to preparation for natural hazards. The Kīhei High School would also be used as a shelter for the Kīhei community if a natural hazard were to occur. Coordination with appropriate County and State agencies will be carried out throughout the planning and design of the project to minimize unnecessary impacts for occurring.*			

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PART J: Promote Sustainable Land Use and Growth Management			
Goal: Community character, lifestyles, economies, and natural assets will be preserved by managing growth and using land in a sustainable manner.			
Objective (1): Improve land use management and implement a directed-growth strategy.	X		
Policies:			
(a) Establish, map, and enforce urban- and rural-growth limits.			X
(b) Direct urban and rural growth to designated areas.	X		
(c) Limit the number of visitor-accommodation units and facilities in Community Plan Areas.			X
(d) Maintain a sustainable balance between the resident, part-time resident, and visitor populations.			X
(e) Encourage redevelopment and infill in existing communities on lands intended for urban use to protect productive farm land and open-space resources.	X		
(f) Discourage new entitlements for residential, resort, or commercial development along the shoreline.			X
(g) Restrict development in areas that are prone to natural hazards, disasters, or sea-level rise.			X
(h) Direct new development in and around communities with existing infrastructure and service capacity, and protect natural, scenic, shoreline, and cultural resources.	X		
(i) Establish and maintain permanent open space between communities to protect each community's identity.			X
(j) Support the dedication of land for public uses.	X		
(k) Preserve the public's rights of access to and continuous lateral access along all shorelines.			X
(l) Enable existing and future communities to be self-sufficient through sustainable land use planning and management practices.			X
(m) Protect summits, slopes, and ridgelines from inappropriate development.			X
Implementing Actions:			
(a) Regularly update urban- and rural-growth boundaries and their maps.			X
(b) Establish transfer and purchase of development rights programs.			X
(c) Develop and adopt a green infrastructure plan.			X
(d) Develop studies to help determine a sustainable social, environmental, and economic carrying capacity for each island			X
(e) Identify and define resort-destination areas.			X
Discussion: *The resident population of the Kīhei-Mākena region experienced significant growth between 1990 and 2000. The Kīhei-Mākena region was projected to have a 2010 population of 28,124 people. The future 2025 population estimate for the Kīhei-Mākena region is 35,962 persons, or a 28 percent increase over the 2010 population (County Planning Department, June 2006). The proposed Kīhei High School project site is located in the planned growth area of the Draft Maui Island Plan and is listed as a regional facility recommended for development in South Maui. Development of the land will provide necessary educational services to the growing population in the region and has long been sought after by community residents. The high school will be located near existing and future residential areas in Kīhei, and will support compact patterns of urban development and smart land use and community planning concepts.*			
Objective (2): Improve planning for and management of agricultural lands and rural areas.	X		
Policies:			
(a) Protect prime, productive, and potentially productive agricultural lands to maintain the islands' agricultural and rural identities and economies.			X
(b) Provide opportunities and incentives for self-sufficient and subsistence homesteads and farms.			X
(c) Discourage developing or subdividing agriculturally designated lands when non-agricultural activities would be primary uses.		X	

Table 5-7 COUNTYWIDE POLICY PLAN OBJECTIVES, POLICIES, AND IMPLMENTING ACTIONS S = Supportive, N/S = Not Supportive, N/A = Not Applicable	S	N/S	N/A
(d) Conduct agricultural development planning to facilitate robust and sustainable agricultural activities.			X
Implementing Actions:			
(a) Inventory and protect prime, productive, and potentially productive agricultural lands from competing non-agricultural land uses.			X
Discussion: *While the proposed project site lies within the Agricultural District, it is not considered to be a valued agricultural resource. The property consists of soils with poor agricultural viability. ALISH designates only 2% (1.7 acres) of the site soils as Prime and the Land Study Bureau has designated all the project site soils as E, the lowest rating. Further, areas within the property containing higher quality soils are isolated from other suitable agricultural lands, and are too small to provide significant agricultural opportunities. The applicant will be applying for a State Land Use District Boundary Amendment to change the site's Agricultural designation to Urban. The proposed Kīhei High School project site is located in the planned growth area of the December 2009 Draft Maui Island Plan and is listed as a regional facility recommended for development in South Maui.*			
Objective (3): Design all developments to be in harmony with the environment and to protect each community's sense of place.	X		
Policies:			
(a) Support and provide incentives for green building practices.	X		
(b) Encourage the incorporation of green building practices and technologies into all government facilities to the extent practicable.	X		
(c) Protect and enhance the unique architectural and landscape characteristics of each Community Plan Area, small town, and neighborhood.	X		
(d) Ensure that adequate recreational areas, open spaces, and public-gathering places are provided and maintained in all urban centers and neighborhoods.	X		
(e) Ensure business districts are distinctive, attractive, and pedestrian-friendly destinations.			X
(f) Use trees and other forms of landscaping along rights-of-way and within parking lots to provide shade, beauty, urban-heat reduction, and separation of pedestrians from automobile traffic in accordance with community desires.	X		
(g) Where appropriate, integrate public-transit, equestrian, pedestrian, and bicycle facilities, and public rights-of-way as design elements in new and existing communities.	X		
(h) Ensure better connectivity and linkages between land uses.	X		
(i) Adequately buffer and mitigate noise and air pollution in mixed-use areas to maintain residential quality of life.	X		
(j) Protect rural communities and traditional small towns by regulating the footprint, locations, site planning, and design of structures.			X
(k) Support small-town revitalization and preservation.			X
(l) Facilitate safe pedestrian access, and create linkages between destinations and within parking areas.	X		
Implementing Actions:			
(a) Establish design guidelines and standards to enhance urban and rural environments.			X
(b) Provide funding for civic-center and civic-space developments.			X
(c) Establish and enhance urban forests in neighborhoods and business districts.			X
Discussion: *Kīhei High School will be designed to achieve certification under the USGBC LEED program or comparable program. The physical design and operations of the Kīhei High School campus will be in harmony with the natural environment by promoting the use of established environmental best practices. The design objectives of the high school will encourage building forms that fit with the topographic and landscape character of the land. The project will provide*			

Table 5-7 COUNTYWIDE POLICY PLAN OBJECTIVES, POLICIES, AND IMPLMENTING ACTIONS S = Supportive, N/S = Not Supportive, N/A = Not Applicable	S	N/S	N/A
a range of recreational opportunities. The proposed Kīhei High School is envisioned as a place for the community to gather for sports and recreational activities that bring people together and build community pride. The campus will be integrated with open spaces and wide landscaped pedestrian malls. The design of the project will also utilize green corridors to provide connectivity and cohesiveness within the campus.			
Objective (4): Improve and increase efficiency in land use planning and management.	X		
Policies:			
(a) Assess the cumulative impact of developments on natural ecosystems, natural resources, wildlife habitat, and surrounding uses.	X		
(b) Ensure that new development projects requiring discretionary permits demonstrate a community need, show consistency with the General Plan, and provide an analysis of impacts.	X		
(c) Encourage public and private partnerships to preserve lands of importance, develop housing, and meet the needs of residents.			X
(d) Promote creative subdivision designs that implement: best practices in land development, sustainable management of natural and physical resources, increased pedestrian and bicycle functionality and safety, and the principles of livable communities.			X
(e) Coordinate with Federal, State, and County officials in order to ensure that land use decisions are consistent with County plans and the vision local populations have for their communities.	X		
(f) Enable greater public participation in the review of subdivisions.			X
(g) Improve land use decision making through the use of land- and geographic-information systems.			X
Implementing Actions:			
(a) Institute a time limit and sunsetting stipulations on development entitlements and their implementation.			X
Discussion: *The applicant supports public participation and coordination with State and County officials in the planning and management process of the project. In accordance with Chapter 343, HRS, this EIS discusses the potential short-term and long-term impacts of the project on the environment. Throughout the HRS Chapter 343 process, public review and comments are welcomed and will be incorporated into the overall environmental review and analysis.* *The proposed Kīhei High School project also consistent with the plans and objectives of the current General Plan (Countywide Policy Plan and December 2009 Draft Maui Island Plan). The site is designated for development of public facilities in the County's Kīhei-Mākena Community Plan, and is designated for a future high school in the County's December 2009 Draft Maui Island Plan Public Facility/Infrastructure Improvements Map (February 25, 2009).*			
PART K: Strive for Good Governance			
Goal: Government services will be transparent, effective, efficient, and responsive to the needs of residents.			
Objective (1): Strengthen governmental planning, coordination, consensus building, and decision making.	X		
Policies:			
(a) Plan and prepare for the effects of social, demographic, economic, and environmental shifts.	X		
(b) Plan for and address the possible implications of Hawaiian sovereignty.			X
(c) Encourage collaboration among government agencies to reduce duplication of efforts and promote information availability and exchange.			X
(d) Expand opportunities for the County to be involved in and affect State and Federal decision making.			X

Table 5-7 COUNTYWIDE POLICY PLAN OBJECTIVES, POLICIES, AND IMPLMENTING ACTIONS S = Supportive, N/S = Not Supportive, N/A = Not Applicable	S	N/S	N/A
(e) Plan and prepare for large-scale emergencies and contingencies.			X
(f) Improve public awareness about preparing for natural hazards, disasters, and evacuation plans.			X
(g) Improve coordination among Federal, State, and County agencies.			X
Implementing Actions:			
(a) Develop policies, regulations, and programs to protect and enhance the unique character and needs of the County's various communities.			X
(b) Evaluate and if necessary, recommend modifications to the County Charter that could result in a possible change to the form of governance for Maui County.			X
(c) Study and evaluate the feasibility and implications of voting in Maui County Council elections.			X
(d) Study and evaluate the feasibility of authorizing town governments in Maui County.			X
Discussion: *As a State government agency, the DOE strives to attain good governance whenever possible to meet the needs of the people of Hawai'i. With the development of the proposed Kīhei High School, the applicant is planning for the continued population growth of the Kīhei-Mākena region. Coordination with other government agencies will be conducted throughout the planning and design of the project.*			
Objective (2): Promote civic engagement.			X
(a) Foster consensus building through in-depth, innovative, and accessible public-participatory processes.			X
(b) Promote and ensure public participation and equal access to government among all citizens.			X
(c) Encourage a broad cross-section of residents to volunteer on boards and commissions.			X
(d) Encourage the State to improve its community-involvement processes.			X
(e) Support community-based decision making.			X
(f) Expand advisory functions at the community level.			X
(g) Expand opportunities for all members of the public to participate in public meetings and forums.			X
(h) Facilitate the community's ability to obtain relevant documentation.	X		
(i) Increase voter registration and turnout.			X
Implementing Actions:			
(a) Implement two-way communication using audio-visual technology that allows residents to participate in the County's planning processes.			X
(b) Ensure and expand the use of online notification of County business and public meetings, and ensure the posting of all County board and commission meeting minutes.			X
(c) Explore funding mechanisms to improve participation by volunteers on boards and commissions.			X
(d) Develop a project-review process that mandates early and ongoing consultation in and with communities affected by planning and land use activities.			X
Discussion: *Throughout the HRS Chapter 343 process, public review and comments are welcomed and incorporated into the overall environmental review and analysis of the EIS. This EIS is made publically available on the Office of Environmental Quality Control's website and can be easily accessed by community members. The State Land Use District Boundary Amendment and County planning processes will also provide opportunities for public participation.*			
Objective (3): Improve the efficiency, reliability, and transparency of County government's internal processes and decision making.			X
Policies:			
(a) Use advanced technology to improve efficiency.			X

Table 5-7 COUNTYWIDE POLICY PLAN OBJECTIVES, POLICIES, AND IMPLMENTING ACTIONS S = Supportive, N/S = Not Supportive, N/A = Not Applicable	S	N/S	N/A
(b) Simplify and clarify the permitting process to provide uniformity, reliability, efficiency, and transparency.			X
(c) Improve communication with Lana'i and Moloka'i through the expanded use of information technologies, expanded staffing, and the creation and expansion of government-service centers.			X
(d) Ensure that laws, policies, and regulations are internally consistent and effectuate the intent of the General Plan.			X
Implementing Actions:			
(a) Update the County Code to be consistent with the General Plan.			X
(b) Identify and update County regulations and procedures to increase the productivity and efficiency of County government.			X
(c) Develop local level-of-service standards for infrastructure, public facilities, and services.			X
(d) Implement plans through programs, regulations, and capital improvements in a timely manner.			X
(e) Expand government online services.			X
Discussion: *The Kīhei High School project is not directly related to County processes.*			
Objective (4): Adequately fund in order to effectively administer, implement, and enforce the General Plan.			X
Policies:			
(a) Adequately fund, staff, and support the timely update and implementation of planning policy, programs, functional plans, and enforcement activities.			X
(b) Ensure that the County's General Plan process provides for efficient planning at the County, island, town, and neighborhood level.			X
(c) Encourage ongoing professional development, education, and training of County employees.			X
(d) Encourage competitive compensation packages for County employees to attract and retain County personnel.			X
(e) Enable the County government to be more responsive in implementing our General Plan and Community Plans.			X
(f) Review discretionary permits for compliance with the Countywide Policy Plan.			X
(g) Strengthen the enforcement of County, State, and Federal land use laws.			X
Implementing Actions:			
(a) Establish penalties to ensure compliance with County, State, and Federal land use laws.			X
Discussion: *The Kīhei High School project will not directly impact government administrations, and implementation of programs or plans; therefore, this objective and these policies are not applicable.*			
Objective (5): Strive for County government to be a role model for implementing cultural and environmental policies and practices.			X
Policies:			
(a) Educate residents on the benefits of sustainable practices.			X
(b) Encourage the retention and hiring of qualified professionals who can improve cultural and environmental practices.			X
(c) Incorporate environmentally sound and culturally appropriate practices in government operations and services.			X
(d) Encourage all vendors with County contracts to incorporate environmentally sound and culturally appropriate practices.			X
Discussion: *While the applicant supports this objective and these policies, they are not directly applicable to the proposed Kīhei High School project.*			

5.2.3 Maui Island Plan

The County of Maui is currently in the process of updating the General Plan. The Countywide Policy Plan, the first component of the Maui County General Plan update, was adopted in March 2010 and replaced the General Plan 1990. As a comprehensive policy framework for the islands of Maui County to the year 2030, the Countywide Policy Plan provides the goals, objectives, policies and implementing actions used to develop the Maui Island Plan and Community Plans.

The Draft MIP has not yet been adopted by the Maui County Council. Currently, only a Draft version of the Maui Island Plan is available for review (December 2009). However, the purpose of the Plan is directly related to the Directed Growth Strategy which identifies areas appropriate for future urbanization and revitalization. The corresponding Directed Growth Maps specify "urban growth boundaries" for the Island of Maui. As of December 2010, the proposed site for the Kīhei High School project is located within the "urban growth boundary" of the Directed Growth Maps put forth by the County of Maui, Department of Planning (*Figure 3-1*). Further, the Plan's Public Facility/Infrastructure Improvements Map designates the location of the proposed Kīhei High School project site for the development of a future high school (*Figure 3-2*).

5.2.4 Kīhei-Mākena Community Plan

The Kīhei-Mākena Community Plan (March 6, 1998) is one ~~(1)~~ of nine ~~(9)~~ community plans for Maui County. The Plan advances planning goals, objectives, policies and implementation considerations to guide decision-making within the Kīhei-Mākena region through the year 2010. The Plan provides specific recommendations to address the goals, objectives, and policies contained in the General Plan, while recognizing the values and unique attributes of the Kīhei-Mākena area to enhance the region's living environment. The proposed project supports the following goals, objectives, policies, and implementing actions set forth in the Kīhei-Mākena Community Plan as detailed in *Table 5-8* below.

Table 5-8 KĪHEI-MĀKENA COMMUNITY PLAN OBJECTIVES, POLICIES AND IMPLMENTING ACTIONS S = Supportive, N/S = Not Supportive, N/A = Not Applicable	**S**	**N/S**	**N/A**
LAND USE			
Goal: A well-planned community with land use and development patterns designed to achieve the efficient and timely provision of infrastructural and community needs while preserving and enhancing the unique character of Ma`alaea, Kīhei, Wailea and Mākena as well as the region's natural environment, marine resources and traditional shoreline uses.			
Objectives and Policies:			
(a) Acquire beachfront properties for public use.			X
(b) Identify priority growth areas to focus public and private efforts on the provision of infrastructure and amenities to serve existing residents and to accommodate new growth.	X		
(c) Upon adoption of this plan, allow no further development unless infrastructure, public facilities, and services needed to service new development are available prior to or concurrent with the impacts of new development.			X
(d) Limit hotel uses to those areas presently planned for hotel use, and limit hotel development until adequate public facilities and services are established to meet existing needs.			X
(e) Establish a system of parks, utility easements, shoreline areas, drainageways and wetlands as an open space framework for the urban areas of the region, i.e. where structures exist or are planned to exist, and provide an integrated system of pedestrian and bicycle paths.			X
(f) Establish a distribution of land uses which provides housing, jobs, shopping, open space, and recreation areas in close proximity to each other in order to enhance Kīhei's neighborhoods and to minimize dependence on automobiles.	X		

Table 5-8 KĪHEI-MĀKENA COMMUNITY PLAN OBJECTIVES, POLICIES AND IMPLMENTING ACTIONS S = Supportive, N/S = Not Supportive, N/A = Not Applicable	S	N/S	N/A
(g) Encourage the establishment of single-family and multi-family land use designations which provide affordable housing opportunities for areas which are in close proximity to infrastructure systems and other urban services.			X
(h) Develop commercial services at the following locations to meet community needs: 1) North Kīhei, between the existing South Kīhei Road, Pi'ilani Highway and Uwapo Road. 2) A central business and commercial center for Kīhei clustered about the South Kīhei Road/Road "C" intersection. 3) In existing commercially zoned areas along South Kīhei Rd. in the vicinity of Kalama Park. 4) Along South Kīhei Road opposite the Kama'ole beach parks.			X
(i) Limit commercial services to neighborhood business uses or other low-key business activities with a residential scale on those properties which abut single-family residential areas.			X
(j) Locate resort-related retail commercial facilities at strategic points in the Wailea and Mākena destination areas.			X
(k) Provide for limited expansion of light industrial services in the area south of Ohukai and mauka of Pi'ilani Highway, as well as limited marine-based industrial services in areas next to Ma`alaea Harbor. Provide for moderate expansion of light industrial use in the Central Maui Baseyard, along Mokulele Highway. These areas should limit retail business or commercial activities to the extent that they are accessory or provide service to the predominate light industrial use. These actions will place industrial use near existing and proposed transportation arteries for the efficient movement of goods.			X
(l) Preserve coastal vistas, open space and recreational opportunities for residents by prohibiting further shoreline development except in places designated on the 1997 community plan land use map, and prohibit future community plan amendments along the shoreline that would increase the intensity of land use, with the exception of land use that is public or quasi-public in nature.			X
(m) Provide for limited residential expansion in Ma`alaea which complements the existing natural and built environment.			X
(n) Maintain State Conservation District boundaries in the planning region. However, State Conservation District reclassification of lands may be warranted to enhance environmental preservation.			X
(o) Establish a site for a future higher educational institution north of the research and technology park project district.			X
(p) Prevent urbanization of important agricultural lands.			X
(q) Allow ohana units only where sufficient infrastructure is available.			X
(r) Allow special permits in the State Agricultural Districts to accommodate unusual yet reasonable uses including: (1) limited agriculturally related commercial, public and quasi-public uses serving the immediate community; (2) uses clearly accessory or subordinate to a principal agricultural use on the property; (3) public facility uses such as utility installations or landfills whose location depends on technical considerations; and (4) extractive industries, such as quarrying, where the operation would not adversely affect the environment or surrounding agricultural uses.			X
Implementing Actions:			
(a) Prepare a prioritized island-wide directed and managed growth strategy to ensure that the location, rate and timing of development is consistent with the provision of infrastructure and public facilities and services.			X
(b) Include conditions of approval for new residential developments requiring that adequate school facilities shall be in place before a certificate of occupancy is issued.			X
(c) Prepare an Open Space Master Plan for the region to provide a unified system of non-motorized access to community resources, and to provide a planned program of resource stewardship. Establish standards for the use of drainageways, gulches, wetlands, and easements for public access. The Open Space Master Plan shall be prepared by partnership between governmental and non-governmental organizations. The plan preparation shall include, but not be limited to, public input and informational workshops; inventory and mapping of cultural, natural, and open space resources; and review of legal options and constraints. Professional design of the Open Space Master Plan should be funded; and, upon its adoption, the Open Space Master Plan should be incorporated into the Kihei- Makena Community Plan.			X

Table 5-8 KĪHEI-MĀKENA COMMUNITY PLAN OBJECTIVES, POLICIES AND IMPLMENTING ACTIONS S = Supportive, N/S = Not Supportive, N/A = Not Applicable	S	N/S	N/A
(d) Control the timing and phasing of project district construction through zoning in order to ensure systematic and incremental development. Such an action shall prevent haphazard development, and ensure that the provision of adequate infrastructure and public facilities and services takes place prior to or concurrent with development.			X
(e) Review, amend and adopt, as appropriate, zoning ordinances and maps to carry out the intent of the land use categories identified in the plan.			X
(f) Establish and enforce building height limits and densities mauka of Pi'ilani Highway which preserve significant mauka views and vistas.	X		

Discussion: *The Kīhei High School project will add to the County's design of a well-planned community to support existing and future growth of the Kīhei-Mākena region. The project site is identified for a proposed high school site in the Draft Maui Island Plan's Public Facility/Infrastructure Improvements Map. Development of the site will fit with existing land use and development patterns to achieve the efficient and timely provision of infrastructural and community needs while preserving and enhancing the unique character of the region's natural environment, marine resources and traditional shoreline uses. The project will not have significant adverse impacts on mauka views and vistas. Building forms on the campus will meet established height limits and design standards. The campus will also provide a new recreation area for the community to gather and hold events.*

The South Maui Region Parks & Open Space Master Plan was prepared in 2006 by Chris Hart and Partners, subsequent to the 1998 Kīhei Mākena Community Plan. The Open Space Master Plan meets the intention of Implementing Action (c) in the Land Use section for the preparation of such a plan. The Kīhei High School project will be consistent with the Open Space Master Plan's vision of open space and multi-modal transportation corridors.

ENVIRONMENT			
Goal: Preservation, protection, and enhancement of Kīhei-Mākena's unique and fragile environmental resources.			
Objectives and Policies:			
(a) Maintain and enhance the long-term availability of shoreline resources for public enjoyment through adequate access, space, and facility provisions, and through on-going resource management programs.			X
(b) Preserve, protect, and restore unique natural areas with significant conservation values.			X
(c) Require that new shoreline development respect shoreline resources and maintain public access: 1) Existing dune formations are important elements of the natural setting and should remain intact. 2) Indigenous or endemic strand vegetation should remain undisturbed; new development and landscaping should treat such vegetation as given conditions. 3) Planning for new shoreline development, as well as redevelopment, shall consider the cyclic nature of beach processes. Setbacks shall be used to provide a sufficient buffer between the ocean and structures to allow for periodic and long-term accretion and erosion of the shoreline. A Coastal Erosion Rate Analysis shall be developed. The planning commissions are encouraged to incorporate data from the analysis into planning decisions for shoreline areas, especially with respect to shoreline building setbacks. In the interim period prior to the completion of the analysis, the planning commissions are further encouraged to utilize minimum setbacks for multi-family and hotel uses of 150 feet from sandy shorelines, and 75 feet from rocky shorelines, or 25% of the average lot depth, whichever is greater. Where shoreline erosion threatens existing structures or facilities, beach replenishment shall be the preferred means of controlling erosion, as opposed to sole reliance on seawalls or other permanent shoreline hardening structures.			X

Table 5-8 KĪHEI-MĀKENA COMMUNITY PLAN OBJECTIVES, POLICIES AND IMPLMENTING ACTIONS S = Supportive, N/S = Not Supportive, N/A = Not Applicable	S	N/S	N/A
4) Storm water run-off from proposed developments shall not adversely affect the marine environment and nearshore and offshore water quality. 5) Planning, design, and layout for new development shall be integrated with public shoreline use and sound principles of resource management.			
(d) Permit recreational activities in the shoreline zone which respond to shoreline characteristics and principles of sound resource management. Activities which damage or deplete shoreline resources, or are incompatible with ecological systems, shall not be permitted.			X
(e) Protect the quality of nearshore waters by ensuring that land-based discharges meet water quality standards. Continued monitoring of existing and future waste disposal systems is necessary to ensure their efficient operation. Programs should be implemented to reduce the reliance on injection wells for wastewater disposal.	X		
(f) Protect all wetland resources, such as those at Kealia Pond and near Road "C". These open space and wildlife habitat resources are important for flood control and for their natural beauty.			X
(g) Require the integration of wetlands and drainageways into an open space, pedestrian pathway, and bikeway system within and around the Lipoa business district.			X
(h) Encourage such land uses as would serve to reduce hazardous fire conditions in the developed community plan areas.	X		
(i) Discourage shoreline hardening structures where North Kīhei Road abuts the coastline. Instead, use soft approaches such as dune restoration and beach nourishment with or without supporting structures.			X
Implementing Actions:			
(a) Implement programs to reduce the reliance on injection wells for wastewater disposal.			X
(b) Establish and maintain a monitoring program for nearshore waters.			X
(c) Support the development of the Ma`alaea-Kealia bypass highway.			X
(d) Develop a master plan for a recreational coastline access along North Kihei Road once the Ma'alaea-Kealia bypass is planned.			X
(e) Facilitate protection of valuable shoreline resources in the Open Space Master Plan by transferring State Beach Reserves and adjacent undeveloped State-owned lots to County jurisdiction. Prepare and implement a plan for enhancement of these lands to provide stewardship of cultural and natural resources and the fostering of traditional cultural activities.			X
(f) Survey, map, and describe the mauka boundaries of the State Beach Reserves to delineate between public and private property.			X
(g) Partner with the Na Ala Hele, South Maui Heritage Corridor, Kihei 2000, and Bikeways Maui organizations to establish a continuous trail/greenway/bikeway system from Kealia Pond to Kilohana Road, to provide pedestrian lateral accesses to the Kihei-Makena shoreline, and to protect and maintain traditional shoreline access.			X
(h) Initiate a wetlands enhancement project with the Kihei Franks development in coordination with the enhancement of the County owned wetland adjacent to Saint Theresa's Church. Include a pedestrian and bikepath to allow school children to access the beach and greenway.			X
(i) Develop and implement a strategy for sand dune protection.			X
(j) New studies should be commissioned that seek to better understand site-specific causes of coastal erosion.			X
(k) Develop and implement a dune restoration project for the beach area along South Kihei Road from the Maui Lu to Suda Store. Such a project may use drift fencing, native vegetation, and dune walkovers in order to restore the sand dunes and prevent sand from blowing onto and across the road.			X

Discussion: *The Kīhei High School project site is not located on or near the coastline; therefore, policies regarding shoreline resources are not applicable. However, the project will implement water quality standards that comply with Federal and State regulations.*

Table 5-8 KĪHEI-MĀKENA COMMUNITY PLAN OBJECTIVES, POLICIES AND IMPLMENTING ACTIONS S = Supportive, N/S = Not Supportive, N/A = Not Applicable	S	N/S	N/A
CULTURAL RESOURCES			
Goal: Identification, preservation, enhancement, and appropriate use of cultural resources, cultural practice, and historic sites that: **a. provides a sense of history and defines a sense of place for the Kīhei-Mākena region; and** **b. preserves and protects native Hawaiian rights customarily and traditionally exercised for subsistence, cultural, and religious purposes in accordance with Article XII, Section 7, of the Hawaii State Constitution, and the Hawaii Supreme Court's PASH opinion, 79 Haw. 425 (1995).**			
Objectives and Policies:			
(a) Identify, preserve, protect and restore significant historical and cultural sites.	X		
(b) Foster an awareness of the diversity and importance of cultural and archaeological resources and of the history of Kīhei-Mākena. Promote distinct cultural resources as an identifying characteristic of the region.			X
(c) Encourage and protect traditional mauka and makai accesses, cultural practices and rural lifestyles.	X		
(d) Protect those areas, structures and elements that are a significant and functional part of Hawaii's ethnic and cultural heritage.			X
(e) Encourage community stewardship of historic sites.			X
(f) Preserve and restore historical roads and paths as cultural resources, and require such resources to be available to the public.			X
(g) Recognize and respect family ancestral ties to certain sites.	X		
(h) Establish "cultural parks" and heritage corridors for visitation and education.			X
(i) Establish cultural and educational programs to perpetuate Hawaiian and other ethnic heritages.			X
(j) Develop a County ordinance for indigenous architecture.			X
Implementing Actions:			
(a) Prepare a Kihei-Makena specific Cultural Resources Management Plan. Use the plan to update the Countywide Cultural Resources Management Plan. Include an inventory of cultural resources and develop strategies for the preservation and enhancement of those resources.			X
(b) Require development projects to identify all cultural resources located within or adjacent to the project area, prior to application, as part of the County development review process. Further require that all proposed activity include recommendations to mitigate potential adverse impacts on cultural resources, including site avoidance, adequate buffer areas and interpretation. Particular attention should be directed toward the southern areas of the planning region.	X		
(c) Implement a historic or cultural district overlay ordinance to provide protection for areas of significant archaeological, historical and cultural resources. These ordinances should be used at Palauea, Keone'o'io and other significant archaeological complexes in the Honua'ula District of the region.			X
(d) Upon development of Project District 8 (Palauea), the developer shall implement a historic park and interpretative center at Palauea, preserving the Palauea archaeological district and providing interpretation for sites in the Makena-Wailea region. Permitted uses shall include a cultural preserve/park area which shall be a minimum of at least 20 contiguous acres to protect and preserve known significant archaeological sites, which shall include, but not be limited to, the Palauea village and heiau complex, and the Palauea landing complex. Consideration should also be given to expanding the cultural preserve to include additional newly identified sites. Because of the significance of the sites, the County Cultural Resources Commission shall review all plans for development. Because of high public interest and the contiguous nature of the sites, consideration should be given to educational uses of the sites.			X
(e) Formulate and adopt rural and historic district roadway standards for the old Makena Road to promote the maintenance of historic landscapes and streetscapes in character with the region, so long as these standards are for public roadway purposes, and do not obstruct or interfere with the rights of the public for the use and enjoyment of the area. Makena Road shall be kept open for public use.			X
(f) General sites that should be identified for preservation include, but are not limited to, the following: 1) Ancient Trails/Old Government Roads 2) Fishponds 3) Landings			X

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4) Nearshore marine cultural resources 5) Significant native vegetation zones 6) Plantation ditch systems 7) Religious Structures (shrines, churches and heiau) 8) Old bridges 9) Plantation camps 10) Plantation era structures and homes 11) Petroglyphs 12) Burials			
(g) Important sites and areas in the Kihei-Makena Community Plan region include the following: 1) Lahaina-Pali Trail 2) McGregor's Landing 3) Ma`alaea/McGregor Complex 4) Ma`alaea Petroglyphs 5) Kealia Pond 6) Naval Air Station Pu`unene 7) Kihei Landing 8) Keolahou Church 9) Kalepolepo Fishpond 10) David Malo Church 11) Waiohuli Kai Fishpond 12) Ko`a at Waimahaihai, Kama`ole 13) Kihei Regional Park Complex 14) Kama`ole House Site 15) Palauea Complex 16) Makena Landing Area Sites 17) Makena Complex 18) Keawala`i Church 19) Pu`u Olai 20) Mo`omuku Ko`a 21) Kanahena Landing Area 22) Moanakala Village 23) Kanahena Point Complex 24) Kalaeloa Complex 25) Keone`o`io Village 26) Hoapili Trail 27) Keawanaku Complex 28) Wawaloa Complex 29) Alaha Complex 30) Waiakapuhi Complex 31) Kalulu Complex The above list is not comprehensive. It represents some of the well known sites that are currently listed in the State inventory of Historic Places and on file with the State and National Registers of Historic Places. Many more sites have not been surveyed for historic significance. A map indicating the general location of these sites is on file with the County's Department of Planning. The said map should be consulted prior to development proposals affecting the above-mentioned areas. Prior to any development approvals, the said map shall be referenced and the comments of the State Historic Preservation Division and the County Cultural Resources Commission shall be sought.			X
Discussion: *An AIS and a CIA were prepared for the project by Scientific Consultant Services, Inc., and are included as part of this EIS. During the AIS, one ~~(1)~~ site (SIHP No. 50-50-9-6393) was re-identified within the study parcel consisting of historic era rock piles and one ~~(1)~~*			

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alignment. Although SIHP No. 50-50-10-6393 will be adversely impacted through project construction, the features have been documented to the fullest extent. The SHPD accepted the AIS on February 12, 2010. Information presented in the CIA for the project site also revealed no notable cultural activities took place at the specific project areas. Therefore, no adverse effects are anticipated. Should significant cultural materials and/or burials be inadvertently discovered during construction, all work in the immediate area will cease and SHPD will be notified.			
ECONOMIC ACTIVITY			
Goal: A diversified and stable economic base which serves resident and visitor needs while providing long-term resident employment.			
Objectives and Policies:			
(a) Establish a sustainable rate of economic development consistent with concurrent provision of needed transportation, utilities, and public facilities improvements.	X		
(b) Expand educational opportunities and encourage research and technological activities.	X		
(c) Encourage research, development, and use of alternate energy sources.	X		
(d) Establish balance between visitor industry employment and nonvisitor industry employment.			X
(e) Provide for the preservation and enhancement of important agricultural lands for a variety of agricultural activities, including sugar cane, diversified agriculture and aquaculture.			X
(f) Increase the availability and variety of commercial services to provide for regional needs and strategically establish small scale commercial uses within, or in close proximity to, residential areas.			X
Implementing Actions:			
(a) Seek State and private support for the establishment of a four-year university in the Kihei-Makena region.			X
(b) Establish a comprehensive data base to analyze county and regional economic statistics.			X
(c) Where feasible within the region, utilize alternate energy sources in all public structures, and encourage the same in private residences.	X		
Discussion: *Development of the Kīhei High School project will meet the needs for an educational facility to serve the Kīhei-Mākena region as described in the Kīhei-Mākena Community Plan. By developing a new high school to serve surrounding community, the project will provide expanded educational opportunities and encourage research and other related activities.* *The new high school will result in significant expenditures that will have a positive impact on the economies of the State and the County. With significantly increasing capital investment and capital flow in the region, economic benefits will result from increased employment and tax revenues. The proposed development will also provide opportunities for short and long-term employment within the Kīhei area. It is a goal of the development that the school serves not only youth, but be a center for the community as well. The proposed Kīhei High School project plans on fostering partnerships with the community and private sector through creation of a Science and Technology Center, and a Health and Wellness Center.*			
HOUSING AND URBAN DESIGN			
Goal: A variety of attractive, sanitary, safe and affordable homes for Kīhei's residents, especially for families earning less than the median income for families within the County. Also, a built environment which provides complementary and aesthetically pleasing physical and visual linkages with the natural environment.			
Objectives and Policies:			

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(a) Provide an adequate variety of housing choices and range of prices for the needs of Kīhei's residents, especially for families earning less than the median income for families within the County, through the project district approach and other related programs. Choices can be increased through public/private sector cooperation and coordinated development of necessary support facilities and services.			X
(b) Require a mix of affordable and market-priced housing in all major residential projects, unless the project is to be developed exclusively as an affordable housing project.			X
(c) Preserve Kīhei-Mākena's significant views of the Pacific Ocean and the broad vista to the Central Maui and Upcountry region. Prohibit the use of walls higher than 4 feet in front yard setbacks especially in areas close to the shoreline where view corridors can be blocked.			X
(d) Provide for integration of natural physical features with future development of the region. New development shall incorporate features such as gulches and wetlands into open space and pedestrian pathway and bikeway systems.	X		
(e) Implement landscaped setbacks for future multi-family and commercial areas. Developments shall provide space for landscaped pedestrian ways and bikeways.			X
(f) Incorporate the principles of xeriscaping in all future landscaping.	X		
(g) Encourage the use of native plants in landscaping in the spirit of Act 73, Session Laws of Hawaii, 1992.	X		
(h) Recommend to the Maui County Arborist Committee for consideration as "Exceptional Trees" all trees, or groves of trees, that have historic or cultural value, represent an important community resource, or are exceptional by reason of age, rarity, location, size, aesthetic quality, or endemic qualities. Healthy mature trees shall be saved and incorporated in the landscape plans of subdivisions, roads, or any other construction or development.			X
Implementing Actions:			
(a) Develop a comprehensive strategy for housing assistance which coordinates all available public and private resources and incorporates appropriate regulatory measures.			X
(b) Explore modifying zoning, building and subdivision codes to incorporate minimum lot sizes, compact parking ratios, and roadway and utility standards which meet resident needs but which may depart from customary urban standards, in an effort to reduce development and housing costs.			X
(c) Plant appropriate trees, turfgrass, and ground covers along existing public rights-of way, roads, and parks. Neighborhood communities and citizen groups shall be encouraged to upgrade their streets and parks in accordance with the Maui County Planting Plan.	X		
(d) Provide landscaped buffer areas between Pi'ilani Highway and adjacent communities to mitigate highway noise and to reduce the visual impact of development. Both Pi`ilani Highway and South Kihei Road shall be landscaped to achieve a parkway character.			X
(e) Provide an aesthetic landscaped entry-way and park at the north end of Kihei, north of the future commercial area. Provide a similar Kihei entry-way at Road C.			
(f) Develop Kihei-Makena Urban Design Guidelines to address architectural, landscape, and graphic design standards. Use the guidelines to establish a sense of place by defining distinctive standards for four neighborhoods: the Uwapo Road- Suda Store neighborhood, the Lipoa Street-Azeka Place neighborhood, the Kalama Park neighborhood, and the Kama'ole Parks neighborhood.			X
(g) Implement streetscape beautification through an "adoption" program for trees, sidewalks, street frontages, and intersections.			X

Discussion: *The Kīhei High School project site is not related to the development of housing in Kīhei; therefore, most policies regarding housing and urban design are not directly applicable to the proposed project. However, the project design will incorporate design features such as the integration of natural physical features throughout the campus, use of native plants and principles of xeriscaping in landscaping.*

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PHYSICAL AND SOCIAL INFRASTRUCTURE			
Goal: Provision of facility systems, public services and capital improvement projects in an efficient, reliable, cost effective, and environmentally sensitive manner which accommodates the needs of the Kīhei-Mākena community, and fully support present and planned land uses, especially in the case of project district implementation. **Allow no development for which infrastructure may not be available concurrent with the development's impacts.**			
Transportation			
Objectives and Policies:			
(a) Develop and implement a well-planned road and public transportation system to allow residents and visitors to move safely, effectively and comfortably within the region. Roadway improvements should be planned, designed, and constructed as prioritized under the Implementing Actions section below, and as generally described in the Kīhei Traffic Master Plan.	X		
(b) Undertake transportation system improvements concurrently with planned growth of the Kīhei-Mākena region. Require adequate interregional highway capacity, including the widening of Pi`ilani and Mokulele Highways to four lanes, prior to the construction of major projects south of Kilohana Road or mauka of Pi`ilani Highway.			X
(c) Strengthen the coordination of land use planning and transportation planning to promote sustainable development and to reduce dependence on automobiles. New residential communities should provide convenient pedestrian and bicycle access between residences and neighborhood commercial areas, parks and public facilities.	X		
(d) Support ridesharing, bicycle and pedestrian use, alternative work schedules, traffic signal synchronization, and/or other transportation demand management strategies.	X		
(e) Support a new bypass highway mauka of Pi`ilani Highway, coordinated with a Ma`alaea-Kealia Pond bypass highway, and an Upcountry-Kīhei connector road, to be constructed as growth in the region warrants.			X
(f) Protect and preserve the traditional rural scale and character of existing portions of old Mākena Road in a manner similar to that existing at Keawalai Church.			X
(g) Plan, design, and construct a pedestrian and bikeway network throughout the Kīhei-Mākena region which considers the utilization of existing stream beds, drainageways, wetlands and public rights-of-way along coastal and inland areas.			X
(h) Encourage joint public/private participation in the planning, design and construction of roadway improvements, especially those identified in this plan.			X
(i) Support the planning and design of the Ma`alaea-Kealia bypass highway in order to address potential environmental concerns of North Kīhei Road, and its proximity to the shoreline.			X
Implementing Actions:			
(a) Plan, design and construct a new Road "C", from South Kihei Road to Pi`ilani Highway, to provide an alternative connector roadway in Central Kihei, as described in the Kihei Traffic Master Plan. Said alignment shall extend in an easterly direction from its existing segment at South Kihei Road and link with Pi`ilani Highway. This is the highest priority for roadway improvements in the community plan region.			X
(b) Plan, design and construct appropriate sections of a new North-South Collector Road, from Uwapo Road to Keonekai Road, to facilitate improved traffic movement in Kihei proper. When selecting a specific alignment, impacting existing structures should be kept to a minimum. Consideration should be given to segments between Kaonoulu Street and Auhana Street as well as between Ke Alii Alanui and Keonekai Road. In terms of roadway improvements within the community plan region, this shall be the second priority.			X
(c) Widen Pi`ilani Highway, between Mokulele Highway and Wailea Ike Drive, to four lanes. In terms of roadway improvements within the community plan region, this shall be the third priority.			X
(d) Plan, design and construct a new Road "B", from South Kihei Road to the new North-South Collector Road, to improve internal circulation in the Central Kihei area.			X
(e) Plan, design and construct a new Road "A", from Road "B" to Lipoa Street, to provide increased circulation in the Lipoa business area.			X
(f) Provide clear signage with adequate lighting along Pi`ilani Highway to indicate Kihei access points. Also provide a landscape buffer and bikepath on both sides of Pi`ilani Highway.	X		

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(g) Provide left turn storage lanes and acceleration/deceleration lanes on Pi`ilani Highway, and traffic signals at important intersections along South Kihei Road.	X		
(h) Widen Mokulele Highway to four lanes.			X
(i) Preserve and enhance the identity of Kihei's neighborhoods by designing the northsouth collector road in discontinuous segments. Work with landowners, neighborhoods, and community groups to plan and implement an adjacent but separate trail/greenway/bikepath to provide non-motorized public access along the full length of the road reserve. In sections where no roadway is built, the trail/greenway/bikepath may be broadened to form a neighborhood park, public access, or open space area.			X

Discussion: *A traffic study was prepared for the Kīhei High School project (Appendix G). As described in Section 4.2.5, development of the project is not expected to have a significant impact on traffic operations, primarily due to the provision of turning lanes and a traffic signal system at the intersection of Piʻilani Highway with Kūlanihākoʻi Street, and the access road for the high school. New roadway infrastructure will be developed to fit the community and existing character of the area. A landscaped buffer will be provided along Piʻilani Highway. State and County transportation officials will be consulted throughout the planning and design of the project.*

The new high school in Kīhei is expected to serve students who currently attend high schools in Kahului and Wailuku. Therefore, the project will alleviate long travel distances for families driving their children to and from school in Central Maui. Safe walking and bicycling opportunities will also be integrated into the overall project design. The location of the high school is within walking distance to existing and future residential areas, thereby encouraging students to walk and bike to and from school. Students will also be encouraged to carpool or utilize alternative means of transportation.

Water Distribution			
Objectives and Policies:			
(a) Provide for appropriate water source and transmission improvements concurrent with planned growth of the Kīhei-Mākena region.	X		
(b) Support and expand the projected development of the Central Maui and East Maui water systems in order to meet the needs of all Maui residents.			X
(c) Develop water conservation, reuse and educational programs.	X		
(d) Encourage the use of non-potable water for irrigation purposes and water features. Prohibit the use of potable water in large water features or require substantial mitigation fees.	X		
(e) Encourage the use of plants which have a relatively low need for water.	X		

Discussion: *There are no on-site public or private water systems serving the property. The domestic water supply would be supplied through the Central Maui Water System by connecting to the existing water main on Līloa Drive and upgrading the existing water main in the Piʻilani Village Subdivision. The project team will continue to work with DWS to provide potable water supply for the proposed Kīhei High School project. Irrigation water will be supplied via on-site brackish wells drilled into the groundwater lens below the site.*

The project will be designed in accordance with the USGBC LEED certification or comparable program requirements. Sustainable design strategies will water conservation measures, such as xeriscape landscaping principles, and best management practices for water use.

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Liquid and Solid Waste			
Objectives and Policies:			
(a) Coordinate improvements to sewer transmission lines and wastewater reclamation facilities to meet the needs of future population growth. Require that the Wailea Resort Company and the Wailea Mākena Alliance work toward a solution that would enable the Wailea sewerage system to be dedicated to the County.	X		
(b) Provide efficient, safe and environmentally sound systems for the reuse, recycling, and disposal of liquid and solid wastes.	X		
(c) Reduce the reliance on injection wells for wastewater disposal. Require the use of reclaimed effluent--a procedure which is safe, economical and environmentally sound--for irrigation of golf courses, parks and landscaped areas.	X		
(d) Encourage public awareness of the need to reduce, reuse, recycle and compost waste materials, and make composting facilities available to the public.	X		
Discussion: *The sewer requirements of the proposed project will require additional capacity at the existing Kīhei Wastewater Pump Station Nos. 3, 4, 5 and 6. While the existing collection system should have adequate capacity for flows generated by the high school such that upgrades are not necessary, the County will formally determine if any upgrades are required after the Plan Review Application form is submitted. Proposed on- and off-site sewer lines will comply with the County standards. The proposed Kīhei High School project will also incorporate green design principles which include re-use and recycling as practicable to reduce solid wastes. Standard recycling practices will also be implemented once the high school is operational.* *The high school will be constructed and operated in accordance with State and federal water quality regulations. No septic tanks, leach fields, or injection wells are proposed. Best management practices will be implemented to minimize adverse impacts from occurring.*			
Drainage			
Objectives and Policies:			
(a) Design drainage systems that protect coastal water quality by incorporating best management practices to remove pollutants from runoff. Construct and maintain, as needed, sediment retention basins and other best management practices to remove sediments and other pollutants from runoff.	X		
(b) Construct necessary drainage improvements in flood prone areas. Where replacement drainage are required for flood protection, these systems shall be designed, constructed, and maintained using structural controls and best management practices to preserve the functions of the natural system that are beneficial to water quality. These functions include infiltration, moderation of flow velocity, reduced erosion, uptake of nutrients and pollutants by plants, filtering, and settlement of sediment particles. The use of landscaped swales and unlined channels shall be urged.			X
(c) Support the implementation of flood control projects and sediment retention basins mauka of Piilani Highway to address present problem areas.	X		
(d) Minimize the increase in discharge of storm water runoff to coastal waters by preserving flood storage capacity in low-lying areas, and encouraging infiltration of runoff.	X		
(e) Encourage the use of setbacks and flood protection areas as part of an open space pedestrian-way and bikeway network throughout the region.			X
Implementing Actions:			
(a) Formulate a drainage master plan for Kihei-Makena that considers the cumulative impacts of existing and planned development. The master plan shall guide future development while preventing flooding and providing guidance to reduce the degradation of coastal waters.			X
(b) Establish a comprehensive program of improvements to the storm drainage system; implement a maintenance program; and ensure that safety, property loss, pollutant removal, and the need for comprehensive planning, are considered.			X
(c) Revise the County drainage rules to require that drainage system design shall not adversely affect			X

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downstream and coastal water quality.			
Discussion: *As detailed in Section 4.2.10.3, drainage from the project is not expected to have a significant adverse effect on coastal water quality. The project will adopt water quality standards and will be constructed and operated in accordance with State and federal water quality regulations. Drainage improvements will be designed to result little or no increase in the peak rate of storm water runoff from existing conditions. Best management practices will be implemented, such as the use of basins, grass swales, infiltration trenches and vegetative filter strips to minimize runoff from occurring. During construction, grading operations will be in conformance with the applicable ordinances by the DOH and the County. Mitigation will consist of implementing grading and construction period erosion control BMPs.* *The proposed Kīhei High School site is located in an area designated Zone X, outside the 100-year flood plain (Figure 1-8). The site is flanked by Kūlanihāko'i Gulch and Waipu'ilani Gulch. These gulches are generally dry except after significant rainfall events. Due to the topography of the land, flooding is not expected within the project site. The proposed project will provide adequate setbacks and will be constructed in compliance with applicable building codes.*			
Energy and Public Utilities			
Objectives and Policies:			
(a) Promote energy efficiency as the energy resource of first choice, and increase energy efficiency in all sectors of the community.	X		
(b) Locate goods, services, and employment in close proximity to residential centers to minimize energy expenditures for transportation. Support the development of communication infrastructure and promote telecommuting to minimize travel.	X		
(c) Increase the use of renewable resources in all County-owned buildings, facilities, and vehicles. Utilize renewable energy for water pumping or other energy services which can take advantage of intermittent energy resources.			X
(d) Promote environmentally and culturally sensitive use of renewable energy resources like biomass, solar, wind, and hydroelectric energy in all sectors of the community.			X
(e) Support the establishment of an alternate fuels distribution infrastructure.			X
(f) Interface County planning with the energy utilities' integrated resource planning programs.			X
(g) Encourage the provision of public utilities which will meet community needs in a timely manner.			X
(h) Require proper site selection, facility construction and monitoring of power generation facilities in order to minimize adverse environmental impacts upon the Kīhei-Mākena community.			X
(i) Increase the energy security of community "lifeline" facilities and improve energy emergency response capabilities.			X
Implementing Actions:			
(a) Develop incentives and requirements for energy-efficient building design and site development practices through various approaches, including modifications to building, zoning, and subdivision codes.			X
(b) Develop, compile and disseminate information on new energy technologies, policies, and programs that may prove helpful to the community's economy and environment.			X
(c) Initiate an integrated County energy resource planning program.			X
(d) Use energy-efficient street lights and develop appropriate street lighting standards for agricultural and rural areas.			X

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Discussion: *As a State of Hawai'i agency, the applicant is committed to the use of renewable energy sources that are proven, viable, cost effective, and environmentally responsible. Kīhei High School will be designed to achieve certification under the USGBC LEED program or comparable program. The project will contribute to energy efficiency through incorporating green building standards and sustainable features to conserve energy and water usage, and principles of waste minimization and pollution prevention. The project design may also support alternative modes of transportation and low-emitting and fuel efficient vehicles to help reduce greenhouse gas emission.* *Kīhei High School will also implement an environmental awareness among students and faculty that promote the importance of the energy efficiency and renewable energy resources. The new high school will be located in close proximity to existing and future residential centers thereby encourage walking, biking and other alternative means of transportation.*			
Recreation			
Objectives and Policies:			
(a) Provide high-quality recreational facilities to meet the present and future needs of residents of all ages and physical ability.	X		
(b) Provide for a range of park sizes and types at neighborhood, community and regional scales. New residential developments shall provide recreational facilities on-site to meet the immediate needs of project residents.			X
(c) Plan, design and construct a regional park on approximately 100-150 acres within the District. Facilities should include, but may not be limited to: a community center, swimming pool, ball fields, and basketball and tennis courts. Consideration should be given to locating the park in fairly close proximity to the Kīhei Wastewater Reclamation Facility so that treated effluent may be used for park irrigation purposes.			X
(d) Encourage the construction of public parks adjacent to schools to provide for joint utilization of facilities by school and community.			X
(e) Improve recreation facilities and services through the integration of public parking, vehicular drop-offs and turnarounds, and sanitation facilities with facility planning and design.			X
(f) Improve public access to shoreline and nearshore resources through the following measures: 1) Develop and implement a plan for public access to the shoreline, which includes both existing and future accesses, based on the location of significant shoreline resources. Accesses shall be consistent with the characteristics of resources to be reached. 2) Provide adequate landscaped public access to shoreline areas with significant recreational and scenic value. Provide adequate lateral public access along the shoreline to connect significant shoreline areas and to establish continuity of the public shoreline areas. Particular attention shall be directed toward southern shoreline resources from Polo Beach southwards, and between Kama`ole Parks II and III. 3) Require setbacks to include recreational space on lands behind the legally defined public shoreline zone wherever possible. This allows for adequate recreational activities and proper management of the shoreline. 4) Provide setback areas with landscaping to enhance recreational use and scenic quality. Recreational amenities should be commensurate with the scale of the setback area, intended use, and resource characteristics.			X
(g) Establish several youth centers throughout the region, one of which could be located at the park site adjacent to Lokelani Intermediate School.			X
(h) Provide for adequate parking at all park facilities. Many existing parks lack sufficient parking and require substantial increases in parking spaces.			X
(i) Support the creation and promotion of overnight campsites within the region.			X
Implementing Actions:			
(a) Designate appropriate locations and provide for community and neighborhood parks within the Kihei-Makena region.			X

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(b) Revise standards in the park dedication ordinance to increase the quantity and quality of parks generated by new developments. Strategies which should be explored include increasing park assessment provisions, various cash vs. land dedication options, and provision of active vs. passive recreation parks. The analysis should recognize the importance of on-site recreational facilities as well as the need for parks at the neighborhood, community and regional level.			X
(c) Implement Makena-LaPerouse Park for nature-oriented recreation, including shoreline activities, picnicking, camping, biking, and interpretive/educational pursuits. Provide for a residential caretaker and security personnel to oversee facilities and public safety at this large remote destination.			X
(d) Provide adequate maintenance programs and enforce existing regulations regarding littering and defacement of public property at all public facilities.	X		
(e) Create a master plan to rehabilitate the existing beach parks in the region, and to develop County-owned lands designated for park use.			X
Discussion: *The project will provide a range of recreational opportunities, many of which may be carried out in coordination with other groups and organizations. Athletic fields and large open spaces will be provided on the lower campus area of the proposed high school. These recreational areas will be cleaned and maintained by school custodians and staff. Public parking would be provided after school hours. The campus is envisioned as a place for the community to gather for sports and recreational activities.*			
Health and Public Safety			
Objectives and Policies:			
(a) Improve and expand the delivery of health and public safety services to Kīhei-Mākena residents and visitors.	X		
(b) Provide for the establishment of a health clinic with full emergency services.			X
(c) Support a new full-service hospital facility in the Kīhei-Mākena region to be constructed as growth in the region and the island warrants.			X
Implementing Actions:			
(a) Provide a police station in the Kihei-Makena region.			X
(b) Expand fire fighting and rescue capabilities, including the acquisition of a new ladder truck, and the provision of a fire and ambulance station in the Wailea area.			X
Discussion: *While the project will not directly impact health and public safety services for Kīhei-Mākena residents and visitors, the DOE does takes the responsibility of the wellness and safety of its students and staff seriously. Therefore, general health and public safety services will be provided for all students and faculty within the high school campus.*			
Education			
Objectives and Policies:			
(c) Require the delivery of quality educational facilities at the time such facilities are needed. Emphasize advanced planning so that school facilities such as classrooms, playgrounds, libraries, cafeterias and other appurtenant structures are delivered in a timely manner so as to eliminate the use of portable facilities.	X		
(d) Enhance the classroom learning environment through measures which would reduce excessive temperature and background noise problems.	X		
(e) Consider a third elementary school site of approximately 20 acres in the North Kīhei area.			X
(f) Build a high school to serve the Kīhei region when required to accommodate growth.	X		
(g) Encourage the construction of child day care centers which are located convenient to users, but which place minimal impact upon residential neighborhoods.			X
Implementing Actions:			
(a) Enhance the classroom learning environment through such measures as the installation of air-conditioning and ceiling fans.	X		

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(b) Require the construction of a playground and physical education facilities east of Lokelani Intermediate School. Consider the joint use of property on the south side of Lokelani Intermediate School for playground use in order to provide additional recreation space and flexibility for both Lokelani and Kihei Elementary schools.			X
(c) Request that the Department of Education shall provide and maintain a landscaped buffer between Pi`ilani Highway and Lokelani and Kihei Elementary schools. This visually attractive buffer would reduce excessive noise problems from Pi`ilani Highway.			X
(d) Plan and locate a site for a high school to serve the Kihei region.	X		
Discussion: *Significant population growth in the Kīhei-Mākena region, coupled with the geographical separation from existing crowded central Maui high schools has created the need for the proposed Kīhei High School. The proposed high school has been planned for in County's December 2009 Draft Maui Island Plan 2030 and long desired by community residents. The proposed project would deliver an additional educational resource support the region at a time when these facilities are needed. The campus will provide adequate setbacks and landscaped buffers from Pi'ilani Highway to reduce excessive background noise. Other sustainable design measures will be integrated to enhance the overall classroom learning environment.*			
GOVERNMENT			
Goal: Efficient, effective and responsive government services in the Kīhei-Mākena region.			
Objectives and Policies:			
(a) Improve the delivery of services by government agencies to the Kīhei- Mākena region.	X		
(b) Continue to streamline the permit process, where appropriate, through means such as consolidated public hearings and concurrent processing of applications.			X
(c) Continue to expedite the review and approval process for projects which will result in public benefit by "fast-tracking" and the assignment of permit expediters.			X
(d) Use the County's real property tax assessment function as a mechanism to encourage desirable private development, rehabilitation, or preservation, to monitor the implementation of the Community Plan, and to establish a land use information base.			X
Implementing Actions:			
(a) Evaluate and modify present zoning and subdivision ordinances to incorporate land use and design guidelines as well as other recommendations incorporated herein.			X
(b) Compile plans and studies to implement the recommendations of this Plan, including water development, housing, local and regional circulation, drainage, solid waste, and other special studies as required.			X
(c) Continue to develop and utilize a computerized County planning system, including, but not limited to, integrating into the system future plans, studies, guidelines, and legislation. The computerized planning system should not become stagnant, but should become an integral part of planning within the County.			X
(d) Continue to operate and fund mobile/satellite government facilities.			X
(e) Implement tax incentives and/or disincentives that encourage desirable private development or preservation.			X
(f) Adopt a beach/mountain access dedication ordinance pursuant to Chapter 46, Hawaii Revised Statutes to assist in establishing public mauka and makai accesses, in conjunction with an overall public access master plan to serve as the framework for decision-making.			X
Discussion: *The Kīhei High School project will not directly improve government services and processes, particularly relating to land use and decision making and standards, therefore, this objective and these policies are not applicable. However, the DOE is a State (government) agency committed to providing necessary public school services to meet community needs. Coordination with other government agencies will be conducted throughout the planning and design of the project.*			

Table 5-8 KĪHEI-MĀKENA COMMUNITY PLAN OBJECTIVES, POLICIES AND IMPLMENTING ACTIONS S = Supportive, N/S = Not Supportive, N/A = Not Applicable	S	N/S	N/A
INDIGENOUS ARCHITECTURE			
Goal: Reserve for future implementation provisions for indigenous architecture as may be adopted from time to time by the County Council and/or the County Cultural Resources Commission.			
Objectives and Policies:			
(a) To legitimize indigenous architecture as viable spaces for living, work, and recreation.			X
Implementing Actions:			
(a) Develop a County ordinance for indigenous architecture.			X
(b) Adopt standards for indigenous architecture.			X

Discussion: *The Kīhei High School project does not currently involve planning for the region's future implementation of indigenous architecture. However, elements of indigenous architecture may be incorporated into the project, as specific design details continue to be developed.*

Chapter6
Alternatives to the Proposed Project

6.0 ALTERNATIVES TO THE PROPOSED PROJECT

This section describes the following alternatives to the proposed action that were considered during the planning process:

- No-action
- Alternative Sites
- Reduced Campus Size

The alternatives analysis describes the alternative, identifies the potential environmental impacts of the alternative and compares them with the potential impacts of the proposed action.

6.1 NO-ACTION ALTERNATIVE

This alternative assumes the development of the land in accordance with the current State Agricultural District classification and County Agricultural zoning of the site. Under this alternative, the land would probably remain essentially undeveloped for the foreseeable future. The existing character would be maintained and any adverse or beneficial impacts created by the proposed project would not be generated. If the project was not implemented at this time, it is probable that the land would remain in its present condition until development of a master planned community was pursued by property owners at a later date.

6.1.1 Potential Impacts Compared to the Proposed Action

The No-Action Alternative would have no anticipated adverse short- or long-term, direct or indirect impacts on the resources described in *Section 4.0*. The No-Action Alternative would also create no beneficial impacts such as: a new school, new athletic facilities, runoff and erosion control, employment or other economic benefits. With the minor existing activities remaining on the property, there would be very limited vegetation management against seasonal wild fires. Wind erosion and soil runoff would also remain uncontrolled over this land.

In comparison, the proposed action would have some potential impacts on State land use, County zoning, topography, agricultural use, visual resources, traffic, air quality, erosion, drainage and solid waste and wastewater management, water and power supplies. The proposed action will have beneficial impacts on public services, employment and economics that will not be realized under the No Action Alternative.

The subject property is classified as State Land Use Agricultural District and Agricultural zoning district at the County level. The property is designated Agriculture and Public/Quasi Public pursuant to the County's Kīhei-Mākena Community Plan. Given the State and County designations, and the growing demands for a high school in the region, there would continue to be development pressure focused on the project area. If the project area were not chosen, other areas in the region, including much more productive agricultural lands compared to the project area, would need to be identified for potential development of a high school.

6.2 ALTERNATIVE SITES

The DOE conducted a Site Selection Study (SSS) for Proposed Kīhei High School (Munekiyo and Hiraga, January 2008) at the outset of the project. The SSS initially identified 11 viable school sites within the Kīhei-Mākena region. Through a comprehensive evaluation process, the 11 sites were narrowed to seven ~~(7)~~, based on a general evaluative review, then to, four ~~(4)~~ sites for further review. Based on discussions with the landowners, three ~~(3)~~ of these finalist sites yielded potential development opportunities (*Figure 6-1*).

The SSS evaluated the finalist candidate sites on a point system based on the following categories: proximity to population served, proximity to future expansion of community, proximity to important existing facilities locations, historical/archaeological/cultural resources, flora/fauna, land use entitlements, safety and security, accessibility/traffic, proximity to existing water infrastructure, water pressure adequacy, proximity to existing wastewater infrastructure, proximity to existing utilities infrastructure, topography, drainage, indoor air quality, acoustic comfort, thermal comfort visual comfort, day lighting, noise pollution, light pollution/trespass, proximity to reclaimed water source, and buildable area. Sites were awarded more points for more favorable impact, and less points for less favorable impacts.

Site 1 - Kawamoto Piʻilani

Site 1 is located adjacent to and east of Piʻilani Highway, just north of the Maui Meadows subdivision and south of Liʻilioholo Gulch. This site did not score favorably in terms of proximity to population, expansion of community or existing facilities. Nor did it score well under land use entitlements, light and noise pollution, and proximity to reclaimed water. The site was awarded the most points possible for proximity to wastewater infrastructure, proximity to utilities, visual comfort, and day lighting. Site 1 earned a total of 63.25 out of a possible 115 points in the site selection review conducted by consultants. During an independent poll conducted at a Kīhei Community Association (KCA) meeting in June 2007, Site 1 received two ~~(2)~~ votes.

Site 2 - Piʻilani Park 1

Site 2 is located adjacent to and east of Piʻilani Highway, just north of the Kamaʻole Gulch and south of the Kanani Road intersection. This site earned the highest points for proximity to wastewater infrastructure, proximity to utilities and reclaimed water source, drainage and day lighting. It scored low on land use entitlements, water pressure, buildable area and cultural resources. Site 2 earned a total of 74.75 out of a possible 115 points in the consultant review. During the KCA meeting poll in June 2007, Site 2 received 59 votes, the highest number of the three ~~(3)~~ finalist sites.

Site 3 - Piʻilani Makai Hybrid

Site 3 (the proposed Kīhei High School project) earned a total of 78.5 out of a possible 115 points. During the KCA meeting in June 2007, 10 members voted for Site 3. Site 3 earned the most points due to the close proximity of resident populations, community resources, utility connections, existing land designation, low probability of additional archaeological sites, site constructability and relatively mild traffic impacts.

Site 3, Piʻilani Makai Hybrid, was recommended as the single preferred site for the future high school in Kīhei. The rationale of choosing this site over another site was based on the systematic evaluation and rating of site features as well as cost associated with the development and construction of each site in regards to location and terrain.

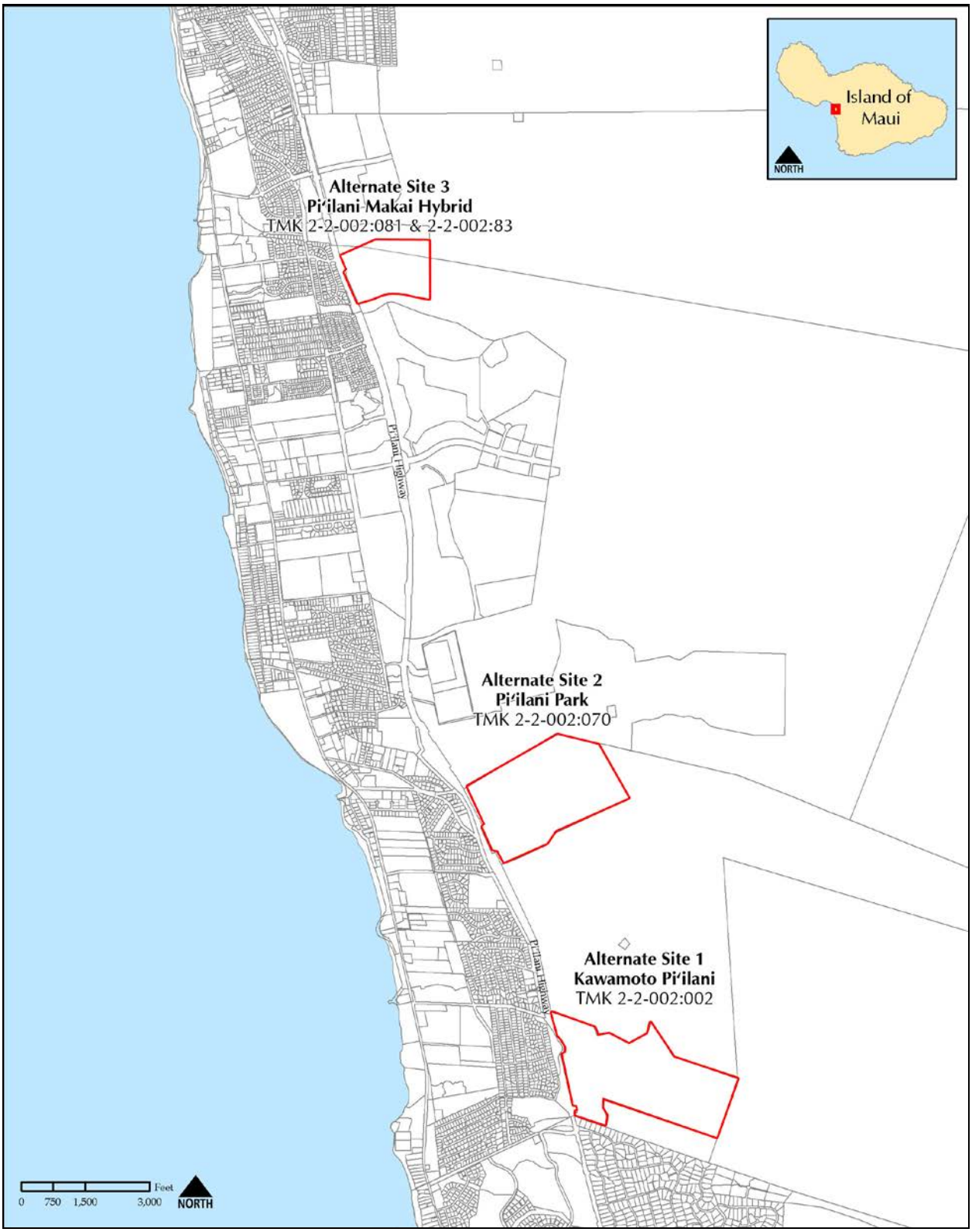

Figure 6-1
Possible Alternative Sites for Kīhei High School Map

See *Table 6-1* below for a detailed summary of the scoring for each of the three finalist sites.

Table 6-1 SITE SELECTION RANKINGS

Site Number	Site Name & TMK	Proximity to Population to be Served	Proximity to Future Expansion of Community	Proximity to Important Existing Facilities Location	Historical/ Archaeological/ Cultural Resources	Flora/Fauna	Land Use Entitlements	Safety & Security	Accessibility/ Traffic	Proximity to Existing Water Infrastructure	Water Pressure Adequacy	Proximity to Existing Wastewater Infrastructure	Proximity to Existing Utilities Infrastructure	Topography	Drainage	Indoor Air Quality
1	Kawamoto Pi'ilani (2) 2-2-002:002	1	1	1	3	4	1	2.75	3	3	3	5	5	1	3	3
2	Pi'ilani Park (2) 2-2-002:070	3	3	3	2	4	1	2.75	3	3	1	5	5	3	5	2.5
3	Pi'ilani Makai Hybrid (2) 2-2-002:054 and (2) 2-2-002:015	3	3	5	4	3.5	3	2.5	3	5	3	5	5	5	5	2

Source: Munekiyo & Hiraga, Inc., 2008.

The SSS noted that the point difference between Site 3, Pi'ilani Makai Hybrid, and Site 2, Pi'ilani Park 1 was 3.75 points. The study noted that this seemed to suggest that the two sites were relatively comparable on a technical and environmental basis. It was also noted that final selection of the site rested with the DOE and that the final rank order of the sites may not dictate the final site selected. The SSS stated that there may be extenuating factors that were not included in the study that may be taken into consideration by the DOE in the final selection. One extenuating factor identified by the SSS was the estimated cost for site work and infrastructure improvements as each of the three sites were undeveloped.

Preliminary cost estimates for site work and infrastructure installation were prepared for each of the three sites and included in the SSS. The order of magnitude opinions on the costs were based on the conceptual master plans prepared for each site as part of the SSS and accounted for additional lands that may be needed for each site due to topographical considerations. The preliminary estimates were based on construction costs in effect in summer 2007. The total estimated costs for site work and infrastructure installation for Site 3 were estimated at $33.29 million, while the total costs for Site 2 were estimated at $38.45 million. See *Table 6-2* below for a summary of the preliminary site work and infrastructure costs for the three potential sites.

Table 6-2 COST ESTIMATES			
Site Name	**Site Work Estimate**	**Infrastructure Installation Estimate**	**Total Site Work and Infrastructure Installation Costs**
Site 1 - Kawamoto Pi'ilani	$47,000,000	$3,075,000	$50,075,000
Site 2 - Pi'ilani Park	$37,500,000	$950,000	$38,450,000
Site 3 - Pi'ilani Makai Hybrid	$32,000,000	$1,290,000	$33,290,000

Source: Munekiyo & Hiraga, Inc., 2008.

The SSS noted that the preliminary cost estimates were meant to serve as a guide and provide the DOE with a rough estimate on construction costs.

Based on these factors, Site 3 Pi'ilani Makai Hybrid was selected by the DOE and purchased by the State.

6.2.1 Potential Impacts Compared to the Proposed Action

All three finalist alternative sites are expected to have a similar level of environmental impact as they all involve conversion of undeveloped land. The scoring system utilized in the SSS involved a more detailed impacts assessment; the higher the score, the better the location with respect to environmental and planning impacts. The most impacts of the three sites were anticipated on Site 1. Site 2 was very close in score to Site 3, but anticipated more impacts with respect to cultural resources than the chosen alternative. Site 3, the proposed project, had the highest score and was anticipated to have the least amount of impacts.

6.3 REDUCED CAMPUS SIZE

According to the DOE, Education Specifications (EDSPECS) for High Schools, Section 201-1, enrollment guidelines for a new high school with minimum enrollment of 1,000 students should be situated on a site with a minimum of 50 usable acres. This standard is used as the basis for the Reduced Campus Size alternative.

For the Reduced Campus Size alternative, a 50-acre campus has been evaluated at the selected project site. The SSS assessed a high school campus configured on 50 acres at Site 3, Pi'ilani Makai Hybrid. The 50-acre site extended approximately 1/2 mile mauka of Pi'ilani Highway with its southern border along Waipu'ilani Gulch. Most of the 50-acre site was situated on Haleakala Ranch land, with a smaller portion of the campus extending onto the adjacent Kaonoulu Ranch property. The 50-acre site would accommodate 1,000 students, buildings for associated enrollment and supporting staff, open space, landscaping, parking, and future expansion needs of the high school. The campus would include classrooms, a library, auditorium, cafeteria, an administration building, a football/track stadium, gym, tennis courts, grassed playfields, a softball field, and a baseball field.

For this alternative, a 50-acre campus at the Pi'ilani Makai Hybrid site is evaluated in relationship to the objectives of the proposed project.

Student Enrollment

The current objectives of the project are to create a high school campus to support a design enrollment of 1,650 students. The SSS accounted for a 50-acre site to accommodate a design enrollment of 1,000 students. According to preliminary design calculations, approximately 65 contiguous usable acres of land would be necessary to provide campus buildings, outdoor facilities and site improvements for 1,650 students. According to preliminary design calculations, the 50-acre alternative would not meet the objectives of the proposed project with respect to student enrollment requirements.

Site Configuration

The initial site configuration provided in the SSS confined most of the 50 acres to the Haleakala Ranch property. This configuration resulted in a long, narrow site that was not ideal for a campus development, and it left Kaonoulu Ranch with a slender and difficult to develop remnant parcel between the north edge of the campus and Kūlanihāko'i Gulch. The site was subsequently reconfigured to include the remnant parcel on Kaonoulu Ranch, resulting in site that resembles the current configuration, with more frontage on Pi'ilani Highway, and depth to less than a half mile east of the highway. Due to development constraints and landowner constraints, the 50-acre alternative as proposed in the SSS would be challenged to meet the requirements of the proposed project with respect to site configuration.

Land Requirements

As mentioned above, the 50-acre reduced campus site alternative would accommodate facilities for students and support staff, open space, landscaping, and parking for a design enrollment of 1,000 students.

For the proposed project which totals at 77.2 acres, approximately 65 usable contiguous acres would be necessary to support a high school campus with an expected enrollment of 1,650 students. An additional 4.6 acres is necessary for roadway and utilities requirements including the campus access road (Kūlanihāko'i extension) right-of-way, lane widening along Pi'ilani Highway, buffer areas along both gulches, and utility and drainage easements. Due to the geometry of the proposed campus access road, a 7.7-acre parcel across the Kūlanihāko'i Street extension is created in the northwest corner of the project site. The access road separates this parcel from the rest of the campus. The current proposal is to use this parcel for required overflow event parking.

According to this analysis, all 77.2 acres are necessary for development of a high school campus for the proposed project. The 50-acre alternative would not meet some of the additional land requirements for roadways, utilities and parking requirements.

6.3.1 Potential Impacts Compared to the Proposed Action

The Reduced Campus Size alternative proposed using a 50-acre site alternative at the selected Site 3 Pi'ilani Makai Hybrid location. The analysis above illustrates that the 50-acre site would not fully support development of a high school campus for 1,650 students due to increased facilities requirements, site configuration constraints, and land requirements for roads and utilities. The proposed action increases the project area to 77.2 acres which is large enough to support the necessary facilities to serve 1,650 students.

Chapter 7
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Chapter 8
Agencies and Parties Consulted

8.0 AGENCIES AND PARTIES CONSULTED

Table 8-1 lists the agencies, organizations, and individuals who were contacted during the planning process, the preparation of the EISPN, Draft EIS or this ~~Draft~~ Final EIS for the proposed Kīhei High School project. Copies of the written comment letters and responses are included in this section.

Table 8-1 CONSULTED PARTIES

Respondents and Distribution	Consulted in Project Planning	Received EISPN	Submitted Comments on EISPN	Received Draft EIS	Submitted Comments on Draft EIS	Received Final EIS
A. Federal Agencies						
US Army Corps of Engineers, Honolulu Division	X	X		X		X
US Department of Agriculture, National Resource Conservation Service		X	X	X		X
US Fish and Wildlife Service		X		X	X	X
US Department of the Interior, Geological Survey		X	X	X	X	X
US Environmental Protection Agency, Pacific Islands Office		X		X		X
US Federal Highway Administration		X		X		X
B. State of Hawai'i Agencies						
Department of Accounting and General Services, Maui District Office	X	X		X		X
Department of Agriculture	X	X		X		X
Department of Budget and Finance		X		X	X	X
Department of Business, Economic Development and Tourism (DBEDT)	X	X		X		X
DBEDT, Strategic Industries Division			X	X		X
DBEDT, Energy, Resources and Technology Division		X		X		X
DBEDT, Office of Planning		X		X	X	X
Department of Defense		X		X	X	X
Department of Education (DOE)	X	X		X		X
DOE, Baldwin-Kekaulike-Maui Complex Area				X		X

Table 8-1 CONSULTED PARTIES

Respondents and Distribution	Consulted in Project Planning	Received EISPN	Submitted Comments on EISPN	Received Draft EIS	Submitted Comments on Draft EIS	Received Final EIS
DOE, Facilities Development Branch, Planning Section	X	X		X		X
DOE, Facilities Development Branch, Project Management Section	X	X		X		X
DOE, Kihei Elementary School				X		X
DOE, Lokelani Intermediate School				X		X
DOE, Maui School District	X	X		X		X
Department of Hawaiian Home Lands		X		X	X	X
Department of Health (DOH)		X		X		X
DOH, Environmental Planning Office		X		X		X
DOH, Environmental Management Division, Clean Air Branch					X	X
DOH, Environmental Management Division, Clean Water Branch		X	X	X	X	X
Department of Human Services Housing and Community Development Corporation		X		X		X
Department of Labor and Industrial Relations		X	X	X		X
Department of Land and Natural Resources (DLNR)	X	X	X	X	X	X
DLNR Land Division			X	X		X
DLNR, State Historic Preservation Division	X	X	X	X		X
DLNR, Division of Aquatic Resources					X	X
DLNR, Commission on Water Resource Management					X	X
DLNR, Engineering Division					X	X
DLNR, Division of Forestry and Wildlife						X
DLNR, Land Division, Maui District						X
Department of Transportation	X	X	X	X	X	X
Hawaii Housing Finance Development Corporation				X		X

Table 8-1 CONSULTED PARTIES

Respondents and Distribution	Consulted in Project Planning	Received EISPN	Submitted Comments on EISPN	Received Draft EIS	Submitted Comments on Draft EIS	Received Final EIS
Hawai'i Public Utilities Commission		X		X		X
Office of Environmental Quality Control	X	X		X		X
Office of Hawaiian Affairs	X	X	X	X	X	X
University of Hawai'i, Environmental Center				X	X	X (1HC)
C. County of Maui						
Civil Defense Agency		X		X		X
Department of Environmental Management		X	X	X		X
Department of Fire and Public Safety		X		X	X	X
Department of Housing and Human Concerns	X	X	X	X	X	X
Department of Parks and Recreation	X	X	X	X	X	X
Department of Planning	X	X	X	X	X	X
Department of Public Works	X	X	X	X	X	X
Department of Transportation		X		X	X	X
Department of Water Supply	X	X	X	X	X	X
Maui Planning Commission				X	X	X
Police Department	X	X	X	X	X	X
D. Elected Officials						
5th Senatorial District	X	X		X		X
11th Representative District	X	X		X		X
County Council Member Donald Couch (former Wayne K. Nishiki)	X	X		X		X
Office of the Mayor, County of Maui				X		X
E. Media						
Honolulu Advertiser		X				
Honolulu Star Advertiser				X		X
Honolulu Star Bulletin		X				
Maui News		X		X		X

Table 8-1 CONSULTED PARTIES						
Respondents and Distribution	**Consulted in Project Planning**	**Received EISPN**	**Submitted Comments on EISPN**	**Received Draft EIS**	**Submitted Comments on Draft EIS**	**Received Final EIS**
F. Public Libraries						
Legislative Reference Bureau				X		X
Library of the DBEDT				X		X
Maui Community College Library				X		X
Hilo Regional Library				X		X
Kahului Regional Library		X		X		X
Kaimukī Regional Library				X		X
Kāneʻohe Regional Library				X		X
Līhuʻe Regional Library				X		X
Pearl City Regional Library				X		X
State Main Library				X		X
UH Hamilton Library				X		X
G. Community Organizations, Non-Profit Special Interest Organizations and Individuals						
Haleakala Ranch Company	X	X	X	X	X	X
Kaonoulu Ranch LLLP	X	X	X	X	X	X
Kīhei Charter School		X		X		X
Kīhei Community Association	X	X		X	X	X
Maui Academy of Performing Arts		X		X		X
Maui Economic Development Board Inc.	X	X		X		X
Munekiyo and Hiraga, Inc.		X		X		X
Kīhei Community Association, Kīhei High School Action Team					X	X
Mark G. Hyde					X	X
Hawaii Nutrition and Physical Activity Coalition, Maui County Coalition					X	X
Victoria Huffman, P.E.					X	X

HC = Hard Copy

United States Department of Agriculture

NRCS

Natural Resources Conservation Service
P.O. Box 50004 Rm. 4-118
Honolulu, HI 96850
808-541-2600

December 7, 2009

Christine Ruotola, AICP, LEED AP Principal
Group 70 International, Inc.
925 Bethel Street, 5th Floor
Honolulu, HI 96813

Dear Ms. Ruotola,

Thank you for providing the NRCS the opportunity to review Environmental Impact Statement Preparation Notice for the Kihei High School Project on the Island of Maui, Kihei-Makena District. Please find enclosed the NRCS Soil Survey Map, soil reports, and a map indicating areas of Important Farmlands. The Important Farmlands map has been enclosed for your aid in determining if an AD-1006 form, Farmland Impact Conversion Rating Form, is needed for this project. Typically, this form is required on projects that convert farmlands into non-farmland uses, and have federal dollars attached to the project. See the website link below for more information on the Farmland Protection Policy Act, and a copy of the AD-1006 form, with instructions. The soil mapping does not identify any hydric soils in this project area. Hydric soils identify potential areas of wetlands. If wetlands do exist, any proposed impacts to these wetlands would need to demonstrate compliance with the "Clean Water Act", and may need an Army Corp of Engineers 404 permit.

The enclosed Soil Survey Map identifies all soil map units in the project area. The soil reports provide selected soil properties and interpretations, i.e. Small Commercial Buildings, soil layers with USDA textures, and engineering classifications. The limitation ratings for the selected uses, i.e. Small Commercial Buildings and Local Roads and Streets are Severe and Very Limited respectively. These ratings do not preclude the intended land use, however they do identify potential limitations for the use, which may require corrective measures, increase costs, and/or require continued maintenance.

The NRCS Soil Survey is a general planning tool and does not eliminate the need for an onsite investigation. If you have any questions concerning the soils or interpretations for this project please call, Tony Rolfes, Assistant State Soil Scientist, (808) 541-2600 x129, or email, Tony.Rolfes@hi.usda.gov.

NRCS - Farmland Protection Policy Act Website: http://www.nrcs.usda.gov/programs/fppa/

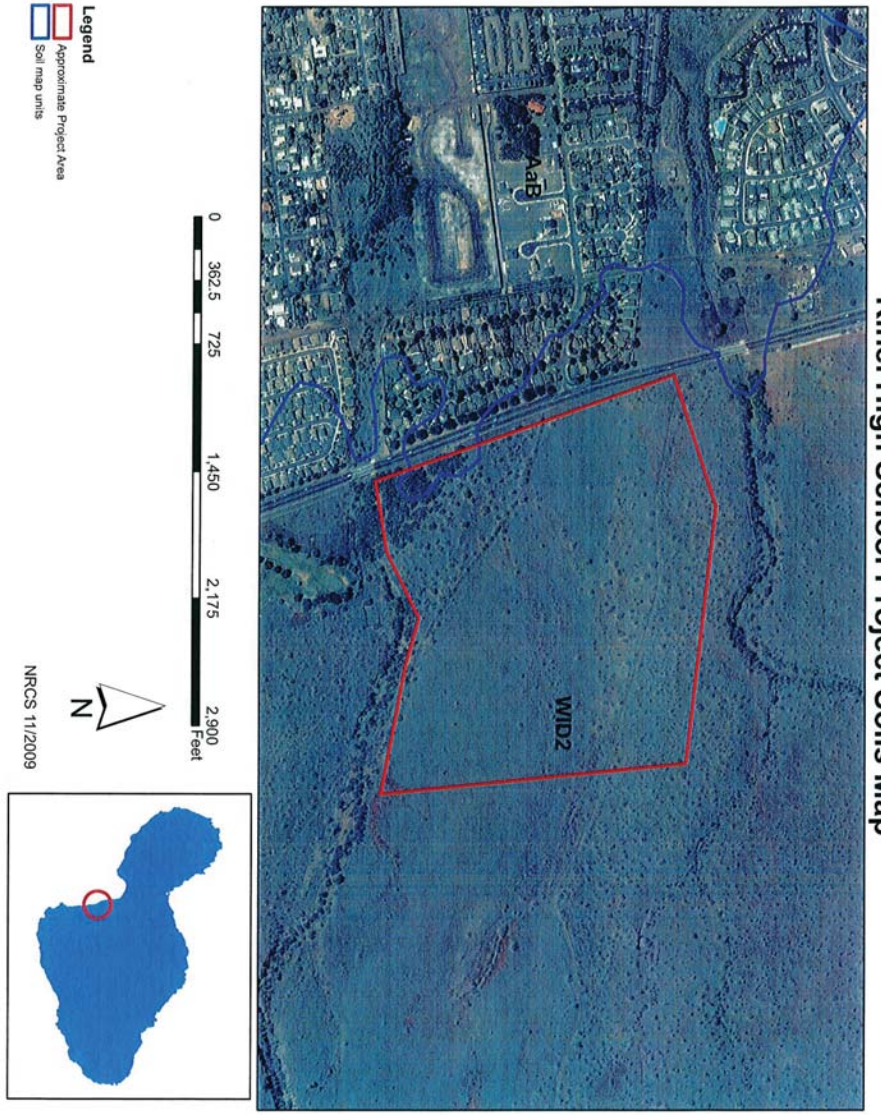
Sincerely,

LAWRENCE T. YAMAMOTO
Director, Pacific Islands Area

Cc: Michael Robotham, Asst. Director for Soil Science and Natural Resource Assessments

Enclosures: 5 pages

Helping People Help the Land



Engineering Properties

Island of Maui, Hawaii

[Absence of an entry indicates that the data were not estimated. This report shows only the major soils in each map unit]

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percent passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 Inches	3-10 Inches	4	10	40	200		
	In				*Pct*	*Pct*					*Pct*	
AaB:												
Alae	0-7	Sandy loam	SM	A-2, A-4	0-5	3-10	80-100	75-100	50-70	25-45	0-14	NP
	7-14	Stratified sandy loam	SM	A-2, A-4	0-5	3-10	80-100	75-100	50-70	25-45	0-14	NP
	14-55	Gravelly coarse sand	GP, GP-GM, SP, SP-SM	A-1	0-5	10-25	45-70	40-60	15-25	0-5	0-14	NP
WID2:												
Waiakoa, extremely stony	0-1	Extremely stony silty clay loam	CL-K (proposed), ML-K (proposed)	A-6	25-45	35-55	85-95	85-95	85-95	80-95	35-40	10-20
	1-20	Extremely stony silty clay loam	CL-K (proposed), ML-K (proposed)	A-6	25-50	35-55	85-100	85-90	80-90	75-85	35-40	10-20
	20-28	Stony silty clay loam	CL-K (proposed), GC, GM, ML-K (proposed)	A-6	10-20	15-25	70-85	65-75	55-70	45-60	35-40	10-20
	28-32	Bedrock	---	---	0	0	0	0	0	0	0	NP

Kihei High School Project Importland Farmlands Maps

Legend

Approximate Project Area

Important Farmlands

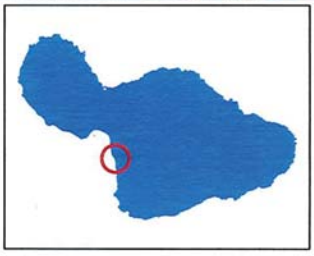
AGTYPE

- 0
- Prime Farmlands
- Unique Farmalnds
- Local and Statewide important Farmlands

0 362.5 725 1,450 2,175 2,900 Feet

N

NRCS 11/2009



Selected Soil Interpretations

Island of Maui, Hawaii

[The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The table shows only the top five limitations for any given soil. The soil may have additional limitations. This report shows only the major soils in each map unit]

*This soil interpretation was designed as a "limitation" as opposed to a "potential" or "suitability". The numbers in the value column range from 0.01 to 1.00. The larger the value, the greater the potential limitation.

Map symbol and soil name	Pct. of map unit	ENG - Lawn, Landscape, Golf Fairway*		ENG - Small Commercial Buildings (HI)*		ENG - Local Roads and Streets*	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
AaB:							
Alae	100	Somewhat limited		Severe		Very limited	
		Flooding	0.60	Flash flooding > Rare	1.00	Flooding	1.00
		Droughty	0.21	Slopes are from 4 to 8%	0.26		
		Large stones content	0.05				
WID2:							
Waiakoa, extremely stony	100	Very limited		Severe		Very limited	
		Large stones content	1.00	Slopes > 8%	1.00	Large stones content	1.00
		Slope	0.96	Fragments (>3") >50%	1.00	Slope	0.96
		Depth to bedrock	0.65	Bedrock (hard) from 20 to 40"	0.64	Depth to hard bedrock	0.64
		Droughty	0.26			Low strength	0.10

Map Unit Legend

Island of Maui, Hawaii

Map symbol	Map unit name
AaB	Alae sandy loam, 3 to 7 percent slopes
WID2	Waiakoa extremely stony silty clay loam, 3 to 25 percent slopes, eroded

GROUP 70
INTERNATIONAL

December 20, 2011

Angel Figueroa, Director, Pacific Islands Area
United States Department of Agriculture
Natural Resources Conservation Service
P.O. Box 50004 Rm. 4 -118
Honolulu, HI 96850

Subject: Response to Comments on the Environmental Impact Statement Preparation Notice for Proposed Kīhei High School Project
Tax Map Keys: 2-2-2-002:081; 2-2-2-002:083
(Kīhei, Maui, Hawai'i)

Dear Mr. Figueroa:

Thank you for your comment letter dated December 7, 2009 concerning the Environmental Impact Statement (EIS) Preparation Notice for the proposed Kīhei High School Project.

Thank you for providing copies of the NRCS Soil Survey Map, soil reports, and map indicating areas of important farmlands in association with the proposed project site. We also appreciate you providing information on the Farmland Protection Policy Act and Farmland Impact Conversion Rating Form, AD-1006.

An Agriculture Impacts assessment was prepared for the Kihei High School project by Plasch Econ Pacific LLC and is included as *Appendix B* of the Draft EIS. An analysis of project's applicability to the Federal Farmland and Protection Policy Act is described in Section 12 of the report (page 14). The findings of the report indicate that Form AD-1006 is not required for the project since no Federal assistance will be involved in the design/construction of the school; the property consists of grazing land; only 1.7 acres (2%) of the property has soils rated as Prime; there is no existing water system to irrigate crops; and no crops are currently grown on the property and the site is regarded as unsuitable for growing crops.

We appreciate your participation in the environmental review process. Your comment letter and this response will be included in the Draft EIS.

Sincerely,
GROUP 70 INTERNATIONAL, INC.

Christine Mendes Ruotola, AICP, LEED AP
Principal

United States Department of the Interior

U.S. GEOLOGICAL SURVEY
Pacific Islands Water Science Center
677 Ala Moana Blvd., Suite 415
Honolulu, HI 96813
Phone: (808) 587-2400/Fax: (808) 587-2401

November 18, 2009

Ms. Christine Mendes Ruotola, AICP, LEED AP
Principal
Group 70 International, Inc.
925 Bethel Street, 5th Floor
Honolulu, Hawaii 96813-4307

Dear Ms. Mendes Ruotola:

Subject: Kihei High School, Environmental Impact Statement Preparation Notice (EISPN), Island of Maui, Kihei-Makena District, 2-2-002: Por. 54, 2-2-002: Por. 015

Thank you for forwarding the subject EISPN for review and comment by the staff of the U.S. Geological Survey Pacific Islands Water Science Center. We regret however, that due to prior commitments and lack of available staff, we are unable to review the report.

We appreciate the opportunity to participate in the review process.

Sincerely,

Stephen S. Anthony
Acting Center Director

cc: Mr. Robert Purdie, Jr.
State of Hawaii, Department of Education
Facilities Development Branch
P.O. Box 2360
Honolulu, Hawaii 96804

Ms. Patricia Hamamoto, Superintendent
State of Hawaii, Department of Education
Office of the Superintendent
Queen Liliuokalani Building
1390 Miller Street, Room 309
Honolulu, Hawaii 96804

GROUP 70
INTERNATIONAL

November 5, 2009

Subject: **Kihei High School**
Environmental Impact Statement Preparation Notice

Dear Participant:

On behalf of the State of Hawaii, Department of Education, please find the enclosed Environmental Impact Statement Preparation Notice (EISPN) for your review. This EISPN was prepared pursuant to the EIS law (Chapter 343, HRS and Chapter 11-200, HAR).

Name of Project:	Kihei High School
Island and District:	Island of Maui, Kihei-Makena District
Tax Map Key:	2-2-002: Por. 54, 2-2-002: Por. 015
Proposing Agency:	State of Hawaii, Department of Education, Facilities Development Branch
Address:	P.O. Box 2360, Honolulu, Hawaii 96804
Contact:	Robert Purdie, Jr., (808) 586-0408
Accepting Authority:	State of Hawaii, Department of Education Office of the Superintendent
Address:	Queen Liliuokalani Building 1390 Miller Street, Room 309 Honolulu, Hawaii 96804
Contact:	Patricia Hamamoto, Superintendent, (808) 586-3110
Consultant:	Group 70 International, Inc.
Address:	925 Bethel Street, 5th Floor, Honolulu, Hawaii 96813
Contact:	Christine Ruotola, (808) 523-5866, cruotola@group70int.com

Please send comments to the Proposing Agency, Accepting Authority and Consultant.

Comment must be received or postmarked by: **December 8, 2009**

Thank you for your participation in the environmental review process.

Sincerely,
GROUP 70 INTERNATIONAL, INC.

Christine Mendes Ruotola, AICP, LEED AP
Principal

GROUP 70
INTERNATIONAL

December 20, 2011

Stephen S. Anthony, Center Director
United States Department of the Interior
U.S. Geological Survey
Pacific Islands Water Science Center
677 Ala Moana Blvd., Suite 415
Honolulu, HI 96813

Subject: Response to Comments on the Environmental Impact Statement Preparation Notice for Proposed Kīhei High School Project
Tax Map Keys: 2-2-2-002:081; 2-2-2-002:083
(Kīhei, Maui, Hawai'i)

Dear Mr. Anthony:

Thank you for your comment letter dated November 18, 2009 concerning the Environmental Impact Statement Preparation (EIS) Notice for the proposed Kīhei High School Project.

We appreciate your participation in the environmental review process and understand that due to prior commitments and lack of available staff that you were unable to review the report. Your comment letter and this response will be included in the Draft EIS.

Sincerely,
GROUP 70 INTERNATIONAL, INC.

Christine Mendes Ruotola, AICP, LEED AP
Principal

PRINCIPALS

Francis S. Oda, Arch.D., FAIA, AICP, LEED AP
Norman G.Y. Hong AIA
Sheryl B. Seaman AIA, ASID, LEED AP
Hitoshi Hida AIA
Roy H. Nihei AIA, CSI, LEED AP
Ralph E. Portmore AICP
James I. Nishimoto AIA
Stephen Yuen AIA
Linda C. Miki AIA
George I. Atta AICP, LEED AP
Charles Y. Kaneshiro AIA, LEED AP
Jeffrey H. Overton AICP, LEED AP
Christine Mendes Ruotola AICP, LEED AP
James L. Stone, Arch.D., AIA, LEED AP
Katherine M. MacNeil AIA, LEED AP
Tom Young, MBA AIA
Paul T. Matsuda PE, LEED AP

Group 70 International • 925 Bethel Street, 5th Floor • Honolulu, HI 96813-4307 • tel. 808.523.5866 • fax. 808.523.5874 • www.group70int.com

DEPARTMENT OF BUSINESS, ECONOMIC DEVELOPMENT & TOURISM

FILE COPY

LINDA LINGLE
GOVERNOR
THEODORE E. LIU
DIRECTOR
MARK K. ANDERSON
DEPUTY DIRECTOR

STRATEGIC INDUSTRIES DIVISION
235 South Beretania Street, Leiopapa A Kamehameha Bldg., 5th Floor, Honolulu, Hawaii 96813
Mailing Address: P.O. Box 2359, Honolulu, Hawaii 96804

Telephone: (808) 587-3807
Fax: (808) 586-2536
Web site: www.hawaii.gov/dbedt

November 30, 2009

State of Hawaii
Department of Education
Facilities Development Branch
P.O. Box 2360
Honolulu, Hawaii 96804
Attn: Robert Purdie, Jr.

Dear Mr. Purdie:

Subject: Environmental Impact Statement Preparation Notice (EISPN)
Kihei High School, Maui

In response to your November 5, 2009, notice, thank you for the opportunity to provide comments on the EISPN for the Kihei High School, Maui. The project is planned to have 215,000 square feet of educational buildings to support a student capacity of 1,650, along with athletic fields and associated infrastructure improvements.

We would like to call your attention to: (l) State energy conservation goals; and, (2) energy and resource efficiency and renewable energy and resource development.

1. **State energy conservation goals.** Project buildings, activities, and site grounds should be designed and/or retrofit with energy saving considerations. The mandate for such consideration is found in Chapter 344, HRS ("State Environmental Policy") and Chapter 226 ("Hawaii State Planning Act"). In particular, we would like to call to your attention HRS 226 18(c) (4) which includes a State objective of promoting all cost-effective energy conservation through adoption of energy-efficient practices and technologies.

2. **Energy and resource efficiency and renewable energy and resource development.** We note that the project's goal is to achieve the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) Silver Certification.

Our website (http://www.hawaii.gov/dbedt/info/energy/efficiency/) provides detailed information on guidelines, directives and statutes, as well as studies and reports on aspects of energy and resource efficiency. Please also do not hesitate to contact Carilyn Shon, Energy Efficiency Branch Manager, at telephone number 587-3810, for additional information on LEED, energy efficiency, and renewable energy resources.

Sincerely,

Theodore A. Peck
Administrator

c: OEQC
Ms. Ruotola, Group 70 International, Inc.

GROUP 70 INTERNATIONAL

December 20, 2011

Mark Glick, Administrator
State of Hawai'i
Department of Business, Economic Development & Tourism
Hawai'i State Energy Office
P.O. Box 2359
Honolulu, HI 96804

Subject: Response to Comments on the Environmental Impact Statement Preparation Notice for Proposed Kīhei High School Project
Tax Map Keys: 2-2-2-002:081; 2-2-2-002:083
(Kīhei, Maui, Hawai'i)

Dear Mr. Glick:

Thank you for your comment letter dated November 30, 2009 concerning the Environmental Impact Statement (EIS) Preparation Notice for the proposed Kīhei High School Project.

We take note of your comments relating to the preparation of the Draft EIS for the proposed project. The following are offered in response to the comments provided:

1. The State Energy Conservation Goals (HRS 226 18 (C) (4) and the energy efficient design guidelines recommended by the Energy Division of the State of Hawaii Department of Business, Economic Development & Tourism will be considered in the design and development of the proposed project. Energy conservation will be demonstrated through energy efficient practices and technologies being integrated into the design of the project.

2. In an effort to minimize energy consumption, the project will be designed and developed to meet or exceed the U.S. Green Building Council's Leadership in Energy & Environmental Design (LEED) Silver certification, or a comparable rating system. Effective energy conservation will take place as energy-efficient technologies as well as renewable energy development will be integrated into the design of the proposed project. The project team will contact DBEDT if needed, on LEED, energy efficiency, and renewable energy resources.

We appreciate your participation in the environmental review process. Your comment letter and this response will be included in the Draft EIS.

Sincerely,
GROUP 70 INTERNATIONAL, INC.

Christine Mendes Ruotola, AICP, LEED AP
Principal

Group 70 International • 925 Bethel Street, 5th Floor • Honolulu, HI 96813-4307 • tel. 808.523.5866 • fax. 808.523.5874 • www.group70int.com

LINDA LINGLE
GOVERNOR OF HAWAII

CHIYOME L. FUKINO, M.D.
DIRECTOR OF HEALTH

STATE OF HAWAII
DEPARTMENT OF HEALTH
P. O. BOX 3378
HONOLULU, HI 96801-3378

In reply, please refer to
DOH-12038

12038PSW.09

December 8, 2009

RECEIVED
DEC 15 2009
GROUP 70 INT'L

Ms. Christine Ruotola
Group 70 International, Inc.
925 Bethel Street, 5th Floor
Honolulu, Hawaii 96813

Dear Ms. Ruotola:

SUBJECT: Environmental Impact Statement Preparation Notice for Kihei High School, Kihei, Island of Maui, Hawaii
TMK 2-2-002: 015 (por.); 2-2-002: 054 (por.)

The Department of Health, Clean Water Branch (CWB), has reviewed the document received November 23, 2009, regarding the subject project and offers these comments. Please note that our review is based solely on the document for the subject project and its compliance with Hawaii Administrative Rules (HAR), Chapters 11-54 and 11-55. You may be responsible for fulfilling additional requirements related to our program. We recommend that you also read our standard comments on our website at http://hawaii.gov/health/environmental/env-planning/landuse/CWB-standardcomment.pdf

1. Any project and its potential impacts to State waters must meet the following criteria:

   a. Anti-degradation policy (HAR, Section 11-54-1.1), which requires that the existing uses and the level of water quality necessary to protect the existing uses of the receiving State water be maintained and protected.

   b. Designated uses (HAR, Section 11-54-3), as determined by the classification of the receiving State waters.

   c. Water quality criteria (HAR, Sections 11-54-4 through 11-54-8).

2. You are required to obtain a National Pollutant Discharge Elimination System (NPDES) permit for discharges of wastewater, including storm water runoff, into State surface waters (HAR, Chapter 11-55). For the following types of discharges into Class A or Class 2 State waters, you may apply for NPDES general permit coverage by submitting a Notice of Intent (NOI) form:

   a. Storm water associated with construction activities, including clearing, grading, and excavation, that result in the disturbance of equal to or greater than one (1) acre of total land area. The total land area includes a contiguous area where multiple separate and distinct construction activities may be taking place at different times on different schedules under a

larger common plan of development or sale. This includes areas used for a construction base yard and the storage of any construction related equipment, material, and waste products. An NPDES permit is required before the start of the construction activities.

b. Hydrotesting water,

c. Construction dewatering effluent.

You must submit a separate NOI form for each type of discharge at least 30 calendar days prior to the start of the discharge activity, except when applying for coverage for discharges of storm water associated with construction activity. For this type of discharge, the NOI forms may be picked up at our office or downloaded from our website at http://hawaii.gov/health/environmental/water/cleanwater/forms/genl-index.html

3. For other types of wastewater not listed in Item No. 2 above or wastewater discharging into Class 2 or Class AA waters, an NPDES individual permit will need to be obtained. An application for an NPDES individual permit must be submitted at least 180 calendar days before the commencement of the discharge. The NPDES application forms may be picked up at our office or downloaded from our website at http://hawaii.gov/health/environmental/water/cleanwater/forms/environmental/water/cleanwater/forms/indiv-index.html

4. Please call the Army Corps of Engineers at (808) 438-9258 to determine which Department of the Army (DA) permit(s) shall be required for the subject project. Permits may be required for work performed in, over, and under navigable waters of the United States. Projects requiring a DA permit also require a Section 401 Water Quality Certification (WQC) from our office.

5. Please note that all discharges related to the project construction or operation activities, whether or not NPDES permit coverage and/or 401 WQC are required, must comply with the State's Water Quality Standards. Noncompliance with water quality requirements contained in HAR, Chapter 11-54, and/or permitting requirements, specified in HAR, Chapter 11-55, may be subject to penalties of $25,000 per day per violation.

If you have any questions, please visit our website at http://hawaii.gov/health/environmental/water/cleanwater/index.html, or contact the Engineering Section, CWB, at 586-4309.

Sincerely,

Alec Wong

ALEC WONG, P.E. CHIEF
Clean Water Branch

SW:ml

c: Mr. Jiacai Liu, EPO 09-161 [via email only]
Mr. Robert Purdie, Jr., Department of Education
The Honorable Patricia Hamamoto, Department of Education

GROUP 70
INTERNATIONAL

December 20, 2011

Alec Wong, P.E., Chief
State of Hawai'i
Department of Health, Clean Water Branch
P.O. Box 3378
Honolulu, HI 96801

Subject: Response to Comments on the Environmental Impact Statement Preparation Notice for Proposed Kīhei High School Project
Tax Map Keys: 2-2-2-002:081; 2-2-2-002:083
(Kīhei, Maui, Hawai'i)

Dear Mr. Wong:

Thank you for your comment letter dated December 8, 2009 concerning the Environmental Impact Statement (EIS) Preparation Notice for the proposed Kīhei High School Project.

We understand the importance of protecting our State receiving waters from impacts associated with development. The following are offered in response to comments received from the Department of Health, Clean Water Branch:

1. A description of ground disturbing activities associated with the project will be provided in the Draft EIS. The proposed project will comply with DOH water quality criteria as defined in HAR Sections 11-54-1.1, 11-54-3, 11-54-4, and 11-54-8.

2. A National Pollutant Discharge Elimination System (NPDES) Permit will be acquired for construction activities related to the proposed project. The project will implement best management practices (BMP) for stormwater management, particularly during the construction phase, to minimize impacts to the existing area's hydrology while maintaining on site infiltration and preventing polluted runoff from storm events.

3. The Department of the Army, Army Corp of Engineers, Honolulu District has been consulted as part of the environmental review process. As noted in Table 2-4 of the Draft EIS, Section 404 of the Clean Water Act (CWA) Permit for the discharge of dredged or fill material in the waters of the United State associated with work within Waipuilani Gulch will be obtained for the project. In addition, Section 401 of the CWA certification will also be obtained to certify that discharges authorized by the Section 404 permit will not violate the State's water quality standards. Necessary permits and approvals will be obtained in a timely manner to support the development of the proposed project.

We appreciate your participation in the environmental review process. Your comment letter and this response will be included in the Draft EIS.

Sincerely,
GROUP 70 INTERNATIONAL, INC.

Christine Mendes Ruotola

Christine Mendes Ruotola, AICP, LEED AP
Principal

Group 70 International • 925 Bethel Street, 5th Floor • Honolulu, HI 96813-4307 • tel. 808.523.5866 • fax. 808.523.5874 • www.group70int.com

LINDA LINGLE
GOVERNOR

DARWIN L.D. CHING
DIRECTOR

COLLEEN Y. LaCLAIR
DEPUTY DIRECTOR

STATE OF HAWAII
DEPARTMENT OF LABOR AND INDUSTRIAL RELATIONS
830 PUNCHBOWL STREET, ROOM 321
HONOLULU, HAWAII 96813
www.hawaii.gov/labor
Phone: (808) 586-8842 / Fax: (808) 586-9099
Email: dlir.director@hawaii.gov

November 23, 2009

RECEIVED
NOV 24 2009
GROUP 70 INT'L

Superintendent Patricia Hamamoto
Department of Education
Office of the Superintendent
1390 Miller Street, Room 309
Honolulu, Hawaii 96804

Dear Superintendent Hamamoto:

In accordance with a request from your consultant, Group 70, dated November 5, 2009, regarding the "Kihei High School Environmental Impact Statement Preparation Notice", the Department of Labor and Industrial Relations does not have any comments.

Should you or staff have questions, please contact me 586-8844, or Mr. Patrick Fukuki, our Business Management Officer, at 586-8888.

Sincerely,

DARWIN L.D. CHING

c: Christine Mendes Ruotola
Group 70 International, Inc.

GROUP 70
INTERNATIONAL

December 20, 2011

PRINCIPALS

Francis S. Oda, Arch.D., FAIA, AICP, LEED AP
Norman G.Y. Hong AIA
Sheryl B. Seaman AIA, ASID, LEED AP
Hitoshi Hida AIA
Roy H. Nihei AIA, CSI, LEED AP
Ralph E. Portmore AICP
James I. Nishimoto AIA
Stephen Yuen AIA
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Christine Mendes Ruotola AICP, LEED AP
James L. Stone, Arch.D., AIA, LEED AP
Katherine M. MacNeil AIA, LEED AP
Tom Young, MBA AIA
Paul T. Matsuda PE, LEED AP

Dwight Takamine, Director
State of Hawai'i
Department of Labor and Industrial Relations
830 Punchbowl Street, Room 321
Honolulu, HI 96813

Subject: Response to Comments on the Environmental Impact Statement Preparation Notice for Proposed Kīhei High School Project
Tax Map Keys: 2-2-2-002:081; 2-2-2-002:083
(Kīhei, Maui, Hawai'i)

Dear Mr. Takamine:

Thank you for your comment letter dated November 23, 2009 concerning the Environmental Impact Statement (EIS) Preparation Notice for the proposed Kīhei High School Project.

We understand that your department has no comments to offer at this time.

We appreciate your participation in the environmental review process. Your comment letter and this response will be included in the Draft EIS.

Sincerely,
GROUP 70 INTERNATIONAL, INC.

Christine Mendes Ruotola, AICP, LEED AP
Principal

LINDA LINGLE
GOVERNOR OF HAWAII

LAURA H. THIELEN
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

December 7, 2009

RECEIVED
DEC - 9 2009
GROUP 70 INT'L

Group 70 International
925 Bethel Street 5th Floor
Honolulu, Hawaii 96813-4307

Attention: Ms. Christine Mendes Ruotola, AICP, LEED AP

Ladies and Gentlemen:

Subject: Environmental Impact Statement Preparation Notice for Kihei High School

Thank you for the opportunity to review and comment on the subject matter. The Department of Land and Natural Resources' (DLNR), Land Division distributed or made available a copy of your report pertaining to the subject matter to DLNR Divisions for their review and comment.

Other than the comments from Engineering Division, Commission on Water Resource Management, the Department of Land and Natural Resources has no other comments to offer on the subject matter. Historic Preservation will be submitting comments through a separate letter. Should you have any questions, please feel free to call our office at 587-0433. Thank you.

Sincerely,

for Morris M. Atta
Administrator

cc: DOE

LINDA LINGLE
GOVERNOR OF HAWAII

LAURA H. THIELEN
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

November 9, 2009

MEMORANDUM

TO: **DLNR Agencies:**
x Div. of Aquatic Resources
_ Div. of Boating & Ocean Recreation
x Engineering Division
_ Div. of Forestry & Wildlife
_ Div. of State Parks
x Commission on Water Resource Management
_ Office of Conservation & Coastal Lands
x Land Division –Barbara Lee
Maui District

FROM: for Morris M. Atta
SUBJECT: Environmental Impact Statement Preparation Notice for Kihei High School
LOCATION: Island of Maui
APPLICANT: Group 70 International on behalf of Department of Education

Transmitted for your review and comment on the above referenced document. We would appreciate your comments on this document. Please submit any comments by December 5, 2009.

If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact my office at 587-0433. Thank you.

Attachments

( ) We have no objections.
( ) We have no comments.
(X) Comments are attached.

Signed:
Date: 12/3/09

DEPT. OF LAND & NATURAL RESOURCES STATE OF HAWAII
2009 DEC -7 A 9:43
RECEIVED LAND DIVISION

DEPARTMENT OF LAND AND NATURAL RESOURCES
ENGINEERING DIVISION

LM/MorrisAtta
REF.: EISPNSKiheiHighSchool
Maui.490

COMMENTS

(X) **We confirm that the project site, according to the Flood Insurance Rate Map (FIRM), is located in Zone X. The Flood Insurance Program does not have any regulations for developments within Zone X.**

( ) Please take note that the project site, according to the Flood Insurance Rate Map (FIRM), is located in Zone.

( ) Please note that the correct Flood Zone Designation for the project site according to the Flood Insurance Rate Map (FIRM) is ___.

( ) Please note that the project must comply with the rules and regulations of the National Flood Insurance Program (NFIP) presented in Title 44 of the Code of Federal Regulations (44CFR), whenever development within a Special Flood Hazard Area is undertaken. If there are any questions, please contact the State NFIP Coordinator, Ms. Carol Tyau-Beam, of the Department of Land and Natural Resources, Engineering Division at (808) 587-0267.

Please be advised that 44CFR indicates the minimum standards set forth by the NFIP. Your Community's local flood ordinance may prove to be more restrictive and thus take precedence over the minimum NFIP standards. If there are questions regarding the local flood ordinances, please contact the applicable County NFIP Coordinators below:

( ) Mr. Robert Sumitomo at (808) 768-8097 or Mr. Mario Siu Li at (808) 768-8098 of the City and County of Honolulu, Department of Planning and Permitting.
( ) Mr. Frank DeMarco at (808) 961-8042 of the County of Hawaii, Department of Public Works.
( ) Mr. Francis Cerizo at (808) 270-7771 of the County of Maui, Department of Planning.
( ) Mr. Mario Antonio at (808) 241-6620 of the County of Kauai, Department of Public Works.

( ) The applicant should include water demands and infrastructure required to meet project needs. Please note that projects within State lands requiring water service from the Honolulu Board of Water Supply system will be required to pay a resource development charge, in addition to Water Facilities Charges for transmission and daily storage.

(X) **The applicant should provide the water demands and calculations to the Engineering Division so it can be included in the State Water Projects Plan Update.**

( ) Additional Comments: _____

( ) Other: _____

Should you have any questions, please call Ms. Suzie S. Agraan of the Planning Branch at 587-0258.

Signed: _____
CARTY S. CHANG, ACTING CHIEF ENGINEER

Date: 12/3/09

LINDA LINGLE
GOVERNOR OF HAWAII

LAURA H. THIELEN
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

November 9, 2009

MEMORANDUM

TO: **DLNR Agencies:**
x Div. of Aquatic Resources
_Div. of Boating & Ocean Recreation
x Engineering Division
_Div. of Forestry & Wildlife
_Div. of State Parks
x Commission on Water Resource Management
_Office of Conservation & Coastal Lands
x Land Division –Barbara Lee
Maui District

FR:

to:

RECEIVED
COMMISSION ON WATER
RESOURCE MANAGEMENT
2009 NOV 10 AM 10: 17

FROM: for Morris M. Atta
SUBJECT: Environmental Impact Statement Preparation Notice for Kihei High School
LOCATION: Island of Maui
APPLICANT: Group 70 International on behalf of Department of Education

Transmitted for your review and comment on the above referenced document. We would appreciate your comments on this document. Please submit any comments by December 5, 2009.

If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact my office at 587-0433. Thank you.

Attachments

( ) We have no objections.
(✓) We have no comments.
( ) Comments are attached.

Signed: Edwin T. Sakai
Date: 11.12.09

GROUP 70
INTERNATIONAL

December 20, 2011

Morris M. Atta, Administrator
State of Hawai'i
Department of Land and Natural Resources
Land Division
P.O. Box 621
Honolulu, HI 96809

Subject: Response to Comments on the Environmental Impact Statement Preparation Notice for Proposed Kīhei High School Project
Tax Map Keys: 2-2-2-002:081; 2-2-2-002:083
(Kīhei, Maui, Hawai'i)

Dear Mr. Atta:

Thank you for your comment letter dated December 7, 2009 concerning the Environmental Impact Statement Preparation (EIS) Notice for the proposed Kīhei High School Project.

We understand that the Division of Aquatic Resources, Commission on Water Resource Management, and Land Division, of the State Department of Land and Natural Resources, have no comments to offer at this time. The following are offered in response to the comments from the Engineering Division:

1. Thank you for confirming that the project site, according to the Flood Insurance Rate Map (FIRM), is located in Zone X. The Flood Insurance Program does not have any regulations for developments within Zone X.

2. Water demands and calculations for the proposed project are provided in the Draft Environmental Impact Statement (EIS). A Groundwater Resources & Supply Report and Preliminary Civil Engineering Report were prepared for the project and are included as *Appendix C and K* respectively of the Draft EIS. Please also refer to *Sections 4.2.10.1, 4.2.10.2 and 4.2.10.3* of the Draft EIS for discussion of the Water System, Wastewater and Drainage for the proposed project

We appreciate your participation in the environmental review process. Your comment letter and this response will be included in the Draft EIS.

Sincerely,
GROUP 70 INTERNATIONAL, INC.

Christine Mendes Ruotola, AICP, LEED AP
Principal

LINDA LINGLE
GOVERNOR OF HAWAII

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

STATE HISTORIC PRESERVATION DIVISION
601 KAMOKILA BOULEVARD, ROOM 555
KAPOLEI, HAWAII 96707

LAURA H. THIELEN
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

RUSSELL Y. TSUJI
FIRST DEPUTY

KEN C. KAWAHARA
DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
BUREAU OF CONVEYANCES
COMMISSION ON WATER RESOURCE MANAGEMENT
CONSERVATION AND COASTAL LANDS
CONSERVATION AND RESOURCES ENFORCEMENT
ENGINEERING
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

December 8, 2009

Ms. Christine M. Ruotola, Principal
Group 70 International, Inc.
925 Bethel Street, 5th Floor
Honolulu, Hawai'i 96813-4307
rshaak@group70int.com

LOG NO: 2009.3462
DOC NO: 0912PC35
Archaeology

SUBJECT: Chapter 6E-8 Historic Preservation Review –
Pre-Consultation for Preparation of a Draft EA for the Proposed Kihei High School
Kama'ole Ahupua'a, Wailuku District, Island of Maui
TMK: (2) 2-2-002:015; (2) 2-2-002:054 por.

Thank you for the opportunity to comment on the aforementioned project, correspondence for which we received on August 18 (from Group 70) and August 28 (from DLNR Land Division).

Based on the submitted documents, the project involves the development of a 77 acre area as the location of the Kihei High School and associated infrastructure.

We are aware that an archaeological inventory survey of the proposed area of effect is being undertaken by Scientific Consultant Services, Inc., and expect that a copy of the report will be forwarded to this office for review and acceptance in the near future.

Therefore, upon review of any permit application forwarded to us by the County of Maui, we will comment according to the results and recommendations of the survey.

Should you have any questions or comments regarding this letter, please contact Patty Conte at (Patty.J.Conte@hawaii.gov).

Aloha,

Nancy McMahon, Deputy SHPO/State Archaeologist
State Historic Preservation Division

c: DLNR Land Division: morris.m.atta@hawaii.gov
Jeff Hunt, Director, Dept. of Planning, 250 S. High Street, Wailuku, Hawai'i 96793

GROUP 70
INTERNATIONAL

December 20, 2011

Pua Aiu, Administrator
State of Hawai'i,
DLNR, State Historic Preservation Division
601 Kamokila Boulevard Room 555
Kapolei, HI 96707

Subject: Response to Comments on the Pre-Consultation and Environmental Impact Statement Preparation Notice for Proposed Kīhei High School Project
Tax Map Keys: 2-2-2-002:081; 2-2-2-002:083
(Kīhei, Maui, Hawai'i)

Dear Ms. Aiu:

Thank you for your comment letter dated December 8, 2009 concerning the Pre-Consultation and Environmental Impact Statement (EIS) Preparation Notice for the proposed Kīhei High School Project.

In regards to Chapter 6E-8 Historic Preservation Review, Scientific Consultant Services, Inc. has conducted an archaeological inventory survey of the proposed project area. This survey was submitted to the State Historic Preservation Division (SHPD) for review and acceptance. Per correspondence from Nancy McMahon, former Deputy SHPO/State Archaeologist to Scientific Consultant Services, Inc. dated February 12, 2010 (enclosed), the *Archaeological Inventory Survey of 77 Acres for the Proposed Construction of Kīhei High School* has been accepted pursuant to HAR Section 13-276. It is understood that SHPD believes a program of intermittent monitoring during initial phases of ground preparation and build out should be implemented and later adjusted to address specific conditions within the project area. We also understand that SHPD will reserve final comments pending review of all project related permit applications and plans.

We appreciate your participation in the environmental review process. Your comment letter and this response will be included in the Draft EIS.

Sincerely,
GROUP 70 INTERNATIONAL, INC.

Christine Mendes Ruotola, AICP, LEED AP
Principal

Group 70 International • 925 Bethel Street, 5th Floor • Honolulu, HI 96813-4307 • tel. 808.523.5866 • fax. 808.523.5874 • www.group70int.com

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

STATE HISTORIC PRESERVATION DIVISION
601 KAMOKILA BOULEVARD, ROOM 555
KAPOLEI, HAWAII 96707

February 12, 2010

Michael F. Dega, Ph.D.
Scientific Consultant Services, Inc.
711 Kapiolani Boulevard, Suite 975
Honolulu, Hawai'i 96813
shpdreply@scshawaii.com

LOG NO: 2010.1140
DOC NO: 1002PC09
Archaeology

SUBJECT: Chapter 6E-8 Historic Preservation Review – REVISED
Archaeological Inventory Survey for the Proposed Kihei High School
Ka'ono'ulu/Koheo 1-2/Waiohuli Ahupua'a, Wailuku/Makawao Districts, Maui
TMK: (2) 2-2-002:015 por.; (2) 2-2-002:054 por.

Thank you for the opportunity to review this revised report, which our staff received in PDF format on February 4 (Perzinski and Dega 2009): *Archaeological Inventory Survey of 77 Acres for the Proposed Construction of Kihei High School*...Scientific Consultant Services, Inc.

The report was first reviewed by SHPD staff on January 30 (SHPD LOG NO: 2010.0194; DOC NO: 1001PC26), resulting in several requested revisions.

The survey area as described in the report consists of a 77 acre (30.8 hectare) portion of TMKs (2) 2-2-002:015 and (2) 2-2-002:054. Fieldwork, undertaken between August 16 and September 1 of 2009, was comprised of a 100% pedestrian survey and included two manually excavated test units. One surface architectural site (partially previously recorded) comprised of eight features [seven rock mounds, one alignment], now on record as SIHP #50-50-10-6393, was identified. All of the features are believed to have originated during the post-Contact ranching period.

The report now contains the required information as specified in HAR §13-276-5 regarding the documentation of inventory level fieldwork in general and is acceptable.

As stated in the initial review letter, we concur that SIHP #50-50-10-6393 is significant under Criterion D of the Hawai'i and National Registers of Historic Places for its ability to yield important information related to prehistory or history and that no further work with respect to the site itself is needed because it is significant solely for information content and a reasonable and adequate amount of that information was collected during the survey.

However, we are still not comfortable with the recommendation for no monitoring during any portion of ground altering disturbance within the 77 acre project area. While continuous monitoring does not appear to be necessary, we believe a program of intermittent monitoring during initial phases of ground

preparation and build out should be implemented. Such a program could then later be adjusted to address specific conditions within the project area. Therefore, we will reserve final comment pending review of all project related permit applications and plans.

Now that the archaeological inventory report has been accepted pursuant to HAR §13-276, please send one hardcopy, clearly marked **FINAL** *(the revised electronic copy does not need to be sent again)* to the attention of "**SHPD Library**" at the Kapolei SHPD office.

Aloha,

Nancy A. McMahon

Nancy McMahon, Deputy SHPO/State Archaeologist
State Historic Preservation Division

c: Jeff Hunt, Director, Dept. of Planning, FAX (808) 270-7634
Maui CRC, Dept. of Planning, 250 S. High Street, Wailuku, Hawai'i 96793

LINDA LINGLE
GOVERNOR

BRENNON T. MORIOKA
DIRECTOR

Deputy Directors
MICHAEL D. FORMBY
FRANCIS PAUL KEENO
BRIAN H. SEKIGUCHI
JIRO A. SUMADA

IN REPLY REFER TO:

HWY-PS
2.4029

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
869 PUNCHBOWL STREET
HONOLULU, HAWAII 96813-5097

December 14, 2009

RECEIVED
DEC 15 2009

Ms. Christine Mendes Ruotola, Principal
Group 70 International, Inc.
925 Bethel Street, 5th Floor
Honolulu, Hawaii 96813

Dear Ms. Ruotola:

Subject: Kihei High School, Environmental Impact Statement Preparation Notice (EISPN)
Island of Maui, Makawao District, Kihei-Makena,
TMK: (2) 2-2-002:54 por., 2-2-002:15 por.

Thank you for consulting us on the subject project. We have the following comments:

1. We will provide our detailed comments when the Traffic Impact Analysis Report (TIAR), is available for our review.
   (a) The TIAR should also include traffic analysis and discussion of not only during AM and PM peak hours but also during weekends on special school events. Appropriate roadway mitigation measures should be incorporated into the TIAR;
   (b) The EISPN mentions that the future access will be from the Kulanihakoi Street/ Piilani Highway intersection. The TIAR should analyze this intersection as well as adjacent intersections along Piilani Highway. A secondary access point to the school site should be strongly considered; and
   (c) The school parking lots should be situated and designed in such a way that there shall not be no vehicle backups onto Piilani Highway.

2. We require the submittal of a Drainage Report and grading plans of the project. Diversion of additional surface water run-off onto Piilani Highway is not permitted.

3. The Draft Environmental Impact Statement should discuss and include:
   (a) Safety of students from nearby residential homes who will possibly be walking and bicycling to and from the school; and
   (b) Notice and air study reports

4. We require the submittal of construction plans for all work done within our State highway rights-of- way.

If there are any questions, please contact Ken Tatsuguchi, Head Planning Engineer, Highways Division, at (808) 587-1830.

Very truly yours,

BRENNON T. MORIOKA, Ph.D., P.E.
Director of Transportation

c: State of Hawaii, DOE, Facilities Development Branch, Attention: Robert Purdie, Jr.
State of Hawaii, DOE, Office of the Superintendent, Attention: Patricia Hamamoto

GROUP 70
INTERNATIONAL

December 20, 2011

Glenn Okimoto, Director
State of Hawai'i
Department of Transportation (DOT)
869 Punchbowl Street
Honolulu, HI 96813

Subject: Response to Comments on the Environmental Impact Statement Preparation Notice for Proposed Kīhei High School Project
Tax Map Keys: 2-2-2-002:081; 2-2-2-002:083
(Kīhei, Maui, Hawai'i)

Dear Mr. Okimoto:

Thank you for DOT's comment letter dated December 14, 2009 concerning the Environmental Impact Statement Preparation Notice for the proposed Kīhei High School Project.

We take note of your comments relating to the Environmental Impact Statement Preparation Notice and preparation of the Draft Environmental Impact Statement (EIS) and we understand that you will provide detailed comments regarding the proposed project when the Traffic Impact Analysis Report (TIAR) is provided to you for review.

The following are offered in response to the comments provided at this time:

1. The TIAR includes and discussion of AM and PM peak hour traffic conditions. A Traffic Management Plan is recommended as mitigation to during weekend when special school events would take place. We understand that The TIAR addresses traffic conditions at the Kūlanihāko'i Street and Pi'ilani Highway intersection as well as adjacent intersections along Pi'ilani Highway. Roadway mitigation measures are incorporated into the TIAR. It is also noted that the school parking lot should be designed and situated to ensure that no vehicle backups occur onto Pi'ilani Highway.

2. DOT's letter recommends consideration of a secondary access point to the school. However, based on a May 2008 meeting with Group 70, Gray, Hong, Nojima, DOT and County representatives, it was understood that a secondary access would not be permitted for the project. Therefore, the site plan was conceptualized accordingly and approved final subdivision maps of the site (dated January 2011) indicate the single access point to Pi'ilani Highway.

3. We understand that diversion of surface water run-off onto Pi'ilani Highway is not permitted. A Preliminary Civil Engineering Report was prepared for the Kīhei High School project and is included as *Appendix K* of the Draft EIS. *Section 4.2.10.3* of the Draft EIS also provides a discussion of the existing and proposed drainage system for the proposed project. Final grading plans for the project will be submitted to the DOT during the design-build process.

4. *Section 4.2.5* discusses general pedestrian safety relating to the proposed project. The location of the high school is within walking distance to existing and future residential areas, thereby encouraging students to walk and bike to and from school. Safe walking and bicycling opportunities will be integrated into the overall project design. The installation of a traffic signal system at the intersection of Pi'ilani Highway and Kūlanihāko'i Street, and the access road for the high school, is intended to provide for safe crossing and pedestrian travel to and from the campus.

   An Air Quality Study and Acoustic Study were prepared for the project (*Appendix H and I*). A summary of this information is also provided in *Section 4.2.6 and 4.2.7* of the Draft EIS.

5. Construction plans regarding all work associated with highway right-of-ways will be submitted to the DOT for review as required.

We appreciate your participation in the environmental review process. Your comment letter and this response will be included in the Draft EIS.

Sincerely,
GROUP 70 INTERNATIONAL, INC.

Christine Mendes Ruotola, AICP, LEED AP
Principal

PHONE (808) 594-1888 FAX (808) 594-1865

STATE OF HAWAI'I
OFFICE OF HAWAIIAN AFFAIRS
711 KAPI'OLANI BOULEVARD, SUITE 500
HONOLULU, HAWAI'I 96813

RECEIVED
DEC 15 2009
INTL

HRD09/4623B

December 4, 2009

Christine Ruotola
Group 70 International, Inc.
925 Bethel Street, 5th Floor
Honolulu, HI 96813

RE: Request for comments on the Kihei High School environmental impact statement preparation notice (EISPN), Kīhei, Maui, TMK: 2-2-002:054.

Aloha e Christine Ruotola,

The Office of Hawaiian Affairs (OHA) is in receipt of the above-mentioned letter dated October 23, 2009. OHA has reviewed the project and offers the following comments.

At this early stage, OHA is unaware of any beneficiary concerns that would make us take an unsupportive stance towards this proposal. As such, we continue to offer comments to better shape this project. For example, as our October 2, 2009 comment letter states, we do look forward to reviewing a cultural impact statement. We note that a full Archaeological Inventory Survey for the project is forthcoming and that the report will be submitted to the State Historic Preservation Division. OHA also looks forward to seeing how the water availability and wastewater issues will be resolved in the draft environmental impact statement (DEIS). We also see that a preliminary drainage report will be included in the DEIS.

OHA sees that the high school will be designed and constructed to meet or exceed LEED Silver certification and we ask if this is in consideration of Hawaii Revised Statutes §196-9. OHA notes that the applicant should implement, to the extent possible, the goals of §196-9 during planning, budget preparation and program implementation of this facility including water savings, energy efficiency and materials selection. As such, we suggest that surface runoff generated by the facility should be stored or re-used for on-site needs as part of a design concept attempting to reduce or eliminate any demands on the municipal storm drainage system. We also

appreciate that landscaping will incorporate native species that are compatible with the climate of the region as stated in your October 28, 2009 response letter to us.

OHA would also like to point out that the applicant should consider that by 2020, 20% of Hawai'i's electricity is to be from renewable sources. As such, OHA recommends the use of photovoltaic and small wind harvesting electrical generation for peripheral uses such as parking lot lighting. Solar energy should also be incorporated into the building plans. During construction, OHA urges the use of recyclable materials: steel studs and structural members, and wood products from certified sustainable sources.

Thank you for the opportunity to comment. If you have further questions, please contact Grant Arnold by phone at (808) 594-0263, or e-mail him at granta@oha.org.

'O wau iho nō me ka 'oia'i'o,

Clyde W. Nāmu'o
Administrator

C: OHA Maui CRC

GROUP 70
INTERNATIONAL

December 20, 2011

Clyde W. Nāmu'o, Administrator
State of Hawai'i
Office of Hawaiian Affairs
711 Kapi'olani Blvd., Suite500
Honolulu, HI 96813

Subject: Response to Comments on the Environmental Impact Statement Preparation Notice for Proposed Kīhei High School Project
Tax Map Keys: 2-2-2-002:081; 2-2-2-002:083
(Kīhei, Maui, Hawai'i)

Dear Mr. Nāmu'o:

Thank you for your comment letter dated December 4, 2009 concerning the Environmental Impact Statement (EIS) Preparation Notice for the proposed Kīhei High School Project.

We appreciate your continued participation in the environmental review process and understand that at this time the Office of Hawaiian Affairs (OHA) is not aware of concerns that would result in an unsupportive stance towards the project.

Several studies were conducted for the Draft EIS including an Agricultural Impact Assessment, Air Quality Study, Archaeological Inventory Survey (AIS), Biological Survey, Cultural Impact Assessment, Economic and Fiscal Impact Report, Groundwater Resources & Supply Report, Acoustic Study, Preliminary Civil Engineering Report and Traffic Impact Report. The studies are included as appendices in the Draft EIS.

The AIS for Kīhei High School was reviewed by the State Historic Preservation Division (SHPD), and, per correspondence from Nancy McMahon, former Deputy SHPO/State Archaeologist to Scientific Consultant Services, Inc. dated February 12, 2010, the *Archaeological Inventory Survey of 77 Acres for the Proposed Construction of Kīhei High School* was accepted by SHPD pursuant to HAR Section 13-276.

We note that OHA is interested in how the project will assess the water availability and wastewater issues in the project area and looks forward to reviewing information in the Draft EIS. As mentioned above, a Groundwater Resources & Supply Report and Preliminary Civil Engineering Report were prepared for the project and are included as *Appendix C and K* respectively. Please also refer to *Sections 4.2.10.1, 4.2.10.2 and 4.2.10.3* of the Draft EIS also provide a discussion of the Water System, Wastewater and Drainage for the proposed project.

It is noted that the OHA suggest that the applicant implement the goals documented in Hawaii Revised Statutes 196-9, to the extent possible, in association with the project being designed and constructed in accordance with USGBC LEED Standards. Goals in regards to water savings, energy efficiency, and materials selection including use of recyclable materials for steel studs, structural members, and wood products from certified sustainable sources; as well as retaining surface water runoff onsite for re-use and to reduce demands to the municipal storm drainage systems, are suggested to be integrated into the project design.

Thank you for informing us of your receipt of the response letter dated October 28, 2009. As stated in the letter, planned landscaping for the associated project will attempt to incorporate selected native species that are native to the project location and compatible to the climate of the Kīhei-Mākena region.

The recommendation of integrating of the use of photovoltaic's and wind energy into the project design to harvest electricity generation for use on the project site has been noted. Energy saving design features will be determined during the Design Build process.

We appreciate your continued participation in the environmental review process. Your comment letter and this response will be included in the Draft EIS.

Sincerely,
GROUP 70 INTERNATIONAL, INC.

Christine Mendes Ruotola, AICP, LEED AP
Principal

COUNTY OF MAUI
DEPARTMENT OF
ENVIRONMENTAL MANAGEMENT
2200 MAIN STREET, SUITE 100
WAILUKU, MAUI, HAWAII 96793

December 10, 2009

Ms. Christine Mendes Ruotola
Group 70 International, Inc.
925 Bethel Street, 5th Floor
Honolulu, Hawaii 96813

Dear Ms. Mendes Ruotola,

SUBJECT: **KIHEI HIGH SCHOOL**
ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE
TMK (2) 2-2-002:054(POR.) AND 015(POR.)

We reviewed the subject project as a pre-application consultation and have the following comments:

1. Solid Waste Division comments:
   a. None.
2. Wastewater Reclamation Division (WWRD) comments:
   a. Although wastewater system capacity is currently available as of 12/10/2009, the developer should be informed that wastewater system capacity cannot be ensured until the issuance of the building permit.
   b. Provide discussion and calculations (sewer impact study) to substantiate that the existing wastewater system is adequate to serve this project.
   c. Wastewater contribution calculations are required before building permit is issued.
   d. Developer is not required to pay assessment fees for this area at the current time since the fees are exempt for public schools.
   e. Developer is required to fund any necessary off-site improvements to collection system and wastewater pump stations.
   f. Plans should show the installation of a property sewer service manhole prior to connection to the County sewer.
   g. Indicate on the plans the ownership of each easement (in favor of which party). Note: County will not accept sewer easements that traverse private property.

h. Commercial kitchen facilities within the proposed project shall comply with pre-treatment requirements (including grease interceptors, sample boxes, screens etc.)
i. Non-contact cooling water and condensate should not drain to the wastewater system.

If you have any questions regarding this memorandum, please contact Gregg Kresge at 270-8230.

Sincerely,

Cheryl K. Okuma, Director
Environmental management

xc: Mr. Robert Purdie, Jr., State of Hawaii, Department of Education
Ms. Patricia Hamamoto, Superintendent, State of Hawaii, Department of Education

GROUP 70 INTERNATIONAL

December 20, 2011

Kyle Ginoza, Director
County of Maui
Department of Environmental Management
2200 Main Street, Suite 100
Wailuku, HI 96793

Subject: Response to Comments on the Environmental Impact Statement Preparation Notice for Proposed Kīhei High School Project
Tax Map Keys: 2-2-2-002: Por. 054; 2-2-2-002: Por. 015
(Kīhei, Maui, Hawai'i)

Dear Mr. Ginoza:

Thank you for your comment letter dated December 10, 2009 concerning the Environmental Impact Statement (EIS) Preparation Notice for the proposed Kīhei High School Project.

We take note of your comments relating to the EIS Preparation Notice and preparation of the Draft EIS. The following are offered in response to your comments:

1. We understand that the Solid Waste Division has no comments to offer at this time.

2. We take note of the comments submitted from the Wastewater Reclamation Division (WWRD) and offer the following in response to those comments:

   a. and c: It is understood that the Kīhei Region is served by the Maui County Wastewater Reclamation Facility (WWRF) and that although wastewater system capacity is currently available, that wastewater system capacity for the proposed project cannot be ensured until issuance of a building permit to the developer. Calculations regarding project related wastewater contributions will be provided prior to building permit issuance.

   b. A Preliminary Civil Engineering Report is provided with the Draft EIS which addresses the existing wastewater infrastructure on and in the vicinity of the proposed project site, proposed infrastructure improvements, cost estimates, and potential impacts and mitigation measures.

d. and e.: It is understood that the developer is not required to pay assessment fees for this area as fees are exempt for public schools. Funding of necessary off-site improvements to wastewater collection systems and pump stations will be the responsibility of the developer.

f. and g.: Installation of property sewer service manhole and ownership of each easement will be indicated on the project plans prior to connection to the County sewer.

h. and i.: It is understood that the WWRD requires pre-treatment of commercial kitchen facilities including grease interceptors, sample boxes, and screens. It is also understood that non-contact cooling water and condensate should not drain to the wastewater system. Pre-treatment requirements will be followed and non-contact cooling water, nor condensate water, will be designed to drain to the wastewater system.

We appreciate your participation in the environmental review process. Your comment letter and this response will be included in the Draft EIS.

Sincerely,
GROUP 70 INTERNATIONAL, INC.

Christine Mendes Ruotola, AICP, LEED AP
Principal

DEPARTMENT OF
HOUSING AND HUMAN CONCERNS
HOUSING DIVISION
COUNTY OF MAUI

CHARMAINE TAVARES
Mayor
LORI TSUHAKO
Director
JO-ANN T. RIDAO
Deputy Director

35 LUNALILO STREET, SUITE 102 • WAILUKU, HAWAII 96793 • PHONE (808) 270-7351 • FAX (808) 270-6284

December 10, 2009

Ms. Christine Routola
Principal
Group 70 International, Inc.
925 Bethel Street, 5th Floor,
Honolulu, Hawaii 96813

Dear Ms. Christine Routola

Subject: Kihei High School
Environmental Impact Statement Preparation Notice

The Department has reviewed the Environmental Impact Statement Preparation Notice for the above subject project. Based on our review, we have determined that the subject project is not subject to Chapter 2.96, Maui County Code. At the present time, the Department has no additional comments to offer.

Please call Ms. Cara Bohne of our Housing Division at 270-5748 if you have any questions.

Sincerely,

WAYDE T. OSHIRO
Housing Administrator

cc: Director of Housing and Human Concerns
State of Hawaii, Department of Education, Facilities Development Branch
State of Hawaii, Department of Education, Office of the Superintendent

GROUP 70
INTERNATIONAL

December 20, 2011

Jo-Ann T. Ridao, Housing Administrator
County of Maui
Department of Housing and Human Concerns
Housing Division
35 Lunalilo Street, Suite 102
Wailuku, HI 96793

Subject: Response to Comments on the Environmental Impact Statement Preparation Notice for Proposed Kīhei High School Project
Tax Map Keys: 2-2-2-002:081; 2-2-2-002:083
(Kīhei, Maui, Hawai'i)

Dear Ms. Ridao:

Thank you for your comment letter dated December 10, 2009 concerning the Environmental Impact Statement (EIS) Preparation Notice for the proposed Kīhei High School Project.

We understand that the Department has determined that the project is not subject to Maui County Code Chapter 2.96, and that no additional comments are offered at this time.

We appreciate your participation in the environmental review process. Your comment letter and this response will be included in the Draft EIS.

Sincerely,
GROUP 70 INTERNATIONAL, INC.

Christine Mendes Ruotola, AICP, LEED AP
Principal

CHARMAINE TAVARES
Mayor

TAMARA HORCAJO
Director

ZACHARY Z. HELM
Deputy Director

(808) 270-7230
Fax (808) 270-7934

DEPARTMENT OF PARKS & RECREATION
700 Hali'a Nakoa Street, Unit 2, Wailuku, Hawaii 96793

November 18, 2009

Group 70 International, Inc
Attention: Christine Mendes Ruotola, AICP, LEED AP
925 Bethel Street, 5th Floor
Honolulu, Hawaii 96813-4307

SUBJECT: Kihei High School; TMK (2) 2-2-002: Por. 54, (2) 2-2-002: Por. 015
Environmental Impact Statement Preparation Notice

Dear Ms. Ruotola:

The Department of Parks and Recreation has reviewed the Environmental Impact Statement Preparation Notice and has no comments at this time.

Thank you for the opportunity to review and comment on this matter. Please feel free to contact me or Mr. Patrick Matsui, Chief of Parks Planning and Development at 270-7387 should you have any other questions.

Sincerely,

TAMARA HORCAJO
Director

xc: Patrick Matsui, Chief of Parks Planning & Development
TH:PTM:bks

GROUP 70
INTERNATIONAL

December 20, 2011

Glenn Correa, Director
County of Maui
Department of Parks & Recreation
700 Hali'a Nakoa Street, Unit 2
Wailuku, HI 96793

Subject: Response to Comments on the Environmental Impact Statement Preparation Notice for Proposed Kīhei High School Project
Tax Map Keys: 2-2-2-002:081; 2-2-2-002:083
(Kīhei, Maui, Hawai'i)

Dear Mr. Correa:

Thank you for your comment letter dated November 18, 2009 concerning the Environmental Impact Statement (EIS) Preparation Notice for the proposed Kīhei High School Project.

We understand that your department has no comments to offer at this time.

We appreciate your participation in the environmental review process. Your comment letter and this response will be included in the Draft EIS.

Sincerely,
GROUP 70 INTERNATIONAL, INC.

Christine Mendes Ruotola, AICP, LEED AP
Principal

Group 70 International • 925 Bethel Street, 5th Floor • Honolulu, HI 96813-4307 • tel. 808.523.5866 • fax. 808.523.5874 • www.group70int.com

COUNTY OF MAUI
DEPARTMENT OF PLANNING

December 4, 2009

Mr. Robert Purdie, Jr., Project Manager
Department of Education
Office of School Facilities and Support Services
Facilities Development Branch
P.O. Box 2360
Honolulu, Hawaii 96804

Dear Mr. Purdie:

SUBJECT: COMMENTS ON AN ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE FOR THE PROPOSED KIHEI HIGH SCHOOL LOCATED MAUKA AND ADJOINING PI'ILANI HIGHWAY, AT KIHEI, MAUI, HAWAII; TMK(S): (2) 2-2-002:054 (POR.) AND 015 (POR.) (EAC 2009/0031)

The Department of Planning (Department) is in receipt of the above-referenced Environmental Impact Statement Preparation Notice (EISPN) for the proposed Kihei High School Project (High School). We appreciate the opportunity to provide the following comments:

1. Page 1-6: The State Land Use District Classification Map shows the site area proposed to change from the Agricultural State Land Use District to Urban, leaving the adjoining portion of Pi'ilani Highway designated as Agriculture. So that the project site does not become an island of Urban designated land, please consider working with the Department of Transportation and the State Land Use Commission to extend the area of the District Boundary Amendment petition to include the portion of Pi'ilani Highway adjoining the proposed High School site within the Urban District and remove it from the Agricultural District;

2. Page 2-2: It is more common than not that schools are designed with their administration and more public buildings sited facing and nearby the major access to, or roadway fronting, the school site. When combined with complementary building design, such siting can be employed to make a strong statement of the civic contribution the school wishes to provide to the community. We note that the proposed site plan depicted in Figure 2-1 would instead place the concentration of buildings on the mauka portion of the site, with athletic fields and related uses fronting Pi'ilani Highway. Please identify the factors considered in arriving at this general layout;

250 SOUTH HIGH STREET, WAILUKU, MAUI, HAWAII 96793
MAIN LINE (808) 270-7735; FACSIMILE (808) 270-7634
CURRENT DIVISION (808) 270-8205; LONG RANGE DIVISION (808) 270-7214; ZONING DIVISION (808) 270-7253

3. Pages 2-2 and 2-3: It is possible that, after anticipating the building of this project so strongly and for so long, the Kihei community may wish the site design to reflect a more intensive presence along Pi'ilani Highway and a closer physical connection to the community than represented in the Figure 2-1 site design. This could make some positive difference toward meeting the project goal stated in the EISPN that the school "not only serve youth, but be a center for the community as well." A more makai location for the campus building area should also encourage more student bicycle and pedestrian access to the campus in lieu of automobile use. Unless the general layout now proposed was arrived at following substantial public input from the Kihei community, please seek such input as soon as possible as part of and/or in addition to the Applicant's community involvement process referred to in Section 8 of the EISPN and before proceeding too much further with the general layout in Figure 2-1. During such a process of public input, please also seek review and comment by the Maui Urban Design Review Board;

4. Page 4-3, Item No. 5 "Substantially affects public health": Line 2 does not appear to relate to the subject project; and

5. The Department acknowledges the letter response dated October 28, 2009, from EIS consultant representative Christine Ruotola of Group 70 International to the Department's letter of September 17, 2009, provided in response to the request for early consultation comments. We appreciate the commitments made in the October 28, 2009 letter and look forward to receipt and review of the Draft EIS.

Thank you for the opportunity to comment. Should you require further clarification, please contact Current Planning Supervisor Jeffrey Dack at jeffrey.dack@mauicounty.gov or at (808) 270-6275.

Sincerely,

JEFFREY S. HUNT, AICP
Planning Director

xc: Clayton I. Yoshida, AICP, Planning Program Administrator
John F. Summers, Planning Program Administrator
Jeffrey P. Dack, AICP, Current Planning Supervisor
Christine M. Ruotola, AICP, Group 70 International, Inc
Patricia Hamamoto, Superintendent, State of Hawaii, Department of Education
2009 EAC File
General File

JSH:JPD:vb
K:\WP_DOCS\PLANNING\EAC\2009\0031_KiheiHighSchool\EISPNcommentsLtr.doc

GROUP 70
INTERNATIONAL

PRINCIPALS

Francis S. Oda, Arch.D., FAIA, AICP, LEED AP
Norman G.Y. Hong AIA
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Christine Mendes Ruotola AICP, LEED AP
James L. Stone, Arch.D., AIA, LEED AP
Katherine M. MacNeil AIA, LEED AP
Tom Young, MBA AIA
Paul T. Matsuda PE, LEED AP

December 20, 2011

William Spence, Planning Director
County of Maui
Department of Planning
250 South High Street, Suite 200
Wailuku, HI 96793

Subject: Response to Comments on the Environmental Impact Statement Preparation Notice for Proposed Kīhei High School Project
Tax Map Keys: 2-2-2-002:081; 2-2-2-002:083
(Kīhei, Maui, Hawai'i)

Dear Mr. Spence:

Thank you for your Department's comment letter dated December 4, 2009 concerning the Environmental Impact Statement (EIS) Preparation Notice for the proposed Kīhei High School Project.

We take note of your comments relating to the EIS Preparation Notice and preparation of the Draft EIS. The following are offered in response to your comments:

1. State Land Use District Classification-The Department of Education has brought the Maui County Planning Department's suggestion to the Department of Transportation's (DOT) attention. A letter was sent to the DOT regarding the Maui County Planning Department's suggestion on February 22, 2010. A copy of the correspondence is attached.

2. And 3. The design and programming of the proposed Kīhei High School campus was determined in the conceptual design phase and in association with stakeholder input. During conceptual design, a series of design charrettes were held, during which two prominent themes emerged, 1) to enhance Kīhei pride through athletic events and sports, and 2) the school being a center of the community.

   The PE facilities, sports stadium and athletics complex were identified during conceptual design as the most prominent part of the campus from the community perspective. These facilities were located closest to Pi'ilani Highway to embody the project's major themes and readily identify the school as a Kīhei landmark. Their high visibility, central location and easy accessibility set the stage for pride through athletics and sports, the top major theme of the project.

   The theme of the school being a center of the community is supported by the location and prominence of the campus site and its athletics facilities. Visibility,

   accessibility to academic and support buildings, and availability of outdoor facilities offer opportunities for the public and community to use the campus and school facilities.

   By their proximity to the highway, the stadium and athletic facilities serve to separate the more populated academic upper campus from the highway, to reduce infiltration of highway noise as well as promote pedestrian safety.

   The Maui Urban Design Review Board will be consulted at the appropriate phase in the design process. Final design will be determined in the RFP and Design Build process.

4. Thank you. Line 2 does not relate to the subject project and will be deleted for the DEIS.

We appreciate your participation in the environmental review process. Your comment letter and this response will be included in the Draft EIS.

Sincerely,
GROUP 70 INTERNATIONAL, INC.

Christine Mendes Ruotola, AICP, LEED AP
Principal

Attachment: Letter to DOT (February 22, 2010)

Group 70 International • 925 Bethel Street, 5th Floor • Honolulu, HI 96813-4307 • tel. 808.523.5866 • fax. 808.523.5874 • www.group70int.com

D Rachel S.

LINDA LINGLE
GOVERNOR

KATHRYN S. MATAYOSHI
INTERIM SUPERINTENDENT

STATE OF HAWAI'I
DEPARTMENT OF EDUCATION
P.O. BOX 2360
HONOLULU, HAWAI'I 96804

RECEIVED
MAR - 1 2010
GROUP 70 INT'L

OFFICE OF THE SUPERINTENDENT

February 22, 2010

TO: The Honorable Brennon T. Morioka, Ph.D., P.E., Director
Department of Transportation

FROM: Kathryn S. Matayoshi, Interim Superintendent
Department of Education

SUBJECT: Kihei High School – New School
Petition for Land Use Boundary Amendment, Kihei, Maui, Hawaii
DOE Job No. Q00017-06

The State of Hawaii, Department of Education (DOE), is planning the development of the new Kihei High School on approximately 77 acres of land adjoining the State of Hawaii, Department of Transportation's (DOT) Pi`ilani Highway between the Kulanihakoi and the Waipu`ilani gulches adjacent to and mauka of the intersection of Pi`ilani Highway and Kulanihakoi Road. We have attached a map illustrating the portion of the land to be included in the Land Use District Boundary Amendment application. Before DOE can begin construction, DOE must apply for a State Land Use District Boundary Amendment from the Agricultural District to the Urban District and a zone change from the County of Maui.

During the course of DOE's planning for this project, the Maui County Planning Department has suggested the portion of Pi`ilani Highway fronting Maui Tax Map Key No. 2-2-02: 054 be included in the Land Use District Boundary Amendment application and the rezoning application in order that this portion of Pi`ilani Highway not be a remnant in the Agricultural District if the reclassification into the Urban District is approved.

Neither reclassification of this portion of Pi`ilani Highway to the Land Use Urban District Boundary nor rezoning by the County of Maui would change the use of the land for highway purposes or affect DOT's ownership and control of this portion of Pi`ilani Highway.

While DOE cannot include the portion of Pi`ilani Highway fronting the proposed Kihei High School in its Land Use District Boundary Amendment Application, DOE desires to bring the Maui County Planning Department's suggestion to DOT's attention in order that DOT may consider applying to amend the Land Use District Boundary of this portion of Pi`ilani Highway on its own.

If more information is needed, please contact Robert Purdie, Jr., of the Facilities Development Branch, Project Management Section, at (808) 586-0408.

KSM:lh

Attachment

c: Randolph Moore, Assistant Superintendent, OSFSS
Duane Kashiwai, Facilities Development Branch
Michael Shigetani, Facilities Development Branch
Robert Purdie, Jr., Facilities Development Branch
Group 70 International, Inc.

CHARMAINE TAVARES
Mayor

MILTON M. ARAKAWA, A.I.C.P.
Director

MICHAEL M. MIYAMOTO
Deputy Director

Telephone: (808) 270-7845
Fax: (808) 270-7955

RALPH NAGAMINE, L.S., P.E.
Development Services Administration

CARY YAMASHITA, P.E.
Engineering Division

BRIAN HASHIRO, P.E.
Highways Division

COUNTY OF MAUI
DEPARTMENT OF PUBLIC WORKS
200 SOUTH HIGH STREET, ROOM NO. 434
WAILUKU, MAUI, HAWAII 96793

December 14, 2009

Mr. Robert Purdie, Jr.
State of Hawaii, Department of Education
Facilities Development Branch
P. O. Box 2360
Honolulu, Hawaii 96804

Dear Mr. Purdie:

SUBJECT: ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE FOR KIHEI HIGH SCHOOL; TMK: (2) 2-2-002:054, 015 (POR.)

We reviewed the subject application and have the following comments:

1. The applicant shall be responsible for all required improvements as required by Hawaii Revised Statutes, Maui County Code and rules and regulations.

2. As applicable, construction plans shall be designed in conformance with Hawaii Standard Specifications for Road and Bridge Construction dated 2005 and Standard Details for Public Works Construction, 1984, as amended.

3. As applicable, worksite traffic-control plans/devices shall conform to Manual on Uniform Traffic Control Devices for Streets and Highways, 2003.

4. Development of Kulanihakoi Street extension, mauka of Piilani Highway, must be coordinated with the Engineering Division of the Department of Public Works.

5. Recommend root barriers be included for vegetation (trees/shrubs) adjacent or near to paved streets, parking lots, concrete sidewalks, etc. to prevent future uplifting of these facilities.

Please call Michael Miyamoto at (808) 270-7845 if you have any questions regarding this letter.

Sincerely,

MILTON M. ARAKAWA, A.I.C.P.
Director of Public Works

MMA:MMM:ls
xc: Highways Division
Engineering Division
Patricia Hamamoto, Superintendent, Department of Education
Christine Ruotola, Group 70
S:\LUCA\CZM\Prop_Kihei_HS_eis_222054_015_ls.wpd

GROUP 70
INTERNATIONAL

PRINCIPALS

Francis S. Oda, Arch.D., FAIA, AICP, LEED AP
Norman G.Y. Hong AIA
Sheryl B. Seaman AIA, ASID, LEED AP
Hitoshi Hida AIA
Roy H. Nihei AIA, CSI, LEED AP
Ralph E. Portmore AICP
James I. Nishimoto AIA
Stephen Yuen AIA
Linda C. Miki AIA
George I. Atta AICP, LEED AP
Charles Y. Kaneshiro AIA, LEED AP
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Christine Mendes Ruotola AICP, LEED AP
James L. Stone, Arch.D., AIA, LEED AP
Katherine M. MacNeil AIA, LEED AP
Tom Young, MBA AIA
Paul T. Matsuda PE, LEED AP

December 20, 2011

David Goode, Director
County of Maui
Department of Public Works
200 South High Street, Room No. 434
Wailuku, HI 96793

Subject: Response to Comments on the Environmental Impact Statement Preparation Notice for Proposed Kīhei High School Project
Tax Map Keys: 2-2-2-002:081; 2-2-2-002:083
(Kīhei, Maui, Hawai'i)

Dear Mr. Goode:

Thank you for your comment letter dated December 14, 2009 concerning the Environmental Impact Statement (EIS) Preparation Notice for the proposed Kīhei High School Project.

We take note of your comments relating to the EIS Preparation Notice and preparation of the Draft EIS. The following are offered in response to your comments:

1. The applicant's proposed action will be assessed according to its conformity with established land use plans, policies and controls, including; Chapter 226 Hawai'i Revised Statutes (HRS), Hawai'i State Plan, Hawai'i State Functional Plan, HRS Chapter 15-15 Land Use Commission Rules, Coastal Zone Management Program, State Function Plan on Education, County of Maui General Plan 2030 (draft), Maui County codes and rules and regulations, and the Kīhei-Makena Community Plan.

2. Construction plans will be designed in conformance with Hawai'i Standard Specifications for Road and Bridge Construction dated 2005 and Standard Details for Public Works Construction, 1984, as amended as applicable to the proposed project.

3. Worksite Traffic-control plans/devices will conform to Manual on Uniform Traffic Control Devices for Streets and Highways, 2003, as applicable to the proposed project.

4. It is noted that coordination with the Engineering Division of the Department of Public Works must take place in regards to the development of the Kulanihakoi Street extension, mauka of Pi'ilani Highway.

5. We understand the need for durability of paved streets, parking lots, concrete sidewalks, etc. It is noted that vegetation consisting of trees and shrubs located adjacent to hardscapes should have root barriers included for the vegetation.

We appreciate your participation in the environmental review process. Your comment letter and this response will be included in the Draft EIS.

Sincerely,
GROUP 70 INTERNATIONAL, INC.

Christine Mendes Ruotola, AICP, LEED AP
Principal

Group 70 International • 925 Bethel Street, 5th Floor • Honolulu, HI 96813-4307 • tel. 808.523.5866 • fax. 808.523.5874 • www.group70int.com

CHARMAINE TAVARES
Mayor

JEFFREY K. ENG
Director

ERIC H. YAMASHIGE, P.E., L.S.
Deputy Director

DEPARTMENT OF WATER SUPPLY
COUNTY OF MAUI
200 SOUTH HIGH STREET
WAILUKU, MAUI, HAWAII 96793-2155
www.mauiwater.org

November 14, 2009

Ms. Christine Mendes Ruotola, AICP, LEED AP, Principal
Group 70 International, Inc.
925 Bethel Street, 5th fl
Honolulu, HI 96813-4307

Re: Pre-Consultation for Preparation of an Environmental Impact Statement for Proposed Kihei High School Project
TMK:2-2-002:054 and 2-2-002:015

Dear Ms. Mendes Ruotola:

Thank you for consulting with the Department of Water Supply on this Environmental Impact Statement Preparation Notice. Please find attached our comment letter to the pre consultation for this project dated October 26, 2009. We have no additional comments.

Should you have any questions regarding system improvements for this project, please contact our engineering division at (808) 270-7835. For questions on water resources, please contact our Water Resources and Planning Division at (808) 244-8550.

Sincerely,

Jeffrey K. Eng, Director
emb

c: engineering division

attachment: Department of Water Supply letter dated 10/26/09

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CHARMAINE TAVARES
Mayor

JEFFREY K. ENG
Director

ERIC H. YAMASHIGE, P.E., L.S.
Deputy Director

DEPARTMENT OF WATER SUPPLY
COUNTY OF MAUI
200 SOUTH HIGH STREET
WAILUKU, MAUI, HAWAII 96793-2155
www.mauiwater.org

October 26, 2009

Ms. Rachel Shaak, AICP, LEED AP
Group 70 International, Inc.
925 Bethel Street, 5th fl
Honolulu, HI 96813-4307

Re: Pre-Consultation for Preparation of an Environmental Impact Statement for Proposed Kihei High School Project
TMK:2-2-002:054 and 2-2-002:015

Dear Ms. Shaak:

Thank you for consulting with the Department of Water Supply (DWS) in preparation of this Environmental Impact Statement (EIS).

Source Availability and Consumption
The EIS should identify sources and expected potable and non-potable demand. Based on system per-acre standards, daily demand for this project would be 130,900 gallons. Based on per student guidelines, demand would be 41,250 gallons. Subdivision of the project site would be subject to the County's availability policy, codified in Title 14 of the Maui County Code. The Department may delay issuance of meters until new sources are on line. The Department will not issue temporary construction meters for Central Maui projects. The county reclaimed water line is within 1,700 feet of parcel 2-2-002:054. Reclaimed water should be considered as an alternative source for irrigation.

System Infrastructure
The project site is served by an 8-inch waterline about 290 feet west of the property, and two fire hydrants along Mahealani Street. System improvements and storage requirements will be determined in the subdivision process.

Pollution Prevention
The project overlies the Kamole aquifer. DWS strives to protect water resources by encouraging adoption of Best Management Practices (BMPs) designed to minimize infiltration and runoff. The EIS should identify mitigation measures to be implemented during construction, including the following:

"By Water All Things Find Life"

The Department of Water Supply is an Equal Opportunity provider and employer. To file a complaint of discrimination, write: USDA, Director, Office of Civil Rights, Room 326-W, Whitten Building, 14th and Independence Avenue, SW, Washington DC 20250-9410. Or call (202) 720-5964 (voice and TDD)

Printed on recycled paper

1. Prevent cement products, oil, fuel and other toxic substances from falling or leaching into the water.
2. Properly and promptly dispose of all loosened and excavated soil and debris material from drainage structure work.
3. Retain ground cover until the last possible date.
4. Stabilize denuded areas by sodding or planting as soon as possible. Replanting should include soil amendments and temporary irrigation. Use high seeding rates to ensure rapid stand establishment.
5. Avoid fertilizers and biocides, or apply only during periods of low rainfall to minimize chemical run-off.
6. Keep run-off on site.

Conservation
The EIS should identify conservation measures to be implemented in project design and construction. The following conservation measures should be considered:
Use Non-potable Water: Use brackish or reclaimed water for irrigation and dust control during construction where available. Reclaimed water is available at the Kihei Sewage Treatment Plant.
Use Climate-adapted Plants: The project is located in the "Maui County Planting Plan" - Plant Zone 3. Native plants adapted to the area conserve water and protect the watershed from degradation due to invasive alien species. Use native plants for all landscaping purposes.
Prevent Over-Watering By Automated Systems: Provide rain-sensors on all automated irrigation controllers in common areas. Check and reset controllers at least once a month to reflect the monthly changes in evapo-transpiration rates at the site. As an alternative, provide the more automated, soil-moisture sensors on controllers.
Eliminate Single-Pass Cooling: Single-pass, water-cooled systems should be eliminated per Maui County Code Subsection 14.21.20. Although prohibited by code, single-pass water cooling is still manufactured into some models of air conditioners, freezers, and commercial refrigerators.
Utilize Low-Flow Fixtures and Devices: Maui County Code Subsection 16.20A.680 requires the use of low-flow water fixtures and devices in faucets, showerheads, urinals, water closets, and hose bibs. Water conserving washing machines, ice-makers and other units are also available.
Maintain Fixtures to Prevent Leaks: A simple, regular program of repair and maintenance can prevent the loss of hundreds or even thousands of gallons a day.

Should you have any questions regarding system improvements for this project, please contact our engineering division at (808) 270-7835. For questions on water resources, please contact our Water Resources and Planning Division at (808) 244-8550.

Sincerely,

Jeffrey K. Eng, Director
emb

c: engineering division

attachments:
A Checklist of Water Conservation Ideas for Schools and Public Buildings
Plant Brochure: "Saving Water in the Yard"

C:\EA EIS SLUD\Kihei_High_School_preEIS.wpd

GROUP 70
INTERNATIONAL

December 20, 2011

Dave Taylor, Director
County of Maui
Department of Water Supply
200 South High Street
Wailuku, HI 96793

Subject: Response to Comments on the Environmental Impact Statement Preparation Notice for Proposed Kīhei High School Project
Tax Map Keys: 2-2-2-002:081; 2-2-2-002:083
(Kīhei, Maui, Hawai'i)

Dear Mr. Taylor:

Thank you for your comment letter dated November 14, 2009 concerning the Environmental Impact Statement (EIS) Preparation Notice for the proposed Kīhei High School Project.

We understand that your department has no additional comments at this time and is re-submitting the October 26, 2009 comments submitted during the Pre-Consultation for Preparation of an EIS.

A Preliminary Civil Engineering Report assessing the proposed Kīhei High School projects effects on County's water infrastructure, demand and supply was conducted by Gray, Hong, Nojima and Associates, Inc. and is included in the EIS as Appendix K.

A response to your department's October 26th, 2009 comment letter was sent to DWS on December 21, 2009. A copy of the correspondence is attached.

We appreciate your participation in the environmental review process. Your comment letter and this response will be included in the Draft EIS.

Sincerely,
GROUP 70 INTERNATIONAL, INC.

Christine Mendes Ruotola, AICP, LEED AP
Principal

Attachment: Letter to DWS (December 21, 2009)

GROUP 70
INTERNATIONAL

December 20, 2011

Jeffrey K. Eng, Director
County of Maui
Department of Water Supply
200 South High Street
Wailuku, HI 96793

Subject: Response to Comments for Pre-Consultation for Preparation of an Environmental Impact Statement for Proposed Kihei High School Project TMK: Tax Map Keys: 2-2-002: Por. 054; 2-2-002: Por. 015 (Kihei, Maui, Hawai'i)

Dear Mr. Eng:

Thank you for your comment letter dated October 26, 2009 concerning the Pre-Consultation for Preparation of an Environmental Impact Statement (EIS) for the proposed Kihei High School Project. We also received the Department's November 14, 2009 EISPN comment letter, stating no further comments. We apologize, we were unable to include the October 26th letter in the EISPN due to publication timing.

We take note of your comments relating to the preparation of the Draft EIS for the proposed project. The following are offered in response to your comments:

1. Source Availability and Consumption – We understand that potable water resource availability and consumption are critical County issues. Please refer to the July 24, 2009 letter (attached) that was submitted to the Department of Water Supply from the State of Hawai'i Department of Education. This letter requested potable water for the subject project and detailed preliminary water demand expectations and design measures to reduce potable water demand through the year 2020. The applicant is awaiting response from the County to advise whether water service to the project site is anticipated. This remains a most critical issue for the project.

   A Water Resources and Supply Report is being prepared for the Kihei High School Draft EIS. The report will provide additional details on potable and non-potable water resources, as well as alternative means for irrigation. These findings will be presented in the Draft EIS. Kihei High School will be designed to meet or exceed the United States Green Building Council (USGBC) Leadership in Energy & Environmental Design (LEED) Silver certification and will include water conservation measures.

2. System Infrastructure – Existing infrastructure support facilities in the project area will be assessed along with additional requirements generated by the

project. The Engineering Basis of Design Report will assess and provide general criteria and assumptions regarding the proposed infrastructure associated with potable water, waste water, non-potable water, irrigation water, electrical power, and utilities. Findings will be presented in the Draft EIS.

3. Pollution Prevention – We understand that water resource protection and water quality are also critical County issues. A Preliminary Drainage Report is being prepared for the Kihei High School Project. Best Management Practices (BMPs) will be integrated into the project design to minimize infiltration and pollutant runoff and National Pollution Discharge Elimination System requirements will be followed. The Draft EIS will identify BMPs to be implemented during construction to mitigate the following items as listed in your comment letter:

   a. Prevention of cement products, oil, fuel and other toxic substances from falling or leaching into soils, surface water and groundwater.
   b. Properly and promptly disposing of all loosened and excavated soil and debris material from drainage structure work.
   c. Retaining ground cover on site until the last possible date.
   d. Stabilizing denuded areas by sodding or planting as soon as possible. Replanting should include soil amendments and temporary irrigation. High seeding rates will be recommended to ensure rapid stand establishment.
   e. Fertilizers and biocides will be avoided or applied during periods of low rainfall to minimize chemical run-off.
   f. Run-off will be kept on site.

4. Conservation – We understand DWS concerns for conservation measures being incorporated into the project design and construction. The Draft EIS will provide additional details on conservation measures including: use of non-potable water, use of climate-adapted plants, use of automated irrigation systems with preventative over-watering controllers, elimination of single-pass cooling systems, utilization of low flow fixtures and devices, and a monitoring/maintenance program to maintain fixtures and prevent water leaks.

We appreciate your participation in the pre-consultation for this environmental review process. Your comment letter and this response will be included in the Draft EIS.

Sincerely,
GROUP 70 INTERNATIONAL, INC.

Christine Mendes Ruotola

Christine Mendes Ruotola, AICP, LEED AP
Principal

cc: Bob Purdie, DOE Facilities Development Branch
Gaylyn Nakatsuka, DOE Facilities Development Branch

LINDA LINGLE
GOVERNOR

PATRICIA HAMAMOTO
SUPERINTENDENT

STATE OF HAWAI'I
DEPARTMENT OF EDUCATION
P.O. BOX 2360
HONOLULU, HAWAI'I 96804

OFFICE OF SCHOOL FACILITIES AND SUPPORT SERVICES
[redacted]

Letter PMS-431.9

July 24, 2009

Mr. Jeffrey K. Eng, Director
Department of Water Supply
County of Maui
200 South High Street
Wailuku, Hawaii 96793-2155

Dear Mr. Eng:

SUBJECT: Kihei High School – New School
Availability of Water
DOE Job No. Q00017-06
TMK: (2) 2-2-002: 015 & 054

The Department of Education (DOE) is pursuing construction of a new high school in Kihei, Maui. The school will be designed for grades 9 through 12 with a projected design enrollment of 1,650 students. The proposed school site is fronted by Piilani Highway, situated on two adjoining parcels designated (2) 2-2-002: 015 & 054 (refer to enclosed concept plans). The parcels are privately-owned by Kaonoulu Ranch and Haleakala Ranch, respectively. The DOE expects to acquire 70+ acres through subdivision of each of the two parcels and consolidation into a single lot for development of the school.

Conceptual plans for the new high school have been developed through a design charrette process with input from a variety of local stakeholders. Based on the charrette discussions and the DOE's anticipated growth in enrollment for the proposed school, preliminary water demands have been projected (see table below). Enrollment is expected to increase at a modest pace beginning with 200 students in the first year of operation, followed by an increase of 200 additional students each year over the next 3 years. The DOE expects annual enrollment to level off after this point at 800 students per year.

YEAR	No. of Students	No. of Staff	No. of Students & Staff	GPCD	No. of Visitors	GPCD	POTABLE (GPD) Avg Day	Max Day	Peak Hr	NONPOTABLE Avg Day (GPD) Irrigation
2013	200	40	240	20	10	10	4,900	7,350	14,700	233,000
2014	400	40	440	20	20	10	9,000	13,500	27,000	233,000
2015	600	100	700	20	30	10	14,300	21,450	42,900	233,000
2016-20	800	120	920	20	40	10	18,800	28,200	56,400	233,000
DESIGN	1,650	180	1,830	20	85	10	37,450	56,175	112,350	233,000

Given the island's water shortage, a dual water system (potable/non-potable irrigation) is seen as appropriate and inevitable by the DOE for our facilities at Kihei High School, and the use of low-flow or ultra low-flow fixtures is to be incorporated in the various campus buildings. A preliminary breakdown of proposed building fixture units is attached.

The project will also be designed for sustainability by incorporating Water Efficiency criteria in accordance with the Leadership in Environmental and Energy Design (LEED) rating system. While a swimming pool and auditorium are shown on the concept master plan, construction of these elements is not anticipated within the next 10 years. However, the estimated average of 20 GPD/student (potable water) does take into account the full build out of both facilities (pool and auditorium) at design population, which is significantly less than the County domestic consumption guideline of 60 GPCD/student.

Our consultants have also begun communication with the Department of Environmental Management regarding the feasibility of obtaining an R-1 water supply for landscape irrigation at the school site. Early indications are that the irrigation demand can be supplied by non-potable R-1 effluent from the nearby Kihei Wastewater Reclamation Facility, though hydraulic modeling and a plant equipment assessment must also be performed.

We understand that there is no existing water meter service at either of the two properties that could be available for the proposed school use. Please advise us of the following issues critical in our project planning efforts for Kihei High School:

1. Can the County's potable supply system adequately serve the proposed project in terms of source, storage, and distribution through the year 2020 (enrollment of 800 students) as indicated above?

Mr. Jeffrey K. Eng, Director
July 24, 2009
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2. Are there ongoing or planned County water system improvement projects in the vicinity of the project site? If so, please provide a timetable of the expected completion date(s) and comment on their potential support for our project.

3. If the County water system cannot adequately serve the proposed school development, will the project be subject to the water availability policy described in Chapters 14.12 and 18.04 of the Maui County Code?

Thank you in advance for your assistance with this matter. Please feel free to contact Robert Purdie, Jr. at 586-0408 should there be any questions.

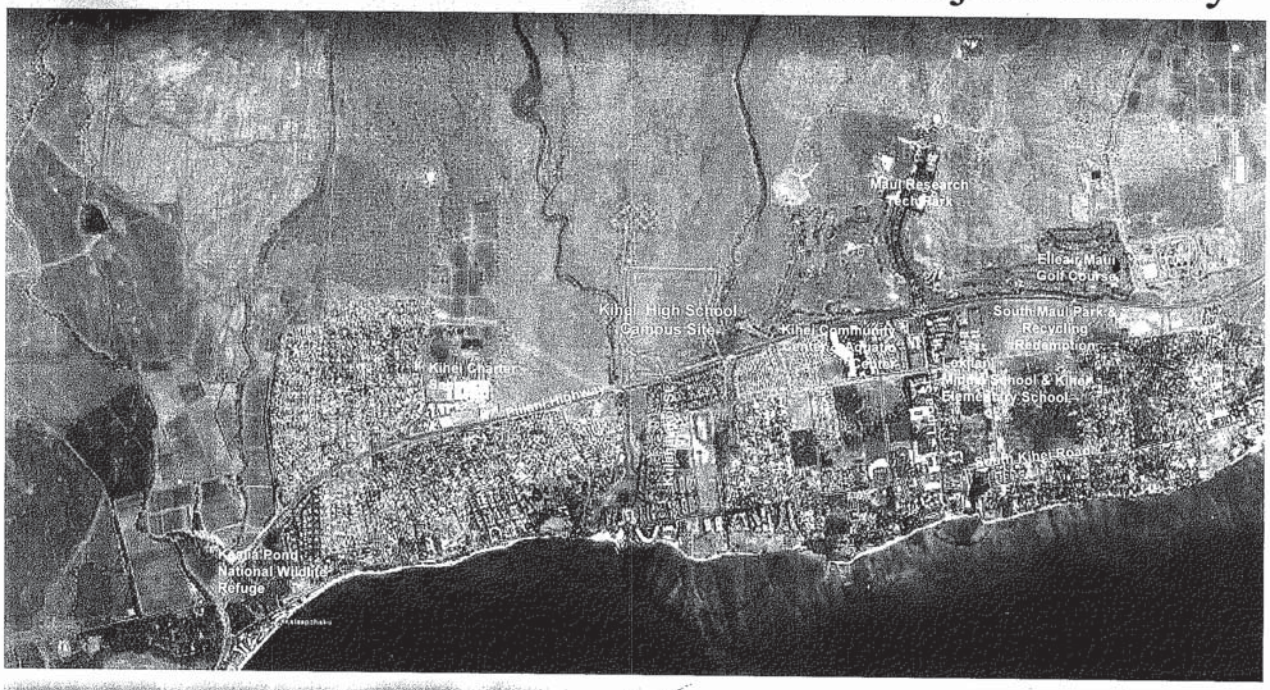
Very truly yours,

Duane Kashiwai
Public Works Administrator

Enclosures

c: Group 70 International
Tom Nance Water Resource Engineering
Gray, Hong, Nojima & Assoc.
FDB/Project Management Section (RP)

Aerial View of Project Vicinity



GROUP 70 INTERNATIONAL

Architecture Planning & Environmental Services Interior Design Assets Management

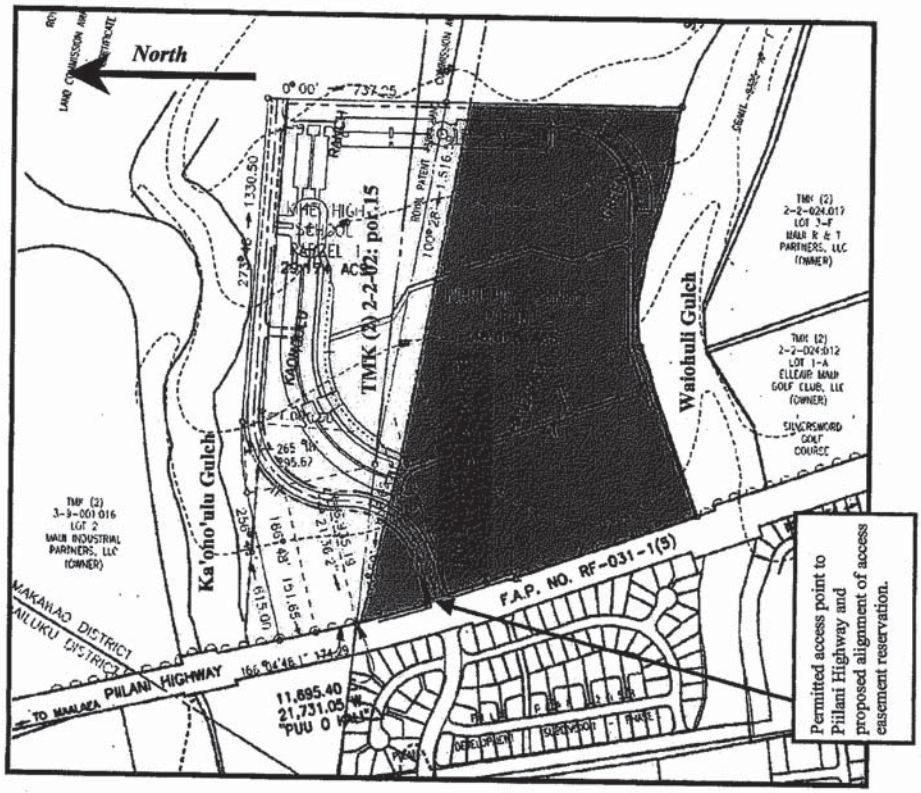


EXHIBIT B

Kihei High School

PLUMBING FIXTURE CALCULATION

6/25/2008													
8/9/2008	rev A												
8/20/2008	rev B												
9/8/2008	rev C												
9/16/2008	rev D												
7/17/2009	rev E												
			CW	CW	HW	HW	WASTE	WASTE					
FIXTURE		QTY	FU/EA	FU	FU/EA	FU	FU/EA	FU					
ADMINISTRATION													
	Men's												
	Water Closet (FV)	1	5.6	5.6	-	-	4	4					
	Urinal	1	2.8	2.8	-	-	4	4					
	Lavatory	1	1.2	1.2	-	-	1	1					
	Drinking Fountain	1	2.0	2	-	-	0.5	0.5					
	Floor Drain	0	-	-	-	-	2	0					
	Mop Sink	1	2.0	2	-	-	3	3					
	Ext Hose Bibb	4	0.5	2	-	-	-	-					
	Women's												
	Water Closet (FV)	1	5.6	5.6	-	-	4	4					
	Lavatory	1	1.2	1.2	-	-	1	1					
	Floor Drain	0	-	-	-	-	2	0					
	Health Room												
	Water Closet (FV)	1	5.6	5.6	-	-	4	4					
	Lavatory	1	1.2	1.2	-	-	1	1					
	Shower	1	1.6	1.6	1.6	1.6	2	2					
	Student Center												
	Water Closet (FV)	3	5.6	16.8	-	-	4	12					
	Lavatory	3	1.2	3.6	-	-	1	3					
	Floor Drain	0	-	-	-	-	2	0					
CLASSROOM A													
	Men's												
	Water Closet (FV)	8	5.6	44.8	-	-	4	32					
	Urinal	6	2.8	16.8	-	-	4	24					
	Lavatory	6	1.2	7.2	-	-	1	6					
	Drinking Fountain	2	2.0	4	-	-	0.5	1					
	Floor Drain	4	-	-	-	-	2	8					
	Mop Sink	2	2.0	4	-	-	3	6					
	Ext Hose Bibb	4	0.5	2	-	-	-	-					
	Int Hose Bibb	4	0.5	2	-	-	-	-					
	Women's												
	Water Closet (FV)	12	5.6	67.2	-	-	4	48					
	Lavatory	6	1.2	7.2	-	-	1	6					
	Floor Drain	4	-	-	-	-	2	8					

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Faculty Center (2 ea)							
Water Closet (FV)	4	5.6	22.4	-	-	4	16
Lavatory	4	1.2	4.8	-	-	1	4
Floor Drain	0	-	-	-	-	2	0
SPED Classroom (2 ea)							
Water Closet (FV)	4	5.6	22.4	-	-	4	16
Lavatory	2	1.2	2.4	-	-	1	2
Floor Drain	2	-	-	-	-	2	4
Shower	2	1.6	3.2	1.6	3.2	2	4
Laundry Tray	1	2.0	2	2.0	2	2	2
Washer Box	1	2.0	2	2.0	2	2	2
Laboratory (2 ea)							
Sinks	16	1.6	25.6	-	-	2	32
Large sink	2	1.6	3.2	-	-	2	4
ADA sink	2	1.6	3.2	-	-	2	4
Teacher Demo sink	2	1.6	3.2	-	-	2	4
Prep Rm sink	1	1.6	1.6	-	-	3	3
CLASSROOM B							
Men's							
Water Closet (FV)	8	5.6	44.8	-	-	4	32
Urinal	6	2.8	16.8	-	-	4	24
Lavatory	6	1.2	7.2	-	-	1	6
Drinking Fountain	2	2.0	4	-	-	0.5	1
Floor Drain	4	-	-	-	-	2	8
Mop Sink	2	2.0	4	-	-	3	6
Ext Hose Bibb	4	0.5	2	-	-	-	-
Int Hose Bibb	4	0.5	2	-	-	-	-
Women's							
Water Closet (FV)	12	5.6	67.2	-	-	4	48
Lavatory	6	1.2	7.2	-	-	1	6
Floor Drain	4	-	-	-	-	2	8
Faculty Center (2 ea)							
Water Closet (FV)	4	5.6	22.4	-	-	4	16
Lavatory	4	1.2	4.8	-	-	1	4
Floor Drain	0	-	-	-	-	2	0
SPED Classroom (2 ea)							
Water Closet (FV)	4	5.6	22.4	-	-	4	16
Lavatory	2	1.2	2.4	-	-	1	2
Floor Drain	2	-	-	-	-	2	4
Shower	2	1.6	3.2	1.6	3.2	2	4
Laundry Tray	1	2.0	2	2.0	2	2	2
Washer Box	1	2.0	2	2.0	2	2	2
Laboratory (2 ea)							
Sinks	16	1.6	25.6	-	-	2	32

Large sink	2	1.6	3.2	-	-	2	4
ADA sink	2	1.6	3.2	-	-	2	4
Teacher Demo sink	2	1.6	3.2	-	-	2	4
Prep Rm sink	1	1.6	1.6	-	-	3	3
CLASSROOM C							
Men's							
Water Closet (FV)	8	5.6	44.8	-	-	4	32
Urinal	6	2.8	16.8	-	-	4	24
Lavatory	6	1.2	7.2	-	-	1	6
Drinking Fountain	2	2.0	4	-	-	0.5	1
Floor Drain	4	-	-	-	-	2	8
Mop Sink	2	2.0	4	-	-	3	6
Ext Hose Bibb	4	0.5	2	-	-	-	-
Int Hose Bibb	4	0.5	2	-	-	-	-
Women's							
Water Closet (FV)	12	5.6	67.2	-	-	4	48
Lavatory	6	1.2	7.2	-	-	1	6
Floor Drain	4	-	-	-	-	2	8
Faculty Center (2 ea)							
Water Closet (FV)	4	5.6	22.4	-	-	4	16
Lavatory	4	1.2	4.8	-	-	1	4
Floor Drain	0	-	-	-	-	2	0
SPED Classroom (2 ea)							
Water Closet (FV)	4	5.6	22.4	-	-	4	16
Lavatory	2	1.2	2.4	-	-	1	2
Floor Drain	2	-	-	-	-	2	4
Shower	2	1.6	3.2	1.6	3.2	2	4
Laundry Tray	1	2.0	2	2.0	2	2	2
Washer Box	1	2.0	2	2.0	2	2	2
Laboratory (2 ea)							
Sinks	16	1.6	25.6	-	-	2	32
Large sink	2	1.6	3.2	-	-	2	4
ADA sink	2	1.6	3.2	-	-	2	4
Teacher Demo sink	2	1.6	3.2	-	-	2	4
Prep Rm sink	1	1.6	1.6	-	-	3	3
CLASSROOM D							
Men's							
Water Closet (FV)	8	5.6	44.8	-	-	4	32
Urinal	6	2.8	16.8	-	-	4	24
Lavatory	6	1.2	7.2	-	-	1	6
Drinking Fountain	2	2.0	4	-	-	0.5	1
Floor Drain	4	-	-	-	-	2	8
Mop Sink	2	2.0	4	-	-	3	6
Ext Hose Bibb	4	0.5	2	-	-	-	-
Int Hose Bibb	4	0.5	2	-	-	-	-

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Women's							
Water Closet (FV)	12	5.6	67.2	-	-	4	48
Lavatory	6	1.2	7.2	-	-	1	6
Floor Drain	4	-	-	-	-	2	8
Faculty Center (2 ea)							
Water Closet (FV)	4	5.6	22.4	-	-	4	16
Lavatory	4	1.2	4.8	-	-	1	4
Floor Drain	0	-	-	-	-	2	0
SPED Classroom (2 ea)							
Water Closet (FV)	4	5.6	22.4	-	-	4	16
Lavatory	2	1.2	2.4	-	-	1	2
Floor Drain	2	-	-	-	-	2	4
Shower	2	1.6	3.2	1.6	3.2	2	4
Laundry Tray	1	2.0	2	2.0	2	2	2
Washer Box	1	2.0	2	2.0	2	2	2
Laboratory (2 ea)							
Sinks	16	1.6	25.6	-	-	2	32
Large sink	2	1.6	3.2	-	-	2	4
ADA sink	2	1.6	3.2	-	-	2	4
Teacher Demo sink	2	1.6	3.2	-	-	2	4
Prep Rm sink	1	1.6	1.6	-	-	3	3
LIBRARY							
Men's							
Water Closet (FV)	1	5.6	5.6	-	-	4	4
Urinal	1	2.8	2.8	-	-	4	4
Lavatory	1	1.2	1.2	-	-	1	1
Drinking Fountain	1	2.0	2	-	-	0.5	0.5
Floor Drain	0	-	-	-	-	2	0
Mop Sink	1	2.0	2	-	-	3	3
Ext Hose Bibb	4	0.5	2	-	-	-	-
Women's							
Water Closet (FV)	1	5.6	5.6	-	-	4	4
Lavatory	1	1.2	1.2	-	-	1	1
Floor Drain	0	-	-	-	-	2	0
Workroom							
Kitchen Sink	1	1.6	1.6	-	-	2	2
MUSIC BUILDING							
Men's							
Water Closet (FV)	1	5.6	5.6	-	-	4	4
Urinal	1	2.8	2.8	-	-	4	4
Lavatory	1	1.2	1.2	-	-	1	1
Drinking Fountain	1	2.0	2	-	-	0.5	0.5
Floor Drain	0	-	-	-	-	2	0
Mop Sink	1	2.0	2	-	-	3	3
Ext Hose Bibb	4	0.5	2	-	-	-	-

Women's							
Water Closet (FV)	1	5.6	5.6	-	-	4	4
Lavatory	1	1.2	1.2	-	-	1	1
Floor Drain	0	-	-	-	-	2	0
Faculty Rm							
Water Closet (FV)	1	5.6	5.6	-	-	4	4
Lavatory	1	1.2	1.2	-	-	1	1
Floor Drain	0	-	-	-	-	2	0
Workroom							
Kitchen Sink	2	1.6	3.2	-	-	2	4
TECHNOLOGY/ELECTIVES CENTER							
Men's							
Water Closet (FV)	8	5.6	44.8	-	-	4	32
Urinal	6	2.8	16.8	-	-	4	24
Lavatory	6	1.2	7.2	-	-	1	6
Drinking Fountain	2	2.0	4	-	-	0.5	1
Floor Drain	4	-	-	-	-	2	8
Mop Sink	4	2.0	8	-	-	3	12
Ext Hose Bibb	4	0.5	2	-	-	-	-
Int Hose Bibb	4	0.5	2	-	-	-	-
Women's							
Water Closet (FV)	12	5.6	67.2	-	-	4	48
Lavatory	6	1.2	7.2	-	-	1	6
Floor Drain	4	-	-	-	-	2	8
Mop Sink	0	2.0	0	-	-	3	0
Faculty Rm							
Water Closet (FV)	1	5.6	5.6	-	-	4	4
Lavatory	1	1.2	1.2	-	-	1	1
Floor Drain	0	-	-	-	-	2	0
Arts & Crafts							
Sinks	4	1.6	6.4	-	-	2	8
ATHLETIC LOCKERS							
Men's							
Water Closet (FV)	4	5.6	22.4	-	-	4	16
Urinal	3	2.8	8.4	-	-	4	12
Lavatory	3	1.2	3.6	-	-	1	3
Shower	9	1.6	14.4	1.6	14.4	2	18
Drinking Fountain	1	2.0	2	-	-	0.5	0.5
Floor Drain	9	-	-	-	-	2	18
Mop Sink	1	2.0	2	-	-	3	3
Int Hose Bibb	1	0.5	0.5	-	-	-	-
Women's							
Water Closet (FV)	6	5.6	33.6	-	-	4	24

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Lavatory	3	1.2	3.6	-	-	1	3
Shower	9	1.6	14.4	1.6	14.4	2	18
Floor Drain	9	-	-	-	-	2	18
Int Hose Bibb	1	0.5	0.5	-	-	-	-
PE FACILITY							
Men's Lockers							
Water Closet (FV)	4	5.6	22.4	-	-	4	16
Urinal	3	2.8	8.4	-	-	4	12
Lavatory	3	1.2	3.6	-	-	1	3
Shower	9	1.6	14.4	1.6	14.4	2	18
Drinking Fountain	2	2.0	4	-	-	0.5	1
Floor Drain	4	-	-	-	-	2	8
Mop Sink	1	2.0	2	-	-	3	3
Int Hose Bibb	1	0.5	0.5	-	-	-	-
Locker Women's							
Water Closet (FV)	6	5.6	33.6	-	-	4	24
Lavatory	3	1.2	3.6	-	-	1	3
Shower	4	1.6	6.4	1.6	6.4	2	8
Floor Drain	4	-	-	-	-	2	8
Int Hose Bibb	1	0.5	0.5	-	-	-	-
Faculty Rm (2 ea)							
Water Closet (FV)	2	5.6	11.2	-	-	4	8
Lavatory	2	1.2	2.4	-	-	1	2
Shower	2	1.6	3.2	1.6	3.2	2	4
Floor Drain	0	-	-	-	-	2	0
GYMNASIUM							
Men's Lockers							
Water Closet (FV)	4	5.6	22.4	-	-	4	16
Urinal	3	2.8	8.4	-	-	4	12
Lavatory	3	1.2	3.6	-	-	1	3
Shower	9	1.6	14.4	1.6	14.4	2	18
Drinking Fountain	2	2.0	4	-	-	0.5	1
Floor Drain	4	-	-	-	-	2	8
Mop Sink	1	2.0	2	-	-	3	3
Int Hose Bibb	1	0.5	0.5	-	-	-	-
Locker Women's							
Water Closet (FV)	6	5.6	33.6	-	-	4	24
Lavatory	3	1.2	3.6	-	-	1	3
Shower	4	1.6	6.4	1.6	6.4	2	8
Floor Drain	4	-	-	-	-	2	8
Int Hose Bibb	1	0.5	0.5	-	-	-	-
Men's							
Water Closet (FV)	4	5.6	22.4	-	-	4	16
Urinal	3	2.8	8.4	-	-	4	12
Lavatory	3	1.2	3.6	-	-	1	3
Drinking Fountain	1	2.0	2	-	-	0.5	0.5

Floor Drain	2	-	-	-	-	2	4
Mop Sink	1	2.0	2	-	-	3	3
Hose Bibb	2	0.5	1	-	-	-	-
Women's							
Water Closet (FV)	6	5.6	33.6	-	-	4	24
Lavatory	3	1.2	3.6	-	-	1	3
Floor Drain	2	-	-	-	-	2	4
OUTDOOR FACILITIES							
Men's							
Water Closet (FV)	4	5.6	22.4	-	-	4	16
Urinal	3	2.8	8.4	-	-	4	12
Lavatory	3	1.2	3.6	-	-	1	3
Drinking Fountain	1	2.0	2	-	-	0.5	0.5
Floor Drain	2	-	-	-	-	2	4
Mop Sink	1	2.0	2	-	-	3	3
Int Hose Bibb	2	0.5	1	-	-	-	-
Ext Hose Bibb	2	0.5	1	-	-	-	-
Women's							
Water Closet (FV)	6	5.6	33.6	-	-	4	24
Lavatory	3	1.2	3.6	-	-	1	3
Floor Drain	2	-	-	-	-	2	4
Concessions							
Sink	1	2.0	2	2.0	2	0	0
Hand Sink	2	0.6	1.2	0.6	1.2	1	2
Ice Machine	1	0.5	0.5	-	-	0	0
Floor Drain	1	-	-	-	-	2	2
CAFETERIA							
Kitchen							
Sink	2	2.0	4	2.0	4	0	0
3-Comp Sink (faucet)	1	4.0	4	4.0	4	0	0
Pot Sink (faucets)	1	6.0	6	6.0	6	6	6
Fill Faucet	4	2.0	8	2.0	8	0	0
Steam Supply	1	0.5	0.5	0.0	0	0	0
Service Faucet	2	3.0	6	3.0	6	0	0
Hand Sink	2	0.6	1.2	0.6	1.2	1	2
Laundry Tray	1	2.0	2	2.0	2	2	2
Washer Box	1	2.0	2	2.0	2	2	2
Trough drain	4	-	-	-	-	6	24
Floor Sink	4	-	-	-	-	3	12
Floor Drain	9	-	-	-	-	2	18
Can Wash Drain	1	-	-	-	-	3	3
Ext Hose Bibb	4	0.5	2	-	-	-	-
Staff							
Sink	1	1.6	1.6	1.6	1.6	2	2
Water Closet (FV)	3	3.4	10.2	-	-	3	9

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Lavatory	3	0.6	1.8	-	-	1	3
Shower	1	1.6	1.6	1.6	1.6	2	2
Student							
Water Closet (FV)	4	5.6	22.4	-	-	4	16
Urinal	2	2.8	5.6	-	-	4	8
Lavatory	4	1.2	4.8	-	-	1	4
Drinking Fountain	1	2.0	2	-	-	0.5	0.5
Floor Drain	2	-	-	-	-	2	4
Mop Sink	1	2.0	2	-	-	3	3
		Total	1851.4	FU	143.6	FU	1806.5
			310	gpm			
			24,800	gal/day			
30% reduction			7,440				
			17,360	**gal/day**			
By enrollment	1650	students	15	gal/student	=	24,750	gal/day
				30% reduction		7,425	
						17,325	**gal/day**
SWIMMING POOL & HEADHOUSE (FUTURE)							
Men's							
Water Closet (FV)	4	5.6	22.4	-	-	4	16
Urinal	3	2.8	8.4	-	-	4	12
Lavatory	3	1.2	3.6	-	-	1	3
Drinking Fountain	3	2.0	6	-	-	0.5	1.5
Floor Drain	2	-	-	-	-	2	4
Mop Sink	1	2.0	2	-	-	3	3
Hose Bibb	4	0.5	2	-	-	-	-
Women's							
Water Closet (FV)	6	5.6	33.6	-	-	4	24
Lavatory	3	1.2	3.6	-	-	1	3
Floor Drain	2	-	-	-	-	2	4
Swimming Pool							
Pool Utilities	***1***	***100.0***	***100***	***-***	***-***	***100***	***100***
AUDITORIUM (FUTURE)							
Men's							
Water Closet (FV)	4	5.6	22.4	-	-	4	16
Urinal	3	2.8	8.4	-	-	4	12
Lavatory	3	1.2	3.6	-	-	1	3
Drinking Fountain	1	2.0	2	-	-	0.5	0.5
Floor Drain	2	-	-	-	-	2	4
Mop Sink	1	2.0	2	-	-	3	3
Hose Bibb	4	0.5	2	-	-	-	-

Women's							
Water Closet (FV)	6	5.6	33.6	-	-	4	24
Lavatory	3	1.2	3.6	-	-	1	3
Floor Drain	2	-	-	-	-	2	4

H:\HNL0802900P Kihei High School\1 - Mechanical\2 - Calculations\HNL0802900.1.2.SHI80916 Kihei HS Plumbing Fixt Calc rev E.xls

CHARMAINE TAVARES
MAYOR

OUR REFERENCE
YOUR REFERENCE

POLICE DEPARTMENT
COUNTY OF MAUI

55 MAHALANI STREET
WAILUKU, HAWAII 96793
(808) 244-6400
FAX (808) 244-6411

GARY A. YABUTA
CHIEF OF POLICE

CLAYTON N.Y.W. TOM
DEPUTY CHIEF OF POLICE

November 24, 2009

Ms. Christine Mendes Ruotola, AICP, LEED AP
Principal
Group 70 International, Inc.
925 Bethel Street, 5th Floor
Honolulu, HI 96813-4307

Dear Ms. Mendes Ruotola:

SUBJECT: Kihei High School Project
Environmental Impact Statement Preparation Notice

This is in response to your letter dated November 5, 2009, requesting comments on the above subject.

We have reviewed the information provided and have enclosed our concerns regarding this project. Thank you for giving us the opportunity to provide our comments.

Very truly yours,

Assistant Chief Danny J. Matsuura
for: Gary A. Yabuta
Chief of Police

Enclosure

c: Jeffrey Hunt, Planning Department

COPY

Concur w/ofc Hickle
DJM 11/24/09

TO : GARY YABUTA, CHIEF OF POLICE, COUNTY OF MAUI

VIA : CHANNELS

FROM : BRAD HICKLE. POLICE OFFICER III, DISTRICT VI KIHEI

SUBJECT : ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE FOR THE KIHEI HIGH SCHOOL

APPLICANT INFORMATION:

The applicant, State of Hawaii, Facilities Development Branch has submitted the Environmental Impact Statement Preparation Notice. The documents were prepared pursuant to the EIS law (Chapter 343, HRS and Chapter 11-200, HAR).

POLICE CONCERNS:

Please refer to Officer's report submitted via channels on 09/01/09 referring to the above requested information.

Respectfully Submitted,

Officer Brad Hickle E-9966
11/20/09 14:15 hours

COMMENTS:
OFF. B. HICKLE ATTENDED A PRE-PLANNING MEETING AND SUBMITTED WRITTEN COMMENTS PRIOR TO THIS. COPIES ATTACHED.
11/20/09

COPY

TO : **GARY YABUTA, CHIEF OF POLICE, COUNTY OF MAUI**

VIA : **CHANNELS**

FROM : **BRAD HICKLE, POLICE OFFICER III, DISTRICT VI KIHEI**

SUBJECT : **PRE-CONSUTATION REQUEST IN PREPARATION FOR AN ENVIRONMENTAL IMPACT STATEMENT (EIS) FOR THE PROPOSED KIHEI HIGH SCHOOL PROJECT**

APPLICANT INFORMATION:

The applicant, Group 70 International, Inc. has submitted this pre-consultation request for this project in preparation for an Environmental Impact Statement (EIS).

The proposed new Kihei High School will be built upon 77 acres of undeveloped land located above Piilani Highway in Kihei. The project will include the construction of educational buildings to eventually support an enrollment capacity of 1,650 students.

The project will also include associated athletic fields and infrastructure improvements.

POLICE CONCERNS:

It is suspected there will be a large volume of parents, students and faculty entering and exiting the school grounds from Piilani Highway at all hours of the day. This will likely pose the most threat to students and top the list of public safety concerns by the general public as well as the Police.

There are a large number of new homes recently constructed on the "makai", west side of Piilani Highway and plans for additional new housing to be constructed in the area of the proposed school as well. Most likely these new homes will provide a large percentage of the students who will be attending the new high school in the future. Some of the students will choose to walk to school, some may be bussed and some may even drive themselves to school.

Traffic calming devices, such as traffic lights will be needed at the entry to the school on Piilani Highway. Furthermore the developer should consider construction of walkway bridges over the highway to prevent pedestrian/motor vehicle interaction. These types of walkways are used in many locations on the Island of Oahu and are proven to be safe avenues of travel for students as well as the general public.

Although Piilani Highway has a posted speed limit of forty (40) miles per hour I have regularly cited drivers for speeding in excess of sixty (60) miles per hour through this area. Although enforcement is vigilant and continual speeders will continue to ignore the law. It is my belief, separating vehicle traffic from pedestrians is essential in the area.

COPY

RECOMMENDATIONS:

It is recommended that this response be returned to the Group 70 International, Inc. for their review and consideration in this matter.

Respectfully Submitted,

Officer Brad Hickle E-9966
09/01/09 13:45 hours

COMMENTS:

I CONCUR WITH OFFICER B. HICKLE'S CONCERNS REGARDING VEHICLE AND PEDESTRIAN SEPARATION. I WOULD LIKE TO ADD THAT A SEPARATED PEDESTRIAN SIDEWALK BE CREATED ON THE MAKAI SHOULDER (SOUTHBOUND LANE) FROM THE INTERSECTION OF KULANIHAKOI STREET TO PIIKEA AVENUE OR SOME SORT OF PATHWAY SIMILAR TO MOKULELE HIGHWAY.

09/01/09

COPY

GROUP 70
INTERNATIONAL

December 20, 2011

Gary A. Yabuta, Chief of Police
Attn: Danny J. Matsuura, Assistant Chief
County of Maui
Police Department
55 Mahalani Street
Wailuku, HI 96793

Subject: Response to Comments on the Environmental Impact Statement Preparation Notice for Proposed Kīhei High School Project
Tax Map Keys: 2-2-2-002:081; 2-2-2-002:083
(Kīhei, Maui, Hawai'i)

Dear Assistant Chief Matsuura:

Thank you for your comment letter dated November 24, 2009 concerning the Environmental Impact Statement (EIS) Preparation Notice for the proposed Kīhei High School Project.

We understand your concerns for public safety with an increase in the number of parents, students and faculty entering and exiting the school grounds from Pi'ilani Highway as a result of the proposed project.

A Traffic Impact Report/Traffic Signal Warrant Study was prepared for the Kīhei High School Project. The studies provide recommendations to accommodate the increased travel near the proposed school site and surrounding areas. Your suggestions of traffic calming devices and construction of walkways and sidewalks to separate vehicles from pedestrian are noted and will be considered in the project design.

We appreciate your participation in the environmental review process. Your comment letter and this response will be included in the Draft EIS.

Sincerely,
GROUP 70 INTERNATIONAL, INC.

Christine Mendes Ruotola, AICP, LEED AP
Principal

HALEAKALA RANCH
• EST. MAUI 1888 •

December 7, 2009

Ms. Christine Ruotola, AICP
Group 70 International, Inc.
925 Bethel Street, 5th Floor
Honolulu, HI 96813

SUBJECT: KIHEI HIGH SCHOOL EISPN

Dear Ms. Ruotola,

Haleakala Ranch is one of the landowners that is making land available for the campus and supporting the State Department of Education's (DOE) effort to develop the Kihei High School.

Haleakala Ranch and Kaonoulu Ranch have undertaken a joint master plan for North Kihei (also referred to as Kihei Mauka). In response to community planning efforts for the updating of the Maui General Plan, this area was identified as a directed growth area for community development in the recently completed Maui Island Plan. We feel it is important that the campus planning and related EIS reflect the regional planning directives included in the County Planning Department's recommendations for the Maui Island Plan (Draft 10/2009).

The EIS should discuss the relevant land use policies and regional infrastructure plans addressed in the Maui Island Plan for North Kihei. Some of the key planning and related infrastructure policies include:

1) Future Kihei Mauka By-Pass Highway. To plan for future access alternatives to the campus, the extension of Kulanihakoi Street would likely extend mauka to connect to the planned Mauka Highway. Please reference the North Kihei Conceptual Master Plan that has previously been provided to you by our planning consultant, PBR HAWAII.

2) Extension of Kulanihakoi Street. Plan sufficient infrastructure through the campus that will provide access to and serve as a collector road for future community growth mauka of the campus. Necessary upsizing of the infrastructure would be coordinated with the surrounding landowners so that it can be implemented concurrent with the campus development.

3) Planned North-South Connector Road. Plan for an alternate access route to the campus to provide for a more connected roadway system to serve North Kihei. A North-South Connector Road is planned to extend from the planned Kihei-Upcountry Highway (extension of Kaonoulu Street) to the lands mauka of the campus.

4) Pedestrian/Bike Path Connectivity. The proposed North Kihei community plan includes a network of pedestrian/bike paths and stream greenways that can be coordinated to connect to the campus.

We look forward to continuing a coordinated planning effort with the DOE for North Kihei to achieve a well connected and planned community. Thank you for the opportunity to comment and should you have any questions, please contact me.

Sincerely,

Don Young, President/CEO
Haleakala Ranch

Cc: Mr. Robert Purdie, Jr., Project Manager
State Department of Education
Facilities Development Branch
P.O. Box 2360
Honolulu, HI 96804

Thomas S. Witten, ASLA
PBR HAWAII
1001 Bishop Street, Suite 650
Honolulu, HI 96813

GROUP 70
INTERNATIONAL

December 20, 2011

Don Young, President/CEO
Haleakalā Ranch Company
529 Kealaloa Avenue
Makawao, HI 96768

Subject: Response to Comments on the Environmental Impact Statement Preparation Notice for Proposed Kīhei High School Project
Tax Map Keys: 2-2-2-002:081; 2-2-2-002:083
(Kīhei, Maui, Hawai'i)

Dear Mr. Young:

Thank you for your comment letter dated December 7, 2009 concerning the Environmental Impact Statement (EIS) Preparation Notice for the proposed Kīhei High School Project.

We appreciate your participation and take note that Haleakalā Ranch is one of the landowners making land available for the campus and the State Department of Education (DOE) to develop the proposed Kīhei High School. It is understood that Haleakalā Ranch and Kaonoulu Ranch are undertaking a joint master plan for their lands in North Kīhei, referred to as Kīhei Mauka and identified within the Urban Growth Boundary on the Draft 2030 Maui Island Plan, Maui County Planning Department, Directed Growth Map for North Kīhei (December 2009).

The following are offered in response to your provided comments. As consultants, we will continue to support coordinated planning efforts between DOE and the landowners. The proposed project will demonstrate overall consistency with the applicable plans and policies of the Maui General Plan 2030, which include the recently adopted Countywide Policy Plan and Draft Maui Island Plan.

We appreciate your participation in the environmental review process. Your comment letter and this response will be included in the Draft EIS.

Sincerely,
GROUP 70 INTERNATIONAL, INC.

Christine Mendes Ruotola, AICP, LEED AP
Principal

Cc: Mr. Robert Purdie Jr. Project Manager
State Department of Education
Facilities Development Branch
P.O. Box 2360
Honolulu, HI 96804

KAONOULU RANCH
P. O. Box 390
Kula, Hawaii 96790
[Office] 808 876-0400 [Fax] 808 876-0422

December 8, 2009

Ms. Christine Ruotola, AICP
Group 70 International, Inc.
925 Bethel Street, 5th Floor
Honolulu, HI 96813

SUBJECT: KIHEI HIGH SCHOOL EISPN

Dear Ms. Ruotola,

Kaonoulu Ranch has been cooperating and supporting the State Department of Education's (DOE) effort to develop the Kihei High School and is one of the landowners that is making land available for the campus.

Concurrent with DOE's efforts, Kaonoulu Ranch and Haleakala Ranch have undertaken a joint master plan for the surrounding lands. This area, referred to as North Kihei or Kihei Mauka, was identified as a directed growth area for community development in the recently completed Maui Island Plan that is currently under review by the Maui County Council. We feel it is important that the campus planning and related EIS reflect the regional planning directives included in the County Planning Department's recommendations for the Maui Island Plan (Draft 10/2009).

Specifically, the EIS should discuss the relevant land use and infrastructure plans addressed in the Maui Island Plan including the following:

1) Extension of Kulanihakoi Street with sufficient infrastructure through the campus that will provide access to and serve as a collector road for future community growth mauka of the campus. Any necessary upsizing of the infrastructure would be coordinated with the surrounding landowners so that it can be implemented concurrent with the campus development.

2) Future Kihei Mauka By-Pass Highway that the extension of Kulanihakoi Street would likely connect with will provide future multiple access routes to the campus.

3) Planned North-South Connector Road, that would extend from the planned Kihei-Up Country Highway (extension of Kaonoulu Street), would also provide an alternate access route to the campus and provide for a more connected roadway system to serve North Kihei.

4) Integration of the campus plans into the proposed North Kihei community plans, including pedestrian/bike paths connections. Refer to attached North Kihei Conceptual Master Plan July 15, 2009.

We look forward to continuing a coordinated planning effort with DOE as the detailed campus plans are developed. Thank you for the opportunity to comment and should you have any questions, please contact me.

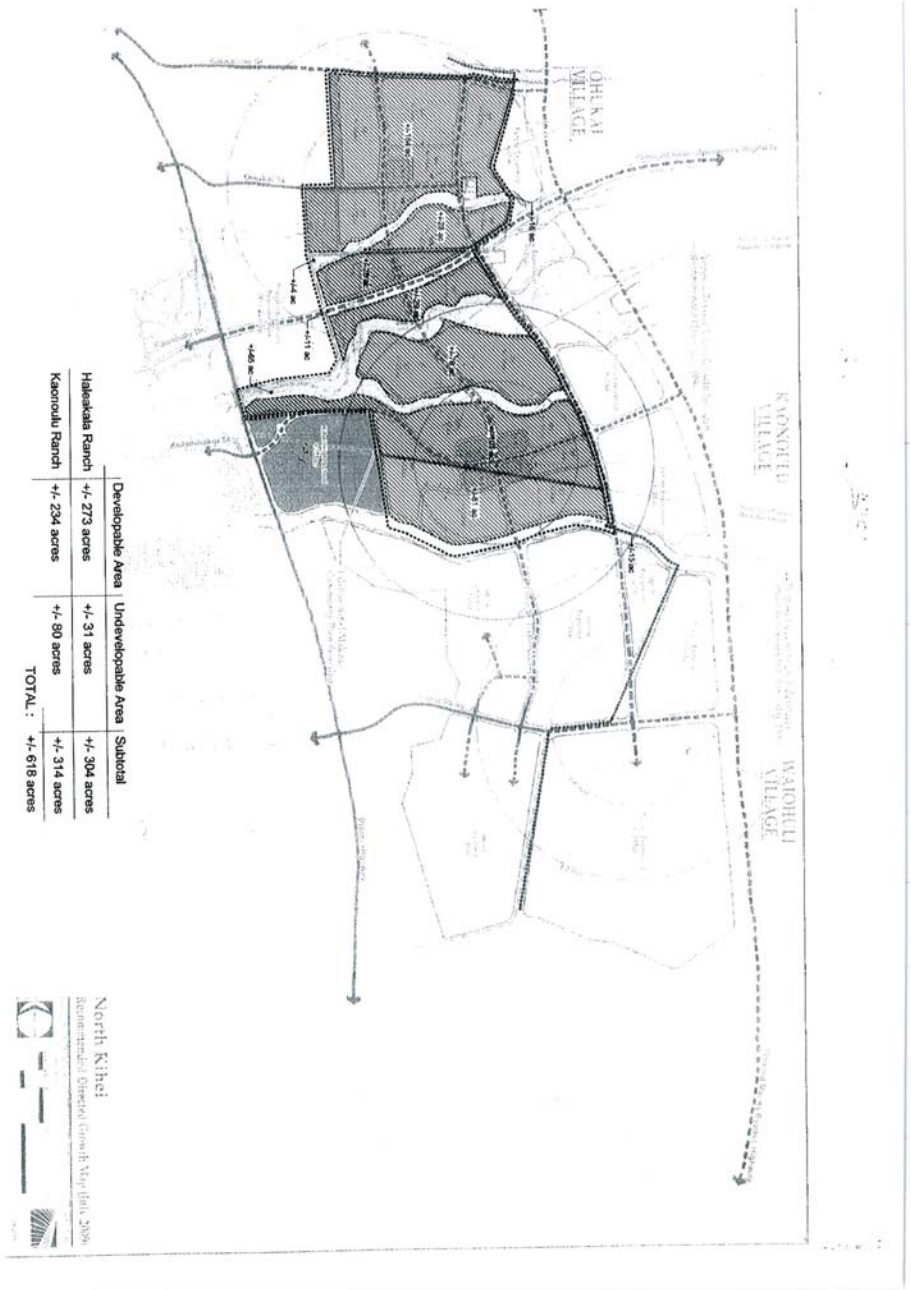
Aloha,

Henry F. Rice
Managing Partner, Kaonoulu Ranch LLLP

Cc: Mr. Robert Purdie, Jr., Project Manager
State Department of Education
Facilities Development Branch
P.O. Box 2360
Honolulu, HI 96804

Attachment

2789.01/BL-01 Kaonoulu Ranch



	Developable Area	Undevelopable Area	Subtotal
Haleakala Ranch	+/- 273 acres	+/- 31 acres	+/- 304 acres
Kaonoulu Ranch	+/- 234 acres	+/- 80 acres	+/- 314 acres
TOTAL :			+/- 618 acres

GROUP 70 INTERNATIONAL

December 20, 2011

Henry F. Rice, Managing Partner
Kaonoulu Ranch LLP
P.O. Box 390
Kula, HI 96790

Subject: Response to Comments on the Environmental Impact Statement Preparation Notice for Proposed Kīhei High School Project
Tax Map Keys: 2-2-2-002:081; 2-2-2-002:083
(Kīhei, Maui, Hawai'i)

Dear Mr. Rice:

Thank you for your comment letter dated December 8, 2009 concerning the Environmental Impact Statement (EIS) Preparation Notice for the proposed Kīhei High School Project.

We appreciate your participation and take note that Kaonoulu Ranch is one of the landowners making land available for the campus and the State Department of Education (DOE) to develop the proposed Kīhei High School. It is understood that Kaonoulu Ranch and Haleakalā Ranch are undertaking a joint master plan for their land in North Kīhei, referred to as Kīhei Mauka, and that the area is identified as a directed growth area for community development in the Draft 2030 Maui Island Plan (December 2009).

As consultants we will continue to support coordinated planning efforts between DOE and the landowners regarding infrastructure in the Kūlanihāko'i Street extension.

Thank you for providing a copy of your latest master plan concept. The Draft EIS will discuss land use policies and regional infrastructure plans identified in the Draft 2030 Maui Island Plan for Kīhei.

We appreciate your participation in the environmental review process. Your comment letter and this response will be included in the Draft EIS.

Sincerely,
GROUP 70 INTERNATIONAL, INC.

Christine Mendes Ruotola, AICP, LEED AP
Principal

Cc: Mr. Robert Purdie Jr. Project Manager
State Department of Education
Facilities Development Branch
P.O. Box 2360
Honolulu, HI 96804

United States Department of the Interior

U.S. GEOLOGICAL SURVEY
Pacific Islands Water Science Center
677 Ala Moana Blvd., Suite 415
Honolulu, Hawaii 96813
Phone: (808) 587-2400/Fax: (808) 587-2401

RECEIVED
JAN 20 2012
GROUP 70 INTL

January 19, 2012

Mr. Robert Purdie, Jr.
State of Hawaii, Department of Education
Facilities Development Branch
P.O. Box 2360
Honolulu, Hawaii 96804

Dear Mr. Purdie:

Subject: Kihei High School Draft Environmental Impact Statement (DEIS), Island of Maui, Kihei-Makena District, Tax Map Key (s): 2-2-2-002: 81, 2-2-2-002: 83

Thank you for forwarding the subject DEIS for review and comment by the staff of the U.S. Geological Survey Pacific Islands Water Science Center. We regret however, that due to prior commitments and lack of available staff, we are unable to review this document.

We appreciate the opportunity to participate in the review process.

Sincerely,

Stephen S. Anthony
Center Director

cc: Christine Mendes Ruotola, AICP, LEED AP, Group 70 International, Inc.

GROUP 70 INTERNATIONAL

September 5, 2012

Mr. Stephen S. Anthony, Center Director
United States Department of the Interior
U.S. Geological Survey
Pacific Islands Water Science Center
677 Ala Moana Blvd., Suite 415
Honolulu, HI 96813

Subject: Response to Comments on the Draft Environmental Impact Statement for the Proposed Kīhei High School

Aloha Mr. Anthony:

Thank you for your comment letter dated January 19, 2012 concerning the Draft Environmental Impact Statement (EIS) for the proposed Kīhei High School Project. We understand that the U.S. Geological Survey Pacific Islands Water Science Center staff is unable to review the Draft EIS for the proposed project at this time.

We appreciate your participation in the environmental review process. You will receive a copy of the Final EIS.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Christine Mendes Ruotola, AICP, LEED AP
Principal

From: Tim_Langer@fws.gov [mailto:Tim_Langer@fws.gov]
Sent: Monday, February 13, 2012 9:53 AM
To: Christine Ruotola
Subject: Response to Draft Environmental Impact Statement for Proposed Kihei High School, Maui
Importance: High

Dear Ms. Ruotola,

I sincerely apologize for the lateness of our comments, which were requested by Februrary 5. If possible, please incorporate them into your environmental review process. Thank you, Tim.

The U.S. Fish and Wildlife Service received your letter and accompanying Draft Environmental Impact Statement (DEIS) on December 21, 2011, requesting comment on the proposed construction of the new Kihei High School at TMKs 222002:81 and 222002:83 on Maui. The proposed parcel is currently undeveloped and, according to photographs and botanical survey data included in the DEIS, is predominantly vegetated by exotic trees, shrubs, and grasses interspersed with bare ground.

Affected Species
Based on information you provided and pertinent information in our files, including data compiled by the Hawaii Biodiversity and Mapping Program, there are no designated critical habitats within the proposed project's action area. However, this action may impact three protected species that may use the area for foraging and/or breeding:

The endangered Hawaiian hoary bat (*Lasiurus cinereus semotus*) roosts in both exotic and native woody vegetation and, while foraging, leaves young unattended in "nursery" trees and shrubs. If trees or shrubs suitable for bat roosting are cleared during the breeding season, there is a risk that young bats could inadvertently be harmed or killed. As a result, woody plants greater than 15 feet (4.6 meters) tall should not be removed or trimmed between June 1 and September 15.

The threatened Newell's shearwater (*Puffinus auricularis newelli*) and the endangered Hawaiian petrel (*Pterodroma sandwichensis*) may traverse the project area when flying between the ocean and mountain nesting sites during their breeding season (March through December). Artificial lighting, such as street lights and flood lighting for athletic venues, can adversely impact seabirds by causing disorientation resulting in collision with utility lines, buildings, fences, and vehicles. Furthermore, exhausted birds have been known to "fall out" and become grounded. Too weak to fly, these birds become vulnerable to depredation by feral predators, such as dogs, cats, and mongoose.

Avoidance and Minimization Measures
The Service recommends that the applicant implement measures that minimize the amount of glare from outdoor lighting installations at the project site. Outdoor lighting should be constructed in a manner that fully shields lighting sources and directs light downwards. For guidance, we encourage the applicant to refer to the State of Hawaii's website dedicated to informing the public about seabird and lighting related issues:

http://www.state.hi.us/dlnr/dofaw/fbrp/shearwaterlights.htm

I would be happy to review your plan for outdoor lighting before you finalize it; thank you for the opportunity to comment on the DEIS. Sincerest regards, Tim.

~~~~~~

Tim Langer, Ph.D.
Branch Chief, Consultation and HCP Program
United States Fish and Wildlife Service
Pacific Islands Field Office
300 Ala Moana Boulevard, Room 3-122, Box 50088
Honolulu, Hawaii 96850

Direct line: (808) 792-9462
web page: http://www.fws.gov/pacificislands/
~~~~~~

GROUP 70
INTERNATIONAL

September 5, 2012

Mr. Tim Langer, Ph.D.,
Branch Chief Consultation and HCP Program
United States Fish and Wildlife Service (USFWS)
Pacific Islands Field Office
300 Ala Moana Blvd., Room 3-122, Box 50088
Honolulu, HI 96850

Subject: Response to Comments on the Draft Environmental Impact Statement for the Proposed Kīhei High School

Aloha Mr. Langer:

Thank you for your comment letter dated February 13, 2012 concerning the Draft Environmental Impact Statement (EIS) for the proposed Kīhei High School Project. We take note of your comments relating to the preparation of the Draft EIS for the proposed project. The following are offered in response to your comments:

Response 1: Hawaiian Hoary Bat Habitat
Although no critical habitats were identified within the project area, we understand the potential for Hawaiian hoary bat habitat exists on the site. A new section was added to the Final EIS in Chapter 4.1.7.2 Mammalian Resources to include USFWS' recommendation as mitigation.

Response 2: Newell's Shearwater and Hawaiian Petrel
We acknowledge the potential for artificial lighting to impact the threatened Newell's shearwater and the endangered Hawaiian petrel. This concern is addressed in Chapter 4.1.7.2 Mammalian Resources, under the subsection of Avian Resources Protected Under the Endangered Species Act. Thank you for providing the website reference for seabird and lighting issues.

We appreciate your participation in the environmental review process. You will receive a copy of the Final EIS.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Christine Mendes Ruotola

Christine Mendes Ruotola, AICP, LEED AP
Principal

Group 70 International • 925 Bethel Street, 5th Floor • Honolulu, HI 96813-4307 • tel. 808.523.5866 • fax. 808.523.5874 • www.group70int.com

NEIL ABERCROMBIE
GOVERNOR
RICHARD C. LIM
DIRECTOR
MARY ALICE EVANS
DEPUTY DIRECTOR
JESSE K. SOUKI
DIRECTOR
OFFICE OF PLANNING

DEPARTMENT OF BUSINESS, ECONOMIC DEVELOPMENT & TOURISM

OFFICE OF PLANNING
235 South Beretania Street, 6th Floor, Honolulu, Hawaii 96813
Mailing Address: P.O. Box 2359, Honolulu, Hawaii 96804

Telephone: (808) 587-2846
Fax: (808) 587-2824

Ref. No. P-13511

February 3, 2012

To: Duane Y. Kashiawai, Administrator
Facilities Development Branch
Department of Education

From: Jesse K. Souki, Director Mary Alice Evans

Subject: Kihei High School
Draft Environmental Impact Statement (DEIS)
TMK(s) (2) 2-2-002: 081 (portion) and 083 (portion)
Kihei-Makena District, Maui

The State Department of Education (DOE) proposes to develop the Kihei High School on 77.2 acres of undeveloped lands located at Maui Tax Map Key (2) 2-2-002: 081(portion) and 083 (portion), (Property) Kihei, Island of Maui, Hawaii. The DEIS will support an existing petition submitted to the State Land Use Commission (LUC) to reclassify 77.2 acres of land from the State Agricultural District to the State Urban District (Docket No. A11-794).

OP has reviewed the DEIS and has the following comments:

1. The discussion on potable water should elaborate on the status of the Central Maui Water System relative to water use and available supply, and identify the potential source or sources of water to supply the proposed project. The position of the County of Maui, Department of Water Supply, relative to the Project's use of water from the Central Maui Water System should be provided.

2. On page 5-42, please clarify in your "Discussion" paragraph that the proposed project is located within the coastal zone. Hawaii Revised Statutes (HRS) Chapter 205A, Coastal Zone Management, establishes the Coastal Zone Management (CZM) Program and defines the CZM area as "…all lands of the state extending seaward from the shoreline to the limit of the state's police power and management authority, including the United States territorial seas."

3. The lead sentence regarding the national CZM program is not accurate. We would suggest replacement language such as the following: "The National Coastal Zone

Management program is a partnership between the federal government and coastal states and territories which balances coastal resource use and preservation so that people will continue to benefit from the rich resources the coast provides."

4. Please clarify the amount of solid waste to be generated at full build out. Also, include a discussion on measures to be used to reduce the amount of solid waste generated during and after construction.

5. A discussion should be included in the Final EIS regarding consultations with the affected community and the nature of their involvement in the planning and siting for the new high school. It would also be worthwhile to summarize any expressed issues or concern.

6. We commend the methodical approach and thoughtful consideration of State and County land use plans and policies in the DEIS. We recommend, however, the following changes to your assessments, relative to the State Land Use Law and associated Administrative Rules.

   a. p. 5-2, HRS 205A-2 (a) (1): Supportive should be checked.

   b. p. 5-5, HAR 15-15-17: Should be either N/A or the section and discussion deleted in its entirety.

   c. p. 5-5, HAR 15-15-18 (1) "city-like concentration": Not Supportive should be checked – there is mostly open space mauka of Piilani Highway surrounding the project site.

   d. p. 5-5, HAR 15-15-18 (2)(B) Availability of basic services: Supportive is checked, however, water supply appears unresolved so this should at least be explained in the text portion.

   e. p. 5-6, HAR 15-15-18 (6): Revise to reflect changes above, suggest checking (6) (A) as Supportive.

   f. p. 5-7, HAR 15-15-77 (6), also (6)(A) and (6)(B): Should be Not Applicable, unless the site was in active cultivation.

   g. p. 5-9: The last sentence should be deleted, as this is for the LUC to decide. If this statement is made elsewhere, it should also be deleted.

Thank you for the opportunity to provide comments. Please provide us with a copy of the Final EIS.

Should you have any questions, please contact Robyn Loudermilk, AICP, at 587-2821, or email Robyn.L.Loudermilk@dbedt.hawaii.gov.

Enclosures

c: √Ms. Christine Mendes Ruotola, AICP, LEED AP, Group 70 International
Department of Planning, County of Maui

GROUP 70
INTERNATIONAL

PRINCIPALS

Francis S. Oda, Arch.D., FAIA, AICP, LEED AP
Norman G.Y. Hong AIA
Sheryl B. Seaman AIA, ASID, LEED AP
Hitoshi Hida AIA
Roy H. Nihei AIA, CSI, LEED AP
Ralph E. Portmore AICP
James I. Nishimoto AIA
Stephen Yuen AIA
Linda C. Miki AIA
George I. Atta AICP, LEED AP
Charles Y. Kaneshiro AIA, LEED AP
Jeffrey H. Overton AICP, LEED AP
Christine Mendes Ruotola AICP, LEED AP
James L. Stone, Arch.D., AIA, LEED AP
Katherine M. MacNeil AIA, LEED AP
Tom Young, MBA AIA
Paul T. Matsuda PE, LEED AP

September 5, 2012

Mr. Jesse K. Souki, Director
State of Hawaii
Department of Business, Economic Development and Tourism
Office of Planning
P.O. Box 2359
Honolulu, HI 96804

Subject: Response to Comments on the Draft Environmental Impact Statement for the Proposed Kīhei High School

Aloha Mr. Souki:

Thank you for your comment letter dated February 3, 2012 concerning the Draft Environmental Impact Statement (EIS) for the proposed Kīhei High School Project. We take note of your comments relating to the preparation of the Draft EIS for the proposed project. The following are offered in response to your comments:

Response 1: Potable Water
The Maui Department of Water Supply's position has been clarified since the Water Resources and Supply report (DEIS, Appendix C) was written. According to MDWS' letter of February 3, 2012 to State Department of Education, "As a public development project, the school [proposed Kīhei High School] will be exempt from the Maui County availability policy codified in Maui County Code Chapter 14.12. There is currently no moratorium on issuance of water meters on the Central Maui system." The Kīhei High School will apply for a water meter and meet all the necessary approvals of the Maui Department of Water Supply.

Response 2 and 3: Coastal Zone Management
Thank you for noting the inaccurate reference to the national CZM program and providing the definition of the CZM area. Section 5.1.7 of the Final EIS has been modified to include the suggested clarifications.

Response 4: Solid Waste
The estimated solid waste generation for the project at full build out is discussed in the EIS Section 4.2.12 Solid Waste. Regarding solid waste reduction measures, these measures will be defined during the project's sustainable design certification process which will be carried out by the Design-Build team. A discussion of waste reduction measures that could potentially be employed during project construction and operation has been included in Section 4.2.12 Solid Waste of the Final EIS.

Response 5: Consultation
In response to your recommendation to add a summary of early community consultation and their involvement in project planning, a new section entitled "Community Consultation and Project Design" has been added to Section 2.1 Site Plan and Project Summary in the Final EIS.

Response 6:
We appreciate the Office of Planning's comments with respect to the project's consistency with County and State land use plans and policies. Sections 5.1.2 and 5.1.3 of the Final EIS were updated based on OP's recommendations.

We appreciate your participation in the environmental review process. You will receive a copy of the Final EIS.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Christine Mendes Ruotola, AICP, LEED AP
Principal

Group 70 International • 925 Bethel Street, 5th Floor • Honolulu, HI 96813-4307 • tel. 808.523.5866 • fax. 808.523.5874 • www.group70int.com

RECEIVED

JAN 1 1 2012

GROUP 70 INTL

NEIL ABERCROMBIE
GOVERNOR

KALBERT K. YOUNG
DIRECTOR

LUIS P. SALAVERIA
DEPUTY DIRECTOR

EMPLOYEES' RETIREMENT SYSTEM
HAWAII EMPLOYER-UNION HEALTH BENEFITS TRUST FUND
OFFICE OF THE PUBLIC DEFENDER
PUBLIC UTILITIES COMMISSION

STATE OF HAWAII
DEPARTMENT OF BUDGET AND FINANCE
P.O. BOX 150
HONOLULU, HAWAII 96810-0150

ADMINISTRATIVE AND RESEARCH OFFICE
BUDGET, PROGRAM PLANNING AND
MANAGEMENT DIVISION
FINANCIAL ADMINISTRATION DIVISION
OFFICE OF ECONOMIC RECOVERY
AND REINVESTMENT (ARRA)

December 27, 2011

Ms. Christine Mendes Ruotola, AICP, LEED AP, Principal
Group 70 International
925 Bethel Street, 5th Floor
Honolulu, Hawaii 96813-4307

Dear Ms. Ruotola:

This is to acknowledge receipt of your letter dated December 20, 2011, which is soliciting comments on the Draft Environmental Impact Statement for Kihei High School, Island of Maui, Kihei-Makena District.

We have no comments at this time.

Aloha,

KALBERT K. YOUNG
Director of Finance

No. 1 Capitol District Building, 250 S. Hotel Street, Honolulu, Hawaii 96813

GROUP 70
INTERNATIONAL

PRINCIPALS

Francis S. Oda, Arch.D., FAIA, AICP, LEED AP
Norman G.Y. Hong AIA
Sheryl B. Seaman AIA, ASID, LEED AP
Hitoshi Hida AIA
Roy H. Nihei AIA, CSI, LEED AP
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James L. Stone, Arch.D., AIA, LEED AP
Katherine M. MacNeil AIA, LEED AP
Tom Young, MBA AIA
Paul T. Matsuda PE, LEED AP

September 5, 2012

Mr. Kalbert Young, Director of Finance
State of Hawai'i, Department of Budget and Finance
P.O. Box 150
Honolulu, HI 96810-0150

Subject: **Response to Comments on the Draft Environmental Impact Statement for the Proposed Kīhei High School**

Aloha Mr. Young:

Thank you for your comment letter dated December 27, 2011 concerning the Draft Environmental Impact Statement (EIS) for the proposed Kīhei High School Project. We understand you have no comments to offer at this time.

We appreciate your participation in the environmental review process. You will receive a copy of the Final EIS.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Christine Mendes Ruotola, AICP, LEED AP
Principal

NEIL ABERCROMBIE
GOVERNOR
STATE OF HAWAI'I

ALBERT "ALAPAKI" NAHALE-A
CHAIRMAN
HAWAIIAN HOMES COMMISSION

MICHELLE K. KAUHANE
DEPUTY TO THE CHAIRMAN

M. WAIALEALE SARSONA
EXECUTIVE ASSISTANT

STATE OF HAWAI'I
DEPARTMENT OF HAWAIIAN HOME LANDS
P.O. BOX 1879
HONOLULU, HAWAII 96805

RECEIVED
FEB - 2 2012
GROUP 70 INTL

January 17, 2012

GROUP 70
Attn: Christine Mendes Ruotola, AICP,LEED AP
5th Floor
925 Bethel Street
Honolulu, Hawaii 96813-4307

Dear Ms. Ruotola:

Subject: Draft Environmental Impact Statement
Kihei High School

Thank you for the opportunity to review the subject Draft Environmental Impact Statement. The Department of Hawaiian Home Lands has no comment to offer at this time.

If you have any questions, please contact our Planning Office at (808) 620-9480.

Me ke aloha,

Albert "Alapaki" Nahale-a, Chairman
Hawaiian Homes Commission

GROUP 70
INTERNATIONAL

September 5, 2012

Ms. Jobie Masagatani, Chair-Designate
Hawaiian Homes Commission
Department of Hawaiian Homelands (DHHL)
P.O. Box 1879
Honolulu, HI 96805

Subject: Response to Comments on the Draft Environmental Impact Statement for the Proposed Kīhei High School

Aloha Ms. Masagatani:

Thank you for your comment letter dated January 17, 2012 concerning the Draft Environmental Impact Statement (EIS) for the proposed Kīhei High School Project.

We understand DHHL has no comments to offer at this time. We appreciate your participation in the environmental review process. You will receive a copy of the Final EIS.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Christine Mendes Ruotola, AICP, LEED AP
Principal

NEIL ABERCROMBIE
GOVERNOR OF HAWAII

WILLIAM J. AILA, JR.
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

February 7, 2012

Department of Education
Facilities Development Branch
Attention: Mr. Robert Purdie, Jr.
P.O. Box 2360
Honolulu, Hawaii 96813

via email: robert_purdie@notes.K12.hi.us

Group 70 International, Inc.
Attention: Ms. Christine Ruotola
925 Bethel Street, 5th Floor
Honolulu, Hawaii 96813

via email: cruotola@group70int.com

Dear Mr. Purdie and Ms. Ruotola:

SUBJECT: Draft Environmental Impact Statement for Kihei High School located in Kihei-Makena District, Island of Maui; TMK: (2) 2-2-002:081 and 083

Thank you for the opportunity to review and comment on the subject matter. The Department of Land and Natural Resources' (DLNR) Land Division distributed or made available a copy of your report pertaining to the subject matter to DLNR Divisions for their review and comments.

At this time, enclosed are comments from (a) Engineering Division; (b) Division of Forestry & Wildlife; and (c) Land Division – Maui District on the subject matter. Should you have any questions, please feel free to call Darlene Nakamura at 587-0417. Thank you.

Sincerely,

Russell Y. Tsuji
Land Administrator

Enclosures

NEIL ABERCROMBIE
GOVERNOR OF HAWAII

'12 JAN 19 AM 11:21

WILLIAM J. AILA, JR.
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

January 13, 2012

MEMORANDUM

RECEIVED
LAND DIVISION
2012 JAN 24 A 10 09
DEPT. OF LAND & NATURAL RESOURCES
STATE OF HAWAII

TO: **DLNR Agencies:**
- X Div. of Aquatic Resources
- __Div. of Boating & Ocean Recreation
- X Engineering Division
- X Div. of Forestry & Wildlife
- __Div. of State Parks
- X Commission on Water Resource Management
- X Office of Conservation & Coastal Lands
- X Land Division – Maui District
- X Historic Preservation

FROM: Russell Y. Tsuji, Land Administrator
SUBJECT: Draft Environmental Impact Statement for Kihei High School
LOCATION: Kihei-Makena District, Island of Maui; TMK: (2) 2-2-002:081 and 083
APPLICANT: Group 70 International, Inc. on behalf of Department of Education

Transmitted for your review and comment on the above referenced document. We would appreciate your comments on this document. Please submit any comments by February 3, 2012.

Only one (1) copy of the CD is available for your review in Land Division office, Room 220.

If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact Darlene Nakamura at 587-0417. Thank you.

Attachments

( ) We have no objections.
( ) We have no comments.
(✓) Comments are attached.

Signed:
Date: 1/20/12

cc: Central Files

DEPARTMENT OF LAND AND NATURAL RESOURCES
ENGINEERING DIVISION

LD/Russell Y. Tsuji
Ref.: DEIS for Kihei High School, Kihei-Makena District
Maui.001

COMMENTS

(X) **We confirm that the project site, according to the Flood Insurance Rate Map (FIRM), is located in Flood Zone X. The National Flood Insurance Program (NFIP) does not regulate developments within Zone X.**

( ) Please take note that the project site, according to the Flood Insurance Rate Map (FIRM), is also located in Zone ____.

( ) Please note that the correct Flood Zone Designation for the project site according to the Flood Insurance Rate Map (FIRM) is ___.

( ) Please note that the project site must comply with the rules and regulations of the National Flood Insurance Program (NFIP) presented in Title 44 of the Code of Federal Regulations (44CFR), whenever development within a Special Flood Hazard Area is undertaken. If there are any questions, please contact the State NFIP Coordinator, Ms. Carol Tyau-Beam, of the Department of Land and Natural Resources, Engineering Division at (808) 587-0267.

Please be advised that 44CFR indicates the minimum standards set forth by the NFIP. Your Community's local flood ordinance may prove to be more restrictive and thus take precedence over the minimum NFIP standards. If there are questions regarding the local flood ordinances, please contact the applicable County NFIP Coordinators below:

( ) Mr. Mario Siu Li at (808) 523-4247 of the City and County of Honolulu, Department of Planning and Permitting.
( ) Mr. Frank DeMarco at (808) 961-8042 of the County of Hawaii, Department of Public Works.
( ) Mr. Francis Cerizo at (808) 270-7771 of the County of Maui, Department of Planning.
( ) Ms. Wynne Ushigome at (808) 241-4890 of the County of Kauai, Department of Public Works.

( ) The applicant should include project water demands and infrastructure required to meet water demands. Please note that the implementation of any State-sponsored projects requiring water service from the Honolulu Board of Water Supply system must first obtain water allocation credits from the Engineering Division before it can receive a building permit and/or water meter.

(X) **The applicant should provide the water demands and calculations to the Engineering Division so it can be included in the State Water Projects Plan Update.**

( ) Additional Comments: _____

_____

( ) Other: _____

Should you have any questions, please call Mr. Dennis Imada of the Planning Branch at 587-0257.

Signed: _____
CARTY S. CHANG, CHIEF ENGINEER

Date: 1/20/12

NEIL ABERCROMBIE
GOVERNOR OF HAWAII

WILLIAM J. AILA, JR.
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

January 13, 2012

MEMORANDUM

TO: **DLNR Agencies:**
X Div. of Aquatic Resources
__Div. of Boating & Ocean Recreation
X Engineering Division
X Div. of Forestry & Wildlife
__Div. of State Parks
X Commission on Water Resource Management
X Office of Conservation & Coastal Lands
X Land Division – Maui District
X Historic Preservation

FROM: Russell Y. Tsuji, Land Administrator
SUBJECT: Draft Environmental Impact Statement for Kihei High School
LOCATION: Kihei-Makena District, Island of Maui; TMK: (2) 2-2-002:081 and 083
APPLICANT: Group 70 International, Inc. on behalf of Department of Education

Transmitted for your review and comment on the above referenced document. We would appreciate your comments on this document. Please submit any comments by February 3, 2012.

Only one (1) copy of the CD is available for your review in Land Division office, Room 220.

If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact Darlene Nakamura at 587-0414. Thank you.

Attachments

( ) We have no objections.
(X) We have no comments.
( ) Comments are attached.

Signed: _____
Date: 1/19/12

cc: Central Files

RECEIVED
LAND DIVISION
2012 JAN 20 P 3:03
DEPT. OF LAND & NATURAL RESOURCES
STATE OF HAWAII

NEIL ABERCROMBIE
GOVERNOR OF HAWAII

WILLIAM J. AILA, JR.
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

RECEIVED
LAND DIVISION
2012 JAN 25 A 11:34
DEPT. OF LAND & NATURAL RESOURCES
STATE OF HAWAII

RECEIVED
LAND DIVISION
MAUI DISTRICT
2012 JAN 19 PM 12:07

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION
POST OFFICE BOX 621
HONOLULU, HAWAII 96809

January 13, 2012

MEMORANDUM

TO: **DLNR Agencies:**
- X Div. of Aquatic Resources
- __ Div. of Boating & Ocean Recreation
- X Engineering Division
- X Div. of Forestry & Wildlife
- __ Div. of State Parks
- X Commission on Water Resource Management
- X Office of Conservation & Coastal Lands
- X Land Division – Maui District
- X Historic Preservation

FROM: Russell Y. Tsuji, Land Administrator
SUBJECT: Draft Environmental Impact Statement for Kihei High School
LOCATION: Kihei-Makena District, Island of Maui; TMK: (2) 2-2-002:081 and 083
APPLICANT: Group 70 International, Inc. on behalf of Department of Education

Transmitted for your review and comment on the above referenced document. We would appreciate your comments on this document. Please submit any comments by February 3, 2012.

Only one (1) copy of the CD is available for your review in Land Division office, Room 220.

If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact Darlene Nakamura at 587-0417. Thank you.

Attachments

( ) We have no objections.
(X) We have no comments.
( ) Comments are attached.

Signed:
Date: 1/23/12

cc: Central Files

GROUP 70 INTERNATIONAL

PRINCIPALS

Francis S. Oda, Arch.D., FAIA, AICP, LEED AP
Norman G.Y. Hong AIA
Sheryl B. Seaman AIA, ASID, LEED AP
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James L. Stone, Arch.D., AIA, LEED AP
Katherine M. MacNeil AIA, LEED AP
Tom Young, MBA AIA
Paul T. Matsuda PE, LEED AP

September 5, 2012

Mr. Russell Tsuji, Land Administrator
State of Hawai'i
Department of Land and Natural Resources, Land Division
P.O. Box 621
Honolulu, HI 96809

Subject: Response to Comments on the Draft Environmental Impact Statement for the Proposed Kihei High School

Aloha Mr. Tsuji:

Thank you for your comment letters dated February 7, 2012, February 8, 2012 and March 22, 2012 concerning the Draft Environmental Impact Statement (EIS) for the proposed Kihei High School Project. We take note of your comments relating to the Draft EIS for the proposed project.

We understand that the Department of Land and Natural Resources, Land Division has comments from the Engineering Division, Commission on Water Resource Management and Division of Aquatic Resources. We will respond to the comments of each division in separate correspondences.

We appreciate your participation in the environmental review process. You will receive a copy of the Final EIS.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Christine Mendes Ruotola, AICP, LEED AP
Principal

Group 70 International • 925 Bethel Street, 5th Floor • Honolulu, HI 96813-4307 • tel. 808.523.5866 • fax. 808.523.5874 • www.group70int.com

GROUP 70
INTERNATIONAL

September 5, 2012

Mr. Paul Conry, Administrator
State of Hawai'i, Department of Land and Natural Resources
Division of Forestry and Wildlife
1151 Punchbowl Street, Room 325
Honolulu, HI 96813

Subject: Response to Comments on the Draft Environmental Impact Statement for the Proposed Kīhei High School

Aloha Mr. Conry:

Thank you for your comment letter dated January 13, 2012 concerning the Draft Environmental Impact Statement (EIS) for the proposed Kīhei High School Project. We take note of your comments relating to the Draft EIS for the proposed project.

We understand that the Division of Forestry and Wildlife has no comments to offer at this time.

We appreciate your participation in the environmental review process. You will receive a copy of the Final EIS.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Christine Mendes Ruotola, AICP, LEED AP
Principal

GROUP 70
INTERNATIONAL

PRINCIPALS

Francis S. Oda, Arch.D., FAIA, AICP, LEED AP
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Ralph E. Portmore AICP
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Jeffrey H. Overton AICP, LEED AP
Christine Mendes Ruotola AICP, LEED AP
James L. Stone, Arch.D., AIA, LEED AP
Katherine M. MacNeil AIA, LEED AP
Tom Young, MBA AIA
Paul T. Matsuda PE, LEED AP

September 5, 2012

Department of Land and Natural Resources
Land Division, Maui District
54 High Street, Room 101
Wailuku, HI 96813

Subject: Response to Comments on the Draft Environmental Impact Statement for the Proposed Kīhei High School

Aloha:

Thank you for your comment letter dated January 13, 2012 concerning the Draft Environmental Impact Statement (EIS) for the proposed Kīhei High School Project.

We understand that the Land Division – Maui District has no comments to offer at this time.

We appreciate your participation in the environmental review process. You will receive a copy of the Final EIS.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Christine Mendes Ruotola, AICP, LEED AP
Principal

Group 70 International • 925 Bethel Street, 5th Floor • Honolulu, HI 96813-4307 • tel. 808.523.5866 • fax. 808.523.5874 • www.group70int.com

NEIL ABERCROMBIE
GOVERNOR OF HAWAII

WILLIAM J. AILA, JR.
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

March 22, 2012

Department of Education
Facilities Development Branch
Attention: Mr. Robert Purdie, Jr.
P.O. Box 2360
Honolulu, Hawaii 96813

via email: robert_purdie@notes.K12.hi.us

Group 70 International, Inc.
Attention: Ms. Christine Ruotola
925 Bethel Street, 5th Floor
Honolulu, Hawaii 96813

via email: cruotola@group70int.com

Dear Mr. Purdie and Ms. Ruotola:

SUBJECT: Draft Environmental Impact Statement for Kihei High School located in Kihei-Makena District, Island of Maui; TMK: (2) 2-2-002:081 and 083

Thank you for the opportunity to review and comment on the subject matter. In addition to the comments previously sent you on February 7, and February 8, 2012, enclosed are comments from the Commission on Water Resources Management on the subject matter. Should you have any questions, please feel free to call Lydia Morikawa at 587-0410. Thank you.

Sincerely,

Russell Y. Tsuji
Land Administrator

Enclosure

NEIL ABERCROMBIE
GOVERNOR OF HAWAII

WILLIAM J. AILA, JR.
CHAIRPERSON
WILLIAM D. BALFOUR, JR.
SUMNER ERDMAN
LORETTA J. FUDDY, A.C.S.W., M.P.H.
NEAL S. FUJIWARA
LAWRENCE H. MIIKE, M.D., J.D.

WILLIAM M. TAM
DEPUTY DIRECTOR

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT
P.O. BOX 621
HONOLULU, HAWAII 96809

RECEIVED
LAND DIVISION
2012 MAR -2 A 10:36
DEPT. OF LAND & NATURAL RESOURCES STATE OF HAWAII

February 29, 2012

TO: Russell Tsuji, Administrator
Land Division

FROM: William M. Tam, Deputy Director
Commission on Water Resource Management

SUBJECT: Kihei High School (Maui) DEIS

FILE NO.: N/A
TMK NO.: (2) 2-2-002:081 & 083

Thank you for the opportunity to review the subject document. The Commission on Water Resource Management (CWRM) is the agency responsible for administering the State Water Code (Code). Under the Code, all waters of the State are held in trust for the benefit of the citizens of the State, therefore, all water use is subject to legally protected water rights. CWRM strongly promotes the efficient use of Hawaii's water resources through conservation measures and appropriate resource management. For more information, please refer to the State Water Code, Chapter 174C, Hawaii Revised Statutes, and Hawaii Administrative Rules, Chapters 13-167 to 13-171. These documents are available via the Internet at http://www.hawaii.gov/dlnr/cwrm.

Our comments related to water resources are checked off below.

☒ 1. We recommend coordination with the county to incorporate this project into the county's Water Use and Development Plan. Please contact the respective Planning Department and/or Department of Water Supply for further information.

☒ 2. We recommend coordination with the Engineering Division of the State Department of Land and Natural Resources to incorporate this project into the State Water Projects Plan.

☐ 3. We recommend coordination with the Hawaii Department of Agriculture (HDOA) to incorporate the reclassification of agricultural zoned land and the redistribution of agricultural resources into the State's Agricultural Water Use and Development Plan (AWUDP). Please contact the HDOA for more information.

☒ 4. We recommend that water efficient fixtures be installed and water efficient practices implemented throughout the development to reduce the increased demand on the area's freshwater resources. Reducing the water usage of a home or building may earn credit towards Leadership in Energy and Environmental Design (LEED) certification. More information on LEED certification is available at http://www.usgbc.org/leed. A listing of fixtures certified by the EPA as having high water efficiency can be found at http://www.epa.gov/watersense/pp/index.htm.

☒ 5. We recommend the use of best management practices (BMP) for stormwater management to minimize the impact of the project to the existing area's hydrology while maintaining on-site infiltration and preventing polluted runoff from storm events. Stormwater management BMPs may earn credit toward LEED certification. More information on stormwater BMPs can be found at http://hawaii.gov/dbedt/czm/initiative/lid.php.

☒ 6. We recommend the use of alternative water sources, wherever practicable.

☐ 7. There may be the potential for ground or surface water degradation/contamination and recommend that approvals for this project be conditioned upon a review by the State Department of Health and the developer's acceptance of any resulting requirements related to water quality.

Permits required by CWRM:
Additional information and forms are available at http://hawaii.gov/dlnr/cwrm/resources_permits.htm.

☐ 8. The proposed water supply source for the project is located in a designated water management area, and a Water Use Permit is required prior to use of water.

☒ 9. A Well Construction Permit(s) is (are) required before any well construction work begins.

☒ 10. A Pump Installation Permit(s) is (are) required before ground water is developed as a source of supply for the project.

☐ 11. There is (are) well(s) located on or adjacent to this project. If wells are not planned to be used and will be affected by any new construction, they must be properly abandoned and sealed. A permit for well abandonment must be obtained.

☐ 12. Ground water withdrawals from this project may affect streamflows, which may require an instream flow standard amendment.

☐ 13. A Stream Channel Alteration Permit(s) is (are) required before any alteration(s) can be made to the bed and/or banks of a stream channel.

☐ 14. A Stream Diversion Works Permit(s) is (are) required before any stream diversion works is (are) constructed or altered.

☐ 15. A Petition to Amend the Interim Instream Flow Standard is required for any new or expanded diversion(s) of surface water.

☐ 16. The planned source of water for this project has not been identified in this report. Therefore, we cannot determine what permits or petitions are required from our office, or whether there are potential impacts to water resources.

☒ OTHER:

The DEIS document anticipates an initial potable water demand of 4,900 gpd in 2015. This will expand to 37,450 gpd at full buildout. Water will be supplied through the Maui Department of Water Supply's (MDWS) Central Maui Service Area (CMSA).

The sources serving this area are currently at full capacity. All uses are regulated within a water management area. New water uses will require the development of new sources outside the existing water management areas.

The project anticipates a need for 185,000 gpd irrigation water through on-site brackish wells.

Contact DLNR, Engineering Division regarding State Water Project Plan.

If there are any questions, please contact Charley Ice at 587-0218.

GROUP 70 INTERNATIONAL

September 5, 2012

Mr. William M. Tam, Deputy Director
State of Hawai'i, Department of Land and Natural Resources
Commission on Water Resource Management (CWRM)
P.O. Box 621
Honolulu, HI 96813

Subject: Response to Comments on the Draft Environmental Impact Statement for the Proposed Kīhei High School

Aloha Mr. Tam:

Thank you for your comment letter dated February 29, 2012 concerning the Draft Environmental Impact Statement (EIS) for the proposed Kīhei High School Project. We take note of your comments relating to the preparation of the Draft EIS for the proposed project. The following are offered in response to your comments:

Response 1: County Coordination
The project team will continue to coordinate with appropriate County agencies and provide the necessary project information for inclusion in the County's Water Use and Development Plan.

Response 2: Coordination with Engineering Division
When available, the DOE and Design-Build (DB) team will provide final water demand calculations to the Engineering Division for inclusion in the State Water Projects Plan Update.

Response 4: Water Efficient Practices
The Kīhei High School project will be constructed through a DB process. The Design-Build Entity (DBE) selected by the Department of Education (DOE) will be responsible for design, construction, and commissioning of the new school. The DBE has been directed to seek a minimum of Silver certification under the LEED program developed by the USGBC, or under a comparable rating system. The DOE is committed to sustainable building practices; however, detailed sustainable design features such as water efficient plumbing fixtures have not been determined at the time of the Final EIS and will be determined by the DOE and DB team.

Feasible water conservation mitigation measures have been incorporated into Section 4.2.10.1 of the Final EIS.

Response 5: Best Management Practices
BMPs will be included for stormwater management and pollutant control. The inclusion of a properly designed proposed detention/retention basin system can control peak flow discharge from the school site, such that there is no overall increase in pre- and post-development flows (Preliminary Engineering Report, Appendix K of the Draft EIS).

Response 6: Alternative Water Sources
A *Non-potable Water System Alternatives Analysis* report was prepared by Gray, Hong, Nojima & Associates, Inc. to analyze potential non-potable water systems for irrigation, non-potable water sources, and provide recommendations based a life cycle cost comparison, among other factors. Two alternatives for non-potable water were identified in the report: 1) onsite brackish groundwater wells, and 2) the use of R-1 recycled water from the County of Maui's existing WWRF. Please refer to Appendix M of the Final EIS for the full report.

Response 9 & 10: Permits
Well Construction Permit and Pump Installation Permit will be obtained as required. Both are listed in the Draft EIS Section 2.6 Required Permits, Approvals and Plans.

Response "Other": Water
Provision of potable water service will be coordinated with the County of Maui Department of Water Supply.

We appreciate your participation in the environmental review process. You will receive a copy of the Final EIS.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Christine Mendes Ruotola

Christine Mendes Ruotola, AICP, LEED AP
Principal

NEIL ABERCROMBIE
GOVERNOR OF HAWAII

WILLIAM J. AILA, JR.
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION
POST OFFICE BOX 621
HONOLULU, HAWAII 96809

February 8, 2012

Department of Education
Facilities Development Branch
Attention: Mr. Robert Purdie, Jr. via email: robert_purdie@notes.K12.hi.us
P.O. Box 2360
Honolulu, Hawaii 96813

Group 70 International, Inc. via email: cruotola@group70int.com
Attention: Ms. Christine Ruotola
925 Bethel Street, 5th Floor
Honolulu, Hawaii 96813

Dear Mr. Purdie and Ms. Ruotola:

SUBJECT: Draft Environmental Impact Statement for Kihei High School located in Kihei-Makena District, Island of Maui; TMK: (2) 2-2-002:081 and 083

Thank you for the opportunity to review and comment on the subject matter. In addition to the comments previously sent you on February 7, 2012, enclosed are comments from the Division of Aquatic Resources on the subject matter. Should you have any questions, please feel free to call Darlene Nakamura at 587-0417. Thank you.

Sincerely,

Russell Y. Tsuji
Land Administrator

Enclosure

NEIL ABERCROMBIE
GOVERNOR OF HAWAII

WILLIAM J. AILA, JR.
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

AMV
SHV

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

January 13, 2012

PAR 4201

MEMORANDUM

TO: DLNR Agencies:
✓ X Div. of Aquatic Resources
__Div. of Boating & Ocean Recreation
X Engineering Division
X Div. of Forestry & Wildlife
__Div. of State Parks
X Commission on Water Resource Management
X Office of Conservation & Coastal Lands
X Land Division – Maui District
X Historic Preservation

RECEIVED
JAN 19 2012
AQUATIC RESOURCES

RECEIVED
LAND DIVISION
2012 FEB -6 A 10:21
DEPT. OF LAND & NATURAL RESOURCES
STATE OF HAWAII

FROM: Russell Y. Tsuji, Land Administrator
SUBJECT: Draft Environmental Impact Statement for Kihei High School
LOCATION: Kihei-Makena District, Island of Maui; TMK: (2) 2-2-002:081 and 083
APPLICANT: Group 70 International, Inc. on behalf of Department of Education

Transmitted for your review and comment on the above referenced document. We would appreciate your comments on this document. Please submit any comments by February 3, 2012.

Only one (1) copy of the CD is available for your review in Land Division office, Room 220.

If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact Darlene Nakamura at 587-0417. Thank you.

Attachments

( ) We have no objections.
( ) We have no comments.
(X) Comments are attached.

RECEIVED

Signed: [signature]
Date: 2/1/2012

cc: Central Files

Div. of Aquatic Resources
Maui

DIVISION OF AQUATIC RESOURCES - MAUI
DEPARTMENT OF LAND & NATURAL RESOURCES
130 Mahalani Street
Wailuku, Hawai'i 96793
February 1, 2011

To: Alton Miyasaka, Aquatic Biologist

From: Skippy Hau, Aquatic Biologist

Subject: Draft Environmental Impact Statement for Kihei High School
TMK: (2) 2-2-002:081 AND 083 (DAR 4207)
(Darlene Nakamura, Land – Due Feb. 3, 2012)

(P. 4-64) Has the DOT been contacted about runoff? Stating it is likely that the DOT will not allow any additional runoff also implies that no one has decided. During heavy storms, runoff will flow downstream whether plans have been implemented or not.

(PP.4-65 to 4-66) Whether runoff will be allowed will determine the specifications for the on-site Basin concept. We strongly support the use of best management practices that were presented.

GROUP 70
INTERNATIONAL

September 5, 2012

Mr. Francis Oishi (Fisheries)
State of Hawai'i, Department of Land and Natural Resources
Land Division, Division of Aquatic Resources
1151 Punchbowl Street, Room 330
Honolulu, HI 96813

Subject: Response to Comments on the Draft Environmental Impact Statement for the Proposed Kīhei High School

Aloha Mr. Oishi:

Thank you for your comment letter dated January 13, 2012 concerning the Draft Environmental Impact Statement (EIS) for the proposed Kihei High School Project. We take note of your comments relating to the preparation of the Draft EIS for the proposed project. The following are offered in response to your comments:

Site Runoff

Please note that the Department of Transportation (DOT) Highways Division was contacted for preliminary input on requirements for projects/new developments that are located upstream of existing DOT drainage structures. Per this initial discussion, DOT indicated that if development of areas upstream of existing DOT drainage structures occurs, DOT will not require improvements to existing drainage structures if a comparison between pre-development and post-development peak flow rates show that the post-development condition does not result in an increase over the pre-development condition. As indicated in the Preliminary Engineering Report (Appendix K of the Draft EIS), the inclusion of a properly designed proposed detention/retention basin system can control peak flow discharge from the school site, such that there is no overall increase in post-development flows. This will be confirmed by the Design-Build team once the analysis and design are underway.

We appreciate your participation in the environmental review process. You will receive a copy of the Final EIS.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Christine Mendes Ruotola, AICP, LEED AP
Principal

Group 70 International • 925 Bethel Street, 5th Floor • Honolulu, HI 96813-4307 • tel. 808.523.5866 • fax. 808.523.5874 • www.group70int.com

NEIL ABERCROMBIE
GOVERNOR OF HAWAII

WILLIAM J. AILA, JR.
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

'12 JAN 19 AM 11:21

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

January 13, 2012

MEMORANDUM

RECEIVED
LAND DIVISION
2012 JAN 24 A 10 09
DEPT. OF LAND & NATURAL RESOURCES
STATE OF HAWAII

TO: **DLNR Agencies:**
X Div. of Aquatic Resources
__Div. of Boating & Ocean Recreation
X Engineering Division
X Div. of Forestry & Wildlife
__Div. of State Parks
X Commission on Water Resource Management
X Office of Conservation & Coastal Lands
X Land Division – Maui District
X Historic Preservation

FROM: Russell Y. Tsuji, Land Administrator
SUBJECT: Draft Environmental Impact Statement for Kihei High School
LOCATION: Kihei-Makena District, Island of Maui; TMK: (2) 2-2-002:081 and 083
APPLICANT: Group 70 International, Inc. on behalf of Department of Education

Transmitted for your review and comment on the above referenced document. We would appreciate your comments on this document. Please submit any comments by February 3, 2012.

Only one (1) copy of the CD is available for your review in Land Division office, Room 220.

If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact Darlene Nakamura at 587-0417. Thank you.

Attachments

( ) We have no objections.
( ) We have no comments.
(✓) Comments are attached.

Signed:
Date: 1/20/12

cc: Central Files

DEPARTMENT OF LAND AND NATURAL RESOURCES
ENGINEERING DIVISION

LD/Russell Y. Tsuji
Ref.: DEIS for Kihei High School, Kihei-Makena District
Maui.001

COMMENTS

(X) **We confirm that the project site, according to the Flood Insurance Rate Map (FIRM), is located in Flood Zone X. The National Flood Insurance Program (NFIP) does not regulate developments within Zone X.**

( ) Please take note that the project site, according to the Flood Insurance Rate Map (FIRM), is also located in Zone ____.

( ) Please note that the correct Flood Zone Designation for the project site according to the Flood Insurance Rate Map (FIRM) is ____.

( ) Please note that the project site must comply with the rules and regulations of the National Flood Insurance Program (NFIP) presented in Title 44 of the Code of Federal Regulations (44CFR), whenever development within a Special Flood Hazard Area is undertaken. If there are any questions, please contact the State NFIP Coordinator, Ms. Carol Tyau-Beam, of the Department of Land and Natural Resources, Engineering Division at (808) 587-0267.

Please be advised that 44CFR indicates the minimum standards set forth by the NFIP. Your Community's local flood ordinance may prove to be more restrictive and thus take precedence over the minimum NFIP standards. If there are questions regarding the local flood ordinances, please contact the applicable County NFIP Coordinators below:

( ) Mr. Mario Siu Li at (808) 523-4247 of the City and County of Honolulu, Department of Planning and Permitting.
( ) Mr. Frank DeMarco at (808) 961-8042 of the County of Hawaii, Department of Public Works.
( ) Mr. Francis Cerizo at (808) 270-7771 of the County of Maui, Department of Planning.
( ) Ms. Wynne Ushigome at (808) 241-4890 of the County of Kauai, Department of Public Works.

( ) The applicant should include project water demands and infrastructure required to meet water demands. Please note that the implementation of any State-sponsored projects requiring water service from the Honolulu Board of Water Supply system must first obtain water allocation credits from the Engineering Division before it can receive a building permit and/or water meter.

(X) **The applicant should provide the water demands and calculations to the Engineering Division so it can be included in the State Water Projects Plan Update.**

( ) Additional Comments: _____

( ) Other: _____

Should you have any questions, please call Mr. Dennis Imada of the Planning Branch at 587-0257.

Signed: _____
CARTY S. CHANG, CHIEF ENGINEER

Date: 1/20/12

GROUP 70 INTERNATIONAL

PRINCIPALS

Francis S. Oda, Arch.D., FAIA, AICP, LEED AP
Norman G.Y. Hong AIA
Sheryl B. Seaman AIA, ASID, LEED AP
Hitoshi Hida AIA
Roy H. Nihei AIA, CSI, LEED AP
Ralph E. Portmore AICP
James I. Nishimoto AIA
Stephen Yuen AIA
Linda C. Miki AIA
George I. Atta AICP, LEED AP
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Christine Mendes Ruotola AICP, LEED AP
James L. Stone, Arch.D., AIA, LEED AP
Katherine M. MacNeil AIA, LEED AP
Tom Young, MBA AIA
Paul T. Matsuda PE, LEED AP

September 5, 2012

Mr. Carty Chang, Chief Engineer
State of Hawai'i, Department of Land and Natural Resources
Engineering Division
1151 Punchbowl Street, Room 221
Honolulu, HI 96813

Subject: **Response to Comments on the Draft Environmental Impact Statement for the Proposed Kīhei High School**

Aloha Mr. Chang:

Thank you for your comment letter dated January 20, 2012 concerning the Draft Environmental Impact Statement (EIS) for the proposed Kīhei High School Project. We take note of your comments relating to the Draft EIS for the proposed project. The following are offered in response to your comments:

Thank you for confirmation that the property is located in Zone X on the Flood Insurance Rate Map (FIRM), and that the National Flood Insurance Program (NFIP) does not regulate developments within Zone X.

When available, the DOE and Design-Build team will provide final water demand calculations to the Engineering Division for inclusion in the State Water Projects Plan Update.

We appreciate your participation in the environmental review process. You will receive a copy of the Final EIS.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Christine Mendes Ruotola

Christine Mendes Ruotola, AICP, LEED AP
Principal

NEIL ABERCROMBIE
GOVERNOR

MAJOR GENERAL DARRYLL D. M. WONG
DIRECTOR OF CIVIL DEFENSE

VICTOR G. GUSTAFSON
INTERIM VICE DIRECTOR OF CIVIL DEFENSE

PHONE (808) 733-4300
FAX (808) 733-4287

STATE OF HAWAII
DEPARTMENT OF DEFENSE
OFFICE OF THE DIRECTOR OF CIVIL DEFENSE
3949 DIAMOND HEAD ROAD
HONOLULU, HAWAII 96816-4495

February 1, 2012

Ms. Christine Ruotola
Group 70 International, Inc.
925 Bethel Street, 5th Floor
Honolulu, Hawaii 96813

Mr. Robert Purdie, Jr.
Facilities Development Branch
Department of Education
State of Hawaii
P. O. Box 2360
Honolulu, Hawaii 96804

Dear Ms. Ruotola and Mr. Purdie:

Kihei High School
Island of Maui, Kihei-Makena District, Draft Environmental Assessment

Thank you for this opportunity to comment on the Draft Environmental Assessment for the proposed project to develop a new high school in Kihei on approximately 77 acres mauka of Piilani Highway.

The proposed project site is located between the Waipuilani Gulch and the Kulanihakoi Gulch, in Flood Insurance Rate Map (FIRM) Flood Zone X, and east of the Piilani Highway, the designated tsunami evacuation route for the South Kihei and Wailea communities.

Although the FIRM identifies the proposed project area as located within Flood Zone X and not subject to inundation by a one percent annual chance flood, we recommend that the engineering and design for the new high school include reasonable design features as appropriate to mitigate potential flood risks that exceed a one percent annual chance event. We also strongly recommend additional design measures for safe room(s) be incorporated, in order to provide near-absolute protection during a high- or extreme -wind event.(For more information, please see FEMA 320, "Taking Shelter from the Storm," at http://www.fema.gov/plan/prevent/saferoom/fema320.shtm.)

Kihei High School proposes to add as many as 1,650 students and 206 faculty and staff to an area served by only one evacuation route in the event of a tsunami emergency. We recommend appropriate study(-ies) be conducted to review emergency egress from and ingress to the high school in the event of a tsunami disaster.

Plans for continuity of essential services should be considered and appropriate mitigation measures be incorporated during the planning and the design phase of any new construction, as mitigation prevents loss of life and minimizes loss of property. Generally, the cost of integrating mitigation measures during construction is approximately one-third the cost of post-construction retrofit. Based on availability of funds and project eligibility, pre- or post-disaster grant funds could be used to offset natural hazard mitigation costs for the proposed project.

Please keep us informed as existing plans are updated. We look forward to a copy of the Environmental Assessment when it is completed. If you have any questions, please have your staff contact Ms. Dawn Johnson at (808) 733-4300.

Sincerely,

VICTOR G. GUSTAFSON
Interim Vice Director of Civil Defense

GROUP 70
INTERNATIONAL

September 5, 2012

Mr. Victor Gustafson, Interim Vice Director of Civil Defense
State of Hawaii Department of Defense
Office of the Director of Civil Defense
3949 Diamond Head Road
Honolulu, HI 96816-4495

Subject: Response to Comments on the Draft Environmental Impact Statement for the Proposed Kīhei High School

Aloha Mr. Gustafson:

Thank you for your comment letter dated February 1, 2012 concerning the Draft Environmental Impact Statement (EIS) for the proposed Kīhei High School Project. We take note of your comments relating to the Draft EIS for the proposed project. The following are offered in response to your comments:

Response 1: Additional Design Features
We understand that the State Department of Defense Office of the Director of Civil Defense (Department) recommends design features to mitigate potential flood risks associated that exceed a one percent annual chance event. We further understand the Department's recommendation that additional design measures be implemented for any safe rooms to withstand extreme wind events.

The Department will need to coordinate directly with the Department of Education (DOE) to discuss any additional design measures above and beyond code requirements.

Response 2: Evacuation Route Study
The Department's recommendation for a study of emergency egress and ingress to the high school site in the event of a tsunami or disaster is noted. Additionally, the project's structural design for wind loads will comply with code requirements of the 2006 International Building Code (IBC).

Response 3: Continuity of Essential Services
According to the DOE, the high school is not considered an essential facility and therefore will not be staffed in the event of a major calamity. The facility will be constructed for hurricane and earthquake resistance according to the 2006 IBC. An auxiliary engine generator and keyed disconnect will be provided for the cafeteria for emergency use. Other emergency provisions for school facilities will be provided in accordance with the Maui building code and County code for assembly facilities.

We appreciate your participation in the environmental review process. You will receive a copy of the Final EIS.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Christine Mendes Ruotola, AICP, LEED AP
Principal

Group 70 International • 925 Bethel Street, 5th Floor • Honolulu, HI 96813-4307 • tel. 808.523.5866 • fax. 808.523.5874 • www.group70int.com

NEIL ABERCROMBIE
GOVERNOR OF HAWAII

LORETTA J. FUDDY, A.C.S.W., M.P.H.
DIRECTOR OF HEALTH

STATE OF HAWAII
DEPARTMENT OF HEALTH
P.O. Box 3378
HONOLULU, HAWAII 96801-3378

In reply, please refer to:
File: 12-101A CAB

RECEIVED
FEB 10 2012
GROUP 70 INTL

February 7, 2012

Ms. Christine Mendes Ruotola, AICP, LEED AP
Principal
Group 70 International, Inc.
925 Bethel Street, 5th Floor
Honolulu, Hawaii 96813-4307

Dear Ms. Ruotola:

SUBJECT: Kihei High School, Draft Environmental Impact Statement
Kihei-Makena District, Island of Maui

A significant potential for fugitive dust emissions exists during all phases of construction. The proposed activities will occur in proximity to public areas and thoroughfares, thereby exacerbating potential dust problems.

We encourage the contractor to implement a dust control plan, which does not require approval by the Department of Health, and to comply with the provisions of Hawaii Administrative Rules, §11-60.1-33 on Fugitive Dust. The plan should provide adequate measures to control fugitive dust during the various phases of construction. The measures identified in your draft environmental impact statement are examples of practices that can be beneficial in a dust control plan. Other examples include, but are not limited to, the following:

- Planning the different phases of construction, focusing on minimizing the amount of dust-generating materials and activities, centralizing on-site vehicular traffic routes, and locating potential dust-generating equipment in areas of the least impact;
- Providing an adequate water source at the site prior to start-up of construction activities;
- Landscaping and providing rapid covering of bare areas, including slopes, starting from the initial grading phase;
- Minimizing dust from shoulders and access roads;
- Providing adequate dust control measures during weekends, after hours, and prior to daily start-up of construction activities; and
- Controlling dust from debris being hauled away from the project site.

If you have any questions, please contact Mr. Barry Ching of the Clean Air Branch at 586-4200.

Sincerely,

NOLAN S. HIRAI
Acting Manager, Clean Air Branch

BC:rg

c: Robert Purdie, Jr., Facilities Development Branch, Department of Education, State of Hawaii

GROUP 70 INTERNATIONAL

PRINCIPALS

Francis S. Oda, Arch.D., FAIA, AICP, LEED AP
Norman G.Y. Hong AIA
Sheryl B. Seaman AIA, ASID, LEED AP
Hitoshi Hida AIA
Roy H. Nihei AIA, CSI, LEED AP
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James I. Nishimoto AIA
Stephen Yuen AIA
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Jeffrey H. Overton AICP, LEED AP
Christine Mendes Ruotola AICP, LEED AP
James L. Stone, Arch.D., AIA, LEED AP
Katherine M. MacNeil AIA, LEED AP
Tom Young, MBA AIA
Paul T. Matsuda PE, LEED AP

September 5, 2012

Mr. Nolan Hirai, Acting Manager
State of Hawai'i, Department of Health
Clean Air Branch
P.O. Box 3378
Honolulu, HI 96801-3378

Subject: Response to Comments on the Draft Environmental Impact Statement for the Proposed Kīhei High School

Aloha Mr. Hirai:

Thank you for your comment letter dated February 7, 2012 concerning the Draft Environmental Impact Statement (EIS) for the proposed Kīhei High School Project. We take note of your comments relating to the Draft EIS for the proposed project. The following are offered in response to your comments:

The Kīhei High School project will be constructed through a Design-Build (DB) process. As such, Request for Qualifications (RFQ) and Request for Proposal (RFP) documents are being prepared for the DB procurement process. The winning DB team selected by the Department of Education (DOE) will be responsible for design, construction, and commissioning of the new school. The DBE will be alerted to the requirements of Hawaii Administrative Rules, §11-60.1-33 on Fugitive Dust. The DBE will also be encouraged to implement a dust control plan that includes the mitigation measures enclosed in Section 4.2.6 of the Draft EIS and the additional measures recommended in the Clean Air Branch's February 7, 2012 comment letter.

We appreciate your participation in the environmental review process. You will receive a copy of the Final EIS.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Christine Mendes Ruotola, AICP, LEED AP
Principal

NEIL ABERCROMBIE
GOVERNOR OF HAWAII

STATE OF HAWAII
DEPARTMENT OF HEALTH
P. O. BOX 3378
HONOLULU, HI 96801-3378

LORETTA J. FUDDY, A.C.S.W., M.P.H.
DIRECTOR OF HEALTH

In reply, please refer to:
EMD/CWB

02003PDCL.12

February 1, 2012

RECEIVED
FEB - 2 2012
GROUP 70 INTL

Ms. Christine Ruotola
Principal
Group 70 International
925 Bethel Street, 5th Floor
Honolulu, Hawaii 96813

Dear Ms. Ruotola:

SUBJECT: Comments on Draft Environmental Impact Statement (EIS) for Kihei High School Kihei, Island of Maui, Hawaii

The Department of Health (DOH), Clean Water Branch (CWB), acknowledges receipt of your letter, dated December 20, 2011, requesting comments on the subject project. We have reviewed your letter and have no comments at this time. The DOH-CWB provided comments on the EIS Preparation Notice (DOH-CWB Letter No. 12038PSW.09, dated December 8, 2009).

If you have any questions, please visit our website at http://www.hawaii.gov/health/environmental/water/cleanwater/index.html, or contact the Engineering Section, CWB, at (808) 586-4309.

Sincerely,

ALEC WONG, P.E., CHIEF
Clean Water Branch

DCL:ml

c: DOH-EPO # 11-280
Ms. Chistine Ruotola, Group 70 International, Inc.
[via email cruotola@group70int.com]

GROUP 70
INTERNATIONAL

PRINCIPALS

Francis S. Oda, Arch.D., FAIA, AICP, LEED AP
Norman G.Y. Hong AIA
Sheryl B. Seaman AIA, ASID, LEED AP
Hitoshi Hida AIA
Roy H. Nihei AIA, CSI, LEED AP
Ralph E. Portmore AICP
James I. Nishimoto AIA
Stephen Yuen AIA
Linda C. Miki AIA
George I. Atta AICP, LEED AP
Charles Y. Kaneshiro AIA, LEED AP
Jeffrey H. Overton AICP, LEED AP
Christine Mendes Ruotola AICP, LEED AP
James L. Stone, Arch.D., AIA, LEED AP
Katherine M. MacNeil AIA, LEED AP
Tom Young, MBA AIA
Paul T. Matsuda PE, LEED AP

September 5, 2012

Mr. Alec Wong, P.E., Chief
State of Hawai'i Department of Health (DOH)
Clean Water Branch (CWB)
P.O. Box 3378
Honolulu, HI 96801-3378

Subject: Response to Comments on the Draft Environmental Impact Statement for the Proposed Kihei High School

Aloha Mr. Wong:

Thank you for your comment letter dated February 1, 2012 concerning the Draft Environmental Impact Statement (EIS) for the proposed Kihei High School Project.

We acknowledge prior receipt of DOH CWB's EIS Preparation Notice comment letter dated December 8, 2009. We understand DOH CWB has no further comments to offer at this time. We appreciate your participation in the environmental review process.

We appreciate your participation in the environmental review process. You will receive a copy of the Final EIS.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Christine Mendes Ruotola, AICP, LEED AP
Principal

NEIL ABERCROMBIE
GOVERNOR

GLENN M. OKIMOTO
DIRECTOR

Deputy Directors
JADE T. BUTAY
FORD N. FUCHIGAMI
RANDY GRUNE
JADINE URASAKI

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
869 PUNCHBOWL STREET
HONOLULU, HAWAII 96813-5097

IN REPLY REFER TO:
HWY-PS 968
2.0944

February 21, 2012

TO: ROBERT PURDIE, JR.
FACILITIES DEVELOPMENT BRANCH
DEPARTMENT OF EDUCATION

FROM: GLENN M. OKIMOTO, Ph.D.
DIRECTOR OF TRANSPORTATION

SUBJECT: KIHEI HIGH SCHOOL
DRAFT ENVIRONMENTAL IMPACT STATEMENT (DEIS) AND
TRAFFIC IMPACT ANALYSIS REPORT (TIAR)
STATE ROUTE NO. 31, PIILANI HIGHWAY
MAUI, MAKAWAO, KIHEI, TMK: (2) 2-2-002: 81 AND 83

Thank you for the submittal of the subject DEIS dated December 2011 and TIAR dated September 2011. The State of Hawaii Department of Transportation (HDOT) understands that due to the growing population of the area, there is a significant need for the development of a high school to serve the Kihei-Makena District.

The proposed 77 acre, Kihei High School project with an estimated 1,650 students at full operation, will be a significant trip generator for all modes of transportation of the community. Furthermore, the centralized location will have a direct impact on the local and regional movement of pedestrians, cyclists, and motorists. Since the proposed Kihei High School is being planned for a single access to Piilani Highway, a State Highway Facility, at its intersection with Kulanihakoi Street, it is critical that the DEIS and TIAR analyze all traffic related issues to assure the roadways operate safely and efficiently for all users.

In reviewing the DEIS and TIAR, the Highways Division has the following comments:

1. HDOT is concerned that the new high school will result in a significant increase in pedestrian and bicyclist activity on Piilani Highway. The DEIS and TIAR does not adequately identify pedestrian and bicyclist movements, nor does it provide specific recommendations for infrastructure improvements to Piilani Highway that would assure the safety of pedestrians and bicyclists traveling to and from the high school campus. The proposed shopping center and bridge adjacent to and north of the proposed high school should also be considered when analyzing the infrastructure needs for project related pedestrian and bicyclist movement along Piilani Highway. Further detailed discussion and recommendations should be included.

2. The DEIS should include discussions of possible future additional accesses, such as connections to the planned mid-level roadways and developments in the area.

3. Table 4-7 Peak Hour Trip Generation Characteristics in the DEIS and Table 1: Peak Hour Trip Generation in the TIAR should be revised to include a "Total" for the trip generation of 1,650 students at year 2025 in addition to providing the calculation for only the additional 850 "New" students.

4. Figure 4-7 (1) and (2), and Figure 4-8 (1) and (2) in the DEIS are incorrectly labeled. The labels for the figures appear to be switched and should be revised accordingly.

5. The TIAR should clarify the methodology used to calculate the trip generation for the PM peak hour. Since the traffic counts at the Kulanihakoi Street/Piilani Highway intersection appear to show minimal changes in volumes prior to the projected peak hour for the adjacent street of 3:45pm - 4:45pm, the TIAR should include an analysis of how the volumes during the school's peak hour of the generator correlates to the peak hour of the adjacent roadways, as well as any resulting impacts of the two peak periods.

6. The TIAR shall include an analysis of special events at the 5000 seat stadium.

7. The TIAR shall include an analysis of the transportation impacts related to the future developments in the region with implementation schedules.

8. Figures 11 and 12 in the TIAR are incorrectly titled as "without project."

9. The Traffic Management Plan (TMP) for school and special events shall be provided to HDOT for review and acceptance.

10. Further coordination with our department is necessary to assure all transportation related issues are appropriately addressed for the direct and regional impacts to the State Highway System.

If you have any questions, please contact Ken Tatsuguchi, Engineering Program Manager, Highways Division, Planning Branch at 587-1830.

c: Christine Ruotola, Group 70 International

bc: HWY-M, HWY-T, HWY-PS (2012-011)

BN/GA:th

GROUP 70
INTERNATIONAL

September 5, 2012

Mr. Glenn M. Okimoto, Director
State of Hawai'i, Department of Transportation (HDOT)
869 Punchbowl Street
Honolulu, HI 96813

Subject: Response to Comments on the Draft Environmental Impact Statement for the Proposed Kīhei High School

Aloha Mr. Okimoto:

Thank you for your comment letter dated February 21, 2012 concerning the Draft Environmental Impact Statement (EIS) for the proposed Kīhei High School Project. We take note of your comments relating to the preparation of the Draft EIS for the proposed project. The following are offered in response to your comments:

Response 1: Pedestrian and Bicycle Movement
Stantec Consulting Services, Inc. (Stantec) prepared a pedestrian and bicycle analysis for the project site. The report focuses on community connectivity, access to and at the high school site, and provision of appropriate safety measures for bicycles and pedestrians. Stantec provides a list of recommendations to improve walking and bicycling infrastructure for the high school. The analysis is discussed in Chapter 4 and the entire report "Kīhei High School Project Pedestrian and Bicycle Analysis" is included in the Final EIS as Appendix N.

Response 2: Future Accesses
Our understanding of mauka master plans includes a connector at the Kulanihāko'i Street extension to the mid-level roadways. In addition, the Department of Education (DOE) is open to future discussion with landowners whose development may allow for additional accessibility to the school.

Response 3: Peak Hour Trip Generation
Table 4-7 Peak Hour Trip Generation Characteristics of the Final EIS and Table 1 in the TIAR have been updated to include a total for trip generation for 1,650 students in 2025.

Response 4: Figure Labels
Thank you for calling our attention to the error in the Draft EIS Figure 4-7 (1) and (2). The "AM" and "PM" designations were corrected. Figure 4-8 in the Draft EIS is labeled correctly.

Response 5: PM Peak Hour Methodology
The trip generation for the PM peak hour was calculated utilizing the ITE high school trip generation rate (Code 530) for the peak hour of the adjacent street. Traffic volumes along Pi'ilani Highway are 5-10% higher during the PM commuter peak than during PM peak of the generator. As such, the TIAR conservatively assessed the commuter

peak periods to identify the impacts of the proposed school. It should be noted that the TIAR recommends the provision of exclusive turning lanes on all approaches of the intersection of the school's access and the highway, as well as, the installation of a traffic signal system at that intersection.

Response 6: Special Events
Special events at the school's stadium are expected to occur during off-peak periods and, as such, were not assessed by the TIAR. However, the recommended Traffic Management Plan for the high school will assess strategies for minimizing traffic impacts on the surrounding roadways during special events.

Response 7: Future Developments
The traffic study assumes that there will be growth in traffic in the project vicinity as a result of population growth and future development projects in the region. The traffic study incorporated a 4% growth in traffic between 2011 and 2015, and a 14% growth in traffic between 2011 and 2025 to account for the assumed growth in the region. In addition, the study acknowledges that there are other developments such as Kīhei Mauka, Pi'ilani Promenade, Maui Outlets Center, etc., but the details of these projects are not known at this time. As stated in the TIAR, each of these future projects are expected to prepare their own traffic study to determine its individual impacts and mitigative measures.

Response 8: Figure Labels
The labels on Figures 11 and 12 have been corrected to read "With Project."

Response 9: Traffic Management Plan
When available, the Traffic Management Plan will be provided to HDOT for review.

Response 10: HDOT Coordination
DOE and the Design-Build team will continue to coordinate with HDOT to address transportation related concerns.

We appreciate your participation in the environmental review process. You will receive a copy of the Final EIS.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Christine Mendes Ruotola

Christine Mendes Ruotola, AICP, LEED AP
Principal

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STATE OF HAWAI'I
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711 KAPI'OLANI BOULEVARD, SUITE 500
HONOLULU, HAWAI'I 96813

HRD11/4623D

RECEIVED
JAN - 6 2012
GROUP 70 INTL

December 27, 2011

Robert Purdie, Jr.
State of Hawai'i- Department of Education
Facilities Development Branch
P.O. Box 2360
Honolulu, Hawai'i 96804

Re: Draft Environmental Impact Statement
Kihei High School
Island of Maui

Aloha e Robert Purdie, Jr.,

The Office of Hawaiian Affairs (OHA) is in receipt of your December 20, 2011 request for comments on a draft environmental impact statement (DEIS) which has been prepared to support the construction of Kihei High School (KHS) which is proposed by the State of Hawai'i-Department of Education (DOE) on the Island of Maui. The DEIS serves to support the use of State of Hawai'i funds to purchase the 77.2 acres of land (project area) on which KHS will be constructed. The project area is currently used by Haleakala Ranch and Ka'ono'ulu Ranch for cattle crazing. The DEIS will also serve as a primary support document for State Land Use Commission District Boundary Amendment, Kihei-Makena Community Plan Amendment and a County of Maui Change in Zone.

At full build-out in 2025, KHS will support a student enrollment of 1,650 and approximately 206 faculty and staff. Over crowding at other Maui high schools will be reduced, and travel times and distances for students who will enroll at KHS but currently commute to other high schools in the region will be reduced. Approximately 215, 000 square feet of buildings, athletic fields and infrastructure improvements will be constructed. The existing Kulanihako'i Street will be extended mauka of the existing Pi'ilani Highway and serve as the main access road to KHS. OHA appreciates the DOE's intent to achieve a minimum of a "Silver Certification" under the U.S. Green Building Council's Leadership in Energy and Environmental Design.

An archaeological inventory survey (AIS) has been conducted for the project area (DEIS, Appendix E) and a single historic property, comprised of multiple component features was identified. By letter dated February 12, 2010, the Department of Land and Natural Resources-State Historic Preservation Division (SHPD) accepted the AIS. OHA does note that the SHPD has recommended that an intermittent archaeological monitoring program (program) be employed during initial ground disturbing activities and OHA seeks clarification whether the DOE is agreeable to such a program.

A cultural impact assessment (CIA) has been prepared to support the determinations and conclusions of the DEIS (DEIS, Appendix F). While OHA has no substantive objections to the conclusion in the CIA that no traditional or customary practices will be adversely affected by the construction of KHS, we are disappointed to note that the individuals recommended by the SHPD for CIA consultation appear to have been disregarded because the SHPD's response was "received after the waiting period of one month had expired" (CIA, page 17).

Approximately 37,450 gallons of potable water per day will be required to support KHS as full build-out. The DOE intends to connect KHS to the existing County of Maui-Department of Water Supply's transmission system which services the Kihei region in order to meet potable water needs. Approximately 185, 000 gallons of non-potable water per day will be required to support irrigation needs of KHS at full build-out. Construction of two wells, a transmission system and appurtenances is proposed within the project area to meet non-potable water needs. Like other existing wells in the region, the KHS wells will draw brackish groundwater from the Kama'ole Aquifer System. The groundwater report which as prepared as an appendix to the DEIS (Appendix C) describes the basal lens of the Kama'ole Aquifer System (aquifer system) as a "thin basal aquifer which is mostly, if not entirely brackish". With this in mind, OHA is cautious on what the potential cumulative effects of drawing water from this brackish aquifer system will have on near shore water quality and resources and suggest that this issue be considered in long term regional planning.

OHA notes that the electronic version of the DEIS which was sent with your request for comments and the version we downloaded from the Office of Environmental Quality Control website is missing "Appendix B". Furthermore, the discussion relative to water in Chapter 4.1.5 of the DEIS references an "Appendix K' which is also unavailable as an appendix in the DEIS. We request clarification on this issue.

As we have mentioned in previous correspondence ahead of the DEIS, consideration should be afforded to utilizing native species that are common or adapted to the Kihei region in landscaping plans. Thank you for the opportunity to provide comments. We look forward to seeing the construction of KHS completed and OHA applauds the DOE for their efforts to do so. Should you have any questions or concerns, please contact Keola Lindsey at 594-0244 or keolal@oha.org.

'O wau iho nō me ka 'oia'i'o,

Clyde W. Nāmu'o
Chief Executive Officer

CWN:kl

C: OHA, Maui Community Outreach Coordinator
Christine Ruotola, Group 70 International, Inc.

GROUP 70
INTERNATIONAL

September 5, 2012

Mr. Kamana'opono M. Crabbe, Chief Executive Officer
State of Hawai'i, Office of Hawaiian Affairs
711 Kapi'olani Boulevard, Suite 500
Honolulu, HI 96813

Subject: Response to Comments on the Draft Environmental Impact Statement for the Proposed Kīhei High School

Aloha Mr. Crabbe:

Thank you for your comment letter dated December 27, 2011 concerning the Draft Environmental Impact Statement (EIS) for the proposed Kīhei High School Project. We take note of your comments relating to the Draft EIS for the proposed project. The following are offered in response to your comments:

Response 1: Intermittent Archaeological Monitoring
Thank you for calling our attention to the fact that intermittent archaeological monitoring was not specifically called out in the Draft EIS as a mitigation measure. The sentence in question has been changed as follows in Section 4.2.3 Archaeological and Historic Environment the Final EIS:

"Per the SHPD-approved AIS, SIHP No. 50-50-10-6393 has been documented to the fullest extent and no further mitigation for this site is recommended. Intermittent monitoring will be conducted during the initial phases of ground disturbing activities."

Response 2: Cultural Impact Assessment (CIA)
We would also like to offer additional information concerning the individuals SHPD recommended for consultation in the CIA in their April 19, 2010 letter. We understand that:

a) OHA's April 12, 2010 comment letter on the CIA, they agreed with Scientific Consulting Services' (SCS) list of contacts and were "confident it will provide you with the information you need to move forward with your consultation process."
b) SHPD's April 19, 2010 comment letter on the CIA recommended that Les Kuloloio be contacted during the CIA consultation. While SCS did not consult with Les Kuloloio (former Maui/Lana'i Island Burial Council member), they did consult with Charlie Maxwell, who, at the time, was chair of the council.
c) SHPD's April 19, 2010 comment letter on the CIA recommended that the Maui Office of Hawaiian Affairs be contacted during the CIA consultation. SCS did consult with Thelma Shimaoka, the OHA Maui Branch representative in a letter dated March 18, 2010.

Based on the historical background and archival research, the findings of the Archaeological Inventory Survey, and the responses to the Letters of Inquiry, SCS feels confident that the consultation conducted for the CIA has been inconclusive of finding

evidence of traditional cultural practices occurring (in the past and present) in the area and accurately represents knowledge of traditional or customary practices in the area. SCS is confident that the consultation conducted for the CIA has been inclusive and accurately represents knowledge of traditional or customary practices in the area.

Response 3: Aquifer System Impacts
We acknowledge OHA's concern regarding near shore water quality impacts of brackish aquifer system use and recommendation that the issue be considered in long-term regional planning.

Response 4: Draft EIS Electronic Versions
Upon reviewing the content of the Draft EIS both online on the OEQC website and on the CD distributed to participants in the environmental review, the Draft EIS appeared to be complete and contain both Appendix B and Appendix K. We would be happy to provide a replacement CD if one is desired.

Response 5: Use of Native Plants
Use of appropriate native Hawaiian and Polynesian-introduced will be encouraged in landscaping. Drought and salt tolerant plants in landscaping will be specified in the RFP. Plant selection at the high school will be guided by the Landscape Practices and Procedures, Department of Education Plant List, and the Maui County Department of Water Supply's Landscape and Gardening Handbook. The project's landscape architect will make the final plant selections based on her/his professional judgment of the most appropriate materials for the specific location and project irrigation plans.

We appreciate your participation in the environmental review process. You will receive a copy of the Final EIS.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Christine Mendes Ruotola

Christine Mendes Ruotola, AICP, LEED AP
Principal

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FAX TRANSMITTAL SHEET

ENVIRONMENTAL CENTER
University of Hawaii
2500 Dole Street, Krauss Annex 19, Honolulu, HI 96822
Telephone: (808) 956-7361 Fax: (808) 956-3980

DATE: 02/06/2012

FROM: David Penn
956-3974

TO: State of Hawaii Department of Education, Facilities Development Branch (Duane Y. Kashiwai)
586-8223

State of Hawaii Office of Environmental Quality Control (OEQC)
586-4186

Group 70 International, Inc. (Christine M. Ruotola)
523-5874

SUBJECT: **Draft Environmental Impact Statement**
Kihei High School, Maui

No. of Pages: including cover sheet: 7

Water Resources Research Center
Environmental Center

UNIVERSITY of HAWAI'I MĀNOA

February 06, 2012
RE: 0811

Duane Y. Kashiwai, Administrator
State of Hawaii Department of Education, Facilities Development Branch
P.O. Box 2360
Honolulu, HI 96804
VIA FAX TO (808) 586-8223

Dear Mr. Kashiwai,

Draft Environmental Impact Statement
Kihei High School, Maui

The State of Hawaii Department of Education (DOE) proposes to construct a new high school—eventually serving 1,650 students and related community interests—on approximately 77 acres of land that the DOE is purchasing from two private landowners. At full build-out, approximately 25 of the 77 acres would be converted from existing pasture use to paved vehicular areas (15.1 acres), instructional space (6.5 acres), and outdoor facilities (3.3 acres), while the rest of the campus would be re-landscaped and maintained as open space. Associated new infrastructure would include two brackish water wells, a drainage system, and roadways sized to accommodate future construction on adjacent and nearby lands.

This review of the DOE's Draft Environmental Impact Statement (DEIS) is a service activity of the University of Hawaii's Environmental Center to help determine and maintain the optimum quality of the environment. It is not intended to represent the official views of the University of Hawaii. The objectives of our review process are to enhance environmental consciousness, encourage cooperation and coordination, and facilitate public participation. These comments were drafted with the assistance of Sara Bolduc, Environmental Center. Please note that although the published deadline for comments on the DEIS is February 05, 2012, Hawaii Revised Statutes § 1-29 provides for extending this deadline to February 06, 2012.

General Comments:

1. Unresolved Issues

The DEIS identifies three unresolved issues that we would expect to be advanced towards resolution in the Final EIS (FEIS): (1) parking requirements, (2) potable water supply, and (3) detailed project design. We discuss potable water supply and detailed project design in our specific comments, below. To analyze the potential environmental impacts of each parking alternative, we suggest that the FEIS identify, assess, and compare the on-site, off-site, and regional environmental impacts and mitigation measures for each alternative. For example, how

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An Equal Opportunity/Affirmative Action Institution

much impervious surface, stormwater runoff, and pollutant loading would be generated under each parking alternative, and how would associated mitigation approaches change in response?

Our review process identified additional unresolved issues with regard to archaeological monitoring, the results of the Phase I Environmental Site Assessment, and biological conservation. These issues are discussed within the context of our specific comments, below.

2. *Interrelationships and Cumulative Environmental Impacts*

We suggest that the DEIS provide a more thorough analysis of the cumulative impacts that could be associated with increased demand on local infrastructure and traffic. According to page 4-77 of the document, "[t]his project and other planned projects in the region are likely to have long –term cumulative impacts, such as increased traffic, and higher demand on infrastructure. However, many of the planned projects are consistent with County plans and will have cumulative long-term beneficial impacts such as reducing commute traffic to distant parts of the County and increasing employment opportunities." Reliance on consistency with County plans is not analogous with providing a satisfactory assessment of potential cumulative impacts, unless that assessment was already conducted as part of the county planning process.

A more complete analysis might include a comprehensive review of (1) past and future development of the area, (2) the accumulation of environmental impacts associated with past development, and (3) an assessment of potential additional cumulative impacts on regional traffic and infrastructure. In particular, we suggest including a review of potable and non-potable water demands for each planned development within the overall scheme of water availability established by the State Commission on Water Resource Management and the Maui County Water Use and Development Plan. Surely, a thorough consideration of potential cumulative impacts would include a more holistic view of the region in which the proposed action is planned.

Specific Comments:

In addition to our general comments, please consider our specific comments about population data, archaeological monitoring, the preliminary site assessment, biological conservation, water resource management, detailed project design, and economic and fiscal impacts.

3. *Population Data*

We strongly recommend that the FEIS replace 2000 US Census Bureau decennial data, as well as 2006 American Community Survey estimates, with 2010 decennial census data that has been publicly available since early 2011. Please note that Section 4.3.5 of the DEIS outlines the demographics of school aged individuals in Kihei as consisting solely of Asian, White, and Hispanic students. We are perplexed at the thought that there are no school-aged individuals of Hawaiian ancestry living in Kīhei.

4. *Archaeological Monitoring*

Section 4.2.3 of the DEIS suggests that DOE will not implement the State Historic Preservation Division's (SHPD) recommendation for "a program of intermittent archaeological monitoring during the initial phases of ground preparation and build out . . . ." To help resolve this disagreement, we suggest that the FEIS provide a succinct comparison of the potential for significant effects on cultural resources—and sufficient mitigation of same—with and without the monitoring recommended by SHPD.

5. *Phase I Environmental Site Assessment*

The Phase I Environmental Site Assessment (Appendix J) contains a lot of useful and interesting historical information about potentially contaminating activities within the region. We suggest that a bit more documentation of this information would give a more complete picture of the regional situation. For example, the current location of the contaminated soils that were purportedly removed from the Kihei Base Yard appears unclear, and without additional detail about (1) DOH processing of the 1997 No Further Action request and (2) drainage patterns at the stockpiling site, it seems possible that the contaminated soils could flow into Kulanihakoi gulch and affect the proposed project area (page 18). Similarly, absent further explanation, the lack of conclusive information about the location and status of the Kihei Marine Facility Underground Injection well may qualify its potential impact upon the proposed project area as an unresolved issue (page 19). For disclosure purposes, we also suggest that this appendix include a table identifying the 20 orphan sites that do not "have a reasonable potential to impact the project site" (page 19).

We also note that although the Cultural Impact Assessment (Appendix F) suggests that WWII military training exercises may have occurred within or near the proposed project area, (page 16), this potentially contaminating activity is not identified or discussed in the environmental site assessment.

6. *Biological Conservation*

As reported in the Environmental Impact Statement Preparation Notice (EISPN, Page 3-2), Robert Hobdy assessed site flora and fauna in 2007 for the project's Site Selection Study. Hobdy pointed out that although the present vegetation in the project area predominantly consisted of "grassland with scattered kiawe trees along the dry gulch channels," there were at least eighteen plant species on the site, including four native species: ilima, uhaloa, alena, and ma`o. According to Hobdy, because alena and ma`o plants are less common, they "warrant consideration for preservation". We suggest that the FEIS include a reference to Hobdy's study and address the recommended preservation considerations.

7. Water Resource Management

The proposed action appears to involve unresolved issues concerning (1) the implementation of the Maui Department of Water Supply's Water Availability Policy and (2) the source of non-potable water. With regard to the water availability policy, we suggest that it would be useful for section 4.2.10.1 of the FEIS to quote the exact language of the policy, thus begging clarification of whether or not the proposed project site is actually "within the service area of the department's central . . . Maui water system." Maui County Code § 14.12.030, Section 1.G. For the sake of a more transparent disclosure process, we also suggest that this section of the FEIS include additional information from the Groundwater Resources and Supply analysis (Appendix C), the State Water Resources Protection Plan, and the Maui County Water Use and Development Plan concerning sustainable groundwater yields, instream flow standards (if applicable), and the overall allocation of water to land use within the projected potable water source areas and the Kamaole Aquifer System (non-potable water).

The EISPN for the proposed action references the description in the Site Selection Study of the existing Kihei Wastewater Reclamation Facility and the potential for it to bring recycled effluent to the project site for irrigation purposes (page 3-8). The EISPN promises that "[t]he Basis-of-Design Report for the project will describe existing and proposed non-potable water system facilities and associated impacts and mitigation measures," and "[a]lternative means for irrigation will also be explored." In addition, the Groundwater Resources and Supply analysis in the DEIS (Appendix C) states that "[a]lternative consideration is also being given to the use of surplus R-1 effluent from the County's Kihei Wastewater Reclamation Facility . . . However, the feasibility of using this alternative source of water to meet the project's irrigation water requirement will be studied by others."

Surprisingly, despite this background, the Preliminary Engineering Report (Appendix K) and Section 4.2.10 of the DEIS completely ignore the potential use of recycled effluent as a source of non-potable water for the proposed action. Therefore, we suggest that the FEIS compare the potential impacts of recycled v. brackish water use and explain why the recycled water alternative has disappeared from the proposal. In addition, does the proposed project include any plans to capture, store, and utilize rainwater from rooftops and runoff from slopes/channels, and to reuse drainage water from indoor plumbing (e.g. wash areas) for toilet/urinal flushing?

We note that final approval of a drainage master plan for the proposed project area may also be considered as an unresolved issue. We suggest that the FEIS include additional information about the relationship between drainage water quality and the receiving waters for this drainage area at Maalaea Bay, a waterbody for which the 2006 State of Hawaii Water Quality Monitoring and Assessment Report includes at least three listings for locations where water quality is impaired due to excessive nutrient loading and turbidity. How would the proposed action provide data that could be used to assist the pollutant loading analysis that is required for these waters, and how would the mitigation measures proposed in the drainage master plan contribute to the load reductions that are necessary in order for these receiving waters to achieve the water quality objectives defined by the state water quality standards?

In this regard, we note that mere conformance with county drainage standards and USGBC requirements, as discussed on page 10 of the Preliminary Engineering Report (Appendix K), does not equate to or guarantee compliance with state water quality standards. Also, although basins should be designed to reduce post-development pollutant loading and manage post-development increases in flow rates and quantity, we suggest that great care be exercised in attempts to "reduce [flows] to below pre-development levels," because this form of runoff robbery could negatively impact downgradient receiving waters (including groundwater) that would otherwise benefit from these inputs.

8. Detailed Project Design

It is difficult to identify and assess the energy-related impacts of this proposed project without a clear understanding of the final project design parameters. The DEIS states that the project will promote sustainable design, "seeking a minimum of Silver certification under the LEED program developed by the USGBC, or a comparable rating system." A commitment to building a school with a minimal environmental footprint would seem to require something more than merely entertaining more sustainable building strategies. We suggest that the FEIS explicitly consider alternative scenarios of building designs and energy sources (grid-based v. on-site) and how the different designs and sources affect overall energy use, carbon footprints, and related impacts.

9. Economic and Fiscal Impacts

According to p. 4 of the Economic and Fiscal Impacts Study (Appendix L), total construction expenditures for the Kihei High School are estimated at nearly $170 million. The breakdown for these expenditures is not clear. Does this include land acquisition, planning, and design costs? The 2012 Hawaii State Legislature is currently hearing a bill (Senate Bill 2996) that would provide $20 million to resume "remaining planning, design, and construction work," and suggests that $5.365 million of the $12 million released to date was for land acquisition. Despite the particulars, how do these costs compare with similar sized projects in Hawaii and other locations? How would construction costs and long-term operation and maintenance costs change with design changes such as using recycled water for nonpotable use and utilizing on-site photovoltaic electrical generation systems?

Thank you for considering our comments on this Draft Environmental Impact Statement We hope that our comments will help to improve the utility of the Final Environmental Impact Statement for regulatory authorities who must weigh carefully whether the social benefits of the proposed action would justify the environmental impacts that would likely occur. When the Final Environmental Impact Statement is distributed, please send one printed copy to the Environmental Center.

Sincerely,

David Penn

David Penn, Assistant Specialist

cc: State of Hawaii Office of Environmental Quality Control (OEQC)
Chittaranjan Ray, Interim Director, Water Resources Research Center, UH Manoa
Christine M. Ruotola, Group 70 International, Inc.
Sara Bolduc

GROUP 70 INTERNATIONAL

September 5, 2012

Mr. David Penn
University of Hawai'i
Environmental Center
2500 Dole Street, Krauss Annex 19
Honolulu, HI 96822

Subject: Response to Comments on the Draft Environmental Impact Statement for the Proposed Kīhei High School

Aloha Mr. Penn:

Thank you for your comment letter dated February 6, 2012 concerning the Draft Environmental Impact Statement (EIS) for the proposed Kīhei High School Project. We take note of your comments relating to the preparation of the Draft EIS for the proposed project. The following are offered in response to your comments:

Response 1: Unresolved Issues, Parking Requirements
The EIS identifies parking requirements as an unresolved issue. The County of Maui Department of Planning, in their February 3, 2012 comment letter on the Kīhei High School Draft EIS wrote:

"The Department acknowledges the calculation of a total of 1,941 parking spaces needed for the development shown on the conceptual site plan compared to the 948 spaces now incorporated within it. The Department looks forward to working with the DOE [Department of Education] to resolve any deficiency which may remain as plans are further refined. If DOE anticipates possibly requesting consideration of a Variance approval from the County as one potential means of resolution, this may be good to be disclosed within the "Permits Required" Section of the Project Summary on Page 1-1 and/or elsewhere."

The Department of Planning acknowledged the project has not been fully designed and expressed openness to discussing the parking issue as plans are further refined. The DOE is committed to working closely with the County through the Design-Build (DB) process to resolve this issue, including any mitigation measures.

Response 2. Interrelationships and Cumulative Environmental Impacts
Impacts of known projects, where such data is known, have been included in the EIS analysis.

Regarding traffic, growth in the region has been incorporated into the project Traffic Impact Assessment Report. Subsequent to the Draft EIS, Stantec Consulting Services, Inc. (Stantec) prepared a pedestrian and bicycle analysis for the project site. The report focuses on community connectivity, access to and at the high school site, and provision of appropriate safety measures for bicycles and pedestrians. Stantec provides a list of recommendations to improve walking and bicycling infrastructure for the high

school. The analysis is discussed in Chapter 4 and the entire report "Kīhei High School Project Pedestrian and Bicycle Analysis" is included in the Final EIS as Appendix N.

Preparation of the Water Resources and Supply report included coordination with the State Commission on Water Resource Management (CWRM) and Maui County. Regional use of the Kama'ole aquifer, including all current users, has been documented and assessed in the EIS. Actual water use data is not available for proposed, planned, and speculative developments. As such, discussion of the impacts would be speculative in nature. Each future project in the region will be responsible for evaluation its projected non-potable water usage and its respected impacts on the sustainable yield of the Kama'ole aquifer.

Response 3: Population Data
The population data in the Final EIS has been updated to include 2010 census information from the U.S. Census Bureau and the 2011 Maui County Data Book.

Response 4: Archaeological Monitoring
Thank you for calling our attention to the fact that intermittent archaeological monitoring was not specifically called out in the Draft EIS as a mitigation measures. The paragraph in question has been changed as follows in Section 4.2.3 Archaeological and Historic Environment the Final EIS:

"Chapter 4.2.3 Archaeological and Historic Environment
Per the SHPD-approved AIS, SIHP No. 50-50-10-6393 has been documented to the fullest extent and no further mitigation for this site is recommended. Intermittent monitoring will be conducted during the initial phases of ground disturbing activities."

Response 5: Phase I Environmental Assessment
Kīhei Base Yard
Potential residual contamination from the Kīhei Base Yard on the project site is unlikely. Contaminated soils were excavated, stockpiled and removed from the property. Per the 1994 Site Remediation Executive Summary Report conducted by South Pacific Geotechnical, lab testing of site soils showed the site was remediated per DOH standards.

Kīhei Marine Underground Injection Well Site
According to records on file at the State of Hawai'i Department of Health Safe Drinking Water Branch (SDWB) Underground Injection Control Program, the Kīhei Marine Facility and Underground Injection well are located in North Kīhei near the intersection of North Kīhei Road and Pi'ilani Highway, approximately two miles away from the Kīhei High School project site. The Underground Injection well is too far away from the project site to cause any impacts at the school site. Additionally, SDWB never received confirmation whether the Underground Injection well was constructed.

Orphan Sites
The 20 orphan sites are listed in the Phase I ESA, Appendix A, page 11.

WWII Military Training Exercises
Through the preparation of the Phase I ESA, property owners were contacted regarding uses of the parcels. Military training use was not a documented use.

Response 6: Biological Conservation
Robert Hobdy's 2007 flora and fauna assessment was a resource for the project's 2009 flora and fauna assessment. Resources identified by Hobdy were sought during 2009 field surveys. 'Ilima and alena were not found within the project site. The lone Ma'o plant was located outside the western property boundary, within the Highway shoulder. 'Uhaloa is an extremely common native species and is not a candidate for special attention.

Response 7: Water Resource Management
Paragraph 1. Clarification has been added to the Final EIS Chapter 4.2.10.1 to quote the exact language of the MDWS' Water Availability policy.

"Chapter 4.2.10.1 Water System
The project will not be subject to the Maui Department of Water Supply's Water Availability Policy per Maui County Code §14.12.030. The project is a public development project is exempt per the definitions below.

> §14.12.030G states: This chapter shall not apply to, "Public or quasi-public development projects as defined in section 19.03.040 of this code and related subdivisions, and are within the service area of the department's central or west Maui water system".
>
> §19.03.040 defines "public" as "a use conducted by, or a facility or structure owned or managed by, the government of the United States, the State of Hawaii, or the County of Maui which provides a governmental function, activity, or service for public benefit."

Please note that the actual wording used in the code is "public facility" or "public use." There is no definition of "public development project" §19.03.040 (exact wording may be verified at http://library.municode.com/index.aspx?clientId=16289)."

Also, according to MDWS' letter of February 3, 2012 to State Department of Education, "As a public development project, the school [proposed Kīhei High School] will be exempt from the Maui County availability policy codified in Maui County Code Chapter 14.12. There is currently no moratorium on issuance of water meters on the Central Maui system."

Regarding the source of non-potable water for the project, we believe Appendix C adequately addresses matters concerning groundwater resources and sustainable yield relating to the school project, which is projected to withdraw 0.185 mgd of non-potable groundwater from two well-spaced wells in the Kama'ole Aquifer System. The proposed brackish water withdrawal amounts to 1.7% of the aquifer's estimated sustainable yield. The two brackish wells will develop brackish groundwater in an

efficient manner from a thin basal lens near the Kīhei coast. Because the brackish groundwater is to be used entirely for irrigation purposes, a portion may return to the groundwater table, thereby resulting in a net groundwater withdrawal lower than the proposed amount of 0.185 mgd.

Paragraph 2 and 3. A *Non-potable Water System Alternatives Analysis* report was prepared by Gray, Hong, Nojima & Associates, Inc. to analyze potential non-potable water system improvements, non-potable water sources, and provide recommendations based a life cycle cost comparison, among other factors. Two alternatives for non-potable water were identified in the report, 1) onsite brackish groundwater wells, and 2) use of R-1 recycled water from the County of Maui's existing Kīhei Wastewater Reclamation Facility (WRRF). Please refer to Appendix M of the Final EIS for details.

The proposed project does not include any plans for rain catchment because rainfall in the project area averages only 10 inches a year, an amount making rain catchment ineffective. Furthermore, the 10 inches average annual rainfall occurs primarily during occasional rainstorms making rain catchment less effective for irrigation purposes.

Paragraph 4. As indicated in the Preliminary Engineering Report, runoff from the proposed project site will not discharge directly into inland state waters included in the 2006 Clean Water Act §303(d) List of Impaired Waters; however, your comments correctly state that Maalaea Bay is downstream, and it is designated as an impaired water (ammonia, algal growth, nitrates/nitrites/nitrogen, and turbidity). According to the 2006 *State of Hawaii Water Quality Monitoring and Assessment Report*, no Total Maximum Daily Loads (TMDL) has been established for this water body.

Paragraph 5: The intent of the conceptual basin sizing presented in the PER was to determine approximate basin dimensions such that, theoretically, there would be no peak storm runoff rate (CFS) increase from the exiting the site for the target/regulatory design storm. Design storms of interest were selected based on LEED and County requirements

As indicated in the PER, the preliminary basin volume provides a permanent storage volume of 145,000 CF (+/-), whereas the required storage volume (based on LEED criteria) is 140,000 CF.

It should also be noted that according to the preliminary geotechnical investigation by Hirata and Associates (October 16, 2009), the existing soil around the basin has a percolation rate of 1.3 minutes/inch, allowing for infiltration groundwater recharge.

Response 8: Detailed Project Design
The Kīhei High School project will be constructed through a DB process. As such, Request for Qualifications (RFQ) and Request for Proposal (RFP) documents are being prepared. The winning Design-Build Entity (DBE) selected by the DOE will be responsible for design, construction, and commissioning of the new school. The DBE will be required to seek a minimum of Silver certification under the LEED program developed by the USGBC, or a similar designation under a comparable rating system. The DOE is committed to sustainable building practices; however, specific sustainable design features will be determined by the DOE and DBE.

Response 9: Economic and Fiscal Impacts
In Appendix L of the Final EIS, the report, "Kīhei High School: Economic and Fiscal Impacts," (July 2011), Section 3 addresses the "Economic Impacts of Construction" based on an estimated cost of $170 million to build the school. This estimate was provided by DOE, and it covers only construction costs based on (1) the initial plans for KHS and (2) recent comparables. As such, the cost does not include the cost of land acquisition, planning, or design. Since this report is an impact assessment and not a cost analysis, it does not address the construction and O&M costs of variations in the design of the school, the specifics of which are to be determined through the Design-Build process.

We appreciate your participation in the environmental review process. You will receive a copy of the Final EIS.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Christine Mendes Ruotola, AICP, LEED AP
Principal

ALAN M. ARAKAWA
Mayor

JO ANNE JOHNSON-WINER
Director
MARC I. TAKAMORI
Deputy Director
Telephone (808) 270-7511

DEPARTMENT OF TRANSPORTATION

COUNTY OF MAUI
200 South High Street
Wailuku, Hawaii, USA 96793-2155

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FACILITIES DEV BRANCH
CONSTR MGMT SEC

February 7, 2012

Mr. Robert Purdie
Hawaii Department of Education
Facilities Development Branch
PO Box 2360
Honolulu, Hawaii 96804

Subject: Draft EIS for Kihei High School

Dear Mr. Purdie,

Thank you for the opportunity to comment on this project. We have no comments to make at this time.

Please feel free to contact me if you have any questions.

Sincerely,

Jo Anne Johnson Winer /aQ

Jo Anne Johnson Winer
Director

GROUP 70
INTERNATIONAL

September 5, 2012

Ms. Jo Anne Johnson Winer, Director
County of Maui
Department of Transportation
200 South High Street
Wailuku, HI 96793-2155

Subject: Response to Comments on the Draft Environmental Impact Statement for the Proposed Kīhei High School

Aloha Ms. Winer:

Thank you for your comment letter dated February 7, 2012 concerning the Draft Environmental Impact Statement (EIS) for the proposed Kīhei High School Project. We understand you have no comments to offer at this time.

We appreciate your participation in the environmental review process. You will receive a copy of the Final EIS.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Christine Mendes Ruotola

Christine Mendes Ruotola, AICP, LEED AP
Principal

DEPARTMENT OF
HOUSING AND HUMAN CONCERNS
HOUSING DIVISION
COUNTY OF MAUI

ALAN M. ARAKAWA
Mayor
JO-ANN T. RIDAO
Director
JAN SHISHIDO
Deputy Director

35 LUNALILO STREET, SUITE 102 • WAILUKU, HAWAII 96793 • PHONE (808) 270-7351 • FAX (808) 270-6284

December 28, 2011

Ms. Christine Mendes Ruotola, AICP, LEED AP
Principal
Group 70 International, Inc.
925 Bethel Street, 5th Floor
Honolulu, Hawaii 96813

Dear Ms. Ruotola:

Subject: Draft Environmental Impact Statement (DEIS) for Kihei High School of Maui, Hawaii. TMK's 2-2-2-002:81 and 2-2-2-002:83

The Department has reviewed the Draft Environmental Assessment (EA) for the above subject project. Based on our review, we have determined that the subject project is not subject to Chapter 2.96, Maui County Code. At the present time, the Department has no additional comments to offer.

Please call Mr. Veranio Tongson Jr. of our Housing Division at (808) 270-1741 if you have any questions.

Sincerely,

CLYDE ALMEIDA
Assistant Housing Administrator

cc: Director of Housing and Human Concerns
State of Hawaii, Department of Education

GROUP 70
INTERNATIONAL

September 5, 2012

Mr. Clyde Almeida, Assistant Housing Administrator
County of Maui
Department of Housing and Human Concerns, Housing Division
35 Lunalilo Street, Suite 102
Wailuku, HI 96793

Subject: Response to Comments on the Draft Environmental Impact Statement for the Proposed Kīhei High School

Aloha Mr. Almeida,

Thank you for your comment letter dated December 28, 2011 concerning the Draft Environmental Impact Statement (EIS) for the proposed Kīhei High School Project. We take note of that the subject project is not subject to Chapter 2.96, Maui County Code, and that the Department has no additional comments at this time.

We appreciate your participation in the environmental review process. You will receive a copy of the Final EIS.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Christine Mendes Ruotola

Christine Mendes Ruotola, AICP, LEED AP
Principal

ALAN M. ARAKAWA
Mayor

DAVID C. GOODE
Director

ROWENA M. DAGDAG-ANDAYA
Deputy Director

Telephone: (808) 270-7845
Fax: (808) 270-7955

COUNTY OF MAUI
DEPARTMENT OF PUBLIC WORKS
200 SOUTH HIGH STREET, ROOM NO. 434
WAILUKU, MAUI, HAWAII 96793

RALPH NAGAMINE, L.S., P.E.
Development Services Administration

CARY YAMASHITA, P.E.
Engineering Division

BRIAN HASHIRO, P.E.
Highways Division

February 17, 2012

Mr. Robert Purdie, Jr.
State of Hawaii
Department of Education
Facilities Development Branch
P. O. Box 2360
Honolulu, Hawaii 96804

Dear Mr. Purdie:

SUBJECT: DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR THE PROPOSED KIHEI HIGH SCHOOL; TMK: (2) 2-2-002:081; 083

We reviewed the subject application and have the following comments:

1. The applicant shall be responsible for all required improvements as required by Hawaii Revised Statutes, Maui County Code and rules and regulations.

2. As applicable, construction plans shall be designed in conformance with Hawaii Standard Specifications for Road and Bridge Construction dated 2005 and Standard Details for Public Works Construction, 1984, as amended.

3. As applicable, worksite traffic-control plans/devices shall conform to Manual on Uniform Traffic Control Devices for Streets and Highways, 2003.

4. Waipuilani Gulch becomes a narrow drainage channel at South Kihei Road. Flooding of South Kihei Road and adjacent areas have been problematic in the past due to stormwater from Waipuilani Gulch.

The Draft Environmental Impact Statement (EIS) indicates that the off-site drainage improvements are intended to divert runoff from the proposed high school to Waipuilani Gulch. The diversion channel proposed for the off-site drainage improvements must be sized using the Natural Resources Conservation Service hydrograph method with a recurrence interval of 100 years based on a 24 hour storm event. Watershed area contributing to runoff into the diversion channel exceeds 100 acres triggering the above requirement.

Overflows from Kulanihakoi Gulch have also caused flooding and mud flows on to Kaonoulu Street and South Kihei Road. Although the proposed drainage improvements do not call for the diversion of runoff into Kulanihakoi Gulch, any diversion of water into this gulch should be minimized.

5. We would highly recommend that the school consider adding photovoltaic panels to reduce electrical consumption from the local utility.

6. The section on pedestrian safety on page 4-40 states that the location of the school is within walking distance to existing and future residential areas, thereby encouraging students to cross Piilani Highway on foot or by bike. Vehicles travel on Piilani Highway at highway speeds and there is a strong potential for conflicts between vehicles and pedestrians/bikes. Please include a discussion in the Final EIS that outline alternatives being considered to provide safe walking and bicycling opportunities across Piilani Highway and within the project area.

Please call Rowena M. Dagdag-Andaya at (808) 270-7845 if you have any questions regarding this letter.

Sincerely,

DAVID C. GOODE
Director of Public Works

DCG:RMDA:ls
xc: Highways Division
Engineering Division
S:\LUCA\CZM\prop_kihei_high_sch_deis_22002081_083_ls.wpd

GROUP 70
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Tom Young, MBA AIA
Paul T. Matsuda PE, LEED AP

September 5, 2012

Mr. David Goode, Director
County of Maui
Department of Public Works
200 South High Street, Room No. 434
Wailuku, HI 96793

Subject: Response to Comments on the Draft Environmental Impact Statement for the Proposed Kīhei High School

Aloha Mr. Goode:

Thank you for your comment letter dated February 17, 2017 concerning the Draft Environmental Impact Statement (EIS) for the proposed Kīhei High School Project. We take note of your comments relating to the Draft EIS for the proposed project. The following are offered in response to your comments:

Response 1: Rules and Regulations
The project will adhere to the requirements of the Hawai'i Revised Statutes, Maui County Code and applicable rules and regulations.

Response 2: Construction Plans
Construction plans will be designed in conformance with Hawai'i Standards Specifications for Road and Bridge Construction (2005) and Standard Details for Public Works Construction (1984), as applicable.

Response 3: Traffic Control Plans/Devices
Worksite traffic-control plans/devices shall conform to Manual on Uniform Traffic Control Devices for Streets and Highways (2003), as applicable.

Response 4: Drainage
We acknowledge your concerns regarding flooding of areas downstream of Pi'ilani Highway due to storm water from Waipu'ilani Gulch. The estimated increase in the 100-year 24-hour peak flow rate through Waipu'ilani Bridge due to the project should be minimal (less than 1%).

The runoff area being intercepted by the proposed diversion ditch at the mauka boundary of the campus site is approximately 85 acres (which is less than 100 acres). This is considerably smaller compared to the runoff areas of the Waipu'ilani (Gulch) Bridge (7,379 acres) and Kūlanihāko'i (Gulch) Bridge (9,649 acres). Although the hydrologic criteria for the diversion ditch was not included in the DEIS, preliminary sizing for site layout purposes was based on the 100-year 24-hour storm event using the National Resources Conservation Service method as called for in your comment letter. It should be noted that under section 15-04-05(f) of the "Rules for the Design of Storm Drainage Facilities in the County of Maui" states: *When a drainage area of less than 100 acres contributes to a major stream or channel with a total drainage area*

greater than 100 acres, the contributory drainage system shall be designed for 10-year or 50-year storm, whichever is applicable. Therefore, the preliminary sizing of the diversion ditch is conservative based on this standard.

We acknowledge your concerns regarding flooding downstream of Pi'ilani Highway due to overflows from Kūlanihāko'i Gulch. Language has been added to the Final EIS Section 4.2.10.3 Drainage, stating that any diversion of runoff into Kūlanihāko'i Gulch should be minimized.

Response 5: Energy Efficiency
Energy efficiency will be a priority of the school. Specific energy conservation design features will be selected during the Design-Build process.

Response 6: Pedestrian Safety
Stantec Consulting Services, Inc. (Stantec) prepared a pedestrian and bicycle analysis for the project site. The report focuses on community connectivity, access to and at the high school site, and provision of appropriate safety measures for bicycles and pedestrians. Stantec provides a list of recommendations to improve walking and bicycling infrastructure for the high school. The analysis is discussed in Chapter 4 and the entire report "Kīhei High School Project Pedestrian and Bicycle Analysis" is included in the Final EIS as Appendix N.

We appreciate your participation in the environmental review process. You will receive a copy of the Final EIS.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Christine Mendes Ruotola, AICP, LEED AP
Principal

Group 70 International • 925 Bethel Street, 5th Floor • Honolulu, HI 96813-4307 • tel. 808.523.5866 • fax. 808.523.5874 • www.group70int.com

ALAN M. ARAKAWA
Mayor

DAVID TAYLOR, P.E.
Director

PAUL J. MEYER
Deputy Director

DEPARTMENT OF WATER SUPPLY
COUNTY OF MAUI
200 SOUTH HIGH STREET
WAILUKU, MAUI, HAWAII 96793-2155
www.mauiwater.org

February 3, 2012

Mr. Robert Purdie, Jr.
State of Hawaii Department of Education
Facilities Development Branch
PO Box 2360
Honolulu, Hawaii 96804

Project: Kihei High School Environmental Impact Statement
TMK: 2-2-002:081, 2-2-002:083

Dear Mr. Purdie,

Thank you for the opportunity to comment on this Draft Environmental Impact Statement (EIS). We note that our comment letters dated October 26, 2009 and November 14, 2009 are included in the Draft EIS document.

Source Availability
As a public development project, the school will be exempt from the Maui County availability policy codified in Maui County Code Chapter 14.12. There is currently no moratorium on issuance of water meters on the Central Maui system. Meter size will be determined based on domestic calculations in the building permit process. The potable demand estimate of 20 gpd per student may be on the low side, even considering use of low-flow fixtures as it would serve swimming pool and any other non potable water features.

We note that two on site irrigation wells are proposed to meet all irrigation demand. The Department of Water Supply will not review the private non-potable water system. Actual pumpage from wells installed in Kamaole aquifer probably differs from reported pumpage. It should be noted that permitted pumps installed in Kamaole aquifer totals at least 13.45 mgd with a sustainable yield of 11 mgd. We recommend that the applicant further analyze the alternative of using reclaimed water from Kihei Sewage Treatment Plant from a potential distribution line mauka of the project site that could serve multiple proposed projects in the Kaonoulu area.

System Infrastructure
System improvements, including storage requirements will be determined in the building permit

process. Installation of backflow preventer, approved, installed and tested by a technician certified by the State Department of Health will be required to mitigate potential effects of cross connection of the dual water system.

Pollution Prevention
We note that the best management practices recommended in our October 26, 2009 letter are included in the Draft EIS.

Conservation
In addition to the conservation measures proposed in the Draft EIS, the following measures can further reduce potable and non potable demand for this project:
Indoor Conservation Measures:

a. Use EPA WaterSense labeled plumbing fixtures.
b. Install flow reducers and faucet aerators in all plumbing fixtures where-ever possible.
c. Install dual flush toilets with high efficiency models that use 1.28 gallons per flush or less.
d. Install showerheads with a flow rate of 1.5 gpm at 60 psi or less.
e. Install bathroom sink faucets with fixtures that do not exceed 1 gpm at 60 psi. Laundry facilities and/or individual unit machines must use Energy Star labeled washers.
f. Limit the distance from the hot water source to the tap early in the design stage.

.Exterior Areas:

a. Install infrastructure necessary to utilize a future connection to reclaimed water line
b. Use Smart Approved WaterMark irrigation products. Examples include ET irrigation controllers, drip irrigation, and water saving spray heads.
c. Avoid plant fertilizing and pruning that would stimulate excessive growth. Time watering to occur in the early morning or evening to limit evaporation. Limit turf to as small an area as possible

Should you have any questions on system improvements, please contact our engineering division at (808)270-7835. For any water resources questions, please contact Staff Planner Eva Blumenstein at (808) 463-3102 or eva.blumenstein@co.maui.hi.us.

Sincerely,

David Taylor, Director
emb

Attachments:
c: engineering
Christine Mendes Ruotola, Group 70 International, Inc.

GROUP 70
INTERNATIONAL

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Paul T. Matsuda PE, LEED AP

September 5, 2012

Mr. David Taylor, Director
County of Maui
Department of Water Supply
200 South High Street
Wailuku, HI 96793-2155

Subject: Response to Comments on the Draft Environmental Impact Statement for the Proposed Kīhei High School

Aloha Mr. Taylor:

Thank you for your comment letter dated February 3, 2012 concerning the Draft Environmental Impact Statement (EIS) for the proposed Kīhei High School Project. We take note of your comments relating to the preparation of the Draft EIS for the proposed project. The following are offered in response to your comments:

Response 1: Source Availability
Thank you for confirming that the Kīhei High School project will be exempt from the Maui County availability policy as codified in the Maui County Code Chapter 14.12. We understand that there is no moratorium on the issuance of water meters on the Central Maui System, and that meter size will be determined during the building permit process.

A *Non-potable Water System Alternatives Analysis* report was prepared by Gray, Hong, Nojima & Associates, Inc. to analyze potential non-potable water system alternatives, non-potable water sources, and provide recommendations based a life cycle cost comparison, among other factors. Two alternatives for non-potable water were identified in the report: 1) onsite brackish groundwater wells, and 2) the use of R-1 recycled water from the Kīhei Wastewater Reclamation Facility. Please refer to Appendix M of the Final EIS for the full report.

The DOE will continue to discuss non-potable irrigation system options with Maui County representatives.

Response 2: System Infrastructure
We understand that system improvements will be determined at the building permit process.

Response 3: Pollution Prevention
Best management practices recommended in the October 26, 2009 letter were included in the Draft EIS.

Response 4: Conservation
Thank you for providing additional recommended water conservation measures. Feasible mitigation measures have been incorporated into Section 4.2.10.1 of the Final EIS.

We appreciate your participation in the environmental review process. You will receive a copy of the Final EIS.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Christine Mendes Ruotola, AICP, LEED AP
Principal

Group 70 International • 925 Bethel Street, 5th Floor • Honolulu, HI 96813-4307 • tel. 808.523.5866 • fax. 808.523.5874 • www.group70int.com

ALAN M. ARAKAWA
MAYOR

JEFFREY A. MURRAY
CHIEF

ROBERT M. SHIMADA
DEPUTY CHIEF

COUNTY OF MAUI
DEPARTMENT OF FIRE AND PUBLIC SAFETY
FIRE PREVENTION BUREAU

313 MANEA PLACE • WAILUKU, HAWAII 96793
(808) 244-9161 • FAX (808) 244-1363

RECEIVED
FEB - 1 2012
GROUP 70 INTL

Date : **January 30, 2012**

To : **Group 70 International, Inc.**
C/O Christine Ruotola
925 Bethel Street, 5th Floor
Honolulu, HI 96813

From : **Paul Haake**
Captain, Fire Prevention Bureau
Department of Fire & Public Safety

RE : **Kihei High School**
Draft Environmental Impact Statement (DEIS)
(2) 2-2-002: 081 & (2) 2-2-002: 083

Dear Robert,

Thank you for allowing our office the opportunity to comment on this DEIS. At this time, there are no comments specific to DEIS. Our office does reserve the right to comment during the building permit application process when fire department access, water supply for fire protection, and life safety requirements will be addressed.

Please feel free to contact me should there be any questions or comments. Thank you for your attention to fire prevention and public safety.

Sincerely,

Paul Haake
Captain, Fire Prevention Bureau
313 Manea Place
Wailuku, HI 96793
244-9161 ext. 23

GROUP 70 INTERNATIONAL

PRINCIPALS

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Paul T. Matsuda PE, LEED AP

September 5, 2012

Mr. Paul Haake, Captain, Fire Prevention Bureau
County of Maui, Department of Fire and Public Safety
Fire Prevention Bureau
313 Manea Place
Wailuku, HI 96793

Subject: **Response to Comments on the Draft Environmental Impact Statement for the Proposed Kihei High School**

Aloha Mr. Haake:

Thank you for your comment letter dated January 30, 2012 concerning the Draft Environmental Impact Statement (EIS) for the proposed Kihei High School Project.

We understand the Department of Fire and Public Safety has no comments to offer at this time, but does reserve the right to comment during the building permit application process. We appreciate your participation in the environmental review process.

We appreciate your participation in the environmental review process. You will receive a copy of the Final EIS.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Christine Mendes Ruotola, AICP, LEED AP
Principal

ALAN M. ARAKAWA
Mayor

WILLIAM R. SPENCE
Director

MICHELE CHOUTEAU McLEAN
Deputy Director

COUNTY OF MAUI

DEPARTMENT OF PLANNING

February 29, 2012

Ms. Christine Ruotola, AICP, LEED AP
Group 70 International
925 Bethel Street, 5th Floor
Honolulu, Hawaii 96813

Mr. Robert Purdie, Jr., Project Manager
State of Hawaii, Department of Education
Facilities Development Branch
P.O. Box 2360
Honolulu, Hawaii 96804

Dear Ms. Ruotola and Mr. Purdie:

SUBJECT: COMMENTS ON A DRAFT ENVIRONMENTAL IMPACT STATEMENT (EIS) PREPARED IN SUPPORT OF A PETITION FOR A STATE LAND USE COMMISSION DISTRICT BOUNDARY AMENDMENT (DBA), AND ANTICIPATED APPLICATIONS OR COUNTY COUNCIL RESOLUTION(S) INITIATING A COMMUNITY PLAN AMENDMENT (CPA), AND CHANGE IN ZONING (CIZ) FOR THE PROPOSED KIHEI HIGH SCHOOL, LOCATED AT KIHEI, ISLAND OF MAUI, HAWAII; TMK: (2) 2-2-002:081 (POR.) AND 083 (POR.) (A 11-794) (EAC 2011/0018)

At its regular meeting on February 14, 2012, the Maui Planning Commission (Commission) reviewed the above-referenced document for the proposed Kihei High School (the Project) and provides the following comments:

1. Please investigate further in depth and report on alternatives to the single planned signalized intersection crossing of Piilani Highway at Kulanihakoi Street in order to facilitate safe and convenient pedestrian and bicycle access to the campus from neighborhoods makai of Piilani Highway. Adequate lighting for the crossing(s) should also be included in this study;

2. Address how possible demands for overflow parking will be accommodated, including lighting for such overflow parking;

3. Provide a table presenting how the final three (3) candidate sites for the high school compared across the variety of evaluative criteria considered to arrive at a determination of the final chosen site. Provide more extensive information as to why the final site was selected, including cost factors;

4. In Section 4.3.4 on Economy and Labor look more carefully at the net jobs added in the County as a result of the project, not mainly just those added in Kihei. For example, jobs will be added in Kihei, but many of these may be mainly from a shift of jobs from Maui and Baldwin High schools in Central Maui;

250 SOUTH HIGH STREET, WAILUKU, MAUI, HAWAII 96793
MAIN LINE (808) 270-7735; FACSIMILE (808) 270-7634
CURRENT DIVISION (808) 270-8205; LONG RANGE DIVISION (808) 270-7214; ZONING DIVISION (808) 270-7253

5. Please indicate the location of the nearest public bus stops to the project site;

6. The Commission was told that the RFP for selection of the design-build team will include multiple criteria regarding energy sustainability. In the Final EIS please include project provisions for energy reduction and generation from within the site, as well as estimates of project energy usage;

7. Pursue design options amongst the approaches aiming for an environmentally sustainable project;

8. The Final EIS should use 2010 census data instead of 2000 data. Also, age specific data should be employed in student demand forecasting;

9. In forecasting student demand also include analysis of elementary and other feeder schools' student populations;

10. Provide a fuller range of ethnicity data for the anticipated student population, including Hawaiian;

11. To help determine numbers of students likely to travel to and from school by walking or bicycling, please investigate 2010 census data in age cohorts at a block level by distance from the school for residential blocks from which students could be reasonably anticipated to travel by walking or bicycling. Please present the results of this investigation in the Final EIS;

12. List the types and/or categories of native plants expected to be employed in landscaping and whether those selected for use will present positive and/or negative features including, but not limited to, ability to thrive with R-1 reclaimed water for irrigation, whether they are poisonous, and whether they tend to produce asthmatic conditions in humans, etc.;

13. Pursue provision of a secondary vehicular access to the campus, including for use in emergency situations;

14. Identify how students are anticipated to arrive at and depart from school, e.g., how many would arrive and depart by bus, walking, bicycling, cars driven by the students, and car drop off/pick up of students;

15. Identify and address any lighting impacts on surrounding residential areas, including from the stadium;

16. Include as economic benefits the transportation expense savings from the Department of Education's, Kihei students, and their families reduced travel expenses and time involved in trips to and from Central Maui after South Maui students now assigned to Central Maui high schools can instead attend in Kihei;

17. Address the adequacy of sidewalk and bikeway facilities along the off-site routes students and others would be expected to follow during their non-vehicular travel to and from the school;

18. Beyond the continued provision of mandated education and related services, address what reduction in education and related services is anticipated to result from the reductions of students attending Central Maui high schools; and

19. In the calculations and projections of student demand estimates, include student generation from large future South Maui residential projects including, but not limited to, Wailea 670, a.k.a Honuaula, and Alexander & Baldwin's 600 unit "Kihei Residential Project". Include a comprehensive list of potential South Maui residential projects with entitled land and how they may have entered into calculations and projections of student demand.

The Commission appreciates the opportunity to comment and also appreciates your anticipated responsiveness to the above comments. Should you have any questions about the comments in this letter, please contact Current Planning Supervisor Jeffrey Dack at jeffrey.dack@mauicounty.gov or at (808) 270-6275.

Sincerely,

WILLIAM SPENCE
Planning Director

xc: Clayton I. Yoshida, AICP, Planning Program Administrator (PDF)
John F. Summers, Planning Program Administrator (PDF)
Aaron H. Shinmoto, PE, Planning Program Administrator (PDF)
Jeffrey P. Dack, AICP, Current Planning Supervisor (PDF)
Kyle Ginoza, Director, Department of Environmental Management
David Goode, Director, Department of Public Works
Dave Taylor, Director, Department of Water Supply
State Land Use Commission
State Office of Planning
Project File
General File

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GROUP 70 INTERNATIONAL

September 5, 2012

Mr. William Spence, Planning Director
County of Maui, Department of Planning
Attn: Maui Planning Commission
250 South High Street
Wailuku, HI 96793

Subject: Response to Comments on the Draft Environmental Impact Statement for the Proposed Kīhei High School

Aloha Mr. Spence:

Thank you for the Maui Planning Commission's comment letter dated February 29, 2012 concerning the Draft Environmental Impact Statement (EIS) for the proposed Kīhei High School Project. We take note of the comments relating to the Draft EIS for the proposed project. The following are offered in response:

Response 1: Access

Stantec Consulting Services, Inc. (Stantec) prepared a pedestrian and bicycle analysis for the project site. The report focuses on community connectivity, access to and at the high school site, and provision of appropriate safety measures for bicyclists and pedestrians. Stantec provides a list of recommendations to improve walking and bicycling infrastructure for the high school. The analysis is discussed in Chapter 4 and the entire report "Kīhei High School Project Pedestrian and Bicycle Analysis" is included in the Final EIS as Appendix N. Lighting at the intersection will be provided per Maui County standards.

Response 2: Overflow Parking

The EIS identifies parking requirements as an unresolved issue. Specific design details for overflow parking and associated lighting will be determined during the Design-Build (DB) process. The EIS indicates that overflow parking for events will potentially be accommodated on the seven-acre portion of the campus located across from the campus access driveway (Section 2.3 Parking).

Regarding project parking requirements, the County of Maui Department of Planning, in their February 3, 2012 comment letter on the Kīhei High School Draft EIS, wrote:

"The Department acknowledges the calculation of a total of 1,941 parking spaces needed for the development shown on the conceptual site plan compared to the 948 spaces now incorporated within it. The Department looks forward to working with the DOE [Department of Education] to resolve any deficiency which may remain as plans are further refined. If DOE anticipates possibly requesting consideration of a Variance approval from the County as one potential means of resolution, this may be good to be disclosed within the "Permits Required" Section of the Project Summary on Page 1-1 and/or elsewhere."

The Department of Planning has expressed openness to discussing the parking issue as plans are further refined. The Department of Planning also suggested a Variance approval as means by which to resolve the deficiency. The DOE is committed to working closely with the County through the (Design-Build) DB process to resolve this issue.

Response 3: Final Site Selection
Based on the Commission's comments, additional information has been provided in the Final EIS Section 6.2: Alternative Sites to more fully address the criteria considered in the final site selection.

Response 4: Economy and Labor
We note your inquiry regarding net jobs added in the County. Over time, the school-age population in Central Maui is expected to grow so that existing and new schools will operate at or near capacity. As a result, existing schools are expected to maintain employment near their current levels, while Kīhei High School will add new jobs on Maui. Some existing teachers, administrators, and support staff may initially move from existing schools (eg., Maui High School and Baldwin High School) to Kīhei High School, but eventually the vacated positions at the existing schools will be filled by new employees. Thus, all or nearly all of the projected direct plus indirect jobs generated by Kīhei High School will reflect new employment on Maui. As indicated in the report, "Kīhei High School: Economic and Fiscal Impacts," (July 2011), Kīhei High School is expected to generate about 170 direct and indirect jobs on Maui related to Phase I operations, and about 290 jobs related to Phase II operations.

Response 5: Public Bus Stop
The closest bus stop to the project site is located at Kulanihākoʻi Street and South Kīhei Road. Please see the Final EIS Section 4.3.5 Public Services and *Figure 4-19: Maui Public Bus Routes in the Project Area* for additional Public Transportation information.

Response 6 & 7: Sustainability
The Kīhei High School project will be constructed through a DB process. The Commission is correct that the RFP for selection of the DB team will include energy sustainability criteria. The Request for Qualifications (RFQ) and Request for Proposal (RFP) documents are being prepared for the DB procurement process. The winning DB team selected by the DOE will be responsible for design, construction, and commissioning of the new school. The DBE will be directed to seek a minimum of Silver certification under the LEED program developed by the USGBC, or under a comparable rating system. The DOE is committed to sustainable building practices; however, detailed sustainable design features and project energy usage estimates have not been determined at the time of the Final EIS and will be determined by the DOE and DB team.

Response 8: Census Data
The population data in the Final EIS has been updated to include 2010 census information from the U.S. Census Bureau and the 2011 Maui County Data Book. Please see Comment 11 below regarding age-specific data.

Mr. William Spence, Planning Director
County of Maui, Department of Planning
Attn: Maui Planning Commission
September 5, 2012

Response 9: Student Populations
Feeder school student generation was included in DOE's student demand projections for a new high school in Kīhei.

Response 10: Ethnicity Data
Ethnicity data is provided in the Final EIS Section 4.3.5 Public Services.

Response 11: Age Cohorts at Block Level by Distance from School
An investigation of persons 20 years of age and under within a 1.5 mile radius of the proposed Kīhei High School was conducted in the Final EIS. The investigation used 2010 census data to show school aged children within each census tract and block within the 1.5 mile radius. Results of the investigation are shown in the Education portion of Section 4.3.5 Public Services of the Final EIS. In 2010 there were 6,616 persons aged 20 and younger within a 1.5 mile radius of the school site. Of these, 983 were 11 to 15 years of age, and 837 were 16 to 20 years of age.

Response 12: Landscaping
Use of appropriate native Hawaiian and Polynesian-introduced will be encouraged in landscaping. Drought and salt tolerant plants in landscaping will be specified in the RFP. No poisonous plants or plants known to produce asthmatic human conditions will be used in the landscaping. Plant selection at the high school will be guided by the Landscape Practices and Procedures, DOE Plant List, and the Maui County Department of Water Supply's Landscape and Gardening Handbook. The project's landscape architect will make the final plant selections based on her/his professional judgment of the most appropriate materials for the specific location and project irrigation plans.

Response 13: Secondary Access
The Kīhei High School campus is expected to connect to the future mauka or mid-level roadway providing secondary access to the site. A secondary access to Piʻilani Highway has not been recommended by the State Department of Transportation.

Response 14: Modes of Student Transportation
Although this information would be useful, the DOE does not track the modes of transportation individual students use to get to school at their existing facilities. No information is available at this time to project the anticipated breakdown of multi-modal uses at the future Kīhei High School. Facilities for safe multi-modal access will be provided at Kīhei High School regardless of the number of students using each means of transportation. For discussion of pedestrian and bicycle facilities, please refer to the "Kīhei High School Project Pedestrian and Bicycle Analysis," included in the Final EIS as Appendix N.

Response 15: Lighting
We acknowledge the potential for artificial lighting to impact residential neighborhoods. The project will comply with the Maui County Code § 20.35 *et seq.*

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that requires that exterior lights on Maui be shielded. Shielded lighting will reduce lighting interference with residential areas.

Response 16: Economic Benefits
The Final EIS Section 4.3.4 Economy and Labor Force has been updated to address the economic benefits of project operations in the form of travel time and expense savings after students relocate to Kīhei High School.

School operations will create economic benefits for students and their families in the form of reduced travel expenses and time savings after students have been reassigned from Central Maui schools to Kīhei High School. After construction of Phase I, Kīhei High School will reduce transportation costs for families by an estimated $90,000 per year, and about $920,000 per year for the DOE, for a total annual savings of about $1.01 million. In addition, students will save an estimated 108,000 hours per year in commute time, valued at between $190,000 and $540,000. At full development of Phase II, transportation costs will decrease by about $190,000 per year for families and about $1.89 million per year for the DOE, for a total annual savings of about $2.08 million. Also, students will save about 223,000 hours per year valued between $400,000 and $1.1 million.

These estimates are based on the following assumptions: Kīhei High School will have an enrollment of about 800 and 1,650 students under Phase I and Phase II, respectively; DOE contracts private bus companies to provide bus services for students commuting to school; bus passes are provided to an estimated 90% of the South Maui students who travel to existing Central Maui schools, this percentage will be reduced to an estimated 20% if they travel to the new Kīhei High School; DOE pays an annual cost of $1,800 per student for bus transportation; partially offset by an annual charge of $270 per student for a DOE bus pass (paid by an estimated 60% of the students who travel by bus); a new high school in Kīhei would reduce average daily travel time by about 45 minutes for all students; each student makes about 180 round-trips per year; and student time is valued between $1.25 and $5 per hour (between approximately one-quarter and two-thirds of the minimum wage). (Analysis by Plasch Econ Pacific, LLC)

Comment 17: Adequacy of Pedestrian and Bicycle Facilities
Please see response to Comment 1.

Comment 18: Educational Services
Mandatory educational services at Maui and Baldwin High Schools will not be impacted by the provision of a new high school. Teacher allocations are dependent upon the number of students, therefore if student enrollment declines at a school, the number of teachers may be reduced. The school would still maintain its service for general education; special education, and for graduation requirements. The offering of some electives may be affected in the case of reduced enrollment.

Mr. William Spence, Planning Director
County of Maui, Department of Planning
Attn: Maui Planning Commission
September 5, 2012

Comment 19: Student Demand Estimates
The DOE employed data from the Draft Maui Island Plan as the primary basis for student population projections. To the extent that these future projects were included in the Draft Maui Island Plan, they would be included in the projections. (DOE, Facilities Development Branch, Planning Section, 3/14/12)

We appreciate your participation in the environmental review process. You will receive a copy of the Final EIS.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Christine Mendes Ruotola, AICP, LEED AP
Principal

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ALAN M. ARAKAWA
Mayor

GLENN T. CORREA
Director

PATRICK T. MATSUI
Deputy Director

(808) 270-7230
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DEPARTMENT OF PARKS & RECREATION
700 Hali'a Nakoa Street, Unit 2, Wailuku, Hawaii 96793

January 12, 2012

Mr. Robert Purdie, Jr.
State of Hawaii, Department of Education
Facilities Development Branch
PO Box 2360
Honolulu, Hawaii 96804

Dear Mr. Purdie:

SUBJECT: KIHEI HIGH SCHOOL
Draft Environmental Impact Statement

Thank you for the opportunity to review and comment on the subject project. We are in support of the proposed action as the project will help meet the regional demand for additional athletic facilities.

Please feel free to contact me or Karla Peters, Capital Improvements Project Coordinator, at (808) 270-7981, if there are any questions.

Sincerely,

GLENN T. CORREA
Director of Parks and Recreation

c: Christine Ruotola, Group 70 International, Inc.
Robert Halvorson, Chief of Parks Planning and Development

GTC:RH:kp

GROUP 70 INTERNATIONAL

PRINCIPALS

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September 5, 2012

Mr. Glenn T. Correa, Director of Parks and Recreation
County of Maui
Department of Parks & Recreation (DPR)
700 Hali'a Nakoa Street, Unit 2
Wailuku, Hawai'i 96793

Subject: Response to Comments on the Draft Environmental Impact Statement for the Proposed Kīhei High School

Aloha Mr. Correa:

Thank you for your comment letter dated January 12, 2012 concerning the Draft Environmental Impact Statement (EIS) for the proposed Kīhei High School Project.

We understand DPR is in support of the proposed project.

We appreciate your participation in the environmental review process. You will receive a copy of the Final EIS.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Christine Mendes Ruotola, AICP, LEED AP
Principal

ALAN M. ARAKAWA
Mayor

WILLIAM R. SPENCE
Director

MICHELE CHOUTEAU McLEAN
Deputy Director

COUNTY OF MAUI

DEPARTMENT OF PLANNING

February 3, 2012

Ms. Christine Ruotola, AICP, LEED AP
Group 70 International
925 Bethel Street, 5th Floor
Honolulu, Hawaii 96813

Mr. Robert Purdie, Jr., Project Manager
State of Hawaii, Department of Education
Facilities Development Branch
P.O. Box 2360
Honolulu, Hawaii 96804

Dear Ms. Ruotola and Mr. Purdie:

SUBJECT: COMMENTS ON A DRAFT ENVIRONMENTAL IMPACT STATEMENT (EIS) PREPARED IN SUPPORT OF A PETITION FOR A STATE LAND USE COMMISSION DISTRICT BOUNDARY AMENDMENT (DBA), AND ANTICIPATED APPLICATIONS OR COUNTY COUNCIL RESOLUTION(S) INITIATING A COMMUNITY PLAN AMENDMENT (CPA), AND CHANGE IN ZONING (CIZ) FOR THE PROPOSED KIHEI HIGH SCHOOL, LOCATED AT KIHEI, ISLAND OF MAUI, HAWAII; TMK: (2) 2-2-002:081 (POR.) AND 083 (POR.) (A 11-794) (EAC 2011/0018)

The Department of Planning (Department) is in receipt of the above-referenced document for the proposed Kihei High School (the project). The Department understands the action proposed by the Department of Education (DOE) includes the following filed and/or anticipated land use entitlements:

> A State Land Use DBA from Agricultural to Urban, an amendment to the County of Maui's Kihei-Makena Community Plan land use designation from Agriculture to Public/Quasi-Public, and a CIZ from Agricultural to P-1 Public/Quasi-Public
>
> The proposed action, as further stated in the Draft EIS, includes:
>
> "to develop a new high school campus in Kihei on 77.2 acres of undeveloped land mauka of Piilani Highway between Kulanihakoi and Waipuilani Gulches on the island of Maui. The proposed school will serve grades 9-12 in the South Maui Region. Site improvements would include construction of approximately 215,000 SF of buildings to support an enrollment capacity of 1,650 students and approximately 206 supporting faculty and staff. The high school will be constructed to meet or exceed the United States Green Building Council (USGBC) Leadership in Energy and Environmental Design (LEED) Silver certification, or comparable rating system. The campus also will include athletic fields (e.g., tennis, track and field, football, soccer, baseball and softball fields, and swimming pool) and associated infrastructure improvements (e.g., new roadways, utilities, drainage, wastewater and water systems). An extension of Kulanihakoi Street mauka of Piilani Highway will serve as the main campus access

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CURRENT DIVISION (808) 270-8205; LONG RANGE DIVISION (808) 270-7214; ZONING DIVISION (808) 270-7253

> road.... Also included is a final subdivision and consolidation approval to allow for the development of the 77.2-acre high school campus. It is a goal of the proposed development that the school will not only serve the enrolled youth, but be a center for the Kihei community. Kihei High School will provide opportunities for employment (both short and long-term) within the Kihei-Makena area."

Based on the foregoing, the Department provides the following comments on the Draft EIS:

1. Page 1-1, Permits Required, and Page 2-9, Required Permits, Approvals and Plans - The subject property is located within the Flood Hazard Area Zone X. However, the subdivision map identifies a drainageway passing through the middle of the property. A flood development permit will be required for any construction done within a drainageway;

2. Page 2-4, Staff, Student and Visitor Population, and/or elsewhere – The Department's pre-consultation comment no. 4. in our letter of September 17, 2009, as well as the response letter of October 28, 2009, from Group 70 International called for the Draft EIS to "please thoroughly describe the anticipated operations of the school, including anticipated numbers of students, faculty, support personnel, vehicles on-site, after school and weekend activities, and the daily or weekly timeframes of the anticipated operations." Beyond the information now on Page 2-4, it would be helpful if there were a fuller but still brief section addressing anticipated operations;

3. Pages 4-13 and 4-14, Non-Potable Water – The DOE is encouraged to further explore the use of reclaimed wastewater. Please update the Final EIS accordingly if these explorations lead to the use of reclaimed wastewater as a comparable or more favorable alternative to brackish wells for non-potable water needs;

4. Pages 4-22 and 4-23, Current Land Uses and Regulation – The Department's December 4, 2009 letter commenting on the project's Environmental Impact Statement Preparation Notice (EISPN) included the following as its Comment No. 1. "The State Land Use District Classification Map shows the site area proposed to change from the Agricultural State Land Use District to Urban, leaving the adjoining portion of Piilani Highway designated as Agriculture. So that the project site does not become an island of Urban designated land, please consider working with the Department of Transportation and the State Land Use Commission to extend the area of the District Boundary Amendment petition to include the portion of Piilani Highway adjoining the proposed High School site within the Urban District and remove it from the Agricultural District";

   The EISPN comment response letter of April 30, 2010, from Group 70 International states that, "The Department of Education has brought the Maui County Planning Department's suggestion to the Department of Transportation's (DOT) attention. A letter was sent to the DOT regarding the Maui County Planning Department's suggestion on February 22, 2010." Please let us know of any response DOE has received from DOT and any further progress on our request of which you are aware;

5. Pages 4-36 and 4-40, Future Traffic Volumes with the Project – With the installation of a traffic signal at the intersection of Piilani Highway with Kulanihakoi Street, the level of service for two (2) of the turning movements in the modeled year 2015 will decrease from C to D. The conclusion of this traffic section is that "With the implementation of the above mitigation measures, traffic impacts are not expected to be significant." Please provide the basis for the conclusion that this impact does not meet any threshold for determining that such an impact is significant, or acknowledge its significance and disclose that in other appropriate sections of the EIS;

6. Pages 4-40 and 4-79, Parking and Loading – The Department acknowledges the calculation of a total of 1,941 parking spaces needed for the development shown on the conceptual site plan compared to the 948 spaces now incorporated within it. The Department looks forward to working with DOE to resolve any deficiency which may remain as plans are further refined. If DOE anticipates possibly requesting consideration of a Variance approval from the County as one potential means of resolution, this may be good to be disclosed within the "Permits Required" Section of the Project Summary on Page 1-1 and/or elsewhere;

7. Pages 4-46 and 4-79, Long-Term Impact (Noise) – Page 4-45 reports that, "According to federal noise standards, the existing traffic noise levels in the project environs along Piilani Highway are in the 'Significant Exposure, Normally Unacceptable' category, and at or greater than 65 DNL at the first row of existing homes on the makai side of the highway." Then on Page 4-46, it is reported that, "Along Kulanihakoi Street, west of Piilani Highway, traffic noise levels are expected to increase by 0.7 DNL by CY 2025 as a result of project traffic." Given that the project will add an increment of noise to a current level which appears to already exceed noise significance thresholds, long-term cumulative noise impacts and those more directly associated with the project appear to be significant;

8. Pages 4-48 and 4-49, Scenic and Visual resources - The Department's pre-consultation comment no. 6. in our letter of September 17, 2009, stated, "The Draft Maui Island Plan considers Piilani Highway to be a scenic resource corridor with medium scenic resource values. It also includes a policy to 'Protect public views of Haleakala, the Pacific Ocean and other significant water features, ridgelines, and landforms.' These should be addressed through site sections, photo simulations, or other appropriate means". The Draft EIS states a conclusion that, "The project is not anticipated to significantly impact mauka views of Haleakala." The Department asks that you demonstrate bases for the conclusion through the types of evidence we suggested previously or by other valid means;

9. Page 4-61, Drainage – Please research past drainage history of the site given a recent anecdotal report of major historical sheetflow drainage on or in close proximity to the site from a January 27, 2012, meeting of DOE and Group 70 International with Mayor Alan Arakawa and representatives of the Department. Advice to DOE was to include design considerations to protect from such future possible events;

10. Pages 4-64 and 4-65, Onsite Drainage Concept – The Draft EIS reports on a proposed ditch to be "constructed along the Kihei High School upper boundary" for diversion of upland runoff into Waipuilani Gulch before it were to reach the Kihei High School development. It continues that, "based on the conceptual site plan, it is anticipated that the ditch will be a 5-foot wide reinforced concrete channel with an approximate wall height of 8 feet." Although we can anticipate that school regulations would "prohibit" students from being in the vicinity of this ditch, it is also realistically very likely that some student will at times stray into or actually seek out this ditch for various unauthorized purposes. From this standpoint it might even be looked as something akin to an "attractive nuisance." Therefore, its design must give high consideration to safety of students who might be attracted to a ditch 5-feet wide and 8-feet deep. This could be addressed by, for example, an alternative design of equivalent capacity which is shallower and wider, but which will still stop the upland drainage at whatever velocity and volume is anticipated during the more intense range of storm events;

11. Page 5-47, Countywide Policy Plan (CWPP) Objective: Protect the natural environment – The Draft EIS makes a statement that, "The design of the project will also utilize green corridors to provide connectivity and cohesiveness within the campus." Please provide more detail on where these green corridors will be within the campus. Also, in keeping with the intent of the CWPP policy, how will the Kihei High School Campus connect, via landscaped pedestrian corridors, to Kihei – makai of Piilani Highway and to the new, emerging neighborhoods mauka of the Piilani. Will the gulch become a landscaped corridor? How would the integrity of the gulch as a landscaped corridor be protected/maintained?

12. Pages 5-46 and 5-61 through 5-63, CWWP Objective: Diversify Transportation Options - It is not clear from the documentation how the plan for the Kihei High School will include transit or will provide a safe pedestrian/bike connection to transit. The traffic study does not examine pedestrian, bicycle, or transit options for travel to and from the Kihei High School Campus. Please provide more detail on how bicycle, pedestrian, and transit will be accommodated on the site as well as how it will connect to pedestrian, bicycle and transit corridors off-site. Will there be pedestrian/bicycle facilities on the extension of Kulanihakoi Road? Please examine and delineate how students from adjacent residential neighborhoods (makai of Piilani Highway) will be able to safely walk or bike to the Kihei High School;

13. Page 5-66, CWWP Objective: Significantly increase the use of renewable and green technologies – Given the current lack of specificity of building and site design and the design/build approach being followed, please indicate how the measures proposed in the Draft EIS to achieve this objective will be assured during and after project construction;

14. Pages 5-69 and 5-70, CWWP Objective: Design all developments to be in harmony with the environment and to protect each community's sense of place - Please elaborate on how there will be pedestrian linkages from the Kihei High School to destinations in Kihei; that is to areas surrounding the site, not just within the site of the Kihei High

School. Please also provide detail on pedestrian/bicycle linkages from the Kihei High School to established Kihei neighborhoods that are makai of Piilani Highway;

15. Pages 5-80 and 5-81, Kihei – Makena Community Plan Objectives, Policies and Implementing Actions re: Housing and Urban Design - The policies are about Urban Design as well as Housing, so many of the policies and actions are applicable. Please provide more detail on how the site design supports Policies d, e, f, g, and Actions c, d, and g. How is the natural feature of the gulch on the south edge of site integrated into the site design for the Kihei High School? Where are the landscaped pedestrian ways and/or bikeways located? and

16. Page 5-81, Kihei – Makena Community Plan Objectives, Policies and Implementing Actions re: Physical and Social Infrastructure – As requested above, please specify how the project will support bicycle and pedestrian use, not only on-site, but also through appropriate connectivity to key destinations off-site. How will students walk and bike to school?

Thank you for the opportunity to comment. The Department appreciates your anticipated responsiveness to the above comments. Should you have any questions about the comments in this letter or if you desire any clarifications about the various permit processes, please feel free to contact Current Planning Supervisor Jeffrey Dack by email at jeffrey.dack@mauicounty.gov or by phone at (808) 270-6275.

Sincerely,

WILLIAM SPENCE
Planning Director

xc: Clayton I. Yoshida, AICP, Planning Program Administrator (PDF)
John F. Summers, Planning Program Administrator (PDF)
Aaron H. Shinmoto, PE, Planning Program Administrator (PDF)
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State Land Use Commission
State Office of Planning
Project File
General File

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GROUP 70 INTERNATIONAL

September 5, 2012

Mr. William Spence, Planning Director
County of Maui, Department of Planning
250 South High Street
Wailuku, HI 96793

Subject: Response to Comments on the Draft Environmental Impact Statement for the Proposed Kīhei High School

Aloha Mr. Spence:

Thank you for your comment letter dated February 3, 2012 concerning the Draft Environmental Impact Statement (EIS) for the proposed Kīhei High School Project. We take note of your comments relating to the Draft EIS for the proposed project. The following are offered in response to your comments:

Response1: Permits Required
Thank you for calling our attention to the potential need for a flood development permit. This permit has been added to the list of permits and approvals in Chapter 2.6 Required Permits, Approvals and Plans of the Final EIS.

Response 2: School Operations
Please refer to Section 2.1.5 of the Final EIS where school operations are described.

Response 3: Non-Potable Water
We appreciate the recommendation to further explore the use of reclaimed wastewater. A *Non-potable Water System Alternatives Analysis* report was prepared by Gray, Hong, Nojima & Associates, Inc. (GHN) to analyze potential non-potable water system improvements, non-potable water sources, and provide recommendations based on a life cycle cost comparison, among other factors. Two alternatives for non-potable water were identified in the report, onsite brackish groundwater wells, and use of R-1 recycled water from the County of Maui's existing Kīhei Wastewater Reclamation Facility. Please refer to Section 4.2.10.1 Water System and Appendix M of the Final EIS for details.

Response 4: Current Land Uses and Regulation
Thank you for following up on the inquiry to the State Department of Transportation (DOT). No response was received from the February 22, 2010 letter sent to DOT.

Response 5: Future Traffic Volumes with the Project
The analysis of unsignalized and signalized conditions are similar, but not the same as indicated by the inclusion of separate level of service definitions in the appendices. In addition, LOS "D" is generally considered an acceptable level of service and recommendations have been included in the report to mitigate the effects of project related traffic.

Response 6: Parking and Loading
The Department of Education (DOE) will continue to work with the County Planning Department to resolve the number of provided parking and loading spaces. The DOE will consider requesting a Variance from the County as a potential means of resolution. A Variance Permit has been added to the list of required permits in Table 2-4 in Chapter 2.6 Required Permits, Approvals and Plans.

The Final EIS also includes an update to Section 4.2.5.2 Parking and Loading to include consideration of a Variance.

Response 7: Long Term Impact (Noise)
It should be noted that current traffic noise levels are in the "Significant Exposure, Normally Unacceptable" category only along Piʻilani Highway, and not so along Kulanihākoʻi Street west of Piʻilani Highway. Along Kulanihākoʻi Street west of Piʻilani Highway, traffic noise levels are approximately 17 DNL units lower than those along Piʻilani Highway, and are in the "Moderate Exposure, Acceptable" category. While future traffic noise levels along Kulanihākoʻi Street are predicted to increase by 0.7 DNL units due to project traffic, this increase should not cause future traffic noise levels to be in the "Significant Exposure, Normally Unacceptable" category along Kulanihākoʻi Street. The 0.7 DNL unit increase also applies to future traffic noise levels along Piʻilani Highway, but non-project traffic is predicted to cause most of the increases along Piʻilani Highway (0.6 DNL and 0.1 DNL unit increases from non-project and project traffic, respectively).

Response 8: Scenic and Visual Resources
We appreciate your recommendation to demonstrate potential impacts to the Piʻilani Highway scenic resource corridor. A viewshed perspective showing the potential impacts of the conceptual plan to views of Haleakalā from Piʻilani Highway is included in the Final EIS Section 4.2.9 Scenic and Visual Resources as Figure 4-15.

Response 9: Drainage
GHN civil engineering firm offers the following response to comment No. 9. Although GHN was not involved in the 1/27/12 meeting with Mayor Arakawa, GHN researched articles regarding recent flooding that occurred in Kihei. Their findings indicate that these events occurred in the lower lying areas, makai of Piʻilani Highway in the vicinity of South Kīhei Road. In addition, during the December 5, 2007 storm reported in *The Maui News* (December 6, 2007 – Kīhei Roads Flooded; Electricity Out), USGS stream gage station 16660000 (located in Kūlanihākoʻi Gulch, mauka of Piʻilani Highway) recorded a stream flow of 2,340 CFS. (http://nwis.waterdata.usgs.gov/nwis/peak?site_no=16660000&agency_cd=USGS&format=html) This is significantly lower than the design capacity of 13,100 CFS as indicated in DOT drainage.

In similar reports on another flood event (*The Maui News*, December 28, 2010 – Kīhei in Cleanup Mode) "County spokeswoman Mahina Martin said in an e-mailed statement that the Public Works Department believed the debris came from "the topside" or the slopes of Haleakalā where heavy rains hit Pukalani early Sunday morning. She indicated that Public Works personnel reported there were mud and debris at three

major stream crossings: Waiakoa Gulch, Kūlanihākoi Gulch, and Waipuʻilani Gulch. "Floodwaters brought debris down the channel and caused a blockage at the mauka end of the culverts along South Kīhei Road. As a result, the floodwaters poured onto adjacent roadways, depositing mud and debris," Martin said. The County's Department of Planning should confirm that the Department of Public Works' upcoming Kīhei Drainage Master Plan will address these existing drainage deficiencies. The Kīhei High School site is part of a much larger land area with regional drainage issues. The DOE and the Design-Build (DB) entity will work with the County to determine appropriate site-specific drainage features during the design phase of the project.

Response 10: Onsite Drainage Concept
We acknowledge the County's concern regarding potential unauthorized use of the proposed diversion ditch on the school's upper boundary. Increasing the width of the ditch would require additional land area, thus reducing available space for school facilities. A wider and shallower ditch would still remain a potential safety hazard attracting more unwanted intruders such as skate boarders during dry periods and body boarders during heavy storms. In should be noted that simply widening the ditch will not significantly reduce the depth of the ditch. For example doubling the width of the ditch to 10 feet would still require a ditch depth of 6 feet to convey for the 100-year storm and 5 feet for the 50-year storm. We understand designing for student safety is critical and the Department's concerns will be forwarded to the DB team to be addressed during project design.

Response 11: CWPP Objective : Protect the Natural Environment
Incorporate green spaces within the planned high school campus is a priority, however, specific design details such as location of future greenways and landscaped pedestrian corridors are not known at this time. Final design will be determined by the DB team. We are in agreement regarding the importance of protecting the gulches. The DOE does not own the gulch properties and does not control how they will be developed or maintained. We have noted the Department's comments regarding connectivity between the campus and adjacent areas and will forward them with the Final EIS to the DB team.

Response 12: CWPP Objective: Diversify Transportation Options
Although the policies of the Countywide Policy Plan Objective to Diversify Transportation Options are largely not applicable to the proposed project, development of the high school in the community where students reside will facilitate the use of alternative forms of transportation and help to reduce peak hour automobile traffic in Kīhei. The Final EIS includes a pedestrian and bicycle analysis for the project site, prepared by Stantec Consulting Services, Inc. (Stantec). The report focuses on community connectivity, access to and at the high school site, and provision of appropriate safety measures for bicyclists and pedestrians. Stantec provides a list of recommendations to improve walking and bicycling infrastructure for the high school. The analysis is discussed in Chapter 4 and the entire report "Kīhei High School Project Pedestrian and Bicycle Analysis" is included in the Final EIS as Appendix N.

Response 13: Significantly Increase Green Technologies
Sustainable design strategies indicated in the EIS will be incorporated into the project specifications of the RFP. The DB team will be responsible for implementing the specifications of the RFP in project construction.

Response 14: Connectivity
Connectivity to the community is an important objective for the high school. For discussion of pedestrian and bicycle linkages, please refer to the "Kīhei High School Project Pedestrian and Bicycle Analysis," included in the Final EIS as Appendix N.

Response 15: Kīhei - Mākena Community Plan Objectives
In accordance with the Kīhei-Mākena Community Plan Housing and Urban Design Objectives, Policies and Implementing Actions, the project will strive for integration of natural physical features, and connectivity to pedestrian and bicycle facilities. The campus will be landscaped and include native plants and principles of xeriscaping. A landscaped setback will be provided adjacent to Pi'ilani Highway to mitigate highway noise and reduce visual impacts. The Department's comments will be sent along with the Final EIS to the DB team. Final design details such as pedestrian and bicycle linkages will be determined during the design phase by the DOE and DB team.

Response 16: Kīhei - Mākena Community Plan Objectives
In accordance with the Kīhei-Mākena Community Plan Physical and Social Infrastructure Objectives, Policies and Implementing Actions, the project will promote convenient pedestrian and bicycle access and applicable transportation demand strategies. Please refer to the "Kīhei High School Project Pedestrian and Bicycle Analysis," included in the Final EIS as Appendix N, for additional information on pedestrian and bicycle access.

We appreciate your participation in the environmental review process. You will receive a copy of the Final EIS.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Christine Mendes Ruotola

Christine Mendes Ruotola, AICP, LEED AP
Principal

ALAN M. ARAKAWA
MAYOR

OUR REFERENCE

YOUR REFERENCE

POLICE DEPARTMENT
COUNTY OF MAUI

55 MAHALANI STREET
WAILUKU, HAWAII 96793
(808) 244-6400
FAX (808) 244-6411

GARY A. YABUTA
CHIEF OF POLICE

CLAYTON N.Y.W. TOM
DEPUTY CHIEF OF POLICE

January 6, 2012

RECEIVED
JAN 11 2012
GROUP 70 INTL

Ms. Christine Ruotola, AICP, LEED AP
Principal
Group 70 International, Inc.
925 Bethel Street, 5th Floor
Honolulu, HI 96813-4307

Dear Ms. Ruotola:

SUBJECT: Draft Environmental Impact Statement
Kihei High School

This is in response to your letter dated December 20, 2011, requesting comments on the above subject.

We have reviewed the information provided and have enclosed our concerns regarding this project. Thank you for giving us the opportunity to provide our comments.

Very truly yours,

Assistant Chief Victor K. Ramos
for: Gary A. Yabuta
Chief of Police

Enclosure

c: William Spence, Planning Department
Robert Purdie, State Dept. of Education, Facilities Development Branch

COPY

TO : GARY YABUTA, CHIEF OF POLICE, COUNTY OF MAUI

VIA : CHANNELS

FROM : BRAD HICKLE, POLICE OFFICER III, DISTRICT VI KIHEI

SUBJECT : ENVIRONMENTAL IMPACT STATEMENT (EIS) FOR THE NEW KIHEI HIGH SCHOOL

THIS DISCUSSION HAS TAKEN PLACE SINCE 2005. CONCUR WITH COMMENTS

ACV. [illegible] 01/06/2012

APPLICANT INFORMATION:

The applicant, State of Hawaii-Department of Education, Facilities Development Branch has submitted a completed Environmental Impact Statement (EIS).

The document was prepared pursuant to Chapter 343, Hawaii Revised Statutes, as amended, and Chapter 200 of title 11, State of Hawaii Department of Health Administrative Rules, Environmental Impact Statement.

IMPACT ON POLICE:

I suspect this new facility will create very little impact on Police services in south Maui. It is a much appreciated and welcome facility in our community.

RECOMMENDATIONS:

It is recommended that the developer use "Best Practices" in Crime Prevention Through Environmental Design (CPTED) when developing this property. The application of the CPTED design will help to minimize opportunity for crime and criminal activities to occur upon the property once completed.

DISPOSITION:

Thank you for allowing us to review the EIS, comment and make recommendations regarding this facility. It is recommended that these documents along with our comments be returned to the Consultant-Christine Routola of Group 70 International, Inc. for review and final disposition.

Respectfully Submitted,

NOTED:
LT. [illegible]
01/04/12 @ 1500hrs

Officer Brad Hickle E-9966

12/30/11 07:50 hours

Noted
Cpt [illegible] 1/4/2012 @ 1625 hrs

GROUP 70 INTERNATIONAL

September 5, 2012

Mr. Gary Yabuta
County of Maui, Police Department
55 Mahalani Street
Wailuku, HI 96793

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James L. Stone, Arch.D., AIA, LEED AP
Katherine M. MacNeil AIA, LEED AP
Tom Young, MBA AIA
Paul T. Matsuda PE, LEED AP

Subject: Response to Comments on the Draft Environmental Impact Statement for the Proposed Kīhei High School

Aloha Mr. Yabata:

Thank you for your comment letter dated December 27, 2011 concerning the Draft Environmental Impact Statement (EIS) for the proposed Kīhei High School Project. We take note of your comments relating to the Draft EIS for the proposed project. The following are offered in response to your comments:

We understand that little project-related impact is anticipated on Police services in South Maui, and that "Best Practices" in Crime Prevention Through Environmental Design (CPTED) are recommended to the developer. CPTED Best Practices will be noted in the Design-Build RFP criteria. Thank you for your support of this project as a much anticipated and welcomed facility in the community.

We appreciate your participation in the environmental review process. You will receive a copy of the Final EIS.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Christine Mendes Ruotola

Christine Mendes Ruotola, AICP, LEED AP
Principal

HALEAKALA RANCH
• EST. MAUI 1888 •

February 3, 2012

Ms. Christine Ruotola, AICP
Group 70 International, Inc.
925 Bethel Street, 5th Floor
Honolulu, HI 96813

Subject: Kihei High School DEIS

Dear Ms. Ruotola,

Haleakala Ranch appreciates the opportunity to comment on the Draft Environmental Impact Statement (DEIS) for the proposed Kihei High School. We encourage the State to move forward expeditiously on this much needed facility. The following comments are provided based on review of the DEIS.

1. Landowner Identification (pg. 1-2). As you are aware, the State has recently completed acquisition of the property from Haleakala Ranch and Kaonoulu Ranch. We assume all appropriate references to land ownership will be updated in the Final EIS.

2. Chapter 343, HRS, Trigger (pgs. 1-1 and 1-15). It is our understanding that the trigger for preparation of the Draft EIS is the use of State lands and the proposed Community Plan Amendment. We understand that the purchase of the unimproved lands was determined to be exempt pursuant to Chapter 343, HRS.

3. Long term Infrastructure and Community Planning. Thank you for acknowledging the long term master planning efforts of Haleakala Ranch and Kaonoulu Ranch related to the Kihei Mauka growth area. We look forward to continued discussions with the Department and designers of the High School to ensure that long term planning of local and regional infrastructure mauka of Piilani Highway is undertaken in an efficient and comprehensive manner, to the extent practicable. As noted in our pre-consultation letter, this may include the potential of upsizing infrastructure as necessary. We understand that detailed analysis of various infrastructure options will take place during later phases of the project. In an effort to not foreclose future infrastructure planning options, the potential for coordinated infrastructure planning with mauka lands should be discussed in the Final EIS.

4. Wastewater re-use. The DEIS mentions that use of reclaimed wastewater from the Kihei Wastewater Reclamation Facility (KWRF) for on-site irrigation may be examined in the future. Given the projected amount of water needed on a daily basis for on-site irrigation (185,000 gpd) as well as the upfront capital costs of drilling wells and long term operational costs associated with operating the high capacity pumps to maintain pressure, further analysis of use of reclaimed wastewater for irrigation would appear warranted. We note the presence of existing transmission and storage facilities within the Maui Research & Technology Park located mauka and to the south of the school site. We recognize that detailed studies would need to take place to determine the feasibility of this option, however, we suggest including the potential of connecting to these facilities in the Final EIS so as to not foreclose future planning options.

HALEAKALA RANCH COMPANY · 529 KEALALOA AVENUE · MAKAWAO, HAWAII 96768 · PH: 808.572.1500 FAX: 808.572.7288

5. Drainage. The civil engineering report makes reference to the need for creation of a drainage diversion structure mauka of the school property to divert off-site drainage flows to Waipulani Gulch. Reference is made to the potential for increased engineering costs if the diversion structure is located on the school property versus ranch property. Given the similarity of the land on either side of the property boundary, there would appear to be little to no difference in costs to construct the proposed diversion structure whether on school or ranch property. Based on discussions with our civil engineer, it is our understanding that there is ample space to locate the diversion structure on school property and that doing so would not necessarily affect the way drainage is handled on the rest of the school property. Locating the structure on school property would also simplify implementation of the project by avoiding the need for legal easements and long term liability and maintenance agreements. And as part of the site acquisition process, Haleakala Ranch agreed to grant an easement to allow for the discharge of runoff from the school property to Waipulani Gulch, anticipating a diversion structure constructed on school property. So, while we are not opposed to future discussions on this option, it appears that location of the drainage diversion on the school site is the preferable alternative.

6. Pedestrian/Bike Path Connectivity. Preliminary concept planning for the Kihei Mauka growth area contemplates a network of pedestrian/bike paths and greenways that can be coordinated to connect to the campus. We look forward to future discussions during the detailed design stages of the project to achieve a well connected and planned community.

7. Haleakala Ranch Description. Please change the number of ranch employees to 10 and the number of breeding cattle to 1,200 on page 4-8 in the DEIS and page 10 in Appendix B. Also on both of these pages, please delete the sentence stating that cattle grazing only occurs in this area in the winter.

Thank you for the opportunity to comment and should you have any questions, please contact me or our land use planner, Mr. Rory Frampton at (808) 298-4956 or rory@roryframpton.com.

Sincerely,

Don Young, President/CEO
Haleakala Ranch

Cc: Mr. Robert Purdie, Jr., Project Manager
State Department of Education
Facilities Development Branch
P.O. Box 2360
Honolulu, HI 96804

GROUP 70
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Tom Young, MBA AIA
Paul T. Matsuda PE, LEED AP

September 5, 2012

Mr. Don Young, President/CEO
Haleakala Ranch Company
529 Kealaloa Avenue
Makawao, HI 96768

Subject: Response to Comments on the Draft Environmental Impact Statement for the Proposed Kīhei High School

Aloha Mr. Young:

Thank you for your comment letter dated February 3, 2012 concerning the Draft Environmental Impact Statement (EIS) for the proposed Kīhei High School Project. We take note of your comments relating to the Draft EIS for the proposed project. The following are offered in response to your comments:

Response 1: Landowner Identification
In January 2012 the project site was acquired in fee by the State of Hawai'i, Board of Land and Natural Resources. All landowner references in the Final EIS are updated to reflect Board of Land and Natural Resources (BLNR) ownership.

Response 2: Chapter 343, HRS, Trigger
We stand in agreement with your comment that the use of State funds for unimproved real property is not a trigger under HRS 343. Use of State funds and State lands for construction of a high school, and the proposed amendment to the Kīhei-Mākena Community Plan are triggers. For clarification, we have revised the text in Final EIS Section 1.1 Project Summary and Section 1.5 Reasons for Preparing the EIS. (We did not find reference to EIS triggers on page 1-15.)

Response 3: Long Term Infrastructure and Community Planning
Coordination with Haleakala Ranch and Kaonoulu Ranch will continue through the Design-Build process to ensure coordinated infrastructure planning during the later phases of the project. Text regarding coordinated planning between DOE and Kīhei Mauka landowners was included in Section 4.2.1 Planned Projects in the Region of the Final EIS.

Response 4: Wastewater Re-use
A *Non-potable Water System Alternatives Analysis* report was prepared by Gray, Hong, Nojima & Associates, Inc. to analyze potential non-potable water system improvements, non-potable water sources, and provide recommendations based a life cycle cost comparison, among other factors. The report is included as Appendix M of the Final EIS.

Response 5: Drainage
The drainage ditch will be constructed on DOE property. The PER presently shows a portion of the ditch and outlet within Haleakala Ranch's property (refer to PER figure 10). DOE will coordinate an easement with adjacent property owners for any portion of the ditch located off-site in order to properly convey the runoff into Waipu'ilani Gulch.

Response 6: Pedestrian/Bike Path Connectivity
Stantec Consulting Services, Inc. (Stantec) prepared a pedestrian and bicycle analysis for the project site. The report focuses on community connectivity, access to and at the high school site, and provision of appropriate safety measures for bicyclists and pedestrians. Stantec provides a list of recommendations to improve walking and bicycling infrastructure for the high school. The analysis is discussed in Chapter 4 and the entire report "Kīhei High School Project Pedestrian and Bicycle Analysis" is included in the Final EIS as Appendix N.

The DOE will participate in future discussions with ranch owners regarding community connectivity.

Response 7: Haleakala Ranch Description
The requested changes to the number of ranch employees and cattle have been made to the Final EIS and Appendix B.

We appreciate your participation in the environmental review process. You will receive a copy of the Final EIS.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Christine Mendes Ruotola, AICP, LEED AP
Principal

Group 70 International • 925 Bethel Street, 5th Floor • Honolulu, HI 96813-4307 • tel. 808.523.5866 • fax. 808.523.5874 • www.group70int.com

9909 Lemon Ave
La Mesa, CA 91941
January 22, 2012

State of Hawaii, Department of Education
Facilities Development Branch
P.O. Box 2360
Honolulu, Hawaii 96804

Dear Mr. Purdie,

I appreciate the opportunity to review the Draft Environmental Impact Statement (DEIS) for the proposed Kihei High School. First, I'd like to voice my support of this much needed educational facility. However, the following comments regarding the Traffic portion of the DEIR and Appendix G, Traffic Impact Report (TIR) and Traffic Signal Warrant Study, should be addressed prior to the DEIR being finalized.

1. Future Traffic Volumes: The methodologies used to develop future traffic volumes appear to underestimate future traffic for the following two reasons:

A. The TIR for the DEIS states that historical traffic count data obtained from the State Department of Transportation (SDOT), Highway Division survey stations in the vicinity of the project site indicates traffic volumes have remained relatively stable and, as such, an annual traffic growth rate of approximately 1.0% per year was conservatively assumed along Pi'ilani Highway and South Kihei Road in the project vicinity. However, the traffic impact report does not cite the years of the historical data nor provide this data anywhere in the report. If the historical traffic count data includes 2008 and later years, the severe economic downturn to Maui County's economy may explain why traffic has remained relatively stable. As a comparison, traffic count data has actually declined by approximately 10% since 2008 in the City of San Diego region. The study indicates a 1.04% annual growth rate was used to compute Year 2015 volumes and a 1.14% annual growth rate to compute Year 2025 volumes. However, these growth factors would be low given the population growth anticipated in the area. The Purpose and Need for the Project DEIS indicates one of the purposes of the proposed project is to meet the needs of the growing population and that, "The 2025 population estimate for Kihei-Makena region is 35,962 persons, or a 57 percent increase from 2000 (County Planning Department, June 2006)." Additionally, the population of Kihei was 16,749 persons in Year 2000 and it had climbed to 20,881 according the United States Census Bureau, which is an increase of 24.7%. Assuming the 57% projected increase by the County Planning Department from Year 2000 to Year 2025, Kihei's population would be expected to grow 32.3% from Year 2010 to Year 2025, or 2.15% per year. This is almost double the rate assumed for traffic growth in the DEIS.

B. None of the four cumulative projects listed in the TIR (Kihei Mauka, Pi'ilani Promedade and Muai Outlets Center, Maui Research and Tech Park, and Honua'ula Development) was assumed constructed, nor any portion was assumed constructed, in the Year 2015 or Year 2025 scenarios. The DEIS states this is because these projects' development plan and implementation schedule for their development are not known at this time. To assume no new development on any of these project sites in Year 2015 and Year 2025 is very unrealistic, particularly in Year 2025. Further, the fact that these four cumulative projects would be undertaking a traffic study to access its impacts on the surrounding roadways as stated in the TIR does not relieve Kihei High School's responsibility to accurately assess its own impacts and to disclose these impacts to the public.

Therefore, for the above given reasons, the traffic volumes projected for Year 2015 and Year 2025 are probably low; and, therefore, there may be traffic impacts that are not disclosed in the DEIS.

2. Parking: The DEIS indicates that the proposed high school would provide 948 automobile parking spaces whereas 1,941 spaces are required by Maui County Zoning Code. The DEIS should fully discuss and disclose the effects this parking shortfall may have on nearby residences, including on the community of Pi'ilani Villages, in the event sporting events are held at the proposed stadium during normal school hours. If this is not discussed and disclosed in the DEIS, then Kihei High School should not be allowed to hold events which have a high parking demand during normal school hours.

3. Pedestrian Safety: Page 4-40 of the DEIS states, "The installation of a traffic signal system at the intersection of Pi'ilani Highway and Kulanihakoi Street, and the access road for the high school, will provide for safe crossing and pedestrian travel to and from the campus." However, the installation of a traffic signal does not necessarily provide a safe crossing for the following reasons:

A. The traffic impact study assumes northbound free-right hand turns are provided on Piilani Highway at Kulanikahoi Street in future scenarios, after the signalization of this intersection with this project. Either these free-right turns should be removed and the intersection delay be re-calculated and re-reported, or the DEIS should fully disclose the safety hazards resulting from free-right turns for pedestrians.

B. The Synchro analyses sheets for this intersection were evaluated with permissive phasing for eastbound and westbound automobiles. Protected left turn phasing would provide a safer alternative to permissive phasing. If permissive phasing is proposed at this intersection, then DEIS should fully disclose the potential hazard to pedestrians resulting from this type of phasing. If permissive left turn phasing is not proposed, then the HCM analyses sheets should be revised accordingly and the new intersection delay reported.

4. Intersection Analysis: The number of pedestrian calls per hour assumed in the HCM intersection analyses is not shown on the Synchro analysis sheets in the TIR. Therefore, the text of the traffic impact analysis should provide this information, given that many ped calls per hour can degrade the LOS at an intersection. It would be expected that an intersection providing access for a school facility would have many pedestrian calls per hour in the a.m. peak on school days.

5. Minor Revision Requested: All figures in the TIR with the words "Trip Distribution" should have these words replaced with the words, "Trip Assignment," since trip distribution is provided as percentages whereas trip assignment is provided as specific numbers.

Please address these comments, as it is imperative that the DEIS accurately disclose its impacts to the public.

Thank you one again for providing me the opportunity to review and comment on this document.

Sincerely,

Victoria Huffman

cc: Christine Ruotolo, Group 70 International

GROUP 70
INTERNATIONAL

September 5, 2012

Ms. Victoria Huffman
9909 Lemon Ave.
La Mesa, CA 91941

Subject: Response to Comments on the Draft Environmental Impact Statement for the Proposed Kīhei High School

Aloha Ms. Huffman:

Thank you for your comment letter dated January 22, 2012 concerning the Draft Environmental Impact Statement (EIS) for the proposed Kīhei High School Project. We take note of your comments relating to the Draft EIS for the proposed project. The following are offered in response to your comments:

Response 1: Future Traffic Volumes

The historic traffic count data collected by the State Department of Transportation does indicate relatively stable traffic volumes in the vicinity of the project site. However, since population in Kīhei is anticipated to grow in the future and other projects are expected to be developed in the region, the traffic study assumes that there will be growth in traffic in the vicinity as a result. The traffic study incorporated a 4% growth in traffic between 2011 and 2015, and a 14% growth in traffic between 2011 and 2025 to account for the assumed growth in the region. In addition, the study acknowledges that there are other developments such as Kīhei Mauka, Pi'ilani Promenade, Maui Outlets Center, etc., but the details of these projects are not known at this time. The impacts from these projects should be addressed by those projects. The TIAR for the high school includes all of the traffic projections associated with the school and identifies the impacts and mitigative measures as a result of the school's development.

Response 2: Parking

Parking requirements are specifically listed as an "Unresolved Issue" in Section 4.4.5 of the Draft EIS. The Design-Build team will work in conjunction with the County of Maui to determine minimum parking requirements and any timing restrictions on sporting events. In addition to the 948 spaces shown in the Conceptual Parking Plan, an area of approximately seven acres is available for overflow parking.

Response 3A: Pedestrian Safety

The design of the northbound right-turn deceleration lane recommended at the intersection of the project driveway with Pi'ilani Highway should include appropriate pavement markings and signage to provide for a pedestrian crossing across the dedicated lane. These elements should include "Yield to Pedestrians" signage and a marked crosswalk. The final design details will be worked out during the design build process with DOE, the State Department of Transportation and the County of Maui.

Response 3B and 4: Pedestrian Safety and Intersection Analysis
The analysis included in the TIAR with regards to the future signalized intersection of the project driveway with Pi'ilani Highway includes reasonable assumptions regarding the anticipated traffic signal phasing and timing. The intent of this analysis is to identify potential traffic operational deficiencies and develop recommended mitigative measures such as the provision of exclusive acceleration/deceleration lanes and the installation of a traffic signal system as detailed in the TIAR. During the design and implementation of the traffic signal system, the signal timing and phasing could be modified to accommodate the inclusion of a protected left-turn phase if deemed appropriate at that time. In addition, the TIAR also recommends the preparation of a Traffic Management Plan and consideration of subsequent Traffic Assessment Reports to verify projected traffic conditions and monitor the effectiveness of traffic management strategies.

In addition, Stantec Consulting Services, Inc. (Stantec) prepared a pedestrian and bicycle analysis for the project site. The report focuses on community connectivity, access to and at the high school site, and provision of appropriate safety measures for bicyclists and pedestrians. Stantec provides a list of recommendations to improve walking and bicycling infrastructure for the high school. The analysis is discussed in Chapter 4 and the entire report "Kīhei High School Project Pedestrian and Bicycle Analysis" is included in the Final EIS as Appendix N.

Response 5: Minor Revision Requested
The differences between "Trip Distribution" and "Trip Assignment" is understood, however, for the purposes of this report, the term is being used to describe both trip distribution and trip assignment.

We appreciate your participation in the environmental review process. You will receive a copy of the Final EIS.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Christine Mendes Ruotola, AICP, LEED AP
Principal

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4320 E. Waiola Loop
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State of Hawaii, Department of Education
Facilities Development Branch, P.O. Box 2360
Attn: Robert Purdie, Jr.
Honolulu, Hawaii 96804

Group 70 International Inc.
Attn: Christine Ruotola
925 Bethel Street, 5th Floor
Honolulu, Hawaii 96813

Re: Kihei High School EIS
Submission #1
Water

Dear Gentlepersons,

I submit the following comments on the water/groundwater section of the Kihei High School Draft EIS ("DEIS").

1. The DEIS contains statements about the sustainable yield of the Kamaole aquifer that are incomplete.

a. The DEIS states that the CWRM has estimated the groundwater recharge from rainfall in the Kamaole Aquifer System to be 25 million gallons per day, citing the Water Resource Protection Plan, CWRM, 1990. Please supply a page reference to verify this statement.

b. The DEIS states that "Of the estimated 25 million gallons per day (mgd) of groundwater recharge, CWRM estimates that 11 mgd of groundwater can be developed within the Kamaole Aquifer System on a sustainable basis, Water Resources Protection Plan, CWRM, 2008)."

This overstates the CWRM's position. In fact, the CWRM's 2008 Water Protection Plan assigns a sustainable yield calculation of 11 mgd, but with a confidence rating of 3. The CWRM assigns sustainable yields estimates to aquifers on a 1 – 3 scale, 1 being "most confident," 2 being "moderately confident,' and 3 being "least confident." CRWM notes the following regarding level 3 sustainable yields: "There is significant uncertainty associated with this Sustainable Yield due to the lack of hydrologic and pumpage information." (See CWRM Water Resources Protection Plan, 2008, pp. 3-82, 3-86 and 87.) Acknowledgement that the sustainable yield of the Kamaole aquifer is poorly

understood is a prerequisite to cogent discussion of groundwater resources, particularly when no water service is available to the project site, one that is located in a desert.

2. The probable effect of documented climate change in Hawaii is unaddressed.

Kamaole aquifer's capability to support the proposed high school is particularly relevant in light of well-document climate change data and projections that describe a hotter and dryer climate in the islands. The situation is of such urgency and concern that the Department of Land and Natural Resources recently published a plan to replenish Hawaii's water sources by engaging in a massive reforestation project. ("The Rain Follows The Forest, A Plan to Replenish Hawaii's Source of Water," DLNR, November 2011.) Under the caption "Hawaii's Water Supply is at Risk" the report states, "Our fresh water supply, revered and relied upon since the first ancient Hawaiians arrived on these islands, is declining. If this trend continues, future generations will not have access to water at reasonable rates, and may face tight restrictions." The report notes that rainfall has declined in Hawaii over the past century, with a 12% decline in the last 20 years alone.

Other well documented studies and professional journal articles speak to the effect climate change will have on the Hawaiian islands. See, for instance, "Change in the Vertical Profiles of Mean Temperature and Humidity in the Hawaiian Islands" by Diaz, Giambelluca and Eischeid, published in Global and Planetary Change, volume 77, pages 21-25 (2011): "Recent drought and warmer than normal temperature affecting the Hawaiian Islands have raised concern among natural resource managers that impacts associated with global warming are becoming manifest in the region." Also see "Secular Temperature Changes in Hawaii." by Giambelluca, Diaz and Luke, published in Geophysical Research Letters, volume 35, beginning at page L12702 (2008): ". . . Hawaii's climate is likely to continue to become drier as warming continues. Reduced precipitation in combination with a possible increase in potential evapotranspiration due to increased temperature would result in significant reductions in ground-water and stream discharge . . . ."

3. Kihei has been in prolonged drought. Climate change data suggest that drought conditions are here to stay.

The DEIS should recognize that Kihei and other parts of the Hawaiian Islands have been in prolonged drought, with obvious effect on the water supply. (See, e.g., U.S. Drought Monitor, January 17, 2012, indicating Kihei is in "severe drought condition" even in the midst of what should be the rainy season.) Discussion of this fact on water supply for the proposed school is warranted.

4. The DEIS does not include or aggregate a wide array of Kamaole aquifer users, many of whom tap significant amounts of the available yield.

The DEIS does not account for current usage by either Makena Resort or the Wailea golf courses, all of which draw from the same Kamaole aquifer. This data is readily available and should be acknowledged and accounted for in terms of assessment of sustainable yield. Additionally, this data should be considered on a seasonal basis to obtain a true picture of actual draw since significantly more water is used in summer than in winter.

Monthly ground water use reports filed with the CWRM indicate that Seibu wells #1 – 11 drew 68 million gallons of water from its Kamaole aquifer wells in August 1997, averaging approximately 2.2 million gallons per day. Wailea Resort Company reported using over 86 million gallons of water the same month, or roughly 2.8 million gallons a day. The two together total 5 million gallons a day, none of which is accounted for in the DEIS. While these wells are not located in the immediate vicinity of the Kihei High School site, they nonetheless draw from the same aquifer. If the sustainable yield of the aquifer is indeed 11 mgd, then all users must be accounted for in the project's analysis or, in the alternative, some science-based rationale given for dismissal of the data.

5. The DEIS does not account for future users of the Kamaole aquifer.

The DEIS speaks to "existing water use" and "existing wells" but does not acknowledge the impact other well-known developments will have on the Kamaole aquifer's sustainable yield. For instance, two large shopping centers have been approved just north of the proposed high school site. These will obviously need water. The same can be said for the regional police station now under construction south of the proposed site. In addition, Wailea 670, a huge residential/golf course community approved south of the site also intends to draw from the Kamaole aquifer for sustenance. None of the data from these projects is acknowledged, much less discussed.

Conclusion

For the above reasons, the DEIS is inadequate in its discussion of water supply for the proposed high school.

Sincerely,

Mark G. Hyde

GROUP 70
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Paul T. Matsuda PE, LEED AP

September 5, 2012

Mr. Mark Hyde
4320 E. Waiola Loop
Kihei, HI 96753

Subject: Response to Comments on the Draft Environmental Impact Statement for the Proposed Kīhei High School

Aloha Mr. Hyde:

Thank you for your comment letter (Submission #1, Water) received on January 24, 2012 concerning the Draft Environmental Impact Statement (EIS) for the proposed Kīhei High School Project. We take note of your comments relating to the preparation of the Draft EIS for the proposed project. The following responses to your comments are offered by Water Resource Associates, preparer of the Groundwater Resources and Supply report:

Response 1 a: Rainfall
The cited reference for rainfall of 25 mgd in the Kama'ole Aquifer is on page B-7, Column I (mgd), Water Resource Protection Plan, 1990.

Response 1 b: Sustainable Yield
The CWRM has established sustainable yield estimates for all aquifers in the State, including the Kama'ole Aquifer. These estimates serve primarily as a tool for managing groundwater resources. The Draft EIS objectively presents the CWRM's sustainable yield estimate of 11 mgd for the Kama'ole Aquifer (in which the project is located) for comparison with the project's proposed withdrawal of 0.185 mgd of brackish groundwater. As with many other aquifers in the State, the CWRM's assignment of confidence level 3 to the sustainable yield estimate for the Kama'ole Aquifer is recognized as due in large part to inadequate rainfall and other hydrologic data. However, this does not diminish or overstate the usefulness of sustainable estimates as a management tool.

Response 2: Climate Change
Studies of climate change in Hawai'i, which have been mostly general or island-wide in scope, do not provide an adequate or reasonable scientific basis for evaluating the Kama'ole Aquifer System's capability (i.e., sustainable yield) to support the proposed Kīhei high school's brackish irrigation water requirement of 0.185 mgd (million gallons per day), or 185,000 gpd (gallons per day). Concerning the State Department of Land and Natural Resources' (DLNR) recently published reforestation plan mentioned in your letter, the subject of watershed protection and reforestation programs to protect and enhance Hawai'i's interior rainfall areas have been a concern of governmental agencies and private entities in Hawai'i for many decades. Finally, climate change in Hawai'i as it might affect the Kama'ole Aquifer System's sustainable yield of 11 mgd was not addressed because the 11 mgd estimate has a CWRM confidence level of 3, which means there is significant uncertainty associated with the estimate due to lack of hydrologic and pumpage information. Assessing impacts based on speculative climate change data and uncertain sustainable yield estimates would be conjectural in nature.

Response 3: Drought
The principle goal of the water resources study for the proposed project is, first, to estimate the project's water requirements; secondly, to determine how the water requirements are to be met; and thirdly, to assess the impacts on the water resources or aquifer system to be used. The CWRM (Hawai'i State Commission on Water Resource Management) has the responsibility for managing Hawai'i's water resources. The CWRM manages ground water resources by an established system of aquifers with sustainable yield values assigned to each aquifer. Sustainable yield numbers are long-term averages, which are not affected by seasonal or other normal drought periods. The estimated brackish irrigation water requirement for the proposed project of 0.185 mgd is also an average value which allows it to be compared with Kama'ole aquifer's sustainable yield of 11 mgd. We are unaware of any drought studies related to the Kīhei area which might provide a quantitative basis for assessing any potential impact that drought conditions might have on the proposed irrigation water supply for the high school project.

Response 4: Kama'ole Aquifer Usage
As presented at the top of page 4 of the Water Resources and Supply report prepared by Water Resource Associates, the existing water demand (as of July 2005) of all users in the Kama'ole Aquifer System amounted to 1.859 mgd (12-month moving average), or 17% of the aquifer's sustainable yield of 11 mgd. This information is from the CWRM's Water Resources Protection Plan, June 2008, pg. 6-17.

The Water Resources and Supply report also stated, at the top of page 4, that the primary use of the 1.859 mgd water demand was for golf course and landscape irrigation. This statement implied but did not directly identify the wells as belonging to the two major resorts, Wailea and Mākena, located within the Kama'ole Aquifer system. The Wailea and Mākena Resort wells are located roughly 5 miles and 7½ miles south, respectively, of the proposed brackish wells for the Kīhei High School project.

The Wailea and Mākena (Seibu) wells account for the bulk of existing groundwater demand in the Kama'ole Aquifer System. There are five additional users with reported pumpage, as shown in the attached Table, "Wells with Reported Pumpage, Kama'ole Aquifer". Currently, groundwater use (12-month moving average, 2009) in the Kama'ole Aquifer is less than 1.0 mgd (CWRM staff, personal communication, February 2012). Based on an unpublished graphical data by the CWRM, the 12-month moving average of groundwater use in the Kama'ole Aquifer ranged between approximately 1.8 mgd and 2.5 mgd during 2006, between 2.5 mgd and 3.5 mgd during 2007, and declined from 2.6 mgd to 1.3 mgd during 2008. The addition of the proposed high school project's brackish water requirement (0.185 mgd) to the current 12-month moving average of groundwater use (1.0 mgd), amounts to 1.185 mgd, or 10.8% of the Kama'ole Aquifer's sustainable yield (11 mgd).

Combining the highest 12-month moving average of groundwater use in 2007 (3.5 mgd) with the proposed project's 0.185 mgd water requirement, would represent 33.5% of the Kama'ole Aquifer's sustainable yield.

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Response 5: Future Water Use
The purpose of the Water Resources and Supply report in the DEIS is to first determine the project's water requirements, water availability, and water development needed to meet those requirements; and, secondly, assess the impacts that the proposed water development will have on existing water resources. The basic criterion for assessing the impacts on existing aquifer conditions is a comparison of sustainable yield, existing withdrawals, and proposed project withdrawal.

The actual water use data is not available for proposed, planned, and speculative developments within the Kama'ole Aquifer System that might require groundwater withdrawal. Discussion of the impacts would be speculative in nature. Each future project in the region will be responsible for evaluating its projected non-potable water usage and its respective impact on the sustainable yield of the Kama'ole aquifer.

We appreciate your participation in the environmental review process. You will receive a copy of the Final EIS.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Christine Mendes Ruotola, AICP, LEED AP
Principal

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hydem001@hawaii.rr.com

January 26, 2012

State of Hawaii, Department of Education
Facilities Development Branch, P.O. Box 2360
Attn: Robert Purdie, Jr.
Honolulu, Hawaii 96804

Group 70 International, Inc.
Attn: Christine Rutola
925 Bethel Street, 5th Floor
Honolulu, Hawaii 96813

Re: Kihei High School DEIS
Submission #2
Site Plan and Traffic

Dear Gentlepersons,

I submit the following comments to the draft environmental impact statement ("DEIS") for the proposed Kihei High School.

I. The Project is Unsafe and Poses Unreasonable Risk to the Community and to the State

Given (1) the site plan for the proposed high school (entirely separated from the community by a high speed roadway where automobiles frequently travel at speeds ranging from 45 – 60 miles per hour); (2) an inadequate traffic plan that wholly fails to address the fact that a certain number of students will walk and bike to school; (3) the presence of large numbers of juveniles/students with undeveloped senses of risk and limited awareness of the tenuous hold we have on life; and (4) the mixing of this cocktail at peak traffic hours, our youth will be put at risk of serious injury and possibly death, creating the probability of tragedy in our community and placing the State of Hawaii and the Department of Education at significant financial and moral risk.

I urge the proponents of this project to seek legal counsel to assess this obvious risk and to take all steps necessary to focus a revised EIS on the safety of our youth.

II. The Project Is Not in Keeping with Good Community Design Concepts

The project's location fits the definition of sprawl. If built, the school will have a deleterious effect on the health and worth of the entire Kihei community. Schools located away from residential neighborhoods discourage walking and biking, which in turn leads to over-dependence on the automobile and a growing population of overweight and obese youth. According to the Partnership for Safe Schools, "Trends indicate that the average school size has grown and that new schools have been increasingly located on large sites away from the families in the neighborhoods that they serve." (Safe Routes to School National Partnership, *School Siting*.) The National Trust for Historic Preservation's report titled "*Why Johnny Can't Walk to School,*" criticizes school planners for the lack of walkable schools.

III. The Project is Not in Compliance with Maui County General Plan Policies

The people of Maui County aspire to have a better community. To achieve this end, the community engaged in a Herculean effort to update the general plan, looking out to 2030. To date, the County has enacted a set of policies, goals and objectives designed to achieve a better future state. The proposed Kihei High School is out of alignment with these policies, goals and objectives and is, therefore, out of step with the aspirations for our island community, even though all would agree that a high school in Kihei is desirable. We want smart growth, not growth at any cost.

I urge the proponents of this project to review the County of Maui General Plan 2030 Countywide Policy Plan and match the Kihei High School with the will of the people - to have a live-able, sustainable, desirable, safe community. "Vision – Maui county will be an innovative model of sustainable living . . . ." We cannot achieve this vision with the out-of-date thinking incorporated into the proposed Kihei High School plan as presented, one that is rooted in the past. We want, expect and demand better.

IV. The Traffic Study is Wholly Inadequate

The DEIS is 738 pages long. *Only three sentences are devoted to pedestrians.* The traffic study is totally focused on automobile traffic and fails to address pedestrian and bike traffic and safety altogether. As to the three sentences (you would expect more since this is a school project involving children), all three are mere conclusions without any basis in fact or analysis, and some are simply erroneous. (See page 4-40 for the three sentence, single paragraph discussion of pedestrian safety.)

The first sentence is without foundation and incorrect: "The location of the high school is within walking distance to existing and future residential areas, thereby encouraging students to walk and bike to and from school." This is not a true statement. South Maui extends from well north of the proposed campus all the way into Makena. Is it credible to believe that students living in Makena or Wailea are within walking distance? How far are the outer reaches of the school service area to the project site? What routes will children likely take? How many miles do these routes cover? Are these routes safe? Where are the future residential areas referenced and how/where will children living in them walk and bike to school?

The second sentence states: "Safe walking and bicycling opportunities will be integrated into the overall project design." No facts, schematics or other support is provided for this broad conclusion. In addition, whether it is safe to walk or bike to school will largely be dictated by the surrounding environment - not limited to the project site alone. Please do the work to support (or reject) this seminal conclusion.

The third sentence states: "The installation of a traffic signal . . . will provide for safe crossing [of Pi'ilani Highway] and pedestrian travel to and from campus." This is presented without any factual support or analysis. The intersection drawings submitted certainly don't support this conclusion inasmuch as they only speak to automobile traffic, nor is there any recognition that peak traffic times on Pi'ilani Highway will coincide (collide) with peak student commute hours.

Conclusion

The DEIS is significantly flawed, in part because the project itself is poorly conceived, but also because the work has not been done to flesh out the real challenges presented, or to imagine and describe the mitigation measures that might be entertained to address them.

Respectfully submitted,

Mark G. Hyde

GROUP 70
INTERNATIONAL

September 5, 2012

Mr. Mark Hyde
4320 E. Waiola Loop
Kihei, HI 96753

Subject: Response to Comments on the Draft Environmental Impact Statement for the Proposed Kīhei High School

Aloha Mr. Hyde:

Thank you for your comment letter (Submission #2, Site Plan and Traffic) dated January 26, 2012 concerning the Draft Environmental Impact Statement (EIS) for the proposed Kīhei High School Project. We take note of your comments relating to the Draft EIS for the proposed project. The following are offered in response to your comments:

Response 1 & 4 : Community Impacts & Traffic Study
Stantec Consulting Services, Inc. (Stantec) prepared a pedestrian and bicycle analysis for the project site. The report focuses on community connectivity, access to and at the high school site, and provision of appropriate safety measures for bicycles and pedestrians. Stantec provides a list of recommendations to improve walking and bicycling infrastructure for the high school. The analysis is discussed in Chapter 4 and the entire report "Kīhei High School Project Pedestrian and Bicycle Analysis" is included in the Final EIS as Appendix N.

Response 2: Community Design
Although the project area is currently undeveloped, it does not meet the definition of sprawl. The site is near existing residential development, adjacent to planned urban residential and commercial development, and adjacent to regional transportation corridor, and consistent with long-term land use plans for the region. During the site selection study process, the site was chosen from available parcels within the Kīhei region for its location, including proximity to the population which the school will serve.

Response 3: Compliance with County of Maui General Plan.
The Draft EIS conducted an evaluation of the County of Maui General Plan 2030 Countywide Policy Plan in Section 5.2.2 Countywide Policy Plan. Each goal, objective, and policy was evaluated in relationship to the proposed project. The project is consistently supportive of applicable goals, objectives and policies. The project is also consistent with the land use plans provided in the County's draft Maui Island Plan (December 2009). The Directed Growth Maps (December 2010) put forth by the County of Maui Department of Planning show the proposed site for Kīhei High School within the "Planned Growth Area" and the Public Facility/Infrastructure Improvement Map designations the location of the proposed Kīhei High School for the development of a future high school.

We appreciate your participation in the environmental review process. You will receive a copy of the Final EIS.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Christine Mendes Ruotola

Christine Mendes Ruotola, AICP, LEED AP
Principal

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February 3, 2012

Ms. Christine Ruotola, AICP
Group 70 International, Inc.
925 Bethel Street, 5th Floor
Honolulu, HI 96813

Subject: Kihei High School DEIS

Dear Ms. Ruotola,

Kaonoulu Ranch appreciates the opportunity to comment on the Draft Environmental Impact Statement (DEIS) for the proposed Kihei High School. We encourage the State to move forward expeditiously on this much needed facility. The following comments are provided based on review of the DEIS.

1. Landowner Identification (pg. 1-2). As you are aware, the State has recently completed acquisition of the property from Haleakala Ranch and Kaonoulu Ranch. We assume all appropriate references to land ownership will be updated in the Final EIS.

2. Chapter 343, HRS, Trigger (pgs. 1-1 and 1-15). It is our understanding that the trigger for preparation of the Draft EIS is the use of State lands and the proposed Community Plan Amendment. We understand that the purchase of the unimproved lands was determined to be exempt pursuant to Chapter 343, HRS.

3. Long term Infrastructure and Community Planning. Thank you for acknowledging the long term master planning efforts of Haleakala Ranch and Kaonoulu Ranch related to the Kihei Mauka growth area. We look forward to continued discussions with the Department and designers of the High School to ensure that long term planning of local and regional infrastructure mauka of Piilani Highway is undertaken in an efficient and comprehensive manner, to the extent practicable. As noted in our pre-consultation letter, this may include the potential of upsizing infrastructure as necessary. We understand that detailed analysis of various infrastructure options will take place during later phases of the project. In an effort to not foreclose future infrastructure planning options, the potential for coordinated infrastructure planning with mauka lands should be discussed in the Final EIS.

4. Wastewater re-use. The DEIS mentions that use of reclaimed wastewater from the Kihei Wastewater Reclamation Facility (KWRF) for on-site irrigation may be examined in the future. Given the projected amount of water needed on a daily basis for on-site irrigation (185,000 gpd) as well as the upfront capital costs of drilling wells and long term operational costs associated with operating the high capacity pumps to maintain pressure, further analysis of use of reclaimed wastewater would appear warranted. We note the presence of existing transmission and storage facilities within the Maui Research & Technology Park located mauka and to the south of the school site. We recognize that detailed studies would need to take place to determine the feasibility of this option, however, we suggest including the potential of connecting to these facilities in the Final EIS so as to not foreclose future planning options.

5. Drainage. The civil engineering report makes reference to the need for creation of a drainage diversion structure mauka of the school property to divert off-site drainage flows to Waipulani Gulch. Reference is made to the potential for increased engineering costs if the diversion structure is located on the school property versus ranch property. Given the similarity of the land on either side of the property boundary, there would appear to be little to no difference in costs to construct the proposed diversion structure whether on school or ranch property. Based on discussions with our civil engineer, it is our understanding that there is ample space to locate the diversion structure on school property and that doing so would not necessarily affect the way drainage is handled on the rest of the school property. Locating the structure on school property would also simplify implementation of the project by avoiding the need for legal easements and long term liability and maintenance agreements. And as part of the site acquisition process, Haleakala Ranch agreed to grant an easement to allow for the discharge of runoff from the school property to Waipulani Gulch, anticipating a diversion structure constructed on school property. So, while we are not opposed to future discussions on this option, it appears that location of the drainage diversion on the school site is the preferable alternative.

6. Pedestrian/Bike Path Connectivity. Preliminary concept planning for the Kihei Mauka growth area contemplates a network of pedestrian/bike paths and greenways that can be coordinated to connect to the campus. We look forward to future discussions during the detailed design stages of the project to achieve a well connected and planned community.

7. Other minor edits. There is no okina in the spelling of Kaonoulu Ranch. The total ranch acreage is approximately 10,000 acres, the references to 9,000 acres should be corrected throughout the DEIS and page 11 of Appendix B.

Thank you for the opportunity to comment and should you have any questions, please contact me or our land use planner, Mr. Rory Frampton at (808) 298-4956 or rory@roryframpton.com.

Sincerely,

Henry F. Rice
Managing Partner, Kaonoulu Ranch, LLLP

Cc: Mr. Robert Purdie, Jr., Project Manager
State Department of Education
Facilities Development Branch
P.O. Box 2360
Honolulu, HI 96804

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Paul T. Matsuda PE, LEED AP

September 5, 2012

Mr. Henry Rice, Managing Partner
Kaonoulu Ranch LLLP
P.O. Box 390
Kula, HI 96790

Subject: Response to Comments on the Draft Environmental Impact Statement for the Proposed Kīhei High School

Aloha Mr. Rice:

Thank you for your comment letter dated February 3, 2012 concerning the Draft Environmental Impact Statement (EIS) for the proposed Kīhei High School Project. We take note of your comments relating to the Draft EIS for the proposed project. The following are offered in response to your comments:

Response 1: Landowner Identification
In January 2012 the project site was acquired in fee by the State of Hawai'i, Board of Land and Natural Resources. All landowner references have been updated in the Final EIS to reflect DOE ownership.

Response 2: Chapter 343, HRS, Trigger
We stand in agreement with your comment that the use of State funds for unimproved real property is not a trigger under HRS 343. Use of State funds and State lands for construction of a high school, and the proposed amendment to the Kīhei-Mākena Community Plan are triggers. For clarification, we have revised the text in Final EIS Section 1.1 Project Summary and Section 1.5 Reasons for Preparing the EIS. (We did not find reference to EIS triggers on page 1-15.)

Response 3: Long-Term Infrastructure and Community Planning
Coordination with Haleakala Ranch and Kaonoulu Ranch will continue through the Design-Build process to ensure coordinated infrastructure planning during the later phases of the project. Text regarding coordinated planning between DOE and Kīhei Mauka landowners was included in Section 4.2.1 Planned Projects in the Region of the Final EIS.

Response 4: Wastewater Re-use
A *Non-potable Water System Alternatives Analysis* report was prepared by Gray, Hong, Nojima & Associates, Inc. to analyze potential non-potable water system improvements, non-potable water sources, and provide recommendations based a life cycle cost comparison, among other factors. Two alternatives for non-potable water were identified in the report, onsite brackish groundwater wells, and use of R-1 recycled water from the County of Maui's existing Kīhei Wastewater Reclamation Facility. Please refer to Appendix M of the Final EIS for details.

Response 5: Drainage
The drainage ditch will be constructed on DOE property. The PER presently shows a portion of the ditch and outlet within Haleakala Ranch's property (refer to PER figure 10). DOE will coordinate an easement with adjacent property owners for any portion of the ditch located off-site in order to properly convey the runoff into Waipu'ilani Gulch.

Response 6: Pedestrian/Bike Path Connectivity
Stantec Consulting Services, Inc. (Stantec) prepared a pedestrian and bicycle analysis for the project site. The report focuses on community connectivity, access to and at the high school site, and provision of appropriate safety measures for bicyclists and pedestrians. Stantec provides a list of recommendations to improve walking and bicycling infrastructure for the high school. The analysis is discussed in Chapter 4 and the entire report "Kīhei High School Project Pedestrian and Bicycle Analysis" is included in the Final EIS as Appendix N.

Response 7: Other Minor Edits
Requested changes to the spelling of Kaonoulu Ranch, and the ranching acreage have been made.

We appreciate your participation in the environmental review process. You will receive a copy of the Final EIS.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Christine Mendes Ruotola, AICP, LEED AP
Principal

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KCA
Kihei Community Association

February 1, 2012

State of Hawaii
Department of Education
Facilities Development Branch
P.O. Box 2360
Honolulu, Hawaii 96804

Group 70 International, Inc.
725 Bethel Street, 5th Floor
Honolulu, Hawaii 96813

Re: Draft Environmental Impact Statement ("DEIS")
Kihei High School

Dear Rachel Shaak,

The Kihei Community Association ("KCA") is a nonprofit organization that advocates for the interests of area residents in the development, improvement and maintenance of the Kihei community. It is also the organization's mission to promote the health, safety and welfare of residents.

KCA strongly supports the development of a high school in Kihei. The KCA appreciates the comprehensive efforts of the EIS and respectfully submits the following comments:

There is confirmation in the EIS the new high school meets the Community Island Plan's objective and implements the action.

We appreciate that the EIS has identified and confirmed in the Maui Island Plan the need and location of a new high school to offset the overcrowding at one central Maui high school. We would suggest the inclusion of supplemental information as to the number of temporary buildings in use at Maui High School and Baldwin High School. Supplemental data on the number of students who currently and may in the future apply for geographic exemptions to attend a Kihei High School could further substantiate and predict demand for phase 1 enrollment and phase 2 build out schedules.

Re: Census Numbers (3.0)
Census data from year 2000 was used in the EIS. We would recommend the usage of updated 2010 census numbers. The 2010 census recognizes further growth in the project area, to the degree that Kihei is now the largest community on island and the largest community in the state without a high school.

P.O. Box 662 · Kihei, Maui, Hawaii 96753 · Phone/Fax: (808) 879-5390
Email: kca@gokihei.org

KCA
Kihei Community Association

Re: Existing Schools and Capacity
The EIS states "…Maui High School in Kahului which serves eastern Maui communities including Kīhei, Mākena and Wailea". The geo-referencing of Kihei, Wailea, Makena as being *east* is outdated and would be more accurately referenced as "South Maui".

Re: Site location (2.0)
The full 77-acre site supports the objectives of the project and not a smaller acreage site plan. We appreciate the EIS findings are consistent with the previous site selection as the land has recently been purchased and acquired for development by the State of Hawaii.

Re: Site plan, design
We appreciate that the site plan is consistent with the objectives of the previously held design charrettes, and that the EIS will allow for customization as afforded by the design/build specs. We endorse the concepts presented re: sustainable design in accordance with the efforts of the DOE and eco-charrette to achieve a LEED certification of silver to possibly gold.

Re: Site plan, configuration
We support the efforts of the design charette that are reflected in the EIS, including the concept of a tiered campus, grass fields near the highway and parking lots further mauka and out of view. We noted that the accessibility to visitors was excellent and consolidated as not to distract from the learning areas.

Re: Pedestrian Access
We support a campus that is walk-able, bicycle-friendly and safe for our youth. The DEIS, as currently written, does not focus sufficiently on pedestrian and bicycle access to and from the proposed high school campus, particularly given the location of the campus: separated from existing residential neighborhoods by a high speed roadway.

Although not located on site, the nearby North/South collector road and its completion could be an integral part of pedestrian and bike path access to and from KHS.

Re: Irrigation water
Although we appreciate the feasibility of brackish wells, similar to other large scale developments in the area. We also note that there is a R-1 water line approximately 1 mile away.

Re: Neighboring developments
We would suggest the inclusion of Alexander & Baldwin's proposed multi-family development in North Kihei and the inclusion of Wailea 670's affordable housing project just North of the High School. The KCA would also suggest a reference to a comprehensive list of other entitled projects in South Maui, not currently mentioned in the draft EIS, indicative of thousands of more units that may be built in the area.

P.O. Box 662 · Kihei, Maui, Hawaii 96753 · Phone/Fax: (808) 879-5390
Email: kca@gokihei.org

KCA
Kihei Community Association

In closing, the KCA would like to recognize the positive efforts of Group 70 to provide a comprehensive EIS in a timely manner and we thank you for your continued communication with the KCA.

Sincerely,

Jonathan D. Miller

Jon Miller,
President, KCA

P.O. Box 662 · Kihei, Maui, Hawaii 96753 · Phone/Fax: (808) 879-5390
Email: kca@gokihei.org

GROUP 70
INTERNATIONAL

September 5, 2012

Mr. Jon Miller, President
Kīhei Community Association
P.O. Box 662
Kīhei, HI 96753

Subject: Response to Comments on the Draft Environmental Impact Statement for the Proposed Kīhei High School

Aloha Mr. Miller:

Thank you for your comment letter dated February 1, 2012 concerning the Draft Environmental Impact Statement (EIS) for the proposed Kīhei High School Project. We take note of your comments relating to the preparation of the Draft EIS for the proposed project. The following are offered in response to your comments:

Response 1: Temporary Buildings
The planned Kīhei High School is anticipated to offset overcrowding experienced at Baldwin and Maui High Schools. According to the Department of Education (DOE), there are currently 25 existing portables at Baldwin High School, and 34 existing portables and one in design at Maui High School. Although use of temporary buildings is an indicator of overcrowding conditions, not all portables are being used as classroom spaces. Although this information would be of interest, unfortunately the DOE does not have supplemental data on the number of students that may apply for geographic exemptions to attend Kīhei High School.

Response 2: Census Numbers
The population data in the Final EIS has been updated to include 2010 census information from the U.S. Census Bureau and the 2011 Maui County Data Book.

Response 3: Existing Schools and Capacity
The reference to eastern Maui was struck from the Final EIS and replaced with "South" Maui.

Response 4, 5 and 6: Site Location, Site Plan
Thank you for the feedback and concurrence concerning the site, charrette process, conceptual site plan, EIS findings, land acquisition, future Design Build process, and proposed sustainable design efforts.

Response 7: Pedestrian Access
Stantec Consulting Services, Inc. (Stantec) prepared a pedestrian and bicycle analysis for the project site. The report focuses on community connectivity, access to and at the high school site, and provision of appropriate safety measures for bicyclists and pedestrians. Stantec provides a list of recommendations to improve walking and bicycling infrastructure for the high school. The analysis is discussed in Chapter 4 and the entire report "Kīhei High School Project Pedestrian and Bicycle Analysis" is included in the Final EIS as Appendix N.

Response 8: Irrigation water
A *Non-potable Water System Alternatives Analysis* report was prepared by Gray, Hong, Nojima & Associates, Inc. to analyze potential non-potable water system improvements, non-potable water sources, and provide recommendations based a life cycle cost comparison, among other factors. Two alternatives for non-potable water were identified in the report, 1) onsite brackish groundwater wells, and 2) use of R-1 recycled water from the County of Maui's existing Kīhei Wastewater Reclamation Facility. Please refer to Appendix M of the Final EIS for details. This issue will require ongoing discussion between the DOE, the design-build entity and the County of Maui.

Response 9: Neighboring Developments
The suggested development projects have been included in the Final EIS in Section 4.2.1 Planned Projects within the Region.

A comprehensive list of other entitled projects has also been provided as Figures 4-4 and 4-5, South Maui Development Projects.

We appreciate your participation in the environmental review process and look forward to continued communication with KCA. You will receive a copy of the Final EIS.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Christine Mendes Ruotola, AICP, LEED AP
Principal

February 5, 2012

State of Hawaii
Department of Education
Facilities Development Branch
P.O. Box 2360
Honolulu, Hawaii 96804

Group 70 International, Inc.
725 Bethel Street, 5th Floor
Honolulu, Hawaii 96813

Re: Draft Environmental Impact Statement ("DEIS") Kihei High School

Dear Rachel Shaak,

I am wrting on behalf of the Kihei High School Action Team (KHAT), a group of community volunteers who advocate for the development of a high school in Kihei. The KHAT appreciates the comprehensive efforts of the EIS and respectfully submits the following comments:

There is confirmation in the EIS the new high school meets the Community Island Plan's objective and implements the action.

We appreciate that the EIS has identified and confirmed in the Maui Island Plan the need and location of a new high school to offset the overcrowding at one central Maui high school. We would suggest the inclusion of supplemental information as to the number of temporary buildings in use at Maui High School and Baldwin High School. Supplemental data on the number of students who currently and may in the future apply for geographic exemptions to attend a Kihei High School could further substantiate and predict demand for phase 1 enrollment and phase 2 build out schedules.

Re: Census Numbers (3.0)
Census data from year 2000 was used in the EIS. We would recommend the usage of updated 2010 census numbers. The 2010 census recognizes further growth in the project area, to the degree that Kihei is now the largest community on island and the largest community in the state without a high school.

Re: Existing Schools and Capacity
The EIS states "…Maui High School in Kahului which serves eastern Maui communities including Kīhei, Mākena and Wailea". The geo-referencing of Kihei, Wailea, Makena as being *east* is outdated and would be more accurately referenced as "South Maui".

Re: Site location (2.0)

The full □□-acre site supports the objectives of the project and not a smaller acreage site plan. We appreciate the EIS findings are consistent with the previous site selection as the land has recently been purchased and ac□uired for development by the State of Hawaii.

Re: Site plan, design
We appreciate that the site plan is consistent with the objectives of the previously held design charrettes, and that the EIS will allow for customization as afforded by the design□build specs. We endorse the concepts presented re: sustainable design in accordance with the efforts of the D□E and eco-charrette to achieve a □EED certification of silver to possibly gold.

Re: Site plan, configuration
We support the efforts of the design charette that are reflected in the EIS, including the concept of a tiered campus, grass fields near the highway and parking lots further mauka and out of view. We noted that the accessibility to visitors was excellent and consolidated as not to distract from the learning areas.

Re: Pedestrian Access
We support a campus that is walk-able, bicycle-friendly and safe for our youth. The DEIS, as currently written, does not focus sufficiently on pedestrian and bicycle access to and from the proposed high school campus, particularly given the location of the campus: separated from existing residential neighborhoods by a high speed roadway.

Although not located on site, the nearby North□South collector road and its completion could be an integral part of pedestrian and bike path access to and from KHS.

Re: Irrigation water
Although we appreciate the feasibility of brackish wells, similar to other large scale developments in the area. We also note that there is a R-1 water line approximately 1 mile away.

Re: Neighboring developments
We would suggest the inclusion of Alexander □ Baldwin's proposed multi-family development in North Kihei and the inclusion of Wailea 6□0's affordable housing project just North of the High School. The Kihei High School Action Team would also suggest a reference to a comprehensive list of other entitled projects in South Maui, not currently mentioned in the draft EIS, indicative of thousands of more units that may be built in the area.

In closing, the Kihei High School Action Team would like to recognize the positive efforts of □roup □0 to provide a comprehensive EIS in a timely manner and we thank you for your continued communication with our group.

Sincerely,

Andrew Beerer

GROUP 70
INTERNATIONAL

September 5, 2012

Mr. Andrew Beerer, Kīhei High School Action Team
Kīhei Community Association
P.O. Box 662
Kīhei, HI 96753

Subject: Response to Comments on the Draft Environmental Impact Statement for the Proposed Kīhei High School

Aloha Mr. Beerer:

Thank you for your comment letter dated February 5, 2012 concerning the Draft Environmental Impact Statement (EIS) for the proposed Kīhei High School Project. We take note of your comments relating of the Draft EIS for the proposed project. The following are offered in response to your comments:

Response 1: Temporary Buildings
The planned Kīhei High School is anticipated to offset overcrowding experienced at Baldwin and Maui High Schools. According to DOE, there are currently 25 existing portables at Baldwin High School, and 34 existing portables and one in design at Maui High School. Although use of temporary buildings is an indicator of overcrowding conditions, not all portables are being used as classroom spaces. Although this information would be of interest, unfortunately the DOE does not have supplemental data on the number of students that may apply for geographic exemptions to attend Kīhei High School.

Response 2: Census Numbers
The population data in the Final EIS has been updated to include 2010 census information from the U.S. Census Bureau and the 2011 Maui County Data Book.

Response 3: Existing Schools and Capacity
The reference to eastern Maui was struck from the Final EIS and replaced with "South" Maui.

Response 4, 5 and 6: Site Location, Site Plan
Thank you for the feedback and concurrence concerning the site, charrette process, conceptual site plan, EIS findings, land acquisition, future Design Build process, and proposed sustainable design efforts.

Response 7: Pedestrian Access
Stantec Consulting Services, Inc. (Stantec) prepared a pedestrian and bicycle analysis for the project site. The report focuses on community connectivity, access to and at the high school site, and provision of appropriate safety measures for bicyclists and pedestrians. Stantec provides a list of recommendations to improve walking and bicycling infrastructure for the high school. The analysis is discussed in Chapter 4 and the entire report "Kīhei High School Project Pedestrian and Bicycle Analysis" is included in the Final EIS as Appendix N.

Response 8: Irrigation water
A *Non-potable Water System Alternatives Analysis* report was prepared by Gray, Hong, Nojima & Associates, Inc. to analyze potential non-potable water system improvements, non-potable water sources, and provide recommendations based on life cycle cost comparison, among other factors. Two alternatives for non-potable water were identified in the report, onsite brackish groundwater wells, and use of R-1 recycled water from the County of Maui's existing Kīhei Wastewater Reclamation Facility. Please refer to Appendix M of the Final EIS for details. This issue will require ongoing discussion between the DOE, the design-build entity and the County of Maui.

Response 9: Neighboring Developments
The suggested development projects have been included in the Final EIS in Section 4.2.1 Planned Projects within the Region.

A comprehensive list of other entitled projects has also been provided as Figures 4-4 and 4-5, South Maui Development Projects.

We appreciate your participation in the environmental review process and look forward to continued communication with KCA Kīhei High School Action Team. You will receive a copy of the Final EIS.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Christine Mendes Ruotola

Christine Mendes Ruotola, AICP, LEED AP
Principal

NPAC
Hawai'i Nutrition and Physical Activity Coalition

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DEPT EDUCATION
FACILITIES DEV BRANCH

Hawaii Nutrition and Physical Activity Coalition
Maui County Coalition
P.O. Box 769
Makawao, Hawaii 96768
(808) 264-7895
smcguinn@hawaii.edu

January 26, 2012

State of Hawaii, Department of Education
Facilities Development Branch
P.O. Box 2360
Honolulu, Hawaii 96804

Re: Kihei High School DEIS

Dear Gentlepersons,

The Maui County Coalition of the Hawaii Nutrition and Physical Activity Coalition (NPAC) hereby submits the following comments to the draft environmental impact statement (DEIS) for the proposed Kihei High School:

In general, the study should include more extensive analysis, discussion and planning for pedestrian and bike traffic and pathways to and from school. The subject facility will serve significant numbers of south Maui children of high school age, typically ranging from 14 to 18 years of age. While the DEIS contains a thorough traffic study, consideration of how high school students can safely and confidently walk and bike to school is largely absent. This is of particular concern since the high school is proposed to be located on the opposite side of a high speed highway, away from existing residential neighborhoods; to the extent residential neighborhoods exist on the same side of the Pi'ilani Highway as the school, no connection between these neighborhoods and the school is considered, discussed or proposed. In addition, it should be noted that peak traffic travel times on Pi'ilani Highway coincide with the times of day students will be going to or coming from school.

The United States has the highest rate of obesity in the developed world. This is caused, in part, by the lack of active daily transportation. "Another health impact of auto-dominated, low-density development is the increasing obesity rates in these areas, where the effective use of active modes of transportation is difficult or impossible." (Community Planning, An Introduction to the Comprehensive Plan, p. 21, 2d ed. [2010].) The U. S. Center for Disease Control states that two-thirds of adults and nearly one-fifth of American children are overweight, placing them at greater risk of a host of diseases and making our country less competitive in the global economy. To reverse this

epidemic, the CDC recommends we change our physical and food environments. Among 24 recommended strategies for obesity prevention and reduction are:

"17. Enhance infrastructure supporting bicycling
18. Enhance infrastructure supporting waking
19. Support locating schools within easy walking distance of residential areas"

With the above in mind, the following is recommended for consideration, discussion, elaboration and/or inclusion in the final EIS for this project:

- Discussion of the suitability of the subject site for a high school when all residential neighborhoods are located opposite the Pi'ilani Highway, with the exception of neighborhoods north of the project site for which there are no connections to the school mauka of the highway.

- Consideration of general pedestrian and bicycle safety given the need for students to cross a major high-speed roadway to get to school (a roadway that lacks sidewalks and formal bicycle lanes).

- Consideration of whether it is safe for 14 – 18 year old children to get to and from the proposed school by means of Pi'ilani Highway and, if not, describe what steps need to be taken to mitigate the risk (mixing large numbers of juvenile students with high speed traffic) posed.

- Consideration of mitigation strategies in light of the congruence of peak highway travel times and the hours most students will be going to or coming from school.

- Discussion of dedicated pedestrian walkways or bike lanes for access to and from the site.

- Discussion of the orientation of the school campus - locating school building away from Pi'ilani Highway, necessitating pedestrians and bicyclists to travel a greater distance to attend school.

- Discussion of connectivity of existing neighborhoods with the proposed school, both makai and mauka of the Pi'ilani Highway.

- Discussion of connection of the school to existing and developing (Lipoa) walking paths and bicycle paths in Kihei, with particular focus on Kulanihakoi Street and all other neighboring streets leading up to the intersection with Pi'ilani Highway.

- Consideration of the effect of additional traffic on all streets adjacent to Kulanihakoi Street makai of Pi'ilani Highway, including but not limited to South Kihei Road, coupled with discussion of mitigation strategies and pedestrian/bicycle friendly solutions.

- Consideration of the Open Space Master Plan for Kihei/South Maui and integration of planned trails, walkways and bicycle lanes to the school site.

- Consideration of overpasses, underpasses and/or walkways/bicycle lanes using existing gulches near the school site, with connection to existing and/or future walkways, bicycle lanes and hiking trails.

- Discussion of recently enacted Complete Streets legislation in Hawaii and its applicability to the site and surrounding streets and neighborhoods; the traffic and roadway plan presented in the DEIS are auto-centric.

- Comparison of the proposed traffic plan (and absence of a pedestrian/bicycling plan) with the Maui County 2030 General Plan, Countywide Policy Plan, adopted March 24, 2010. The discussion should address how the school site and traffic plan will meet (or fail to meet) the following policies, goals, objectives and strategies: (1) County's Vision statement ("The health of our people will be fostered . . . ."); (2) Core Principles ("10. Nurturance of the health and well-being of our families and communities."); (3) Section III, subsection B. entitled "Land Use Development Patterns" defining Smart Growth as that which is designed to scale and is comfortable to pedestrians and is not automobile centric; and defining "sprawl" as reliant on the automobile and cheap fossil fuel; (4) Section III under the heading key strategies, explain how the transportation and traffic plan proposed in the DEIS meets the stated transportation diversification criteria: "Diversification of the County's transportation network is essential to building capacity within the existing overtaxed transportation system. Maui County should work with the State and Federal governments to provide equal access and many options, including bikeways and pedestrian corridors to move safely around the islands."; and (5) Section IV, Goals, Objectives, Policies and Actions, specifically transportation Objective 2. "Reduce the reliance on the automobile and fossil fuels by encouraging walking, bicycling, and other energy-efficient and safe alternative modes of transportation."

- Consideration of student safety when crossing Pi'ilani Highway early in the morning before sun-up or later in the day after sun-down, particularly during sport seasons when students are likely to remain on campus after normal school hours when bus service is unavailable.

- Discussion of neighborhoods likely to receive bus service and those not likely to be served, with consideration of safe walking and bicycling for all.

- Discussion of traffic calming or other means of remediation to ensure safe walking and biking to school throughout the high school's service area.

- Identification and discussion of "best practices" in school access and promotion of active transportation.

- Discussion of strategies to encourage active means of transportation to and from school, such as incentives to walk, bike or carpool to school along with consideration of appropriate disincentives to discourage driving to school.

- Consideration of transit corridors to connect and serve the school and the greater south Maui community.

- Connection of the school to a "big picture" plan for the whole of south Maui, one that encourages walking, biking, and other forms of active transportation, and depicting the school as part of the whole.

- Discussion of wheel chair access to and from school, other than by car, van or bus.

- Revision of intersection plans at Pi'ilani Highway to accommodate best practices in pedestrian, bike and wheelchair access; site plans should clearly identify walkways, bike ways and other safety features consistent with Complete Streets policies, the law and common sense. Turning lanes at the intersection of Kulanihakoi Street and Pi'ilani should be given intense scrutiny given the expected presence of a significant number of student pedestrians and bicyclists during peak traffic hours.

- Consideration of alternatives to a signalized intersection at the intersection of the school with Pi'ilani Highway, including round-a-bouts, and consideration of U.S. Department of Transportation studies and practices associated with traffic calming and increased pedestrian and bicycle flow.

- Discussion of Safe Routes to School standards and strategies *vis-à-vis* the proposed site (while not specifically applicable, nevertheless instructive).

Thank you for this opportunity to comment on the DEIS.

Sincerely,

Mike Morris,
Chair, NPAC

GROUP 70
INTERNATIONAL

September 5, 2012

Hawai'i Nutrition and Physical Activity Coalition
Maui County Coalition
Mike Morris, Chair
P.O. Box 769
Makawao, HI 96768

Subject: Response to Comments on the Draft Environmental Impact Statement for the Proposed Kīhei High School

Aloha Mr. Morris:

Thank you for your comment letter dated January 26, 2012 concerning the Draft Environmental Impact Statement (EIS) for the proposed Kīhei High School Project. We take note of your comments relating to the Draft EIS for the proposed project. The following are offered in response to your comments:

Response 1: Site Suitability
We note your concern regarding the location of the proposed high school. A site selection study was conducted by the Department of Education (DOE) in 2008 for the selection of the Kīhei High School project site. Candidate sites were evaluated on multiple criteria and the final selected site was purchased by the State. Additional detail of the Site Selection Study and its findings is provided in the Final EIS Section 6.2: Alternative Sites.

Response 2 & 3: General Pedestrian and Bicycle Safety, Pi'ilani Highway Crossing
Stantec Consulting Services, Inc. (Stantec) has prepared a pedestrian and bicycle analysis for the project site. The report focuses on community connectivity, access to and at the high school site, and provision of appropriate safety measures for bicyclists and pedestrians. The study provides a list of recommendations to improve walking and bicycling infrastructure for the high school. The analysis is discussed in Section 4.2.5.2 Pedestrian and Bicycle Facilities of the Final EIS and the entire report "Kīhei High School Project Pedestrian and Bicycle Analysis" is included as Appendix N.

Response 4: Peak Hour Mitigation
Mitigation measures recommended in the Traffic Impact Report and Kīhei High School Project Pedestrian and Bicycle Analysis were made with awareness of the congruence between school commuting and peak hour travel times.

Response 5: Pedestrian Walkways or Bike Lanes
Discussion of walkways and bike lanes to and from the campus is provided in Section 4.2.5.2 Pedestrian and Bicycle Facilities and Appendix N of the Final EIS. The study also recommends supportive facilities on-campus.

Response 6: Campus Orientation
Please refer to Chapter 2.1.1 Site Plan of the Final EIS for discussion of the conceptual campus design. Many factors were considered, and a design charrette was held to reach consensus on the conceptual site plan. Athletic fields were located toward the highway to provide open space adjacent to the highway in order to mitigate highway noise to classrooms, locate the more public areas of the campus closer to the community, maximize views of Haleakalā, and, at the request of the community to show pride in their athletic facilities. The site plan is, however, conceptual. Final design is to be determined by the DOE and Design-Build entity (DBE).

Response 7: Connectivity to Existing Neighborhoods
Discussion of connectivity to existing neighborhoods is provided in Section 4.2.5.2 Pedestrian and Bicycle Facilities and Appendix N of the Final EIS.

Response 8: Connectivity to Pedestrian and Bicycle Paths
Discussion of connectivity to existing and developing bicycle and pedestrian paths is provided in Section 4.2.5.2 Pedestrian and Bicycle Facilities and Appendix N of the Final EIS. Improvements to Kulanihakoi Street and the intersection of it with Pi'ilani Highway are recommended.

Response 9: Mitigation Strategies
Discussion of mitigation strategies is provided in Section 4.2.5.2 Pedestrian and Bicycle Facilities and Appendix N of the Final EIS.

Response 10: Open Space Master Plan
The South Maui Region Parks & Open Space Master Plan is discussed in Chapter 4 Sections 4.3.5 Public Services, 4.2.5.2 Pedestrian and Bicycle Facilities, Chapter 5 and Appendix N of the Final EIS.

Response 11: Connectivity via Overpasses, Underpasses, and/or Gulches
Discussion of connecting to existing and/or future walkways and bicycle lanes via overpasses, underpasses, and/or gulches is provided in Section 4.2.5.2 Pedestrian and Bicycle Facilities and Appendix N of the Final EIS.

Response 12: Complete Streets
Hawai'i adopted a Complete Streets legislation in 2009 (Act 54, HRS §264-20.5). Act 54 required that the State Department of Transportation and Hawai'i's County governments to adopt a Complete Streets policy. In April 2012, the Council of the County of Maui passed Resolution No. 12-34 that urges County agencies to incorporate Complete Streets in budgeting, planning, and development services, and it urges the Mayor to establish a Complete Streets Task Force. The Resolution requests that the Task Force propose necessary budget amendments and policy ordinances within 18 months of the adoption of the resolution. At the time of this letter, the County of Maui Department of Public Works is involved in the 18-month-long process of drafting legislation to revise Title 18, Maui County Code, which will incorporate Complete Streets concepts. The proposed Kīhei High School project will voluntarily provide

complete street features on the campus driveway, including bicycle and pedestrian access. If the County of Maui Complete Streets Policy is adopted prior to project design, the project will be designed in accordance with adopted standards. The DOE and Design-Build entity will work with the County to address the issue.

Response 13: Consistency with Adopted Plans
Provision of a needed public high school for the community on lands designated by the County of Maui for development of a high school meet the objectives to nurture the well-being of families and the community, and meet the County's planned land use patterns. The project will encourage multi-modal transportation and improve facilities for pedestrians and bicycles which is an option not available today. Students currently traveling to Maui and Baldwin High schools will be able to attend school in Kīhei, thus reducing automobile dependency and travel times.

Response 14: Off-Hours Mitigation
Mitigation measures recommended in the Pedestrian and Bicycle Analysis are applicable 24-hours a day, including non-school hours.

Response 15: Bus Service
The DOE provides bus service to students who live farther than 1.5 miles from the school they are enrolled at. Therefore, students within 1.5 miles from the proposed Kīhei High School may be predisposed to walking or biking as their primary transportation to and from school. The Kīhei High School Project Pedestrian and Bicycle Analysis (Section 4.2.5.2 and Appendix N of the Final EIS) considers three miles a bike-able radius, and 0.5 miles a walkable radius, and considers safety measures within these radii.

Response 16: Traffic Calming
The Traffic Impact Report (Appendix G of the Final EIS) prepared for the project provides recommendations for mitigating potential traffic impacts. The Pedestrian and Bicycle Analysis (Section 4.2.5.2 and Appendix N of the Final EIS) provides additional recommendations for creating safe walking and bicycling conditions in the high school service area.

Responses 17 and 18: Best Practices and Promotion of Active Transportation
Roadway access to the high school site will be constructed according to County of Maui adopted building code requirements. Active transportation will be promoted through provision of pedestrian and bicycle facilities on the high school campus. Recommended on campus facilities are included in the Pedestrian and Bicycle Analysis. Promotion of active transportation to and from school would fall to the DOE and/or parent and student organizations in the high school community.

Response 19: Transit Corridors
Preliminary design for the high school has taken into consideration applicable transportation planning documents such as the State of Hawai'i Department of Transportation's, Bike Plan Hawai'i, and Long Range Division transportation plans for

the County of Maui. The Pedestrian and Bicycle Analysis recommends specific improvements to connect to regional transit facilities.

Response 20: Connection to the "Big Picture"
Connecting to the planned multi-modal transportation routes for South Maui is important for the high school. Technical studies conducted for the EIS provide a "big picture" overview of the South Maui transportation network. The Traffic Impact Report (Section 4.2.5 Traffic and Circulation and Appendix G of Final EIS) discusses how the project will relate to and impact the existing roadway network in the vicinity of the project site. The Kīhei High School Project Pedestrian and Bicycle Analysis (Section 4.2.5.2 and Appendix N of the Final EIS) discusses applicable transportation planning documents that relate to walking and biking, and how the project relates to existing and planned transportation routes in South Maui. Recommendations are made for improving connectivity to these transportation routes. Implementation is the purview of various County and State agencies depending on the location and scope of the recommended improvement. The DOE will implement improvements within its jurisdictional authority in association with development of the high school. The DOE will coordinate with other State and County agencies regarding improvements outside of DOE authority.

Response 21: Wheel Chair Access
DOE will provide wheelchair accessibility within school property in the form of access sidewalks. Facilities on campus will be designed in accordance with ADA standards to accommodate wheelchair access. Outside of the school property, Pi'ilani Highway is a primary access route to the high school campus. Pi'ilani is a State owned highway, and does not provide sidewalks for pedestrians and wheelchairs, thus limiting access for persons on wheelchairs. Nearly continuous sidewalks on Kūlanihāko'i Street would provide some campus access via wheelchair.

Response 22: Intersection at Pi'ilani Highway
We are in agreement that intersection improvements at Pi'ilani Highway should be carefully considered in light of the new pedestrian, bicycle and automobile traffic anticipated with the operation of the high school. The Traffic Impact Report (Appendix G of Final EIS) makes detailed recommendations for intersection improvements in Section V Recommendations. The Kīhei High School Project Pedestrian and Bicycle Analysis (Section 4.2.5.2 Pedestrian and Bicycle Facilities and Appendix N of the Final EIS) provides recommendations for this intersection in Section 4.0 Recommendations.

Response 23: Alternatives to a Signalized Intersection
Alternatives to a signalized intersection at Pi'ilani Highway are touched on in the Kīhei High School Project Pedestrian and Bicycle Analysis (Appendix N of the Final EIS) in Section 4.0 Recommendations. It is noted that provision of a roundabout at this location is the jurisdiction of State DOT. The State DOT has been consulted through the environmental planning process and DOE and the DBE will continue to consult with them during the design phase of the project for their input on appropriate intersection design.

Response 24: Safe Routes to School

The State DOT website (http://hawaii.gov/dot/highways/srts/) lists the goals of the Federal Safe Routes to School (SRTS) Program:

- enable and encourage children, including those with disabilities, to walk and bicycle to school;
- make bicycling and walking to school a safer and more appealing transportation alternative, thereby encouraging a healthy and active lifestyle from an early age; and
- facilitate the planning, development, and implementation of projects and activities that will improve safety and reduce traffic, fuel consumption, and air pollution in the vicinity of schools.

Providing safe routes to school is a community-wide planning issue. The DOE has planned the Kīhei High school project to conform with existing community plans, and DOE will implement recommended pedestrian and bicycle safety features on campus to provide a safe and appealing multi-modal school access. The Design-Build entity will be provided information on the Federal Safe Routes to School Program along with the Final EIS.

We appreciate your participation in the environmental review process. You will receive a copy of the Final EIS.

Sincerely,

GROUP 70 INTERNATIONAL, INC.

Christine Mendes Ruotola, AICP, LEED AP
Principal

Chapter 9
Preparers of the EIS

9.0 PREPARERS OF THE EIS

This ~~Draft~~ Final EIS was prepared for the applicant, the DOE Facilities Development Branch, by Group 70 International, Inc. The following list identifies the individuals and organizations involved in the preparation of this report and their respective contributions.

Group 70 International, Inc.	**Role**
Christine Mendes Ruotola, AICP, LEED AP	Principal-in-Charge
Rachel Shaak, AICP, LEED AP	Senior Planner
Tracy Furuya	Planner
Dricka Brown, LEED AP	Planner
Mary Tomonaga	GIS/Graphics Preparation
Kathryn Nam	Graphics Preparation
Joy Kepa	Graphics Preparation
Silas Haglund	Document Specialist
Annie Okazaki	Administrative Coordinator
Reyna Deponte	Administrative Coordinator

Other Consultants	**Technical Area**
Gray, Hong, Nojima and Associates, Inc.	Preliminary Civil Engineering Report
Wilson Okamoto and Associates	Traffic Impact Analysis Report
Ronald M. Fukumoto Engineering, Inc.	Topographic Survey, Subdivision
Ching, Yuen and Morikawa	Legal Counsel
Scientific Consulting Services	Archaeology Inventory Survey and Cultural Impact Assessment
B.D. Neal and Associates	Air Quality Assessment
Rana Productions, Ltd.	Biological Survey
Y. Ebisu and Associates, Inc.	Acoustic Study
Water Resource Associates	Hydrogeological Report and Consulting
Decision Analysts Hawai'i, Inc.	Agricultural and Economic Impact Analysis
Stantec Consulting Services, Inc.	Pedestrian and Bicycle Analysis

Technical Appendices

Appendix A

Preliminary Geotechnical Investigation
Kīhei High School
Kīhei, Maui, Hawai'i

Hirata & Associates, Inc. – October 2009

PRELIMINARY GEOTECHNICAL INVESTIGATION
KIHEI HIGH SCHOOL
KIHEI, MAUI, HAWAII

for

GROUP 70 INTERNATIONAL, INC.

HIRATA & ASSOCIATES, INC.
W.O. 09-4797
October 16, 2009

October 16, 2009
W.O. 09-4797

Hirata & Associates
Geotechnical Engineering
Hirata & Associates, Inc.
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Mr. Rodney Lee
Group 70 International, Inc.
925 Bethel Street, 5th Floor
Honolulu, Hawaii 96813

Dear Mr. Lee:

Our report, "Preliminary Geotechnical Investigation, Kihei High School, Kihei, Maui, Hawaii," dated October 16, 2009, our Work Order 09-4797 is enclosed. This investigation was conducted in general conformance with the scope of services presented in our proposal dated May 8, 2008.

This preliminary geotechnical investigation report was prepared in support of the preparation of Design-Build RFP documents for the proposed Kihei High School Campus in Kihei, Maui, Hawaii. A more detailed investigation of the site, including additional exploratory test borings, laboratory testing, and analyses, should be performed by the Design-Build team's Geotechnical Engineer for design.

Slightly to highly weathered basalt was encountered in all of our borings at relatively shallow depths. Based on the Initial Concept Plan and the preliminary topographic survey, it appears that grading will primarily consist of cuts, with isolated shallow fill sections. Maximum cut depths on the order of 15 to 20 feet are expected in the northern portion of the site. As a result, we expect that building excavations will generally expose medium hard to hard weathered basalt. Conventional shallow foundations bearing directly on the weathered basalt may be used for support of the proposed structures. For buildings located in fill areas, footings should extend through the fill material and bear on the underlying weathered basalt.

The following is a summary of our geotechnical recommendations. This summary is not intended to be a substitute for our report which includes more detailed explanations of our recommendations, as well as additional requirements.

- Allowable bearing value = 6,000 psf
- Coefficient of friction = 0.5
- Passive earth pressure = 500 pcf

We appreciate this opportunity to be of service. Should you have any questions concerning this report, please feel free to call on us.

Very truly yours,
HIRATA & ASSOCIATES, INC.

Paul S. Morimoto President

PSM:RIKY:ph

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Hirata & Associates, Inc. W.O. 09-4797

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PRELIMINARY GEOTECHNICAL INVESTIGATION
KIHEI HIGH SCHOOL
KIHEI, MAUI, HAWAII

INTRODUCTION

This report presents the results of our preliminary geotechnical investigation performed for the proposed Kihei High School in Kihei, Maui, Hawaii. We understand that the project will be developed using the Design-Build procurement process, and this report was prepared in support of the Design-Build RFP documents being prepared by your office.

Our scope of services for this study included the following:

- A visual reconnaissance of the site to observe existing conditions which may affect the project. The general location of the project site is shown on the enclosed Location Map, Plate A2.1.
- A review of available in-house soils information pertinent to the site and the proposed project.
- Drilling and sampling 19 exploratory borings to depths ranging from about 15 to 50 feet. A description of our field investigation is summarized on Plates A1.1 and A1.2. The approximate exploratory boring locations are shown on the enclosed Boring Location Plan, Plate A2.2, and the soils encountered in the borings are described on the Boring Logs, Plates A4.1 through A4.24.
- Performing percolation tests in three of the borings at depths of about 20 feet. Test results are presented on Department of Health Site Evaluation/ Percolation Test forms, Plates A5.1 through A5.3.
- Laboratory testing of selected soil samples. Testing procedures are presented in the Description of Laboratory Testing, Plates B1.1 and B1.2. Test results are presented on the Boring Logs (Plates A4.1 through A4.24), Consolidation Test report (Plate B2.1), Direct Shear Test reports (Plates B3.1 and B3.2), Modified Proctor Test reports (Plates B4.1 through B4.4), and Gradation Test report (Plate B5.1).

- Engineering analyses of the field and laboratory data.
- Preparation of this report presenting preliminary geotechnical recommendations for the design of foundations, seismic considerations, resistance to lateral pressures, slabs-on-grade, flexible pavement, and site grading.

PROJECT CONSIDERATIONS

The proposed high school campus will encompass approximately 50 acres of land. The project will include about 200,000 square feet of enclosed educational space. In addition, the Initial Conceptual Site Plan shows a football field with track and field facilities, baseball and softball fields, a soccer field, and a practice field. We assume that the football, baseball, and softball fields will be lighted. The school grounds will also include paved parking and driveway areas.

SITE CONDITIONS

The project site is located on existing ranch land on the east side of Piilani Highway, east of its intersection with Kulanihakoi Street in Kihei, Maui. The northern portion of the site is owned by Kaonoulu Ranch, while the southern portion of the site is owned by Haleakala Ranch Company. The site is bordered on the north by Kulanihakoi Gulch and on the south by Waipuilani Gulch. Land from both ranches border the site on the east. A wire fence extending in an approximate east-west alignment, about midway through the project site, separates the two ranches.

The subject property is vacant of structures and is covered with moderate vegetation. Occasional basalt outcrops were observed at ground surface throughout the site. The site generally slopes downward toward the west and southwest, with ground elevations ranging from about +110 in the northeast to about +40 in the southwest.

SOIL CONDITIONS

Cobbles, boulders, and basalt outcrops were observed at ground surface throughout much of the site. Weathered basalt was encountered in all of the borings at depths

of about 0.5 to 6.5 feet below existing grade, extending to the maximum depths drilled. With the exception of boring B19, the basalt was covered by reddish brown sandy silt in a medium stiff condition. Boring B19 encountered surface soil consisting of grayish brown silty sand in a medium dense condition to a depth of about 4.5 feet. Underlying the silty sand was reddish brown clayey silt to a depth of about 6.5 feet. Occasional boulders were encountered within the surface sandy silt stratum.

Underlying the surface soils was weathered basalt ranging from a highly to slightly weathered condition, with occasional moderately weathered sections. In general, the highly weathered basalt ranged from a dense to medium hard condition with sampling resulting in over 50 blows for 6 inches of penetration during sampling, or refusal. The moderately and slightly weathered basalt ranged from a medium hard to hard condition, with NX coring typically resulting in high core recovery and RQD percentages. Lower core recovery and RQD percentages were generally recorded while drilling in highly fractured sections of the basalt.

Neither groundwater nor seepage water was encountered in our borings.

CONCLUSIONS AND RECOMMENDATIONS

Based on our exploratory fieldwork and laboratory testing, we believe that from a geotechnical viewpoint, the site can generally be developed as planned. Conventional shallow foundations may be used to support the proposed structures.

The Initial Concept Plan, prepared by Group 70 International, Inc., and the preliminary topographic survey indicate that site grading for the project will primarily consist of cuts, with isolated shallow fill sections. Maximum cut depths on the order of 15 to 20 feet are expected in the northern portion of the site. As a result, we expect that building excavations will generally expose medium hard to hard, moderately and slightly weathered basalt. Therefore, conventional shallow foundations bearing directly on the weathered basalt may be used for support of the proposed structures. For buildings located in fill areas, footings should extend through the new fill material and be founded directly on the underlying weathered basalt.

Building Foundations

Conventional shallow foundations founded directly on the medium hard to hard weathered basalt may be used for support of the proposed buildings. Foundations founded on the medium hard to hard weathered basalt may be designed for an allowable bearing value of 6,000 pounds per square foot. The allowable bearing value is for the total of dead and frequently applied live loads, and may be increased by one-third for short duration loading which includes the effect of wind and seismic forces.

The bottom of all footing excavations should be cleaned of loose or deleterious material prior to placement of reinforcing steel and concrete. Footings located on, or near the top of slopes, should be embedded such that a minimum horizontal distance of 5 feet is maintained between the bottom edge of footing and slope face.

Lightpole Foundations

Drilled pier foundations embedded into the medium hard to hard weathered basalt may be used for support of light poles. The drilled piers may be designed using an allowable end bearing value of 6,000 pounds per square foot. Additional vertical load bearing capacity and uplift capacity may be determined using an adhesion value of 2,000 pounds per square foot between the basalt and drilled pier. The minimum diameter of the drilled piers is usually governed by the size of the base plate of the light pole. The final diameter and length of the drilled pier foundations should be determined by the Structural Engineer.

Based on our past experience, we believe that temporary casing will not be required for drilled pier excavations extending into the weathered basalt. If casing is required during construction, temporary, non-corrugated steel casing should be used. The use of permanent casing should not be allowed.

Seismic Design

Based on the borings drilled as part of this study and our knowledge of the deep soil conditions in the area, the subsurface soils can be characterized as a rock soil profile. Therefore, based on the 2003 International Building Code, Site Class B is recommended for this site.

Lateral Design

Resistance to lateral loading may be provided by friction acting at the base of foundations and by passive earth pressure acting on the buried portions of foundations.

A coefficient of friction of 0.5 may be used with the dead load forces. Passive earth pressure may be computed as equivalent fluids having densities of 300 and 500 pounds per cubic foot, with maximum earth pressures of 3,000 and 5,000 pounds per

square foot, for new granular fill and basalt, respectively. Unless covered by pavement or concrete slabs, the upper 12 inches of soil should not be considered in computing lateral resistance.

Retaining Walls

Retaining wall foundations may be designed using recommendations in the *Foundations, Seismic Design,* and *Lateral Design* sections of this report. For active earth pressure considerations, the following equivalent fluid pressures may be used:

Soil Type	Level Backfill Condition	Sloping Backfill Condition	Restrained/ At-rest Condition
Highly weathered basalt	25 pcf	30 pcf	35 pcf
Granular structural fill	35 pcf	45 pcf	50 pcf

To prevent the buildup of hydrostatic pressures, retaining structures should be well-drained. The standard of practice consists of placing a minimum 12-inch thick layer of free-draining gravel at the back of the wall. The gravel should extend from the base of the wall, around subdrains and/or weepholes, and up to within 12 inches of finish grade. Alternatively, prefabricated drainage geocomposites, such as Miradrain or J-drain, may be used in lieu of the free-draining gravel. As with the free-draining gravel, the drainage geocomposites should be placed at the back of the wall, be connected with the weepholes and/or subdrains (in accordance with manufacturer's specifications), and extend to within 12 inches of finish grade.

For freestanding walls, the drainage system should be covered by at least 12 inches of low permeability soil, such as the onsite sandy silt. If the backfill is covered by interior or exterior concrete slabs, the gravel fill should extend to the bottom of slab cushion elevation.

Foundation Settlement

Structural loads were not available at the time of this report. However, neither excessive total nor differential settlement is anticipated for foundations bearing on the medium hard to hard weathered basalt.

Slabs-on-Grade

To provide uniform support, all building slabs-on-grade should be underlain by a 4-inch cushion of clean gravel, such as #3 Fine (ASTM C33 Size No. 67), and protected by a vapor barrier placed over the cushion material.

Slabs-on-grade which will receive floor covering, especially "hard" floor covering such as slate or marble, should include control joints saw-cut into the concrete slab. The purpose of this is to help reduce the potential for reflective cracking of the floor covering due to shrinkage cracks in the concrete slab. Proper curing of the concrete slabs will help reduce shrinkage cracking.

Exterior slabs-on-grade and concrete walkways should be underlain by at least 4 inches of aggregate base course in lieu of the gravel cushion.

Pavement Design

Pavement subgrade throughout most of the project site is expected to generally expose the weathered basalt. Flexible pavement for driveways and parking areas may be designed based on the following section:

2.0"	Asphaltic Concrete
6.0"	Base Course (minimum CBR = 85)
8.0"	Total Thickness

Site Grading

Site Preparation - The project site should be cleared of all vegetation and other deleterious material. We expect that most of the relatively thin surface layer of

clayey silt will be removed during clearing and grubbing operations, as well as during mass grading.

Onsite Fill Materials - The onsite sandy silt will not be acceptable for reuse in structural fills, however, the soil may be reused in general or yard fill areas. Excavated basalt may be reused in structural fills and backfills provided the material is crushed to a well-graded consistency, with a maximum particle size of 3 inches.

Imported Fill Materials - Imported structural fill should be well-graded, non-expansive granular material. Specifications for imported granular structural fill should indicate a maximum particle size of 3 inches, and state that between 8 and 20 percent of soil by weight shall pass the #200 sieve. In addition, the plasticity index (P.I.) of that portion of the soil passing the #40 sieve shall not be greater than 10. Granular structural fill should also have a minimum CBR value of 15 and a CBR expansion value less than 1.0 percent when tested in accordance with ASTM D 1883.

Compaction - Granular structural fill and backfill should be placed in horizontal lifts restricted to eight inches in loose thickness and compacted to a minimum 95 percent compaction as determined by ASTM D 1557.

Fill placed in areas which slope steeper than 5H:1V should be continually benched as the fill is brought up in lifts. Fill placed on slopes should be keyed and benched into the existing slope to provide stability for the new fill against sliding. Filling the slope with sliver fills should be avoided.

Structural Excavations - Based on our exploratory borings, we believe that excavations into the weathered basalt layer will require pneumatic equipment. Temporary cuts into the weathered basalt should stand a near vertical gradient. However, it should be the Contractor's responsibility to conform to all OSHA safety standards for excavations.

Slope Gradients - Cut slopes into the weathered basalt may be designed for gradients of 1H:1V or flatter. Fill slopes may be designed for gradients of 2H:1V or flatter. Fill slopes should be planted as soon as practical upon completion of grading to reduce the effects of erosion and weathering.

LIMITATIONS

The boring logs indicate the approximate subsurface soil conditions encountered only at those times and locations where our borings were made, and may not represent conditions at other times and locations.

This preliminary geotechnical investigation report was prepared specifically for Group 70 International, Inc. and their sub-consultants in support of the preparation of Design-Build RFP documents for the proposed Kihei High School Campus in Kihei, Maui, Hawaii. The boring logs, laboratory test results, and preliminary recommendations presented in this report are for planning and preliminary design purposes only, and are not intended for use in the final design or for developing cost estimates by the contractor.

A more detailed investigation of the site, including additional exploratory test borings, laboratory testing, and analyses, should be performed by the Design-Build team's Geotechnical Engineer.

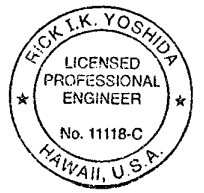
Our preliminary recommendations and conclusions are based upon the site materials observed, the preliminary design information made available, the data obtained from our site exploration, our engineering analyses, and our experience and engineering judgement. The conclusions and preliminary recommendations are professional opinions which we have strived to develop in a manner consistent with that level of care, skill, and competence ordinarily exercised by members of the profession in good standing, currently practicing under similar conditions. We will be responsible

for those preliminary recommendations and conclusions, but will not be responsible for the interpretation by others of the information developed. No warranty is made regarding the services performed under this agreement, either express or implied.

Respectfully submitted,

HIRATA & ASSOCIATES, INC.

Rick Yoshida, P.E.



This work was prepared by me or under my supervision
Expiration Date of License:
April 30, 2010

APPENDIX A

FIELD INVESTIGATION

DESCRIPTION OF FIELD INVESTIGATION

GENERAL

The site was explored from July 15 to August 6, 2009, by performing a visual site reconnaissance and drilling 19 exploratory test borings to depths ranging from between 15 and 50 feet with a truck-mounted Mobile B-53 truck mounted drill rig. In addition, three percolation tests were performed in borings B19 (P1), B16 (P3), and B18 (P2). P1 was tested at a depth of 20 feet prior to advancing boring B19 to the maximum depth drilled of 50 feet.

During drilling operations, the soils were continuously logged by our field engineer and classified by visual examination in accordance with the Unified Soil Classification System. The boring logs indicate the depths at which the soils or their characteristics change, although the change could actually be gradual. If the change occurred between sample locations, the depth was interpreted based on field observations. Classifications and sampling intervals are shown on the boring logs. A Boring Log Legend is presented on Plate A3.1. The Unified Soil Classification and Rock Weathering Classification Systems are shown on Plates A3.2 and A3.3, respectively. The soils encountered are logged on Plates A4.1 through A4.24.

Boring locations were located in the field by measuring/taping offsets from existing site features shown on the site plan. Ground surface elevations at boring locations were estimated using the Topographic Plan provided by Group 70 International, Inc. The accuracy of the boring locations shown on Plate A2.2 and the surface elevations shown on the boring logs are therefore approximate, in accordance with the field methods used.

SOIL SAMPLING

Representative and bulk soil samples, as well as core samples of rock, were recovered from the borings for selected laboratory testing and analyses.

Representative samples were recovered by driving a 3-inch O.D. split tube sampler a total of 18 inches with a 140-pound hammer dropped from a height of 30 inches. The number of blows required to drive the sampler the final 12 inches are recorded at the appropriate depths on the boring logs.

Core samples were obtained by drilling with an NX core barrel having an inside diameter of 2.1 inches. Recovery percentages for each core run are shown on the enclosed Boring Log. The rock quality designation (RQD) for the core run is also shown on the Boring Log. This is a modified core recovery percentage which takes into account the number of fractures observed in the core samples. Only pieces of core 4 inches in length or longer, as measured along the centerline, were included in the determination of this modified core recovery percentage. Fractures caused by drilling or handling were ignored.

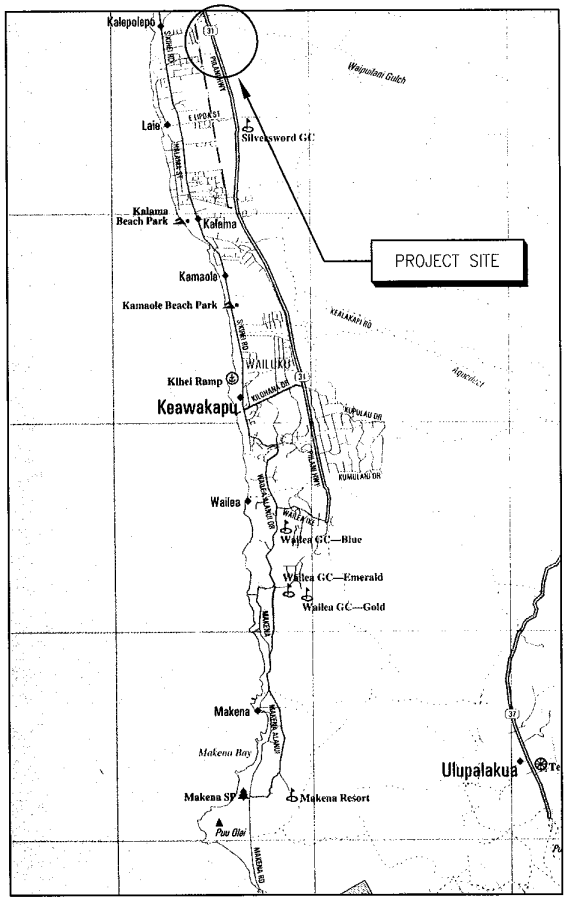
The following is a general correlation between RQD percentages and rock quality.

RQD (%)	Description of Rock Quality
0 - 25	Very Poor
25 - 50	Poor
50 - 75	Fair
75 - 90	Good
90 - 100	Excellent

Reference: Tunnel Engineering Handbook, Second Edition, edited by J.O. Bickel, T.R. Kuesel, and E.H. King, 1996.

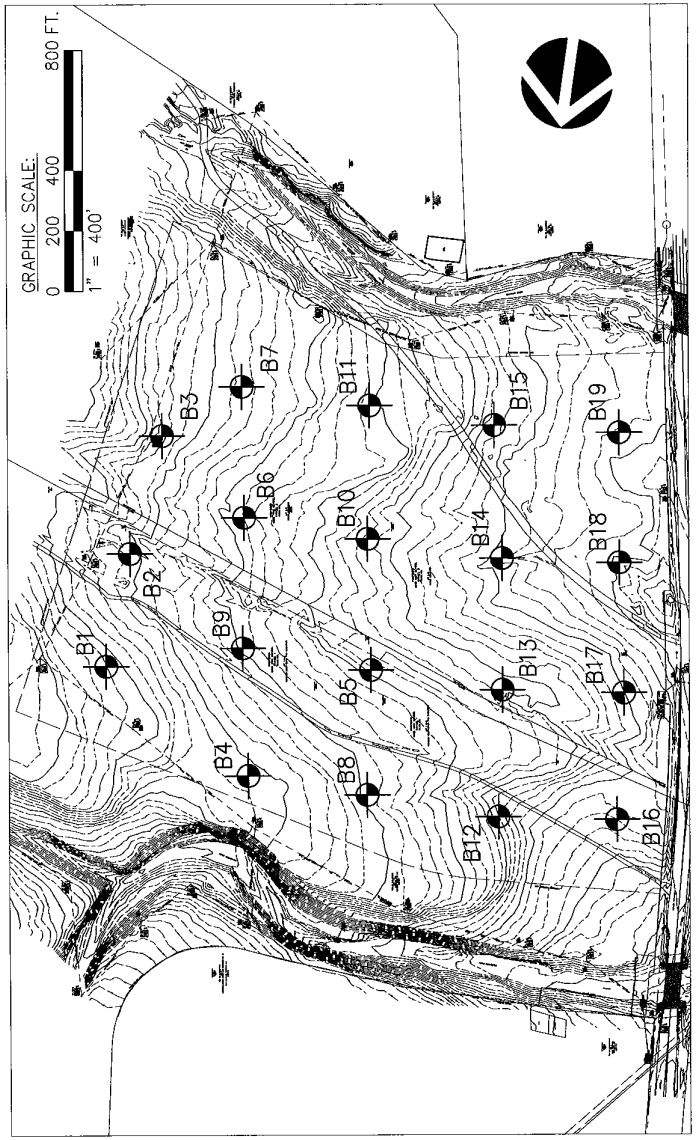
PERCOLATION TESTING

Percolation tests were performed in general accordance with State Department of Health guidelines. The approximate test hole locations are shown on Plate A2.2, and the test results are shown on Plates A5.1 through A5.3.



Reference: Hawaii Atlas & Gazetteer, Topo Maps of the Entire State by DeLorme (1999)

W.O. 09-4797	Kihei High School
Hirata & Associates, Inc.	LOCATION MAP Plate A2.1



BORING LOCATION PLAN

Plate A2.2

Kihei High School

W.O. 09-4797

Hirata & Associates, Inc.

LEGEND:

Approximate location of borings

Reference: Topographic Map provided by Group 70 International, Inc.

MAJOR DIVISIONS			GROUP SYMBOLS		TYPICAL NAMES
COARSE GRAINED SOILS (More than 50% of the material is LARGER than No. 200 sieve size.)	GRAVELS (More than 50% of coarse fraction is LARGER than the No. 4 sieve size.)	CLEAN GRAVELS (Little or no fines.)		GW	Well graded gravels, gravel-sand mixtures, little or no fines.
				GP	Poorly graded gravels or gravel-sand mixtures, little or no fines.
		GRAVELS WITH FINES (Appreciable amt. of fines.)		GM	Silty gravels, gravel-sand-silt mixtures.
				GC	Clayey gravels, gravel-sand-clay mixtures.
	SANDS (More than 50% of coarse fraction is SMALLER than the No. 4 sieve size.)	CLEAN SANDS (Little or no fines.)		SW	Well graded sands, gravelly sands, little or no fines.
				SP	Poorly graded sands or gravelly sands, little or no fines.
		SANDS WITH FINES (Appreciable amt. of fines.)		SM	Silty sands, sand-silt mixtures.
				SC	Clayey sands, sand-clay mixtures.
FINE GRAINED SOILS (More than 50% of the material is SMALLER than No. 200 sieve size.)	SILTS AND CLAYS (Liquid limit LESS than 50.)			ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity.
				CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays.
				OL	Organic silts and organic silty clays of low plasticity.
	SILTS AND CLAYS (Liquid limit GREATER than 50.)			MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts.
				CH	Inorganic clays of high plasticity, fat clays.
				OH	Organic clays of medium to high plasticity, organic silts.
HIGHLY ORGANIC SOILS				PT	Peat and other highly organic soils.
					FRESH TO MODERATELY WEATHERED BASALT
					VOLCANIC TUFF / HIGHLY TO COMPLETELY WEATHERED BASALT
					CORAL

SAMPLE DEFINITION		
2" O.D. Standard Split Spoon Sampler	Shelby Tube	RQD Rock Quality Designation
3" O.D. Split Tube Sampler	NX / 4" Coring	Water Level

W.O. 09-4784

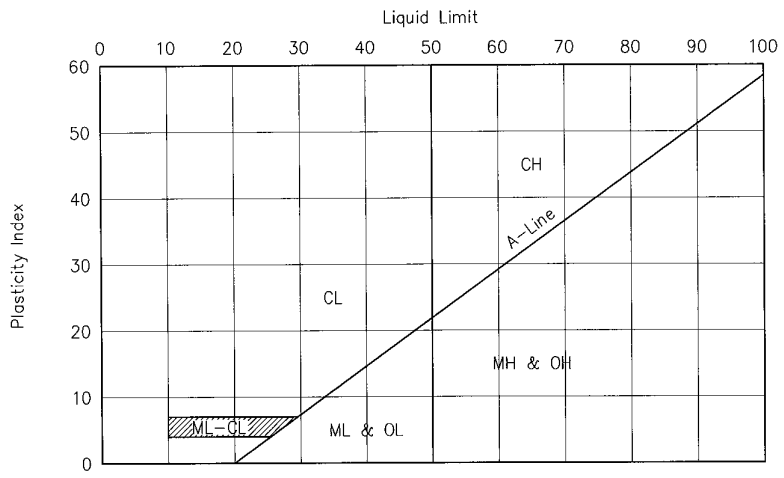
Kihei High School

Hirata & Associates, Inc.

BORING LOG LEGEND

Plate A3.1

PLASTICITY CHART



GRADATION CHART

COMPONENT DEFINITIONS BY GRADATION	
COMPONENT	SIZE RANGE
Boulders	Above 12 in.
Cobbles	3 in. to 12 in.
Gravel Coarse gravel Fine gravel	3 in. to No. 4 (4.76 mm) 3 in. to 3/4 in. 3/4 in. to No. 4 (4.76 mm)
Sand Coarse sand Medium sand Fine sand	No. 4 (4.76 mm) to No. 200 (0.074 mm) No. 4 (4.76 mm) to No. 10 (2.0 mm) No. 10 (2.0 mm) to No. 40 (0.42 mm) No. 40 (0.42 mm) to No. 200 (0.074 mm)
Silt and clay	Smaller than No. 200 (0.074 mm)

W.O. 09-4797	Kihei High School
Hirata & Associates, Inc.	UNIFIED SOIL CLASSIFICATION SYSTEM Plate A3.2

Grade	Symbol	Description
Fresh	F	No visible signs of decomposition or discoloration. Rings under hammer impact.
Slightly Weathered	WS	Slight discoloration inwards from open fractures, otherwise similar to F.
Moderately Weathered	WM	Discoloration throughout. Weaker minerals such as feldspar decomposed. Strength somewhat less than fresh rock but cores cannot be broken by hand or scraped by knife. Texture preserved.
Highly Weathered	WH	Most minerals somewhat decomposed. Specimens can be broken by hand with effort or shaved with knife. Core stones present in rock mass. Texture becoming indistinct but fabric preserved.
Completely Weathered	WC	Minerals decomposed to soil but fabric and structure preserved (Saprolite). Specimens easily crumbled or penetrated.
Residual Soil	RS	Advanced state of decomposition resulting in plastic soils. Rock fabric and structure completely destroyed. Large volume change.

Reference: Soils Mechanics, NAVFAC DM-7.1, Department of the Navy, Naval Facilities Engineering Command, September, 1986.

W.O. 09-4797	Kihei High School
Hirata & Associates, Inc.	ROCK WEATHERING CLASSIFICATION SYSTEM Plate A3.3

HIRATA & ASSOCIATES, INC.

BORING LOG

W.O. 09-4797

BORING NO. B1 DRIVING WT. 140 lb. START DATE 08/04/09
SURFACE ELEV. 102±* DROP 30 in. END DATE 08/04/09

DEPTH	GRAPH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
0			10/No Penetration			Sandy SILT (ML) – Reddish brown, moist, medium stiff, with cobbles and boulders.
			10/No Penetration			HIGHLY WEATHERED BASALT (WH) – Light brown, dense to medium hard.
5						SLIGHTLY WEATHERED BASALT (WS) – Gray, fractured, hard. Begin NX coring at 5 feet. 93% Recovery from 5 to 10 feet. RQD = 50%
10						100% Recovery from 10 to 15 feet. RQD = 51% Slightly vesicular from 10 feet.
15						88% Recovery from 15 to 20 feet. RQD = 38% Clinker from 17 to 18 feet.
20						End boring at 20 feet. Neither groundwater nor seepage water encountered. * Elevations based on Topographic Survey provided by Group 70 International, Inc.
25						
30						

Plate B4.1

HIRATA & ASSOCIATES, INC.

BORING LOG

W.O. 09-4797

BORING NO. B2 DRIVING WT. 140 lb. START DATE 08/03/09
SURFACE ELEV. 91± DROP 30 in. END DATE 08/03/09

DEPTH	GRAPH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
0			10/No Penetration			Sandy SILT (ML) – Reddish brown, moist, medium stiff, with cobbles and boulders.
5						SLIGHTLY WEATHERED BASALT (WS) – Gray, slightly vesicular, fractured, hard. Begin NX coring at 2.5 feet. 87% Recovery from 2.5 to 7.5 feet. RQD = 83% 96% Recovery from 7.5 to 12.5 feet. RQD = 91% 97% Recovery from 12.5 to 17.5 feet. RQD = 44%
10						
15						HIGHLY WEATHERED BASALT (WH) – Grayish to reddish brown, vesicular, fractured, medium hard. 0% Recovery from 17.5 to 20 feet. RQD = 0%
20						End boring at 20 feet. Neither groundwater nor seepage water encountered.
25						
30						

Plate B4.2

HIRATA & ASSOCIATES, INC.

BORING LOG

W.O. 09-4797

BORING NO. B3 DRIVING WT. 140 lb. START DATE 07/22/09
SURFACE ELEV. 95± DROP 30 in. END DATE 07/22/09

DEPTH	GRAPH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
0			100/8"	67	14	Sandy SILT (ML) – Reddish brown, moist, stiff, with cobbles and boulders.
			10/No Penetration			SLIGHTLY WEATHERED BASALT (WS) – Gray, hard. Begin NX coring at 3 feet. 100% Recovery from 3 to 8 feet RQD = 100%
5						
						100% Recovery from 8 to 13 feet RQD = 100%
10						
						100% Recovery from 13 to 18 feet RQD = 98%
15						
						End boring at 18 feet.
20						Neither groundwater nor seepage water encountered.
25						
30						

Plate B4.3

HIRATA & ASSOCIATES, INC.

BORING LOG

W.O. 09-4797

BORING NO. B4 DRIVING WT. 140 lb. START DATE 08/05/09
SURFACE ELEV. 91± DROP 30 in. END DATE 08/05/09

DEPTH	GRAPH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
0			10/No Penetration			Sandy SILT (ML) – Reddish brown, moist, stiff, with cobbles and boulders.
						SLIGHTLY WEATHERED BASALT (WS) – Gray, slightly vesicular, slightly fractured, hard. Begin NX coring at 3 feet. 100% Recovery from 3 to 8 feet RQD = 100%
5						
						100% Recovery from 8 to 13 feet RQD = 88%
10						
						100% Recovery from 13 to 15 feet RQD = 100%
15						
						End boring at 15 feet.
20						Neither groundwater nor seepage water encountered.
25						
30						

Plate B4.4

HIRATA & ASSOCIATES, INC.

BORING LOG

W.O. 09-4797

BORING NO. B5 DRIVING WT. 140 lb. START DATE 08/04/09
SURFACE ELEV. 68± DROP 30 in. END DATE 08/04/09

DEPTH	GRAPH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
0						Sandy SILT (ML) – Reddish brown, moist, stiff, with cobbles.
			64/6"		12	HIGHLY WEATHERED BASALT (WH) – Brown, dense to medium hard.
5						SLIGHTLY WEATHERED BASALT (WS) – Gray, slightly vesicular, fractured, hard. Begin NX coring at 3 feet. 95% Recovery from 3 to 8 feet RQD = 45% 100% Recovery from 8 to 13 feet RQD = 70%
10						
15						100% Recovery from 13 to 18 feet RQD = 70%
						HIGHLY WEATHERED BASALT (WH) – Brown, dense to medium hard. 58% Recovery from 18 to 20 feet RQD = 50%
20						End boring at 20 feet.
25						Neither groundwater nor seepage water encountered.
30						

Plate B4.5

HIRATA & ASSOCIATES, INC.

BORING LOG

W.O. 09-4797

BORING NO. B6 DRIVING WT. 140 lb. START DATE 07/22/09
SURFACE ELEV. 78± DROP 30 in. END DATE 07/22/09

DEPTH	GRAPH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
0						Sandy SILT (ML) – Reddish brown, moist, medium stiff, with cobbles and boulders.
			57/6"	70	11	HIGHLY WEATHERED BASALT (WH) – Brown, dense to medium hard.
			50/3"	No Recovery		
5						SLIGHTLY WEATHERED BASALT (WS) – Gray, slightly vesicular, slightly fractured, hard. Begin NX coring at 5 feet. 100% Recovery from 5 to 10 feet RQD = 95%
10						27% Recovery from 10 to 15 feet RQD = 27%
						HIGHLY WEATHERED BASALT (WH) – Reddish brown, moist, dense.
15			78		48	
20			86			
						End boring at 21 feet.
25						Neither groundwater nor seepage water encountered.
30						

Plate B4.6

HIRATA & ASSOCIATES, INC.

BORING LOG

W.O. 09-4797

BORING NO. B7 DRIVING WT. 140 lb. START DATE 07/22/09
SURFACE ELEV. 87± DROP 30 in. END DATE 07/22/09

DEPTH	GRAPH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
0						Sandy SILT (ML) – Reddish brown, moist, medium stiff, with cobbles and boulders.
			81/10"	67	11	HIGHLY WEATHERED BASALT (WH) – Light brown, dense to medium hard.
5						SLIGHTLY WEATHERED BASALT (WS) – Gray, slightly fractured, hard. Begin NIX coring at 5 feet. 100% Recovery from 5 to 10 feet RD = 100%
10						100% Recovery from 10 to 15 feet RD = 98%
15						100% Recovery from 15 to 20 feet RD = 100%
20						End boring at 20 feet.
25						Neither groundwater nor seepage water encountered.
30						

Plate B4.7

HIRATA & ASSOCIATES, INC.

BORING LOG

W.O. 09-4797

BORING NO. B8 DRIVING WT. 140 lb. START DATE 08/05/09
SURFACE ELEV. 79± DROP 30 in. END DATE 08/05/09

DEPTH	GRAPH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
0						Sandy SILT (ML) – Reddish brown, moist, medium stiff, with cobbles and boulders.
			50/6"	67	13	HIGHLY WEATHERED BASALT (WH) – Light brown, dense to medium hard.
5						SLIGHTLY WEATHERED BASALT (WS) – Gray, slightly fractured, hard. Begin NX coring at 4 feet. 98% Recovery from 4 to 8 feet RQD = 98% 100% Recovery from 8 to 13 feet RQD = 70%
10						
15						100% Recovery from 13 to 15 feet RQD = 100% End boring at 15 feet.
20						Neither groundwater nor seepage water encountered.
25						
30						

Plate B4.8

HIRATA & ASSOCIATES, INC.

BORING LOG

W.O. 09-4797

BORING NO. B9 DRIVING WT. 140 lb. START DATE 08/04/09
SURFACE ELEV. 80± DROP 30 in. END DATE 08/04/09

DEPTH	GRAPH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
0						Sandy SILT (ML) – Reddish brown, moist, medium stiff, with cobbles and boulders.
			50/3"		12	HIGHLY WEATHERED BASALT (WH) – Light brown, fractured, dense to medium hard.
5						Begin NX coring at 4 feet. 81% Recovery from 4 to 8 feet. RQD = 56%
						SLIGHTLY WEATHERED BASALT (WS) – Gray, fractured, hard. 88% Recovery from 8 to 13 feet RQD = 80%
10						
						MODERATELY WEATHERED BASALT (WM) – Grayish brown, vesicular, highly fractured, medium hard. 53% Recovery from 13 to 18 feet RQD = 0%
15						
						75% Recovery from 18 to 20 feet. RQD = 0%
20						End boring at 20 feet.
25						Neither groundwater nor seepage water encountered.
30						

Plate B4.9

HIRATA & ASSOCIATES, INC.

BORING LOG

W.O. 09-4797

BORING NO. B10 DRIVING WT. 140 lb. START DATE 07/30/09
SURFACE ELEV. 64± DROP 30 in. END DATE 07/31/09

DEPTH	GRAPH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
0						Sandy SILT (ML) – Reddish brown, moist, medium stiff, with cobbles.
			10/No Penetration			SLIGHTLY WEATHERED BASALT (WS) – Gray, slightly vesicular, highly fractured, hard. Begin NX coring at 2 feet. 97% Recovery from 2 to 7 feet RQD = 48%
5						
						HIGHLY WEATHERED BASALT (WH) – Brown, vesicular, fractured, medium hard. 13% Recovery from 7 to 12 feet RQD = 10%
10						
						42% Recovery from 12 to 17 feet RQD = 0%
15						
						0% Recovery from 17 to 22 feet RQD = 0%
20			63		10	
						78% Recovery from 23.5 to 28.5 feet RQD = 38%
25						
						MODERATELY WEATHERED BASALT (WM) – Gray, vesicular, fractured, medium hard to hard. 98% Recovery from 28.5 to 33.5 feet. RQD = 47%
30						

Plate B4.10

HIRATA & ASSOCIATES, INC.

BORING LOG

W.O. 09-4797

BORING NO. B10 (continued) DRIVING WT. 140 lb. START DATE 07/30/09
SURFACE ELEV. 64± DROP 30 in. END DATE 07/31/09

DEPTH	GRAPH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
30						60% Recovery from 33.5 to 38.5 feet. RQD = 10% Highly fractured from 33.5 feet.
35						
40						End boring at 38.5 feet.
45						Neither groundwater nor seepage water encountered.
50						
55						
60						

Plate B4.11

HIRATA & ASSOCIATES, INC.

BORING LOG

W.O. 09-4797

BORING NO. B11 DRIVING WT. 140 lb. START DATE 07/22/09
SURFACE ELEV. 72± DROP 30 in. END DATE 07/23/09

DEPTH	GRAPH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
0						Sandy SILT (ML) – Reddish brown, moist, medium stiff, with cobbles and boulders.
5						HIGHLY WEATHERED BASALT (WH) – Brown, highly fractured, medium hard. Begin NX coring at 2 feet. 94% Recovery from 2 to 5 feet. RQD = 0%
10						SLIGHTLY WEATHERED BASALT (WS) – Gray, slighty fractured, hard. 100% Recovery from 5 to 10 feet. RQD = 95% 88% Recovery from 10 to 15 feet. RQD = 73% Fractured from 13 feet. 100% Recovery from 15 to 19 feet. RQD = 54%
15						
20						End boring at 19 feet.
25						Neither groundwater nor seepage water encountered.
30						

Plate B4.12

HIRATA & ASSOCIATES, INC.

BORING LOG

W.O. 09-4797

BORING NO. B12 DRIVING WT. 140 lb. START DATE 08/06/09
SURFACE ELEV. 58± DROP 30 in. END DATE 08/06/09

DEPTH	GRAPH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
0			80/11"	73	15	Sandy SILT (ML) – Reddish brown, moist, medium stiff, with cobbles and boulders.
						SLIGHTLY WEATHERED BASALT (WS) – Gray, slightly vesicular, slightly fractured, hard. Begin NX coring at 2 feet. 95% Recovery from 2 to 7.5 feet. RQD = 94%
5						100% Recovery from 7.5 to 12.5 feet. RQD = 100%
10						90% Recovery from 12.5 to 15 feet. RQD = 63%
15						End boring at 15 feet.
20						Neither groundwater nor seepage water encountered.
25						
30						

Plate B4.13

HIRATA & ASSOCIATES, INC.

BORING LOG

W.O. 09-4797

BORING NO. B13 DRIVING WT. 140 lb. START DATE 07/30/09
SURFACE ELEV. 60± DROP 30 in. END DATE 07/30/09

DEPTH	GRAPH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
0						Sandy SILT (ML) – Reddish brown, moist, medium stiff, with cobbles and boulders.
			50/4"		13	HIGHLY WEATHERED BASALT (WH) – Brown, dense to medium hard.
5						SLIGHTLY WEATHERED BASALT (WS) – Gray, slightly vesicular, slightly fractured, hard. Begin NX coring at 4 feet. 100% Recovery from 4 to 8 feet. RQD = 100%
						100% Recovery from 8 to 13 feet. RQD = 88%
10						
						88% Recovery from 13 to 18 feet. RQD = 58%
15						MODERATELY WEATHERED BASALT (WM) – Grayish brown, vesicular, highly fractured, medium hard to hard.
						77% Recovery from 18 to 23 feet. RQD = 12%
20						Reddish brown color from 21.5 to 25.5 feet.
						87% Recovery from 23 to 28 feet. RQD = 12%
25						
						87% Recovery from 28 to 33 feet. RQD = 18%
30						

Plate B4.14

HIRATA & ASSOCIATES, INC.

BORING LOG

W.O. 09-4797

BORING NO. B13 (continued) DRIVING WT. 140 lb. START DATE 07/30/09
SURFACE ELEV. 60± DROP 30 in. END DATE 07/30/09

DEPTH	GRAPH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
30						
						End boring at 33 feet.
35						Neither groundwater nor seepage water encountered.
40						
45						
50						
55						
60						

Plate B4.15

HIRATA & ASSOCIATES, INC.

BORING LOG

W.O. 09-4797

BORING NO. B14 DRIVING WT. 140 lb. START DATE 07/20/09
SURFACE ELEV. 48± DROP 30 in. END DATE 07/21/09

DEPTH	GRAPH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
0						Sandy SILT (ML) – Reddish brown, moist, medium stiff, with cobbles and boulders.
5						SLIGHTLY WEATHERED BASALT (WS) – Gray, slightly vesicular, fractured, hard. Begin NX coring at 2 feet. 88% Recovery from 2 to 7 feet. RQD = 54% 100% Recovery from 7 to 10 feet. RQD = 82%
10			48		36	HIGHLY WEATHERED BASALT (WH) – Reddish brown, moist, dense to medium hard.
15			50/3"		23	
20						MODERATELY WEATHERED BASALT (WM) – Gray, vesicular, fractured, hard. 94% Recovery from 15.5 to 20.5 feet. RQD = 72% 100% Recovery from 20.5 to 25.5 feet. RQD = 92%
25						100% Recovery from 25.5 to 30.5 feet. RQD = 93%
30						

Plate B4.16

HIRATA & ASSOCIATES, INC.

BORING LOG

W.O. 09-4797

BORING NO. B14 (continued) DRIVING WT. 140 lb. START DATE 07/20/09
SURFACE ELEV. 48± DROP 30 in. END DATE 07/21/09

DEPTH	GRAPH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
30						25% Recovery from 30.5 to 35.5 feet. RQD = 25%
35			88		25	HIGHLY WEATHERED BASALT (WH) – Gray, moist, dense to medium hard. 47% Recovery from 38 to 43 feet. RQD = 20%
40						
45						MODERATELY WEATHERED BASALT (WM) – Gray, slightly vesicular, fractured, medium hard to hard. 93% Recovery from 43 to 48 feet. RQD = 51%
50						End boring at 48 feet. Neither groundwater nor seepage water encountered.
55						
60						

Plate B4.17

HIRATA & ASSOCIATES, INC.

BORING LOG

W.O. 09-4797

BORING NO. B15 DRIVING WT. 140 lb. START DATE 07/29/09
SURFACE ELEV. 55± DROP 30 in. END DATE 07/29/09

DEPTH	GRAPH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
0			56/6"			Sandy SILT (ML) – Reddish brown, moist, medium stiff, with cobbles and boulders.
5						SLIGHTLY WEATHERED BASALT (WS) – Gray, fractured, hard. Begin NX coring at 2 feet. 100% Recovery from 2 to 7 feet. RQD = 68% 88% Recovery from 7 to 12 feet. RQD = 72%
10						
15						95% Recovery from 12 to 17 feet. RQD = 72% 25% Recovery from 17 to 22 feet. RQD = 72%
20						HIGHLY WEATHERED BASALT (WH) – Grayish brown, highly vesicular, highly fractured, medium hard to hard. 0% Recovery from 22 to 27 feet.
25						
30						20% Recovery from 27 to 32 feet. RQD = 7%

Plate B4.18

HIRATA & ASSOCIATES, INC.

BORING LOG

W.O. 09-4797

BORING NO. B15 (continued) DRIVING WT. 140 lb. START DATE 07/29/09
SURFACE ELEV. 55± DROP 30 in. END DATE 07/29/09

DEPTH	GRAPH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
30						53% Recovery from 32 to 37 feet. RQD = 30%
35						MODERATELY WEATHERED BASALT (WM) – Gray, vesicular, fractured, medium hard to hard. 85% Recovery from 37 to 42 feet. RQD = 45%
40						98% Recovery from 42 to 47 feet. RQD = 98%
45						
50						End boring at 47 feet. Neither groundwater nor seepage water encountered.
55						
60						

Plate B4.19

HIRATA & ASSOCIATES, INC.

BORING LOG

W.O. 09-4797

BORING NO. B16 DRIVING WT. 140 lb. START DATE 08/06/09
SURFACE ELEV. 46± DROP 30 in. END DATE 08/06/09

DEPTH	GRAPH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
0			27	63	18	Sandy SILT (ML) – Reddish brown, moist, medium stiff, with cobbles and boulders.
			35	67	20	
5			10/No Penetration			HIGHLY WEATHERED BASALT (WH) – Brown to reddish brown, moist, dense to medium hard.
10			93	Lost Recovery		
15			98/9"	87	12	
			50/2"		18	
20						End boring at 20 feet. Neither groundwater nor seepage water encountered.
25						
30						

Plate B4.20

HIRATA & ASSOCIATES, INC.

BORING LOG

W.O. 09-4797

BORING NO. B17 DRIVING WT. 140 lb. START DATE 07/23/09

SURFACE ELEV. 50± DROP 30 in. END DATE 07/23/09

DEPTH	GRAPH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
0			10/No Penetration			Sandy SILT (ML) – Reddish brown, moist, medium stiff, with cobbles and boulders.
5						SLIGHTLY WEATHERED BASALT (WS) – Gray, slightly fractured, hard. Begin NX coring at 3 feet. 98% Recovery from 3 to 8 feet. RQD = 98%
10						93% Recovery from 8 to 13 feet. RQD = 85%
15						100% Recovery from 13 to 18 feet. RQD = 100%
20						End boring at 18 feet.
25						Neither groundwater nor seepage water encountered.
30						

Plate B4.21

HIRATA & ASSOCIATES, INC.

BORING LOG

W.O. 09-4797

BORING NO. B18 DRIVING WT. 140 lb. START DATE 07/15/09

SURFACE ELEV. 40± DROP 30 in. END DATE 07/15/09

DEPTH	GRAPH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
0			10/No Penetration			Sandy SILT (ML) – Reddish brown, moist, medium stiff, with cobbles and boulders.
5			60/4"	Lost Recovery		HIGHLY WEATHERED BASALT (WH) – Gray, medium hard.
10						SLIGHTLY WEATHERED BASALT (WS) – Gray, slightly vesicular, slightly fractured, hard. Begin NX coring at 6 feet. 100% Recovery from 6 to 10 feet. RQD = 88% 92% Recovery from 10 to 15 feet. RQD = 88%
15						HIGHLY WEATHERED BASALT (WH) – Grayish brown, vesicular, highly fractured, dense to medium hard. 5% Recovery from 15 to 20 feet. RQD = 0%
20						End boring at 20 feet.
25						Neither groundwater nor seepage water encountered.
30						

Plate B4.22

HIRATA & ASSOCIATES, INC.

BORING LOG

W.O. 09-4797

BORING NO. B19 DRIVING WT. 140 lb. START DATE 07/16/09
SURFACE ELEV. 42± DROP 30 in. END DATE 07/20/09

DEPTH	GRAPH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
0			15	98	3	Silty SAND (SM) – Grayish brown, slightly moist, medium dense, with cobbles.
			16	103	3	
5			50/6"	80	16	Clayey SILT (ML) – Reddish brown, moist, medium stiff.
10						SLIGHTLY WEATHERED BASALT (WS) – Gray, slightly vesicular, fractured, hard. Begin NX coring at 7 feet. 45% Recovery from 7 to 12 feet. RQD = 36% Highly fractured from 10 to 12 feet. 100% Recovery from 12 to 17 feet. RQD = 98% 100% Recovery from 17 to 22 feet. RQD = 69%
15						
20						
25			99/8"			HIGHLY WEATHERED BASALT (WH) – Reddish brown, vesicular, highly fractured, medium hard. 17% Recovery from 22 to 25 feet. RQD = 0%
30						

Plate B4.23

HIRATA & ASSOCIATES, INC.

BORING LOG

W.O. 09-4797

BORING NO. B19 (continued) DRIVING WT. 140 lb. START DATE 07/29/09
SURFACE ELEV. 42± DROP 30 in. END DATE 07/29/09

DEPTH	GRAPH	SAMPLE	BLOWS PER FOOT	DRY DENSITY (PCF)	MOIST. CONT. (%)	DESCRIPTION
30						MODERATELY WEATHERED BASALT (WM) – Gray, vesicular, fractured, hard. 77% Recovery from 30 to 35 feet. RQD = 13%
35						70% Recovery from 35 to 40 feet. RQD = 20%
40						100% Recovery from 40 to 45 feet. RQD = 58%
45						100% Recovery from 45 to 50 feet. RQD = 88%
50						End boring at 50 feet.
55						Neither groundwater nor seepage water encountered.
60						

Plate B4.24

SITE EVALUATION/PERCOLATION TEST

Date/Time: August 3, 2009
Test performed by: Hirata & Associates, Inc.
Owner:
Tax Map Key:
Test Number: P1 (boring B19)

Elevation: ~42± ft.
Depth to Groundwater Table: 50 ft. below grade (based on final depth of boring)
Depth to Bedrock (if observed): 6.5 ft. below grade
Diameter of Hole: 3 in.
Depth to Hole Bottom: 20 ft. below grade

Depth (inches)	Soil Profile (Color, texture, other)
0 - 54	Grayish brown silty sand
54 - 78	Reddish brown clayey silt
78 - 240	Gray slightly weathered basalt

PERCOLATION READINGS

Time 12 inches of water to seep away: <30 min.
Time 12 inches of water to seep away: <30 min.

✓ For percolation tests in sandy soils, record time intervals and water drops every 10 minutes for at least 1 hour.

___ For percolation tests in non-sandy soils, presoak the test hole for at least 4 hours. Record time intervals and water drops at least every 10 minutes for 1 hour; or if the time for the first 6 inches to seep away is greater than 30 minutes, record time intervals and water drops at least every 30 minutes for 4 hours or until 2 successive drops do not vary by more than 1/16 inch.

Time interval	Drop in inches	Time interval	Drop in inches
10 min.	11-1/16	10 min.	7-1/2
10 min.	8-1/4	10 min.	7-3/4
10 min.	8	10 min.	7-1/2
10 min.	7-3/4	10 min.	7-9/16

Percolation Rate (time/final water level drop): 1.32 min/in

As the engineer responsible for gathering and providing site information and percolation test results, I attest to the fact that above site information is accurate and that the site evaluation was conducted in accordance with the provisions of Chapter 11-62, "Wastewater Systems" and the results were acceptable.

RICK I.K. YOSHIDA LICENSED PROFESSIONAL ENGINEER No. 11118-C HAWAII, U.S.A.

Engineer's Signature/Stamp

SITE EVALUATION/PERCOLATION TEST

Date/Time: August 3, 2009
Test performed by: Hirata & Associates, Inc.
Owner:
Tax Map Key:
Test Number: P2 (Boring B18)

Elevation: ~40± ft.
Depth to Groundwater Table: >20 ft. below grade
Depth to Bedrock (if observed): 3 ft. below grade
Diameter of Hole: 3 in.
Depth to Hole Bottom: 20 ft. below grade

Depth (inches)	Soil Profile (Color, texture, other)
0 - 36	Reddish brown sandy silt
36 - 174	Gray slightly weathered basalt.
174 - 240	Grayish brown highly weathered basalt

PERCOLATION READINGS

Time 12 inches of water to seep away: <30 min.
Time 12 inches of water to seep away: <30 min.

___ For percolation tests in sandy soils, record time intervals and water drops every 10 minutes for at least 1 hour.

___ For percolation tests in non-sandy soils, presoak the test hole for at least 4 hours. Record time intervals and water drops at least every 10 minutes for 1 hour; or if the time for the first 6 inches to seep away is greater than 30 minutes, record time intervals and water drops at least every 30 minutes for 4 hours or until 2 successive drops do not vary by more than 1/16 inch.

Time interval	Drop in inches	Time interval	Drop in inches
* See note below			

Percolation Rate (time/final water level drop): NA min/in

* Water was pumped into the test hole at a rate of approximately 4.4 gallons per minute for a period of about 30 minutes. A measurable head could not be maintained.

As the engineer responsible for gathering and providing site information and percolation test results, I attest to the fact that above site information is accurate and that the site evaluation was conducted in accordance with the provisions of Chapter 11-62, "Wastewater Systems" and the results were acceptable.

RICK I.K. YOSHIDA LICENSED PROFESSIONAL ENGINEER No. 11118-C HAWAII, U.S.A.

Engineer's Signature/Stamp

SITE EVALUATION/PERCOLATION TEST

Date/Time: August 6, 2009
Test performed by: Hirata & Associates, Inc.
Owner:
Tax Map Key:
Test Number: P3 (boring B16)

Elevation: ~46± ft.
Depth to Groundwater Table: >20 ft. below grade
Depth to Bedrock (if observed): 4.5 ft. below grade
Diameter of Hole: 3 in.
Depth to Hole Bottom: 20 ft. below grade

Depth (inches)	Soil Profile (Color, texture, other)
0 - 54	Reddish brown sandy silt
54 - 240	Brown to reddish brown highly weathered basalt

PERCOLATION READINGS

Time 12 inches of water to seep away: <30 min.
Time 12 inches of water to seep away: <30 min.

✓ For percolation tests in sandy soils, record time intervals and water drops every 10 minutes for at least 1 hour.

___ For percolation tests in non-sandy soils, presoak the test hole for at least 4 hours. Record time intervals and water drops at least every 10 minutes for 1 hour; or if the time for the first 6 inches to seep away is greater than 30 minutes, record time intervals and water drops at least every 30 minutes for 4 hours or until 2 successive drops do not vary by more than 1/16 inch.

Time interval	Drop in inches	Time interval	Drop in inches
10 min.	7-3/4	10 min.	7-1/4
10 min.	8	10 min.	7-3/4
10 min.	8-1/4	10 min.	7-1/2
10 min.	7-3/4	10 min.	7-9/16

Percolation Rate (time/final water level drop): 1.32 min/in

As the engineer responsible for gathering and providing site information and percolation test results, I attest to the fact that above site information is accurate and that the site evaluation was conducted in accordance with the provisions of Chapter 11-62, "Wastewater Systems" and the results were acceptable.

RICK I.K. YOSHIDA
LICENSED PROFESSIONAL ENGINEER
No. 11118-C
HAWAII, U.S.A.

Engineer's Signature/Stamp

Plate A5.3

APPENDIX B

LABORATORY TESTING

DESCRIPTION OF LABORATORY TESTING

CLASSIFICATION

Field classification was verified in the laboratory in accordance with the Unified Soil Classification System. Laboratory classification was determined by visual examination and sieve analysis testing. The final classifications are shown at the appropriate locations on the Boring Logs, Plates A4.1 through A4.24.

MOISTURE-DENSITY

Representative samples were tested for field moisture content and dry unit weight. The dry unit weight was determined in pounds per cubic foot while the moisture content was determined as a percentage of dry weight. Samples were obtained using a 3-inch O.D. split tube sampler. Test results are shown at the appropriate depths on the Boring Logs, Plates A4.1 through A4.24.

CONSOLIDATION

A representative samples was tested for its consolidation characteristics. The test sample was 2.42 inches in diameter and 1 inch high. Porous stones were placed in contact with the top and bottom of the test sample to permit addition and release of pore fluid. Loads were then applied in several increments in a geometric progression, and the resulting deformations recorded at selected time intervals. Test results are plotted on the Consolidation Test Report, Plate B2.1.

SHEAR TESTS

Shear tests were performed in the Direct Shear Machine which is of the strain control type. Each sample was sheared under varying confining loads in order to determine the Coulomb shear strength parameters, cohesion and angle of internal friction. Test results are presented on Plates B3.1 and B3.2.

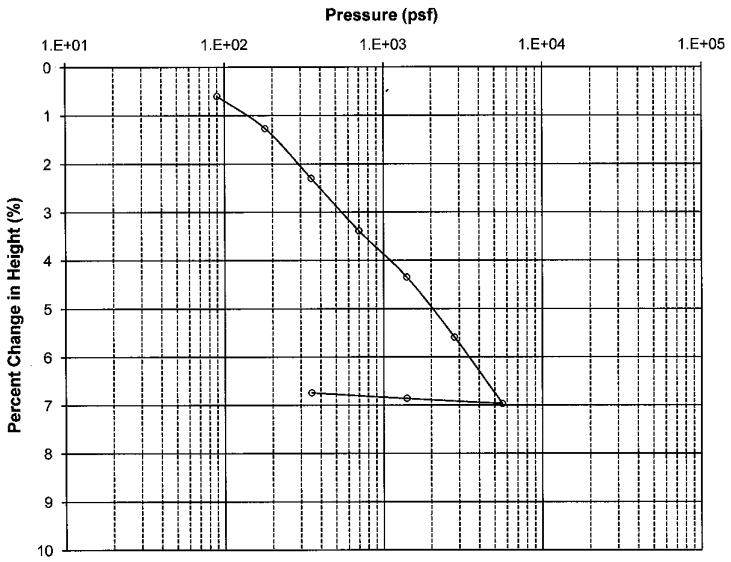
PROCTOR TEST

Modified Proctor tests were performed on bulk samples in general accordance with ASTM D 1557. The test is used to determine the optimum moisture content at which the soil compacts to 100 percent density. Results are shown on Plates B4.1 through B4.4.

SIEVE ANALYSIS

Sieve analysis tests were conducted on bulk samples in general accordance with ASTM D 422. The test is used to classify granular soils. Test results are presented on Plate B5.1.

Consolidation Test Results



Sample Description

Boring No.: B19 Depth (ft): 3

Soil Description: Grayish brown silty sand

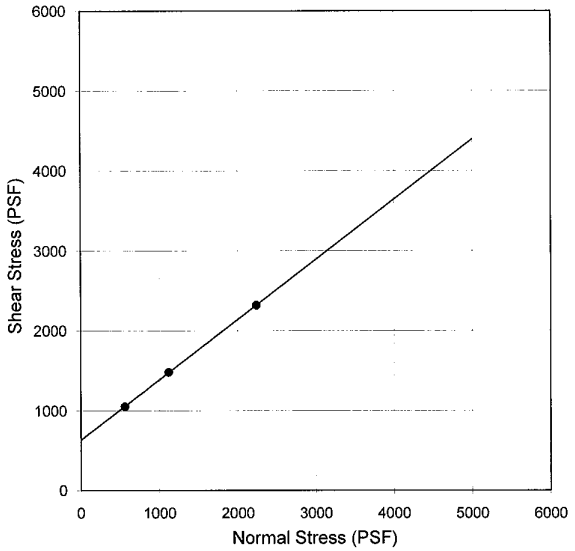
	Moisture Content (%)	Dry Density (pcf)
Initial	3.1	102.5
Final	2.0	109.9

Remark: 8/6/09

W.O. 09-4797	Kihei High School
Hirata & Associates, Inc.	CONSOLIDATION TEST

Plate B2.1

Direct Shear Test Results



Sample Description

Boring No.: B3 Depth (ft): 1

Soil Description: Reddish brown sandy silt

Strength Intercept (C): 633.6 PSF (Peak Strength)

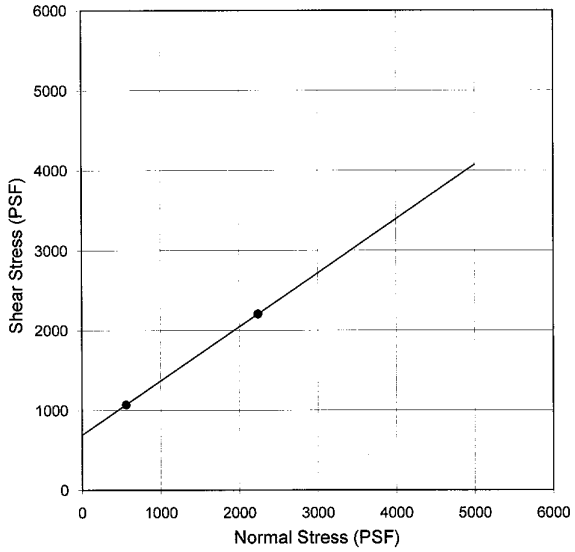
Friction Angle (ϕ): 37.0 DEG (Peak Strength)

Remark: 08/06/09

W.O. 09-4797	Kihei High School
Hirata & Associates, Inc.	DIRECT SHEAR TEST

Plate B3.1

Direct Shear Test Results

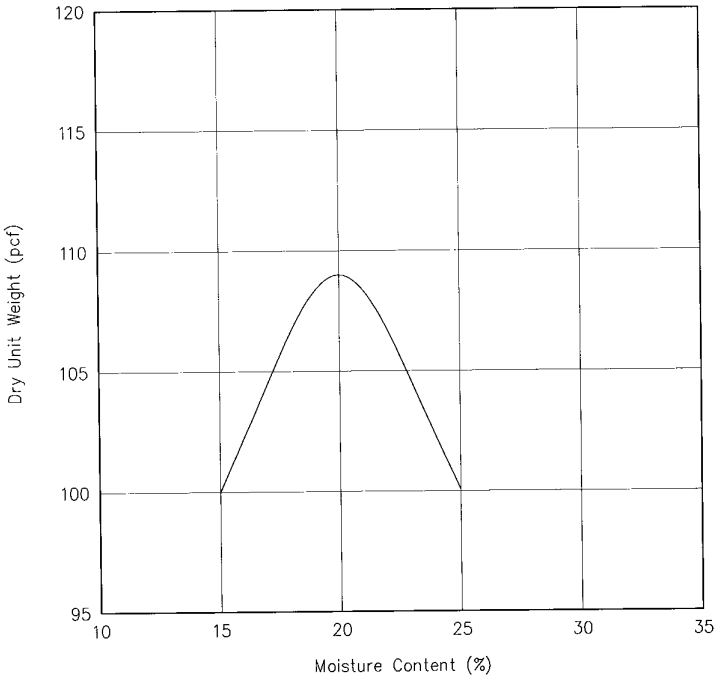


Sample Description

Boring No.: B5 Depth (ft): 1
Soil Description: Brown highly weathered basalt
Strength Intercept (C): 692.2 PSF (Peak Strength)
Friction Angle (ϕ): 34.0 DEG (Peak Strength)

Remark: 8/14/09

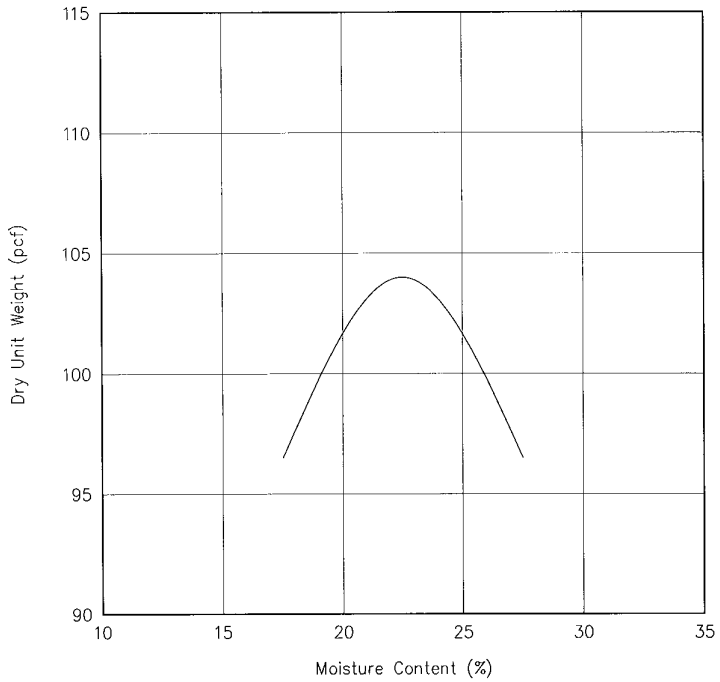
W.O. 09-4797	Kihei High School
Hirata & Associates, Inc.	**DIRECT SHEAR TEST** Plate B3.2



Soil Data
Location: Boring B4 at 0.5 feet.
Description: Reddish brown sandy silt

Test Results
Maximum Dry Density: 109 pcf
Optimum Moisture Content: 20%

W.O. 09-4797	Kihei High School
Hirata & Associates, Inc.	MODIFIED PROCTOR CURVE Plate B4.1



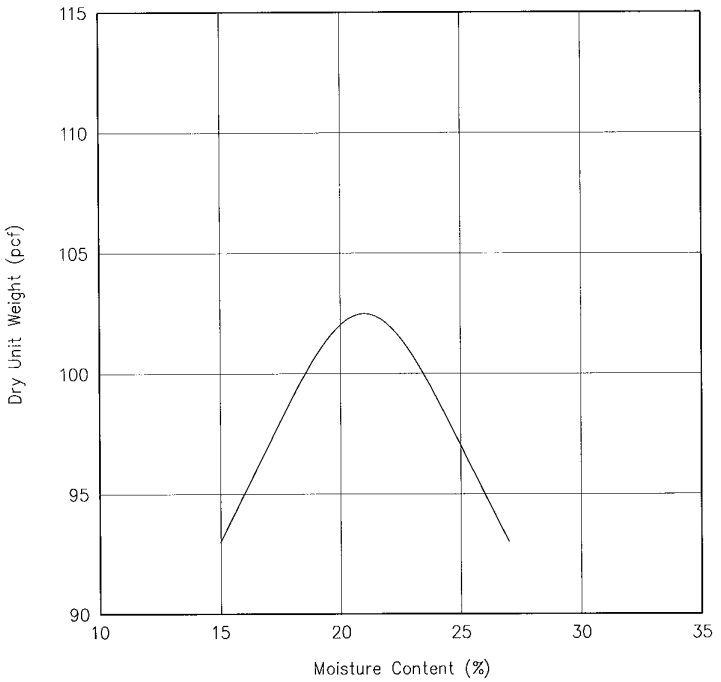
Soil Data

Location: Boring B6 at 0.5 feet.
Description: Reddish brown sandy silt

Test Results

Maximum Dry Density: 104 pcf
Optimum Moisture Content: 22.5%

W.O. 09-4797	Kihei High School
Hirata & Associates, Inc.	MODIFIED PROCTOR CURVE Plate B4.2



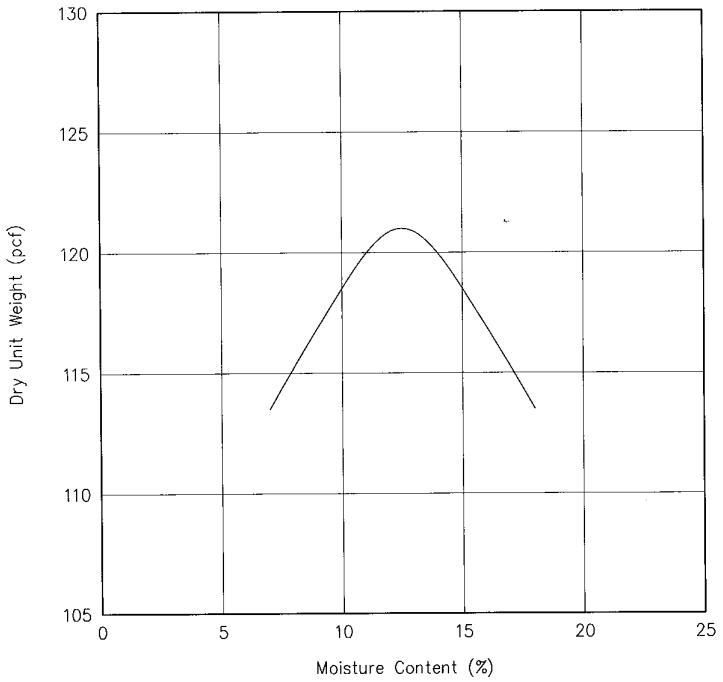
Soil Data

Location: Boring B17 at 0.5 feet.
Description: Reddish brown sandy silt

Test Results

Maximum Dry Density: 102.5 pcf
Optimum Moisture Content: 21%

W.O. 09-4797	Kihei High School
Hirata & Associates, Inc.	MODIFIED PROCTOR CURVE Plate B4.3



Soil Data

Location: Boring B19 at 0.5 feet.

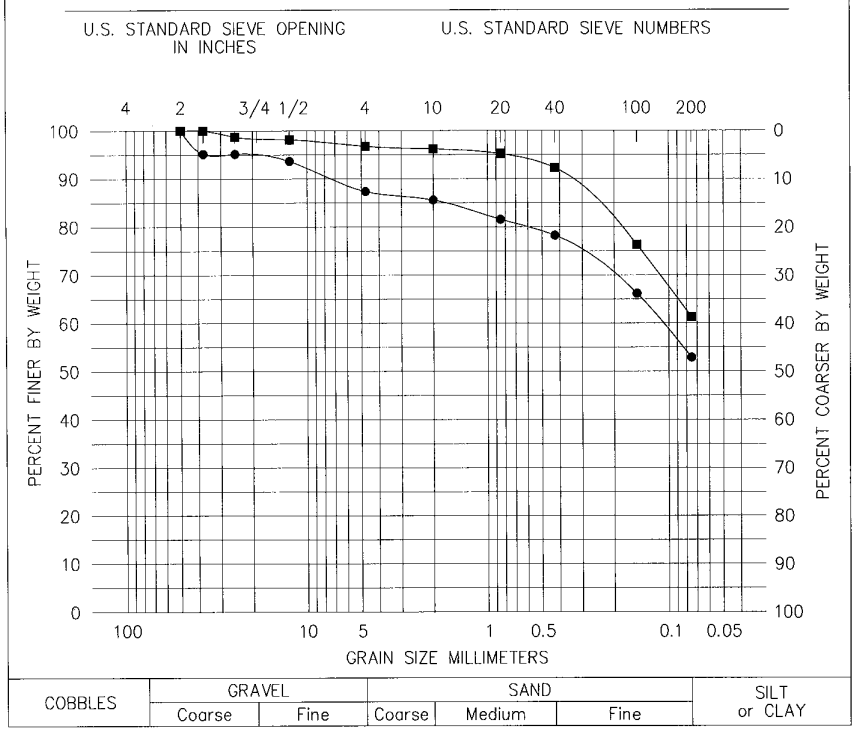
Description: Grayish brown silty sand

Test Results

Maximum Dry Density: 121 pcf

Optimum Moisture Content: 12.5%

W.O. 09-4797	Kihei High School
Hirata & Associates, Inc.	MODIFIED PROCTOR CURVE Plate B4.4



● Sample #1	Location:	Boring B4 at 0.5 feet
	Description:	Reddish brown sandy silt
■ Sample #2	Location:	Boring B11 at 1 foot
	Description:	Reddish brown sandy silt

W.O. 09-4797	Kihei High School
Hirata & Associates, Inc.	GRADATION CURVES Plate B5.1

Appendix B

Kīhei High School
Impacts on Agriculture

Plasch Econ Pacific LLC – July 2011

KĪHEI HIGH SCHOOL:
IMPACTS ON AGRICULTURE

Plasch Econ Pacific LLC

KĪHEI HIGH SCHOOL:
IMPACTS ON AGRICULTURE

PREPARED FOR:
State of Hawai‘i, Department of Education

PREPARED BY:
Plasch Econ Pacific LLC

July 2011

CONTENTS

EXECUTIVE SUMMARY

1. PROPOSED DEVELOPMENT

Kīhei High School ("the School") will be located on a 77.33-acre site in Kīhei, Maui. The School is initially being planned for 800 students in grades 9-12 (Phase I), with the potential to expand by an additional 850 students (Phase II), resulting in a potential total of 1,650 students.

The estimated construction period for Phase I of the School is about 2.25 years and about 2 years for Phase II. Phase II construction would be completed about 10 years after the completion of Phase I construction. Construction could require more or less time, depending on the need for additional school capacity and the availability of State funding for the School.

2. AGRICULTURAL CONDITIONS

The School site has high solar radiation, but the poor soils, low soil ratings, and the lack of an existing irrigation system indicate that the property is poorly suited for growing commercial field crops.

3. IMPACT ON CATTLE OPERATIONS

a. Haleakalā Ranch

Impact of the School on Haleakalā Ranch Cattle Operations

Development of the School will remove about 44 acres of grazing land from Haleakalā Ranch, or about 0.2% of its total 23,000-acre supply of grazing land. The corresponding reduction in feed produced from all of its grazing land will be about 0.1%. The lower percentage for feed reflects the fact that the arid Kīhei lands have lower yields than *mauka* pastures.

While Kīhei pastures are important for seasonal ~~winter~~ cattle grazing, Haleakalā Ranch anticipates that this relatively small reduction in feed will have no significant effect on its cattle operation, including no significant impact on the size of its herd, production, revenues,

employment or payroll. Haleakalā Ranch has sufficient land to move its cattle to other pastures.

Cumulative Impact on Haleakalā Ranch Cattle Operations

Over the next 20 years or so, planned and proposed projects on file with the County could result in the development of about 415 acres that are now used by Haleakalā Ranch to graze cattle, including about 44 acres for the School and about 371 acres for other projects. All of this land is located in Kīhei within the Urban Growth Boundary. This loss amounts to about 1.8% of the Ranch's grazing land, or about 0.9% of its available feed.

Haleakalā Ranch regards a 0.9% loss in feed as too small to have a significant effect on its cattle operation. Again, the Ranch has sufficient lands to move its cattle to other pastures.

b. Kaonoulu Ranch

Impact of the School on Kaonoulu Ranch Cattle Operations

Development of the School will remove about 32 acres of grazing land from Kaonoulu Ranch, or about 0.3% ~~0.4%~~ of its total 10,000 ~~9,000~~-acre supply of grazing land. The corresponding reduction in feed produced from all of its grazing land will be about 0.15% ~~0.2%~~. Kaonoulu Ranch anticipates that this relatively small reduction in feed will have no significant effect on its cattle operation, including no significant impact on the size of its herd, production, revenues, employment or payroll. The Ranch has sufficient land to move its cattle to other pastures.

Cumulative Impact on Kaonoulu Ranch Cattle Operations

Over the next 20 years or so, planned and proposed projects on file with the County could result in the development of about 347 acres that are now used by Kaonoulu Ranch to graze cattle, including about 32 acres for the School and about 315 acres for other projects. All of this land is located in Kīhei within the Urban Growth Boundary. This loss amounts to about 3.5% ~~3.9%~~ of the Ranch's grazing land, or about 1.8% ~~2%~~ of its available feed.

Kaonoulu Ranch regards a 1.8% ~~2%~~ loss in feed as too small to have a significant effect on its cattle operation inasmuch as the Ranch has sufficient lands to move its cattle to other pastures.

c. Mitigating Measures

As discussed above, the School in combination with other projects will result in an insignificant impact on the cattle operations of Haleakalā Ranch and Kaonoulu Ranch. In

view of this finding, mitigation measures for the impact of the School on cattle operations are not recommended.

4. IMPACT ON NEARBY FARM OPERATIONS

Seed corn and orchard operations are located about a half-mile north of the School site. Given the distance, these farms are not expected to cause nuisance problems for the School—i.e., tractor and truck noises, dust blown from fields, drifting of crop-protection products during occasional applications, etc. Consequently, these two farms will not have to change their operations because of the School.

In the long run, planned urban development will displace these two farms.

5. IMPACT ON THE GROWTH OF DIVERSIFIED CROP FARMING

The School will result in a small loss of low-quality agricultural land (about 77.3 acres) of which there is a large supply on Maui, but will not affect the supply of good farmland of which there is also a large supply. Consequently, the School will have no impact on the growth of diversified crop farming.

6. OFFSETTING BENEFITS

The loss of 77.3 acres of low-quality agricultural land will be offset by the following benefits of the School:

— Education of High School Students

Kīhei High School will be a modern school that will provide education to students grades 9 to 12. The School will accommodate 800 students at the end of Phase I construction, and up to 1,650 students at the end of Phase II construction, depending upon need and the availability of State funding.

— Construction and Related Jobs

Phase I construction will last about four years. During this period, construction activity will generate an average of about 460 direct and indirect jobs, of which about 370 jobs will be on Maui. Phase II construction (about 8 years) will generate about 50 direct and indirect jobs, of which about 40 jobs will be on Maui.

— Operating and Related Jobs

At the completion of Phase I construction, School operations will provide about 190 direct and indirect jobs, of which nearly 170 jobs will be on Maui. Phase II will increase these figures to about 330 direct and indirect jobs, of which nearly 290 jobs will be on Maui.

7. CONSISTENCY WITH STATE AND COUNTY AGRICULTURAL POLICIES

a. Availability of Lands for Agriculture

The *Hawai'i State Constitution*, the *Hawai'i State Plan*, the *State Agriculture Functional Plan*, the *County of Maui 2030 General Plan,* the County's *Maui Island Plan (Draft),* and the County's *Kīhei-Mākena Community Plan* call directly or implicitly for preserving the economic viability of plantation agriculture and promoting the growth of diversified agriculture. To accomplish this, an adequate supply of agriculturally suitable lands and water must be assured.

With regard to plantation agriculture, the Project site is not and never was part of a sugarcane or pineapple plantation.

With regard to diversified crop farming, there is no current or recent farming on the property. The Project will result in a small loss of low-quality agricultural land of which there is a large supply on Maui, but will not affect the supply of good farmland of which there is also a large supply. Consequently, the Project will have no impact on the growth of diversified crop farming.

With regard to ranching, about 76 acres of the School site are used for grazing cattle. However, feed production is low due to arid conditions. Also, the acreage loss will be too small to effect cattle operations.

b. Conservation of Agricultural Lands

In addition to the above, State and County policies call for conserving and protecting prime agricultural lands, including protecting farmland from urban development.

The School will result in the loss of 1.7 acres of land that is rated as Prime under the ALISH system but is rated as poor under the NRCS and LSB rating systems. All of the remaining 75.6 acres have poor soils.

c. Kīhei-Mākena Community Plan

The proposed School is partially consistent with the County's Kīhei-Mākena Community Plan in that the southern portion of the property (44.73 acres) is designated Public/Quasi Public while the northern portion (32.6 acres) is designated Agriculture. Development of the School will require changing the Community Plan so that all of the property is designated Public/Quasi Public.

KĪHEI HIGH SCHOOL: IMPACTS ON AGRICULTURE

1. INTRODUCTION

a. Content and Purpose

This report addresses the agricultural impacts of Kīhei High School ("the School") which is planned by the State of Hawai'i for a site in Kīhei, Maui. The purpose of the report is to provide State and County officials with information relevant to their decisions about the School.

b. Organization of the Report

The material below gives the following information about the School and its agricultural impacts: the School location, description, and required approvals; the agricultural conditions at the School site; potential crops; locational advantages and disadvantages for farming; surrounding land uses; the impact of the School on cattle operations; the impact of the School on nearby farming operations; the impact of the School on the growth of diversified crop farming; benefits of the School that would offset adverse agricultural impacts; and consistency of the School with State and County agricultural policies related to agricultural land. The Appendix provides State and County goals, objectives, policies and guidelines related to agricultural lands. Relevant maps are at the end of the report.

c. Economic Consultant

The analysis was conducted by Plasch Econ Pacific LLC, a Hawai'i-based economic-consulting firm specializing in economic development, land and housing economics, feasibility studies, valuations, market analysis, public policy analysis, and the economic and fiscal impacts of projects.

2. SCHOOL DESCRIPTION AND REQUIRED APPROVALS

a. School Location and Area

The School will be located on a 77.33-acre site in Kīhei, Maui. As shown in Figure 1, the site is *mauka* of Pi'ilani Highway, and between Kūlanihāko'i Gulch to the north and Waipu'ilani Gulch to the south. The School site covers portions of two Tax Map Keys:

— (2) 2-2-002:015 (32.6 acres)

— (2) 2-2-002:054 (44.73 acres

The School will utilize about 70 acres (91%) of the site.

b. School Size and Components

The School is being planned for 800 students in grades 9-12 (Phase I), with the potential to expand by an additional 850 students (Phase II), resulting in a potential total of 1,650 students.

Initial school improvements (Phase I) will include the following: classrooms, administration and student center, library and media arts center, cafeteria and custodial service center, technology and electives center, music building, gymnasium, locker facilities, storage buildings, concessions building, JROTC (Army) classroom building, football/soccer field, track, softball field, baseball field, practice field, grassed playfield, basketball courts, tennis courts, bleachers, walkways, driveways, parking, lighting, landscaping, utilities, highway improvements, etc. (see Figure 2). Depending upon need and available funding, future improvements (Phase II) will include the following: additional classrooms, auditorium, swimming pool complex, choral room, food kiosk, and additional bleachers.

c. Development Schedule

The estimated construction period for Phase I of the School is about 2.25 years and about 2 years for Phase II. Phase II construction would be completed about 10 years after the completion of Phase I construction. Construction could require more or less time, depending on the need for additional school capacity and the availability of State funding for the School.

d. Required Approvals

State Land Use District Boundary Amendment

The School site is currently in the State Agricultural District (see Figure 3). Development will require a State Land Use District Boundary Amendment from Agricultural to Urban.

County Community Plan Amendment

The School site is located within the County's Kīhei-Mākena Community Plan region. As shown in Figure 4, the northern portion of the property (32.6 acres of TMK (2) 2-2-002:015) is designated Agriculture, while the southern portion (44.73 acres of TMK (2) 2-2-002:054) is designated Public/Quasi Public. Development of the School will require changing the Kīhei-MākenaCommunity Plan so that all of the property is designated Public/Quasi Public.

County Change in Zoning

The School site is currently zoned Agricultural. Development will require a change in County zoning to P-1 Public/Quasi-Public.

County Subdivision Approval

The School will also require subdivision approval from the County.

3. AGRICULTURAL CONDITIONS

a. Soil Types and Characteristics

According to the soil survey by the Natural Resources Conservation Service (NRCS), formerly known as the Soil Conservation Service, the School site includes two soil types (see Figure 5):

— AaB: Alae sandy loam, 3% to 5% slopes (1.1 acres)

This soil type occurs on smooth alluvial fans that developed from volcanic ash and basic igneous rock. Although the slopes are generally 3% to 5%, some small areas are nearly level. In a representative profile, the surface layer is about 7 inches thick, and consists of sandy loam that has granular structure. There are no cobblestones on the surface. In some places, there are a few to many pebble-size rock fragments in the surface layer. The substratum extends to a depth of 48 inches or more, and consists of sandy loam as well as coarse and very coarse sand. In some places roots penetrate to a depth of 4 feet or more.

Permeability is rapid, runoff is slow, and the erosion hazard is slight. The soil is neutral or mildly alkaline in the surface layer and mildly to moderately alkaline in the substratum.

Most of this soil type is used for sugarcane and pasture, but some is used for truck crops.

— WID2: Waiakoa extremely stony silty clay loam, 7% to 15% slopes (76.2 acres)

This soil type developed from weathered basic igneous rock, with the upper soils influenced by volcanic ash. Although the slopes are generally 7% to 15%, some small areas have steeper slopes. In a representative profile the surface layer is silty clay loam about 2 inches thick. The subsoil is about 23 inches thick, and consists of silty clay loam that has a prismatic structure or is massive. The substratum is silty clay loam and hard, basic igneous rock. In places roots penetrate to bedrock.

This soil is eroded and stones cover 3 to 15 percent of the surface. In most areas about 50 percent of the surface layer has been removed by erosion. Permeability is moderate, runoff is medium, and the erosion hazard is severe. The soil is neutral in the surface layer and slightly acid to neutral in the subsoil.

This soil type is used for pasture and wildlife habitat.

b. Soil Ratings

Three classification systems are commonly used to rate soils in Hawai'i: (1) Land Capability Grouping, (2) Agricultural Lands of Importance to the State of Hawai'i, and (3) Overall Productivity Rating.

Land Capability Grouping (NRCS Rating)

The 1972 Land Capability Grouping by the NRCS rates soils according to eight levels, ranging from the highest classification level "I" to the lowest "VIII."

Soil type AaB (1.1 acres) has a rating of IVs if irrigated. Class IV soils have very severe limitations that reduce the choice of plants, require very careful management, or both. The subclassification "s" indicates that the soils are stony, shallow, have unfavorable texture, or have low water-holding capacity.

Soil type WID2 (76.2 acres) has a rating of VIIs. Class VII soils have very severe limitations that make them unsuitable for cultivation and restrict their use largely to pasture or range, woodland, or wildlife habitat. In this case, the subclassification "s" indicates that the soils have an unfavorable texture, or are extremely rocky or stony.

Agricultural Lands of Importance in the State of Hawai'i (ALISH)

ALISH ratings were developed in 1977 by the NRCS, the University of Hawai'i College (UH) of Tropical Agriculture and Human Resources, and the State Department of

Agriculture. This system classifies land into three broad categories: (1) Prime agricultural land which is land that is best-suited for the production of crops because of its ability to sustain high yields with relatively little input and with the least damage to the environment; (2) Unique agricultural land which is non-Prime agricultural land used for the production of specific high-value crops; and (3) Other agricultural land which is non-Prime and non-Unique agricultural land that is important to the production of crops. Unclassified lands have poor conditions for cultivating crops.

The ALISH soil ratings are shown in Figure 6. About 1.7 acres of the School site are rated Prime, and about 75.6 acres are Unclassified.

Overall Productivity Rating (LSB Rating)

In 1972, the UH Land Study Bureau (LSB) developed the Overall Productivity Rating, which classifies soils according to five levels, with "A" representing the class of highest productivity and "E" the lowest.

All of the soils within the School site are rated "E" (see Figure 6).

Summary Evaluation of Soil Quality

The three rating systems indicated that all or nearly all of the School site has poor soils for growing crops with, at most, 1.7 acres of the School site (about 2.2%) having soils suitable for crop farming.

c. Elevation and Slopes

The School site ranges in elevation from about 30 feet to about 100 feet, with an average slope of less than 3.5%.

d. Climatic Conditions

Hawai'i has a mild *semi*tropical climate which is due primarily to three factors: (1) Hawai'i's mid-Pacific location near the Tropic of Cancer, (2) the surrounding warm ocean waters that vary little in temperature between the winter and summer seasons, and (3) the prevailing northeasterly tradewinds that bring air having temperatures that are close to those of the surrounding waters. But because Haleakalā blocks the tradewinds, Kīhei has a semi-arid climate.

Solar Radiation

The School site receives considerable sunshine, with average daily insulation of about 500 calories per square centimeter.

Rainfall

Annual rainfall in Kīhei averages less than 15 inches. Most of this rainfall occurs during the winter rainy season (October through April), while the summer months (May through September) are hot and dry.

Temperatures

Temperature in Kīhei range from an average low of 64°F in the winter to an average high of 87°F in the summer.

Winds

The prevailing tradewinds blow across the isthmus and out to sea at a mean speed of about 11 miles per hour in the winter and 15 miles per hour in the summer.

e. Irrigation Water

The School site has no existing water system to irrigate crops.

f. Road Access

Dirt roads provide access from Pi‘ilani Highway to the property.

g. Summary

The School site has high solar radiation, but the poor soils, low soil ratings, and lack of irrigation water indicate that the property is poorly suited for growing commercial field crops.

4. POTENTIAL CROPS

The School site is unsuitable for most commercial field crops grown in Hawai‘i. Nevertheless, seed-corn operations in Kīhei indicate that high-value crops could be grown provided that the land is cleared of rocks, *kiawe*, grasses and weeds; the soil is amended; and

water is obtained. Also, crops which do not require good soil—such as hydroponic crops and algae—could be grown provided that water is available.

It should be noted, however, that Kīhei has a large supply of low-quality agricultural land similar to that of the School site (see Section 9). Also, high-quality farmland is available in Central and West Maui due to past closures of sugarcane and pineapple plantations.

5. LOCATIONAL ADVANTAGES AND DISADVANTAGES FOR FARMING

a. Maui Island Market

Farmers in Central Maui are well-situated for supplying the Maui Island market because of the short trucking distance to Kahului, which is the island’s commercial, industrial, distribution and transportation center. While the Maui Island market is significant, it is comparatively small: in 2009, Maui County had a *de facto* population of about 181,050 residents and visitors.

b. Honolulu Market

All farmers on Maui are at a disadvantage in competing against farmers on O'ahu for supplying the Honolulu market due to the interisland shipping costs, delays and extra handling. In comparing barge and air-cargo services, shipping by barge is less expensive and larger loads can be shipped, but the shipments are slow and infrequent. Air service is faster and frequent, but it is far more expensive and capacities are limited.

In 2009, O'ahu had a *de facto* population of about 936,600 residents and visitors. Thus, the Honolulu market is over five times larger than the Maui market.

c. Mainland Market

Compared to Hawai'i, the mainland market is enormous: in 2010, the U.S. population totaled 308.7 million. In supplying this market with products that can be carried by container ship because they have long shelf-lives (e.g., canned fruit), farmers on Maui are competitive with farmers on O'ahu and the other islands. Even though freight from Maui must first be barged to Honolulu then transferred onto a container ship, Matson’s overseas shipping service includes inter-island barge service at no additional fee: with the exception of some minor port charges, Matson charges a common fare for all islands.

In the case of fresh products that must be shipped by air to the mainland because of their short shelf-lives, farmers on Maui are at a disadvantage compared to farmers on O'ahu because most mainland air cargo is shipped via the Honolulu International Airport. Com-

pared to farmers on O'ahu, Maui farmers encounter additional costs, delays, and handling for interisland air-cargo service and for transferring the fresh products from small interisland aircraft to large overseas aircraft.

However, overseas air-cargo service from Maui has improved somewhat because the current generation of aircraft can depart from the short runway at Kahului with a full load of passengers and a full load of cargo in the hold. This direct service allows Maui farmers to be more competitive in mainland markets. However, the lift capacity from Maui is limited by the number of direct flights.

In the U.S. mainland market, farmers in Hawai'i must also compete against farmers on the mainland and in Mexico, Central and South America, the Caribbean, Australia, New Zealand, Southeast Asia, etc. Most of the competing farm areas have lower production and delivery costs than Hawai'i does. Competing against Mexico is particularly difficult given the North America Free Trade Agreement (NAFTA) and Mexico's proximity to major U.S. markets.

d. Summary

In terms of location, farmers in Central Maui are well-situated to supply the small Maui Island market. And compared to other farmers in Hawai'i, they can also compete reasonably well in supplying mainland markets, as long as their products have long shelf-lives and so can be shipped by surface vessel.

However, compared to farmers on O'ahu, they are at a disadvantage in supplying the Honolulu market. Furthermore, they are at a disadvantage in supplying mainland markets if their products have short shelf-lives and so must be shipped by air. Also, farmers on Maui are at a disadvantage in competing against the low-cost producers who supply mainland markets.

6. SURROUNDING LAND USES

Current, planned, and proposed land uses surrounding the School site are as follows:

— North

Currently, grazing operations of Kaonoulu Ranch abut and extend north about a half-mile from the School site (see Figure 1). Beyond a half-mile are commercial and industrial operations, a seed-corn farm, and an orchard.

The Kīhei-Mākena Community Plan designates a portion of the grazing land to the north as Light Industrial (see Figure 4). This area is about 100 yards north of the School site, and extends about one-third of a mile *mauka* from Pi'ilani Highway. Beyond a half-mile north, the land currently being used for an orchard is designated Light Industrial, while the land used for seed corn is designated Single Family.

Proposed development includes residential and related neighborhood commercial development to the north of the School site on land designated as Agriculture and Single Family. A park would abut the School site.

— East

Currently, grazing operations of Kaonoulu Ranch (TMK (2) 2-2-002:015) and Haleakalā Ranch (TMK (2) 2-2-002:054) abut the east side of the School site and extend *mauka* (see Figure 1).

The Community Plan designates the abutting Haleakalā Ranch lands as Public/Quasi Public, while the abutting Kaonoulu Ranch would remain as Agriculture (see Figure 4).

Proposed development includes residential and related neighborhood commercial development that would extend about 0.7 mile *mauka* of the School site.

— South

Currently, south of the School site are Elleair Maui Golf Club and some Haleakalā Ranch grazing lands (see Figure 1).

The Community Plan designates these grazing lands as Public/Quasi Public (see Figure 4).

Residential development of the grazing lands are proposed as part of the expansion of the Maui Research and Technology Park.

— West

Makai of the School site are Pi'ilani Highway, Pi'ilani Village, and some vacant land (see Figure 1).

The Community Plan designates the vacant land as Multi-Family (see Figure 4).

7. IMPACT ON CATTLE OPERATIONS

The School site is currently used for grazing cattle by two ranches: Haleakalā Ranch south of the property line which crosses the School site as shown in Figure 1, and Kaonoulu Ranch north of the property line.

a. Haleakalā Ranch

Haleakalā Ranch Cattle Operations

Incorporated in 1888, Haleakalā Ranch is the oldest and largest cattle ranch on Maui. This family-owned ranch has about 23,000 acres used for grazing cattle, about 1,200 ~~1,700~~ breeding cows, and about 10 ~~30~~ employees involved with its cattle operation.

To increase the available feed, the Kīhei lands were planted in buffelgrass in the early 1900s. Buffelgrass is drought-resistant, so is able to survive the dry summer months in Kīhei. Native to Africa, this grass was introduced to improve cattle forage in many tropical and subtropical regions of the world. ~~Cattle grazing on Kīhei pastures occurs in the winter months when the grass is more plentiful following winter rains.~~ The number of cattle on these lands and the duration of their grazing depend upon rainfall. Due to the arid summer conditions, annual per-acre yields of forage from Kīhei pastures are about 50% of those for Haleakalā Ranch as a whole.

Impact of the School on Haleakalā Ranch Cattle Operations

Development of the School will remove about 44 acres of grazing land from Haleakalā Ranch, or about 0.2% of its total 23,000-acre supply of grazing land. The corresponding reduction in feed produced from all its grazing land will be about 0.1% (0.2% x 50% adjustment for the lower yields from the Kīhei pastures).

While Kīhei pastures are important for seasonal ~~winter~~ cattle grazing, Haleakalā Ranch anticipates that this relatively small reduction in feed will have no significant effect on its cattle operation, including no significant impact on the size of its herd, production, revenues, employment or payroll. Haleakalā Ranch has sufficient land to move its cattle to other pastures.

Cumulative Impact on Haleakalā Ranch Cattle Operations

Over the next 20 years or so, planned and proposed projects on file with the County could result in the development of about 415 acres that Haleakalā Ranch uses now to graze cattle, including about 44 acres for the School and about 371 acres for other projects. All of this land is located in Kīhei within the Urban Growth Boundary. This loss amounts to about 1.8% of the Haleakalā Ranch grazing land (415 acres ÷ 23,000 acres), or about 0.9% of its available feed (1.8% x 50% adjustment for the lower yields from the Kīhei pastures).

Haleakalā Ranch regards a 0.9% loss in feed as too small to have a significant effect on its cattle operations. Again, the Ranch has sufficient lands to move its cattle to other pastures. Even if Haleakalā Ranch were operated at its maximum carrying capacity and

replacement pastures were not available, the impact would be small: about 10.8 ~~15.3~~ fewer breeding cows (about 0.9% x about 1,200 ~~1,700~~ cows), about 8.1 ~~11.5~~ fewer calves per year (about 75% x the number of cows), about $3,200 ~~$4,600~~ less in annual revenues (about $400 x the number of calves), and the loss of about 9% ~~27%~~ of one job (0.9% x 10 ~~30~~ jobs).

b. Kaonoulu Ranch

Kaonoulu Ranch Cattle Operations

Kaonoulu Ranch is a family-owned and operated cattle ranch that comprises most of the Kaonoulu Ahupua‘a which was purchased by the family in 1916. Kaonoulu Ranch has about 10,000 ~~9,000~~ acres used for grazing cattle, about 1,100 breeding cows on average, and about 4.5 employees involved with its cattle operation. Annual per-acre yields of forage from its Kīhei pastures amount to about 50% of those for Kaonoulu Ranch as a whole.

Impact of the School on Kaonoulu Ranch Cattle Operations

Development of the School will remove about 32 acres of grazing land from Kaonoulu Ranch, or about 0.3% ~~0.4%~~ of the 10,000 ~~9,000~~ acres of their grazing land. The corresponding reduction in feed produced from all of its grazing land will be about 0.15% ~~0.2%~~ (0.3% ~~0.4%~~ x 50% adjustment for the lower yields from the Kīhei pastures).

While Kīhei pastures are important for seasonal ~~winter~~ cattle grazing (similar to the situation with Haleakalā Ranch), Kaonoulu Ranch anticipates that this relatively small reduction in feed will have no significant effect on its cattle operation, including no significant impact on the size of its herd, production, revenues, employment or payroll. Kaonoulu Ranch has sufficient land to move its cattle to other pastures.

Cumulative Impact on Kaonoulu Ranch Cattle Operations

Over the next 20 years or so, planned and proposed projects on file with the County could result in the development of about 347 acres that Kaonoulu Ranch uses now to graze cattle, including about 32 acres for the School and about 315 acres for other projects. All of this land is located in Kīhei within the Urban Growth Boundary. This loss amounts to about 3.5% ~~3.9%~~ of its grazing land (347 acres ÷ 10,000 ~~9,000~~ acres), or about 1.8% ~~2%~~ of its available feed (3.5% ~~3.9%~~ x 50% adjustment for the lower yields from the Kīhei pastures).

Kaonoulu Ranch regards a 1.8% ~~2%~~ loss in feed as too small to have a significant effect on its cattle operations inasmuch as it has sufficient lands to move its cattle to other pastures. Even if Kaonoulu Ranch were operated at its maximum carrying capacity and replacement pastures were not available, the impact would be small: about 19.8 ~~22~~ fewer breeding cows

(about 1.8% ~~2%~~ x about 1,100 cows), about 14.9 ~~16.5~~ fewer calves per year (about 75% x the number of cows), about $6,000 ~~$6,600~~ less in annual revenues (about $400 x the number of calves), and the loss of about 0.8% ~~9%~~ of one job (1.8% ~~2%~~ x 4.5 jobs).

c. Mitigating Measures

As discussed above, the School in combination with other projects will result in an insignificant impact on the cattle operations of Haleakalā Ranch and Kaonoulu Ranch. In view of this finding, mitigation measures for the impact of the School on cattle operations are not recommended.

8. IMPACT ON NEARBY FARM OPERATIONS

Seed corn and orchard operations are located about a half-mile north of the School site (see Figure 1). Given the distance, these farms are not expected to cause nuisance problems for the School—i.e., tractor and truck noises, dust blown from fields, drifting of crop-protection products during occasional applications (e.g., fertilizers, soil amendments, dust-control agents, pesticides, etc.). For comparison, many homes in northern Kīhei are less than 120 feet downwind of seed-corn operations. In view of the above, the two farms north of the School site will not have to change their operations because of the School.

In the long run, planned urban development will displace these two farms.

9. IMPACT ON THE GROWTH OF DIVERSIFIED CROP FARMING

The School will commit about 77 acres of land now in the Agricultural District to a non-agricultural use. However, as summarized in Subsection 3.g, this land is poorly suited for growing commercial field crops due to poor soils and the lack of water for irrigating crops.

Maui has a large supply of low-quality agricultural land, including about 20,000 acres *mauka* of Kīhei that is similar in quality to the land that will be used for the School. And since 1990, the contraction and eventual closure of Pioneer Mill (sugarcane) and Maui Pineapple Co. released over 19,000 acres of good farmland in Central and West Maui. While some of this former plantation land was planted in other crops (e.g., seed corn and coffee) and some was developed for homes, most of it remains available for farming. For comparison, the entire County has about 1,700 acres in food crops that are grown for the Hawai‘i market, including about 400 acres in vegetables and melons, about 300 acres in fruits other than pineapple, and about 1,000 acres in pineapple.

In summary, the School will result in a small loss of low-quality agricultural land of which there is a large supply on Maui, but will not affect the supply of good farmland of which there is also a large supply. Consequently, the School will have no impact on the growth of diversified crop farming.

10. OFFSETTING BENEFITS

The loss of 77 acres of low-quality agricultural land will be offset by the following benefits of the School:

— Education of High School Students

Kīhei High School will be a modern school that will provide education to students grades 9 to 12. The School will accommodate 800 students at the end of Phase I construction, and up to 1,650 students at the end of Phase II construction, depending upon need and the availability of State funding.

— Construction and Related Jobs

Phase I construction will last about four years. During this period, construction activity will generate an average of about 460 direct and indirect jobs, of which about 370 jobs will be on Maui. Phase II construction (about 8 years) will generate about 50 direct and indirect jobs, of which about 40 jobs will be on Maui.

— Operating and Related Jobs

At the completion of Phase I construction, School operations will provide about 190 direct and indirect jobs, of which nearly 170 jobs will be on Maui. Phase II will increase these figures to about 330 direct and indirect jobs, of which nearly 290 jobs will be on Maui.

11. CONSISTENCY WITH STATE AND COUNTY AGRICULTURAL POLICIES

a. Availability of Lands for Agriculture

The *Hawai'i State Constitution*, the *Hawai'i State Plan*, the *State Agriculture Functional Plan*, the *County of Maui 2030 General Plan,* the County's *Maui Island Plan (Draft),* and the County's *Kīhei-Mākena Community Plan* call directly or implicitly for preserving the economic viability of plantation agriculture and promoting the growth of diversified agri-

culture. To accomplish this, an adequate supply of agriculturally suitable lands and water must be assured.

With regard to plantation agriculture, the Project site is not and never was part of a sugarcane or pineapple plantation.

With regard to diversified crop farming, there is no current or recent farming on the property. The Project will result in a small loss of low-quality agricultural land of which there is a large supply on Maui, but will not affect the supply of good farmland of which there is also a large supply. Consequently, the Project will have no impact on the growth of diversified crop farming.

With regard to ranching, about 76 acres of the School site are used for grazing cattle. However, feed production is low due to arid conditions. Also, the acreage loss will be too small to effect cattle operations.

b. Conservation of Agricultural Lands

In addition to the above, State and County policies call for conserving and protecting prime agricultural lands, including protecting farmland from urban development.

The School will result in the loss of 1.7 acres of land that is rated as Prime under the ALISH system but is rated as poor under the NRCS and LSB rating systems. All of the remaining 75.6 acres have poor soils.

c. Kīhei-Mākena Community Plan

As shown in Figure 4, the proposed School is partially consistent with the County's Kīhei-Mākena Community Plan in that the southern portion of the property (44.73 acres) is designated Public/Quasi Public while the northern portion (32.6 acres) is designated Agriculture. Development of the School will require changing the Community Plan so that all of the property is designated Public/Quasi Public.

12. FEDERAL FARMLAND PROTECTION

The Federal Farmland Protection Policy Act has as its purpose "… to minimize the extent to which Federal programs contribute to the unnecessary and irreversible conversion of farmland to nonagricultural uses …" To help accomplish this purpose, Form AD-1006 is to be completed for Federal projects or Federally funded projects that convert farmland to a nonagricultural use.

Form AD-1006 was not required for the following reasons:

- No Federal funding or federal assistance was or will be involved with the design and construction of the School.
- The property consists of grazing land, not farmland.
- Only 1.7 acres (2%) of the property have soils that are rated Prime.
- The site does not have an existing water system to irrigate crops.
- No crops are grown on the property, and the site is regarded as unsuitable for growing crops. The only agricultural use is cattle grazing.

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APPENDIX

APPENDIX

STATE AND COUNTY GOALS, OBJECTIVES, POLICIES AND GUIDELINES RELATED TO AGRICULTURAL LANDS

1. HAWAI'I STATE CONSTITUTION (Article XI, Section 3):

…to conserve and protect agricultural lands, promote diversified agriculture, increase agricultural self-sufficiency and assure the availability of agriculturally suitable lands…

2. HAWAI'I STATE PLAN (Chapter 226, Hawaii Revised Statutes, as amended):

Section 226-7 Objectives and policies for the economy--agriculture.

(a) Planning for the State's economy with regard to agriculture shall be directed towards achievement of the following objectives:

(1) Viability in Hawaii's sugar and pineapple industries.

(2) Growth and development of diversified agriculture throughout the State.

(3) An agriculture industry that continues to constitute a dynamic and essential component of Hawaii's strategic, economic, and social well-being.

(b) To achieve the agricultural objectives, it shall be the policy of the State to:

(2) Encourage agriculture by making best use of natural resources.

(10) Assure the availability of agriculturally suitable lands with adequate water to accommodate present and future needs.

(16) Facilitate the transition of agricultural lands in economically nonfeasible agricultural production to economically viable agricultural uses.

Section 226-103 Economic priority guidelines.

(c) Priority guidelines to promote the continued viability of the sugar and pineapple industries:

(1) Provide adequate agricultural lands to support the economic viability of the sugar and pineapple industries.

(d) Priority guidelines to promote the growth and development of diversified agriculture and aquaculture:

(1) Identify, conserve, and protect agricultural and aquacultural lands of importance and initiate affirmative and comprehensive programs to promote economically productive agricultural and aquacultural uses of such lands.

(10) Support the continuation of land currently in use for diversified agriculture.

Section 226-104 Population growth and land resources priority guidelines.

(b) Priority guidelines for regional growth distribution and land resource utilization:

(2) Make available marginal or non-essential agricultural lands for appropriate urban uses while maintaining agricultural lands of importance in the agricultural district.

3. AGRICULTURAL STATE FUNCTIONAL PLAN (1991)

(Functional plans are guidelines for implementing the State Plan. They are approved by the Governor, but not adopted by the State Legislature.)

Objective H: Achievement of Productive Agricultural Use of Lands Most Suitable and Needed for Agriculture.

Policy H(2): Conserve and protect important agricultural lands in accordance with the Hawaii State Constitution.

Action H(2)(a): Propose enactment of standards and criteria to identify, conserve, and protect important agricultural lands and lands in agricultural use.

Action H(2)(c): Administer land use district boundary amendments, permitted land uses, infrastructure standards, and other planning and regulatory functions on important agricultural lands and lands in agricultural use, so as to ensure the availability of agriculturally suitable lands and promote diversified agriculture.

4. COUNTY OF MAUI 2030 GENERAL PLAN, COUNTYWIDE POLICY PLAN (2010)

Countywide goals, objectives, policies and actions

F. Strengthen the Local Economy

Objective

2. Diversify and expand sustainable forms of agriculture and aquaculture.

Policies

b. Prioritize the use of agricultural land to feed the local population, and promote the use of agriculture lands for sustainable and diversified agricultural activities.

c. Support ordinances, programs, and policies that keep agricultural land and water available and affordable to farmers.

Implementing Actions

c. Create agricultural parks in areas distant from genetically modified crops.

J. Promote Sustainable Land Use and Growth Management

Objective

2. Improve planning for and management of agricultural lands and rural areas.

Policies

a. Protect prime, productive, and potentially productive agricultural lands to maintain the islands' agricultural and rural identities and economies.

c. Discourage developing or subdividing agriculturally designated lands when non-agricultural activities would be primary uses.

Implementing Actions

a. Inventory and protect prime, productive, and potentially productive agricultural lands from competing non-agricultural land uses.

5. MAUI ISLAND PLAN, GENERAL PLAN 2030, DRAFT (2009)

Core Values

E. Preserve rural and agricultural lands and encourage sustainable agriculture.

Agricultural Lands

Goal

7.1 Maui Island will have a prosperous agricultural industry and will protect agricultural lands.

Objective

7.1.1 Significantly reduce the loss of prime and productive agricultural lands.

Policies

7.1.1.a Allow limited clustering of development on prime and productive agricultural lands identified on Maui Island Plan Map #7-1 when approved as a Conservation Site Design (CSD) through regulations.

7.1.1.b Require the review and approval of Conservation Site Design (CSD) plans prior to the subdivision of prime and productive agricultural lands identified on Maui Island Plan Map # 7-1.

7.1.1.c Discourage developing or subdividing Prime, Productive or Important agricultural lands for residential uses in which the residence would be

the primary use and any agricultural activities would be secondary uses.

7.1.1.e Focus urban growth, to the extent practicable, away from Prime, Productive or Important Agricultural Lands identified on Maui Island Plan Map #7-1.

7.1.1.f Strongly discourage the conversion of Prime, Productive or Important Agricultural Lands identified on Maui Island Plan Map #7-1 to rural or urban use, unless justified during the General Plan update, when other overriding factors are present.

7.1.1.h Protect Prime, Productive or Important Agricultural Lands identified on Maui Island Plan Map #7-1 from development through the use of TDR/PDR, tax credits, and easement programs.

7.1.1.j Require all major developments adjacent to agricultural lands to provide an appropriate and site-specific agricultural protection buffer as part of a required site plan.

7.1.1.k Support agricultural protection zoning as a vital component of an agricultural land preservation program.

6. COUNTY OF MAUI, KĪHEI-MĀKENA COMMUNITY PLAN (1998)

LAND USE

Objectives and Policies

p. Prevent urbanization of important agricultural lands

r. Allow special permits in the State Agricultural Districts to accommodate unusual yet reasonable uses including: (1) limited agriculturally related commercial, public and quasi-public uses serving the immediate community; (2) uses clearly accessory or subordinate to a principal agricultural use on the property; (3) public facility uses such as utility installations or landfills whose location depends on technical considerations; and (4) extractive industries, such as quarrying, where the operation would not adversely affect the environment or surrounding agricultural uses.

ECONOMIC ACTIVITY

Objectives and Policies

e. Provide for the preservation and enhancement of important agricultural lands for a variety of agricultural activities, including sugar cane, diversified agriculture and aquaculture.

7. REFERENCES

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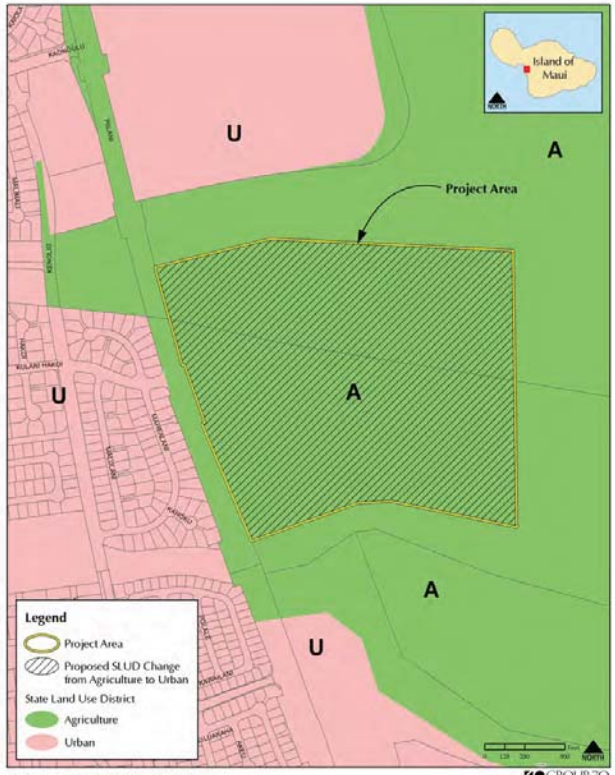
FIGURES

FIGURE 1. LOCATION, KĪHEI HIGH SCHOOL

FIGURE 2. SITE PLAN, KĪHEI HIGH SCHOOL

FIGURE 3. STATE LAND USE DISTRICTS



State Land Use District (SLUD) Map
Kihei High School

GROUP 70 INTERNATIONAL
Date: 8/17/2009

FIGURE 4. COUNTY KĪHEI-MĀKENA COMMUNITY PLAN

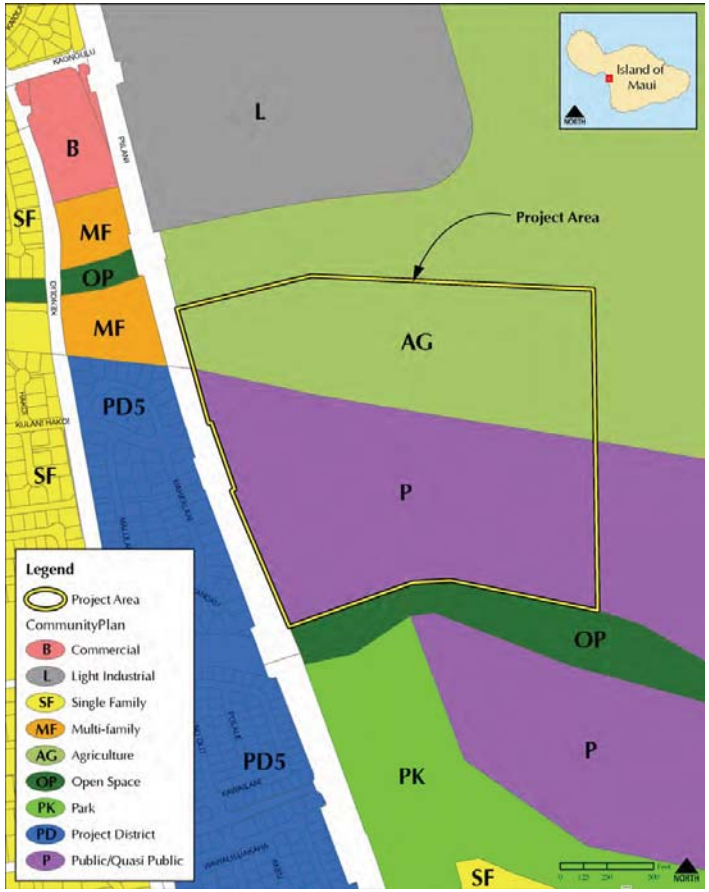
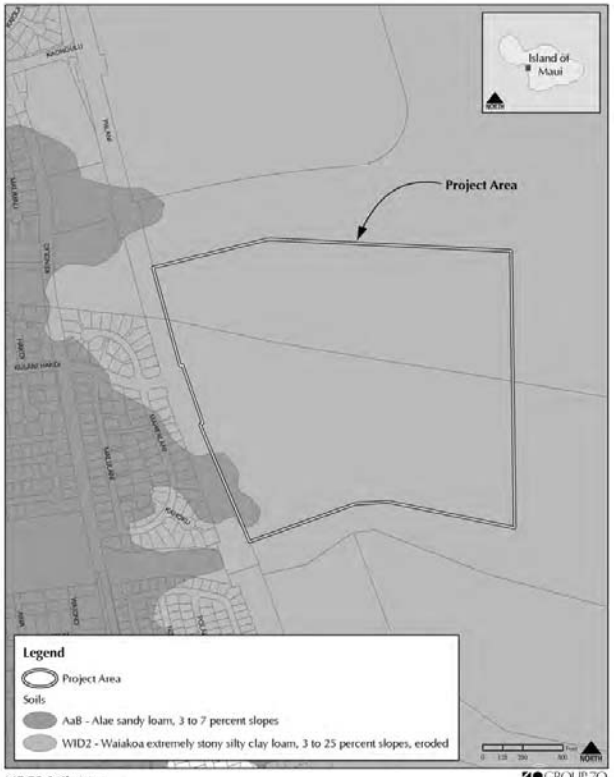


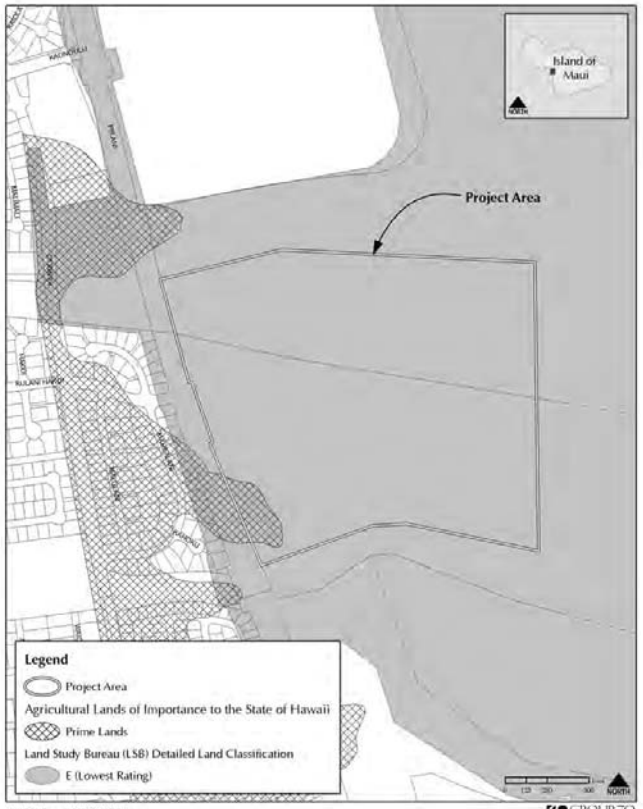
FIGURE 5. SOIL TYPES



NRCS Soils Map
Kihei High School

GROUP 70 INTERNATIONAL
Date: 9/2/2009

FIGURE 6. ALISH AND LSB SOIL RATINGS



ALISH and LSB Map
Kihei High School

GROUP 70 INTERNATIONAL
Date: 9/02/2009

Appendix C

Groundwater Resources and Supply for Kīhei High School Design/Build Project Kīhei, Maui, Hawai'i

Water Resource Associates – May 2011

GROUNDWATER RESOURCES AND SUPPLY
For
KIHEI HIGH SCHOOL DESIGN/BUILD PROJECT
Kihei, Maui, Hawaii

Prepared for:

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May 2011

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GROUNDWATER RESOURCES AND SUPPLY
for
PROPOSED KIHEI HIGH SCHOOL PROJECT
Kihei, Maui

INTRODUCTION

This report presents an assessment of water resources available to meet the water requirements of the proposed Kihei High School as well as an assessment of the probable impacts on those water resources that may result from meeting those water requirements. The proposed school site is located on the mauka side of Piilani Highway, across from Piilani Village in Kihei. The project site is situated on gentle volcanic slopes between two dry gulches and covers approximately 77.1 acres of land ranging in elevation from 40 to 100 ft. Kulanihakoi Gulch lies to the north of the project site and Waipuilani Gulch to the south and both drain westward toward the coast (see Figure 1). The project site includes existing parcels TMK 2-2-002:015 and TMK 2-2-02:54 which are to be consolidated into one parcel.

The conceptual site plan, developed by the Hawaii Department of Education and Group 70 International, Inc., envisions a high school facility consisting of multiple buildings for classrooms, library, cafeteria, gym, student center, and utilities with associated access roads and parking areas. Roughly half the project area is dedicated to sports including fields for softball, baseball, football/track/soccer combined, and practice/play. The high school will require a modest amount of *potable water* which presumably will be provided by the Maui Department of Water Supply (MDWS) from its existing Central Water System (no potable water resources are available within a

reasonable distance of the project site, as described later in this report). *Non-potable water*, on the other hand, required for irrigation of approximately 40 acres of proposed landscaped areas, are proposed to be provided by two new wells to be located and drilled within the project site to tap brackish water in the underlying Kamaole aquifer.

REGIONAL HYDROGEOLOGIC SETTING

The project site is located near the coast at Kihei on the western slopes of East Maui's Haleakala Volcano, some 14 miles from its summit. From Haleakala's summit, innumerable lava flows erupted and built up the western slopes of East Maui in three distinct phases. First, permeable basalt flows erupted during a period of volcanic activity that produced the Honomanu volcanic series and formed the volcanic core and primary aquifer of East Maui. After major erosion of the Honomanu series, a series of poorly permeable andesites and andesitic basalts called the Kula volcanic series erupted and capped the Honomanu series during a later stage of renewed volcanic activity.

Permeable Honomanu basalts underlie the project site and form the principal aquifer in the Kihei region.

Rainfall on the slopes above Kihei is the principal source of groundwater recharge in the region. Rainfall averages 10 inches a year near the coast and increases to 40 inches a year at approximately 6,000 feet and its distribution corresponds roughly with the topographic contours. Groundwater in the underlying aquifer is basal and is typically brackish along the coast with very gradual freshening inland from the coast. No perennial flows occur in the dry gulches that drain the Kihei coastal area, and runoff that does occur in the gulches does not reach the ocean except during large rainstorms.

KAMAOLE AQUIFER SYSTEM

Location and Description

The project site is located in the northern part of the Kamaole Aquifer System approximately ¾ mile inland from the coast (see Figure 2). The aquifer system comprises a triangular-shaped area of approximately 90 square miles, bounded on the south by the Southwest Rift Zone which extends from the coast near La Perouse Bay to the top of Haleakala summit and from there down slope back to the coast just north of Kihei.

Although the Kamaole Aquifer System embraces a large area with an environment ranging from low coastal areas to steep mountain slopes reaching 7,000 ft. in elevation, the system has an average annual rainfall of only 28 inches per year. The system's modest rainfall is primarily due to its location on the leeward side (leeward of Trade winds) of East Maui. Within the aquifer system, annual rainfall ranges from 10 inches a year at the Kihei coast to 40 inches a year at elevations of 5,000 to 6,000 ft.

Groundwater Recharge and Sustainable Yield

The State Commission on Water Resource Management (CWRM) has estimated the groundwater recharge from rainfall in the Kamaole Aquifer System to be 25 million gallons per day (Water Resource Protection Plan, CWRM, 1990). Of the estimated 25 million gallons per day (mgd) of groundwater recharge, CWRM estimates that 11 mgd of groundwater can be developed within the Kamaole Aquifer System on a sustainable basis (Water Resource Protection Plan, CWRM, 2008).

Existing Water Use

Existing water use (12-month moving average, July 2005) within the Kamaole Aquifer System amounted to 1.859 mgd (Water Resource Protection Plan, CWRM, June 2008, pg. 6-17). This reported water use is primarily for golf course and landscape irrigation purposes from brackish wells located near the coast. These wells yield non-potable water with chloride concentrations ranging from approximately 300 mg/L and higher.

Existing Wells

Most of the existing wells in the Kamaole Aquifer System have been drilled within ½ to ¾ miles of the coast to develop brackish groundwater or to dispose of waste effluent and storm runoff into the underlying aquifer. A few wells have been drilled further inland at higher elevations in search of potable or less brackish water. In the Kihei area, most of the existing wells have been drilled makai of Piilani Highway (see Figure 1). Data from these wells, although sparse and sometimes unreliable, indicate that wells located in the Kihei coastal area can be expected to yield small quantities of brackish water with varying chloride salinities (see Table 1). Approximately one mile north of the project site, two wells (4627-14, 16) located ¾ mile inland at elevations of 130 and 140 ft. encountered brackish water with 302 and 362 mg/L chlorides, respectively. One mile south of the project site, Well 4426-03, located at an elevation of 124 ft., encountered brackish water with chlorides initially ranging from 260 to 370 mg/L, but two years later with a 225 gpm pump installed, yielded water with 400 mg/L chlorides.

Approximately two miles southeast of the project site, two wells (4424-01, 4425-01) were drilled in 2005 and 2004 at a distance of 2¾ mile inland from the coast, at elevations of 553 and 551 ft. These two wells encountered brackish groundwater with chloride concentrations of 320 and 300 mg/L (250 mg/L is the arbitrary limit for potable water). The pump capacity installed in each of these wells is reported to be 300 gallons per minute (gpm).

Table 1. Selected Wells in the Kihei Area, Maui

Well No.	Well Name	Year Drilled	Owner/User	Dia. (inch)	Elev (ft.)	Depth (ft.)	Head (ft.	Chloride (mg/L)	Pump Cap. (mgd)
4424-01	Keokea Highlands 2	2005	Maui Highlands Pro	8	553	577	2.6	320	0.432
4425-01	Keokea Highlands	2004	Maui Highlands LLC	6	551	570	2.8	300	0.432
4426-03	Kihei-Maui R&T	1990	Maui R&T Part	8	124	157	1.9	260-400	0.321
4427-03	Medo	1948	Miranda, H.	10		22		803	
4427-09	Kihei Baptist Chapel	1978	Kihei Baptist Chapel	20		15			0.021
4527-01	Tmk 3-9-02-36	1945	Akina, R.	6		30		635	0.170
4527-02	Tmk 3-9-02-32	1946	Yee, W.	8		35		555	
4527-03	Tmk 3—01-02	1947	Perreira, L.	8		20		610	
4527-05	Tmk 3-9-08	1948	Maui County					528	
4527-06	Tmk 3-9-9-01-09	1948	Teruya, E.	6		25		1820	
4527-07	Tmk 3-9-23-30	1949	Uyeno, H.	8		42			
4527-08	Kihei-Piilani	1990	Blackfield Haw	10	41	71	0.8	420	0.057
4527-10	Kihei-Koa	1992	Koa Res Assoc.	24	7	14		697	0.043
4527-12	Waiohuli 1	1989	Baldwin Malama	60		20			
4527-14	Kauhale Makai	2001	Kauhale Makai	6	9	86	1.7	2897	0.216
4527-16	St. Theresa Church	2007		6		45		300	0.086

At Wailea, five miles south of the project site, two wells (not shown in Table 1) drilled in 1991 approximately 1.3 miles inland from the coast also encountered groundwater of near-potable quality. One well (4125-01) was pump tested for four days at a constant rate of approximately 350 gpm (0.50 mgd) with an apparently stable drawdown of 0.5 to 0.7 ft. and a calculated chloride concentration ranging from 250 to 320 mg/L. The other nearby well (4125-02) was also pump tested for four days, but at a higher rate of 420 gpm (0.60 mgd) with a stable drawdown of approximately 1.6 ft. and an estimated chloride concentration of 160 to 175 mg/L.

KIHEI HYDROLOGY

The gulches in the Kihei area are normally dry and only during large rainstorms does runoff in them reach the ocean. The slopes above the Kihei area do not receive much rainfall. Rainfall averages only 10 inches a year at the project site and increases modestly to an average of 40 inches a year approximately 11 miles inland of the project site. Based on existing wells, the groundwater resources within a two-mile radius of the project site consist of a thin basal aquifer that is mostly, if not entirely brackish. The salinity of existing wells in the Kihei area range from roughly 2,000 mg/L chlorides near the coast to roughly 500-600 mg/L approximately ½ to ¾ mile inland from the coast. Wells located north and south of the project site at a distance of approximately ¾ to 1 mile inland from the coast have reported salinities of about 300 to 350 mg/L chlorides. Approximately two miles from the project site, two wells (4424-01, 4425-01) located 2¾ miles inland from the coast, also yielded groundwater with a chloride concentration of 300 to 320 mg/L (see Figure 1).

Well No.	Well Name	Year Drilled	Owner/User	Dia. (inch)	Elev (ft.)	Depth (ft.)	Head (ft.	Chloride (mg/L)	Pump Cap. (mgd)
4527-18	Kaonoulu 5	2007		6	18	50	3.1	184	
4626-01	Waiakea Gulch	1949	Maui County	8	236	260	3.6	453	
4627-03	Tmk 3-9-01-54	1947	Ting, L.	10		29		538	
4627-08	Tmk 3-9-01-33	1948	Hashimoto, T.	6		116		477	
4627-11	Tmk 3-9-01-99	1949	Alo, S.	8		19		515	
4627-14	Tmk 3-9-01-34	1969	Hashimoto, T.		130	200		302	
4627-15	Tmk 3-9-26-43	1969	Neubauer, A.	4		110			
4627-16	Tmk 3-9-26-67	1969	Batoon A	4	140	161		362	
4627-17	Tmk 3-9-26-66	1969	Tavares, H.	4		120			
4627-19	Maui Lu	1956	Maui Lu Resort						0.857

Source of Data: Commission on Water Resource Management and personal notes

PROJECT WATER REQUIREMENT

Potable Water Requirement

The potable water requirement of the Kihei High School project has been estimated by Gray, Hong, Nojima & Associates, Inc. (see Table 2), based on the project having dual water systems: one supplying *potable water* for domestic use from the Maui Department of Water Supply's Central System and one supplying *non-potable water* for landscape irrigation use from two new brackish water wells to be drilled within the project site.

Table 2. ESTIMATED POTABLE WATER REQUIREMENT
(Does not include irrigation water use)

Year	No. of Students	No. of Staff	No. of Students & Staff	Demand Factor (gpcd)	No. of Visitors	Demand Factor (gpcd)	Demand (gpd) Avg Day	Demand (gpd) Max Day	Demand (gpd) Peak Hr
2015	200	40	240	20	10	10	4,900	7,350	14,700
2016	400	40	440	20	20	10	9,000	13,500	27,000
2017	600	100	700	20	30	10	14,300	21,450	42,900
2018	800	120	920	20	40	10	18,800	28,200	56,400
*	1,650	180	1,830	20	85	10	37,450	56,175	112,350

Source of Data: Gray, Hong, Nojima & Associates, Inc., April 2011
*Design capacity at year 2025
gpd - gallons per day
gpcd - gallons per capita per day

In its opening year (2015), the proposed Kihei High School is expected to have an average daily potable water requirement of 4,900 gallons per day (gpd), or approximately 13% of the total requirement at design capacity at year 2025. In the second year of the school's opening (2016), the average daily potable water requirement is expected to increase to 9,000 gpd, or approximately 24% of the total requirement. In the third year (2017), the average daily potable water requirement is estimated at 14,300 gpd, or

approximately 38% of the total requirement. In the fourth year (2018), the average daily potable water requirement is estimated at 18,800 gpd, or approximately 50% of design capacity.

Non-Potable Water Requirement

The project's non-potable water requirement for irrigation of the proposed landscaped areas, which comprise approximately 40 acres, has been estimated by Walters, Kimura, Motoda, Inc. to average 185,000 gpd (see Table 3, third column). This average daily demand is based on an application rate of 1.5 inches of water per acre per week for lawn areas and 1.0 inch of water per acre per week for groundcover areas. The 185,000 gpd amount does not include irrigation of the infield area of the running track.

Total Project Water Requirement

The project's total water requirement, which includes potable water for domestic use from the MDWS's Central System and non-potable water for irrigation use from two new onsite brackish water wells, amounts to 189,900 gpd in the opening year (2015) of the high school. In subsequent years as student enrollment increases, potable water use will increase slightly, while non-potable water use for irrigation will remain unchanged. Consequently, the total project water requirement is estimated to increase only slightly each year, from an average 189,900 gpd in 2015 to 222,450 gpd in the year 2025 (see Table 3, last column).

Table 3. Estimated Total Project Water Requirement

Year	Potable Water Requirement (gpd)	Non-potable Water Requirement (gpd)	Total (gpd)
2015	4,900	185,000	189,900
2016	9,000	185,000	194,000
2017	14,300	185,000	199,300
2018	18,800	185,000	203,800
2025	37,450	185,000	222,450

WATER AVAILABILITY

Potable Water Availability

A study of hydrologic conditions and existing well data indicates that potable water resources do not occur in the project site or within a radius of two miles. No streams or springs occur anywhere and all gulches are normally dry. Groundwater, however, does occur as a thin basal aquifer in permeable basaltic Honomanu lava flows; but with limited regional rainfall and recharge, the underlying aquifer is characteristically brackish and sensitive to increases in salinity under pumping conditions. With no prospect for potable water development within a two mile radius of the project site, the proposed Kihei High School project must look to the Maui County Department of Water Supply (MDWS) to meet its potable water requirements.

Non-Potable Water Availability

A separate non-potable water supply will be developed to meet the project's irrigation water needs and the planned source of water will be the brackish basal aquifer that underlies the project site. Based on a study of existing well data, it is estimated that the aquifer, although thin, will yield brackish water of a quality suitable for irrigation use. In order to maximize chances of success, the aquifer should be explored first by a well located in the northeast (mauka) part of the project site. At this general location, it is estimated that a well will have a salinity ranging from 400 to 500 mg/L chlorides at a pumping rate ranging from 250 to 350 gpm. This projection assumes that the geologic formation encountered by the well will be typical permeable Honomanu basalts and that the well design and construction will be appropriate for a thin basal aquifer.

Alternative consideration is also being given to the use of surplus R-1 effluent from the County's Kihei Wastewater Reclamation Facility located approximately a mile south of the project site. However, the feasibility of using this alternative source of water to meet the project's irrigation water requirement will be studied by others.

PROPOSED WATER SUPPLY

Potable Water Supply

As described earlier in this report, there are no potable water resources, either surface or groundwater, available within a two-mile radius of the project site that could be economically or feasibly developed for the proposed high school. Consequently, the State Department of Education (DOE) will request potable water service for the proposed project from MDWS. Although MDWS does not currently provide service to the project site, the Department does have an existing water system (Central Water System) located nearby. This system serves the Kihei area (as well as others) and has an 18-inch

transmission main located directly makai of the project site, across Piilani Highway. The DOE will construct two water systems for the school project: a *potable water* system to serve the school and a separate *non-potable* water system to irrigate the school grounds. For the potable water system, the DOE will request and seek all necessary approvals of MDWS to supply potable water for both domestic and fire flow requirements in accordance with the department's water system standards. The potable water system will include a main pipeline connecting to the County's 18-inch transmission main, booster pumps, storage tanks, and other appurtenances as may be required by the MDWS. When completed, the potable water system leading to the school property will be dedicated to MDWS.

Non-Potable Water Supply

The proposed non-potable water system for irrigation of approximately 40 acres of school grounds will include two brackish wells, transmission and distribution pipelines, control valves, and other appurtenances, but is not proposed to include a storage tank. The first proposed well (Well No. 1, Figure 1) is located in the northeast corner of the school property at an elevation of approximately 90 ft. and near the foot of a planned 2:1 cut slope. The nearest existing well (4527-08) which lies approximately 2,000 ft. away had an initial salinity of 420 mg/L chlorides when drilled in 1990 (see Figure 1 and Table 1).

A second well is proposed as a standby/supplemental source for the non-potable water system. This second well (Well No. 2, Figure 1) lies approximately 1,600 ft. south of Well No. 1 in the southeast corner of the school property and is also located at an elevation of approximately 90 ft near the foot of a planned 2:1 cut slope. Construction of the second well will depend on the results of the first well.

Based on existing well data, it is projected that each well will have a pump capacity in the range of 250 to 350 gpm while producing suitable brackish water in the salinity range of 400 to 500 mg/L chlorides. Because the proposed non-potable system will operate as a pressurized system without a storage tank, the system's wells must produce at least 385 gpm in order to supply the estimated daily requirement of 185,000 gpd within an

irrigation period of 8 hours. However, the pumping rate required can be decreased by increasing the irrigation period, and vice versa.

The dimensions and other aspects of *each* proposed well are listed below:

Ground Elevation:	90 feet, mean sea level (msl)
Total Depth:	110 feet. (-20 ft., msl)
Casing Diameter:	12 inches
Solid Casing Depth:	90 feet (0 ft., msl)
Louvered Screen Casing Depth:	110 feet (-20 ft., msl)
Casing Material:	Corrosion-Resistant Steel
Anticipated Well Capacity:	250 to 350 gpm
Anticipated Aquifer Head:	2 feet, msl, approx.
Anticipated Total Dynamic Head:	118 psi
Anticipated Salinity (Chlorides):	400 to 500 mg/L
Anticipated Well Drilling/Testing Cost:	$160,000
Stainless Steel Lineshaft Pump (300 gpm) and Controls Cost:	$160,000

Regulatory Requirements

Development of the project's proposed non-potable wells will require permits for well construction and pump installation from the Commission on Water Resources Management (CWRM). Construction and testing of the wells and installation of pumps must conform to the Hawaii Well Construction and Pump Installation Standards of the CWRM. As provided in the Standards, each proposed well must be tested with a pump, including a step-drawdown test of several hours duration and a constant-rate test of 24 to 48 hours duration. Under the well construction and pump installation permits issued for each well, the licensed contractor must promptly file two reports: (1) a Well Completion Report, Part I, after well construction and testing have been completed, and (2) a Well Completion Report, Part II, after installation of the permanent pump has been completed.

Applications for a well and pump installation permit are usually submitted by the licensed well drilling contractor representing the well owner.

Based on a preliminary query, the CWRM currently has no particular concerns regarding the project's proposed brackish wells, but it was pointed out that others in the dry Kihei area are utilizing non-potable wells for landscape irrigation (C. Ice, personal communication, May 2011).

PROBABLE IMPACTS ON GROUNDWATER RESOURCES AND MITIGATION MEASURES

The proposed Kihei High School project is located in the northern part of the Kamaole Aquifer System where the underlying aquifer consists of a thin, brackish, basal aquifer. The proposed project is not expected to have any adverse impact on either the sustainable yield or quality of the underlying brackish aquifer due to the proposed development of 185,000 gpd of brackish groundwater. There are no surface water resources in the vicinity of the project site. The probable impacts of the proposed project on groundwater resources are discussed below.

Impacts on Water Supply

The proposed Kihei High School will require an estimated average of 37,450 gpd of potable water for student and staff and an estimated average of 185,000 gpd of non-potable water for irrigation of approximately 40 acres of landscaping. The potable water requirement for the school is expected to be provided by MDWS by connecting to an existing 18-inch transmission main located near the project site (part of MDWS' Central Water System) located on the North-South Connector Road situated makai of the project site across Piilani Highway. The project's potable water requirement of 37,450 gpd,

represents less than one percent of the County's Central Water System sources of supply which include wells located in a five mile stretch of windward West Maui, extending from Wailuku to north of Waihee Valley.

The project's non-potable water requirement of 185,000 gpd, which will be met from two new onsite wells which will develop basal groundwater from the underlying Kamaole Aquifer System, represents only 1.7 % of the aquifer system's 11 mgd sustainable yield. Consequently, no adverse impacts on existing water supplies are expected from meeting the project's potable and non-potable water requirements.

Impacts on Groundwater Recharge and Sustainable Yield

The proposed withdrawal of 185,000 gpd of brackish groundwater for the Kihei High School is not expected to have any impact on the recharge or sustainable yield of the underlying Kamaole Aquifer System. Rainfall at the project site averages only 10 inches a year and does not contribute recharge to the underlying aquifer. The bulk of aquifer recharge comes from rainfall over much higher elevations inland of Kihei. The withdrawal of 185,000 gpd of brackish water from two new onsite wells represents 1.7% of the 11 mgd sustainable yield of the underlying Kamaole Aquifer System. Thus, the project's proposed non-potable water development is not expected to have any measurable impact on aquifer recharge and sustainable yield.

Impacts on Existing Wells

The project's proposed development and use of an average 185,000 gpd of non-potable water for landscape irrigation from new brackish wells located in the mauka corners of the project site (see Figure 1), is not expected have any adverse impact on existing wells. No existing wells are located up slope of the proposed brackish wells within a radius of two miles. Down slope, the nearest well (4527-08) to proposed Well No.1, lies approximately 2,500 ft. away in a southwest direction, has a brackish water

quality of 420 mg/L chlorides, and has a 40 gpm (57,600 gpd) pump installed. The next three closest wells (4527-06, 4527-07, and 4527-18) all lie approximately 3,400 ft. away in various down slope directions, but none of them have pumps to withdraw water. The existing well closest to proposed Well No. 2 also happens to be Well 4527-08 which is the only nearby well with a pump. Because Well No. 2 lies approximately up-gradient, it has the potential to increase the salinity of Well 4527-08, located 1,900 ft. away, if withdrawals were to become excessive. However, Well No.2 is not expected to have any adverse impact on Well 4527-08 because Well No. 2 is proposed as a standby/supplemental source with limited groundwater withdrawal. Most of the estimated 185,000 gpd of irrigation water supply will be provided by Well No.1 which lies 0.5 mile away and not directly up gradient of Well 4527-08.

Based on an assessment of existing wells in the Kihei coastal area, comparative distances between existing wells, and little groundwater withdrawals from nearby wells; the project's proposed brackish wells and estimated withdrawal of an average 185,000 gpd for landscape irrigation are not expected to have any adverse effect on existing wells located nearby or in the general vicinity of the project.

Impacts on Water Quality

The proposed development of two non-potable wells and the withdrawal of an average 185,000 gpd of brackish groundwater for landscape irrigation are not expected to have any adverse impact on the existing water quality of the Kamaole aquifer at Kihei. The project's proposed development of only 185,000 gpd is also not expected to have any adverse impact on the brackish water quality of any existing wells and their existing primary use for landscape irrigation.

Mitigation Measures

Because no adverse impacts on water resources are expected from the withdrawal of an average 185,000 gpd of brackish groundwater from two new wells located in the project site for landscape irrigation, no direct mitigation measures are proposed.

However, the proposed project will indirectly mitigate impacts on Maui's water resources in the following ways:

- By utilizing brackish groundwater for irrigation purposes, instead of potable water.
- By designing the brackish wells for optimum water withdrawal from a thin basal aquifer.
- By designing the irrigation system for efficient operation to conserve water resources.
- By utilizing efficient irrigation practices to conserve water resources.
- By utilizing drought and brackish-water tolerant plants appropriate for water conservation and Kihei's dry climate.

REFERENCES

State of Hawaii, Department of Land and Natural Resources, Commission on Water Resource Management. Water Resource Protection Plan, 1990.

_____, Water Resource Protection Plan Update, 2008.

_____, Hawaii Well Construction and Pump Installation Standards, 2004.

Maui County, Department of Water Supply. Water System Standards, 2002.

Appendix D

Biological Surveys Conducted for the Proposed New Kīhei High School Kīhei, Maui

Rana Biological Consulting, Inc. – December 2009

Biological Surveys Conducted for the Proposed New Kīhei High School, Kīhei, Maui

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December 4, 2009

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Figures & Tables

Introduction

The State of Hawai‘i Department of Education (DOE) proposes to develop a new high school in Kīhei on an approximately 77-acre site located *mauka* of Pi‘ilani Highway between Kūlanihāko‘i and Waipu‘ilani Gulchs (Figure 1). The lands surveyed are identified as TMK: 2-2-002: 054 (por.); 2-2-002: 015 (por.)

The primary purpose of these surveys was to determine if there were any botanical, avian or mammalian species currently listed, or proposed for listing as endangered or threatened under either the federal or the State of Hawai‘i’s endangered species programs on, or within the immediate vicinity of the project depicted on Figure 1. Federal and State of Hawai‘i listed species status follows species identified in the following referenced documents (Division of Land and Natural Resources (DLNR) 1998, Federal Register 2005, U. S. Fish & Wildlife Service (USFWS) 2005, 2009). Fieldwork was conducted on November 17 and 18, 2009.

Avian phylogenetic order and nomenclature follows *The American Ornithologists' Union Check-list of North American Birds 7th Edition* (American Ornithologists' Union 1998), and the 42nd through the 50th supplements to *Check-list of North American Birds* (American Ornithologists' Union 2000; Banks et al. 2002, 2003, 2004, 2005, 2006, 2007, 2008, Chesser et al., 2009). Mammal scientific names follow *Mammals in Hawaii* (Tomich 1986). Plant names follow *Manual of the Flowering Plants of Hawai‘i* (Wagner et al., 1990, 1999) for native and naturalized flowering plants, and *A Tropical Garden Flora* (Staples and Herbst, 2005) for crop and ornamental plants. Place names follow *Place Names of Hawaii* (Pukui et al*.,* 1974).

Hawaiian and scientific names are italicized in the text. A glossary of technical terms and acronyms used in the document, which may be unfamiliar to the reader, are included at the end of the narrative text.

General Site and Project Description

The school and associated infrastructure is being planned to accommodate an enrollment of up to 1,650 students in grades 9-12. The DOE is planning on building general use and specialty classrooms, library, auditorium, cafeteria, an administration building, industrial arts building, ROTC facility, central plant, physical education and athletic buildings for locker/shower facilities, gymnasium, swimming pool and bleachers.

Access to the high school campus will be gained via a new right-in right-out access road off of Pi‘ilani Highway. The new road will be a *mauk*a extension of the existing Kūlanihāko‘i Street in the Pi‘ilani Village subdivision. The new road will serve as a connector to the master planned communities *mauka* of the school site. Other anticipated circulation improvements include on-site roadways, parking areas, parking lighting, emergency access requirements and traffic signalization.

Location
Kihei High School

GROUP 70 INTERNATIONAL

Date: 7/13/2009

The site is currently being used for cattle pasturage and is highly degraded as is graphically illustrated in Figures 2 and 3. The vegetation on the site is best described as a savanna: grassland with scattered trees.

There are ample signs of past wildfires on the site. Additionally there are numerous unimproved roads; firebreaks and what appear to be bulldozed roads used by the geotechnical-drilling rig during geotechnical studies of the site.

Figure – 2 Kīhei HS site looking northwest showing buflegrass/kiawe habitat taken from southeast corner of the site

Botanical Survey Methods

The botanical survey was undertaken on November 17 and 18, 2009 utilizing wandering transects that traversed all parts of the subject parcel. The route of the botanical survey was recorded (November 17 only) using GPS so that coverage could be assessed as the survey progressed. The survey was conducted early in the wet season and it was apparent that this part of Maui had seen little or no rainfall in the preceding weeks. Therefore some plants occurring on the site, especially annuals were likely not observed. In particular, dried remnants of grasses and herbs were noted that could not be identified or were just barely recognizable. At highly disturbed lowland sites, such as these pasture properties, missed species due to seasonal constraints are expected to be introduced (non-native), weedy species.

Figure-3 Northern portion of the site taken from the center of the Kaonoulu Ranch property showing ungulate grazing damage

Botanical Survey Results

A plant checklist (Table 1) was compiled from the field observations, with entries arranged alphabetically under plant family names (standard practice). Included in the list are scientific name, common name, and status (whether native or non-native) for each species observed on the property. Species status given in **bold** indicates a plant of some interest to the Hawaiian Islands flora. In addition to identifying the plants present within the study site, qualitative estimates of plant abundance were made. These are coded in the table as explained in the Legend to Table 1 and apply to observations made during the present survey.

The project area supports two basic vegetation types: 1) grassland; and 2) savanna. The difference between grassland and savanna is the density of the trees present, but there is no fully accepted definition of a savanna. Definitions range from scattered trees on grassland to open forest with dense, grassy undergrowth. Here, the pasture (on the less grazed southern parcel) is a bufflegrass/lovegrass (*Cenchrus ciliaris*/*Eragrostis pectinacea*) grassland. This parcel merges into a bufflegrass/kiawe (*Cenchrus ciliaris/Prosopis pallida*) savanna towards Waipu‘ilani Gulch along the southern boundary. The northern parcel is essentially all a bufflegrass/kiawe savanna in the project area.

Abundance ratings in Table 1 are given for the entire project area, but are skewed to the only live grass observed: buffelgrass. It was apparent that much a smaller lovegrass (*Eragrostis* cf. *pectinacea*) was also abundant in many areas, but no live plants were seen. A third grass (*Chloris* sp.) may also be abundant, but its distribution was difficult to ascertain from the dried remnants encountered.

Table 1 - Checklist of Plant Species Observed at the Proposed Kīhei High School Site

Species listed by family	***Common name***	**Status**	**Abundance**	**Notes**
	FUNGI			
LYCOPERDACEAE				
Vascellum sp. or *Bovista* sp.	puffball fungus	Nat	R	
	FLOWERING PLANTS			
	DICOTYLEDONES			
EUPHORBIACEAE				
Chamaesyce hyssopifolia (L.) Small	---	Nat	--	<1>
FABACEAE				
Acacia farnesiana (L.) Willd.	*klu*	Nat	O	
Indigofera hendecaphylla Jacq.	prostrate indigo	Nat	--	<1>
Leucaena leucocephala (Lam.) de Wit	*koa haole*	Nat	--	<1>
Prosopis pallida (Humb. & Bonpl. ex Willd.) Kunth	*kiawe*	Nat	AA	
MALVACEAE				
Gossypium tomentosum Nutt. ex Seem.	*ma'o,* Hawaiian cotton	**End**	--	<1>
Sida rhombifolia L.	---	Nat	--	<1>
STERCULIACEAE				
Waltheria indica L.	*'uhaloa*	**Ind.**	O	
	MONCOTYLEDONES			
POACEAE				
Cenchrus ciliaris L.	buffelgrass	Nat	AA	
Chloris sp.	finger grass	Nat	A	<2>
Cynodon dactylon (L.) Pers.	Bermuda grass	Nat	--	<1>
Eragrostis pectinacea (Michx.) Nees	Carolina lovegrass	Nat	AA	<2>

Legend to Table 1

STATUS = distributional status for the Hawaiian Islands:

End = Native only to the Hawaiian Islands.

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

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

ABUNDANCE = occurrence ratings for plants by area:

R – Rare seen in only one or perhaps two locations.

O - Occasional seen with some regularity

A - Abundant found in large numbers; may be locally dominant.
AA - Very abundant abundant and dominant; defining species for vegetation type.

NOTES:

<1> Observed only outside the property along the highway verge fronting the site .
<2> Specimens encountered lacked fruit or flowers; dead material; species determination uncertain.

Excluding the observation of a fungal fruiting body, the total number of species recorded for the property (all flowering plants) was six. This is an astoundingly low number for the size of the property and the number of hours spent conducting the survey. Only *ʻuhaloa* (*Waltheria indica*) counted as a native species, but the low number of all species results in a respectable (for lowland, disturbed sites) ratio of natives of 17%!

Although the survey area was considered to be *mauka* of the fence along the highway and back away from the upper margins of the gulches on the north and south, the land between the fence and the highway was surveyed on the premise that the project could have some impacts in this area, even if limited to access roadways. This area added an additional six species of plants to the listing in Table 1 (see Note <1>). These are, with one exception, ruderal weeds typical of a highway verge. The exception is Hawaiian cotton or *maʻo* (*Gossypium tomentosum*). *Maʻo* is an endemic species. It is widespread in drier areas of the Islands, but numbers of plants tend to be low in most places where it is found. Combining the surveys yields a total of 12 recorded flowering plants (still a very low number), no ferns, and including one each of indigenous and endemic Hawaiian plant species (17% native)

Avian Survey Methods

Nine avian count stations were sited approximately 300-meter apart along three transects that ran from east-to-west within the proposed development site. Eight-minute point counts were made at each of the nine count stations. Each station was counted once. Field observations were made with the aid of Leica 10 X 42 binoculars and by listening for vocalizations. Counts were concentrated between 06:30 a.m. and 10:00 a.m., the peak of daily bird activity. Additionally, the zoologist walked the site in a similar fashion as the botanist, to ensure that no additional species or habitats not encountered during the time dependant avian counts were present on the site.

Avian Survey Results

A total of 168 individual birds of 11 different species, representing eight separate families, were recorded during station counts (Table 2). One of the species recorded, Pacific Golden-Plover (*Pluvialis fulva*), is an indigenous migratory shorebird species that nests in the high Arctic during the late spring and summer months, returning to Hawaiʻi and the Tropical Pacific to spend the fall and winter months each year. They usually leave Hawaiʻi for their trip back to the Arctic in late April or the very early part of May each year. The remaining 10 species detected are all considered to be alien to the Hawaiian Islands. No avian species currently listed, or proposed for

listing under either the federal or State of Hawai‘i endangered species statutes was detected during the course of this survey.

Avian diversity and densities were low, though in keeping with the xeric habitat present within the project site and its current usage for pasturage. Two species: Zebra Dove (*Geopelia striata*) and House Finch (*Carpodacus mexicanus*) accounted for slightly less than 48 percent of the total number of birds detected. The most common avian species recorded was Zebra Dove, which accounted for slightly more than 27 percent of the total number of individual birds recorded. An average of 19 individual birds was recorded per station count.

Table 2 – Avian Species Detected Within the Proposed Kīhei High School Site

Common Name	***Scientific Name***	***ST***	***RA***
	GALLIFORMES		
	PHASIANIDAE - Pheasants & Partridges		
	Phasianinae - Pheasants & Allies		
Gray Francolin	*Francolinus pondicerianus*	A	1.78
Black Francolin	*Francolinus francolinus*	A	1.22
Red Junglefowl	*Gallus gallus*	A	0.22
	CHARADRIIFORMES		
	CHARADRIIDAE - Lapwings & Plovers		
	Charadriinae - Plovers		
Pacific Golden-Plover	*Pluvialis fulva*	IM	0.78
	COLUMBIFORMES		
	COLUMBIDAE - Pigeons & Doves		
Spotted Dove	*Streptopelia chinensis*	A	0.67
Zebra Dove	*Geopelia striata*	A	5.11
	PASSERIFORMES		
	ZOSTEROPIDAE - White-eyes		
Japanese White-eye	*Zosterops japonicus*	A	1.89
	STURNIDAE - Starlings		
Common Myna	*Acridotheres tristis*	A	1.00
	CARDINALIDAE - Cardinals & Allies		
Northern Cardinal	*Cardinalis cardinalis*	A	0.67
	FRINGILLIDAE - Fringilline and Carduleline Finches & Allies		
	Carduelinae - Carduline Finches		
House Finch	*Carpodacus mexicanus*	A	3.78
	ESTRILDIDAE - Estrildid Finches		
	Estrildinae - Estrildine Finches		
Nutmeg Mannikin	*Lonchura punctulata*	A	1.56

Key to table 2

ST Status

A Alien – Introduced to the Hawaiian Islands by humans

IM Indigenous Migratory Species – Native to Hawai‘i, but also found elsewhere naturally, does not nest in Hawai‘i

RA Relative Abundance - Number of birds detected divided by the number of count stations (9)

Mammalian Survey Methods

With the exception of the endangered Hawaiian hoary bat (*Lazarus cinereus semotus*), or *‘ōpe‘ape‘a* as it is known locally, all terrestrial mammals currently found on the Island of Maui are alien species. Most are ubiquitous. The survey of mammals was limited to visual and auditory detection, coupled with visual observation of scat, tracks, and other animal sign. A running tally was kept of all vertebrate species observed and heard within the project area.

Mammalian Survey Results

Seven mammalian species were detected during the course of this survey (Table 3). Only two of these: humans (*Homo sapiens*) and Axis deer (Axis axis) were seen alive. We encountered humans driving trucks within the northern portion of the site. A herd of approximately 10 Axis deer was seen running out of the site and into Kūlanihāko‘i Gulch. We encountered one relatively recently dead cow (*Bos taurus*) on the northern portion of the site. Additionally, we encountered skeletal remains of several other cows within the area surveyed, as well as tracks, sign and scat of dog (*Canis f. familiaris*), cat (*Felis c. catus*), horse (*Equus c. caballus*), pig (*Sus s. scrofa*), Axis deer and cattle throughout the site.

Table 3 – Mammalian Species Detected Within the Kīhei High School Site

Common name	***Scientific Name***	***Detection Type***
	PRIMATES – LEMURS, LORISIDS, GALAGOS, TARSIERS	
	MONKEYS & ALLIES	
	Hominidae – Great Apes & Humans	
Human	*Homo sapiens*	V, A, Si
	CARNIVORA- FLESH EATERS	
	Canidae - Wolves, Jackals & Allies	
Domestic dog	*Canis f. familiaris*	A, T, Si
	Felidae- Cats	
House cat	*Felis catus*	T, Si
	PERISSODACTYLA - ODD-TOED UNGULATES	
	Equidae - Horses, Asses & Zebras	
Domestic horse	*Equus c. caballus*	T, Si
	ATRIODACTYLA - EVEN-TOED UNGULATES	
	Suicidae - Old World Swine	
Pig	*Sus s. scrofa*	T, Si

Table 2 continued

Common name	***Scientific Name***	***Detection Type***
	Cervidae - Antlered Ruminants	
Axis deer	*Axis axis*	V, A, Si,
	Bovidae- Hollow-horned Ruminants	
Domestic cattle	*Bos taurus*	Sk, T, Si

Key to table 3

Detection Type	
V	Visual – at least one live animal was seen
A	Audio – animals were heard
Si	Sign – rubbing, rut marks, dust wallows were seen on the site
T	Tracks – foot prints were seen
Sk	Skeletal – skeletal remains were encountered on the site

Discussion

Botanical Resources

The entire project site is highly disturbed from a natural vegetation perspective, strongly influenced by low amounts of rainfall and grazing by deer and pasture animals.

Avian Resources

The findings of this survey are consistent with the extremely xeric nature and the habitat present on the site. During the course of this survey a total of 11 avian species were recorded during the time spent within the project area (Table 2). One of the species recorded, Pacific Golden-Plover is a native species. Pacific Golden-Plover is indigenous migratory shorebird species that nests in the high Arctic during the late spring and summer months, returning to Hawai‘i and the Tropical Pacific to spend the fall and winter months each year. One species detected Red Junglefowl (*Gallus gallus*), is a domesticated alien species. Red Junglefowl are currently not considered to be established in the wild on the island of Maui, so the two birds heard were likely domestic birds, which may have escaped from their owners. The remaining nine species detected are considered to be alien to the Hawaiian Islands (Table 2). Avian diversity and densities were in keeping with the habitat present within the project area, and its location. No species currently listed, or proposed for listing under either the federal or the State of Hawai‘i endangered species programs were detected during the course of this survey.

Although not detected during this survey, it is possible that small numbers of the endangered endemic Hawaiian Petrel (*Pterodroma sandwichensis*), and the threatened Newell’s Shearwater (*Puffins auriculars newelli*), over-fly the project area between the months of May and November (Banko 1980a, 1980b, Harrison 1990). Recent surveys using ornithological radar have recorded these species flying inland along Maui’s southern and western facing shores (Cooper and Day 2003, 2004, Day and Cooper 1999, Denis and Hamer 2007). There is no suitable nesting habitat within or close to the proposed project site for either of these pelagic seabird species.

The primary cause of mortality in both Hawaiian Petrels and Newell's Shearwaters is thought to be predation by alien mammalian species at the nesting colonies (USFWS 1983, Simons and Hodges 1998, Ainley et al. 2001). Collision with man-made structures is considered to be the second most significant cause of mortality of these seabird species in Hawai'i. Nocturnally flying seabirds, especially fledglings on their way to sea in the summer and fall, can become disoriented by exterior lighting. When disoriented, seabirds often collide with manmade structures, and if they are not killed outright, the dazed or injured birds are easy targets of opportunity for feral mammals (Hadley 1961, Telfer 1979, Sincock 1981, Reed et al. 1985, Telfer et al. 1987, Cooper and Day 1998, Podolsky et al. 1998, Ainley et al. 2001, Hue et al., 2001, Day et al., 2003).

Mammalian Resources

The findings of this survey are consistent with the habitat present on the site, and its location on Maui, and it's current usage as cattle pasturage.

Although no rodents were detected during the course of this survey it is probable that one or more of the four established alien rodents known from the Island of Maui; roof rat (*Rattus r. rattus*), Norway rat (*Rattus norvegicus*), Polynesian rat (*Rattus exulans hawaiiensis*), and European house mice (*Mus musculus domesticus*), use resources within the project site on occasion.

All of the other mammalian species recorded during the course of this survey are commonly occurring species in pastures in the Kīhei area. All of the quadrupeds recorded are considered to be alien to the Hawaiian Islands, and none are protected under either state or the federal endangered species statutes.

Potential Impacts to Protected Species

The development and operation of the proposed school is not expected to result in deleterious impacts to any botanical, avian or mammalian species currently listed or proposed for listing under either the federal or state of Hawai'i endangered species statutes.

Botanical Resources

No plants of interest or concern were observed on the property. However, two specimens of Hawaiian cotton or *ma'o* were observed along the top of the road cut fronting the property. These are in a location unlikely to be used for construction access. *Ma'o* was at one time considered for listing as an endangered species by the USFWS, but this status was downgraded (candidate status withdrawn) when it was established that the species was more widespread than originally believed. Presently the plant has no status under the endangered species act (USFWS, 2009).

Hawaiian Petrel and Newell's Shearwater

The principal potential impact that construction and operation of the new school poses to Hawaiian Petrels and Newell's Shearwaters is the increased threat that birds will be downed after becoming disoriented by lights associated with the project during the nesting season. The two main areas that outdoor lighting could pose a threat to these nocturnally flying seabirds is if, 1)

during construction it is deemed expedient, or necessary to conduct nighttime construction activities, 2) following build-out the potential operation of streetlights and athletic field lighting.

Recommendations

If nighttime construction activity or equipment maintenance is proposed during the construction phases of the project, all associated lights should be shielded, and when large flood/work lights are used they should be placed on poles that are high enough to allow the lights to be pointed directly at the ground.

If streetlights or facility lighting is installed in conjunction with the school, it is recommended that lights be shielded to reduce the potential for interactions of nocturnally flying Hawaiian Petrels and Newell's Shearwaters with external lights and man-made structures (Reed et al. 1985, Telfer et al. 1987). This minimization measure would serve the dual purpose of minimizing the threat of disorientation and downing of Hawaiian Petrels and Newell's Shearwaters, while at the same time complying with the Maui County Code § 20.35 *et seq.* that requires that exterior lights on Maui be shielded.

Replant where appropriate and practicable, with native, xeric tolerant species. *Gossypium tomentosum* is able to survive here without supplemental care of any kind (other than protection from ungulates) and is a type of hibiscus with landscape value in xeric settings (Rauch et al., 1993, Staples and Herbst 2005).

Glossary:

Alien – Introduced to Hawai‘i by humans
Endangered – Listed and protected under the Endangered Species Act of 1973, as amended as an endangered species.
Indigenous – Native to the Hawaiian Islands, but also found elsewhere naturally
Mauka – Upslope, towards the mountains
Nocturnal – Night-time, after dark
‘Ōpe‘ape‘a – Hawaiian hoary bat
Pelagic – An animal that spends its life at sea – in this case seabirds that only return to land to nest and rear their young
Phylogenetic – The evolutionary order that organisms are arranged by
Ruderal – Disturbed, rocky, rubbishy areas, such as old agricultural fields and rock piles
Sign – Biological term referring tracks, scat, rubbing, odor, marks, nests, and other signs created by animals by which their presence may be detected
Threatened – Listed and protected under the ESA as a threatened species
Xeric - Extremely dry conditions or habitat

ASL – Above mean sea level
DLNR – Hawai‘i State Department of Land & Natural Resources
DOE - Hawai‘i State Department of Education
GPS – Global Positioning System, an accurate worldwide navigational and surveying facility based on the reception of signals from an array of orbiting satellites
TMK – Tax Map Key
USFWS – United State Fish & Wildlife Service

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Appendix E

Archaeological Inventory Survey of 77-acres for the Proposed Construction of Kīhei High School in Kīhei, Kaʻonoʻulu, Kōheo 1 & 2 and Waiohuli Ahupuaʻa, Makawao District, Island of Maui, Hawaiʻi

Scientific Consultant Services – December 2009

LINDA LINGLE
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February 12, 2010

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LOG NO: 2010.1140
DOC NO: 1002PC09
Archaeology

SUBJECT: **Chapter 6E-8 Historic Preservation Review – REVISED**
Archaeological Inventory Survey for the Proposed Kihei High School
Ka'ono'ulu/Koheo 1-2/Waiohuli Ahupua'a, Wailuku/Makawao Districts, Maui
TMK: (2) 2-2-002:015 por.; (2) 2-2-002:054 por.

Thank you for the opportunity to review this revised report, which our staff received in PDF format on February 4 (Perzinski and Dega 2009): *Archaeological Inventory Survey of 77 Acres for the Proposed Construction of Kihei High School*...Scientific Consultant Services, Inc.

The report was first reviewed by SHPD staff on January 30 (SHPD LOG NO: 2010.0194; DOC NO: 1001PC26), resulting in several requested revisions.

The survey area as described in the report consists of a 77 acre (30.8 hectare) portion of TMKs (2) 2-2-002:015 and (2) 2-2-002:054. Fieldwork, undertaken between August 16 and September 1 of 2009, was comprised of a 100% pedestrian survey and included two manually excavated test units. One surface architectural site (partially previously recorded) comprised of eight features [seven rock mounds, one alignment], now on record as SIHP #50-50-10-6393, was identified. All of the features are believed to have originated during the post-Contact ranching period.

The report now contains the required information as specified in HAR §13-276-5 regarding the documentation of inventory level fieldwork in general and is acceptable.

As stated in the initial review letter, we concur that SIHP #50-50-10-6393 is significant under Criterion D of the Hawai'i and National Registers of Historic Places for its ability to yield important information related to prehistory or history and that no further work with respect to the site itself is needed because it is significant solely for information content and a reasonable and adequate amount of that information was collected during the survey.

However, we are still not comfortable with the recommendation for no monitoring during any portion of ground altering disturbance within the 77 acre project area. While continuous monitoring does not appear to be necessary, we believe a program of intermittent monitoring during initial phases of ground

preparation and build out should be implemented. Such a program could then later be adjusted to address specific conditions within the project area. Therefore, we will reserve final comment pending review of all project related permit applications and plans.

Now that the archaeological inventory report has been accepted pursuant to HAR §13-276, please send one hardcopy, clearly marked **FINAL** *(the revised electronic copy does not need to be sent again)* to the attention of "**SHPD Library**" at the Kapolei SHPD office.

Aloha,

Nancy A. McMahon

Nancy McMahon, Deputy SHPO/State Archaeologist
State Historic Preservation Division

c: Jeff Hunt, Director, Dept. of Planning, FAX (808) 270-7634
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ARCHAEOLOGICAL INVENTORY SURVEY OF 77-ACRES FOR THE PROPOSED CONSTRUCTION OF KĪHEI HIGH SCHOOL IN KĪHEI, KA`ONO`ULU, KŌHEO 1 & 2 AND WAIOHULI AHUPUA`U, MAKAWAO DISTRICT, ISLAND OF MAUI, HAWAI`I [TMK: (2) 2-2-002:015 (por.) and 054 (por.)]

Prepared by:
David Perzinski, B.A.
and
Michael Dega, Ph.D.
December 2009

Prepared for:
Group 70 International Inc.
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Honolulu, Hawaii 96813

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INTRODUCTION

At the request of Group 70 and the State of Hawai`i Department of Education, Scientific Consultant Services, Inc. (SCS) conducted an Archaeological Inventory Survey for the Proposed Kīhei High School in Kīhei, Ka`ono`ulu, Kōheo 1 & 2 and Waiohuli Ahupua`a, Wailuku and Makawao District, Island of Maui, Hawai`i [TMK: (2) 2-2-002:015 (por.) and :054 (por.)] (Figures 1 and 2). The archaeological inventory survey consisted of historical background and archival research; pedestrian survey and inspection of the parcel; mapping and description of site features, manual subsurface testing; and, analysis, interpretation, and reporting of all relevant data. Fieldwork was conducted between August 16- September 1, 2009 by David Perzinski, B.A. and Brian Armstrong, B.A. under the overall direction of Michael Dega, Ph.D. (Principle Investigator).

Archaeological work in the project area was conducted to determine the presence/absence of archaeological deposits in surface and subsurface contexts through a thorough survey and representative subsurface testing. The ultimate goals of the project were to determine if significant cultural or historic resources, and/or human burials occurred on the parcel; and, to provide significance assessments and recommendations to the State Historic Preservation Division (SHPD).

The project area is planned for the development of a new high school and will include a library, auditorium, cafeteria, administration building, industrial arts building, ROTC facility, physical education and athletic buildings, gymnasium, swimming pool and bleachers. Ground disturbing activities associated with the proposed high school include mass excavation, site grading, excavation for retaining walls, landscaping, a stadium and baseball and softball fields. The project will be situated on a portion of 77-acres of undeveloped land currently owned by Ka`ono`ulu Ranch (Parcel 15) and Haleakala Ranch Company Pacific Rim Land Holdings, Inc. (Parcel 54).

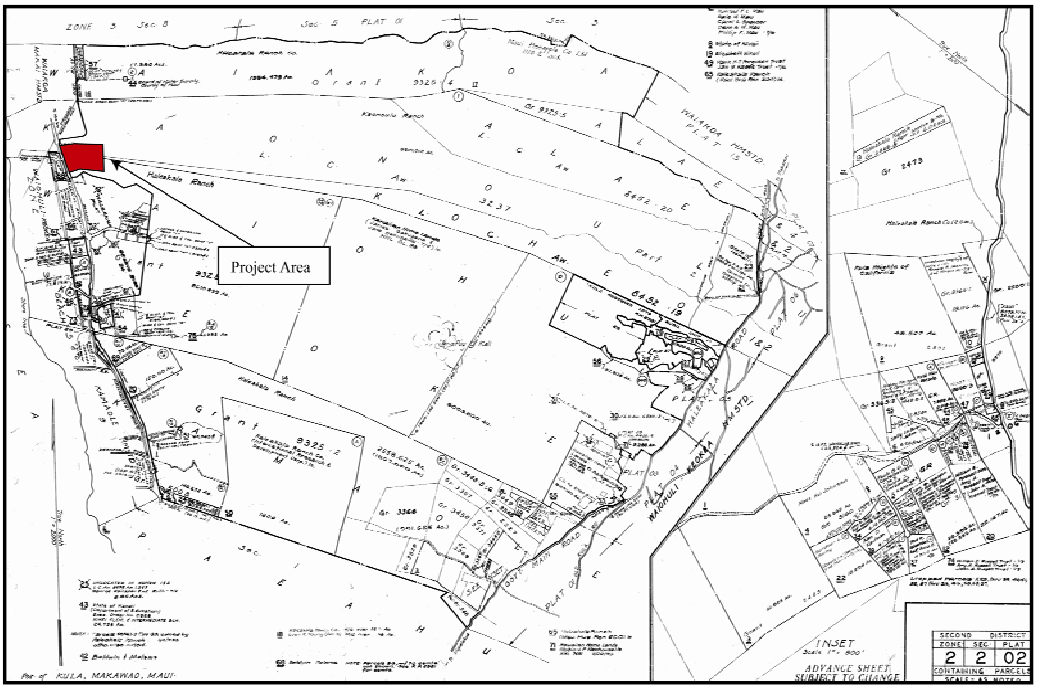

Figure 2: TMK (2) 3-9-09 Showing Location of Project Area

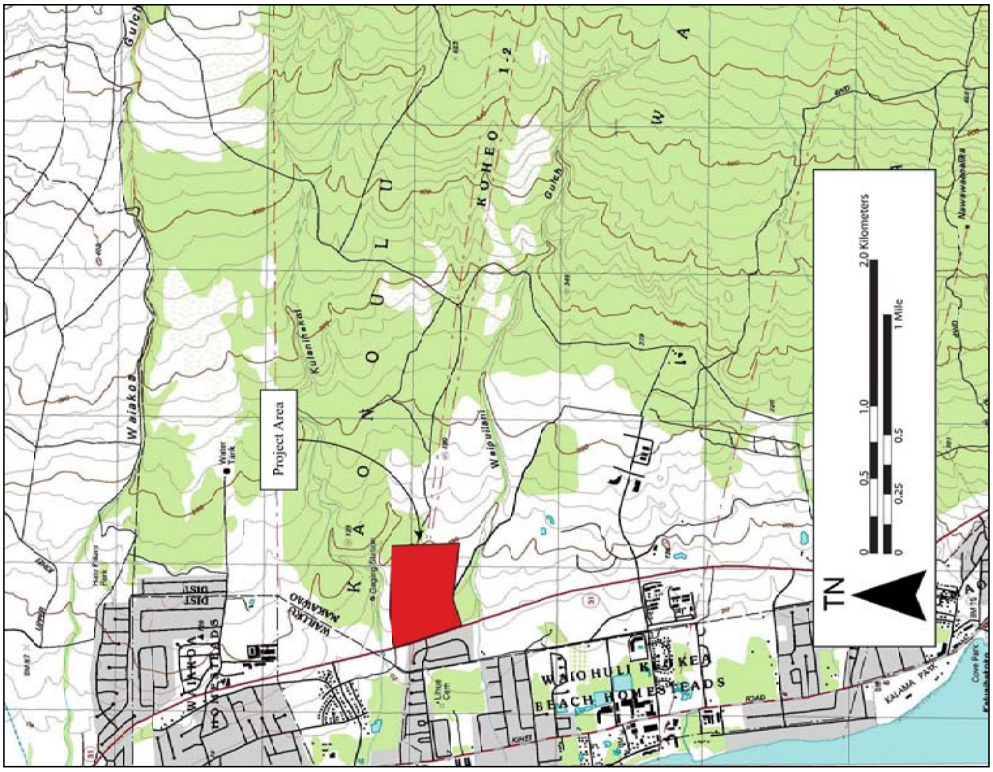

Figure 1: Portion of USGS Topographic Map Showing the Location of the Project Area

ENVIRONMENTAL SETTING

PROJECT AREA DESCRIPTION

The project area is roughly rectangular shaped and consists of a 77-acre lot that is bounded by Kulanihakoi Gulch to the north, Waipuilani Gulch to the south, undeveloped ranch land to the east and Pi`ilani Highway to the west. The parcel is located 1 kilometer inland from Kalepolepo Park at elevations ranging from 30 feet to 100 feet A.M.S.L. and is currently undeveloped.

SOILS

The project area soils are classified as "Waiakoa extremely stony silty clay loam" (Foote, et al., 1972). These soils form on smooth, low uplands, and stones cover 3 to 15 percent of the ground surface. In most areas where this soil occurs, approximately 50 percent of the surface layer has been eroded. Runoff levels are average, and the erosion hazard is severe (Foote *et al.* 1972). For these reasons, soils in the project area are generally only good for pastureland and wildlife habitat. Low bedrock outcrops are commonly associated with these soils, and cultivation is usually impractical unless the stones are removed. (*ibid*., 127).

CLIMATE AND VEGETATION

Coastal Kīhei, in general, is classified as a '*Kiawe* and Lowland Shrubs' vegetation zone, and common, local plants include: *kiawe* (*Prosopis pallida*), *koa haole* (*Leucaena glauca*), finger grass, and *pili* grass, (the latter is a native species) (Armstrong 1983). In traditional times, *i.e.,* before the historic-era introduction of *kiawe* and *koa haole,* the project area was probably covered with indigenous grasses (Kirch 1973a).

Coastal Kīhei, in general, is classified as a '*Kiawe* and Lowland Shrubs' vegetation zone, and common, local plants include: *kiawe* (*Prosopis pallida*), *koa haole* (*Leucaena glauca*), finger grass, and *pili* grass, (the latter is a native species) (Armstrong 1983). In traditional times, *i.e.,* before the historic-era introduction of *kiawe* and *koa haole,* the project area was probably covered with indigenous grasses (Kirch 1973a). Today, vegetation in the project area includes beach *naupaka* (*Scaevola taccada*), coconut palm (*Cocus nucifera*), beach heliotrope (*Heliotropium* sp.), plumeria (*Plumeria acuminate*), *wiliwili* (*Erythrina sandwicensis*), yellow hibiscus (Family, *Malvaceae*), and bougainvillea (*Bougainvillea spectabilis*) as well as various other introduced tropical flowering plants and extensive grassy lawns.

Annual rainfall in the project area ranges between 22 and 33 centimeters annually and is the lowest on Maui, making this region one of the driest in the Hawaiian Islands archipelago (Armstrong 1983). At the time of the present survey, the subject parcel was exceptionally dry and dusty, consistent with a period of prolonged drought in the area. In fact, because of this combination of low rainfall and fairly unproductive soils, the general area in which the subject parcel is located has been labeled the

"barren zone" (Cordy 1977), a characterization that has been supported by numerous archaeological surveys in the area.

BARREN ZONE

In geographical and physiographical terms, the barren zone is an intermediary zone between direct coastline and back beach areas to upland forests and more mountainous environments. The barren zone is a medial zone that appears to have been almost exclusively transitory, or at best, intermittently occupied through time. Intermittent habitation loci, as defined by surface midden scatters or small architectural features (*i.e.*, C-shapes and alignments) dominate the few documented traditional-period site types in the area through time. Post-Contact features are generally limited to walls and small alignments, respectively associated with ranching and military training in the area.

The barren zone was an intermediary region between verdant upland regions and the coastline. Apparently, agricultural endeavors were practically non-existent in the barren zone and tool procurement materials (basalt and wood) were selected from other locales as well. Sediment regimes in the area are shallow, most often overlying bedrock, and perennial water sources are virtually non-existent.

Cordy (1977) divided the Kīhei area (inclusive of the project area) into three environmental zones (or subzones when one considers the entire *ahupua`a*): coastal, transitional/barren, and inland. The current project location occurs in the transitional or barren zone: the slopes back of the coast with less than 30 inches of rainfall annually (Cordy 1977:4).

This barren zone is perceived as dry and antagonistic to permanent habitation. Use of the area would primarily have been intermittent or transitory, particularly as the zone could have contained coastal-inland trails and would have marked an intermediary point between the two more profitable eco-zones. The region remains hostile to permanent habitation, only having been "conquered" in recent times through modern adaptation (*i.e.*, water feed systems, etc.).

Based on general archaeological and historic research, the barren zone was not subject to permanent or expansive population until recent times. This intimates that population pressure along the coast was minimal or non-existent in the Kīhei coastal area through time. As such, architectural structures associated with permanent habitation sites and/or ceremonial sites are not often identified in the area. The prevailing model that temporary habitation / temporary use sites predominate in the barren zone has been authenticated further by recent research.

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HISTORICAL BACKGROUND

CULTURAL HISTORICAL CONTEXT

The island of Maui ranks second in size of the eight main islands in the Hawaiian Archipelago. The island was formed by two volcanoes, Mount Kukui in the west and Haleakalā in the east. The younger of the two volcanoes, Haleakalā, soars 3055 m or 10,023 feet (over 30,000 feet if measured from the sea floor) above sea level and embodies the largest section of the island. Unlike the amphitheater valleys of West Maui, the flanks of Haleakalā are distinguished by gentle slopes. Although it receives more rain than its counterpart in the east, the permeable lava flows of the Honomanū and Kula Volcanic Series prevent the formation of rain-fed perennial streams. The few perennial streams found on the windward side of Haleakalā originate from springs located at low elevations. Valleys and gulches were formed by intermittent water runoff.

The environment factors and resource availability heavily influenced pre-Contact settlement patterns. Although an extensive population was found occupying the uplands above the 30-inch rainfall line where crops could easily be grown, coastal settlement was also common (Kolb *et al*. 1997). The existence of three fishponds at Kalepolepo, north of the project area, and at least two *heiau* (shrine, temple, place of worship) identified near the shore confirm the presence of a stable population relying mainly on coastal and marine resources.

PAST POLITICAL BOUNDARIES

Traditionally, the division of Maui's lands into districts (*moku*) and sub-districts was performed by a *kahuna* (priest, expert) named Kalaiha`ōhia, during the time of the *ali`i* Kaka`alaneo (Beckwith 1979:383; Fornander places Kaka`alaneo at the end of the fifteenth century or the beginning of the sixteenth century [Fornander 1919-20, Vol. 6:248]). Land was considered the property of the king or *ali`i `ai moku* (the *ali`i* who eats the island/district), which he held in trust for the gods. The title of *ali`i `ai moku* ensured rights and responsibilities to the land, but did not confer absolute ownership. The king kept the parcels he wanted; his higher chiefs received large parcels from him and, in turn, distributed smaller parcels to lesser chiefs. The *maka`āinana* (commoners) worked the individual plots of land.

In general, several terms were used to delineate various land sections. A district (*moku*) contained smaller land divisions (*ahupua`a*), which customarily continued inland from the ocean and upland into the mountains. Extended household groups living within the *ahupua`a* were able to harvest from both the land and the sea. Ideally, this situation allowed each *ahupua`a* to be self sufficient by supplying needed resources from different environmental zones (Lyons 1875:111). The *`ili `āina* or *`ili* were smaller land divisions next to importance to the *ahupua`a* and were administered by the chief who controlled the *ahupua`a* in which it was located (*ibid*:33; Lucas 1995:40). The

mo`o`āina were narrow strips of land within an *`ili*. The land holding of a tenant or *hoa `āina* residing in an *ahupua`a* was called a *kuleana* (Lucas 1995:61).

The project area is located in the *ahupua`a* of Ka`ono`ulu, which translated means literally "the desire for breadfruit" (Pukui *et al*.:86), Waiohuli "water of change" (*Ibid.* 226*),* and Kōheo "to show off" or "to twirl" (*Ibid*, 115).

TRADITIONAL ACCOUNTS

There is little specific information pertaining directly to Kīhei, which was originally a small area adjacent to a landing built in the 1890s (Clark 1980). Presently, Kīhei refers to a six-mile section along the coast from the town of Kīhei to Keawakapu. Scattered amongst the agricultural and habitation sites were places of cultural significance to the *kama`āina* of the district including at least two *heiau.* In ancient times, there was a small village at Kalepolepo (located approximately 1 km west of the present study parcel) based primarily on marine resources. Occasionally, it has been recorded, that the blustery Kaumuku Winds would arrive with amazing intensity along the coast (Wilcox 1921).

There were several fishponds in the vicinity of Kīhei; Waiohuli, Kēōkea-kai, and Kalepolepo Pond (also known by the ancient name of Kō`ie`ie Pond; Kolb et al. 1997). Constructed on the boundary between Ka`ono`ulu and Waiohuli Ahupua`a, these three ponds were some of the most important royal fishponds on Maui. The builder of Kalepolepo and two other ponds (Waiohuli and Kēōkea-kai) have been lost in antiquity, but they were reportedly rebuilt at least three times through history, beginning during the reign of Pi`ilani (Cordy 2000).

Oral tradition recounts the repairing of the fishponds during the reign of Kiha-Pi`ilani, the son of the great chief Pi`ilani, who had bequeathed the ponds to Umi, ruler of Hawai`i Island. Umi's *konohiki* (land overseer or manager) ordered all the people from Maui to help repair the walls of Kalepolepo's fishponds. A man named Kikau protested that the repairs couldn't be done without the assistance of the *menehune* who were master builders (Wilcox 1921:66-67). The *konohiki* was furious and Kikau was told he would die once the repairs had been made. Kēōkea-kai was the first to be repaired. When the capstone was carried on a litter to the site, the *konohiki* rode proudly on top of the rock as it was being placed in the northeast corner of the pond. When it was time for repairs on Waiohuli-kai, the konohiki did the same. As the last pond, then known as Ka`ono`ulu-kai, was completed, the *konohiki* once again rode the capstone to its resting place. Before it could be put into position, the capstone broke throwing both the rock and *konohiki* into the dirt. The workers reportedly said "*Ua konohiki Kalepolepo, ua eku i ka lepo*," or, "the manager of Kalepolepo, one who roots in the dirt" (ibid:66). That night a tremendous storm threw down the walls of the fishponds. The *konohiki* implored Kikau to help him repair the damage. Kikau called the *menehune* who rebuilt the walls in one night. Umi sent for Kikau who lived in the court of Waipi`o valley from then on. The region of Kēōkea-kai and Ka`ono`ulu-kai fishpond became known as Kalepolepo fishpond (*ibid*).

The Kalepolepo fishponds were rebuilt by Kekaulike, chief of Maui in the 1700s, at which time it supplied *`ama`ama* (mullet) to Kahekili II. Again, it was restored by Kamehameha I when he ruled as governing chief over Maui and for the last time in the 1840s when prisoners from Kaho`olawe penal colony were sent to do repairs (Kamakau 1961; Wilcox 1921). At this time, stones were taken from Waiohuli-kai pond for the reconstruction of Kalepolepo. It was here at Kalepolepo that Kamehameha I reportedly beached his victorious canoes after subduing the Maui chiefs.

Trails extended from the coast to the mountains, linking the two for both economic and social reasons. A trail known as the *alanui* or "King's trail" built by Kihapi`ilani, extended along the coast passing through all the major communities between Lāhainā and Mākena, including Kīhei. One trail, named "*Kekuawaha`ula`ula*" or the "red-mouthed god", extended from Kīhei inland to Kēōkea. Another, the Kalepolepo trail, began at the Kalepolepo fishpond and continued to upland Waiohuli. These trails were not only used in the pre-Contact era, but were expanded to accommodate wagons bringing produce to the coast in the 1850s (Kolb et al. 1997:61).

The Hawaiian economy was based on agricultural production and marine exploitation, as well as raising livestock and collecting wild plants and birds. Extended household groups settled in various ahupua`a. During pre-Contact times, there were primarily two types of agriculture, wetland and dry land, both of which were dependent upon geography and physiography. River and stream valleys provided ideal conditions for wetland *kalo* (*Colocasia esculenta*) agriculture that incorporated pond fields and irrigation canals. Other cultigens, such as *kō* (sugar cane, *Saccharum officinaruma*) and *mai`a* (banana, *Musa sp.*), were also grown and, where appropriate, such crops as *`uala* (sweet potato, *Ipomoea batatas*) were produced. This was the typical agricultural pattern seen during traditional times on all the Hawaiian Islands (Kirch and Sahlins 1992, Vol. 1:5, 119; Kirch 1985).

The district of Kula (presently Makawao) was known for dry land agriculture, and later, pig husbandry. Dryland agricultural field systems were characterized by extensive stone and earthen embankments, reliance on rainfall, and regular rotation of crops (Kolb *et al.* 1997:6). These systems were also noted for their arid conditions and lack of perennial streams (Chun *et al.* 2005). In fact, the word *kula* is also used to describe lands which were dry and inaccessible to water, except from rainfall (Malo, 1951). According to Kolb *et al.* (1997), the key component of Kula's economy was the dryland agriculture in and near the upland forests. *`Uala* (*Ipomoea batatas*), or sweet potato, is a tuber that will not grow in very wet areas. In discussing the environs of the region, Handy (1940) noted that the primary staple of Kula was the *`uala*:

> Kula was always an arid region, throughout its long, low seashore, vast stony *kula* lands, and broad uplands. Both on the coast, where fishing was good, and on the lower westward slopes of Haleakala a considerable population existed.... [Activities included] fishing and raising occasional crops of potatoes along the coast, and cultivating large crops of potatoes

> inland, especially in the central and northeastern section including Keokea, Waiohuli, Koheo, Kaunoulu, and Waiakoa….Kula was widely famous for its sweet-potato plantations. '*Uala* was the staple of life here. [1940: 161]

Agricultural development on the leeward side of Maui was likely to have begun early in what is known as the Expansion Period (A.D. 1200–1400, Kirch 1985). According to Handy:

> On the south side of western Maui the flat coastal plain all the way from Kīhei and Ma`alaea to Honokahua, in old Hawaiian times, must have supported many fishing settlements and isolated fishermen's houses, where sweet potatoes were grown in the sandy soil or red lepo [soil] near the shore. For fishing, this coast is the most favorable on Maui, and, although a considerable amount of taro was grown, I think it is reasonable to suppose that the large fishing population, which presumably inhabited this leeward coast, ate more sweet potatoes than taro with their fish…[1940:159].

Handy and Handy (1972:131) also describe the planting methods in the drier sections of Kula:

> Where potatoes are planted in crumbling lava with humus, as on eastern Maui and in Kona, Hawaii, the soil is softened and heaped carelessly in little pockets and patches using favorable spots on slopes the crumbling porous lava gives ample aeration without much mounding.

At lower, drier elevations, in the so-called barren zone, agriculture was a relatively minor component of the traditional subsistence economy. In fact, the early historical accounts and archaeological evidence suggest that the barren zone, in which the subject parcel is situated, was a transitional area in which people moved resources between the coast and the uplands to heights of c. 1,000 feet (above mean annual sea level). Large, permanent settlements—with clusters of habitations, *heiau*, petroglyphs, and large agricultural terraces and garden enclosures—have been documented in the uplands, above the 30-inch annual rainfall line, while Fishponds and coastal *heiau* indicate a relatively sizable coastal population relying on marine resources (Kolb et al. 1997).

EARLY HISTORIC TO MID-1800'S

Early records, such as journals kept by explorers, travelers and missionaries, Hawaiian traditions that survived long enough to be written down, and archaeological investigations have assisted in the understanding of past cultural activities. Unfortunately, early descriptions of this portion of the Maui coast are brief and infrequent. Captain King, Second Lieutenant on the *Revolution* during Cook's third voyage briefly described what he saw from a vantage point of "eight or ten leagues" (approximately 24 miles) out to sea as his ship departed the islands in 1779 (Beaglehole 1967). He mentions Pu`u Ōla`i, south of Kīhei, and enumerates the observed animals, thriving groves of breadfruit, the excellence of the *taro*, and describes the sugarcane as being of an unusual height. Seen from this distance and the mention of breadfruit suggest the uplands of Kīpahulu-Kaupo and `Ulupalakua were his focus.

In the ensuing years, LaPérouse (1786), Nathaniel Portlock and George Dixon, (also in 1786), sailed along the western coast, but added little to our direct knowledge of Kīhei. During the second visit of Vancouver in 1793, his expedition becalmed in the Ma`alaea Bay close to the project area. (A marker commemorating this visit is located across from the Maui Lu Hotel). He reported:

> The appearance of this side of Mowee was scarcely less forbidding than that of its southern parts, which we had passed the preceding day. The shores, however, were not so steep and rocky, and were mostly composed of a sandy beach; the land did not rise so very abruptly from the sea towards the mountains, nor was its surface so much broken with hills and deep chasms; yet the soil had little appearance of fertility, and no cultivation was to be seen. A few habitations were promiscuously scattered near the waterside, and the inhabitants who came off to us, like those seen the day before, had little to dispose of. [Vancouver 1984:852]

Archibald Menzies, a naturalist accompanying Vancouver stated, "…we had some canoes off from the latter island [Maui], but they brought no refreshments. Indeed, this part of the island appeared to be very barren and thinly inhabited" (Menzies 1920:102). According to Kahekili, then chief of Maui, the extreme poverty in the area was the result of the continuous wars between Maui and Hawai`i Island causing the land to be neglected and human resources wasted (Vancouver 1984:856).

Cultivation of Irish potatoes in the Kula district began shortly before 1840, after which time Kula became known as "the potato district" because of its great success in their cultivation. During Kula's peak potato producing period of the 19th century, dryland gardens in the uplands extended all the way from Kula to Kaupo. The resulting deforestation adversely affected the amount of rainfall in the district and periods of drought became more common (Kolb *et al*. 1997). The *Honolulu Advertiser* describes the changes to Kula and the Kīhei area:

> Before 1850 Kula was supplied with moisture naturally through the existence of a large forest. That forest was cut down when land was cleared in Kula to open farm plots in 1850. This was in answer to the demand for food in California during the gold rush… [and] by ranchers clearing for pasture. A secondary result of clearing forests was destruction of existing fresh water ponds in Kihei on the Maalaea Bay coast below Kula. When forest was cleared, water was free to rush down the mountains carrying soil from Kula and filling with mud the ponds for which Kihei was once famous [1962:A15].

Ranching was also present in Kula prior to the 1840s (Land Court Awards, State Archives). Large sections of Crown Land were leased for grazing cattle, and, by the 1880s, lower Kula consisted primarily of pastureland for ranching. Archaeological evidence of ranching is present near the subject parcel (see below). In 1888, Edwin H. Baily, Lorrin A. Thurston, W.H. Baily, and Henry P. Baldwin met in Honolulu and purchased Maui ranch lands owned by Charles Alexander for $50,000. The

resulting ranch included 33,817 acres with 400 to 500 acres set aside for corn cultivation. Haleakala Ranch Company historically used the land in and around the project area for ranching activities.

THE MĀHELE 1848-1851

During the late Historic Period, extreme modification to traditional land tenure occurred throughout all of the Hawaiian Islands. Kame`eleihiwa (1992: 209), states that the Makawao District was the first area in Hawai`i to experiment with land sales. In January 1846, land was made available for eventual ownership to *maka`āinana* (commoners). According to Chinen (1961), land was sold for $1.00 per acre; this would mark the beginning of land grants. Experimental lots purchased by Hawaiians ranged from five to ten acres and if applicants met all of the requirements (and were notified of the procedures), they eventually received the title to their land.

The transition from traditional Hawaiian communal land use to private ownership and division was commonly referred to as the Māhele (division). The Māhele of 1848 set the stage for vast changes to land holdings within the islands as it introduced the foreign (western) concept of land ownership to the Islands. Although it remains a complex issue, many scholars believe that in order to protect Hawaiian sovereignty from foreign powers, Kauikeaouli (Kamehameha III) was forced to establish laws changing the traditional Hawaiian economy to that of a market economy (Kuykendall Vol. I, 1938:145 footnote 47, 152, 165–166, 170; Daws 1968:111; Kelly 1983:45; Kame`eleihiwa 1992:169–170, 176).

For natives that had been cultivating and living on the lands, lengthy and costly procedures enabled them to (possibly) claim some of the plots. The first Land Commission was formed in 1845, during which time all individuals holding land were required to submit their claims or forfeit their lands. Once lands were made available and private ownership was instituted the *maka`āinana* were able to claim the plots on which they had been cultivating and living, if they had been made aware of the foreign procedures (kuleana lands, Land Commission Awards, LCA). These claims could not include any previously cultivated or presently fallow land, *`okipū* (on O`ahu), stream fisheries or many other resources necessary for traditional survival (Kelly 1983; Kame`eleihiwa 1992:295; Kirch and Sahlins 1992). If occupation could be established through the testimony of two witnesses, the petitioners were awarded the claimed Land Commission Award (LCA), issued a Royal Patent number (RP), and could then take possession of the property (Chinen 1961: 16).

The land that *maka`āinana* received was less than one percent of total lands, all of which needed to be surveyed. A total of 88,000 people submitted 14,195 requests for land and of these only 8,421 were awarded. (Kame`eleihiwa 1992: 295). In 1850, it became legal for foreigners to purchase land and they received large portions for diminutive prices. At this time, many Native Hawaiians lost access to their lands due to mortgage default.

The *Māhele* statute paved the way for the private ownership of land [awarded claims were called Land Commission Awards]. The portion of the present project area within Ka`ono`ulu Ahupua`a appears to have been awarded to Hewahewa (LCA 3237 Part 2) (Waihona Aina Database, 2009).

HISTORIC PERIOD

Ranching was present in Kula prior to the 1840's (Land Court Aeards, State Archives). Large sections of Crown Lands were leased for grazing cattle and by the 1880s, lower Kula consisted primarily of pasture land for ranching. In 1888, Edwin H. Baily, Lorrin A. Thurston, W. H. Baily, and Henry P. Baldwin met in Honolulu and purchased Maui ranch lands owned by Charles Alexander for $50,000. The resulting ranch included 33,817 acres with 400 to 500 acres set aside for corn cultivation. The land of Kēōkea, particularly the lowland/coastal portion, was historically used for ranching activities by Haleakalā Ranch Company.

Twentieth century activities in the Kula District included a significant WWII military presence along the beach of Ma`alaea Bay, a Combat Demolition training Station at Kama`ole, two naval air stations at Pu`unēnē and Kahului, and Army camps and hospitals in the Kula and Makawao area. Large acreage was used for livestock breeding and comprised the majority of the land use (Mark 1975). Rapid commercial resort development and private residences, especially in the Kīhei area, has occurred in the Kula coastal section since the 1970s.

Within the present project area, commercial ranching encompasses the entire project area. Several bulldozed roads exist within the *makai* portion of the parcel and a fence running east/west divides Haleakala Ranch lands from Ka`ono`ulu Ranch lands.

PREVIOUS ARCHAEOLOGICAL RESEARCH

A substantial number of archaeological investigations have been conducted over the past few years near the present project area in the Kīhei area of Maui. The following presents a synthesis of studies within the transitional and "barren zone" of Kula District showing that despite a large number of studies, relatively few significant sites have been documented (Figure 3).

Work by Cordy (1977) in the Kīhei area resulted in a pre-Contact settlement model that divides the landscape into three environmental zones: coastal, transitional/barren, and inland. The current project area falls into the transitional/barren zone, which refers to "the slopes back of the coast with less than 30 inches of rainfall" (Cordy 1977:4). This barren zone is viewed as relatively marginal for permanent habitation because of its dryness, rocky soils, and dearth of natural resources. In general, archaeological surveys in the barren zone around Kīhei have confirmed these earlier suppositions about land use as there was very little evidence of pre-Contact Native Hawaiian settlement.

Cox (1976) surveyed near the project area along the corridor of the Pi`ilani Highway and failed to notice a single site or significant feature. Kirch (1985) examined similar geographic settings to the south (towards Makena) and also failed to find any evidence of traditional Native Hawaiian activities in the barren zone. In fact, as Kennedy (1986) observes, this settlement pattern of avoiding the barren zone probably continued from ancient times through the early historic period as LCAs were issued for land situated in the further upland reaches.

Just *makai* of the project area, within the two phases of the Pi`ilani Residential Community, four archaeological studies have been conducted. Cordy (1977), EISC (1982) and Donham (1989 and 1990) documented a total of 23 sites including wall segments, small structures, cairns, historic structures, enclosures and agricultural features. The surface features were interpreted as traditional Hawaiian (with the exception of the concrete structure remnants) related to temporary habitation and agricultural pursuits. Based on similar findings in leeward East Maui, it was suggested that the "features within the survey area post date c. AD 1500" (Donham, 1990:15).

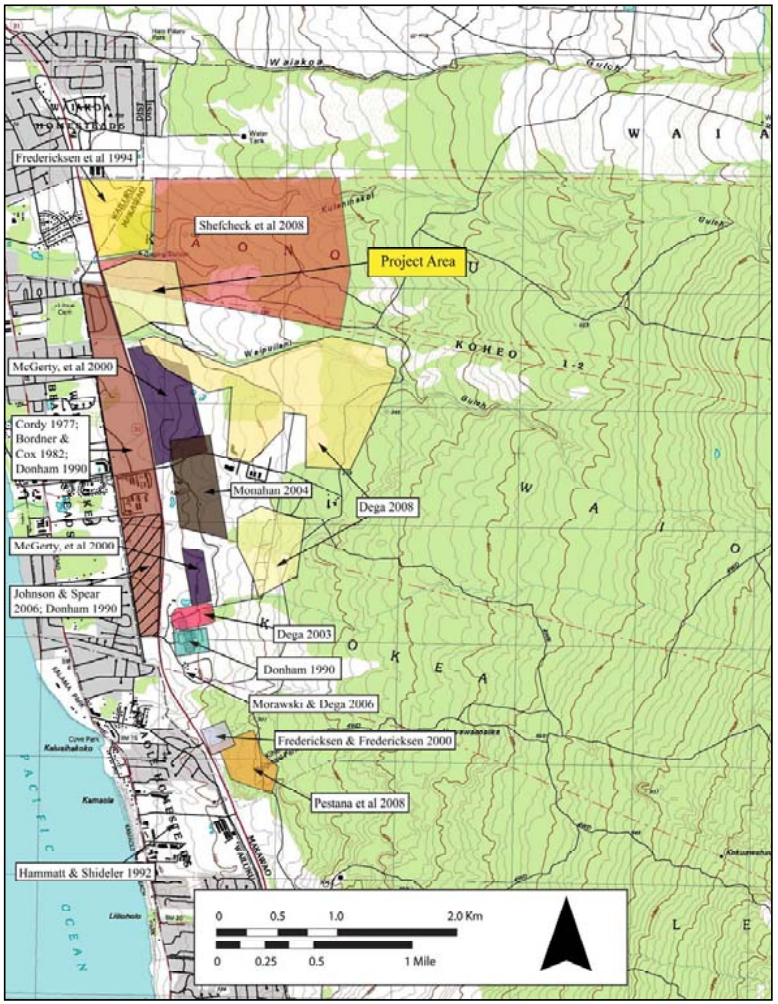

Figure 3: Portion of USGS Map Showing Location of Previous Archaeological Studies in Vicinity of Project Area

Kennedy (1986) conducted an archaeological reconnaissance of the entire 150.032 acres of the then-proposed Maui Research and Technology Park (TMK:2-2-02, since changed to 2-2-24), situated 3 km south of the project area. Kennedy's study, which did not include subsurface testing (excavation), concluded that no archaeological sites or features were located within the proposed site.

Hammatt and Shideler (1989) conducted work across Pi`ilani Highway west of the proposed Kīhei Regional Park area between the highway and the coast. This project led to the identification of a historic ranch site, possible burials, a C-shaped structure, and a midden scatter.

Hammatt and Shideler (1992) also conducted an inventory survey in the *makai* portion of Kama`ole Ahupua`a and documented a disturbed traditional Hawaiian site. As noted by Hammatt and Shideler (1992:10), "what is particularly striking in the many archaeological reports on Kīhei is the general paucity of sites within the transitional or barren zone.

Theresa Donham conducted an archaeological reconnaissance of the Haleakala Greens Subdivision area (Hibbard 1994). She identified a low, circular rock mound, a historical site with multiple features on the crest of a prominent ridge, a linear rock mound or wall remnant, a rock-filled terrace outlined with a low, rock wall, and other modifications along a rock outcrop. Shell midden was observed on the surface inside an enclosure.

Chaffee et al. (1997) conducted an Archaeological Inventory Survey, including subsurface testing (excavation), of a portion of the Maui Research and Technology Park, within the area investigated by Kennedy (1986). Three sites consisting of ten archaeological features were identified. The features included remnant terraces, stone alignments, a mound, and a modified outcrop. All of the sites were interpreted as agricultural in function with the exception of a rock mound that may have functioned as a religious feature.

Mayberry and Haun (1998) conducted a survey south of the present project area. This work led to the identification of 33 sites consisting of at least 69 features, these interpreted as agricultural, habitation, and military structures.

McGerty *et al.* (2000) surveyed fifteen selected areas within the Elleair Maui Golf Club, and identified five archaeological sites (State Site Nos. 50-50-10-5043, -5044, -5045, -5046, and -5047) containing a total of seven surface features. The surface features were interpreted as agricultural terraces, perhaps dating from the pre-Contact period, and C-shaped rock formations

(fighting positions) built during World War II training. Ten excavation units placed within these features yielded no cultural material.

McDermott (2001) conducted an archaeological inventory survey for a retention basin adjacent to the project area on the south side of Waipuilani Gulch. In total, four historic properties were located within the project area and three additional located just outside the parcel. The sites consisted of stone cairns, modified outcrop enclosures, terraces, stone mounds and alignments. The sites were thought to be traditional Hawaiian temporary habitations or ancillary features associated with the habitations. McDermott states that site densities are typically quite low within the "barren zone" with multiple studies having been conducted on large parcels (Kennedy 1986, Watanabe 1987, Hammatt and Shideler 2000) that did not lead to the identification any pre-Contact sites. However, military sites related to World War II training exercises have been previously documented in the area (McGerty *et al*. 2000), these sites often consisting of low, short alignments or walls. The few radiocarbon dates acquired from the area indicate definitive use of the landscape in later prehistory c. A.D. 1500 to 1600+.

Tome and Dega (2002) conducted an Inventory Survey on a 3.142-acre parcel located approximately 400 m inland from the Kama`ole coastline where one traditional archaeological site, four surface midden scatters, and a basalt alignment were identified. Interpretations of the survey reflected that the property had been utilized as a single-use site due to absence of subsurface cultural material from 14 stratigraphic trenches excavated on the parcel. Like this project, most of the ones mentioned above occurred just to the west of coastal sand deposits in what is commonly known as the "Barren Zone". However, while some archaeological surveys were productive, there were those along the coast that were not. Namely, Calis' (2001) Inventory Survey directly in sandy sediment along Kamaole did not lead to the documentation of occupation or burials.

Tome and Dega (2002) also conducted an Archaeological Inventory Survey along the northeastern flank of the Elleair Maui Golf Club property. They identified a historical ranching corral and a short agricultural wall, collectively designated State Site No. 50-50-10-5233. No other structures or subsurface deposits were identified. No traditional Native Hawaiian sites or features were identified. Another Inventory Survey along the southern flank of the Elleair Maui Golf Course (Dega 2003) failed to yield any archaeological or historical site or features.

A more recent Inventory Survey (Dega and Tome 2003) conducted in Kīhei Town also failed to yield significant deposits or burials in sandy substrate. Recent exceptions to this rule

have been seen in Waiakoa Ahupua`a (Hamada-Takatani Subdivision at TMK: 3-9-006:40) where a fairly large number of burials and possible burials have been identified (Rotunno-Hazuka n.d.).

Monahan (2003) conducted an Archaeological Inventory Survey, including subsurface testing (excavation), of a 28.737-acre portion of the Maui Research and Technology Park, also within the area investigated by Kennedy (1986), situated immediately upslope (*mauka*) of Lot No. 1-B. Other than one surface feature—a small arrangement of stacked boulders interpreted as a 'push pile,' this survey yielded no evidence of historic or prehistoric significance.

Monahan (2004) also surveyed a 56 acre parcel located near Elleair Golf Course. Four surface features, consisting of stacked basalt stones, were identified and recorded as individual sites. Three of these sites were interpreted as traditional Hawaiian temporary habitation and work areas. Unfortunately two of the sites failed to yield datable materials and the other returned a modern radiocarbon date (0+/- 50 BP).

Shefcheck, *et al* (2008) conducted an Archaeological Inventory Survey of 516 acres of land in Ka`ono`lulu Ranch which included a portion of the present project area. Forty new archaeological sites were identified and recorded during this work. Of the forty sites recorded during this work, eight are associated with pre-Contact activities. These pre-Contact sites consisted of temporary rock shelters with petroglyph components, enclosures, platforms, a mound and a wall. Historic sites found during this work pertained to agriculture and military training activities.

In summary, previous archaeological research has documented a fairly limited degree of human settlement in the Kīhei area. Within the "barren zone", archaeological reconnaissance and inventory surveys adjacent to, and nearby the subject parcel have yielded a modest amount of evidence of both historical and traditional human activities. Based on the over thirty years of archaeological study in the barren zone of the former Kula District, it is clear that the area was not a desirable location for either a permanent population or for large scale agricultural endeavors that were undertaken in the more upland locales. Whether this pattern was the result of poor soil development, low precipitation, or lack of population pressure that would have forced individuals to seek new areas to settle, it is likely that previous archaeological studies would have identified at least remnants of any permanent habitation or agricultural complexes that can be found in the more inland reaches of Kula.

SETTLEMENT PATERNS

The settlement pattern for the district of Kula (Makawao) is varied, as are the models describing such settlement patterns. From environmental deterministic models to the "exclusive upland permanent settlement model", the "exclusive coastal permanent habitation model", the bimodal model-permanent habitation in the uplands and on the coast", and the transhumance model" (Hayden in Kolb et al. 1997: 145-152), the history of Kula District has been somewhat dichotomized into a classic upland-lowland motif. All four models mentioned above are indeed directly relevant to Kula District. As is noted by Hayden (in Kolb et al. 1997:157), and must be considered in any settlement pattern modeling of the islands:

> "One problem with the coastal sample set is that a large amount of construction had occurred prior to the introduction or enforcement of the preservation laws, particularly in the Kula area. This development proceeded without archaeological work, and as a result little information is available, and many of the coastal Kula sites have been destroyed. Thus, we know little yet about the coastal zone of Kula."

The prevailing "model" at this time for Kula settlement pattern analysis has been formed by Kolb et al. (1997:191) and consists of a combination of all four models. The models take into account the entire district of Kula. A more succinct model pertaining solely to coastal and near coastal reaches of Kula District has been proposed by Cordy (1977, 2000). This model provides more in-depth discussion of zones characterizing the present project area.

The settlement pattern of the Kula District would included both permanent and temporary sites near the coast, a minimal amount of ceremonial sites (*heiau*), dryland field and field hale, and burials, although the latter have not yet been reported in large concentrations. Proceeding upland to the current project area, the "barren zone" would have trails and associated shelters leading to the uplands. Both the barren zone and coastal areas are suggested to have a low density of sites (see Cordy 2000:2). The barren zone and far above would contain the bulk of prehistoric through historic-period sites, and temporary habitation areas and trails, among other classes. By way of comparison, while the upland field zone was occupied contemporaneously with coastal reaches of Kula, the upland zone contains a higher density of sites as well as greater diversity of site types. Again, evidence for the Kula coastal zone may have been obscured by recent residential and commercial developments.

In specific terms of the barren zone wherein the present research was conducted, this intermediary zone between direct coastline and backbeach areas to upland forests appears to

have been almost exclusively transitory, or at best, intermittently occupied during traditional times. Intermittent habitation loci, as defined by surface midden scatters or small architectural features (i.e., C-shapes, alignments) dominate documented site types in the area through time. Divided within an inland-coastal dichotomy, the barren zone was a necessary area to access more productive upland regions and along the coastline. Apparently, agricultural endeavors were practically non-existent in the barren zone until historic times and tool procurement materials (basalt, wood) were selected from other locales. Based on archaeological and historic research, the barren zone was not subject to permanent or expansive population (until recently with ranching). This intimates that population pressure along the coast was minimal or non-existent along the Kīhei coastline through time.

As such, architectural structures associated with permanent habitation sites and/or ceremonial sites were not expected within the project area prior to the inventory survey. The prevailing model that temporary habitation-temporary use sites and later ranching-period sites predominate in the barren zone has been authenticated further by the present research.

METHODS

The Field Inspection of the parcel was conducted by SCS archaeologist David Perzinski, B.A. and Brian Armstrong from August 16-September 1, 2009, under the direction of Michael Dega, Ph.D (Principal Investigator). The inventory survey covered a 100% pedestrian surveys utilizing 5-10 m transects oriented roughly north/south (upslope/down slope) depending on ground cover and visual range. The project area boundaries were clearly delineated by Pi`ilani Highway to the west, Waipuilani Gulch to the south, Kalanihakoi Gulch to the north and survey stakes to the east.

When sites were encountered, the location was flagged, noted on a project area map and later recorded. The sites were plotted on a map using site topography and visual indicators and were documented with written descriptions, photographs and plan view maps. Site boundaries were determined by their horizontal and horizontal extent. In addition, 2 manually excavated units on 2 mounds were excavated for a better understanding of the function of the sites and chronological information. Site age and function were determined based on construction technique, spatial relationship to other sites and topography, presence/absence of historic indicators (i.e. introduced materials, construction techniques), and previous archaeological research.

Archival research entailed investigating the historic and archaeological background of the general project area. This examination included a documentary search of previous archaeological research conducted in this region of Maui as well as a review of archival literature relating to Land Commission Awards and local mythology. The review of historical documents was accomplished in order to understand the impact of post-Contact events on the cultural and archaeological landscape of the region. All project area records (i.e. notes, profiles, photographs, etc.) are currently being curated in the SCS Maui office.

D. Consultation with Individuals Knowledgeable About the Project Area

Informal interviews were conducted with a Haleakala Ranch worker, Haleakala Ranch Vice President of Land and Resources J. Scott Meidell (*vis* Patty Conte, SHPD Archaeologist), James Pa`anui (MLIBC Representative), Hinano Rodrigues (SHPD Cultural Historian) and Patty Conte (SHPD Maui Archaeologist) about the project area.

RESULTS OF FIELDWORK

One site was identified during the archaeological inventory survey of 77 acres in Ka`ono`ulu, Kōheo 1 & 2, and Waiohuli Ahupua`a, Makawao District, Island of Maui, Hawaii [TMK (2) 2-2-02:15 (por.) and 54 (por.)]. A 100% pedestrian survey and limited subsurface testing re-documented one site, SIHP No.: 50-50-10-6393, which consists of 8 features (7 mounds, 1 alignment) (Figure 4). Three manually excavated test units were excavated to aid in the understanding of the functional interpretation of the features.

SIHP No.: 50-50-10-6393 **Condition:** Poor
Site Type: Mound Complex
Function: Agriculture/Ranching
Feature (#): 8
Age: Historic

Description: Site -6393 (Figure 5) is a complex of 8 features located in the northeastern portion of the project area. The site is located on Keonoulu Ranch lands on a relatively level portion of the project area, approximately 300 m from Pi`ilani Highway at an elevation of 20 m A.M.S.L. The eight features consist of a series of low mounds and one alignment constructed of basalt cobbles and boulders. A portion of this site was previously documented by SCS (Shefcheck *et al.* 2008) and was described as consisting of "three features, all of which are rock mounds that were likely constructed during bulldozer activities on the lot, due to the angular, broken up condition of stones in the features and the presence of a bulldozed area (possibly an old road) just north of Feature 3" (Shefcheck *et al.* 2008:23). The three features described by Shefcheck are believed to correspond to features A-C below.

Feature A is located in a dry, grassy area amid a landscape of weathered cobbles, boulders and exposed bedrock. The feature consists of a roughly constructed mound measuring 1.9 m in diameter with a maximum height of 60 cm (Figure 6 and 7). The feature is constructed of piled basalt cobbles and is not faced. The cobbles and boulders displayed relatively fresh breaks, as compared to the weathered cortex of the basalt, suggesting that the mounds are likely historic constructions. No additional cultural materials were observed on the surface. The feature is suggested to have functioned for ranching purposes.

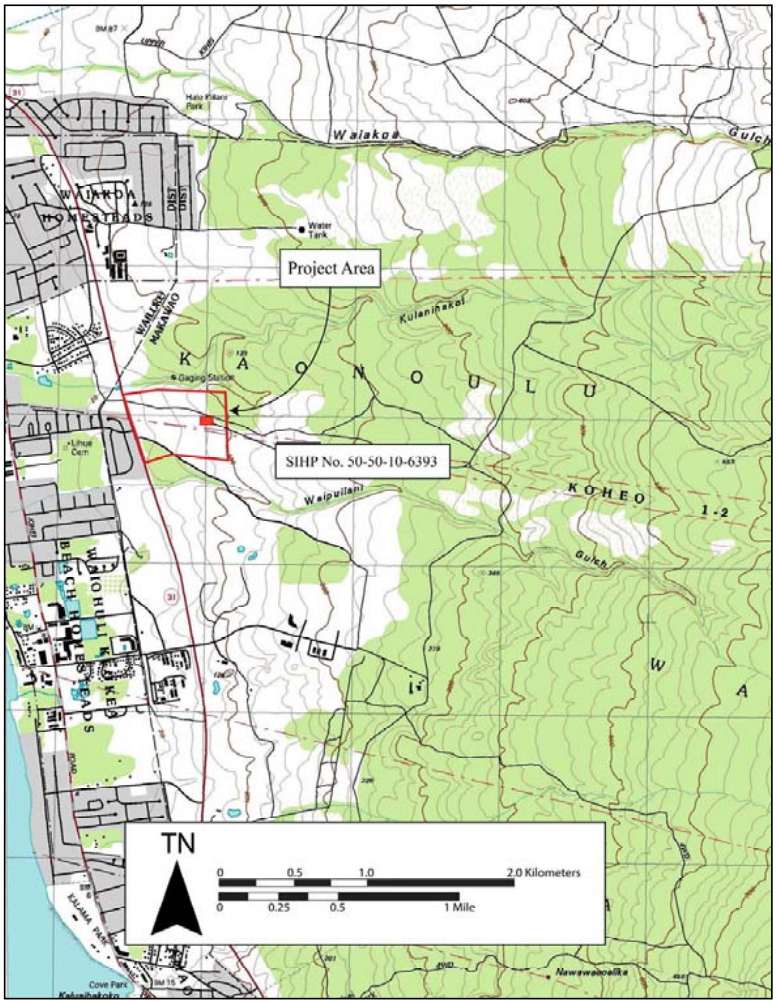

Figure 4: Portion of USGS Map Showing Location of SIHP No. 50-50-10-6393

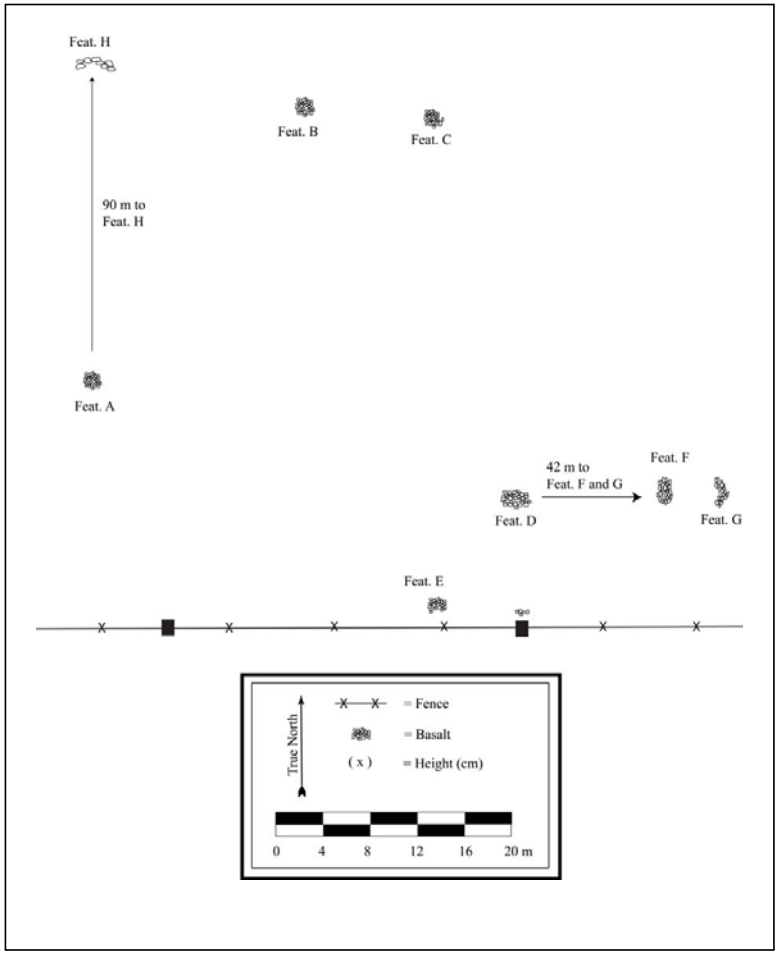

Figure 5: Plan View of SIHP No. -6393

Figure 7: View West of SIHP No. -6393 Feature A

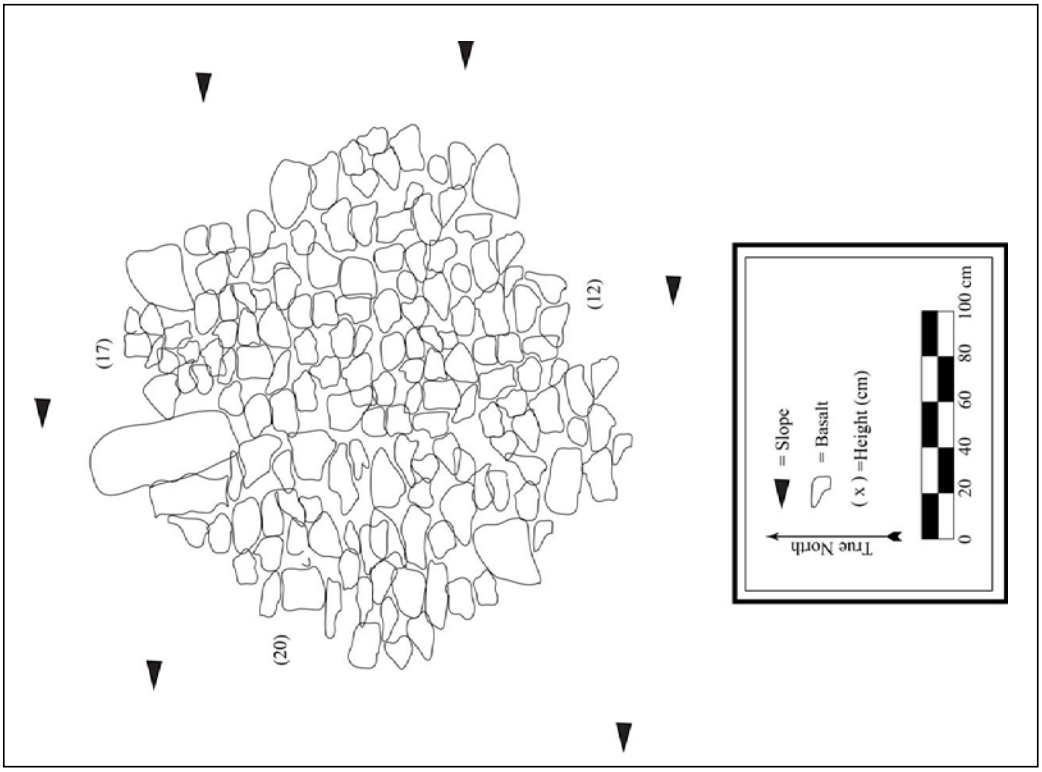

Figure 6: Plan View of SIHP No. -6393 Feature A

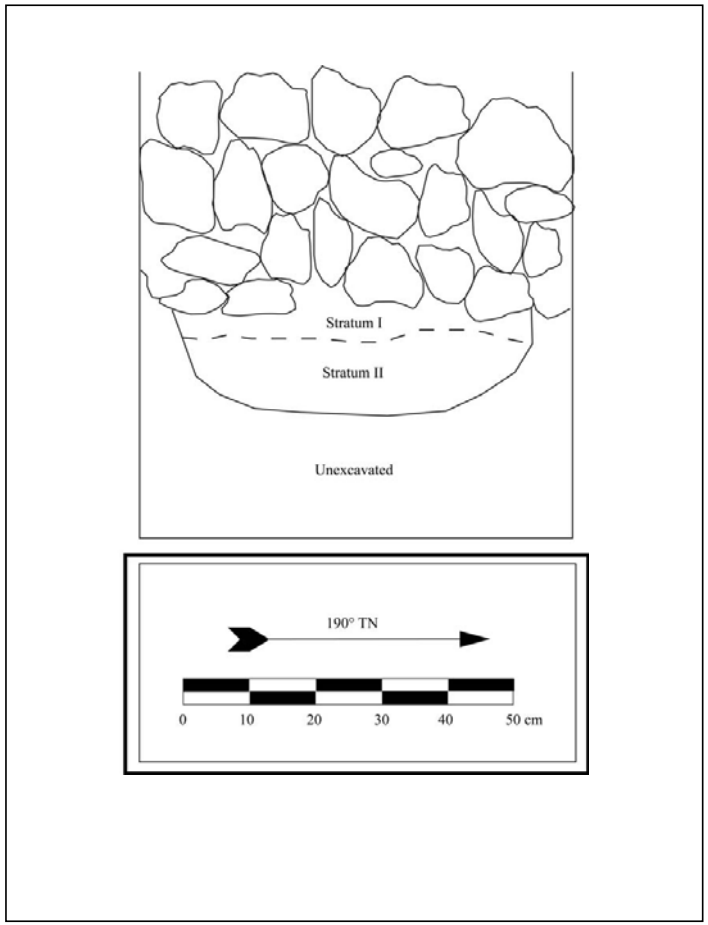

Figure 8: Profile of Stratigraphic Sequence of -6393 Feature A

A 1 m by 1 m test unit was excavated through Feature A to aid in determining the age and function of the mound (see Figure 8). The unit was placed in the center of the mound with all cobbles and boulders removed down to the ground surface. After the stones were removed, manual excavation continued into the underlying sediments. Stratum I consisted of dark reddish brown (5 YR ¾) dry, silt that had fine, weak, granular structure. Stratum II consisted of dark reddish brown (5 YR ¾) dry, hard silt surrounding decomposing basalt. Once sterile sediments were encountered excavation was halted. No cultural materials or midden was encountered.

Feature B consists of a low mound, roughly square in shape located 25 m north of Feature A (Figures 9 and 10). The mound measures 155 cm by 137 cm with a maximum height of 56 cm. The boulder mound is roughly stacked with broken basalt, of which the breaks look relatively fresh compared to the unbroken weathered cortex of the other boulders. No cultural materials or midden was observed on or around the mound. It is suggested that Feature B is a clearing mound.

Feature C consists of a rough alignment of basalt boulders located 11.5 m east of Feature B (Figures 11 and 12). The feature measures 4.82 m north/south by 3.60 m east/west with a maximum height of 47 cm. The north end of the alignment is marked by a small pile of basalt boulders piled 2 courses high. A small stack of stones define the western side of the feature. No cultural materials or midden was observed on or around the feature. The function of this alignment is indeterminate.

Feature D consists of a cobble and boulder mound located 33.8 m south of Feature C (Figures 13 and 14). The mound measures 2.1 m east/west by 1.22 m north/south with a maximum height of 60 cm. The mound is very roughly stacked with broken boulders, similar to Features A and B. No cultural materials or midden was observed and it is suggested that Feature D is a clearing mound related to ranching activities.

Figure 10: View North of SIHP No. -6393 Feature B

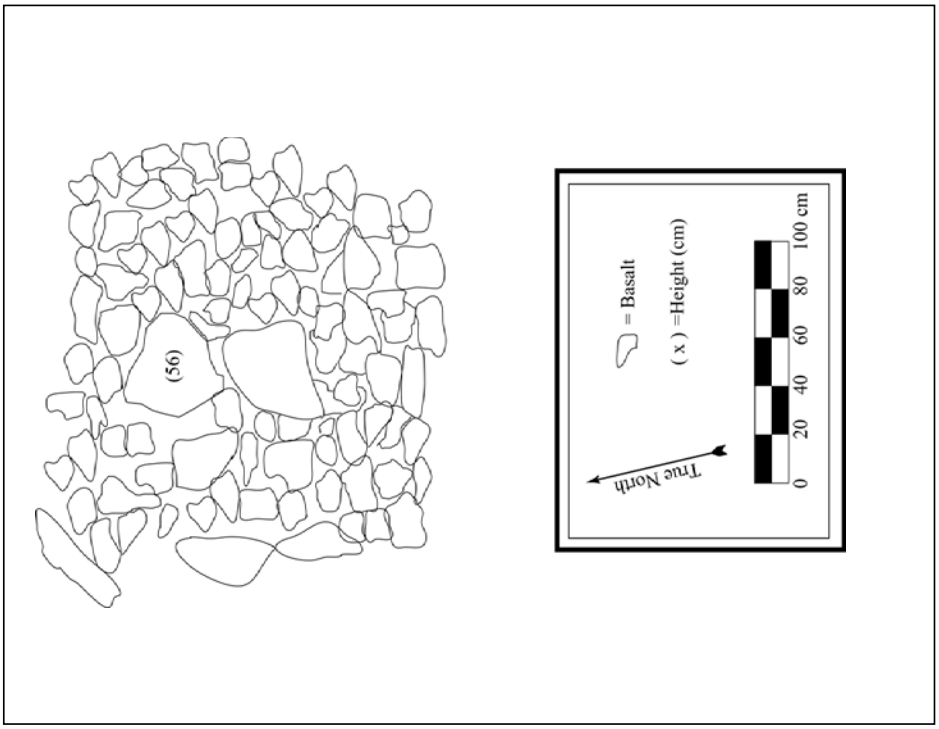

Figure 9: Plan View of SIHP No. -6393 Feature B

Figure 12: View West of SIHP No. -6393 Feature C

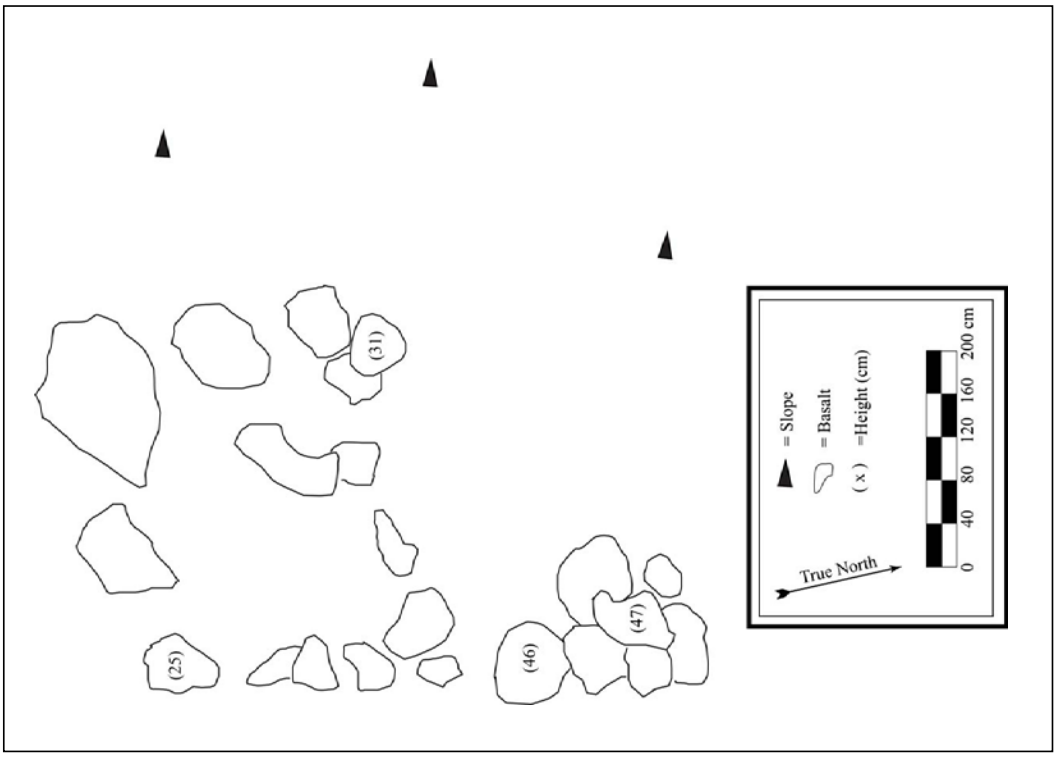

Figure 11: Plan View of SIHP No. -6393 Feature C

Figure 14: View North of SIHP No. -6393 Feature D

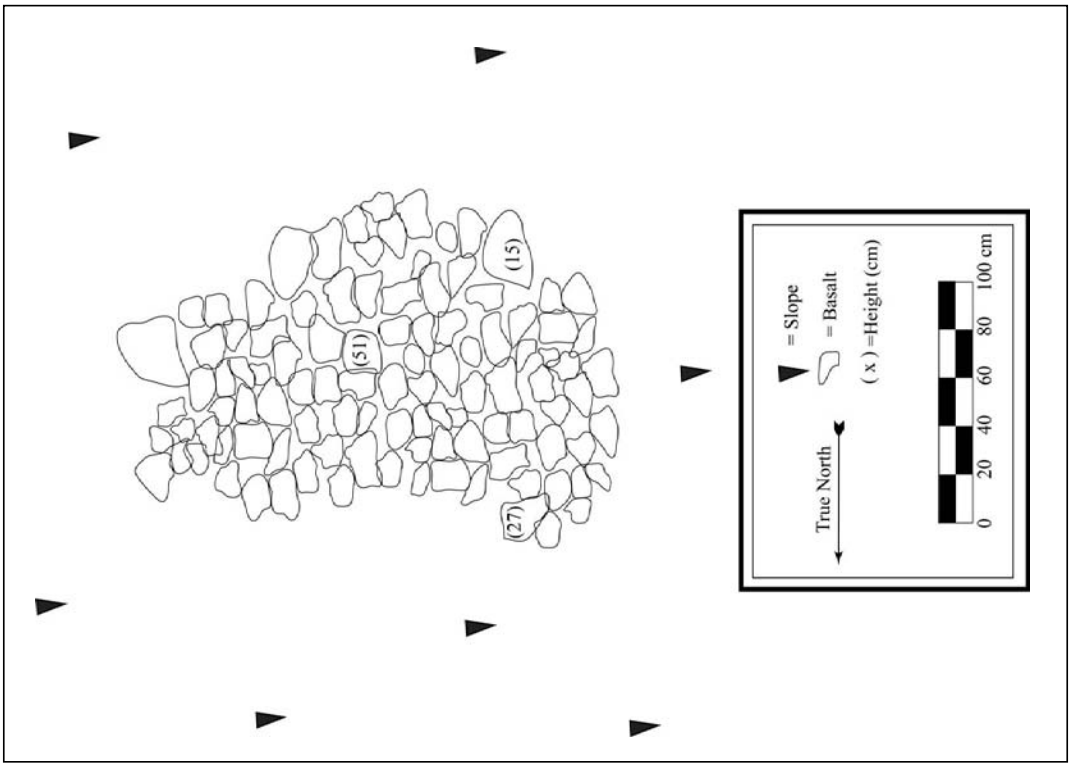

Figure 13: Plan View of SIHP No. -6393 Feature D

Feature E consists of a small basalt mound located 10.6 m south of Feature D and 1.5 m north of the Keonoulu Ranch and Haleakala Ranch boundary fence (Figures 15 and 16). The mound measures 120 cm north/south by 120 cm east/west and is constructed of broken basalt cobbles and boulders. No cultural materials or midden was observed on or around the feature. It is suggested that Feature E is a clearing mound related to ranching activities.

Feature F consists of a small oval basalt cobble and boulder mound (Figures 17 and 18). The feature measures 1.6 m by 1.1 m with a maximum height of 55 cm. The mound is constructed of piled, broken basalt cobbles and boulders. No cultural materials or midden was observed and it is suggested that the feature likely functioned as a clearing mound for ranching activities.

A 1 m by 1 m test unit was excavated through Feature F to aid in determining the age and function of the mound (Figure 19). The mound was taken down to the ground surface and construction techniques were noted. In general, the mound was constructed without formal stacking, and appeared to have been built by piling the stones. Once the ground surface was exposed, a 50 cm by 50 cm test unit was manually excavated. Like Feature A, Stratum I consisted of dark reddish brown (5 YR ¾) dry, silt that had fine, weak, granular structure to a depth of 30 cm below surface. Stratum II consisted of dark reddish brown (5 YR ¾) dry, hard silt surrounding decomposing basalt. Once sterile sediments were encountered excavation was halted. No cultural materials or midden was encountered. Based on the informal construction technique, unweathered breaks on the cobbles and boulders, lack of cultural material and location within an active ranch, it is suggested that the feature functioned as a clearing mound or other ancillary ranching feature.

Feature G consists of a roughly triangular mound situated 10 m east southeast of Feature F (Figures 17 and 20). The mound measures 2.5 m north/south by 1.55 m east/west with a maximum height of 51 cm. The mound is constructed of broken, angular basalt boulders. No cultural materials or midden scatters were observed and it is suggested that the feature functioned as an historic ranch related clearing mound.

Feature H consists of a small 3.2 m long by 1 m wide crescent shaped mound located approximately 90 m north of Feature A (Figures 21 and 22). The mound is constructed of weathered basalt cobbles and boulders stacked a maximum of 2 courses (33 cm). Feature H differs from the other mounds in that no shattered basalt is incorporated into the feature. No cultural material or midden scatters were observed on or around the mound.

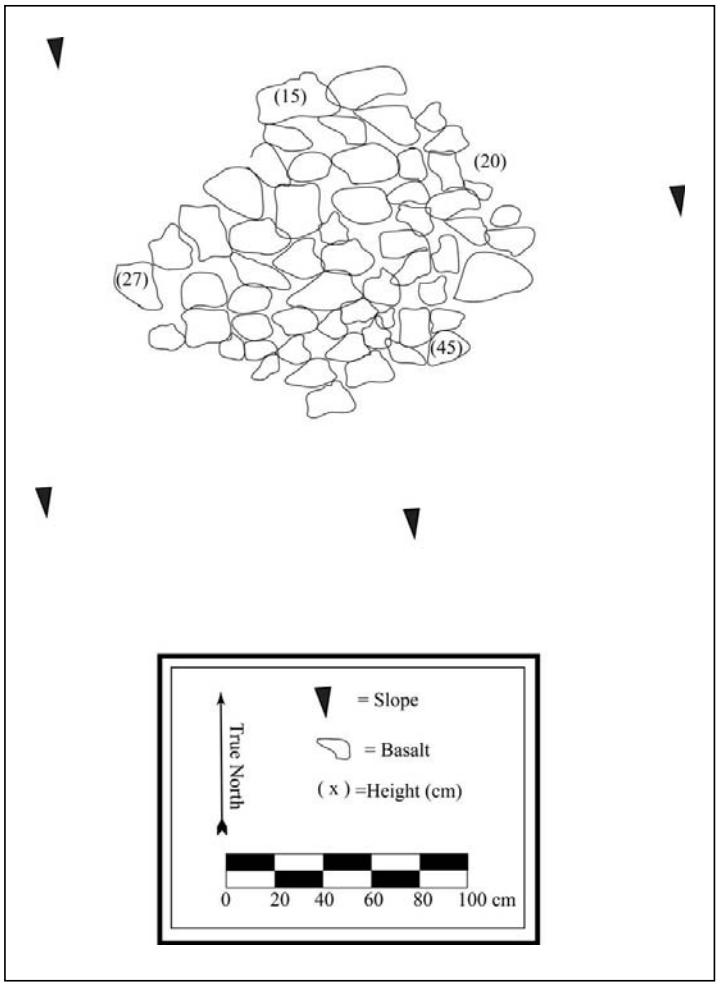

Figure 15: Plan View of SIHP No. -6393 Feature E

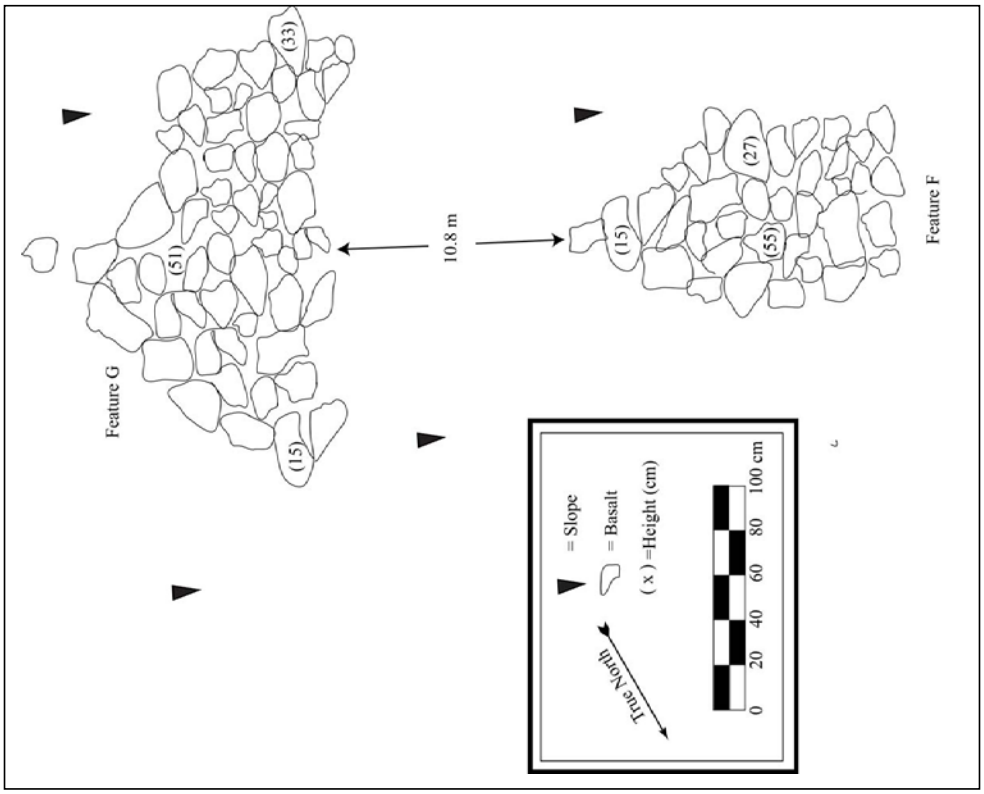

Figure 17: Plan View of SIHP No. -6393 Feature F and G

Figure 16: View Northeast of SIHP No. -6393 Feature E

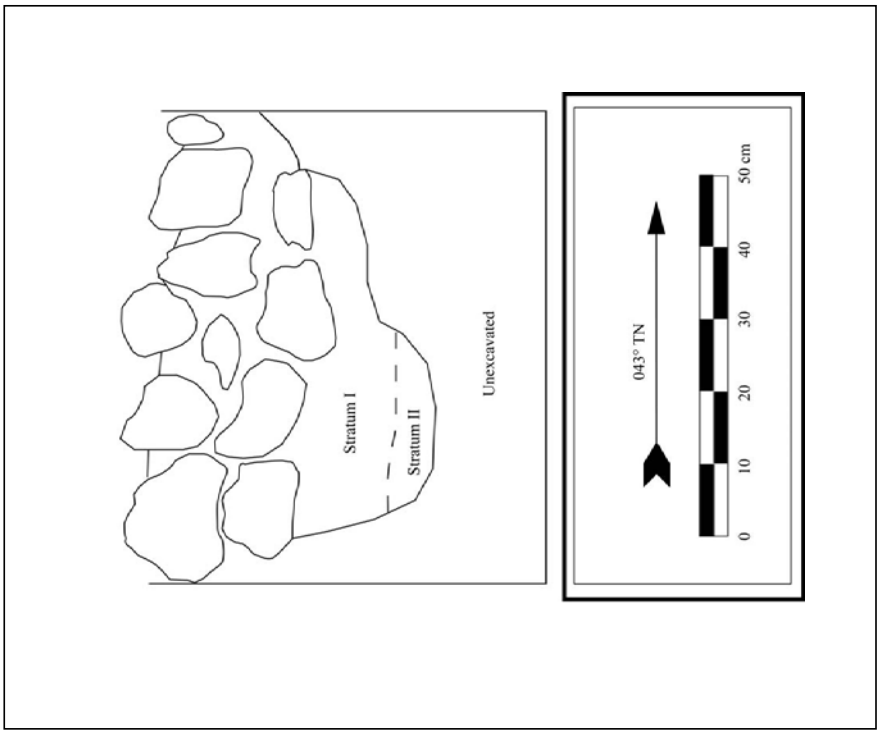

Figure 19: Profile of Stratigraphic Sequence of -6393 Feature F

Figure 18: View West of SIHP No. -6393 Feature F

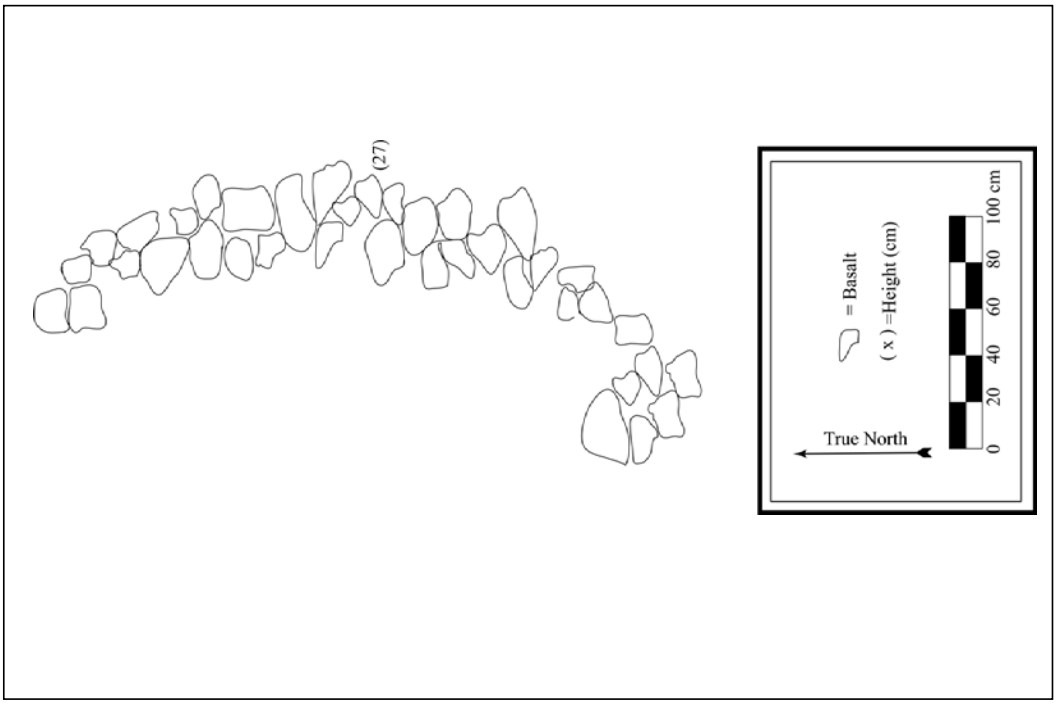

Figure 21: Plan View of SIHP No. -6393 Feature H

Figure 20: View North of SIHP No. -6393 Feature G

Figure 22: View Northwest of SIHP No. -6393 Feature H

One additional modern platform was encountered during the inventory survey. The feature consists of a rectangular shaped basalt platform located in the southwestern portion of the project area, on a flat portion of a gently sloping landscape, approximately 60 m east of Pi`ilani Highway. The feature measures 2.7 m north/south by 2.0 m east/west with a maximum height of 104 cm (Figures 23 and 24). The platform is constructed of a maximum of 7 courses of stacked, angular blue rock basalt cobbles and boulders that show evidence of relatively fresh breaks. The surface of the platform is constructed of shattered blue rock as well and is relatively flat with a slightly concave surface.

Based on conversations with Mr. Scott Meidell (Vice President of Haleakala Ranch) and a veteran ranch worker, it is believed that the platform was constructed for the once proposed Kīhei Charter School sign that was not completed. Based on its age and function, this feature was not assigned a site number.

Figure 23: View West of Modern Platform

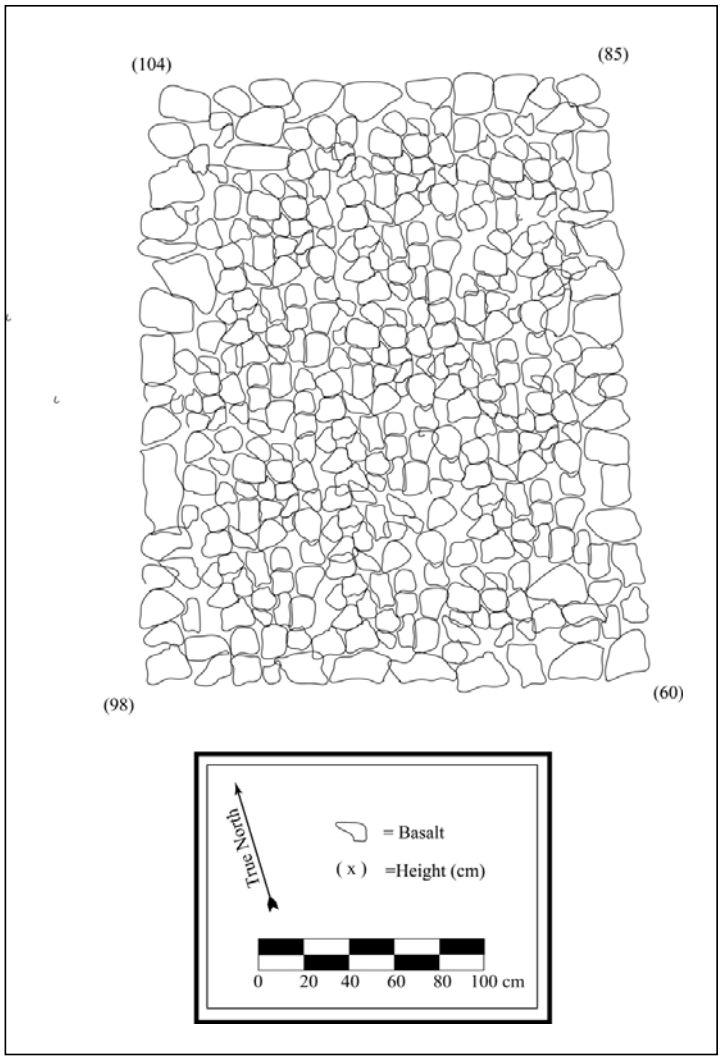

Figure 24: Plan View of Modern Platform

SUMMARY

An archaeological inventory survey was conducted in advance of proposed construction of a new Kīhei High School in Ka`ono`ulu, Kōheo 1 and 2 and Waiohuli Ahupua`a, Makawao District, Maui, Hawai`i [TMK: (2) 2-2-002:015 (por.) and 054 (por.).]. An archaeological inventory survey was conducted to document and evaluate cultural resources on 77 acres of Haleakala and Ka`ono`ulu Ranch Lands. In all, one site (SIHP No. 50-50-9-6393) was documented within the study parcel consisting of historic era rock piles and one alignment.

Previous archaeological investigations and historic documentation in the vicinity of the project area suggests that the area was marginally utilized in pre-contact times and has been used in the historic era primarily for ranching activities and WWII military training exercises. The site re-identified during this survey is associated with the historic period activities.

SIGNIFICANCE ASSESSMENTS

One site composed of eight features was documented in the project area during Archaeological Inventory Survey. The site (see below) has been evaluated for significance according to the criteria established for the State and National Register of Historic Places. The five criteria are listed below:

Criterion A: Site is associated with events that have made a significant contribution to the broad patterns of our history;
Criterion B: Site is associated with the lives of persons significant to our past;
Criterion C: Site is an excellent site type; embodies distinctive characteristics of a type, period, or method of construction, or represents the work of a master, or possesses high artistic values, or represents a significant and distinguishable entity whose components may lack individual construction;
Criterion D: Site has yielded or has the potential to yield information important in prehistory or history;
Criterion E: Site has cultural significance; probable religious structures or burials present (State of Hawai`i criteria only).

State Site 50-50-10-6393 is (and was previously) designated under Criterion D as a site that has yielded or has the potential to yield information important in prehistory or history. The eight features have been thoroughly documented with photographs, scale plan view maps and

written descriptions and three of the features were manually tested to gather additional information.

RECOMMENDATIONS

STATE SITE 50-50-10-6393

No further work is recommended for SIHP No. 50-50-10-6393. This recommendation follows a previously accepted recommendation made by Shefcheck (2008). It is believed that the features have been adequately documented and additional research focused on the site would not contribute to the interpretation of the area, region or Hawaiian prehistory and/or history. It is therefore recommended that no further archaeological work is warranted within the project area.

ARCHAEOLOGICAL MONITORING

Archaeological Monitoring is not recommended during the proposed construction for the new Kīhei High School. However, should the inadvertent discovery of significant cultural materials and/or burials occur during construction, all work in the immediate area of the find must cease and the SHPD be notified to discuss mitigation.

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Appendix F

A Cultural Impact Assessment of 77-acres for the Proposed Construction of Kīhei High School in Kīhei, Kaʻonoʻulu, Kōheo 1& 2 and Waiohuli Ahupaʻa, Makawao District, Island of Maui, Hawaiʻi [TMK: 2-2-002:015 por. & 054 por.]

Scientific Consultant Services – April 2010

SCS Project Number 755-CIA-1

A CULTURAL IMPACT ASSESSMENT OF 77-ACRES FOR THE PROPOSED CONSTRUCTION OF KĪHEI HIGH SCHOOL IN KĪHEI, KA`ONO`ULU, KŌHEO 1& 2 AND WAIOHULI AHUPUA`A, MAKAWAO DISTRICT, ISLAND OF MAUI, HAWAI`I [TMK: 2-2-002:015 por. AND 054 por.]

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April 2010

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INTRODUCTION

Scientific Consultant Services, Inc. (SCS) has been contracted by Group 70 International Inc., to conduct a Cultural Impact Assessment of 77-acres for the proposed construction of Kīhei High School in Kīhei Ka`ono`ulu, Kōheo 1 & 2 and Waiohuli Ahupua`a,, Makawao District, Island of Maui, Hawai`i [TMK: 2-2-002:015 por. and 054 por.) (Figures 1 and 2). The development of a new high school is proposed and would include a library, auditorium, cafeteria, administration building, industrial arts building, ROTC facility, physical education and athletic buildings, gymnasium, and bleachers.

The Constitution of the State of Hawai`i clearly states the duty of the State and its agencies is to preserve, protect, and prevent interference with the traditional and customary rights of native Hawaiians. Article XII, Section 7 requires the State to "protect all rights, customarily and traditionally exercised for subsistence, cultural and religious purposes and possessed by ahupua`a tenants who are descendants of native Hawaiians who inhabited the Hawaiian Islands prior to 1778" (2000). In spite of the establishment of the foreign concept of private ownership and western-style government, Kamehameha III (Kauikeaouli) preserved the peoples traditional right to subsistence. As a result in 1850, the Hawaiian Government confirmed the traditional access rights to native Hawaiian *ahupua*`a tenants to gather specific natural resources for customary uses from undeveloped private property and waterways under the Hawaiian Revised Statutes (HRS) 7-1. In 1992, the State of Hawai`i Supreme Court, reaffirmed HRS 7-1 and expanded it to include, "native Hawaiian rights…may extend beyond the *ahupua`a* in which a native Hawaiian resides where such rights have been customarily and traditionally exercised in this manner" (Pele Defense Fund v. Paty, 73 Haw.578, 1992).

In Section 1 of Act 50, enacted by the Legislature of the State of Hawai`i (2000) with House Bill 2895, it is stated that:

> …there is a need to clarify that the preparation of environmental assessments or environmental impact statements should identify and address effects on Hawaii's culture, and traditional and customary rights…[H.B. NO. 2895].

Articles IX and XII of the state constitution, other state laws, and the courts of the State impose on government agencies a duty to promote and protect cultural beliefs and practices, and resources of native Hawaiians as well as other ethnic groups. Act 50 also requires state agencies and other developers to assess the effects of proposed land use or shore line developments on the "cultural practices of the community and State" as part of the HRS Chapter 343 environmental review process (2001).

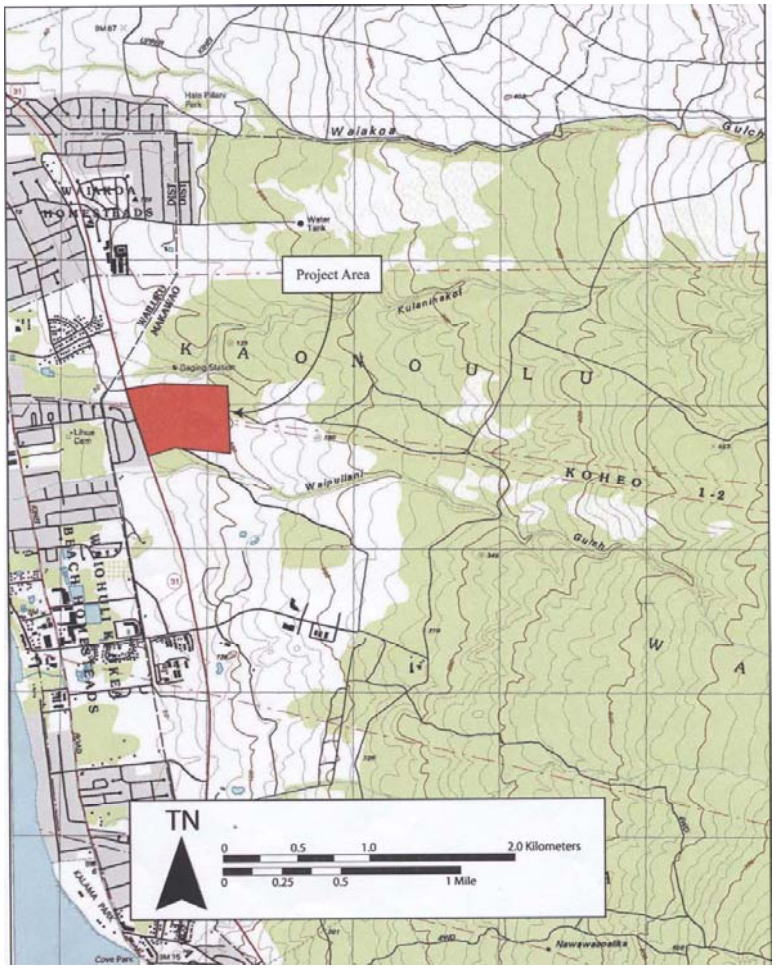

Figure 1: USGS Quadrangle Map Showing Project Area.

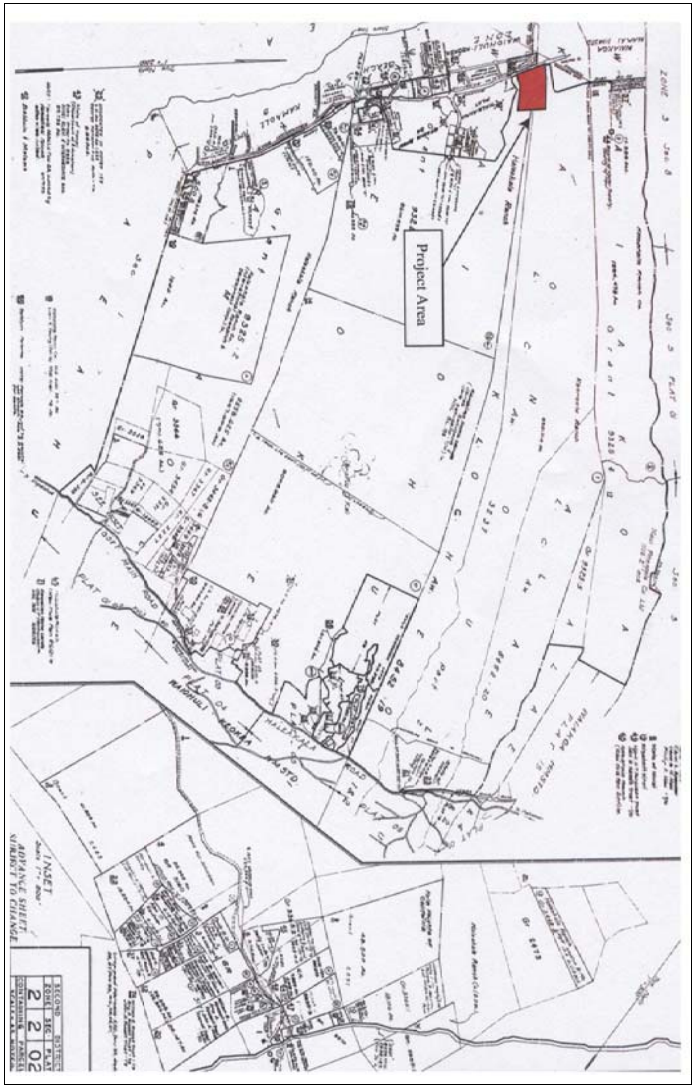

Figure 2: Tax Map Key [TMK] Showing Project Area.

It also re-defined the definition of "significant effect" to include "the sum of effects on the quality of the environment including actions impact a natural resource, limit the range of beneficial uses of the environment, that are contrary to the State's environmental policies. . . or adversely affect the economic welfare, social welfare or cultural practices of the community and State" (H.B. 2895, Act 50, 2000). Cultural resources can include a broad range of often overlapping categories, including places, behaviors, values, beliefs, objects, records, stories, etc. (H.B. 2895, Act 40, 2000).

Thus, Act 50 requires that an assessment of cultural practices and the possible impacts of a proposed action be included in Environmental Assessments and Environmental Impact Statements, and to be taken into consideration during the planning process. The concept of geographical expansion is recognized by using, as an example, "the broad geographical area, e.g. district or *ahupua`a*" (OEQC 1997). It was decided that the process should identify 'anthropological' cultural practices, rather than 'social' cultural practices. For example, *limu* (edible seaweed) gathering would be considered an anthropological cultural practice, while a modern-day marathon would be considered a social cultural practice.

Therefore, the purpose of a Cultural Impact Assessment is to identify the possibility of cultural activities and resources within a project area, or its vicinity, and then assessing the potential for impacts on these cultural resources. The CIA is not intended to be a document of in depth archival-historical land research, or a record of oral family histories, unless these records contain information about specific cultural resources that might be impacted by a proposed project.

According to the Guidelines for Assessing Cultural Impacts established by the Hawaii State Office of Environmental Quality Control (OEQC 1997):

> The types of cultural practices and beliefs subject to assessment may include subsistence, commercial, residential, agricultural, access-related, recreational, and religions and spiritual customs. The types of cultural resources subject to assessment may include traditional cultural properties or other types of historic sites, both manmade and natural, which support such cultural beliefs.

The meaning of "traditional" was explained in *National Register Bulletin*:

> Traditional" in this context refers to those beliefs, customs, and practices of a living community of people that have been passed down through the generations', usually orally or through practice. The traditional cultural significance of a historic property, then is significance derived from the role the property plays in a community's historically rooted beliefs, customs, and practices. . . . [Parker and King 1990:1]

METHODOLOGY

This Cultural Impact Assessment was prepared in accordance with the suggested methodology and content protocol in the Guidelines for Assessing Cultural Impacts (OEQC 1997). In outlining the "Cultural Impact Assessment Methodology", the OEQC states that:

> "…information may be obtained through scoping, community meetings, ethnographic interviews and oral histories…" (1997).

This report contains archival and documentary research, as well as communication with organizations having knowledge of the project area, its cultural resources, and its practices and beliefs. This Cultural Impact Assessment was prepared in accordance with the suggested methodology and content protocol provided in the Guidelines for Assessing Cultural Impacts (OEQC 1997), when possible. The assessment concerning cultural impacts may address, but not be limited to, the following matters:

(1) a discussion of the methods applied and results of consultation with individuals and organizations identified by the preparer as being familiar with cultural practices and features associated with the project area, including any constraints of limitations which might have affected the quality of the information obtained;

(2) a description of methods adopted by the preparer to identify, locate, and select the persons interviewed, including a discussion of the level of effort undertaken;

(3) ethnographic and oral history interview procedures, including the circumstances under which the interviews were conducted, and any constraints or limitations which might have affected the quality of the information obtained;

(4) biographical information concerning the individuals and organizations consulted, their particular expertise, and their historical and genealogical relationship to the project area, as well as information concerning the persons submitting information or

being interviewed, their particular knowledge and cultural expertise, if any, and their historical and genealogical relationship to the project area;

(5) a discussion concerning historical and cultural source materials consulted, the institutions and repositories searched, and the level of effort undertaken, as well as the particular perspective of the authors, if appropriate, any opposing views, and any other relevant constraints, limitations or biases;

(6) a discussion concerning the cultural resources, practices and beliefs identified, and for the resources and practices, their location within the broad geographical area in which the proposed action is located, as well as their direct or indirect significance or connection to the project site;

(7) a discussion concerning the nature of the cultural practices and beliefs, and the significance of the cultural resources within the project area, affected directly or indirectly by the proposed project;

(8) an explanation of confidential information that has been withheld from public disclosure in the assessment;

(9) a discussion concerning any conflicting information in regard to identified cultural resources, practices and beliefs;

(10) an analysis of the potential effect of any proposed physical alteration on cultural resources, practices, or beliefs; the potential of the proposed action to isolate cultural resources, practices, or beliefs from their setting; and the potential of the proposed action to introduce elements which may alter the setting in which cultural practices take place, and;

(11) the inclusion of bibliography of references, and attached records of interviews which were allowed to be disclosed.

Based on the inclusion of the above information, assessments of the potential effects on cultural resources in the project area and recommendations for mitigation of these effects can be proposed.

ARCHIVAL RESEARCH

Archival research focused on a historical documentary study involving both published and unpublished sources. These included legendary accounts of native and early foreign writers; early historical journals and narratives; historic maps and land records such as Land Commission Awards, Royal Patent Grants, and Boundary Commission records; historic accounts; and previous archaeological project reports.

INTERVIEW METHODOLOGY

Interviews are conducted in accordance with Federal and State laws, and guidelines, when knowledgeable individuals are able to identify cultural practices in, or in close proximity to the project area. If they have knowledge of traditional stories, practices and beliefs associated with a project area or if they know of historical properties within the project area, they are sought out for additional consultation and interviews. Individuals who have particular knowledge of traditions passed down from preceding generations and a personal familiarity with the project area are invited to share their relevant information concerning particular cultural resources. Often people are recommended for their expertise, and indeed, organizations, such as Hawaiian Civic Clubs, the Island Branch of Office of Hawaiian Affairs (OHA), historical societies, Island Trail clubs, and Planning Commissions are depended upon for their recommendations of suitable informants. These groups are invited to contribute their input, and suggest further avenues of inquiry, as well as specific individuals to interview. It should be stressed that this process does not include formal ethnographic interviews or oral histories as described in the OEQC's *Guidelines for Assessing Cultural Impacts* (1997). The assessments are intended to identify potential impacts to ongoing cultural practices or resources within a project area or in its close vicinity.

If knowledgeable individuals are identified, personal interviews are sometimes taped and then transcribed. These draft transcripts are returned to each of the participants for their review and comments. After corrections are made, each individual signs a release form, making the information available for this study. When telephone interviews occur, a summary of the information is usually sent for correction and approval, or dictated by the informant and then incorporated into the document. If no cultural resource information is forthcoming and no knowledgeable informants are suggested for further inquiry, interviews are not conducted.

Letters were sent to organizations whose jurisdiction included knowledge of the area. Consultation was sought from Phillis (Coochie) Cayan, History and Culture Branch Chief with SHPD; Office of Hawaiian Affairs, O`ahu Branch; Thelma Shimaoka, OHA Maui Branch; Charles Maxwell, Maui Island Burial Council; Kimokeo Kapahulehua; Dept. of Planning, Cultural Resources Commission; Hinano Rodrigues, DLNR; Kīhei Community Association; and Central Maui Hawaiian Civic Club (Appendix A).

In addition, a Cultural Impact Assessment Notice was published on March 28, 30, and 31, 2010 in *The Honolulu Advertise*r and *The Maui New*, and in the April issue if the OHA

newspaper, *Na Wai Ola* (Appendix B). These notices requested information of cultural resources or activities in the area of the proposed project, gave the TMK number and where to respond with information. Based on the responses, an assessment of the potential effects on cultural resources in the project area and recommendations for mitigation of these effects can be proposed.

PROJECT AREA AND VICINITY

The project area is roughly rectangular in shape and consists of a 77-acre lot that is bounded by Kulanihakoi Gulch to the north, Waipuilani Gulch to the south, undeveloped ranch land to the east and Pi`ilani Highway to the west. The parcel is located one kilometer inland from Kalepolepo Park at elevations ranging from 30 feet to 100 feet above mean sea level and is currently undeveloped.

CULTURAL HISTORICAL CONTEXT

The island of Maui ranks second in size of the eight main islands in the Hawaiian Archipelago. The Island was formed by two volcanoes, Mount Kukui in the west and Haleakalā in the east. The younger of the two volcanoes, Haleakalā, soars 2,727 m (10,023 feet) above sea level and embodies the largest section of the island. Unlike the amphitheater valleys of West Maui, the flanks of Haleakalā are distinguished by gentle slopes. Although it receives more rain than its counterpart in the west, the permeable lavas of the Honomanū and Kula Volcanic Series prevent the formation of rain-fed perennial streams. The few perennial streams found on the windward side of Haleakalā originate from springs located at low elevations. Valleys and gulches were formed by intermittent water run-off. The environment factors and resource availability heavily influenced pre-Contact settlement patterns. Although an extensive population was found occupying the uplands above the 30-inch rainfall line where crops could easily be grown, coastal settlement was also common (Kolb *et al*. 1997). The existence of three fishponds at Kalepolepo, north of the project area, and at least two *heiau* have been identified near the shore.

The literature confirms the presence of a stable population relying mainly on coastal and marine resources. Agriculture may have been practiced behind the dune berms in low-lying marshland or in the vicinity of Kealia Pond. It is suggested that permanent habitation and their associated activities occurred from A.D. 1200 through the present in both the uplands and coastal region (*Ibid*.).

PAST POLITICAL BOUNDARIES

Traditionally, the division of Maui's lands into districts (*moku*) and sub-districts was performed by a *kahuna* (priest, expert) named Kalaiha`ōhia, during the time of the *ali`i* Kaka`alaneo (Beckwith 1940:383; Fornander places Kaka`alaneo at the end of the 15th century or the beginning of the 16th century [Fornander 1919-20, Vol. 6:248]). Land was considered the property of the king or *ali`i `ai moku* (the *ali`i* who eats the island/district), which he held in trust for the gods. The title of *ali`i `ai moku* ensured rights and responsibilities to the land, but did not confer absolute ownership. The king kept the parcels he wanted, his higher chiefs received large parcels from him and, in turn, distributed smaller parcels to lesser chiefs. The *maka`āinana* (commoners) worked the individual plots of land.

In general, several terms, such as *moku*, *ahupua`a*, *`ili* or *`ili`āina* were used to delineate various land sections. A district (*moku*) contained smaller land divisions (*ahupua`a*), which customarily continued inland from the ocean and upland into the mountains. Extended household groups living within the *ahupua`a* were therefore, able to harvest from both the land and the sea. Ideally, this situation allowed each *ahupua`a* to be self-sufficient by supplying needed resources from different environmental zones (Lyons 1875:111). The *`ili `āina* or *`ili* were smaller land divisions next to importance to the *ahupua`a* and were administered by the chief who controlled the *ahupua`a* in which it was located (*ibid*:33; Lucas 1995:40). The *mo`o`āina* were narrow strips of land within an *`ili*. The land holding of a tenant or *hoa `āina* residing in an *ahupua`a* was called a *kuleana* (Lucas 1995:61).

TRADITIONAL SETTLEMENT PATTERNS

The Hawaiian economy was based on agricultural production and marine exploitation, as well as raising livestock and collecting wild plants and birds. Extended household groups settled in various *ahupua`a*. Within the *ahupua`a*, residents were able to harvest from both the land and the sea. Ideally, this situation allowed each *ahupua`a* to be self-sufficient by supplying needed resources from different environmental zones (Lyons 1875:111).

During pre-Contact times, there were primarily two types of agriculture, wetland and dry land, both of which were dependent upon geography and physiography. River valleys provided ideal conditions for wetland *kalo* (*Colocasia esculenta*) agriculture that incorporated pond fields and irrigation canals. Other cultigens, such as *kō* (sugar cane, *Saccharum officinaruma*) and *mai`a* (banana, *Musa* sp.), were also grown and, where appropriate, such crops as *`uala* (sweet

potato, *Ipomoea batatas*) were produced. This was the typical agricultural pattern seen during traditional times on all the Hawaiian Islands (Kirch and Sahlins 1992, Vol. 1:5, 119; Kirch 1985). Agricultural development on the leeward side of Maui was likely to have begun early in what is known as the Expansion Period (AD 1200-1400, Kirch 1985). According to Handy, there was continuous cultivation on the coastal region along the northwest coast of Maui. Of the leeward side, he wrote:

> On the south side of western Maui the flat coastal plain all the way from Kihei and Ma`alaea to Honokahua, in old Hawaiian times, must have supported many fishing settlements and isolated fishermen's houses, where sweet potatoes were grown in the sandy soil or red lepo [soil] near the shore. For fishing, this coast is the most favorable on Maui, and, although a considerable amount of taro was grown, I think it is reasonable to suppose that the large fishing population, which presumably inhabited this leeward coast, ate more sweet potatoes than taro with their fish…[1940:159].

There is little specific information pertaining directly to Kīhei, which was originally a small area adjacent to a landing built in the 1890s (Clark 1980). Presently, Kīhei refers a six-mile section along the coast from the town of Kīhei to Keawakapu. The present project area is located in what has been referred to as the "barren zone" (Cordy 1977). This zone was an intermediary region between verdant upland regions and the coastline. In the transitional/barren zone, agriculture endeavors were practically non-existent and tool procurement materials, such as basalt rock and wood, were selected from other locales. Sediment regimes in the area are shallow, most often overlying bedrock, and perennial water sources are virtually non-existent. In addition, the immediate slope in back of the coast receives less than 30 inches of rainfall annually, which is needed for productive cultivation (*ibid.*).

The barren zone is perceived as dry and antagonistic to permanent habitation, as well. Use of the area would have primarily been intermittent, or transitory, but would have supported trails extending between the two more profitable eco-zones of the coast and the higher slopes of Haleakalā.

Confirming this, Handy continued,

> Between Kihei and Makena there was probably very little settlement in former times. Today along this dry coast there are a few settlements and houses and a few gardens with sweet potatoes [*ibid.*]

Scattered amongst the few habitation sites along the coast were places of cultural significance to the *kama`āina* of the district including at least two *heiau*. In ancient times, there was a small village at Kalepolepo, supported primarily by marine resources. It was recorded that occasionally the blustery Kaumuku Winds would arrive with amazing intensity along the coast (Wilcox 1921).

There were several fishponds in the vicinity of Kīhei; Waiohuli, Kēōkea-kai, and Kalepolepo Pond (also known by the ancient name of Kō`ie`ie Pond; Kolb *et al*. 1997). Constructed on the boundary between Ka`ono`ulu and Waiohui Ahupua`a, these three ponds were some of the most important royal fishponds on Maui. The builder of Kalepolepo and two other ponds (Waiohuli and Kēōkea-kai) has been lost in antiquity, but they were reportedly rebuilt at least three times through history, beginning during the reign of Pi`ilani (1500s; *Ibid*; Cordy 2000).

Oral tradition recounted the repairing of the fishponds during the reign of Kiha-Pi`ilani, the son of the great chief Pi`ilani, who had bequeathed the ponds to Umi, ruler of Hawai`i Island. Umi's *konohiki* (land manager) ordered all the people from Maui to help repair the walls of Kalepolepo's fishponds. A man named Kikau protested that the repairs couldn't be done without the assistance of the *menehune* who were master builders (Wilcox 1921:66-67). The *konohiki* was furious and Kikau was told he would die once the repairs had been made. Kēōkea-kai was the first to be repaired. When the capstone was carried on a litter to the site, the *konohiki* rode proudly on top of the rock as it was being placed in the northeast corner of the pond. When it was time for repairs on Waiohuli-kai, the *konohiki* did the same. As the last pond, then known as Ka`ono`ulu-kai, was completed, the *konohiki* once again rode the capstone to its resting place. Before it could be put into position, the capstone broke throwing both the rock and *konohiki* into the dirt. The workers reportedly said "*Ua konohiki Kalepolepo, ua eku i ka lepo*"or, "the manager of Kalepolepo, one who roots in the dirt" (*Ibid*:66). That night a tremendous storm threw down the walls of the fishponds. The *konohiki* implored Kikau to help him repair the damage. Kikau called the *menehune* who rebuilt the walls in one night. Umi sent for Kikau who lived in the court of Waipi`o valley from then on. The region o Kēōkea-kai and Ka`ono`ulu-kai fishpond became known as Kalepolepo fishpond (*Ibid*).

The Kalepolepo fishponds were rebuilt by Kekaulike, chief of Maui in the 1700s, at which time it supplied *`ama`ama* (mullet) to Kahekili II. Again, it was restored by Kamehameha

I when he ruled as governing chief over Maui and for the last time in the 1840s when prisoners from Kaho`olawe penal colony were sent to do repairs (Kamakau 1961; Wilcox 1921). At this time, stones were taken from Waiohuli-kai pond for the reconstruction of Kalepolepo. It was here at Kalepolepo that Kamehameha I reportedly beached his victorious canoes after subduing the Maui chiefs. The stream draining into Kealia pond (north of the project area) became sacred to royalty and *kapu* to commoners (Stoddard 1894).

Trails extended from the coast to the mountains, linking the two for both economic and social reasons. A trail known as the *alanui* or "King's trail" built by Kihapi`ilani, extended along the coast passing through all the major communities between Lāhainā and Mākena, including Kīhei. Kolb noted that two traditional trails extended through Kēōkea. One trail, named "*Kekuawaha`ula`ula*" or the "red-mouthed god", went from Kīhei inland to Kēōkea. Another, the Kalepolepo trail, began at the Kalepolepo fishpond and continued to upland Waiohuli. These trails were not only used in the pre-Contact era, but were expanded to accommodate wagons bringing produce to the coast in the 1850s (Kolb *et al*. 1997).

WESTERN CONTACT

Early records, such as journals kept by explorers, travelers and missionaries, Hawaiian traditions that survived long enough to be written down, and archaeological investigations have assisted in the understanding of past cultural activities. Unfortunately, early descriptions of this portion of the Maui are brief and infrequent and usually refer to coastal activities. Captain King, Second Lieutenant on the *Revolution* during Cook's third voyage briefly described what he saw from a vantage point of "eight or ten leagues" (approximately 24 miles) out to sea as his ship departed the islands in 1779 (Beaglehole 1967). He mentions Pu`u Ōla`i south of Kīhei and enumerates the observed animals, thriving groves of breadfruit, the excellence of the taro, and almost prophetically, says the sugar cane is of an unusual height. Seen from this distance and the mention of breadfruit suggest the uplands of Kīpahulu-Kaupo and `Ulupalakua, and not the lower regions, were his focus.

In the ensuing years, LaPérouse (1786), Nathaniel Portlock and George Dixon, (also in 1786), sailed along the western coast, but added little to our direct knowledge of Kīhei. During the second visit of Vancouver in 1793, his expedition becalmed in the Ma`alaea Bay close to the project area. He reported:

> The appearance of this side of Mowee was scarcely less forbidding than that of its southern parts, which we had passed the preceding day. The shores, however, were not so steep and rocky, and were mostly composed of a sandy beach; the land did not rise so very abruptly from the sea towards the mountains, nor was its surface so much broken with hills and deep chasms; yet the soil had little appearance of fertility, and no cultivation was to be seen. A few habitations were promiscuously scattered near the waterside, and the inhabitants who came off to us, like those seen the day before, had little to dispose of [Vancouver 1984:852].

Archibald Menzies, a naturalist accompanying Vancouver stated, "…we had some canoes off from the latter island [Maui], but they brought no refreshments. Indeed, this part of the island appeared to be very barren and thinly inhabited" (Menzies 1920:102). According to Kahekili, then chief of Maui, the extreme poverty in the area was the result of the continuous wars between Maui and Hawai`i Island causing the land to be neglected and human resources wasted (Vancouver 1984:856).

THE GREAT MĀHELE

In the 1840s, traditional land tenure shifted drastically with the introduction of private land ownership based on western law. While it is a complex issue, many scholars believe that in order to protect Hawaiian sovereignty from foreign powers, Kauikeaouli (Kamehameha III) was forced to establish laws changing the traditional Hawaiian economy to that of a market economy (Kame`eleihiwa 1992:169-70, 176; Kelly 1983:45, 1998:4; Daws 1962:111; Kuykendall 1938 Vol. I:145). The Great Māhele of 1848 divided Hawaiian lands between the king, the chiefs, the government, and began the process of private ownership of lands. The subsequently awarded parcels were called Land Commission Awards (LCAs). Once lands were thus made available and private ownership was instituted, the *maka`āinana* (commoners), if they had been made aware of the procedures, were able to claim the plots on which they had been cultivating and living. These claims did not include any previously cultivated but presently fallow land, *`okipū* (on O`ahu), stream fisheries, or many other resources necessary for traditional survival (Kelly 1983; Kame`eleihiwa 1992:295; Kirch and Sahlins 1992). If occupation could be established through the testimony of two witnesses, the petitioners were awarded the claimed LCA and issued a Royal Patent after which they could take possession of the property (Chinen 1961:16). Hewahewa, Kamehameha's *Kahuna Nui*, was awarded Ka`ono`ulu (LCA3237).

As western influence grew, Kalepolepo in Kīhei became the important provisioning area. Europeans were now living or frequently visiting the coast and several churches and missionary stations were established. A Mr. Halstead left medical school on the East coast of the continent to become a whaler and after marrying the granddaughter of Issac Davis, settled in Kalepolepo on land given him by Kamehameha III (Kolb et al. 1997). His residence and store situated at Kalepolepo landing was known as the Koa House having been constructed of *koa* logs brought from the uplands of Kula. The store flourished due to the whaling and successful upland potato industry, and provided an accessible port for exported produce. A landing was built at Kīhei around 1890. Several of Hawai`i's ruling monarchs stayed at the Koa House, including Kauikeaouli (Kamehameha III), Kamehameha the 1V, Lot Kamehameha (V), and Lunalilo. Wilcox, giving a glimpse of the surroundings before abandonment stated, "…Kalepolepo was not so barren looking a place. Coconut trees grew beside pools of clear warm water along the banks of which grew taro and ape…" (1921:67). However, by 1887 this had changed. Wilcox continues:

> …the Kula mountains had become denuded of their forests, torrential winter rains were washing down earth from the uplands, filling with silt the ponds at Kalepolepo…ruins of grass huts [were] partly covered by drifting sand, and a few weather-beaten houses perched on the broad top of the old fish pond wall at the edge of the sea, with the Halstead house looming over them dim and shadowy in the daily swirl of dust and flying sand…" [1921]

Ranching was present prior to the 1840s and large sections of Crown Lands were leased for grazing cattle. By the 1880s, the lower *kula* lands, including the project area, consisted primarily of pasture land for ranching. Large portions of Ka`ono`ulu Ahupua`a were used for cattle by the Ka`ono`ulu Ranch Co. Ltd and by Ulupalakua Ranch, Inc.

INTERVIEW

An interview was conducted in 2000 with Mr. Henry Rice, owner of Ka`ono`ulu Ranch (containing the present project area) by SCS pertaining to another cultural impact assessment (McGerty and Spear 2000). Mr. Rice is descended from a *kama`āina* family and, at that time, the ranch consisted of approximately 9,000 acres of land that had been held by the Rice family since 1916. Mr. Rice stated that land was used for pasturage both up slope and near the coast where the project is located. The cattle were rotated according to vegetation growth, up and down the slope. In the 1950s, most of the breeding herds were kept on the *makai* lands. At the

time of the interview, breeding herds were being kept both *mauka* of Kula highway and *makai*. Calves from the *makai* breeding herd were born in October and November when the winter rains brought grasses that provided healthy milk for the newborn. Mr. Rice did not know of any old trails, traditional properties, or cultural activities occurring on his Ka`ono`ulu Ranch lands. He did mention that in the late 1800s people living in the *kula* region were still obtaining fish from the Ka`ono`ulu fishpond in Kīhei.

With the introduction of a dependable water supply in 1952 to the dry Kīhei region, came overseas investment and development for the tourist industry, which has continued up to, and including, this time.

SUMMARY

The "level of effort undertaken" to identify potential effect by a project to cultural resources, places or beliefs (OEQC 1997) has not been officially defined and is left up to the investigator. A good faith effort can mean contacting agencies by letter, interviewing people who know of cultural resources and activities that may be affected by the project or who know its history, conducting research identifying sensitive areas and previous land use, holding meetings in which the public is invited to testify, notifying the community through the media, and other appropriate strategies based on the type of project being proposed and its impact potential. Sending inquiring letters to organizations concerning development of a piece of property that has already been totally impacted by previous activity and is located in an already developed industrial area may be a "good faith effort". However, when many factors need to be considered, such as in coastal or mountain development, a good faith effort might mean an entirely different level of research activity.

In the case of the present parcel, letters were sent to organizations whose jurisdiction included knowledge of the area. Consultation was sought from Phillis (Coochie) Cayan, History and Culture Branch Chief with SHPD; Office of Hawaiian Affairs, O`ahu Branch; Thelma Shimaoka, OHA Maui Branch; Charles Maxwell, Maui Island Burial Council; Kimokeo Kapahulehua; Dept. of Planning, Cultural Resources Commission; Hinano Rodrigues, DLNR; Kīhei Community Association; and Central Maui Hawaiian Civic Club.

In addition, a Cultural Impact Assessment Notice was published on March 28, 30, and 31, 2010 in *The Honolulu Advertise*r and *The Maui New*, and in the April issue if the OHA

newspaper, *Na Wai Ola*. These notices requested information of cultural resources or activities in the area of the proposed project, gave the TMK number and where to respond with information.

Historical and cultural source materials were extensively used and can be found listed in the References Cited portion of the report. Such scholars as I`i, Kamakau, Malo, Beckwith, Chinen, Kame`eleihiwa, Fornander, Kuykendall, Kelly, Handy and Handy, Puku`i and Elbert, Thrum, Sterling, and Cordy have contributed, and continue to contribute to our knowledge and understanding of Hawai`i, past and present. The works of these and other authors were consulted and incorporated in the report where appropriate. Land use document research was supplied by the Waihona `Aina 2009 Data base.

In addition, an archaeological report specific to the project vicinity was reviewed. Early archaeological investigations and historic documentation in the vicinity of the project area suggested that the area was marginally utilized in pre-Contact times and had been used in the historic era primarily for ranching activities and WWII military training exercises. An Archaeological Inventory Survey of the 77-acres was conducted in 2010 (Perzinski and Dega 2010). The study included a 100% pedestrian survey and limited subsurface testing and there-documentation of one site, SIHP No.:0-50-10-6393, consisting of eight features (seven mounds, one alignment). Three test units were excavated at this site to aid in the understanding of the functional interpretation of the features. After analysis, it was decided the features were historic and associated with ranching activities. No new sites were identified during the Inventory Survey.

Archaeology deals with material remains, and although cultural beliefs are often reflected through some sort of architecture, like *heiau*, or *ko`a,* there are many examples of cultural associations still important to the community with no physical structures to mark their significance. One such place, *Ulukukui O Lanikāula*, located on Moloka`i, is considered an extremely sacred spot. Another might be Kīlauea and Halema`uma`u, home of Pele. These places have become important sites supporting a traditional belief system still held by the many peoples of Hawai`i. They contain no identified archaeological features, however they are highly meaningful "…because of [their] association with cultural practices or beliefs of a living community . . ." (King 2003:3).

CIA INQUIRY RESPONSE

Two responses were received from the above listed organizations or news periodical announcements (Appendix C). Neither contained additional information concerning on-going cultural activities, or resources in the project area. This would be expected from an area known for its general lack of pre-Contact usage. The letter that was emailed to the Kīhei Community Association was returned due to "no Answer".

One letter was from the O`ahu Branch of the Office of Hawaiian Affairs acknowledging receipt of the letter if inquiry. The other letter was from Phillis (Coochie) Cayan, History and Culture Branch Chief with SHPD, also acknowledging receipt of the letter of inquiry and suggesting several contacts, many of whom had already been contacted with no results. This letter was received after the waiting period of one month had expired.

Analysis of the potential effect of the project on cultural resources, practices or beliefs, its potential to isolate cultural resources, practices or beliefs from their setting, and the potential of the project to introduce elements which may alter the setting in which cultural practices take place is a requirement of the OEQC (No. 10, 1997). To our knowledge, the project area has not been used for traditional cultural purposes within recent times.

CULTURAL ASSESSMEMNT

Based on, no additional suggestions or information from the contacted organizations, newspapers, and negative results of the archival research, it is reasonable to conclude that, pursuant to Act 50, the exercise of native Hawaiian rights, or any ethnic group, related to gathering, access or other customary activities will not be affected by development activities. Because there were no cultural activities identified within the project area, there are no adverse effects.

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APPENDIX A: INQUIREY LETTERS

SCIENTIFIC CONSULTANT SERVICES, Inc.
711 Kapiolani Blvd., Suite 975 Honolulu, Hawai'i 96813

March 18, 2010

Central Maui
Hawaiian Civic Club
310 Ka'ahumanu Ave.
Kahului, Maui 96732

Dear Members:

Scientific Consultant Services, Inc. (SCS) has been contracted by Group 70 International to conduct a Cultural Impact Assessment (CIA) of land parcel consisting of 77-acres in Kihei, Ka'ono'ulu, Kōheo1&2, and Waiohuli Ahupua'a, Makawao District, Maui Island [TMK:2-2-002:015 (por.) and 054 (por.)] According to documents supplied by Group 70 International, the project area is planned for the development of a new high school and will include a library, auditorium, cafeteria, administration building, industrial arts building, ROTC facility, physical education and athletic buildings, gymnasium, and bleachers.

According to the *Guidelines for Assessing Cultural Impacts* (Office of Environmental Quality Control, Nov. 1997):

> The types of cultural practices and beliefs subject to assessment may include subsistence, commercial, residential, agricultural, access-related, recreational, and religious and spiritual customs…The types of cultural resources subject to assessment may include traditional cultural properties or other types of historic sites, both man made and natural which support such cultural beliefs…

We are asking you for any information that might assist us in gathering knowledge of traditional activities, or traditional rights that might be impacted by development of the property. The results of our assessments rely greatly on the assistance and response of individuals and organizations such as yours. Enclosed are maps showing the proposed project area. Please contact me at our SCS Honolulu office at (808) 597-1182; my cell phone, 225-2355; or home, (808) 637-9539, with any information or recommendations concerning this Cultural Impact Assessment.

Sincerely yours,

Leann McGerty

Leann McGerty, Senior Archaeologist
Enclosures (2)

Ph: 808-597-1182 SCS... SERVING ALL YOUR ARCHAEOLOGICAL NEEDS Fax: 808-597-1192
Neighbor Island Offices • Hawai'i Island • Maui • Kaua'i

SCIENTIFIC CONSULTANT SERVICES, Inc.
711 Kapiolani Blvd., Suite 975 Honolulu, Hawai'i 96813

March 18, 2010

Clyde Nāmu'o, Director
C/o Office of Hawaiian Affairs
711 Kapi'olani Blvd, Suite 500
Honolulu, HI 96813

Dear Mr. Nāmu'o:

Scientific Consultant Services, Inc. (SCS) has been contracted by Group 70 International to conduct a Cultural Impact Assessment (CIA) of land parcel consisting of 77-acres in Kīhei, Ka'ono'ulu, Kōheo1&2, and Waiohuli Ahupua'a, Makawao District, Maui Island [TMK:2-2-002:015 (por.) and 054 (por.)] According to documents supplied by Group 70 International, the project area is planned for the development of a new high school and will include a library, auditorium, cafeteria, administration building, industrial arts building, ROTC facility, physical education and athletic buildings, gymnasium, and bleachers. In 2010, an Archaeological Inventory Survey Report by Perzinski and Dega was submitted to SHPD and contains a summary of previous archaeology in the area.

Other contacts include Phyllis Cayan, Thelma Shimaoka, Charles Maxwell, Kimokeo Kapahulehua, Maui Dept. of Planning and Cultural Resources, Hinano Rodrigues, Kīhei Communiaty Association, and Central Maui Hawaiian Civic Club.

According to the *Guidelines for Assessing Cultural Impacts* (Office of Environmental Quality Control, Nov. 1997):

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Sincerely yours,

Leann McGerty

Leann McGerty, Senior Archaeologist
Enclosures (2)

SCIENTIFIC CONSULTANT SERVICES, Inc.
711 Kapiolani Blvd., Suite 975 Honolulu, Hawai'i 96813

March 18, 2010

Phyllis Coochie Cayan, History and Culture Branch Chief
C/O State Historic Preservation Division
601 Kamokila Blvd. Room 555
Kapolei, Hawai'i 96707

Dear Ms. Cayan:

Scientific Consultant Services, Inc. (SCS) has been contracted by Group 70 International to conduct a Cultural Impact Assessment (CIA) of land parcel consisting of 77-acres in Kīhei, Ka'ono'ulu, Kōheo1&2, and Waiohuli Ahupua'a, Makawao District, Maui Island [TMK:2-2-002:015 (por.) and 054 (por.)] According to documents supplied by Group 70 International, the project area is planned for the development of a new high school and will include a library, auditorium, cafeteria, administration building, industrial arts building, ROTC facility, physical education and athletic buildings, gymnasium, and bleachers.

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Sincerely yours,

Leann McGerty

Leann McGerty,
Senior Archaeologist
Enclosures (2)

Ph: 808-597-1182 SCS... SERVING ALL YOUR ARCHAEOLOGICAL NEEDS Fax: 808-597-1193
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SCIENTIFIC CONSULTANT SERVICES, Inc.
711 Kapiolani Blvd., Suite 975 Honolulu, Hawai'i 96813

March 18, 2010

Thelma Shimaoka
c/o Office of Hawaiian Affairs
140 Hoohana St.
Suite 206
Kahului, HI 96732

Dear Ms. Shimaoka:

Scientific Consultant Services, Inc. (SCS) has been contracted by Group 70 International to conduct a Cultural Impact Assessment (CIA) of land parcel consisting of 77-acres in Kihei, Ka'ono'ulu, Kōheo1&2, and Waiohuli Ahupua'a, Makawao District, Maui Island [TMK:2-2-002:015 (por.) and 054 (por.)] According to documents supplied by Group 70 International, the project area is planned for the development of a new high school and will include a library, auditorium, cafeteria, administration building, industrial arts building, ROTC facility, physical education and athletic buildings, gymnasium, and bleachers.

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Sincerely yours,

Leann McGerty

Leann McGerty, Senior Archaeologist
Enclosures (2)

A4

SCIENTIFIC CONSULTANT SERVICES, Inc.
711 Kapiolani Blvd., Suite 975 Honolulu, Hawai'i 96813

March 18, 2010

Mr. Charles Maxwell
157 Aiea Place
Pukalani, HI 96768

Dear Mr. Maxwell:

Scientific Consultant Services, Inc. (SCS) has been contracted by Group 70 International to conduct a Cultural Impact Assessment (CIA) of land parcel consisting of 77-acres in Kihei, Ka'ono'ulu, Kōheo1&2, and Waiohuli Ahupua'a, Makawao District, Maui Island [TMK:2-2-002:015 (por.) and 054 (por.)] According to documents supplied by Group 70 International, the project area is planned for the development of a new high school and will include a library, auditorium, cafeteria, administration building, industrial arts building, ROTC facility, physical education and athletic buildings, gymnasium, and bleachers.

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Sincerely yours,

Leann McGerty

Leann McGerty, Senior Archaeologist
Enclosures (2)

Ph: 808-597-1182 SCS... SERVING ALL YOUR ARCHAEOLOGICAL NEEDS Fax: 808-597-1183
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A5

SCIENTIFIC CONSULTANT SERVICES, Inc.
711 Kapiolani Blvd., Suite 975 Honolulu, Hawai'i 96813

March 18, 2010

Kimokeo Kapahulehua
c/o ʻAoʻao O Nā Loko Iʻa O Maui
P.O. Box 1574
Kīhei, HI 96731

Dear Mr. Kapahulehua:

Scientific Consultant Services, Inc. (SCS) has been contracted by Group 70 International to conduct a Cultural Impact Assessment (CIA) of land parcel consisting of 77-acres in Kīhei, Kaʻonoʻulu, Kōheo1&2, and Waiohuli Ahupuaʻa, Makawao District, Maui Island [TMK:2-2-002:015 (por.) and 054 (por.)] According to documents supplied by Group 70 International, the project area is planned for the development of a new high school and will include a library, auditorium, cafeteria, administration building, industrial arts building, ROTC facility, physical education and athletic buildings, gymnasium, and bleachers.

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Sincerely yours,

Leann McGerty

Leann McGerty, Senior Archaeologist
Enclosures (2)

A6

SCIENTIFIC CONSULTANT SERVICES, Inc.
711 Kapiolani Blvd., Suite 975 Honolulu, Hawai'i 96813

March 18, 2010

County of Maui
Department of Planning
Cultural Resources Commission
250 S. High Street
Wailuku, HI 96793

Dear Sir or Madam:

Scientific Consultant Services, Inc. (SCS) has been contracted by Group 70 International to conduct a Cultural Impact Assessment (CIA) of land parcel consisting of 77-acres in Kīhei, Kaʻonoʻulu, Kōheo1&2, and Waiohuli Ahupuaʻa, Makawao District, Maui Island [TMK:2-2-002:015 (por.) and 054 (por.)] According to documents supplied by Group 70 International, the project area is planned for the development of a new high school and will include a library, auditorium, cafeteria, administration building, industrial arts building, ROTC facility, physical education and athletic buildings, gymnasium, and bleachers.

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Sincerely yours,

Leann McGerty

Leann McGerty, Senior Archaeologist
Enclosures (2)

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Neighbor Island Offices • Hawai'i Island • Maui • Kaua'i

A7

SCIENTIFIC CONSULTANT SERVICES, Inc.
711 Kapiolani Blvd., Suite 975 Honolulu, Hawai'i 96813

March 18, 2010

Hinano Rodrigues, Cultural Historian
DLNR Maui Office
130 Mahalani Street
Wailuku, HI 96791

Dear Hinano:

Scientific Consultant Services, Inc. (SCS) has been contracted by Group 70 International to conduct a Cultural Impact Assessment (CIA) of land parcel consisting of 77-acres in Kīhei, Ka'ono'ulu, Kōheo1&2, and Waiohuli Ahupua'a, Makawao District, Maui Island [TMK:2-2-002:015 (por.) and 054 (por.)] According to documents supplied by Group 70 International, the project area is planned for the development of a new high school and will include a library, auditorium, cafeteria, administration building, industrial arts building, ROTC facility, physical education and athletic buildings, gymnasium, and bleachers.

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Sincerely yours,

Leann McGerty

Leann McGerty, Senior Archaeologist
Enclosures (2)

SCIENTIFIC CONSULTANT SERVICES, Inc.
711 Kapiolani Blvd., Suite 975 Honolulu, Hawai'i 96813

March 18, 2010

Kīhei Community Association
Kīhei, Maui
FAX: 808-879-5390

Dear Sirs:

Scientific Consultant Services, Inc. (SCS) has been contracted by Group 70 International to conduct a Cultural Impact Assessment (CIA) of land parcel consisting of 77-acres in Kīhei, Ka'ono'ulu, Kōheo1&2, and Waiohuli Ahupua'a, Makawao District, Maui Island [TMK:2-2-002:015 (por.) and 054 (por.)] According to documents supplied by Group 70 International, the project area is planned for the development of a new high school and will include a library, auditorium, cafeteria, administration building, industrial arts building, ROTC facility, physical education and athletic buildings, gymnasium, and bleachers.

According to the *Guidelines for Assessing Cultural Impacts* (Office of Environmental Quality Control, Nov. 1997):

> The types of cultural practices and beliefs subject to assessment may include subsistence, commercial, residential, agricultural, access-related, recreational, and religious and spiritual customs…The types of cultural resources subject to assessment may include traditional cultural properties or other types of historic sites, both man made and natural which support such cultural beliefs…

We are asking you for any information that might assist us in gathering knowledge of traditional activities, or traditional rights that might be impacted by development of the property. The results of our assessments rely greatly on the assistance and response of individuals and organizations such as yours. Enclosed are maps showing the proposed project area. Please contact me at our SCS Honolulu office at (808) 597-1182; my cell phone, 225-2355; or home, (808) 637-9539, with any information or recommendations concerning this Cultural Impact Assessment.

Sincerely yours,

Leann McGerty

Leann McGerty, Senior Archaeologist
Enclosures (2)

Ph: 808-597-1182 SCS... SERVING ALL YOUR ARCHAEOLOGICAL NEEDS Fax: 808-597-1182
Neighbor Island Offices • Hawai'i Island • Maui • Kaua'i

APPENDIX B: BURIAL NOTICES

IN THE MATTER OF

CULTURAL IMPACT ASSESSMENT
NOTICE

155

CULTURAL IMPACT ASSESSMENT NOTICE:
Information requested by SCS of cultural resources or ongoing cultural activities on or near these parcels in Kihei, Maui Island TMK: 3-2-(02:015 por. and 054 por. Please respond within 30 days to SCS at (808) 597-1182.
(Hon. Adv.; Mar. 28, 30, 31, 2010) (798701)

STATE OF HAWAII
City and County of Honolulu

AFFIDAVIT OF PUBLICATION

ss.

Grace Santos being duly sworn deposes and says that she is a clerk, duly authorized to execute this affidavit of THE HONOLULU ADVERTISER, a division of GANNETT PACIFIC CORPORATION, that said newspaper is a newspaper of general circulation in the State of Hawaii, and that the attached notice is a true notice as was published in the aforereferenced newspaper as follows

03/28/2010 The Honolulu Advertiser
03/30/2010 The Honolulu Advertiser
03/31/2010 The Honolulu Advertiser

and that affiant is not a party to or in any way interested in the above entitled matter.

Grace Santos

Subscribed and sworn to before me this 31st day of March A.D. 2010

JEANETTE T. CHING NOTARY PUBLIC No. 98-321 STATE OF HAWAII

Notary Public of the First Judicial Circuit
State of Hawaii
My commission expires _____

March 31, 2010
1st
April 10

JEANETTE T. CHING NOTARY PUBLIC No. 98-321 STATE OF HAWAII

798701

AFFIDAVIT OF PUBLICATION

(755)

STATE OF HAWAII, } ss.
County of Maui. }

Rhonda M. Kurohara being duly sworn deposes and says,that she is in Advertising Sales of the Maui Publishing Co., Ltd., publishers of THE MAUI NEWS, a newspaper published in Wailuku, County of Maui, State of Hawaii; that the ordered publication as to

CULTURAL IMPACT ASSESSMENT NOTICE

of which the annexed is a true and correct printed notice, was published 3 times in THE MAUI NEWS, aforesaid, commencing on the 28th day of March, 2010, and ending on the 31st day of March, 2010, (both days inclusive), to-wit: on

March 28, 30, 31, 2010

and that affiant is not a party to or in any way interested in the above entitled matter.

This 1 page Cultural Impact, dated March 28, 30, 31, 2010, was subscribed and sworn to before me this 31st day of March, 2010, in the Second Circuit of the State of Hawaii, by Rhonda M. Kurohara

Notary Public, Second Judicial Circuit, State of Hawaii

BETTY E. UEHARA
My commission expires 09-26-11

BETTY E. UEHARA NOTARY PUBLIC No. 83-344 STATE OF HAWAII

CULTURAL IMPACT ASSESSMENT NOTICE

Information requested by SCS of cultural resources or on-going cultural activities on or near these parcels in Kihei, Maui Island TMK: 2-2-002:015 por. and 054 por. Please respond within 30 days to SCS at (808) 597-1182.

(MN: Mar. 28, 30, 31, 2010)

APPENDIX C: PROJECT CORRESPONDENCE

LINDA LINGLE
GOVERNOR OF HAWAII

LAURA H. THIELEN
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

RUSSELL Y. TSUJI
FIRST DEPUTY

KEN C. KAWAHARA
DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
BUREAU OF CONVEYANCES
COMMISSION ON WATER RESOURCE MANAGEMENT
CONSERVATION AND COASTAL LANDS
CONSERVATION AND RESOURCES ENFORCEMENT
ENGINEERING
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

STATE HISTORIC PRESERVATION DIVISION
601 KAMOKILA BOULEVARD, ROOM 555
KAPOLEI, HAWAII 96707

April 19, 2010

Ms Leann McGerty, Senior Archaeologist
Scientific Consultant Services, Inc.
711 Kapiolani Blvd, Suite 975
Honolulu, Hawai'i 96813

LOG NO: 2010.0107
DOC NO: 1004.HR02

Dear Leann McGerty:

SUBJECT: Request for Information Regarding a Cultural Impact Assessment of 77 Acres Located at Kihei, Ka'ono'ulu, Kōheo 1&2, and Waiohuli Ahupua'a, Makawao District, Island of Maui. TMK: (2) 2-2-002: 015.

This is in response to your request for any information that may assist your firm in gathering knowledge of traditional cultural activities and/or traditional cultural rights that may be impacted by the development of the above property.

Kihei has several active community organizations who may be helpful by talking to its members such as the Neighborhood Board or similar entity, or the Hawaiian Civic Club of that area (see the Association of Hawaiian Civic Clubs for information of all Maui chapters.) You might find some leads in reviewing any AIS or CIA of nearby areas (i.e., Honua'ula) and/or the local Kihei weekly newspapers that list community groups (i.e. canoe clubs, rotary club) and their events.

The following may be able to share mana'o and/or refer folks who may be helpful:

1. Mrs. Nanifay Paglinawan — Phone: 808.879.6577
2. Kumu Hula Kaponoai Molitau — contact: Native Intelligence Shop, Wailuku
3. Uncle Les Kuloloio — Phone: 808.281.7652
4. Maui Office of Hawaiian Affairs — Phone: 808.873.3364

Should you have any questions or concerns, please contact our Maui SHPD Cultural Historian, Mr. Hinano Rodrigues at 808 243-4640.

Sincerely,

Phyllis Coochie Cayan

Phyllis Coochie Cayan
History and Culture Branch Chief

cc: Mr. Hinano Rodrigues, SHPD Cultural Historian

PHONE (808) 594-1888

FAX (808) 594-1865

STATE OF HAWAI'I
OFFICE OF HAWAIIAN AFFAIRS
711 KAPI'OLANI BOULEVARD, SUITE 500
HONOLULU, HAWAI'I 96813

HRD10/4623C

April 12, 2010

Leann McGerty
Senior Archaeologist
711 Kapi'olani Blvd, Suite 975
Honolulu, HI 96813

RE: Cultural Impact Assessment consultation
Kihei, Ka'ono'ulu, Kōheo 1&2 Project
Waiohuli Ahupua'a
Tax Map Key: (2) 2-2-002:015, (2) 2-2-002:054

Aloha e Ms. McGerty:

The Office of Hawaiian Affairs (OHA) is in receipt of your March 18, 2010 letter initiating consultation and seeking comments ahead of a cultural impact assessment (assessment) for the proposed development project of the development of the new high school. According to the information in your letter, the proposed development is located in the Waiohuli Ahupua'a, Makawao District on the island of Maui on the above tax map key parcel mentioned above.

According to your letter, the project area is planned for the development of a new high school and will include a library, auditorium, cafeteria, administrative building, industrial arts building, ROTC facility, physical education and athletic building, gymnasium, and bleachers. OHA applauds your efforts to perform an Archaeological Inventory Survey Report in connection with this project and requests information or a summary of your findings.

OHA also applauds your recent public notice in the April edition of the Ka Wai Ola. We appreciate your attempt to reach out to the community and to anyone who might have an interest or can provide mana'o and mo'olelo of this area, cultural and traditional practices, heiau location, and other significant cultural sites. We also agree with your list of contacts and are confident it will provide you with the information you need to move forward with your consultation process.

Thank you for initiating consultation at this early stage and we look forward to the opportunity to review the completed assessment. Should you have any questions, please contact Kathryn Keala at 594-0272 or kathyk@oha.org.

'O wau iho nō me ka 'oia'i'o,

Clyde W. Nāmu'o
Chief Executive Officer

C: OHA-Maui Community Resources Coordinator

Appendix G

Traffic Impact Report-Kīhei High School and Traffic Signal Warrant Study-Piʻilani Highway and Kūlanihākoʻi Street

Wilson Okamoto Corporation – September 2011 and May 2010

Traffic Impact Report

Kihei High School

Prepared for:
Group 70 International, Inc.

Prepared by:
Wilson Okamoto Corporation

September 2011
Revised April 2012

TRAFFIC IMPACT REPORT

FOR

KIHEI HIGH SCHOOL

Prepared for:

Group 70 International, Inc.
925 Bethel Street, Fifth Floor
Honolulu, Hawaii 96813

Prepared by:

Wilson Okamoto Corporation
1907 S. Beretania Street, Suite 400
Honolulu, Hawaii 96826
WOC Ref #7854-01

September 2011
Revised April 2012

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I. INTRODUCTION

A. Purpose of Study

The purpose of this study is to identify and assess the traffic impacts resulting from the proposed Kihei High School in Kihei on the island of Maui. High school students who reside in Kihei currently attend Maui High School in Kahului or Baldwin High School in Wailuku. The proposed school will allow these and future high school students from Kihei to attend a school within their region.

B. Scope of Study

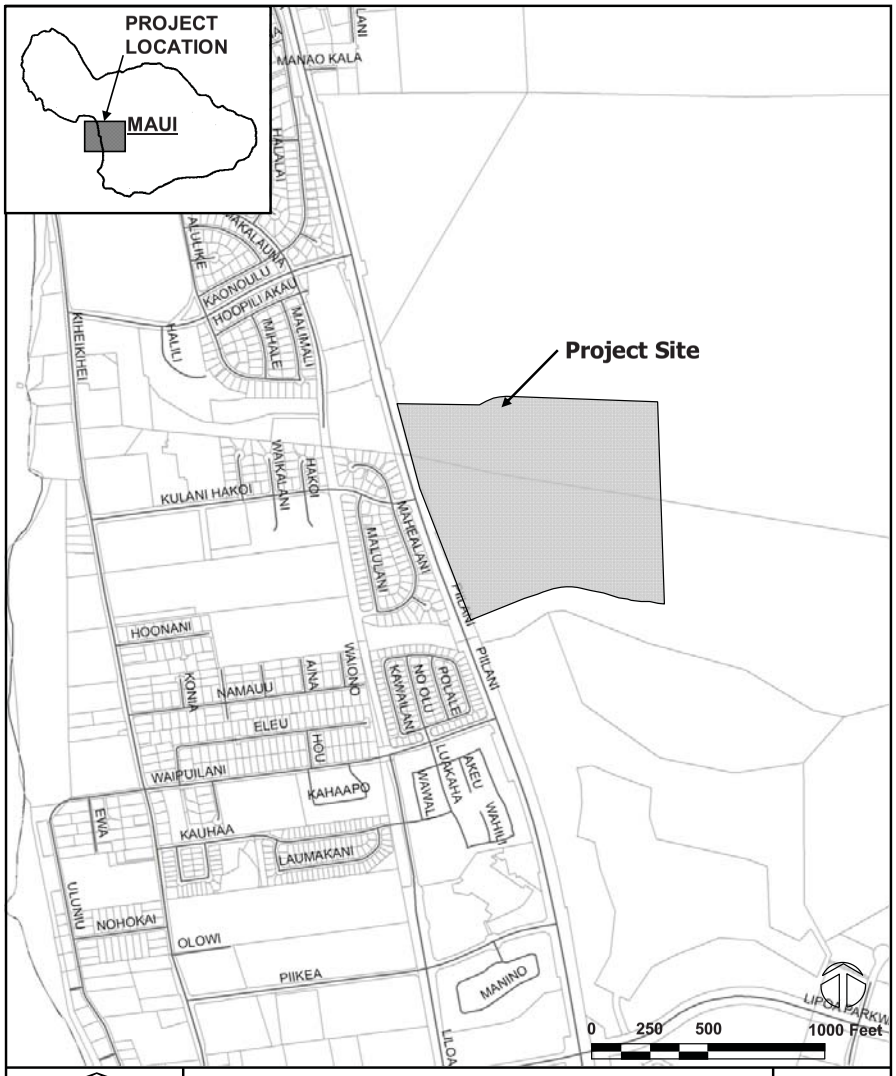
This report presents the findings and conclusions of the traffic study, the scope of which includes:

1. Description of the proposed project.
2. Evaluation of existing roadway and traffic operations in the vicinity.
3. Analysis of future roadway and traffic conditions without the proposed project.
4. Analysis and development of trip generation characteristics for the proposed project.
5. Superimposing site-generated traffic over future traffic conditions.
6. The identification and analysis of traffic impacts resulting from the proposed project.
7. Recommendations of improvements, if appropriate, that would mitigate the traffic impacts resulting from the proposed project.

II. PROJECT DESCRIPTION

A. Location

The Kihei High School will be located on an over 70-acre site adjacent to Piilani Highway in Kihei on the island of Maui (see Figure 1). The proposed project site is further identified as Tax Map Keys (TMKs): 2-2-002: 15 (por) and 54 (por). The site is bounded by Piilani Highway to the west and agricultural lands to the north, east, and south. Vehicular access to the proposed school will be provided via a new access roadway off Piilani Highway at the intersection with Kulanihakoi Street.



B. Project Characteristics

The State of Hawaii Department of Education (DOE) has plans to construct a new high school in Kihei adjacent to Piilani Highway. The proposed high school will include the following:

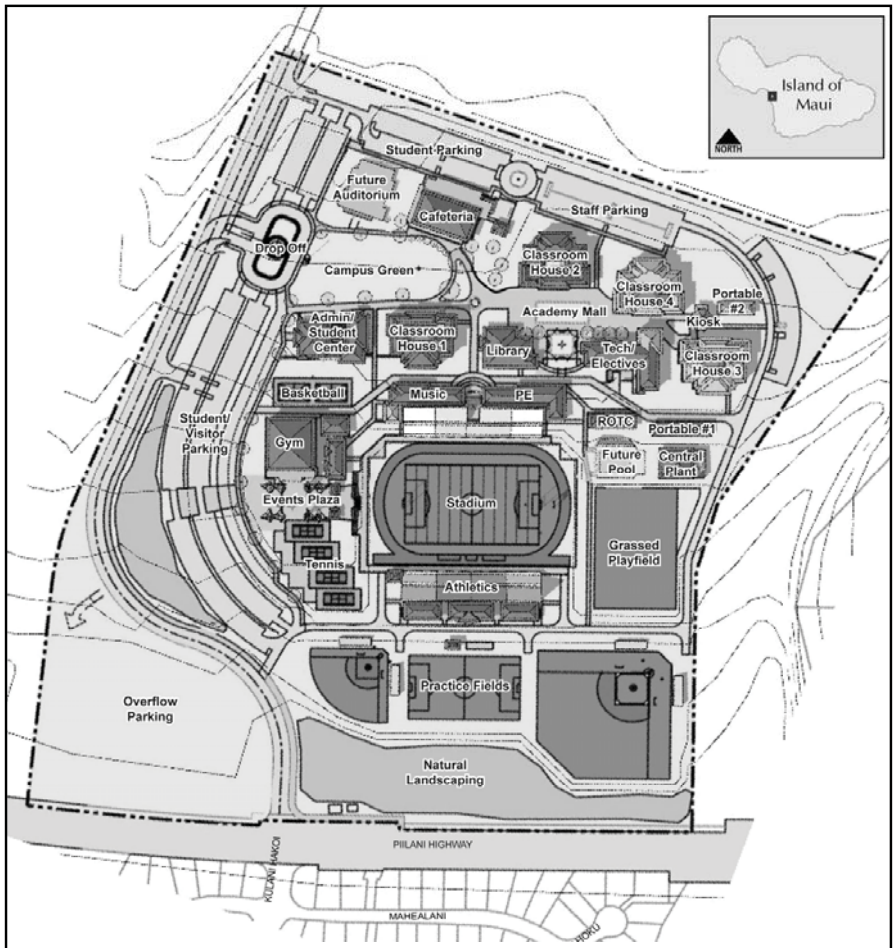
- Classrooms
- Library
- Auditorium
- Cafeteria
- Administration building
- Industrial arts building
- ROTC facility
- PE and athletic buildings
- Gymnasium
- Swimming pool
- Football/track stadium
- Tennis courts
- Grassed playfields
- Track and field appurtenances
- Softball and baseball fields
- Parking areas

Access to the new high school will be provided via a new access roadway off Piilani Highway at the intersection with Kulanihakoi Street. The majority of the facilities at the high school are expected to be completed when the school opens in the Year 2015. The school is initially expected to accommodate approximately 800 students with a full enrollment of 1,650 students expected by the Year 2025. Figure 2 shows the proposed project site plan.

III. EXISTING TRAFFIC CONDITIONS

A. Area Roadway System

In the vicinity of the project, Piilani Highway is a predominantly four-lane, two-way roadway generally oriented in the north-south direction that provides access through Kihei. North of the project site, Piilani Highway intersects Kaonoulu Street. At this unsignalized T-intersection, the northbound approach of the highway has an exclusive left-turn lane and two through lanes while the southbound approach has two through lanes and an exclusive right-turn lane. Kaonoulu Street is generally oriented



WILSON OKAMOTO CORPORATION ENGINEERS • PLANNERS	KIHEI HIGH SCHOOL PROJECT SITE PLAN	FIGURE 2

in the east-west direction and serves as a connector roadway between South Kihei Road and Piilani Highway. At the intersection with Piilani Highway, the Kaonoulu Street approach has two stop-controlled lanes that serve left-turn and right-turn traffic movements. In addition, a refuge lane is provided within the median along the highway to assist vehicles turning left from Kaonoulu Street.

South of the intersection with Kaonoulu Street, Piilani Highway intersects Kulanihakoi Street. At this unsignalized T-intersection, the northbound approach of the highway has an exclusive left-turn lane and two through lanes while the southbound approach has two through lanes and an exclusive right-turn lane. Kulanihakoi Street is generally oriented in the east-west direction and serves as a connector roadway between South Kihei Road and Piilani Highway. At the intersection with Piilani Highway, the Kulanihakoi Street approach has two stop-controlled lanes that serve left-turn and right-turn traffic movements. In addition, a refuge lane is provided within the median along the highway to assist vehicles turning left from Kulanihakoi Street.

Further south, Piilani Highway intersects E. Waipuilani Road. At this unsignalized T-intersection, the northbound approach of the highway has two through lanes while the southbound approach has two through lanes and an exclusive right-turn lane. E. Waipuilani Road is generally oriented in the east-west direction and serves as a connector roadway between South Kihei Road and Piilani Highway. At the intersection with Piilani Highway, the E. Waipuilani Road approach has one stop-controlled lane that serves right-turn traffic movements only.

At the southern end of the study area, Piilani Highway intersects Piikea Avenue. At this signalized intersection, the northbound approach of the highway has an exclusive left-turn lane and two through lanes while the southbound approach has two through lanes and an exclusive right-turn lane. Piikea Avenue is generally oriented in the east-west direction and serves as a connector roadway between South Kihei Road and Piilani Highway. At the intersection with Piilani Highway, the Piikea Avenue approach has exclusive left-turn and right-turn lanes.

West of the intersection with Piilani Highway, Kulanihakoi Street intersects South Kihei Road. At this unsignalized T-intersection, the Kulanihakoi Street approach has two stop-controlled lanes that serve left-turn and right-turn traffic movements. South Kihei Road runs parallel to Piilani Highway and serves as an alternate north-south route through Kihei. At the intersection with Kulanihakoi Street, the northbound approach of South Kihei Road has a shared through and right-turn lane while the southbound approach has an exclusive left-turn lane and one through lane.

B. Traffic Volumes and Conditions

1. General

a. Field Investigation

Field investigations were conducted on January 26-27, 2011, and consisted of manual turning movement count surveys in the project vicinity. The manual turning movement count surveys were conducted between the morning peak hours of 6:00 AM and 9:00 AM, and the afternoon peak hours of 3:00 PM and 6:00 PM at the following intersections:

- Piilani Highway and Kaonoulu Street
- Piilani Highway and Kulanihakoi Street
- Piilani Highway and E. Waipuilani Road
- Piilani Highway and Piikea Avenue
- Kulanihakoi Street and South Kihei Road

Appendix A includes the existing traffic count data.

b. Capacity Analysis Methodology

The highway capacity analysis performed in this study is based upon procedures presented in the "Highway Capacity Manual", Transportation Research Board, 2000, and the "Synchro" software, developed by Trafficware. The analysis is based on the concept of Level of Service (LOS).

LOS is a quantitative and qualitative assessment of traffic operations. Levels of Service are defined by LOS "A" through "F";

LOS "A" representing ideal or free-flow traffic operating conditions and LOS "F" unacceptable or potentially congested traffic operating conditions.

"Volume-to-Capacity" (v/c) ratio is another measure indicating the relative traffic demand to the road carrying capacity. A v/c ratio of one (1.00) indicates that the roadway is operating at or near capacity. A v/c ratio of greater than 1.00 indicates that the traffic demand exceeds the road's carrying capacity. The LOS definitions are included in Appendix B.

2. Existing Peak Hour Traffic

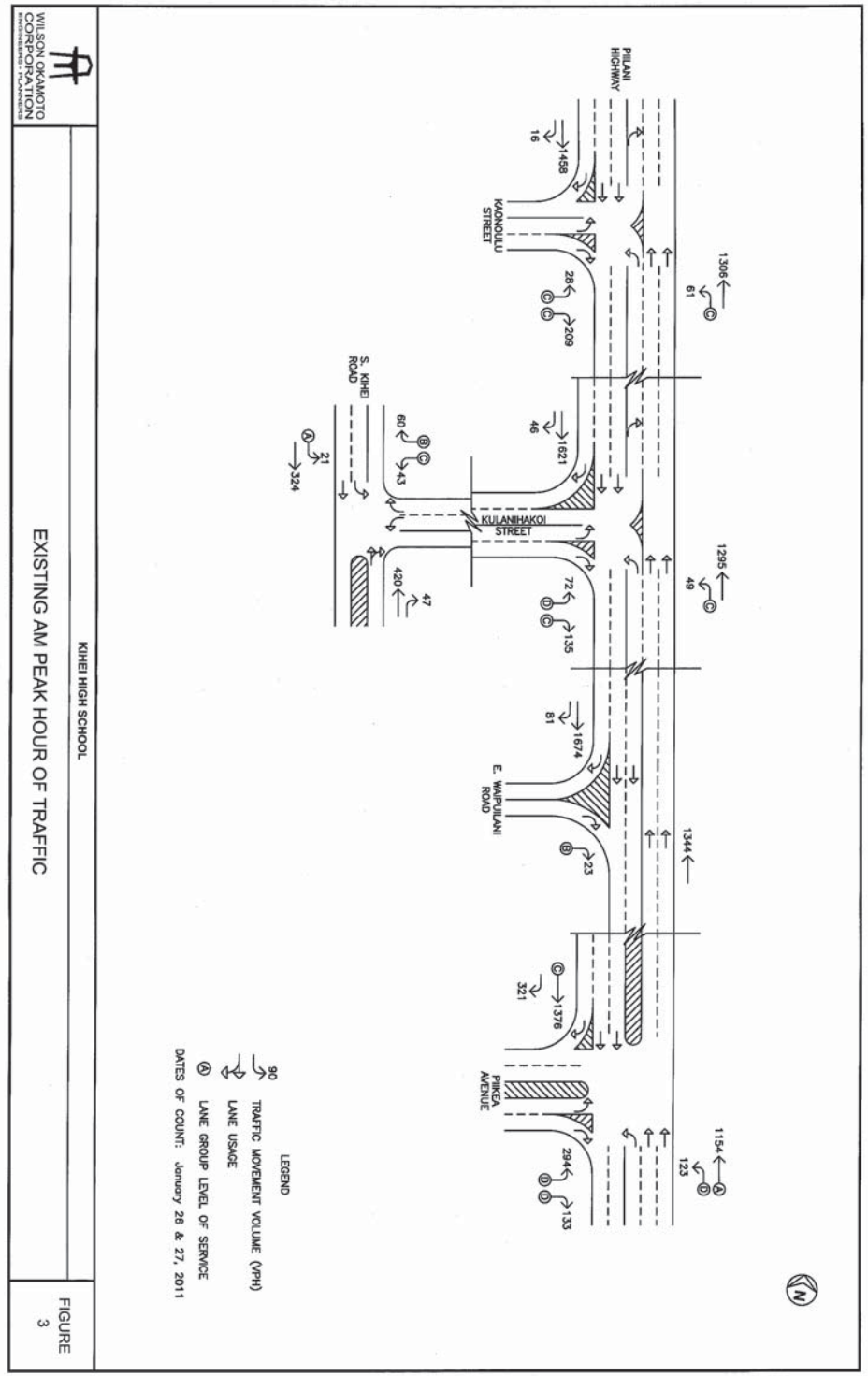
a. General

Figures 3 and 4 show the existing AM and PM peak hour traffic volumes and operating traffic conditions. The AM peak hour of traffic generally occurs between the hours of 7:15 AM and 8:15 AM while the PM peak hour of traffic generally occurs between the hours of 3:45 PM and 4:45 PM. The analysis is based on these peak hour time periods for each intersection to identify the traffic impacts resulting from the proposed project. LOS calculations are included in Appendix C.

b. Piilani Highway and Kaonoulu Street

At the intersection with Kaonoulu Street, Piilani Highway carries 1,367 vehicles northbound and 1,474 vehicles southbound during the AM peak hour of traffic. During the PM peak period, traffic volumes are higher with 1,593 vehicles traveling northbound and 1,654 vehicles traveling southbound. The critical movement on the highway approaches of the intersection is the northbound left-turn traffic movement which operates at LOS "C" during both peak periods.

The Kaonoulu Street approach of the intersection carries 237 vehicles and 129 vehicles eastbound during the AM and PM peak



periods, respectively. The left-turn traffic movement on this approach operates at LOS "D" and LOS "C" during the AM and PM peak periods, respectively, while the right-turn traffic movement operates at LOS "C" during both peak periods. Traffic queues periodically formed on this approach with the average queue lengths of 2-3 vehicles observed during both peak periods.

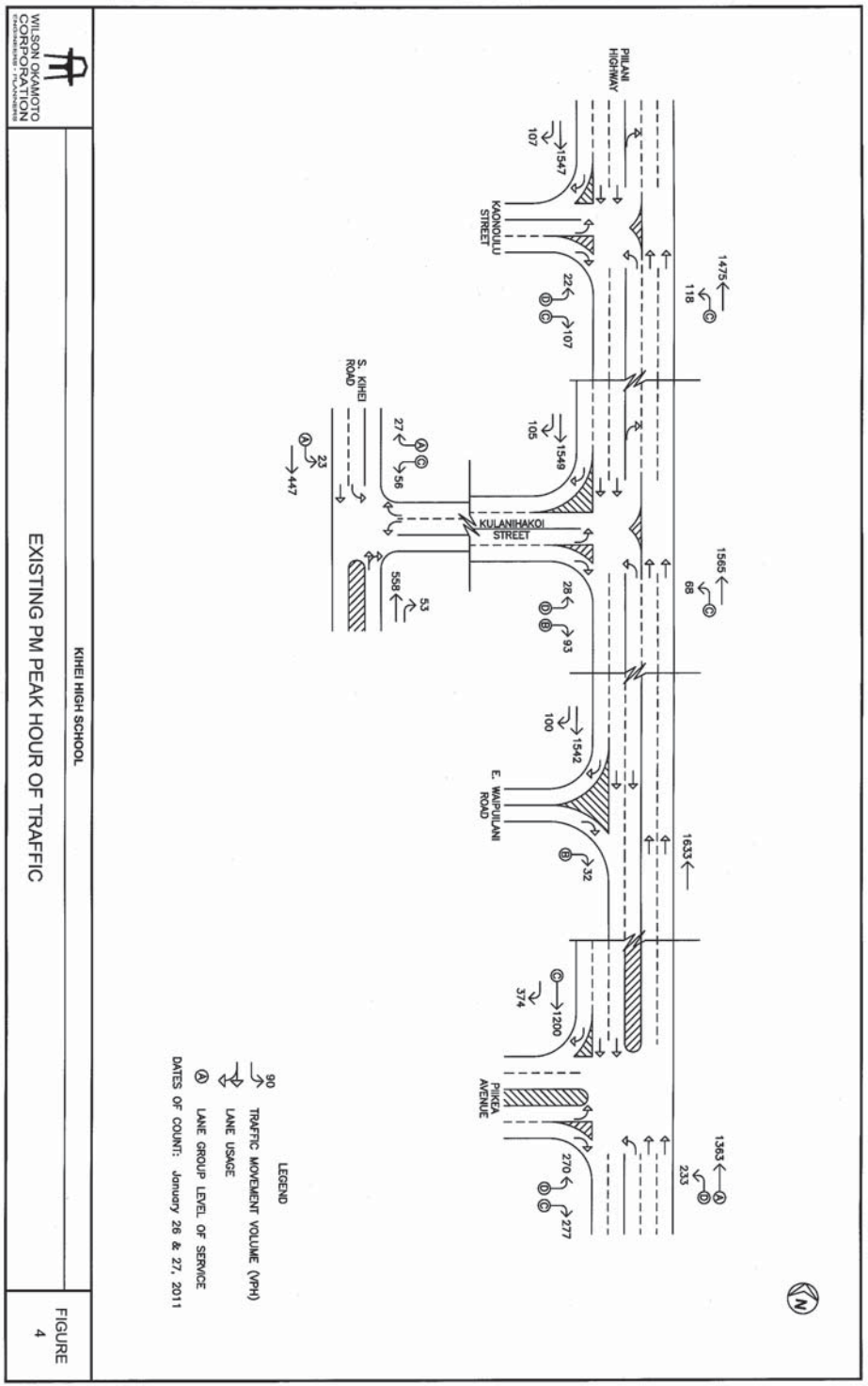
c. Piilani Highway and Kulanihakoi Street

At the intersection with Kulanihakoi Street, Piilani Highway carries 1,344 vehicles northbound and 1,667 vehicles southbound during the AM peak hour of traffic. During the PM peak period, the overall traffic volume is higher with 1,633 vehicles traveling northbound and 1,654 vehicles traveling southbound. The critical movement on the highway approaches of the intersection is the northbound left-turn traffic movement which operates at LOS "C" during both peak periods.

The Kulanihakoi Street approach of the intersection carries 207 vehicles and 121 vehicles eastbound during the AM and PM peak periods, respectively. The left-turn traffic movement on this approach operates at LOS "C" during both peak periods while the right-turn traffic movement operates at LOS "C" and LOS "B" during the AM and PM peak periods, respectively. Traffic queues periodically formed on this approach with the average queue lengths of 2-4 vehicles observed during both peak periods.

d. Piilani Highway and E. Waipuilani Road

At the intersection with E. Waipuilani Road, Piilani Highway carries 1,344 vehicles northbound and 1,755 vehicles southbound during the AM peak hour of traffic. During the PM peak period, the overall traffic volume is higher with 1,633 vehicles traveling northbound and 1,642 vehicles traveling southbound.



The E. Waipuilani Road approach of the intersection carries 23 vehicles and 32 vehicles eastbound during the AM and PM peak periods, respectively. This approach operates at LOS "B" during both peak periods.

e. Piilani Highway and Piikea Avenue

At the intersection with Piikea Avenue, Piilani Highway carries 1,277 vehicles northbound and 1,697 vehicles southbound. During the PM peak period, the overall traffic volume is higher with 1,596 vehicles traveling northbound and 1,574 vehicles traveling southbound. The critical movements on the highway approaches of the intersection are the northbound left-turn traffic movement which operates at LOS "D" during both peak periods and the southbound through traffic movement which operates at LOS "C" during both peak periods. Traffic queues periodically formed on the highway approaches of the intersection with the most significant queuing occurring during the PM peak periods. During this period, average queue lengths of 7-9 vehicles were observed on both approaches. These queues were observed to clear the intersection after each traffic signal cycle change.

The Piikea Avenue approach of the intersection carries 427 vehicles and 547 vehicles eastbound during the AM and PM peak periods, respectively. The left-turn traffic movement on this approach operates at LOS "D" during both peak periods while the right-turn traffic movement operates at LOS "D" and LOS "C" during the AM and PM peak periods, respectively. Traffic queues periodically formed on the Piikea Avenue approach of the intersection with average queue lengths of 7-9 vehicles observed during both peak periods. Occasionally, queues extended through the upstream intersection with the Piilani Village Shopping Center, but most of these queues were observed to clear the intersection after each traffic signal cycle change.

f. Kulanihakoi Street and South Kihei Road

At the intersection with South Kihei Road, the Kulanihakoi Street approach of the intersection carries 103 vehicles and 83 vehicles westbound during the AM and PM peak periods, respectively. The critical movement on the Kulanihakoi Street approach is the left-turn traffic movement which operates at LOS "C" during both peak periods.

The South Kihei Road approaches of the intersection carry 467vehicles northbound and 342 vehicles southbound during the AM peak hour of traffic. During the PM peak period, traffic volumes are higher with 611 vehicles traveling northbound and 470 vehicles traveling southbound. The critical movement on the South Kihei Road approaches of the intersection is the southbound left-turn traffic movement which operates at LOS "A" during both peak periods.

IV. PROJECTED TRAFFIC CONDITIONS

A. Site-Generated Traffic

1. Trip Generation Methodology

The trip generation methodology used in this study is based upon generally accepted techniques developed by the Institute of Transportation Engineers (ITE) and published in "Trip Generation, 8th Edition," 2008. The ITE trip generation rates are developed empirically by correlating the vehicle trip generation data with various land use characteristics such as the number of vehicle trips generated per student. As previously stated, high school students from Kihei currently attend high schools in Kahului and Wailuku and these students are expected to transfer to the new high school once it is opened. As provided by the Department of Education (DOE), there are currently 704 students from Kihei attending high schools in other regions. Table 1 summarizes the project site trip generation characteristics applied to the AM and PM peak hours of traffic to measure the impact resulting from the proposed Kihei High School.

Table 1: Peak Hour Trip Generation

YEAR 2015		
HIGH SCHOOL (EXISTING STUDENTS)		
INDEPENDENT VARIABLE:	Students = 704 (Existing)	
		PROJECTED TRIP ENDS
AM PEAK	ENTER	201
	EXIT	95
	TOTAL	296
PM PEAK	ENTER	43
	EXIT	49
	TOTAL	92
HIGH SCHOOL (NEW STUDENTS)		
INDEPENDENT VARIABLE:	Students = 96 (New)	
		PROJECTED TRIP ENDS
AM PEAK	ENTER	27
	EXIT	13
	TOTAL	40
PM PEAK	ENTER	6
	EXIT	6
	TOTAL	12
YEAR 2015 SUBTOTAL		
INDEPENDENT VARIABLE:	Students = 800	
		PROJECTED TRIP ENDS
AM PEAK	ENTER	228
	EXIT	108
	TOTAL	336
PM PEAK	ENTER	49
	EXIT	55
	TOTAL	104
YEAR 2025		
HIGH SCHOOL (NEW STUDENTS)		
INDEPENDENT VARIABLE:	Students = 850 (New)	
AM PEAK	ENTER	243
	EXIT	114
	TOTAL	357
PM PEAK	ENTER	52
	EXIT	59
	TOTAL	111

Table 1: Peak Hour Trip Generation (Cont'd)

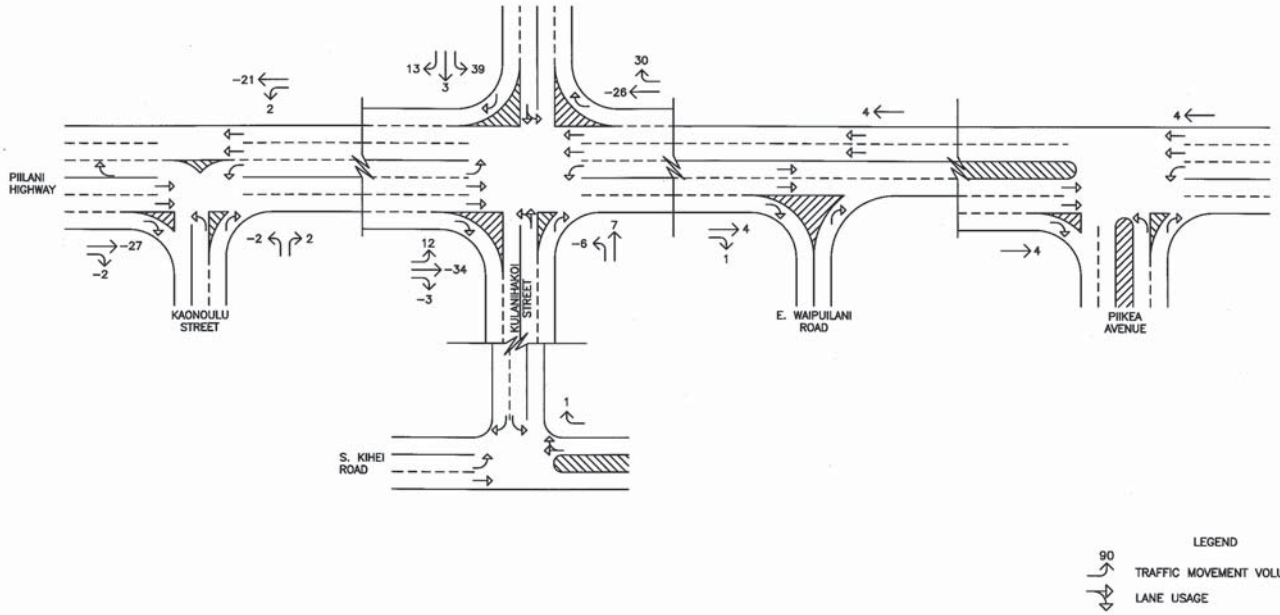
TOTALS (EXISTING AND NEW STUDENTS)		
		PROJECTED TRIP ENDS
AM PEAK	ENTER	471
	EXIT	222
	TOTAL	693
PM PEAK	ENTER	101
	EXIT	114
	TOTAL	215

2. Trip Distribution

Figures 5 to 8 show the distribution of site-generated vehicular trips at the study intersections during the Year 2015 and Year 2025 AM and PM peak periods. Access to Kihei High School will be provided via new access road off Piilani Highway at the intersection with Kulanihakoi Street. High School students from Kihei currently attending other schools in Kahului and Wailuku are assumed to already be utilizing Piilani Highway to travel to/from Kihei. As such, trips associated with existing students were reassigned from Piilani Highway to the new high school access. The directional distribution of existing and new trips to/from the high school was based upon the relative distribution of households within the Kihei and Wailea areas and the available routes to/from the new school.

B. Through Traffic Forecasting Methodology

Historical traffic count data obtained from the State Department of Transportation (SDOT), Highway Division survey stations in the vicinity of the project site indicates traffic volumes have remained relatively stable and, as such, an annual traffic growth rate of approximately 1.0% per year was conservatively assumed along Piilani Highway and South Kihei Road in the project vicinity. Using 2011 as the Base Year, growth factors of 1.04 and 1.14 were applied to the existing through traffic demands along those roadways to achieve the projected Year 2015 and Year 2025, respectively traffic demands.

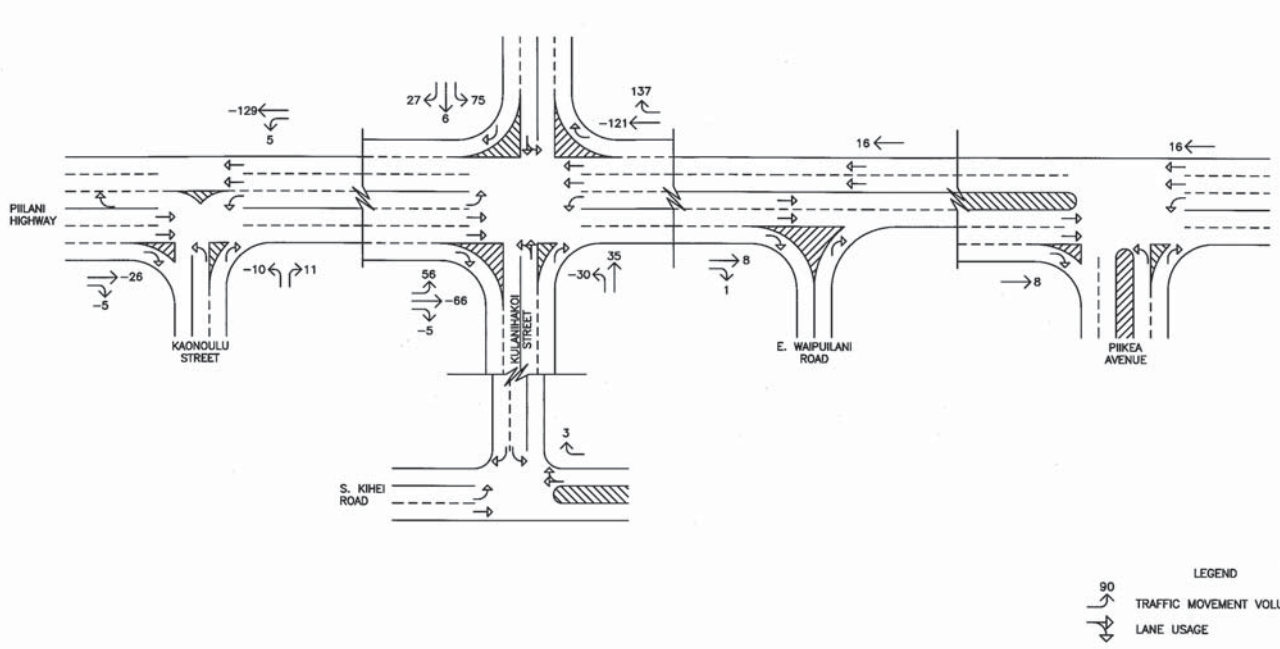


KIHEI HIGH SCHOOL

YEAR 2015 DISTRIBUTION OF SITE-GENERATED VEHICLES - PM PEAK HOUR OF TRAFFIC

FIGURE 6

WILSON OKAMOTO CORPORATION ENGINEERS · PLANNERS

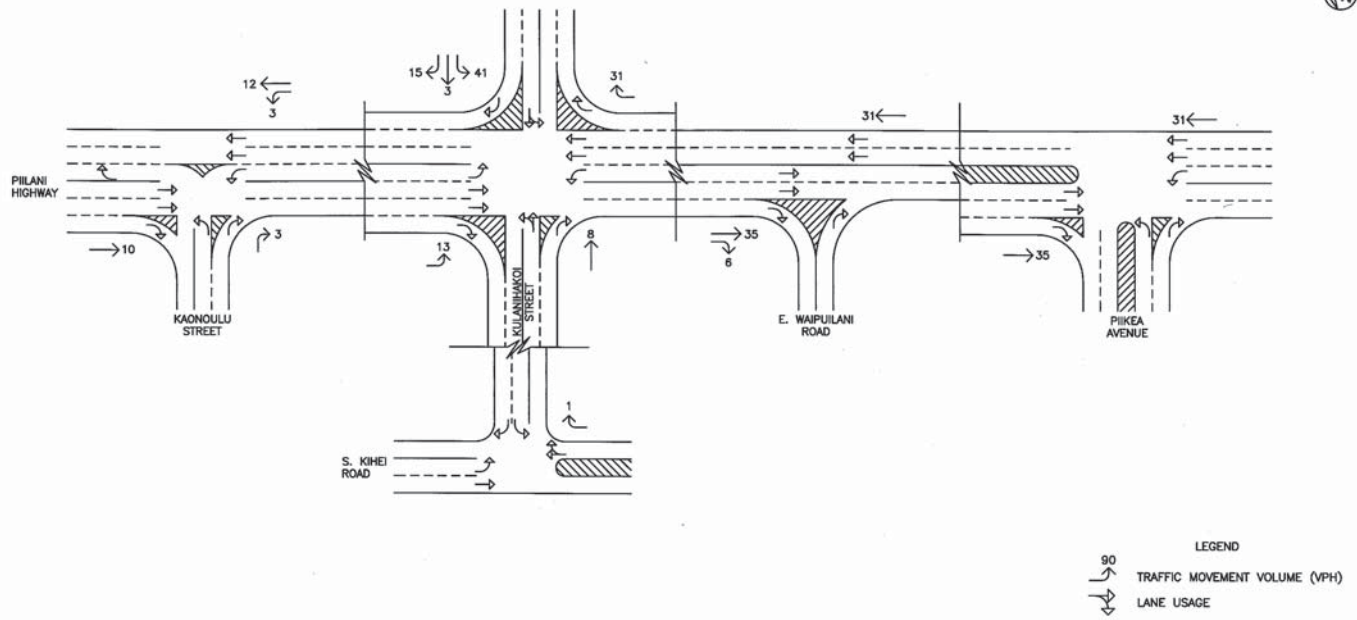


KIHEI HIGH SCHOOL

YEAR 2015 DISTRIBUTION OF SITE-GENERATED VEHICLES - AM PEAK HOUR OF TRAFFIC

FIGURE 5

WILSON OKAMOTO CORPORATION ENGINEERS · PLANNERS

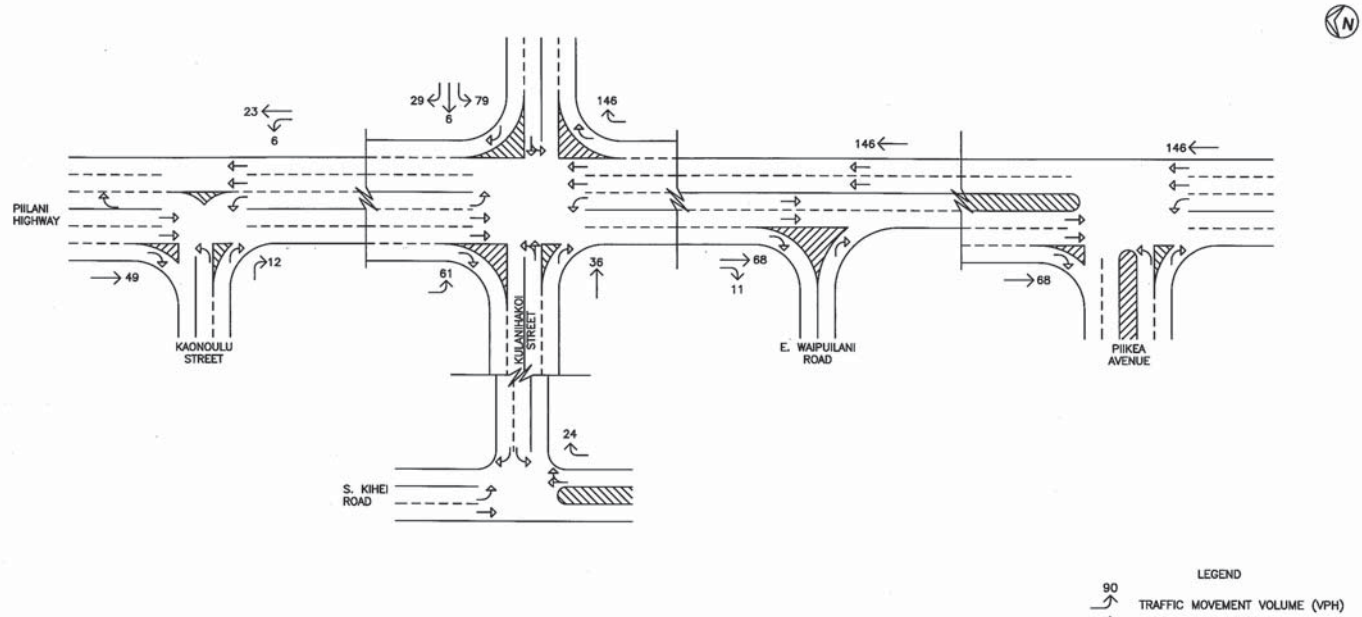


WILSON OKAMOTO CORPORATION
ENGINEERS • PLANNERS

KIHEI HIGH SCHOOL

YEAR 2025 DISTRIBUTION OF SITE-GENERATED VEHICLES - PM PEAK HOUR OF TRAFFIC (FROM YEAR 2015)

FIGURE 8



WILSON OKAMOTO CORPORATION
ENGINEERS • PLANNERS

KIHEI HIGH SCHOOL

YEAR 2025 DISTRIBUTION OF SITE-GENERATED VEHICLES - AM PEAK HOUR OF TRAFFIC (FROM YEAR 2015)

FIGURE 7

C. Other Considerations

1. Kihei Mauka

The agricultural lands surrounding the project site for the proposed high school are owned by Kaonoulu Ranch and Haleakala Ranch. The ranches have future plans to develop these lands (currently referred to as "Kihei Mauka") that will include residential, commercial, and industrial uses. The project development plan and implementation schedule for this project are not known at this time and, as such, the Kihei Mauka development is not incorporated into projected conditions. It should be noted that the ranches plans currently include connection to the access roadway for the high school. However, once the details of the Kihei Mauka development are known, the ranches should be undertaking a traffic study to assess the development's impact on the surrounding roadways.

2. Piilani Promenade and Maui Outlets Center

The Piilani Promenade and Maui Outlets Center will be located adjacent to Piilani Highway north of the proposed Kihei High School. The two projects are expected to include over 703,000 square feet of retail and restaurant space and include the extension of Kaonoulu Street further east. The project development plan and implementation schedule for these projects are not known at this time and, as such, the Piilani Promenade and Maui Outlets Center are not incorporated into projected conditions. It should be noted once the project details are known, the project developers should be undertaking traffic studies to assess the impact of the projects on the surrounding roadways.

3. Maui Research and Tech Park

The existing Maui Research and Tech Park is located east of Piilani Highway near the intersection with Lipoa Street. The proposed project entails the expansion of the existing tech park, as well as, development of other residential and commercial uses in the surrounding areas. The project development plan and implementation schedule for this project are not known

at this time and, as such, the Maui Research and Tech Park expansion is not incorporated into projected conditions. It should be noted once the project details are known, the project developers should be undertaking traffic studies to assess the impact of the projects on the surrounding roadways.

4. Honua'ula Development

The Honua'ula development will be located on an approximately 670 acre parcel near the end of Piilani Highway. The proposed development will include a maximum of 1,400 residential units (mix of single- and multi-family units), mixed use areas, two golf courses, and a variety of public and private amenities. The project development plan and implementation schedule for this development are not known at this time and, as such, the Honua'ula development is not incorporated into projected conditions.

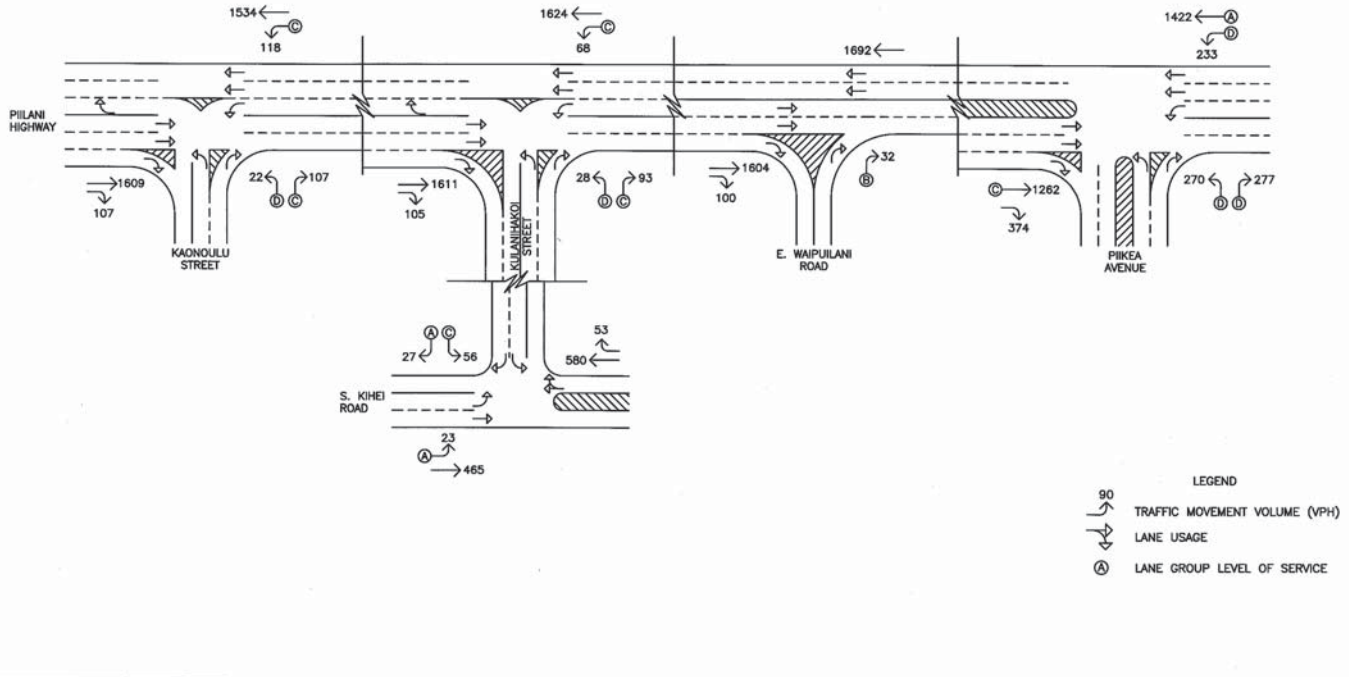
D. Year 2015 Total Traffic Volumes

1. Without Project

The projected Year 2015 peak hour traffic volumes and operating conditions in the project vicinity without the proposed Kihei High School are shown on Figures 9 and 10, and summarized in Table 2. The existing levels of service are provided for comparison purposes. LOS calculations are included in Appendix D.

Table 2: Existing and Projected Year 2015 (Without Project) LOS Traffic Operating Conditions

Intersection	Critical Traffic Movement/ Approach		AM		PM	
			Exist	Year 2015 w/out Proj	Exist	Year 2015 w/out Proj
Piilani Hwy/ Kaonoulu St	Eastbound	LT	C	C	D	D
		RT	C	C	C	C
	Northbound	LT	C	C	C	C
Piilani Hwy/ Kulanihakoi St	Eastbound	LT	D	D	D	D
		RT	C	C	B	C
	Northbound	LT	C	C	C	C



KIHEI HIGH SCHOOL

YEAR 2015 PM PEAK HOUR OF TRAFFIC WITHOUT PROJECT

FIGURE 10

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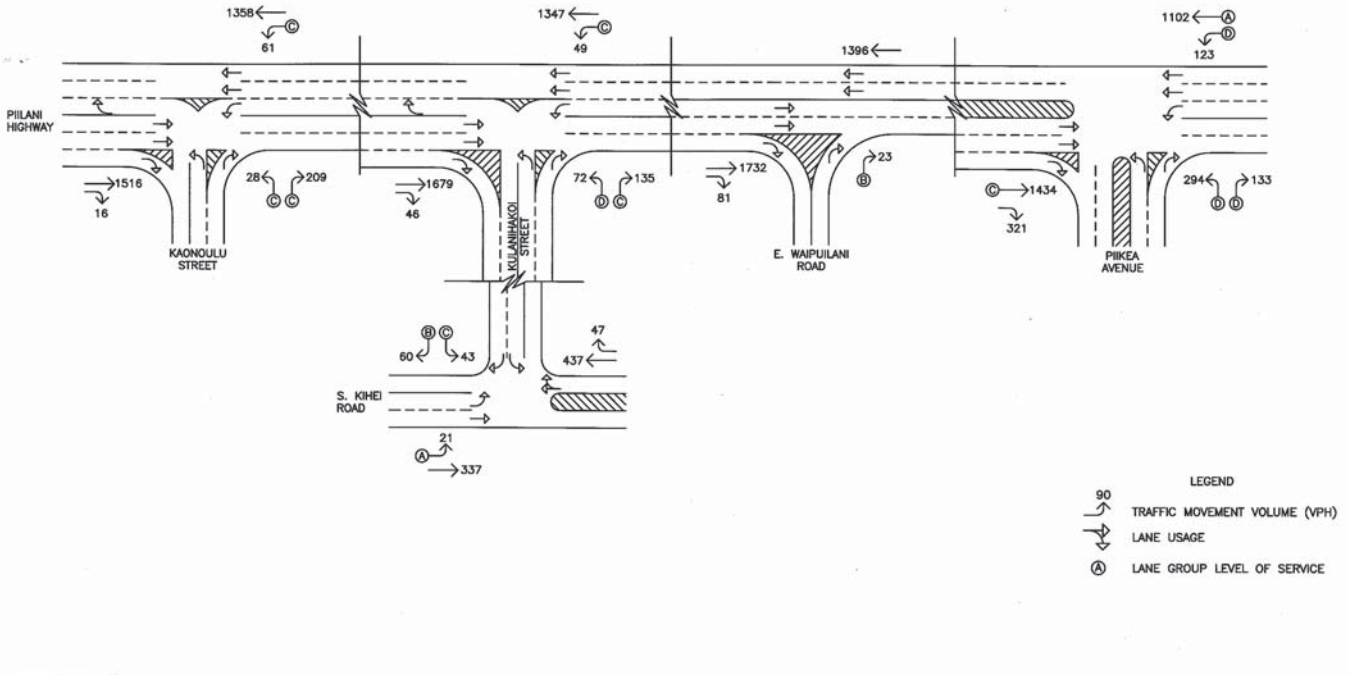

KIHEI HIGH SCHOOL

YEAR 2015 AM PEAK HOUR OF TRAFFIC WITHOUT PROJECT

FIGURE 9

WILSON OKAMOTO CORPORATION
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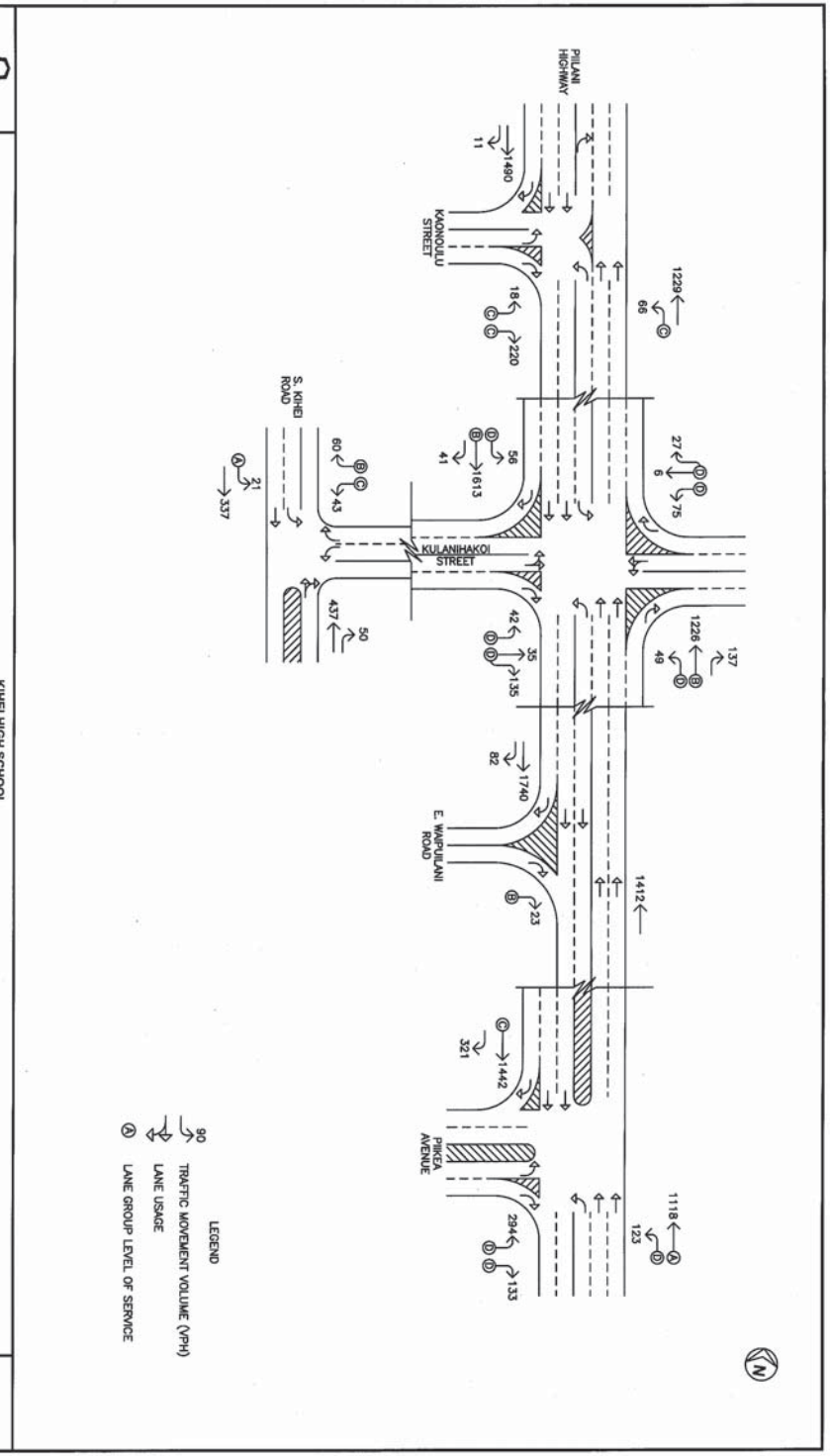
Table 2: Existing and Projected Year 2015 (Without Project) LOS Traffic Operating Conditions (Cont'd)

Intersection	Critical Traffic Movement/ Approach		AM		PM	
			Exist	Year 2015 w/out Proj	Exist	Year 2015 w/out Proj
Piilani Hwy/ E. Waipuilani Rd	Eastbound	RT	B	B	B	B
Piilani Hwy/ Piikea Ave	Eastbound	LT	D	D	D	D
		RT	D	D	C	D
	Northbound	LT	D	D	D	D
	Southbound	TH	C	C	C	C
Kulanihakoi St/ South Kihei Rd	Westbound	LT	C	C	C	C
	Southbound	LT	B	B	A	A

Under Year 2015 without project conditions, traffic operations in the project vicinity are expected to deteriorate slightly from existing conditions due to ambient growth in traffic along the surrounding roadways. The eastbound right-turn traffic movement at the intersection of Piilani Highway and Kulanihakoi Street is expected to deteriorate from LOS "B" to LOS "C" during the PM peak period while the eastbound right-turn traffic movement at the intersection of Piilani Highway and Piikea Avenue is expected to deteriorate from LOS "C" to LOS "D" during the PM peak period. The remaining critical movements at these intersections, as well as, the other study intersections are expected to continue operating at levels of service similar to existing conditions.

2. With Project

The Year 2015 cumulative peak hour traffic conditions with the proposed Kihei High School are shown in Figures 11 and 12, and summarized in Table 3. The cumulative volumes consist of site-generated traffic superimposed over Year 2015 projected traffic demands. Due to the anticipated increases in traffic at the intersection of Piilani Highway and



Kulanihakoi Street due to ambient growth in traffic and the inclusion of the proposed access for the Kihei High School, a Traffic Signal Warrant Study was undertaken for that intersection (see Appendix E) to determine if a traffic signal system was warranted. Based on existing and projected traffic volumes, the study recommends the installation of a traffic signal system at that intersection. As such, a traffic signal system is assumed to be installed in conjunction with the Kihei High School project by the Year 2015. The projected Year 2015 (Without Project) operating conditions are provided for comparison purposes. LOS calculations are included in Appendix F.

Table 3: Projected Year 2015 (Without and With Project) LOS Traffic Operating Conditions

Intersection	Critical Traffic Movement/ Approach		AM		PM	
			Year 2015 w/out Proj	Year 2015 w/ Proj	Year 2015 w/out Proj	Year 2015 w/ Proj
Piilani Hwy/ Kaonoulu St	Eastbound	LT	C	C	D	D
		RT	C	C	C	C
	Northbound	LT	C	C	C	C
Piilani Hwy/ Kulanihakoi St*	Eastbound	LT	D	D	D	D
		TH	-		-	
		RT	C	D	C	D
	Westbound	LT-TH	-	D	-	D
		RT	-	D	-	D
	Northbound	LT	C	D	C	D
		TH	-	B	-	A
	Southbound	LT	-	D	-	D
		TH	-	B	-	B
Piilani Hwy/ E. Waipuilani Rd	Eastbound	RT	B	B	B	B

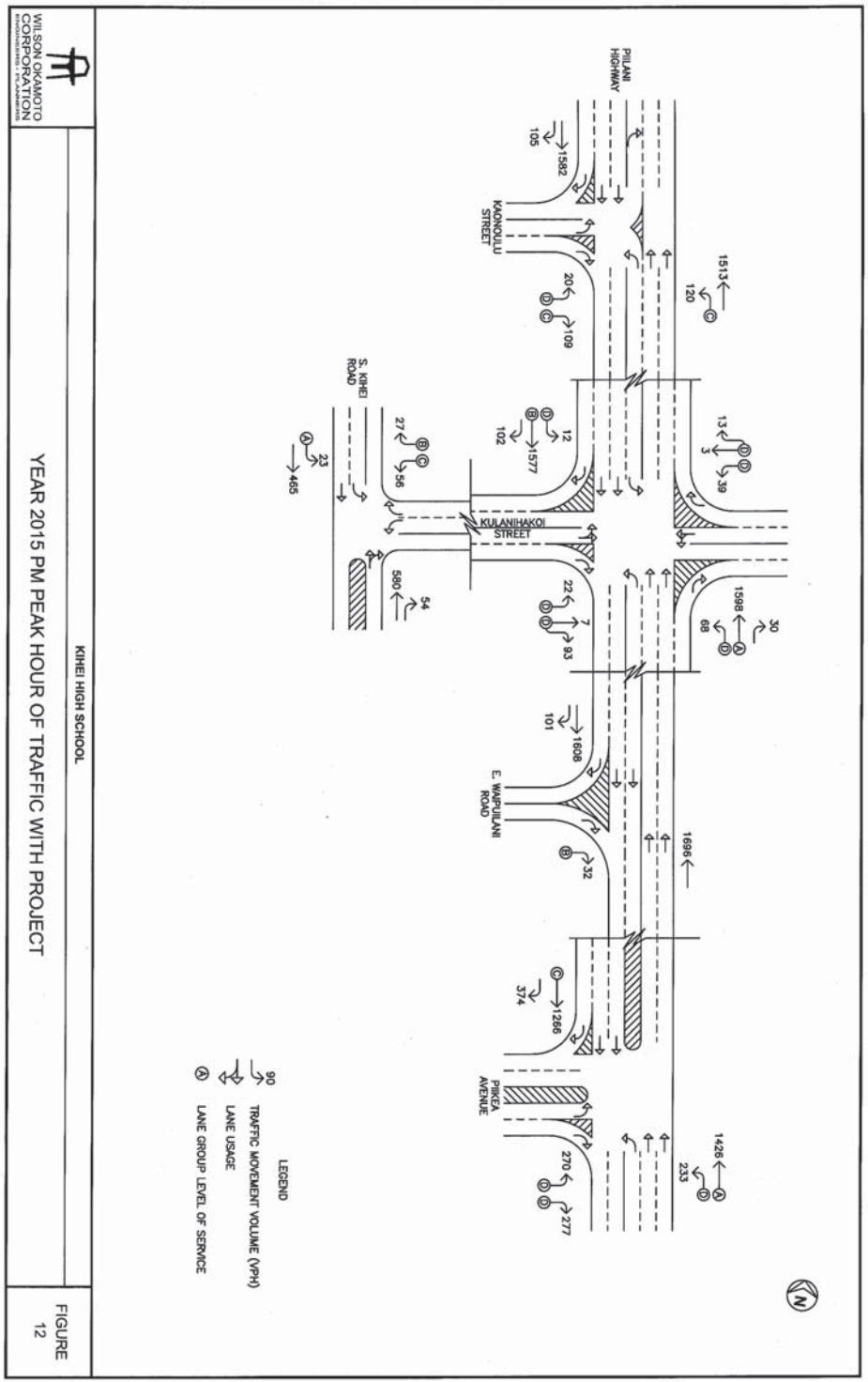


Table 3: Projected Year 2015 (Without and With Project) LOS Traffic Operating Conditions (Cont'd)

Intersection	Critical Traffic Movement/ Approach		AM		PM	
			Year 2015 w/out Proj	Year 2015 w/ Proj	Year 2015 w/out Proj	Year 2015 w/ Proj
Piilani Hwy/ Piikea Ave	Eastbound	LT	D	D	D	D
		RT	D	D	D	D
	Northbound	LT	D	D	D	D
	Southbound	TH	C	C	C	C
Kulanihakoi St/ South Kihei Rd	Westbound	LT	C	C	C	C
	Southbound	LT	B	B	A	B

*Traffic signal system installed in conjunction with the proposed high school.

Under Year 2015 with project conditions, traffic operations in the project vicinity are generally expected to remain similar to without project conditions despite the addition of site-generated vehicles to the surrounding roadways. Along Piilani Highway, the critical movements at the intersection with Kaonoulu Street are expected to continue operating at LOS "C" or better during the AM peak period and LOS "D" or better during the PM peak period while those at the intersection and Piikea Avenue are expected to continue operating at LOS "D" during both peak periods. At the intersection of the highway with E. Waipuilani Road, the eastbound approach is expected to continue operating at LOS "B" during both peak periods while the critical movements at the intersection of Kulanihakoi Street and South Kihei Road area expected to continue operating at LOS "C" or better during both peak periods. At the intersection of Piilani Highway and Kulanihakoi Street, the critical movements are expected to operate at LOS "D" or better during both peak periods primarily due to the installation of a traffic signal system at that intersection.

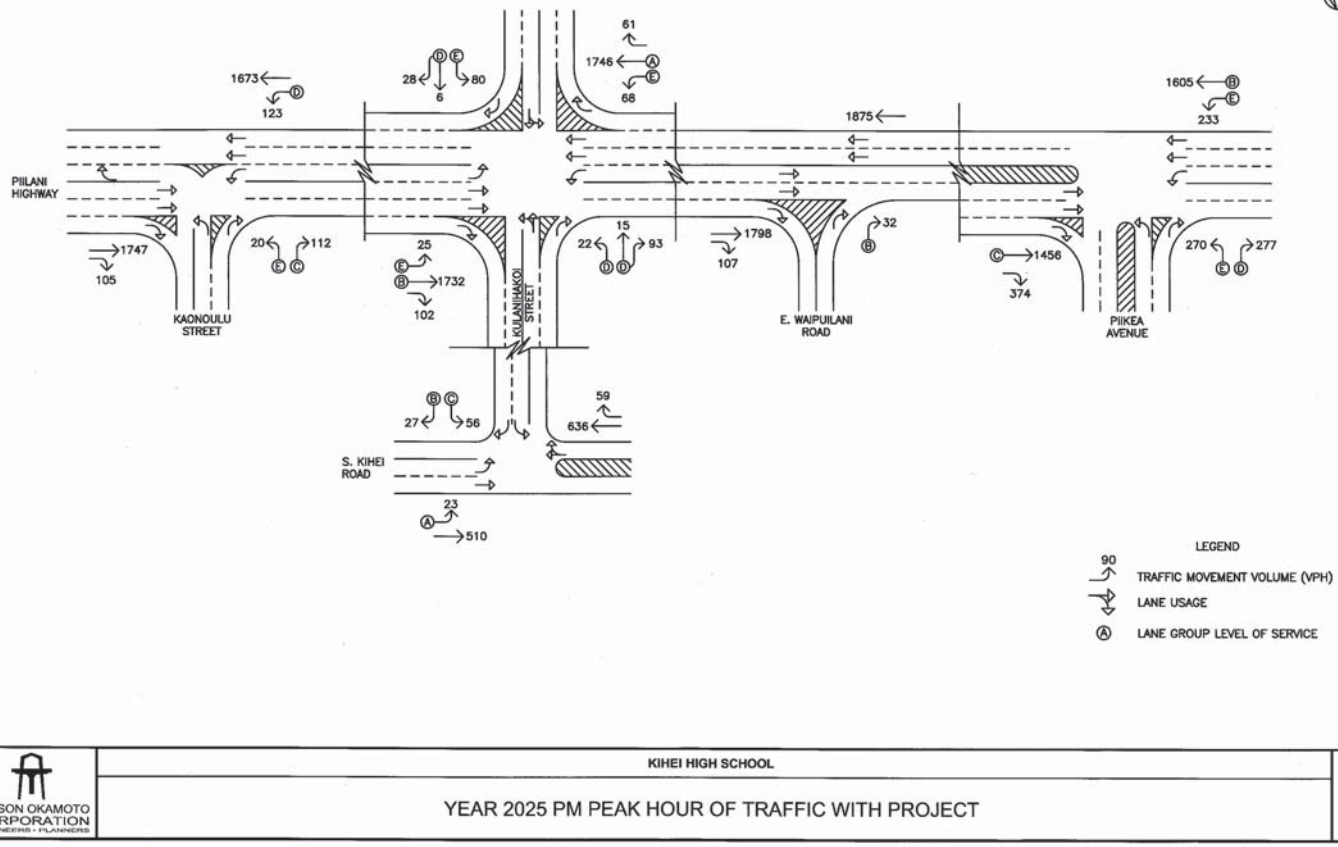
E. Year 2025 Total Traffic Volumes

The Year 2025 cumulative peak hour traffic conditions with the proposed Kihei High School are shown in Figures 13 and 14, and summarized in Table 4. The cumulative volumes consist of site-generated traffic superimposed over Year 2025 projected traffic demands. The projected Year 2015 (With Project) operating conditions are provided for comparison purposes. LOS calculations are included in Appendix G.

Table 4: Projected Year 2015 (With Project) and Year 2025 (With Project) LOS Traffic Operating Conditions

Intersection	Critical Traffic Movement/ Approach		AM		PM	
			Year 2015 w/ Proj	Year 2025 w/ Proj	Year 2015 w/ Proj	Year 2025 w/ Proj
Piilani Hwy/ Kaonoulu St	Eastbound	LT	C	D	D	E
		RT	C	C	C	C
	Northbound	LT	C	C	C	D
Piilani Hwy/ Kulanihakoi St*	Eastbound	LT-TH	D	D	D	D
		RT	D	D	D	D
	Westbound	LT-TH	D	E	D	E
		RT	D	D	D	D
	Northbound	LT	D	E	D	E
		TH	B	C	A	A
	Southbound	LT	D	E	D	E
		TH	B	C	B	B
Piilani Hwy/ E. Waipuilani Rd	Eastbound	RT	B	C	B	B
Piilani Hwy/ Piikea Ave	Eastbound	LT	D	E	D	E
		RT	D	D	D	D
	Northbound	LT	D	E	D	E
	Southbound	TH	C	C	C	C

*Traffic signal system installed in conjunction with the proposed high school.



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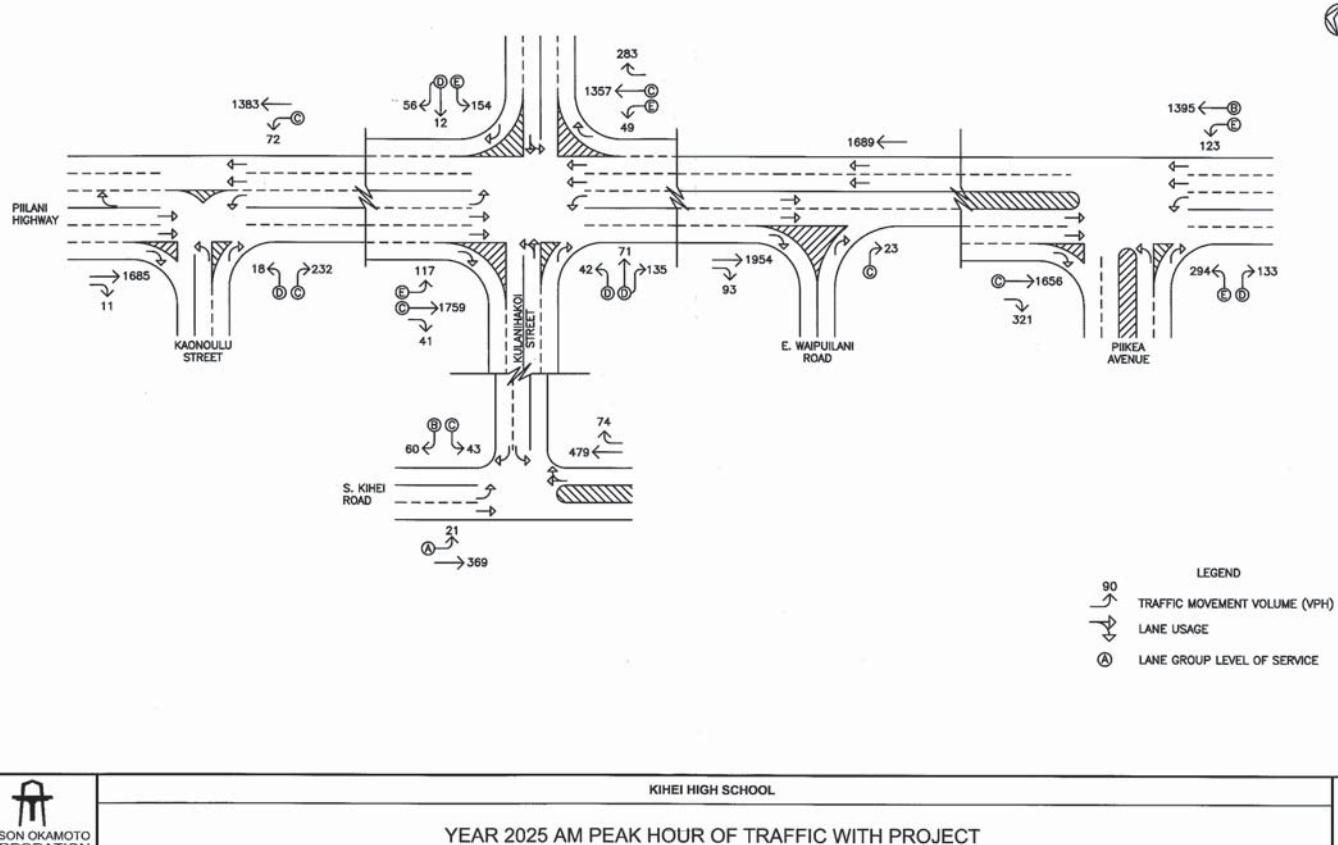
KIHEI HIGH SCHOOL

YEAR 2025 PM PEAK HOUR OF TRAFFIC WITH PROJECT

FIGURE 14



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KIHEI HIGH SCHOOL

YEAR 2025 AM PEAK HOUR OF TRAFFIC WITH PROJECT

FIGURE 13

Table 4: Projected Year 2015 (With Project) and Year 2025 (With Project) LOS Traffic Operating Conditions (Cont'd)

Intersection	Critical Traffic Movement/ Approach		AM		PM	
			Year 2015 w/ Proj	Year 2025 w/ Proj	Year 2015 w/ Proj	Year 2025 w/ Proj
Kulanihakoi St/ South Kihei Rd	Westbound	LT	C	C	C	C
	Southbound	LT	B	B	B	B

Under Year 2025 with project conditions, traffic operations in the project vicinity are expected to deteriorate slightly from Year 2015 with project conditions primarily due to ambient growth in traffic along the surrounding roadways. Along Piilani Highway, the critical movements at the intersection with Kaonoulu Street are expected to operate at LOS "D" or better during the AM peak period and LOS "E" or better during the PM peak period while those at the intersections with Kulanihakoi Street and Piikei Avenue are expected to operate at LOS "E" or better during both peak periods. At the intersection of the highway with E. Waipuilani Road, the eastbound approach is expected to operate at LOS "C" and LOS "B" during the AM and PM peak periods, respectively. Along South Kihei Road, the critical movements at the intersection with Kulanihakoi Street are expected to operate at LOS "C" or better during both peak periods.

V. RECOMMENDATIONS

Based on the analysis of the traffic data, the following are the recommendations of this study to be implemented prior to the opening of Kihei High School in the Year 2015:

1. Maintain sufficient sight distance for motorists to safely enter and exit all project roadways.

2. Provide adequate on-site loading and off-loading service areas and prohibit off-site loading operations.

3. Provide adequate turn-around area for service, delivery, and refuse collection vehicles to maneuver on the project site to avoid vehicle-reversing maneuvers onto public roadways.

4. Provide sufficient turning radii at all project roadways to avoid or minimize vehicle encroachments to oncoming traffic lanes.

5. Provide an exclusive right-turn lane and shared left-turn and through lane on the access road approach from the high school at the intersection with Piilani Highway. The layout and dimension of these lanes should be determined during the design phase of the project.

6. Provide a channelized northbound deceleration lane along Piilani Highway at the intersection with the access road for the high school. The layout and dimension of these lanes should be determined during the design phase of the project.

7. Provide a channelized northbound acceleration lane along Piilani Highway at the intersection with the access road for the high school. The layout and dimension of these lanes should be determined during the design phase of the project.

8. Provide an exclusive southbound left-turn lane along Piilani Highway at the intersection with the access road for the high school. The layout and dimension of these lanes should be determined during the design phase of the project.

9. Provide two eastbound departure lanes along the access road for the high school from the intersection with Piilani Highway. The layout and dimension of these lanes should be determined during the design phase of the project.

10. Modify the eastbound approach of Kulanihakoi Street at the intersection with Piilani Highway and the access road for the high school to provide an exclusive right-turn lane and a shared left-turn and through lane. The layout and dimension of these lanes should be determined during the design phase of the project.

11. Install at traffic signal system at the intersection of Piilani Highway with Kulanihakoi Street and the access road for the high school. The layout, phasing, and timing of this signal system should be determined during the design phase of the project.

12. Prepare a Traffic Management Plan for the high school to minimize the impact of school related vehicles on the surrounding roadways. This plan should address daily school and special event traffic.

13. Consider preparing Traffic Assessment Reports periodically (every 5 years at a minimum) once the high school is opened to verify projected traffic conditions in the vicinity and assess the effectiveness of traffic management strategies implemented by the high school.

VI. CONCLUSION

High school students that reside in Kihei currently have to attend Maui High School in Kahului or Baldwin High School in Wailuku. The proposed Kihei High School will allow these students to attend a high school in their district. The proposed high school will include classrooms, support facilities, and athletic facilities to support an initial enrollment of 800 students with an ultimate enrollment of 1,650 students expected within 10 years. With the development of the proposed high school, traffic operations upon opening are expected to remain similar to without project conditions primarily due to the provision of turning lanes and a traffic signal system at the intersection of Piilani Highway with Kulanihakoi Street and the access road for the high school. By the Year 2025, traffic operations in the vicinity are expected to deteriorate slightly primarily due to ambient growth in traffic along the surrounding roadways. As such, the preparation of a Traffic Management Plan for the high school is recommended to minimize the impact of school related traffic on the surrounding roadways.

APPENDIX A

EXISTING TRAFFIC COUNT DATA

Wilson Okamoto Corporation

1907 S. Beretania Street Suite 400
Honolulu, Hi 96826

Counter:5671, 5674
Counted By:DB and DF
Weather:Clear

File Name : KaopiiPM
Site Code : 00000006
Start Date : 1/26/2011
Page No : 1

Groups Printed- Unshifted

	Piilani Highway Southbound					Westbound	Piilani Highway Northbound					Kaonoulu Street Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
02:00 PM	0	340	13	0	353	0	23	328	0	0	351	6	0	31	0	37	741
02:15 PM	0	312	11	0	323	0	22	438	0	0	460	7	0	25	0	32	815
02:30 PM	0	306	10	0	316	0	28	471	0	0	499	3	0	37	0	40	855
02:45 PM	0	352	9	0	361	0	38	393	0	0	431	1	0	67	0	68	860
Total	0	1310	43	0	1353	0	111	1630	0	0	1741	17	0	160	0	177	3271
03:00 PM	0	414	9	0	423	0	17	351	0	0	368	3	0	27	0	30	821
03:15 PM	0	388	12	0	400	0	19	387	0	0	406	4	0	30	0	34	840
03:30 PM	0	393	12	0	405	0	27	433	0	0	460	7	0	29	0	36	901
03:45 PM	0	401	4	0	405	0	36	335	0	0	371	5	0	26	0	31	814
Total	0	1596	37	0	1633	0	99	1506	0	0	1605	19	0	119	0	138	3376
04:00 PM	0	456	16	0	472	0	23	346	0	0	369	3	0	23	0	26	867
04:15 PM	0	367	8	0	375	0	28	431	0	0	459	8	0	19	0	27	861
04:30 PM	0	379	11	0	390	0	32	371	0	0	403	6	0	36	0	42	835
04:45 PM	0	395	13	0	408	0	22	265	0	0	287	3	0	30	0	33	728
Total	0	1597	48	0	1645	0	105	1413	0	0	1518	20	0	108	0	128	3291
05:00 PM	0	363	12	0	375	0	30	320	0	0	350	4	0	22	0	26	751
05:15 PM	0	369	11	0	380	0	18	328	0	0	346	5	0	26	0	31	757
05:30 PM	0	305	13	0	318	0	22	294	0	0	316	7	0	30	0	37	671
05:45 PM	0	318	10	0	328	0	18	223	0	0	241	4	0	32	0	36	605
Total	0	1355	46	0	1401	0	88	1165	0	0	1253	20	0	110	0	130	2784
Grand Total	0	5858	174	0	6032	0	403	5714	0	0	6117	76	0	497	0	573	12722
Apprch %	0	97.1	2.9	0			6.6	93.4	0	0		13.3	0	86.7	0		
Total %	0	46	1.4	0	47.4	0	3.2	44.9	0	0	48.1	0.6	0	3.9	0	4.5	

	Piilani Highway Southbound					Westbound	Piilani Highway Northbound					Kaonoulu Street Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 03:30 PM																	
03:30 PM	0	393	12	0	405	0	27	**433**	0	0	**460**	7	0	29	0	36	**901**
03:45 PM	0	401	4	0	405	0	**36**	335	0	0	371	5	0	**33**	0	**38**	814
04:00 PM	0	**456**	**16**	0	**472**	0	23	346	0	0	369	3	0	23	0	26	867
04:15 PM	0	367	8	0	375	0	28	431	0	0	459	**8**	0	19	0	27	861
Total Volume	0	1617	40	0	1657	0	114	1545	0	0	1659	23	0	104	0	127	3443
% App. Total	0	97.6	2.4	0			6.9	93.1	0	0		18.1	0	81.9	0		
PHF	.000	.887	.625	.000	.878	.000	.792	.892	.000	.000	.902	.719	.000	.788	.000	.836	.955

Wilson Okamoto Corporation

1907 S. Beretania Street Suite 400
Honolulu, Hi 96826

Counter:5671/5674
Counted By:DB and DF
Weather:Clear

File Name : KaopiiAM
Site Code : 00000006
Start Date : 1/26/2011
Page No : 1

Groups Printed- Unshifted

	Piilani Highway Southbound					Kainoulu Street Westbound					Piilani Highway Northbound					Kainoulu Street Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
06:00 AM	0	114	2	0	116	0	0	0	0	0	4	106	0	0	110	3	0	5	0	8	234
06:15 AM	0	180	5	0	185	0	0	0	0	0	1	131	0	0	132	9	0	16	0	25	342
06:30 AM	0	209	0	0	209	0	0	0	0	0	5	222	0	0	227	3	0	17	0	20	456
06:45 AM	0	235	7	0	242	0	0	0	0	0	8	282	0	0	290	6	0	33	0	39	571
Total	0	738	14	0	752	0	0	0	0	0	18	741	0	0	759	21	0	71	0	92	1603
07:00 AM	0	268	0	0	268	0	0	0	0	0	11	292	0	0	303	7	0	29	0	36	607
07:15 AM	0	393	6	0	399	0	0	0	0	0	11	328	0	0	339	6	0	63	0	69	807
07:30 AM	0	403	4	0	407	0	0	0	0	0	18	341	0	0	359	10	0	61	0	71	837
07:45 AM	0	327	4	0	331	0	0	0	0	0	21	335	0	0	356	5	0	42	0	47	734
Total	0	1391	14	0	1405	0	0	0	0	0	61	1296	0	0	1357	28	0	195	0	223	2985
08:00 AM	0	345	2	0	347	0	0	0	0	0	11	299	0	0	310	7	0	45	0	52	709
08:15 AM	0	286	5	0	291	0	0	0	0	0	13	258	0	0	271	8	0	37	0	45	607
08:30 AM	0	270	6	0	276	0	0	0	0	0	13	329	0	0	342	4	0	31	0	35	653
08:45 AM	0	267	7	0	274	0	0	0	0	0	11	296	0	0	307	7	0	40	0	47	628
Total	0	1168	20	0	1188	0	0	0	0	0	48	1182	0	0	1230	26	0	153	0	179	2597
Grand Total	0	3297	48	0	3345	0	0	0	0	0	127	3219	0	0	3346	75	0	419	0	494	7185
Apprch %	0	98.6	1.4	0		0	0	0	0		3.8	96.2	0	0		15.2	0	84.8	0		
Total %	0	45.9	0.7	0	46.6	0	0	0	0	0	1.8	44.8	0	0	46.6	1	0	5.8	0	6.9	

	Piilani Highway Southbound					Kainoulu Street Westbound					Piilani Highway Northbound					Kainoulu Street Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:15 AM																					
07:15 AM	0	393	**6**	0	399	0	0	0	0	0	11	328	0	0	339	6	0	**63**	0	69	807
07:30 AM	0	**403**	4	0	**407**	0	0	0	0	0	18	**341**	0	0	**359**	**10**	0	61	0	**71**	**837**
07:45 AM	0	327	4	0	331	0	0	0	0	0	**21**	335	0	0	356	5	0	42	0	47	734
08:00 AM	0	345	2	0	347	0	0	0	0	0	11	299	0	0	310	7	0	45	0	52	709
Total Volume	0	1468	16	0	1484	0	0	0	0	0	61	1303	0	0	1364	28	0	211	0	239	3087
% App. Total	0	98.9	1.1	0		0	0	0	0		4.5	95.5	0	0		11.7	0	88.3	0		
PHF	.000	.911	.667	.000	.912	.000	.000	.000	.000	.000	.726	.955	.000	.000	.950	.700	.000	.837	.000	.842	.922

Wilson Okamoto Corporation
1907 S. Beretania Street Suite 400
Honolulu, Hi 96826

Counter:3890/5675
Counted By:SH and NH
Weather:Clear

File Name : KulpilPM
Site Code : 00000007
Start Date : 1/26/2011
Page No : 1

Groups Printed- Unshifted

	Piilani Highway Southbound					Kulanihakoi Street Westbound					Piilani Highway Northbound					Kulanihakoi Street Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
02:00 PM	0	328	24	0	352	0	0	0	0	0	11	311	0	0	322	30	0	21	0	51	725
02:15 PM	0	387	24	0	411	0	0	0	0	0	13	403	0	0	416	29	0	14	0	43	870
02:30 PM	0	365	29	0	394	0	0	0	0	0	16	392	0	0	408	36	0	16	0	52	854
02:45 PM	0	416	30	0	446	0	0	0	0	0	10	405	0	0	415	39	0	37	0	76	937
Total	0	1496	107	0	1603	0	0	0	0	0	50	1511	0	0	1561	134	0	88	0	222	3386
03:00 PM	0	414	29	0	443	0	0	0	0	0	12	325	0	0	337	23	0	19	0	42	822
03:15 PM	0	408	20	0	428	0	0	0	0	0	16	398	0	0	414	7	0	19	0	26	868
03:30 PM	0	393	18	0	411	0	0	0	0	0	17	413	0	0	430	7	0	31	0	38	879
03:45 PM	0	403	29	0	432	0	0	0	0	0	13	418	0	0	431	9	0	31	0	40	903
Total	0	1618	96	0	1714	0	0	0	0	0	58	1554	0	0	1612	46	0	100	0	146	3472
04:00 PM	0	469	23	0	492	0	0	0	0	0	19	344	0	0	363	7	0	18	0	25	880
04:15 PM	0	347	28	0	375	0	0	0	0	0	19	438	0	0	457	6	0	23	0	29	861
04:30 PM	0	404	25	0	429	0	0	0	0	0	17	448	0	0	465	6	0	21	0	27	921
04:45 PM	0	376	25	0	401	0	0	0	0	0	20	310	0	0	330	9	0	27	0	36	767
Total	0	1596	101	0	1697	0	0	0	0	0	75	1540	0	0	1615	28	0	89	0	117	3429
05:00 PM	0	386	22	0	408	0	0	0	0	0	10	311	0	0	321	9	0	18	0	27	756
05:15 PM	0	390	26	0	416	0	0	0	0	0	17	363	0	0	380	8	0	33	0	41	837
05:30 PM	0	317	18	0	335	0	0	0	0	0	23	291	0	0	314	12	0	22	0	34	683
05:45 PM	0	330	27	0	357	0	0	0	0	0	27	271	0	0	298	7	0	23	0	30	685
Total	0	1423	93	0	1516	0	0	0	0	0	77	1236	0	0	1313	36	0	96	0	132	2961
06:00 PM	0	0	0	0	0	0	0	0	0	0	5	65	0	0	70	0	0	0	0	0	70
Grand Total	0	6133	397	0	6530	0	0	0	0	0	265	5906	0	0	6171	244	0	373	0	617	13318
Apprch %	0	93.9	6.1	0		0	0	0	0		4.3	95.7	0	0		39.5	0	60.5	0		
Total %	0	46.1	3	0	49	0	0	0	0	0	2	44.3	0	0	46.3	1.8	0	2.8	0	4.6	

	Piilani Highway Southbound					Kulanihakoi Street Westbound					Piilani Highway Northbound					Kulanihakoi Street Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 02:00 PM to 05:30 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 03:45 PM																					
03:45 PM	0	403	**29**	0	432	0	0	0	0	0	**13**	418	0	0	431	**9**	0	**31**	0	**40**	903
04:00 PM	0	**469**	23	0	**492**	0	0	0	0	0	**19**	344	0	0	363	7	0	18	0	25	880
04:15 PM	0	347	28	0	375	0	0	0	0	0	19	438	0	0	457	6	0	23	0	29	861
04:30 PM	0	404	25	0	429	0	0	0	0	0	17	**448**	0	0	**465**	6	0	21	0	27	**921**
Total Volume	0	1623	105	0	1728	0	0	0	0	0	68	1648	0	0	1716	28	0	93	0	121	3565
% App. Total	0	93.9	6.1	0		0	0	0	0		4	96	0	0		23.1	0	76.9	0		
PHF	.000	.865	.905	.000	.878	.000	.000	.000	.000	.000	.895	.920	.000	.000	.923	.778	.000	.750	.000	.756	.968

Wilson Okamoto Corporation
1907 S. Beretania Street Suite 400
Honolulu, Hi 96826

Counter:3890/5675
Counted By:SH and NH
Weather:Clear

File Name : KulpiiAM
Site Code : 00000007
Start Date : 1/26/2011
Page No : 1

Groups Printed- Unshifted

	Piilani Highway Southbound					Kulanihakoi Street Westbound					Piilani Highway Northbound					Kulanihakoi Street Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
06:00 AM	0	104	2	0	106	0	0	0	0	0	3	100	0	0	103	11	0	9	0	20	229
06:15 AM	0	176	4	0	180	0	0	0	0	0	2	125	0	0	127	8	0	14	0	22	329
06:30 AM	0	236	3	0	239	0	0	0	0	0	1	214	0	0	215	14	0	10	0	24	478
06:45 AM	0	239	8	0	247	0	0	0	0	0	5	263	0	0	268	19	0	12	0	31	546
Total	0	755	17	0	772	0	0	0	0	0	11	702	0	0	713	52	0	45	0	97	1582
07:00 AM	0	264	6	0	270	0	0	0	0	0	7	296	0	0	303	10	0	27	0	37	610
07:15 AM	0	443	6	0	449	0	0	0	0	0	8	323	0	0	331	19	0	38	0	57	837
07:30 AM	0	437	12	0	449	0	0	0	0	0	8	334	0	0	342	21	0	40	0	61	852
07:45 AM	0	390	7	0	397	0	0	0	0	0	21	330	0	0	351	16	0	31	0	47	795
Total	0	1534	31	0	1565	0	0	0	0	0	44	1283	0	0	1327	66	0	136	0	202	3094
08:00 AM	0	355	21	0	376	0	0	0	0	0	12	284	0	0	296	16	0	26	0	42	714
08:15 AM	0	344	13	0	357	0	0	0	0	0	16	250	0	0	266	9	0	38	0	47	670
08:30 AM	0	285	11	0	296	0	0	0	0	0	11	297	0	0	308	22	0	28	0	50	654
08:45 AM	0	299	19	0	318	0	0	0	0	0	11	235	0	0	246	39	0	26	0	65	629
Total	0	1283	64	0	1347	0	0	0	0	0	50	1066	0	0	1116	86	0	118	0	204	2667
Grand Total	0	3572	112	0	3684	0	0	0	0	0	105	3051	0	0	3156	204	0	299	0	503	7343
Apprch %	0	97	3	0		0	0	0	0		3.3	96.7	0	0		40.6	0	59.4	0		
Total %	0	48.6	1.5	0	50.2	0	0	0	0	0	1.4	41.5	0	0	43	2.8	0	4.1	0	6.9	

	Piilani Highway Southbound					Kulanihakoi Street Westbound					Piilani Highway Northbound					Kulanihakoi Street Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:15 AM																					
07:15 AM	0	**443**	6	0	**449**	0	0	0	0	0	8	323	0	0	331	19	0	38	0	57	837
07:30 AM	0	437	12	0	449	0	0	0	0	0	8	**334**	0	0	342	**21**	0	**40**	0	**61**	**852**
07:45 AM	0	390	7	0	397	0	0	0	0	0	**21**	330	0	0	**351**	16	0	31	0	47	795
08:00 AM	0	355	**21**	0	376	0	0	0	0	0	12	284	0	0	296	**16**	0	26	0	42	714
Total Volume	0	1625	46	0	1671	0	0	0	0	0	49	1271	0	0	1320	72	0	135	0	207	3198
% App. Total	0	97.2	2.8	0		0	0	0	0		3.7	96.3	0	0		34.8	0	65.2	0		
PHF	.000	.917	.548	.000	.930	.000	.000	.000	.000	.000	.583	.951	.000	.000	.940	.857	.000	.844	.000	.848	.938

Wilson Okamoto Corporation

1907 S. Beretania Street Suite 400
Honolulu, Hi 96826

Counter:5671/5672
Counted By:JS, TT
Weather:Clear

File Name : WaipiiPM
Site Code : 00000009
Start Date : 1/27/2011
Page No : 1

Groups Printed- Unshifted

	Piilani Highway Southbound					E. Waipuilani Road Westbound					Piilani Highway Northbound					E. Waipuilani Road Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
02:00 PM	0	314	21	0	335	0	0	0	0	0	0	381	0	0	381	0	0	6	0	6	722
02:15 PM	0	355	21	0	376	0	0	0	0	0	0	547	0	0	547	0	0	6	0	6	929
02:30 PM	0	363	27	0	390	0	0	0	0	0	0	697	0	0	697	0	0	14	0	14	1101
02:45 PM	0	369	34	0	403	0	0	0	0	0	0	931	0	0	931	0	0	7	0	7	1341
Total	0	1401	103	0	1504	0	0	0	0	0	0	2556	0	0	2556	0	0	33	0	33	4093
03:00 PM	0	422	29	0	451	0	0	0	0	0	0	655	0	0	655	0	0	6	0	6	1112
03:15 PM	0	385	23	0	408	0	0	0	0	0	0	515	0	0	515	0	0	9	0	9	932
03:30 PM	0	403	27	0	430	0	0	0	0	0	0	616	0	0	616	0	0	11	0	11	1057
03:45 PM	0	395	24	0	419	0	0	0	0	0	0	426	0	0	426	0	0	7	0	7	852
Total	0	1605	103	0	1708	0	0	0	0	0	0	2212	0	0	2212	0	0	33	0	33	3953
04:00 PM	0	360	28	0	388	0	0	0	0	0	0	587	0	0	587	0	0	15	0	15	990
04:15 PM	0	357	18	0	375	0	0	0	0	0	0	481	0	0	481	0	0	7	0	7	863
04:30 PM	0	368	30	0	398	0	0	0	0	0	0	481	0	0	481	0	0	3	0	3	882
04:45 PM	0	374	37	0	411	0	0	0	0	0	0	397	0	0	397	0	0	6	0	6	814
Total	0	1459	113	0	1572	0	0	0	0	0	0	1946	0	0	1946	0	0	31	0	31	3549
05:00 PM	0	396	36	0	432	0	0	0	0	0	0	383	0	0	383	0	0	5	0	5	820
05:15 PM	0	395	28	0	423	0	0	0	0	0	0	348	0	0	348	0	0	10	0	10	781
05:30 PM	0	321	33	0	354	0	0	0	0	0	0	397	0	0	397	0	0	3	0	3	754
05:45 PM	0	363	32	0	395	0	0	0	0	0	0	0	0	0	0	0	0	15	0	15	410
Total	0	1475	129	0	1604	0	0	0	0	0	0	1128	0	0	1128	0	0	33	0	33	2765
Grand Total	0	5940	448	0	6388	0	0	0	0	0	0	7842	0	0	7842	0	0	130	0	130	14360
Apprch %	0	93	7	0		0	0	0	0		0	100	0	0		0	0	100	0		
Total %	0	41.4	3.1	0	44.5	0	0	0	0	0	0	54.6	0	0	54.6	0	0	0.9	0	0.9	

	Piilani Highway Southbound					E. Waipuilani Road Westbound					Piilani Highway Northbound					E. Waipuilani Road Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 02:30 PM																					
02:30 PM	0	363	27	0	390	0	0	0	0	0	0	697	0	0	697	0	0	**14**	0	**14**	**1101**
02:45 PM	0	369	**34**	0	403	0	0	0	0	0	0	**931**	0	0	**931**	0	0	7	0	7	**1341**
03:00 PM	0	**422**	29	0	**451**	0	0	0	0	0	0	655	0	0	655	0	0	6	0	6	1112
03:15 PM	0	385	23	0	408	0	0	0	0	0	0	515	0	0	515	0	0	9	0	9	932
Total Volume	0	1539	113	0	1652	0	0	0	0	0	0	2798	0	0	2798	0	0	36	0	36	4486
% App. Total	0	93.2	6.8	0		0	0	0	0		0	100	0	0		0	0	100	0		
PHF	.000	.912	.831	.000	.916	.000	.000	.000	.000	.000	.000	.751	.000	.000	.751	.000	.000	.643	.000	.643	.836

Wilson Okamoto Corporation

1907 S. Beretania Street Suite 400
Honolulu, Hi 96826

Counter:D4-5671, D4-5672
Counted By:JS, TT
Weather:Clear

File Name : WaipiiAM
Site Code : 00000009
Start Date : 1/27/2011
Page No : 1

Groups Printed- Unshifted

	Piilani Highway Southbound					Westbound	Northbound	E. Waipuilani Road Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	App. Total	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
06:00 AM	0	115	2	0	117	0	0	0	0	4	0	4	121
06:15 AM	0	170	2	0	172	0	0	0	0	3	0	3	175
06:30 AM	0	173	5	0	178	0	0	0	0	6	0	6	184
06:45 AM	0	223	5	0	228	0	0	0	0	5	0	5	233
Total	0	681	14	0	695	0	0	0	0	18	0	18	713
07:00 AM	0	295	11	0	306	0	0	0	0	4	0	4	310
07:15 AM	0	427	21	0	448	0	0	0	0	7	0	7	455
07:30 AM	0	418	23	0	441	0	0	0	0	5	0	5	446
07:45 AM	0	390	21	0	411	0	0	0	0	1	0	1	412
Total	0	1530	76	0	1606	0	0	0	0	17	0	17	1623
08:00 AM	0	347	16	0	363	0	0	0	0	10	0	10	373
08:15 AM	0	320	18	0	338	0	0	0	0	5	0	5	343
08:30 AM	0	259	9	0	268	0	0	0	0	15	0	15	283
08:45 AM	0	297	18	0	315	0	0	0	0	9	0	9	324
Total	0	1223	61	0	1284	0	0	0	0	39	0	39	1323
Grand Total	0	3434	151	0	3585	0	0	0	0	74	0	74	3659
Apprch %	0	95.8	4.2	0				0	0	100	0		
Total %	0	93.9	4.1	0	98	0	0	0	0	2	0	2	

	Piilani Highway Southbound				Westbound	Northbound	E. Waipuilani Road Eastbound				
Start Time	Left	Thru	Right	App. Total	App. Total	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1											
Peak Hour for Entire Intersection Begins at 07:15 AM											
07:15 AM	0	**427**	21	**448**	0	0	0	0	7	7	**455**
07:30 AM	0	418	**23**	441	0	0	0	0	5	5	446
07:45 AM	0	390	21	411	0	0	0	0	1	1	412
08:00 AM	0	347	16	363	0	0	0	0	**10**	**10**	373
Total Volume	0	1582	81	1663	0	0	0	0	23	23	1686
% App. Total	0	95.1	4.9				0	0	100		
PHF	.000	.926	.880	.928	.000	.000	.000	.000	.575	.575	.926

Wilson Okamoto Corporation

1907 S. Beretania Street Suite 400
Honolulu, Hi 96826

Counter:D4-3889, D4-5674
Counted By:DF, BB
Weather:Clear

File Name : PiipiiPM
Site Code : 00000010
Start Date : 1/27/2011
Page No : 1

Groups Printed- Unshifted

	Piilani Highway Southbound					Westbound	Piilani Highway Northbound					Piikea Avenue Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
02:00 PM	0	218	80	0	298	0	65	317	0	0	382	83	0	68	0	151	831
02:15 PM	0	279	103	0	382	0	60	342	0	0	402	82	0	69	0	151	935
02:30 PM	0	325	99	0	424	0	68	315	0	0	383	88	0	79	0	167	974
02:45 PM	0	282	106	0	388	0	85	327	0	0	412	87	0	69	0	156	956
Total	0	1104	388	0	1492	0	278	1301	0	0	1579	340	0	285	0	625	3696
03:00 PM	0	330	83	0	413	0	51	332	0	0	383	55	0	70	0	125	921
03:15 PM	0	305	104	0	409	0	64	358	0	0	422	76	0	75	0	151	982
03:30 PM	0	321	90	0	411	0	59	355	0	0	414	69	0	91	0	160	985
03:45 PM	0	299	96	0	395	0	62	316	0	0	378	75	0	79	0	154	927
Total	0	1255	373	0	1628	0	236	1361	0	0	1597	275	0	315	0	590	3815
04:00 PM	0	268	97	0	365	0	55	354	0	0	409	60	0	76	0	136	910
04:15 PM	0	308	79	0	387	0	68	349	0	0	417	69	0	57	0	126	930
04:30 PM	0	279	88	0	367	0	48	336	0	0	384	65	0	65	0	130	881
04:45 PM	0	284	94	0	378	0	55	232	0	0	287	58	0	67	0	125	790
Total	0	1139	358	0	1497	0	226	1271	0	0	1497	252	0	265	0	517	3511
05:00 PM	0	240	75	0	315	0	46	326	0	0	372	55	0	78	0	133	820
05:15 PM	0	276	124	0	400	0	57	256	0	0	313	70	0	74	0	144	857
05:30 PM	0	244	91	0	335	0	42	232	0	0	274	66	0	63	0	129	738
05:45 PM	0	196	104	0	300	0	0	0	0	0	0	60	0	66	0	126	426
Total	0	956	394	0	1350	0	145	814	0	0	959	251	0	281	0	532	2841
Grand Total	0	4454	1513	0	5967	0	885	4747	0	0	5632	1118	0	1146	0	2264	13863
Apprch %	0	74.6	25.4	0			15.7	84.3	0	0		49.4	0	50.6	0		
Total %	0	32.1	10.9	0	43	0	6.4	34.2	0	0	40.6	8.1	0	8.3	0	16.3	

	Piilani Highway Southbound				Westbound	Piilani Highway Northbound				Piikea Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1														
Peak Hour for Entire Intersection Begins at 02:45 PM														
02:45 PM	0	282	**106**	388	0	**85**	327	0	412	**87**	0	69	156	956
03:00 PM	0	**330**	83	**413**	0	51	332	0	383	55	0	70	125	921
03:15 PM	0	305	104	409	0	64	**358**	0	**422**	76	0	75	151	982
03:30 PM	0	321	90	411	0	59	355	0	414	69	0	**91**	**160**	**985**
Total Volume	0	1238	383	1621	0	259	1372	0	1631	287	0	305	592	3844
% App. Total	0	76.4	23.6			15.9	84.1	0		48.5	0	51.5		
PHF	.000	.938	.903	.981	.000	.762	.958	.000	.966	.825	.000	.838	.925	.976

Wilson Okamoto Corporation

1907 S. Beretania Street Suite 400
Honolulu, Hi 96826

Counter:3889/5674
Counted By:DF and BB
Weather:Clear

File Name : PiipiiAM
Site Code : 00000010
Start Date : 1/27/2011
Page No : 1

Groups Printed- Unshifted

	Piilani Highway Southbound					Westbound	Piilani Highway Northbound					Piikea Avenue Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
06:00 AM	0	80	24	0	104	0	4	81	0	0	85	20	0	13	0	33	222
06:15 AM	0	164	27	0	191	0	14	105	0	0	119	26	0	5	0	31	341
06:30 AM	0	194	29	0	223	0	10	167	0	0	177	28	0	20	0	48	448
06:45 AM	0	210	45	0	255	0	19	213	0	0	232	48	0	15	0	63	550
Total	0	648	125	0	773	0	47	566	0	0	613	122	0	53	0	175	1561
07:00 AM	0	240	61	0	301	0	19	251	0	0	270	43	0	19	0	62	633
07:15 AM	0	359	72	0	431	0	20	314	0	0	334	67	0	22	0	89	854
07:30 AM	0	365	98	0	463	0	33	270	0	0	303	66	0	40	0	106	872
07:45 AM	0	328	79	0	407	0	33	249	0	0	282	89	0	30	0	119	808
Total	0	1292	310	0	1602	0	105	1084	0	0	1189	265	0	111	0	376	3167
08:00 AM	0	310	68	0	378	0	37	220	0	0	257	72	0	41	0	113	748
08:15 AM	0	285	70	0	355	0	34	196	0	0	230	68	0	40	0	108	693
08:30 AM	0	226	65	0	291	0	50	218	0	0	268	62	0	33	0	95	654
08:45 AM	0	238	76	0	314	0	43	208	0	0	251	62	0	40	0	102	667
Total	0	1059	279	0	1338	0	164	842	0	0	1006	264	0	154	0	418	2762
Grand Total	0	2999	714	0	3713	0	316	2492	0	0	2808	651	0	318	0	969	7490
Apprch %	0	80.8	19.2	0			11.3	88.7	0	0		67.2	0	32.8	0		
Total %	0	40	9.5	0	49.6	0	4.2	33.3	0	0	37.5	8.7	0	4.2	0	12.9	

	Piilani Highway Southbound					Westbound	Piilani Highway Northbound					Piikea Avenue Eastbound					
Start Time	Left	Thru	Right	Peds	App. Total	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	0	359	72	0	431	0	20	**314**	0	0	**334**	67	0	22	0	89	854
07:30 AM	0	**365**	**98**	0	**463**	0	33	270	0	0	303	66	0	40	0	106	**872**
07:45 AM	0	328	79	0	407	0	33	249	0	0	282	**89**	0	30	0	**119**	808
08:00 AM	0	310	68	0	378	0	**37**	220	0	0	257	72	0	**41**	0	113	748
Total Volume	0	1362	317	0	1679	0	123	1053	0	0	1176	294	0	133	0	427	3282
% App. Total	0	81.1	18.9	0			10.5	89.5	0	0		68.9	0	31.1	0		
PHF	.000	.933	.809	.000	.907	.000	.831	.838	.000	.000	.880	.826	.000	.811	.000	.897	.941

Wilson Okamoto Corporation

1907 S. Beretania Street Suite 400
Honolulu, Hi 96826

Counmter:5676/5672
Counted By:BB and LM
Weather:Clear

File Name : KulkiePM
Site Code : 00000000
Start Date : 1/26/2011
Page No : 1

Groups Printed- Unshifted

	S. Kihei Road Southbound					Kulanihakoi Street Westbound					S. Kihei Road Northbound					Eastbound	
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	App. Total	Int. Total
02:00 PM	3	49	0	0	52	11	0	14	4	29	0	88	28	3	119	0	200
02:15 PM	8	89	0	0	97	12	0	10	3	25	0	78	21	0	99	0	221
02:30 PM	6	78	0	0	84	20	0	8	3	31	0	100	34	2	136	0	251
02:45 PM	20	108	0	0	128	15	0	12	1	28	0	75	35	3	113	0	269
Total	37	324	0	0	361	58	0	44	11	113	0	341	118	8	467	0	941
03:00 PM	5	105	0	0	110	10	0	10	7	27	0	130	17	3	150	0	287
03:15 PM	6	99	0	0	105	7	0	15	4	26	0	135	10	0	145	0	276
03:30 PM	11	108	0	0	119	11	0	13	2	26	0	158	21	3	182	0	327
03:45 PM	5	136	0	0	141	20	0	7	2	29	0	147	11	0	158	0	328
Total	27	448	0	0	475	48	0	45	15	108	0	570	59	6	635	0	1218
04:00 PM	7	114	0	0	121	7	0	4	1	12	0	126	12	0	138	0	271
04:15 PM	5	89	0	0	94	14	0	7	2	23	0	142	14	1	157	0	274
04:30 PM	6	108	0	0	114	15	0	9	2	26	0	143	16	1	160	0	300
04:45 PM	7	132	0	0	139	13	0	6	4	23	0	133	17	2	152	0	322
Total	25	443	0	0	468	49	0	34	9	92	0	544	59	4	607	0	1167
05:00 PM	8	125	0	0	133	5	0	15	2	22	0	145	15	1	161	0	316
05:15 PM	6	106	0	0	112	11	0	6	9	26	0	134	22	8	164	0	302
05:30 PM	10	109	0	0	119	13	0	8	5	26	0	117	20	0	137	0	282
05:45 PM	4	94	0	0	98	17	0	12	2	31	0	128	14	2	144	0	273
Total	28	434	0	0	462	46	0	41	18	105	0	524	71	11	606	0	1173
Grand Total	117	1649	0	0	1766	201	0	164	53	418	0	1979	307	29	2315	0	4499
Apprch %	6.6	93.4	0	0		48.1	0	39.2	12.7		0	85.5	13.3	1.3			
Total %	2.6	36.7	0	0	39.3	4.5	0	3.6	1.2	9.3	0	44	6.8	0.6	51.5	0	

	S. Kihei Road Southbound					Kulanihakoi Street Westbound					S. Kihei Road Northbound					Eastbound	
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	App. Total	Int. Total
Peak Hour Analysis From 02:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	6	108	0	0	114	15	0	9	2	26	0	143	16	1	160	0	300
04:45 PM	7	132	0	0	139	13	0	14	4	31	0	133	17	2	152	0	322
05:00 PM	8	125	0	0	133	5	0	15	2	22	0	145	15	1	161	0	316
05:15 PM	6	106	0	0	112	11	0	6	9	26	0	134	22	8	164	0	302
Total Volume	27	471	0	0	498	44	0	44	17	105	0	555	70	12	637	0	1240
% App. Total	5.4	94.6	0	0		41.9	0	41.9	16.2		0	87.1	11	1.9			
PHF	.844	.892	.000	.000	.896	.733	.000	.733	.472	.847	.000	.957	.795	.375	.971	.000	.963

Wilson Okamoto Corporation

1907 S. Beretania Street Suite 400
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Counter:5676/5672
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File Name : KulkieAM
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Start Date : 1/26/2011
Page No : 1

Groups Printed- Unshifted

	S. Kihei Road Southbound					Kulanihakoi Street Westbound					S. Kihei Road Northbound					Eastbound	
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	App. Total	Int. Total
06:00 AM	0	17	0	1	18	0	0	5	0	5	0	38	0	0	38	0	61
06:15 AM	1	33	0	1	35	3	0	8	0	11	0	47	0	0	47	0	93
06:30 AM	1	47	0	4	52	3	0	5	3	11	0	69	5	0	74	0	137
06:45 AM	2	66	0	0	68	8	0	13	1	22	0	89	6	0	95	0	185
Total	4	163	0	6	173	14	0	31	4	49	0	243	11	0	254	0	476
07:00 AM	1	46	0	1	48	10	0	16	3	29	0	98	6	0	104	0	181
07:15 AM	4	84	0	0	88	10	0	12	4	26	0	93	9	0	102	0	216
07:30 AM	4	81	0	0	85	11	0	18	4	33	0	104	10	0	114	0	232
07:45 AM	2	83	0	0	85	8	0	13	8	29	0	111	14	0	125	0	239
Total	11	294	0	1	306	39	0	59	19	117	0	406	39	0	445	0	868
08:00 AM	11	76	0	1	88	14	0	17	4	35	0	112	14	0	126	0	249
08:15 AM	5	80	0	0	85	13	0	15	6	34	0	85	7	2	94	0	213
08:30 AM	13	64	0	0	77	10	0	15	4	29	0	83	13	2	98	0	204
08:45 AM	12	60	0	2	74	13	0	5	8	26	0	70	34	1	105	0	205
Total	41	280	0	3	324	50	0	52	22	124	0	350	68	5	423	0	871
Grand Total	56	737	0	10	803	103	0	142	45	290	0	999	118	5	1122	0	2215
Apprch %	7	91.8	0	1.2		35.5	0	49	15.5		0	89	10.5	0.4			
Total %	2.5	33.3	0	0.5	36.3	4.7	0	6.4	2	13.1	0	45.1	5.3	0.2	50.7	0	

	S. Kihei Road Southbound					Kulanihakoi Street Westbound					S. Kihei Road Northbound					Eastbound	
Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	App. Total	Int. Total
Peak Hour Analysis From 06:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:15 AM																	
07:15 AM	4	84	0	0	88	10	0	12	4	26	0	93	9	0	102	0	216
07:30 AM	4	81	0	0	85	11	0	18	4	33	0	104	10	0	114	0	232
07:45 AM	2	83	0	0	85	8	0	13	8	29	0	111	14	0	125	0	239
08:00 AM	11	76	0	1	88	14	0	17	4	35	0	112	14	0	126	0	249
Total Volume	21	324	0	1	346	43	0	60	20	123	0	420	47	0	467	0	936
% App. Total	6.1	93.6	0	0.3		35	0	48.8	16.3		0	89.9	10.1	0			
PHF	.477	.964	.000	.250	.983	.768	.000	.833	.625	.879	.000	.938	.839	.000	.927	.000	.940

APPENDIX B

LEVEL OF SERVICE DEFINITIONS

LEVEL OF SERVICE DEFINITIONS

LEVEL-OF-SERVICE CRITERIA FOR SIGNALIZED INTERSECTIONS

Level of Service (LOS) for signalized intersections is defined in terms of delay, which is a measure of driver discomfort, frustration, fuel consumption, and increased travel time. Specifically, level-of-service (LOS) criteria are stated in terms of the average control delay per vehicle, typically a 15-min analysis period. The criteria are given in the following table.

Table 1: Level-of-Service Criteria for Signalized Intersections

Level of Service	Control Delay per Vehicle (sec/veh)
A	≤10.0
B	>10.0 and ≤20.0
C	>20.0 and ≤35.0
D	>35.0 and ≤55.0
E	>55.0 and ≤80.0
F	>80.0

Delay is a complex measure and depends on a number of variables, including the quality of progression, the cycle length, the green ratio, and the v/c ratio for the lane group.

Level of Service A describes operations with low control delay, up to 10 sec per vehicle. This level of service occurs when progression is extremely favorable and most vehicles arrive during the green phase. Many vehicles do not stop at all. Short cycle lengths may tend to contribute to low delay values.

Level of Service B describes operations with control delay greater than 10 and up to 20 sec per vehicle. This level generally occurs with good progression, short cycle lengths, or both. More vehicles stop than with LOS A, causing higher levels of delay.

Level of Service C describes operations with control delay greater than 20 and up to 35 sec per vehicle. These higher delays may result from only fair progression, longer cycle lengths, or both. Individual cycle failures may begin to appear at this level. Cycle failure occurs when a given green phase does not serve queued vehicles and overflows occur. The number of vehicles stopping is significant at this level, though many still pass through the intersection without stopping.

Level of Service D describes operations with control delay greater than 35 and up to 55 sec per vehicle. At level of service D, the influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high v/c ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.

"Highway Capacity Manual," Transportation Research Board, 2000.

Level of Service E describes operation with control delay greater than 55 and up to 80 sec per vehicle. These high delay values generally indicate poor progression, long cycle lengths, and high v/c ratios. Individual cycle failures are frequent.

Level of Service F describes operations with control delay in excess of 80 sec per vehicle. This level, considered to be unacceptable to most drivers, often occurs with oversaturation, that is, when arrival flow rates exceed the capacity lane groups. It may also occur at high v/c ratios with many individual cycle failures. Poor progression and long cycle lengths may also contribute significantly to high delay levels.

LEVEL OF SERVICE DEFINITIONS

LEVEL-OF-SERVICE CRITERIA FOR UNSIGNALIZED INTERSECTIONS

Level of Service (LOS) criteria are given in Table 1. As used here, control delay is defined as the total elapsed time from the time a vehicle stops at the end of the queue to the time required for the vehicle to travel from the last-in-queue position to the first-in-queue position, including deceleration of vehicles from free-flow speed to the speed of vehicles in the queue.

The average total delay for any particular minor movement is a function of the service rate or capacity of the approach and the degree of saturation. If the degree of saturation is greater than about 0.9, average control delay is significantly affected by the length of the analysis period.

Table 1: Level-of-Service Criteria for Unsignalized Intersections

Level of Service	Average Control Delay (Sec/Veh)
A	≤10.0
B	>10.0 and ≤15.0
C	>15.0 and ≤25.0
D	>25.0 and ≤35.0
E	>35.0 and ≤50.0
F	>50.0

"Highway Capacity Manual," Transportation Research Board, 2000.

APPENDIX C

CAPACITY ANALYSIS CALCULATIONS
EXISTING PEAK HOUR TRAFFIC ANALYSIS

HCM Unsignalized Intersection Capacity Analysis
3: Kaonoulu & Piilani 5/3/2011

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	28	209	61	1306	1458	16
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.84	0.84	0.95	0.95	0.91	0.91
Hourly flow rate (vph)	33	249	64	1375	1602	18
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2418	801	1602			
vC1, stage 1 conf vol	1602					
vC2, stage 2 conf vol	816					
vCu, unblocked vol	2418	801	1602			
tC, single (s)	*5.8	*5.9	4.1			
tC, 2 stage (s)	4.8					
tF (s)	*2.5	*2.3	2.2			
p0 queue free %	86	54	84			
cM capacity (veh/h)	245	538	404			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	33	249	64	687	687	801	801	18
Volume Left	33	0	64	0	0	0	0	0
Volume Right	0	249	0	0	0	0	0	18
cSH	245	538	404	1700	1700	1700	1700	1700
Volume to Capacity	0.14	0.46	0.16	0.40	0.40	0.47	0.47	0.01
Queue Length 95th (ft)	12	60	14	0	0	0	0	0
Control Delay (s)	22.0	17.3	15.6	0.0	0.0	0.0	0.0	0.0
Lane LOS	C	C	C					
Approach Delay (s)	17.9		0.7			0.0		
Approach LOS	C							

Intersection Summary				
Average Delay	1.8			
Intersection Capacity Utilization	57.9%	ICU Level of Service		B
Analysis Period (min)	15			

* User Entered Value

HCM Unsignalized Intersection Capacity Analysis
3: Kaonoulu & Piilani

5/3/2011

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	22	107	118	1475	1547	107
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.79	0.79	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	28	135	136	1695	1778	123
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2897	889	1778			
vC1, stage 1 conf vol	1778					
vC2, stage 2 conf vol	1119					
vCu, unblocked vol	2897	889	1778			
tC, single (s)	*5.8	*5.9	4.1			
tC, 2 stage (s)	4.8					
tF (s)	*2.5	*2.3	2.2			
p0 queue free %	84	72	61			
cM capacity (veh/h)	172	478	345			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	28	135	136	848	848	889	889	123
Volume Left	28	0	136	0	0	0	0	0
Volume Right	0	135	0	0	0	0	0	123
cSH	172	478	345	1700	1700	1700	1700	1700
Volume to Capacity	0.16	0.28	0.39	0.50	0.50	0.52	0.52	0.07
Queue Length 95th (ft)	14	29	45	0	0	0	0	0
Control Delay (s)	29.9	15.5	22.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	D	C	C					
Approach Delay (s)	17.9		1.6			0.0		
Approach LOS	C							

Intersection Summary			
Average Delay	1.5		
Intersection Capacity Utilization	60.2%	ICU Level of Service	B
Analysis Period (min)	15		

* User Entered Value

HCM Unsignalized Intersection Capacity Analysis
5: Kulanihakoi & Piilani

5/3/2011

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	72	135	49	1295	1621	46
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.85	0.85	0.94	0.94	0.93	0.93
Hourly flow rate (vph)	85	159	52	1378	1743	49
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	TWLTL	
Median storage veh)					2	
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2536	872	1743			
vC1, stage 1 conf vol	1743					
vC2, stage 2 conf vol	793					
vCu, unblocked vol	2536	872	1743			
tC, single (s)	*5.8	*5.9	4.1			
tC, 2 stage (s)	4.8					
tF (s)	*2.5	*2.3	2.2			
p0 queue free %	61	68	85			
cM capacity (veh/h)	218	489	357			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	85	159	52	689	689	872	872	49
Volume Left	85	0	52	0	0	0	0	0
Volume Right	0	159	0	0	0	0	0	49
cSH	218	489	357	1700	1700	1700	1700	1700
Volume to Capacity	0.39	0.32	0.15	0.41	0.41	0.51	0.51	0.03
Queue Length 95th (ft)	43	35	13	0	0	0	0	0
Control Delay (s)	31.6	15.9	16.8	0.0	0.0	0.0	0.0	0.0
Lane LOS	D	C	C					
Approach Delay (s)	21.3		0.6			0.0		
Approach LOS	C							

Intersection Summary			
Average Delay	1.8		
Intersection Capacity Utilization	57.6%	ICU Level of Service	B
Analysis Period (min)	15		

* User Entered Value

HCM Unsignalized Intersection Capacity Analysis
5: Kulanihakoi & Piilani

5/3/2011

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	28	93	68	1565	1549	105
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.76	0.76	0.92	0.92	0.88	0.88
Hourly flow rate (vph)	37	122	74	1701	1760	119
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	TWLTL	
Median storage veh)					2	
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2759	880	1760			
vC1, stage 1 conf vol	1760					
vC2, stage 2 conf vol	998					
vCu, unblocked vol	2759	880	1760			
tC, single (s)	*5.8	*5.9	4.1			
tC, 2 stage (s)	4.8					
tF (s)	*2.5	*2.3	2.2			
p0 queue free %	82	75	79			
cM capacity (veh/h)	201	484	351			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	37	122	74	851	851	880	880	119
Volume Left	37	0	74	0	0	0	0	0
Volume Right	0	122	0	0	0	0	0	119
cSH	201	484	351	1700	1700	1700	1700	1700
Volume to Capacity	0.18	0.25	0.21	0.50	0.50	0.52	0.52	0.07
Queue Length 95th (ft)	16	25	20	0	0	0	0	0
Control Delay (s)	26.9	14.9	18.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	D	B	C					
Approach Delay (s)	17.7		0.7			0.0		
Approach LOS	C							

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	57.6%	ICU Level of Service	B
Analysis Period (min)	15		

* User Entered Value

HCM Unsignalized Intersection Capacity Analysis
7: E. Waipuilani & Piilani

5/3/2011

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	0	23	0	1344	1674	81
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.58	0.58	0.88	0.88	0.91	0.91
Hourly flow rate (vph)	0	40	0	1527	1840	89
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2603	920	1840			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2603	920	1840			
tC, single (s)	6.8	*5.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	*2.3	2.2			
p0 queue free %	100	91	100			
cM capacity (veh/h)	20	458	327			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	40	764	764	920	920	89
Volume Left	0	0	0	0	0	0
Volume Right	40	0	0	0	0	89
cSH	458	1700	1700	1700	1700	1700
Volume to Capacity	0.09	0.45	0.45	0.54	0.54	0.05
Queue Length 95th (ft)	7	0	0	0	0	0
Control Delay (s)	13.6	0.0	0.0	0.0	0.0	0.0
Lane LOS	B					
Approach Delay (s)	13.6	0.0		0.0		
Approach LOS	B					

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	54.0%	ICU Level of Service	A
Analysis Period (min)	15		

* User Entered Value

HCM Unsignalized Intersection Capacity Analysis
7: E. Waipuilani & Piilani

5/3/2011

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	0	32	0	1633	1542	100
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.57	0.57	0.95	0.95	0.96	0.96
Hourly flow rate (vph)	0	56	0	1719	1606	104
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2466	803	1606			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2466	803	1606			
tC, single (s)	6.8	*5.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	*2.3	2.2			
p0 queue free %	100	90	100			
cM capacity (veh/h)	25	537	403			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	56	859	859	803	803	104
Volume Left	0	0	0	0	0	0
Volume Right	56	0	0	0	0	104
cSH	537	1700	1700	1700	1700	1700
Volume to Capacity	0.10	0.51	0.51	0.47	0.47	0.06
Queue Length 95th (ft)	9	0	0	0	0	0
Control Delay (s)	12.5	0.0	0.0	0.0	0.0	0.0
Lane LOS	B					
Approach Delay (s)	12.5	0.0		0.0		
Approach LOS	B					

Intersection Summary				
Average Delay		0.2		
Intersection Capacity Utilization		50.5%	ICU Level of Service	A
Analysis Period (min)		15		

* User Entered Value

HCM Signalized Intersection Capacity Analysis
9: Piikea & Piilani

5/3/2011

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	294	133	123	1050	1376	321
Ideal Flow (vphpl)	1900	1900	2000	2000	2000	2000
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	4.0
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770	1583	1863	3725	3725	1667
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	1863	3725	3725	1667
Peak-hour factor, PHF	0.90	0.90	0.88	0.88	0.91	0.91
Adj. Flow (vph)	327	148	140	1193	1512	353
RTOR Reduction (vph)	0	113	0	0	0	0
Lane Group Flow (vph)	327	35	140	1193	1512	353
Turn Type		Perm	Prot			Free
Protected Phases	4		5	2	6	
Permitted Phases		4				Free
Actuated Green, G (s)	28.3	28.3	14.5	80.1	60.6	118.4
Effective Green, g (s)	28.3	28.3	14.5	80.1	60.6	118.4
Actuated g/C Ratio	0.24	0.24	0.12	0.68	0.51	1.00
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	423	378	228	2520	1907	1667
v/s Ratio Prot	c0.18		c0.08	0.32	c0.41	
v/s Ratio Perm		0.02				0.21
v/c Ratio	0.77	0.09	0.61	0.47	0.79	0.21
Uniform Delay, d1	42.1	35.1	49.3	9.1	23.7	0.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	8.5	0.1	4.8	0.1	2.3	0.3
Delay (s)	50.6	35.2	54.1	9.3	26.1	0.3
Level of Service	D	D	D	A	C	A
Approach Delay (s)	45.8			14.0	21.2	
Approach LOS	D			B	C	

Intersection Summary				
HCM Average Control Delay	21.8	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.76			
Actuated Cycle Length (s)	118.4	Sum of lost time (s)	15.0	
Intersection Capacity Utilization	71.4%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
9: Piikea & Piilani

5/3/2011

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	270	277	233	1363	1200	374
Ideal Flow (vphpl)	1900	1900	2000	2000	2000	2000
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	4.0
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770	1583	1863	3725	3725	1667
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	1863	3725	3725	1667
Peak-hour factor, PHF	0.89	0.89	0.95	0.95	0.96	0.96
Adj. Flow (vph)	303	311	245	1435	1250	390
RTOR Reduction (vph)	0	239	0	0	0	0
Lane Group Flow (vph)	303	72	245	1435	1250	390
Turn Type		Perm	Prot			Free
Protected Phases	4		5	2	6	
Permitted Phases		4				Free
Actuated Green, G (s)	25.7	25.7	20.9	75.1	49.2	110.8
Effective Green, g (s)	25.7	25.7	20.9	75.1	49.2	110.8
Actuated g/C Ratio	0.23	0.23	0.19	0.68	0.44	1.00
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	411	367	351	2525	1654	1667
v/s Ratio Prot	c0.17		c0.13	0.39	c0.34	
v/s Ratio Perm		0.05				0.23
v/c Ratio	0.74	0.20	0.70	0.57	0.76	0.23
Uniform Delay, d1	39.4	34.2	42.0	9.4	25.8	0.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	6.8	0.3	6.0	0.3	2.0	0.3
Delay (s)	46.2	34.5	48.0	9.7	27.8	0.3
Level of Service	D	C	D	A	C	A
Approach Delay (s)	40.3			15.2	21.3	
Approach LOS	D			B	C	

Intersection Summary				
HCM Average Control Delay	21.7	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.74			
Actuated Cycle Length (s)	110.8	Sum of lost time (s)	15.0	
Intersection Capacity Utilization	71.2%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
13: Kulanihakoi &

5/3/2011

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	43	60	420	47	21	324
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.83	0.83	0.93	0.93	0.98	0.98
Hourly flow rate (vph)	52	72	452	51	21	331
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	850	477			502	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	850	477			502	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	84	88			98	
cM capacity (veh/h)	324	588			1062	

Direction, Lane #	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	52	72	502	21	331
Volume Left	52	0	0	21	0
Volume Right	0	72	51	0	0
cSH	324	588	1700	1062	1700
Volume to Capacity	0.16	0.12	0.30	0.02	0.19
Queue Length 95th (ft)	14	10	0	2	0
Control Delay (s)	18.2	12.0	0.0	8.5	0.0
Lane LOS	C	B		A	
Approach Delay (s)	14.6		0.0	0.5	
Approach LOS	B				

Intersection Summary			
Average Delay	2.0		
Intersection Capacity Utilization	35.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	56	27	558	53	23	447
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.78	0.78	0.96	0.96	0.84	0.84
Hourly flow rate (vph)	72	35	581	55	27	532
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1196	609			636	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1196	609			636	
tC, single (s)	*5.4	*5.2			4.1	
tC, 2 stage (s)						
tF (s)	*2.5	*2.3			2.2	
p0 queue free %	79	96			97	
cM capacity (veh/h)	342	784			947	

Direction, Lane #	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	72	35	636	27	532
Volume Left	72	0	0	27	0
Volume Right	0	35	55	0	0
cSH	342	784	1700	947	1700
Volume to Capacity	0.21	0.04	0.37	0.03	0.31
Queue Length 95th (ft)	19	3	0	2	0
Control Delay (s)	18.3	9.8	0.0	8.9	0.0
Lane LOS	C	A		A	
Approach Delay (s)	15.5		0.0	0.4	
Approach LOS	C				

Intersection Summary			
Average Delay	1.5		
Intersection Capacity Utilization	42.6%	ICU Level of Service	A
Analysis Period (min)	15		

* User Entered Value

APPENDIX D

CAPACITY ANALYSIS CALCULATIONS
PROJECTED YEAR 2015 PEAK HOUR TRAFFIC
ANALYSIS WITHOUT PROJECT

HCM Unsignalized Intersection Capacity Analysis
3: Kaonoulu & Piilani

5/4/2011

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	28	209	61	1358	1516	16
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.84	0.84	0.95	0.95	0.91	0.91
Hourly flow rate (vph)	33	249	64	1429	1666	18
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2509	833	1666			
vC1, stage 1 conf vol	1666					
vC2, stage 2 conf vol	843					
vCu, unblocked vol	2509	833	1666			
tC, single (s)	*5.8	*5.9	4.1			
tC, 2 stage (s)	4.8					
tF (s)	*2.5	*2.3	2.2			
p0 queue free %	85	52	83			
cM capacity (veh/h)	230	515	382			

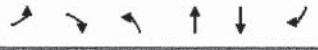
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	33	249	64	715	715	833	833	18
Volume Left	33	0	64	0	0	0	0	0
Volume Right	0	249	0	0	0	0	0	18
cSH	230	515	382	1700	1700	1700	1700	1700
Volume to Capacity	0.15	0.48	0.17	0.42	0.42	0.49	0.49	0.01
Queue Length 95th (ft)	12	65	15	0	0	0	0	0
Control Delay (s)	23.3	18.3	16.3	0.0	0.0	0.0	0.0	0.0
Lane LOS	C	C	C					
Approach Delay (s)	18.9		0.7			0.0		
Approach LOS	C							

Intersection Summary			
Average Delay	1.8		
Intersection Capacity Utilization	59.4%	ICU Level of Service	B
Analysis Period (min)	15		

* User Entered Value

HCM Unsignalized Intersection Capacity Analysis
3: Kaonoulu & Piilani

5/4/2011



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	22	107	118	1534	1609	107
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.79	0.79	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	28	135	136	1763	1849	123
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	3002	925	1849			
vC1, stage 1 conf vol	1849					
vC2, stage 2 conf vol	1153					
vCu, unblocked vol	3002	925	1849			
tC, single (s)	*5.8	*5.9	4.1			
tC, 2 stage (s)	4.8					
tF (s)	*2.5	*2.3	2.2			
p0 queue free %	82	70	58			
cM capacity (veh/h)	159	455	324			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	28	135	136	882	882	925	925	123
Volume Left	28	0	136	0	0	0	0	0
Volume Right	0	135	0	0	0	0	0	123
cSH	159	455	324	1700	1700	1700	1700	1700
Volume to Capacity	0.18	0.30	0.42	0.52	0.52	0.54	0.54	0.07
Queue Length 95th (ft)	15	31	50	0	0	0	0	0
Control Delay (s)	32.4	16.2	23.9	0.0	0.0	0.0	0.0	0.0
Lane LOS	D	C	C					
Approach Delay (s)	19.0		1.7			0.0		
Approach LOS	C							

Intersection Summary			
Average Delay	1.6		
Intersection Capacity Utilization	61.8%	ICU Level of Service	B
Analysis Period (min)	15		

* User Entered Value

HCM Unsignalized Intersection Capacity Analysis
5: Kulanihakoi & Piilani

5/4/2011

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	72	135	49	1347	1679	46
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.85	0.85	0.94	0.94	0.93	0.93
Hourly flow rate (vph)	85	159	52	1433	1805	49
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	TWLTL	
Median storage veh)					2	
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2626	903	1805			
vC1, stage 1 conf vol	1805					
vC2, stage 2 conf vol	821					
vCu, unblocked vol	2626	903	1805			
tC, single (s)	*5.8	*5.9	4.1			
tC, 2 stage (s)	4.8					
tF (s)	*2.5	*2.3	2.2			
p0 queue free %	59	66	85			
cM capacity (veh/h)	205	469	337			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	85	159	52	716	716	903	903	49
Volume Left	85	0	52	0	0	0	0	0
Volume Right	0	159	0	0	0	0	0	49
cSH	205	469	337	1700	1700	1700	1700	1700
Volume to Capacity	0.41	0.34	0.15	0.42	0.42	0.53	0.53	0.03
Queue Length 95th (ft)	47	37	14	0	0	0	0	0
Control Delay (s)	34.5	16.6	17.6	0.0	0.0	0.0	0.0	0.0
Lane LOS	D	C	C					
Approach Delay (s)	22.8		0.6			0.0		
Approach LOS	C							

Intersection Summary			
Average Delay	1.8		
Intersection Capacity Utilization	59.1%	ICU Level of Service	B
Analysis Period (min)	15		

* User Entered Value

HCM Unsignalized Intersection Capacity Analysis
5: Kulanihakoi & Piilani

5/4/2011

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	28	93	68	1624	1611	105
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.76	0.76	0.92	0.92	0.88	0.88
Hourly flow rate (vph)	37	122	74	1765	1831	119
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	TWLTL	
Median storage veh)					2	
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2861	915	1831			
vC1, stage 1 conf vol	1831					
vC2, stage 2 conf vol	1030					
vCu, unblocked vol	2861	915	1831			
tC, single (s)	*5.8	*5.9	4.1			
tC, 2 stage (s)	4.8					
tF (s)	*2.5	*2.3	2.2			
p0 queue free %	80	73	78			
cM capacity (veh/h)	187	461	330			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	37	122	74	883	883	915	915	119
Volume Left	37	0	74	0	0	0	0	0
Volume Right	0	122	0	0	0	0	0	119
cSH	187	461	330	1700	1700	1700	1700	1700
Volume to Capacity	0.20	0.27	0.22	0.52	0.52	0.54	0.54	0.07
Queue Length 95th (ft)	18	26	21	0	0	0	0	0
Control Delay (s)	29.0	15.6	19.1	0.0	0.0	0.0	0.0	0.0
Lane LOS	D	C	C					
Approach Delay (s)	18.7		0.8			0.0		
Approach LOS	C							

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	59.2%	ICU Level of Service	B
Analysis Period (min)	15		

* User Entered Value

HCM Unsignalized Intersection Capacity Analysis
7: E. Waipuilani & Piilani

5/4/2011

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	0	23	0	1396	1732	81
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.58	0.58	0.88	0.88	0.91	0.91
Hourly flow rate (vph)	0	40	0	1586	1903	89
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2696	952	1903			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2696	952	1903			
tC, single (s)	6.8	*5.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	*2.3	2.2			
p0 queue free %	100	91	100			
cM capacity (veh/h)	17	439	309			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	40	793	793	952	952	89
Volume Left	0	0	0	0	0	0
Volume Right	40	0	0	0	0	89
cSH	439	1700	1700	1700	1700	1700
Volume to Capacity	0.09	0.47	0.47	0.56	0.56	0.05
Queue Length 95th (ft)	7	0	0	0	0	0
Control Delay (s)	14.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	B					
Approach Delay (s)	14.0	0.0		0.0		
Approach LOS	B					

Intersection Summary				
Average Delay		0.2		
Intersection Capacity Utilization		55.5%	ICU Level of Service	B
Analysis Period (min)		15		

* User Entered Value

HCM Unsignalized Intersection Capacity Analysis
7: E. Waipuilani & Piilani

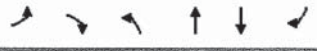
5/4/2011

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	0	32	0	1692	1604	100
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.57	0.57	0.95	0.95	0.96	0.96
Hourly flow rate (vph)	0	56	0	1781	1671	104
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2561	835	1671			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2561	835	1671			
tC, single (s)	6.8	*5.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	*2.3	2.2			
p0 queue free %	100	89	100			
cM capacity (veh/h)	21	514	380			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	56	891	891	835	835	104
Volume Left	0	0	0	0	0	0
Volume Right	56	0	0	0	0	104
cSH	514	1700	1700	1700	1700	1700
Volume to Capacity	0.11	0.52	0.52	0.49	0.49	0.06
Queue Length 95th (ft)	9	0	0	0	0	0
Control Delay (s)	12.9	0.0	0.0	0.0	0.0	0.0
Lane LOS	B					
Approach Delay (s)	12.9	0.0		0.0		
Approach LOS	B					

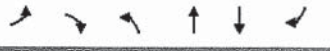
Intersection Summary				
Average Delay		0.2		
Intersection Capacity Utilization		52.1%	ICU Level of Service	A
Analysis Period (min)		15		

* User Entered Value



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	294	133	123	1102	1434	321
Ideal Flow (vphpl)	1900	1900	2000	2000	2000	2000
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	4.0
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770	1583	1863	3725	3725	1667
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	1863	3725	3725	1667
Peak-hour factor, PHF	0.90	0.90	0.88	0.88	0.91	0.91
Adj. Flow (vph)	327	148	140	1252	1576	353
RTOR Reduction (vph)	0	113	0	0	0	0
Lane Group Flow (vph)	327	35	140	1252	1576	353
Turn Type		Perm	Prot			Free
Protected Phases	4		5	2	6	
Permitted Phases		4				Free
Actuated Green, G (s)	28.6	28.6	15.0	82.8	62.8	121.4
Effective Green, g (s)	28.6	28.6	15.0	82.8	62.8	121.4
Actuated g/C Ratio	0.24	0.24	0.12	0.68	0.52	1.00
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	417	373	230	2541	1927	1667
v/s Ratio Prot	c0.18		c0.08	0.34	c0.42	
v/s Ratio Perm		0.02				0.21
v/c Ratio	0.78	0.09	0.61	0.49	0.82	0.21
Uniform Delay, d1	43.5	36.3	50.4	9.2	24.5	0.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	9.3	0.1	4.5	0.2	2.8	0.3
Delay (s)	52.8	36.4	54.9	9.4	27.3	0.3
Level of Service	D	D	D	A	C	A
Approach Delay (s)	47.7			14.0	22.4	
Approach LOS	D			B	C	

Intersection Summary				
HCM Average Control Delay	22.5	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.78			
Actuated Cycle Length (s)	121.4	Sum of lost time (s)	15.0	
Intersection Capacity Utilization	72.9%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	270	277	233	1422	1262	374
Ideal Flow (vphpl)	1900	1900	2000	2000	2000	2000
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	4.0
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770	1583	1863	3725	3725	1667
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	1863	3725	3725	1667
Peak-hour factor, PHF	0.89	0.89	0.95	0.95	0.96	0.96
Adj. Flow (vph)	303	311	245	1497	1315	390
RTOR Reduction (vph)	0	240	0	0	0	0
Lane Group Flow (vph)	303	71	245	1497	1315	390
Turn Type		Perm	Prot			Free
Protected Phases	4		5	2	6	
Permitted Phases		4				Free
Actuated Green, G (s)	26.3	26.3	21.4	78.3	51.9	114.6
Effective Green, g (s)	26.3	26.3	21.4	78.3	51.9	114.6
Actuated g/C Ratio	0.23	0.23	0.19	0.68	0.45	1.00
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	406	363	348	2545	1687	1667
v/s Ratio Prot	c0.17		c0.13	0.40	c0.35	
v/s Ratio Perm		0.05				0.23
v/c Ratio	0.75	0.20	0.70	0.59	0.78	0.23
Uniform Delay, d1	41.0	35.6	43.6	9.6	26.5	0.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	7.3	0.3	6.3	0.4	2.4	0.3
Delay (s)	48.4	35.9	50.0	10.0	28.9	0.3
Level of Service	D	D	D	A	C	A
Approach Delay (s)	42.0			15.6	22.3	
Approach LOS	D			B	C	

Intersection Summary				
HCM Average Control Delay	22.4	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.75			
Actuated Cycle Length (s)	114.6	Sum of lost time (s)	15.0	
Intersection Capacity Utilization	72.9%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	43	60	437	47	21	337
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.83	0.83	0.93	0.93	0.98	0.98
Hourly flow rate (vph)	52	72	470	51	21	344
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	882	495			520	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	882	495			520	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	83	87			98	
cM capacity (veh/h)	310	574			1046	

Direction, Lane #	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	52	72	520	21	344
Volume Left	52	0	0	21	0
Volume Right	0	72	51	0	0
cSH	310	574	1700	1046	1700
Volume to Capacity	0.17	0.13	0.31	0.02	0.20
Queue Length 95th (ft)	15	11	0	2	0
Control Delay (s)	18.9	12.2	0.0	8.5	0.0
Lane LOS	C	B		A	
Approach Delay (s)	15.0		0.0	0.5	
Approach LOS	B				

Intersection Summary				
Average Delay	2.0			
Intersection Capacity Utilization	36.2%	ICU Level of Service		A
Analysis Period (min)	15			

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	56	27	580	53	23	465
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.78	0.78	0.96	0.96	0.84	0.84
Hourly flow rate (vph)	72	35	604	55	27	554
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1240	632			659	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1240	632			659	
tC, single (s)	*5.4	*5.2			4.1	
tC, 2 stage (s)						
tF (s)	*2.5	*2.3			2.2	
p0 queue free %	78	95			97	
cM capacity (veh/h)	324	764			929	

Direction, Lane #	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	72	35	659	27	554
Volume Left	72	0	0	27	0
Volume Right	0	35	55	0	0
cSH	324	764	1700	929	1700
Volume to Capacity	0.22	0.05	0.39	0.03	0.33
Queue Length 95th (ft)	21	4	0	2	0
Control Delay (s)	19.2	9.9	0.0	9.0	0.0
Lane LOS	C	A		A	
Approach Delay (s)	16.2		0.0	0.4	
Approach LOS	C				

Intersection Summary				
Average Delay	1.5			
Intersection Capacity Utilization	43.7%	ICU Level of Service		A
Analysis Period (min)	15			

* User Entered Value

APPENDIX E

TRAFFIC SIGNAL WARRANT STUDY
FOR THE INTERSECTION OF PIILANI HIGHWAY
AND KULANIHAKOI STREET

Traffic Signal Warrant Study

Piilani Highway and Kulanihakoi Street

Prepared for:
Group 70 International, Inc.

Prepared by:
Wilson Okamoto Corporation

May 2010

TRAFFIC SIGNAL WARRANT STUDY

FOR THE INTERSECTION OF

PIILANI HIGHWAY AND KULANIHAKOI STREET

Prepared for:
Group 70 International, Inc.
925 Bethel Street, 5th Floor
Honolulu, HI 96813

Prepared by:

Wilson Okamoto Corporation
1907 S. Beretania Street, Suite 400
Honolulu, Hawaii 96826
WOC Ref. #7854-02

May 2011

TABLE OF CONTENTS

I. INTRODUCTION

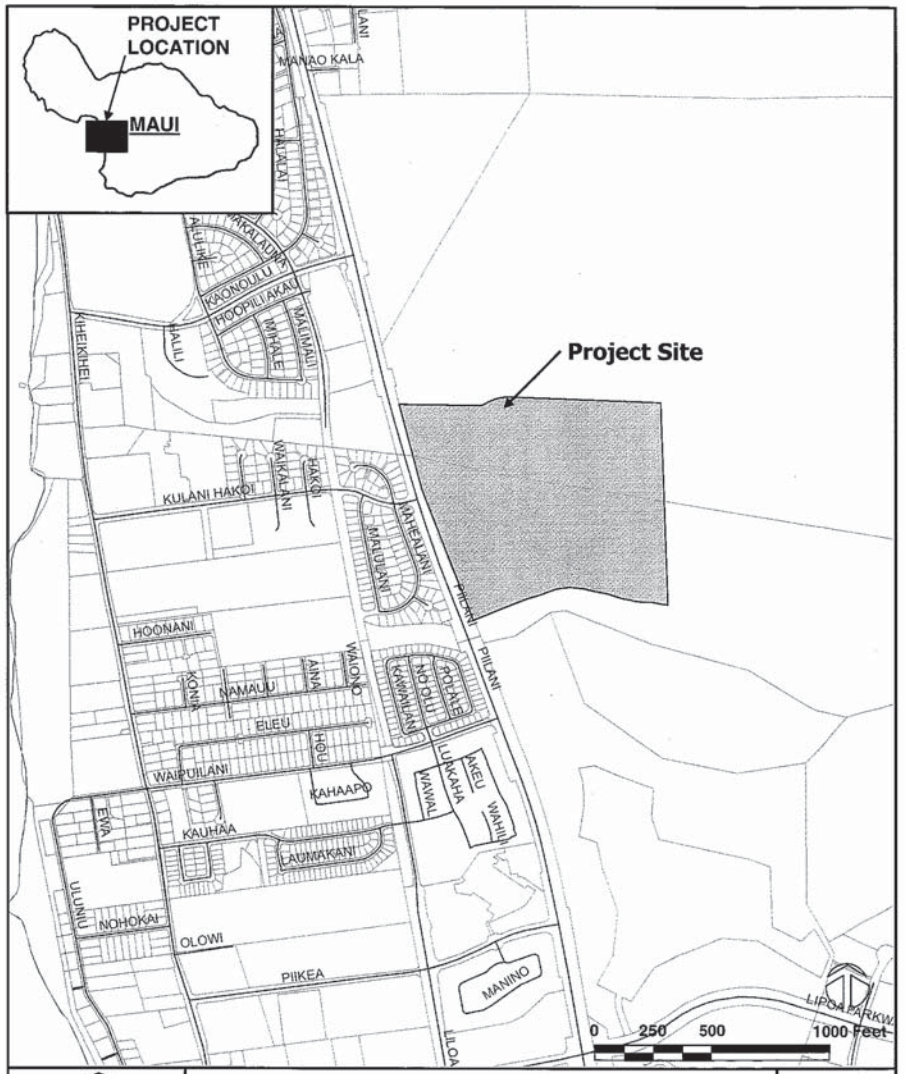
The purpose of this study is to determine if a traffic signal system is warranted at the intersection of Piilani Highway and Kulanihakoi Street in Kihei on the island of Maui (see Figure 1). The proposed Kihei High School will be located adjacent to the highway in the vicinity with access provided via a new roadway at this intersection. The traffic volumes at this intersection may warrant the installation of a traffic signal system and the provision of a traffic signal system at this intersection could provide additional safety for turning vehicles and pedestrians at the intersection.

II. EXISTING TRAFFIC CONDITIONS

A. Area Roadway System

In the vicinity of the intersection with Kulanihakoi Street, Piilani Highway is a predominantly four-lane, two-way roadway generally oriented in the north-south direction that provides access through Kihei. At the intersection with Kulanihakoi Street, the northbound approach of the highway has an exclusive left-turn lane and two through lanes while the southbound approach has two through lanes and an exclusive right-turn lane. Kulanihakoi Street is generally oriented in the east-west direction and serves as a connector roadway between South Kihei Road and Piilani Highway. At the intersection with Piilani Highway, the Kulanihakoi Street approach has two stop-controlled lanes that serve left-turn and right-turn traffic movements.

The access roadway for the proposed Kihei High School will connect to the east side of the intersection creating a four-way intersection. After the connection is completed, the westbound approach of the access road is expected to have two westbound lanes that serve left-turn, through, and right-turn traffic movements. In addition, northbound deceleration and acceleration lanes are expected to be constructed along Piilani Highway to facilitate entering and exiting traffic at the school's access.



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KIHEI HIGH SCHOOL

LOCATION MAP AND VICINITY MAP

FIGURE 1

B. Traffic Volumes and Conditions

Field investigations were conducted on January 24-27, 2011 at the intersection of Piilani Highway and Kulanihakoi Street. The investigations consisted of manual turning movement count surveys conducted during the morning peak hours of 6:00 AM to 9:00 AM and the afternoon peak hours of 3:00 PM and 6:00 PM. In addition, 24-hour mechanical count surveys were conducted along Piilani Highway and Kulanihakoi Street for all approaches of the intersection. Appendix A includes the existing traffic count data.

III. TRAFFIC SIGNAL WARRANTS

A. General

The installation of a traffic signal at an intersection may be justified by one or more of the nine warrants outlined in the "Manual on Uniform Traffic Control Devices for Streets and Highways," 2009 Edition (MUTCD). These warrants take into account factors such as eight-hour vehicular volumes (Warrant 1), four-hour vehicular volumes (Warrant 2), peak hour volumes (Warrant 3), pedestrian volumes (Warrant 4), the presence of a school crossing or coordinated signal system (Warrants 5 and 6), crash experience (Warrant 7), other characteristics of the roadway network (Warrant 8), and the presence of railroad crossings (Warrant 9). The applicable Warrants 1, 2, and 3 are assessed in this study to determine if a traffic signal system is warranted at the intersection of Piilani Highway and Kulanihakoi Street.

B. Warrant 1

Warrant 1, the "Eight-Hour Volume Warrant," consists of two conditions that may justify the installation of a traffic signal at an intersection where vehicles experience high traffic delay due to large volumes of intersecting traffic during any eight hours of an average day. The first condition is the "Minimum Vehicular Volume Condition" and the second is the "Interruption of Continuous Traffic Condition." Warrant 1 can be satisfied either by meeting the thresholds shown in the 100% columns of either condition of Table 4C-1of the MUTCD or by meeting the thresholds shown in the 80% columns for both conditions of Table 4C-1 of the

MUTCD. Under existing conditions, the traffic volumes entering the intersection of Piilani Highway and Kulanihakoi Street meet the thresholds during any eight hours of the day and, as such, satisfy Warrant 1 for minor street approaches with two lanes for high traffic volumes on the major street (see Appendix B). It should also be noted that after the proposed Kihei High School is constructed traffic volumes at this intersection are expected to increase thereby more than adequately satisfying the conditions for Warrant 1.

C. Warrant 2

Warrant 2, the "Four-Hour Volume Warrant," consists of several conditions that may justify the installation of a traffic signal at an intersection where vehicles experience high traffic delay due to large volumes of intersecting traffic during any four hours of an average day. One of the conditions is based upon the relationship between the traffic volumes along the major and minor street. If the traffic volumes along the minor street exceed the thresholds shown in Figure 4C-1 of the MUTCD, a traffic signal system may be warranted. Under existing conditions, the traffic volumes entering the intersection of Piilani Highway and Kulanihakoi Street meet the thresholds during any four hours of the day and, as such, satisfy Warrant 2 for minor street approaches with two lanes for high traffic volumes on the major street (see Appendix C). It should also be noted that after the proposed Kihei High School is constructed traffic volumes at this intersection are expected to increase thereby more than adequately satisfying the conditions for Warrant 2.

D. Warrant 3

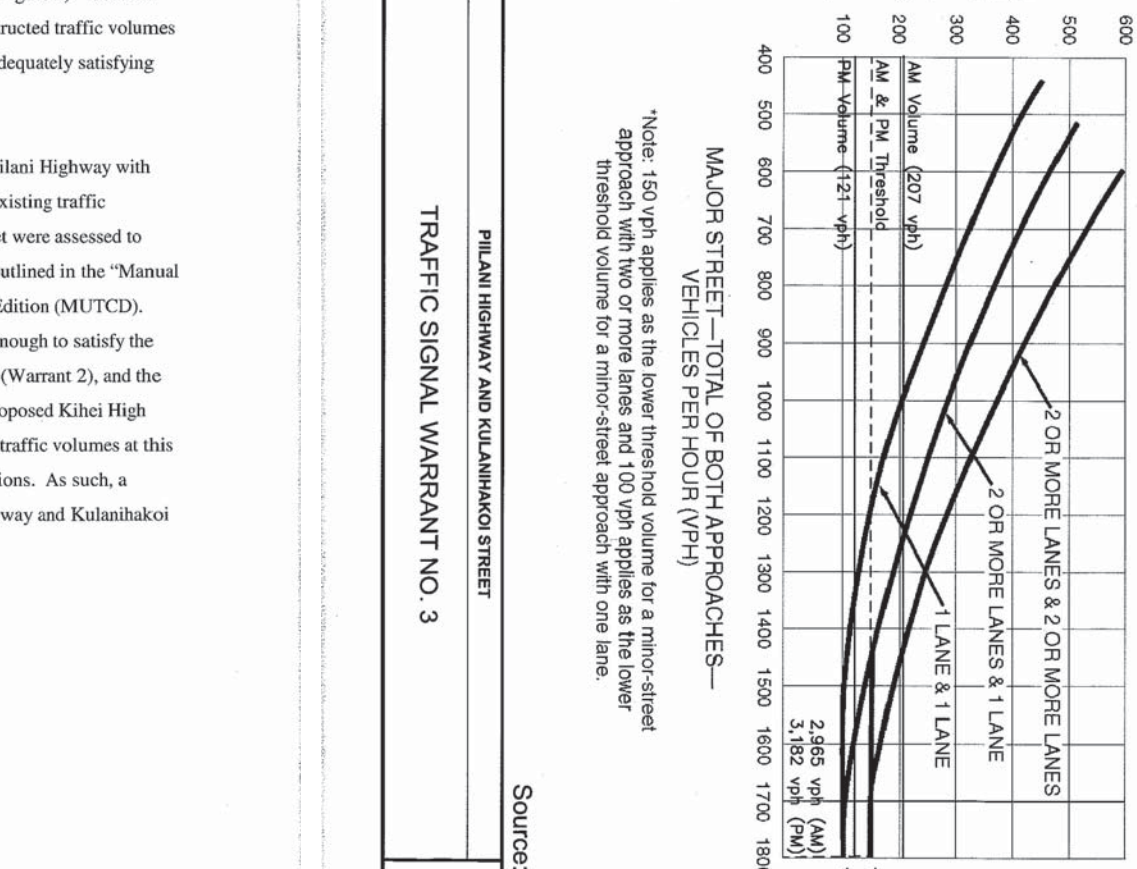
Warrant 3, the "Peak Hour Warrant," consists of several conditions that may justify the installation of a traffic signal at an intersection where vehicles experience high traffic delay due to large volumes of intersecting traffic during the peak hour periods. One of the conditions is based upon the relationship between the traffic volumes along the major and minor streets. If the traffic volumes along the minor street exceed the thresholds shown in Figure 4C-3 of the MUTCD, a traffic signal system may be warranted. Under existing conditions, the traffic volumes entering the

intersection of Piilani Highway and Kulanihakoi Street meet the thresholds during the AM peak hour of traffic and, as such, satisfy Warrant 3 for minor street approaches with two lanes for high traffic volumes on the major street (see Figure 2). It should also be noted that after the proposed Kihei High School is constructed traffic volumes at this intersection are expected to increase thereby more than adequately satisfying the conditions for Warrant 3.

IV. CONCLUSION

The proposed Kihei High School will be located adjacent to Piilani Highway with access provided at the intersection with Kulanihakoi Street. As such, existing traffic conditions at the intersection of Piilani Highway and Kulanihakoi Street were assessed to determine if a traffic signal system is warranted at that intersection as outlined in the "Manual on Uniform Traffic Control Devices for Streets and Highways," 2009 Edition (MUTCD). The existing traffic volumes at the that intersection are currently high enough to satisfy the Eight-Hour Volume Warrant (Warrant 1), Four-Hour Volume Warrant (Warrant 2), and the Peak Hour Warrant (Warrant 3). In addition, the construction of the proposed Kihei High School, as well as, other projects in the vicinity is expected to increase traffic volumes at this intersection thereby more than adequately satisfying the warrant conditions. As such, a traffic signal system is recommended at the intersection of Piilani Highway and Kulanihakoi Street.

Figure 4C-3. Warrant 3, Peak Hour



Source: MUTCD

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PIILANI HIGHWAY AND KULANIHAKOI STREET

TRAFFIC SIGNAL WARRANT NO. 3

FIGURE 2

APPENDIX A

EXISTING TRAFFIC COUNT DATA

Wilson Okamoto Corporation
1907 S. Beretania St., Suite 400
Honolulu, HI 96826

Piilani Hwy. South of Kulanihakoi Street
Site Code:
Station ID:

Latitude: 0' 0.000 Undefined

Start Time	24-Jan-11 Mon	NB Morning	NB Afternoon	Hour Totals Morning	Hour Totals Afternoon	SB Morning	SB Afternoon	Hour Totals Morning	Hour Totals Afternoon	Combined Totals Morning	Combined Totals Afternoon
12:00		*	*			*	*				
12:15		*	*			*	*				
12:30		*	*			*	*				
12:45		*	*	0	0	*	*	0	0	0	0
01:00		*	*			*	*				
01:15		*	*			*	*				
01:30		*	*			*	*				
01:45		*	*	0	0	*	*	0	0	0	0
02:00		*	*			*	*				
02:15		*	*			*	*				
02:30		*	*			*	*				
02:45		*	*	0	0	*	*	0	0	0	0
03:00		*	263			*	54				
03:15		*	262			*	61				
03:30		*	256			*	53				
03:45		*	292	0	1073	*	58	0	226	0	1299
04:00		*	275			*	58				
04:15		*	296			*	57				
04:30		*	291			*	56				
04:45		*	252	0	1114	*	56	0	227	0	1341
05:00		*	242			*	53				
05:15		*	243			*	54				
05:30		*	270			*	49				
05:45		*	248	0	1003	*	37	0	193	0	1196
06:00		*	223			*	42				
06:15		*	212			*	29				
06:30		*	220			*	31				
06:45		*	195	0	850	*	32	0	134	0	984
07:00		*	187			*	21				
07:15		*	196			*	32				
07:30		*	169			*	18				
07:45		*	168	0	720	*	9	0	80	0	800
08:00		*	171			*	20				
08:15		*	156			*	16				
08:30		*	154			*	7				
08:45		*	157	0	638	*	19	0	62	0	700
09:00		*	176			*	12				
09:15		*	173			*	31				
09:30		*	157			*	11				
09:45		*	147	0	653	*	6	0	60	0	713
10:00		*	131			*	9				
10:15		*	126			*	17				
10:30		*	102			*	6				
10:45		*	96	0	455	*	2	0	34	0	489
11:00		*	84			*	4				
11:15		*	84			*	3				
11:30		*	68			*	3				
11:45		*	56	0	292	*	1	0	11	0	303
Total		0	6798			0	1027			0	7825
Percent		0.0%	100.0%			0.0%	100.0%			0.0%	100.0%

Wilson Okamoto Corporation

1907 S. Beretania St., Suite 400
Honolulu, HI 96826

Piilani Hwy. South of Kulanihakoi Street
Site Code:
Station ID:

Latitude: 0' 0.000 Undefined

Start Time	25-Jan-11 Tue	NB Morning	NB Afternoon	Hour Totals Morning	Hour Totals Afternoon	SB Morning	SB Afternoon	Hour Totals Morning	Hour Totals Afternoon	Combined Totals Morning	Combined Totals Afternoon
12:00		52	209			3	55				
12:15		52	221			1	53				
12:30		24	225			2	44				
12:45		23	218	151	873	0	63	6	215	157	1088
01:00		20	236			0	47				
01:15		17	210			0	61				
01:30		20	229			2	40				
01:45		16	230	73	905	0	46	2	194	75	1099
02:00		25	239			0	49				
02:15		9	263			1	61				
02:30		17	247			0	57				
02:45		16	227	67	976	0	57	1	224	68	1200
03:00		14	238			0	51				
03:15		20	234			1	67				
03:30		29	255			0	66				
03:45		26	274	89	1001	1	58	2	242	91	1243
04:00		51	246			3	66				
04:15		39	263			2	67				
04:30		54	226			3	74				
04:45		52	224	196	959	2	60	10	267	206	1226
05:00		74	240			8	59				
05:15		74	211			5	57				
05:30		108	204			8	65				
05:45		113	206	369	861	4	65	25	246	394	1107
06:00		129	208			13	39				
06:15		193	199			20	59				
06:30		215	207			23	45				
06:45		246	223	783	837	39	43	95	186	878	1023
07:00		253	176			39	30				
07:15		245	179			54	28				
07:30		238	178			59	27				
07:45		268	172	1004	705	41	21	193	106	1197	811
08:00		242	176			44	23				
08:15		252	184			45	18				
08:30		245	148			47	16				
08:45		202	146	941	654	34	16	170	73	1111	727
09:00		206	158			47	19				
09:15		214	150			35	19				
09:30		212	159			51	27				
09:45		211	151	843	618	59	20	192	85	1035	703
10:00		213	162			58	17				
10:15		223	157			53	18				
10:30		228	120			42	8				
10:45		227	102	891	541	46	6	199	49	1090	590
11:00		223	98			50	9				
11:15		239	99			46	13				
11:30		215	66			51	5				
11:45		223	65	900	328	59	4	206	31	1106	359
Total		6307	9258			1101	1918			7408	11176
Percent		40.5%	59.5%			36.5%	63.5%			39.9%	60.1%

Wilson Okamoto Corporation

1907 S. Beretania St., Suite 400
Honolulu, HI 96826

Piilani Hwy. South of Kulanihakoi Street
Site Code:
Station ID:

Latitude: 0' 0.000 Undefined

Start Time	26-Jan-11 Wed	NB Morning	NB Afternoon	Hour Totals Morning	Hour Totals Afternoon	SB Morning	SB Afternoon	Hour Totals Morning	Hour Totals Afternoon	Combined Totals Morning	Combined Totals Afternoon
12:00		46	203			1	66				
12:15		60	220			1	94				
12:30		31	240			1	65				
12:45		35	225	172	888	1	82	4	307	176	1195
01:00		34	264			0	69				
01:15		29	226			3	78				
01:30		17	249			0	65				
01:45		15	238	95	977	0	65	3	277	98	1254
02:00		24	227			0	69				
02:15		13	241			0	64				
02:30		22	244			0	74				
02:45		15	248	74	960	1	71	1	278	75	1238
03:00		19	238			1	60				
03:15		22	236			1	82				
03:30		22	218			0	80				
03:45		27	208	90	900	2	97	4	319	94	1219
04:00		42	218			2	88				
04:15		39	223			4	97				
04:30		62	212			7	108				
04:45		60	216	203	869	0	79	13	372	216	1241
05:00		68	219			5	80				
05:15		86	205			5	97				
05:30		106	195			22	98				
05:45		105	185	365	804	20	96	52	371	417	1175
06:00		138	159			11	77				
06:15		157	190			27	92				
06:30		195	181			36	56				
06:45		223	175	713	705	44	74	118	299	831	1004
07:00		190	176			74	58				
07:15		189	158			56	56				
07:30		212	157			47	38				
07:45		221	167	812	658	75	47	252	199	1064	857
08:00		219	149			62	42				
08:15		236	143			63	32				
08:30		218	137			57	53				
08:45		245	134	918	563	52	42	234	169	1152	732
09:00		204	150			66	35				
09:15		181	151			75	68				
09:30		191	147			61	18				
09:45		222	137	798	585	55	24	257	145	1055	730
10:00		211	129			63	24				
10:15		219	124			65	30				
10:30		227	111			60	18				
10:45		211	90	868	454	42	11	230	83	1098	537
11:00		218	74			57	5				
11:15		217	110			63	9				
11:30		222	65			66	8				
11:45		226	69	883	318	62	8	248	30	1131	348
Total		5991	8681			1416	2849			7407	11530
Percent		40.8%	59.2%			33.2%	66.8%			39.1%	60.9%

Wilson Okamoto Corporation

1907 S. Beretania St., Suite 400
Honolulu, HI 96826

Piilani Hwy. South of Kulanihakoi Street
Site Code:
Station ID:

Latitude: 0' 0.000 Undefined

Start Time	27-Jan-11 Thu	NB Morning	NB Afternoon	Hour Totals Morning	Hour Totals Afternoon	SB Morning	SB Afternoon	Hour Totals Morning	Hour Totals Afternoon	Combined Totals Morning	Combined Totals Afternoon
12:00		48	*			5	*				
12:15		36	*			0	*				
12:30		19	*			0	*				
12:45		21	*	124	0	2	*	7	0	131	0
01:00		16	*			1	*				
01:15		20	*			2	*				
01:30		14	*			4	*				
01:45		23	*	73	0	1	*	8	0	81	0
02:00		25	*			2	*				
02:15		24	*			6	*				
02:30		18	*			3	*				
02:45		11	*	78	0	3	*	14	0	92	0
03:00		18	*			7	*				
03:15		17	*			9	*				
03:30		20	*			9	*				
03:45		25	*	80	0	8	*	33	0	113	0
04:00		36	*			13	*				
04:15		35	*			14	*				
04:30		64	*			17	*				
04:45		50	*	185	0	15	*	59	0	244	0
05:00		63	*			13	*				
05:15		78	*			27	*				
05:30		108	*			27	*				
05:45		124	*	373	0	15	*	82	0	455	0
06:00		136	*			15	*				
06:15		165	*			23	*				
06:30		174	*			60	*				
06:45		171	*	646	0	66	*	164	0	810	0
07:00		207	*			70	*				
07:15		196	*			80	*				
07:30		168	*			83	*				
07:45		205	*	776	0	70	*	303	0	1079	0
08:00		191	*			99	*				
08:15		212	*			56	*				
08:30		196	*			52	*				
08:45		238	*	837	0	48	*	255	0	1092	0
09:00		209	*			84	*				
09:15		211	*			55	*				
09:30		221	*			77	*				
09:45		220	*	861	0	62	*	278	0	1139	0
10:00		196	*			56	*				
10:15		*	*	*	*	*	*	*	*	*	*
10:30		*	*	*	*	*	*	*	*	*	*
10:45		*	*	*	*	*	*	*	*	*	*
11:00		*	*	*	*	*	*	*	*	*	*
11:15		*	*	*	*	*	*	*	*	*	*
11:30		*	*	*	*	*	*	*	*	*	*
11:45		*	*	*	*	*	*	*	*	*	*
Total		4229	0			1259	0			5236	0
Percent		100.0%	0.0%			100.0%	0.0%			100.0%	0.0%
Grand Total		16527	24737			3776	5794			20051	30531
Percent		40.1%	59.9%			39.5%	60.5%			39.6%	60.4%

ADT ADT 18,760 AADT 18,760

Wilson Okamoto Corporation

1907 S. Beretania St., Suite 400
Honolulu, HI 96826

Piilani Hwy. North of Kulanihakoi Street
Site Code:
Station ID:

Latitude: 0' 0.000 Undefined

Start Time	24-Jan-11 Mon	SB Morning	SB Afternoon	Hour Totals Morning	Hour Totals Afternoon	NB Morning	NB Afternoon	Hour Totals Morning	Hour Totals Afternoon	Combined Totals Morning	Combined Totals Afternoon
12:00		*	*			*	*				
12:15		*	*			*	*				
12:30		*	*			*	*				
12:45		*	*	0	0	*	*	0	0	0	0
01:00		*	*			*	*				
01:15		*	*			*	*				
01:30		*	*			*	*				
01:45		*	*	0	0	*	*	0	0	0	0
02:00		*	*			*	*				
02:15		*	*			*	*				
02:30		*	309			*	120				
02:45		*	310	0	619	*	152	0	272	0	891
03:00		*	337			*	123				
03:15		*	285			*	159				
03:30		*	310			*	140				
03:45		*	320	0	1252	*	128	0	550	0	1802
04:00		*	367			*	107				
04:15		*	296			*	150				
04:30		*	390			*	132				
04:45		*	375	0	1428	*	112	0	501	0	1929
05:00		*	364			*	98				
05:15		*	353			*	127				
05:30		*	310			*	101				
05:45		*	292	0	1319	*	126	0	452	0	1771
06:00		*	289			*	85				
06:15		*	288			*	86				
06:30		*	260			*	85				
06:45		*	221	0	1058	*	79	0	335	0	1393
07:00		*	212			*	80				
07:15		*	212			*	74				
07:30		*	175			*	63				
07:45		*	173	0	772	*	57	0	274	0	1046
08:00		*	141			*	57				
08:15		*	146			*	70				
08:30		*	146			*	53				
08:45		*	164	0	597	*	55	0	235	0	832
09:00		*	151			*	76				
09:15		*	122			*	74				
09:30		*	141			*	58				
09:45		*	92	0	506	*	69	0	277	0	783
10:00		*	104			*	58				
10:15		*	86			*	62				
10:30		*	87			*	41				
10:45		*	68	0	345	*	35	0	196	0	541
11:00		*	56			*	37				
11:15		*	48			*	39				
11:30		*	41			*	30				
11:45		*	40	0	185	*	25	0	131	0	316
Total		0	8081			0	3223			0	11304
Percent		0.0%	100.0%			0.0%	100.0%			0.0%	100.0%

Wilson Okamoto Corporation

1907 S. Beretania St., Suite 400
Honolulu, HI 96826

Piilani Hwy. North of Kulanihakoi Street
Site Code:
Station ID:

Latitude: 0' 0.000 Undefined

Start Time	25-Jan-11 Tue	SB		Hour Totals		NB		Hour Totals		Combined Totals	
		Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00		37	199			17	230				
12:15		25	244			26	155				
12:30		27	276			7	163				
12:45		18	263	107	982	5	175	55	723	162	1705
01:00		10	267			8	196				
01:15		9	311			5	183				
01:30		12	293			7	202				
01:45		10	306	41	1177	7	189	27	770	68	1947
02:00		10	300			14	168				
02:15		11	316			4	184				
02:30		10	299			6	188				
02:45		14	318	45	1233	5	163	29	703	74	1936
03:00		10	305			5	197				
03:15		17	362			8	164				
03:30		29	351			6	202				
03:45		24	323	80	1341	14	201	33	764	113	2105
04:00		51	337			9	158				
04:15		43	341			15	209				
04:30		63	284			18	169				
04:45		49	306	206	1268	16	173	58	709	264	1977
05:00		61	317			31	180				
05:15		79	313			28	181				
05:30		96	286			46	164				
05:45		99	310	335	1226	51	131	156	656	491	1882
06:00		114	276			62	142				
06:15		154	264			102	142				
06:30		216	238			124	185				
06:45		217	210	701	988	153	155	441	624	1142	1612
07:00		288	216			150	130				
07:15		352	208			187	115				
07:30		366	175			158	117				
07:45		324	207	1330	806	146	95	641	457	1971	1263
08:00		259	168			152	103				
08:15		281	160			133	112				
08:30		232	155			166	89				
08:45		261	150	1033	633	119	85	570	389	1603	1022
09:00		258	161			115	77				
09:15		248	166			162	111				
09:30		223	177			147	97				
09:45		229	172	958	676	185	93	609	378	1567	1054
10:00		181	148			184	88				
10:15		217	116			188	98				
10:30		233	92			178	82				
10:45		238	63	869	419	166	64	716	332	1585	751
11:00		208	68			204	72				
11:15		234	54			183	66				
11:30		268	48			190	40				
11:45		273	39	983	209	161	40	738	218	1721	427
Total		6688	10958			4073	6723			10761	17681
Percent		37.9%	62.1%			37.7%	62.3%			37.8%	62.2%

Wilson Okamoto Corporation

1907 S. Beretania St., Suite 400
Honolulu, HI 96826

Piilani Hwy. North of Kulanihakoi Street
Site Code:
Station ID:

Latitude: 0' 0.000 Undefined

Start Time	26-Jan-11 Wed	SB		Hour Totals		NB		Hour Totals		Combined Totals	
		Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00		29	315			27	181				
12:15		21	339			37	237				
12:30		17	325			22	221				
12:45		9	295	76	1274	31	251	117	890	193	2164
01:00		14	313			23	289				
01:15		19	329			19	218				
01:30		13	317			9	248				
01:45		15	312	61	1271	12	228	63	983	124	2254
02:00		5	282			21	224				
02:15		8	347			8	219				
02:30		10	322			11	229				
02:45		18	361	41	1312	4	249	44	921	85	2233
03:00		15	342			4	196				
03:15		17	343			9	217				
03:30		17	341			11	223				
03:45		28	345	77	1371	14	190	38	826	115	2197
04:00		43	368			19	186				
04:15		44	311			12	253				
04:30		71	325			29	176				
04:45		42	347	200	1351	30	195	90	810	290	2161
05:00		54	320			37	198				
05:15		84	350			39	192				
05:30		100	299			56	183				
05:45		105	303	343	1272	65	141	197	714	540	1986
06:00		108	290			91	141				
06:15		174	286			100	163				
06:30		189	232			169	141				
06:45		219	271	690	1079	167	128	527	573	1217	1652
07:00		253	218			171	140				
07:15		320	195			153	126				
07:30		347	197			146	117				
07:45		273	198	1193	808	191	121	661	504	1854	1312
08:00		346	167			152	105				
08:15		295	164			159	110				
08:30		259	153			167	117				
08:45		272	170	1172	654	175	102	653	434	1825	1088
09:00		238	162			181	99				
09:15		233	173			177	128				
09:30		221	148			192	96				
09:45		228	141	920	624	202	97	752	420	1672	1044
10:00		235	112			198	85				
10:15		251	102			200	90				
10:30		224	108			198	68				
10:45		277	70	987	392	188	61	784	304	1771	696
11:00		255	38			221	56				
11:15		251	37			240	78				
11:30		301	41			215	45				
11:45		335	41	1142	157	106	48	782	227	1924	384
Total		6902	11565			4708	7606			11610	19171
Percent		37.4%	62.6%			38.2%	61.8%			37.7%	62.3%

Wilson Okamoto Corporation
1907 S. Beretania St., Suite 400
Honolulu, HI 96826

Description 1: Kihei High School
Description 2: Kulanihakoi Street
Description 3:

Date: 1/24/2011
Monday

Daily Volume

Begin	EB	WB	Combined	Begin	EB	WB	Combined
12:00 AM	-	-	-	12:00 PM	-	-	-
12:15 AM	-	-	-	12:15 PM	-	-	-
12:30 AM	-	-	-	12:30 PM	-	-	-
12:45 AM	-	-	-	12:45 PM	-	-	-
1:00 AM	-	-	-	1:00 PM	-	-	-
1:15 AM	-	-	-	1:15 PM	-	-	-
1:30 AM	-	-	-	1:30 PM	-	-	-
1:45 AM	-	-	-	1:45 PM	-	-	-
2:00 AM	-	-	-	2:00 PM	-	-	-
2:15 AM	-	-	-	2:15 PM	-	-	-
2:30 AM	-	-	-	2:30 PM	-	-	-
2:45 AM	-	-	-	2:45 PM	-	-	-
3:00 AM	-	-	-	3:00 PM	- 102	- 88	- 190
3:15 AM	-	-	-	3:15 PM	11	12	23
3:30 AM	-	-	-	3:30 PM	46	42	88
3:45 AM	-	-	-	3:45 PM	45	34	79
4:00 AM	-	-	-	4:00 PM	36 171	39 165	75 336
4:15 AM	-	-	-	4:15 PM	47	44	91
4:30 AM	-	-	-	4:30 PM	37	49	86
4:45 AM	-	-	-	4:45 PM	51	33	84
5:00 AM	-	-	-	5:00 PM	28 143	39 184	67 327
5:15 AM	-	-	-	5:15 PM	46	45	91
5:30 AM	-	-	-	5:30 PM	42	50	92
5:45 AM	-	-	-	5:45 PM	27	50	77
6:00 AM	-	-	-	6:00 PM	21 143	45 166	66 309
6:15 AM	-	-	-	6:15 PM	26	46	72
6:30 AM	-	-	-	6:30 PM	50	47	97
6:45 AM	-	-	-	6:45 PM	46	28	74
7:00 AM	-	-	-	7:00 PM	17 84	35 133	52 217
7:15 AM	-	-	-	7:15 PM	29	40	69
7:30 AM	-	-	-	7:30 PM	18	22	40
7:45 AM	-	-	-	7:45 PM	20	36	56
8:00 AM	-	-	-	8:00 PM	14 55	26 94	40 149
8:15 AM	-	-	-	8:15 PM	9	29	38
8:30 AM	-	-	-	8:30 PM	18	19	37
8:45 AM	-	-	-	8:45 PM	14	20	34
9:00 AM	-	-	-	9:00 PM	24 71	17 82	41 153
9:15 AM	-	-	-	9:15 PM	19	16	35
9:30 AM	-	-	-	9:30 PM	9	28	37
9:45 AM	-	-	-	9:45 PM	19	21	40
10:00 AM	-	-	-	10:00 PM	19 46	10 52	29 98
10:15 AM	-	-	-	10:15 PM	16	13	29
10:30 AM	-	-	-	10:30 PM	7	14	21
10:45 AM	-	-	-	10:45 PM	4	15	19
11:00 AM	-	-	-	11:00 PM	5 15	15 36	20 51
11:15 AM	-	-	-	11:15 PM	2	6	8
11:30 AM	-	-	-	11:30 PM	5	9	14
11:45 AM	-	-	-	11:45 PM	3	6	9

	EB	WB	Combined
24 Hour Volume	830 (45.4%)	1000 (54.6%)	1830

	12:00 AM - 12:00 PM			12:00 PM - 12:00 AM		
	EB	WB	Combined	EB	WB	Combined
Count	0	0	0	830	1000	1830
	-	-		45.4 %	54.6 %	
Peak Hour	-	-	-	3:30 PM	5:30 PM	4:00 PM
Volume	-	-	-	174	191	336
Factor	-	-	-	0.93	0.95	0.92

Wilson Okamoto Corporation
1907 S. Beretania St., Suite 400
Honolulu, HI 96826

Piilani Hwy. North of Kulanihakoi Street
Site Code:
Station ID:

Latitude: 0' 0.000 Undefined

Start Time	27-Jan-11 Thu	SB		Hour Totals		NB		Hour Totals		Combined Totals	
		Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00		23	*			31	*				
12:15		14	*			25	*				
12:30		16	*			11	*				
12:45		15	*	68	0	12	*	79	0	147	0
01:00		5	*			11	*				
01:15		9	*			12	*				
01:30		11	*			9	*				
01:45		12	*	37	0	18	*	50	0	87	0
02:00		15	*			17	*				
02:15		14	*			14	*				
02:30		13	*			11	*				
02:45		11	*	53	0	4	*	46	0	99	0
03:00		18	*			8	*				
03:15		24	*			6	*				
03:30		28	*			7	*				
03:45		28	*	98	0	14	*	35	0	133	0
04:00		42	*			15	*				
04:15		46	*			13	*				
04:30		71	*			25	*				
04:45		54	*	213	0	28	*	81	0	294	0
05:00		53	*			34	*				
05:15		91	*			39	*				
05:30		89	*			63	*				
05:45		105	*	338	0	72	*	208	0	546	0
06:00		107	*			79	*				
06:15		151	*			119	*				
06:30		209	*			137	*				
06:45		213	*	680	0	172	*	507	0	1187	0
07:00		256	*			179	*				
07:15		288	*			188	*				
07:30		346	*			173	*				
07:45		298	*	1188	0	196	*	736	0	1924	0
08:00		298	*			169	*				
08:15		293	*			125	*				
08:30		268	*			133	*				
08:45		261	*	1120	0	165	*	592	0	1712	0
09:00		250	*			180	*				
09:15		254	*			166	*				
09:30		232	*			216	*				
09:45		129	*	865	0	79	*	641	0	1506	0
10:00		*	*	*	*	*	*	*	*	*	*
10:15		*	*	*	*	*	*	*	*	*	*
10:30		*	*	*	*	*	*	*	*	*	*
10:45		*	*	*	*	*	*	*	*	*	*
11:00		*	*	*	*	*	*	*	*	*	*
11:15		*	*	*	*	*	*	*	*	*	*
11:30		*	*	*	*	*	*	*	*	*	*
11:45		*	*	*	*	*	*	*	*	*	*
Total		4660	0			2975	0			7635	0
Percent		100.0%	0.0%			100.0%	0.0%			100.0%	0.0%
Grand Total		18250	30604			11756	17552			30006	48156
Percent		37.4%	62.6%			40.1%	59.9%			38.4%	61.6%
ADT		ADT 29,612				AADT 29,612					

Wilson Okamoto Corporation
1907 S. Beretania St., Suite 400
Honolulu, HI 96826

Description 1: Kihei High School
Description 2: Kulanihakoi Street
Description 3:

Date: 1/26/2011
Wednesday

Daily Volume

Begin	EB		WB		Combined		Begin	EB		WB		Combined	
12:00 AM	3	25	6	26	9	51	12:00 PM	68	370	49	142	117	512
12:15 AM	4		11		15		12:15 PM	98		35		133	
12:30 AM	3		6		9		12:30 PM	111		35		146	
12:45 AM	15		3		18		12:45 PM	93		23		116	
1:00 AM	2	4	5	21	7	25	1:00 PM	106	289	24	155	130	444
1:15 AM	0		4		4		1:15 PM	71		39		110	
1:30 AM	0		3		3		1:30 PM	54		41		95	
1:45 AM	2		9		11		1:45 PM	58		51		109	
2:00 AM	4	12	2	5	6	17	2:00 PM	60	288	25	142	85	430
2:15 AM	3		1		4		2:15 PM	71		47		118	
2:30 AM	5		2		7		2:30 PM	63		42		105	
2:45 AM	0		0		0		2:45 PM	94		28		122	
3:00 AM	0	13	0	8	0	21	3:00 PM	75	204	36	160	111	364
3:15 AM	2		4		6		3:15 PM	35		45		80	
3:30 AM	1		1		2		3:30 PM	37		38		75	
3:45 AM	10		3		13		3:45 PM	57		41		98	
4:00 AM	2	23	0	10	2	33	4:00 PM	41	173	41	190	82	363
4:15 AM	3		1		4		4:15 PM	32		54		86	
4:30 AM	9		4		13		4:30 PM	38		41		79	
4:45 AM	9		5		14		4:45 PM	62		54		116	
5:00 AM	6	55	5	28	11	83	5:00 PM	32	168	41	203	73	371
5:15 AM	6		4		10		5:15 PM	44		49		93	
5:30 AM	21		8		29		5:30 PM	54		53		107	
5:45 AM	22		11		33		5:45 PM	38		60		98	
6:00 AM	30	134	10	57	40	191	6:00 PM	39	172	51	186	90	358
6:15 AM	36		10		46		6:15 PM	62		59		121	
6:30 AM	31		9		40		6:30 PM	34		41		75	
6:45 AM	37		28		65		6:45 PM	37		35		72	
7:00 AM	56	291	20	115	76	406	7:00 PM	27	101	33	125	60	226
7:15 AM	73		29		102		7:15 PM	25		26		51	
7:30 AM	92		29		121		7:30 PM	27		36		63	
7:45 AM	70		37		107		7:45 PM	22		30		52	
8:00 AM	50	256	37	174	87	430	8:00 PM	19	95	23	119	42	214
8:15 AM	56		45		101		8:15 PM	23		32		55	
8:30 AM	74		38		112		8:30 PM	24		32		56	
8:45 AM	76		54		130		8:45 PM	29		32		61	
9:00 AM	97	286	18	133	115	419	9:00 PM	12	73	33	117	45	190
9:15 AM	47		44		91		9:15 PM	19		25		44	
9:30 AM	83		30		113		9:30 PM	23		42		65	
9:45 AM	59		41		100		9:45 PM	19		17		36	
10:00 AM	67	222	33	131	100	353	10:00 PM	17	47	21	73	38	120
10:15 AM	56		30		86		10:15 PM	14		15		29	
10:30 AM	38		29		67		10:30 PM	10		18		28	
10:45 AM	61		39		100		10:45 PM	6		19		25	
11:00 AM	44	180	44	170	88	350	11:00 PM	9	27	8	35	17	62
11:15 AM	38		46		84		11:15 PM	3		9		12	
11:30 AM	49		37		86		11:30 PM	9		13		22	
11:45 AM	49		43		92		11:45 PM	6		5		11	

	EB	WB	Combined
24 Hour Volume	3508 (58.1%)	2525 (41.9%)	6033

	12:00 AM - 12:00 PM			12:00 PM - 12:00 AM		
	EB	WB	Combined	EB	WB	Combined
Count	1501	878	2379	2007	1647	3654
	63.1 %	36.9 %		54.9 %	45.1 %	
Peak Hour	8:15 AM	8:00 AM	8:15 AM	12:15 PM	5:30 PM	12:15 PM
Volume	303	174	458	408	223	525
Factor	0.78	0.81	0.88	0.92	0.93	0.90

Wilson Okamoto Corporation
1907 S. Beretania St., Suite 400
Honolulu, HI 96826

Description 1: Kihei High School
Description 2: Kulanihakoi Street
Description 3:

Date: 1/25/2011
Tuesday

Daily Volume

Begin	EB		WB		Combined		Begin	EB		WB		Combined	
12:00 AM	3	15	5	23	8	38	12:00 PM	32	142	33	120	65	262
12:15 AM	4		8		12		12:15 PM	33		27		60	
12:30 AM	6		7		13		12:30 PM	45		34		79	
12:45 AM	2		3		5		12:45 PM	32		26		58	
1:00 AM	6	9	4	13	10	22	1:00 PM	23	147	20	107	43	254
1:15 AM	1		3		4		1:15 PM	27		30		57	
1:30 AM	1		1		2		1:30 PM	37		22		59	
1:45 AM	1		5		6		1:45 PM	60		35		95	
2:00 AM	2	12	4	11	6	23	2:00 PM	48	193	32	141	80	334
2:15 AM	3		6		9		2:15 PM	21		34		55	
2:30 AM	6		0		6		2:30 PM	65		33		98	
2:45 AM	1		1		2		2:45 PM	59		42		101	
3:00 AM	2	22	2	7	4	29	3:00 PM	40	159	42	169	82	328
3:15 AM	9		3		12		3:15 PM	34		52		86	
3:30 AM	1		1		2		3:30 PM	47		34		81	
3:45 AM	10		1		11		3:45 PM	38		41		79	
4:00 AM	5	27	4	13	9	40	4:00 PM	34	145	35	146	69	291
4:15 AM	4		4		8		4:15 PM	30		42		72	
4:30 AM	11		2		13		4:30 PM	44		33		77	
4:45 AM	7		3		10		4:45 PM	37		36		73	
5:00 AM	10	71	4	11	14	82	5:00 PM	37	156	41	152	78	308
5:15 AM	23		1		24		5:15 PM	36		27		63	
5:30 AM	15		2		17		5:30 PM	48		43		91	
5:45 AM	23		4		27		5:45 PM	35		41		76	
6:00 AM	29	134	3	52	32	186	6:00 PM	39	137	48	171	87	308
6:15 AM	23		9		32		6:15 PM	32		48		80	
6:30 AM	41		23		64		6:30 PM	40		44		84	
6:45 AM	41		17		58		6:45 PM	26		31		57	
7:00 AM	52	266	24	87	76	353	7:00 PM	29	87	37	115	66	202
7:15 AM	73		23		96		7:15 PM	22		32		54	
7:30 AM	76		14		90		7:30 PM	19		21		40	
7:45 AM	65		26		91		7:45 PM	17		25		42	
8:00 AM	54	192	29	119	83	311	8:00 PM	23	74	30	102	53	176
8:15 AM	52		37		89		8:15 PM	9		24		33	
8:30 AM	56		28		84		8:30 PM	19		30		49	
8:45 AM	30		25		55		8:45 PM	23		18		41	
9:00 AM	39	187	22	80	61	267	9:00 PM	19	65	20	87	39	152
9:15 AM	40		15		55		9:15 PM	16		26		42	
9:30 AM	46		16		62		9:30 PM	18		24		42	
9:45 AM	62		27		89		9:45 PM	12		17		29	
10:00 AM	60	186	21	115	81	301	10:00 PM	11	50	22	72	33	122
10:15 AM	46		37		83		10:15 PM	22		24		46	
10:30 AM	44		24		68		10:30 PM	7		10		17	
10:45 AM	36		33		69		10:45 PM	10		16		26	
11:00 AM	47	184	30	122	77	306	11:00 PM	12	20	8	28	20	48
11:15 AM	43		20		63		11:15 PM	1		9		10	
11:30 AM	59		45		104		11:30 PM	5		9		14	
11:45 AM	35		27		62		11:45 PM	2		2		4	

	EB	WB	Combined
24 Hour Volume	2680 (56.5%)	2063 (43.5%)	4743

	12:00 AM - 12:00 PM			12:00 PM - 12:00 AM		
	EB	WB	Combined	EB	WB	Combined
Count	1305	653	1958	1375	1410	2785
	66.6 %	33.4 %		49.4 %	50.6 %	
Peak Hour	7:15 AM	10:45 AM	7:15 AM	2:30 PM	5:45 PM	2:30 PM
Volume	268	128	360	198	181	367
Factor	0.88	0.71	0.94	0.76	0.94	0.91

APPENDIX B
WARRANT 1
EIGHT HOUR VOLUME WARRANT

Wilson Okamoto Corporation
1907 S. Beretania St., Suite 400
Honolulu, HI 96826

Description 1: Kihei High School
Description 2: Kulanihakoi Street
Description 3:

Date: 1/27/2011 Thursday

Daily Volume

Begin	EB		WB		Combined		Begin	EB	WB	Combined
12:00 AM	4	18	5	17	9	35				
12:15 AM	13		5		18					
12:30 AM	1		3		4					
12:45 AM	0		4		4					
1:00 AM	1	5	2	9	3	14				
1:15 AM	0		3		3					
1:30 AM	0		0		0					
1:45 AM	4		4		8					
2:00 AM	5	19	5	22	10	41				
2:15 AM	3		10		13					
2:30 AM	8		4		12					
2:45 AM	3		3		6					
3:00 AM	1	5	2	5	3	10				
3:15 AM	0		0		0					
3:30 AM	0		2		2					
3:45 AM	4		1		5					
4:00 AM	3	20	3	9	6	29				
4:15 AM	3		0		3					
4:30 AM	5		2		7					
4:45 AM	9		4		13					
5:00 AM	13	70	4	30	17	100				
5:15 AM	8		5		13					
5:30 AM	22		11		33					
5:45 AM	27		10		37					
6:00 AM	29	128	10	64	39	192				
6:15 AM	40		12		52					
6:30 AM	19		13		32					
6:45 AM	40		29		69					
7:00 AM	53	309	19	104	72	413				
7:15 AM	106		23		129					
7:30 AM	77		29		106					
7:45 AM	73		33		106					
8:00 AM	53	220	55	183	108	403				
8:15 AM	53		45		98					
8:30 AM	52		50		102					
8:45 AM	62		33		95					
9:00 AM	59	182	27	127	86	309				
9:15 AM	52		40		92					
9:30 AM	36		27		63					
9:45 AM	35		33		68					
10:00 AM	27	27	38	38	65	65				

		EB	WB	Combined
	24 Hour Volume	1003 (62.3%)	608 (37.7%)	1611

	12:00 AM - 12:00 PM			12:00 PM - 12:00 AM		
	EB	WB	Combined	EB	WB	Combined
Count	1003	608	1611	0	0	0
	62.3 %	37.7 %		-	-	
Peak Hour	7:00 AM	7:45 AM	7:15 AM	-	-	-
Volume	309	183	449	-	-	-
Factor	0.73	0.83	0.87	-	-	-

Time	Piilani Hwy		Kulanihakoi St		100%		80%	
	15 Min Count	Hourly Total	15 Min Count	Hourly Total	Condition A	Condition B	Condition A	Condition B
8:00	488	1922	54	192	0	1	1	1
8:15	519	1885	52	177				
8:30	465	1816	56	165				
8:45	450	1775	30	155				
9:00	451	1754	39	187	0	1	1	1
9:15	450	1688	40	208				
9:30	424	1667	46	214				
9:45	429	1692	62	212				
10:00	385	1716	60	186	0	1	1	1
10:15	429	1752	46	173				
10:30	449	1784	44	170				
10:45	453	1805	36	185				
11:00	421	1837	47	184	0	1	1	1
11:15	461	1814	43	169				
11:30	470	1806	59	159				
11:45	485	1823	35	145				
12:00	398	1806	32	142	0	1	0	1
12:15	453	1898	33	133				
12:30	487	1950	45	127				
12:45	468	1970	32	119				
13:00	490	2023	23	147	0	1	0	1
13:15	505	2057	27	172				
13:30	507	2115	37	166				
13:45	521	2139	60	194				
14:00	524	2147	48	193	0	1	1	1
14:15	563	2151	21	185				
14:30	531	2166	65	198				
14:45	529	2223	59	180				
15:00	528	2275	40	159	0	1	0	1
15:15	578	2313	34	153				
15:30	588	2322	47	149				
15:45	581	2230	38	146				
16:00	566	2164	34	145	0	1	0	1
16:15	587	2139	30	148				
16:30	496	2060	44	154				

Warrant 1
8-Hour Volumes (:00)

Time	Piilani Hwy		Kulanihakoi St		100%		80%	
	15 Min Count	Hourly Total	15 Min Count	Hourly Total	Condition A	Condition B	Condition A	Condition B
0:00	87	253	3	15	0	0	0	0
0:15	76	196	4	18				
0:30	50	146	6	15				
0:45	40	127	2	10				
1:00	30	113	6	9	0	0	0	0
1:15	26	118	1	5				
1:30	31	111	1	7				
1:45	26	107	1	12				
2:00	35	110	2	12	0	0	0	0
2:15	19	99	3	12				
2:30	27	116	6	18				
2:45	29	146	1	13				
3:00	24	166	2	22	0	0	0	0
3:15	36	241	9	25				
3:30	57	285	1	20				
3:45	49	342	10	30				
4:00	99	392	5	27	0	0	0	0
4:15	80	425	4	32				
4:30	114	494	11	51				
4:45	99	579	7	55				
5:00	132	687	10	71	0	0	0	0
5:15	149	792	23	90				
5:30	199	982	15	90				
5:45	207	1203	23	116				
6:00	237	1448	29	134	0	1	0	1
6:15	339	1738	23	157				
6:30	420	1978	41	207				
6:45	452	2144	41	242				
7:00	527	2268	52	266	1	1	1	1
7:15	579	2229	73	268				
7:30	586	2169	76	247				
7:45	576	2048	65	227				

Warrant 1
8-Hour Volumes (:15)

	Piilani Hwy		Kulanihakoi St		100%		80%	
Time	15 Min Count	Hourly Total	15 Min Count	Hourly Total	Condition A	Condition B	Condition A	Condition B
0:00	87	253	3	15				
0:15	76	196	4	18	0	0	0	0
0:30	50	146	6	15				
0:45	40	127	2	10				
1:00	30	113	6	9				
1:15	26	118	1	5	0	0	0	0
1:30	31	111	1	7				
1:45	26	107	1	12				
2:00	35	110	2	12				
2:15	19	99	3	12	0	0	0	0
2:30	27	116	6	18				
2:45	29	146	1	13				
3:00	24	166	2	22				
3:15	36	241	9	25	0	0	0	0
3:30	57	285	1	20				
3:45	49	342	10	30				
4:00	99	392	5	27				
4:15	80	425	4	32	0	0	0	0
4:30	114	494	11	51				
4:45	99	579	7	55				
5:00	132	687	10	71				
5:15	149	792	23	90	0	0	0	1
5:30	199	982	15	90				
5:45	207	1203	23	116				
6:00	237	1448	29	134				
6:15	339	1738	23	157	0	1	0	1
6:30	420	1978	41	207				
6:45	452	2144	41	242				
7:00	527	2268	52	266				
7:15	579	2229	73	268	1	1	1	1
7:30	586	2169	76	247				
7:45	576	2048	65	227				

	Piilani Hwy		Kulanihakoi St		100%		80%	
Time	15 Min Count	Hourly Total	15 Min Count	Hourly Total	Condition A	Condition B	Condition A	Condition B
16:45	515	2040	37	158				
17:00	541	2026	37	156	0	1	0	1
17:15	508	1955	36	158				
17:30	476	1897	48	154				
17:45	501	1854	35	146				
18:00	470	1776	39	137	0	1	0	1
18:15	450	1687	32	127				
18:30	433	1614	40	117				
18:45	423	1525	26	96				
19:00	381	1471	29	87	0	0	0	1
19:15	377	1426	22	81				
19:30	344	1385	19	68				
19:45	369	1336	17	68				
20:00	336	1256	23	74	0	0	0	0
20:15	336	1231	9	70				
20:30	295	1203	19	77				
20:45	289	1235	23	76				
21:00	311	1260	19	65	0	0	0	0
21:15	308	1252	16	57				
21:30	327	1211	18	63				
21:45	314	1091	12	52				
22:00	303	939	11	50	0	0	0	0
22:15	267	799	22	51				
22:30	207	682	7	30				
22:45	162	587	10	28				
23:00	163	527	12	20	0	0	0	0
23:15	150	364	1	8				
23:30	112	214	5	7				
23:45	102	102	2	2				
			# of Periods Warrant Satisfied		**1**	**13**	**6**	**14**

Time	Piilani Hwy		Kulanihakoi St		100%		80%	
	15 Min Count	Hourly Total	15 Min Count	Hourly Total	Condition A	Condition B	Condition A	Condition B
16:45	515	2040	37	158				
17:00	541	2026	37	156				
17:15	508	1955	36	158	0	1	0	1
17:30	476	1897	48	154				
17:45	501	1854	35	146				
18:00	470	1776	39	137				
18:15	450	1687	32	127	0	1	0	1
18:30	433	1614	40	117				
18:45	423	1525	26	96				
19:00	381	1471	29	87				
19:15	377	1426	22	81	0	0	0	1
19:30	344	1385	19	68				
19:45	369	1336	17	68				
20:00	336	1256	23	74				
20:15	336	1231	9	70	0	0	0	0
20:30	295	1203	19	77				
20:45	289	1235	23	76				
21:00	311	1260	19	65				
21:15	308	1252	16	57	0	0	0	0
21:30	327	1211	18	63				
21:45	314	1091	12	52				
22:00	303	939	11	50				
22:15	267	799	22	51	0	0	0	0
22:30	207	682	7	30				
22:45	162	587	10	28				
23:00	163	527	12	20				
23:15	150	364	1	8				
23:30	112	214	5	7				
23:45	102	102	2	2				
			# of Periods Warrant Satisfied		**2**	**13**	**7**	**15**

Time	Piilani Hwy		Kulanihakoi St		100%		80%	
	15 Min Count	Hourly Total	15 Min Count	Hourly Total	Condition A	Condition B	Condition A	Condition B
8:00	488	1922	54	192				
8:15	519	1885	52	177	0	1	1	1
8:30	465	1816	56	165				
8:45	450	1775	30	155				
9:00	451	1754	39	187				
9:15	450	1688	40	208	1	1	1	1
9:30	424	1667	46	214				
9:45	429	1692	62	212				
10:00	385	1716	60	186				
10:15	429	1752	46	173	0	1	1	1
10:30	449	1784	44	170				
10:45	453	1805	36	185				
11:00	421	1837	47	184				
11:15	461	1814	43	169	0	1	1	1
11:30	470	1806	59	159				
11:45	485	1823	35	145				
12:00	398	1806	32	142				
12:15	453	1898	33	133	0	1	0	1
12:30	487	1950	45	127				
12:45	468	1970	32	119				
13:00	490	2023	23	147				
13:15	505	2057	27	172	0	1	1	1
13:30	507	2115	37	166				
13:45	521	2139	60	194				
14:00	524	2147	48	193				
14:15	563	2151	21	185	0	1	1	1
14:30	531	2166	65	198				
14:45	529	2223	59	180				
15:00	528	2275	40	159				
15:15	578	2313	34	153	0	1	0	1
15:30	588	2322	47	149				
15:45	581	2230	38	146				
16:00	566	2164	34	145				
16:15	587	2139	30	148	0	1	0	1
16:30	496	2060	44	154				

Time	Piilani Hwy		Kulanihakoi St		100%		80%	
	15 Min Count	Hourly Total	15 Min Count	Hourly Total	Condition A	Condition B	Condition A	Condition B
8:00	488	1922	54	192				
8:15	519	1885	52	177				
8:30	465	1816	56	165	0	1	1	1
8:45	450	1775	30	155				
9:00	451	1754	39	187				
9:15	450	1688	40	208				
9:30	424	1667	46	214	1	1	1	1
9:45	429	1692	62	212				
10:00	385	1716	60	186				
10:15	429	1752	46	173				
10:30	449	1784	44	170	0	1	1	1
10:45	453	1805	36	185				
11:00	421	1837	47	184				
11:15	461	1814	43	169				
11:30	470	1806	59	159	0	1	0	1
11:45	485	1823	35	145				
12:00	398	1806	32	142				
12:15	453	1898	33	133				
12:30	487	1950	45	127	0	1	0	1
12:45	468	1970	32	119				
13:00	490	2023	23	147				
13:15	505	2057	27	172				
13:30	507	2115	37	166	0	1	1	1
13:45	521	2139	60	194				
14:00	524	2147	48	193				
14:15	563	2151	21	185				
14:30	531	2166	65	198	0	1	1	1
14:45	529	2223	59	180				
15:00	528	2275	40	159				
15:15	578	2313	34	153				
15:30	588	2322	47	149	0	1	0	1
15:45	581	2230	38	146				
16:00	566	2164	34	145				
16:15	587	2139	30	148				
16:30	496	2060	44	154	0	1	0	1

Warrant 1
8-Hour Volumes (:30)

Time	Piilani Hwy		Kulanihakoi St		100%		80%	
	15 Min Count	Hourly Total	15 Min Count	Hourly Total	Condition A	Condition B	Condition A	Condition B
0:00	87	253	3	15				
0:15	76	196	4	18				
0:30	50	146	6	15	0	0	0	0
0:45	40	127	2	10				
1:00	30	113	6	9				
1:15	26	118	1	5				
1:30	31	111	1	7	0	0	0	0
1:45	26	107	1	12				
2:00	35	110	2	12				
2:15	19	99	3	12				
2:30	27	116	6	18	0	0	0	0
2:45	29	146	1	13				
3:00	24	166	2	22				
3:15	36	241	9	25				
3:30	57	285	1	20	0	0	0	0
3:45	49	342	10	30				
4:00	99	392	5	27				
4:15	80	425	4	32				
4:30	114	494	11	51	0	0	0	0
4:45	99	579	7	55				
5:00	132	687	10	71				
5:15	149	792	23	90				
5:30	199	982	15	90	0	0	0	1
5:45	207	1203	23	116				
6:00	237	1448	29	134				
6:15	339	1738	23	157				
6:30	420	1978	41	207	1	1	1	1
6:45	452	2144	41	242				
7:00	527	2268	52	266				
7:15	579	2229	73	268				
7:30	586	2169	76	247	1	1	1	1
7:45	576	2048	65	227				

Warrant 1
8-Hour Volumes (:45)

	Piilani Hwy		Kulanihakoi St		100%		80%	
Time	15 Min Count	Hourly Total	15 Min Count	Hourly Total	Condition A	Condition B	Condition A	Condition B
0:00	87	253	3	15				
0:15	76	196	4	18				
0:30	50	146	6	15				
0:45	40	127	2	10	0	0	0	0
1:00	30	113	6	9				
1:15	26	118	1	5				
1:30	31	111	1	7				
1:45	26	107	1	12	0	0	0	0
2:00	35	110	2	12				
2:15	19	99	3	12				
2:30	27	116	6	18				
2:45	29	146	1	13	0	0	0	0
3:00	24	166	2	22				
3:15	36	241	9	25				
3:30	57	285	1	20				
3:45	49	342	10	30	0	0	0	0
4:00	99	392	5	27				
4:15	80	425	4	32				
4:30	114	494	11	51				
4:45	99	579	7	55	0	0	0	0
5:00	132	687	10	71				
5:15	149	792	23	90				
5:30	199	982	15	90				
5:45	207	1203	23	116	0	1	0	1
6:00	237	1448	29	134				
6:15	339	1738	23	157				
6:30	420	1978	41	207				
6:45	452	2144	41	242	1	1	1	1
7:00	527	2268	52	266				
7:15	579	2229	73	268				
7:30	586	2169	76	247				
7:45	576	2048	65	227	1	1	1	1

	Piilani Hwy		Kulanihakoi St		100%		80%	
Time	15 Min Count	Hourly Total	15 Min Count	Hourly Total	Condition A	Condition B	Condition A	Condition B
16:45	515	2040	37	158				
17:00	541	2026	37	156				
17:15	508	1955	36	158				
17:30	476	1897	48	154	0	1	0	1
17:45	501	1854	35	146				
18:00	470	1776	39	137				
18:15	450	1687	32	127				
18:30	433	1614	40	117	0	1	0	1
18:45	423	1525	26	96				
19:00	381	1471	29	87				
19:15	377	1426	22	81				
19:30	344	1385	19	68	0	0	0	0
19:45	369	1336	17	68				
20:00	336	1256	23	74				
20:15	336	1231	9	70				
20:30	295	1203	19	77	0	0	0	0
20:45	289	1235	23	76				
21:00	311	1260	19	65				
21:15	308	1252	16	57				
21:30	327	1211	18	63	0	0	0	0
21:45	314	1091	12	52				
22:00	303	939	11	50				
22:15	267	799	22	51				
22:30	207	682	7	30	0	0	0	0
22:45	162	587	10	28				
23:00	163	527	12	20				
23:15	150	364	1	8				
23:30	112	214	5	7				
23:45	102	102	2	2				
			# of Periods Warrant Satisfied		**3**	**13**	**7**	**14**

Time	Piilani Hwy		Kulanihakoi St		100%		80%	
	15 Min Count	Hourly Total	15 Min Count	Hourly Total	Condition A	Condition B	Condition A	Condition B
16:45	515	2040	37	158	0	1	0	1
17:00	541	2026	37	156				
17:15	508	1955	36	158				
17:30	476	1897	48	154				
17:45	501	1854	35	146	0	1	0	1
18:00	470	1776	39	137				
18:15	450	1687	32	127				
18:30	433	1614	40	117				
18:45	423	1525	26	96	0	0	0	1
19:00	381	1471	29	87				
19:15	377	1426	22	81				
19:30	344	1385	19	68				
19:45	369	1336	17	68	0	0	0	0
20:00	336	1256	23	74				
20:15	336	1231	9	70				
20:30	295	1203	19	77				
20:45	289	1235	23	76	0	0	0	0
21:00	311	1260	19	65				
21:15	308	1252	16	57				
21:30	327	1211	18	63				
21:45	314	1091	12	52	0	0	0	0
22:00	303	939	11	50				
22:15	267	799	22	51				
22:30	207	682	7	30				
22:45	162	587	10	28	0	0	0	0
23:00	163	527	12	20				
23:15	150	364	1	8				
23:30	112	214	5	7				
23:45	102	102	2	2				
			# of Periods Warrant Satisfied		**3**	**13**	**6**	**14**

Time	Piilani Hwy		Kulanihakoi St		100%		80%	
	15 Min Count	Hourly Total	15 Min Count	Hourly Total	Condition A	Condition B	Condition A	Condition B
8:00	488	1922	54	192				
8:15	519	1885	52	177				
8:30	465	1816	56	165				
8:45	450	1775	30	155	0	1	0	1
9:00	451	1754	39	187				
9:15	450	1688	40	208				
9:30	424	1667	46	214				
9:45	429	1692	62	212	1	1	1	1
10:00	385	1716	60	186				
10:15	429	1752	46	173				
10:30	449	1784	44	170				
10:45	453	1805	36	185	0	1	1	1
11:00	421	1837	47	184				
11:15	461	1814	43	169				
11:30	470	1806	59	159				
11:45	485	1823	35	145	0	1	0	1
12:00	398	1806	32	142				
12:15	453	1898	33	133				
12:30	487	1950	45	127				
12:45	468	1970	32	119	0	1	0	1
13:00	490	2023	23	147				
13:15	505	2057	27	172				
13:30	507	2115	37	166				
13:45	521	2139	60	194	0	1	1	1
14:00	524	2147	48	193				
14:15	563	2151	21	185				
14:30	531	2166	65	198				
14:45	529	2223	59	180	0	1	1	1
15:00	528	2275	40	159				
15:15	578	2313	34	153				
15:30	588	2322	47	149				
15:45	581	2230	38	146	0	1	0	1
16:00	566	2164	34	145				
16:15	587	2139	30	148				
16:30	496	2060	44	154				

APPENDIX C

WARRANT 2
FOUR HOUR VOLUME WARRANT

Warrant 2
4-Hour Volumes (:00)

	Piilani Hwy		Kulanihakoi St			Warrant
Time	15 Min Count	Hourly Total	15 Min Count	Hourly Total	Above Min	Satisfied
0:00	87	253	3	15	0	
0:15	76	196	4	18	0	
0:30	50	146	6	15	0	
0:45	40	127	2	10	0	
1:00	30	113	6	9	0	
1:15	26	118	1	5	0	
1:30	31	111	1	7	0	
1:45	26	107	1	12	0	
2:00	35	110	2	12	0	
2:15	19	99	3	12	0	
2:30	27	116	6	18	0	
2:45	29	146	1	13	0	
3:00	24	166	2	22	0	
3:15	36	241	9	25	0	
3:30	57	285	1	20	0	
3:45	49	342	10	30	0	
4:00	99	392	5	27	0	
4:15	80	425	4	32	0	
4:30	114	494	11	51	0	
4:45	99	579	7	55	0	
5:00	132	687	10	71	0	
5:15	149	792	23	90	0	
5:30	199	982	15	90	0	
5:45	207	1203	23	116	1	
6:00	237	1448	29	134	1	1
6:15	339	1738	23	157	1	
6:30	420	1978	41	207	1	
6:45	452	2144	41	242	1	
7:00	527	2268	52	266	1	1
7:15	579	2229	73	268	1	
7:30	586	2169	76	247	1	
7:45	576	2048	65	227	1	
8:00	488	1922	54	192	1	1
8:15	519	1885	52	177	1	
8:30	465	1816	56	165	1	
8:45	450	1775	30	155	1	
9:00	451	1754	39	187	1	1
9:15	450	1688	40	208	1	
9:30	424	1667	46	214	1	
9:45	429	1692	62	212	1	
10:00	385	1716	60	186	1	1
10:15	429	1752	46	173	1	
10:30	449	1784	44	170	1	
10:45	453	1805	36	185	1	
11:00	421	1837	47	184	1	1
11:15	461	1814	43	169	1	
11:30	470	1806	59	159	1	

Time	Piilani Hwy		Kulanihakoi St			Warrant
	15 Min Count	Hourly Total	15 Min Count	Hourly Total	Above Min	Satisfied
11:45	485	1823	35	145	1	
12:00	398	1806	32	142	1	1
12:15	453	1898	33	133	1	
12:30	487	1950	45	127	1	
12:45	468	1970	32	119	1	
13:00	490	2023	23	147	1	1
13:15	505	2057	27	172	1	
13:30	507	2115	37	166	1	
13:45	521	2139	60	194	1	
14:00	524	2147	48	193	1	1
14:15	563	2151	21	185	1	
14:30	531	2166	65	198	1	
14:45	529	2223	59	180	1	
15:00	528	2275	40	159	1	1
15:15	578	2313	34	153	1	
15:30	588	2322	47	149	1	
15:45	581	2230	38	146	1	
16:00	566	2164	34	145	1	1
16:15	587	2139	30	148	1	
16:30	496	2060	44	154	1	
16:45	515	2040	37	158	1	
17:00	541	2026	37	156	1	1
17:15	508	1955	36	158	1	
17:30	476	1897	48	154	1	
17:45	501	1854	35	146	1	
18:00	470	1776	39	137	1	1
18:15	450	1687	32	127	1	
18:30	433	1614	40	117	1	
18:45	423	1525	26	96	0	
19:00	381	1471	29	87	0	
19:15	377	1426	22	81	0	
19:30	344	1385	19	68	0	
19:45	369	1336	17	68	0	
20:00	336	1256	23	74	0	
20:15	336	1231	9	70	0	
20:30	295	1203	19	77	0	
20:45	289	1235	23	76	0	
21:00	311	1260	19	65	0	
21:15	308	1252	16	57	0	
21:30	327	1211	18	63	0	
21:45	314	1091	12	52	0	
22:00	303	939	11	50	0	
22:15	267	799	22	51	0	
22:30	207	682	7	30	0	
22:45	162	587	10	28	0	
23:00	163	527	12	20	0	
23:15	150	364	1	8	0	
23:30	112	214	5	7	0	
23:45	102	102	2	2	0	
				# of Periods Warrant Satisfied		**13**

Warrant 2
4-Hour Volumes (:15)

Time	Piilani Hwy		Kulanihakoi St			Warrant
	15 Min Count	Hourly Total	15 Min Count	Hourly Total	Above Min	Satisfied
0:00	87	253	3	15	0	
0:15	76	196	4	18	0	
0:30	50	146	6	15	0	
0:45	40	127	2	10	0	
1:00	30	113	6	9	0	
1:15	26	118	1	5	0	
1:30	31	111	1	7	0	
1:45	26	107	1	12	0	
2:00	35	110	2	12	0	
2:15	19	99	3	12	0	
2:30	27	116	6	18	0	
2:45	29	146	1	13	0	
3:00	24	166	2	22	0	
3:15	36	241	9	25	0	
3:30	57	285	1	20	0	
3:45	49	342	10	30	0	
4:00	99	392	5	27	0	
4:15	80	425	4	32	0	
4:30	114	494	11	51	0	
4:45	99	579	7	55	0	
5:00	132	687	10	71	0	
5:15	149	792	23	90	0	
5:30	199	982	15	90	0	
5:45	207	1203	23	116	1	
6:00	237	1448	29	134	1	
6:15	339	1738	23	157	1	1
6:30	420	1978	41	207	1	
6:45	452	2144	41	242	1	
7:00	527	2268	52	266	1	
7:15	579	2229	73	268	1	1
7:30	586	2169	76	247	1	
7:45	576	2048	65	227	1	
8:00	488	1922	54	192	1	
8:15	519	1885	52	177	1	1
8:30	465	1816	56	165	1	
8:45	450	1775	30	155	1	
9:00	451	1754	39	187	1	
9:15	450	1688	40	208	1	1
9:30	424	1667	46	214	1	
9:45	429	1692	62	212	1	
10:00	385	1716	60	186	1	
10:15	429	1752	46	173	1	1
10:30	449	1784	44	170	1	
10:45	453	1805	36	185	1	
11:00	421	1837	47	184	1	
11:15	461	1814	43	169	1	1
11:30	470	1806	59	159	1	

Warrant 2
4-Hour Volumes (:30)

Time	Piilani Hwy		Kulanihakoi St			Warrant Satisfied
	15 Min Count	Hourly Total	15 Min Count	Hourly Total	Above Min	
0:00	87	253	3	15	0	
0:15	76	196	4	18	0	
0:30	50	146	6	15	0	
0:45	40	127	2	10	0	
1:00	30	113	6	9	0	
1:15	26	118	1	5	0	
1:30	31	111	1	7	0	
1:45	26	107	1	12	0	
2:00	35	110	2	12	0	
2:15	19	99	3	12	0	
2:30	27	116	6	18	0	
2:45	29	146	1	13	0	
3:00	24	166	2	22	0	
3:15	36	241	9	25	0	
3:30	57	285	1	20	0	
3:45	49	342	10	30	0	
4:00	99	392	5	27	0	
4:15	80	425	4	32	0	
4:30	114	494	11	51	0	
4:45	99	579	7	55	0	
5:00	132	687	10	71	0	
5:15	149	792	23	90	0	
5:30	199	982	15	90	0	
5:45	207	1203	23	116	1	
6:00	237	1448	29	134	1	
6:15	339	1738	23	157	1	
6:30	420	1978	41	207	1	1
6:45	452	2144	41	242	1	
7:00	527	2268	52	266	1	
7:15	579	2229	73	268	1	
7:30	586	2169	76	247	1	1
7:45	576	2048	65	227	1	
8:00	488	1922	54	192	1	
8:15	519	1885	52	177	1	
8:30	465	1816	56	165	1	1
8:45	450	1775	30	155	1	
9:00	451	1754	39	187	1	
9:15	450	1688	40	208	1	
9:30	424	1667	46	214	1	1
9:45	429	1692	62	212	1	
10:00	385	1716	60	186	1	
10:15	429	1752	46	173	1	
10:30	449	1784	44	170	1	1
10:45	453	1805	36	185	1	
11:00	421	1837	47	184	1	
11:15	461	1814	43	169	1	
11:30	470	1806	59	159	1	1

Time	Piilani Hwy		Kulanihakoi St			Warrant Satisfied
	15 Min Count	Hourly Total	15 Min Count	Hourly Total	Above Min	
11:45	485	1823	35	145	1	
12:00	398	1806	32	142	1	
12:15	453	1898	33	133	1	1
12:30	487	1950	45	127	1	
12:45	468	1970	32	119	1	
13:00	490	2023	23	147	1	
13:15	505	2057	27	172	1	1
13:30	507	2115	37	166	1	
13:45	521	2139	60	194	1	
14:00	524	2147	48	193	1	
14:15	563	2151	21	185	1	1
14:30	531	2166	65	198	1	
14:45	529	2223	59	180	1	
15:00	528	2275	40	159	1	
15:15	578	2313	34	153	1	1
15:30	588	2322	47	149	1	
15:45	581	2230	38	146	1	
16:00	566	2164	34	145	1	
16:15	587	2139	30	148	1	1
16:30	496	2060	44	154	1	
16:45	515	2040	37	158	1	
17:00	541	2026	37	156	1	
17:15	508	1955	36	158	1	1
17:30	476	1897	48	154	1	
17:45	501	1854	35	146	1	
18:00	470	1776	39	137	1	
18:15	450	1687	32	127	1	1
18:30	433	1614	40	117	1	
18:45	423	1525	26	96	0	
19:00	381	1471	29	87	0	
19:15	377	1426	22	81	0	
19:30	344	1385	19	68	0	
19:45	369	1336	17	68	0	
20:00	336	1256	23	74	0	
20:15	336	1231	9	70	0	
20:30	295	1203	19	77	0	
20:45	289	1235	23	76	0	
21:00	311	1260	19	65	0	
21:15	308	1252	16	57	0	
21:30	327	1211	18	63	0	
21:45	314	1091	12	52	0	
22:00	303	939	11	50	0	
22:15	267	799	22	51	0	
22:30	207	682	7	30	0	
22:45	162	587	10	28	0	
23:00	163	527	12	20	0	
23:15	150	364	1	8	0	
23:30	112	214	5	7	0	
23:45	102	102	2	2	0	
				# of Periods Warrant Satisfied		**13**

Warrant 2
4-Hour Volumes (:45)

Time	Piilani Hwy		Kulanihakoi St			Warrant Satisfied
	15 Min Count	Hourly Total	15 Min Count	Hourly Total	Above Min	
0:00	87	253	3	15	0	
0:15	76	196	4	18	0	
0:30	50	146	6	15	0	
0:45	40	127	2	10	0	
1:00	30	113	6	9	0	
1:15	26	118	1	5	0	
1:30	31	111	1	7	0	
1:45	26	107	1	12	0	
2:00	35	110	2	12	0	
2:15	19	99	3	12	0	
2:30	27	116	6	18	0	
2:45	29	146	1	13	0	
3:00	24	166	2	22	0	
3:15	36	241	9	25	0	
3:30	57	285	1	20	0	
3:45	49	342	10	30	0	
4:00	99	392	5	27	0	
4:15	80	425	4	32	0	
4:30	114	494	11	51	0	
4:45	99	579	7	55	0	
5:00	132	687	10	71	0	
5:15	149	792	23	90	0	
5:30	199	982	15	90	0	
5:45	207	1203	23	116	1	
6:00	237	1448	29	134	1	
6:15	339	1738	23	157	1	
6:30	420	1978	41	207	1	
6:45	452	2144	41	242	1	1
7:00	527	2268	52	266	1	
7:15	579	2229	73	268	1	
7:30	586	2169	76	247	1	
7:45	576	2048	65	227	1	1
8:00	488	1922	54	192	1	
8:15	519	1885	52	177	1	
8:30	465	1816	56	165	1	
8:45	450	1775	30	155	1	1
9:00	451	1754	39	187	1	
9:15	450	1688	40	208	1	
9:30	424	1667	46	214	1	
9:45	429	1692	62	212	1	1
10:00	385	1716	60	186	1	
10:15	429	1752	46	173	1	
10:30	449	1784	44	170	1	
10:45	453	1805	36	185	1	1
11:00	421	1837	47	184	1	
11:15	461	1814	43	169	1	
11:30	470	1806	59	159	1	

Time	Piilani Hwy		Kulanihakoi St			Warrant Satisfied
	15 Min Count	Hourly Total	15 Min Count	Hourly Total	Above Min	
11:45	485	1823	35	145	1	
12:00	398	1806	32	142	1	
12:15	453	1898	33	133	1	
12:30	487	1950	45	127	1	1
12:45	468	1970	32	119	1	
13:00	490	2023	23	147	1	
13:15	505	2057	27	172	1	
13:30	507	2115	37	166	1	1
13:45	521	2139	60	194	1	
14:00	524	2147	48	193	1	
14:15	563	2151	21	185	1	
14:30	531	2166	65	198	1	1
14:45	529	2223	59	180	1	
15:00	528	2275	40	159	1	
15:15	578	2313	34	153	1	
15:30	588	2322	47	149	1	1
15:45	581	2230	38	146	1	
16:00	566	2164	34	145	1	
16:15	587	2139	30	148	1	
16:30	496	2060	44	154	1	1
16:45	515	2040	37	158	1	
17:00	541	2026	37	156	1	
17:15	508	1955	36	158	1	
17:30	476	1897	48	154	1	1
17:45	501	1854	35	146	1	
18:00	470	1776	39	137	1	
18:15	450	1687	32	127	1	
18:30	433	1614	40	117	1	1
18:45	423	1525	26	96	0	
19:00	381	1471	29	87	0	
19:15	377	1426	22	81	0	
19:30	344	1385	19	68	0	
19:45	369	1336	17	68	0	
20:00	336	1256	23	74	0	
20:15	336	1231	9	70	0	
20:30	295	1203	19	77	0	
20:45	289	1235	23	76	0	
21:00	311	1260	19	65	0	
21:15	308	1252	16	57	0	
21:30	327	1211	18	63	0	
21:45	314	1091	12	52	0	
22:00	303	939	11	50	0	
22:15	267	799	22	51	0	
22:30	207	682	7	30	0	
22:45	162	587	10	28	0	
23:00	163	527	12	20	0	
23:15	150	364	1	8	0	
23:30	112	214	5	7	0	
23:45	102	102	2	2	0	
				# of Periods Warrant Satisfied		**13**

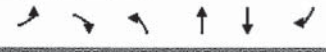
Time	Piilani Hwy		Kulanihakoi St			Warrant
	15 Min Count	Hourly Total	15 Min Count	Hourly Total	Above Min	Satisfied
11:45	485	1823	35	145	1	1
12:00	398	1806	32	142	1	
12:15	453	1898	33	133	1	
12:30	487	1950	45	127	1	
12:45	468	1970	32	119	1	1
13:00	490	2023	23	147	1	
13:15	505	2057	27	172	1	
13:30	507	2115	37	166	1	
13:45	521	2139	60	194	1	1
14:00	524	2147	48	193	1	
14:15	563	2151	21	185	1	
14:30	531	2166	65	198	1	
14:45	529	2223	59	180	1	1
15:00	528	2275	40	159	1	
15:15	578	2313	34	153	1	
15:30	588	2322	47	149	1	
15:45	581	2230	38	146	1	1
16:00	566	2164	34	145	1	
16:15	587	2139	30	148	1	
16:30	496	2060	44	154	1	
16:45	515	2040	37	158	1	1
17:00	541	2026	37	156	1	
17:15	508	1955	36	158	1	
17:30	476	1897	48	154	1	
17:45	501	1854	35	146	1	1
18:00	470	1776	39	137	1	
18:15	450	1687	32	127	1	
18:30	433	1614	40	117	1	
18:45	423	1525	26	96	0	
19:00	381	1471	29	87	0	
19:15	377	1426	22	81	0	
19:30	344	1385	19	68	0	
19:45	369	1336	17	68	0	
20:00	336	1256	23	74	0	
20:15	336	1231	9	70	0	
20:30	295	1203	19	77	0	
20:45	289	1235	23	76	0	
21:00	311	1260	19	65	0	
21:15	308	1252	16	57	0	
21:30	327	1211	18	63	0	
21:45	314	1091	12	52	0	
22:00	303	939	11	50	0	
22:15	267	799	22	51	0	
22:30	207	682	7	30	0	
22:45	162	587	10	28	0	
23:00	163	527	12	20	0	
23:15	150	364	1	8	0	
23:30	112	214	5	7	0	
23:45	102	102	2	2	0	
				# of Periods Warrant Satisfied		**12**

APPENDIX F

CAPACITY ANALYSIS CALCULATIONS
PROJECTED YEAR 2015 PEAK HOUR TRAFFIC
ANALYSIS WITH PROJECT

HCM Unsignalized Intersection Capacity Analysis
3: Kaonoulu & Piilani

5/4/2011



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	18	220	66	1229	1490	11
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.84	0.84	0.95	0.95	0.91	0.91
Hourly flow rate (vph)	21	262	69	1294	1637	12
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2423	819	1637			
vC1, stage 1 conf vol	1637					
vC2, stage 2 conf vol	786					
vCu, unblocked vol	2423	819	1637			
tC, single (s)	*5.8	*5.9	4.1			
tC, 2 stage (s)	4.8					
tF (s)	*2.5	*2.3	2.2			
p0 queue free %	91	50	82			
cM capacity (veh/h)	238	525	392			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	21	262	69	647	647	819	819	12
Volume Left	21	0	69	0	0	0	0	0
Volume Right	0	262	0	0	0	0	0	12
cSH	238	525	392	1700	1700	1700	1700	1700
Volume to Capacity	0.09	0.50	0.18	0.38	0.38	0.48	0.48	0.01
Queue Length 95th (ft)	7	69	16	0	0	0	0	0
Control Delay (s)	21.6	18.5	16.2	0.0	0.0	0.0	0.0	0.0
Lane LOS	C	C	C					
Approach Delay (s)	18.7		0.8			0.0		
Approach LOS	C							

Intersection Summary			
Average Delay	1.9		
Intersection Capacity Utilization	59.4%	ICU Level of Service	B
Analysis Period (min)	15		

* User Entered Value

HCM Unsignalized Intersection Capacity Analysis
3: Kaonoulu & Piilani

5/4/2011

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	20	109	120	1513	1582	105
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.79	0.79	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	25	138	138	1739	1818	121
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2964	909	1818			
vC1, stage 1 conf vol	1818					
vC2, stage 2 conf vol	1145					
vCu, unblocked vol	2964	909	1818			
tC, single (s)	*5.8	*5.9	4.1			
tC, 2 stage (s)	4.8					
tF (s)	*2.5	*2.3	2.2			
p0 queue free %	85	70	59			
cM capacity (veh/h)	163	465	333			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	25	138	138	870	870	909	909	121
Volume Left	25	0	138	0	0	0	0	0
Volume Right	0	138	0	0	0	0	0	121
cSH	163	465	333	1700	1700	1700	1700	1700
Volume to Capacity	0.15	0.30	0.41	0.51	0.51	0.53	0.53	0.07
Queue Length 95th (ft)	13	31	49	0	0	0	0	0
Control Delay (s)	31.0	16.0	23.2	0.0	0.0	0.0	0.0	0.0
Lane LOS	D	C	C					
Approach Delay (s)	18.3		1.7			0.0		
Approach LOS	C							

Intersection Summary			
Average Delay	1.6		
Intersection Capacity Utilization	61.2%	ICU Level of Service	B
Analysis Period (min)	15		

* User Entered Value

HCM Signalized Intersection Capacity Analysis
5: Kulanihakoi & Piilani

5/4/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	42	35	135	75	6	27	49	1226	137	56	1613	41
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	2000	2000	2000	2000	2000	2000
Total Lost time (s)		5.0	5.0		5.0	5.0	5.0	5.0	4.0	5.0	5.0	4.0
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.97	1.00		0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1813	1583		1781	1583	1863	3725	1667	1863	3725	1667
Flt Permitted		0.78	1.00		0.68	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		1457	1583		1264	1583	1863	3725	1667	1863	3725	1667
Peak-hour factor, PHF	0.85	0.85	0.85	0.92	0.92	0.92	0.94	0.94	0.94	0.93	0.93	0.93
Adj. Flow (vph)	49	41	159	82	7	29	52	1304	146	60	1734	44
RTOR Reduction (vph)	0	0	119	0	0	25	0	0	0	0	0	0
Lane Group Flow (vph)	0	90	40	0	89	4	52	1304	146	60	1734	44
Turn Type	Perm		Perm	Perm		Perm	Prot		Free	Prot		Free
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8			Free			Free
Actuated Green, G (s)		13.9	13.9		13.9	13.9	6.6	62.1	98.2	7.2	62.7	98.2
Effective Green, g (s)		13.9	13.9		13.9	13.9	6.6	62.1	98.2	7.2	62.7	98.2
Actuated g/C Ratio		0.14	0.14		0.14	0.14	0.07	0.63	1.00	0.07	0.64	1.00
Clearance Time (s)		5.0	5.0		5.0	5.0	5.0	5.0		5.0	5.0	
Vehicle Extension (s)		3.0	3.0		3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		206	224		179	224	125	2356	1667	137	2378	1667
v/s Ratio Prot							0.03	0.35		c0.03	c0.47	
v/s Ratio Perm		0.06	0.03		c0.07	0.00			c0.09			0.03
v/c Ratio		0.44	0.18		0.50	0.02	0.42	0.55	0.09	0.44	0.73	0.03
Uniform Delay, d1		38.6	37.1		38.9	36.3	44.0	10.2	0.0	43.6	12.0	0.0
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		1.5	0.4		2.2	0.0	2.2	0.3	0.1	2.2	1.1	0.0
Delay (s)		40.1	37.5		41.1	36.3	46.2	10.5	0.1	45.8	13.2	0.0
Level of Service		D	D		D	D	D	B	A	D	B	A
Approach Delay (s)		38.4			39.9			10.7			13.9	
Approach LOS		D			D			B			B	

Intersection Summary				
HCM Average Control Delay	15.1	HCM Level of Service		B
HCM Volume to Capacity ratio	0.63			
Actuated Cycle Length (s)	98.2	Sum of lost time (s)		10.0
Intersection Capacity Utilization	67.7%	ICU Level of Service		C
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
5: Kulanihakoi & Piilani

5/4/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	22	7	93	39	3	13	68	1598	30	12	1577	102
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	2000	2000	2000	2000	2000	2000
Total Lost time (s)		5.0	5.0		5.0	5.0	5.0	5.0	4.0	5.0	5.0	4.0
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.96	1.00		0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1794	1583		1780	1583	1863	3725	1667	1863	3725	1667
Flt Permitted		0.75	1.00		0.71	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		1392	1583		1327	1583	1863	3725	1667	1863	3725	1667
Peak-hour factor, PHF	0.76	0.76	0.76	0.92	0.92	0.92	0.92	0.92	0.92	0.88	0.88	0.88
Adj. Flow (vph)	29	9	122	42	3	14	74	1737	33	14	1792	116
RTOR Reduction (vph)	0	0	106	0	0	13	0	0	0	0	0	0
Lane Group Flow (vph)	0	38	16	0	45	1	74	1737	33	14	1792	116
Turn Type	Perm		Perm	Perm		Perm	Prot		Free	Prot		Free
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8			Free			Free
Actuated Green, G (s)		9.3	9.3		9.3	9.3	8.0	74.7	101.3	2.3	69.0	101.3
Effective Green, g (s)		9.3	9.3		9.3	9.3	8.0	74.7	101.3	2.3	69.0	101.3
Actuated g/C Ratio		0.09	0.09		0.09	0.09	0.08	0.74	1.00	0.02	0.68	1.00
Clearance Time (s)		5.0	5.0		5.0	5.0	5.0	5.0		5.0	5.0	
Vehicle Extension (s)		3.0	3.0		3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		128	145		122	145	147	2747	1667	42	2537	1667
v/s Ratio Prot							c0.04	c0.47		0.01	c0.48	
v/s Ratio Perm		0.03	0.01		c0.03	0.00			0.02			0.07
v/c Ratio		0.30	0.11		0.37	0.01	0.50	0.63	0.02	0.33	0.71	0.07
Uniform Delay, d1		42.9	42.2		43.2	41.8	44.7	6.5	0.0	48.7	9.9	0.0
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		1.3	0.3		1.9	0.0	2.7	0.5	0.0	4.6	0.9	0.1
Delay (s)		44.2	42.5		45.1	41.8	47.4	7.0	0.0	53.4	10.8	0.1
Level of Service		D	D		D	D	D	A	A	D	B	A
Approach Delay (s)		42.9			44.3			8.5			10.5	
Approach LOS		D			D			A			B	

Intersection Summary				
HCM Average Control Delay	11.4	HCM Level of Service		B
HCM Volume to Capacity ratio	0.70			
Actuated Cycle Length (s)	101.3	Sum of lost time (s)		20.0
Intersection Capacity Utilization	66.8%	ICU Level of Service		C
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
7: E. Waipuilani & Piilani

5/4/2011

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	0	23	0	1412	1740	82
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.58	0.58	0.88	0.88	0.91	0.91
Hourly flow rate (vph)	0	40	0	1605	1912	90
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2714	956	1912			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2714	956	1912			
tC, single (s)	6.8	*5.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	*2.3	2.2			
p0 queue free %	100	91	100			
cM capacity (veh/h)	17	437	306			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	40	802	802	956	956	90
Volume Left	0	0	0	0	0	0
Volume Right	40	0	0	0	0	90
cSH	437	1700	1700	1700	1700	1700
Volume to Capacity	0.09	0.47	0.47	0.56	0.56	0.05
Queue Length 95th (ft)	7	0	0	0	0	0
Control Delay (s)	14.1	0.0	0.0	0.0	0.0	0.0
Lane LOS	B					
Approach Delay (s)	14.1	0.0		0.0		
Approach LOS	B					

Intersection Summary				
Average Delay		0.2		
Intersection Capacity Utilization		55.7%	ICU Level of Service	B
Analysis Period (min)		15		

* User Entered Value

HCM Unsignalized Intersection Capacity Analysis
7: E. Waipuilani & Piilani

5/4/2011

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	0	32	0	1696	1608	101
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.57	0.57	0.95	0.95	0.96	0.96
Hourly flow rate (vph)	0	56	0	1785	1675	105
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2568	838	1675			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2568	838	1675			
tC, single (s)	6.8	*5.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	*2.3	2.2			
p0 queue free %	100	89	100			
cM capacity (veh/h)	21	512	379			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	56	893	893	838	838	105
Volume Left	0	0	0	0	0	0
Volume Right	56	0	0	0	0	105
cSH	512	1700	1700	1700	1700	1700
Volume to Capacity	0.11	0.53	0.53	0.49	0.49	0.06
Queue Length 95th (ft)	9	0	0	0	0	0
Control Delay (s)	12.9	0.0	0.0	0.0	0.0	0.0
Lane LOS	B					
Approach Delay (s)	12.9	0.0		0.0		
Approach LOS	B					

Intersection Summary				
Average Delay		0.2		
Intersection Capacity Utilization		52.2%	ICU Level of Service	A
Analysis Period (min)		15		

* User Entered Value

HCM Signalized Intersection Capacity Analysis
9: Piikea & Piilani

5/4/2011

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	294	133	123	1118	1442	321
Ideal Flow (vphpl)	1900	1900	2000	2000	2000	2000
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	4.0
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770	1583	1863	3725	3725	1667
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	1863	3725	3725	1667
Peak-hour factor, PHF	0.90	0.90	0.88	0.88	0.91	0.91
Adj. Flow (vph)	327	148	140	1270	1585	353
RTOR Reduction (vph)	0	113	0	0	0	0
Lane Group Flow (vph)	327	35	140	1270	1585	353
Turn Type		Perm	Prot			Free
Protected Phases	4		5	2	6	
Permitted Phases		4				Free
Actuated Green, G (s)	28.6	28.6	15.2	83.0	62.8	121.6
Effective Green, g (s)	28.6	28.6	15.2	83.0	62.8	121.6
Actuated g/C Ratio	0.24	0.24	0.12	0.68	0.52	1.00
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	416	372	233	2543	1924	1667
v/s Ratio Prot	c0.18		c0.08	0.34	c0.43	
v/s Ratio Perm		0.02				0.21
v/c Ratio	0.79	0.09	0.60	0.50	0.82	0.21
Uniform Delay, d1	43.6	36.4	50.3	9.3	24.7	0.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	9.4	0.1	4.3	0.2	3.0	0.3
Delay (s)	53.1	36.5	54.6	9.5	27.7	0.3
Level of Service	D	D	D	A	C	A
Approach Delay (s)	47.9			13.9	22.7	
Approach LOS	D			B	C	

Intersection Summary				
HCM Average Control Delay	22.6	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.78			
Actuated Cycle Length (s)	121.6	Sum of lost time (s)	15.0	
Intersection Capacity Utilization	73.1%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
9: Piikea & Piilani

5/4/2011

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	270	277	233	1426	1266	374
Ideal Flow (vphpl)	1900	1900	2000	2000	2000	2000
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	4.0
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770	1583	1863	3725	3725	1667
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	1863	3725	3725	1667
Peak-hour factor, PHF	0.89	0.89	0.95	0.95	0.96	0.96
Adj. Flow (vph)	303	311	245	1501	1319	390
RTOR Reduction (vph)	0	240	0	0	0	0
Lane Group Flow (vph)	303	71	245	1501	1319	390
Turn Type		Perm	Prot			Free
Protected Phases	4		5	2	6	
Permitted Phases		4				Free
Actuated Green, G (s)	26.3	26.3	21.4	78.7	52.3	115.0
Effective Green, g (s)	26.3	26.3	21.4	78.7	52.3	115.0
Actuated g/C Ratio	0.23	0.23	0.19	0.68	0.45	1.00
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	405	362	347	2549	1694	1667
v/s Ratio Prot	c0.17		c0.13	0.40	c0.35	
v/s Ratio Perm		0.04				0.23
v/c Ratio	0.75	0.20	0.71	0.59	0.78	0.23
Uniform Delay, d1	41.3	35.8	43.9	9.6	26.5	0.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	7.4	0.3	6.4	0.4	2.3	0.3
Delay (s)	48.7	36.1	50.3	9.9	28.8	0.3
Level of Service	D	D	D	A	C	A
Approach Delay (s)	42.3			15.6	22.3	
Approach LOS	D			B	C	

Intersection Summary				
HCM Average Control Delay	22.4	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.76			
Actuated Cycle Length (s)	115.0	Sum of lost time (s)	15.0	
Intersection Capacity Utilization	73.0%	ICU Level of Service	C	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
13: Kulanihakoi &

5/4/2011

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	43	60	437	50	21	337
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.83	0.83	0.93	0.93	0.98	0.98
Hourly flow rate (vph)	52	72	470	54	21	344
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	884	497			524	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	884	497			524	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	83	87			98	
cM capacity (veh/h)	310	573			1043	

Direction, Lane #	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	52	72	524	21	344
Volume Left	52	0	0	21	0
Volume Right	0	72	54	0	0
cSH	310	573	1700	1043	1700
Volume to Capacity	0.17	0.13	0.31	0.02	0.20
Queue Length 95th (ft)	15	11	0	2	0
Control Delay (s)	19.0	12.2	0.0	8.5	0.0
Lane LOS	C	B		A	
Approach Delay (s)	15.0		0.0	0.5	
Approach LOS	C				

Intersection Summary				
Average Delay		2.0		
Intersection Capacity Utilization		36.4%	ICU Level of Service	A
Analysis Period (min)		15		

HCM Unsignalized Intersection Capacity Analysis
13: Kulanihakoi &

5/4/2011

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	56	27	603	54	23	483
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.78	0.78	0.96	0.96	0.84	0.84
Hourly flow rate (vph)	72	35	628	56	27	575
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1286	656			684	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1286	656			684	
tC, single (s)	*5.4	*5.2			4.1	
tC, 2 stage (s)						
tF (s)	*2.5	*2.3			2.2	
p0 queue free %	77	95			97	
cM capacity (veh/h)	307	743			909	

Direction, Lane #	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	72	35	684	27	575
Volume Left	72	0	0	27	0
Volume Right	0	35	56	0	0
cSH	307	743	1700	909	1700
Volume to Capacity	0.23	0.05	0.40	0.03	0.34
Queue Length 95th (ft)	22	4	0	2	0
Control Delay (s)	20.3	10.1	0.0	9.1	0.0
Lane LOS	C	B		A	
Approach Delay (s)	17.0		0.0	0.4	
Approach LOS	C				

Intersection Summary				
Average Delay		1.5		
Intersection Capacity Utilization		45.0%	ICU Level of Service	A
Analysis Period (min)		15		

* User Entered Value

APPENDIX G

CAPACITY ANALYSIS CALCULATIONS
PROJECTED YEAR 2025 PEAK HOUR TRAFFIC
ANALYSIS WITH PROJECT

HCM Unsignalized Intersection Capacity Analysis
3: Kaonoulu & Piilani 5/4/2011

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	18	232	72	1383	1685	11
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.84	0.84	0.95	0.95	0.91	0.91
Hourly flow rate (vph)	21	276	76	1456	1852	12
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2731	926	1852			
vC1, stage 1 conf vol	1852					
vC2, stage 2 conf vol	879					
vCu, unblocked vol	2731	926	1852			
tC, single (s)	*5.8	*5.9	4.1			
tC, 2 stage (s)	4.8					
tF (s)	*2.5	*2.3	2.2			
p0 queue free %	89	39	77			
cM capacity (veh/h)	190	455	323			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	21	276	76	728	728	926	926	12
Volume Left	21	0	76	0	0	0	0	0
Volume Right	0	276	0	0	0	0	0	12
cSH	190	455	323	1700	1700	1700	1700	1700
Volume to Capacity	0.11	0.61	0.23	0.43	0.43	0.54	0.54	0.01
Queue Length 95th (ft)	9	99	22	0	0	0	0	0
Control Delay (s)	26.3	24.4	19.5	0.0	0.0	0.0	0.0	0.0
Lane LOS	D	C	C					
Approach Delay (s)	24.6		1.0			0.0		
Approach LOS	C							

Intersection Summary				
Average Delay	2.4			
Intersection Capacity Utilization	65.3%	ICU Level of Service		C
Analysis Period (min)	15			

* User Entered Value

HCM Unsignalized Intersection Capacity Analysis
3: Kaonoulu & Piilani

5/4/2011

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	20	112	123	1673	1747	105
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.79	0.79	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	25	142	141	1923	2008	121
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				TWLTL	TWLTL	
Median storage veh)				2	2	
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	3252	1004	2008			
vC1, stage 1 conf vol	2008					
vC2, stage 2 conf vol	1244					
vCu, unblocked vol	3252	1004	2008			
tC, single (s)	*5.8	*5.9	4.1			
tC, 2 stage (s)	4.8					
tF (s)	*2.5	*2.3	2.2			
p0 queue free %	80	65	50			
cM capacity (veh/h)	129	409	281			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	25	142	141	961	961	1004	1004	121
Volume Left	25	0	141	0	0	0	0	0
Volume Right	0	142	0	0	0	0	0	121
cSH	129	409	281	1700	1700	1700	1700	1700
Volume to Capacity	0.20	0.35	0.50	0.57	0.57	0.59	0.59	0.07
Queue Length 95th (ft)	17	38	66	0	0	0	0	0
Control Delay (s)	39.8	18.4	30.1	0.0	0.0	0.0	0.0	0.0
Lane LOS	E	C	D					
Approach Delay (s)	21.6		2.1			0.0		
Approach LOS	C							

Intersection Summary			
Average Delay	1.8		
Intersection Capacity Utilization	65.7%	ICU Level of Service	C
Analysis Period (min)	15		

* User Entered Value

HCM Signalized Intersection Capacity Analysis
5: Kulanihakoi & Piilani

5/4/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	42	71	135	154	12	56	49	1357	283	117	1759	41
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	2000	2000	2000	2000	2000	2000
Total Lost time (s)		5.0	5.0		5.0	5.0	5.0	5.0	4.0	5.0	5.0	4.0
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.98	1.00		0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1829	1583		1780	1583	1863	3725	1667	1863	3725	1667
Flt Permitted		0.74	1.00		0.58	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		1386	1583		1084	1583	1863	3725	1667	1863	3725	1667
Peak-hour factor, PHF	0.85	0.85	0.85	0.92	0.92	0.92	0.94	0.94	0.94	0.93	0.93	0.93
Adj. Flow (vph)	49	84	159	167	13	61	52	1444	301	126	1891	44
RTOR Reduction (vph)	0	0	75	0	0	48	0	0	0	0	0	0
Lane Group Flow (vph)	0	133	84	0	180	13	52	1444	301	126	1891	44
Turn Type	Perm		Perm	Perm		Perm	Prot		Free	Prot		Free
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8			Free			Free
Actuated Green, G (s)		26.4	26.4		26.4	26.4	5.1	67.6	123.0	14.0	76.5	123.0
Effective Green, g (s)		26.4	26.4		26.4	26.4	5.1	67.6	123.0	14.0	76.5	123.0
Actuated g/C Ratio		0.21	0.21		0.21	0.21	0.04	0.55	1.00	0.11	0.62	1.00
Clearance Time (s)		5.0	5.0		5.0	5.0	5.0	5.0		5.0	5.0	
Vehicle Extension (s)		3.0	3.0		3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		297	340		233	340	77	2047	1667	212	2317	1667
v/s Ratio Prot							0.03	0.39		c0.07	c0.51	
v/s Ratio Perm		0.10	0.05		c0.17	0.01			0.18			0.03
v/c Ratio		0.45	0.25		0.77	0.04	0.68	0.71	0.18	0.59	0.82	0.03
Uniform Delay, d1		42.0	40.0		45.5	38.2	58.1	20.4	0.0	51.8	17.9	0.0
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		1.1	0.4		14.6	0.0	20.9	1.1	0.2	4.4	2.3	0.0
Delay (s)		43.0	40.4		60.1	38.3	79.1	21.5	0.2	56.2	20.2	0.0
Level of Service		D	D		E	D	E	C	A	E	C	A
Approach Delay (s)		41.6			54.6			19.6			22.0	
Approach LOS		D			D			B			C	

Intersection Summary					
HCM Average Control Delay	24.1	HCM Level of Service		C	
HCM Volume to Capacity ratio	0.81				
Actuated Cycle Length (s)	123.0	Sum of lost time (s)		15.0	
Intersection Capacity Utilization	77.9%	ICU Level of Service		D	
Analysis Period (min)	15				

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
5: Kulanihakoi & Piilani

5/4/2011

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	22	15	93	80	6	28	68	1746	61	25	1732	102
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	2000	2000	2000	2000	2000	2000
Total Lost time (s)		5.0	5.0		5.0	5.0	5.0	5.0	4.0	5.0	5.0	4.0
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		1.00	0.85		1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected		0.97	1.00		0.96	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)		1809	1583		1780	1583	1863	3725	1667	1863	3725	1667
Flt Permitted		0.78	1.00		0.71	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)		1453	1583		1316	1583	1863	3725	1667	1863	3725	1667
Peak-hour factor, PHF	0.76	0.76	0.76	0.92	0.92	0.92	0.92	0.92	0.92	0.88	0.88	0.88
Adj. Flow (vph)	29	20	122	87	7	30	74	1898	66	28	1968	116
RTOR Reduction (vph)	0	0	80	0	0	27	0	0	0	0	0	0
Lane Group Flow (vph)	0	49	42	0	94	3	74	1898	66	28	1968	116
Turn Type	Perm		Perm	Perm		Perm	Prot		Free	Prot		Free
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8		8			Free			Free
Actuated Green, G (s)		13.8	13.8		13.8	13.8	8.0	89.2	121.1	3.1	84.3	121.1
Effective Green, g (s)		13.8	13.8		13.8	13.8	8.0	89.2	121.1	3.1	84.3	121.1
Actuated g/C Ratio		0.11	0.11		0.11	0.11	0.07	0.74	1.00	0.03	0.70	1.00
Clearance Time (s)		5.0	5.0		5.0	5.0	5.0	5.0		5.0	5.0	
Vehicle Extension (s)		3.0	3.0		3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		166	180		150	180	123	2744	1667	48	2593	1667
v/s Ratio Prot							c0.04	c0.51		0.02	c0.53	
v/s Ratio Perm		0.03	0.03		c0.07	0.00			0.04			0.07
v/c Ratio		0.30	0.23		0.63	0.02	0.60	0.69	0.04	0.58	0.76	0.07
Uniform Delay, d1		49.2	48.8		51.2	47.6	55.0	8.6	0.0	58.4	11.9	0.0
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2		1.0	0.7		7.9	0.0	8.0	0.8	0.0	16.8	1.3	0.1
Delay (s)		50.2	49.5		59.1	47.7	63.0	9.3	0.0	75.1	13.2	0.1
Level of Service		D	D		E	D	E	A	A	E	B	A
Approach Delay (s)		49.7			56.4			11.0			13.3	
Approach LOS		D			E			B			B	

Intersection Summary				
HCM Average Control Delay	14.8	HCM Level of Service	B	
HCM Volume to Capacity ratio	0.77			
Actuated Cycle Length (s)	121.1	Sum of lost time (s)	20.0	
Intersection Capacity Utilization	73.1%	ICU Level of Service	D	
Analysis Period (min)	15			

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
7: E. Waipuilani & Piilani

5/4/2011

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	0	23	0	1689	1954	93
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.58	0.58	0.88	0.88	0.91	0.91
Hourly flow rate (vph)	0	40	0	1919	2147	102
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	3107	1074	2147			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	3107	1074	2147			
tC, single (s)	6.8	*5.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	*2.3	2.2			
p0 queue free %	100	89	100			
cM capacity (veh/h)	9	372	248			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	40	960	960	1074	1074	102
Volume Left	0	0	0	0	0	0
Volume Right	40	0	0	0	0	102
cSH	372	1700	1700	1700	1700	1700
Volume to Capacity	0.11	0.56	0.56	0.63	0.63	0.06
Queue Length 95th (ft)	9	0	0	0	0	0
Control Delay (s)	15.8	0.0	0.0	0.0	0.0	0.0
Lane LOS	C					
Approach Delay (s)	15.8	0.0		0.0		
Approach LOS	C					

Intersection Summary				
Average Delay	0.1			
Intersection Capacity Utilization	61.3%	ICU Level of Service	B	
Analysis Period (min)	15			

* User Entered Value

HCM Unsignalized Intersection Capacity Analysis
7: E. Waipuilani & Piilani

5/4/2011

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	0	32	0	1875	1798	107
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.57	0.57	0.95	0.95	0.96	0.96
Hourly flow rate (vph)	0	56	0	1974	1873	111
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	2860	936	1873			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	2860	936	1873			
tC, single (s)	6.8	*5.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	*2.3	2.2			
p0 queue free %	100	87	100			
cM capacity (veh/h)	13	448	317			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	56	987	987	936	936	111
Volume Left	0	0	0	0	0	0
Volume Right	56	0	0	0	0	111
cSH	448	1700	1700	1700	1700	1700
Volume to Capacity	0.13	0.58	0.58	0.55	0.55	0.07
Queue Length 95th (ft)	11	0	0	0	0	0
Control Delay (s)	14.2	0.0	0.0	0.0	0.0	0.0
Lane LOS	B					
Approach Delay (s)	14.2	0.0		0.0		
Approach LOS	B					

Intersection Summary				
Average Delay	0.2			
Intersection Capacity Utilization	57.2%	ICU Level of Service		B
Analysis Period (min)	15			

* User Entered Value

HCM Signalized Intersection Capacity Analysis
9: Piikea & Piilani

5/4/2011

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	294	133	123	1395	1656	321
Ideal Flow (vphpl)	1900	1900	2000	2000	2000	2000
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	4.0
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770	1583	1863	3725	3725	1667
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	1863	3725	3725	1667
Peak-hour factor, PHF	0.90	0.90	0.88	0.88	0.91	0.91
Adj. Flow (vph)	327	148	140	1585	1820	353
RTOR Reduction (vph)	0	116	0	0	0	0
Lane Group Flow (vph)	327	32	140	1585	1820	353
Turn Type		Perm	Prot			Free
Protected Phases	4		5	2	6	
Permitted Phases		4				Free
Actuated Green, G (s)	29.6	29.6	14.2	95.3	76.1	134.9
Effective Green, g (s)	29.6	29.6	14.2	95.3	76.1	134.9
Actuated g/C Ratio	0.22	0.22	0.11	0.71	0.56	1.00
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	388	347	196	2632	2101	1667
v/s Ratio Prot	c0.18		c0.08	0.43	c0.49	
v/s Ratio Perm		0.02				0.21
v/c Ratio	0.84	0.09	0.71	0.60	0.87	0.21
Uniform Delay, d1	50.4	42.0	58.4	10.1	25.1	0.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	15.2	0.1	11.7	0.4	4.0	0.3
Delay (s)	65.6	42.1	70.0	10.5	29.1	0.3
Level of Service	E	D	E	B	C	A
Approach Delay (s)	58.3			15.3	24.4	
Approach LOS	E			B	C	

Intersection Summary				
HCM Average Control Delay	24.5	HCM Level of Service		C
HCM Volume to Capacity ratio	0.84			
Actuated Cycle Length (s)	134.9	Sum of lost time (s)		15.0
Intersection Capacity Utilization	78.7%	ICU Level of Service		D
Analysis Period (min)	15			
c Critical Lane Group				

HCM Signalized Intersection Capacity Analysis
9: Piikea & Piilani

5/4/2011

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	270	277	233	1605	1456	374
Ideal Flow (vphpl)	1900	1900	2000	2000	2000	2000
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	4.0
Lane Util. Factor	1.00	1.00	1.00	0.95	0.95	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (prot)	1770	1583	1863	3725	3725	1667
Flt Permitted	0.95	1.00	0.95	1.00	1.00	1.00
Satd. Flow (perm)	1770	1583	1863	3725	3725	1667
Peak-hour factor, PHF	0.89	0.89	0.95	0.95	0.96	0.96
Adj. Flow (vph)	303	311	245	1689	1517	390
RTOR Reduction (vph)	0	244	0	0	0	0
Lane Group Flow (vph)	303	67	245	1689	1517	390
Turn Type		Perm	Prot			Free
Protected Phases	4		5	2	6	
Permitted Phases		4				Free
Actuated Green, G (s)	27.2	27.2	22.0	88.5	61.5	125.7
Effective Green, g (s)	27.2	27.2	22.0	88.5	61.5	125.7
Actuated g/C Ratio	0.22	0.22	0.18	0.70	0.49	1.00
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	383	343	326	2623	1822	1667
v/s Ratio Prot	c0.17		c0.13	0.45	c0.41	
v/s Ratio Perm		0.04				0.23
v/c Ratio	0.79	0.20	0.75	0.64	0.83	0.23
Uniform Delay, d1	46.6	40.3	49.3	10.1	27.7	0.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	10.6	0.3	9.4	0.5	3.4	0.3
Delay (s)	57.2	40.6	58.7	10.6	31.1	0.3
Level of Service	E	D	E	B	C	A
Approach Delay (s)	48.8			16.7	24.8	
Approach LOS	D			B	C	

Intersection Summary				
HCM Average Control Delay	24.6	HCM Level of Service	C	
HCM Volume to Capacity ratio	0.81			
Actuated Cycle Length (s)	125.7	Sum of lost time (s)	15.0	
Intersection Capacity Utilization	78.0%	ICU Level of Service	D	
Analysis Period (min)	15			
c Critical Lane Group				

HCM Unsignalized Intersection Capacity Analysis
13: Kulanihakoi &

5/4/2011

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	43	60	479	74	21	369
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.83	0.83	0.93	0.93	0.98	0.98
Hourly flow rate (vph)	52	72	515	80	21	377
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	974	555			595	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	974	555			595	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	81	86			98	
cM capacity (veh/h)	273	531			982	

Direction, Lane #	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	52	72	595	21	377
Volume Left	52	0	0	21	0
Volume Right	0	72	80	0	0
cSH	273	531	1700	982	1700
Volume to Capacity	0.19	0.14	0.35	0.02	0.22
Queue Length 95th (ft)	17	12	0	2	0
Control Delay (s)	21.2	12.8	0.0	8.7	0.0
Lane LOS	C	B		A	
Approach Delay (s)	16.3		0.0	0.5	
Approach LOS	C				

Intersection Summary			
Average Delay	2.0		
Intersection Capacity Utilization	40.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	56	27	636	59	23	510
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.78	0.78	0.96	0.96	0.84	0.84
Hourly flow rate (vph)	72	35	662	61	27	607
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1355	693			724	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1355	693			724	
tC, single (s)	*5.4	*5.2			4.1	
tC, 2 stage (s)						
tF (s)	*2.5	*2.3			2.2	
p0 queue free %	75	95			97	
cM capacity (veh/h)	282	712			879	

Direction, Lane #	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	72	35	724	27	607
Volume Left	72	0	0	27	0
Volume Right	0	35	61	0	0
cSH	282	712	1700	879	1700
Volume to Capacity	0.25	0.05	0.43	0.03	0.36
Queue Length 95th (ft)	25	4	0	2	0
Control Delay (s)	22.1	10.3	0.0	9.2	0.0
Lane LOS	C	B		A	
Approach Delay (s)	18.2		0.0	0.4	
Approach LOS	C				

Intersection Summary				
Average Delay	1.5			
Intersection Capacity Utilization	47.1%	ICU Level of Service		A
Analysis Period (min)	15			

* User Entered Value

Appendix H

Air Quality Study for the Proposed Kīhei High School Kīhei, Maui, Hawai'i

B.D. Neal & Associates – September 2011

AIR QUALITY STUDY

FOR THE PROPOSED

KIHEI HIGH SCHOOL

KIHEI, MAUI, HAWAII

Prepared for:

Group 70 International, Inc.

September 2011

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1.0 SUMMARY

The State of Hawaii Department of Education is proposing to construct a new high school at Kihei, Maui. The proposed project will consist of high school facilities for 1,650 students on approximately 70 acres of land along Piilani Highway in Kihei. The school is expected to be completed and begin classes in 2015 with full enrollment by 2025. This study examines the potential short- and long-term air quality impacts that could occur as a result of construction and use of the proposed facilities and suggests mitigative measures to reduce any potential air quality impacts where possible and appropriate.

Both federal and state standards have been established to maintain ambient air quality. At the present time, seven parameters are regulated including: particulate matter, sulfur dioxide, hydrogen sulfide, nitrogen dioxide, carbon monoxide, ozone and lead. Hawaii air quality standards are generally comparable to the national standards although the state standards for carbon monoxide are more stringent than the national standards.

Regional and local climate together with the amount and type of human activity generally dictate the air quality of a given location. The climate of the project area is very much affected by its elevation near sea level and by nearby mountains. Haleakala shelters the area from the northeast trade winds, and local winds (such as land/sea breezes and upslope/downslope winds) affect the wind flow in the area much of the time. Temperatures in the project area are generally very consistent and warm with average daily temperatures ranging from about 63°F to 86°F. Rain-

fall in the project area is minimal with an average of only about 12 inches per year.

Except for periodic impacts from volcanic emissions (vog) and possibly occasional localized impacts from traffic congestion and local agricultural sources, the present air quality of the project area is believed to be relatively good. There is very little air quality monitoring data from the Department of Health for the project area, but the limited data that are available suggest that concentrations are generally well within state and national air quality standards.

If the proposed project is given the necessary approvals to proceed, it may be inevitable that some short- and/or long-term impacts on air quality will occur either directly or indirectly as a consequence of project construction and use. Short-term impacts from fugitive dust will likely occur during the project construction phase. To a lesser extent, exhaust emissions from stationary and mobile construction equipment, from the disruption of traffic, and from workers' vehicles may also affect air quality during the period of construction. State air pollution control regulations require that there be no visible fugitive dust emissions at the property line. Hence, an effective dust control plan must be implemented to ensure compliance with state regulations. Fugitive dust emissions can be controlled to a large extent by watering of active work areas, using wind screens, keeping adjacent paved roads clean, and by covering of open-bodied trucks. Other dust control measures could include limiting the area that can be disturbed at any given time and/or mulching or chemically stabilizing inactive areas that have been worked. Paving and landscaping of project areas early in the construction schedule

will also reduce dust emissions. Monitoring dust at the project boundary during the period of construction could be considered as a means to evaluate the effectiveness of the project dust control program. Exhaust emissions can be mitigated by moving construction equipment and workers to and from the project site during off-peak traffic hours.

After construction, motor vehicles coming to and from the proposed development will result in a long-term increase in air pollution emissions in the project area. To assess the impact of emissions from these vehicles, a computer modeling study was undertaken to estimate current ambient concentrations of carbon monoxide at intersections in the project vicinity and to predict future levels both with and without the proposed project. During worst-case conditions, model results indicated that present 1-hour and 8-hour carbon monoxide concentrations are well within both the state and the national ambient air quality standards. In the year 2015 without the project, carbon monoxide concentrations were predicted to decrease (improve) somewhat in the project area, and worst-case concentrations should remain well within air quality standards. With the project in the year 2015, carbon monoxide concentrations compared to the without-project case were projected to remain nearly unchanged, and worst-case concentrations should remain well within air quality standards. This would continue to be so in the year 2025 when full enrollment is reached. With or without the project, carbon monoxide concentrations in the project area during the next 15 years will likely decrease (improve) somewhat compared to existing concentrations. Implementing mitigation measures for traffic-related air quality impacts is probably unnecessary and unwarranted.

2.0 INTRODUCTION

The State of Hawaii Department of Education (DOE) is proposing to construct a new high school on approximately 70 acres of vacant land in Kihei on the island of Maui. The project site is located in Kihei along the mauka side Piilani Highway near Kulanihakoi Street (see Figure 1 for project location). The new school will include classrooms, library, auditorium, cafeteria, administration building, industrial arts building, ROTC facility, PE and athletic buildings and facilities, and parking areas. Access to the new high school will be provided via a new access roadway off Piilani Highway at the intersection of Kulanihakoi Street. The school is expected to open in the year 2015 with an initial enrollment of approximately 800 students. A full enrollment of 1,650 students is expected by 2025.

The purpose of this study is to describe existing air quality in the project area and to assess the potential short- and long-term direct and indirect air quality impacts that could result from construction and use of the proposed facilities as planned. Measures to mitigate potential project impacts are suggested where possible and appropriate.

3.0 AMBIENT AIR QUALITY STANDARDS

Ambient concentrations of air pollution are regulated by both national and state ambient air quality standards (AAQS). National AAQS are specified in Section 40, Part 50 of the Code of Federal Regulations (CFR), while State of Hawaii AAQS are defined in Chapter 11-59 of the Hawaii Administrative Rules. Table 1

summarizes both the national and the state AAQS that are specified in the cited documents. As indicated in the table, national and state AAQS have been established for particulate matter, sulfur dioxide, nitrogen dioxide, carbon monoxide, ozone and lead. The state has also set a standard for hydrogen sulfide. National AAQS are stated in terms of both primary and secondary standards for most of the regulated air pollutants. National primary standards are designed to protect the public health with an "adequate margin of safety". National secondary standards, on the other hand, define levels of air quality necessary to protect the public welfare from "any known or anticipated adverse effects of a pollutant". Secondary public welfare impacts may include such effects as decreased visibility, diminished comfort levels, or other potential injury to the natural or man-made environment, e.g., soiling of materials, damage to vegetation or other economic damage. In contrast to the national AAQS, Hawaii State AAQS are given in terms of a single standard that is designed "to protect public health and welfare and to prevent the significant deterioration of air quality".

Each of the regulated air pollutants has the potential to create or exacerbate some form of adverse health effect or to produce environmental degradation when present in sufficiently high concentration for prolonged periods of time. The AAQS specify a maximum allowable concentration for a given air pollutant for one or more averaging times to prevent harmful effects. Averaging times vary from one hour to one year depending on the pollutant and type of exposure necessary to cause adverse effects. In the case of the short-term (i.e., 1- to 24-hour) AAQS, both national and state standards allow a specified number of exceedances each year.

The Hawaii AAQS are in some cases considerably more stringent than the comparable national AAQS. In particular, the Hawaii 1-hour AAQS for carbon monoxide is four times more stringent than the comparable national limit. On the other hand, the current Hawaii AAQS for sulfur dioxide are probably less stringent than the national standards. During the early part of 2010, the national primary annual and 24-hour standards for sulfur dioxide were revoked in favor of a new national 1-hour standard which is considered to be more stringent than the Hawaii short-term standards. The Hawaii AAQS for sulfur dioxide have not yet been updated to bring them in line with the national standards.

In 1993, the state revised its particulate standards to follow those set by the federal government. During 1997, the federal government again revised its standards for particulate, but the new standards were challenged in federal court. A Supreme Court ruling was issued during February 2001, and as a result, the new standards for particulate were finally implemented during 2005. To date, the Hawaii Department of Health has not updated the state particulate standards.

In September 2001, the state vacated the state 1-hour standard for ozone and an 8-hour standard was adopted that was the same as the national standard. During 2008, the national standard for ozone was again revised and made more stringent. The Hawaii standard for ozone has not yet been amended to follow the national standard.

During the latter part of 2008, EPA revised the standard for lead making the standard more stringent. So far, the Hawaii Department of Health has not revised the corresponding state standard for lead.

During early 2010, a national 1-hour primary standard for nitrogen dioxide was implemented. To date, Hawaii has not promulgated a 1-hour standard for nitrogen dioxide, but the Hawaii annual standard for this pollutant is more stringent than the national annual standard.

4.0 REGIONAL AND LOCAL CLIMATOLOGY

Regional and local climatology significantly affect the air quality of a given location. Wind, temperature, atmospheric turbulence, mixing height and rainfall all influence air quality. Although the climate of Hawaii is relatively moderate throughout most of the state, significant differences in these parameters may occur from one location to another. Most differences in regional and local climates within the state are caused by the mountainous topography.

The topography of Maui is dominated by the great volcanic masses of Haleakala (10,023 feet) and the West Maui Mountains (5,788 feet). The island consists entirely of the slopes of these mountains and of a connecting isthmus. Haleakala is still considered to be an active volcano and last erupted about 1790. The project site is located in the isthmus area between the West Maui Mountains and Haleakala at an elevation of about 200 feet.

Maui lies well within the belt of northeasterly trade winds generated by the semi-permanent Pacific high pressure cell to the north and east. Because the project area is located on the leeward side of Haleakala, it is sheltered much of the time from the northeast trade winds. Occasionally, when the trade winds are more northerly, the winds will sweep through the valley between the mountains and into the Kihei area. Local winds such as land/sea breezes and/or upslope/downslope winds also influence the wind pattern for the area. During the daytime, winds can typically be expected to move onshore because of seabreeze and/or upslope effects or because of the aerodynamic cavity caused by the trade winds flowing around Haleakala. At night, winds are often drainage winds that move downslope from Haleakala and out to sea. During winter, occasional strong winds from the south or southwest occur in association with the passage of winter storm systems.

Air pollution emissions from motor vehicles, the formation of photochemical smog and smoke plume rise all depend in part on air temperature. Colder temperatures tend to result in higher emissions of contaminants from automobiles but lower concentrations of photochemical smog and ground-level concentrations of air pollution from elevated plumes. In Hawaii, the annual and daily variation of temperature depends to a large degree on elevation above sea level, distance inland and exposure to the trade winds. Average temperatures at locations near sea level generally are warmer than those at higher elevations. Areas exposed to the trade winds tend to have the least temperature variation, while inland and leeward areas often have the most. The project site's lower elevation and leeward location results in warmer temperatures compared with many other parts of the island. At Puunene, which is a few miles to the north of the project area

and at an elevation of about 130 feet, average daily minimum and maximum temperatures are 63°F and 86°F, respectively [1]. Temperatures at the project site can be expected to be similar to this or slightly cooler due to the slightly higher elevation.

Small scale, random motions in the atmosphere (turbulence) cause air pollutants to be dispersed as a function of distance or time from the point of emission. Turbulence is caused by both mechanical and thermal forces in the atmosphere. It is often measured and described in terms of Pasquill-Gifford stability class. Stability class 1 is the most turbulent and class 6 is the least. Thus, air pollution dissipates the best during stability class 1 conditions and the worst when stability class 6 prevails. In the Pukualani area, stability classes 5 or 6 typically occur during the nighttime or early morning hours when temperature inversions form due to radiational cooling or to drainage flow from the nearby mountains. Stability classes 1 through 4 occur during the daytime, depending mainly on the amount of cloud cover and incoming solar radiation and the onset and extent of the sea breeze.

Mixing height is defined as the height above the surface through which relatively vigorous vertical mixing occurs. Low mixing heights can result in high ground-level air pollution concentrations because contaminants emitted from or near the surface can become trapped within the mixing layer. In Hawaii, minimum mixing heights tend to be high because of mechanical mixing caused by the trade winds and because of the temperature moderating effect of the surrounding ocean. Low mixing heights may sometimes occur, however, at inland locations and even at times along coastal areas early in the morning following a clear, cool, windless night.

Coastal areas also may experience low mixing levels during sea breeze conditions when cooler ocean air rushes in over warmer land. Mixing heights in Hawaii typically are above 3,000 feet (1,000 meters).

Rainfall can have a beneficial effect on the air quality of an area in that it helps to suppress fugitive dust emissions, and it also may "washout" gaseous contaminants that are water soluble. Rainfall in Hawaii is highly variable depending on elevation and on location with respect to the trade wind. The climate of the project area is relatively dry due to the leeward location. Historical records from Kihei, show that this area of Maui averages about only 12 inches of precipitation per year with the summer months being the driest [1].

5.0 PRESENT AIR QUALITY

Present air quality in the project area is mostly affected by air pollutants from vehicular, industrial, natural and/or agricultural sources. Table 2 presents an air pollutant emission summary for the island of Maui for calendar year 1993. This is the most recent year for which an island-wide emission inventory is available. The emission rates shown in the table pertain to manmade emissions only, i.e., emissions from natural sources are not included. As suggested in the table, most of the manmade particulate and sulfur oxides emissions on Maui originate from point sources, such as power plants and other fuel-burning industries. Nitrogen oxides emissions are roughly equally divided between point sources and area sources (mostly motor vehicle traffic). The majority of carbon monoxide emissions occur from area sources (motor vehicle traffic and sugar cane burning), while

hydrocarbons are emitted mainly from point sources. Emissions today are probably higher than those shown in the table, but the proportional relationships are likely about the same.

The largest sources of air pollution in the immediate project area are most likely agricultural operations and automobile traffic using local roadways. Emissions from these sources consist primarily of particulate, carbon monoxide and nitrogen oxides. Power plants burning diesel fuel are located several miles away. These sources mostly emit sulfur dioxide, nitrogen oxides and particulate. Volcanic emissions from distant natural sources on the Big Island also affect the air quality at times during kona wind conditions. By the time the volcanic emissions reach the project area, they consist mostly of fine particulate sulfate.

The State Department of Health operates a network of air quality monitoring stations at various locations around the state, but only very limited data are available for Maui Island. The only air quality data for the project area consists of particulate measurements collected at Kihei. Table 3 summarizes the data from the Kihei monitoring station. Annual second-highest 24-hour PM-10 particulate concentrations (which are most relevant to the air quality standards) ranged from 60 to 119 $\mu g/m^3$ between 2005 and 2008. Average annual concentrations ranged from 20 to 26 $\mu g/m^3$. One exceedance of the state standard was recorded during 2005. This was reported to be due to agricultural tilling operations in the area. Another exceedance of the standard was reported during 2007. This was considered an exceptional event due to a brush fire nearby. Monitoring of PM-10 at the Kihei monitoring station was discontinued in 2009.

As indicated in Table 3, PM-2.5 particulate is also monitored at the Kihei monitoring station. Annual 24-hour 98^{th} percentile PM-2.5 particulate concentrations (which are most relevant to the air quality standards) ranged from 8 to 16 $\mu g/m^3$ between 2005 and 2009. Average annual concentrations ranged from 4 to 6 $\mu g/m^3$. One relatively high value was flagged during 2006 due to fireworks. No exceedances of the state standard were recorded during this period.

Given the limited air pollution sources in the area, it is likely that air pollution concentrations are near natural background levels most of the time, except possibly for locations adjacent to agricultural operations or near traffic-congested intersections. Present concentrations of carbon monoxide in the project area are estimated later in this study based on computer modeling of motor vehicle emissions.

6.0 SHORT-TERM IMPACTS OF PROJECT

Short-term direct and indirect impacts on air quality could potentially occur due to project construction. For a project of this nature, there are two potential types of air pollution emissions that could directly result in short-term air quality impacts during project construction: (1) fugitive dust from vehicle movement and soil excavation; and (2) exhaust emissions from on-site construction equipment. Indirectly, there also could be short-term impacts from slow-moving construction equipment traveling to and from the project site, from a temporary increase in local traffic caused by commuting construc-

tion workers, and from the disruption of normal traffic flow caused by lane closures of adjacent roadways.

Fugitive dust emissions may arise from the grading and dirt-moving activities associated with site clearing and preparation work. The emission rate for fugitive dust emissions from construction activities is difficult to estimate accurately. This is because of its elusive nature of emission and because the potential for its generation varies greatly depending upon the type of soil at the construction site, the amount and type of dirt-disturbing activity taking place, the moisture content of exposed soil in work areas, and the wind speed. The EPA [2] has provided a rough estimate for uncontrolled fugitive dust emissions from construction activity of 1.2 tons per acre per month under conditions of "medium" activity, moderate soil silt content (30%), and precipitation/evaporation (P/E) index of 50. Uncontrolled fugitive dust emissions at the project site would likely be somewhere near that level, depending on the amount of rainfall that occurs. In any case, State of Hawaii Air Pollution Control Regulations [3] prohibit visible emissions of fugitive dust from construction activities at the property line. Thus, an effective dust control plan for the project construction phase is essential.

Adequate fugitive dust control can usually be accomplished by the establishment of a frequent watering program to keep bare-dirt surfaces in construction areas from becoming significant sources of dust. In dust-prone or dust-sensitive areas, other control measures such as limiting the area that can be disturbed at any given time, applying chemical soil stabilizers, mulching and/or using wind screens may be necessary. Control regulations further stipulate that open-bodied trucks be covered at all times when in

motion if they are transporting materials that could be blown away. Haul trucks tracking dirt onto paved streets from unpaved areas is often a significant source of dust in construction areas. Some means to alleviate this problem, such as road cleaning or tire washing, may be appropriate. Paving of parking areas and/or establishment of landscaping as early in the construction schedule as possible can also lower the potential for fugitive dust emissions. Monitoring dust at the project property line could be considered to quantify and document the effectiveness of dust control measures.

On-site mobile and stationary construction equipment also will emit air pollutants from engine exhausts. The largest of this equipment is usually diesel-powered. Nitrogen oxides emissions from diesel engines can be relatively high compared to gasoline-powered equipment, but the annual standard for nitrogen dioxide is not likely to be violated by short-term construction equipment emissions. Also, the new short-term (1-hour) standard for nitrogen dioxide is based on a three-year average; thus it is unlikely that relatively short-term construction emissions would exceed the standard. Carbon monoxide emissions from diesel engines are low and should be relatively insignificant compared to vehicular emissions on nearby roadways.

Project construction activities will also likely obstruct the normal flow of traffic at times to such an extent that overall vehicular emissions in the project area will temporarily increase. The only means to alleviate this problem will be to attempt to keep roadways open during peak traffic hours and to move heavy construction equipment and workers to and from construction areas during periods of low traffic volume. Thus, most potential short-

term air quality impacts from project construction can be mitigated.

7.0 LONG-TERM IMPACTS OF PROJECT

After construction is completed, use of the proposed facilities will result in increased motor vehicle traffic in the project area, potentially causing long-term impacts on ambient air quality. Motor vehicles with gasoline-powered engines are significant sources of carbon monoxide. They also emit nitrogen oxides and other contaminates.

Federal air pollution control regulations require that new motor vehicles be equipped with emission control devices that reduce emissions significantly compared to a few years ago. In 1990, the President signed into law the Clean Air Act Amendments. This legislation required further emission reductions, which have been phased in since 1994. More recently, additional restrictions were signed into law during the Clinton administration, and these began to take effect during the past decade. The added restrictions on emissions from new motor vehicles will lower average emissions each year as more and more older vehicles are retired and leave the state's roadways. It is estimated that carbon monoxide emissions, for example, will go down by an average of about 20 percent per vehicle during the next 10 years due to the replacement of older vehicles with newer models.

To evaluate the potential long-term indirect ambient air quality impact of increased roadway traffic associated with a project such as this, computerized emission and atmospheric dispersion models

can be used to estimate ambient carbon monoxide concentrations along roadways leading to and from the project. Carbon monoxide is selected for modeling because it is both the most stable and the most abundant of the pollutants generated by motor vehicles. Furthermore, carbon monoxide air pollution is generally considered to be a microscale problem that can be addressed locally to some extent, whereas nitrogen oxides air pollution most often is a regional issue that cannot be addressed by a single new development.

For this project, four scenarios were selected for the carbon monoxide modeling study: (1) year 2011 with present conditions, (2) year 2015 without the project, (3) year 2015 with the project, and (4) year 2025 with the project. To begin the modeling study of the four scenarios, critical receptor areas in the vicinity of the project were identified for analysis. Generally speaking, roadway intersections are the primary concern because of traffic congestion and because of the increase in vehicular emissions associated with traffic queuing. For this study, the same key intersections identified in the traffic study were also selected for air quality analysis. These included the following intersections:

- Piilani Highway at Kaonoulu Street
- Piilani Highway at Kulanihakoi Street
- South Kihei Road at Kulanihakoi Street
- Piilani Highway at E. Waipuilani Road
- Piilani Highway at Piikea Avenue

The traffic impact report for the project [4] describes the existing and projected future traffic conditions and laneage

configurations of these intersections in detail. In performing the air quality impact analysis, it was assumed that all recommended traffic mitigation measures would be implemented.

The main objective of the modeling study was to estimate maximum 1-hour average carbon monoxide concentrations for each of the four scenarios studied. To evaluate the significance of the estimated concentrations, a comparison of the predicted values for each scenario can be made. Comparison of the estimated values to the national and state AAQS was also used to provide another measure of significance.

Maximum carbon monoxide concentrations typically coincide with peak traffic periods. The traffic impact assessment report evaluated morning and afternoon peak traffic periods. These same periods were evaluated in the air quality impact assessment.

The EPA computer model MOBILE6.2 [5] was used to calculate vehicular carbon monoxide emissions for each year studied. One of the key inputs to MOBILE6.2 is vehicle mix. Unless very detailed information is available, national average values are typically assumed, which is what was used for the present study. Based on national average vehicle mix figures, the present vehicle mix in the project area was estimated to be 34.3% light-duty gasoline-powered automobiles, 52.8% light-duty gasoline-powered trucks and vans, 3.6% heavy-duty gasoline-powered vehicles, 0.2% light-duty diesel-powered vehicles, 8.6% heavy-duty diesel-powered trucks and buses, and 0.5% motorcycles. For the future scenarios studied, the vehicle mix was estimated to change slightly with fewer light-

duty gasoline-powered automobiles and more light-duty gasoline-powered trucks and vans.

Ambient temperatures of 59 and 68 degrees F were used for morning and afternoon peak-hour emission computations, respectively. These are conservative assumptions since morning/afternoon ambient temperatures will generally be warmer than this, and emission estimates given by MOBILE6.2 generally have an inverse relationship to the ambient temperature.

After computing vehicular carbon monoxide emissions through the use of MOBILE6.2, these data were then input to an atmospheric dispersion model. EPA air quality modeling guidelines [6] currently recommend that the computer model CAL3QHC [7] be used to assess carbon monoxide concentrations at roadway intersections, or in areas where its use has previously been established, CALINE4 [8] may be used. Until a few years ago, CALINE4 was used extensively in Hawaii to assess air quality impacts at roadway intersections. In December 1997, the California Department of Transportation recommended that the intersection mode of CALINE4 no longer be used because it was thought the model has become outdated. Studies have shown that CALINE4 may tend to over-predict maximum concentrations in some situations. Therefore, CAL3QHC was used for the subject analysis.

CAL3QHC was developed for the U.S. EPA to simulate vehicular movement, vehicle queuing and atmospheric dispersion of vehicular emissions near roadway intersections. It is designed to predict 1-hour average pollutant concentrations near roadway

intersections based on input traffic and emission data, roadway/receptor geometry and meteorological conditions.

Although CAL3QHC is intended primarily for use in assessing atmospheric dispersion near signalized roadway intersections, it can also be used to evaluate unsignalized intersections. This is accomplished by manually estimating queue lengths and then applying the same techniques used by the model for signalized intersections. Currently, only one of the study intersections is signalized, Piilani Highway at Piikea Avenue. For the future scenarios without the project, in accordance with the traffic report, this was assumed to remain the case. For the future scenarios with the project, it was assumed that the intersection of Piilani Highway and Kulanihakoi Street would also become signalized.

Input peak-hour traffic data were obtained from the traffic study cited previously. This included vehicle approach volumes, saturation capacity estimates, intersection laneage and signal timings (where applicable). All emission factors that were input to CAL3QHC for free-flow traffic on roadways were obtained from MOBILE6.2 based on assumed free-flow vehicle speeds corresponding to the posted speed limits (20 to 40 mph depending on location).

Model roadways were set up to reflect roadway geometry, physical dimensions and operating characteristics. Concentrations predicted by air quality models generally are not considered valid within the roadway-mixing zone. The roadway-mixing zone is usually taken to include 3 meters on either side of the traveled portion of the roadway and the turbulent area within 10 meters of

a cross street. Model receptor sites were thus located at the edges of the mixing zones near all intersections that were studied for all four scenarios. This implies that pedestrian sidewalks either already exist or are assumed to exist in the future. All receptor heights were placed at 1.8 meters above ground to simulate levels within the normal human breathing zone.

Input meteorological conditions for this study were defined to provide "worst-case" results. One of the key meteorological inputs is atmospheric stability category. For these analyses, atmospheric stability category 6 was assumed for the morning cases, while atmospheric stability category 4 was assumed for the afternoon cases. These are the most conservative stability categories that are generally used for estimating worst-case pollutant dispersion within suburban areas for these periods. A surface roughness length of 100 cm and a mixing height of 1000 meters were used in all cases. Worst-case wind conditions were defined as a wind speed of 1 meter per second with a wind direction resulting in the highest predicted concentration. Concentration estimates were calculated at wind directions of every 5 degrees.

Existing background concentrations of carbon monoxide in the project vicinity are believed to be at low levels. Thus, background contributions of carbon monoxide from sources or roadways not directly considered in the analysis were accounted for by adding a background concentration of 0.5 ppm to all predicted concentrations for 2011. Although increased traffic is expected to occur within the project area during the next several years with or without the project, background carbon monoxide concentrations may not change significantly since individual

emissions from motor vehicles are forecast to decrease with time. Hence, a background value of 0.5 ppm was assumed to persist for the future scenarios studied.

Predicted Worst-Case 1-Hour Concentrations

Table 4 summarizes the final results of the modeling study in the form of the estimated worst-case 1-hour morning and afternoon ambient carbon monoxide concentrations. These results can be compared directly to the state and the national AAQS. Estimated worst-case carbon monoxide concentrations are presented in the table for four scenarios: year 2011 with existing traffic, year 2015 without the project, year 2015 with the project and year 2025 with the project. The locations of these estimated worst-case 1-hour concentrations all occurred at or very near the indicated intersections.

As indicated in the table, the highest estimated 1-hour concentration within the project vicinity for the present (2011) case was 4.6 ppm. This was projected to occur during the morning peak traffic hour near the intersection of Piilani Highway and Piikea Avenue. Concentrations at other locations and times studied were 4.3 ppm or lower. All predicted worst-case 1-hour concentrations for the 2011 scenario were within both the national AAQS of 35 ppm and the state standard of 9 ppm.

In the year 2015 without the proposed project, the highest worst-case 1-hour concentration was again predicted to occur during the morning at the intersection of Piilani Highway and Piikea Avenue. A value of 4.0 ppm was predicted to occur at this location and

time. Peak-hour worst-case values at the other locations and times studied for the 2015 without project scenario ranged between 1.3 and 3.9 ppm. Compared to the existing case, concentrations generally decreased somewhat, and all projected worst-case concentrations for this scenario remained well within the state and national standards.

In the year 2015 with the proposed project, the predicted highest worst-case 1-hour concentration occurred again during the morning at the intersection of Piilani Highway and Piikea Avenue with a value of 4.1 ppm, slightly higher than the without project scenario. Other concentrations for this scenario ranged between 1.3 and 3.9 ppm. The predicted concentrations remained nearly unchanged at the locations studied compared to the without project scenario, and the values remained well within the state and federal standards.

In the year 2025 with the proposed project, worst-case 1-hour concentrations remained nearly unchanged, and concentrations were predicted to be slightly lower (better) than existing concentrations. All predicted worst-case 1-hour concentrations remained well within the standards.

Predicted Worst-Case 8-Hour Concentrations

Worst-case 8-hour carbon monoxide concentrations were estimated by multiplying the worst-case 1-hour values by a persistence factor of 0.5. This accounts for two factors: (1) traffic volumes averaged over eight hours are lower than peak 1-hour values, and (2) meteorological conditions are more variable (and hence more

favorable for dispersion) over an 8-hour period than they are for a single hour. Based on monitoring data, 1-hour to 8-hour persistence factors for most locations generally vary from 0.4 to 0.8 with 0.6 being the most typical. One study based on modeling [9] concluded that 1-hour to 8-hour persistence factors could typically be expected to range from 0.4 to 0.5. EPA guidelines [10] recommend using a value of 0.7 unless a locally derived persistence factor is available. Recent monitoring data for locations on Oahu reported by the Department of Health [11] suggest that this factor may range between about 0.2 and 0.6 depending on location and traffic variability. Considering the location of the project and the traffic pattern for the area, a 1-hour to 8-hour persistence factor of 0.5 will likely yield reasonable estimates of worst-case 8-hour concentrations.

The resulting estimated worst-case 8-hour concentrations are indicated in Table 5. For the 2011 scenario, the estimated worst-case 8-hour carbon monoxide concentrations for the five locations studied ranged from 1.2 ppm at the South Kihei Road/Kulanihakoi Street intersection to 2.3 ppm at the Piilani Highway/Piikea Avenue intersection. The estimated worst-case concentrations for the existing case were well within both the state standard of 4.4 ppm and the national limit of 9 ppm.

For the year 2015 without project scenario, worst-case concentrations ranged between 1.0 and 2.0 ppm, with the highest concentration occurring at Piilani Highway and Piikea Avenue. All predicted concentrations were within the standards.

For the 2015 with project scenario, worst-case concentrations were predicted to remain essentially unchanged compared to the without project case. Predicted worst-case concentrations ranged from 1.7 to 2.0 ppm with the highest concentration again occurring at the intersection of Piilani Highway and Piikea Avenue. All predicted 8-hour concentrations for this scenario were within both the national and the state AAQS.

In the year 2025 with the project, predicted worst-case 8-hour concentrations remained the same or changed only slightly. All predicted concentrations for this scenario were well within the national and the state AAQS.

Conservativeness of Estimates

The results of this study reflect several assumptions that were made concerning both traffic movement and worst-case meteorological conditions. One such assumption concerning worst-case meteorological conditions is that a wind speed of 1 meter per second with a steady direction for 1 hour will occur. A steady wind of 1 meter per second blowing from a single direction for an hour is extremely unlikely and may occur only once a year or less. With wind speeds of 2 meters per second, for example, computed carbon monoxide concentrations would be only about half the values given above. The 8-hour estimates are also conservative in that it is unlikely that anyone would occupy the assumed receptor sites (within 3 m of the roadways) for a period of 8 hours.

8.0 CONCLUSIONS AND RECOMMENDATIONS

The major potential short-term air quality impact of the project will occur from the emission of fugitive dust during construction. Uncontrolled fugitive dust emissions from construction activities are estimated to amount to about 1.2 tons per acre per month, depending on rainfall. To control dust, active work areas and any temporary unpaved work roads should be watered at least twice daily on days without rainfall. Use of wind screens and/or limiting the area that is disturbed at any given time will also help to contain fugitive dust emissions. Wind erosion of inactive areas of the site that have been disturbed could be controlled by mulching or by the use of chemical soil stabilizers. Dirt-hauling trucks should be covered when traveling on roadways to prevent windage. A routine road cleaning and/or tire washing program will also help to reduce fugitive dust emissions that may occur as a result of trucks tracking dirt onto paved roadways in the project area. Paving of parking areas and establishment of landscaping early in the construction schedule will also help to control dust. Monitoring dust at the project boundary during the period of construction could be considered as a means to evaluate the effectiveness of the project dust control program and to adjust the program if necessary.

During construction phases, emissions from engine exhausts (primarily consisting of carbon monoxide and nitrogen oxides) will also occur both from on-site construction equipment and from vehicles used by construction workers and from trucks traveling to and from the project. Increased vehicular emissions due to disruption of traffic by construction equipment and/or commuting construction workers can be alleviated by moving equipment and personnel to the site during off-peak traffic hours.

After construction of the proposed project is completed and it is fully occupied, carbon monoxide concentrations in the project area should remain nearly unchanged compared to without the project and concentrations will likely decrease (become better) compared to the existing case. Worst-case concentrations should remain well within both the state and the national ambient air quality standards with or without the project. Implementing any air quality mitigation measures for long-term traffic-related impacts is probably unnecessary and unwarranted.

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Table 1

SUMMARY OF STATE OF HAWAII AND NATIONAL AMBIENT AIR QUALITY STANDARDS

Pollutant	Units	Averaging Time	Maximum Allowable Concentration		
			National Primary	National Secondary	State of Hawaii
Particulate Matter (<10 microns)	µg/m^3	Annual	-	-	50
		24 Hours	150[a]	150[a]	150[b]
Particulate Matter (<2.5 microns)	µg/m^3	Annual	15[c]	15[c]	-
		24 Hours	35[d]	35[d]	-
Sulfur Dioxide	ppm	Annual	-	-	0.03
		24 Hours	-	-	0.14[b]
		3 Hours	-	0.5[b]	0.5[b]
		1 Hour	0.075[e]	-	-
Nitrogen Dioxide	ppm	Annual	0.053	0.053	0.04
		1 Hour	0.100[f]	-	-
Carbon Monoxide	ppm	8 Hours	9[b]	-	4.4[b]
		1 Hour	35[b]	-	9[b]
Ozone	ppm	8 Hours	0.075[g]	0.075[g]	0.08[g]
Lead	µg/m^3	3 Months	0.15[h]	0.15[h]	-
		Quarter	1.5[i]	1.5[i]	1.5[i]
Hydrogen Sulfide	ppm	1 Hour	-	-	35[b]

[a] Not to be exceeded more than once per year on average over three years.
[b] Not to be exceeded more than once per year.
[c] Three-year average of the weighted annual arithmetic mean.
[d] 98th percentile value of the 24-hour concentrations averaged over three years.
[e] Three-year average of annual fourth-highest daily 1-hour maximum.
[f] 98th percentile value of the daily 1-hour maximum averaged over three years.
[g] Three-year average of annual fourth-highest daily 8-hour maximum.
[h] Rolling 3-month average.
[i] Quarterly average.

Table 2

AIR POLLUTION EMISSIONS INVENTORY FOR ISLAND OF MAUI, 1993

Air Pollutant	Point Sources (tons/year)	Area Sources (tons/year)	Total (tons/year)
Particulate	63,275	7,030	70,305
Sulfur Oxides	6,419	nil	6,419
Nitrogen Oxides	7,312	8,618	15,930
Carbon Monoxide	4,612	20,050	24,662
Hydrocarbons	1,991	234	2,225

Source: Final Report, "Review, Revise and Update of the Hawaii Emissions Inventory Systems for the State of Hawaii", prepared for Hawaii Department of Health by J.L. Shoemaker & Associates, Inc., 1996

Table 4

ESTIMATED WORST-CASE 1-HOUR CARBON MONOXIDE CONCENTRATIONS ALONG ROADWAYS NEAR KIHEI HIGH SCHOOL PROJECT (parts per million)

Roadway Intersection	Year/Scenario							
	2011/Present		2015/Without Project		2015/With Project		2025/With Project	
	AM	PM	AM	PM	AM	PM	AM	PM
Piilani Highway at Kaonoulu Street	4.0	2.3	3.6	2.2	3.4	2.2	3.3	2.0
Piilani Highway at Kulanihakoi Street	4.1	2.3	3.7	2.1	3.7	2.1	3.8	2.1
South Kihei Road at Kulanihakoi Street	2.3	1.4	2.0	1.3	2.0	1.3	2.0	1.3
Piilani Highway at E. Waipuilani Road	4.3	2.4	3.9	2.2	3.9	2.2	4.0	2.1
Piilani Highway at Piikea Avenue	4.6	3.0	4.0	2.7	4.1	2.7	4.1	2.6

Hawaii State AAQS: 9
National AAQS: 35

Table 3

ANNUAL SUMMARIES OF AIR QUALITY MEASUREMENTS FOR MONITORING STATIONS NEAREST KIHEI HIGH SCHOOL PROJECT

Parameter / Location	2005	2006	2007	2008	2009
Particulate (PM-10) / Kihei					
24-Hour Averaging Period:					
No. of Samples	337	337	326	331	-
Highest Concentration ($\mu g/m^3$)	155	72	281[a]	78	-
2nd Highest Concentration ($\mu g/m^3$)	119	66	93	60	-
No. of State AAQS Exceedances	1	0	1[a]	0	-
Annual Average Concentration ($\mu g/m^3$)	25	22	26	20	-
Particulate (PM-2.5) / Kihei					
24-Hour Averaging Period:					
No. of Samples	108	109	78	58	358
Highest Concentration ($\mu g/m^3$)	10	30[b]	11	16	26
98th Percentile Concentration ($\mu g/m^3$)	8	10	10	15	16
No. of State AAQS Exceedances	0	0	0	0	0
Annual Average Concentration ($\mu g/m^3$)	5	5	5	6	4

[a] **Exceptional event (brush fire)**

[b] **Data flagged due to fireworks**

Source: State of Hawaii Department of Health, "Annual Summaries, Hawaii Air Quality Data, 2005 - 2009"

Table 5

ESTIMATED WORST-CASE 8-HOUR CARBON MONOXIDE CONCENTRATIONS ALONG ROADWAYS NEAR KIHEI HIGH SCHOOL PROJECT (parts per million)

Roadway Intersection	Year/Scenario			
	2011/Present	2015/Without Project	2015/With Project	2025/With Project
Piilani Highway at Kaonoulu Street	2.0	1.8	1.7	1.6
Piilani Highway at Kulanihakoi Street	2.0	1.8	1.8	1.9
South Kihei Road at Kulanihakoi Street	1.2	1.0	1.0	1.0
Piilani Highway at E. Waipuilani Road	2.2	2.0	2.0	2.0
Piilani Highway at Piikea Avenue	2.3	2.0	2.0	2.0

Hawaii State AAQS: 4.4
National AAQS: 9

Appendix I

Acoustic Study for the Kīhei High School Project Kīhei, Maui

Y. Ebisu & Associates – September 2011

ACOUSTIC STUDY FOR THE KIHEI HIGH SCHOOL PROJECT KIHEI, MAUI

Prepared for:

GROUP 70 INTERNATIONAL

Prepared by:

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SEPTEMBER 2011

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CHAPTER I. SUMMARY

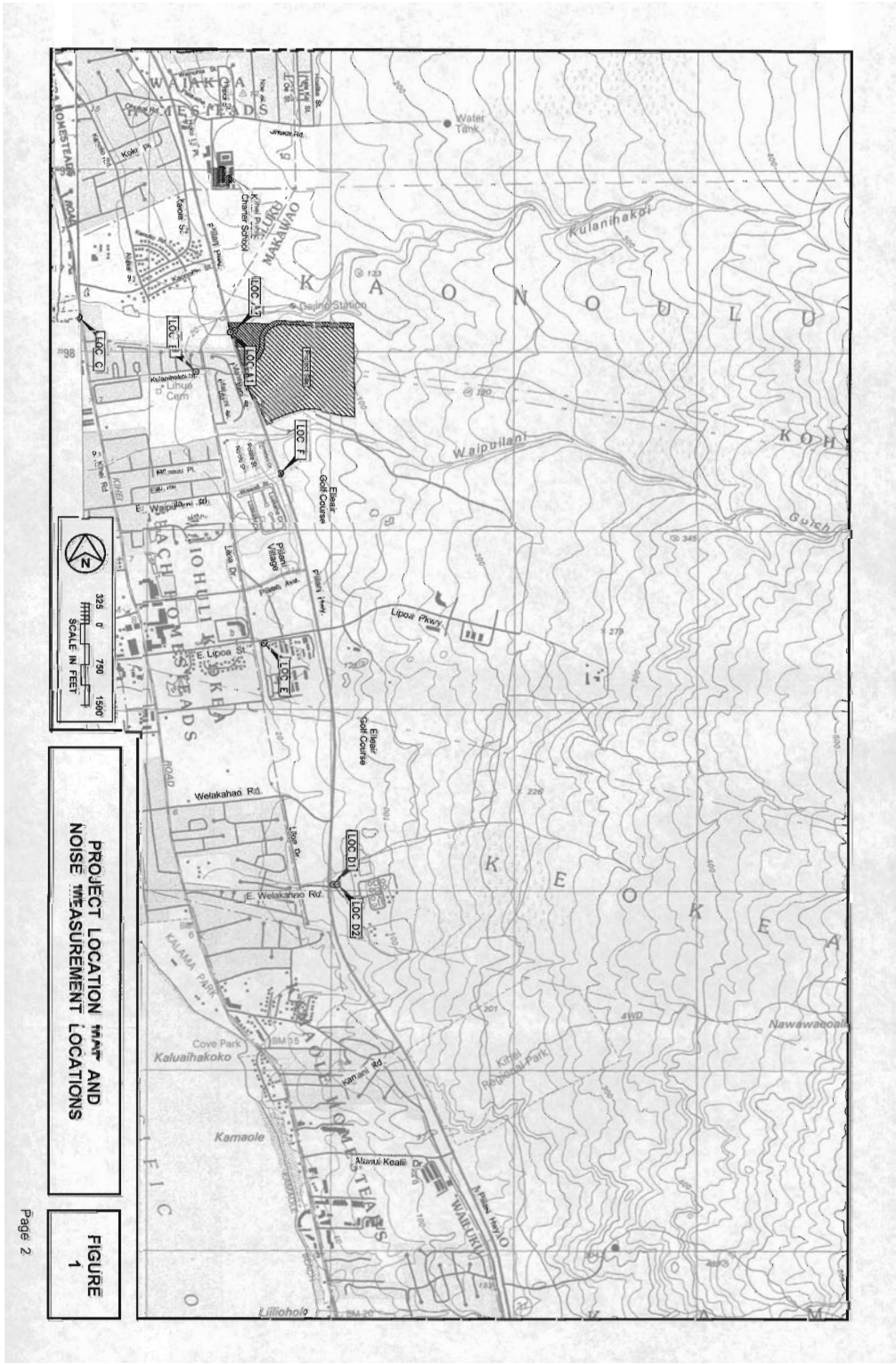
The existing and future traffic noise levels in the vicinity of the planned Kihei High School in Kihei, Maui were evaluated for their potential impacts and their relationship to current FHA/HUD noise standards and classroom background noise level requirements. The traffic noise level increases along the roadways servicing the project site (see Figure 1) were calculated. No significant increases in traffic noise levels are predicted to occur as a result of project traffic following project build-out by CY 2025.

Along Piilani Highway fronting the school site, traffic noise levels are expected to increase from approximately 70 to 71 DNL at 100 foot distance from the centerline by CY 2025 as a result of project and non-project traffic. The 0.7 DNL increase is relatively small due to the relatively high existing traffic volumes on the highway when compared to the projected increases in future traffic volumes along the highway by CY 2025. Project traffic will account for approximately 0.1 of the 0.7 DNL units of noise increase along Piilani Highway in the immediate vicinity of the project. Along Kulanihakoi Street west of Piilani Highway, traffic noise levels are expected to increase by 0.7 DNL by CY 2025 as a result of project traffic. Along South Kihei Road north and south of Kulanihakoi Street, traffic noise levels are expected to increase by 0.5 to 0.6 DNL by CY 2025 as a result of non-project traffic. These levels of traffic noise increases resulting from project generated traffic are not considered to be significant. The predicted increases in project generated traffic noise levels are not expected to generate adverse noise impacts by CY 2025.

The school site is planned such that noise sensitive buildings of the school are situated at very large setback distances from Piilani Highway, where existing and future traffic noise levels are predicted to be less than 55 DNL. The large buffer distances to the highway will allow for the use of naturally ventilated buildings on the school campus.

Potential noise impacts from outdoor activities and central plant equipment are possible on adjacent properties. Compliance with State Department of Health noise regulations are recommended to minimize adverse noise impacts on adjacent properties.

Unavoidable, but temporary, noise impacts may occur during construction of the proposed project, particularly during the excavation and earth moving activities on the project site. Because construction activities are predicted to be audible within the project site and at nearby properties, the quality of the acoustic environment may be degraded to unacceptable levels during periods of construction. Mitigation measures to reduce construction noise to inaudible levels will not be practical in all cases, but the use of quiet equipment and compliance with State Department of Health construction noise regulations are recommended as standard mitigation measures.



CHAPTER II. PURPOSE

The primary objective of this study was to describe the existing and future traffic noise environment in the environs of the proposed Kihei High School in Kihei on the island of Maui. Traffic forecasts for 2025 were used. Traffic noise level increases and impacts associated with the proposed development were to be determined within the project site as well as along the public roadways which are expected to service the project traffic. A specific objective was to determine future traffic noise level increases associated with both project and non-project traffic, and the potential noise impacts associated with these increases.

Impacts from on-site activities and short term construction noise at the project site were also included as noise study objectives. Recommendations for minimizing identified noise impacts were also to be provided as required.

CHAPTER III. NOISE DESCRIPTORS AND THEIR RELATIONSHIP TO LAND USE COMPATIBILITY

The noise descriptor currently used by federal agencies (such as FHA/HUD) to assess environmental noise is the Day-Night Average Sound Level (DNL). This descriptor incorporates a 24-hour average of instantaneous A-Weighted Sound Levels as read on a standard Sound Level Meter. By definition, the minimum averaging period for the DNL descriptor is 24 hours. Additionally, sound levels which occur during the nighttime hours of 10:00 PM to 7:00 AM are increased by 10 decibels (dB) prior to computing the 24-hour average by the DNL descriptor. A more complete list of noise descriptors is provided in APPENDIX B to this report.

Table 1, derived from Reference 1, presents current federal noise standards and acceptability criteria for residential land uses. Table 2, also extracted from Reference 1, presents the general effects of noise on people in residential use situations. Land use compatibility guidelines for various levels of environmental noise as measured by the DNL descriptor system are shown in Figure 2 (from Reference 2). As a general rule, noise levels of 55 DNL or less occur in rural areas, or in areas which are removed from high volume roadways. In urbanized areas which are shielded from high volume streets, DNL levels generally range from 55 to 65 DNL, and are usually controlled by motor vehicle traffic noise. Residences which front major roadways are generally exposed to levels of 65 DNL, and as high as 75 DNL when the roadway is a high speed freeway. In the project area, traffic noise levels associated with Piilani Highway and South Kihei Road are typically greater than 65 DNL along the Right-of-Way due to the relatively large volumes of traffic on these major thoroughfares.

For purposes of determining noise acceptability for funding assistance from federal agencies (FHA/HUD and VA), an exterior noise level of 65 DNL or less is considered acceptable for residences. This standard is applied nationally (Reference 3), including Hawaii. Because of our open-living conditions, the predominant use of naturally ventilated dwellings, and the relatively low exterior-to-interior sound attenuation afforded by these naturally ventilated structures, an exterior noise level of 65 DNL does not eliminate all risks of noise impacts. Because of these factors, and as recommended in Reference 4, a lower level of 55 DNL is considered as the "Unconditionally Acceptable" (or "Near-Zero Risk") level of exterior noise. However, after considering the cost and feasibility of applying the lower level of 55 DNL, government agencies such as FHA/HUD and VA have selected 65 DNL as a more appropriate regulatory standard.

For commercial, industrial, and other non-noise sensitive land uses, exterior noise levels as high as 75 DNL are generally considered acceptable. Exceptions to this occur when naturally ventilated office and other commercial establishments are exposed to exterior levels which exceed 65 DNL.

On the island of Maui, the State Department of Health (DOH) regulates noise from construction activities through the issuance of permits for allowing excessive

TABLE 1

EXTERIOR NOISE EXPOSURE CLASSIFICATION (RESIDENTIAL LAND USE)

NOISE EXPOSURE CLASS	DAY–NIGHT SOUND LEVEL	EQUIVALENT SOUND LEVEL	FEDERAL (1) STANDARD
Minimal Exposure	Not Exceeding 55 DNL	Not Exceeding 55 Leq	Unconditionally Acceptable
Moderate Exposure	Above 55 DNL But Not Above 65 DNL	Above 55 Leq But Not Above 65 Leq	Acceptable(2)
Significant Exposure	Above 65 DNL But Not Above 75 DNL	Above 65 Leq But Not Above 75 Leq	Normally Unacceptable
Severe Exposure	Above 75 DNL	Above 75 Leq	Unacceptable

Notes: (1) Federal Housing Administration, Veterans Administration, Department of Defense, and Department of Transportation.

(2) FHWA uses the Leq instead of the Ldn descriptor. For planning purposes, both are equivalent if: (a) heavy trucks do not exceed 10 percent of total traffic flow in vehicles per 24 hours, and (b) traffic between 10:00 PM and 7:00 AM does not exceed 15 percent of average daily traffic flow in vehicles per 24 hours. The noise mitigation threshold used by FHWA for residences is 67 Leq.

TABLE 2

EFFECTS OF NOISE ON PEOPLE (Residential Land Uses Only)

EFFECTS[1] / DAY-NIGHT AVERAGE SOUND LEVEL IN DECIBELS	Hearing Loss	Speech Interference		Annoyance[2]	Average Community Reaction[4]	General Community Attitude Towards Area
	Qualitative Description	Indoor %Sentence Intelligibility	Outdoor Distance In Meters for 95% Sentence Intelligibility	% of Population[3] Highly Annoyed		
75 and above	May Begin to Occur	98%	0.5	37%	Very Severe	Noise is likely to be the most important of all adverse aspects of the community environment.
70	Will Not Likely Occur	99%	0.9	25%	Severe	Noise is one of the most important adverse aspects of the community environment.
65	Will Not Occur	100%	1.5	15%	Significant	Noise is one of the important adverse aspects of the community environment.
60	Will Not Occur	100%	2.0	9%	Moderate to Slight	Noise may be considered an adverse aspect of the community environment.
55 and below	Will Not Occur	100%	3.5	4%		Noise considered no more important than various other environmental factors.

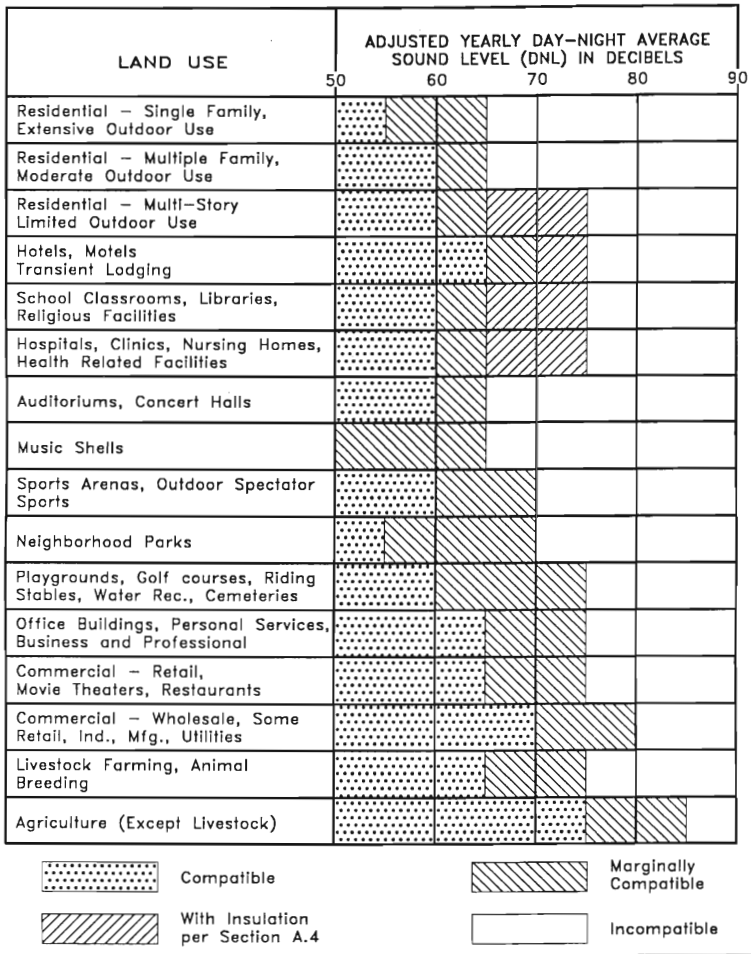
1. "Speech Interference" data are drawn from the following tables in EPA's "Levels Document": Table 3, Fig. D-1, Fig. D-2, Fig. D-3. All other data from National Academy of Science 1977 report "Guidelines for Preparing Environmental Impact Statements on Noise. Report of Working Group 69 on Evaluation of Environmental Impact of Noise."

2. Depends on attitudes and other factors.

3. The percentages of people reporting annoyance to lesser extents are higher in each case. An unknown small percentage of people will report being "highly annoyed" even in the quietest surroundings. One reason is the difficulty all people have in integrating annoyance over a very long time.

4. Attitudes or other non-acoustic factors can modify this. Noise at low levels can still be an important problem, particularly when it intrudes into a quiet environment.

NOTE: Research implicates noise as a factor producing stress-related health effects such as heart disease, high blood pressure and stroke, ulcers and other digestive disorders. The relationships between noise and these effects, however, have not as yet been quantified.



LAND USE COMPATIBILITY WITH YEARLY AVERAGE DAY–NIGHT AVERAGE SOUND LEVEL (DNL) AT A SITE FOR BUILDINGS AS COMMONLY CONSTRUCTED.
(Source: American National Standards Institute S12.9–1998/Part 5)

FIGURE 2

noise during limited time periods. State DOH noise regulations are expressed in maximum allowable property line noise limits rather than DNL (see Reference 5). Although they are not directly comparable to noise criteria expressed in DNL, State DOH noise limits for residential, commercial, and industrial lands equate to approximately 55, 60, and 76 DNL, respectively.

TABLE 3

TRAFFIC AND BACKGROUND NOISE MEASUREMENT RESULTS

LOCATION	Time of Day (HRS)	Ave. Speed (MPH)	Hourly Traffic Volume -------- AUTO	M.TRUCK	H.TRUCK	Measured Leq (dB)	Predicted Leq (dB)
A1. 60 FT from the center line of Piilani Highway (9/12/11)	0634 TO 0734	55	2,358	29	17	74.2	72.9
A2. 120 FT from the center line of Piilani Highway (9/12/11)	0634 TO 0734	55	2,358	29	17	67.7	68.0
B. 50 FT from the center line of Kulanihakoi Street (9/12/11)	0757 TO 0857	35	152	2	0	57.9	55.9
C. 50 FT from the center line of South Kihei Road (9/12/11)	0917 TO 1017	40	802	13	7	64.6	64.8
A1. 60 FT from the center line of Piilani Highway (9/12/11)	1539 TO 1639	55	2,832	28	10	74.0	73.5

CHAPTER IV. GENERAL STUDY METHODOLOGY

Existing traffic noise levels were measured at eight locations (A1, A2, B, C, D1, D2, E, and F) in the project environs to provide a basis for developing the project's traffic noise contributions along the roadways which will service the proposed development. The locations of the measurement sites are shown in Figure 1. Noise measurements were performed during the month of September 2011. The results of the traffic noise measurements were compared with calculations of existing traffic noise levels to validate the computer model used. The traffic noise measurement results, and their comparisons with computer model predictions of existing traffic noise levels are summarized in Table 3.

Traffic noise calculations for the existing conditions as well as noise predictions for the Year 2025 were performed using the Federal Highway Administration (FHWA) Traffic Noise Model (Reference 6). Traffic data entered into the noise prediction model were: roadway and receiver locations; hourly traffic volumes, average vehicle speeds; estimates of traffic mix; and "Loose Soil" propagation loss factor. The traffic data and forecasts for the project (Reference 7), plus the spot traffic counts obtained during the noise measurement periods were the primary sources of data inputs to the model. Appendix C summarizes the AM and PM peak hour traffic volumes for CY 2010 and 2025 which were used to model existing and future traffic noise along the streets in the vicinity of the project site. For existing and future traffic along the streets in the vicinity of the project site, it was assumed that the average noise levels, or Leq(h), during the AM or PM peak traffic hour were equal to the 24-hour DNL along those roadways. This assumption was based on computations of both the hourly Leq and the 24-hour DNL of traffic noise on Piilani Highway (see Figure 3) using State of Hawaii hourly traffic counts from Reference 8.

Traffic noise calculations for both the existing and future conditions in the project environs were developed for ground level receptors with and without the benefit of shielding from natural terrain features or man made obstructions. Traffic noise levels were also calculated for future conditions with and without the proposed project. The forecasted changes in traffic noise levels over existing levels were calculated with and without the project, and noise impact risks evaluated. The relative contributions of non-project and project traffic to the total noise levels were also calculated, and an evaluation of possible traffic noise impacts was made.

Calculations of average exterior and interior noise levels from construction activities were performed for typical naturally ventilated and air conditioned dwellings. Predicted noise levels were compared with existing background ambient noise levels, and the potential for noise impacts was assessed.

TABLE 3 (CONTINUED)

TRAFFIC AND BACKGROUND NOISE MEASUREMENT RESULTS

LOCATION	Time of Day (HRS)	Ave. Speed (MPH)	Hourly Traffic Volume AUTO	M.TRUCK	H.TRUCK	Measured Leq (dB)	Predicted Leq (dB)
D1. 75 FT from the center line of Piilani Highway (9/13/11)	1540 TO 1640	53	2,356	21	15	71.4	69.8
D2. 150 FT from the center line of Piilani Highway (9/13/11)	1540 TO 1640	53	2,356	21	15	62.5	62.4

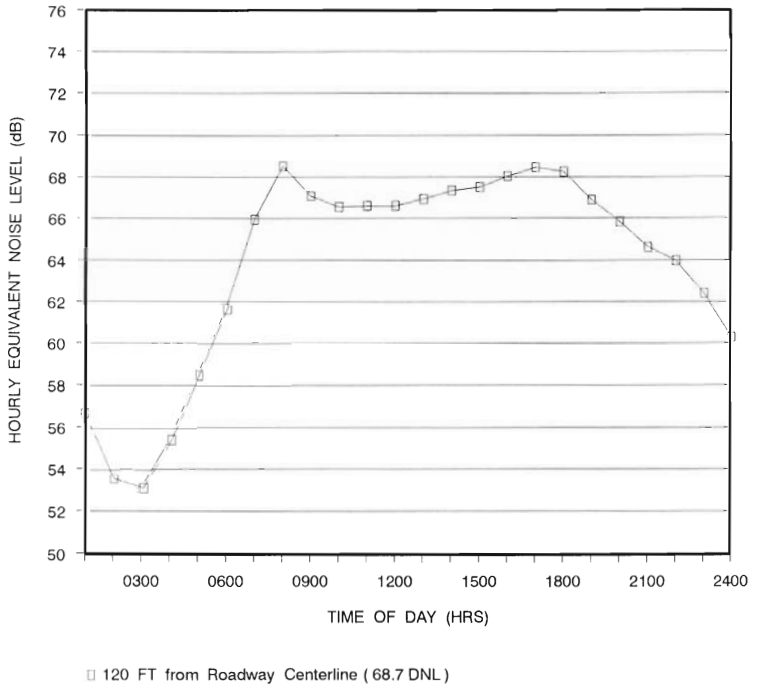
TABLE 3 (CONTINUED)

TRAFFIC AND BACKGROUND NOISE MEASUREMENT RESULTS

LOCATION	Time of Day (HRS)	Ave. Speed (MPH)	Hourly Traffic Volume AUTO	M.TRUCK	H.TRUCK	Measured Leq (dB)	Predicted Leq (dB)
A2. 120 FT from the center line of Piilani Highway (9/12/11)	1539 TO 1639	55	2,832	28	10	68.0	68.3
D1. 75 FT from the center line of Piilani Highway (9/13/11)	0646 TO 0746	55	1,863	18	35	72.0	69.4
D2. 150 FT from the center line of Piilani Highway (9/13/11)	0646 TO 0746	55	1,863	18	35	62.1	62.5
E. 50 FT from the center line of Lipoa Street (9/13/11)	0809 TO 0909	35	402	6	12	61.7	61.1
F. 78 FT from the center line of Piilani Highway (9/13/11)	1030 TO 1130	53	1,950	34	31	69.7	69.7

FIGURE 3

HOURLY VARIATIONS OF TRAFFIC NOISE AT 120 FT SETBACK DISTANCE FROM THE CENTERLINE OF PIILANI HIGHWAY BETWEEN MOKULELE HWY. AND LIPOA ST. (STA. B74003100000; APRIL 21, 2009)



V. EXISTING ACOUSTICAL ENVIRONMENT

The existing background ambient noise levels within the project site are relatively low at the mauka (east) end and relatively high on the makai (west) end of the site. Traffic along Piilani Highway controls the background noise levels at the makai end of the project site, and diminishes to relatively low levels at the mauka end of the project site. On the makai side of Piilani Highway, existing traffic noise levels also diminish with increasing distances from Piilani Highway, and are controlled by the traffic on connector roads and South Kihei Road in areas between Piilani Highway and the shoreline.

Traffic and background ambient noise measurements were obtained in September 2011 at eight locations (A1, A2, B, C, D1, D2, E, and F) in the project environs. These locations are shown in Figure 1. The results of the traffic and background ambient noise measurements are summarized in Table 3, with measurement locations identified in Figure 1. The measurement locations were typically located at street level. As shown in Table 3, correlation between measured and predicted traffic noise levels was good. The Traffic Noise Model's "Loose Soil" and "Field Grass" propagation loss factors were used to obtain the good correlation.

Calculations of existing traffic noise levels during the AM and PM peak traffic hours are presented in Table 4. The hourly Leq (or Equivalent Sound Level) contribution from each roadway section in the project environs was calculated for comparison with forecasted traffic noise levels with and without the project. In Table 4, the Leq values shown also represent the DNL values for the roadways shown. The existing setback distances from the roadways' centerlines to their associated 65 and 75 DNL contours were also calculated as shown in Table 5. The contour line setback distances do not take into account noise shielding effects or the additive contributions of traffic noise from intersecting street sections.

The existing traffic noise levels in the project environs along Piilani Highway are in the "Significant Exposure, Normally Unacceptable" category, and at or greater than 65 DNL at the first row of existing homes on the makai side of the highway. The existing traffic noise levels in the project environs along South Kihei Road are in the "Significant Exposure, Normally Unacceptable" categories, and at or greater than 65 DNL within 50 feet of the roadway's centerline. Along the lower volume connector streets, existing traffic noise levels are in the "Moderate Exposure, Acceptable" category, and less than 65 DNL at 50 feet or greater distance from the roadways' centerlines.

The existing background noise levels at the school site were estimated to range from approximately 56 to 62 DNL near the proposed Practice Fields to approximately 45 DNL at the mauka end of the project site. These estimates were based on traffic noise model calculations of existing noise levels along Piilani Highway.

TABLE 5

EXISTING AND CY 2025 DISTANCES TO 65 AND 75 DNL CONTOURS

STREET SECTION	65 DNL SETBACK (FT) EXISTING	65 DNL SETBACK (FT) CY 2025	75 DNL SETBACK (FT) EXISTING	75 DNL SETBACK (FT) CY 2025
Piilani Hwy. North of Kaonoulu St. (AM)	328	345	47	50
Piilani Hwy. North of Kaonoulu St. (PM)	349	371	51	54
Piilani Hwy. Between Kaonoulu & Kulanihakoi St. (AM)	341	354	49	53
Piilani Hwy. Between Kaonoulu & Kulanihakoi St. (PM)	353	376	51	55
Piilani Hwy. Between Kulanihakoi & E. Waipulani St. (AM)	366	405	52	58
Piilani Hwy. Between Kulanihakoi & E. Waipulani St. (PM)	353	376	51	57
Piilani Hwy. Between E. Waipulani & Piikea Ave. (AM)	366	390	52	58
Piilani Hwy. Between E. Waipulani & Piikea Ave. (PM)	349	381	51	56
Piilani Hwy. South of Piikea Ave. (AM)	336	380	49	54
Piilani Hwy. South of Piikea Ave. (PM)	333	371	49	54
Kulanihakoi St. E. of Piilani Hwy. (AM)	N/A	35	N/A	< 12
Kulanihakoi St. W. of Piilani Hwy. (AM)	23	25	< 12	< 12
Kulanihakoi St. E. of South Kihei Rd. (AM)	17	19	< 12	< 12
South Kihei Rd. N. of Kulanihakoi St. (AM)	49	52	< 12	< 12
South Kihei Rd. N. of Kulanihakoi St. (PM)	56	60	< 12	< 12
South Kihei Rd. S. of Kulanihakoi St. (AM)	50	54	< 12	< 12
South Kihei Rd. S. of Kulanihakoi St. (PM)	58	62	< 12	< 12

Notes:

(1) All setback distances are from the roadways' centerlines.
(2) See TABLES 4 and 6 for traffic volume, speed, and mix assumptions.
(3) Setback distances are for ground level receptors.

TABLE 4

EXISTING (CY 2010) TRAFFIC VOLUMES AND NOISE LEVELS ALONG ROADWAYS IN PROJECT AREA (AM OR PM PEAK HOUR)

LOCATION	SPEED (MPH)	TOTAL VPH	****** VOLUMES (VPH) ******** AUTOS	M TRUCKS	H TRUCKS	50' Leq	100' Leq	200' Leq
Piilani Hwy. North of Kaonoulu St. (AM)	55	2,808	2,763	31	14	74.6	69.6	64.0
Piilani Hwy. North of Kaonoulu St. (PM)	55	3,151	3,100	35	16	75.1	70.1	64.5
Piilani Hwy. Between Kaonoulu & Kulanihakoi St. (AM)	55	3,034	2,989	30	15	74.9	69.9	64.3
Piilani Hwy. Between Kaonoulu & Kulanihakoi St. (PM)	55	3,247	3,199	32	16	75.2	70.2	64.6
Piilani Hwy. Between Kulanihakoi & E. Waipulani St. (AM)	55	3,100	3,023	31	46	75.3	70.3	64.8
Piilani Hwy. Between Kulanihakoi & E. Waipulani St. (PM)	55	3,275	3,226	33	16	75.2	70.2	64.6
Piilani Hwy. Between E. Waipulani & Piikea Ave. (AM)	55	3,093	3,016	31	46	75.3	70.3	64.8
Piilani Hwy. Between E. Waipulani & Piikea Ave. (PM)	55	3,207	3,159	32	16	75.1	70.1	64.5
Piilani Hwy. South of Piikea Ave. (AM)	55	2,786	2,716	28	42	74.8	69.9	64.3
Piilani Hwy. South of Piikea Ave. (PM)	55	3,073	3,027	31	15	74.9	70.0	64.3
Kulanihakoi St. E. of Piilani Hwy. (AM)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Kulanihakoi St. W. of Piilani Hwy. (AM)	35	302	298	4	0	58.4	52.5	46.4
Kulanihakoi St. E. of South Kihei Rd. (AM)	35	171	169	2	0	55.9	50.0	43.9
South Kihei Rd. N. of Kulanihakoi St. (AM)	40	825	805	12	8	64.9	59.1	53.1
South Kihei Rd. N. of Kulanihakoi St. (PM)	40	1,055	1,028	16	11	66.0	60.2	54.3
South Kihei Rd. S. of Kulanihakoi St. (AM)	40	834	813	13	8	65.0	59.2	54.5
South Kihei Rd. S. of Kulanihakoi St. (PM)	40	1,114	1,086	17	11	66.2	60.4	54.3

TABLE 6

FUTURE (CY 2025) TRAFFIC VOLUMES AND NOISE LEVELS ALONG ROADWAYS IN PROJECT AREA (AM OR PM PEAK HOUR, BUILD)

LOCATION	SPEED (MPH)	TOTAL VPH	****** VOLUMES (VPH) ******** AUTOS	M TRUCKS	H TRUCKS	50' Leq	100' Leq	200' Leq
Piilani Hwy. North of Kaonoulu St. (AM)	55	3,097	3,048	34	15	75.0	70.0	64.4
Piilani Hwy. North of Kaonoulu St. (PM)	55	3,545	3,488	39	18	75.6	70.6	65.0
Piilani Hwy. Between Kaonoulu & Kulanihakoi St. (AM)	55	3,372	3,321	34	17	75.4	70.4	64.7
Piilani Hwy. Between Kaonoulu & Kulanihakoi St. (PM)	55	3,655	3,600	37	18	75.7	70.7	65.1
Piilani Hwy. Between Kulanihakoi & E. Waipulani St. (AM)	55	3,737	3,644	37	56	76.1	71.1	65.6
Piilani Hwy. Between Kulanihakoi & E. Waipulani St. (PM)	55	3,780	3,723	38	19	75.9	70.9	65.2
Piilani Hwy. Between E. Waipulani & Piikea Ave. (AM)	55	3,666	3,574	37	55	76.0	71.1	65.5
Piilani Hwy. Between E. Waipulani & Piikea Ave. (PM)	55	3,705	3,649	37	19	75.8	70.8	65.2
Piilani Hwy. South of Piikea Ave. (AM)	55	3,307	3,224	33	50	75.6	70.6	65.1
Piilani Hwy. South of Piikea Ave. (PM)	55	3,571	3,517	36	18	75.6	70.6	65.0
Kulanihakoi St. E. of Piilani Hwy. (AM)	35	693	683	9	1	62.0	56.2	50.2
Kulanihakoi St. W. of Piilani Hwy. (AM)	35	360	355	5	0	59.1	53.3	47.2
Kulanihakoi St. E. of South Kihei Rd. (AM)	35	198	195	3	0	56.6	50.7	44.6
South Kihei Rd. N. of Kulanihakoi St. (AM)	40	929	906	14	9	65.4	59.6	53.7
South Kihei Rd. N. of Kulanihakoi St. (PM)	40	1,196	1,166	18	12	66.5	60.7	54.8
South Kihei Rd. S. of Kulanihakoi St. (AM)	40	965	941	14	10	65.6	59.8	53.9
South Kihei Rd. S. of Kulanihakoi St. (PM)	40	1,261	1,229	19	13	66.8	61.0	55.0

CHAPTER VI. FUTURE NOISE ENVIRONMENT

Predictions of future traffic noise levels were made using the traffic volume assignments of Reference 7 for CY 2025 with the proposed project. Estimates of CY 2025 traffic volumes without the project were made by subtracting the project traffic from the total traffic volumes for CY 2025 as contained in Reference 7. The future projections of project plus non-project traffic noise levels on the roadways which would service the project are shown in Table 6 for the AM and PM peak hours of traffic, under the Build Alternative. Predicted increases in the setback distances to the 65 and 75 DNL contours are shown in Table 5. The separate non-project and project traffic noise contributions for the Build Alternative are shown in Table 7.

Very small changes in traffic noise levels (0.0 to 0.1 DNL) are expected along Piilani Highway in the project environs between CY 2010 and 2025 as a result of project traffic. The growth in non-project traffic by CY 2025 is predicted to result in traffic noise level increases of 0.5 to 0.6 DNL along Piilani Highway. Similar increases in future traffic noise levels are predicted to occur along South Kihei Road. By CY 2025, traffic noise levels in the project area along these two major roadways are expected to increase primarily due to the anticipated growth in non-project traffic, and it will be difficult to determine the increases in future traffic noise associated with the project traffic.

Along Kulanihakoi Street makai of Piilani Highway, increases in future traffic noise levels of 0.7 DNL are predicted by CY 2025, and primarily as a result of project traffic. No increases in traffic noise levels from non-project traffic are predicted along Kulanihakoi Street makai of Piilani Highway. Traffic noise level increases on the mauka side of the Piilani Highway along the future entrance road to the project site are associated only with project traffic.

The dominant traffic noise sources in the project environs will continue to be traffic along Piilani Highway and South Kihei Road, with the increases in future traffic noise levels being relatively small along these two roadways and primarily associated with non-project traffic.

Future traffic noise levels on the proposed school site from forecasted traffic along Piilani are anticipated to range from 45 DNL near the mauka property line to 63 DNL near the makai edge of the Practice Baseball Field. The future campus of Kihei High School is planned so that the noise sensitive buildings and classrooms are set back at least 650 feet from Piilani Highway, where future traffic noise levels are predicted to be less than 55 DNL. The terracing of the school grounds plus the noise shielding effects from buildings which are closest to the highway should further reduce traffic noise levels from Piilani Highway.

TABLE 7

CALCULATIONS OF PROJECT AND NON-PROJECT TRAFFIC NOISE CONTRIBUTIONS (CY 2025) (DNL)

STREET SECTION	NOISE LEVEL INCREASE DUE TO: NON-PROJECT TRAFFIC	PROJECT TRAFFIC
Piilani Hwy. North of Kaonoulu St.	0.5	0.0
Piilani Hwy. Between Kaonoulu & Kulanihakoi St.	0.5	0.0
Piilani Hwy. Between Kulanihakoi & E. Waipulani St.	0.6	0.1
Piilani Hwy. Between E. Waipulani & Piikea Ave.	0.6	0.1
Piilani Hwy. South of Piikea Ave.	0.5	0.1
Kulanihakoi St. E. of Piilani Hwy.	N/A	62.0
Kulanihakoi St. W. of Piilani Hwy.	0.0	0.7
Kulanihakoi St. E. of South Kihei Rd.	0.0	0.7
South Kihei Rd. N. of Kulanihakoi St.	0.5	0.0
South Kihei Rd. S. of Kulanihakoi St.	0.6	0.0

CHAPTER VII. DISCUSSION OF PROJECT-RELATED NOISE IMPACTS AND POSSIBLE MITIGATION MEASURES

Traffic Noise. Existing traffic noise levels along Piilani Highway and South Kihei Road are very high, and are expected to remain so through CY 2025. Traffic noise impacts along those two roadways will continue to occur at noise sensitive receptors which are not provided with noise mitigation measures such as sound attenuating walls and/or closure and air conditioning.

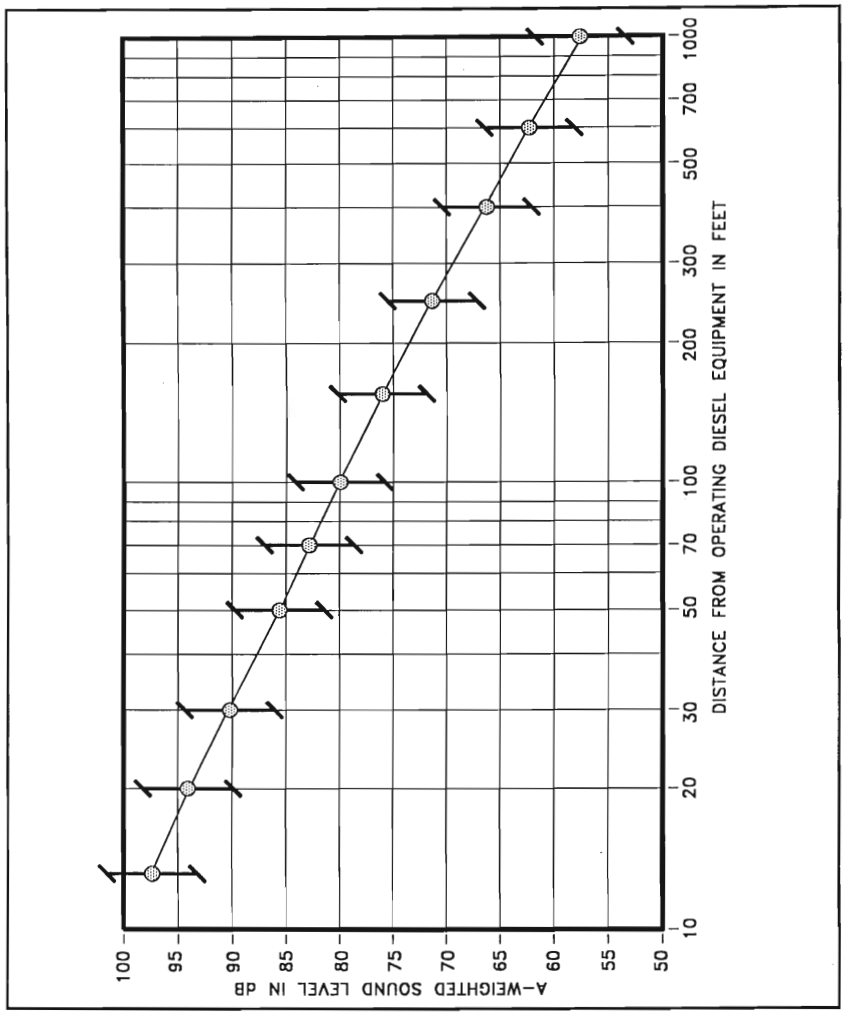
Project related traffic along Piilani Highway and South Kihei Road are not expected to cause measurable increases in future traffic noise levels. The largest increases (of 0.7 DNL) in project related traffic noise are predicted to occur along Kulanihakoi Street makai of Piilani Highway, where future traffic noise levels should remain in the "Moderate Exposure, Normally Acceptable" category. For these reasons, traffic noise mitigation measures should not be required.

On-Site Noise Sources. The potential noise from playground, practice field, pool, and athletic stadium activities could disturb neighboring residences. Noise levels associated with these outdoor facilities tend to be high due to the shouting and screaming which occur during these outdoor activities and play periods. The neighboring properties to the south and across Piilani Highway to the west are the most likely areas to experience the highest noise levels (53 to 65 dBA) from these outdoor activities. In addition, potential noise levels from the school's central plant equipment may also cause adverse noise impacts if the noise levels are not controlled.

Noise mitigation measures which limit the noise from fixed mechanical equipment to those allowed by the State Department of Health (Reference 5) should be incorporated into the project. In addition, public address systems installed at the outdoor facilities should be designed to minimize sound spillover into adjacent properties.

General Construction Noise. Audible construction noise will probably be unavoidable during the entire project construction period. The total time period for construction is unknown, but it is anticipated that the actual work will be moving from one location on the project site to another during that period. Actual length of exposure to construction noise at any receptor location will probably be less than the total construction period for the entire project. Typical levels of exterior noise from construction activity (excluding pile driving activity) at various distances from the job site are shown in Figure 4. The impulsive noise levels of impact pile drivers are approximately 15 dB higher than the levels shown in Figure 4, while the intermittent noise levels of vibratory pile drivers are at the upper end of the noise level ranges depicted in the figure.

Figure 4 is useful for predicting exterior noise levels at short distances (within 100 FT) from the work when visual line of sight exists between the construction



ANTICIPATED RANGE OF CONSTRUCTION NOISE LEVELS VS. DISTANCE

FIGURE 4

equipment and the receptor. Direct line-of-sight distances from the construction equipment to existing residential buildings will range from 200 FT to 1,400 FT, with corresponding average noise levels of 74 to 57 dBA (plus or minus 5 dBA). Typical levels of construction noise inside naturally ventilated and air conditioned structures are approximately 10 and 20 dB less, respectively, than the levels shown in Figure 4.

The existing residences across Piilani Highway west of the school site are the closest existing residences to the potential construction activities within the school site. The highest noise levels from construction activities of 69 to 79 dBA are expected to occur during earthwork and site preparation activities at the west end of the school site. The noise from construction activities will decrease and be masked by traffic noise along Piilani Highway at these residences as school construction activities move toward the east end of the project site. Adverse impacts from construction noise are not expected to be in the "public health and welfare" category due to the temporary nature of the work, and due to the administrative controls available for regulation of construction noise. Instead, these impacts will probably be limited to the temporary degradation of the quality of the acoustic environment in the immediate vicinity of the project site.

Mitigation of construction noise to inaudible levels will not be practical in all cases due to the intensity of construction noise sources (80 dB at 100 FT distance), and due to the exterior nature of the work (pile driving, grading and earth moving, trenching, concrete pouring, hammering, etc.). The use of properly muffled construction equipment should be required on the job site.

Peak airborne noise levels from pile diving may be as much as 15 dBA greater than noise levels shown in Figure 4 for non-impulsive (steady) construction noise sources. Although the pile driving can produce more intense noise levels, each pulse is of short individual duration (less than one second). Therefore, its impact on speech communication is not as severe as that of a steady source of the same noise level.

Severe noise impacts are not expected to occur inside air conditioned structures which are beyond 200 FT of the project construction site. Inside naturally ventilated structures, interior noise levels (with windows or doors opened) are estimated to range between 65 to 53 dBA at 200 FT to 600 FT distances from the construction site. Closure of all doors and windows facing the construction site would generally reduce interior noise levels by an additional 5 to 10 dBA.

The incorporation of State Department of Health construction noise limits and curfew times, which are applicable throughout the State of Hawaii (Reference 5), is another noise mitigation measure which is normally applied to construction activities. Figure 5 depicts the normally permitted hours of construction. Noisy construction activities are not allowed on Sundays and holidays, during the early morning, and during the late evening and nighttime periods under the DOH permit procedures.

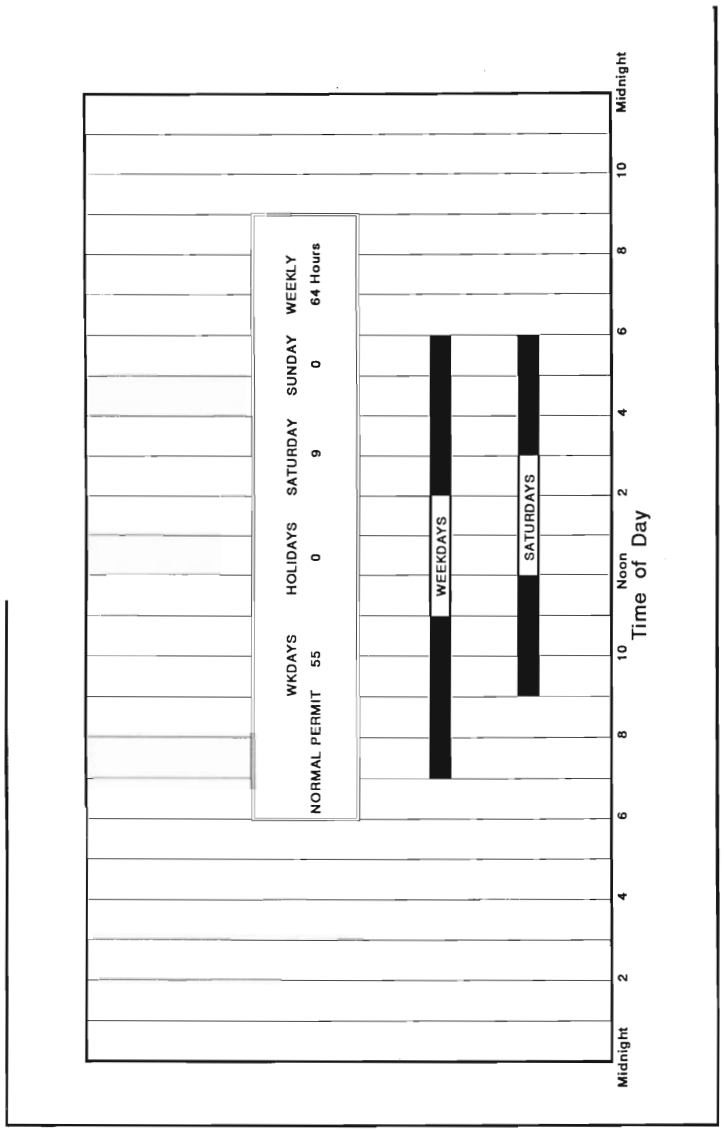


FIGURE 5

AVAILABLE WORK HOURS UNDER DOH PERMIT PROCEDURES FOR CONSTRUCTION NOISE

APPENDIX A. REFERENCES

(1) "Guidelines for Considering Noise in Land Use Planning and Control;" Federal Interagency Committee on Urban Noise; June 1980.

(2) American National Standard, "Sound Level Descriptors for Determination of Compatible Land Use," ANSI S12.9-1998/ Part 5; Acoustical Society of America.

(3) "Environmental Criteria and Standards, Noise Abatement and Control, 24 CFR, Part 51, Subpart B;" U.S. Department of Housing and Urban Development; July 12, 1979.

(4) "Information on Levels of Environmental Noise Requisite to Protect the Public Health and Welfare with an Adequate Margin of Safety;" U.S. Environmental Protection Agency; EPA 550/9-74- 004; March 1974.

(5) "Title 11, Administrative Rules, Chapter 46, Community Noise Control;" Hawaii State Department of Health; September 23, 1996.

(6) "FHWA Highway Traffic Noise Model User's Guide;" FHWA-PD-96-009, Federal Highway Administration; Washington, D.C.; January 1998 and Version 2.5 Upgrade (April 14, 2004).

(7) "Kihei High School, Traffic Impact Report;" Wilson Okamoto Corporation; September 2011.

(8) Hourly Traffic Counts At Station B74003100000, Piilani Highway - Mokulele Highway To Lipoa Street; Hawaii State Department of Transportation; April 21, 2009.

APPENDIX B

EXCERPTS FROM EPA'S ACOUSTIC TERMINOLOGY GUIDE

Descriptor Symbol Usage

The recommended symbols for the commonly used acoustic descriptors based on A-weighting are contained in Table I. As most acoustic criteria and standards used by EPA are derived from the A-weighted sound level, almost all descriptor symbol usage guidance is contained in Table I.

Since acoustic nomenclature includes weighting networks other than "A" and measurements other than pressure, an expansion of Table I was developed (Table II). The group adopted the ANSI descriptor-symbol scheme which is structured into three stages. The first stage indicates that the descriptor is a level (i.e., based upon the logarithm of a ratio), the second stage indicates the type of quantity (power, pressure, or sound exposure), and the third stage indicates the weighting network (A, B, C, D, E.....). If no weighting network is specified, "A" weighting is understood. Exceptions are the A-weighted sound level and the A-weighted peak sound level which require that the "A" be specified. For convenience in those situations in which an A-weighted descriptor is being compared to that of another weighting, the alternative column in Table II permits the inclusion of the "A". For example, a report on blast noise might wish to contrast the LCdn with the LAdn.

Although not included in the tables, it is also recommended that "Lpn" and "LepN" be used as symbols for perceived noise levels and effective perceived noise levels, respectively.

It is recommended that in their initial use within a report, such terms be written in full, rather than abbreviated. An example of preferred usage is as follows:

The A-weighted sound level (LA) was measured before and after the installation of acoustical treatment. The measured LA values were 85 and 75 dB respectively.

Descriptor Nomenclature

With regard to energy averaging over time, the term "average" should be discouraged in favor of the term "equivalent". Hence, Leq, is designated the "equivalent sound level". For Ld, Ln, and Ldn, "equivalent" need not be stated since the concept of day, night, or day-night averaging is by definition understood. Therefore, the designations are "day sound level", "night sound level", and "day-night sound level", respectively.

The peak sound level is the logarithmic ratio of peak sound pressure to a reference pressure and not the maximum root mean square pressure. While the latter is the maximum sound pressure level, it is often incorrectly labelled peak. In that sound level meters have "peak" settings, this distinction is most important.

"Background ambient" should be used in lieu of "background", "ambient", "residual", or "indigenous" to describe the level characteristics of the general background noise due to the contribution of many unidentifiable noise sources near and far.

With regard to units, it is recommended that the unit decibel (abbreviated dB) be used without modification. Hence, DBA, PNdB, and EPNdB are not to be used. Examples of this preferred usage are: the Perceived Noise Level (Lpn was found to be 75 dB. Lpn = 75 dB). This decision was based upon the recommendation of the National Bureau of Standards, and the policies of ANSI and the Acoustical Society of America, all of which disallow any modification of bel except for prefixes indicating its multiples or submultiples (e.g., deci).

Noise Impact

In discussing noise impact, it is recommended that "Level Weighted Population" (LWP) replace "Equivalent Noise Impact" (ENI). The term "Relative Change of Impact" (RCI) shall be used for comparing the relative differences in LWP between two alternatives.

Further, when appropriate, "Noise Impact Index" (NII) and "Population Weighed Loss of Hearing" (PHL) shall be used consistent with CHABA Working Group 69 Report Guidelines for Preparing Environmental Impact Statements (1977).

APPENDIX B (CONTINUED)

TABLE I

A-WEIGHTED RECOMMENDED DESCRIPTOR LIST

	TERM	SYMBOL
1.	A-Weighted Sound Level	L_A
2.	A-Weighted Sound Power Level	L_{WA}
3.	Maximum A-Weighted Sound Level	L_{max}
4.	Peak A-Weighted Sound Level	L_{Apk}
5.	Level Exceeded x% of the Time	L_x
6.	Equivalent Sound Level	L_{eq}
7.	Equivalent Sound Level over Time (T) (1)	$L_{eq(T)}$
8.	Day Sound Level	L_d
9.	Night Sound Level	L_n
10.	Day-Night Sound Level	L_{dn}
11.	Yearly Day-Night Sound Level	$L_{dn(Y)}$
12.	Sound Exposure Level	L_{SE}

(1) Unless otherwise specified, time is in hours (e.g. the hourly equivalent level is $L_{eq(1)}$). Time may be specified in non-quantitative terms (e.g., could be specified a $L_{eq(WASH)}$ to mean the washing cycle noise for a washing machine).

SOURCE: EPA ACOUSTIC TERMINOLOGY GUIDE, BNA 8-14-78,

APPENDIX B (CONTINUED)

TABLE II

RECOMMENDED DESCRIPTOR LIST

	TERM	A-WEIGHTING	ALTERNATIVE[1] A-WEIGHTING	OTHER[2] WEIGHTING	UNWEIGHTED
1.	Sound (Pressure)[3] Level	L_A	L_{pA}	L_B, L_{pB}	L_p
2.	Sound Power Level	L_{WA}		L_{WB}	L_W
3.	Max. Sound Level	L_{max}	L_{Amax}	L_{Bmax}	L_{pmax}
4.	Peak Sound (Pressure) Level	L_{Apk}		L_{Bpk}	L_{pk}
5.	Level Exceeded x% of the Time	L_x	L_{Ax}	L_{Bx}	L_{px}
6.	Equivalent Sound Level	L_{eq}	L_{Aeq}	L_{Beq}	L_{peq}
7.	Equivalent Sound Level Over Time(T)[4]	$L_{eq(T)}$	$L_{Aeq(T)}$	$L_{Beq(T)}$	$L_{peq(T)}$
8.	Day Sound Level	L_d	L_{Ad}	L_{Bd}	L_{pd}
9.	Night Sound Level	L_n	L_{An}	L_{Bn}	L_{pn}
10.	Day-Night Sound Level	L_{dn}	L_{Adn}	L_{Bdn}	L_{pdn}
11.	Yearly Day-Night Sound Level	$L_{dn(Y)}$	$L_{Adn(Y)}$	$L_{Bdn(Y)}$	$L_{pdn(Y)}$
12.	Sound Exposure Level	L_S	L_{SA}	L_{SB}	L_{Sp}
13.	Energy Average Value Over (Non-Time Domain) Set of Observations	$L_{eq(e)}$	$L_{Aeq(e)}$	$L_{Beq(e)}$	$L_{peq(e)}$
14.	Level Exceeded x% of the Total Set of (Non-Time Domain) Observations	$L_{x(e)}$	$L_{Ax(e)}$	$L_{Bx(e)}$	$L_{px(e)}$
15.	Average L_x Value	L_x	L_{Ax}	L_{Bx}	L_{px}

(1) "Alternative" symbols may be used to assure clarity or consistency.

(2) Only B-weighting shown. Applies also to C,D,E,.....weighting.

(3) The term "pressure" is used only for the unweighted level.

(4) Unless otherwise specified, time is in hours (e.g., the hourly equivalent level is Leq(1). Time may be specified in non-quantitative terms (e.g., could be specified as Leq(WASH) to mean the washing cycle noise for a washing machine.

APPENDIX C

SUMMARY OF BASE YEAR AND YEAR 2025 TRAFFIC VOLUMES

ROADWAY LANES	**** CY 2010 ***** AM VPH	PM VPH	CY 2025 (NO BUILD) AM VPH	PM VPH	CY 2025 (BUILD) AM VPH	PM VPH
Piilani Hwy., N. of Kaonoulu (NB)	1,334	1,497	1,378	1,681	1,401	1,693
Piilani Hwy., N. of Kaonoulu (SB)	1,474	1,654	1,647	1,842	1,696	1,852
Two-Way	2,808	3,151	3,025	3,523	3,097	3,545
Piilani Hwy., Between Kaonolulu & Kulanihakoi (NB)	1,367	1,593	1,426	1,781	1,455	1,796
Piilani Hwy., Between Kaonoiulu & Kulanihakoi (SB)	1,667	1,654	1,856	1,846	1,917	1,859
Two-Way	3,034	3,247	3,282	3,627	3,372	3,655
Piilani Hwy., Between Kulanihakoi & E. Waipulani (NB)	1,344	1,633	1,543	1,844	1,689	1,875
Piilani Hwy., Between Kulanihakoi & E. Waipulani (SB)	1,756	1,642	1,969	1,864	2,048	1,905
Two-Way	3,100	3,275	3,512	3,708	3,737	3,780
Piilani Hwy., Between E. Waipulani & Piikea (NB)	1,396	1,633	1,543	1,844	1,689	1,875
Piilani Hwy., Between E. Waipulani & Piikea (SB)	1,697	1,574	1,909	1,795	1,977	1,830
Two-Way	3,093	3,207	3,452	3,639	3,666	3,705
Piilani Hwy., S. of Piikea (NB)	1,277	1,596	1,372	1,807	1,518	1,838
Piilani Hwy., S. of Piikea (SB)	1,509	1,477	1,721	1,698	1,789	1,733
Two-Way	2,786	3,073	3,093	3,505	3,307	3,571
Kaonoului St. W. of Piilani (EB)	237	129	238	129	250	132
Kaonoului St. W. of Piilani (WB)	77	225	77	225	83	228
Two-Way	314	354	315	354	333	360
Kulanihakoi St. E. of Piilani (EB)	N/A	N/A	N/A	N/A	471	101
Kulanihakoi St. E. of Piilani (WB)	N/A	N/A	N/A	N/A	222	114
Two-Way	N/A	N/A	N/A	N/A	693	215
Kulanihakoi St. W. of Piilani (EB)	207	121	212	122	248	130
Kulanihakoi St. W. of Piilani (WB)	95	173	96	173	102	176
Two-Way	302	294	308	295	350	306
E. Waipulani Rd. W. of Piilani (EB)	23	32	23	32	23	32
E. Waipulani Rd. W. of Piilani (WB)	81	100	82	101	93	107
Two-Way	104	132	105	133	116	139
Piikea Ave. W. of Piilani (EB)	427	547	427	547	427	547
Piikea Ave. W. of Piilani (WB)	444	607	444	607	444	607
Two-Way	871	1,154	871	1,154	871	1,154
S. Kihei Rd., N. of Kulanihakoi (NB)	480	585	539	663	539	663
S. Kihei Rd., N. of Kulanihakoi (SB)	345	470	390	533	390	533
Two-Way	825	1,055	929	1,196	929	1,196
S. Kihei Rd., S. of Kulanihakoi (NB)	467	611	529	694	553	695
S. Kihei Rd., S. of Kulanihakoi (SB)	367	503	412	566	412	566
Two-Way	834	1,114	941	1,260	965	1,261

APPENDIX C (CONTINUED)

SUMMARY OF BASE YEAR AND YEAR 2025
TRAFFIC VOLUMES

ROADWAY LANES	**** CY 2010 ***** AM VPH	PM VPH	CY 2025 (NO BUILD) AM VPH	PM VPH	CY 2025 (BUILD) AM VPH	PM VPH
Kulanihakoi St. E. of S. Kihei (EB)	68	76	71	81	95	82
Kulanihakoi St. E. of S. Kihei (WB)	103	83	103	83	103	83
Two-Way	171	159	174	164	198	165

Appendix J

Phase I Environmental Site Assessment
Kīhei High School
Waiohuli, Kōheo 1-2, & Kaʻonoʻulu Ahupuaʻa,
Kīhei-Mākena, Maui, Hawaiʻi
TMK (2) 2-2-002: 081; (2) 2-2-002: 083
Kīhei, Maui, Hawaiʻi

Group 70 International, Inc. – August 2011

Kīhei High School

Waiohuli, Kōheo 1-2, & Ka'ono'ulu Ahupua'a,

Kīhei-Makena District, Maui, Hawai'i

TMK (2) 2-2-002: 081; (2) 2-2-002: 083
Kīhei, Maui, Hawai'i

Phase I Environmental Site Assessment

Prepared for
State of Hawaii
Department of Education
Facilities Development Branch
Honolulu, Hawai'i

Prepared by
Group 70 International, Inc.
Architecture • Planning & Environmental Services • Interior Design •
Assets Management
Honolulu, Hawai'i
August 2011

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Executive Summary

The State of Hawaii Department of Education (DOE) retained Group 70 International (Group 70) to conduct a Phase I Environmental Site Assessment (ESA) of the future Kīhei High School property located on the parcels of land identified as Tax Map Key (TMK) (2) 2-2-002: 081 and TMK (2) 2-2-002: 083 (Lot 2-A) in the Kīhei-Makena District, on the Island of Maui (Figure 1, herein referred to as the "subject property").

Purpose of Phase I Environmental Site Assessment

The purpose of the Phase I Environmental Site Assessment (ESA) is to identify any recognized environmental conditions (specifically, evidence as to the presence or likely presence of any hazardous substance or petroleum product under conditions that indicate an existing release, a past release or a material threat of a release into property structures or to ground, groundwater or surface water) on the parcels of land identified as Tax Map Key (TMK) (2) 2-2-002: 081 and TMK (2) 2-2-002: 083 in Kīhei, Hawaii on the Island of Maui. This Phase I ESA complies with the American Standard for Testing and Materials (ASTM) Standard E 1527-05 Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process, and includes a historical review, regulatory agency and document review, site reconnaissance, interviews and identification of environmental conditions. This Phase I ESA is being conducted as part of a due diligence process related to the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA). It is intended to meet the requirements for the Innocent Landowner Defense identified in the requirements for "all appropriate inquiries" (AAI) under CERCLA.

Site Description

The subject property is located on the Island of Maui in the Kīhei-Makena District, on the slopes of Haleakalā, situated in the Waiohuli Ahupua'a, Kōheo 1-2 Ahupua'a, & Ka'ono'ulu Ahupua'a. Located along Pi'ilani Highway; the subject property is currently composed of portions of two parcels totaling 77.182 acres. The entire subject property consists of vacant undeveloped pasture land.

The north boundary of the property is bordered by Ka'ono'ulu Ranch, beyond which is the Kūlanihāko'i Gulch. The east boundary of the subject property is bordered by Ka'ono'ulu Ranch and Haleakalā Ranch. The southern boundary of the subject property is bordered by Haleakalā Ranch, beyond which is the Waipu'ilani Gulch, followed by the Elleair Maui Golf Club. The western boundary of the property is bordered by Pi'ilani Highway beyond which is the residential community of Pi'ilani Village. Pi'ilani Highway presently provides access to the subject property.

Results of ESA

The following summarizes the independent conclusions representing Group 70 International, Inc.'s (Group 70) best professional judgment based on information and data available to us while performing this assignment. Factual information regarding operational conditions and data provided by the client, owner, or their representatives has been assumed to be correct and complete. The conclusions presented are based on the conditions that existed at the time of the assessment.

Upon completion of the Phase I ESA assessment of the subject property, no evidence of the use or storage of hazardous and/or regulated materials or wastes was identified on the property or adjacent properties.
The review of the regulatory database search report indicated that the project site was not listed on the regulatory agency databases reviewed. The review of the regulatory database search report identified five properties in the surrounding area of the project site. It is Group 70's opinion that the identified properties in the surrounding one mile circumference to the subject property do not have a reasonable potential to adversely impact the environmental condition of the project site. RCRA regulated hazardous waste was not observed to be generated, stored, accumulated, transported, or disposed on the project site.

The regulatory database search report also identifies "orphan" sites which are unable to be mapped due to poor or inadequate address information. Nineteen orphan sites were identified by the regulatory database search report. The orphan sites were listed on the FINDS, FTTS, HIST FTTS, RCRA-SQG, UST, and LUST databases. Group 70 determined the location of the 19 orphan sites, in comparison to the subject property. Based on the distances the orphan sites are located in comparison to the subject property, all over 1/8 mile away, it is Group 70's opinion that these orphan sites do not have a reasonable potential to adversely impact the environmental condition of the project site.

Conclusion
At the time of investigation, site activities included vacant undeveloped pasture land located on two (present) parcels totaling 77.182 acres. It is Group 70's opinion that these activities do not have a reasonable potential to adversely impact the environmental condition of the project site.

Based on review of historical information, including building permit information, chain of title documentation, topographic maps, aerial photographs, and interviews conducted with personnel familiar with the historical operations at the project site, Group 70 did not identify any previous land use for the project site that, in our opinion, is considered to have a reasonable potential to result in an adverse environmental impact to the project site.

Based on the information gathered for this assessment, Group 70 concludes that there is no evidence indicating adverse environmental impacts to the subject property from past activities on the subject property or adjacent properties. This assessment has revealed no evidence of recognized environmental conditions, as defined by ASTM, in connection with the subject property.

1.0 INTRODUCTION

The State of Hawaii Department of Education (DOE) retained Group 70 International (Group 70) to conduct a Phase I Environmental Site Assessment (ESA) of the future Kīhei High School property located on the parcels of land identified as Tax Map Key (TMK) (2) 2-2-002: 081 and TMK (2) 2-2-002: 083 in the Kīhei-Makena District, on the Island of Maui (Figure 1, herein referred to as the "subject property"). The purpose of the Phase I ESA is to identify any recognized environmental conditions (specifically, evidence as to the presence or likely presence of any hazardous substance or petroleum product under conditions that indicate an existing release, a past release or a material threat of a release into property structures or to the ground, groundwater or surface water) on the parcels of land. The purpose of the Phase I ESA was to provide an independent, professional opinion regarding recognized environmental conditions, as defined by the American Society for Testing and Materials (ASTM) E1527-05 Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process.

1.1 PURPOSE

This Phase I Environmental Site Assessment (ESA) is being conducted as part of a due diligence process related to the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA). It is intended to meet the requirements for the Innocent Landowner Defense identified in the requirements for "all appropriate inquiries" (AAI) under CERCLA. The objective of this Phase I ESA is to provide an independent professional opinion regarding *recognized environmental conditions*, as defined by the ASTM, associated with the subject property. The term *recognized environmental condition* is defined as the presence or likely presence of any hazardous substances or petroleum products on a property under conditions that indicate an existing release, a past release, or a material threat of a release of any hazardous substances or petroleum products into structures on the property, or into the ground, groundwater, or surface water of the property. The term includes hazardous substances or petroleum products even under conditions in compliance with laws. The term is not intended to include *de minimis* conditions that generally do not present a threat to human health or the environment and that generally would not be the subject of an enforcement action if brought to the attention of appropriate governmental agencies. Conditions determined to be *de minimis* are not *recognized environmental conditions.*

1.2 SCOPE OF SERVICES

The scope of services for this Phase I ESA is limited to the identification of environmental concerns related to the use and storage of hazardous and/or regulated materials and wastes that are located on or near TMK (2) 2-2-002: 081 and TMK (2) 2-2-002: 083. The scope of services utilized in conducting this assessment included:

- A review of environmental records including regulatory agency reports
- An investigation of historical use of the subject property by examining locally available aerial photographs, historical topography maps, and other readily available historical

information such as fire insurance maps, and real property tax information for evidence of prior land use that could have led to environmental recognized conditions

- A review of an environmental database search report of federal and state regulatory agency records pertinent to the subject property and off-site facilities located within ASTM-specified search distances from the subject property

- A review of information readily available describing the general geology and topography of the subject property, local groundwater characteristics, sources of water, power and sewer, and proximity to ecological sensitive receptors that may be impacted by recognized environmental conditions

- A site walkthrough inspection of the subject property for visual evidence of recognized environmental concerns including existing or potential soil and groundwater contamination, as evidenced by staining or discoloration; stressed vegetation; indications of waste dumping or burial; pits, ponds or lagoons; containers of hazardous substances or petroleum products; electrical and hydraulic equipment that may contain polychlorinated biphenyls, such as transformers or lifts; and underground and aboveground storage tanks

- A site property line visual assessment of adjacent properties for evidence of potential off-site recognized environmental conditions that may affect the subject property

- Interviews with key site personnel and government officials, as available, regarding current and previous site activities on the property especially those involving the use of hazardous substances and petroleum products

- Evaluation and compilation of the information gathered for the development of the Phase I ESA Report

The scope of services does not include sampling and analysis of soil, air, water, groundwater, or building materials. Non-scope considerations also include the following:

- Asbestos-containing materials
- Lead-based paint
- Lead in drinking water
- Wetlands
- Cultural & historic resources
- Industrial hygiene
- Health & safety
- Ecological resources
- Endangered species
- Indoor air quality
- High voltage power lines

1.3 ASSUMPTIONS, LIMITATIONS AND EXCEPTIONS, AND USER RELIANCE

Assumptions

The following are significant assumptions for the Phase I ESA. The data presented in this report, either through Freedom of Information Act requests, database searches of public records, interviews or requested information from DOE records and/or land owner records, is assumed to be factual.

Limitations and Exceptions

This Phase I ESA Report is intended for use only as the complete document. It is limited to representations of identified environmental conditions on and near TMK (2) 2-2-002: 081 and TMK (2) 2-2-002: 083 as they existed at the time of the assessment, and of the conclusions drawn based upon the information obtained and assumptions made during the assessment process.

In preparing this Phase I ESA Report, as a matter of necessity, Group 70 has relied largely on readily available sources of information such as verbal information and representations provided by the client, owners of the parcels, government employees and others, public records, interviews, and contracted research firms for recognizing potential environmental liabilities associated with the subject property. Requests from information resources are made to collect relevant data on current and past practices conducted at the subject property. Group 70 may not receive all information requested or be able to confirm received information during the course of the ESA. Therefore, Group 70 shall not be held responsible for errors, omissions, or misrepresentations resulting from missing documentation or from inaccurate information provided by such sources. To the extent that the conclusions in this Phase I ESA Report are based in whole or in part on such information, they are contingent on its validity.

This Phase I Environmental Site Assessment is limited to issues addressed by ASTM E-1527-05. Additionally, the following limitations are from the ASTM standard and apply to this assessment:

4.5.1 Uncertainty Not Eliminated — No environmental site assessment can wholly eliminate uncertainty regarding the potential for recognized environmental conditions in connection with a property. Performance of this practice or E 1527-05 is intended to reduce, but not eliminate, uncertainty regarding the potential for recognized environmental conditions in connection with a property, and both practices recognize reasonable limits of time and cost.

4.5.2 Not Exhaustive — All appropriate inquiry does not mean an exhaustive assessment of a clean property. There is a point at which the cost of information obtained or the time required to gather it outweighs the usefulness of the information and, in fact, may be a material detriment to the orderly completion of transactions. One of the purposes of this practice is to identify a balance between the competing goals of limiting the costs and time demands inherent in performing an environmental site assessment and the reduction of uncertainty about unknown conditions resulting from additional information.

4.5.3 *Level of Inquiry is Variable* — Not every property will warrant the same level of assessment. Consistent with good commercial or customary practice, the appropriate level of environmental site assessment will be guided by the type of property subject to assessment, the expertise and risk tolerance of the user, and the information developed in the course of the inquiry.

4.5.4 *Comparison with Subsequent Inquiry* — It should not be concluded or assumed that an inquiry was not appropriate merely because the inquiry did not identify recognized environmental conditions in connection with a property. Environmental site assessments must be evaluated based on the reasonableness of judgments made at the time and under the circumstances in which they were made. Subsequent environmental site assessments should not be considered valid standards to judge the appropriateness of any prior assessment based on hindsight, new information, use of developing technology or analytical techniques, or other factors.

User Reliance
The information and opinions rendered in this report are exclusively for DOE. The services provided by Group 70 in completing this project were consistent with normal standards of the profession. No other warranty, expressed or implied, is made.

2.0 SITE DESCRIPTION

2.1 LOCATION AND DESCRIPTION

The subject property is located on the Island of Maui in the Kīhei-Makena District, approximately 10.7 miles northwest of Kahului Airport, and adjacent to/east of Pi'ilani Highway (see Figure 1). Two identified TMKs comprise the subject property. The TMK numbers and the subject property class distribution, as defined by the County of Maui Real Property Tax Division, are provided below and reflected in Figure 2.

TMK (2) 2-2-002: 081 encompassing 29.175 acres

TMK (2) 2-2-002: 083 encompassing 48.007 acres

County of Maui Zoning: Agricultural Total Acreage: 77.182 acres

The project site included a portion of one irregular shaped parcel and a portion of one rectangular-shaped parcel. The project site consists of undeveloped pasture land with no physical structures in place. Primary access to the site was from Pi'ilani Highway, immediately west of the project site. The property is bordered on the south by the Waipu'ilani Gulch and on the north by the Kūlanihāko'i Gulch.

The property is bordered by undeveloped ranch land to the north, east, and south. The west boundary of the property is bordered by Pi'ilani Highway beyond which is the Pi'ilani Village residential subdivision. Ka'ono'ulu Ranch is located to the north of the site, beyond which is Kūlanihāko'i Gulch. Haleakalā Ranch Company is located to the south of the site beyond which is Waipu'ilani Gulch. Elleair Maui Golf Club is located south of Waipu'ilani Gulch. The west boundary of the subject property is bordered by Ka'ono'ulu Ranch and Haleakalā Ranch.

No structures or improvements have been constructed on the project site.

The project site is not presently serviced by any utility providers.

Storm water runoff from the project site flows via sheet flow to the gulches which lie to the north and south of the project site. The gulch's lead to storm drain culverts located beneath Pi'ilani Highway and eventually discharge to Ma'alaea Bay in the Pacific Ocean.

No wastewater currently originates from the project site.

Evidence of additional discharge sources was not observed at the project site.

Figure 1 – Project Location Map

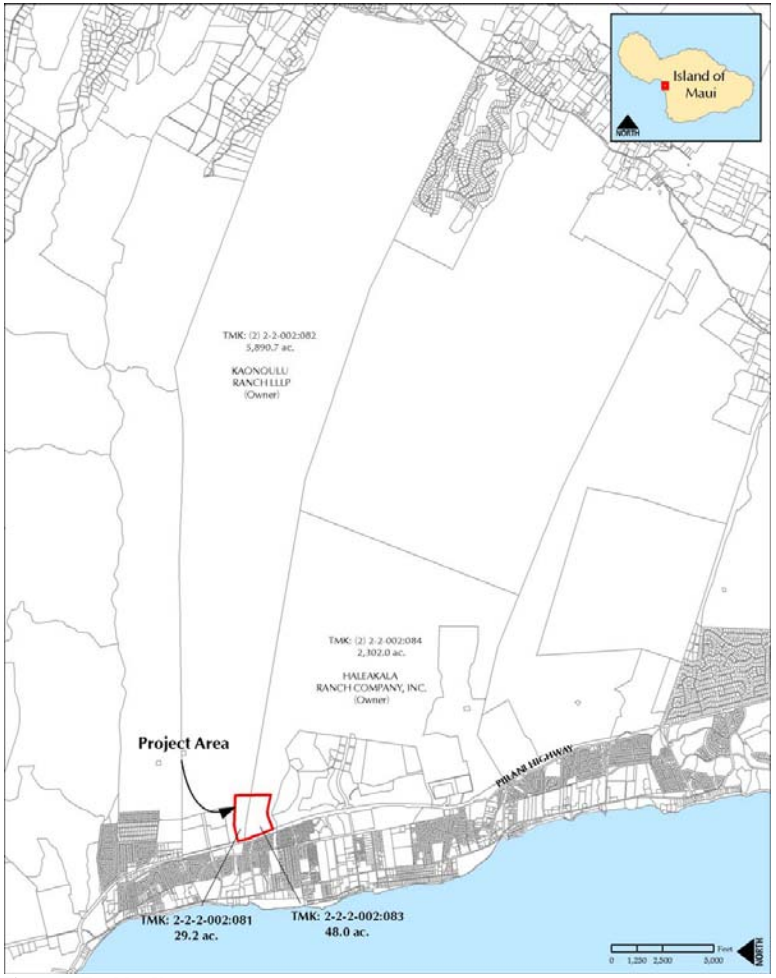

Figure 2 – Tax Map Key

2.2 PROPERTY AND VICINITY CHARACTERISTICS

Topography. The elevation of the subject property is approximately 30 feet above mean sea level (MSL) at Pi'ilani Highway to an elevation of approximately 140 feet MSL at the eastern boundary of the project area. The overall gradient of the subject property is west northwest. A United States Geological Survey (USGS) topographic map of the subject property and surrounding area is presented in Figure 3 (USGS 1998).

Geology. The geologic creation of Maui is a result of the Pacific plate slowly moving in a northwest direction over a hot spot of upwelling lava. Over millions of years the Hawaiian Island chain has been created by volcanic activity. This activity continues today on the Big Island and southeast of Hawai'i below sea level. According to Abott et al., historically, "Maui consists of two major volcanoes; the older one is West Maui, and the younger is Haleakalā, or East Maui. The broad gently sloping plain connecting the two volcanoes, the Maui Isthmus, was formed when lavas from Haleakalā banked against the already existing West Maui volcano. The West Maui volcano is believed to be extinct as it has passed through the principal stages of Hawaiian volcanism, and has produced four small post erosional eruptions. Haleakalā erupted most recently about two centuries ago and must be regarded as dormant" (Abott et al., 1983).

The proposed project site is situated on relatively flat land with a slope of approximately 2-8% and is located approximately 3,000 feet (less than one mile) east of the Pacific Ocean on the west slopes of Haleakalā. The subject property is situated on two soil classifications, the Alae Series and the Waiakoa Series. Soil found on the subject property consists of Alae sandy loam (AaB) and Waiakoa extremely stony silty clay loam (WID2) (USDA SCS 1973).

Soils found in the Alae Series consist of excessively drained soils on alluvial fans on the island of Maui. These soils developed in volcanic ash and recent alluvium derived from basic igneous rock. They are nearly level to gently sloping. Most areas have cobble stones on the surface. Elevations range from 50 to 600 feet. The annual rainfall amounts to 12 to 20 inches. Alea soils are geographically associated with Ewa, Pulehu, and Waiakoa soils. Natural vegetation associated with the Alea series consists of feather fingergrass, kiawe, and uhaloa. These soils are used for sugarcane and pasture. The soil is described as having a low corrosivity for uncoated steel and a low corrosivity for concrete (USDA SCS 1973).

- **AaB (Alae sandy loam, 3 to 7 percent slopes)** Alae sandy loam is similar to Alae cobbly sandy loam, except that there are no cobblestones on the surface. Permeability is low. Runoff is slow and the erosion hazard is slight. Alae sandy loam is considered suitable for growth of sugarcane, pasture, and truck crops.

Soils found in the Waiakoa Series consist of shallow, well-drained soils on uplands on the island of Maui. These soils developed in material weathered from basic igneous rock. The upper part of the profile is influenced by volcanic ash. These soils are gently sloping to moderately steep. Elevations range from 100 to 1,000 feet. The annual rainfall amounts to 12 to 20 inches, occurring mostly in the winter months. These soils are used for sugarcane, pasture, home sites, and wildlife habitat. Natural vegetation associated with the Waiakoa Series consists of buffel grass, feather fingergrass, ilima, kiawe, uhaloa, and zinnia. The soil is described as having a low corrosivity for uncoated steel and concrete (USDA SCS 1973).

- **WID2 (Waiakoa extremely stony silty clay loam, 3 to 25 percent slopes, eroded)** The slope range of this soil is 3 to 7 percent slopes, except that it is eroded and stones cover 3 to 5 percent of the surface. In most areas about 50 percent of the surface layer has been removed by erosion. Permeability is moderate. Runoff is medium, and the erosion hazard is severe. This soil is used for pasture and wildlife habitat.

A soil classification map reflecting the subject property and the soils described above is provided in Figure 4.

Hydrogeology. Groundwater beneath the project site occurs in two distinct aquifers within the Kamaole Aquifer System of the Central Aquifer Sector on the island of Maui. The shallow aquifer is classified as a high-level aquifer type where fresh water is not in contact with seawater. This aquifer type is considered unconfined, where the water table is the upper surface of the saturated aquifer. The geology of this aquifer type is a perched aquifer which lies on impermeable formations. The ground water status is reported as an aquifer with potential utility for drinking water. The groundwater within this aquifer is described as fresh (<250 milligrams per liter Cl^-), replaceable, with a high vulnerability to contamination (Lau and Mink, 1990).

The deeper aquifer is classified as a basal, unconfined flank aquifer, occurring in horizontally extensive lavas. The groundwater status is reported as a currently developed groundwater source used for drinking water purposes. The groundwater within this aquifer is described as low salinity (250- 1000 milligrams per liter Cl^-), irreplaceable, with a moderate vulnerability to contamination (Lau and Mink, 1990).

The State of Hawaii Underground Injection Control (UIC) program was established by the Department of Health (DOH) Safe Drinking Water Branch to protect the quality of underground sources of drinking water. As part of this program, a UIC line was delineated on USGS maps for each island. Groundwater inland of this line is considered by the State to be a potential source of drinking water. Groundwater in areas seaward of this line are not considered potential drinking water sources. A review of the UIC map for the Island of Maui, which includes the area of the subject property, indicates the subject property is located seaward or makai of the UIC line. Therefore the aquifer underlying the subject property is not considered a drinking water source.

Down gradient from the project site, approximately ¼ mile – 1 mile away from the subject property, 18 private wells were identified on the State database well information per the EDR report. The 18 private wells consist of irrigation wells that are non-domestic or non-agriculture, irrigation wells for landscapes/water features, an irrigation well for parks, an agriculture well for crops & processing, as well as unused, sealed, or wells identified as "other". The findings on the subject property and future development plans to create a high school on the subject property, are not likely to impact the private wells negatively.

Flora and Fauna. The flora on the subject property includes vegetation described above in the Geology section, but mostly consists of buffel grass and kiawe trees. Fauna observed on the property included birds, butterflies, and spiders. Cattle hoof prints were observed. Other fauna common to the area was also assumed to be present. A complete flora and fauna survey was not conducted as part of this Phase I ESA.

Water bodies. The closest water body to the project area is the Pacific Ocean. The property is bordered on the south by the Waipu'ilani Gulch and on the north by the Kūlanihāko'i Gulch. During times of heavy rains, water flows in the gulches to the Pacific Ocean. Present and historic activities that have taken place on the project site do not seem to pose a threat of contamination to these low lying areas, because there is no contamination activity on the site.

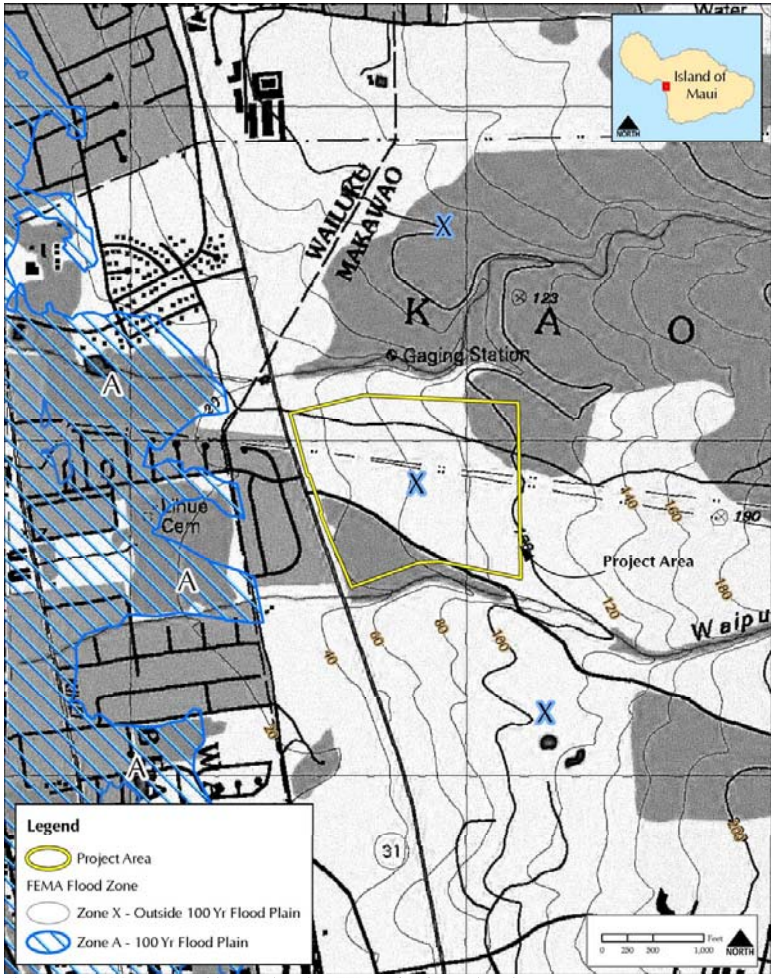

Figure 3 – USGS Topographic Map (1992) & FEMA Flood Data (2005)

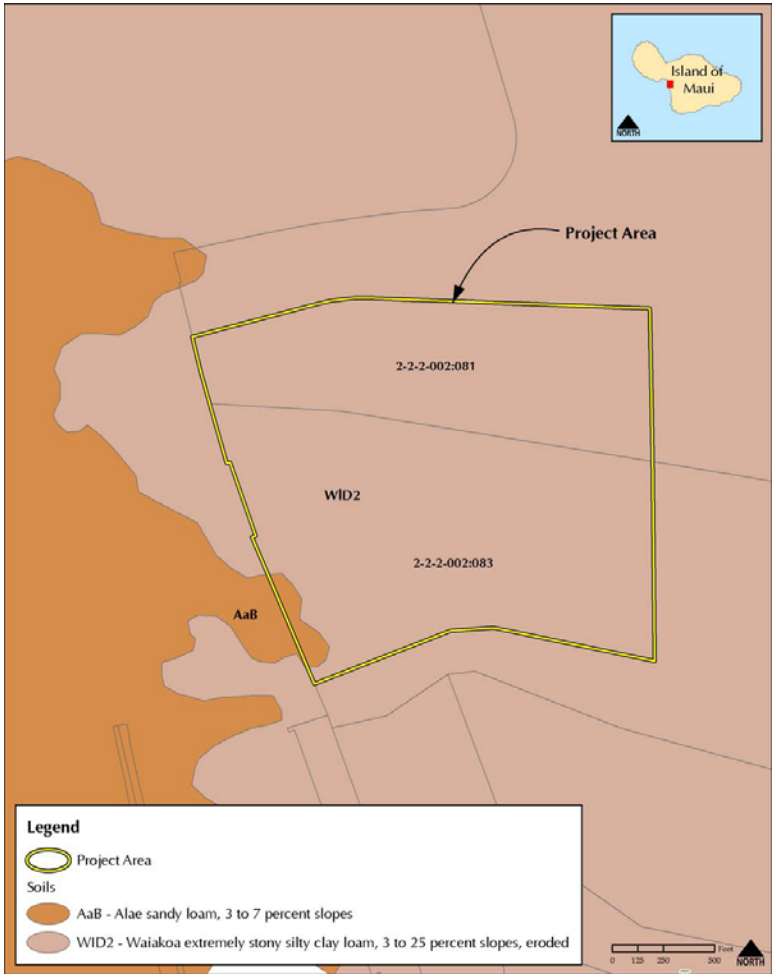

Figure 4 – Soils Classification Map

2.3 CURRENT USE OF THE SUBJECT PROPERTY

The project site, currently owned by the Haleakalā Ranch Company and the Ka'ono'ulu Ranch LLLP, consists of two parcels. The entire project site is currently dry rolling foothills on west-facing lowland slopes of Haleakalā. The project site is presently undeveloped ranchland utilized for grazing. The entire project area is dominantly covered by vegetation.

The planned use for the project site is to develop a new high school and campus for the community of Kīhei. Site improvements would include construction of approximately 215,000 square feet of educational buildings, athletic fields, and infrastructure improvements to support an enrollment capacity of 1,650 students.

2.4 DESCRIPTION OF IMPROVEMENTS TO THE SUBJECT PROPERTY

There are presently no improvements or buildings on the subject property.

Presently no utilities are provided at the subject property.

Storm water runoff from the project site percolates on site or flows via sheet flow down gradient towards Waipu'ilani Gulch and Kūlanihāko'i Gulch. The gulch's lead to stormdrain outlets which flow beneath Pi'ilani Highway and eventually discharge to Mā'alaea Bay in the Pacific Ocean.

Wastewater presently does not originate on site.

Evidence of additional discharge sources was not observed at the project site.

2.5 CURRENT USE OF ADJOINING PROPERTIES

The area surrounding the project site consisted of ranchland and residential properties. Adjoining properties were observed from the project site and from public access roads for signs of recognized environmental conditions and their potential to pose an environmental concern to the project site.

The uses and features of adjoining properties are described below:

North:	Ka'ono'ulu Ranch, beyond which is Kūlanihāko'i Gulch.
South:	Haleakalā Ranch, beyond which is Waipu'ilani Gulch, followed by the Elleair Maui Golf Club.
East:	Ka'ono'ulu Ranch and the Haleakalā Ranch.
West:	Pi'ilani Highway beyond which is the Pi'ilani Village residential community.

Adjoining properties did not appear to present a recognized environmental condition for the project site, based on visual observations and information obtained during the assessment.

3.0 USER PROVIDED INFORMATION

3.1 TITLE RECORDS

Readily available records at the County of Maui Tax Assessor's Office were reviewed to assess past ownership of the project site. This information is summarized below.

The project site is comprised of two parcels identified as TMK (2) 2-2-002: 081 and TMK (2) 2-2-002: 083.

Parcel TMK (2) 2-2-002: 081 was created from parcel (2) 2-2-002: 015 (Lot 1-A-1) in 2011. Parcel (2) 2-2-002: 015 (Lot 1-A-1) originated from TMK (2) 2-2-002: 015, which has been owned by Harold W. Rice, per historic property tax records since the early 1940's. Ownership transferred from Harold W. Rice to Ka'ono'ulu Ranch Company, LTD in approximately 1964. The property was then transferred from Ka'ono'ulu Ranch Company, LTD., to Ka'ono'ulu Ranch in 1983. Property title history for this parcel, that was readily available at the County of Maui Tax Assessor's Office, exists from the year 1943.

The project site parcel identified as TMK (2) 2-2-002: 083 was created from parcel (2) 2-2-002: 054 (Lot 2-A) in 2011. Parcel (2) 2-2-002: 054 (Lot 2-A) originated from Haleakalā Ranch Company TMK (2) 2-2-002: 001 in 1974. Haleakalā Ranch Company has remained the owner of the subject parcel since this time. Property title history for parcel 054 exists from the year 1974 and title history for parcel 001 exists from the year 1943.

Please refer to all title information obtained from the Real Property Tax Division- County of Maui (Appendix B).

No readily apparent evidence of recognized environmental conditions at the project site was noted in the ownership records reviewed.

**Per ASTM, "User" is the party seeking to use Practice E 1527 to perform an environmental site assessment of the property. A user may include a purchaser, a potential tenant, an owner, a lender or a property manager, all associated with the property.*

3.2 ENVIRONMENTAL LIENS OR ACTIVITY AND USE LIMITATIONS

At the time of the report research and preparation, no environmental liens or activity and use limitations (such as deed restrictions) were reported by government records searched for the subject property.

3.3 SPECIALIZED KNOWLEDGE

Specialized knowledge of the subject property was obtained from an interview with Haleakalā Ranch Company Manager Scott Meidell, and Ka'ono'ulu Ranch LLLP General Manager, Mr. Henry F. Rice. This information is presented in Section 6.0.

3.4 VALUE REDUCTION FOR ENVIRONMENTAL ISSUES

The County of Maui, Department of Planning and Permitting records reviewed for this Phase I ESA indicate that property values have not experienced valuation reduction for environmental reasons (see *Appendix B*).

3.5 OWNER, PROPERTY MANAGER AND OCCUPANT INFORMATION

As discussed in Section 2.3, the project site is currently owned by Ka'ono'ulu Ranch LLLP and Haleakalā Ranch Company, consisting of 2 parcels; TMK (2) 2-2-002: 081 encompassing 29.175 acres, and TMK (2) 2-2-002: 083 encompassing 48.007 acres. As discussed the properties are presently ranchland for cattle pasture and grazing. No tenants, or leases are presently associated with the project site.

3.6 REASONS FOR PERFORMING THE PHASE I ENVIRONMENTAL SITE ASSESSMENT

The client informed Group 70 that the purpose for conducting the Phase I Environmental Site Assessment for the project site comprised of TMK (2) 2-2-002: 081 and TMK (2) 2-2-002: 083 was for: the Innocent Landowner Defense identified in the requirements for AAI under CERCLA, for disclosure within an Environmental Impact Statement being prepared in association to the proposed Kīhei High School project, to acquire the property, and to achieve a prerequisite for Leadership and Energy and Environmental Design (LEED) for Schools Certification.

4.0 RECORDS REVIEW

4.1 ENVIRONMENTAL RECORD SOURCES

Environmental Data Resources, Inc. (EDR) was subcontracted by Group 70 to conduct a search of environmental databases pertaining to sites near the subject property. Records for the subject property as well as neighboring properties up to one mile around the property were searched by EDR and reviewed to determine the presence of previous or current environmental impacts. The search of available environmental records through EDR, are listed in Table 1-1 and have been reviewed. The complete EDR report is presented in *Appendix A*.

Table 1 - EDR Records Search

Federal ASTM Standard:	State ASTM Standard:	Federal ASTM Supplemental:	State ASTM Supplemental:
• NPL	• SHWS	• CONSENT	• SPILLS
• Proposed NPL	• SWF/LF	• ROD	• DRYCLEANERS
• CERCLIS	• LUST	• Delisted NPL	• BROWNFIELDS
• CERC-NFRAP	• UST	• FINDS	• AIRS
• CORRACTS	• ENG CONTROLS	• HMIRS	• UIC
• RCRA-TSD	• INST CONTROL	• MLTS	
• RCRA-LQG	• VCP	• MINES	
• RCRA-SQG		• PADS	
• RCRA-CESQG		• DOD	
• US ENG CONTROLS		• FUDS	
• US INST CONTROL		• RAATS	
• ERNS		• TRIS	
		• TSCA	
		• SSTS	
		• FTTS	
		• ICIS	

AIRS	List of Permitted Facilities
BROWNFIELDS	Brownfield Sites
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
CESQG	Conditionally Exempt Small Quantity Generator
CONSENT	Superfund Consent Decrees
CORRACTS	Corrective Action Reports
DOD	Department of Defense Sites
DRYCLEANERS	Permitted Drycleaner Facility Listing
ERNS	Emergency Response Notification System
ENG CONTROLS	Engineering Control Sites
FINDS	Facility Index System/Facility Identification Initiative Program Summary Report
FTTS	Federal Insecticide, Fungicide, & Rodenticide Act (FIRFA)/TSCA Tracking System
FUDS	Formerly Used Defense Sites
HMIRS	Hazardous Material Information Reporting System
ICIS	Integrated Compliance Information System
LQG	Large Quantity Generator
LUST	Leaking Underground Storage Tank
MINES	Mines Master Index File
MLTS	Material Licensing Tracking System
NFRAP	No Further Remedial Action Planned
NPL	National Priority List
PADS	Polychlorinated Biphenyl Activity Database System
RAATS	Resource Conservation and Recovery Act (RCRA) Administrative Tracking System

RCRA	Resource Conservation and Recovery Act
SHWS	Solid and Hazardous Waste Sites
SPILLS	Spill Release Notifications
SQG	Small Quantity Generator
SSTS	Section 7 Tracking Systems
SWF/LF	Permitted Landfills in the State of Hawai'i
TRIS	Toxic Chemical Release Inventory System
TSCA	Toxic Substances Control Act
TSD	Treatment, Storage and Disposal facility
UIC	Underground Injection Wells Listing
US ENG CONTROLS	Engineering Control Sites
US INST CONTROL	Sites with Institutional Controls
UST	Underground Storage Tank
VCP	Voluntary Response Program Sites

The results of the EDR report indicate there are 5 environmental sites identified within, or near, the 1-mile search area around the property as reflected in Table 1-2.

Table 2 - Identified Environmental Sites per EDR Records Search

Environmental Record	Name of Site	Address	Direction/ Distance
UST	Kīhei Minit Stop	Pi'ilani Village Shopping Center 233 Piikea Ave. Kīhei, HI. 96753	< 1/8 mile
UIC	Kīhei Marine Facility	Pi'ilani HWY on N. Kīhei, HI 96753	< 1/8 mile
FTTS , HIST FTTS	Kīhei Charter High School	P.O. Box 2053 Kīhei, HI 96753	< 1/8 mile
SHWS SPILLS	Selland Construction Inc. Kīhei Base Yard	454 Ohukai Rd Kīhei, HI. 96753	NNE 1/2 – 1 mile
SHWS SPILLS	Kīhei Chevron DBA T.A. Hughes Inc.	1281 S. Kīhei Rd. Kīhei, HI 96753	SSW 1/2– 1 mile

Group 70 reviewed the site details and narrative provided in the EDR report for the identified environmental sites above. Group 70 also requested regulatory files from the State of Hawaii Department of Health (DOH), Solid and Hazardous Waste Branch (SHWB), Underground Storage Tank (UST) and Hazard Evaluation Emergency Response Office (HEER) for the sites identified in the EDR report to interpret whether or not the sites identified had a reasonable potential to adversely impact the environmental condition of the project site. Group 70 reviewed records made available by the DOH pertaining to the Kīhei Minit Stop, the Kīhei Chevron DBA T.A. Hughes Inc., and Selland Construction Inc. Kīhei Base Yard.

Group 70 also searched local, state, and county records. Additional searched records are summarized in Table 1-3. Records searched and reviewed for this ESA include those from the Federal Government, State of Hawai'i Department of Health (DOH), and the County of Maui.

Table 3 - Additional Reviewed Records

Records Reviewed
County of Maui, Department of Planning and Permitting
County of Maui, Real Property Assessment
State of Hawai'i Department of Health
Historical Aerial Photos
Historic Sanborn Fire Insurance Maps
Historical Topographic Maps

The Kīhei Minit Stop property is located in the Pi'ilani Village Shopping Center on Pi'ikea Avenue, approximately 1/8 of a mile west/southwest of the subject property. Three Underground Storage Tanks (USTs) used to supply gasoline and diesel are registered to be located and currently in use at this location. During records review at the DOH UST/SHWB branch office, information regarding the UST's was reviewed. Logs regarding UST Permit renewals for the three USTs on site were reviewed as well as communication between UST owners and the DOH. A Notice of Inspection Form was reviewed dated July 26, 2010, documenting the property maintains good standing with no citations being issued. The site was in compliance with UST/RCRA guidelines. Group 70 believes that due to the distance and down gradient location of the Kihei Minit Stop property, this site would not have a reasonable potential to adversely impact the environmental condition of the subject property.

The Selland Construction Inc. Kīhei Base Yard is identified on the EDR report figure as being located ½ to 1 mile north/northeast of the subject property. The site is listed on the SHWS and SPILLS databases. Per records review at the DOH HEER office, soil had been "grossly" contaminated with diesel fuel and heavy oils at this property which is believed to be located immediately north of the Ka'ono'ulu Ranch parcel. Site remediation took place and contaminated soils were excavated, stockpiled, and removed from the property. Following remediation additional environmental sampling took place and based on laboratory test results and DOH standards, clean up of the contaminated soils at the site was accomplished per the Site Remediation Executive Summary Report conducted by South Pacific Geotechnical in December 1994. Excavated and stockpiled contaminated soils were to be transported from the site to Hawaiian bitumen plant to be processed into "cold mix" as verbally approved by DOH. Dickinson Construction submitted a No Further Action request to DOH in July 1997. While the Selland Construction site is located at a higher elevation than the project site; Kūlanihāko'i Gulch separates the site from the project site and the slope gradient runs parallel and not towards the project site. Group 70 believes that due to site remediation efforts and the distance and topography between the location of the Selland Construction property and the project site, this site does not have a reasonable potential to adversely impact the environmental condition of the subject property.

The Kīhei Chevron DBA T.A. Hughes Inc. property was identified on the EDR report figure as being located ½ to one mile south/southwest of the subject property and is recorded on the SHWS and SPILLS databases. Records reviewed at the DOH HEER offices documented that the Kīhei Chevron has three UST's registered in association with the property. The property was

listed on the SPILLS database due to a release that resulted from a customer pumping gas into a leaking automobile gasoline tank. Seventeen gallons of fuel was released in 1994 and a small portion of the released fuel flowed into a storm drain near the Kīhei Chevron property. In 1997 the UST systems on site were retrofitted to comply with Federal UST upgrade requirements. Soil sampling took place in 2003 at the groundwater interface at four boring locations. Results of sampling were below the DOH Soil Action Level and a No Further Action Letter was documented by DOH on March 2, 2004. Group 70 believes that due to the distance and down gradient location of the Kīhei Chevron property, that this site does not have a reasonable potential to adversely impact the environmental condition of the subject property.

The Kīhei Charter High School identified in the EDR report, is listed on the FTTS and HIST FTTS list. The FTTS database is the FIFRA/TSCA Tracking System which acts as a local activity tracking and management tool. This system is a regional system used to track compliance activities such as inspections, case review, enforcement actions taken, samples collected, and pesticide grants and cooperative agreement information. Input for the FTTS is extracted from a variety of documents such as inspection reports, import review, samples, etc. (U.S. EPA). The EDR report reflected that an Asbestos Hazard Emergency Response Act (AHERA) enforcement investigation took place on September 19, 2002. The DOH Indoor and Radiological Health Branch was contacted to gain additional information regarding the database listing. Per verbal communication with Mr. Tom Lileikis, Asbestos Coordinator for the State of Hawaii; a DOH representative, Kathy Chang, inspected the Kīhei Charter High School in 2002 for AHERA compliance. Ms. Chang reported that Kīhei Charter High School located at 300 Ohukai Road in the Kīhei Commercial Center, was in compliance at the time of the inspection. The FTTS and HIST FTTS database reflects and records AHERA compliance actions. Group 70 believes that Kīhei Charter High School would not have a reasonable potential to adversely impact the environmental condition of the subject project site.

The Kīhei Marine Facility identified in the EDR report, is identified on the EDR Overview and Detail Map as being located approximately 1/8 of a mile away from the subject property and identified on the UIC database. Per the EDR report, the facility has a UIC permit under the Harry & Jeanette Weinberg Foundation with approval to construct issuance date of November 1999. Per the EDR report it is believed that this UIC permit is on an inactive use status. Based on the site investigation and interviews with ranch managers, no UIC wells are presently located on or adjacent to the subject property. The DOH HEER/UST/and SHWB branch offices did not have any files on records available for review for the Kīhei Marine Facility. The action and location of the identified property in conjunction with the subject property, would not have a reasonable potential to adversely impact the environmental condition of the subject project site. Group 70 believes the property is incorrectly mapped based on the Overview Map and Physical Setting Source Map which identifies well locations.

Orphan sites are those for which inadequate geographic control exists to accurately map them by the database program; however, other data indicators suggest they may be of concern for the project site. The project site was not listed as an Orphan Site. Twenty Orphan sites were listed. Group 70 reviewed the list of Orphan sites and concluded that none of them have a reasonable potential to impact the project site.

Based on our review of these regulatory files, it is our opinion that none of the identified sites have likely impacted the project site. Refer to *Appendix B* for Government Records Reviewed.

4.2 HISTORICAL USE INFORMATION ASSOCIATED WITH PROPERTY

County of Maui Department of Planning and Permitting and Real Property Assessment Office
Title records searched and reviewed through the County of Maui Department of Real Property Assessment, did not indicate the presence of improvements or structures on or to the subject property, nor did the records searched indicate value reduction due to environmental issues, use limitations or restrictions due to environmental issues.

Hawai'i Department of Health
Request to access government records was submitted to the DOH Solid and Hazardous Waste Branch (SHWB) and the Hazard Evaluation Emergency Response (HEER) Office on February 16, and February 21, 2011. Both the SHWB and the HEER offices did not have any records on file pertaining to the subject property. Copies of records requested and correspondence are provided in *Appendix B*.

Sanborn Maps
Historic Sanborn maps are utilized by fire departments since they provide mapped locations of flammable and/or hazardous materials. No Sanborn maps were available for the subject property in the EDR Report requested by Group 70 (*Appendix A*).

Historic Topographic Maps
Historic topographic maps were requested from EDR. These maps are updated by the USGS periodically and show surface features, reference points, roads and buildings. Historical topographic maps for 1954, 1983 and 1992 are provided in the EDR Report (*Appendix A*).

Aerial Photographs
Historical aerial photographs from the Land Study Bureau were reviewed at the Hawaii State Archives office located on the grounds of the Iolani Palace. The aerial photographs reviewed were the result of fly over's that took place in approximately 1950-1951 and 1965-1966. The subject property was identified in the historic photos. The subject property appeared to be covered with natural vegetation and was undeveloped as it is in present day. The surrounding properties also appeared to be covered with natural vegetation and undeveloped. Pi'ilani Highway is believed to be present in the aerial photographs. Please refer to Figure 5 for a copy of the 1950--1951 historical aerial photograph, and Figure 6 for the 1965-1966 historical aerial photograph.

No other historical use of the subject property was discovered during this assessment. An archeological study was not conducted as part of this Phase I ESA.

KĪHEI HIGH SCHOOL
Phase I Environmental Site Assessment

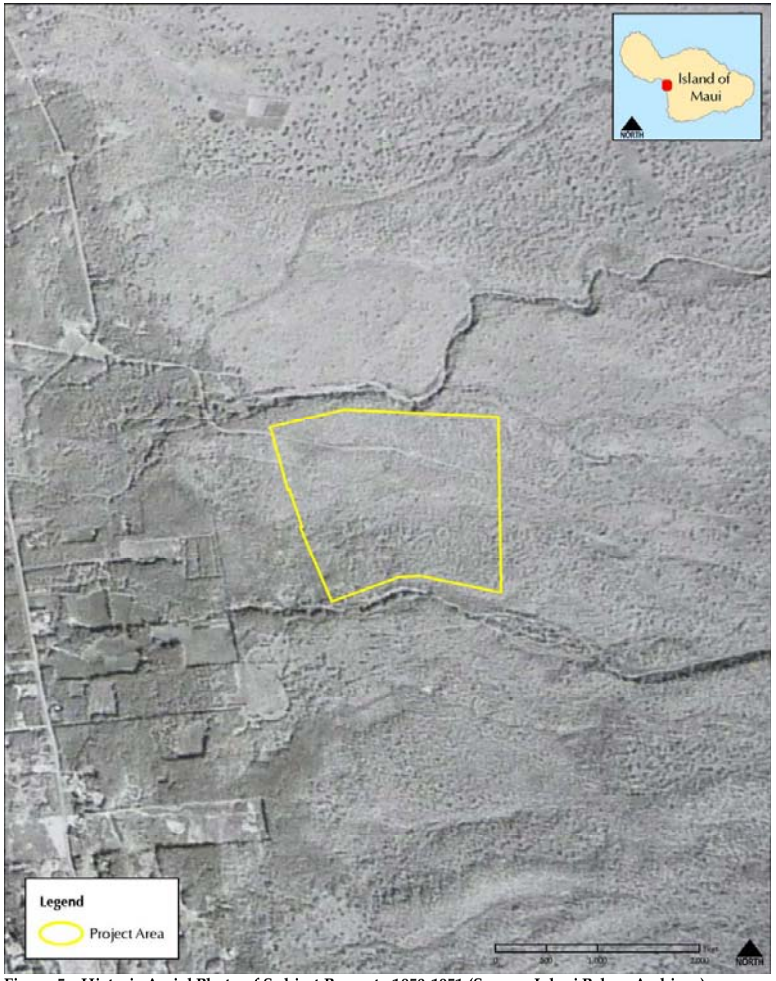

Figure 5 – Historic Aerial Photo of Subject Property 1950-1951 (Source- Iolani Palace Archives)

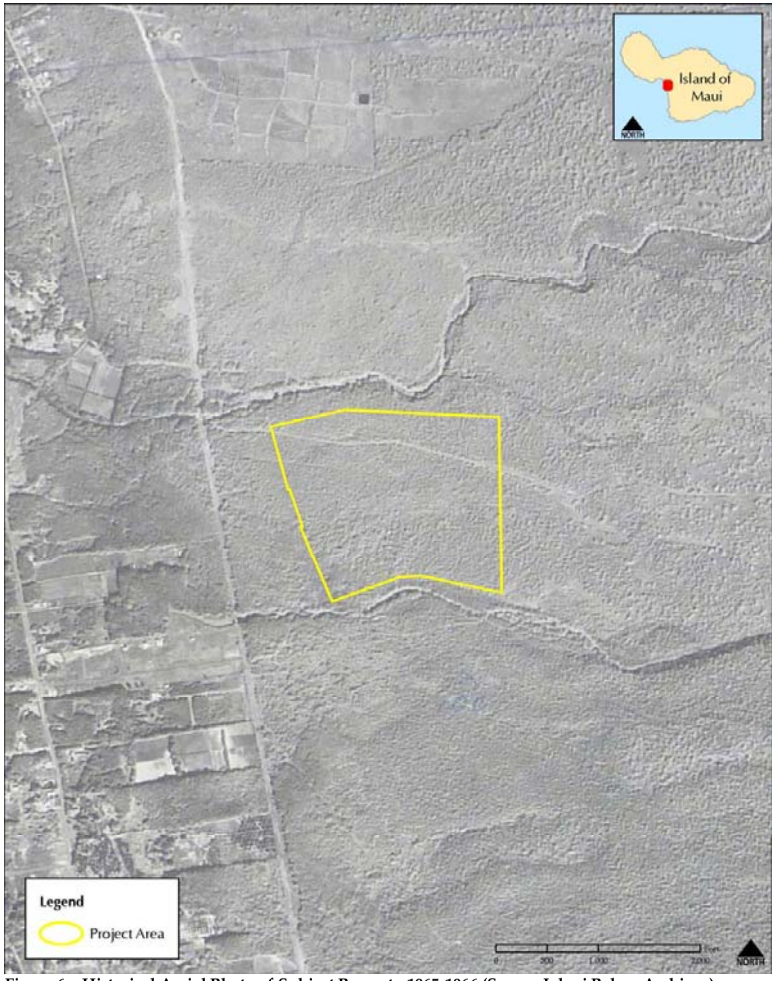

Figure 6 – Historical Aerial Photo of Subject Property 1965-1966 (Source Iolani Palace Archives)

5.0 SITE RECONNAISSANCE

Methodology and Limiting Conditions
Group 70 conducted the onsite inspection of the subject property on foot and via car. Mr. Scott Meidell of Haleakalā Ranch Company and Ms. Wendy Peterson of Ka'ono'ulu Ranch LLLP provided escort throughout the project site. Seventy five percent of the subject property was inspected on foot. Approximately 75% percent of the property was available for visual inspection; however, due to size of the subject property and vegetation, approximately 25% percent of the property was inaccessible and not visually inspected.

General Site Setting
The site reconnaissance of the subject property was completed on February 22, 2011. Site reconnaissance efforts consisted of an inspection of the subject property for past and current uses, topographic and physical conditions, and environmental concerns. Environmental concerns include (but are not limited to) stressed vegetation (from chemical spills), staining, pools of liquid, odors, storage of hazardous or regulated wastes, metals or equipment, tanks, drums, waste water, wells, septic systems, buildings and disposal sites. Neighboring properties were also viewed for the same criteria, where access and view was allowed. A photographic log from the site reconnaissance is presented in *Appendix D*.

At the time of our site reconnaissance, the project site existed as two subdivided lots associated with two separate TMK parcels. The entire project area consisted of undeveloped ranch land covered with natural and introduced vegetation. The pasture areas lay fallow and are rotated for cattle grazing if needed. Adjacent properties were used for ranchland, residential, and extracurricular purposes in the form of a golf course to the south beyond Waipu'ilani Gulch. The site was on topographically flat to gently sloping land, starting at approximately 20-40 feet above mean sea level.

Hazardous Substances and Petroleum Products
Visual observation for the use and/or storage of chemicals, hazardous materials, and hazardous wastes was performed. No RCRA hazardous wastes or materials were observed to be generated, stored, accumulated, transported, used, or disposed on site. No activity was observed on site that would likely generate RCRA regulated hazardous waste.

Underground and Aboveground Storage Tanks
Visual observations for manways, vent pipes, fill connections, concrete pressure dispersion pads, and dispenser pumps were conducted throughout accessible areas of the project site and adjacent properties. Evidence indicating historical or current existence of USTs was not observed.

A review of the State of Hawai'i DOH UST registration lists did not indicate the presence of an underground storage tank system or leaking underground storage tank systems, registered to the project site or properties in the near vicinity of the project site.

Visual observations for vent pipes, secondary containment walls, or other evidence of above ground storage tanks were conducted throughout project site and accessible areas of adjacent properties. Evidence indicating historical or current existence of ASTs was not found.

Interviews with people knowledgeable of the site and site history did not indicate the past or current existence of ASTs at the project site.

Solid Waste Disposal
Currently, no non-hazardous solid waste is generated onsite.

Indications of Polychlorinated Biphenyls (PCBs)
Visual observation for electrical equipment or electrical components that use dielectric fluid that potentially contains PCBs was conducted. PCBs (polychlorinated biphenyl) are heavily regulated under the Toxic Substances Control Act (TSCA), which obligates a property owner to clean up any spills occurring on their property.

No pole-mounted transformers, nor vaulted transformers were identified on or adjacent to the project site. No privately-owned transformer equipment was observed within the subject property.

Visual observation for hydraulic lift equipment or components containing hydraulic fluid that potentially contains PCBs was also conducted. No in-ground hydraulic lift equipment was observed on site at the time of our reconnaissance. Interviews with persons knowledgeable of the project site history did not indicate the historical or current presence of in-ground hydraulic lift equipment on the project site.

Wells
Evidence of wells (supply, monitoring or dry wells) was not observed during the assessment. No additional evidence of wells was observed on the project site. According to the DOH Underground Injection Control (UIC) Program map, dated September 1999, the project site is below the UIC Line, and the underlying aquifer is not considered a drinking water source.

No additional evidence of wells was observed on the project site.

There were no unusual odors noted during the site inspection. No areas of stressed vegetation, resulting from chemical or petroleum spills were observed on the project site. The majority of the vegetation during the inspection was dry and brown due to lack of rain events and a drought like atmosphere.

6.0 INTERVIEWS

Interviews with Site Owners/Occupant's
On February 22, 2011 Group 70 received a completed property questionnaire, containing responses to structured questions regarding the project site's current and historical activities, from Mr. Scott Meidell; owner representative and Ranch Manager for Haleakalā Ranch Company.

Mr. Meidell reported that he had been familiar with the project site for seven years. Mr. Meidell reported that he had no knowledge of previous or current site contamination or previous or current site activities that might have resulted in contamination of the project site. He also reported that he had no knowledge of contamination or land use of adjacent properties that might have resulted in contamination of the project site. Mr. Meidell had reported that Parcel 054 had been used for grazing for the past 100 years.

On March 5, 2011 Group 70 received a completed Phase I ESA property questionnaire from Mr. Henry F. Rice, General Manager of Ka'ono'ulu Ranch LLLP; containing responses to structured questions regarding the project site's current and historical activities. Mr. Rice reported that he had been familiar with the project site for 73 years.

Mr. Rice reported that he had no knowledge of previous or current site contamination or previous or current site activities that might have resulted in contamination of the project site. He also reported that he had no knowledge of contamination or land use of adjacent properties that might have resulted in contamination of the project site. Mr. Rice, via his daughter, had reported that Ka'ono'ulu Ranch LLLP had been using the property for ranch activities and grazing for over the past 100 years.

Copies of the completed Phase I ESA questionnaires are provided in *Appendix C*.

7.0 FINDINGS

Following the Phase I ESA assessment of the subject property, no evidence of the use or storage of hazardous and/or regulated material or wastes was identified presently or historically on the property or neighboring properties.

Group 70 has performed a Phase I Environmental Site Assessment in conformance with the guidelines of ASTM practice E-1527-05 of the undeveloped pasture property, located east of Pi'ilani Highway identified as TMK parcels (2) 2-2-002: 081 and (2) 2-2-002: 083, the project site. Any exceptions or deletions to this practice are described in Sections 1.0.

It is Group 70's opinion that the past ownership and activities associated with the two parcels associated with the project site, does not have a reasonable potential to adversely impact the environmental condition of the project site. Furthermore, based on review of environmental databases, historical maps, regulatory review, site reconnaissance and communication with the current owners, this assessment has revealed no evidence of historical or present recognized environmental conditions in connection with the subject property.

It is our opinion that no *recognized environmental conditions* with respect to the project site were apparent at the time of the investigation.

This assessment has revealed no evidence of recognized environmental conditions, as defined by ASTM, in connection with the project site. Recommendations for further evaluation or remediation are not necessary at this time.

8.0 REFERENCES

Abbott, Macdonald, and Peterson. Volcanoes in the Sea. 2nd ed. Honolulu: University of Hawaii Press, 1983.

Department of Health, State of Hawaii (DOH). Safe Water Drinking Branch. Underground Injection Control Map for the Island of Oahu. Website: http://www.hawaii.gov/health/environmental/water/sdwb/uic/uicprogrm.html

Environmental Data Resources, Inc. (EDR). February 2011. The EDR Radius Map Report with GeoCheck, Kīhei High School, Pi'ilani Highway, Kīhei, Hawaii 96753. Inquiry number 2993316.1s.

Environmental Protection Agency. (EPA). EPA Records Schedule. EPA Records Schedule 421. Website: http://www.epa.gov/records/policy/schedule/sched/421.htm

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Kihei Charter School. Website: www.kiheicharter.org

Lau, L. Stephen and Mink, John F. 1990. *Aquifer Identification and Classification for Maui: Groundwater Protection Strategy for Hawaii*. Tech. Report No. 185. Honolulu: Univ. of Hawaii, Water Resources Research Center. February.

United States Department of Agriculture, Soil Conservation Service (USDA SCS). 1973. *Soil Survey of Islands of Kauai, Oahu, Maui, Molokai, and Lanai, State of Hawaii.* In cooperation with the University of Hawaii Agricultural Experiment Station. Washington, D.C. August.

Geographical Information Systems Data

All maps produced using GIS are based on source data provided from the Federal Government and State of Hawai'i resources. The data layers used to create the maps are used "as is" and are not manipulated or edited for visual improvement.

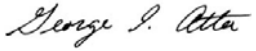
Project Area
Project area - Group 70, GIS, Jan 2010

Soils
Soils - USDA NRCS, 1972

Tax Map Key
State of Hawaii, County of Maui 6/29/2011

Aerial base – ESRI, ArcGIS Online, Date Unknown

9.0 QUALIFICATIONS AND SIGNATURES OF ENVIRONMENTAL PROFESSIONALS



Mr. George Atta, AICP, Principal Planner
Masters in City & Regional Planning - Harvard University
Certified Environmental Inspector - Environmental Assessment Association
Years of Experience: 28 years of professional experience

Ms. Dricka Brown, Environmental Scientist/Sustainable Development Researcher
Environmental Studies - University of California at Santa Barbara
Years of Experience: 7 years of professional experience

APPENDIX A

Environmental Data Resources, Inc. (EDR)
Radius Map™ Report with GeoCheck

Kihei High School
Piilani Highway
Kihei, HI 96753

Inquiry Number: 3061110.1s
May 06, 2011

The EDR Radius Map™ Report with GeoCheck®

EDR® Environmental Data Resources Inc

440 Wheelers Farms Road
Milford, CT 06461
Toll Free: 800.352.0050
www.edrnet.com

FORM-NULL-SXS

TABLE OF CONTENTS

Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

EXECUTIVE SUMMARY

A search of available environmental records was conducted by Environmental Data Resources, Inc (EDR). The report was designed to assist parties seeking to meet the search requirements of EPA's Standards and Practices for All Appropriate Inquiries (40 CFR Part 312), the ASTM Standard Practice for Environmental Site Assessments (E 1527-05) or custom requirements developed for the evaluation of environmental risk associated with a parcel of real estate.

TARGET PROPERTY INFORMATION

ADDRESS

PIILANI HIGHWAY
KIHEI, HI 96753

COORDINATES

Latitude (North):	20.763000 - 20° 45' 46.8''
Longitude (West):	156.448500 - 156° 26' 54.6''
Universal Tranverse Mercator:	Zone 4
UTM X (Meters):	765661.0
UTM Y (Meters):	2297880.8
Elevation:	46 ft. above sea level

USGS TOPOGRAPHIC MAP ASSOCIATED WITH TARGET PROPERTY

Target Property Map:	20156-G4 WAILUKU, HI
Most Recent Revision:	Not reported

TARGET PROPERTY SEARCH RESULTS

The target property was not listed in any of the databases searched by EDR.

DATABASES WITH NO MAPPED SITES

No mapped sites were found in EDR's search of available ("reasonably ascertainable ") government records either on the target property or within the search radius around the target property for the following databases:

STANDARD ENVIRONMENTAL RECORDS

Federal NPL site list

NPL ..... National Priority List
Proposed NPL ..... Proposed National Priority List Sites
NPL LIENS ..... Federal Superfund Liens

Federal Delisted NPL site list

Delisted NPL ..... National Priority List Deletions

EXECUTIVE SUMMARY

Federal CERCLIS list

CERCLIS ..... Comprehensive Environmental Response, Compensation, and Liability Information System
FEDERAL FACILITY ..... Federal Facility Site Information listing

Federal CERCLIS NFRAP site List

CERC-NFRAP ..... CERCLIS No Further Remedial Action Planned

Federal RCRA CORRACTS facilities list

CORRACTS ..... Corrective Action Report

Federal RCRA non-CORRACTS TSD facilities list

RCRA-TSDF ..... RCRA - Treatment, Storage and Disposal

Federal RCRA generators list

RCRA-LQG ..... RCRA - Large Quantity Generators
RCRA-SQG ..... RCRA - Small Quantity Generators
RCRA-CESQG ..... RCRA - Conditionally Exempt Small Quantity Generator

Federal institutional controls / engineering controls registries

US ENG CONTROLS ..... Engineering Controls Sites List
US INST CONTROL ..... Sites with Institutional Controls

Federal ERNS list

ERNS ..... Emergency Response Notification System

State and tribal landfill and/or solid waste disposal site lists

SWF/LF ..... Permitted Landfills in the State of Hawaii

State and tribal leaking storage tank lists

LUST ..... Leaking Underground Storage Tank Database
INDIAN LUST ..... Leaking Underground Storage Tanks on Indian Land

State and tribal registered storage tank lists

INDIAN UST ..... Underground Storage Tanks on Indian Land
FEMA UST ..... Underground Storage Tank Listing

State and tribal institutional control / engineering control registries

ENG CONTROLS ..... Engineering Control Sites
INST CONTROL ..... Sites with Institutional Controls

State and tribal voluntary cleanup sites

INDIAN VCP ..... Voluntary Cleanup Priority Listing

VCP ..... Voluntary Response Program Sites

State and tribal Brownfields sites

BROWNFIELDS ..... Brownfields Sites

ADDITIONAL ENVIRONMENTAL RECORDS

Local Brownfield lists

US BROWNFIELDS ..... A Listing of Brownfields Sites

Local Lists of Landfill / Solid Waste Disposal Sites

DEBRIS REGION 9 ..... Torres Martinez Reservation Illegal Dump Site Locations
ODI ..... Open Dump Inventory
INDIAN ODI ..... Report on the Status of Open Dumps on Indian Lands

Local Lists of Hazardous waste / Contaminated Sites

US CDL ..... Clandestine Drug Labs
CDL ..... Clandestine Drug Lab Listing
US HIST CDL ..... National Clandestine Laboratory Register

Local Land Records

LIENS 2 ..... CERCLA Lien Information
LUCIS ..... Land Use Control Information System

Records of Emergency Release Reports

HMIRS ..... Hazardous Materials Information Reporting System
SPILLS ..... Release Notifications

Other Ascertainable Records

RCRA-NonGen ..... RCRA - Non Generators
DOT OPS ..... Incident and Accident Data
DOD ..... Department of Defense Sites
FUDS ..... Formerly Used Defense Sites
CONSENT ..... Superfund (CERCLA) Consent Decrees
ROD ..... Records Of Decision
UMTRA ..... Uranium Mill Tailings Sites
MINES ..... Mines Master Index File
TRIS ..... Toxic Chemical Release Inventory System
TSCA ..... Toxic Substances Control Act
FTTS ..... FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
HIST FTTS ..... FIFRA/TSCA Tracking System Administrative Case Listing
SSTS ..... Section 7 Tracking Systems
ICIS ..... Integrated Compliance Information System
PADS ..... PCB Activity Database System
MLTS ..... Material Licensing Tracking System
RADINFO ..... Radiation Information Database

EXECUTIVE SUMMARY

FINDS ..... Facility Index System/Facility Registry System
RAATS ..... RCRA Administrative Action Tracking System
UIC ..... Underground Injection Wells Listing
DRYCLEANERS ..... Permitted Drycleaner Facility Listing
AIRS ..... List of Permitted Facilities
INDIAN RESERV ..... Indian Reservations
SCRD DRYCLEANERS ..... State Coalition for Remediation of Drycleaners Listing
COAL ASH EPA ..... Coal Combustion Residues Surface Impoundments List
FINANCIAL ASSURANCE ..... Financial Assurance Information Listing
COAL ASH DOE ..... Sleam-Electric Plan Operation Data
PCB TRANSFORMER ..... PCB Transformer Registration Database

EDR PROPRIETARY RECORDS

EDR Proprietary Records

Manufactured Gas Plants ..... EDR Proprietary Manufactured Gas Plants

SURROUNDING SITES: SEARCH RESULTS

Surrounding sites were identified in the following databases.

Elevations have been determined from the USGS Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified. Sites with an elevation equal to or higher than the target property have been differentiated below from sites with an elevation lower than the target property.
Page numbers and map identification numbers refer to the EDR Radius Map report where detailed data on individual sites can be reviewed.

Sites listed in ***bold italics*** are in multiple databases.

Unmappable (orphan) sites are not considered in the foregoing analysis.

STANDARD ENVIRONMENTAL RECORDS

State- and tribal - equivalent CERCLIS

SHWS: The State Hazardous Waste Sites records are the states' equivalent to CERCLIS. These sites may or may not already be listed on the federal CERCLIS list. Priority sites planned for cleanup using state funds (state equivalent of Superfund) are identified along with sites where cleanup will be paid for by potentially responsible parties. The data come from the Department of Health.

A review of the SHWS list, as provided by EDR, and dated 12/01/2009 has revealed that there are 2 SHWS sites within approximately 1 mile of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
SELLAND CONSTRUCTION INC, KIHE	***454 OHUKAI RD***	***NNE 1/2 - 1 (0.916 mi.)***	***4***	***8***
Lower Elevation	**Address**	**Direction / Distance**	**Map ID**	**Page**
KIHEI CHEVRON DBA T.A. HUGHES	***1281 S KIHEI RD***	***SSW 1/2 - 1 (0.940 mi.)***	***5***	***9***

EXECUTIVE SUMMARY

State and tribal registered storage tank lists

UST: The Underground Storage Tank database contains registered USTs. USTs are regulated under Subtitle I of the Resource Conservation and Recovery Act (RCRA). The data come from the Department of Health's Listing of Underground Storage Tanks.

A review of the UST list, as provided by EDR, and dated 03/08/2011 has revealed that there is 1 UST site within approximately 0.25 miles of the target property.

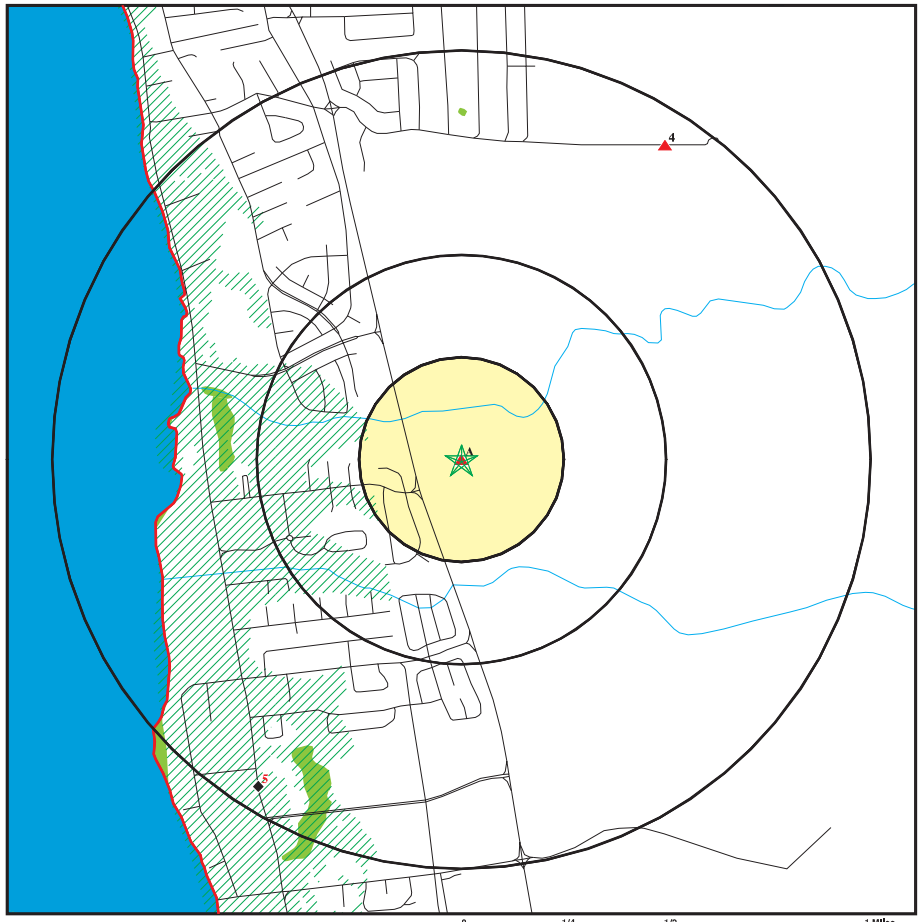
Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
KIHEI MINIT STOP	PIILANI VILLAGE SHOPPIN	0 - 1/8 (0.000 mi.)	A1	7

EXECUTIVE SUMMARY

Due to poor or inadequate address information, the following sites were not mapped. Count: 20 records.

Site Name	Database(s)
KAMALII ELEM. SCHOOL	FTTS,HIST FTTS INSP
KIHEI WWTP	LUST,UST,FINANCIAL ASSURANCE
MONSANTO COMPANY	RCRA-SQG
SOUTH KIHEI ROAD IMPROVEMENTS	FINDS
GTE HAWAIIAN TEL NORTH KIHEI REMOT	FINDS
KIHEI COMMERCIAL CONDOMINIUM	FINDS
KAMALII ELEMENTARY SCHOOL	FINDS
KIHEI SPS #5 (EAST WELAKAHAO)	FINDS
KIHEI SPS #6 (KIHEI FIRE HOUSE)	FINDS
KIHEI SPS #3 (MENEHUNE SHORES)	FINDS
KIHEI SPS#8 (HALE HUI KAI CONDO)	FINDS
KIHEI SPS #7 (KAMAOLE PARK #1)	FINDS
KIHEI SPS #4 (YE'S ORCHARD)	FINDS
LIPOA STREET & SOUTH KIHEI ROAD	FINDS
KIHEI RECYCLING & REDEMPTION C	FINDS
KIHEI WASTEWATER RECLAMATION	FINDS
MAALAEA HARBOR, KIHEI COAST	FINDS
NORTH KIHEI REMOTE EQUIPMENT BLDG	FINDS
KIHEI LUTHERAN CHURCH	FINDS
KIHEI KAUHALE SUBDIVISION	FINDS

OVERVIEW MAP - 3061110.1s

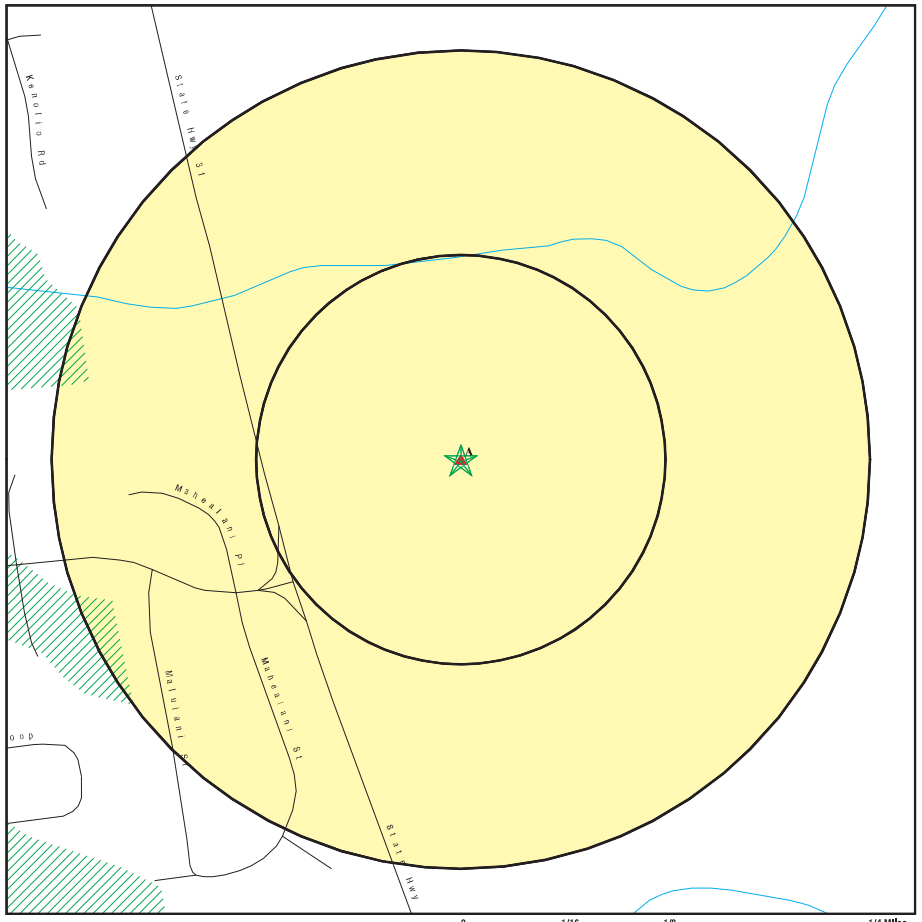


- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Manufactured Gas Plants
- National Priority List Sites
- Dept. Defense Sites
- Indian Reservations BIA
- County Boundary
- Oil & Gas pipelines
- 100-year flood zone
- 500-year flood zone
- National Wetland Inventory

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME: Kihei High School ADDRESS: Piilani Highway Kihei HI 96753 LAT/LONG: 20.7630 / 156.4485	CLIENT: Group 70 International, Inc. CONTACT: Dricka Brown INQUIRY #: 3061110.1s DATE: May 06, 2011 11:43 am

DETAIL MAP - 3061110.1s



- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Manufactured Gas Plants
- Sensitive Receptors
- National Priority List Sites
- Dept. Defense Sites
- Indian Reservations BIA
- Oil & Gas pipelines
- 100-year flood zone
- 500-year flood zone

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME: Kihei High School ADDRESS: Piilani Highway Kihei HI 96753 LAT/LONG: 20.7630 / 156.4485	CLIENT: Group 70 International, Inc. CONTACT: Dricka Brown INQUIRY #: 3061110.1s DATE: May 06, 2011 11:43 am

MAP FINDINGS SUMMARY

Database	Target Property	Search Distance (Miles)	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
STANDARD ENVIRONMENTAL RECORDS								
Federal NPL site list								
NPL		1.000	0	0	0	0	NR	0
Proposed NPL		1.000	0	0	0	0	NR	0
NPL LIENS		TP	NR	NR	NR	NR	NR	0
Federal Delisted NPL site list								
Delisted NPL		1.000	0	0	0	0	NR	0
Federal CERCLIS list								
CERCLIS		0.500	0	0	0	NR	NR	0
FEDERAL FACILITY		1.000	0	0	0	0	NR	0
Federal CERCLIS NFRAP site List								
CERC-NFRAP		0.500	0	0	0	NR	NR	0
Federal RCRA CORRACTS facilities list								
CORRACTS		1.000	0	0	0	0	NR	0
Federal RCRA non-CORRACTS TSD facilities list								
RCRA-TSDF		0.500	0	0	0	NR	NR	0
Federal RCRA generators list								
RCRA-LQG		0.250	0	0	NR	NR	NR	0
RCRA-SQG		0.250	0	0	NR	NR	NR	0
RCRA-CESQG		0.250	0	0	NR	NR	NR	0
Federal institutional controls / engineering controls registries								
US ENG CONTROLS		0.500	0	0	0	NR	NR	0
US INST CONTROL		0.500	0	0	0	NR	NR	0
Federal ERNS list								
ERNS		TP	NR	NR	NR	NR	NR	0
State- and tribal - equivalent CERCLIS								
SHWS		1.000	0	0	0	2	NR	2
State and tribal landfill and/or solid waste disposal site lists								
SWF/LF		0.500	0	0	0	NR	NR	0
State and tribal leaking storage tank lists								
LUST		0.500	0	0	0	NR	NR	0
INDIAN LUST		0.500	0	0	0	NR	NR	0
State and tribal registered storage tank lists								
UST		0.250	1	0	NR	NR	NR	1

MAP FINDINGS SUMMARY

Database	Target Property	Search Distance (Miles)	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
INDIAN UST		0.250	0	0	NR	NR	NR	0
FEMA UST		0.250	0	0	NR	NR	NR	0
State and tribal institutional control / engineering control registries								
ENG CONTROLS		0.500	0	0	0	NR	NR	0
INST CONTROL		0.500	0	0	0	NR	NR	0
State and tribal voluntary cleanup sites								
INDIAN VCP		0.500	0	0	0	NR	NR	0
VCP		0.500	0	0	0	NR	NR	0
State and tribal Brownfields sites								
BROWNFIELDS		0.500	0	0	0	NR	NR	0
ADDITIONAL ENVIRONMENTAL RECORDS								
Local Brownfield lists								
US BROWNFIELDS		0.500	0	0	0	NR	NR	0
Local Lists of Landfill / Solid Waste Disposal Sites								
DEBRIS REGION 9		0.500	0	0	0	NR	NR	0
ODI		0.500	0	0	0	NR	NR	0
INDIAN ODI		0.500	0	0	0	NR	NR	0
Local Lists of Hazardous waste / Contaminated Sites								
US CDL		TP	NR	NR	NR	NR	NR	0
CDL		TP	NR	NR	NR	NR	NR	0
US HIST CDL		TP	NR	NR	NR	NR	NR	0
Local Land Records								
LIENS 2		TP	NR	NR	NR	NR	NR	0
LUCIS		0.500	0	0	0	NR	NR	0
Records of Emergency Release Reports								
HMIRS		TP	NR	NR	NR	NR	NR	0
SPILLS		TP	NR	NR	NR	NR	NR	0
Other Ascertainable Records								
RCRA-NonGen		0.250	0	0	NR	NR	NR	0
DOT OPS		TP	NR	NR	NR	NR	NR	0
DOD		1.000	0	0	0	0	NR	0
FUDS		1.000	0	0	0	0	NR	0
CONSENT		1.000	0	0	0	0	NR	0
ROD		1.000	0	0	0	0	NR	0
UMTRA		0.500	0	0	0	NR	NR	0
MINES		0.250	0	0	NR	NR	NR	0
TRIS		TP	NR	NR	NR	NR	NR	0

MAP FINDINGS SUMMARY

Database	Target Property	Search Distance (Miles)	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
TSCA		TP	NR	NR	NR	NR	NR	0
FTTS		TP	NR	NR	NR	NR	NR	0
HIST FTTS		TP	NR	NR	NR	NR	NR	0
SSTS		TP	NR	NR	NR	NR	NR	0
ICIS		TP	NR	NR	NR	NR	NR	0
PADS		TP	NR	NR	NR	NR	NR	0
MLTS		TP	NR	NR	NR	NR	NR	0
RADINFO		TP	NR	NR	NR	NR	NR	0
FINDS		TP	NR	NR	NR	NR	NR	0
RAATS		TP	NR	NR	NR	NR	NR	0
UIC		TP	NR	NR	NR	NR	NR	0
DRYCLEANERS		0.250	0	0	NR	NR	NR	0
AIRS		TP	NR	NR	NR	NR	NR	0
INDIAN RESERV		1.000	0	0	0	0	NR	0
SCRD DRYCLEANERS		0.500	0	0	0	NR	NR	0
COAL ASH EPA		0.500	0	0	0	NR	NR	0
FINANCIAL ASSURANCE		TP	NR	NR	NR	NR	NR	0
COAL ASH DOE		TP	NR	NR	NR	NR	NR	0
PCB TRANSFORMER		TP	NR	NR	NR	NR	NR	0
EDR PROPRIETARY RECORDS								
EDR Proprietary Records								
Manufactured Gas Plants		1.000	0	0	0	0	NR	0

NOTES:

TP = Target Property

NR = Not Requested at this Search Distance

Sites may be listed in more than one database

MAP FINDINGS

Map ID / Direction / Distance / Elevation | Site | Database(s) | EDR ID Number / EPA ID Number

A1 **KIHEI MINIT STOP** **UST** **U003762157**
PIILANI VILLAGE SHOPPING CENTER 233 PIIKEA AVE **N/A**
< 1/8 **KIHEI, HI 96753**
1 ft.

Site 1 of 3 in cluster A

Relative: Higher

Actual: 47 ft.

UST:

Facility ID:	9-503629
Owner:	MAUI PETROLEUM
Owner Address:	385 HUKILIKE ST, SUITE 200
Ownder City,St,Zip:	Kihei, 96753 96753
Tank ID:	3
Date Installed:	8/31/2000
Tank Status:	**Currently In Use**
Date Closed:	Not reported
Tank Capacity:	4000
Substance:	Diesel
Tank ID:	87
Date Installed:	8/31/2000
Tank Status:	**Currently In Use**
Date Closed:	Not reported
Tank Capacity:	10000
Substance:	Gasoline
Tank ID:	92
Date Installed:	8/31/2000
Tank Status:	**Currently In Use**
Date Closed:	Not reported
Tank Capacity:	6000
Substance:	Gasoline

A2 **KIHEI MARINE FACILITY** **UIC** **S109953357**
PIILANI HWY ON N. **N/A**
< 1/8 **KIHEI MAUI, HI 96753**
1 ft.

Site 2 of 3 in cluster A

Relative: Higher

Actual: 47 ft.

UIC:

UIC Permit Number:	UM-2068
Facility Id/Lat Long Minute Coordinates:	6-
Central Latitude Of The Site:	20 47 15 N
Central Longitude Of The Site:	156 27 52 W
Flow In Gallons Per Day:	Not reported
Total Number Of Inj. Well(S) On Permit:	Not reported
Island:	Maui
Location In Relation To UIC Line:	Not reported
Facility Type:	AQ
Subclass:	B
Facility Operator, Not Contract Opr:	Not available (Inactive use status)
Operator Address:	Not reported
Facility Owner:	Harry & Jeanette Weinberg Foundation, Inc.
Owner Address:	3660 Waialae Ave., Suite 400, HON, HI 96816
Tax Map Key Number:	2:
Owner Of Land Property On Leasehold:	none
Consultant Serving The Application:	Water Res. Assoc.
Receipt Of Initial Application:	8/30/1999

KIHEI MARINE FACILITY (Continued) **S109953357**

Public Notice Date:	Not reported
Approval-To-Construct Issuance Date:	11/4/1999
Exemption Issuance Date:	Not reported
1st Issuance Of Permit:	Not reported
Last Issuance Of Permit:	Not reported
Type:	Not reported
Permit Expiration Date:	Not reported
Date When File Is Closed:	Not reported
UIC Project Geologist:	JR
Remarks:	Not reported

A3 **KIHEI CHARTER HIGH SCHOOL** **FTTS 1009516930**
P.O.BOX 2053 **HIST FTTS N/A**
< 1/8 **KIHEI, HI 96753**
1 ft.

Site 3 of 3 in cluster A

Relative: Higher

Actual: 47 ft.

FTTS INSP:

Inspection Number:	20020919HI08 1
Region:	09
Inspection Date:	09/19/02
Inspector:	KCHANG
Violation occurred:	Yes
Investigation Type:	AHERA, Enforcement, State Conducted
Investigation Reason:	Neutral Scheme, State
Legislation Code:	TSCA
Facility Function:	User

HIST FTTS INSP:

Inspection Number:	20020919HI08 1
Region:	09
Inspection Date:	Not reported
Inspector:	KCHANG
Violation occurred:	Yes
Investigation Type:	AHERA, Enforcement, State Conducted
Investigation Reason:	Neutral Scheme, State
Legislation Code:	TSCA
Facility Function:	User

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4 **SELLAND CONSTRUCTION INC, KIHEI BASE YARD** **SHWS S105262951**
NNE **454 OHUKAI RD** **SPILLS N/A**
1/2-1 **KIHEI, HI 96753**
0.916 mi.
4835 ft.

Relative: Higher

Actual: 181 ft.

SHWS:

Organization:	Selland Construction, Inc.
Supplemental Location Text:	Ohukai Rd Base Yard
Island:	Maui
Environmental Interest:	Selland Construction, Inc., Kihei Base Yard
Hid Number:	Not reported
Facility Registry Identifier:	110013779018
Lead Agency:	HEER
Program:	State

SELLAND CONSTRUCTION INC, KIHEI BASE YARD (Continued) **S105262951**

Project Manager:	Richard Palmer
Hazard Priority:	Low
Site Status:	Inactive
Action:	Response
Potential Hazards And Controls:	Hazard Undetermined
Closure Document Title:	Not reported
Date Of Closure Document:	Not reported

HI SPILLS:

Island:	Maui
Supplemental Loc. Text:	Ohukai Rd Base Yard
Case Number:	19940218-2
HID Number:	Not reported
Facility Registry Id:	110013779018
Lead and Program:	HEER EP&R
ER:	Not reported
Units:	Selland Construction Baseyard
Substances:	Diesel Fuel and oil
Less Or Greater Than:	Not reported
Numerical Quantity:	Not reported
Units:	Not reported
Activity Type:	Response
Activity Lead:	Not reported
Assignment End Date:	Not reported
Result:	8
File Under:	Selland Construction, Inc.

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5 **KIHEI CHEVRON DBA T.A. HUGHES INC** **SHWS S106818529**
SSW **1281 S KIHEI RD** **SPILLS N/A**
1/2-1 **KIHEI, HI 96753**
0.940 mi.
4966 ft.

Relative: Lower

Actual: 7 ft.

SHWS:

Organization:	Chevron Products Company
Supplemental Location Text:	Not reported
Island:	Maui
Environmental Interest:	Kihei Chevron
Hid Number:	Not reported
Facility Registry Identifier:	110013770099
Lead Agency:	SHWB
Program:	State
Project Manager:	Laura Young
Hazard Priority:	NFA
Site Status:	NFA
Action:	Assessment
Potential Hazards And Controls:	Hazard Undetermined
Closure Document Title:	NFA - Type Undetermined
Date Of Closure Document:	2/24/2004 1:19:18 AM

HI SPILLS:

Island:	Maui
Supplemental Loc. Text:	Not reported
Case Number:	20030916-1430
HID Number:	Not reported
Facility Registry Id:	110013770099
Lead and Program:	HEER EP&R

Count: 20 records.

ORPHAN SUMMARY

City	EDR ID	Site Name	Site Address	Zip	Database(s)
KIHEI	1006819090	NORTH KIHEI REMOTE EQUIPMENT BLDG	REMOTE EQUIPMENT BLDG	96753	FINDS
KIHEI	1006842431	KIHEI SPS #5 (EAST WELAKAHAO)	N KIHEI RD	96753	FINDS
KIHEI	1006842789	KIHEI SPS #4 (YE'S ORCHARD)	N KIHEI RD	96753	FINDS
KIHEI	1006842793	KIHEI SPS #7 (KAMAOLE PARK #1)	S KIHEI RD	96753	FINDS
KIHEI	1006842794	KIHEI SPS#8 (HALE HUI KAI CONDO)	S KIHEI RD	96753	FINDS
KIHEI	1006842882	KIHEI SPS #3 (MENEHUNE SHORES)	N KIHEI RD	96753	FINDS
KIHEI	1006844053	KIHEI SPS #6 (KIHEI FIRE HOUSE)	N KIHEI RD	96753	FINDS
KIHEI	1006844284	GTE HAWAIIAN TEL NORTH KIHEI REMOT	HALALAI PL	96753	FINDS
KIHEI	1008013553	KIHEI COMMERCIAL CONDOMINIUM	91-335 KAUHI ST	96753	FINDS
KIHEI	1008170735	KIHEI WASTEWATER RECLAMATION	3901 MOKULELE LOOP, # 6	96753	FINDS
KIHEI	1008173012	KIHEI LUTHERAN CHURCH	VARIOUS	96753	FINDS
KIHEI	1008173333	SOUTH KIHEI ROAD IMPROVEMENTS	AKONI PULE HWY	96753	FINDS
KIHEI	1008318020	KAMALII ELEMENTARY SCHOOL	180 KEALII ALANUI	96753	FINDS
KIHEI	1008919500	KIHEI RECYCLING & REDEMPTION C	SOUTH MAUI COMMUNITY PARK	96753	FINDS
KIHEI	1008982223	KAMALII ELEM. SCHOOL	180 KEALII ALANUI RD.	96753	FTTS,HIST FTTS INSP
KIHEI	1009403749	KIHEI KAUHALE SUBDIVISION	WAIPUILANI ROAD	96753	FINDS
KIHEI	1009794023	MAALAEA HARBOR, KIHEI COAST	NOT GIVEN	96753	FINDS
KIHEI	1009795085	LIPOA STREET & SOUTH KIHEI ROAD	LIPOA & S KIHEI RD	96753	FINDS
KIHEI	1010316486	MONSANTO COMPANY	2111 PIILANI HWY	96753	RCRA-SQG
KIHEI	U001236805	KIHEI WWTP	480 WELEKAHAO RD/PIILANI HWY	96753	LUST,UST,FINANCIAL ASSURANCE

MAP FINDINGS

Map ID
Direction
Distance
Elevation

Site

Database(s)

EDR ID Number
EPA ID Number

KIHEI CHEVRON DBA T.A. HUGHES INC (Continued) **S106818529**

ER: Not reported
Units: Kihei Chevron Service Station Release ID 200309161430
Substances: Unknown
Less Or Greater Than: Not reported
Numerical Quantity: Not reported
Units: Not reported
Activity Type: Response
Activity Lead: Curtis Martin
Assignment End Date: Not reported
Result: 8
File Under: Chevron Products Company

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

To maintain currency of the following federal and state databases, EDR contacts the appropriate governmental agency on a monthly or quarterly basis, as required.

Number of Days to Update: Provides confirmation that EDR is reporting records that have been updated within 90 days from the date the government agency made the information available to the public.

STANDARD ENVIRONMENTAL RECORDS

Federal NPL site list

NPL: National Priority List
National Priorities List (Superfund). The NPL is a subset of CERCLIS and identifies over 1,200 sites for priority cleanup under the Superfund Program. NPL sites may encompass relatively large areas. As such, EDR provides polygon coverage for over 1,000 NPL site boundaries produced by EPA's Environmental Photographic Interpretation Center (EPIC) and regional EPA offices.

Date of Government Version: 12/31/2010
Date Data Arrived at EDR: 01/13/2011
Date Made Active in Reports: 01/28/2011
Number of Days to Update: 15
Source: EPA
Telephone: N/A
Last EDR Contact: 04/13/2011
Next Scheduled EDR Contact: 07/25/2011
Data Release Frequency: Quarterly

NPL Site Boundaries

Sources:

EPA's Environmental Photographic Interpretation Center (EPIC)
Telephone: 202-564-7333

EPA Region 1
Telephone 617-918-1143

EPA Region 6
Telephone: 214-655-6659

EPA Region 3
Telephone 215-814-5418

EPA Region 7
Telephone: 913-551-7247

EPA Region 4
Telephone 404-562-8033

EPA Region 8
Telephone: 303-312-6774

EPA Region 5
Telephone 312-886-6686

EPA Region 9
Telephone: 415-947-4246

EPA Region 10
Telephone 206-553-8665

Proposed NPL: Proposed National Priority List Sites
A site that has been proposed for listing on the National Priorities List through the issuance of a proposed rule in the Federal Register. EPA then accepts public comments on the site, responds to the comments, and places on the NPL those sites that continue to meet the requirements for listing.

Date of Government Version: 12/31/2010
Date Data Arrived at EDR: 01/13/2011
Date Made Active in Reports: 01/28/2011
Number of Days to Update: 15
Source: EPA
Telephone: N/A
Last EDR Contact: 04/13/2011
Next Scheduled EDR Contact: 07/25/2011
Data Release Frequency: Quarterly

NPL LIENS: Federal Superfund Liens
Federal Superfund Liens. Under the authority granted the USEPA by CERCLA of 1980, the USEPA has the authority to file liens against real property in order to recover remedial action expenditures or when the property owner received notification of potential liability. USEPA compiles a listing of filed notices of Superfund Liens.

Date of Government Version: 10/15/1991
Date Data Arrived at EDR: 02/02/1994
Date Made Active in Reports: 03/30/1994
Number of Days to Update: 56
Source: EPA
Telephone: 202-564-4267
Last EDR Contact: 02/14/2011
Next Scheduled EDR Contact: 05/30/2011
Data Release Frequency: No Update Planned

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Federal Delisted NPL site list

DELISTED NPL: National Priority List Deletions
The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) establishes the criteria that the EPA uses to delete sites from the NPL. In accordance with 40 CFR 300.425.(e), sites may be deleted from the NPL where no further response is appropriate.

Date of Government Version: 12/31/2010
Date Data Arrived at EDR: 01/13/2011
Date Made Active in Reports: 01/28/2011
Number of Days to Update: 15
Source: EPA
Telephone: N/A
Last EDR Contact: 04/13/2011
Next Scheduled EDR Contact: 07/25/2011
Data Release Frequency: Quarterly

Federal CERCLIS list

CERCLIS: Comprehensive Environmental Response, Compensation, and Liability Information System
CERCLIS contains data on potentially hazardous waste sites that have been reported to the USEPA by states, municipalities, private companies and private persons, pursuant to Section 103 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). CERCLIS contains sites which are either proposed to or on the National Priorities List (NPL) and sites which are in the screening and assessment phase for possible inclusion on the NPL.

Date of Government Version: 02/25/2011
Date Data Arrived at EDR: 03/01/2011
Date Made Active in Reports: 05/02/2011
Number of Days to Update: 62
Source: EPA
Telephone: 703-412-9810
Last EDR Contact: 04/29/2011
Next Scheduled EDR Contact: 06/13/2011
Data Release Frequency: Quarterly

FEDERAL FACILITY: Federal Facility Site Information listing
A listing of National Priority List (NPL) and Base Realignment and Closure (BRAC) sites found in the Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS) Database where EPAa??s Federal Facilities Restoration and Reuse Office is involved in cleanup activities.

Date of Government Version: 12/10/2010
Date Data Arrived at EDR: 01/11/2011
Date Made Active in Reports: 02/16/2011
Number of Days to Update: 36
Source: Environmental Protection Agency
Telephone: 703-603-8704
Last EDR Contact: 04/15/2011
Next Scheduled EDR Contact: 07/25/2011
Data Release Frequency: Varies

Federal CERCLIS NFRAP site List

CERCLIS-NFRAP: CERCLIS No Further Remedial Action Planned
Archived sites are sites that have been removed and archived from the inventory of CERCLIS sites. Archived status indicates that, to the best of EPA's knowledge, assessment at a site has been completed and that EPA has determined no further steps will be taken to list this site on the National Priorities List (NPL), unless information indicates this decision was not appropriate or other considerations require a recommendation for listing at a later time. This decision does not necessarily mean that there is no hazard associated with a given site; it only means that, based upon available information, the location is not judged to be a potential NPL site.

Date of Government Version: 02/25/2011
Date Data Arrived at EDR: 03/01/2011
Date Made Active in Reports: 05/02/2011
Number of Days to Update: 62
Source: EPA
Telephone: 703-412-9810
Last EDR Contact: 04/29/2011
Next Scheduled EDR Contact: 06/13/2011
Data Release Frequency: Quarterly

Federal RCRA CORRACTS facilities list

CORRACTS: Corrective Action Report
CORRACTS identifies hazardous waste handlers with RCRA corrective action activity.

Date of Government Version: 05/25/2010
Date Data Arrived at EDR: 06/02/2010
Date Made Active in Reports: 10/04/2010
Number of Days to Update: 124

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 02/14/2011
Next Scheduled EDR Contact: 05/30/2011
Data Release Frequency: Quarterly

Federal RCRA non-CORRACTS TSD facilities list

RCRA-TSDF: RCRA - Treatment, Storage and Disposal

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Transporters are individuals or entities that move hazardous waste from the generator offsite to a facility that can recycle, treat, store, or dispose of the waste. TSDFs treat, store, or dispose of the waste.

Date of Government Version: 03/11/2011
Date Data Arrived at EDR: 04/05/2011
Date Made Active in Reports: 05/02/2011
Number of Days to Update: 27

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 04/05/2011
Next Scheduled EDR Contact: 07/18/2011
Data Release Frequency: Quarterly

Federal RCRA generators list

RCRA-LQG: RCRA - Large Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Large quantity generators (LQGs) generate over 1,000 kilograms (kg) of hazardous waste, or over 1 kg of acutely hazardous waste per month.

Date of Government Version: 03/11/2011
Date Data Arrived at EDR: 04/05/2011
Date Made Active in Reports: 05/02/2011
Number of Days to Update: 27

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 04/05/2011
Next Scheduled EDR Contact: 07/18/2011
Data Release Frequency: Quarterly

RCRA-SQG: RCRA - Small Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Small quantity generators (SQGs) generate between 100 kg and 1,000 kg of hazardous waste per month.

Date of Government Version: 03/11/2011
Date Data Arrived at EDR: 04/05/2011
Date Made Active in Reports: 05/02/2011
Number of Days to Update: 27

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 04/05/2011
Next Scheduled EDR Contact: 07/18/2011
Data Release Frequency: Quarterly

RCRA-CESQG: RCRA - Conditionally Exempt Small Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Conditionally exempt small quantity generators (CESQGs) generate less than 100 kg of hazardous waste, or less than 1 kg of acutely hazardous waste per month.

Date of Government Version: 03/11/2011
Date Data Arrived at EDR: 04/05/2011
Date Made Active in Reports: 05/02/2011
Number of Days to Update: 27

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 04/05/2011
Next Scheduled EDR Contact: 07/18/2011
Data Release Frequency: Varies

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Federal institutional controls / engineering controls registries

US ENG CONTROLS: Engineering Controls Sites List

A listing of sites with engineering controls in place. Engineering controls include various forms of caps, building foundations, liners, and treatment methods to create pathway elimination for regulated substances to enter environmental media or effect human health.

Date of Government Version: 01/05/2011
Date Data Arrived at EDR: 01/14/2011
Date Made Active in Reports: 01/28/2011
Number of Days to Update: 14

Source: Environmental Protection Agency
Telephone: 703-603-0695
Last EDR Contact: 03/14/2011
Next Scheduled EDR Contact: 06/27/2011
Data Release Frequency: Varies

US INST CONTROL: Sites with Institutional Controls

A listing of sites with institutional controls in place. Institutional controls include administrative measures, such as groundwater use restrictions, construction restrictions, property use restrictions, and post remediation care requirements intended to prevent exposure to contaminants remaining on site. Deed restrictions are generally required as part of the institutional controls.

Date of Government Version: 01/05/2011
Date Data Arrived at EDR: 01/14/2011
Date Made Active in Reports: 01/28/2011
Number of Days to Update: 14

Source: Environmental Protection Agency
Telephone: 703-603-0695
Last EDR Contact: 03/14/2011
Next Scheduled EDR Contact: 06/27/2011
Data Release Frequency: Varies

Federal ERNS list

ERNS: Emergency Response Notification System

Emergency Response Notification System. ERNS records and stores information on reported releases of oil and hazardous substances.

Date of Government Version: 12/31/2010
Date Data Arrived at EDR: 01/07/2011
Date Made Active in Reports: 03/21/2011
Number of Days to Update: 73

Source: National Response Center, United States Coast Guard
Telephone: 202-267-2180
Last EDR Contact: 04/05/2011
Next Scheduled EDR Contact: 07/18/2011
Data Release Frequency: Annually

State- and tribal - equivalent CERCLIS

SHWS: Sites List

Facilities, sites or areas in which the Office of Hazard Evaluation and Emergency Response has an interest, has investigated or may investigate under HRS 128D (includes CERCLIS sites).

Date of Government Version: 12/01/2009
Date Data Arrived at EDR: 12/07/2009
Date Made Active in Reports: 01/08/2010
Number of Days to Update: 32

Source: Department of Health
Telephone: 808-586-4249
Last EDR Contact: 03/04/2011
Next Scheduled EDR Contact: 06/13/2011
Data Release Frequency: Semi-Annually

State and tribal landfill and/or solid waste disposal site lists

SWF/LF: Permitted Landfills in the State of Hawaii

Solid Waste Facilities/Landfill Sites. SWF/LF type records typically contain an inventory of solid waste disposal facilities or landfills in a particular state. Depending on the state, these may be active or inactive facilities or open dumps that failed to meet RCRA Subtitle D Section 4004 criteria for solid waste landfills or disposal sites.

Date of Government Version: 04/01/2010
Date Data Arrived at EDR: 04/08/2010
Date Made Active in Reports: 05/19/2010
Number of Days to Update: 41

Source: Department of Health
Telephone: 808-586-4245
Last EDR Contact: 04/05/2011
Next Scheduled EDR Contact: 07/18/2011
Data Release Frequency: Varies

State and tribal leaking storage tank lists

LUST: Leaking Underground Storage Tank Database
Leaking Underground Storage Tank Incident Reports. LUST records contain an inventory of reported leaking underground storage tank incidents. Not all states maintain these records, and the information stored varies by state.

Date of Government Version: 03/08/2011
Date Data Arrived at EDR: 03/10/2011
Date Made Active in Reports: 04/12/2011
Number of Days to Update: 33
Source: Department of Health
Telephone: 808-586-4228
Last EDR Contact: 03/07/2011
Next Scheduled EDR Contact: 06/20/2011
Data Release Frequency: Semi-Annually

INDIAN LUST R6: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in New Mexico and Oklahoma.

Date of Government Version: 02/03/2011
Date Data Arrived at EDR: 02/04/2011
Date Made Active in Reports: 03/21/2011
Number of Days to Update: 45
Source: EPA Region 6
Telephone: 214-665-6597
Last EDR Contact: 05/02/2011
Next Scheduled EDR Contact: 08/15/2011
Data Release Frequency: Varies

INDIAN LUST R9: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Arizona, California, New Mexico and Nevada

Date of Government Version: 01/31/2011
Date Data Arrived at EDR: 02/01/2011
Date Made Active in Reports: 03/21/2011
Number of Days to Update: 48
Source: Environmental Protection Agency
Telephone: 415-972-3372
Last EDR Contact: 05/02/2011
Next Scheduled EDR Contact: 08/15/2011
Data Release Frequency: Quarterly

INDIAN LUST R8: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Colorado, Montana, North Dakota, South Dakota, Utah and Wyoming.

Date of Government Version: 02/04/2011
Date Data Arrived at EDR: 02/04/2011
Date Made Active in Reports: 03/21/2011
Number of Days to Update: 45
Source: EPA Region 8
Telephone: 303-312-6271
Last EDR Contact: 05/02/2011
Next Scheduled EDR Contact: 08/15/2011
Data Release Frequency: Quarterly

INDIAN LUST R7: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Iowa, Kansas, and Nebraska

Date of Government Version: 11/04/2009
Date Data Arrived at EDR: 05/04/2010
Date Made Active in Reports: 07/07/2010
Number of Days to Update: 64
Source: EPA Region 7
Telephone: 913-551-7003
Last EDR Contact: 05/04/2010
Next Scheduled EDR Contact: 05/16/2011
Data Release Frequency: Varies

INDIAN LUST R4: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Florida, Mississippi and North Carolina.

Date of Government Version: 03/03/2011
Date Data Arrived at EDR: 03/18/2011
Date Made Active in Reports: 05/02/2011
Number of Days to Update: 45
Source: EPA Region 4
Telephone: 404-562-8677
Last EDR Contact: 05/02/2011
Next Scheduled EDR Contact: 08/15/2011
Data Release Frequency: Semi-Annually

INDIAN LUST R1: Leaking Underground Storage Tanks on Indian Land
A listing of leaking underground storage tank locations on Indian Land.

Date of Government Version: 09/01/2010
Date Data Arrived at EDR: 11/05/2010
Date Made Active in Reports: 01/28/2011
Number of Days to Update: 84
Source: EPA Region 1
Telephone: 617-918-1313
Last EDR Contact: 05/03/2011
Next Scheduled EDR Contact: 08/15/2011
Data Release Frequency: Varies

INDIAN LUST R10: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Alaska, Idaho, Oregon and Washington.

Date of Government Version: 02/03/2011
Date Data Arrived at EDR: 02/04/2011
Date Made Active in Reports: 03/21/2011
Number of Days to Update: 45
Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 05/02/2011
Next Scheduled EDR Contact: 08/15/2011
Data Release Frequency: Quarterly

State and tribal registered storage tank lists

UST: Underground Storage Tank Database
Registered Underground Storage Tanks. UST's are regulated under Subtitle I of the Resource Conservation and Recovery Act (RCRA) and must be registered with the state department responsible for administering the UST program. Available information varies by state program.

Date of Government Version: 03/08/2011
Date Data Arrived at EDR: 03/10/2011
Date Made Active in Reports: 04/12/2011
Number of Days to Update: 33
Source: Department of Health
Telephone: 808-586-4228
Last EDR Contact: 03/07/2011
Next Scheduled EDR Contact: 06/20/2011
Data Release Frequency: Semi-Annually

INDIAN UST R9: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 9 (Arizona, California, Hawaii, Nevada, the Pacific Islands, and Tribal Nations).

Date of Government Version: 01/31/2011
Date Data Arrived at EDR: 02/01/2011
Date Made Active in Reports: 03/21/2011
Number of Days to Update: 48
Source: EPA Region 9
Telephone: 415-972-3368
Last EDR Contact: 05/02/2011
Next Scheduled EDR Contact: 08/15/2011
Data Release Frequency: Quarterly

INDIAN UST R8: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 8 (Colorado, Montana, North Dakota, South Dakota, Utah, Wyoming and 27 Tribal Nations).

Date of Government Version: 02/04/2011
Date Data Arrived at EDR: 02/04/2011
Date Made Active in Reports: 03/21/2011
Number of Days to Update: 45
Source: EPA Region 8
Telephone: 303-312-6137
Last EDR Contact: 05/02/2011
Next Scheduled EDR Contact: 08/15/2011
Data Release Frequency: Quarterly

INDIAN UST R1: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 1 (Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont and ten Tribal Nations).

Date of Government Version: 09/01/2010
Date Data Arrived at EDR: 11/05/2010
Date Made Active in Reports: 01/28/2011
Number of Days to Update: 84
Source: EPA, Region 1
Telephone: 617-918-1313
Last EDR Contact: 05/03/2011
Next Scheduled EDR Contact: 08/15/2011
Data Release Frequency: Varies

INDIAN UST R7: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 7 (Iowa, Kansas, Missouri, Nebraska, and 9 Tribal Nations).

Date of Government Version: 11/01/2010
Date Data Arrived at EDR: 12/02/2010
Date Made Active in Reports: 01/28/2011
Number of Days to Update: 57
Source: EPA Region 7
Telephone: 913-551-7003
Last EDR Contact: 02/03/2011
Next Scheduled EDR Contact: 05/16/2011
Data Release Frequency: Varies

INDIAN UST R6: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 6 (Louisiana, Arkansas, Oklahoma, New Mexico, Texas and 65 Tribes).

Date of Government Version: 02/03/2011
Date Data Arrived at EDR: 02/04/2011
Date Made Active in Reports: 03/21/2011
Number of Days to Update: 45
Source: EPA Region 6
Telephone: 214-665-7591
Last EDR Contact: 05/02/2011
Next Scheduled EDR Contact: 08/15/2011
Data Release Frequency: Semi-Annually

INDIAN UST R5: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 5 (Michigan, Minnesota and Wisconsin and Tribal Nations).

Date of Government Version: 01/01/2011
Date Data Arrived at EDR: 02/23/2011
Date Made Active in Reports: 05/02/2011
Number of Days to Update: 68
Source: EPA Region 5
Telephone: 312-886-6136
Last EDR Contact: 05/02/2011
Next Scheduled EDR Contact: 08/15/2011
Data Release Frequency: Varies

INDIAN UST R10: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 10 (Alaska, Idaho, Oregon, Washington, and Tribal Nations).

Date of Government Version: 02/03/2011
Date Data Arrived at EDR: 02/04/2011
Date Made Active in Reports: 03/21/2011
Number of Days to Update: 45
Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 05/02/2011
Next Scheduled EDR Contact: 08/15/2011
Data Release Frequency: Quarterly

INDIAN UST R4: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 4 (Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee and Tribal Nations)

Date of Government Version: 03/03/2011
Date Data Arrived at EDR: 03/18/2011
Date Made Active in Reports: 05/02/2011
Number of Days to Update: 45
Source: EPA Region 4
Telephone: 404-562-9424
Last EDR Contact: 05/02/2011
Next Scheduled EDR Contact: 08/15/2011
Data Release Frequency: Semi-Annually

FEMA UST: Underground Storage Tank Listing
A listing of all FEMA owned underground storage tanks.

Date of Government Version: 01/01/2010
Date Data Arrived at EDR: 02/16/2010
Date Made Active in Reports: 04/12/2010
Number of Days to Update: 55
Source: FEMA
Telephone: 202-646-5797
Last EDR Contact: 04/18/2011
Next Scheduled EDR Contact: 08/01/2011
Data Release Frequency: Varies

State and tribal institutional control / engineering control registries

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

ENG CONTROLS: Engineering Control Sites
A listing of sites with engineering controls in place.

Date of Government Version: 12/01/2009
Date Data Arrived at EDR: 12/07/2009
Date Made Active in Reports: 01/08/2010
Number of Days to Update: 32
Source: Department of Health
Telephone: 404-586-4249
Last EDR Contact: 03/04/2011
Next Scheduled EDR Contact: 06/13/2011
Data Release Frequency: Varies

INST CONTROL: Sites with Institutional Controls
Voluntary Remediation Program and Brownfields sites with institutional controls in place.

Date of Government Version: 12/01/2009
Date Data Arrived at EDR: 12/07/2009
Date Made Active in Reports: 01/08/2010
Number of Days to Update: 32
Source: Department of Health
Telephone: 808-586-4249
Last EDR Contact: 03/04/2011
Next Scheduled EDR Contact: 06/13/2011
Data Release Frequency: Varies

State and tribal voluntary cleanup sites

INDIAN VCP R1: Voluntary Cleanup Priority Listing
A listing of voluntary cleanup priority sites located on Indian Land located in Region 1.

Date of Government Version: 09/01/2010
Date Data Arrived at EDR: 01/05/2011
Date Made Active in Reports: 03/21/2011
Number of Days to Update: 75
Source: EPA, Region 1
Telephone: 617-918-1102
Last EDR Contact: 04/05/2011
Next Scheduled EDR Contact: 07/18/2011
Data Release Frequency: Varies

VCP: Voluntary Response Program Sites
Sites participating in the Voluntary Response Program. The purpose of the VRP is to streamline the cleanup process in a way that will encourage prospective developers, lenders, and purchasers to voluntarily cleanup properties.

Date of Government Version: 12/01/2009
Date Data Arrived at EDR: 12/07/2009
Date Made Active in Reports: 01/08/2010
Number of Days to Update: 32
Source: Department of Health
Telephone: 808-586-4249
Last EDR Contact: 03/04/2011
Next Scheduled EDR Contact: 06/13/2011
Data Release Frequency: Varies

INDIAN VCP R7: Voluntary Cleanup Priority Lisitng
A listing of voluntary cleanup priority sites located on Indian Land located in Region 7.

Date of Government Version: 03/20/2008
Date Data Arrived at EDR: 04/22/2008
Date Made Active in Reports: 05/19/2008
Number of Days to Update: 27
Source: EPA, Region 7
Telephone: 913-551-7365
Last EDR Contact: 04/20/2009
Next Scheduled EDR Contact: 07/20/2009
Data Release Frequency: Varies

State and tribal Brownfields sites

BROWNFIELDS: Brownfields Sites
With certain legal exclusions and additions, the term 'brownfield site' means real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant.

Date of Government Version: 12/01/2009
Date Data Arrived at EDR: 12/07/2009
Date Made Active in Reports: 01/08/2010
Number of Days to Update: 32
Source: Department of Health
Telephone: 808-586-4249
Last EDR Contact: 03/04/2011
Next Scheduled EDR Contact: 06/13/2011
Data Release Frequency: Varies

ADDITIONAL ENVIRONMENTAL RECORDS

Local Brownfield lists

US BROWNFIELDS: A Listing of Brownfields Sites
Included in the listing are brownfields properties addresses by Cooperative Agreement Recipients and brownfields properties addressed by Targeted Brownfields Assessments. Targeted Brownfields Assessments-EPA's Targeted Brownfields Assessments (TBA) program is designed to help states, tribes, and municipalities--especially those without EPA Brownfields Assessment Demonstration Pilots--minimize the uncertainties of contamination often associated with brownfields. Under the TBA program, EPA provides funding and/or technical assistance for environmental assessments at brownfields sites throughout the country. Targeted Brownfields Assessments supplement and work with other efforts under EPA's Brownfields Initiative to promote cleanup and redevelopment of brownfields. Cooperative Agreement Recipients-States, political subdivisions, territories, and Indian tribes become Brownfields Cleanup Revolving Loan Fund (BCRLF) cooperative agreement recipients when they enter into BCRLF cooperative agreements with the U.S. EPA. EPA selects BCRLF cooperative agreement recipients based on a proposal and application process. BCRLF cooperative agreement recipients must use EPA funds provided through BCRLF cooperative agreement for specified brownfields-related cleanup activities.

Date of Government Version: 12/29/2010
Date Data Arrived at EDR: 12/30/2010
Date Made Active in Reports: 03/21/2011
Number of Days to Update: 81
Source: Environmental Protection Agency
Telephone: 202-566-2777
Last EDR Contact: 03/29/2011
Next Scheduled EDR Contact: 07/11/2011
Data Release Frequency: Semi-Annually

Local Lists of Landfill / Solid Waste Disposal Sites

ODI: Open Dump Inventory
An open dump is defined as a disposal facility that does not comply with one or more of the Part 257 or Part 258 Subtitle D Criteria.

Date of Government Version: 06/30/1985
Date Data Arrived at EDR: 08/09/2004
Date Made Active in Reports: 09/17/2004
Number of Days to Update: 39
Source: Environmental Protection Agency
Telephone: 800-424-9346
Last EDR Contact: 06/09/2004
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

DEBRIS REGION 9: Torres Martinez Reservation Illegal Dump Site Locations
A listing of illegal dump sites location on the Torres Martinez Indian Reservation located in eastern Riverside County and northern Imperial County, California.

Date of Government Version: 01/12/2009
Date Data Arrived at EDR: 05/07/2009
Date Made Active in Reports: 09/21/2009
Number of Days to Update: 137
Source: EPA, Region 9
Telephone: 415-947-4219
Last EDR Contact: 03/28/2011
Next Scheduled EDR Contact: 07/11/2011
Data Release Frequency: No Update Planned

INDIAN ODI: Report on the Status of Open Dumps on Indian Lands
Location of open dumps on Indian land.

Date of Government Version: 12/31/1998
Date Data Arrived at EDR: 12/03/2007
Date Made Active in Reports: 01/24/2008
Number of Days to Update: 52
Source: Environmental Protection Agency
Telephone: 703-308-8245
Last EDR Contact: 02/08/2011
Next Scheduled EDR Contact: 05/23/2011
Data Release Frequency: Varies

Local Lists of Hazardous waste / Contaminated Sites

US CDL: Clandestine Drug Labs
A listing of clandestine drug lab locations. The U.S. Department of Justice ("the Department") provides this web site as a public service. It contains addresses of some locations where law enforcement agencies reported they found chemicals or other items that indicated the presence of either clandestine drug laboratories or dumpsites. In most cases, the source of the entries is not the Department, and the Department has not verified the entry and does not guarantee its accuracy. Members of the public must verify the accuracy of all entries by, for example, contacting local law enforcement and local health departments.

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 02/02/2011
Date Data Arrived at EDR: 03/17/2011
Date Made Active in Reports: 05/02/2011
Number of Days to Update: 46
Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 03/08/2011
Next Scheduled EDR Contact: 06/20/2011
Data Release Frequency: Quarterly

CDL: Clandestine Drug Lab Listing
A listing of clandestine drug lab site locations.

Date of Government Version: 08/04/2010
Date Data Arrived at EDR: 09/10/2010
Date Made Active in Reports: 10/22/2010
Number of Days to Update: 42
Source: Department of Health
Telephone: 808-586-4249
Last EDR Contact: 03/07/2011
Next Scheduled EDR Contact: 06/20/2011
Data Release Frequency: Varies

US HIST CDL: National Clandestine Laboratory Register
A listing of clandestine drug lab locations. The U.S. Department of Justice ("the Department") provides this web site as a public service. It contains addresses of some locations where law enforcement agencies reported they found chemicals or other items that indicated the presence of either clandestine drug laboratories or dumpsites. In most cases, the source of the entries is not the Department, and the Department has not verified the entry and does not guarantee its accuracy. Members of the public must verify the accuracy of all entries by, for example, contacting local law enforcement and local health departments.

Date of Government Version: 09/01/2007
Date Data Arrived at EDR: 11/19/2008
Date Made Active in Reports: 03/30/2009
Number of Days to Update: 131
Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 03/23/2009
Next Scheduled EDR Contact: 06/22/2009
Data Release Frequency: No Update Planned

Local Land Records

LIENS 2: CERCLA Lien Information
A Federal CERCLA ('Superfund') lien can exist by operation of law at any site or property at which EPA has spent Superfund monies. These monies are spent to investigate and address releases and threatened releases of contamination. CERCLIS provides information as to the identity of these sites and properties.

Date of Government Version: 02/01/2011
Date Data Arrived at EDR: 02/04/2011
Date Made Active in Reports: 05/02/2011
Number of Days to Update: 87
Source: Environmental Protection Agency
Telephone: 202-564-6023
Last EDR Contact: 05/02/2011
Next Scheduled EDR Contact: 08/15/2011
Data Release Frequency: Varies

LUCIS: Land Use Control Information System
LUCIS contains records of land use control information pertaining to the former Navy Base Realignment and Closure properties.

Date of Government Version: 12/09/2005
Date Data Arrived at EDR: 12/11/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 31
Source: Department of the Navy
Telephone: 843-820-7326
Last EDR Contact: 02/22/2011
Next Scheduled EDR Contact: 06/06/2011
Data Release Frequency: Varies

Records of Emergency Release Reports

HMIRS: Hazardous Materials Information Reporting System
Hazardous Materials Incident Report System. HMIRS contains hazardous material spill incidents reported to DOT.

Date of Government Version: 12/31/2010
Date Data Arrived at EDR: 01/05/2011
Date Made Active in Reports: 02/25/2011
Number of Days to Update: 51
Source: U.S. Department of Transportation
Telephone: 202-366-4555
Last EDR Contact: 04/05/2011
Next Scheduled EDR Contact: 07/18/2011
Data Release Frequency: Annually

SPILLS: Release Notifications
Releases of hazardous substances to the environment reported to the Office of Hazard Evaluation and Emergency Response since 1988.

Date of Government Version: 03/10/2010
Date Data Arrived at EDR: 03/16/2010
Date Made Active in Reports: 04/13/2010
Number of Days to Update: 28
Source: Department of Health
Telephone: 808-586-4249
Last EDR Contact: 03/04/2011
Next Scheduled EDR Contact: 06/13/2011
Data Release Frequency: Varies

Other Ascertainable Records

RCRA-NonGen: RCRA - Non Generators
RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Non-Generators do not presently generate hazardous waste.

Date of Government Version: 03/11/2011
Date Data Arrived at EDR: 04/05/2011
Date Made Active in Reports: 05/02/2011
Number of Days to Update: 27
Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 04/05/2011
Next Scheduled EDR Contact: 07/18/2011
Data Release Frequency: Varies

DOT OPS: Incident and Accident Data
Department of Transporation, Office of Pipeline Safety Incident and Accident data.

Date of Government Version: 01/12/2011
Date Data Arrived at EDR: 02/11/2011
Date Made Active in Reports: 05/02/2011
Number of Days to Update: 80
Source: Department of Transporation, Office of Pipeline Safety
Telephone: 202-366-4595
Last EDR Contact: 02/11/2011
Next Scheduled EDR Contact: 05/23/2011
Data Release Frequency: Varies

DOD: Department of Defense Sites
This data set consists of federally owned or administered lands, administered by the Department of Defense, that have any area equal to or greater than 640 acres of the United States, Puerto Rico, and the U.S. Virgin Islands.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 11/10/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 62
Source: USGS
Telephone: 703-692-8801
Last EDR Contact: 04/21/2011
Next Scheduled EDR Contact: 08/01/2011
Data Release Frequency: Semi-Annually

FUDS: Formerly Used Defense Sites
The listing includes locations of Formerly Used Defense Sites properties where the US Army Corps of Engineers is actively working or will take necessary cleanup actions.

Date of Government Version: 12/31/2009
Date Data Arrived at EDR: 08/12/2010
Date Made Active in Reports: 12/02/2010
Number of Days to Update: 112
Source: U.S. Army Corps of Engineers
Telephone: 202-528-4285
Last EDR Contact: 03/15/2011
Next Scheduled EDR Contact: 06/27/2011
Data Release Frequency: Varies

CONSENT: Superfund (CERCLA) Consent Decrees
Major legal settlements that establish responsibility and standards for cleanup at NPL (Superfund) sites. Released periodically by United States District Courts after settlement by parties to litigation matters.

Date of Government Version: 10/01/2010
Date Data Arrived at EDR: 10/29/2010
Date Made Active in Reports: 01/28/2011
Number of Days to Update: 91
Source: Department of Justice, Consent Decree Library
Telephone: Varies
Last EDR Contact: 04/04/2011
Next Scheduled EDR Contact: 07/18/2011
Data Release Frequency: Varies

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

ROD: Records Of Decision
Record of Decision. ROD documents mandate a permanent remedy at an NPL (Superfund) site containing technical and health information to aid in the cleanup.

Date of Government Version: 02/25/2011
Date Data Arrived at EDR: 03/16/2011
Date Made Active in Reports: 03/21/2011
Number of Days to Update: 5
Source: EPA
Telephone: 703-416-0223
Last EDR Contact: 03/16/2011
Next Scheduled EDR Contact: 06/27/2011
Data Release Frequency: Annually

UMTRA: Uranium Mill Tailings Sites
Uranium ore was mined by private companies for federal government use in national defense programs. When the mills shut down, large piles of the sand-like material (mill tailings) remain after uranium has been extracted from the ore. Levels of human exposure to radioactive materials from the piles are low; however, in some cases tailings were used as construction materials before the potential health hazards of the tailings were recognized.

Date of Government Version: 09/14/2010
Date Data Arrived at EDR: 10/21/2010
Date Made Active in Reports: 01/28/2011
Number of Days to Update: 99
Source: Department of Energy
Telephone: 505-845-0011
Last EDR Contact: 03/04/2011
Next Scheduled EDR Contact: 06/13/2011
Data Release Frequency: Varies

MINES: Mines Master Index File
Contains all mine identification numbers issued for mines active or opened since 1971. The data also includes violation information.

Date of Government Version: 02/08/2011
Date Data Arrived at EDR: 03/09/2011
Date Made Active in Reports: 05/02/2011
Number of Days to Update: 54
Source: Department of Labor, Mine Safety and Health Administration
Telephone: 303-231-5959
Last EDR Contact: 03/09/2011
Next Scheduled EDR Contact: 06/20/2011
Data Release Frequency: Semi-Annually

TRIS: Toxic Chemical Release Inventory System
Toxic Release Inventory System. TRIS identifies facilities which release toxic chemicals to the air, water and land in reportable quantities under SARA Title III Section 313.

Date of Government Version: 12/31/2009
Date Data Arrived at EDR: 12/17/2010
Date Made Active in Reports: 03/21/2011
Number of Days to Update: 94
Source: EPA
Telephone: 202-566-0250
Last EDR Contact: 03/01/2011
Next Scheduled EDR Contact: 06/13/2011
Data Release Frequency: Annually

TSCA: Toxic Substances Control Act
Toxic Substances Control Act. TSCA identifies manufacturers and importers of chemical substances included on the TSCA Chemical Substance Inventory list. It includes data on the production volume of these substances by plant site.

Date of Government Version: 12/31/2006
Date Data Arrived at EDR: 09/29/2010
Date Made Active in Reports: 12/02/2010
Number of Days to Update: 64
Source: EPA
Telephone: 202-260-5521
Last EDR Contact: 03/29/2011
Next Scheduled EDR Contact: 07/11/2011
Data Release Frequency: Every 4 Years

FTTS: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
FTTS tracks administrative cases and pesticide enforcement actions and compliance activities related to FIFRA, TSCA and EPCRA (Emergency Planning and Community Right-to-Know Act). To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 04/09/2009
Date Data Arrived at EDR: 04/16/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 25
Source: EPA/Office of Prevention, Pesticides and Toxic Substances
Telephone: 202-566-1667
Last EDR Contact: 02/28/2011
Next Scheduled EDR Contact: 06/13/2011
Data Release Frequency: Quarterly

FTTS INSP: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
A listing of FIFRA/TSCA Tracking System (FTTS) inspections and enforcements.

Date of Government Version: 04/09/2009
Date Data Arrived at EDR: 04/16/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 25
Source: EPA
Telephone: 202-566-1667
Last EDR Contact: 02/28/2011
Next Scheduled EDR Contact: 06/13/2011
Data Release Frequency: Quarterly

HIST FTTS: FIFRA/TSCA Tracking System Administrative Case Listing
A complete administrative case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006
Date Data Arrived at EDR: 03/01/2007
Date Made Active in Reports: 04/10/2007
Number of Days to Update: 40
Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 12/17/2007
Next Scheduled EDR Contact: 03/17/2008
Data Release Frequency: No Update Planned

HIST FTTS INSP: FIFRA/TSCA Tracking System Inspection & Enforcement Case Listing
A complete inspection and enforcement case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006
Date Data Arrived at EDR: 03/01/2007
Date Made Active in Reports: 04/10/2007
Number of Days to Update: 40
Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 12/17/2008
Next Scheduled EDR Contact: 03/17/2008
Data Release Frequency: No Update Planned

SSTS: Section 7 Tracking Systems
Section 7 of the Federal Insecticide, Fungicide and Rodenticide Act, as amended (92 Stat. 829) requires all registered pesticide-producing establishments to submit a report to the Environmental Protection Agency by March 1st each year. Each establishment must report the types and amounts of pesticides, active ingredients and devices being produced, and those having been produced and sold or distributed in the past year.

Date of Government Version: 12/31/2009
Date Data Arrived at EDR: 12/10/2010
Date Made Active in Reports: 02/25/2011
Number of Days to Update: 77
Source: EPA
Telephone: 202-564-4203
Last EDR Contact: 05/02/2011
Next Scheduled EDR Contact: 08/15/2011
Data Release Frequency: Annually

ICIS: Integrated Compliance Information System
The Integrated Compliance Information System (ICIS) supports the information needs of the national enforcement and compliance program as well as the unique needs of the National Pollutant Discharge Elimination System (NPDES) program.

Date of Government Version: 01/07/2011
Date Data Arrived at EDR: 01/21/2011
Date Made Active in Reports: 03/21/2011
Number of Days to Update: 59
Source: Environmental Protection Agency
Telephone: 202-564-5088
Last EDR Contact: 03/28/2011
Next Scheduled EDR Contact: 07/11/2011
Data Release Frequency: Quarterly

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

PADS: PCB Activity Database System
PCB Activity Database. PADS Identifies generators, transporters, commercial storers and/or brokers and disposers of PCB's who are required to notify the EPA of such activities.

Date of Government Version: 11/01/2010
Date Data Arrived at EDR: 11/10/2010
Date Made Active in Reports: 02/16/2011
Number of Days to Update: 98
Source: EPA
Telephone: 202-566-0500
Last EDR Contact: 04/22/2011
Next Scheduled EDR Contact: 08/01/2011
Data Release Frequency: Annually

MLTS: Material Licensing Tracking System
MLTS is maintained by the Nuclear Regulatory Commission and contains a list of approximately 8,100 sites which possess or use radioactive materials and which are subject to NRC licensing requirements. To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 03/18/2010
Date Data Arrived at EDR: 04/06/2010
Date Made Active in Reports: 05/27/2010
Number of Days to Update: 51
Source: Nuclear Regulatory Commission
Telephone: 301-415-7169
Last EDR Contact: 03/14/2011
Next Scheduled EDR Contact: 06/27/2011
Data Release Frequency: Quarterly

RADINFO: Radiation Information Database
The Radiation Information Database (RADINFO) contains information about facilities that are regulated by U.S. Environmental Protection Agency (EPA) regulations for radiation and radioactivity.

Date of Government Version: 01/11/2011
Date Data Arrived at EDR: 01/13/2011
Date Made Active in Reports: 02/16/2011
Number of Days to Update: 34
Source: Environmental Protection Agency
Telephone: 202-343-9775
Last EDR Contact: 04/13/2011
Next Scheduled EDR Contact: 07/25/2011
Data Release Frequency: Quarterly

FINDS: Facility Index System/Facility Registry System
Facility Index System. FINDS contains both facility information and 'pointers' to other sources that contain more detail. EDR includes the following FINDS databases in this report: PCS (Permit Compliance System), AIRS (Aerometric Information Retrieval System), DOCKET (Enforcement Docket used to manage and track information on civil judicial enforcement cases for all environmental statutes), FURS (Federal Underground Injection Control), C-DOCKET (Criminal Docket System used to track criminal enforcement actions for all environmental statutes), FFIS (Federal Facilities Information System), STATE (State Environmental Laws and Statutes), and PADS (PCB Activity Data System).

Date of Government Version: 04/14/2010
Date Data Arrived at EDR: 04/16/2010
Date Made Active in Reports: 05/27/2010
Number of Days to Update: 41
Source: EPA
Telephone: (415) 947-8000
Last EDR Contact: 03/14/2011
Next Scheduled EDR Contact: 06/27/2011
Data Release Frequency: Quarterly

RAATS: RCRA Administrative Action Tracking System
RCRA Administration Action Tracking System. RAATS contains records based on enforcement actions issued under RCRA pertaining to major violators and includes administrative and civil actions brought by the EPA. For administration actions after September 30, 1995, data entry in the RAATS database was discontinued. EPA will retain a copy of the database for historical records. It was necessary to terminate RAATS because a decrease in agency resources made it impossible to continue to update the information contained in the database.

Date of Government Version: 04/17/1995
Date Data Arrived at EDR: 07/03/1995
Date Made Active in Reports: 08/07/1995
Number of Days to Update: 35
Source: EPA
Telephone: 202-564-4104
Last EDR Contact: 06/02/2008
Next Scheduled EDR Contact: 09/01/2008
Data Release Frequency: No Update Planned

BRS: Biennial Reporting System
The Biennial Reporting System is a national system administered by the EPA that collects data on the generation and management of hazardous waste. BRS captures detailed data from two groups: Large Quantity Generators (LQG) and Treatment, Storage, and Disposal Facilities.

Date of Government Version: 12/31/2009
Date Data Arrived at EDR: 03/01/2011
Date Made Active in Reports: 05/02/2011
Number of Days to Update: 62

Source: EPA/NTIS
Telephone: 800-424-9346
Last EDR Contact: 03/01/2011
Next Scheduled EDR Contact: 06/13/2011
Data Release Frequency: Biennially

UIC: Underground Injection Wells Listing
A listing of underground injection well locations.

Date of Government Version: 09/21/2010
Date Data Arrived at EDR: 10/01/2010
Date Made Active in Reports: 10/22/2010
Number of Days to Update: 21

Source: Department of Health
Telephone: 808-586-4258
Last EDR Contact: 04/05/2011
Next Scheduled EDR Contact: 06/20/2011
Data Release Frequency: Varies

DRYCLEANERS: Permitted Drycleaner Facility Listing
A listing of permitted drycleaner facilities in the state.

Date of Government Version: 06/30/2010
Date Data Arrived at EDR: 07/13/2010
Date Made Active in Reports: 08/04/2010
Number of Days to Update: 22

Source: Department of Health
Telephone: 808-586-4200
Last EDR Contact: 05/02/2011
Next Scheduled EDR Contact: 07/25/2011
Data Release Frequency: Varies

AIRS: List of Permitted Facilities
A listing of permitted facilities in the state.

Date of Government Version: 12/31/2010
Date Data Arrived at EDR: 01/14/2011
Date Made Active in Reports: 01/24/2011
Number of Days to Update: 10

Source: Department of Health
Telephone: 808-586-4200
Last EDR Contact: 04/25/2011
Next Scheduled EDR Contact: 07/25/2011
Data Release Frequency: Varies

INDIAN RESERV: Indian Reservations
This map layer portrays Indian administered lands of the United States that have any area equal to or greater than 640 acres.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 12/08/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 34

Source: USGS
Telephone: 202-208-3710
Last EDR Contact: 04/21/2011
Next Scheduled EDR Contact: 08/01/2011
Data Release Frequency: Semi-Annually

SCRD DRYCLEANERS: State Coalition for Remediation of Drycleaners Listing
The State Coalition for Remediation of Drycleaners was established in 1998, with support from the U.S. EPA Office of Superfund Remediation and Technology Innovation. It is comprised of representatives of states with established drycleaner remediation programs. Currently the member states are Alabama, Connecticut, Florida, Illinois, Kansas, Minnesota, Missouri, North Carolina, Oregon, South Carolina, Tennessee, Texas, and Wisconsin.

Date of Government Version: 03/07/2011
Date Data Arrived at EDR: 03/09/2011
Date Made Active in Reports: 05/02/2011
Number of Days to Update: 54

Source: Environmental Protection Agency
Telephone: 615-532-8599
Last EDR Contact: 04/25/2011
Next Scheduled EDR Contact: 08/08/2011
Data Release Frequency: Varies

PCB TRANSFORMER: PCB Transformer Registration Database
The database of PCB transformer registrations that includes all PCB registration submittals.

Date of Government Version: 01/01/2008
Date Data Arrived at EDR: 02/18/2009
Date Made Active in Reports: 05/29/2009
Number of Days to Update: 100

Source: Environmental Protection Agency
Telephone: 202-566-0517
Last EDR Contact: 05/05/2011
Next Scheduled EDR Contact: 08/15/2011
Data Release Frequency: Varies

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

COAL ASH DOE: Sleam-Electric Plan Operation Data
A listing of power plants that store ash in surface ponds.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 08/07/2009
Date Made Active in Reports: 10/22/2009
Number of Days to Update: 76

Source: Department of Energy
Telephone: 202-586-8719
Last EDR Contact: 04/19/2011
Next Scheduled EDR Contact: 08/01/2011
Data Release Frequency: Varies

COAL ASH EPA: Coal Combustion Residues Surface Impoundments List
A listing of coal combustion residues surface impoundments with high hazard potential ratings.

Date of Government Version: 08/17/2010
Date Data Arrived at EDR: 01/03/2011
Date Made Active in Reports: 03/21/2011
Number of Days to Update: 77

Source: Environmental Protection Agency
Telephone: N/A
Last EDR Contact: 03/18/2011
Next Scheduled EDR Contact: 06/27/2011
Data Release Frequency: Varies

FEDLAND: Federal and Indian Lands
Federally and Indian administrated lands of the United States. Lands included are administrated by: Army Corps of Engineers, Bureau of Reclamation, National Wild and Scenic River, National Wildlife Refuge, Public Domain Land, Wilderness, Wilderness Study Area, Wildlife Management Area, Bureau of Indian Affairs, Bureau of Land Management, Department of Justice, Forest Service, Fish and Wildlife Service, National Park Service.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 02/06/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 339

Source: U.S. Geological Survey
Telephone: 888-275-8747
Last EDR Contact: 04/21/2011
Next Scheduled EDR Contact: 08/01/2011
Data Release Frequency: N/A

FINANCIAL ASSURANCE: Financial Assurance Information Listing
A listing of financial assurance information for underground storage tank facilities. Financial assurance is intended to ensure that resources are available to pay for the cost of closure, post-closure care, and corrective measures if the owner or operator of a regulated facility is unable or unwilling to pay.

Date of Government Version: 03/22/2011
Date Data Arrived at EDR: 03/25/2011
Date Made Active in Reports: 04/12/2011
Number of Days to Update: 18

Source: Department of Health
Telephone: 808-586-4226
Last EDR Contact: 03/21/2011
Next Scheduled EDR Contact: 07/04/2011
Data Release Frequency: Varies

EDR PROPRIETARY RECORDS

EDR Proprietary Records

Manufactured Gas Plants: EDR Proprietary Manufactured Gas Plants
The EDR Proprietary Manufactured Gas Plant Database includes records of coal gas plants (manufactured gas plants) compiled by EDR's researchers. Manufactured gas sites were used in the United States from the 1800's to 1950's to produce a gas that could be distributed and used as fuel. These plants used whale oil, rosin, coal, or a mixture of coal, oil, and water that also produced a significant amount of waste. Many of the byproducts of the gas production, such as coal tar (oily waste containing volatile and non-volatile chemicals), sludges, oils and other compounds are potentially hazardous to human health and the environment. The byproduct from this process was frequently disposed of directly at the plant site and can remain or spread slowly, serving as a continuous source of soil and groundwater contamination.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

OTHER DATABASE(S)

Depending on the geographic area covered by this report, the data provided in these specialty databases may or may not be complete. For example, the existence of wetlands information data in a specific report does not mean that all wetlands in the area covered by the report are included. Moreover, the absence of any reported wetlands information does not necessarily mean that wetlands do not exist in the area covered by the report.

Oil/Gas Pipelines: This data was obtained by EDR from the USGS in 1994. It is referred to by USGS as GeoData Digital Line Graphs from 1:100,000-Scale Maps. It was extracted from the transportation category including some oil, but primarily gas pipelines.

Electric Power Transmission Line Data
Source: Rextag Strategies Corp.
Telephone: (281) 769-2247
U.S. Electric Transmission and Power Plants Systems Digital GIS Data

Sensitive Receptors: There are individuals deemed sensitive receptors due to their fragile immune systems and special sensitivity to environmental discharges. These sensitive receptors typically include the elderly, the sick, and children. While the location of all sensitive receptors cannot be determined, EDR indicates those buildings and facilities - schools, daycares, hospitals, medical centers, and nursing homes - where individuals who are sensitive receptors are likely to be located.

AHA Hospitals:
Source: American Hospital Association, Inc.
Telephone: 312-280-5991
The database includes a listing of hospitals based on the American Hospital Association's annual survey of hospitals.

Medical Centers: Provider of Services Listing
Source: Centers for Medicare & Medicaid Services
Telephone: 410-786-3000
A listing of hospitals with Medicare provider number, produced by Centers of Medicare & Medicaid Services, a federal agency within the U.S. Department of Health and Human Services.

Nursing Homes
Source: National Institutes of Health
Telephone: 301-594-6248
Information on Medicare and Medicaid certified nursing homes in the United States.

Public Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on elementary and secondary public education in the United States. It is a comprehensive, annual, national statistical database of all public elementary and secondary schools and school districts, which contains data that are comparable across all states.

Private Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on private school locations in the United States.

Flood Zone Data: This data, available in select counties across the country, was obtained by EDR in 2003 & 2009 from the Federal Emergency Management Agency (FEMA). Data depicts 100-year and 500-year flood zones as defined by FEMA.

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002 and 2005 from the U.S. Fish and Wildlife Service.

Scanned Digital USGS 7.5' Topographic Map (DRG)
Source: United States Geologic Survey
A digital raster graphic (DRG) is a scanned image of a U.S. Geological Survey topographic map. The map images are made by scanning published paper maps on high-resolution scanners. The raster image is georeferenced and fit to the Universal Transverse Mercator (UTM) projection.

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

STREET AND ADDRESS INFORMATION

GEOCHECK®- PHYSICAL SETTING SOURCE ADDENDUM

TARGET PROPERTY ADDRESS

KIHEI HIGH SCHOOL
PIILANI HIGHWAY
KIHEI, HI 96753

TARGET PROPERTY COORDINATES

Latitude (North):	20.76300 - 20° 45' 46.8"
Longitude (West):	156.4485 - 156° 26' 54.6"
Universal Tranverse Mercator:	Zone 4
UTM X (Meters):	765661.0
UTM Y (Meters):	2297880.8
Elevation:	46 ft. above sea level

USGS TOPOGRAPHIC MAP

Target Property Map:	20156-G4 WAILUKU, HI
Most Recent Revision:	Not reported

EDR's GeoCheck Physical Setting Source Addendum is provided to assist the environmental professional in forming an opinion about the impact of potential contaminant migration.

Assessment of the impact of contaminant migration generally has two principle investigative components:

1. Groundwater flow direction, and
2. Groundwater flow velocity.

Groundwater flow direction may be impacted by surface topography, hydrology, hydrogeology, characteristics of the soil, and nearby wells. Groundwater flow velocity is generally impacted by the nature of the geologic strata.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

GROUNDWATER FLOW DIRECTION INFORMATION

Groundwater flow direction for a particular site is best determined by a qualified environmental professional using site-specific well data. If such data is not reasonably ascertainable, it may be necessary to rely on other sources of information, such as surface topographic information, hydrologic information, hydrogeologic data collected on nearby properties, and regional groundwater flow information (from deep aquifers).

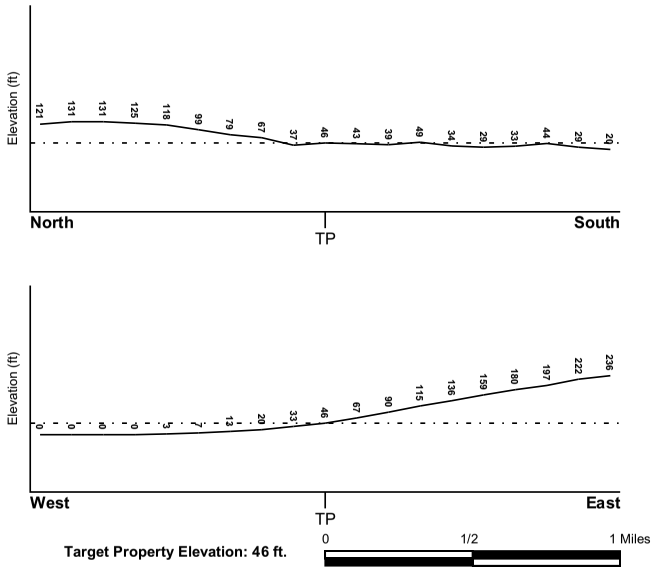
TOPOGRAPHIC INFORMATION

Surface topography may be indicative of the direction of surficial groundwater flow. This information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

TARGET PROPERTY TOPOGRAPHY

General Topographic Gradient: General WSW

SURROUNDING TOPOGRAPHY: ELEVATION PROFILES



Source: Topography has been determined from the USGS 7.5' Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

HYDROLOGIC INFORMATION

Surface water can act as a hydrologic barrier to groundwater flow. Such hydrologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

Refer to the Physical Setting Source Map following this summary for hydrologic information (major waterways and bodies of water).

FEMA FLOOD ZONE

Target Property County	FEMA Flood Electronic Data
MAUI, HI	YES - refer to the Overview Map and Detail Map

Flood Plain Panel at Target Property: 1500030265C - FEMA Q3 Flood data

Additional Panels in search area: 1500030255B - FEMA Q3 Flood data

NATIONAL WETLAND INVENTORY

NWI Quad at Target Property	NWI Electronic Data Coverage
NOT AVAILABLE	YES - refer to the Overview Map and Detail Map

HYDROGEOLOGIC INFORMATION

Hydrogeologic information obtained by installation of wells on a specific site can often be an indicator of groundwater flow direction in the immediate area. Such hydrogeologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

AQUIFLOW®

Search Radius: 1.000 Mile.

EDR has developed the AQUIFLOW Information System to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted by environmental professionals to regulatory authorities at select sites and has extracted the date of the report, groundwater flow direction as determined hydrogeologically, and the depth to water table.

MAP ID	LOCATION FROM TP	GENERAL DIRECTION GROUNDWATER FLOW
Not Reported		

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

GROUNDWATER FLOW VELOCITY INFORMATION

Groundwater flow velocity information for a particular site is best determined by a qualified environmental professional using site specific geologic and soil strata data. If such data are not reasonably ascertainable, it may be necessary to rely on other sources of information, including geologic age identification, rock stratigraphic unit and soil characteristics data collected on nearby properties and regional soil information. In general, contaminant plumes move more quickly through sandy-gravelly types of soils than silty-clayey types of soils.

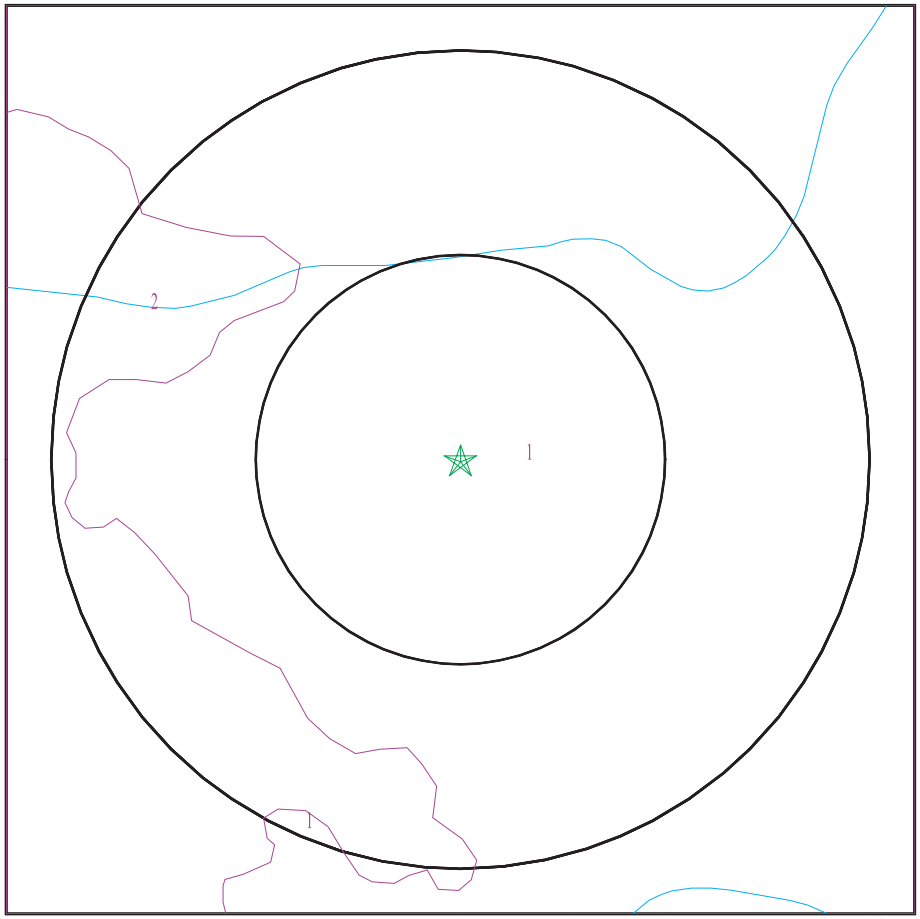
GEOLOGIC INFORMATION IN GENERAL AREA OF TARGET PROPERTY

Geologic information can be used by the environmental professional in forming an opinion about the relative speed at which contaminant migration may be occurring.

ROCK STRATIGRAPHIC UNIT		GEOLOGIC AGE IDENTIFICATION	
Era:	-	Category:	-
System:	-		
Series:	-		
Code:	N/A *(decoded above as Era, System & Series)*		

Geologic Age and Rock Stratigraphic Unit Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - a digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

SSURGO SOIL MAP - 3061110.1s



SITE NAME: Kihei High School ADDRESS: Piilani Highway Kihei HI 96753 LAT/LONG: 20.7630 / 156.4485	CLIENT: Group 70 International, Inc. CONTACT: Dricka Brown INQUIRY #: 3061110.1s DATE: May 06, 2011 11:43 am

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

DOMINANT SOIL COMPOSITION IN GENERAL AREA OF TARGET PROPERTY

The U.S. Department of Agriculture's (USDA) Soil Conservation Service (SCS) leads the National Cooperative Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. The following information is based on Soil Conservation Service SSURGO data.

Soil Map ID: 1

Soil Component Name: Waiakoa

Soil Surface Texture: extremely stony silty clay loam

Hydrologic Group: Class C - Slow infiltration rates. Soils with layers impeding downward movement of water, or soils with moderately fine or fine textures.

Soil Drainage Class: Well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Moderate

Depth to Bedrock Min: > 71 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information

	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	0 inches	extremely stony silty clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	Not reported	Max: 0.42 Min: 0.02	Max: Min:
2	0 inches	20 inches	extremely stony silty clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	Not reported	Max: 0.42 Min: 0.02	Max: Min:
3	20 inches	27 inches	stony silty clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	Not reported	Max: 0.42 Min: 0.02	Max: Min:
4	27 inches	31 inches	bedrock	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	Not reported	Max: 0.42 Min: 0.02	Max: Min:

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Soil Map ID: 2

Soil Component Name: Alae

Soil Surface Texture: sandy loam

Hydrologic Group: Class A - High infiltration rates. Soils are deep, well drained to excessively drained sands and gravels.

Soil Drainage Class: Excessively drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Moderate

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information

	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	7 inches	sandy loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	COARSE-GRAINED SOILS, Gravels, Clean gravels, Poorly Graded Gravel. COARSE-GRAINED SOILS, Gravels, Gravels with fines, Silty Gravel.	Max: 141 Min: 14.11	Max: 8.4 Min: 7.9
2	7 inches	14 inches	stratified sandy loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	COARSE-GRAINED SOILS, Gravels, Clean gravels, Poorly Graded Gravel. COARSE-GRAINED SOILS, Gravels, Gravels with fines, Silty Gravel.	Max: 141 Min: 14.11	Max: 8.4 Min: 7.9
3	14 inches	55 inches	gravelly coarse sand	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	COARSE-GRAINED SOILS, Gravels, Clean gravels, Poorly Graded Gravel. COARSE-GRAINED SOILS, Gravels, Gravels with fines, Silty Gravel.	Max: 141 Min: 14.11	Max: 8.4 Min: 7.9

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

LOCAL / REGIONAL WATER AGENCY RECORDS

EDR Local/Regional Water Agency records provide water well information to assist the environmental professional in assessing sources that may impact ground water flow direction, and in forming an opinion about the impact of contaminant migration on nearby drinking water wells.

WELL SEARCH DISTANCE INFORMATION

DATABASE	SEARCH DISTANCE (miles)
Federal USGS	1.000
Federal FRDS PWS	Nearest PWS within 1 mile
State Database	1.000

FEDERAL USGS WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
No Wells Found		

FEDERAL FRDS PUBLIC WATER SUPPLY SYSTEM INFORMATION

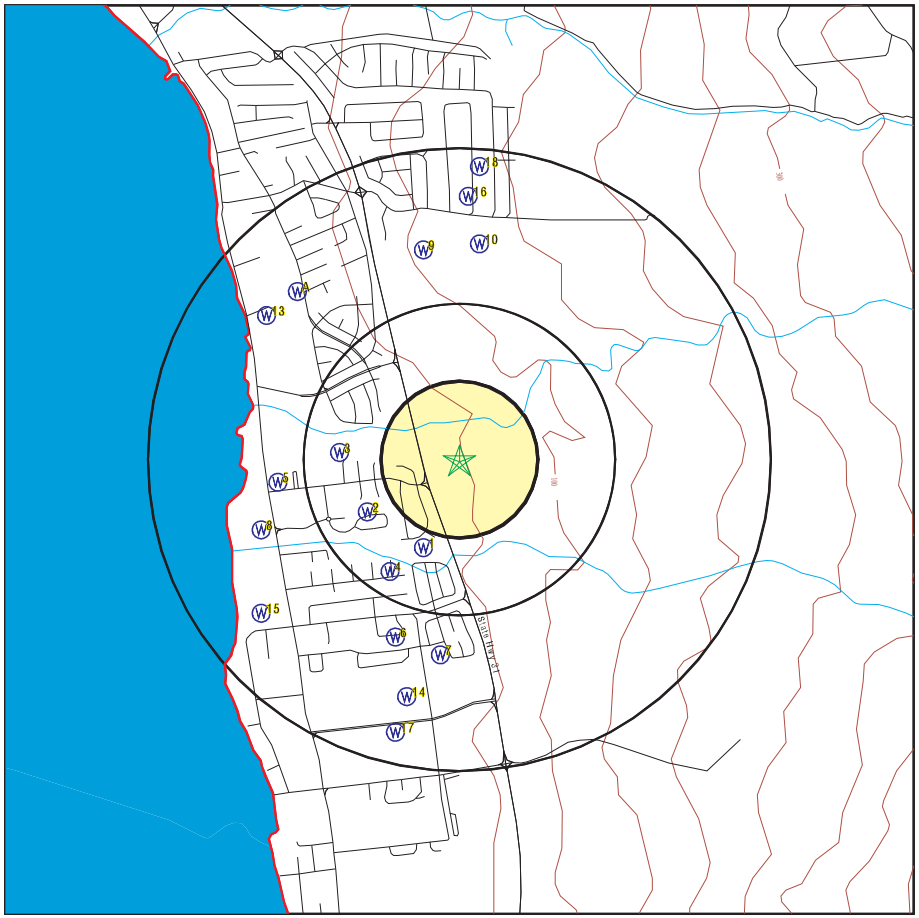
MAP ID	WELL ID	LOCATION FROM TP
No PWS System Found		

Note: PWS System location is not always the same as well location.

STATE DATABASE WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
1	HI6000000001009	1/4 - 1/2 Mile SSW
2	HI6000000001011	1/4 - 1/2 Mile WSW
3	HI6000000001013	1/4 - 1/2 Mile West
4	HI6000000001008	1/4 - 1/2 Mile SSW
5	HI6000000001012	1/2 - 1 Mile West
6	HI6000000001006	1/2 - 1 Mile SSW
7	HI6000000001003	1/2 - 1 Mile South
8	HI6000000001010	1/2 - 1 Mile WSW
9	HI6000000001021	1/2 - 1 Mile North
10	HI6000000001022	1/2 - 1 Mile North
A11	HI6000000001017	1/2 - 1 Mile NW
A12	HI6000000001018	1/2 - 1 Mile NW
13	HI6000000001016	1/2 - 1 Mile NW
14	HI6000000001002	1/2 - 1 Mile SSW
15	HI6000000001007	1/2 - 1 Mile SW
16	HI6000000001027	1/2 - 1 Mile North
17	HI6000000001001	1/2 - 1 Mile SSW
18	HI6000000001030	1/2 - 1 Mile North

PHYSICAL SETTING SOURCE MAP - 3061110.1s



SITE NAME: Kihei High School	CLIENT: Group 70 International, Inc.
ADDRESS: Piilani Highway	CONTACT: Dricka Brown
Kihei HI 96753	INQUIRY #: 3061110.1s
LAT/LONG: 20.7630 / 156.4485	DATE: May 06, 2011 11:43 am

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID / Direction / Distance / Elevation		Database	EDR ID Number
1 **SSW** **1/4 - 1/2 Mile** **Lower**		**HI WELLS**	**HI6000000001009**

Wid:	6-4527-008	Island:	6
Well no:	4527-08	Well name:	Kihei-Piilani
Old name:	Not Reported	Yr drilled:	1990
Driller:	DAVID PICO	Quad map:	08
Longitude2:	1562711	Latitude27:	204544
Longitude8:	1562701	Latitude83:	204532
Lat83d:	20	Lat83m:	45
Lat83s:	32	Lon83d:	156
Lon83m:	27	Lon83s:	01
Lat83dd:	20.75889		
Lon83dd:	-156.45028		
Long83dd:	-156.45028		
Lat83dd 1:	20.75889		
Gps:	0	Utm:	1
Owner user:	Blackfield Hawaii	Old number:	Not Reported
Well type:	ROT	Casing dia:	10
Ground el:	41	Well depth:	71
Solid case:	38	Perf case:	58
Use:	IRR - Irrigation (non-domestic, non-agriculture)		
Use year:	92		
Init water:	0.8		
Init head:	0.75000		
Init chlor:	27	Init cl:	0
Test date:	########	Test gpm:	25
Test ddown:	0.3	Test chlor:	420
Test temp:	23.3	Temp unit:	C
Pump gpm:	40.00000	Draft mgy:	Not Reported
Head feet:	Not Reported	Max chlor:	Not Reported
Min chlor:	Not Reported	Geology:	TK
Pump yr:	97	Draft yr:	Not Reported
Head yr:	Not Reported	Maxchl:	Not Reported
Maxchl yr:	0	Minchl:	Not Reported
Minchl yr:	0	Bot hole:	-30
Bot solid:	3	Bot perf:	-17
Spec capac:	83	Pump mgd:	0.057
Draft mgd:	Not Reported	Aquifer:	60304
Tmk:	2-2-002:042	Old aqui:	Not Reported
Aqui code:	60304	Latest hd:	Not Reported
Cur head:	Not Reported	Cur cl:	Not Reported
Cur temp:	Not Reported	Wcr:	05/01/1990
Pir:	########	Surveyor:	Not Reported
T:	Not Reported	Pump elev:	-9
Pump depth:	50	Site id:	HI6000000001009

2 **WSW** **1/4 - 1/2 Mile** **Lower**		**HI WELLS**	**HI6000000001011**

Wid:	6-4527-006	Island:	6
Well no:	4527-06	Well name:	Tmk 3-9-01-9
Old name:	Not Reported	Yr drilled:	1948
Driller:	MULLIN	Quad map:	08
Longitude2:	1562721	Latitude27:	204550
Longitude8:	1562711	Latitude83:	204538
Lat83d:	20	Lat83m:	45
Lat83s:	38	Lon83d:	156
Lon83m:	27	Lon83s:	11
Lat83dd:	20.76056		
Lon83dd:	-156.45306		
Long83dd:	-156.45306		
Lat83dd 1:	20.76056		
Gps:	0	Utm:	1
Owner user:	Teruya E	Old number:	210-
Well type:	Not Reported	Casing dia:	6
Ground el:	Not Reported	Well depth:	28
Solid case:	25	Perf case:	Not Reported
Use:	IRR - Irrigation (non-domestic, non-agriculture)		
Use year:	71		
Init water:	Not Reported		
Init head:	Not Reported		
Init chlor:	Not Reported	Init cl:	0
Test date:	Not Reported	Test gpm:	42
Test ddown:	Not Reported	Test chlor:	541
Test temp:	Not Reported	Temp unit:	Not Reported
Pump gpm:	Not Reported	Draft mgy:	Not Reported
Head feet:	Not Reported	Max chlor:	1820
Min chlor:	538	Geology:	TK
Pump yr:	Not Reported	Draft yr:	Not Reported
Head yr:	48	Maxchl:	1/1/1958
Maxchl yr:	58	Minchl:	1/1/1949
Minchl yr:	49	Bot hole:	Not Reported
Bot solid:	Not Reported	Bot perf:	Not Reported
Spec capac:	Not Reported	Pump mgd:	Not Reported
Draft mgd:	Not Reported	Aquifer:	60304
Tmk:	3-9-001:009	Old aqui:	Not Reported
Aqui code:	60304	Latest hd:	Not Reported
Cur head:	Not Reported	Cur cl:	Not Reported
Cur temp:	Not Reported	Wcr:	01/01/1948
Pir:	Not Reported	Surveyor:	Not Reported
T:	Not Reported	Pump elev:	Not Reported
Pump depth:	Not Reported	Site id:	HI6000000001011

3
West
1/4 - 1/2 Mile
Lower

HI WELLS **HI6000000001013**

Wid:	6-4527-018	Island:	6
Well no:	4527-18	Well name:	Kaonoulu 5
Old name:	Not Reported	Yr drilled:	2007
Driller:	Not Reported	Quad map:	06
Longitude2:	1562726	Latitude27:	204559
Longitude8:	1562716	Latitude83:	204548
Lat83d:	20	Lat83m:	45
Lat83s:	48	Lon83d:	156
Lon83m:	27	Lon83s:	16
Lat83dd:	20.76333		

Lon83dd:	-156.45444		
Long83dd:	-156.45444		
Lat83dd 1:	20.76333		
Gps:	1	Utm:	0
Owner user:	Not Reported	Old number:	Not Reported
Well type:	ROT	Casing dia:	6
Ground el:	18	Well depth:	50
Solid case:	20	Perf case:	50
Use:	IRR - Landscape/Water Features		
Use year:	07		
Init water:	Not Reported		
Init head:	3.14000		
Init chlor:	Not Reported	Init cl:	184
Test date:	Not Reported	Test gpm:	Not Reported
Test ddown:	Not Reported	Test chlor:	Not Reported
Test temp:	Not Reported	Temp unit:	Not Reported
Pump gpm:	60.00000	Draft mgy:	Not Reported
Head feet:	Not Reported	Max chlor:	Not Reported
Min chlor:	Not Reported	Geology:	TK
Pump yr:	06	Draft yr:	Not Reported
Head yr:	Not Reported	Maxchl:	Not Reported
Maxchl yr:	Not Reported	Minchl:	Not Reported
Minchl yr:	Not Reported	Bot hole:	-32
Bot solid:	-2	Bot perf:	-32
Spec capac:	Not Reported	Pump mgd:	.086
Draft mgd:	Not Reported	Aquifer:	Not Reported
Tmk:	3-9-001:161	Old aqui:	Not Reported
Aqui code:	60304	Latest hd:	Not Reported
Cur head:	Not Reported	Cur cl:	Not Reported
Cur temp:	Not Reported	Wcr:	04/16/2007
Pir:	########	Surveyor:	Not Reported
T:	Not Reported	Pump elev:	-28
Pump depth:	46	Site id:	HI6000000001013

4
SSW
1/4 - 1/2 Mile
Lower

HI WELLS **HI6000000001008**

Wid:	6-4527-007	Island:	6
Well no:	4527-07	Well name:	Tmk 3-9-23-30
Old name:	Not Reported	Yr drilled:	1949
Driller:	MULLIN	Quad map:	08
Longitude2:	1562717	Latitude27:	204540
Longitude8:	1562707	Latitude83:	204528
Lat83d:	20	Lat83m:	45
Lat83s:	28	Lon83d:	156
Lon83m:	27	Lon83s:	07
Lat83dd:	20.75778		
Lon83dd:	-156.45194		
Long83dd:	-156.45194		
Lat83dd 1:	20.75778		
Gps:	0	Utm:	1
Owner user:	Uyeno H	Old number:	207-
Well type:	Not Reported	Casing dia:	8
Ground el:	Not Reported	Well depth:	42
Solid case:	42	Perf case:	Not Reported
Use:	UNU - Unused		
Use year:	71		
Init water:	Not Reported		

Init head:	Not Reported		
Init chlor:	Not Reported	Init cl:	0
Test date:	Not Reported	Test gpm:	Not Reported
Test ddown:	Not Reported	Test chlor:	Not Reported
Test temp:	Not Reported	Temp unit:	Not Reported
Pump gpm:	Not Reported	Draft mgy:	Not Reported
Head feet:	Not Reported	Max chlor:	Not Reported
Min chlor:	Not Reported	Geology:	TK
Pump yr:	Not Reported	Draft yr:	Not Reported
Head yr:	49	Maxchl:	Not Reported
Maxchl yr:	Not Reported	Minchl:	Not Reported
Minchl yr:	Not Reported	Bot hole:	Not Reported
Bot solid:	Not Reported	Bot perf:	Not Reported
Spec capac:	Not Reported	Pump mgd:	Not Reported
Draft mgd:	Not Reported	Aquifer:	60304
Tmk:	3-9-023:030	Old aqui:	Not Reported
Aqui code:	60304	Latest hd:	Not Reported
Cur head:	Not Reported	Cur cl:	Not Reported
Cur temp:	Not Reported	Wcr:	01/01/1949
Pir:	Not Reported	Surveyor:	Not Reported
T:	Not Reported	Pump elev:	Not Reported
Pump depth:	Not Reported	Site id:	HI6000000001008

5
West **HI WELLS** **HI6000000001012**
1/2 - 1 Mile
Lower

Wid:	6-4527-010	Island:	6
Well no:	4527-10	Well name:	Kihei-Koa
Old name:	Not Reported	Yr drilled:	1992
Driller:	OWNER	Quad map:	06
Longitude2:	1562737	Latitude27:	204555
Longitude8:	1562727	Latitude83:	204543
Lat83d:	20	Lat83m:	45
Lat83s:	43	Lon83d:	156
Lon83m:	27	Lon83s:	27
Lat83dd:	20.76194		
Lon83dd:	-156.4575		
Long83dd:	-156.4575		
Lat83dd 1:	20.76194		
Gps:	0	Utm:	1
Owner user:	Koa Res Assoc	Old number:	Not Reported
Well type:	DUG	Casing dia:	24
Ground el:	7	Well depth:	14
Solid case:	7	Perf case:	12
Use:	IRR - Landscape/Water Features		
Use year:	92		
Init water:	Not Reported		
Init head:	Not Reported		
Init chlor:	335	Init cl:	335
Test date:	8/6/1992	Test gpm:	20
Test ddown:	1.8	Test chlor:	697
Test temp:	24.4	Temp unit:	C
Pump gpm:	30.00000	Draft mgy:	Not Reported
Head feet:	Not Reported	Max chlor:	Not Reported
Min chlor:	Not Reported	Geology:	QD
Pump yr:	92	Draft yr:	Not Reported
Head yr:	Not Reported	Maxchl:	Not Reported

Maxchl yr:	0	Minchl:	Not Reported
Minchl yr:	0	Bot hole:	-7
Bot solid:	0	Bot perf:	-5
Spec capac:	11	Pump mgd:	0.043
Draft mgd:	Not Reported	Aquifer:	Not Reported
Tmk:	3-9-001:134	Old aqui:	Not Reported
Aqui code:	60304	Latest hd:	Not Reported
Cur head:	Not Reported	Cur cl:	Not Reported
Cur temp:	Not Reported	Wcr:	07/24/1992
Pir:	8/8/1992	Surveyor:	Not Reported
T:	Not Reported	Pump elev:	Not Reported
Pump depth:	Not Reported	Site id:	HI6000000001012

6
SSW **HI WELLS** **HI6000000001006**
1/2 - 1 Mile
Lower

Wid:	6-4527-001	Island:	6
Well no:	4527-01	Well name:	TMK 3-9-02-36
Old name:	Not Reported	Yr drilled:	1945
Driller:	MULLIN	Quad map:	08
Longitude2:	1562716	Latitude27:	204529
Longitude8:	1562706	Latitude83:	204517
Lat83d:	20	Lat83m:	45
Lat83s:	17	Lon83d:	156
Lon83m:	27	Lon83s:	06
Lat83dd:	20.75472		
Lon83dd:	-156.45167		
Long83dd:	-156.45167		
Lat83dd 1:	20.75472		
Gps:	0	Utm:	1
Owner user:	Akina R	Old number:	200-
Well type:	Not Reported	Casing dia:	6
Ground el:	Not Reported	Well depth:	30
Solid case:	22	Perf case:	Not Reported
Use:	AGR - Crops and Processing		
Use year:	71		
Init water:	Not Reported		
Init head:	Not Reported		
Init chlor:	Not Reported	Init cl:	0
Test date:	Not Reported	Test gpm:	250
Test ddown:	2.0	Test chlor:	Not Reported
Test temp:	Not Reported	Temp unit:	Not Reported
Pump gpm:	120.00000	Draft mgy:	Not Reported
Head feet:	Not Reported	Max chlor:	635
Min chlor:	478	Geology:	TK
Pump yr:	Not Reported	Draft yr:	Not Reported
Head yr:	45	Maxchl:	1/1/1971
Maxchl yr:	71	Minchl:	1/1/1945
Minchl yr:	71	Bot hole:	Not Reported
Bot solid:	Not Reported	Bot perf:	Not Reported
Spec capac:	125	Pump mgd:	0.170
Draft mgd:	Not Reported	Aquifer:	60304
Tmk:	3-9-002:036	Old aqui:	Not Reported
Aqui code:	60304	Latest hd:	Not Reported
Cur head:	Not Reported	Cur cl:	Not Reported
Cur temp:	Not Reported	Wcr:	01/01/1945
Pir:	Not Reported	Surveyor:	Not Reported

T:	Not Reported	Pump elev:	Not Reported
Pump depth:	Not Reported	Site id:	HI6000000001006

7
South
1/2 - 1 Mile
Lower

HI WELLS **HI6000000001003**

Wid:	6-4527-012	Island:	6
Well no:	4527-12	Well name:	Waiohuli 1
Old name:	Not Reported	Yr drilled:	1989
Driller:	GOODFELLOWS	Quad map:	08
Longitude2:	1562708	Latitude27:	204526
Longitude8:	1562658	Latitude83:	204514
Lat83d:	20	Lat83m:	45
Lat83s:	14	Lon83d:	156
Lon83m:	26	Lon83s:	58
Lat83dd:	20.75389		
Lon83dd:	-156.44944		
Long83dd:	-156.44944		
Lat83dd 1:	20.75389		
Gps:	0	Utm:	1
Owner user:	Baldwin Malama	Old number:	Not Reported
Well type:	DUG	Casing dia:	60
Ground el:	Not Reported	Well depth:	20
Solid case:	15	Perf case:	20
Use:	ABN - Sealed		
Use year:	02		
Init water:	Not Reported		
Init head:	Not Reported		
Init chlor:	Not Reported	Init cl:	0
Test date:	Not Reported	Test gpm:	Not Reported
Test ddown:	Not Reported	Test chlor:	Not Reported
Test temp:	Not Reported	Temp unit:	Not Reported
Pump gpm:	Not Reported	Draft mgy:	Not Reported
Head feet:	Not Reported	Max chlor:	Not Reported
Min chlor:	Not Reported	Geology:	TK
Pump yr:	Not Reported	Draft yr:	Not Reported
Head yr:	Not Reported	Maxchl:	Not Reported
Maxchl yr:	0	Minchl:	Not Reported
Minchl yr:	0	Bot hole:	Not Reported
Bot solid:	Not Reported	Bot perf:	Not Reported
Spec capac:	Not Reported	Pump mgd:	Not Reported
Draft mgd:	Not Reported	Aquifer:	Not Reported
Tmk:	2-2-002:066	Old aqui:	Not Reported
Aqui code:	60304	Latest hd:	Not Reported
Cur head:	Not Reported	Cur cl:	Not Reported
Cur temp:	Not Reported	Wcr:	01/01/1989
Pir:	Not Reported	Surveyor:	Not Reported
T:	Not Reported	Pump elev:	Not Reported
Pump depth:	Not Reported	Site id:	HI6000000001003

8
WSW
1/2 - 1 Mile
Lower

HI WELLS **HI6000000001010**

Wid:	6-4527-014	Island:	6
Well no:	4527-14	Well name:	Kauhale Makai
Old name:	Not Reported	Yr drilled:	2001
Driller:	WAILANI DRLG	Quad map:	06
Longitude2:	1562740	Latitude27:	204547
Longitude8:	1562730	Latitude83:	204535
Lat83d:	20	Lat83m:	45
Lat83s:	35	Lon83d:	156
Lon83m:	27	Lon83s:	30
Lat83dd:	20.75972		
Lon83dd:	-156.45833		
Long83dd:	-156.45833		
Lat83dd 1:	20.75972		
Gps:	0	Utm:	1
Owner user:	Kauhale Makai	Old number:	Not Reported
Well type:	ROT	Casing dia:	6
Ground el:	9	Well depth:	86
Solid case:	57	Perf case:	Not Reported
Use:	IRR - Parks		
Use year:	01		
Init water:	Not Reported		
Init head:	1.69000		
Init chlor:	Not Reported	Init cl:	2518
Test date:	3/7/2001	Test gpm:	100
Test ddown:	5.77	Test chlor:	2897
Test temp:	74.0	Temp unit:	F
Pump gpm:	150.00000	Draft mgy:	Not Reported
Head feet:	1.69	Max chlor:	Not Reported
Min chlor:	Not Reported	Geology:	Not Reported
Pump yr:	01	Draft yr:	Not Reported
Head yr:	Not Reported	Maxchl:	Not Reported
Maxchl yr:	Not Reported	Minchl:	Not Reported
Minchl yr:	Not Reported	Bot hole:	-77
Bot solid:	-48	Bot perf:	Not Reported
Spec capac:	17	Pump mgd:	0.216
Draft mgd:	Not Reported	Aquifer:	Not Reported
Tmk:	3-9-001:075	Old aqui:	Not Reported
Aqui code:	60304	Latest hd:	Not Reported
Cur head:	Not Reported	Cur cl:	Not Reported
Cur temp:	Not Reported	Wcr:	01/01/1989
Pir:	Not Reported	Surveyor:	KIRK T TANAKA
T:	4552.00000	Pump elev:	-15
Pump depth:	24	Site id:	HI6000000001010

9
North
1/2 - 1 Mile
Higher

HI WELLS **HI6000000001021**

Wid:	6-4627-008	Island:	6
Well no:	4627-08	Well name:	Tmk 3-9-01-33
Old name:	Not Reported	Yr drilled:	1948
Driller:	MULLIN	Quad map:	08
Longitude2:	1562711	Latitude27:	204634
Longitude8:	1562701	Latitude83:	204622
Lat83d:	20	Lat83m:	46
Lat83s:	22	Lon83d:	156
Lon83m:	27	Lon83s:	01
Lat83dd:	20.77278		

Lon83dd:	-156.45028		
Long83dd:	-156.45028		
Lat83dd 1:	20.77278		
Gps:	0	Utm:	1
Owner user:	Hashimoto T	Old number:	225-
Well type:	Not Reported	Casing dia:	6
Ground el:	Not Reported	Well depth:	116
Solid case:	85	Perf case:	Not Reported
Use:	IRR - Irrigation (non-domestic, non-agriculture)		
Use year:	71		
Init water:	Not Reported		
Init head:	Not Reported		
Init chlor:	Not Reported	Init cl:	0
Test date:	Not Reported	Test gpm:	100
Test ddown:	Not Reported	Test chlor:	435
Test temp:	Not Reported	Temp unit:	Not Reported
Pump gpm:	Not Reported	Draft mgy:	12
Head feet:	Not Reported	Max chlor:	477
Min chlor:	360	Geology:	TK
Pump yr:	Not Reported	Draft yr:	71
Head yr:	48	Maxchl:	1/1/1949
Maxchl yr:	49	Minchl:	1/1/1975
Minchl yr:	75	Bot hole:	Not Reported
Bot solid:	Not Reported	Bot perf:	Not Reported
Spec capac:	Not Reported	Pump mgd:	Not Reported
Draft mgd:	0.0	Aquifer:	60304
Tmk:	Not Reported	Old aqui:	Not Reported
Aqui code:	60304	Latest hd:	Not Reported
Cur head:	Not Reported	Cur cl:	Not Reported
Cur temp:	Not Reported	Wcr:	01/01/1948
Pir:	Not Reported	Surveyor:	Not Reported
T:	Not Reported	Pump elev:	Not Reported
Pump depth:	Not Reported	Site id:	HI6000000001021

10
North
1/2 - 1 Mile
Higher

HI WELLS **HI6000000001022**

Wid:	6-4627-014	Island:	6
Well no:	4627-14	Well name:	Tmk 3-9-01-34
Old name:	Not Reported	Yr drilled:	1969
Driller:	OCEAN VIEW	Quad map:	08
Longitude2:	1562701	Latitude27:	204635
Longitude8:	1562651	Latitude83:	204623
Lat83d:	20	Lat83m:	46
Lat83s:	23	Lon83d:	156
Lon83m:	26	Lon83s:	51
Lat83dd:	20.77306		
Lon83dd:	-156.4475		
Long83dd:	-156.4475		
Lat83dd 1:	20.77306		
Gps:	0	Utm:	1
Owner user:	Hashimoto T	Old number:	226-
Well type:	ROT	Casing dia:	Not Reported
Ground el:	130	Well depth:	200
Solid case:	Not Reported	Perf case:	Not Reported
Use:	IRR - Irrigation (non-domestic, non-agriculture)		
Use year:	71		
Init water:	Not Reported		

Init head:	Not Reported		
Init chlor:	Not Reported	Init cl:	0
Test date:	Not Reported	Test gpm:	Not Reported
Test ddown:	Not Reported	Test chlor:	Not Reported
Test temp:	Not Reported	Temp unit:	Not Reported
Pump gpm:	Not Reported	Draft mgy:	24
Head feet:	Not Reported	Max chlor:	302
Min chlor:	275	Geology:	Not Reported
Pump yr:	Not Reported	Draft yr:	71
Head yr:	Not Reported	Maxchl:	1/1/1971
Maxchl yr:	71	Minchl:	1/1/1974
Minchl yr:	74	Bot hole:	-70
Bot solid:	Not Reported	Bot perf:	Not Reported
Spec capac:	Not Reported	Pump mgd:	Not Reported
Draft mgd:	0.1	Aquifer:	60304
Tmk:	Not Reported	Old aqui:	Not Reported
Aqui code:	60304	Latest hd:	Not Reported
Cur head:	Not Reported	Cur cl:	Not Reported
Cur temp:	Not Reported	Wcr:	01/01/1969
Pir:	Not Reported	Surveyor:	Not Reported
T:	Not Reported	Pump elev:	Not Reported
Pump depth:	Not Reported	Site id:	HI6000000001022

A11
NW
1/2 - 1 Mile
Lower

HI WELLS **HI6000000001017**

Wid:	6-4627-011	Island:	6
Well no:	4627-11	Well name:	Tmk 3-9-01-99
Old name:	Not Reported	Yr drilled:	1949
Driller:	MULLIN	Quad map:	06
Longitude2:	1562733	Latitude27:	204626
Longitude8:	1562723	Latitude83:	204614
Lat83d:	20	Lat83m:	46
Lat83s:	14	Lon83d:	156
Lon83m:	27	Lon83s:	23
Lat83dd:	20.77056		
Lon83dd:	-156.45639		
Long83dd:	-156.45639		
Lat83dd 1:	20.77056		
Gps:	0	Utm:	1
Owner user:	Alo S	Old number:	220-
Well type:	Not Reported	Casing dia:	8
Ground el:	Not Reported	Well depth:	19
Solid case:	18	Perf case:	Not Reported
Use:	IRR - Irrigation (non-domestic, non-agriculture)		
Use year:	56		
Init water:	Not Reported		
Init head:	Not Reported		
Init chlor:	Not Reported	Init cl:	0
Test date:	Not Reported	Test gpm:	Not Reported
Test ddown:	Not Reported	Test chlor:	Not Reported
Test temp:	Not Reported	Temp unit:	Not Reported
Pump gpm:	Not Reported	Draft mgy:	Not Reported
Head feet:	Not Reported	Max chlor:	515
Min chlor:	Not Reported	Geology:	THO
Pump yr:	Not Reported	Draft yr:	Not Reported
Head yr:	49	Maxchl:	Not Reported

Maxchl yr:	50	Minchl:	1/1/1950
Minchl yr:	Not Reported	Bot hole:	Not Reported
Bot solid:	Not Reported	Bot perf:	Not Reported
Spec capac:	Not Reported	Pump mgd:	Not Reported
Draft mgd:	Not Reported	Aquifer:	60304
Tmk:	Not Reported	Old aqui:	Not Reported
Aqui code:	60304	Latest hd:	Not Reported
Cur head:	Not Reported	Cur cl:	Not Reported
Cur temp:	Not Reported	Wcr:	01/01/1949
Pir:	Not Reported	Surveyor:	Not Reported
T:	Not Reported	Pump elev:	Not Reported
Pump depth:	Not Reported	Site id:	HI6000000001017

A12
NW
1/2 - 1 Mile
Lower

HI WELLS **HI6000000001018**

Wid:	6-4627-003	Island:	6
Well no:	4627-03	Well name:	Tmk 3-9-01-54
Old name:	Not Reported	Yr drilled:	1947
Driller:	VENTURA J	Quad map:	06
Longitude2:	1562734	Latitude27:	204628
Longitude8:	1562724	Latitude83:	204616
Lat83d:	20	Lat83m:	46
Lat83s:	16	Lon83d:	156
Lon83m:	27	Lon83s:	24
Lat83dd:	20.77111		
Lon83dd:	-156.45667		
Long83dd:	-156.45667		
Lat83dd 1:	20.77111		
Gps:	0	Utm:	1
Owner user:	Ting L	Old number:	230-
Well type:	Not Reported	Casing dia:	10
Ground el:	Not Reported	Well depth:	29
Solid case:	26	Perf case:	Not Reported
Use:	Other		
Use year:	71		
Init water:	Not Reported		
Init head:	Not Reported		
Init chlor:	Not Reported	Init cl:	0
Test date:	Not Reported	Test gpm:	Not Reported
Test ddown:	Not Reported	Test chlor:	Not Reported
Test temp:	Not Reported	Temp unit:	Not Reported
Pump gpm:	Not Reported	Draft mgy:	Not Reported
Head feet:	Not Reported	Max chlor:	538
Min chlor:	Not Reported	Geology:	QD
Pump yr:	Not Reported	Draft yr:	Not Reported
Head yr:	47	Maxchl:	Not Reported
Maxchl yr:	48	Minchl:	1/1/1948
Minchl yr:	Not Reported	Bot hole:	Not Reported
Bot solid:	Not Reported	Bot perf:	Not Reported
Spec capac:	Not Reported	Pump mgd:	Not Reported
Draft mgd:	Not Reported	Aquifer:	60304
Tmk:	Not Reported	Old aqui:	Not Reported
Aqui code:	60304	Latest hd:	Not Reported
Cur head:	Not Reported	Cur cl:	Not Reported
Cur temp:	Not Reported	Wcr:	01/01/1947
Pir:	Not Reported	Surveyor:	Not Reported

T:	Not Reported	Pump elev:	Not Reported
Pump depth:	Not Reported	Site id:	HI6000000001018

13
NW
1/2 - 1 Mile
Lower

HI WELLS **HI6000000001016**

Wid:	6-4627-019	Island:	6
Well no:	4627-19	Well name:	Maui Lu
Old name:	Not Reported	Yr drilled:	1956
Driller:	GIBSON	Quad map:	08
Longitude2:	1562739	Latitude27:	204623
Longitude8:	1562729	Latitude83:	204611
Lat83d:	20	Lat83m:	46
Lat83s:	11	Lon83d:	156
Lon83m:	27	Lon83s:	29
Lat83dd:	20.76972		
Lon83dd:	-156.45806		
Long83dd:	-156.45806		
Lat83dd 1:	20.76972		
Gps:	0	Utm:	1
Owner user:	Maui Lu Resort	Old number:	Not Reported
Well type:	DUG	Casing dia:	Not Reported
Ground el:	Not Reported	Well depth:	Not Reported
Solid case:	Not Reported	Perf case:	Not Reported
Use:	IRR - Landscape/Water Features		
Use year:	Not Reported		
Init water:	Not Reported		
Init head:	Not Reported		
Init chlor:	Not Reported	Init cl:	0
Test date:	Not Reported	Test gpm:	Not Reported
Test ddown:	Not Reported	Test chlor:	Not Reported
Test temp:	Not Reported	Temp unit:	Not Reported
Pump gpm:	600.00000	Draft mgy:	Not Reported
Head feet:	Not Reported	Max chlor:	Not Reported
Min chlor:	Not Reported	Geology:	Not Reported
Pump yr:	Not Reported	Draft yr:	Not Reported
Head yr:	Not Reported	Maxchl:	Not Reported
Maxchl yr:	Not Reported	Minchl:	Not Reported
Minchl yr:	Not Reported	Bot hole:	Not Reported
Bot solid:	Not Reported	Bot perf:	Not Reported
Spec capac:	Not Reported	Pump mgd:	Not Reported
Draft mgd:	Not Reported	Aquifer:	Not Reported
Tmk:	3-9-001:086	Old aqui:	Not Reported
Aqui code:	60304	Latest hd:	Not Reported
Cur head:	Not Reported	Cur cl:	Not Reported
Cur temp:	Not Reported	Wcr:	01/01/1969
Pir:	Not Reported	Surveyor:	Not Reported
T:	Not Reported	Pump elev:	Not Reported
Pump depth:	Not Reported	Site id:	HI6000000001016

14
SSW
1/2 - 1 Mile
Lower

HI WELLS **HI6000000001002**

Wid:	6-4527-002	Island:	6
Well no:	4527-02	Well name:	Tmk 3-9-02-32
Old name:	Not Reported	Yr drilled:	1946
Driller:	MULLIN	Quad map:	08
Longitude2:	1562714	Latitude27:	204519
Longitude8:	1562704	Latitude83:	204507
Lat83d:	20	Lat83m:	45
Lat83s:	07	Lon83d:	156
Lon83m:	27	Lon83s:	04
Lat83dd:	20.75194		
Lon83dd:	-156.45111		
Long83dd:	-156.45111		
Lat83dd 1:	20.75194		
Gps:	0	Utm:	1
Owner user:	Yee W	Old number:	195-
Well type:	Not Reported	Casing dia:	8
Ground el:	Not Reported	Well depth:	35
Solid case:	Not Reported	Perf case:	35
Use:	IRR - Irrigation (non-domestic, non-agriculture)		
Use year:	71		
Init water:	Not Reported		
Init head:	Not Reported		
Init chlor:	Not Reported	Init cl:	0
Test date:	Not Reported	Test gpm:	20
Test ddown:	Not Reported	Test chlor:	522
Test temp:	Not Reported	Temp unit:	Not Reported
Pump gpm:	Not Reported	Draft mgy:	Not Reported
Head feet:	Not Reported	Max chlor:	555
Min chlor:	497	Geology:	RA
Pump yr:	Not Reported	Draft yr:	Not Reported
Head yr:	46	Maxchl:	1/1/1947
Maxchl yr:	47	Minchl:	1/1/1948
Minchl yr:	48	Bot hole:	Not Reported
Bot solid:	Not Reported	Bot perf:	Not Reported
Spec capac:	Not Reported	Pump mgd:	Not Reported
Draft mgd:	Not Reported	Aquifer:	60304
Tmk:	3-9-002:032	Old aqui:	Not Reported
Aqui code:	60304	Latest hd:	Not Reported
Cur head:	Not Reported	Cur cl:	Not Reported
Cur temp:	Not Reported	Wcr:	01/01/1946
Pir:	Not Reported	Surveyor:	Not Reported
T:	Not Reported	Pump elev:	Not Reported
Pump depth:	Not Reported	Site id:	HI6000000001002

15
SW
1/2 - 1 Mile
Lower

HI WELLS **HI6000000001007**

Wid:	6-4527-003	Island:	6
Well no:	4527-03	Well name:	Tmk 3-9-01-02
Old name:	Not Reported	Yr drilled:	1947
Driller:	VENTURA J	Quad map:	06
Longitude2:	1562740	Latitude27:	204533
Longitude8:	1562730	Latitude83:	204521
Lat83d:	20	Lat83m:	45
Lat83s:	21	Lon83d:	156
Lon83m:	27	Lon83s:	30
Lat83dd:	20.75583		

Lon83dd:	-156.45833		
Long83dd:	-156.45833		
Lat83dd 1:	20.75583		
Gps:	0	Utm:	1
Owner user:	Perreira L	Old number:	205-
Well type:	Not Reported	Casing dia:	8
Ground el:	Not Reported	Well depth:	20
Solid case:	16	Perf case:	Not Reported
Use:	UNU - Unused		
Use year:	71		
Init water:	Not Reported		
Init head:	Not Reported		
Init chlor:	Not Reported	Init cl:	0
Test date:	Not Reported	Test gpm:	Not Reported
Test ddown:	Not Reported	Test chlor:	Not Reported
Test temp:	Not Reported	Temp unit:	Not Reported
Pump gpm:	Not Reported	Draft mgy:	Not Reported
Head feet:	Not Reported	Max chlor:	610
Min chlor:	Not Reported	Geology:	QD
Pump yr:	Not Reported	Draft yr:	Not Reported
Head yr:	47	Maxchl:	Not Reported
Maxchl yr:	0	Minchl:	1/1/1948
Minchl yr:	0	Bot hole:	Not Reported
Bot solid:	Not Reported	Bot perf:	Not Reported
Spec capac:	Not Reported	Pump mgd:	Not Reported
Draft mgd:	Not Reported	Aquifer:	60304
Tmk:	Not Reported	Old aqui:	Not Reported
Aqui code:	60304	Latest hd:	Not Reported
Cur head:	Not Reported	Cur cl:	Not Reported
Cur temp:	Not Reported	Wcr:	01/01/1947
Pir:	Not Reported	Surveyor:	Not Reported
T:	Not Reported	Pump elev:	Not Reported
Pump depth:	Not Reported	Site id:	HI6000000001007

16
North
1/2 - 1 Mile
Higher

HI WELLS **HI6000000001027**

Wid:	6-4627-015	Island:	6
Well no:	4627-15	Well name:	Tmk 3-9-26-43
Old name:	Not Reported	Yr drilled:	1969
Driller:	OCEAN VIEW	Quad map:	08
Longitude2:	1562703	Latitude27:	204643
Longitude8:	1562653	Latitude83:	204631
Lat83d:	20	Lat83m:	46
Lat83s:	31	Lon83d:	156
Lon83m:	26	Lon83s:	53
Lat83dd:	20.77528		
Lon83dd:	-156.44806		
Long83dd:	-156.44806		
Lat83dd 1:	20.77528		
Gps:	0	Utm:	1
Owner user:	Neubauer A	Old number:	227-
Well type:	ROT	Casing dia:	4
Ground el:	Not Reported	Well depth:	110
Solid case:	Not Reported	Perf case:	Not Reported
Use:	IRR - Irrigation (non-domestic, non-agriculture)		
Use year:	71		
Init water:	Not Reported		

Init head:	Not Reported		
Init chlor:	Not Reported	Init cl:	0
Test date:	Not Reported	Test gpm:	Not Reported
Test ddown:	Not Reported	Test chlor:	Not Reported
Test temp:	Not Reported	Temp unit:	Not Reported
Pump gpm:	Not Reported	Draft mgy:	Not Reported
Head feet:	Not Reported	Max chlor:	Not Reported
Min chlor:	Not Reported	Geology:	Not Reported
Pump yr:	Not Reported	Draft yr:	Not Reported
Head yr:	Not Reported	Maxchl:	Not Reported
Maxchl yr:	Not Reported	Minchl:	Not Reported
Minchl yr:	Not Reported	Bot hole:	Not Reported
Bot solid:	Not Reported	Bot perf:	Not Reported
Spec capac:	Not Reported	Pump mgd:	Not Reported
Draft mgd:	Not Reported	Aquifer:	60304
Tmk:	Not Reported	Old aqui:	Not Reported
Aqui code:	60304	Latest hd:	Not Reported
Cur head:	Not Reported	Cur cl:	Not Reported
Cur temp:	Not Reported	Wcr:	01/01/1969
Pir:	Not Reported	Surveyor:	Not Reported
T:	Not Reported	Pump elev:	Not Reported
Pump depth:	Not Reported	Site id:	HI6000000001027

17
SSW
1/2 - 1 Mile
Lower

HI WELLS **HI6000000001001**

Wid:	6-4527-017	Island:	6
Well no:	4527-17	Well name:	Kihei
Old name:	Not Reported	Yr drilled:	Not Reported
Driller:	Not Reported	Quad map:	08
Longitude2:	1562716	Latitude27:	204513
Longitude8:	1562706	Latitude83:	204501
Lat83d:	20	Lat83m:	45
Lat83s:	01	Lon83d:	156
Lon83m:	27	Lon83s:	06
Lat83dd:	20.75028		
Lon83dd:	-156.45167		
Long83dd:	-156.45167		
Lat83dd 1:	20.75028		
Gps:	0	Utm:	1
Owner user:	Not Reported	Old number:	Not Reported
Well type:	DUG	Casing dia:	66
Ground el:	Not Reported	Well depth:	11
Solid case:	Not Reported	Perf case:	Not Reported
Use:	UNU - Unused		
Use year:	Not Reported		
Init water:	Not Reported		
Init head:	Not Reported		
Init chlor:	Not Reported	Init cl:	0
Test date:	Not Reported	Test gpm:	Not Reported
Test ddown:	Not Reported	Test chlor:	Not Reported
Test temp:	Not Reported	Temp unit:	Not Reported
Pump gpm:	0.00000	Draft mgy:	Not Reported
Head feet:	Not Reported	Max chlor:	Not Reported
Min chlor:	Not Reported	Geology:	Not Reported
Pump yr:	Not Reported	Draft yr:	Not Reported
Head yr:	Not Reported	Maxchl:	Not Reported

Maxchl yr:	Not Reported	Minchl:	Not Reported
Minchl yr:	Not Reported	Bot hole:	Not Reported
Bot solid:	Not Reported	Bot perf:	Not Reported
Spec capac:	Not Reported	Pump mgd:	Not Reported
Draft mgd:	Not Reported	Aquifer:	Not Reported
Tmk:	3-9-002:076	Old aqui:	Not Reported
Aqui code:	60304	Latest hd:	Not Reported
Cur head:	Not Reported	Cur cl:	Not Reported
Cur temp:	Not Reported	Wcr:	02/08/2008
Pir:	Not Reported	Surveyor:	Not Reported
T:	Not Reported	Pump elev:	Not Reported
Pump depth:	Not Reported	Site id:	HI6000000001001

18
North
1/2 - 1 Mile
Higher

HI WELLS **HI6000000001030**

Wid:	6-4627-016	Island:	6
Well no:	4627-16	Well name:	Tmk 3-9-26-67
Old name:	Not Reported	Yr drilled:	1969
Driller:	OCEAN VIEW	Quad map:	08
Longitude2:	1562701	Latitude27:	204648
Longitude8:	1562651	Latitude83:	204636
Lat83d:	20	Lat83m:	46
Lat83s:	36	Lon83d:	156
Lon83m:	26	Lon83s:	51
Lat83dd:	20.77667		
Lon83dd:	-156.4475		
Long83dd:	-156.4475		
Lat83dd 1:	20.77667		
Gps:	0	Utm:	1
Owner user:	Batoon A	Old number:	228-
Well type:	ROT	Casing dia:	4
Ground el:	Not Reported	Well depth:	161
Solid case:	Not Reported	Perf case:	Not Reported
Use:	IRR - Irrigation (non-domestic, non-agriculture)		
Use year:	71		
Init water:	Not Reported		
Init head:	Not Reported		
Init chlor:	Not Reported	Init cl:	0
Test date:	Not Reported	Test gpm:	Not Reported
Test ddown:	Not Reported	Test chlor:	Not Reported
Test temp:	Not Reported	Temp unit:	Not Reported
Pump gpm:	Not Reported	Draft mgy:	Not Reported
Head feet:	Not Reported	Max chlor:	362
Min chlor:	Not Reported	Geology:	Not Reported
Pump yr:	Not Reported	Draft yr:	Not Reported
Head yr:	Not Reported	Maxchl:	Not Reported
Maxchl yr:	Not Reported	Minchl:	Not Reported
Minchl yr:	Not Reported	Bot hole:	Not Reported
Bot solid:	Not Reported	Bot perf:	Not Reported
Spec capac:	Not Reported	Pump mgd:	Not Reported
Draft mgd:	Not Reported	Aquifer:	60304
Tmk:	Not Reported	Old aqui:	Not Reported
Aqui code:	60304	Latest hd:	Not Reported
Cur head:	Not Reported	Cur cl:	Not Reported
Cur temp:	Not Reported	Wcr:	01/01/1969
Pir:	Not Reported	Surveyor:	Not Reported

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

T:	Not Reported	Pump elev:	Not Reported
Pump depth:	Not Reported	Site id:	HI6000000001030

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS
RADON

AREA RADON INFORMATION

Federal EPA Radon Zone for MAUI County: 3

Note: Zone 1 indoor average level > 4 pCi/L.
: Zone 2 indoor average level >= 2 pCi/L and <= 4 pCi/L.
: Zone 3 indoor average level < 2 pCi/L.

Federal Area Radon Information for Zip Code: 96753

Number of sites tested: 10

Area	Average Activity	% <4 pCi/L	% 4-20 pCi/L	% >20 pCi/L
Living Area - 1st Floor	0.010 pCi/L	100%	0%	0%
Living Area - 2nd Floor	Not Reported	Not Reported	Not Reported	Not Reported
Basement	Not Reported	Not Reported	Not Reported	Not Reported

PHYSICAL SETTING SOURCE RECORDS SEARCHED

TOPOGRAPHIC INFORMATION

USGS 7.5' Digital Elevation Model (DEM)
Source: United States Geologic Survey
EDR acquired the USGS 7.5' Digital Elevation Model in 2002 and updated it in 2006. The 7.5 minute DEM corresponds to the USGS 1:24,000- and 1:25,000-scale topographic quadrangle maps. The DEM provides elevation data with consistent elevation units and projection.

Scanned Digital USGS 7.5' Topographic Map (DRG)
Source: United States Geologic Survey
A digital raster graphic (DRG) is a scanned image of a U.S. Geological Survey topographic map. The map images are made by scanning published paper maps on high-resolution scanners. The raster image is georeferenced and fit to the Universal Transverse Mercator (UTM) projection.

HYDROLOGIC INFORMATION

Flood Zone Data: This data, available in select counties across the country, was obtained by EDR in 2003 & 2009 from the Federal Emergency Management Agency (FEMA). Data depicts 100-year and 500-year flood zones as defined by FEMA.

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002 and 2005 from the U.S. Fish and Wildlife Service.

HYDROGEOLOGIC INFORMATION

AQUIFLOW^{R} Information System
Source: EDR proprietary database of groundwater flow information
EDR has developed the AQUIFLOW Information System (AIS) to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted to regulatory authorities at select sites and has extracted the date of the report, hydrogeologically determined groundwater flow direction and depth to water table information.

GEOLOGIC INFORMATION

Geologic Age and Rock Stratigraphic Unit
Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - A digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

STATSGO: State Soil Geographic Database
Source: Department of Agriculture, Natural Resources Conservation Services
The U.S. Department of Agriculture's (USDA) Natural Resources Conservation Service (NRCS) leads the national Conservation Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. Soil maps for STATSGO are compiled by generalizing more detailed (SSURGO) soil survey maps.

SSURGO: Soil Survey Geographic Database
Source: Department of Agriculture, Natural Resources Conservation Services (NRCS)
Telephone: 800-672-5559
SSURGO is the most detailed level of mapping done by the Natural Resources Conservation Services, mapping scales generally range from 1:12,000 to 1:63,360. Field mapping methods using national standards are used to construct the soil maps in the Soil Survey Geographic (SSURGO) database. SSURGO digitizing duplicates the original soil survey maps. This level of mapping is designed for use by landowners, townships and county natural resource planning and management.

PHYSICAL SETTING SOURCE RECORDS SEARCHED

LOCAL / REGIONAL WATER AGENCY RECORDS

FEDERAL WATER WELLS

PWS: Public Water Systems
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Public Water System data from the Federal Reporting Data System. A PWS is any water system which provides water to at least 25 people for at least 60 days annually. PWSs provide water from wells, rivers and other sources.

PWS ENF: Public Water Systems Violation and Enforcement Data
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Violation and Enforcement data for Public Water Systems from the Safe Drinking Water Information System (SDWIS) after August 1995. Prior to August 1995, the data came from the Federal Reporting Data System (FRDS).

USGS Water Wells: USGS National Water Inventory System (NWIS)
This database contains descriptive information on sites where the USGS collects or has collected data on surface water and/or groundwater. The groundwater data includes information on wells, springs, and other sources of groundwater.

STATE RECORDS

Well Index Database
Source: Commission on Water Resource Management
Telephone: 808-587-0214
CWRM maintains a Well Index Database to track specific information pertaining to the construction and installation of production wells in Hawaii

OTHER STATE DATABASE INFORMATION

RADON

Area Radon Information
Source: USGS
Telephone: 703-356-4020
The National Radon Database has been developed by the U.S. Environmental Protection Agency (USEPA) and is a compilation of the EPA/State Residential Radon Survey and the National Residential Radon Survey. The study covers the years 1986 - 1992. Where necessary data has been supplemented by information collected at private sources such as universities and research institutions.

EPA Radon Zones
Source: EPA
Telephone: 703-356-4020
Sections 307 & 309 of IRAA directed EPA to list and identify areas of U.S. with the potential for elevated indoor radon levels.

OTHER

Airport Landing Facilities: Private and public use landing facilities
Source: Federal Aviation Administration, 800-457-6656

Epicenters: World earthquake epicenters, Richter 5 or greater
Source: Department of Commerce, National Oceanic and Atmospheric Administration

PHYSICAL SETTING SOURCE RECORDS SEARCHED

STREET AND ADDRESS INFORMATION

Kihei High School
Piilani Highway
Kihei, HI 96753

Inquiry Number: 2991280.3
February 14, 2011

Certified Sanborn® Map Report

EDR® Environmental Data Resources Inc

440 Wheelers Farms Road
Milford, CT 06461
800.352.0050
www.edrnet.com

Certified Sanborn® Map Report

2/14/11

Site Name:
Kihei High School
Piilani Highway
Kihei, HI 96753

Client Name:
Group 70 International, Inc.
925 Bethel Street, Fifth Floor
Honolulu, HI 96740

EDR Inquiry # 2991280.3

Contact: Dricka Brown

EDR® Environmental Data Resources Inc

The complete Sanborn Library collection has been searched by EDR, and fire insurance maps covering the target property location provided by Group 70 International, Inc. were identified for the years listed below. The certified Sanborn Library search results in this report can be authenticated by visiting www.ednet.com/sanborn and entering the certification number. Only Environmental Data Resources Inc. (EDR) is authorized to grant rights for commercial reproduction of maps by Sanborn Library LLC, the copyright holder for the collection.

Certified Sanborn Results:

Site Name: Kihei High School
Address: Piilani Highway
City, State, Zip: Kihei, HI 96753
Cross Street:
P.O. # NA
Project: 28011-02-006
Certification # 37C9-4845-9FAF

Sanborn® Library search results
Certification # 37C9-4845-9FAF

UNMAPPED PROPERTY

This report certifies that the complete holdings of the Sanborn Library, LLC collection have been searched based on client supplied target property information, and fire insurance maps covering the target property were not found.

The Sanborn Library includes more than 1.2 million Sanborn fire insurance maps, which track historical property usage in approximately 12,000 American cities and towns. Collections searched:

- ✔ Library of Congress
- ✔ University Publications of America
- ✔ EDR Private Collection

The Sanborn Library LLC Since 1866™

Limited Permission To Make Copies

Group 70 International, Inc. (the client) is permitted to make up to THREE photocopies of this Sanborn Map transmittal and each fire insurance map accompanying this report solely for the limited use of its customer. No one other than the client is authorized to make copies. Upon request made directly to an EDR Account Executive, the client may be permitted to make a limited number of additional photocopies. This permission is conditioned upon compliance by the client, its customer and their agents with EDR's copyright policy; a copy of which is available upon request.

Kihei High School
Piilani Highway
Kihei, HI 96753

Inquiry Number: 2991280.4
February 15, 2011

EDR Historical Topographic Map Report

EDR® Environmental Data Resources Inc

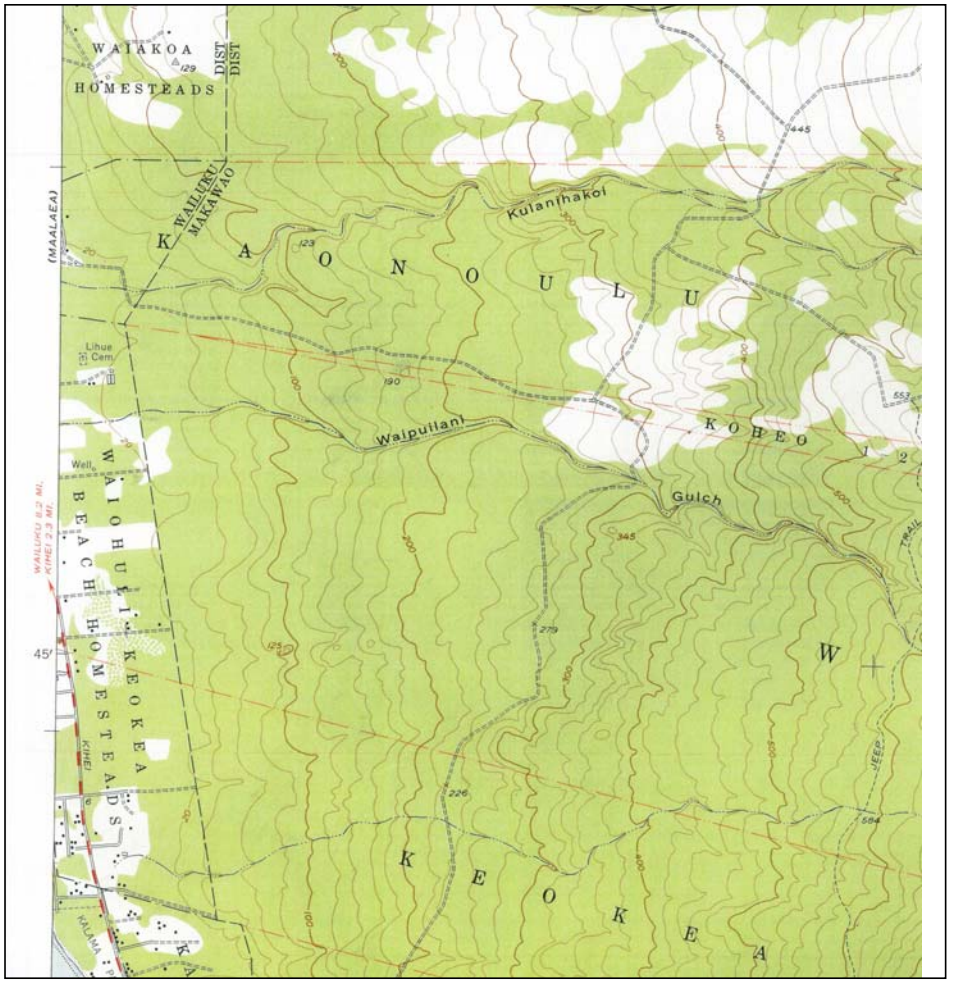
440 Wheelers Farms Road
Milford, CT 06461
800.352.0050
www.edrnet.com

EDR Historical Topographic Map Report

Environmental Data Resources, Inc.s (EDR) Historical Topographic Map Report is designed to assist professionals in evaluating potential liability on a target property resulting from past activities. EDRs Historical Topographic Map Report includes a search of a collection of public and private color historical topographic maps, dating back to the early 1900s.

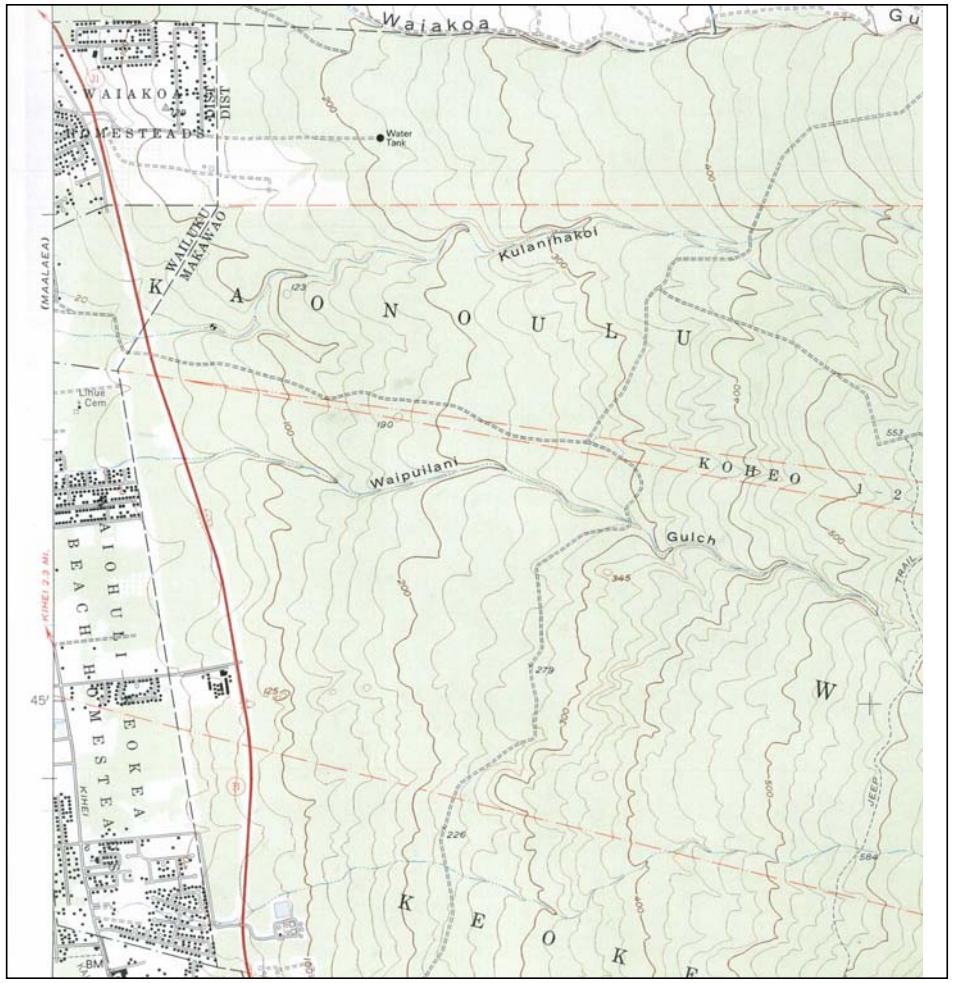
Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

Historical Topographic Map



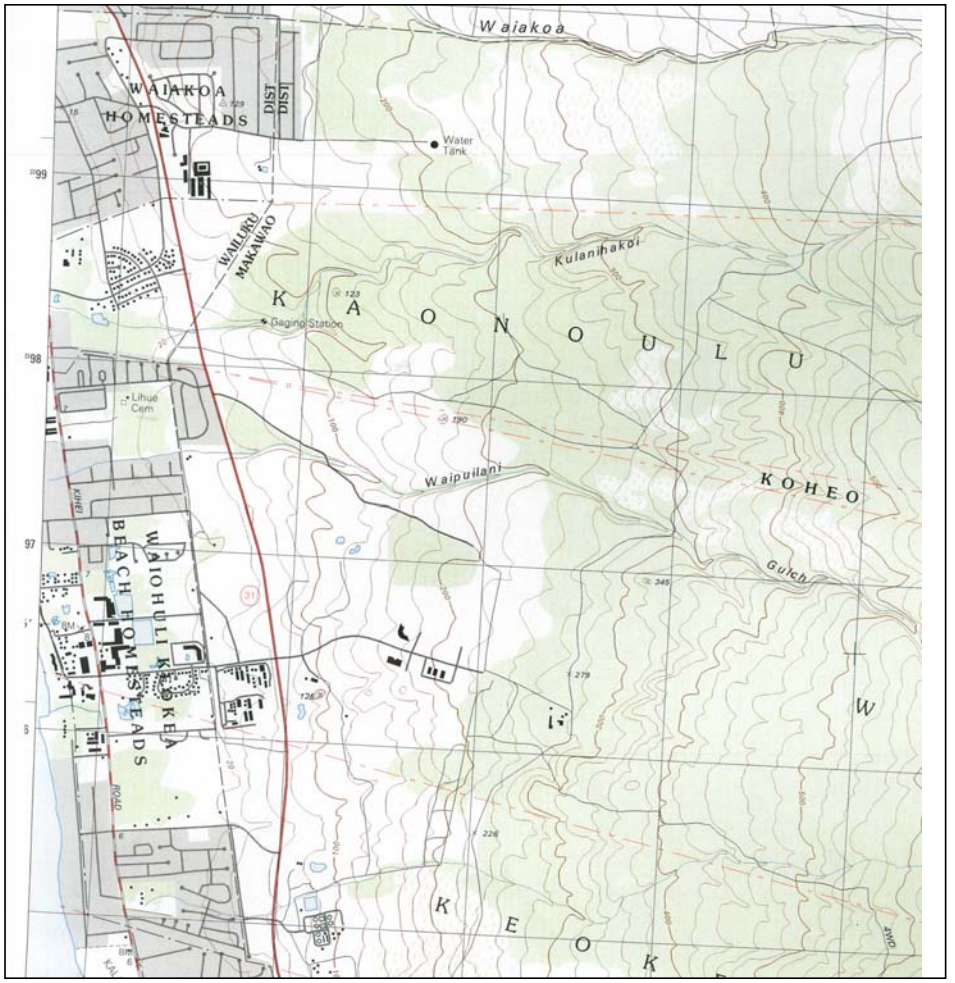
N	**TARGET QUAD** NAME: Puu O Kali, HI MAP YEAR: 1954 SERIES: 7.5 SCALE: 1:24,000	SITE NAME: Kihei High School ADDRESS: Piilani Highway Kihei, HI 96753 LAT/LONG: 20.7576 / -156.4448	CLIENT: Group 70 International, Inc. CONTACT: Dricka Brown INQUIRY#: 2991280.4 RESEARCH DATE: 02/15/2011

Historical Topographic Map



N	TARGET QUAD		SITE NAME: Kihei High School	CLIENT: Group 70 International, Inc.
	NAME: Puu O Kali, HI		ADDRESS: Piilani Highway	CONTACT: Dricka Brown
	MAP YEAR: 1983		Kihei, HI 96753	INQUIRY#: 2991280.4
	SERIES: 7.5		LAT/LONG: 20.7576 / -156.4448	RESEARCH DATE: 02/15/2011
	SCALE: 1:24,000			

Historical Topographic Map



N	TARGET QUAD		SITE NAME: Kihei High School	CLIENT: Group 70 International, Inc.
	NAME: Puu O Kali, HI		ADDRESS: Piilani Highway	CONTACT: Dricka Brown
	MAP YEAR: 1992		Kihei, HI 96753	INQUIRY#: 2991280.4
	SERIES: 7.5		LAT/LONG: 20.7576 / -156.4448	RESEARCH DATE: 02/15/2011
	SCALE: 1:24,000			

APPENDIX B

Government and State Records Reviewed

REQUEST TO ACCESS A GOVERNMENT RECORD

DATE: February 16, 2011

TO: **Hazard Evaluation & Emergency Response Office (Fax: 586-7537)**

FROM: Dricka Brown, Group 70 International

Name or Alias

Contact Information 925 Bethel Street, Fifth Floor (808) 523-5866
Honolulu, Hawaii 96813 fax (808) 523-5874

Although you are not required to provide any personal information, you should provide enough information to allow the agency to contact you about this request. The processing of this request may be stopped if the agency is unable to contact you. Therefore, please provide any information that will allow the agency to contact you (name or alias, telephone or fax number, mailing address, e-mail address, etc.).

I WOULD LIKE THE FOLLOWING GOVERNMENT RECORD:

Describe the government record as specifically as possible so that it can be located. Try to provide a record name, subject matter, date, location, purpose, or names of persons to whom the record refers, or other information that could help the agency identify the record. A complete and accurate description of the government record you request will prevent delays in locating the record. Attach a second page if needed.

Please pull any records the HEER office has on record for the following properties identified by Tax Map Key if possible.

(2) 2-2-002: Parcel 15
Kaonoulu Ranch LLP is the Owner. Located east of Piilani Highway, Kihei, Maui, 96753.

(2) 2-2-002: Parcel 54
Haleakala Ranch Company is the Owner. Located East of Piilani Highway, Kihei, Maui, 96753.

Thank you very much!

I WOULD LIKE: (please check one or more of the options below)

☐ **To inspect the government record.**

☐ **A copy of the government record:** (Please check one of the options below.) See the back of this page for information about fees that you may be required to pay for agency services to process your record request. Note: Copying and transmission charges may also apply to certain options.

- ☐ Pick up at agency **(date and time):** _____
- ☐ Mail
- ☐ Fax (toll free and only if available)
- ☐ Other, if available (please specify): _____

☐ If the agency maintains the records in a form other than paper, please advise in which format you would prefer to have the record.

☐ Electronic ☐ Audio ☐ Other (please specify): _____

☐ Check this box if you are attaching a request for waiver of fees in the public interest (see waiver information on back).

SEE BACK FOR IMPORTANT INFORMATION

OFFICIAL USE ONLY:

_____ _____

REQUEST TO ACCESS A GOVERNMENT RECORD

DATE: February 21, 2011

TO: **Hazard Evaluation & Emergency Response Office (Fax: 586-7537)**

FROM: Dricka Brown, Group 70 International

Name or Alias	925 Bethel Street, Fifth Floor	(808) 523-5866
Contact Information	Honolulu, Hawaii 96813	fax (808) 523-5874

Although you are not required to provide any personal information, you should provide enough information to allow the agency to contact you about this request. The processing of this request may be stopped if the agency is unable to contact you. Therefore, please provide any information that will allow the agency to contact you (name or alias, telephone or fax number, mailing address, e-mail address, etc.).

I WOULD LIKE THE FOLLOWING GOVERNMENT RECORD:

Describe the government record as specifically as possible so that it can be located. Try to provide a record name, subject matter, date, location, purpose, or names of persons to whom the record refers, or other information that could help the agency identify the record. A complete and accurate description of the government record you request will prevent delays in locating the record. Attach a second page if needed.

Please pull any records the HEER office has on record for the following properties:

1. Kihei Charter High School — P.O. Box 2053, Kihei, HI 96753
2. Kihei Marine Facility — Piilani HWY on N. Kihei, HI 96753
3. Kihei Minit Stop — 233 Piikea Ave., Kihei, HI 96753
4. Selland Construction Inc., Kihei Base Yard — 454 Ohukai Rd. Kihei, HI 96753
5. Kihei Chevron DBA T.A. Hughes Inc. — 1281 S Kihei Road, Kihei, HI 96753

Thank you very much!

I WOULD LIKE: (please check one or more of the options below)

☐ **To inspect the government record.**

☐ **A copy of the government record:** (Please check one of the options below.) See the back of this page for information about fees that you may be required to pay for agency services to process your record request. Note: Copying and transmission charges may also apply to certain options.

- ☐ Pick up at agency (**date and time**): _____
- ☐ Mail
- ☐ Fax (toll free and only if available)
- ☐ Other, if available (please specify): _____

☐ If the agency maintains the records in a form other than paper, please advise in which format you would prefer to have the record.

☐ Electronic ☐ Audio ☐ Other (please specify): _____

☐ Check this box if you are attaching a request for waiver of fees in the public interest (see waiver information on back).

SEE BACK FOR IMPORTANT INFORMATION

OFFICIAL USE ONLY:

Office Manager: _____ Date: _____

OIP (rev. 07/29/99)

REQUEST TO ACCESS A GOVERNMENT RECORD

DATE: February 16, 2011

TO: **DOH/EMD/Solid & Hazardous Waste Branch (Fax: 808-586-7509)**

FROM: Dricka Brown, Group 70 International

Name or Alias	925 Bethel Street, Fifth Floor	(808) 523-5866
Contact Information	Honolulu, Hawaii 96813	(808) 523-5874

Although you are not required to provide any personal information, you should provide enough information to allow the agency to contact you about this request. The processing of this request may be stopped if the agency is unable to contact you. Therefore, please provide any information that will allow the agency to contact you (name or alias, telephone or fax number, mailing address, e-mail address, etc.).

I WOULD LIKE THE FOLLOWING GOVERNMENT RECORD:

Describe the government record as specifically as possible so that it can be located. Try to provide a record name, subject matter, date, location, purpose, or names of persons to whom the record refers, or other information that could help the agency identify the record. A complete and accurate description of the government record you request will prevent delays in locating the record. Attach a second page if needed.

Please pull any records the SHWB office has on record for the following properties identified by Tax Map Key.

(2) 2-2-002: Parcel 15
Kaonoulu Ranch LLP is the Owner. Located east of Piilani Highway, Kihei, Maui, 96753.

(2) 2-2-002: Parcel 54
Haleakala Ranch Company is the Owner. Located East of Piilani Highway, Kihei, Maui, 96753.

Thank you very much!

I WOULD LIKE: (please check one or more of the options below)

☐ **To inspect the government record.**

☐ **A copy of the government record:** (Please check one of the options below.) See the back of this page for information about fees that you may be required to pay for agency services to process your record request. Note: Copying and transmission charges may also apply to certain options.

- ☐ Pick up at agency (**date and time**): _____
- ☐ Mail
- ☐ Fax (toll free and only if available)
- ☐ Other, if available (please specify): _____

☐ If the agency maintains the records in a form other than paper, please advise in which format you would prefer to have the record.

☐ Electronic ☐ Audio ☐ Other (please specify): _____

☐ Check this box if you are attaching a request for waiver of fees in the public interest (see waiver information on back).

SEE BACK FOR IMPORTANT INFORMATION

OFFICIAL USE ONLY:

Office Manager: _____ Date: _____

OIP (rev. 07/29/99)

REQUEST TO ACCESS A GOVERNMENT RECORD

DATE: February 21, 2011

TO: **DOH/EMD/Solid & Hazardous Waste Branch (Fax: 808-586-7509)**

FROM: Dricka Brown, Group 70 International

Name or Alias		
Contact Information	925 Bethel Street, Fifth Floor	(808) 523-5866
	Honolulu, Hawaii 96813	(808) 523-5874

Although you are not required to provide any personal information, you should provide enough information to allow the agency to contact you about this request. The processing of this request may be stopped if the agency is unable to contact you. Therefore, please provide any information that will allow the agency to contact you (name or alias, telephone or fax number, mailing address, e-mail address, etc.).

I WOULD LIKE THE FOLLOWING GOVERNMENT RECORD:

Describe the government record as specifically as possible so that it can be located. Try to provide a record name, subject matter, date, location, purpose, or names of persons to whom the record refers, or other information that could help the agency identify the record. A complete and accurate description of the government record you request will prevent delays in locating the record. Attach a second page if needed.

Please, if possible, we would like to review records the UST/SHWB has on record for the following properties:

1. Kihei Charter High School — P.O. Box 2053, Kihei, HI 96753
2. Kihei Marine Facility — Piilani HWY on N. Kihei, HI 96753
3. Kihei Minit Stop — 233 Piikea Ave., Kihei, HI 96753
4. Selland Construction Inc., Kihei Base Yard — 454 Ohukai Rd. Kihei, HI 96753
5. Kihei Chevron DBA T.A. Hughes Inc. — 1281 S Kihei Road, Kihei, HI 96753

Thank you very much!

I WOULD LIKE: (please check one or more of the options below)

☐ **To inspect the government record.**

☐ **A copy of the government record:** (Please check one of the options below.) See the back of this page for information about fees that you may be required to pay for agency services to process your record request. Note: Copying and transmission charges may also apply to certain options.

- ☐ Pick up at agency (**date and time**): _____
- ☐ Mail
- ☐ Fax (toll free and only if available)
- ☐ Other, if available (please specify): _____

☐ If the agency maintains the records in a form other than paper, please advise in which format you would prefer to have the record.

☐ Electronic ☐ Audio ☐ Other (please specify): _____

☐ Check this box if you are attaching a request for waiver of fees in the public interest (see waiver information on back).

SEE BACK FOR IMPORTANT INFORMATION

OFFICIAL USE ONLY:

Office Manager: _____ Date: _____

OIP (rev. 07/29/99)

MAUI COUNTY PARCEL HISTORY (TT101) FOR:

TMK: 2-2-002-015-0000 PAGE: 1

08/14/2009
INSTR-DESC: LUCA
TRANS NO: 302540
INSTR-DATE: 08/14/2009
REC-DATE: 08/14/2009

AREA: 5,919.8580 ACRES
OTHER-TMKS: 2-2-002-015-0000 ETC.

KAONOULU RANCH - WATER TANK SUB'D - FILE 2.2995
-
SUBDIVISION OF LOT 1 OF KAONOULU RANCH (LARGE-LOT) SUB'D INTO LOTS 1-A AND 1-B; TOG/ESMTS PER PLAN BY WARREN S. UNEMORI - ENGINEERING, INC. APPROVED 8/14/09

LOT 1-B TO NEW TMK 2202-77
F/D: AREA, BDRY, NEW LOT 1-A

GROUP#	NAME	F	TC	%-OWNER	TITLE-DESC
2 0011	KAONOULU RANCH				

FOR ASSESSMENT YEAR 2010

PITT 5	LAND VALUE:	$330,500	EXEMPT LAND VALUE:	$0
	BUILDING VALUE:	$192,000	EXEMPT BUILDING VALUE:	$0

SITE ADDRESS: 6564 KULA HWY

MAILING ADDRESS: KAONOULU RANC
C/O KAONOULU RANCH LLLF
P O BOX 390
KULA HI 96790

03/12/2001
INSTR-DESC: LUCA
TRANS NO: 264186
INSTR-DATE: 03/12/2001
REC-DATE: 03/12/2001

AREA: 5,921.0120 ACRES
OTHER-TMKS: 2-2-002-015-0000 ETC.

- KAONOULU RANCH (LARGE-LOT) SUBDIVISION - LUCA 3.1872
-
TMK: 2202-15
FROM: 3901-16 42.292 AC
CONSOLIDATE 5966.720 AC & 42.292 AC & RESUBDIVIDE INTO LOTS 1 & 2, PER PLAN BY WARREN S. UNEMORI-ENGINEERING, INC., APPROVED 3/12/2001
TO: 3901-16 88.000 AC LOT 2
F/D: AREA, BDRY; LOT 1

GROUP#	NAME	F	TC	%-OWNER	TITLE-DESC
2 0011	KAONOULU RANCH				

FOR ASSESSMENT YEAR 2009

PITT 5	LAND VALUE:	$735,500	EXEMPT LAND VALUE:	$0
	BUILDING VALUE:	$188,700	EXEMPT BUILDING VALUE:	$0

FOR ASSESSMENT YEAR 2008

PITT 5	LAND VALUE:	$735,500	EXEMPT LAND VALUE:	$0
	BUILDING VALUE:	$177,200	EXEMPT BUILDING VALUE:	$0

FOR ASSESSMENT YEAR 2007

PITT 5	LAND VALUE:	$660,500	EXEMPT LAND VALUE:	$0
	BUILDING VALUE:	$164,500	EXEMPT BUILDING VALUE:	$0

FOR ASSESSMENT YEAR 2006

PITT 5	LAND VALUE:	$570,500	EXEMPT LAND VALUE:	$0
	BUILDING VALUE:	$150,500	EXEMPT BUILDING VALUE:	$0

FOR ASSESSMENT YEAR 2005					
PITT 5	LAND VALUE:	$413,500	EXEMPT LAND VALUE:		$0
	BUILDING VALUE:	$106,500	EXEMPT BUILDING VALUE:		$0
FOR ASSESSMENT YEAR 2004					
PITT 5	LAND VALUE:	$301,000	EXEMPT LAND VALUE:		$0
	BUILDING VALUE:	$66,300	EXEMPT BUILDING VALUE:		$0
FOR ASSESSMENT YEAR 2003					
PITT 5	LAND VALUE:	$301,000	EXEMPT LAND VALUE:		$0
	BUILDING VALUE:	$64,900	EXEMPT BUILDING VALUE:		$0
FOR ASSESSMENT YEAR 2002					
PITT 5	LAND VALUE:	$301,000	EXEMPT LAND VALUE:		$0
	BUILDING VALUE:	$63,300	EXEMPT BUILDING VALUE:		$0

SITE ADDRESS: 6564 KULA HWY

MAILING ADDRESS: KAONOULU RANC
C/O KAONOULU RANCH LLLF
P O BOX 390
KULA HI 96790

09/28/1995
INSTR-DESC: LUC MAP R/S
INSTR_NO:0000000000
TRANS NO: 15819
INSTR-DATE: 09/28/1995
ACK/EFF DATE: 09/28/1995

AREA: 5,966.7200 ACRES

FORMER ZONING: A
CHANGED TO: A & U
AGR: 5,921.012 AC
URB: 45.708 AC
TOTAL: 5,966.720 AC
SOURCE OF CHANGE: LUC BDRY AMD A94-706 DTD 2/10/95
TMB NOTE: AREA BY MAPPING BRANCH FOR ASSESSMENT PURPOSES ON
LY.

GROUP#	NAME	F	TC	%-OWNER	TITLE-DESC
2 0011	KAONOULU RANCH				

FOR ASSESSMENT YEAR 2001					
PITT 5	LAND VALUE:	$301,000	EXEMPT LAND VALUE:		$0
	BUILDING VALUE:	$63,300	EXEMPT BUILDING VALUE:		$0
FOR ASSESSMENT YEAR 2000					
PITT 5	LAND VALUE:	$293,400	EXEMPT LAND VALUE:		$0
	BUILDING VALUE:	$60,300	EXEMPT BUILDING VALUE:		$0
FOR ASSESSMENT YEAR 1999					
PITT 5	LAND VALUE:	$296,400	EXEMPT LAND VALUE:		$0
	BUILDING VALUE:	$59,000	EXEMPT BUILDING VALUE:		$0
FOR ASSESSMENT YEAR 1998					
PITT 5	LAND VALUE:	$296,500	EXEMPT LAND VALUE:		$0
	BUILDING VALUE:	$58,500	EXEMPT BUILDING VALUE:		$0
FOR ASSESSMENT YEAR 1997					
PITT 5	LAND VALUE:	$286,000	EXEMPT LAND VALUE:		$0
	BUILDING VALUE:	$57,300	EXEMPT BUILDING VALUE:		$0
FOR ASSESSMENT YEAR 1996					
PITT 5	LAND VALUE:	$306,300	EXEMPT LAND VALUE:		$0
	BUILDING VALUE:	$56,200	EXEMPT BUILDING VALUE:		$0

SITE ADDRESS: KULA HWY

MAILING ADDRESS: KAONOULU RANC
P O BOX 390
KULA HI 96790 0000

02/20/1990
INSTR-DESC: AMENDMENT TO GRANT OF EASEMENT
INSTR_NO:9000029038
TRANS NO: 15818
INSTR-DATE: 10/20/1989
REC-DATE: 02/20/1990
ACK/EFF DATE: 02/20/1990

AREA: 5,966.7200 ACRES

FROM: KAONOULU RANCH CO LTD WHOSE CORRECT NAME AND STATUS A
RE KAONOULU
RANCH
TO: TONY HARUYOSHI HASHIMOTO & WF HILDA HASHIMOTO FKA HILDE
GARD Z
HASHIMOTO; EVELYN H HASHIMOTO (M); HEDY NAOMI KANEOKA (M); G
RACE T
TSUTAHARA FKA GRACE T HASHIMOTO (M); SUSAN H HASHIMOTO-SHINO
ZUKA FKA
SUSAN H HASHIMOTO (M); HARRY H HASHIMOTO; TONY H HASHIMOTO T
RS UNDER
UNREC TONY H HASHIMOTO REV LIVING TR AGRMT DTD 8/9/75 & HILD
A HASHIMOTO
TRS UNDER UNREC HILDA HASHIMTO REV LIVING TR AGRMT DTD 8/9/7
5
GRANT OF EASEMENT DTD 7/20/87 LIBER 20934 PAGE 687 AMENDING
TO CORRECTLY
REFLECT GRANTOR'S NAME AND STATUS
WHEREAS JAMES SAKUGAWA DBA JAMES SAKUGAWA RANCH LESSEE OF TH
E SUBJECT
PROPERTY DID CONSENT TO SAID ORIGINAL GRANT
DOES HEREBY JOIN IN AND CONSENT TO THE AMENDMENT TO GRANT OF
EASEMENT
DRAINAGE ESMT NO 1, 25.00 FT WIDE OVER PARCEL 16, POR RP 744
7, LCAW
3237, PART 2 55,216 SF OR 1.268 AC DES
DRAINAGE ESMT NO 2, 25.00 FT WIDE OVER PARCEL 15, POR RP 744
7, LCAW
3237, PART 2 8,757 SF DES
F/D: KEYED ONLY - CORRECT SPELLING & STATUS

GROUP#	NAME	F	TC	%-OWNER	TITLE-DESC
2 0011	KAONOULU RANCH				

FOR ASSESSMENT YEAR 1995					
PITT 5	LAND VALUE:	$306,300	EXEMPT LAND VALUE:		$0
	BUILDING VALUE:	$55,200	EXEMPT BUILDING VALUE:		$0
FOR ASSESSMENT YEAR 1994					
PITT 5	LAND VALUE:	$306,300	EXEMPT LAND VALUE:		$0
	BUILDING VALUE:	$52,600	EXEMPT BUILDING VALUE:		$0
FOR ASSESSMENT YEAR 1993					
PITT 5	LAND VALUE:	$306,300	EXEMPT LAND VALUE:		$0
	BUILDING VALUE:	$50,000	EXEMPT BUILDING VALUE:		$0
FOR ASSESSMENT YEAR 1992					
PITT 5	LAND VALUE:	$316,000	EXEMPT LAND VALUE:		$0
	BUILDING VALUE:	$47,600	EXEMPT BUILDING VALUE:		$0
FOR ASSESSMENT YEAR 1991					
PITT 5	LAND VALUE:	$286,000	EXEMPT LAND VALUE:		$0
	BUILDING VALUE:	$45,800	EXEMPT BUILDING VALUE:		$0

SITE ADDRESS: KULA HWY

MAILING ADDRESS: KAONOULU RANC
P O BOX 390
KULA HI 96790 0000

MAUI COUNTY PARCEL HISTORY (TT101) FOR:

TMK: 2-2-002-015-0000 PAGE: 4

10/08/1987

INSTR-DESC: GRANT EASEMENT
LIBER/PAGE: 20934/687 INSTR_NO:8700110750

TRANS NO: 15820
INSTR-DATE: 07/20/1987
REC-DATE: 07/24/1987
ACK/EFF DATE: 10/08/1987

AREA: 5,966.7200 ACRES

FROM: KAONOULU RANCH CO LTD
TO: TONY H HASHIMOTO &WF HILDA (FKA HILDEGARD Z HASHIMOTO)
EVELYN H HASHIMOTO (M), HEDY N KANEOKA (M), GRACE T TSUTAHAR
A (M) FKA
GRACE T HASHIMOTO), SUSAN H HASHIMOTO-SHINOZUKA (M) (FKA SUS
AN H
HASHIMOTO), HARRY H HASHIMOTO (M), TONY H HASHIMOTO, TRUSTEE
UNDER
THAT CERTAIN UNREC TONY H HASHIMOTO LIVING TRUST AGRMT DTD 8
/9/75,
HILDA HASHIMOTO, TRUSTEE UNDER THAT CERTAIN UNREC HILDA HASH
IMOTO
REVOCABLE LIVING TRUST AGRMT DTD 8/9/75
DRAINAGE EASMENT NO 1 (25.00 FT WD) FOR DRAINAGE PURPOSES
OVER,
UNDER & ACROSS PARCEL 16, BEING POR RP 7447, LCAW 3237, PART
2
1.268 AC DES TMK 3901-16
DRAINAGE EASEMENT NO 2 (25.00 FT WD) FOR DRAINAGE PURPOSES
OVER,
UNDER & ACROSS PARCEL 15, BEING POR RP 7447, LCAW 3237, PART
2
8757 SF DES TMK 2202-15
F/D: SUBJ TO DRAINAGE ESMT NO 2 (25 FT WD) IN FAVOR OF 3901-
33

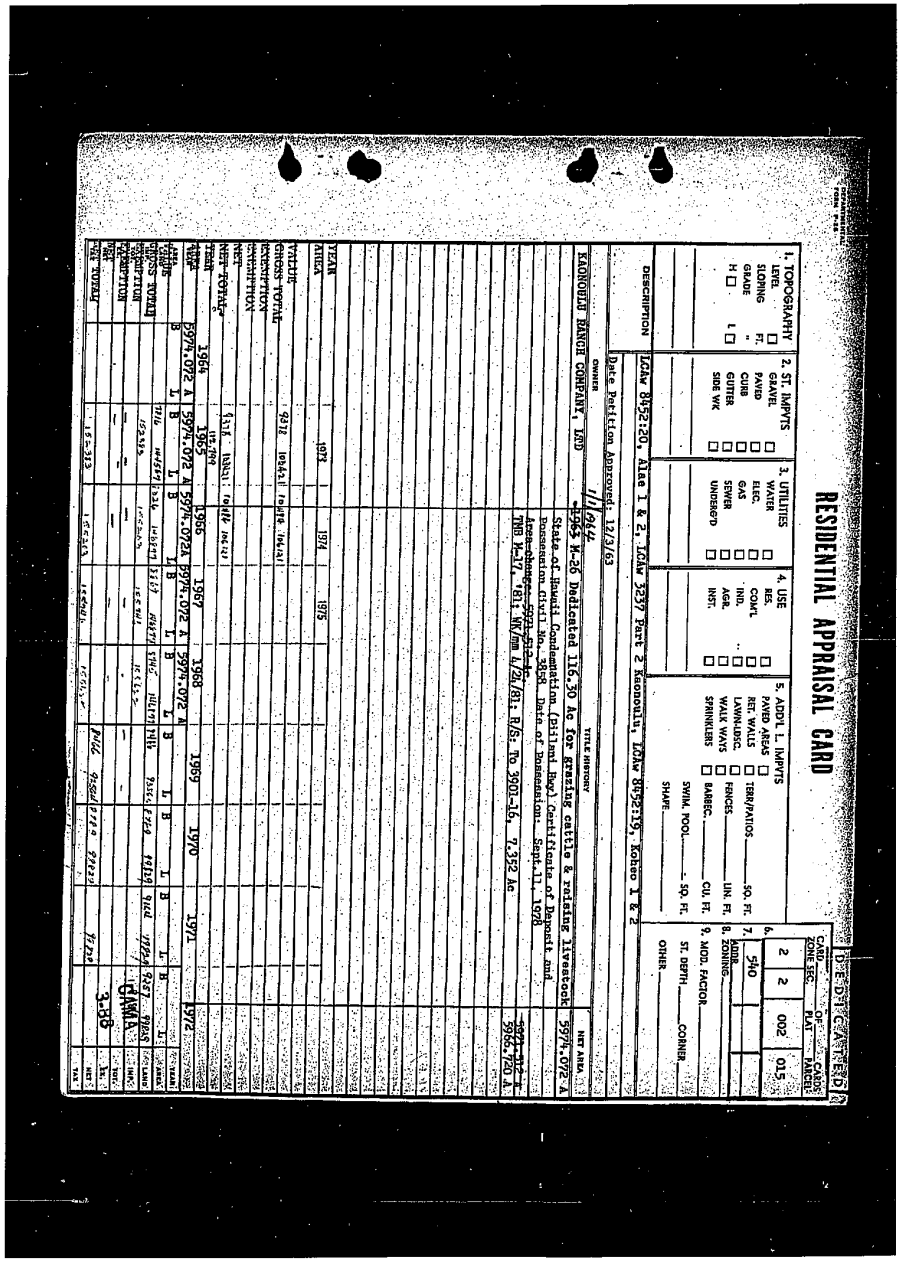
GROUP#	NAME	F	TC	%-OWNER	TITLE-DESC
2 0011	KAONOULU RANCH				

FOR ASSESSMENT YEAR 1990				
PITT 5	LAND VALUE:	$218,500	EXEMPT LAND VALUE:	$0
	BUILDING VALUE:	$45,300	EXEMPT BUILDING VALUE:	$0
FOR ASSESSMENT YEAR 1989				
PITT 5	LAND VALUE:	$187,000	EXEMPT LAND VALUE:	$0
	BUILDING VALUE:	$108,500	EXEMPT BUILDING VALUE:	$0
FOR ASSESSMENT YEAR 1988				
PITT 5	LAND VALUE:	$187,009	EXEMPT LAND VALUE:	$0
	BUILDING VALUE:	$28,960	EXEMPT BUILDING VALUE:	$0

SITE ADDRESS: KULA HWY

MAILING ADDRESS: KAONOULU RANC
P O BOX 1141
WAILUKU HI 96793 0000

----------SEE PARCEL SHEETS FOR MORE INFORMATION----------



OWNER (PENCIL ONLY) | OCCUPANT OR LESSEE (PENCIL ONLY) | SUMMARY BUILDING SHEET

Harold W. Rice

Second DIVISION			
ZONE	SEC.	PLAT.	PARCEL
2	2	02	15

BUILDING COMPUTATIONS (BLD. | POR | DEP RATE | AREA OR CUBE | ϕ_c | FACTOR | REPLACEMENT)

AREA OR CUBE	1943 VALUE	1944 VALUE	1945 VALUE	1946 VALUE
SHEET 1	1102	1087	1087	1087
" 2	837	805	774	774
	1971	1972	1973	1974
	8872	8967		
	290	290		
	9162	9257		
	1975	1982		
Sheet 1		1 14323		
" 2		2 249		
		14572		
TOTAL	1939	1892	1861	1861

AREA OR CUBE	1947 VALUE	1948 VALUE	1949 VALUE	1950 VALUE
SHEET 1	376	376	~~276~~	—
" 2	186	186	126	151
" 3	3727	4952	4602	5108
	4289	5512	4728	5259
	1951	1952	1953	1954
SHEET 1		—	—	—
" 2	151	211	211	211
" 3	4682	5957	5392	4812
	4833	6168	5603	5023
	1955	1956	1957	1958
SHEET 2	212	369	370	370
3	4231	6110	5567	5026
TOTAL	4443	6479	5937	5396

AREA OR CUBE	1959 ~~1963~~ VALUE	1960 ~~1952~~ VALUE	1961 ~~1953~~ VALUE	1962 ~~1954~~ VALUE
SHEET 2	370	292	292	292
" 3	4485	8331	7944	7682
	4855	8623	8236	7974
	1963	1964	1965	1966
SHEET 2	292	315	315	314
" 3	7428	7757	7501	7979
	7720	8072	7816	8376
	1967		1969	1970
Bldg #2	8487	8452	8174 35	8497
Bldg #3	382	298	292 5½	292
	8869		8466	8789
	1972			CAMA 3-88
TOTAL	TOTAL	TOTAL	TOTAL	TOTAL

Second DIVISION				
ZONE	SEC.	PLAT.	PARCEL	65 / 5(4)
2	2	02	15	

Dedicated 8/15/63 11630 Ac.
Dedicated Value

NO.	SYMBOL	RATIO	AV. DEPTH	AREA	U.V.	YR. 1966 VAL.	U.V.	YR.	VAL.	U.V.	YR. 1966 VAL.	U.V.	YR. VAL.
1				1.00 Ac	4775 -	4775			1.00 Ac	4775 -	4775		
2				34.30 Ac	350 -	12005			4.00 Ac	235 -	940		
3				4.00 Ac	235 -	940			319.142 Ac	80 -	25531		
4				82.00 Ac	87 -	7134			808.00 Ac	43 -	34744		
5				202.842 Ac	80 -	16227			1384.00 Ac	26 -	35984		
6				808.00 Ac	43 -	34744			3457.93 Ac	13 -	44953		
7				1384.00 Ac	26 -	35984					146877		
8				3457.93 Ac	13 -	44953							
9						156712							
10						1970			1973		1974		1975
11		32				99,829	2.00 Ac @7000-		14000-	8400	16800	X118	19824
12							Homesite Value 1400x3 avg.		4200-	1600 x 3	4800		4800
13						1979	3.00 Ac @ 235		705-		705		705
14				5,974.072 Ac	3600-	2,150666-	319.142 Ac PAS. B @ 51-		16,276-		16276		16276
15					-90% size		808.00 Ac PAS. C @ 27		21,816		21816		21816
16						1979	1,384.00 Ac PAS. D @ 16-		22,144		22144		22144
17				5971.512 Ac	3600 -90% size	2149744	3457.93 Ac PAS. E @ 8		27,663		27663		27663
18				Area Change in '79					106,804		110,204		113228

YEAR	1965	YR.	1966	YR.	1967	YR.	1968	YR.		YR.	1970	YR.	1971	YR.	1972
AREA	5974.072 ac	AR.		AR.		AR.		AR.		AR.		AR.		AR.	
LAND VALUE	144567	L	146877	L	146877	L	146877	L		L	99,829	L	99,829	L	99,829
IMPROVEMENT	7816	I	8376	I	8869	I		I		I		I		I	
TOTAL	(152383)	T	(155253)	T		T		T		T		T		T	
LESS EX.	— —	EX.	— —	EX.		EX.	— —	EX.		EX.		EX.		EX.	
NET TAX VALUE	7816 144567	N.T.	8376 146877	N.T.		N.T.	8869 146877	N.T.		N.T.		N.T.		N.T.	
TAXES															

YEAR	1973	YR.	1974	YR.		YR.		YR.		YR.		YR.		YR.	1980
AREA		AR.		AR.		AR.		AR.		AR.		AR.		AR.	
LAND VALUE	106,804	L	110204	L		L		L		L		L		L	
IMPROVEMENT		I		I		I		I		I		I		I	
TOTAL	1981	T	1982	T	1983	T		T		T	1986	T		T	
LESS EX.		EX.		EX.		EX.		EX.		EX.		EX.		EX.	
NET TAX VALUE		N.T.		N.T.		N.T.		N.T.		N.T.		N.T.		N.T.	
TAXES															

Second DIVISION				
ZONE	SEC.	PLAT.	PARCEL	45 5(4)
2	2	02	15	Dedicated 8/15/63 116.30 Ac. Dedicated Value

NO.	SYMBOL	RATIO	AV. DEPTH	AREA	U.V.	YR. 1966 VAL.	U.V.	YR. VAL.	U.V.	YR. 1966 VAL.	U.V.	YR. VAL.
1				1.00 Ac	4725 -	4725		1.00 Ac	4725 -	4725		
2				34.30 Ac	350 -	12005		4.00 Ac	235 -	940.		
3				4.00 Ac	235 -	940		319.142 Ac	80 -	25531		
4				82.00 Ac	87 -	7134		808.00 Ac	43 -	34744		
5				202.842 Ac	80 -	16227		1384.00 Ac	26 -	35984		
6				808.00 Ac	43 -	34744		3457.93 Ac	13 -	44953		
7				1384.00 Ac	26 -	35984				146877		
8				3457.93 Ac	13 -	44953						
9						156712.						
10						1970		1973		1974		1975
11						99,829	2.00 Ac @7000-	14000-	8400	16800	X118	19824
12							Homesite Value 1400x3 dwg	4200-	1600 x 3	4800		4800
13						1979	3.00 Ac @ 235	705-		705		705
14				5,974.072 Ac	3600-	2,150666-	319.142 Ac Pas. B @ 51-	16,276-		16276		16276
15					-90% Size		808.00 Ac Pas. C @ 27	21,816		21816		21816
16						1979	1,384.00 Ac Pas. D @ 16-	22,144		22144		22144
17				5971.512 Ac	3600 -90% size	2149744	3457.93 Ac Pas. E @ 8	27,663		27663		27663
18				Area Change in '79				106,804		110,204		113228

YEAR	1965	YR. 1966	YR. 1967	YR. 1968	YR.	YR. 1970	YR. 1971	YR. 1972
AREA	5974.072 ac	AR.	AR.	AR.	AR.	AR.	AR.	AR.
LAND VALUE	144567	L. 146877	L. 146877	L. 146877	L.	L. 99,829	L. 99,829	L. 99,829
IMPROVEMENT	7816	I. 8376	I. 8869	I.	I.	I.	I.	I.
TOTAL	(152383)	T. (155203)	T.	T.	T.	T.	T.	T.
LESS EX.	– –	EX. – –	EX.	EX. – –	EX.	EX.	EX.	EX.
NET TAX VALUE	7816 144567	N.T. 8376 146877	N.T.	N.T. 8869 146877	N.T.	N.T.	N.T.	N.T.
TAXES								

YEAR	1973	YR. 1974	YR.	YR.	YR.	YR.	YR.	YR. 1980
AREA		AR.	AR.	AR.	AR.	AR.	AR.	AR.
LAND VALUE	106,804	L. 110204	L.	L.	L.	L.	L.	L.
IMPROVEMENT		I.	I.	I.	I.	I.	I.	I.
TOTAL	1981	T. 1982	T. 1983	T.	T.	T. 1986	T.	T.
LESS EX.		EX.	EX.	EX.	EX.	EX.	EX.	EX.
NET TAX VALUE		N.T.	N.T.	N.T.	N.T.	N.T.	N.T.	N.T.
TAXES								

DEPARTMENTAL FORM

RESIDENTIAL APPRAISAL CARD MEMO

CARD ___ OF ___ CARDS

ZONE	SEC.	PLAT	PARCEL
2	2	02	15

1. TOPOGRAPHY: LEVEL ☐ SLOPING FT. GRADE " H ☐ L ☐

2. ST. IMPVTS: GRAVEL ☐ PAVED ☐ CURB ☐ GUTTER ☐ SIDE WK ☐

3. UTILITIES: WATER ☐ ELEC. ☐ GAS ☐ SEWER ☐ UNDERG'D ☐

4. USE: RES. ☐ COM'L ☐ IND. ☐ AGR. ☐ INST. ☐

5. ADD'L L. IMPVTS: PAVED AREAS ☐ RET. WALLS ☐ LAWN-LDSC. ☐ WALK WAYS ☐ SPRINKLERS ☐ TERR/PATIOS ______ SQ. FT. FENCES ______ LIN. FT. BARBEC. ______ CU. FT. SWIM. POOL ______ SQ. FT. SHAPE ______

6.
7. 540 ADDR
8. ZONING
9. MOD. FACTOR ______ ST. DEPTH ______ CORNER ______ OTHER ______

DESCRIPTION: LCAw 8452:20, Alae 1 & 2, LCAw 3237-Part 2 Kaonoulu, LCAw 8452:19, Koheo 1 & 2

Dedicated 8/15/63. 116.30 Ac.

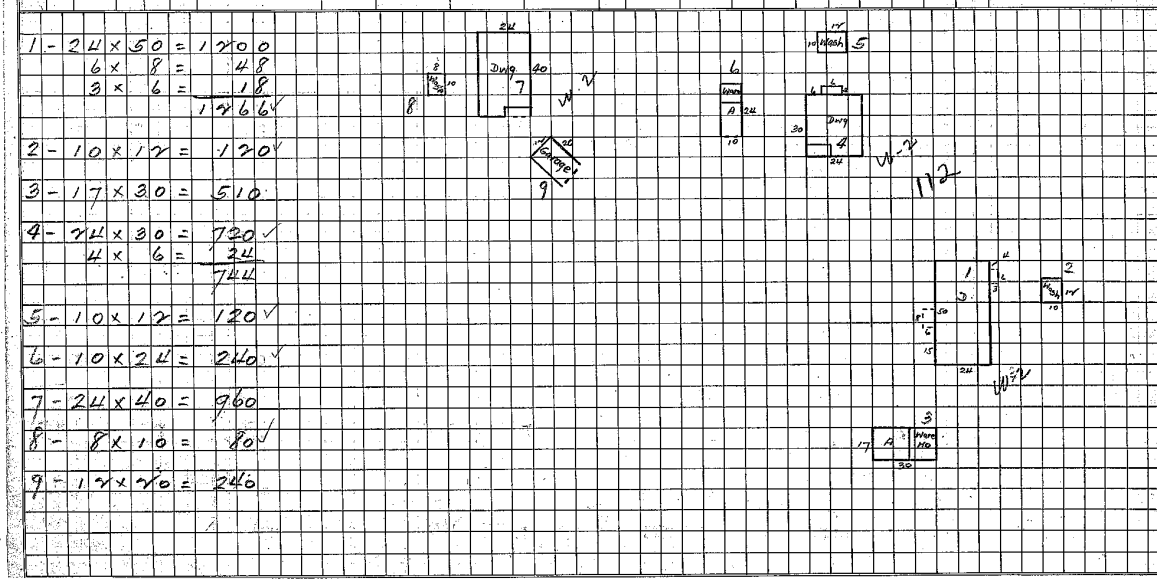
OWNER	TITLE HISTORY	NET AREA
~~Kaonoulu Ranch Company, Ltd.~~		5974.072 ac.
	TMB 7708 1978 Lis Pendens: 9/8/78 State of Hawaii VS Kaonoulu Ranch Ltd Etal; KEYED ONLY LP Civil over 419.503F; 9/20/78 Bk 13150/734	
	State of Hawaii condemnation (Piilani Hwy) Certificate of Deposit and Possession Civil No. 3858 Date of Possession: Sept. 11, 1978.	
	~~Area Revised: 5971.512 Ac.~~	~~5971.512 A~~
	TMB M-17, '81; WK/mm 4/24/81; R/S: to 3901-16, 7.352 Ac	
KAONOULU RANCH	TMB 2738 1983 D: 4/19/83 fr Kao Ranch, Ltd. (fka Kaonoulu Ranch Company, Ltd.) to Kaonoulu Ranch SCT — 4/20/83 Bk 16988/248 (ref 2205-1, 6, 8 & 44; 2206-9, 32, 33, 66; 2207-2, 10; 2219-19; 2408-9; 2412-4, 22; 3901-15, 103, 148, 149, 16; 2715-22; 2408-33)	5966.720 A
	TMB 6307 1987 Gr of Esmt: 7/20/87 fr Kaonoulu Ranch Co Ltd to Tony H Hashimoto & wf Hilda (fka Hildegard Z Hashimoto), Evelyn H Hashimoto(m), Hedy N Kaneoka (m), Grace T Tsutahara (m)(fka Grace T Hashimoto), Susan H Hashimoto-shinosuka (m), (fka Susan H hashimoto), Harry H Hashimoto (m), Tony H hashimoto, Trustee under that certain unrec Tony H Hashimoto Living Trust Agrmt dtd 8/9/75, Hilda Hashimoto, Trustee under that certain unrec Hilda Hashimoto Revocable Living Trust Agrmt dtd 8/9/75; SCT—7/24/87 Bk 20934/687 Subj: to Drainage Esmt No. 2 (25 FT WD) in favor of 3901-33	

YEAR										YEAR
AREA										AREA
LAND										LAND
IMP.										IMP.
TOT.										TOT.
EX.										EX.
NET										NET
TAX										TAX

CAMA 3-88

PERMIT NO.	DATE	AMOUNT	CONTRACTOR	SURVEY BY	DATE	REMARKS
				M.R.S.	8/13/46	

BLD. NO.	POR	USE	STORY	CLASS	FLOOR	CONSTRUCTION	FOUNDATION	ROOF	EXTERIOR	INTERIOR	NO. RMS.	FLOORING	BATH ROOMS	SHOWER	TUB	TOILET	BASIN	SINK	TRAY	HEATER	ELEC. FIX.	
1		Dwg.	1	3		Wood Frame	Conc Block	Hip cut-up Shi	T&G	Conct Ceiling pine	7	Pine	1	1		1	1	1				
2		Wash Ho	1	3		" "	Conc	Gable Comp.	"	No Ceiling	1	Conc										
3		Garage Ware Ho	1	3		" "	" "	" "	Shiplap	" "	2	"										Conc. ft. 7½' high
4		Dwg.	1	3		" "	Cont Block	Hip Gable	T&G	Conct Ceiling pine	9	Pine	1	1		1	1	1				
5		Wash Ho	1	3		" "	Conc	Gable "	"	No Ceiling	1	Conc										
6		Garage Wash Ho	1	3		" "	" "	" "	"	" "	2	"										
7		Dwg.	1	3		" "	Conc Block	Hip Gable Shi.	"	Conct pine	5	Pine	1		1	1	1	1				
8		Wash Ho	1	3		" "	Conc	Gable Shi	"	No Ceiling	1	Conc		1				1				
9		Garage	1	3		" "	" "	" "	T&G Conct 3' Hi	" "	1	"										



OWNER (PENCIL ONLY)	OCCUPANT OR LESSEE (PENCIL ONLY)	BUILDING SHEET # 1	SECOND DIVISION
Harold W. Rice		A-B	

ZONE	SEC.	PLAT.	PARCEL
2.	2	02	15

BUILDING COMPUTATIONS								YEAR 1955				YEAR 1956				YEAR				YEAR			
BLD.	POR	DEP RATE	AREA OR CUBE	⊕	FACTOR	REPLACEMENT		AGE	COND.	%	VALUE	AGE	COND.	%	VALUE	AGE	COND.	%	VALUE	AGE	COND.	%	VALUE
1		3¼	1766		352	4456		R13	M	35	1560	R14	M	44	1961				1983				
2		3¼	120		210	252		R13	M	35	88	R14	M	44	111	41			25968				
3		3¼	510		126	643		R13	M	35	225	R14	M	44	283								1986
4		3¼	744		327	2433		R13	M	35	851	R14	M	44	1071								27714
5		3¼	120		210	252		R13	M	35	88	R14	M	44	111								
6		3¼	240		126	302		R13	M	35	106	R14	M	44	133								
7		3¼	960		293	2813		R12	M	40	1125	R13	M	48	1350								
8		3¼	80		210	168		R12	M	40	67	R13	M	48	81								
9		3¼	240		126	302		R12	M	40	121	R13	M	48	146								
											4231				+16.47%				864				
											1957				1958				1959				
1		4	1266		410							R16	M	36		R17	M	37					
2		4	120		245																		
3		4	510		147	9711					3884				3496				3108				
4		4	744		381																		
5		4	120		245																		
6		4	240		147																		
7		4	960		341			R14	M	44		R15	M	40		R16	M	36					
8		4	80		245	3874					1683				1530				1377				
9		4	240		147																		
											5567				5026				4485				
											1960				1961				1962				1963
1			1266		478	6051																	
2			120		250	300																	
3			510		174	887																	
4			744		610	4538																	
5			120		250	300																	
6			240		174	418																	
7			960		527	5059																	
8			80		250	200																	
9			240		174	418																	
10			14	R11	86	1204																	
46.7				1		19375		R25		43	8331	R26		41	7944	R27			7682	R28			7428
											1964				1965				1966				1967
						19375					7183												
96.7		#2		X	108%	20925		R29		X 108	7757	R30			7501	R31			7979				8487
											1968				1969				1970				1971
						1981					8453	R34			8174	35			8497	36			8874
						12880																	
											1972				1973				1974				1975
								37			8967	38			9058	39			10194				11435
						1978					1976				1977				1979				1980
						11694					9801	41			9915					44			12109

PERMIT NO.	DATE	AMOUNT	CONTRACTOR	SURVEY BY	DATE	REMARKS
821	4/15/76	300	owner			from Garage to carport (?)

BLD. NO.	POR	USE	STORY	CLASS	FLOOR	CONSTRUCTION	FOUNDATION	ROOF	EXTERIOR	INTERIOR	NO. RMS.	FLOORING	BATH ROOMS	SHOWER	TUB	TOILET	BASIN	SINK	TRAY	HEATER	ELEC. FIX.
15		D	1	3		Wood Frame	St Wd	Hip Shingle	T&G	Pine	7	Pine									
16		Stable	1	4		" "	" "	Flat Iron	B&B	No Ceiling	3	Dirt									
17		"	1	4		" "	" "	" "	Iron	" "	3	Pine									
20		14x10 Tank				" "	" "	—	—	—	—	—									
21		Wash Ho	1	3		" "	" "	Gable Shingle	T&G	No Ceiling	2	Pine									
22		Ware Ho	1	3		" "	" "	" C Iron	B&B	" "	1	1½ Rd Wd									
23		" "	1	3		" "	" "	" " "	" "	" "	1	" " "									

15 - ~~40 x 24 = 960~~
~~15 x 5 = 75~~
~~1035~~

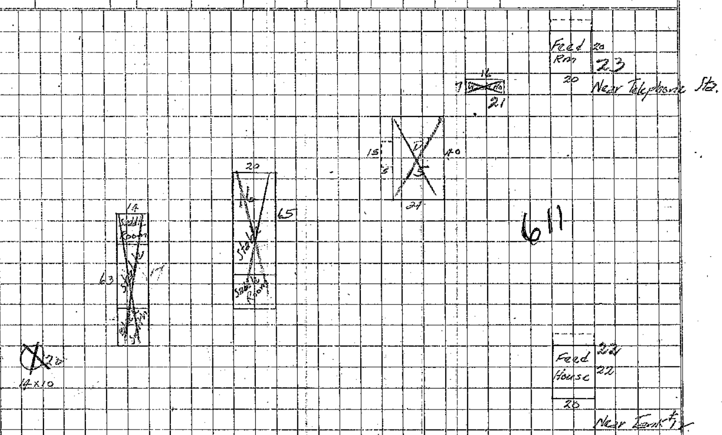
16 - ~~65 x 20 = 1300~~

17 - ~~63 x 14 = 882~~

21 - ~~7 x 16 = 112~~

22 - 22 x 20 = 440

23 - 20 x 20 = 400



OWNER (PENCIL ONLY)	OCCUPANT OR LESSEE (PENCIL ONLY)	BUILDING SHEET # 2 2	Second DIVISION			
Harold W. Rice		A-U	ZONE	SEC.	PLAT.	PARCEL
			2	2	02	15

2

BLD.	POR	DEP RATE	AREA OR CUBE	ΦC	FACTOR	REPLACEMENT	1943 AGE	COND.	%G	VALUE	1944 AGE	COND.	%G	VALUE	1945 AGE	COND.	%G	VALUE	1946 AGE	COND.	%G	VALUE
15			1035		1.60	1656	–	M	20	331	–	M	20	331	–	M	20	331	–	M	20	331
16			1300		.60	845	–	P	20	169	–	P	20	169	–	P	20	169	–	P	20	169
17			882		.40	353	–	P	20	71	–	P	20	71	–	P	20	71	–	P	20	71
20			10,000 gal. Tank			360	–	P	20	60	–	P	20	160	–	P	20	160	–	P	20	60
21			112		.75	84	–	P	20	17	–	P	20	17	–	P	20	17	–	P	20	17
22			440		.75	330	R/14	M	30	99	R15	M	25	82	R16	M	20	66	R17	M	20	66
23			400		.75	300	R/14	M	30	90	R15	M	25	75	R16	M	20	60	R17	M	20	60
										1960				1961				1962				1963
22			440		1.74	766																
23			400		1.74	696																
950				✓		1462 ✓	R31		20	292	R32		20	292	R33		20	292	R34		20	292
TOTAL				TOTAL			TOTAL				TOTAL				TOTAL				TOTAL			

BLD.	POR	DEP RATE	AREA OR CUBE	ΦC	FACTOR	REPLACEMENT	1947 AGE	COND.	%G	VALUE	1948 AGE	COND.	%G	VALUE	1949 AGE	COND.	%G	VALUE	1950 AGE	COND.	%G	VALUE
15			1035		1.60	1656	–	M	20	~~331~~	–	M	20	–				–				–
16			1300		.60	845	–	P	20	~~169~~	–	P	20	–				–				–
17			882		.40	353	–	P	20	~~71~~	–	P	20	–				–				–
20			10,000 gal. Tank			300	–	P	20	60	–	P	20	60	–	P	20	~~60~~				–
21			112		.75	84	–	P	20	~~17~~	–	P	20	–				–				–
22			440		.75	330	R18	M	20	66	R19	M	20	66	R20	M	20	66	R21	M	20	66
23			400		.75	300	R18	M	20	60	R19	M	20	60	R20	M	20	60	R21	M	20	60
																			+	20%		25
																						151
										1964				1965				1966				1967
2						1462			292													
950				x	108%	1579	R35		20 x108	315	R36			315	R37			317	R38		20 2	382
										1968				1969				1970				1971
			MAKE 8-14		FOR '48	NOT ON LISTING				292				292	5/1			292	SALVAGE			290
TOTAL				TOTAL			TOTAL				TOTAL				TOTAL				TOTAL			

BLD.	POR	DEP RATE	AREA OR CUBE	ΦC	FACTOR	REPLACEMENT	1951 AGE	COND.	%G	VALUE	1952 AGE	COND.	%G	VALUE	1953 AGE	COND.	%G	VALUE	1954 AGE	COND.	%G	VALUE
22			440		.75	330	R22	M	20	66	R23	M	20	66	R24	M	20	66	R25	M	20	66
23			400		.75	300	R22	M	20	60	R23	M	20	60	R24	M	20	60	R25	M	20	60
			1983				+	20%		25	+67.6%			85	+67.6%			85	+67.6%			85
			415							151				211				211				211
						1986																
						415				1955				1956				1977				1976
22			440		1.26	554	R26	M	20	111	R27	M	30	166	SALVAGE			249				249 1979
23			400		1.26	504	R26	M	20	101	R27	M	30	151								1981
										212	+16	47%		59				1978				
														369				249	CAMA			249 1980
										1957				1958				1959				249
22			440		1.47	1732	R28	M	30	370	R29	M	30	370	R30	M	30	370	3-88			
23			400		1.47		"	"	"	1972	"	"	"	1973				1974				1975
							5/1			290				290				290				290
TOTAL				TOTAL			TOTAL				TOTAL											

12/09/2009
INSTR-DESC: LUCA
TRANS NO: 306672
INSTR-DATE: 12/09/2009
REC-DATE: 12/09/2009

AREA: 2,349.9980 ACRES
OTHER-TMKS: 2-2-002-054-0000 ETC.

ANAWIO SUBDIVISION - FILE 2.3064
-
FROM: 2202-69 LOT B-1-A-2 66.252 ACS
CONSOLIDATION OF LOT 3-A-1-B-3 OF HALEAKALA GREENS SUBDIVISION AND LOT B-1-A-2 OF KAMAOLE-KIHEI WATER STORAGE RESERVOIR SUBDIVISION INTO ONE LOT AND RESUBDIVISION INTO LOTS 1 AND 2; TOG/ESMTS
PER PLAN BY WARREN S. UNEMORI - ENGINEERING, INC. APPROVED 12/9/09

TO: 2202-69 LOT 1 310.000 ACS
F/D: AREA, BDRY, NEW LOT NUMBER 2

GROUP#	NAME	F	TC	%-OWNER	TITLE-DESC
2 0011	HALEAKALA RANCH COMPANY				
8 0011	UNITED STATES OF AMERICA				

FOR ASSESSMENT YEAR 2010

PITT 5 LAND VALUE:	$50,200	EXEMPT LAND VALUE:		$35,600
BUILDING VALUE:	$516,300	EXEMPT BUILDING VALUE:		$81,000

APPEAL EXISTS FOR THIS YEAR

SITE ADDRESS: 2111 PIILANI HWY

MAILING ADDRESS: HALEAKALA RANCH COMPAI
529 KEALALOA AVE
MAKAWAO HI 96768

12/09/2009
INSTR-DESC: QUITCLAIM DEED
INSTR_NO:09-186595
TRANS NO: 306614
INSTR-DATE: 08/27/2009
REC-DATE: 12/09/2009

AMOUNT:$1,000
AREA: 2,593.7460 ACRES STATE-CONV-TAX: $ 1
OTHER-TMKS: 2-2-002-054-0000 ETC.

FROM: PACIFIC RIM LAND, INC.
TO: HALEAKALA RANCH COMPANY
ALL OF GRANTOR'S INTEREST IN:
LOT 3-A-1-B-3 HALEAKALA GREENS SUBDIVISION POR GR 9325:1 2,593.746 AC NO DES

GROUP#	NAME	F	TC	%-OWNER	TITLE-DESC
2 0011	HALEAKALA RANCH COMPANY				
8 0011	UNITED STATES OF AMERICA				

SITE ADDRESS: 2111 PIILANI HWY

MAILING ADDRESS: HALEAKALA RANCH COMPAI
529 KEALALOA AVE
MAKAWAO HI 96768

12/07/2009
INSTR-DESC:
INSTR_NO:09-61905
TRANS NO: 306610
INSTR-DATE: 04/22/2009
REC-DATE: 04/24/2009
ACK/EFF DATE: 04/22/2009

AREA: 2,593.7460 ACRES
OTHER-TMKS: 2-2-002-054-0000 ETC.

INSTRUMENT UNDATED - ACK: 4/22/2009
-
FROM: PACIFIC RIM LAND, INC. & HALEAKALA RANCH COMPANY
TO: PACIFIC RIM LAND, INC. & HALEAKALA RANCH COMPANY
"...GRANTOR IS THE OWNER OF THAT CERTAIN REAL PROPERTY ...LOT 3-A-1-B HALEAKALA GREENS SUBDIVISION TMK 2202-54 2,610499 AC;...A PORTION OF THE PROPERTY CONSISTING OF APPROX 2.34 AC...DESCRIBED IN EXHIBIT "B' IS THE SITE OF EXISTING &/OR PROPOSED UNDERGROUND WASTEWATER LINES...; BY THIS GRANT, GRANTOR DESIRES TO GRANT AN EASEMENT IN FAVOR OF THE LAND DESCRIBED IN EXHIBIT "C" OVER THE EASEMENT AREA...; GRANTOR DOES HEREBY GRANT & CONVEY TO GRANTEE...A PERPETUAL NON-EXCL RIGHT & EASEMENT OVER, UPON, ACROSS, THROUGH & UNDER THE EASEMENT AREA...; THE RIGHT OF VEHICULAR & PEDESTRIAN ACCESS OVER THE PROPERTY TO THE EASEMENT AREA BY THE GRANTEE..."
TMB NOTE: THIS EASEMENT SHOULD HAVE BEEN POSTED & ENTERED PRIOR TO ENTRY OF LUCA'S 2.2797, 2.2798 & 2.2799 APPROVED 12/7/2009 & AFFECTS LOT 3-A-1-B (TMK 2202-54) PRIOR TO SUBDIVISION (LUCA 2.2799) OF SAID LOT INTO LOTS 3-A-1-B-1 THRU 3-A-1-B-3;
SUBSEQUENT TO SUBDIVISION - EASEMENT THEN AFFECTED LOTS 3-A-1-B-1 (TMK 2202-79) & 3-A-1-B-3 (TMK 2202-54);
LOT 3-A-1-B-1 (TMK 2202-79) THEN CONSOLIDATED WITH LOT B-1-A-1 (TMK 2202-69) PREVIOUSLY SUBDIVIDED BY LUC 2.2797 TMKS 2202-69 & 78) INTO LOT 1 (14.5 AC TMK 2202-78 - LUCA 2.2798) DESCRIBED AS LOT A HEREIN - EASEMENT IS IN FAVOR OF SAID LOT 1
F/D: WASTEWATER ESMT - DES; IN FAVOR OF 14.5 AC

GROUP#	NAME	F	TC	%-OWNER	TITLE-DESC
2 0011	HALEAKALA RANCH COMPANY		3TC	99.4599	
2 0021	PACIFIC RIM LAND INC			.5401	
8 0011	UNITED STATES OF AMERICA				

SITE ADDRESS: 2111 PIILANI HWY

MAILING ADDRESS: HALEAKALA RANCH COMPAI
529 KEALALOA AVE
MAKAWAO HI 96768

PACIFIC RIM LAND INC
1300 N HOLOPONO ST STE 201
KIHEI HI 96753 6945

12/07/2009
INSTR-DESC: LUCA
TRANS NO: 306596
INSTR-DATE: 12/07/2009
REC-DATE: 12/07/2009

AREA: 2,593.7460 ACRES
OTHER-TMKS: 2-2-002-054-0000 ETC.

HALEAKALA GREENS SUBDIVISION - FILE 2.2799
-
AREA REVISED TO 2610.085 ACS
SUBDIVISION OF LOT 3-A-1-B INTO LOTS 3-A-1-B-1, 3-A-1-B-2 AND 3-A-1-B-3; TOG/ESMTS PER PLAN BY KEN T NOMURA APPROVED 12/7/09

LOTS 3-A-1-B-1 AND 3-A-1-B-2 TO NEW TMKS 2202-79 & 80 RESPECTIVELY
F/D: AREA, BOUNDRY, NEW LOT NUMBER 3-A-1-B-3

GROUP#	NAME	F	TC	%-OWNER	TITLE-DESC
2 0011	HALEAKALA RANCH COMPANY		3TC	99.4599	
2 0021	PACIFIC RIM LAND INC			.5401	
8 0011	UNITED STATES OF AMERICA				

SITE ADDRESS: 2111 PIILANI HWY

MAILING ADDRESS: HALEAKALA RANCH COMPAI
529 KEALALOA AVE
MAKAWAO HI 96768

PACIFIC RIM LAND INC
1300 N HOLOPONO ST STE 201
KIHEI HI 96753 6945

01/24/2008
INSTR-DESC: GRANT
INSTR_NO:08-010934
TRANS NO: 306584
INSTR-DATE: 10/11/2007
REC-DATE: 01/24/2008

AREA: 2,610.4990 ACRES

FROM: HALEAKALA RANCH COMPANY AND PACIFIC RIM LAND, INC
TO: MAUI ELECTRIC COMPANY, LTD AND HAWAIIAN TELCOM, INC

GRANTORS DO HEREBY GRANT AND CONVEY UNTO GRANTEES, THEIR SUCCESSORS AND ASSIGNS, A PERPETUAL RIGHT AND EASEMENT TO BUILD, CONSTRUCT, REPAIR, MAINTAIN AND OPERATE POLE AND WIRE LINES AND UNDERGROUND POWER LINES FOR THE TRANSMISSION OF ELECTRICITY; TOGETHER ALSO WITH A RIGHT OF ENTRY UPON THE GRANTORS' PROPERTY OVER, ACROSS, THROUGH AND UNDER POR LP GR 9325:1 LOT 3-A-1-B OF THE HALEAKALA GREENS SUBDIVISION 67,429 SF DES
F/D: SUBJ/UTILITY ESMT

GROUP#	NAME	F	TC	%-OWNER	TITLE-DESC
2 0011	HALEAKALA RANCH COMPANY		3TC	99.4599	
2 0021	PACIFIC RIM LAND INC			.5401	
8 0011	UNITED STATES OF AMERICA				

FOR ASSESSMENT YEAR 2009				
PITT 5	LAND VALUE:	$1,651,300	EXEMPT LAND VALUE:	$1,172,420
	BUILDING VALUE:	$814,700	EXEMPT BUILDING VALUE:	$79,730

SITE ADDRESS: 2111 PIILANI HWY

MAILING ADDRESS: HALEAKALA RANCH COMPAI
529 KEALALOA AVE
MAKAWAO HI 96768

PACIFIC RIM LAND INC
1300 N HOLOPONO ST STE 201
KIHEI HI 96753 6945

08/26/2005
INSTR-DESC: Correction
TRANS NO: 263311
INSTR-DATE: 08/26/2005
REC-DATE: 08/26/2005

AREA: 2,610.4990 ACRES
OTHER-TMKS: 2-2-002-069-0000 ETC.

(2202-54 & 69)
CORRECT OWNER/INT TO:
HALEAKALA RANCH COMPANY- 99.4599% INT
PACIFIC RIM LAND INC- 0.5401% INT - T/C

(REF: DUE TO CLERICAL ERROR, HALEAKALA RANCH COMPANY'S INTEREST WAS REMOVED. OWNER/INT SHOWN ABOVE PER DEED 03-131256)
F/D: CORRECT OWNER/INT
LOT 3-A-1-B HALEAKALA GREENS SUBD POR LPGR 9325, AP 1 2,610.499 AC NO DES TOG/DRAINAGE ES T (67,429 SF) DES SUBJ/DRAINAGE ES

GROUP#	NAME	F	TC	%-OWNER	TITLE-DESC
2 0011	HALEAKALA RANCH COMPANY		3TC	99.4599	
2 0021	PACIFIC RIM LAND INC			.5401	

FOR ASSESSMENT YEAR 2008				
PITT 5	LAND VALUE:	$1,651,300	EXEMPT LAND VALUE:	$1,172,420
	BUILDING VALUE:	$782,200	EXEMPT BUILDING VALUE:	$75,890
FOR ASSESSMENT YEAR 2007				
PITT 5	LAND VALUE:	$1,651,300	EXEMPT LAND VALUE:	$1,172,400
	BUILDING VALUE:	$736,500	EXEMPT BUILDING VALUE:	$70,000
FOR ASSESSMENT YEAR 2006				
PITT 5	LAND VALUE:	$1,445,400	EXEMPT LAND VALUE:	$1,026,200
	BUILDING VALUE:	$473,400	EXEMPT BUILDING VALUE:	$408,800

SITE ADDRESS: 2111 PIILANI HWY

MAILING ADDRESS: HALEAKALA RANCH COMPAI
529 KEALALOA AVE
MAKAWAO HI 96768

PACIFIC RIM LAND INC
1300 N HOLOPONO ST STE 201
KIHEI HI 96753 6945

06/27/2003
INSTR-DESC: WARNT DEED
INSTR_NO:03-131256
TRANS NO: 245871
INSTR-DATE: 06/24/2003
REC-DATE: 06/27/2003
ACK/EFF DATE: 06/24/2003

AMOUNT:$450,000
AREA: 2,610.4990 ACRES
STATE-CONV-TAX: $ 450
OTHER-TMKS: 2-2-002-054-0000 ETC.

FROM: HALEAKALA RANCH COMPANY
TO: PACIFIC RIM LAND INC
POR OF LP GR 9325 APANA 1 LOT 3-A-1-B "HALEAKALA GREENS SUBD NO DES TOG W/DRAINAGE ES T NO DES SUBJ HOWEVER/DRAINAGE ES

GROUP#	NAME	F	TC	%-OWNER	TITLE-DESC
2 0011	PACIFIC RIM LAND INC				
8 0011	UNITED STATES OF AMERICA				
8 0011	UNITED STATES OF AMERICA				

FOR ASSESSMENT YEAR 2005				
PITT 5	LAND VALUE:	$1,263,700	EXEMPT LAND VALUE:	$897,200
	BUILDING VALUE:	$459,800	EXEMPT BUILDING VALUE:	$399,000
FOR ASSESSMENT YEAR 2004				
PITT 5	LAND VALUE:	$309,200	EXEMPT LAND VALUE:	$219,500
	BUILDING VALUE:	$447,100	EXEMPT BUILDING VALUE:	$391,800

SITE ADDRESS: PIILANI HWY

MAILING ADDRESS: PACIFIC RIM LAND INC
381 HUKU LI'I PL
KIHEI HI 96753

09/25/1998
INSTR-DESC: SUBD LUCA# 2.2045
INSTR_NO:0000000000
TRANS NO: 15901
INSTR-DATE: 10/15/1998

AREA: 2,610.4990 ACRES ACK/EFF DATE: 09/25/1998
HALEAKALA GREENS SUB'D
SUBD LOT 3-A-1 INTO LOTS 3-A-1-A 3-A-1-B TOG/ESMT
PER PLAN BY WARREN S UNEMORI-ENGINEERING INC APPROVED 9/25/98

LOT 3-A-1 TO NEW PARCEL 2224-26
F/D: AREA, BDRY; LOT 3-A-1-B

GROUP#	NAME	F	TC	%-OWNER	TITLE-DESC
2 0011	HALEAKALA RANCH				
8 0011	UNITED STATES OF AMERICA				

FOR ASSESSMENT YEAR 2003				
PITT 5	LAND VALUE:	$206,500	EXEMPT LAND VALUE:	$146,600
	BUILDING VALUE:	$441,300	EXEMPT BUILDING VALUE:	$387,300
FOR ASSESSMENT YEAR 2002				
PITT 5	LAND VALUE:	$206,500	EXEMPT LAND VALUE:	$146,600
	BUILDING VALUE:	$435,900	EXEMPT BUILDING VALUE:	$383,300
FOR ASSESSMENT YEAR 2001				
PITT 5	LAND VALUE:	$206,500	EXEMPT LAND VALUE:	$146,600
	BUILDING VALUE:	$422,800	EXEMPT BUILDING VALUE:	$370,200
FOR ASSESSMENT YEAR 2000				
PITT 5	LAND VALUE:	$189,400	EXEMPT LAND VALUE:	$134,474
	BUILDING VALUE:	$416,500	EXEMPT BUILDING VALUE:	$416,500
FOR ASSESSMENT YEAR 1999				
PITT 5	LAND VALUE:	$182,500	EXEMPT LAND VALUE:	$140,525
	BUILDING VALUE:	$420,900	EXEMPT BUILDING VALUE:	$420,900

SITE ADDRESS: PIILANI HWY

09/25/1998
INSTR-DESC: ESMTS INSTR_NO:0000000000 TRANS NO: 15902
INSTR-DATE: 10/12/1998
ACK/EFF DATE: 09/25/1998

AREA: 2,611.5340 ACRES
DESIGNATION ELEC & TELEPHONE ESMTS "3" & "7"
PER GRANT/ESMT IN BK 22009 P 763

GROUP#	NAME	F	TC	%-OWNER	TITLE-DESC
2 0011	HALEAKALA RANCH				
8 0011	UNITED STATES OF AMERICA				

07/17/1998
INSTR-DESC: EASEMENT INSTR_NO:9800104504 TRANS NO: 15900
INSTR-DATE: 05/29/1998
REC-DATE: 07/17/1998
ACK/EFF DATE: 07/17/1998

AREA: 2,611.5340 ACRES
FROM: HALEAKALA RANCH COMPANY
TO: COUNTY OF MAUI
GRANTOR GRANT UNTO GRANTEE A NONEXCLUSIVE ESMT TO FLOW RECLAIMED WATER

OVER & ACROSS & TO CONSTRUCT, MAINTAIN & OPERATE PIPES. ESMT EF-1 DESC
ON EXH A.

ESMT EF-1 EFFLUENT LINE POR GR 9325 7,173 SF DES
F/D: SUBJ EFFLUENT LINE ESMT "EF-1" {7,173 SF} IN FAVOR OF COUNTY
OF MAUI

GROUP#	NAME	F	TC	%-OWNER	TITLE-DESC

2 0011	HALEAKALA RANCH
8 0011	UNITED STATES OF AMERICA

11/07/1996
INSTR-DESC: ESMT INSTR_NO:9600158848 TRANS NO: 15895
INSTR-DATE: 10/24/1996
REC-DATE: 11/07/1996
ACK/EFF DATE: 11/07/1996

AREA: 2,611.5340 ACRES
FROM: HALEAKALA RANCH COMPANY
TO: GST TELECOM HAWAII INC
GRANTOR GRANT UNTO GRANTEE A PERPETUAL NONEXCLUSIVE RIGHT &
ESMT TO
CONSTRUCT, MAINTAIN & OPERATE CIRCUIT FACILITIES &/OR UNDERG
ROUND
COMMUNICATIONS LINES & OTHER APPLIANCES FOR THE FUNCTIONING
OF REMOTE
CIRCUIT FACILITIES & COMMUNICATIONS LINES, TOGETHER WITH RIG
HT OF ENTRY,
OVER, ACROSS, THROUGH & UNDER POR OF LAND DESIGNATED ON EXH
"A".
TMB NOTE: ESMT NOT SHOWN; NO DESC
F/D: SUBJ TO ESMT IN FAVOR OF GST TELECOM HAWAII INC

GROUP#	NAME	F	TC	%-OWNER	TITLE-DESC
2 0011	HALEAKALA RANCH				
8 0011	UNITED STATES OF AMERICA				

FOR ASSESSMENT YEAR 1998				
PITT 5	LAND VALUE:	$206,500	EXEMPT LAND VALUE:	$159,005
	BUILDING VALUE:	$405,100	EXEMPT BUILDING VALUE:	$405,100
FOR ASSESSMENT YEAR 1997				
PITT 5	LAND VALUE:	$206,500	EXEMPT LAND VALUE:	$159,005
	BUILDING VALUE:	$407,600	EXEMPT BUILDING VALUE:	$407,600

SITE ADDRESS: PIILANI HWY

10/22/1996
INSTR-DESC: SUBDIVISION LUCA #2.2382 INSTR_NO:0000000000 TRANS NO: 15897
INSTR-DATE: 12/10/1996
ACK/EFF DATE: 10/22/1996

AREA: 2,611.5340 ACRES
AREA REVISED TO 2612.866 AC & SUBD OF LOT 3-A INTO LOTS 3-A-1 & 3-A-2

TOG/ESMT PER PLAN BY CONTROL POINT SURVEYING INC APPROVED 10/22/96

LOT 3-A-2 TO NEW PARCEL 2202-75
F/D: AREA REVISED, BDRY; LOT 3-A-1

GROUP#	NAME	F	TC	%-OWNER	TITLE-DESC
2 0011	HALEAKALA RANCH				
8 0011	UNITED STATES OF AMERICA				

11/07/1991
INSTR-DESC: ROADWAY & UTILITY EASEMENT INSTR_NO:9100153882 TRANS NO: 15896
INSTR-DATE: 10/07/1991
REC-DATE: 11/07/1991
ACK/EFF DATE: 11/07/1991

AREA: 2,612.4520 ACRES
FROM: HALEAKALA RANCH COMPANY
TO: MAUI R & T PARTNERS
GRANTOR HEREBY GRANT AND CONVEY UNTO GRANTEE PERPETUAL NONEX

CLUSIVE
EASEMENTS AND RIGHTS OF ACCESS FOR INGRESS AND EGRESS PURPOS
ES, AND
FOR THE CONSTRUCTION, RECONSTRUTION, INSTALLATION, MAINTENAN
CE,
OPERATION, REPAIR AND REMOVAL OF UTILITY LINES, INCLUDING WA
TERLINES
AND SEWERLINES OVER, UNDER, ACROSS AND THROUGH "EAESMENT ARE
AS"
EASEMENT "K" ROADWAY & UTILITY PURPOSES POR LOT 3-A POR GR
9325:1
25,123 SF DES
F/D: SUBJ/UTILITY ESMT "K" IN FAVOR OF MAUI R & T PARTNERS

GROUP#	NAME	F	TC	%-OWNER	TITLE-DESC
2 0011	HALEAKALA RANCH				
8 0011	UNITED STATES OF AMERICA				

FOR ASSESSMENT YEAR 1996				
PITT 5	LAND VALUE:	$223,600	EXEMPT LAND VALUE:	$172,172
	BUILDING VALUE:	$386,300	EXEMPT BUILDING VALUE:	$386,300
FOR ASSESSMENT YEAR 1995				
PITT 5	LAND VALUE:	$257,800	EXEMPT LAND VALUE:	$198,506
	BUILDING VALUE:	$567,600	EXEMPT BUILDING VALUE:	$567,600
THE ABOVE IS THE AMENDED ASSESSMENT FOR THIS YEAR				
FOR ASSESSMENT YEAR 1994				
PITT 5	LAND VALUE:	$223,600	EXEMPT LAND VALUE:	$172,172
	BUILDING VALUE:	$569,700	EXEMPT BUILDING VALUE:	$569,700
THE ABOVE IS THE AMENDED ASSESSMENT FOR THIS YEAR				
FOR ASSESSMENT YEAR 1993				
PITT 5	LAND VALUE:	$440,900	EXEMPT LAND VALUE:	$339,493
	BUILDING VALUE:	$549,600	EXEMPT BUILDING VALUE:	$549,600
THE ABOVE IS THE AMENDED ASSESSMENT FOR THIS YEAR				
FOR ASSESSMENT YEAR 1992				
PITT 5	LAND VALUE:	$394,700	EXEMPT LAND VALUE:	$0
	BUILDING VALUE:	$567,100	EXEMPT BUILDING VALUE:	$0

SITE ADDRESS: PIILANI HWY

05/04/1989
INSTR-DESC: MAP R/S (SUBD)
INSTR_NO:0000000000
TRANS NO: 15894
INSTR-DATE: 05/04/1989
ACK/EFF DATE: 05/04/1989

AREA: 2,612.4520 ACRES
HALEAKALA GREENS SUB'D - FILE 2.1760
LOT 3 (2612.627 AC.) SUBD INTO LOTS 3-A THRU 3-F INCL, TOG/ESMT
PER PLAN BY WARREN S UNEMORI ENGINEERING, INC
APPROVED 11/17/88. LOTS 3-B TO 3-F INCL TO NEW PARCELS 2202-58 TO 62
INCL RESPECTIVELY, RD LOT 4 TO NEW PARCEL 2202-63.

F/D: AREA, BDRY; LOT 3-A

GROUP#	NAME	F	TC	%-OWNER	TITLE-DESC
2 0011	HALEAKALA RANCH				

FOR ASSESSMENT YEAR 1991				
PITT 5	LAND VALUE:	$394,700	EXEMPT LAND VALUE:	$0
	BUILDING VALUE:	$549,100	EXEMPT BUILDING VALUE:	$0
FOR ASSESSMENT YEAR 1990				
PITT 5	LAND VALUE:	$52,500	EXEMPT LAND VALUE:	$0
	BUILDING VALUE:	$557,400	EXEMPT BUILDING VALUE:	$0

WATER, CABLE TELEVISION, TELEPHONE, OTHER COMMUNICATIONS, SA
NITARY &
STORM SEWERS COLLECTIVELY CALLED THE "FACILITIES: & FOR INGR
ESS &
EGRESS OVER, ACROSS, ALONG, UPON & UNDER THE PARCEL OF LAND
DESCRIBED
IN EXHIBIT A REFERRED TO AS THE "EASEMENT AREA"
EXHIBIT A: HALEAKALA GREENS SUBD LOT 4 (ROADWAY LOT) POR LP
GR 9325:L
7.855 AC
F/D: KEYED ONLY - ESMT OVER RDWY

GROUP#	NAME	F	TC	%-OWNER	TITLE-DESC
2 0011	HALEAKALA RANCH				

----------SEE PARCEL SHEETS FOR MORE INFORMATION----------

ZONE	SEC.	PLAT NO.	PARCEL
2	2	002	054

SHAPE: ___ norm/area ___ irregular
TOPOGRAPHY: ___ near level ___ sloping ___ steep/hilly
ACCESS: ___ fr. paved rd. ___ fr. unpaved rd.
UTILITY: ___ curb/sidewalk ___ sewer/drain ___ cesspool ___ water to site
OTHER LAND IMPROVEMENTS: ___ paved driveway ___ fence/walls ___ walkway/patio ___ retaining wall

DEPARTMENTAL FORM P-26-A (REV. 1981)

SYM.	AV. DEPTH	RATIO	ITEM	AREA	U.V.	ADJ. U.V.	YR. 1978 VAL.	U.V.	ADJ. U.V.	YR. 1977 VAL.	U.V.	ADJ. U.V.	YR. 1979 VAL.
						SEE	PLANTATION	SCHEDULE					
							1980			1979			1981
							1981			1982			1983
							335.71						See Reserved Statement 1192.517
							1985						
							SEE PLANTATION SCHEDULE						

DATE: REMARKS:

DEPARTMENTAL FORM P-26-A (REV. 1981)

LAND APPRAISAL CARD

ZONING: C&C: L.U.C.:

AGRICULTURE or ALL CARDS

ZONE SEC.		PLAT	PARCEL
2	2	002	054

DESCRIPTION: Various Grants, Kamaole Lots ~~B-3~~ B-4

HPR:

APT. UNIT

PRI. CODE: 540

OWNER: HALEAKALA RANCH CO.

TITLE HISTORY	NET AREA
TMB M-153 73-74 5/21/74 R/S; for 74-75 fr 2-2-002-001 Lots B-1 (3411.100 A) & B-4 (2.816 A) = 3413.916 A	3413.916 A
TMB 6048 73-74 12/4/73 25.00 A dropped into 2202-43; area & Bdry (3386.100 A) & (2.816 A) 3388.916 A	3388.916 A
TMB 8036 75-76 D: 2/13/76; fr Haleakala Ranch Company to County of Maui 3.571 Ac SCT 83.85 dropd into par 49; area and bdry of par 042 revised to 3385.345 Ac; 6/1/76 Bk 11443/525	3385.345 Ac
State of Hawaii condemnation (Piilani Hwy) Certificate of Deposit and Possession Civil No. 3888 Date of Possession: September 26, 1978. Area revised: 3346.233 Ac	
TMB 1013 1982 D: 1/5/82 fr Haleakala Ranch Company to County of Maui SCT EXEMPT 1.290 Ac dropped into roadway 3/1/82 Bk 16188/654	3346.233 A 3,344.943 A
TMB M-110 1983 1/3/84 FORMER ZONING: A changed to: A & U. Split parcel: Agriculture - 3,156.533 A Urban - 188.410 A (114.510 A) (67.200 A) (6.100 A)	3,156.533 A
Total: 3,344.943 A. SOURCE: LUC A-83-536 8/12/83 changed 1/3/84 TMB M-108 1985 1/9/86 A:2777.233Ac U:(114.510Ac) (67.8Ac) (6.1Ac) (229.5Ac) (150 Ac) TOTAL:3344.943Ac Cancel TMB M-110 1983 SOURCE: LUC M-8 12/20/74 (A84-576& A84-585)	2,777.233 A
TMB 4726 1987 Gr of Esmt: 4/22/87 Subj/Esmt: In favor of The Silversword Limited Partnership Owner No Change 6/5/87 Bk 20747728	
TMB 4725 1987 Gr of Esmt: 4/22/87 Keyed Only-Esmt over Rdwy 6/5/87 Bk 20747720	

YEAR	1970		1971		1972		1973		1974		1975		1976		1977	
AREA									3388.916 A							
	B	L	B	L	B	L	B	L	B	L	B	L	B	L	B	L
VALUE										21.11-						
GROSS TOTAL																
HOME EX																
OTHER EX																
NET																
NET TOTAL										21.11-						

YEAR	1978															
AREA																
	B	L	B	L	B	L	B	L	B	L	B	L	B	L	B	L
VALUE		24.97														
GROSS TOTAL																
HOME EX																
OTHER EX																
NET																
NET TOTAL																

CAM 3-1

Tax Key: Z	S	Plat	Parcel	HPR Unit No.	Pitt Code
2	2	002	054	0000	540

ZONING:
COUNTY: AG
L.U.C.: AG
NGHOOD: 2254

TOPOGRAPHY: ___ near level ___ sloping ___ steep/hilly ___ low, swampy
ACCESS: ___ fr. paved rd. ___ fr. unpaved rd. ___ utilities ___ elec. on site
___ water onsite ___ curb/sidewalk ___ sewer/drain ___ overhd. util. ___ undergrn. util.
OTHER: ___ paved drs. ___ fence/walls ___ walkway/patio ___ retaining wall

YEAR	CLASSIFICATION	PIT	AREA	UV	AD	DF	OTHER ADJUSTMENTS SZ	SH	TO	AC	LO	ZO	OT	TADJ	ADJF	VALUE	REMARKS
1987																51500	SEE PLANTATION SCHEDULE

YEAR	INDEX	VALUE	YEAR	INDEX	VALUE	YEAR	INDEX	VALUE	YEAR	INDEX	VALUE	YEAR	INDEX	VALUE

DATE	REMARKS:

P26
4/81

COUNTY OF MAUI
PROPERTY TAX DIVISION

LAND APPRAISAL CARD

DESCRIPTION Lots. 3 & 4

Tax Key: Z	S	Plat	Parcel	10 HPR Unit No.	18 Pitt Code	21 Neighborhood Code
2	2	002	054	0000	540	2254

OWNER	TITLE HISTORY	NET AREA
HALEAKALA RANCH COMPANY	TMB M-17-1986 New for 1987 fr 2202-42	2920.482 A
	TMB M-108 1985 A:2777.233 Ac U: 1)3.259 Ac	
	TMB 145 1986 FORMER ZONING: NEW PARCEL CHANGED TO: A & U (Due to Subd)	2920.482 A
	A: 2762.595 Ac U: (150.032Ac) (7.855Ac) Total Area: 2920.482 Ac	
	SOURCE: LUC Bdry Amend (A-84-585) 2/25/86 Bdry Interpretation 5/2/86	
	TMB 4725 1987 Gr of Esmt: 4/22/87 KEYED ONLY-Esmt over Rdwy 6/5/87	
	Bk 20747720 Sct 00.00	
	TMB 4726 1987 Gr of Esmt: 4/22/87 Subj/Esmt in favor of The Silversword	
	Limited Partnership 6/5/87 Bk 20747728	

CAMA
3-88

Tax Key Z	S	Plat	Parcel	HPR Unit No.	Pitt Code
2	2	002	054	0000	3

ZONING: COUNTY: PD; L.U.C.: U; NGHOOD: 2221

TOPOGRAPHY: near level; sloping; steep/hilly; low, swampy

ACCESS: fr. paved rd.; fr. unpaved rd.; utilities; elec. on site

water onsite; curb/sidewalk; sewer/drain; overhd. util.; undergrn. util.

OTHER: paved dirt.; fence/walls; walkway/patio; retaining wall

YEAR	CLASSIFICATION	PIT	AREA	UV	AD	DF	OTHER ADJUSTMENTS SZ	SH	TO	AC	LO	ZO	OT	TADJ	ADJF	VALUE	REMARKS

YEAR	INDEX	VALUE	YEAR	INDEX	VALUE	YEAR	INDEX	VALUE	YEAR	INDEX	VALUE	YEAR	INDEX	VALUE

DATE	REMARKS:

FORM 4/81

COUNTY OF MAUI
PROPERTY TAX DIVISION

LAND APPRAISAL CARD

Tax Key Z	S	Plat	Parcel	10 HPR Unit No.	18 Pitt Code	21 Neighborhood Code
2	2	002	054	0000	400	2221

DESCRIPTION

OWNER	TITLE HISTORY	NET AREA
HALEAKALA RANCH COMPANY	TMB N-145 1986 Split Parcel CHANGED TO: U: (150.032 Ac) (7.855 Ac)	157.887 A
	SOURCE: LUC Bdry Amend (A84-585) 2/25/86	

CAM
3-FF

LAND APPRAISAL CARD

ZONING:
C & C:
L. U. C.:

CARD OBU VALUE

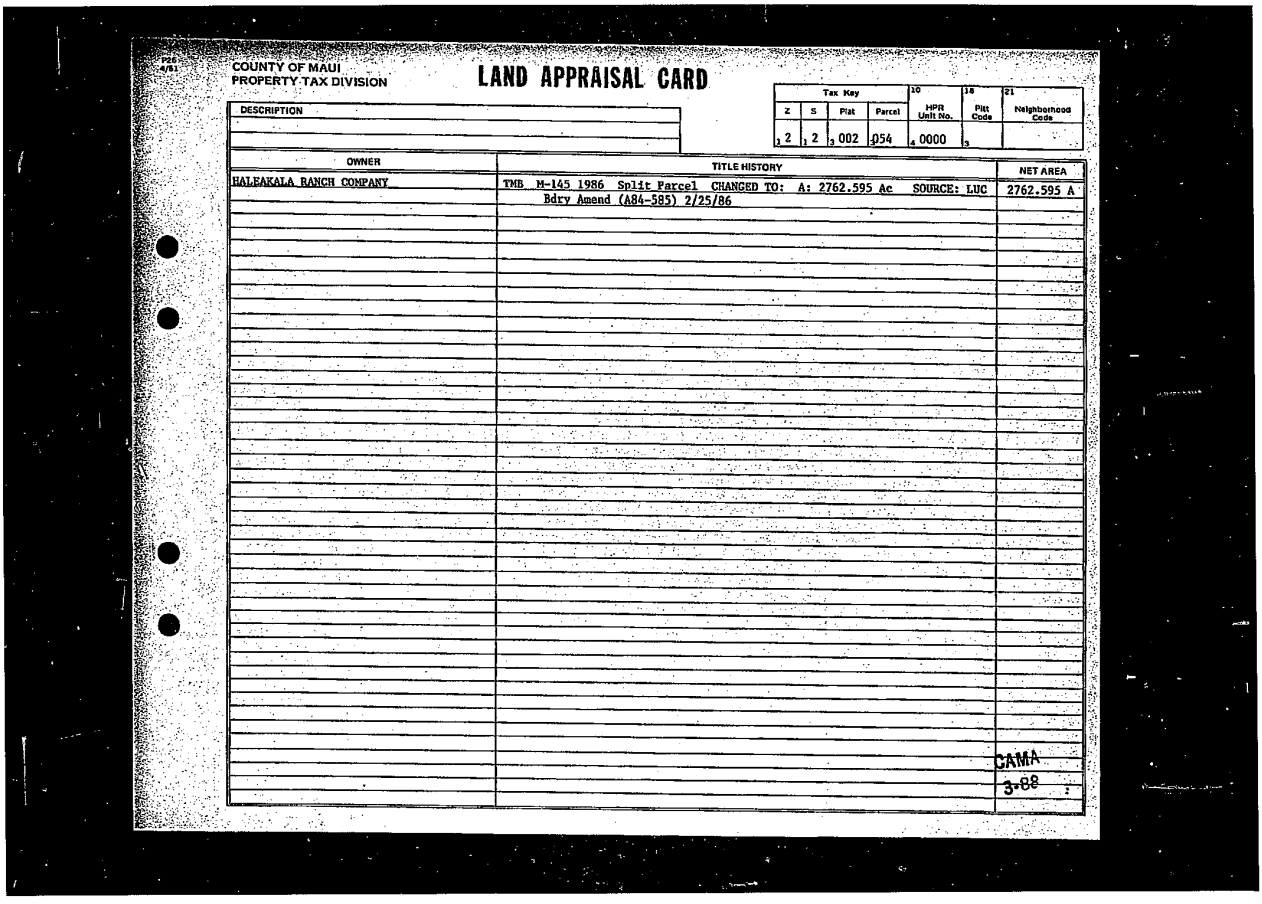
ZONE SEC.		PLAT	CARDS PARCEL
2	2	002	001

Pitt. CODE: 540

DESCRIPTION Various Grants, Kamaole
Lot B-1, etc.

HPR:
APT. UNIT

OWNER	TITLE HISTORY	NET AREA
Haleakala Ranch Co.		4,022.201 A
	TMB 2213 1977 D: 3/2/77 fr Haleakala Ranch, Co. to Maui etal SCT - Rd Esmt (14,059 F) in favor of 2202-7	4,022.201 A
	TMB 8313 1978 Lis Pendens 9/19/78 State of Hi, by its atty general Plaintiff Civil #3888 VS Haleakala Ranch Co & Bd of Wtr Supply of the County of Maui, Defendants; KEYED ONLY L/P civil over por; 10/2/78 Bk 13175/65	
	TMB 2155 1979 D: 4/19/78 fr Davis to Thompson KEYED ONLY 3/9/79 Bk 13539/175	
	TMB 704 1980 D: 1/24/80 fr Sherman Thompson to Davis, Elmer & Cecilia M KEYED ONLY Grantors int unknown over GR 2473 (27.50A) 1/28/80 Bk 14448/556	
	TMB 5042 1980 Stipulated Jdgmt & F/O/C 6/4/80 & 7/23/80 fr State of Hi Civil # 3888, Plaintiff VS Haleakala Ranch Co & Board of Wtr Supply of the County of Maui Defendants ; rd parcels 31(28.961A), 31-A (6.482A) 7 31-B (5.133A) dropped into rd; 8/8/80. Bk 14909/417	
	Area bdry	3,981.625 A
	TMB 8127 1983 9/15/83 1,200 Ac, Lot A dropped into 2202-50 (new)	2,781.625 A
	TMB M-100 1983 1/26/84 R/S: Lot B subd into Lots B-1 (1,789.060 Ac) & B-2 (40.949 F or 0.940 Ac) per survey approved 10/20/83. Lot B-2 dropped into 2202-51 (new)	2,780.685 A
	CAMA 3-88	



COUNTY OF MAUI
PROPERTY TAX DIVISION

LAND APPRAISAL CARD

Tax Key				10	18	21
Z	S	Plat	Parcel	HPR Unit No.	Pitt Code	Neighborhood Code
2	2	002	054	0000		

DESCRIPTION

OWNER	TITLE HISTORY	NET AREA
HALEAKALA RANCH COMPANY	TMB M-145 1986 Split Parcel CHANGED TO: A: 2762.595 Ac SOURCE: LUC Bdry Amend (A84-585) 2/25/86	2762.595 A
	CAMA 3-88	

DESCRIPTION		DIVISION			
Various Grants, Kamaole	MEMO SHD	Second			
		ZONE	SEC.	PLAT.	PARCEL
		2	2	02	01

OWNER	TITLE HISTORY	MAILING ADDRESS
Haleakala Ranch Co.	6/14/45 Bk1899 P398 Exch/D from Peter Santos area 2.411 ac.	A. & B. Box 3440, Honolulu
	TMB 96 73-74 2/22/74 State Land Use Commission Special Permit SP73-155 Approved: 8/30/73 to Dept of Public Works, County of Maui Purpose: To allow a sewage treatment plant on 23.4 Ac of land sit within the State's LUC Agricultural District;Zoning no change	
	TMB M-153 73-74 5/21/74 R/S: Per map & survey by N. Saito dated 2/8/74, subd of Lots B-1 to B-4 incl.	4022.201 A
	BREAKUP AS FOLLOWS:	
	22-2-40 Lot B-2 12.931 A	
	-41 Lot B-3 10.512 A	
	-42 Lot B-1 (3411.100 A)	
	Lot B-4 (2.816 A) 3413.916 A	
	TMB M-31 1979 fr State Land Use Commission to Goodfellow Bros Inc Special Permit: Por SP79-343 Approved: 5/16/79 Purpose: To establish a temporary rock crushing facility & materials storage area on (5.51 Ac) of agriculturally zoned land at Kihei, Maui Subj/conditions. (Other tax keys affected 2202-42)	
	TMB M-51 1979 fr State Land Use Commission to Goodfellow Bros Inc Special Permit: SP79-345 Approved: 7/11/79 Purpose: Operate a job office & baseyard facility on 4 acs of agriculturally zoned land at Kihei Maui NOTE: Land Use Zoning remains the same.	

YEAR	1969	1970	1971	1972	1973	1974	1975	1976
AREA		7,459.56 Ac				4022.201 A		
VALUE	10318 75989	10553 83504	10825 F350L	10861 84594	10919 91344	11807 94006		
GROSS TOTAL				95455				
EXEMPTION	6500 G 1	6744 G 1	6812 1	6827 G 1	6857 1	7741 1		
EXEMPTION								CAMA
NET	3818 75988	3809 83503	4013 87503	4034 811593	4062 91343	4391 54005		3-88
NET TOTAL								

YEAR	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968
AREA	7459.56 ac	7,459.56 Ac	7459.56 Ac	7459.56 ac.	7459.56 Ac					
LAND	77,525.	77,259.	105,390.	77,318.	77318	77318	122639	122639	122639	122639
IMP.	5,706.	7,405.	9,191.	9,438.	9134	9589	9339	9972	10672	10600
TOT.	83,231.	84,664.	114,581.	86,756.	86452	86907	G (131978)	(132611)		
EX.	4,582.	5,550.	6,178.	5,992.	5778	6058	5934 1	6308	6741 G 1	6644 G 1
NET	78,649.	79,114.	108,403.	80,764.	80674	80849	116715 122638	3664	122638	122638
TAX	1,303.21	1,076.74	1,475.36	1,099.20	1129.44					

ZONE	SEC.	PLAT.	DIVISION PARCEL
2	2	002	001

SHAPE: ___ norm/area ___ irregular ~~HBU VALUE~~

TOPOGRAPHY: ___ near level ___ sloping ___ steep/hilly

ACCESS: ___ fr. paved rd. ___ fr. unpaved rd.

UTILITY: ___ curb/sidewalk ___ sewer /drain ___ cesspool ___ water to site

OTHER LAND IMPROVEMENTS: ___ paved driveway ___ fence/walls ___ walkway/patio ___ retaining wall

SYM.	AV. DEPTH	RATIO	ITEM	AREA	U.V.	YR. 377 VAL.	U.V.	YR. 1979 VAL.	U.V.	YR. VAL.	U.V.	YR. VAL.
		Agr.	Hwelot	2.000 Ac	9600	19200	4,822.201 Ac 3600 -80% Soc	2,895,985				
			PAS C	620.150 Ac	25	15504						
			D	1000.000 Ac	15	15000						
						1983		1984				1986
		Agr.	Agricot	2780.685 Ac.			45000/Ac -80% Soc	25,026,165				

DATE: REMARKS:

LAND APPRAISAL CARD

ZOINING:	AGR USE VALUE
C & C:	
L. U. C.:	

CARD OF CARDS ZONE	SEC.	PLAT	PARCEL
2	2	002	001

Pitt. CODE: 540

DESCRIPTION Various Grants, Kamaole

HPR:

APT. UNIT

OWNER	TITLE HISTORY	NET AREA
		7,459.56 Ac
		4,022.201 A
		3,981.625 A
	TMB 8127 1983 9/15/83 1,200 Ac., Lot A dropped into 2202-50 (new)	2,781.625 A
	TMB M-100 1983 1/26/84 R/S: Lot B subd into Lots B-1 (1,789.060 Ac)	
	& B-2 (40,949 F or 0.940 Ac.) per survey approved 10/20/83. Lot	2,780.685 A
	B-2 dropped into 2202-51 (new)	

YEAR	1970		1971		1972		1973		1974		1975		1976		1977	
AREA							7,459.56 Ac		4,022.201 A							
	B	L	B	L	B	L	B	L	B	L	B	L	B	L	B	L
VALUE							10,919	80,885	11802	54006						
GROSS TOTAL							91,804									
HOME EX																
OTHER EX							6,857	1	7411	1						
NET							4,062	80,884	4391	54,005						
NET TOTAL							84,946									
YEAR																
AREA																
	B	L	B	L	B	L	B	L	B	L	B	L	B	L	B	L
VALUE																
GROSS TOTAL														CAMA		
HOME EX																
OTHER EX														3-88		
NET																
NET TOTAL																

Second DIVISION (See Recap 2-4-10-03)

'64 A3 5 (4) AB

ZONE	SEC.	PLAT	PARCEL
2		02	01

NO.	SYMBOL / U.F.V. / FRONT / RATIO / DEPTH	LOT	AREA	43-'46 VAL.	U.F.V.	VAL.	U.F.V.	VAL.	U.F.V.	VAL.
1	500.00 Ac G @ 7.50		7457.15 ac.	3750.-	7.50	3765.-				
2	3000.00 Ac M @ 5.35			16050.-	5.35	16050.-				
3	3957.15 Ac W @ 1.00			3957.-	1.00	3957.-				
4	0.05 Ac Tank Site									
5				23757.-		23772.-				
6	1952							1957		1958
7	2000.00 Ac @ 15.00 Pasture	M	30000.-		21.00 Ac @		70.00	1470.-	70.00	1470.-
8	4000.00 Ac @ 5.00 "	P	20000.-		2000.00 Ac @		20.30	40600.-	18.55	37100.-
9	1459.51 Ac @ 1.00 Waste		1460.-		5438.51 Ac @		5.34	29042.-	4.88	26540.-
10	0.05 Ac @ Tank Site		x 1.-		.05 Ac @		35.00	1.-	35.00	1.-
11			51461.-					71113.-		65111.-
12	1974 / 1975		1970			1970		1972		1973
13	2000 A @ 8400 / 16800 / x1.18 19824	Pas	2.00 Ac	Homesite Layout	3080	1400 / 6160	950 / 3850	950 / 7700	Home Site 7000	1400 / 14000
14	620.150 A 27 / 16744 / 16744	C	620.15 Ac		27	16744	27	16744	27	16744
15	1000.000 A 16 / 5337.360 A 8 / 16000 42699 / 16000 42699	D	1000.00 Ac		16	16,000	16	16000	16	16000
16	500.000 .05 A 1 .35 / 500 / 0	E	5337.36 Ac		8	42,699	8	42699	8	42699
17	Homesite Value / 1600 94344 / 1850 97118	Waste / Tank Site	500.00 Ac / .05		1 / .35	500 / 1	1 / .35	500 / 1	1 / .35	500 / 1
TOTALS			7,459.56 Ac		AREA	83,504	AREA	84594	AREA	91344

YEAR	1943	YR. 1944	YR. 1945	YR. 1946	YR. 1947	YR. 1948	YR. 1949	YR. 1950
AREA	7457.15 ac.	7457.15 ac.	7457.15 ac.	7459.56 ac.	7459.56 ac.	7459.56 ac.	7459.56 ac.	7459.56 ac.
LAND VALUE	23,757.	23,757.	23,757.	23,772.	23,772.	23,772.	23,772.	31,460.
IMPROVEMENT	1,219.	1,432.	1,355.	1,279.	1,202.	1,124.	1,039.	1,253.
TOTAL	24,976.	25,189.	25,112.	25,051.	24,974.	24,896.	24,811.	32,713.
LESS EX.	406.	692.	678.	664.	Filed 650.	636.	6 622.	738.
NET TAX VALUE	24,570.	24,497.	24,434.	24,387.	24,324.	24,260.	24,189.	31,975.
TAXES								

YEAR	1951	YR. 1952	YR. 1953	YR. 1954	YR. 1955	YR. 1956	YR. 1957	YR. 1958
AREA	7459.56 ac.	7459.56 ac.	7459.56 ac.	7459.56 ac.	7459.56 ac.	7459.56 ac.	7459.56 ac.	7459.56 ac
LAND VALUE	31,460.	51,461.	51,461.	51,461.	51,461.	53458 ~~69,755.~~	64,983.	65,111.
IMPROVEMENT	1,236.	1,703.	1,679.	1,683.	4,739.	6096 ~~6,096.~~	5,969.	5,837.
TOTAL	32,696.	53,164.	53,140.	53,144.	56,200.	59354 ~~75,851.~~	70,952.	70,948.
LESS EX.	721.	985.	961.	934.	3,990.	4975 ~~4,975.~~	4,845.	4,713.
NET TAX VALUE	31,975.	52,179.	52,179.	52,210.	52,210.	54379 ~~70,876.~~	66,107.	66,235.
						Adj 750.43	1095.39	1097.51

DEPARTMENT OF TAXATION

RESIDENTIAL APPRAISAL CARD — SUMMARY

CAL. FORM P-17

1. DEPRECIATION

B. NO.	YR. CONSTR.	AGE	LIFE EXP.	% GD.	ADJ. %

2. BLDG. PERMIT RECORD

PUR.	DATE	PER. NO.	AMOUNT	BP BY

3. ADD'L L. IMPVTS

PAVED AREAS ☐ TERR/PATIOS ____ SQ. FT.
RET. WALL ☐ FENCES ____ LIN. FT.
LAWN-LDSC ☐ BARBEC. ____ CU. FT.
WALK WAYS ☐ SWIM. POOL ____ SQ. FT.
SPRINKLERS ☐ SHAPE ____ AV. DEPTH ____

REMARKS

CARD ____ OF ____ CARDS

ZONE	SEC.	PLAT	PARCEL
2	2	2	01

4.
5. ADDRESS
6. CODE 540
7. USE

RES. ☐ AGR. ☐
COM'L ☐ INST. ☐
IND. ☐

8. COMPUTATION OF IMPROVEMENT VALUE

NO.	AREA	CF.	YR. 1970	CF.	YR. 1971	CF.	YR. 1972	CF.	YR. 1973	CF.	YR. 1974	CF.	YR. 1975
	1		3909		4013		4034		4067		4391	1, 2, 3	4758
	2		6644		6812 EX		6827 EX		6857		7411	4, 5, 6	8028
			10553		10825		10861		10919		11802	7	15120
		1	1976									8	15120
		1,2,3	4078				1978		1979		1980	9	47250
		4,5,6	6881			1,2,3	4594		10,935	total	10797	10	112896
		7	12959			4,5,6	6475						209,172
		8	12959			7	12319		1982				
		9	40,498			8	12319	1	1106				
		10	96,763			9	38499	2	3644				
			174,135			10	91985	3	593				
							166191	4	569				1986
			1981				1983	5	1697				
			10841			1	1803	6	3489				
						2	6853		7088				
						3	1038						
						4	916						
						5	2828						
						6	6584						
							19034						

CAMA 3-88

ZONE	SEC.	PLAT.	PARCEL
2	2	002	001

SHAPE: ___ norm/area, ___ irregular
TOPOGRAPHY: ___ near level, ___ sloping, ___ steep/hilly
ACCESS: ___ fr. paved rd., ___ fr. unpaved rd.
UTILITY: ___ curb/sidewalk, ___ sewer/drain, ___ cesspool, ___ water to site
OTHER LAND IMPROVEMENTS: ___ paved driveway, ___ fence/walls, ___ walkway/patio, ___ retaining wall

SYM.	AV. DEPTH	RATIO	ITEM	AREA	U.V.	ADJ. U.V.	YR. 1973 VAL.	U.V.	ADJ. U.V.	YR. 1974 VAL.	U.V.	ADJ. U.V.	YR. 1975 VAL.
	Agr.	Hselot		.50 Ac	7000		3500	7840		3920	X125		4900
		Pasture	C	621.65 Ac	27		16,785	27		16785			16785
			D	1000.00 Ac	16		16,000	16		16000			16000
			E	5337.96 Ac	8		42,699	1980.001 Ac @ 8		15200			15200
		Tank	Site	.05 Ac	35		1			1			1
		Waste		500.00 Ac	1		500			500			—
					Homesite Value		1,400			1600			1850
				7,459.56 Ac			80,885			54006			54,736
							1976			1979			1980
							5022-1			51341			62401
							1981			1982			1983
							66618			66618			111,854
							1984						1985
					SEE PLANTATION SCHEDULE								

DATE: REMARKS:

TERRITORY OF HAWAII

FIELD BOOK BUILDING SHEET

FORM A. D. 17-D 1950

OWNER (PENCIL ONLY)	OCCUPANT OR LESSEE (PENCIL ONLY)	BUILDING SHEET	4, 5, 6	DIVISION
Haleakala Ranch Co.	Maui County Water Dept	Exempt '65	ZONE 2	SEC 2
Pages 4 & 5		5	PLAT. 02	PARCEL 01
Kamaole				

COMMERCIAL CAMA 002

BLD.	POR	DEP RATE	AREA OR CUBE	Φc	FACTOR	REPLACEMENT	1965 AGE	COND.	%G	1965 VALUE	1966 VALUE	1967 AGE	COND	%G	1967 VALUE	1968 AGE	COND.	%G	1968 VALUE	1969 VALUE	1970 AGE	COND.	%G	1970 VALUE	1971 VALUE
1		500	G Steel Tank		37	185																			
4		500	"		37	185																			
5		500	"		37	185																			
6		500	"		37	185																			
7		500	"		37	185																			
8		500	"		37	185																			
9		500	"		37	185								960											27
						1295•	22		41.	—	631	23		39	666	24yr			659	633	26			653	677
④		96.0•		x	108%	1399	21•		42•	588•	—														
2			50,000 Gal RW Tank			4133																			
3			40,000 "			3455																			SALVAGE
						7588•								950											
⑤		95.0•		x	108%	8195	—		20•	1639.	1802	34		20	1983	35yr			1983	1983	5/l			1983	1980
			Page 5											960											17
1		1400	Bbls Steel Tank		3.82	5348•	12		61	—	3875	13		58	4092	14yr			4046	3884	16			4008	4155
⑥		96.0•		x	108%	5776	11•		64•	3697.	—														
							Exempt			5924	6308				6744				6688	6500				6644	6812

BLD.	1972 AGE	1972	1973	1974 AGE	1974	1975	1976
4	28	679	(29) 684	30	762	849	728
5	S/V	1980	1980		1980	1980	1697
6	18	4168	4193	20	4669	5199	4456
		6827	6857		7411	8028	6881

BLD.	Age	1977	1978	1979	1980 AGE	1980	1981
4	32	699	671	644	25	618	593
5	SALVAGE	1697	1697	1697	S/V	1697	1697
6	22	4278	4107	3943	25	3785	3634

1986

	1983		1986
#4	910	#4	839
#5	2828	#5	2828
#6	5582	#6	4939

CAMA 3-88

OWNER (PENCIL ONLY)	OCCUPANT OR LESSEE (PENCIL ONLY)	BUILDING SHEET	1, 2, 3	DIVISION
Haleakala Ranch Co.		'65	ZONE 2	SEC 2
Page 3 & 3A		5	PLAT. 02	PARCEL 01
Kamaole				

BLD.	POR	DEP RATE	AREA OR CUBE	Φc	FACTOR	REPLACEMENT	1965 AGE	COND.	%G	1965 VALUE	1966 VALUE	1967 AGE	COND	%G	1967 VALUE	1968 AGE	COND.	%G	1968 VALUE	1969 VALUE	1970 AGE	COND.	%G	1970 VALUE	1971 VALUE
4			10,000 Gal R.W. Tank			1341	OBY CAMA 001																		
5			10,000 "			1341																			
6			10,000 "			1341																			
7			5,000 "			930																			SALVAGE
						4953•												950		R76					
①		95.0•		x	108%	5349	—		20•	1070	1177	34		20	1294	35yr			1294	1294	5/l			1294	1290
90			Dwg W2 680		6.28	4270	CAMA 001																		
A-			Garage 192		1.57	301																			
B-			Wash Hse 54		2.50	135																			
C-			Toilet 20		2.50	50																			
			Plumbing 5		86.00	430												967		R76					38
						5186•	R33		33	—	2032	R34		31	2161	35yr			2152	2081	37			2163	2259
②		96.7•		x	108%	5601	R32•		34•	1904•	—														
1			2,500 Gal RW Tank			417	CAMA 001 OBY																		
2			2,500 "			417												990		618					20
						834•	R15		46•	—	455	R16		43	476	17yr			466	443	19			452	464
③		95.0•		x	108 %	901	R14•		49•	441.	—														
											3664				3931				3912	3818				3909	4013

BLD.		1972 AGE	1972	1973	1974 AGE	1974			1975	1976
1	611	S/V	1290	1290		1290		1	1290	1106
2		39	2283	(40) 2313	41	2595	611	2	2910	2494
3		21	461	(22) 459	23	506	112	3	558	478
			4034	4062		4391	199		4758	4078

BLD.	Age	1977	1978	1979	1980 AGE	1980	1981
1	SALVAGE	1106	1106	1106		1106	1106
2	43	2472	2974	3033	46	3081	3277
3	25	465	512	517	28	510	534
							4096

	1983		1986
#1	1843	#1	1842
#2	6883	#2	7178
#3	1038	#3	1234

CAMA 3-88

APPENDIX C

Phase I Property Questionnaire/Interviews

PHASE I ENVIRONMENTAL SITE ASSESSMENT
Property/User Questionnaire

Name: Mr. Scott Meidell

Relationship to Site: Owner-Manager

Date: 2/22/2011

Years Familiar with Site: 7

Project Name/Location: **Kihei High School**
Piilani Highway
Kihei, Hawaii 96753
TMK (2) 2-2-002: 054 (por.)
TMK (2) 2-2-002: 015 (por.)

Project Number: **28011-02-006**

Please answer all questions to the best of your knowledge and in good faith. Mark the appropriate response with an "**X**". If the answer is unknown or you have no answer/response to the question, please select the U-NR column.

Question	Yes	No	U-NR
1. Is the *property* or any *adjoining property* used for an industrial use?	( )	(X)	( )
2. To the best of your knowledge, has the *property* or any *adjoining property* been used for an industrial use in the past?	( )	(X)	( )
3. Is the *property* or any *adjoining property* used presently as a gasoline station, motor repair facility, commercial printing facility, dry cleaners, photo developing laboratory, junkyard or landfill, or as a waste treatment, storage, disposal, processing, or recycling facility?	( )	(X)	( )

Question	Yes	No	U-NR
4. To the best of your knowledge, has the *property* or any *adjoining property* been used in the past as a gasoline station, motor repair facility, commercial printing facility, dry cleaners, photo developing laboratory, junkyard or landfill, or as a waste treatment, storage, disposal, processing, or recycling facility?	( )	(X)	( )
5. Are there currently, or to the best of your knowledge have there been previously, any automotive or industrial batteries damaged or discarded, or pesticides, paints, or other chemicals in individual containers of greater than five gallons in volume or fifty gallons in the aggregate, stored on or used at the *property* or at the facility?	( )	(X)	( )
6. Are there currently, or to the best of your knowledge have there been previously, any industrial Drums (typically 55-gallon) or sacks of chemicals located on the *property* or at the facility?	( )	(X)	( )
7. Has *Fill Dirt* been brought onto the *property* which originated from a contaminated site or which is of an unknown origin?	( )	(X)	( )
8. Are there currently, or to the best of your knowledge have there been previously, any Pits, Ponds or Lagoons located on the *property* in connection with waste treatment or waste disposal?	( )	(X)	( )
9. Is there currently, or to the best of your knowledge has there been previously, any stained soil on the *property*?	( )	(X)	( )

Question	Yes	No	U-NR
10. Are there currently, or to the best of your knowledge have there been previously, any registered or unregistered Storage Tanks (above or underground) located on the *property*?	( )	(X)	( )
11. Are there currently, or to the best of your knowledge has there been previously, any Vent Pipes, Fill Pipes, or Access Ways indicating a Fill Pipe protruding from the ground on the *property* or adjacent to any structure located on the *property*?	( )	(X)	( )
12. Are there currently, or to the best of your knowledge have there been previously, any flooring, drains, or walls located within the facility that are stained by substances other than water or are emitting foul odors?	( )	(X)	( )
13. If the *property* is served by a private well or non-public water system, have Contaminants been identified in the well or system that exceed guidelines applicable to the water system or has the well been designated as Contaminated by any government environmental/health agency?	( )	(X)	( )
14. Does the Owner or Occupant of the *property* have any knowledge of Environmental Liens or governmental notification relating to past or current violations of environmental laws with respect to the *property* or any facility located on the *property*?	( )	(X)	( )
15. Has the Owner or Occupant of the *property* been informed of the past or current existence of Hazardous Substances or Petroleum Products or environmental violations with respect to the *property* or any Facility located on the *property*?	( )	(X)	( )

Group 70 International
Kihei High School Phase I
Property Questionnaire

Question	Yes	No	U-NR
16. Does the Owner or Occupant of the *property* have any knowledge, or any Environmental Site Assessment of the *property* or facility that indicated the presence of Hazardous Substances or Petroleum Products on, or contamination of, the *property* or recommended further assessment of the *property*?	( )	(x)	( )
17. Does the Owner or Occupant of the *property* know of any past, threatened, or pending lawsuits or administrative proceedings concerning a release or threatened release of any Hazardous Substances or Petroleum Products involving the *property* by any Owner or Occupant of the *property*?	( )	(x)	( )
18. Does the *property* discharge waste water on or adjacent to the *property* (other than storm water) or into a sanitary system?	( )	(x)	( )
19. To the best of your knowledge, have any Hazardous Substances or Petroleum Products, unidentified waste materials, tires, automotive or industrial batteries or any other waste materials been dumped above grade, buried and/or burned on the *property*?	( )	(x)	( )
20. Is there a transformer, capacitor or any hydraulic equipment for which there are any records indicating the presence of PCBs?	( )	(x)	( )
21. Do any of the following Federal government record systems list the *property* or any property within the circumference of the area noted below:			
National Priorities List (NPL) within 1.0 mile?	( )	(x)	( )
CERCLIS List within 0.5 mile?	( )	(x)	( )
RCRA TSD Facilities within 1.0 mile?	( )	(x)	( )

Question	Yes	No	U-NR
22. Do any of the following state record systems list the *property* or any property within the circumference of the area noted below:			
Hazardous Waste sites -within 1.0 mile?	( )	(x)	( )
State CERCLIS equivalent -within 0.5 mile?	( )	(x)	( )
Leaking underground storage tanks -within 0.5 mile?	( )	(x)	( )
Solid waste/Landfill facilities -within 0.5 mile?	( )	(x)	( )
23. To the best of your knowledge, is there now or has there ever been any Asbestos-Containing Materials (ACM), in any application, on the Property?	( )	(x)	( )
24. Has there ever been any ACM testing conducted on the *property*?	( )	(x)	( )
25. To the best of your knowledge, is there now or has there ever been any Lead-Based Paint (LBP) applications on the *property*?	( )	(x)	( )
26. Has there ever been any LBP testing conducted on the *property*?	( )	(x)	( )
27. Has the water at the *property* ever been tested for Lead?	( )	(x)	( )
28. Has Radon testing ever been conducted on the *property*?	( )	(x)	( )
29. To the best of your knowledge, is the *property* or any portion of the *property* located or involved in any Environmentally Sensitive Areas (i.e., wetlands, coastal barrier resource areas, coastal barrier improvement act areas, flood plain, endangered species, etc.) ?	( )	(x)	( )

30. Are you aware of commonly known or reasonably ascertainable information about the property that would help the environmental professional to identify conditions indicative of releases or threatened releases? For example:

a. Do you know the past uses of the *property*? – GRAZING C. 100 yrs

b. Do you know of specific chemicals that are present or once were present at the *property*? None

c. Do you know of spills or other chemical releases that have taken place at the *property*? None

d. Do you know of any environmental cleanups that have taken place at the *property*? None

31. As the user of this ESA, based on your knowledge and experience related to the *property* are there any obvious indicators that point to the presence or likely presence of contamination at the *property*? No

I declare that to the best of my knowledge the above statements and facts are true and correct and no material facts have been suppressed or misstated.

Signature _____ Date 3-22-2011

Answers to this questionnaire have been orally communicated and completed by:

Name_____ Signature _____ Date _____

PHASE I ENVIRONMENTAL SITE ASSESSMENT
Property/User Questionnaire

Name: Mr. Henry F. Rice

Relationship to Site: General Manager

Date: 3-5-2011

Years Familiar with Site: 73

Project Name/Location: **Kihei High School**
Piilani Highway
Kihei, Hawaii 96753
TMK (2) 2-2-002: 015 (por.)
TMK (2) 2-2-002: 054 (por.)

Project Number: **28011-02-006**

Please answer all questions to the best of your knowledge and in good faith. Mark the appropriate response with an "**X**". If the answer is unknown or you have no answer/response to the question, please select the U-NR column.

Question	Yes	No	U-NR
1. Is the *property* or any *adjoining property* used for an industrial use?	( )	(X)	( )
2. To the best of your knowledge, has the *property* or any *adjoining property* been used for an industrial use in the past?	( )	(X)	( )
3. Is the *property* or any *adjoining property* used presently as a gasoline station, motor repair facility, commercial printing facility, dry cleaners, photo developing laboratory, junkyard or landfill, or as a waste treatment, storage, disposal, processing, or recycling facility?	( )	(X)	( )

Question	Yes	No	U-NR
4. To the best of your knowledge, has the *property* or any *adjoining property* been used in the past as a gasoline station, motor repair facility, commercial printing facility, dry cleaners, photo developing laboratory, junkyard or landfill, or as a waste treatment, storage, disposal, processing, or recycling facility?	( )	(X)	( )
5. Are there currently, or to the best of your knowledge have there been previously, any automotive or industrial batteries damaged or discarded, or pesticides, paints, or other chemicals in individual containers of greater than five gallons in volume or fifty gallons in the aggregate, stored on or used at the *property* or at the facility?	( )	(X)	( )
6. Are there currently, or to the best of your knowledge have there been previously, any industrial Drums (typically 55-gallon) or sacks of chemicals located on the *property* or at the facility?	( )	(X)	( )
7. Has *Fill Dirt* been brought onto the *property* which originated from a contaminated site or which is of an unknown origin?	( )	(X)	( )
8. Are there currently, or to the best of your knowledge have there been previously, any Pits, Ponds or Lagoons located on the *property* in connection with waste treatment or waste disposal?	( )	(X)	( )
9. Is there currently, or to the best of your knowledge has there been previously, any stained soil on the *property*?	( )	(X)	( )

Question	Yes	No	U-NR
10. Are there currently, or to the best of your knowledge have there been previously, any registered or unregistered Storage Tanks (above or underground) located on the *property*?	( )	(X)	( )
11. Are there currently, or to the best of your knowledge has there been previously, any Vent Pipes, Fill Pipes, or Access Ways indicating a Fill Pipe protruding from the ground on the *property* or adjacent to any structure located on the *property*?	( )	(X)	( )
12. Are there currently, or to the best of your knowledge have there been previously, any flooring, drains, or walls located within the facility that are stained by substances other than water or are emitting foul odors?	( )	(X)	( )
13. If the *property* is served by a private well or non-public water system, have Contaminants been identified in the well or system that exceed guidelines applicable to the water system or has the well been designated as Contaminated by any government environmental/health agency?	( )	(X)	( )
14. Does the Owner or Occupant of the *property* have any knowledge of Environmental Liens or governmental notification relating to past or current violations of environmental laws with respect to the *property* or any facility located on the *property*?	( )	(X)	( )
15. Has the Owner or Occupant of the *property* been informed of the past or current existence of Hazardous Substances or Petroleum Products or environmental violations with respect to the *property* or any Facility located on the *property*?	( )	(X)	( )

Group 70 International
Kihei High School Phase I
Property Questionnaire

Question	Yes	No	U-NR
16. Does the Owner or Occupant of the *property* have any knowledge, or any Environmental Site Assessment of the *property* or facility that indicated the presence of Hazardous Substances or Petroleum Products on, or contamination of, the *property* or recommended further assessment of the *property*?	( )	(X)	( )
17. Does the Owner or Occupant of the *property* know of any past, threatened, or pending lawsuits or administrative proceedings concerning a release or threatened release of any Hazardous Substances or Petroleum Products involving the *property* by any Owner or Occupant of the *property*?	( )	(X)	( )
18. Does the *property* discharge waste water on or adjacent to the *property* (other than storm water) or into a sanitary system?	( )	(X)	( )
19. To the best of your knowledge, have any Hazardous Substances or Petroleum Products, unidentified waste materials, tires, automotive or industrial batteries or any other waste materials been dumped above grade, buried and/or burned on the *property*?	( )	(X)	( )
20. Is there a transformer, capacitor or any hydraulic equipment for which there are any records indicating the presence of PCBs?	( )	(X)	( )
21. Do any of the following Federal government record systems list the *property* or any property within the circumference of the area noted below:			
National Priorities List (NPL) within 1.0 mile?	( )	(X)	( )
CERCLIS List within 0.5 mile?	( )	(X)	( )
RCRA TSD Facilities within 1.0 mile?	( )	(X)	( )

Question	Yes	No	U-NR
22. Do any of the following state record systems list the *property* or any property within the circumference of the area noted below:			
Hazardous Waste sites -within 1.0 mile?	( )	(X)	( )
State CERCLIS equivalent -within 0.5 mile?	( )	(X)	( )
Leaking underground storage tanks -within 0.5 mile?	( )	(X)	( )
Solid waste/Landfill facilities -within 0.5 mile?	( )	(X)	( )
23. To the best of your knowledge, is there now or has there ever been any Asbestos-Containing Materials (ACM), in any application, on the Property?	( )	(X)	( )
24. Has there ever been any ACM testing conducted on the *property*?	( )	(X)	( )
25. To the best of your knowledge, is there now or has there ever been any Lead-Based Paint (LBP) applications on the *property*?	( )	(X)	( )
26. Has there ever been any LBP testing conducted on the *property*?	( )	(X)	( )
27. Has the water at the *property* ever been tested for Lead?	( )	(X)	( )
28. Has Radon testing ever been conducted on the *property*?	( )	(X)	( )
29. To the best of your knowledge, is the *property* or any portion of the *property* located or involved in any Environmentally Sensitive Areas (i.e., wetlands, coastal barrier resource areas, coastal barrier improvement act areas, flood plain, endangered species, etc.) ?	( )	(X)	( )

30. Are you aware of commonly known or reasonably ascertainable information about the property that would help the environmental professional to identify conditions indicative of releases or threatened releases? For example:

a. Do you know the past uses of the *property*? NO

b. Do you know of specific chemicals that are present or once were present at the *property*? NO

c. Do you know of spills or other chemical releases that have taken place at the *property*? NO

d. Do you know of any environmental cleanups that have taken place at the *property*? NO

31. As the user of this ESA, based on your knowledge and experience related to the *property* are there any obvious indicators that point to the presence or likely presence of contamination at the *property*? NO

I declare that to the best of my knowledge the above statements and facts are true and correct and no material facts have been suppressed or misstated.

Signature _____ Date 3-19-11

Manager

Answers to this questionnaire have been orally communicated and completed by:

Name_____ Signature _____ Date _____

APPENDIX D

Photo Log

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East Project Boundary
Facing South. Northeast Corner
Property Boundary Stake.

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Adjacent Property to the East
(Ka'ono'ulu Ranch LLLP &
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Adjacent Property to the North
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South, Present Fence Line that
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Facing Southeast

Appendix K

Kīhei High School
Preliminary Civil Engineering Report

Gray, Hong, Nojima & Associates, Inc. – ~~October 2011~~ March 2012

KIHEI HIGH SCHOOL

PRELIMINARY CIVIL ENGINEERING REPORT (PRE-FINAL DRAFT)

TMK: (2) 2-2-002: 81 and 83
Kihei, Maui, Hawaii

October 31, 2011 (Revised March 15, 2012)

Prepared for:
Group 70 International, Inc.
925 Bethel Street, Fifth Floor
Honolulu HI, 96813

Gray • Hong • Nojima & Associates, Inc.
CONSULTING ENGINEERS
201 Merchant Street, Suite 1900 / Honolulu, HI 96813 / Phone: (808) 521-0306 / Fax: (808) 531-8018

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Chapter 1 – INTRODUCTION

1.1 OVERVIEW

The population of Kihei, Maui is significantly increasing and without a high school in the area, students commute to Kahului and Wailuku. To relieve overcrowding in Central Maui schools and to reduce the commute time for students, the State of Hawaii Department of Education (DOE) proposes to develop the new Kihei High School on 77 acres of undeveloped land along Piilani Highway adjacent to the Elleair Golf Course (refer to Figure 1). Facilities would include construction of approximately 215,000 square feet of educational buildings to support an enrollment capacity of 1,650 students. Also proposed for the full build out are a library, auditorium, cafeteria, an administration building, a football/track stadium, gym, tennis courts, grassed playfields, a swimming pool, a softball field, and a baseball field (refer to Figure 2).

The purpose of this report is to describe the existing and proposed civil infrastructure and utilities that will serve the proposed Kihei High School site. In addition, the report will provide a preliminary basis of design for roadways, water, wastewater, and drainage infrastructure that will be further detailed in the project's request for proposal (RFP) documents for the design-build delivery of the school. The project's design-build team will be involved in the design of site improvements, as well as preparation of actual site plan and utility layouts, grading, and roadway/utility profiles during the design phase of the project; however, a conceptual construction costs based on a conceptual campus plan is provided in Appendix A.

1.2 SITE SELECTION AND LOCATION

A site selection study for the proposed Kihei High School was undertaken by the DOE and Munekiyo and Haraga in 2008. The study started with a general evaluative review of eleven different sites based on social, land use, infrastructure, topography and environmental design considerations. Through a series or progression of further analysis, three finalist site locations were identified. Upon consultation with the local community and landowners, a single preferred site was recommended. Ultimately, the DOE selected the current site for the proposed Kihei High School.

The proposed Kihei High School campus site encompasses approximately 77 acres of undeveloped land on the make side of Piilani Highway across from the Piilani Village residential subdivision in Kihei. It is bordered on the south by Waipuilani Gulch and Elleair Golf Course. Further south are the Maui Research and Technology Park, Piilani Shopping Center, and the Kihei Wastewater Reclamation Facility. To the east are undeveloped lands owned by Kaonoulu Ranch Company and Haleakala Ranch LLP. Kulanihakoi Gulch and undeveloped Kaonoulu Ranch land form the northern boundary. The site is currently owned by the two ranches (TMK 2-2-002:81 and 2-2-002:83 respectively, refer to Figure 3). Both ranches have subdivided a portion of their properties (Maui County Subdivision file Nos. 2.3124 and 2.3129) that will be acquired by the State as the school site. The two subdivided parcels will be consolidated into the proposed Kihei High School site at a future date.

Chapter 2 – ROADWAYS

2.1 EXISTING INFRASTRUCTURE

The proposed Kihei High School site is fronted by Piilani Highway. This highway is under the jurisdiction of the State of Hawaii Department of Transportation (HDOT). Piilani Highway runs in the north-south direction with two lanes heading south to Makena and two lanes heading north to Kahului. The posted speed limit is 30 miles per hour in both directions. Fronting the proposed Kihei High School site, Piilani Highway intersects Kulanihakoi Street at an un-signalized T-intersection without cross walks.

Existing access from Piilani Highway to the proposed project site are two dirt roads, one north of Kulanihakoi Gulch near a bridge. The other is south of Kulanihakoi Gulch before another bridge. According to Maui County subdivision maps there are access restrictions from the existing dirt roads to Piilani Highway. The only area along Piilani Highway without access restrictions is a 80-foot wide strip across Kulanihakoi Street created for an access and utility easement (refer to Section 2.2.2 – On-Site Roadways).

2.2 PROPOSED INFRASTRUCTURE

2.2.1 HIGHWAY IMPROVEMENTS

A traffic impact report and traffic signal warrant study was prepared in 2011 by Wilson Okamoto Corporation (WOC) to analyze the traffic impacts resulting from the proposed Kihei High School. The reports update traffic counts, forecast future traffic, and propose measures to relieve traffic impacts. WOC (2011) determined that traffic in the area at the opening of the proposed High School will remain similar to existing conditions due to improvements on Piilani Highway and a traffic signal at the intersection of Piilani Highway and Kulanihakoi Street. When the proposed High School meets full enrollment of 1,650 students, the traffic level of service is expected to worsen. Recommended improvements to Piilani Highway include the following (Wilson Okamoto Corporation, 2011):

- Provide an exclusive right-turn lane and shared left-turn and through lane on the access road approach from the high school at the intersection with Piilani Highway.
- Provide a channelized northbound deceleration lane along Piilani Highway at the intersection with the access road for the high school.
- Provide a channelized northbound acceleration lane along Piilani Highway at the intersection with the access road for the high school.
- Provide an exclusive southbound left-turn lane along Piilani Highway at the intersection with the access road for the high school.
- Provide two eastbound departure lanes along the access road for the high school from the intersection with Piilani Highway.
- Modify the eastbound approach of Kulanihakoi Street at the intersection with Piilani Highway and the access road for the high school to provide an exclusive right-turn lane and a shared left-turn and through lane.
- Install a traffic signal system at the intersection of Piilani Highway with Kulanihakoi Street and the access road for the high school.
- Prepare a Traffic Management Plan for the high school to minimize the impact of school related vehicles on the surrounding roadways. This plan should address daily school and special event traffic.

- Consider preparing Traffic Assessment Reports periodically (every 5 years at a minimum) once the high school is opened to verify projected traffic conditions in the vicinity and assess the effectiveness of traffic management strategies implemented by the high school.

Layout and dimensions of lanes, approaches, and intersection improvements will be determined by the design-build team during the design phase of the project. In addition, phasing and timing of the traffic signalization system will be established during the design phase.

2.2.2 ON-SITE ROADWAYS

According to subdivision maps prepared by the Kaonoulu Ranch Company and Haleakala Ranch, an 80-foot wide access and utility easement was created on the proposed Kihei High School site (Subdivision File 2.3129 approved on January 13, 2011). This easement has no access restriction from Piilani Highway and will serve as the right of way for an extension of Kulanihakoi Street. This Kulanihakoi Street Extension will remain private for the present and serve as the primary access to the proposed Kihei High School.

Both ranches are also planning for future upcountry developments mauka of the school site, although construction schedules are uncertain and unavailable at this time. Preliminary recommendations from the County's Department of Public Works are to design the Kulanihakoi Street Extension as a 4-lane major collector with bicycle lanes and no parking; however, this should be confirmed by the design-build team. The proposed extension must also be designed in accordance with County and HDOT standards and allow for access from Piilani Highway to the school. Since the mauka development of ranch lands will not occur before the school is constructed, the DOE could construct the full 4-lane collector up to the first intersection which could then narrow down to a 2-lane minor street in the remaining right-of-way up to the school's mauka corner. The developer(s) would then be responsible for undertaking a traffic study to assess the development's impact on surrounding roadways and determine necessary improvements and widening of the Kulanihakoi Street Extension.

Design considerations for the school's on-site driveways are as follows:

- Minimum width of 20 feet.
- Looped through the school site to allow for fire vehicle access.
- Compliance with the guidelines set forth in the DOE's Education Specifications for High Schools (EDSPECS) Chapter 10, Traffic, Bus, and Parking Design Criteria.
- School parking lots situated and designed such that there are no vehicle backups onto Piilani Highway.
- Pavement design of 2-inch asphalt concrete over 6-inch base course with a minimum California Bearing Ratio of 85, as recommended by Hirata and Associates (2009).

In addition, on-site roadways should incorporate recommendations from the project's traffic impact report (WOC, 2011):

- Maintain sufficient sight distance for motorists to safely enter and exit all project roadways.
- Provide adequate on-site loading and off-loading service areas and prohibit off-site loading operations.

- Provide adequate turn-around area for service, delivery and refuse collection vehicles to maneuver on the project site to avoid vehicle-reversing maneuvers onto public roadways.
- Provide sufficient turning radii at all project driveways to avoid or minimize vehicle encroachment to oncoming traffic lanes.

Chapter 3 – WATER

3.1 EXISTING INFRASTRUCTURE

Water Resource Associates studied the existing hydrogeological conditions of the Kihei area and concluded "…there are no potable water resources, either surface or groundwater, available within a two-mile radius of the project site that could be economically or feasibly developed for the proposed high school" (2011). Therefore, potable water will need to be provided by the Department of Water Supply (DWS) Central Maui Water System. According to available information, the Central Maui Water System does not extend to Piilani Highway or the project site. The nearest water facility to the project site is the 8-inch water line at the intersection of Kulanihakoi and Mahealani Street in the Piilani Village Subdivision. Further down Kulanihakoi Street at the intersection with Liloa Drive is a 36-inch concrete pipe transmission main and 18-inch ductile iron distribution main. The 18-inch distribution main is connected to both reservoirs in the area, but is primarily served by the Hale Kihei Reservoir at elevation 220 feet mean sea level (MSL). According to DWS staff the water pressure at fire hydrant 763 located on Mahealani Street near to the intersection of Kulanihakoi Street in the Piilani Village subdivision is 82 pounds per square inch (PSI) at elevation 33 feet MSL.

As described in Section 1.3, Department of Education (DOE) will eventually consolidate and subdivide the properties owned by Haleakala Ranch and Kaonoulu Ranch into the proposed Kihei High School site. In the past the water availability policy (a verification of long term-reliable water source for developments) per Title 14 of the Maui County Code would be a condition for subdivision approval. The recent passing of Ordinance 3818, effective April 5, 2011, amends the Maui County Code exempting public developments within the Central Maui Water System from the water availability policy. The proposed school development should qualify for exemption; however, written confirmation should be obtained from the DWS.

3.2 WATER DEMAND ESTIMATE

Conceptual site plans for the proposed school were developed through a design charrette process with input from a variety of local stakeholders. Based on the charrette discussions and the DOE's anticipated growth in enrollment for the proposed school, preliminary water demands have been projected as shown in Table 3.1. In recognition of Maui's water shortage, dual water systems are being planned for the proposed Kihei High School. It is anticipated that potable water will be supplied by the County's Central Maui Water System and brackish water wells to be located at the school site would serve as the nonpotable source of irrigation water.

Potable consumption rates used in the water demand projections were developed on the basis of incorporating low-flow and other water conservation fixtures throughout the various buildings. A sustainable design approach will take into account the Water Efficiency criteria in accordance with the Leadership in Environmental and Energy Design (LEED) rating system. In working with the DOE, the project team estimated an average potable demand of 20 gallons per capita day (GPCD) for students and staff. A corresponding 10 GPCD average demand for visitors was used. At full build-out, the average daily potable demand is projected at 37,450 GPD. In addition, due to the hot arid climate of Kihei, the nonpotable irrigation demand, estimated to be 185,000 GPD, is significantly higher than typical high school campuses. Thus, the total projected potable and non-potable demand of 222,450 GPD exceeds the following DWS requirements:

- 60 GPCD x 1,650 students = 99,000 GPD or
- 1,700 GPD/acre x 77 acres = 130,900 GPD

Therefore, the anticipated domestic demand of 37,450 GPD is much lower than the DWS requirements since the irrigation demand will be handled by a nonpotable supply.

Table 3.1 – Projected Water Demand

Year	No. of Students & Staff	GPCD	No. of Visitors	GPCD	Potable (GPD) Avg Day	Max Day	Peak Hr	Non-Potable (GPD)
2015	240	20	10	10	4,900	7,350	14,700	185,000
2016	440	20	20	10	9,000	13,500	27,000	185,000
2017	700	20	30	10	14,300	21,450	42,900	185,000
2018	920	20	40	10	18,800	28,200	56,400	185,000
2025	1,830	20	85	10	37,450	56,175	112,350	185,000

3.3 PROPOSED INFRASTRUCTURE

There are no on-site public or private water systems serving the property. The domestic water and fire supply would be supplied through the Central Maui Water System by connecting to the existing 18-inch water main on Liloa Drive and upgrading the existing 8-inch water main in the Piilani Village Subdivision (refer to Figure 4). Irrigation water will be supplied via on-site brackish wells. The domestic, fire, and irrigation lines will consist of separate looped distribution systems following the main roadways and sidewalks throughout the campus. Any required system improvements and storage requirements will be determined during the subdivision process.

3.3.1 POTABLE SUPPLY

The proposed on- and off-site domestic water facilities must comply with DWS Water System Standards and be supplied through the Central Maui Water System. Preliminary indications by the DWS are that the proposed Kihei High School Campus would be served off an existing 18-inch ductile iron water main on Liloa Drive makai of the Piilani Village subdivision. Although there is an existing 8-inch main in Kulanihakoi Street connected to the 18-inch main, DWS will require that the DOE install a larger diameter water main in Kulanihakoi Street to service the proposed school. In addition, because Kulanihakoi Street is narrow and shares the right-of-way with other utilities, DWS requests that DOE connect any existing services to the proposed larger diameter water main and abandon the existing 8-inch main. The proposed larger diameter main will cross Piilani Highway and connect to water meters near the project site. The new water main will be situated in both County and State right-of-ways and will be dedicated to the County.

DWS will also require separate meters and on-site water mains for domestic and fire purposes, of which the fire meter should be a double-check detector assembly per Water System Standards Detail M-23 for the fire line. The fire main will be sized for fire flow (2,000 gallon per minute) with a residual pressure of 20 PSI at the critical fire hydrant. Hale Kihei Reservoir is at elevation 220 feet while the highest elevation at the site is approximately 110 feet, giving an elevation head of 110 feet or 48 PSI static pressure. Since a minimum residual pressure of 20 PSI is needed with the fire flow, the maximum loss in the fire line will be limited to 28 PSI until a booster system is required. It should be noted that per Ordinance 3819 effective April 5, 2011, the requirements for adequate fire protection for building permit applications for all non-residential units or structures will be transferred from DWS and administered by the Maui Department of Fire and Public Safety.

The domestic water supply will be served by a compound meter. The size of the compound meter would be dependent on the domestic demand. Once the potable demand is established by the design-build team, the domestic line will be sized per the Uniform Plumbing Code, which stipulates a minimum 15 PSI pressure per plumbing fixture. Assuming the critical fixture is in a multi-story building at elevation 150 feet MSL, the static head from the Hale Kihei Reservoir is approximately 70 feet or 30 PSI. Since 15 PSI is needed for domestic flow, the line can only have a maximum loss of 15 PSI until a booster system is required.

Water pressure calculations should be submitted to the DWS by the Design-build team to ensure adequate pressures can be attained in both fire and domestic lines. If adequate pressure is unavailable, DWS will require installation of a tank and pump, with an air gap off each meter. The air gap will separate the proposed Kihei High School water and fire mains from the Central Maui Water System. The tank and pump must be designed to have sufficient capacity and pressure to provide the proposed Kihei High School the required domestic and fire flow. Per the County of Maui Code §14-04-50, the DOE "shall agree to; and shall execute a written release in favor of the department for all claims on account of any inadequacy in the department's system or inadequacy of water supply to the premise."

DWS will also require fire hydrants on Piilani Highway fronting the school. The fire hydrants would feed off the proposed County water main system upstream of the proposed meters. The fire hydrant and corresponding water main would be transferred to the County.

Refer to Figure 4 for a conceptual water system plan and Appendix A for conceptual construction costs.

3.3.2 NONPOTABLE – BRACKISH GROUNDWATER

Irrigation water will be provided by on-site brackish (fresh/salt mixture) wells drilled into the groundwater lens below the site. Brackish water would be pumped from the "lens" between the salt water and the fresh water. The lens is a transition zone of brackish water that separates the fresh water from the salt water. The lens forms because the weight of the rain water that percolates into the ground depresses the salt water beneath it. Due to the high salinity of the brackish water, the project landscaping should consist of salt tolerant species.

The proposed non-potable water system for irrigation of the school site will include two brackish wells, pressurized transmission and distribution lines, control valves, and other appurtenances, but will not include a storage tank. A primary well would be located at the northeast corner of the site at an elevation of approximately 90 feet MSL (Water Resources Associates, 2011). The second well would serve as a supplemental/standby well located at the southeast corner of the property at roughly the same elevation as the first well (refer to Figure 4).

According to the project's Groundwater and Resources Report prepared by Water Resources Associates (2011), it is projected that each well will have a capacity in the range of 250 to 350 GPM while producing suitable brackish water in the salinity range of 400 to 500 mg/L chlorides. Actual pumping capacities will be determined during well tests when the wells are drilled. Therefore, pending the test results, the system may run under alternating or simultaneous operation of the wells in order to meet the estimated demand of 185,000 GPD within an 9 to 13 hour irrigation period. According to Water Resources Associates (2011), the wells are not expected to have any adverse impact on the existing water supply (fresh and brackish) and nearby wells.

Chapter 4 – WASTEWATER

4.1 EXISTING INFRASTRUCTURE

According to available information, there are no existing wastewater facilities on-site or sewer connections on Piilani Highway. The nearest wastewater connection is a drop manhole at the intersection of Kulanihakoi Street and Mahealani Street in the Piilani Village Subdivision. Wastewater is conveyed through a collection system and pump stations to the Kihei Wastewater Reclamation Facility (WWRF).

4.2 PROPOSED INFRASTRUCTURE

Proposed on- and off-site sewer lines will comply with the County of Maui standards. The existing collection system (including Kihei Wastewater Pump Station Nos. 3, 4, 5 and 6) should have adequate capacity for flows generated by the proposed Kihei High School such that upgrades are not necessary (Munikiyo and Haraga, 2008). The County will formally determine if any upgrades are required after the Plan Review Application form is submitted. If upgrades are necessary to support the proposed Kihei High School, the DOE will be required to fund any mandatory off-site improvements to collection system.

It is anticipated that sewer service will be provided by the extension of the County System from an existing drop manhole in the intersection of Kulanihakoi Street and Mahealani Street in the Piilani Village subdivision approximately 300 feet from the proposed Kihei High School. The proposed sewer line would extend across Piilani Highway to an on-site property sewer service manhole. The DOE would be responsible for any required costs to connect to the County System. The on-site system will consist of gravity sewer mains to be located within roadways and sidewalks. The DOE will be responsible for maintenance of the on-site sewers, since the County will not accept sewer easements that traverse private property.

The wastewater flow projections for the project are based on land use areas, unit counts, and estimated enrollment using demand rates from the State HAR Chapter 11-62, Appendix F and the County of Maui, Wastewater Reclamation Division, *Wastewater Flow Standards*. The flow rate estimates in the table below factor in both wet and dry inflow and infiltration and peak flow factors, including a maximum peak flow factor of 5.

Table 4.1 – Wastewater Flow Projections

Year	Population (Students, Staff, and Visitors)	GPCD	Wastewater Flows (MGD)		
			Avg Flow	Max Flow	Design Peak
2015	250	25	0.01	0.03	0.13
2016	460	25	0.01	0.06	0.16
2017	730	25	0.02	0.09	0.19
2018	960	25	0.02	0.12	0.21
2025	1,915	25	0.05	0.21	0.32

Refer to Figure 5 for a conceptual sewer system plan and Appendix A for conceptual construction costs.

Chapter 5 – DRAINAGE

5.1 TOPOGRAPHY AND EXISTING DRAINAGE PATTERNS

The Kihei High School project site is currently undeveloped and consists of dry rolling foothills on west-facing lowland slopes of Haleakala in the Kihei area of Maui. Vegetation on the site is primarily grassland currently utilized for grazing, with scattered shrubs and trees. The project site ranges in elevation from about 30 feet mean sea level (MSL) at Piilani Highway, to an elevation of about 110 feet at the eastern boundary with slopes ranging from 2 to 8 percent.

Because the property is vacant there is no existing drainage system serving the site except for drainage infrastructure in Piilani Highway, which is owned and maintained by the Hawaii State Department of Transportation (HDOT). The majority of the existing runoff at the site drains towards a 72-inch diameter culvert under Piilani Highway. The remainder of the runoff drains into either Kulanihakoi Gulch or Waipuilani Gulch. Both gulches cross Piilani Highway under bridges spanning the gulches. These gulches are generally dry except after significant rainfall events.

5.2 SOILS

The U.S. Soil Conservation Service (SCS) Soil Survey (1972) has designated several different soil types at the project site (refer to Figure 6), including Alae sandy loam (AaB) and Waiakoa extremely stony silty clay loam (WID2).

The SCS describes the Alae series as moderately deep, well-drained soils that formed in material weathered from basic igneous rock. The slopes vary from nearly level to gently sloping with elevations ranging from 50 to 600 feet. The annual rainfall amounts to 12 to 20 inches. The mean annual soil temperature is 74°F. This sub-series are used for sugarcane and pasture with some small acreage used for truck crops. Permeability is rapid, runoff is slow, and the erosion hazard is no more than slight.

The SCS describes the Waiakoa series as of moderately deep, well-drained soils that formed in material weathered from basic igneous rock. The slopes vary from gently sloping to moderately steep with elevations ranging from 100 to 1,000 feet. The annual rainfall amounts to 12 to 20 inches; most of it occurs in winter. The mean annual soil temperature is 74°F. This sub-series are used for sugarcane, pasture, homes, and wildlife habitat. Permeability is moderate, runoff is medium, and the erosion hazard is severe. In most areas about 50 percent of the surface layer has been removed by erosion.

5.3 FLOOD HAZARDS

Based on the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (Map Number 1500030586E dated September 25, 2009), the project site is located Flood Zone X (refer to Figure 7). Flood Zone X refers to areas determined to be outside the 0.2% annual chance floodplain.

5.4 EXISTING HYDROLOGY

The Kihei coast is known to be sunny, warm, and dry throughout the year. Annual temperatures for the Kihei region average in the mid to high 70s (degrees F). Average rainfall distribution in the region varies from under 10 inches per year along the coastline to more than 20 inches per year at higher elevations. Rainfall in Kihei is highly seasonal with most precipitation occurring

during the winter months. The neighboring Kulanihakoi and Waipuilani Gulches are normally dry except during heavy rainfall events. Northeast trade winds prevail in Kihei most of the year. Trade winds out of the northeast average 10 to 15 miles per hour prevail during the afternoon with lighter winds during the morning and evening. Occasionally southerly winds from Kona occur during the months of October and April.

According to the Trans-Meridian Engineers Hydrology report (no date) for the HDOT's Piilani Highway, the site extends over three drainage basins labeled as 8, 9 and 10 (refer to Figure 8). Basins 8 and 10, which contain Kulanihakoi and Waipuilani Gulches, respectively, extend from bridges crossing Piilani Highway up to Haleakala South West Rift Zone. Basin 9 encompasses a small area between the gulches which empties into the existing 72-inch culvert under Piilani Highway. Since the report was completed in the 1970s, the current Maui Drainage Standards (refer to section 3.1 below) were applied to the basin parameters to obtain updated existing peak flows (refer to Table 5.1 below and Appendix B).

Table 5.1 – Preliminary Analysis of Existing Basins
(NRCS Hydrograph Method based on 24-hour Storm)

~~Basin No.~~	~~Area (Acres)~~	~~CN~~	~~Tc (Min)~~	~~Q(50) (cfs)~~	~~Q(100) (cfs)~~	~~Outlet~~
~~8~~	~~9,649~~	~~73~~	~~99~~	~~9,762~~	~~12,330~~	~~Kulanihakoi Bridge~~
~~9~~	~~142~~	~~79~~	~~26~~	~~367~~	~~450~~	~~72-inch Culvert~~
~~10~~	~~7,314~~	~~73~~	~~96~~	~~7,547~~	~~9,532~~	~~Waipuilani Bridge~~

Basin No.	Area (Acres)	CN	Tc (Min)	Q(50) (cfs)	Q(100) (cfs)	Outlet
8	9,649	73	99	11,489	13,964	Kulanihakoi Bridge
9	142	79	26	367	450	72-inch Culvert
10	7,314	73	96	8,881	10,796	Waipuilani Bridge

5.5 DESIGN CRITERIA

The proposed drainage systems hydrologic criteria should be in accordance with County Standards with the exception of applying National Oceanic and Atmospheric Administration (NOAA) Atlas 14 Volume 4 Version 2.1 (2009) in lieu of Plates 2, 4 and 7 (Intensity Duration Curves and Rainfall Intensity Maps). Plates 2, 4 and 7 of the County Drainage Standards are based on the U.S. Department of Commence Technical Paper 43, Rainfall Frequency Atlas of the Hawaiian Islands (TP-43) published in 1962. The intensity-duration-frequency (IDF) curves and isopluvial (rainfall intensity) maps in NOAA Atlas 14 Volume 4 Version 2.1 was the result of interpolation of frequency estimates of a larger sample of rain stations with longer years of record than TP-43. Hence, NOAA Atlas 14 Volume 4 Version 2.1 portrays a more accurate representation of the rainfall intensity than the current County of Maui Drainage Standards.

The on-site drainage system should be designed for runoff determined by the rational method for 1-hour rainfall with return periods of 10 years or 50 years per the County of Maui Drainage Standards. The rational method is based on the drainage area, runoff coefficient (ground cover conditions), and the rainfall intensity for duration equal to the time of concentration. Since the project site is less than 100 acres and contain potential sumps, the 50-year return period should be used to calculate the on-site runoff.

During the design phase, the design-build team should review of the effects of the proposed school development on neighboring gulches, bridges and downstream properties (Basins 8 and 10 as described in Section 5.4). It should be noted that the offsite basins drainage area exceeds 100 acres, therefore, the National Resource Conservation Service (NRCS, formerly SCS) hydrograph method for 100-year return period based on 24-hour rainfall should be considered during the design phase. The NRCS hydrograph method uses watershed characteristics (drainage area, time of concentration, rainfall, SCS curve number of the landuse or soil group, and a SCS design storm based on geographic locale) to develop a runoff hydrograph.

Since the existing undeveloped site will be replaced with impervious surfaces, an on-site basin is necessary to regulate the increase in runoff into the existing 72-inch culvert under Piilani Highway. The basin should be designed in accordance with County Drainage Standards which stipulate that the storage volume of the basin shall be equal to at least the total additional runoff volume for a 50-year return period based on a 1-hour storm. Additionally, the design-build team could incorporate the current requirements of the United States Green Building Council (USGBC) in the basin design which may allow for possible Leadership in Excellence and Environmental Design (LEED) Site Sustainability credits.

In addition, the Maui County Public Works Engineering Division and R.M. Towill Corporation are preparing a drainage master plan for Kihei with a draft scheduled for release in 2012. During design, the design-build team should prepare a drainage report that that describes the project's overall drainage concept and incorporates the storm water management strategies in accordance with any recommendations of the forthcoming Kihei drainage master plan. The drainage report should include but not be limited to the following: analysis of existing conditions, storm water system sizing criteria, detention/retention analysis, flood analysis, drainage system plans, and hydraulic calculations. As part of the approval process for this project, the drainage report should be submitted to both the County of Maui and HDOT and include any additional criteria per the respective drainage standards.

5.6 PROPOSED CONCEPTUAL DRAINAGE PLAN

The proposed drainage system will consist of the following improvements:

- The off-site drainage improvements are intended to divert runoff generated above the proposed Kihei High School into the neighboring Waipuilani Gulch.
- Final drainage improvements will seek to minimize diversion of runoff into Kulanihakoi Gulch.
- The on-site drainage system should be designed to safely convey on-site runoff into the basin and prevent runoff entering Piilani Highway.
- The on-site basin should be designed to reduce post-development flow rates and quantity to below pre-development levels.
- The 7-acre parcel formed by the extension of Kulanihakoi Street will remain vacant; there will not be any drainage improvements constructed within the parcel at this time.

5.6.1 OFF-SITE DRAINAGE CONCEPT

The proposed school site occupies portions of Basins 8, 9, and 10 as described above. The majority of the school site is situated within the lower portion of Basin 9. The runoff from the remainder upper portion of Basin 9 and portions of Basin 10 will be intercepted by a proposed ditch constructed along the Kihei High School upper boundary and diverted into Waipuilani Gulch (refer to Figures 9 and 10). The proposed ditch should be designed in accordance with County Drainage Standards with appropriate freeboard and velocity dissipation. Based on the

conceptual site plan, it is anticipated that the ditch will be a 5-foot wide reinforced concrete channel with an approximate wall height of 8 feet; however, other materials are available such as prefabricated high density polypropylene (HDPE) channels which may be more cost effective. Final design and dimensioning of the ditch and adjacent maintenance access road will be determined by the design-build team.

Before the ditch is designed, it is likely that the DOE will need to obtain permission and easements from Haleakala Ranch to grade and construct the ditch in their property. If DOE cannot obtain permission, the runoff from the upper portion of Basin 9 must be conveyed through the proposed Kihei High School site. The result would increase construction cost due to larger and more extensive on-site drainage infrastructure.

The effects of the additional flow into Waipuilani Gulch are quantified in Table 5.2 and Appendix C using the computer program Hydroflow Hydrographs Extension by Autodesk. In summary, the increase in off-site runoff will be less than 1% after the school is constructed:

Increase in area = 7,379 – 7,314 Acres
= 65 Acres (< 1%)

~~Increase in Q_{50} = 7,571 – 7,547 CFS~~
~~= 24 CFS (< 1%)~~

Increase in Q_{50} = 8,902 – 8,881 CFS
= 21 CFS (< 1%)

~~Increase in Q_{100} = 9,561 – 9,532 CFS~~
~~= 29 CFS (< 1%)~~

Increase in Q_{100} = 10,822 – 10,796 CFS
= 26 CFS (< 1%)

Table 5.2 – Preliminary Analysis of Waipuilani Gulch (NRCS Hydrograph Method based on 24-hour Storm)

~~Basin Description~~	~~Area (Acres)~~	~~CN~~	~~Tc (min)~~	~~Q_{50} (CFS)~~	~~Q_{100} (CFS)~~
~~1. Post-Development Flows Above School Site~~	~~85~~	~~79~~	~~19~~	~~256~~	~~314~~
~~2. Post-Development Flows Entering Waipuilani Gulch~~	~~7,294~~	~~73~~	~~96~~	~~7,527~~	~~9,506~~
~~3. Post-Development Flows Entering Waipuilani Bridge~~	~~7,379~~	~~N/A~~	~~N/A~~	~~7,571~~	~~9,561~~
~~4. Pre-Development Flows Entering Waipuilani Bridge~~	~~7,314~~	~~73~~	~~96~~	~~7,547~~	~~9,532~~

Basin Description	Area (Acres)	CN	Tc (min)	Q_{50} (CFS)	Q_{100} (CFS)
1. Post-Development Flows Above School Site	85	79	19	256	314
2. Post-Development Flows Entering Waipuilani Gulch	7,294	73	96	8,856	10,766
3. Post-Development Flows Entering Waipuilani Bridge	7,379	N/A	N/A	8,902	10,822
4. Pre-Development Flows Entering Waipuilani Bridge	7,314	73	96	8,881	10,796

5.6.2 ON-SITE DRAINAGE CONCEPT

On-site storm water runoff will sheet flow or be directed by grassed swales/gutters into drain inlets and pipes. Due to on-site sumps, the underground drainage system should be sized to

convey the 50-year runoff quantities with a 1-foot freeboard allowance. The underground drainage system should drain into a detention basin before entering the existing 72-inch culvert under Piilani Highway (refer to Figure 10 for a conceptual drainage plan and Appendix A for preliminary cost estimates). On-site grading of the proposed Kihei High School site near Piilani Highway should direct runoff into on-site inlets and/or the detention basin. It is likely that the HDOT will not allow any additional runoff on to Piilani Highway.

5.6.3 ON-SITE BASIN CONCEPT

Based on the conceptual campus site plan, a possible location for the basin is the lower end of the property adjacent to Piilani Highway (refer to Figures 2 and 10). The final basin location, geometry and dimensions will be determined by the design-build team. It should be noted that the on-site basin will be designed to meet County Standards. Discharge into existing 72-inch diameter culvert must be regulated and controlled and the basin must be sized to handle the total additional runoff volume or more. As mentioned in Section 5.5 – Design Criteria, the basin could be designed to satisfy LEED Site Sustainability Credit requirements. The conceptual basin geometry and sizing are as follows:

- 90 feet wide/480 feet long
- 10-foot overall depth
- 3-feet of permanent storage volume below outlet pipe
- Side slopes at 3H:1V
- Minimum 10-foot overflow weir crest length
- Weir crest above 100-year water surface elevation
- 12-foot wide access road

A preliminary hydrologic and hydraulic analysis of the basin based on the above dimensions may be found in Appendices D and E. A summary of the results are shown in Tables 5.3 and 5.4 below; approximate water surface and invert elevations are depicted in Figure 11.

Table 5.3 – Preliminary Basin Analysis for 24-hour Storms at 1-, 2- and 50-year (NRCS Hydrograph Method based on 24-hour Storm)

School Site Condition	CN	Tc (min)	Q_1 (CFS)	$Volume_1$ (CF)	Q_2 (CFS)	$Volume_2$ (CF)	Q_{50} (CFS)
Existing Condition	79	13.5	20	150,428	47	294,327	248
Developed Condition Flow Entering Basin	86	23	35	252,362	64	436,632	251
Flow Leaving Basin	N/A	N/A	3	107,021	10	291,292	129

Table 5.4 – Preliminary Basin Storage Volume Estimation (NRCS Hydrograph Method based on 50-year 1-hour Storm)

School Site Condition	CN	Tc (min)	Q_{50} (CFS)	Volume (CF)
Existing Condition	79	13.5	104	183,792
Developed Condition Flow Entering Basin	86	23	143	296,599
Required Storage, Δ				112,807
Approximate Available Storage (3-foot Depth)				145,314

The preliminary analysis demonstrates that LEED Site Sustainability Credit can be satisfied, based on the approximate basin geometry, since the 1- and 2-year/24-hour post-development

flows will not exceed existing flows. Pursuant to the County Drainage Standards, the geometry could also provide ~~and~~ that the additional runoff volume generated by the ~~2-year~~ 50-year/1-hour storm can be adequately retained in the bottom 3 feet of the basin.

5.7 BEST MANAGEMENT PRACTICES (BMPs)

The inland waters near the property are designated as Class 2 by the State of Hawaii Department of Health (DOH) and are not listed in the Clean Water Act §303(d) list (impaired waters bodies that do not meet State Water Quality Standards). According to DOH Water Quality Standards, "The objective of Class 2 waters is to protect their use for recreational purposes, the support and propagation of aquatic life, agricultural and industrial water supplies, shipping, and navigation" (HAR §11-54-03(b)(2)). Discharges into Class 2 inland waters qualifies for coverage under National Pollutant Discharge Elimination System (NPDES) General Permit which calls for the application of permanent and construction Best Management Practices (BMPs).

Best Management Practices (BMPs) are pollution control measures, applied to nonpoint sources, on-site or off-site, to control erosion and the transport of sediments and other pollutants which have an adverse impact on waters of the state. Construction BMPs are temporary measures installed before construction commences and removed once the site has been stabilized and permanent BMPs are in place. Potential construction BMPs include, but are not limited to gravel entrance, dust screen, silt fence, retention basins, diversion berm/ditches, and grading procedures that conform to Maui County Code Chapter 20.08 – Soil Erosion and Sediment Control.

Unlike construction BMPs, permanent BMPs are designed to remain part of the project features after the site grading operation is completed. The permanent BMPs are intended to reduce storm water pollution typically associated with the increased impervious surfaces. Examples of permanent BMPs include gravity separators before each outlet, grass swales, infiltration trenches, vegetative filter strips, maximize open space, and the use of on-site soil general or yard fill. Permanent BMPs may also qualify for LEED credit if they meet the criteria in Site Sustainability Credit 6.2 – Storm water Design – Quality Control. According to the HDOT's Stormwater Permanent Best Management Practices Manual, permanent BMPs criteria applies "…..to projects outside of HDOT Highways provided that the project produces storm water runoff from its site and drains to the HDOT Highways MS4, either by a physical connection or surface runoff" (State of Hawaii, Department of Transportation 2007). The proposed Kihei High School conceptual site plan could involve discharge in to the existing HDOT drainage system under Piilani Highway (the existing 72-inch culvert and Waipuilani Bridge), therefore the design-build team should provide permanent BMP plans, design report, and other required information to HDOT for review and approval.

In addition, DWS recommends the following BMPs to protect underlying the Kamole Aquifer (Munekiyo and Haraga, 2008):

- Prevent cement products, oil, fuel and other toxic substances from falling or leaching into the water.
- Properly and promptly dispose of all loosened and excavated soil and debris material from drainage structure work.
- Retain ground cover until the last possible date.
- Stabilize denuded areas by sodding or planting as soon as possible. Replanting should include soil amendments and temporary irrigation. Use high seeding rates to ensure rapid stand establishment.

- Avoid fertilizers and biocides, or apply only during periods of low rainfall to minimize chemical runoff.
- Keep run-off on-site.
- Use brackish or reclaimed water for irrigation and dust control during construction where available.

Increase in runoff rates resulting from the development will be mitigated by the proposed retention/detention basin and the implementation of Best Management Practices. As a result, the proposed project should not an adversely impact nearshore waters.

Chapter 6 – POTENTIAL APPROVALS AND PERMITS

6.1 OVERVIEW

This section outlines potential approvals and permits that may be applicable to the civil work on the conceptual site plan. This section does not include approvals and permits required by other disciplines (electrical, environmental review process, historic preservation, land use, etc.) as they will be addressed by others. It should be noted that additional approvals and permits maybe required depending on the final layout by the design-build team.

6.2 FEDERAL

- Department of the Army
  - Section 404 of the Clean Water Act Permit for the discharge of dredged or fill material in the waters of the United States associated with work within Waipuilani Gulch.

6.3 STATE OF HAWAII

- State Department of Health
  - Air pollution Control permit.
  - Community Noise Permit for Construction Activities.
  - Disability and Communication Access Board review for compliance with Hawaii Revised Statutes §103-50.
  - National Pollutant Discharge Elimination System (NPDES) General Permit Coverage for discharges of storm water associated with construction activities into State Waters.
  - NPDES General Permit Coverage for discharge of water system hydrotesting into State Waters.
  - Section 401 of the Clean Water Act to certify that discharges authorized by the Section 404 permit will not violate the state's water quality standards.

- State Department of Land and Natural Resources Commission on Water Resource Management
  - Stream Channel Alteration Permit for the construction of a ditch and outlet within Waipuilani Gulch.
  - Pump Installation Permit for the installation of brackish well pumps.
  - Well Construction Permit for the installation of brackish wells for landscaping.
  - Well Completion Report
  - Well Abandoning/Sealing Report

- State Department of Transportation Highways Division
  - Construction Plan Review for conformance with the State Highway standards.
  - Permit to perform work within a State Right-of Way.
  - Discharge Permit for work that will generate construction runoff into the State Highway drainage system.
  - Drainage report review to address the impacts to changes in flow patterns and quantity to the State Highways system.
  - Permit for Connection to the State Highways Drainage System.
  - Permit to Transport of Oversize and Overweight Vehicle on State Highways.

6.4 COUNTY OF MAUI

- Department of Environmental Management
  - Construction Plan Review for conformance with County wastewater standards.
  - Wastewater Permit for connection to the County wastewater system.

- Department of Fire and Public Safety
  - Construction Plan Review for conformance with County fire standards.
  - Fire Protection Permit for water mains for fire protection and fire hydrants.

- Department of Public Works
  - Building Permit for site work.
  - Construction Plan Review for conformance with County standards.
  - Drainage report review to address the impacts to changes in flow patterns and quantity to downstream/neighboring properties and any County drainage system.
  - Grading Permit for excavation, embankment, and temporary storage of soil.
  - Grubbing Permit for the removal of vegetation.
  - Moving Permit for the transport of oversized and or overweight vehicles on County roads.
  - Permit to Perform Work on a County highway for trenching and utility installation on County owned roads.

- Department of Water Supply
  - Approval to connect to the County water system.
  - Construction Plan Review for conformance with the County water system standards.

6.5 OTHER PERMITS AND APPROVALS

- Kaonoulu Ranch LLP and Haleakala Ranch Company
  - Right-of-entry.
  - Permission to grade within ranch property.
  - Permission to construct improvements within ranch property.

- Utility Company approvals.

- Various easements.

Chapter 7 – REFERENCES

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Storm Water Hawaii
http://stormwaterhawaii.com/

State of Hawaii: National Flood Insurance Program
Flood Hazard Assessment Tool
http://gis.hawaiinfip.org/fhat/

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Soil Data Mart
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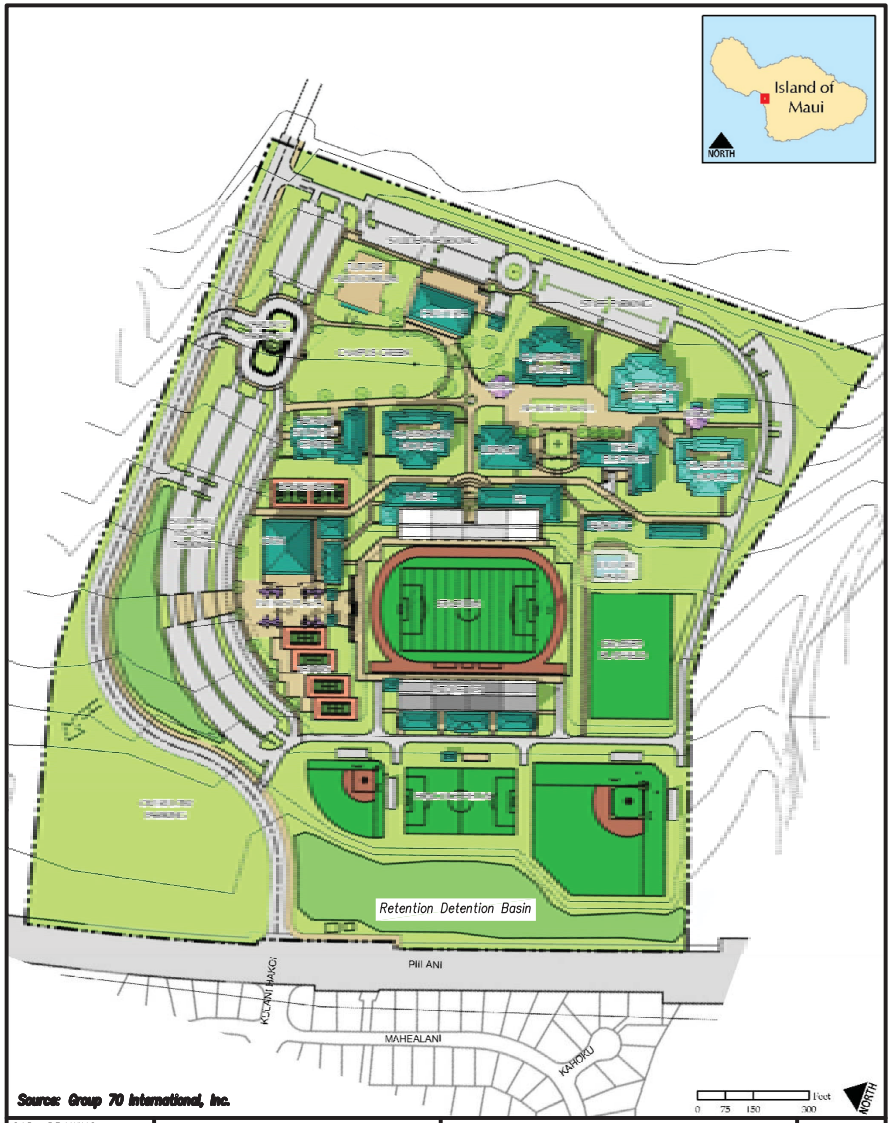
U.S. Federal Emergency Management Agency
FEMA Map Service Center
http://msc.fema.gov/

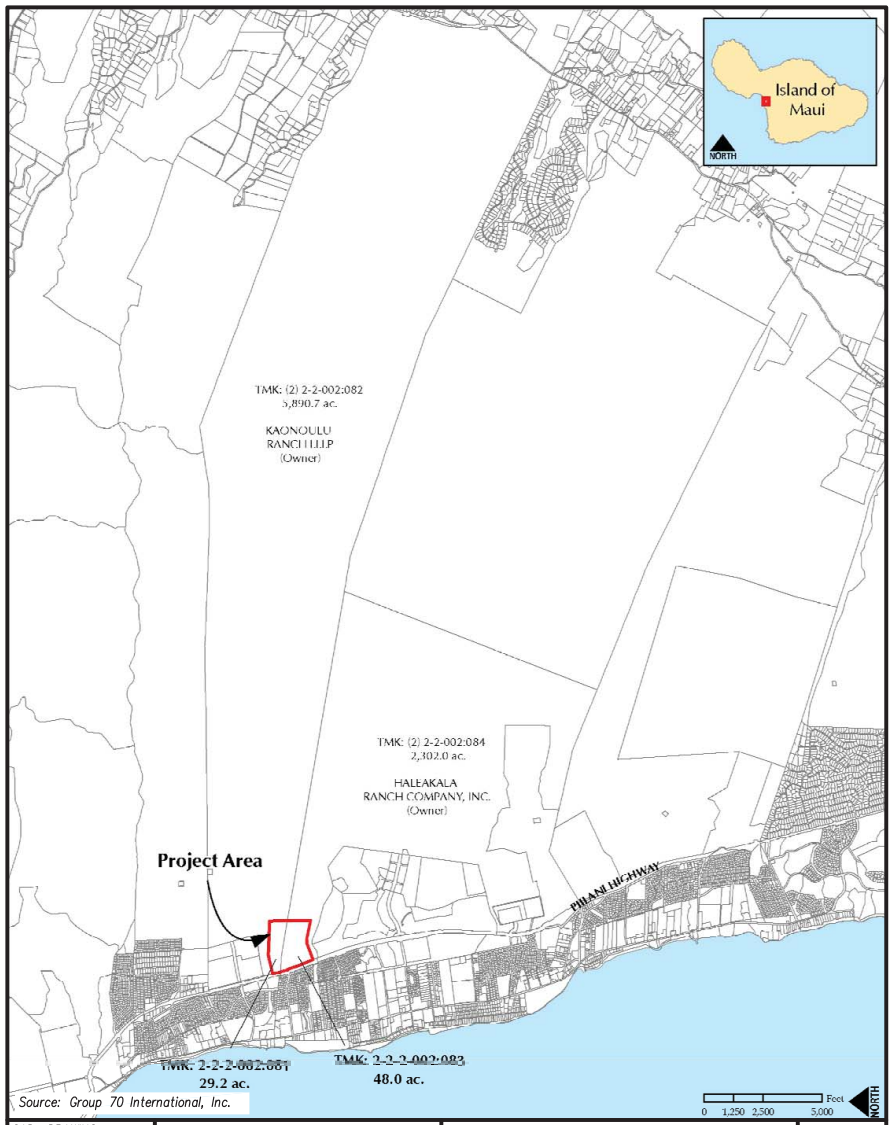
U.S. National Oceanic and Atmospheric Administration, National Weather Service
HDSC Precipitation Frequency Data Server
http://hdsc.nws.noaa.gov/hdsc/pfds/hi/hi_pfds.html

LIST OF FIGURES

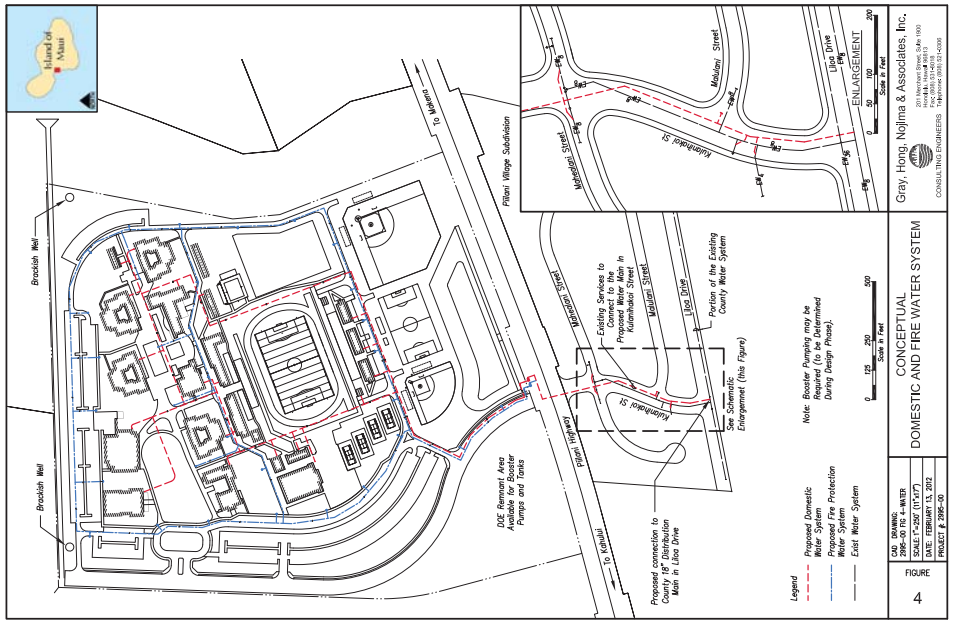
CAD DRAWING: 2995-00 FIG 1-LOC DATE: AUGUST 31, 2011 SCALE: AS SHOWN PROJECT #: 2995-00	LOCATION MAP	Gray, Hong, Nojima & Associates, Inc. CONSULTING ENGINEERS 201 Merchant Street, Suite 1900 Honolulu, Hawaii 96813 Fax: (808) 531-8018 Telephone: (808) 521-0306	FIGURE 1

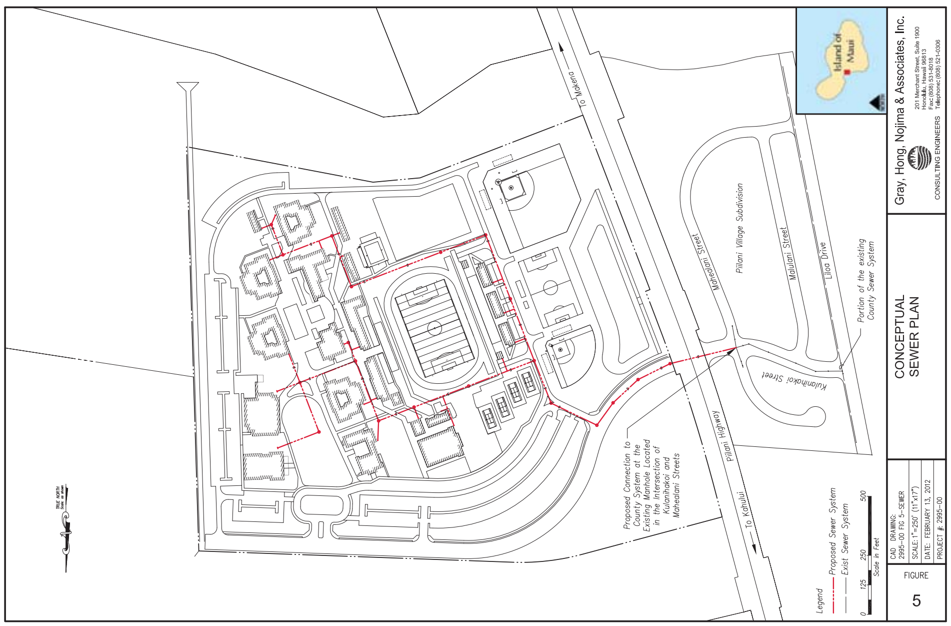


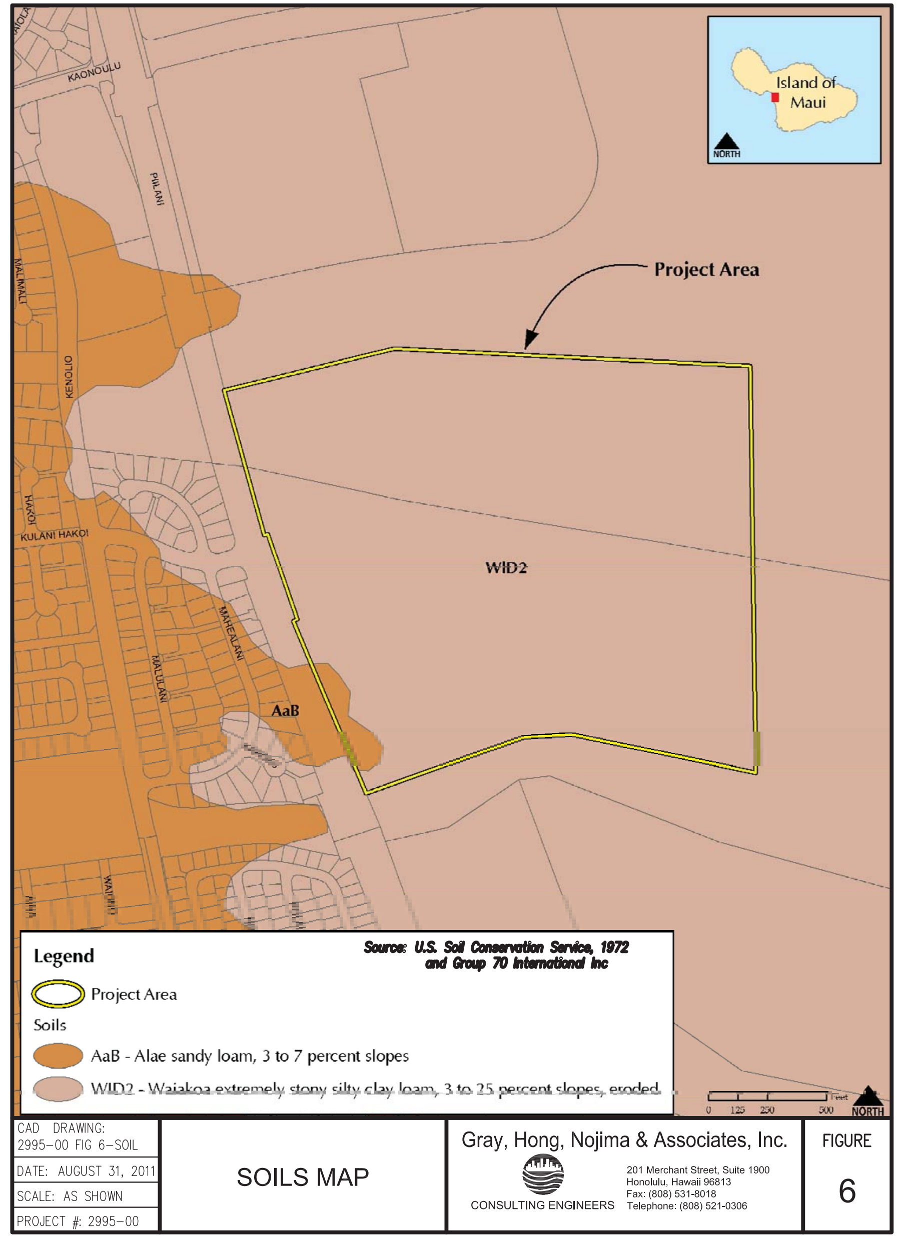
CAD DRAWING: 2995-00 FIG 2-SITE DATE: FEB 13, 2012 SCALE: AS SHOWN PROJECT #: 2995-00	PROPOSED CAMPUS SITE PLAN	Gray, Hong, Nojima & Associates, Inc. CONSULTING ENGINEERS 201 Merchant Street, Suite 1900 Honolulu, Hawaii 96813 Fax: (808) 531-8018 Telephone: (808) 521-0306	FIGURE 2

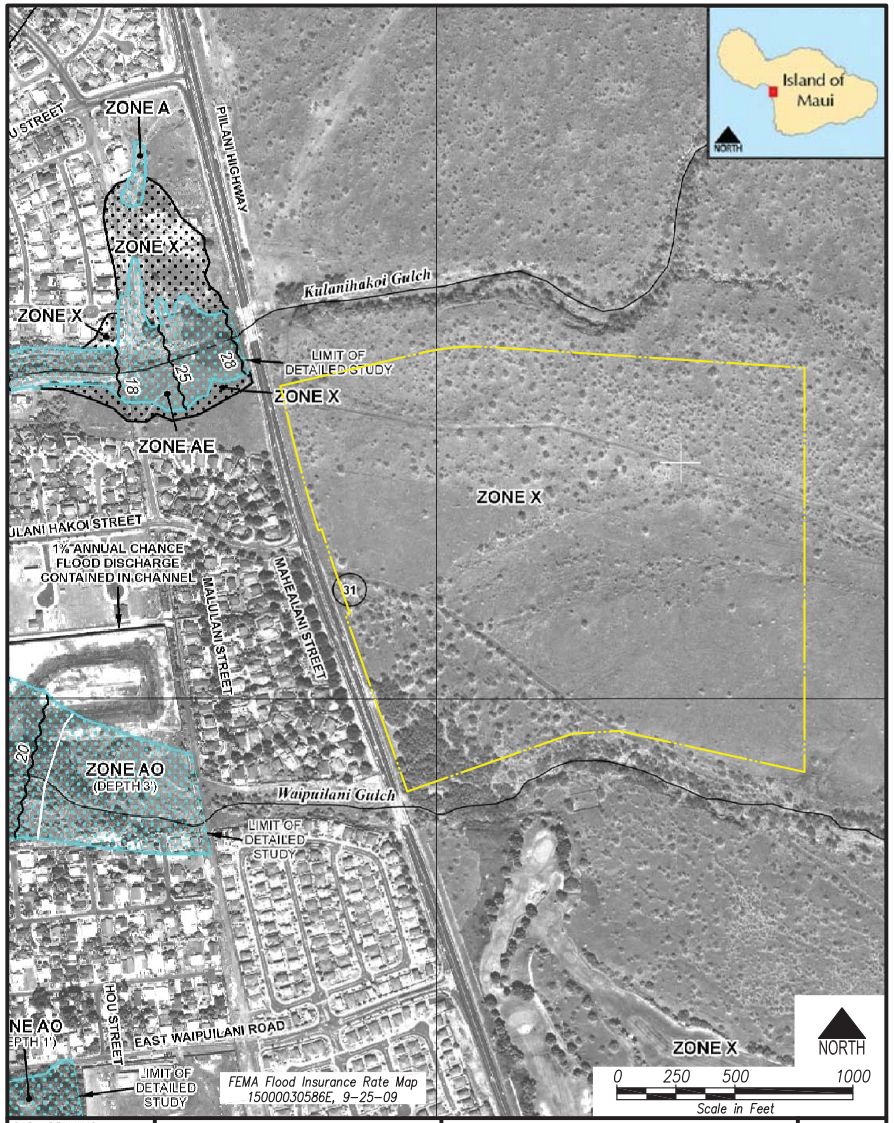


CAD DRAWING: 2995-00 FIG 3-TMK DATE: SEPT 9, 2011 SCALE: AS SHOWN PROJECT #: 2995-00	TAX MAP KEY	Gray, Hong, Nojima & Associates, Inc. CONSULTING ENGINEERS 201 Merchant Street, Suite 1900 Honolulu, Hawaii 96813 Fax: (808) 531-8018 Telephone: (808) 521-0306	FIGURE 3




Island of Maui
To Makena
Mahealani Street
Piilani Village Subdivision
Malulani Street
Liloa Drive
Portion of the existing County Sewer System
Kulanihakoi Street
Piilani Highway
To Kahului
Proposed Connection to County System at the Existing Manhole Located in the Intersection of Kulanihakoi and Mahealani Streets
Legend
Proposed Sewer System
Exist Sewer System
0 125 250 500
Scale in Feet
Gray, Hong, Nojima & Associates, Inc.
CONSULTING ENGINEERS
CONCEPTUAL SEWER PLAN
CAD DRAWING: 2995-00 FIG 5-SEWER
SCALE: 1"=250' (11"x17")
DATE: FEBRUARY 13, 2012
PROJECT #: 2995-00
FIGURE
5


Island of Maui
NORTH
KAONOULU
PIILANI
MALIMALI
KENOLIO
HAKOI
KULANI HAKOI
MAHEALANI
MALULANI
WAIOHULI
AIHA
Project Area
WID2
AaB
Legend
Source: U.S. Soil Conservation Service, 1972 and Group 70 International Inc
Project Area
Soils
AaB - Alae sandy loam, 3 to 7 percent slopes
WID2 - Waiakoa extremely stony silty clay loam, 3 to 25 percent slopes, eroded
0 125 250 500 Feet
NORTH
CAD DRAWING: 2995-00 FIG 6-SOIL
DATE: AUGUST 31, 2011
SCALE: AS SHOWN
PROJECT #: 2995-00
SOILS MAP
Gray, Hong, Nojima & Associates, Inc.
CONSULTING ENGINEERS
201 Merchant Street, Suite 1900
Honolulu, Hawaii 96813
Fax: (808) 531-8018
Telephone: (808) 521-0306
FIGURE
6



CAD DRAWING: 2995-00 FIG 7-FLOOD DATE: FEB 24, 2012 SCALE: AS SHOWN PROJECT #: 2995-00	FLOOD MAP	Gray, Hong, Nojima & Associates, Inc. CONSULTING ENGINEERS 201 Merchant Street, Suite 1900 Honolulu, Hawaii 96813 Fax: (808) 531-8018 Telephone: (808) 521-0306	FIGURE 7

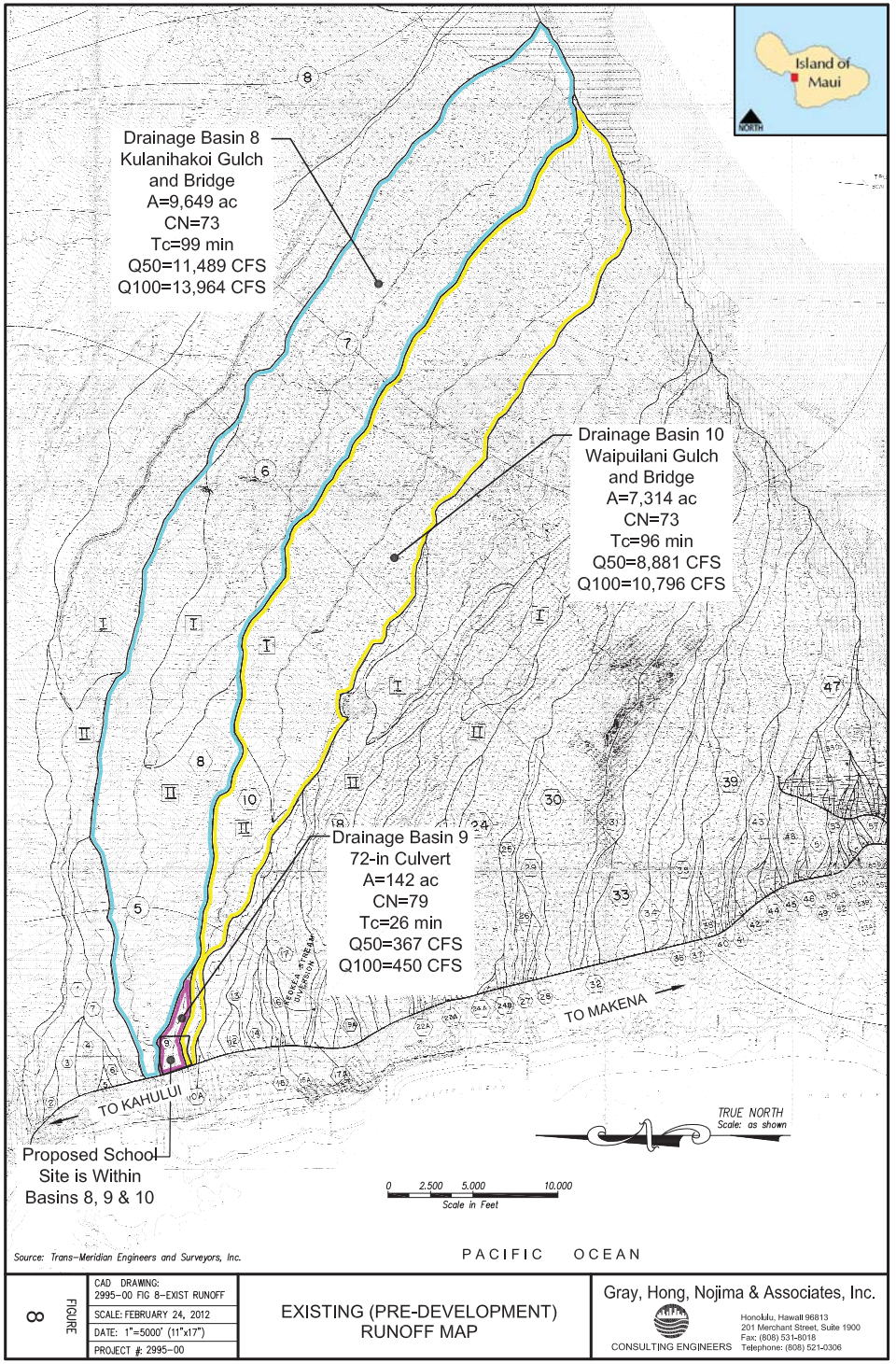


FIGURE 8	CAD DRAWING: 2995-00 FIG 8-EXIST RUNOFF SCALE: FEBRUARY 24, 2012 DATE: 1"=5000' (11"x17") PROJECT #: 2995-00	EXISTING (PRE-DEVELOPMENT) RUNOFF MAP	Gray, Hong, Nojima & Associates, Inc. CONSULTING ENGINEERS Honolulu, Hawaii 96813 201 Merchant Street, Suite 1900 Fax: (808) 531-8016 Telephone: (808) 521-0306

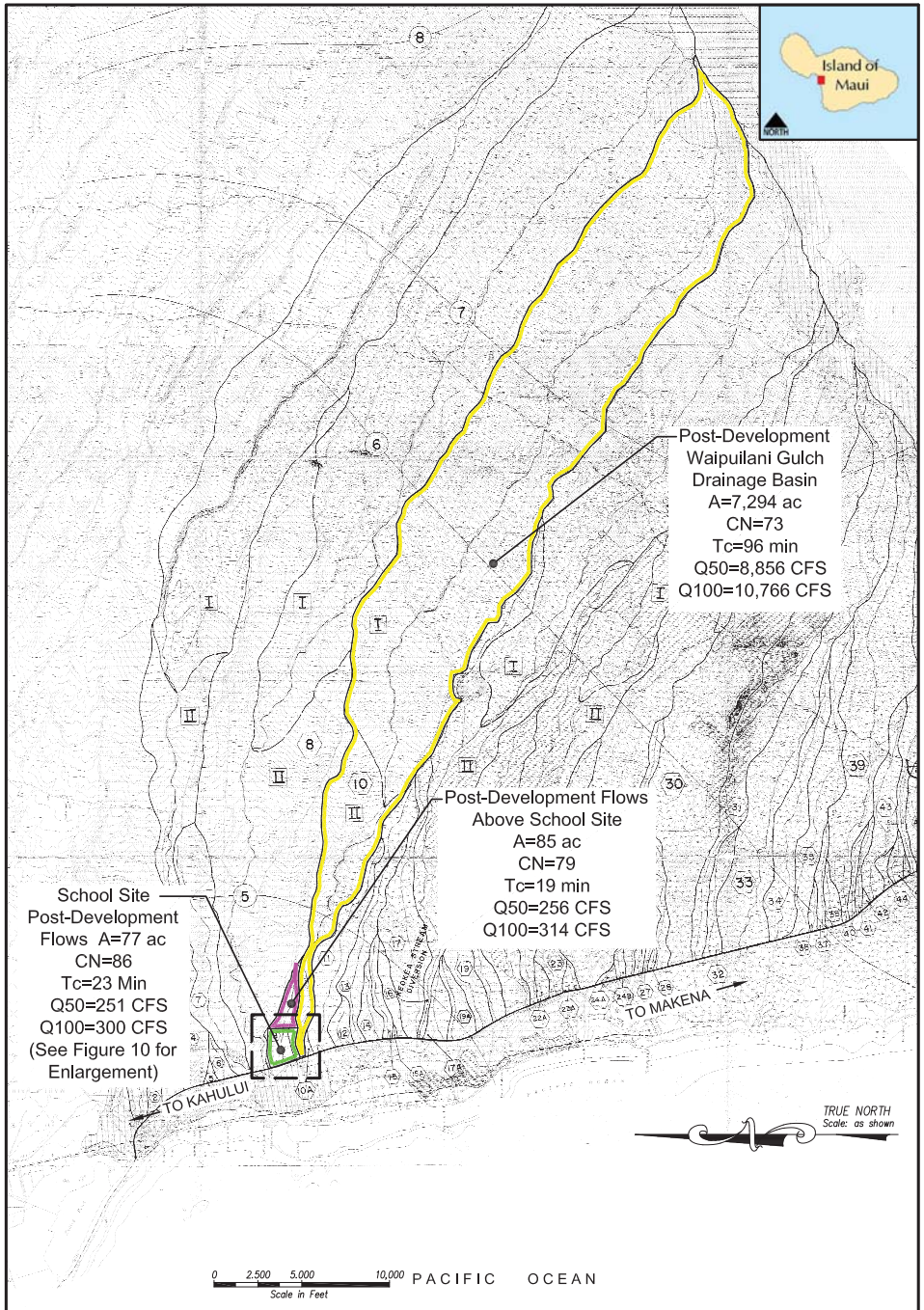


FIGURE 9	CAD DRAWING: 2995-00 FIG 9-DEV RUNOFF SCALE: FEBRUARY 24, 2012 DATE: 1"=5000' (11"x17") PROJECT #: 2995-00	POST-DEVELOPMENT RUNOFF AREA	Gray, Hong, Nojima & Associates, Inc. CONSULTING ENGINEERS Honolulu, Hawaii 96813 201 Merchant Street, Suite 1900 Fax: (808) 531-8018 Telephone: (808) 521-0306

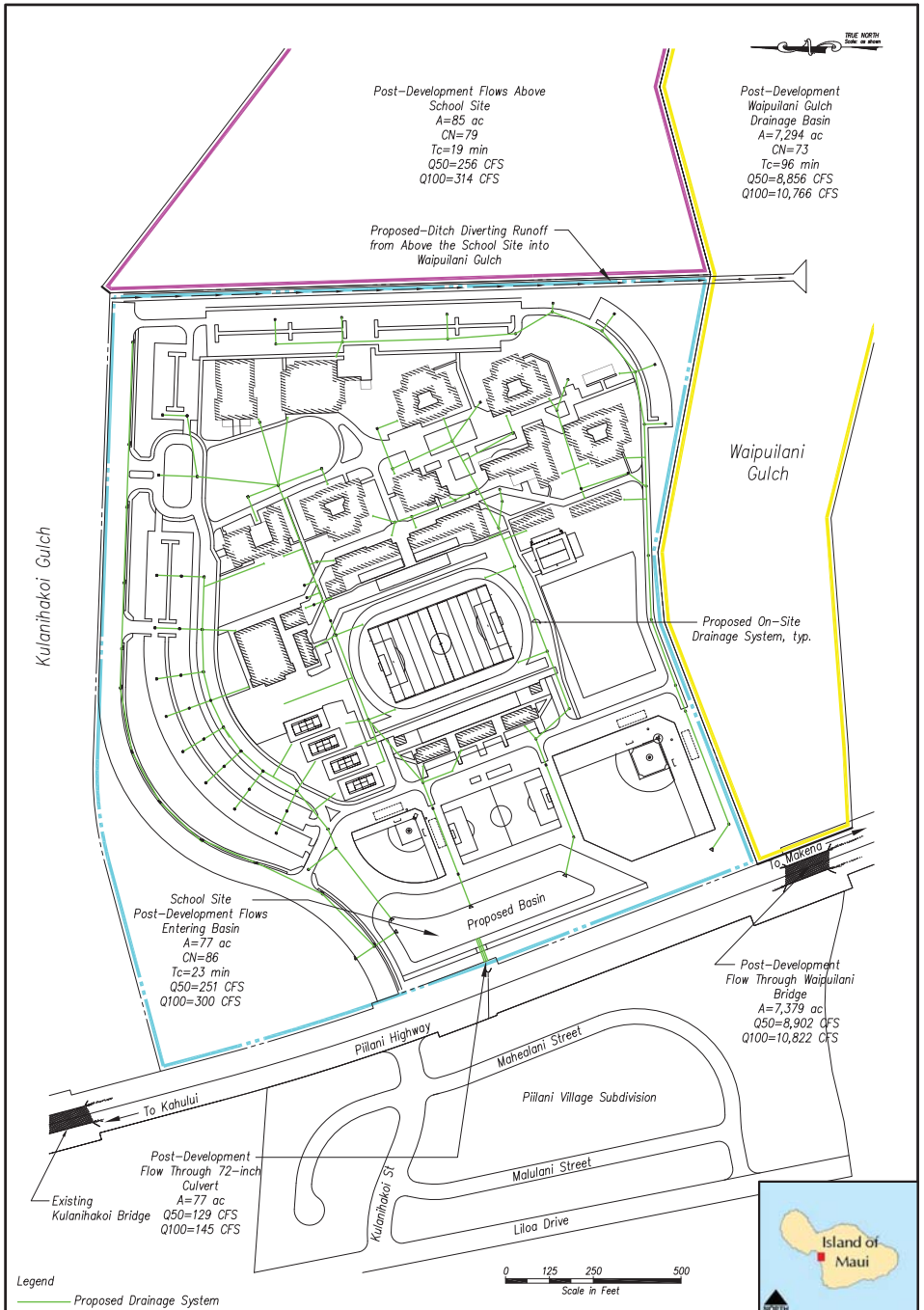
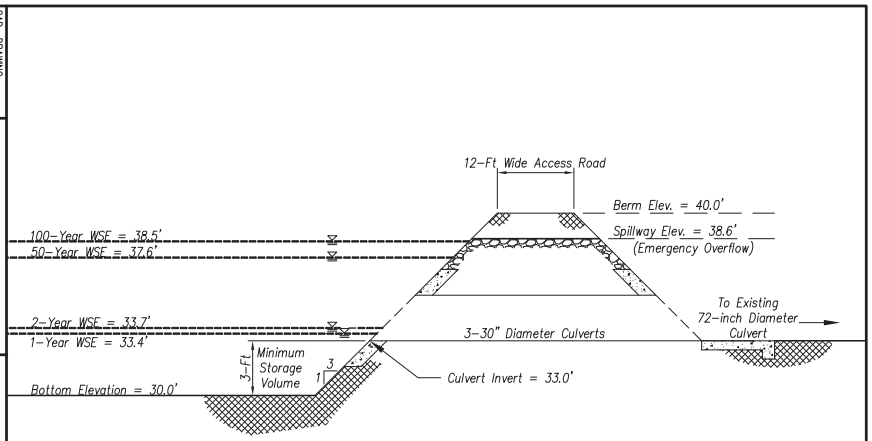


FIGURE 10	CAD DRAWING: 2995-00 FIG 10-DRAIN SCALE: 1'=250' (11"x17") DATE: FEBRUARY 24, 2012 PROJECT #: 2995-00	CONCEPTUAL DRAINAGE PLAN	Gray, Hong, Nojima & Associates, Inc. CONSULTING ENGINEERS 201 Merchant Street, Suite 1900 Honolulu, Hawaii 96813 Fax: (808) 531-8018 Telephone: (808) 521-0306



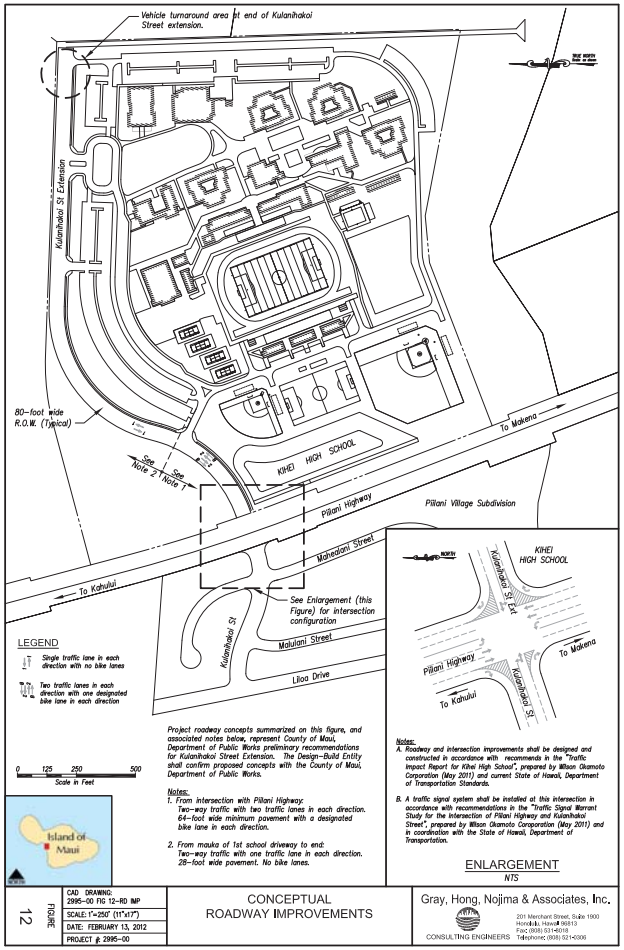
NOTES:
1. Approximate Basin Dimensions are 90-Ft Wide by 480-Ft Long by 10-Ft Deep
2. Basin Side Slope is 3H:1V
3. 3-Ft Minimum Storage Volume for Compliance with LEED and County Storage Requirements.
4. WSE=Water Surface Elevation (Based on 24-Hour Storm Duration).
5. Minimum Spillway (Crest) Length=10'

CONCEPTUAL
RETENTION/DETENTION
BASIN ELEVATIONS

CAD DRAWING: 2995-00 FIG 11-BASIN
DATE: FEB 10, 2012
SCALE: NOT TO SCALE
PROJECT #: 2995-00

Gray, Hong, Nojima & Associates, Inc.
CONSULTING ENGINEERS
201 Merchant Street, Suite 1900
Honolulu, Hawaii 96813
Fax: (808) 531-4818
Telephone: (808) 521-4300

FIGURE 11



ENLARGEMENT
NTS

FIGURE 12

CAD DRAWING: 2995-00 FIG 12-RD IMP
SCALE: 1"=250' (11"x17")
DATE: FEBRUARY 13, 2012
PROJECT #: 2995-00

CONCEPTUAL
ROADWAY IMPROVEMENTS

Gray, Hong, Nojima & Associates, Inc.
CONSULTING ENGINEERS
201 Merchant Street, Suite 1900
Honolulu, Hawaii 96813
Fax: (808) 531-4818
Telephone: (808) 521-4300

APPENDICES

Kihei High School – Preliminary Engineering Report

APPENDIX A

Conceptual Construction Costs

Gray • Hong • Nojima & Associates, Inc. APPENDICES

APPENDIX B

Preliminary Analysis of Existing Basins

KIHEI HIGH SCHOOL **10/31/11**
Kihei, Maui, Hawaii

CONCEPTUAL CONSTRUCTION COSTS

Item	Description	Quantity	Unit	Unit Price	Total
	ON-SITE				
1	Clearing	**71**	ACS	$11,000	**$781,000**
2	Erosion and Dust Control	**71**	ACS	$27,500	**$1,952,500**
3	Excavation	**250,000**	CY	$15	**$3,750,000**
4	Embankment	**330,000**	CY	$15	**$4,950,000**
5	Concrete Walkways	**399,100**	SF	$12	**$4,789,200**
6	AC Pavement	**61,200**	SY	$50	**$3,060,000**
7	Curb/Gutter	**4,700**	LF	$30	**$141,000**
8	On-site Driveway Curb	**20,900**	LF	$15	**$313,500**
	Sewer System				
9	Sewer Main	**4,200**	LF	$110	**$462,000**
10	Sewer Lateral	**1,520**	LF	$110	**$167,200**
11	Manhole	**20**	EA	$7,700	**$154,000**
12	Cleanouts	**22**	EA	$800	**$17,600**
	Drainage System				
13	Drainlines	**12,700**	LF	$160	**$2,032,000**
14	Drain Laterals	**3,800**	LF	$80	**$304,000**
15	Catch Basins	**13**	EA	$12,100	**$157,300**
16	Drain Inlets	**120**	EA	$6,600	**$792,000**
17	Area Drains	**9**	EA	$820	**$7,380**
18	Detention Pond Outlets	**6**	EA	$24,200	**$145,200**
19	Detention Pond Culvert	**240**	LF	$380	**$91,200**
20	Detention Pond Weir/Spillway	**1**	LS	$33,000	**$33,000**
	Water System				
21	Domestic Water Main	**4,500**	LF	$100	**$450,000**
22	Domestic Water Lateral	**1,800**	LF	$100	**$180,000**
23	Domestic Water Meter Box	**1**	EA	$11,000	**$15,000**
24	Domestic Water Backflow Preventer	**1**	EA	$11,000	**$15,000**
25	Fire Protection Water Main	**9,000**	LF	$120	**$1,080,000**
26	Fire Hydrant	**34**	EA	$4,400	**$149,600**
27	Fire Protection Double Check Detector	**1**	EA	$33,000	**$33,000**
28	Fire Protection System Pumps & Controls	**2**	EA	$120,000	**$240,000**
29	Fire Protection Storage Tank	**1**	EA	$400,000	**$400,000**
30	Domestic Water System Pump & Controls	**2**	EA	$50,000	**$100,000**
31	Domestic Water Storage Tank	**1**	EA	$250,000	**$250,000**
	Non-Potable Well Development				
32	Drilling and Testing	**2**	EA	$160,000	**$320,000**
33	Pump and Controls	**2**	EA	$160,000	**$320,000**
				Subtotal	**$27,652,680**
	OFF-SITE				
34	Concrete Channel and Outlet	**2,000**	LF	$660	**$1,320,000**
35	Domestic Water Main	**3,000**	LF	$100	**$300,000**
36	Sewer Main	**300**	LF	$110	**$33,000**
37	Underground Electrical	**300**	LF	$330	**$99,000**
38	Highway Improvements	**1**	LF	$2,090,000	**$2,090,000**
39	Additional offsite development	**1**	LS	$27,500	**$27,500**
				Subtotal	**$3,869,500**
				Total	**$31,522,180**
					$32 M

Assumptions/Exclusions

1 - The scope of work for the off-site improvements items 34-39 is unknown at this time, therefore, unit cost and quantities to be determined during design-build process.

2 - Potable water system improvements for source, storage and transmission are not required. Off-site improvements limited to installation of waterline as shown on item 35.

3 - Nonpotable brackish water system improvements are limited to well development/installation. Irrigation distribution system not included.

4 - Construction cost estimates for off-site drainage improvements are limited to concrete channel and outlet.

5 - Construction cost estimates for the proposed heat rejection system including source, storage and distribution are not included.

6 - The scope of work for improvements to the 7.7 acre overflow lot (parcel) is unknown, therefore, construction cost estimates have not been included.

7 - On-site improvements for security requirements (e.g. fencing) are not included.

8 - Costs for site electrical/communications are not included.

9 - Costs for landscaping and irrigation are not included.

10 - Kulanihakoi Street/Piilani Highway Intersection improvements limited to curb, gutter and sidewalk on one side. Traffic signalization and Piilani Highway Improvements are not included.

11 - Onsite roadways assumed to have curb (no gutter).

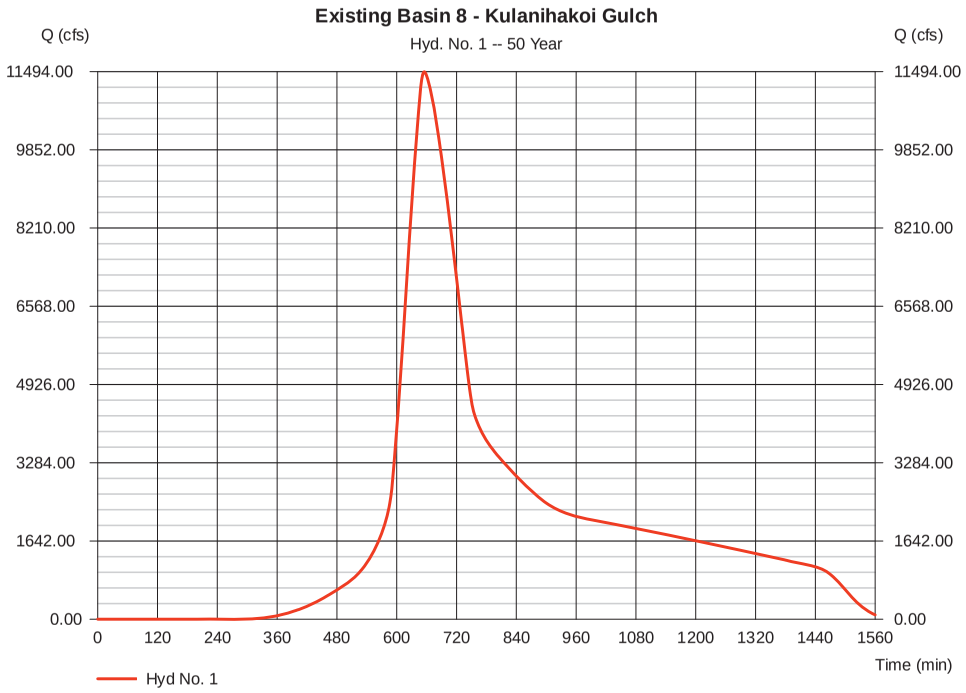
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 — Friday, Feb 24, 2012

Hyd. No. 1

Existing Basin 8 - Kulanihakoi Gulch

Hydrograph type	= SCS Runoff	Peak discharge	= 11488.77 cfs
Storm frequency	= 50 yrs	Time to peak	= 656 min
Time interval	= 2 min	Hyd. volume	= 176,880,900 cuft
Drainage area	= 9649.180 ac	Curve number	= 73
Basin Slope	= 12.5 %	Hydraulic length	= 75200 ft
Tc method	= KIRPICH	Time of conc. (Tc)	= 98.74 min
Total precip.	= 8.27 in	Distribution	= Type I
Storm duration	= 24 hrs	Shape factor	= 484



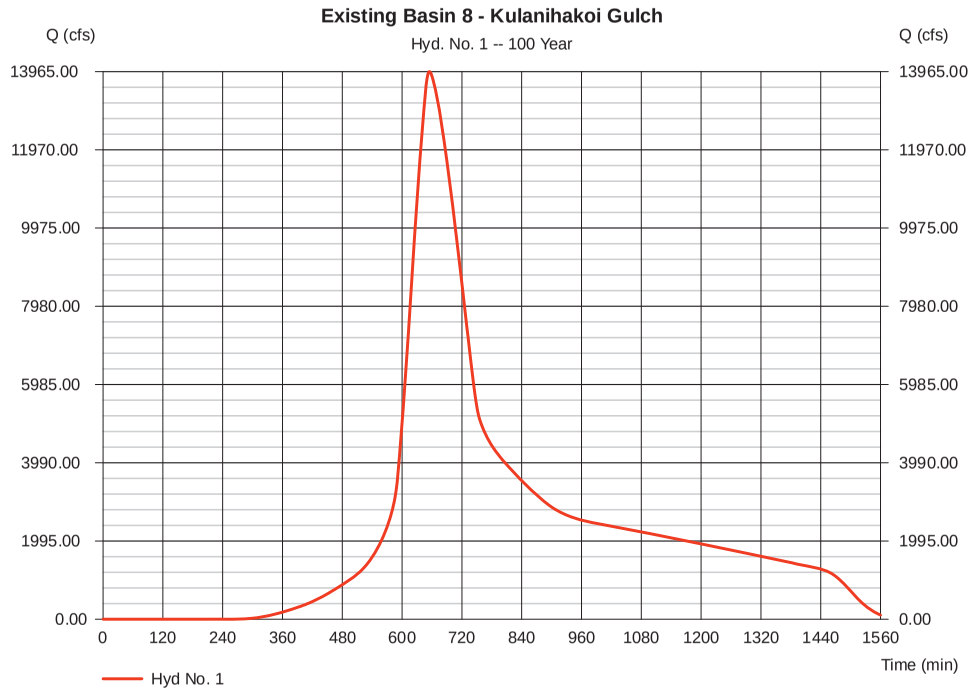
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 — Friday, Feb 24, 2012

Hyd. No. 1

Existing Basin 8 - Kulanihakoi Gulch

Hydrograph type	= SCS Runoff	Peak discharge	= 13964.40 cfs
Storm frequency	= 100 yrs	Time to peak	= 654 min
Time interval	= 2 min	Hyd. volume	= 212,878,200 cuft
Drainage area	= 9649.180 ac	Curve number	= 73
Basin Slope	= 12.5 %	Hydraulic length	= 75200 ft
Tc method	= KIRPICH	Time of conc. (Tc)	= 98.74 min
Total precip.	= 9.41 in	Distribution	= Type I
Storm duration	= 24 hrs	Shape factor	= 484



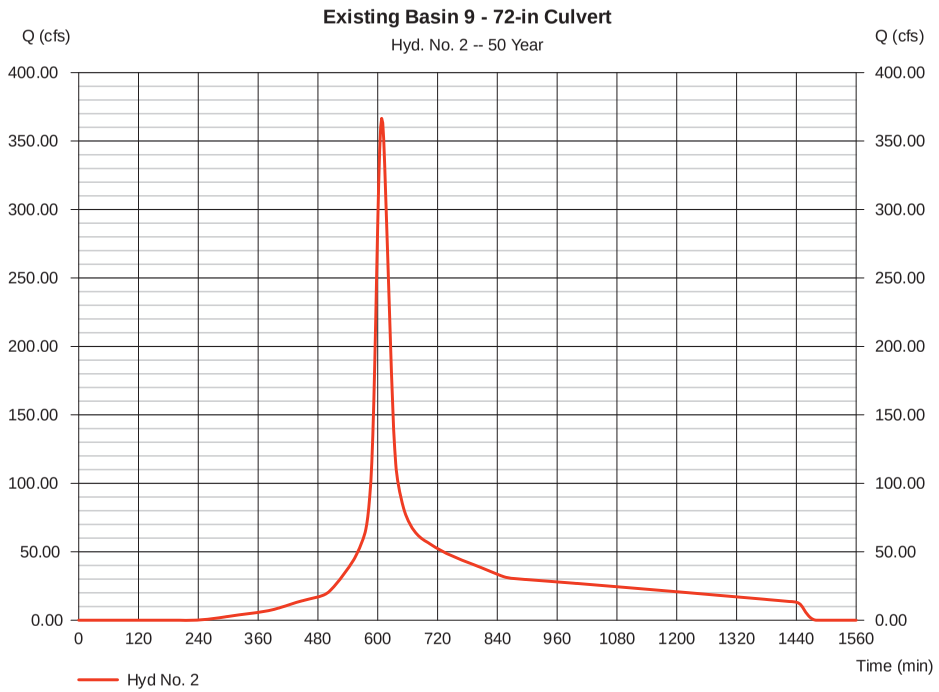
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Friday, Aug 12, 2011

Hyd. No. 2

Existing Basin 9 - 72-in Culvert

Hydrograph type	= SCS Runoff	Peak discharge	= 366.58 cfs
Storm frequency	= 50 yrs	Time to peak	= 608 min
Time interval	= 2 min	Hyd. volume	= 2,546,595 cuft
Drainage area	= 142.330 ac	Curve number	= 79
Basin Slope	= 3.0 %	Hydraulic length	= 6460 ft
Tc method	= KIRPICH	Time of conc. (Tc)	= 25.84 min
Total precip.	= 7.46 in	Distribution	= Type I
Storm duration	= 24 hrs	Shape factor	= 484



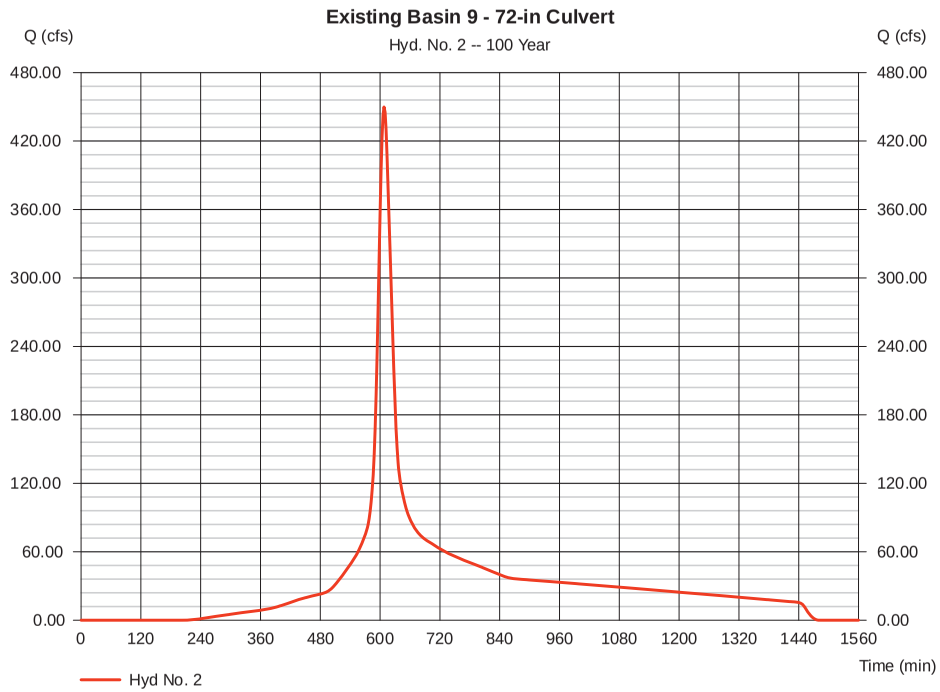
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Friday, Aug 12, 2011

Hyd. No. 2

Existing Basin 9 - 72-in Culvert

Hydrograph type	= SCS Runoff	Peak discharge	= 449.92 cfs
Storm frequency	= 100 yrs	Time to peak	= 608 min
Time interval	= 2 min	Hyd. volume	= 3,115,191 cuft
Drainage area	= 142.330 ac	Curve number	= 79
Basin Slope	= 3.0 %	Hydraulic length	= 6460 ft
Tc method	= KIRPICH	Time of conc. (Tc)	= 25.84 min
Total precip.	= 8.66 in	Distribution	= Type I
Storm duration	= 24 hrs	Shape factor	= 484



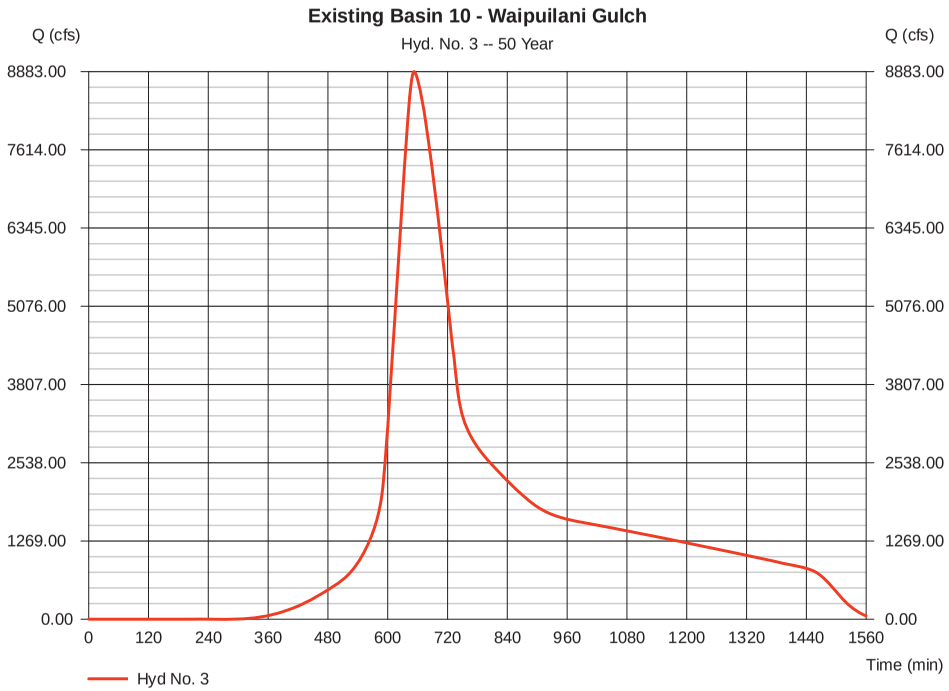
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 — Friday, Feb 24, 2012

Hyd. No. 3

Existing Basin 10 - Waipuilani Gulch

Hydrograph type	= SCS Runoff	Peak discharge	= 8880.56 cfs
Storm frequency	= 50 yrs	Time to peak	= 654 min
Time interval	= 2 min	Hyd. volume	= 133,496,700 cuft
Drainage area	= 7314.020 ac	Curve number	= 73
Basin Slope	= 12.0 %	Hydraulic length	= 71380 ft
Tc method	= KIRPICH	Time of conc. (Tc)	= 96.35 min
Total precip.	= 8.27 in	Distribution	= Type I
Storm duration	= 24 hrs	Shape factor	= 484



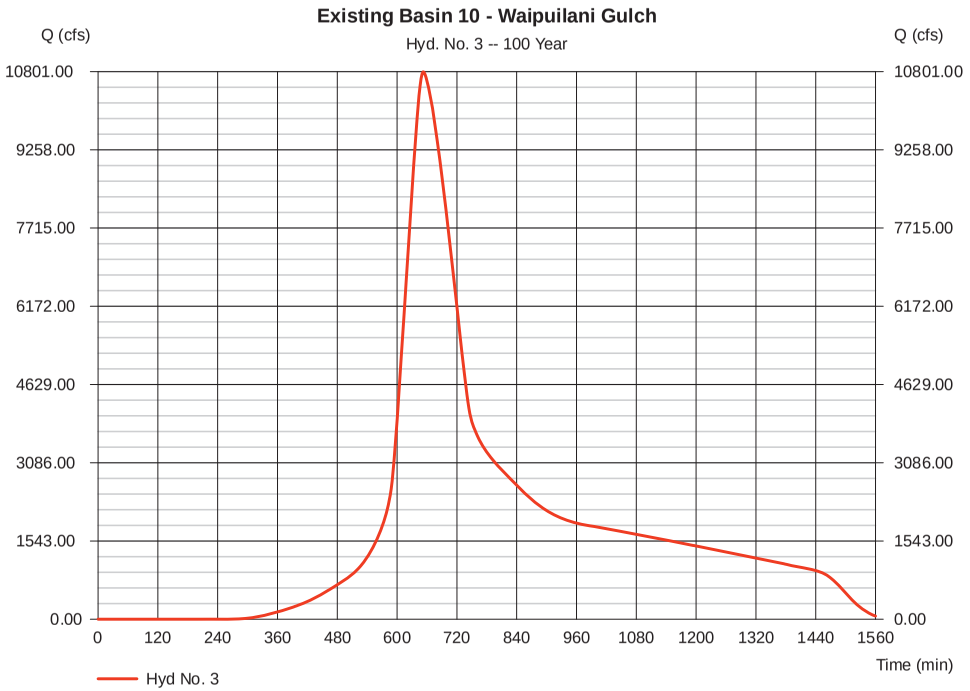
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 — Friday, Feb 24, 2012

Hyd. No. 3

Existing Basin 10 - Waipuilani Gulch

Hydrograph type	= SCS Runoff	Peak discharge	= 10795.73 cfs
Storm frequency	= 100 yrs	Time to peak	= 652 min
Time interval	= 2 min	Hyd. volume	= 160,664,900 cuft
Drainage area	= 7314.020 ac	Curve number	= 73
Basin Slope	= 12.0 %	Hydraulic length	= 71380 ft
Tc method	= KIRPICH	Time of conc. (Tc)	= 96.35 min
Total precip.	= 9.41 in	Distribution	= Type I
Storm duration	= 24 hrs	Shape factor	= 484



APPENDIX C

Preliminary Analysis of Waipuilani Gulch

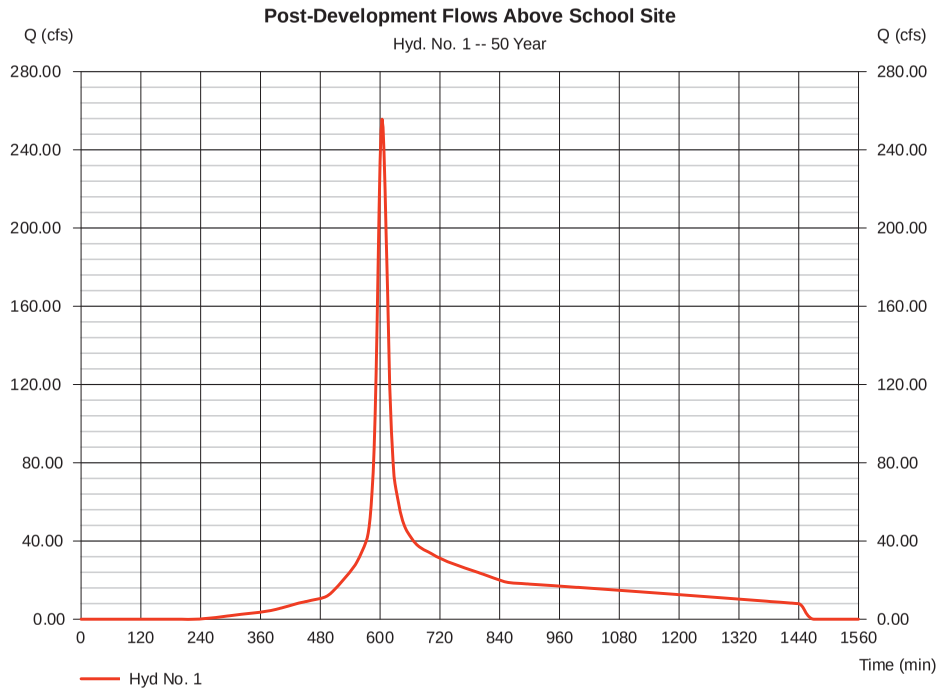
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Tuesday, Aug 16, 2011

Hyd. No. 1

Post-Development Flows Above School Site

Hydrograph type	= SCS Runoff	Peak discharge	= 255.71 cfs
Storm frequency	= 50 yrs	Time to peak	= 604 min
Time interval	= 2 min	Hyd. volume	= 1,548,249 cuft
Drainage area	= 85.180 ac	Curve number	= 79
Basin Slope	= 3.0 %	Hydraulic length	= 4200 ft
Tc method	= KIRPICH	Time of conc. (Tc)	= 18.55 min
Total precip.	= 7.46 in	Distribution	= Type I
Storm duration	= 24 hrs	Shape factor	= 484



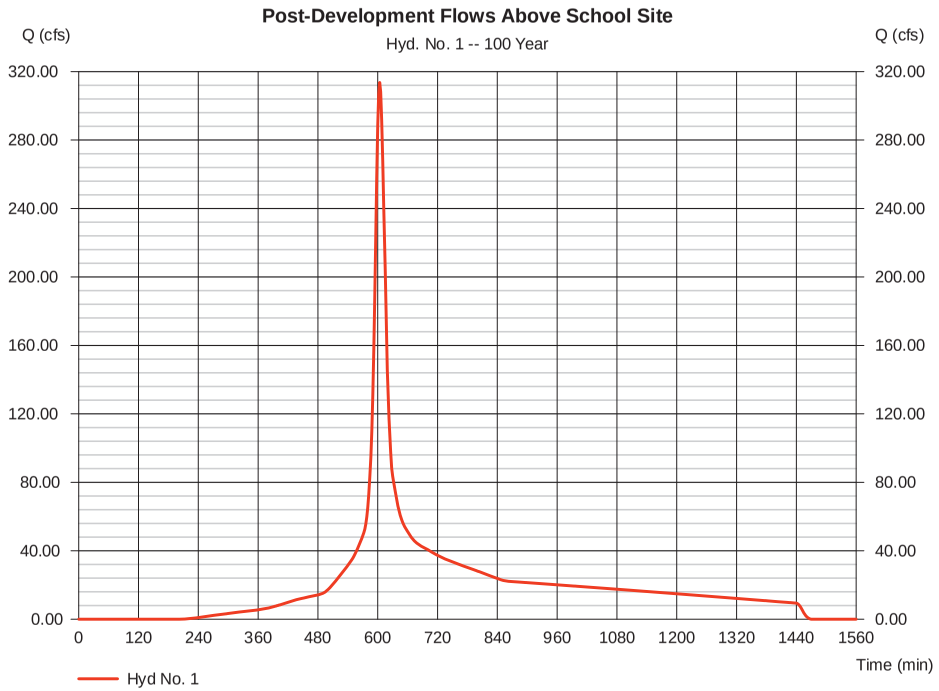
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 — Tuesday, Aug 16, 2011

Hyd. No. 1

Post-Development Flows Above School Site

Hydrograph type	= SCS Runoff	Peak discharge	= 313.66 cfs
Storm frequency	= 100 yrs	Time to peak	= 604 min
Time interval	= 2 min	Hyd. volume	= 1,893,937 cuft
Drainage area	= 85.180 ac	Curve number	= 79
Basin Slope	= 3.0 %	Hydraulic length	= 4200 ft
Tc method	= KIRPICH	Time of conc. (Tc)	= 18.55 min
Total precip.	= 8.66 in	Distribution	= Type I
Storm duration	= 24 hrs	Shape factor	= 484



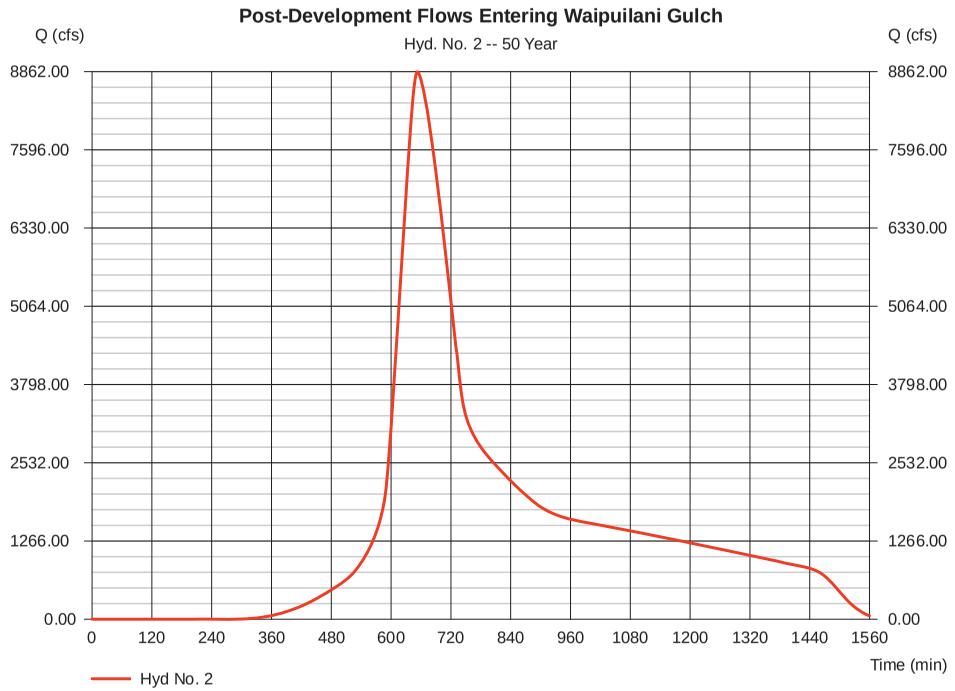
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066
 Friday, Feb 24, 2012

Hyd. No. 2

Post-Development Flows Entering Waipuilani Gulch

Hydrograph type	= SCS Runoff	Peak discharge	= 8856.46 cfs
Storm frequency	= 50 yrs	Time to peak	= 654 min
Time interval	= 2 min	Hyd. volume	= 133,134,600 cuft
Drainage area	= 7294.170 ac	Curve number	= 73
Basin Slope	= 12.0 %	Hydraulic length	= 71380 ft
Tc method	= KIRPICH	Time of conc. (Tc)	= 96.35 min
Total precip.	= 8.27 in	Distribution	= Type I
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Friday, Feb 24, 2012

Hyd. No. 2

Post-Development Flows Entering Waipuilani Gulch

Hydrograph type	= SCS Runoff	Peak discharge	= 10766.44 cfs
Storm frequency	= 100 yrs	Time to peak	= 652 min
Time interval	= 2 min	Hyd. volume	= 160,228,800 cuft
Drainage area	= 7294.170 ac	Curve number	= 73
Basin Slope	= 12.0 %	Hydraulic length	= 71380 ft
Tc method	= KIRPICH	Time of conc. (Tc)	= 96.35 min
Total precip.	= 9.41 in	Distribution	= Type I
Storm duration	= 24 hrs	Shape factor	= 484

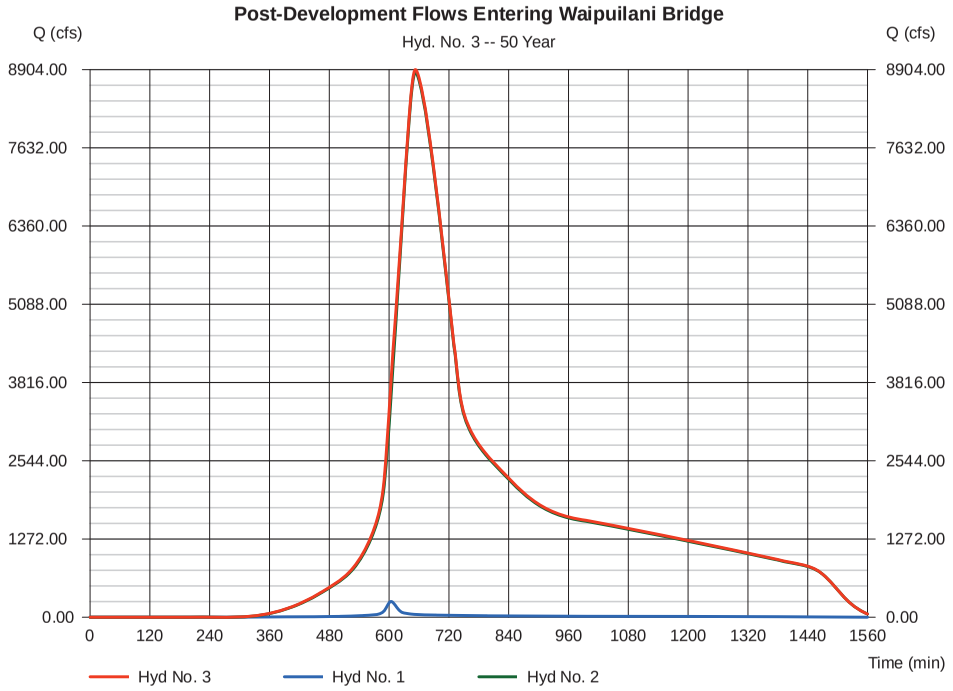
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Friday, Feb 24, 2012

Hyd. No. 3

Post-Development Flows Entering Waipuilani Bridge

Hydrograph type	= Combine	Peak discharge	= 8901.87 cfs
Storm frequency	= 50 yrs	Time to peak	= 652 min
Time interval	= 2 min	Hyd. volume	= 134,682,800 cuft
Inflow hyds.	= 1, 2	Contrib. drain. area	= 7379.350 ac



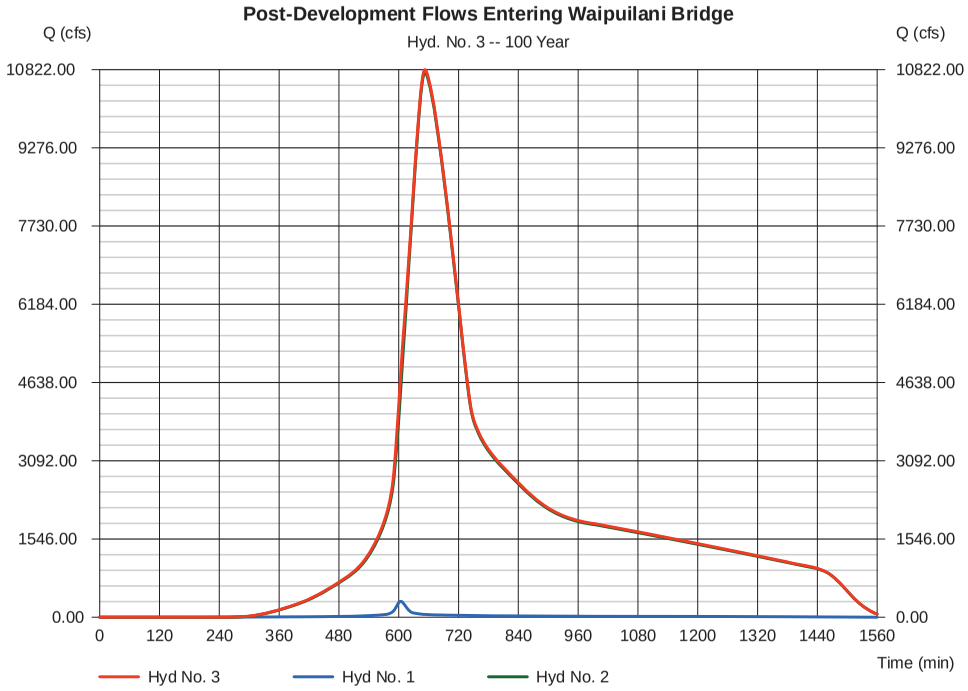
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Friday, Feb 24, 2012

Hyd. No. 3

Post-Development Flows Entering Waipuilani Bridge

Hydrograph type	= Combine	Peak discharge	= 10821.69 cfs
Storm frequency	= 100 yrs	Time to peak	= 652 min
Time interval	= 2 min	Hyd. volume	= 162,122,800 cuft
Inflow hyds.	= 1, 2	Contrib. drain. area	= 7379.350 ac



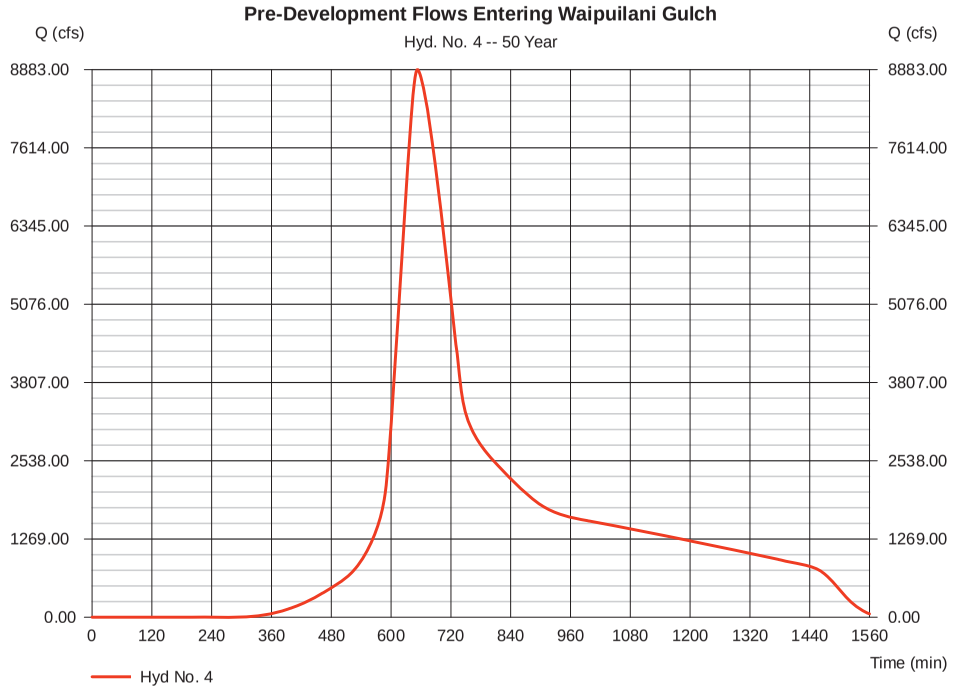
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Friday, Feb 24, 2012

Hyd. No. 4

Pre-Development Flows Entering Waipuilani Gulch

Hydrograph type	= SCS Runoff	Peak discharge	= 8880.56 cfs
Storm frequency	= 50 yrs	Time to peak	= 654 min
Time interval	= 2 min	Hyd. volume	= 133,496,700 cuft
Drainage area	= 7314.020 ac	Curve number	= 73
Basin Slope	= 12.0 %	Hydraulic length	= 71380 ft
Tc method	= KIRPICH	Time of conc. (Tc)	= 96.35 min
Total precip.	= 8.27 in	Distribution	= Type I
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 — Friday, Feb 24, 2012

Hyd. No. 4

Pre-Development Flows Entering Waipuilani Gulch

Hydrograph type	= SCS Runoff	Peak discharge	= 10795.73 cfs
Storm frequency	= 100 yrs	Time to peak	= 652 min
Time interval	= 2 min	Hyd. volume	= 160,664,900 cuft
Drainage area	= 7314.020 ac	Curve number	= 73
Basin Slope	= 12.0 %	Hydraulic length	= 71380 ft
Tc method	= KIRPICH	Time of conc. (Tc)	= 96.35 min
Total precip.	= 9.41 in	Distribution	= Type I
Storm duration	= 24 hrs	Shape factor	= 484

APPENDIX D

Preliminary Basin Analysis

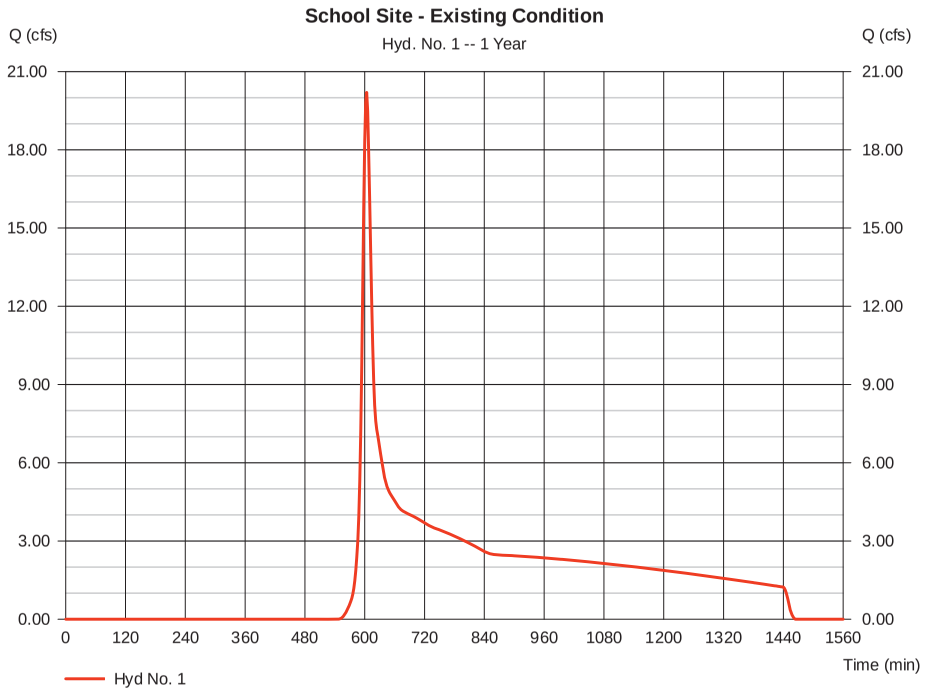
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Tuesday, Aug 16, 2011

Hyd. No. 1

School Site - Existing Condition

Hydrograph type	= SCS Runoff	Peak discharge	= 20.20 cfs
Storm frequency	= 1 yrs	Time to peak	= 604 min
Time interval	= 2 min	Hyd. volume	= 150,428 cuft
Drainage area	= 77.000 ac	Curve number	= 79
Basin Slope	= 2.0 %	Hydraulic length	= 2260 ft
Tc method	= KIRPICH	Time of conc. (Tc)	= 13.45 min
Total precip.	= 2.05 in	Distribution	= Type I
Storm duration	= 24 hrs	Shape factor	= 484



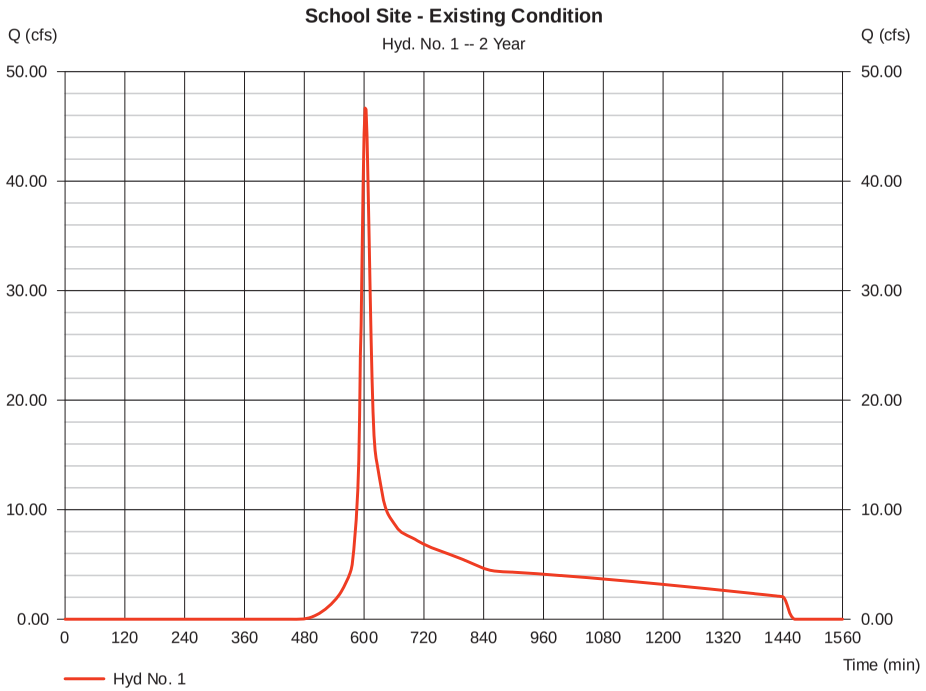
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Tuesday, Aug 16, 2011

Hyd. No. 1

School Site - Existing Condition

Hydrograph type	= SCS Runoff	Peak discharge	= 46.68 cfs
Storm frequency	= 2 yrs	Time to peak	= 602 min
Time interval	= 2 min	Hyd. volume	= 294,327 cuft
Drainage area	= 77.000 ac	Curve number	= 79
Basin Slope	= 2.0 %	Hydraulic length	= 2260 ft
Tc method	= KIRPICH	Time of conc. (Tc)	= 13.45 min
Total precip.	= 2.85 in	Distribution	= Type I
Storm duration	= 24 hrs	Shape factor	= 484



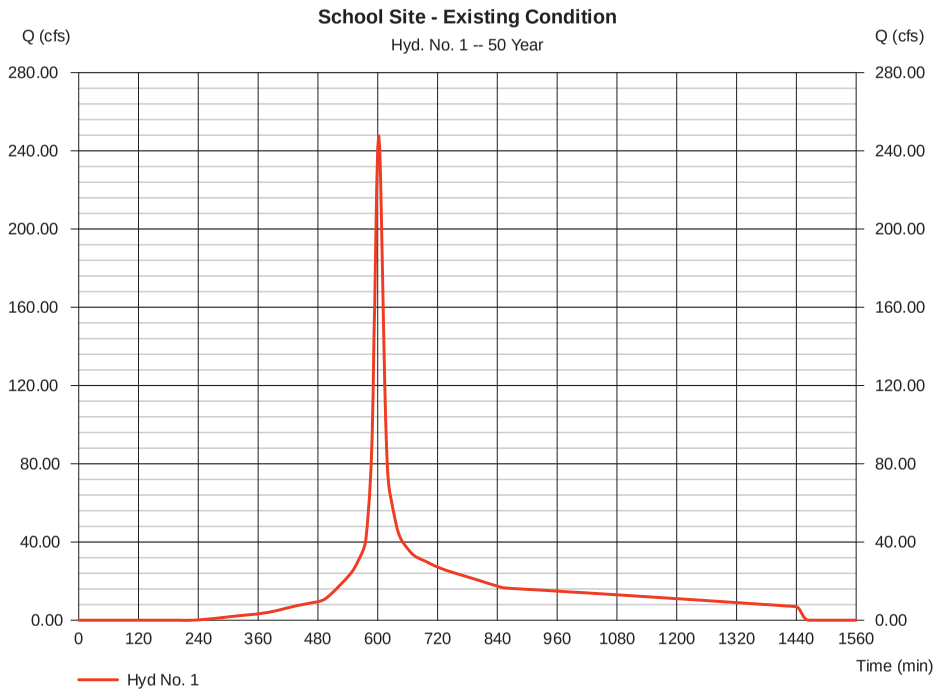
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Tuesday, Aug 16, 2011

Hyd. No. 1

School Site - Existing Condition

Hydrograph type	= SCS Runoff	Peak discharge	= 247.71 cfs
Storm frequency	= 50 yrs	Time to peak	= 602 min
Time interval	= 2 min	Hyd. volume	= 1,364,579 cuft
Drainage area	= 77.000 ac	Curve number	= 79
Basin Slope	= 2.0 %	Hydraulic length	= 2260 ft
Tc method	= KIRPICH	Time of conc. (Tc)	= 13.45 min
Total precip.	= 7.46 in	Distribution	= Type I
Storm duration	= 24 hrs	Shape factor	= 484



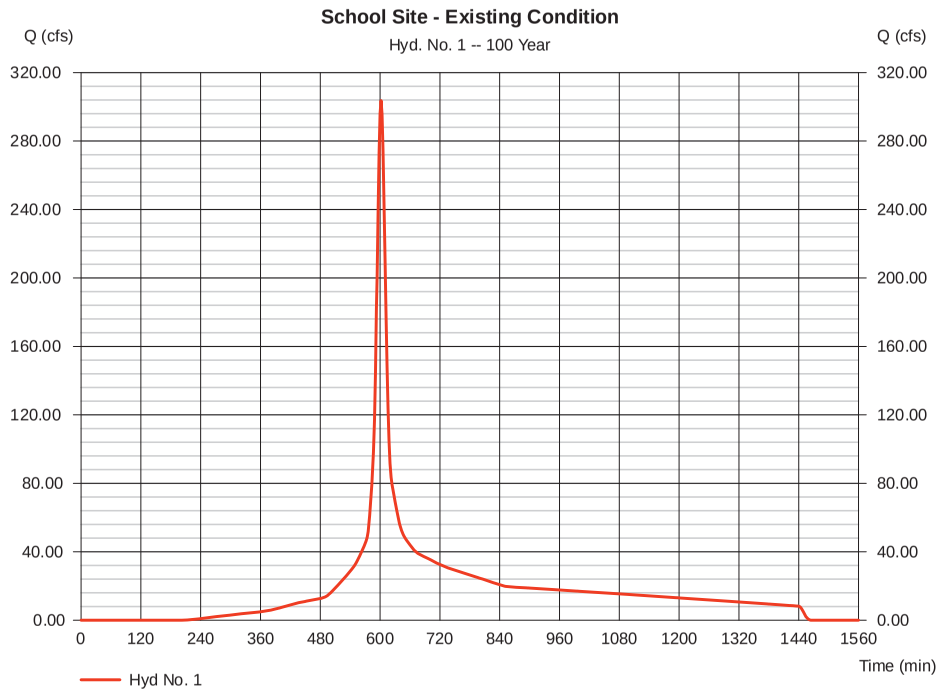
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Tuesday, Aug 16, 2011

Hyd. No. 1

School Site - Existing Condition

Hydrograph type	= SCS Runoff	Peak discharge	= 303.65 cfs
Storm frequency	= 100 yrs	Time to peak	= 602 min
Time interval	= 2 min	Hyd. volume	= 1,669,256 cuft
Drainage area	= 77.000 ac	Curve number	= 79
Basin Slope	= 2.0 %	Hydraulic length	= 2260 ft
Tc method	= KIRPICH	Time of conc. (Tc)	= 13.45 min
Total precip.	= 8.66 in	Distribution	= Type I
Storm duration	= 24 hrs	Shape factor	= 484

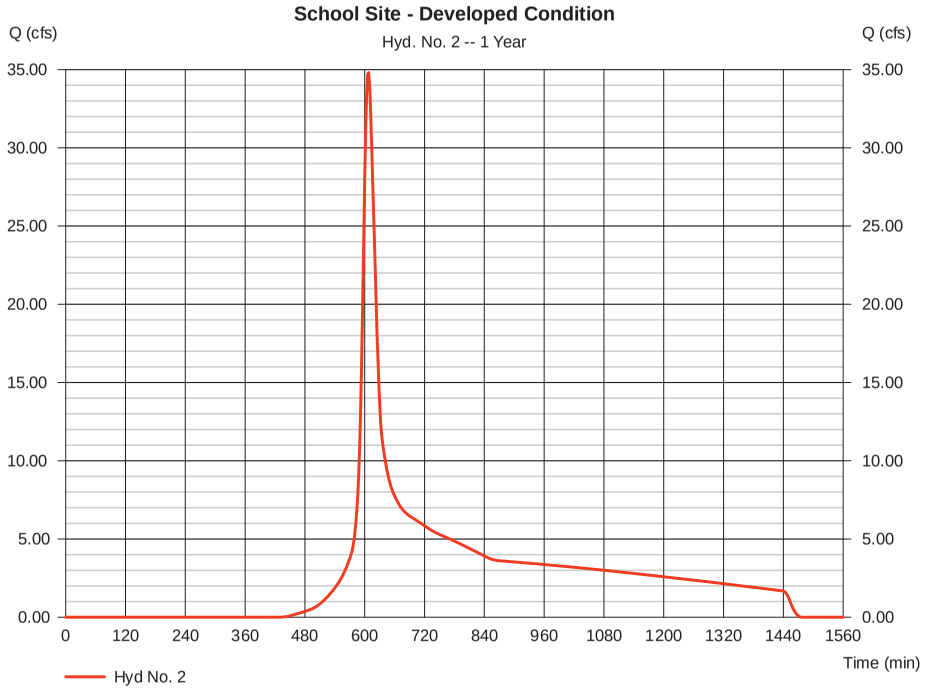


Hydrograph Report

Hyd. No. 2

School Site - Developed Condition

Hydrograph type	= SCS Runoff	Peak discharge	= 34.81 cfs
Storm frequency	= 1 yrs	Time to peak	= 608 min
Time interval	= 2 min	Hyd. volume	= 252,362 cuft
Drainage area	= 77.000 ac	Curve number	= 86
Basin Slope	= 1.0 %	Hydraulic length	= 300 ft
Tc method	= USER	Time of conc. (Tc)	= 23.00 min
Total precip.	= 2.05 in	Distribution	= Type I
Storm duration	= 24 hrs	Shape factor	= 484



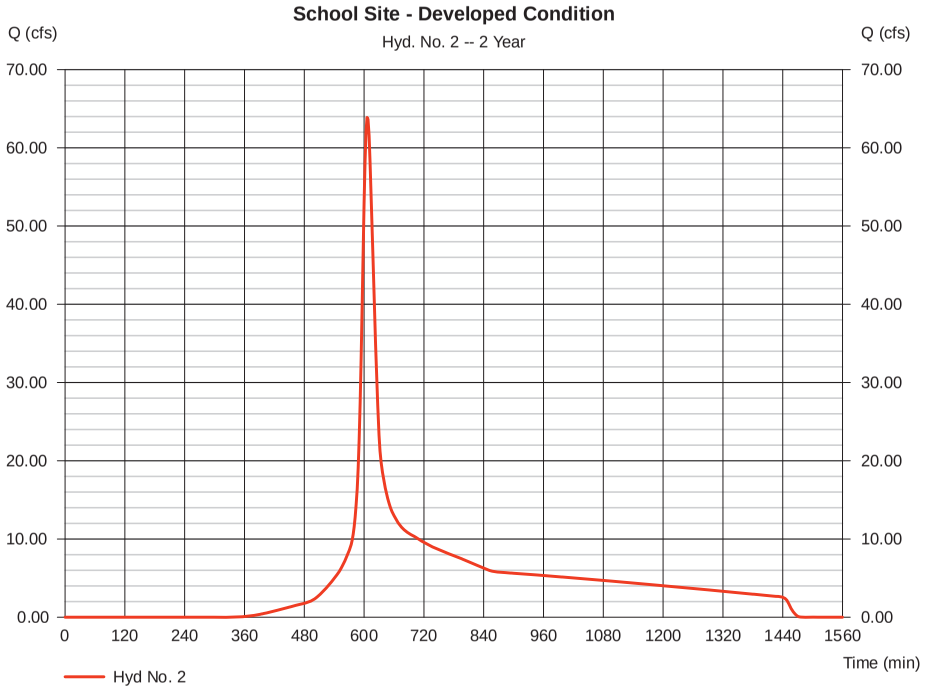
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Tuesday, Aug 16, 2011

Hyd. No. 2

School Site - Developed Condition

Hydrograph type	= SCS Runoff	Peak discharge	= 63.89 cfs
Storm frequency	= 2 yrs	Time to peak	= 606 min
Time interval	= 2 min	Hyd. volume	= 436,632 cuft
Drainage area	= 77.000 ac	Curve number	= 86
Basin Slope	= 1.0 %	Hydraulic length	= 300 ft
Tc method	= USER	Time of conc. (Tc)	= 23.00 min
Total precip.	= 2.85 in	Distribution	= Type I
Storm duration	= 24 hrs	Shape factor	= 484



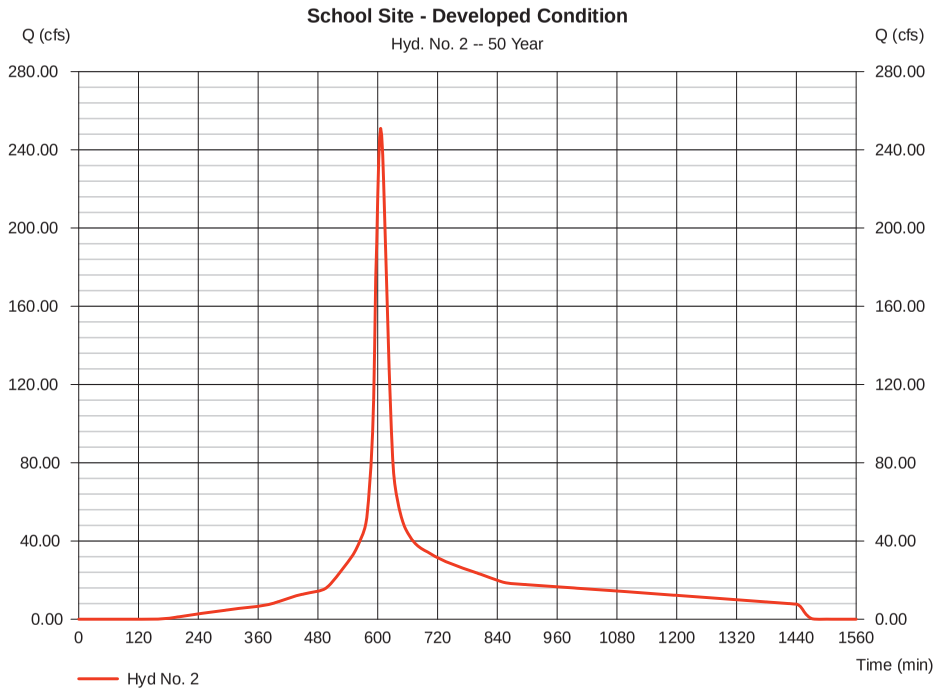
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Tuesday, Aug 16, 2011

Hyd. No. 2

School Site - Developed Condition

Hydrograph type	= SCS Runoff	Peak discharge	= 250.94 cfs
Storm frequency	= 50 yrs	Time to peak	= 606 min
Time interval	= 2 min	Hyd. volume	= 1,652,656 cuft
Drainage area	= 77.000 ac	Curve number	= 86
Basin Slope	= 1.0 %	Hydraulic length	= 300 ft
Tc method	= USER	Time of conc. (Tc)	= 23.00 min
Total precip.	= 7.46 in	Distribution	= Type I
Storm duration	= 24 hrs	Shape factor	= 484



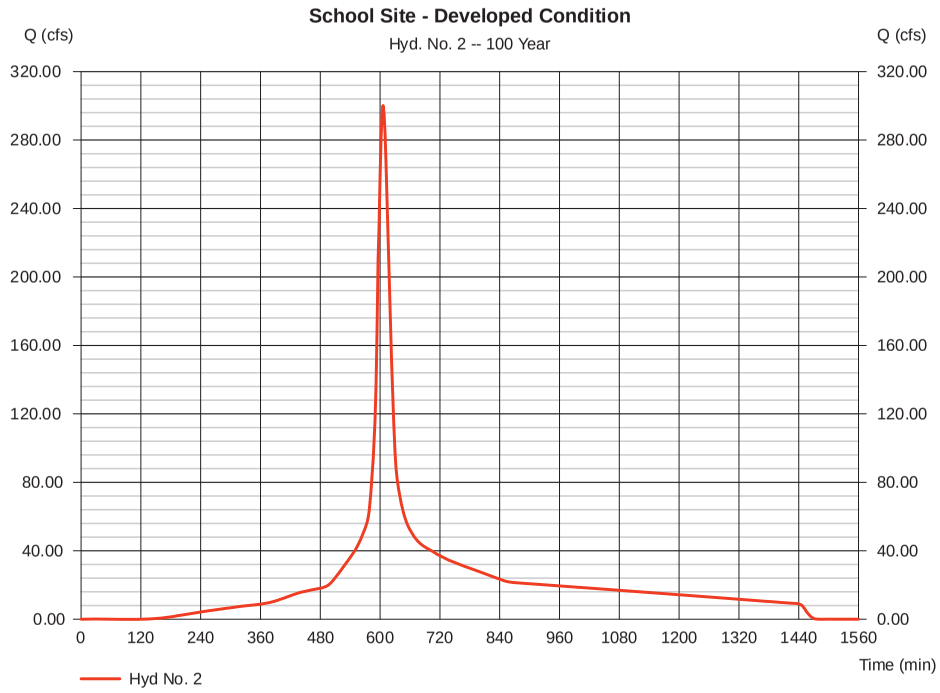
Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Tuesday, Aug 16, 2011

Hyd. No. 2

School Site - Developed Condition

Hydrograph type	= SCS Runoff	Peak discharge	= 300.12 cfs
Storm frequency	= 100 yrs	Time to peak	= 606 min
Time interval	= 2 min	Hyd. volume	= 1,983,689 cuft
Drainage area	= 77.000 ac	Curve number	= 86
Basin Slope	= 1.0 %	Hydraulic length	= 300 ft
Tc method	= USER	Time of conc. (Tc)	= 23.00 min
Total precip.	= 8.66 in	Distribution	= Type I
Storm duration	= 24 hrs	Shape factor	= 484



Hydrograph Report

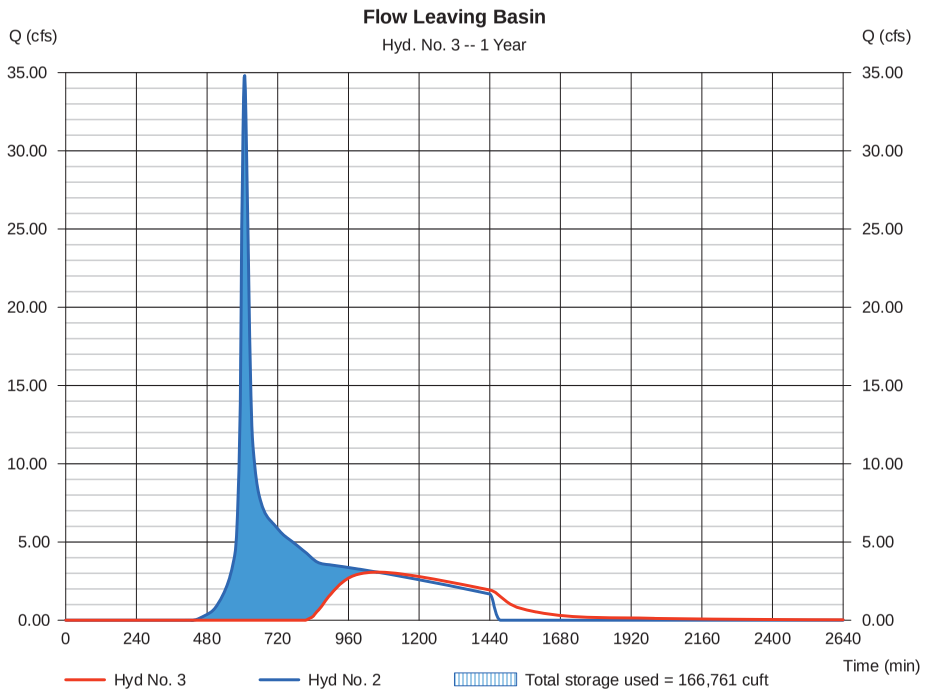
Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Tuesday, Aug 16, 2011

Hyd. No. 3

Flow Leaving Basin

Hydrograph type	=	Reservoir	Peak discharge	=	3.074 cfs
Storm frequency	=	1 yrs	Time to peak	=	1058 min
Time interval	=	2 min	Hyd. volume	=	107,021 cuft
Inflow hyd. No.	=	2 - School Site - Developed Condition	Max. Elevation	=	33.39 ft
Reservoir name	=	Retention/Detention Basin	Max. Storage	=	166,761 cuft

Storage Indication method used.



Hydrograph Report

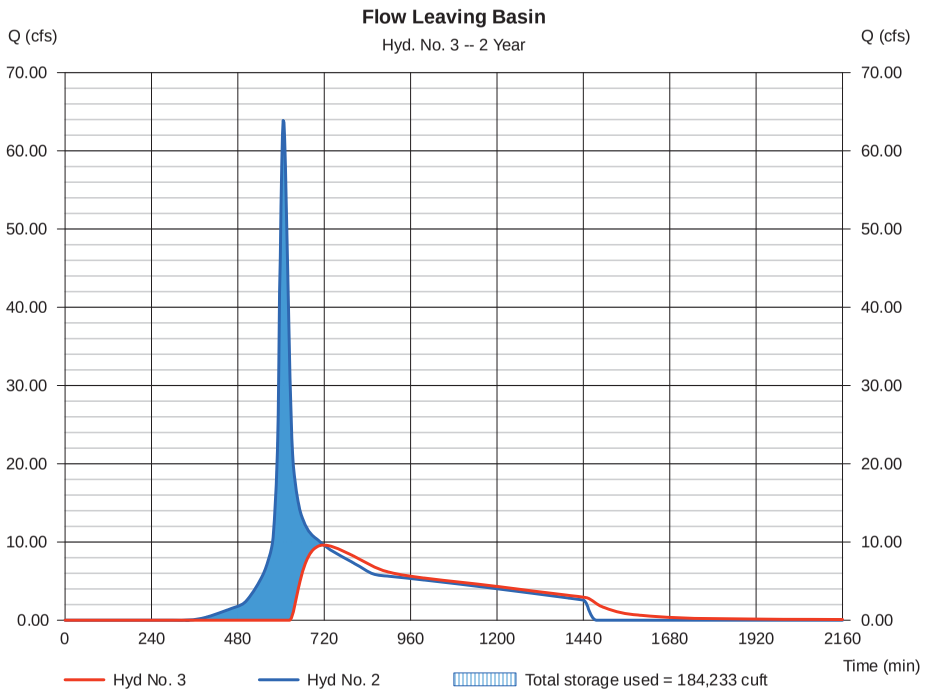
Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Tuesday, Aug 16, 2011

Hyd. No. 3

Flow Leaving Basin

Hydrograph type	=	Reservoir	Peak discharge	=	9.612 cfs
Storm frequency	=	2 yrs	Time to peak	=	720 min
Time interval	=	2 min	Hyd. volume	=	291,292 cuft
Inflow hyd. No.	=	2 - School Site - Developed Condition	Max. Elevation	=	33.70 ft
Reservoir name	=	Retention/Detention Basin	Max. Storage	=	184,233 cuft

Storage Indication method used.



Hydrograph Report

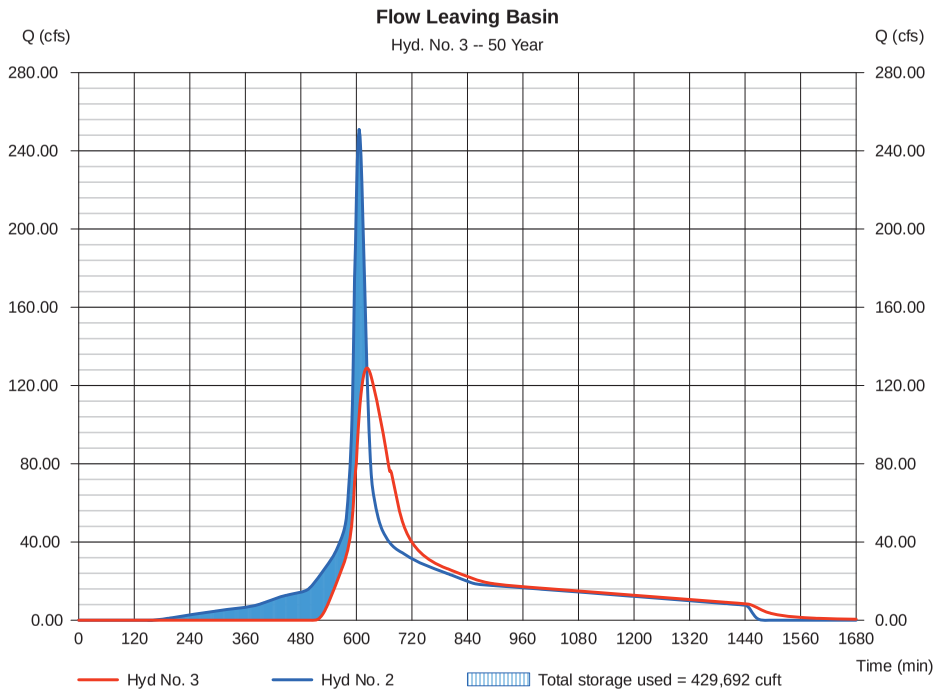
Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Tuesday, Aug 16, 2011

Hyd. No. 3

Flow Leaving Basin

Hydrograph type	=	Reservoir	Peak discharge	=	128.90 cfs
Storm frequency	=	50 yrs	Time to peak	=	622 min
Time interval	=	2 min	Hyd. volume	=	1,507,314 cuft
Inflow hyd. No.	=	2 - School Site - Developed Condition	Max. Elevation	=	37.56 ft
Reservoir name	=	Retention/Detention Basin	Max. Storage	=	429,692 cuft

Storage Indication method used.



Hydrograph Report

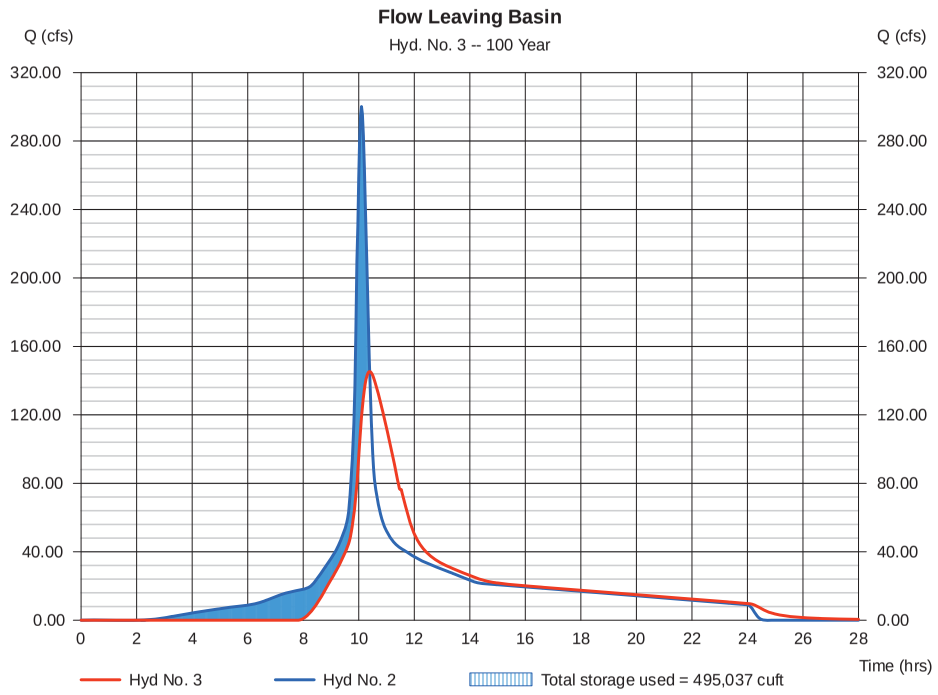
Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Friday, Feb 10, 2012

Hyd. No. 3

Flow Leaving Basin

Hydrograph type	=	Reservoir	Peak discharge	=	145.33 cfs
Storm frequency	=	100 yrs	Time to peak	=	10.40 hrs
Time interval	=	2 min	Hyd. volume	=	1,838,350 cuft
Inflow hyd. No.	=	2 - School Site - Developed Condition	Max. Elevation	=	38.45 ft
Reservoir name	=	Retention/Detention Basin	Max. Storage	=	495,037 cuft

Storage Indication method used.



Pond Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Friday, Feb 10, 2012

Pond No. 1 - Retention/Detention Basin

Pond Data

Trapezoid - Bottom L x W = 480.0 x 90.0 ft, Side slope = 3.00:1, Bottom elev. = 30.00 ft, Depth = 10.00 ft

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	30.00	43,200	0	0
1.00	31.00	46,656	44,922	44,922
2.00	32.00	50,184	48,414	93,336
3.00	33.00	53,784	51,978	145,314
4.00	34.00	57,456	55,614	200,928
5.00	35.00	61,200	59,322	260,250
6.00	36.00	65,016	63,102	323,352
7.00	37.00	68,904	66,954	390,306
8.00	38.00	72,864	70,878	461,184
9.00	39.00	76,896	74,874	536,058
10.00	40.00	81,000	78,942	615,000

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 30.00	0.00	0.00	0.00
Span (in)	= 30.00	0.00	0.00	0.00
No. Barrels	= 3	1	1	0
Invert El. (ft)	= 33.00	0.00	0.00	0.00
Length (ft)	= 100.00	0.00	0.00	0.00
Slope (%)	= 1.00	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 10.00	0.00	0.00	0.00
Crest El. (ft)	= 38.60	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= Ciplti	---	---	---
Multi-Stage	= No	No	No	No

Exfil.(in/hr) = 0.000 (by Contour)
TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	30.00	0.00	---	---	---	0.00	---	---	---	---	---	0.000
0.10	4,492	30.10	0.00	---	---	---	0.00	---	---	---	---	---	0.000
0.20	8,984	30.20	0.00	---	---	---	0.00	---	---	---	---	---	0.000
0.30	13,477	30.30	0.00	---	---	---	0.00	---	---	---	---	---	0.000
0.40	17,969	30.40	0.00	---	---	---	0.00	---	---	---	---	---	0.000
0.50	22,461	30.50	0.00	---	---	---	0.00	---	---	---	---	---	0.000
0.60	26,953	30.60	0.00	---	---	---	0.00	---	---	---	---	---	0.000
0.70	31,445	30.70	0.00	---	---	---	0.00	---	---	---	---	---	0.000
0.80	35,938	30.80	0.00	---	---	---	0.00	---	---	---	---	---	0.000
0.90	40,430	30.90	0.00	---	---	---	0.00	---	---	---	---	---	0.000
1.00	44,922	31.00	0.00	---	---	---	0.00	---	---	---	---	---	0.000
1.10	49,763	31.10	0.00	---	---	---	0.00	---	---	---	---	---	0.000
1.20	54,605	31.20	0.00	---	---	---	0.00	---	---	---	---	---	0.000
1.30	59,446	31.30	0.00	---	---	---	0.00	---	---	---	---	---	0.000
1.40	64,288	31.40	0.00	---	---	---	0.00	---	---	---	---	---	0.000
1.50	69,129	31.50	0.00	---	---	---	0.00	---	---	---	---	---	0.000
1.60	73,970	31.60	0.00	---	---	---	0.00	---	---	---	---	---	0.000
1.70	78,812	31.70	0.00	---	---	---	0.00	---	---	---	---	---	0.000
1.80	83,653	31.80	0.00	---	---	---	0.00	---	---	---	---	---	0.000
1.90	88,495	31.90	0.00	---	---	---	0.00	---	---	---	---	---	0.000
2.00	93,336	32.00	0.00	---	---	---	0.00	---	---	---	---	---	0.000
2.10	98,534	32.10	0.00	---	---	---	0.00	---	---	---	---	---	0.000
2.20	103,732	32.20	0.00	---	---	---	0.00	---	---	---	---	---	0.000
2.30	108,929	32.30	0.00	---	---	---	0.00	---	---	---	---	---	0.000
2.40	114,127	32.40	0.00	---	---	---	0.00	---	---	---	---	---	0.000
2.50	119,325	32.50	0.00	---	---	---	0.00	---	---	---	---	---	0.000
2.60	124,523	32.60	0.00	---	---	---	0.00	---	---	---	---	---	0.000
2.70	129,721	32.70	0.00	---	---	---	0.00	---	---	---	---	---	0.000
2.80	134,918	32.80	0.00	---	---	---	0.00	---	---	---	---	---	0.000
2.90	140,116	32.90	0.00	---	---	---	0.00	---	---	---	---	---	0.000
3.00	145,314	33.00	0.00	---	---	---	0.00	---	---	---	---	---	0.000
3.10	150,875	33.10	0.21 ic	---	---	---	0.00	---	---	---	---	---	0.214
3.20	156,437	33.20	0.85 ic	---	---	---	0.00	---	---	---	---	---	0.846
3.30	161,998	33.30	1.87 ic	---	---	---	0.00	---	---	---	---	---	1.874

Continues on next page...

Retention/Detention Basin

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
3.40	167,560	33.40	3.28 ic	---	---	---	0.00	---	---	---	---	---	3.276
3.50	173,121	33.50	5.06 ic	---	---	---	0.00	---	---	---	---	---	5.063
3.60	178,682	33.60	7.17 ic	---	---	---	0.00	---	---	---	---	---	7.171
3.70	184,244	33.70	9.62 ic	---	---	---	0.00	---	---	---	---	---	9.616
3.80	189,805	33.80	12.39 ic	---	---	---	0.00	---	---	---	---	---	12.39
3.90	195,367	33.90	15.45 ic	---	---	---	0.00	---	---	---	---	---	15.45
4.00	200,928	34.00	18.74 ic	---	---	---	0.00	---	---	---	---	---	18.74
4.10	206,860	34.10	22.32 ic	---	---	---	0.00	---	---	---	---	---	22.32
4.20	212,792	34.20	26.09 ic	---	---	---	0.00	---	---	---	---	---	26.09
4.30	218,725	34.30	30.07 ic	---	---	---	0.00	---	---	---	---	---	30.07
4.40	224,657	34.40	34.21 ic	---	---	---	0.00	---	---	---	---	---	34.21
4.50	230,589	34.50	38.52 ic	---	---	---	0.00	---	---	---	---	---	38.52
4.60	236,521	34.60	42.88 ic	---	---	---	0.00	---	---	---	---	---	42.88
4.70	242,453	34.70	47.37 ic	---	---	---	0.00	---	---	---	---	---	47.37
4.80	248,386	34.80	51.90 ic	---	---	---	0.00	---	---	---	---	---	51.90
4.90	254,318	34.90	56.40 ic	---	---	---	0.00	---	---	---	---	---	56.40
5.00	260,250	35.00	60.83 ic	---	---	---	0.00	---	---	---	---	---	60.83
5.10	266,560	35.10	65.19 ic	---	---	---	0.00	---	---	---	---	---	65.19
5.20	272,870	35.20	69.32 ic	---	---	---	0.00	---	---	---	---	---	69.32
5.30	279,181	35.30	73.19 ic	---	---	---	0.00	---	---	---	---	---	73.19
5.40	285,491	35.40	76.64 ic	---	---	---	0.00	---	---	---	---	---	76.64
5.50	291,801	35.50	76.05 oc	---	---	---	0.00	---	---	---	---	---	76.05
5.60	298,111	35.60	79.73 oc	---	---	---	0.00	---	---	---	---	---	79.73
5.70	304,421	35.70	83.28 oc	---	---	---	0.00	---	---	---	---	---	83.28
5.80	310,732	35.80	86.68 oc	---	---	---	0.00	---	---	---	---	---	86.68
5.90	317,042	35.90	89.95 oc	---	---	---	0.00	---	---	---	---	---	89.95
6.00	323,352	36.00	93.11 oc	---	---	---	0.00	---	---	---	---	---	93.11
6.10	330,047	36.10	96.16 oc	---	---	---	0.00	---	---	---	---	---	96.16
6.20	336,743	36.20	99.00 ic	---	---	---	0.00	---	---	---	---	---	99.00
6.30	343,438	36.30	101.51 ic	---	---	---	0.00	---	---	---	---	---	101.51
6.40	350,134	36.40	103.96 ic	---	---	---	0.00	---	---	---	---	---	103.96
6.50	356,829	36.50	106.35 ic	---	---	---	0.00	---	---	---	---	---	106.35
6.60	363,524	36.60	108.68 ic	---	---	---	0.00	---	---	---	---	---	108.68
6.70	370,220	36.70	110.97 ic	---	---	---	0.00	---	---	---	---	---	110.97
6.80	376,915	36.80	113.21 ic	---	---	---	0.00	---	---	---	---	---	113.21
6.90	383,611	36.90	115.41 ic	---	---	---	0.00	---	---	---	---	---	115.41
7.00	390,306	37.00	117.57 ic	---	---	---	0.00	---	---	---	---	---	117.57
7.10	397,394	37.10	119.69 ic	---	---	---	0.00	---	---	---	---	---	119.69
7.20	404,482	37.20	121.77 ic	---	---	---	0.00	---	---	---	---	---	121.77
7.30	411,569	37.30	123.82 ic	---	---	---	0.00	---	---	---	---	---	123.82
7.40	418,657	37.40	125.83 ic	---	---	---	0.00	---	---	---	---	---	125.83
7.50	425,745	37.50	127.81 ic	---	---	---	0.00	---	---	---	---	---	127.81
7.60	432,833	37.60	129.76 ic	---	---	---	0.00	---	---	---	---	---	129.76
7.70	439,920	37.70	131.69 ic	---	---	---	0.00	---	---	---	---	---	131.69
7.80	447,008	37.80	133.58 ic	---	---	---	0.00	---	---	---	---	---	133.58
7.90	454,096	37.90	135.45 ic	---	---	---	0.00	---	---	---	---	---	135.45
8.00	461,184	38.00	137.29 ic	---	---	---	0.00	---	---	---	---	---	137.29
8.10	468,671	38.10	139.11 ic	---	---	---	0.00	---	---	---	---	---	139.11
8.20	476,159	38.20	140.91 ic	---	---	---	0.00	---	---	---	---	---	140.91
8.30	483,646	38.30	142.68 ic	---	---	---	0.00	---	---	---	---	---	142.68
8.40	491,134	38.40	144.43 ic	---	---	---	0.00	---	---	---	---	---	144.43
8.50	498,621	38.50	146.16 ic	---	---	---	0.00	---	---	---	---	---	146.16
8.60	506,108	38.60	147.87 ic	---	---	---	0.00	---	---	---	---	---	147.87
8.70	513,596	38.70	149.56 ic	---	---	---	1.05	---	---	---	---	---	150.61
8.80	521,083	38.80	151.23 ic	---	---	---	2.98	---	---	---	---	---	154.21
8.90	528,571	38.90	152.88 ic	---	---	---	5.47	---	---	---	---	---	158.35
9.00	536,058	39.00	154.52 ic	---	---	---	8.42	---	---	---	---	---	162.94
9.10	543,952	39.10	156.14 ic	---	---	---	11.77	---	---	---	---	---	167.91
9.20	551,846	39.20	157.74 ic	---	---	---	15.48	---	---	---	---	---	173.21
9.30	559,740	39.30	159.32 ic	---	---	---	19.50	---	---	---	---	---	178.82
9.40	567,635	39.40	160.89 ic	---	---	---	23.83	---	---	---	---	---	184.72
9.50	575,529	39.50	162.45 ic	---	---	---	28.43	---	---	---	---	---	190.88
9.60	583,423	39.60	163.99 ic	---	---	---	33.30	---	---	---	---	---	197.29
9.70	591,317	39.70	165.51 ic	---	---	---	38.42	---	---	---	---	---	203.93
9.80	599,211	39.80	167.02 ic	---	---	---	43.77	---	---	---	---	---	210.80
9.90	607,106	39.90	168.52 ic	---	---	---	49.36	---	---	---	---	---	217.88
10.00	615,000	40.00	170.01 ic	---	---	---	55.16	---	---	---	---	---	225.17

...End

APPENDIX E

Preliminary Hydrographs of the School Site for the 50-Year, 1-Hour Strom

Hydrograph Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2009 by Autodesk, Inc. v6.066 Friday, Feb 24, 2012

Hyd. No. 4

School Site - Existing Condition (1hr Strom)

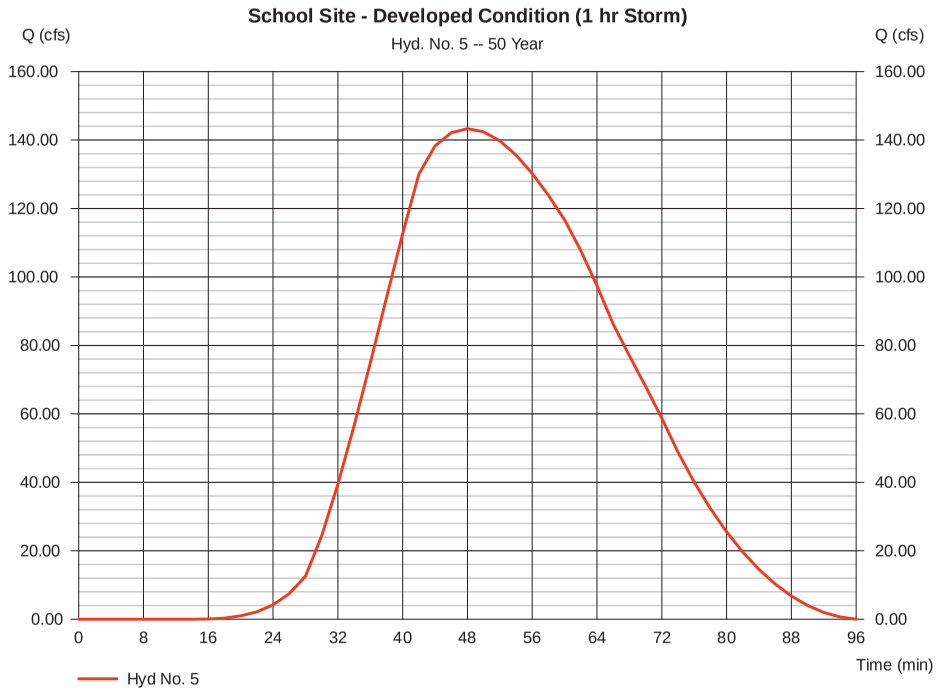
Hydrograph type	= SCS Runoff	Peak discharge	= 103.59 cfs
Storm frequency	= 50 yrs	Time to peak	= 44 min
Time interval	= 2 min	Hyd. volume	= 183,792 cuft
Drainage area	= 77.000 ac	Curve number	= 79
Basin Slope	= 2.0 %	Hydraulic length	= 2260 ft
Tc method	= KIRPICH	Time of conc. (Tc)	= 13.45 min
Total precip.	= 2.25 in	Distribution	= Synthetic
Storm duration	= 1.00 hrs	Shape factor	= 484

Hydrograph Report

Hyd. No. 5

School Site - Developed Condition (1 hr Storm)

Hydrograph type	= SCS Runoff	Peak discharge	= 143.31 cfs
Storm frequency	= 50 yrs	Time to peak	= 48 min
Time interval	= 2 min	Hyd. volume	= 296,599 cuft
Drainage area	= 77.000 ac	Curve number	= 86
Basin Slope	= 1.0 %	Hydraulic length	= 300 ft
Tc method	= USER	Time of conc. (Tc)	= 23.00 min
Total precip.	= 2.25 in	Distribution	= Synthetic
Storm duration	= 1.00 hrs	Shape factor	= 484



Appendix L

Kīhei High School
Economic and Fiscal Impacts

Plasch Econ Pacific LLC – July 2011

KĪHEI HIGH SCHOOL:
ECONOMIC AND FISCAL IMPACTS

Plasch Econ Pacific LLC

KĪHEI HIGH SCHOOL:
ECONOMIC AND FISCAL IMPACTS

PREPARED FOR:
State of Hawai‘i, Department of Education

PREPARED BY:
Plasch Econ Pacific LLC

July 2011

CONTENTS

EXECUTIVE SUMMARY

1. PROPOSED SCHOOL

Kīhei High School ("the School") will be located on a 77.33-acre site in Kīhei, Maui. The School is initially being planned for 800 students in grades 9-12 (Phase I), with the potential to expand by an additional 850 students (Phase II), resulting in a potential total of 1,650 students.

The estimated construction period for Phase I of the School is about 2.25 years and about 2 years for Phase II. Phase II construction would be completed about 10 years after the completion of Phase I construction. Construction could require more or less time, depending on the need for additional school capacity and the availability of State funding for the School.

2. MAJOR ECONOMIC IMPACTS

a. Employment

Construction and Related Employment

Phase I construction of the School will provide an average of about 340 construction jobs over the 2.25-year construction period, about 320 indirect jobs on Maui, and about 160 indirect jobs on O'ahu. Thus, total direct-plus-indirect employment associated with Phase I construction activity will average about 820 jobs, of which about 660 jobs will be on Maui.

Phase II construction of the School will provide an average of about 80 construction jobs during the 2-year construction period, about 80 indirect jobs on Maui, and about 40 indirect jobs on O'ahu. Thus, total direct-plus-indirect employment associated with Phase II construction activity will average about 200 jobs, of which about 160 jobs will be on Maui.

School and Related Employment

At the completion of Phase I construction (Phase I operations), School operations will provide about 120 jobs at the School, about 47 indirect jobs on Maui, and about 23 indirect jobs on O'ahu. Thus, total direct-plus-indirect employment associated with Phase I operations will reach about 190 jobs, of which nearly 170 jobs will be on Maui.

Phase II operations will increase these figures to about 206 jobs at the School, about 81 indirect jobs on Maui, and about 40 indirect jobs on O'ahu. Thus, total direct-plus-indirect employment associated with Phase II operations will reach nearly 330 jobs, of which nearly 290 jobs will be on Maui.

b. Tax Revenues

Tax Revenues Generated by Construction Activity

Phase I construction activity will generate about $12.9 million in tax revenues for the State, and Phase II construction will bring total tax revenues up to about $15.7 million. These tax revenues will offset about 9% of the cost of constructing the School.

Tax Revenues Generated by School Operations

At the completion of Phase I construction, families and businesses supported directly and indirectly by School operations will pay about $590,000 per year in tax revenues to the State, and about $68,000 per year to Maui County. Phase II operations will increase the tax revenues to about $1.0 million per year for the State and about $115,000 per year to the County. These revenues will offset the cost of providing State and County services to these families and businesses.

KĪHEI HIGH SCHOOL:
ECONOMIC AND FISCAL IMPACTS

1. INTRODUCTION

a. Content and Purpose

This report addresses the economic and fiscal benefits and impacts of Kīhei High School ("the School"), which is planned for a site in Kīhei, Maui. The purpose of the report is to provide State and County officials with information relevant to their decisions about the School.

The economic impacts cover expenditures and sales, profits, employment, and payroll related to (1) construction and related activities, and (2) School operations and related activities. Fiscal impacts address the impact of the School on State and County revenues and expenditures.

b. Methodology

Multipliers

The proposed development is translated into economic and fiscal impacts based on a number of multipliers (e.g, indirect sales generated per $1 million in construction expenditures, construction jobs per $1 million in construction expenditures, indirect jobs per direct job, average salary per job, tax rates, etc.). These multipliers reflect the professional judgment of the consultant, and are based on information from the following sources: other high schools similar in size to the School; *The 2002 Input-Output Study for Hawai'i; The Hawai'i Inter-County Input-Output Study: 2002 Benchmark Report;* U.S. Census data; the *State of Hawai'i Data Book;* employment and labor rates from the State Department of Labor and Industrial Relations (DLIR); County and State tax rates; and revenue and expenditure data from the State and County.

2010 Dollars

Throughout the report, dollar amounts are expressed in terms of mid-year 2010 purchasing power and market conditions. Values, prices, costs and dollar amounts for prior years are adjusted for inflation to 2010 dollars based on the Honolulu Consumer Price Index (CPI) for

Urban Consumers. Dollar amounts after 2010 are not increased to account for inflation, appreciation in property values, changes in labor rates, changes in building costs, or other changes in market conditions.

Accuracy of Estimates

Much of the analysis contained in this report is quantitative in nature, where numbers are used to help communicate anticipated impacts. However, these numbers should not be interpreted as precise predictions. Rather, they represent the best estimates of what is expected to occur based on available information about future development, market conditions, and tax rates. As a general rule, economic and fiscal impact estimates in this report are accurate within about 20%.

c. Organization of the Report

The material below gives the following information about the School and its economic and fiscal impacts: a description of the School, the economic impacts of construction and related activities, the economic impacts of School operations and related activities, and the impact on State and County finances.

The detailed assumptions, multipliers, and calculations are shown in five tables at the end of the report. These tables cover the following:

- Table 1: Proposed Development
- Table 2: Economic Impacts of Construction Activity
- Table 3: Economic Impacts of Operations
- Table 4: Impacts on State and County Fiancees

The quantities appearing in **bold** in the tables highlight the more significant economic and fiscal impacts.

d. Economic Consultant

The analysis was conducted by Plasch Econ Pacific LLC, a Hawai'i-based economic-consulting firm specializing in economic development, land and housing economics, feasibility studies, valuations, market analysis, public policy analysis, and the economic and fiscal impacts of projects.

2. SCHOOL DESCRIPTION

a. School Location and Area

The School will be located on a 77.33-acre site in Kīhei, Maui. As shown in Figure 1, the site is mauka of Pi‘ilani Highway across from Kūlanihāko‘i Street, and between Kūlanihāko‘i Gulch to the north and Waipu‘ilani Gulch to the south. The School will use about 70 acres (91%) of the project site.

b. School Size

The School is being planned for 800 students in grades 9-12 (Phase I), with the potential to expand by an additional 850 students (Phase II), resulting in a potential total of 1,650 students.

c. Components of the School

Initial school improvements (Phase I) will include the following: classrooms, administration and student center, library and media arts center, cafeteria and custodial service center, technology and electives center, music building, gymnasium, locker facilities, storage buildings, concessions building, JROTC (Army) classroom building, football/soccer field, track, softball field, baseball field, practice field, grassed playfield, basketball courts, tennis courts, bleachers, walkways, driveways, parking, lighting, landscaping, utilities, highway improvements, etc. (see Figure 2 and Table 1).

Depending upon need and available funding, future improvements (Phase II) will include the following: additional classrooms, auditorium, swimming pool complex, choral room, food kiosk, and additional bleachers.

3. ECONOMIC IMPACTS OF CONSTRUCTION

Construction of the School will involve the following activities: (1) grading and other work to prepare the site for development; (2) construction of infrastructure (roads and parking, a water delivery system, sewer systems, drainage systems, utilities systems, etc.); and (3) construction of buildings. Table 2 summarizes the direct and indirect economic impacts of construction activity. The material in this table gives the development period, construction expenditures, indirect sales generated by the construction activity, profits, employment and payroll, and the number of residents and homes supported by construction activity.

a. Construction Period

The estimated construction period for Phase I of the School is about 2.25 years and about 2 years for Phase II. Phase II construction would be completed about 10 years after the completion of Phase I construction. Construction could require more or less time, depending on the need for additional school capacity and the availability of State funding for the School.

b. Construction Expenditures

Total construction expenditures for the School are estimated at nearly $170 million, including about $140 million for Phase I and about $30 million for Phase II (see Section 2.b of Table 2). This translates into average construction expenditures of about $62.2 million per year during Phase I, and about $15 million per year during Phase II. In practice, construction expenditures will vary from year to year.

c. Indirect Sales Generated by Construction Activity

In addition to construction expenditures, construction activity will generate indirect sales associated with supplying goods and services to construction companies and to the families of construction workers. In turn, the companies supplying goods and services, and the families of their employees, will purchase goods and services from other companies, and so on. These indirect sales will include sales by companies that supply building materials (cement, steel, lumber, roofing materials, plumbing equipment, electrical equipment, hardware supplies, lighting, flooring, etc.); rent out construction equipment; repair equipment; provide warehousing services; provide shipping and trucking services; etc. Indirect sales also include sales by grocery stores, drugstores, restaurants, service stations, beauty salons, medical providers, accountants, attorneys, insurance agents, etc.

Based on State economic multipliers, these indirect sales are expected to average about $61 million per year during Phase I, of which about $41 million per year will be on Maui and about $20 million on O‘ahu (see Section 2.c of Table 2.). Corresponding annual figures during Phase II are about $9.8 million on Maui and about $4.9 million for O‘ahu, for a total of about $14.7 million for the state.

d. Summary of Construction Expenditures and Related Sales

Section 2.d of Table 2 summarizes anticipated expenditures and sales related to construction activity. As indicated, construction expenditures plus indirect sales related to construction are expected to average about $123 million per year during Phase I. About $85 million

per year will be subject to the State 4% excise tax on final sales, while about $38 million will be subject to the 0.5% excise tax on intermediate sales. Corresponding annual figures for Phase II are about $20.5 million for final sales and about $9.2 million for intermediate sales, for a total of nearly $30 million. In some years, construction expenditures plus indirect sales may be significantly higher or lower than the average.

e. Profits Related to Construction Activity

Profits on construction and indirect sales are estimated to average about $15.4 million per year for Phase I, and about $3.7 million per year for Phase II (see Section 2.e of Table 2).

f. Construction Employment and Related Jobs

Construction employment is expected to average about 340 jobs over the 2.25-year construction period for Phase I, and about 82 jobs during the 2-year construction period for Phase II (see Section 2.f of Table 2). Construction jobs will include supervisors, heavy-equipment operators (grading, roads and parking areas, water lines, sewer lines, etc.), cement workers to lay foundations, metal workers, carpenters, plumbers, electricians, roofers, glass and window installers, cabinet makers, carpet and tile layers, painters, equipment installers, interior decorators, landscapers, etc. Other jobs related to construction will include architects, civil engineers, draftsmen, government inspectors, etc. These jobs will range over a variety of skill levels, including entry-level, semiskilled, skilled, management, and professional positions.

As with indirect sales, construction activity will generate indirect jobs associated with supplying goods and services to construction companies and to the families of construction workers. In turn, the companies supplying goods and services, and the families of their employees, will purchase goods and services from other companies, and so on. Indirect jobs will include those at companies supplying building materials (cement, steel, lumber, roofing materials, plumbing equipment, electrical equipment, hardware supplies, lighting, flooring, etc.); rent construction equipment; repair equipment; provide warehousing services; provide shipping and trucking services; etc. Other indirect jobs will include those involved with supplying goods and services to employees and their families: grocery workers, store clerks, restaurant workers, service-station workers, beauty technicians, barbers, bankers, pharmacists, veterinarians, computer technicians, medical workers, accountants attorneys, etc. The jobs will range over a variety of skill levels, including entry-level, semi-skilled, skilled, and management positions.

Based on State employment multipliers, indirect employment related to Phase I construction is expected to average about 320 jobs on Maui and 160 jobs on O‘ahu. For Phase II, indirect employment is expected to average about 80 jobs on Maui and about 40 jobs on O‘ahu.

Thus, total direct-plus-indirect employment associated with Phase I construction activity will average about 820 jobs, of which about 660 jobs will be on Maui (see Figure 3). For Phase II, employment associated with construction activity will average about 200 jobs, of which about 160 jobs will be on Maui.

g. Payroll Related to Construction Activity

Phase I construction activity is expected to generate a total payroll of about $41.7 million per year, of which about $22.4 million will be for construction workers, about $12.5 million for indirect employment on Maui, and about $6.8 million for indirect employment on O‘ahu (see Section 2.g of Table 2). Corresponding annual figures for Phase II are $5.4 million for construction workers, about $3 million for indirect employment on Maui, about $1.7 million for indirect employment on O‘ahu, for a total of about $10.1 million. These estimates are based on the average number of direct and indirect jobs multiplied by average wages as reported to the DLIR.

Annual wages will range from about $25,000 to over $100,000 per year, and are expected to average about $65,900 for construction jobs, about $38,600 for indirect jobs on Maui, and about $43,000 for indirect jobs on O‘ahu.

h. Population and Housing Supported by Construction Activity

During the Phase I construction period, direct and indirect jobs provided by construction activity will support about 1,680 residents housed in about 570 homes (see Sections 2.h and 2.i of Table 2). Construction jobs will support about 690 residents and about 230 homes, while the remainder will be supported by indirect jobs. Most of the residents supported by the direct-plus-indirect jobs are expected to live on Maui: about 1,350 residents housed in about 460 homes. Phase II construction activity will support about 400 residents and about 140 homes, of which about 320 residents and 110 homes will be on Maui.

i. Sources of Construction Workers

As noted above, construction employment is expected to average about 340 jobs during the Phase I construction period. This figure is small compared to the number of available

construction workers. For Maui County, construction employment peaked at about 4,900 jobs in 2007, then declined to about 2,700 jobs in 2010, for a loss of about 2,200 jobs (45%). The 340 Phase I construction jobs comprise about 15.5% of the 2,200-job decline.

In view of the available construction workers, it is expected that the construction jobs for the School will be filled mostly by workers who are already living on Maui. As other construction projects are completed on the island, Maui construction workers will be hired to work on the various components of the School, then move on to other projects. Thus, the School will help keep Maui's existing construction workers employed.

Special programs to increase the number of construction workers on Maui appear to be unwarranted since sufficient workers are already available.

4. ECONOMIC IMPACTS OF OPERATIONS

Table 3 summarizes the economic and related impacts of School operations, including the on-site population of students and employees, the number of jobs provided by type, salaries and payroll, consumption expenditures, related profits, and the population and number of homes that will be supported by the School jobs. In the material which follows, Phase I operations refers to when the school first opens. Phase II operations refers to when the school is functioning at its design capacity, which is expected to be a few years after Phase II construction is completed.

a. School Population

When the School first opens, it will accommodate about 920 students and employees (see Section 3.a of Table 3). Phase II will increase the on-site population to over 1,850 students and employees.

b. Operating Employment and Related Jobs

High School Jobs

The School's Phase I operating employment is expected to total about 120 jobs, including teachers, librarians, counselors, administrators, and support staff (see Section 3.b of Table 3). Support staff includes: assistants (education and administrative); clerks (accounting, library, attendance, office, and typists); health aides; cafeteria personel (managers, cooks, bakers, workers, etc.); custodians; groundskeepers; maintenance workers; security attendants; etc. Phase II will increase on-site employment to about 206 jobs.

Indirect Jobs

Additional economic activity will be generated by the purchase of goods and services by the School and by the families of the School employees. School purchases will include food for the cafeteria, classroom supplies, bathroom supplies, repairs, etc. Family purchases will include groceries, restaurant meals, drug-store items, personal services (hair, nails, etc.), medical services, etc.

Based on State economic multipliers, these purchases are expected to generate about 47 indirect jobs on Maui under Phase I, about 23 indirect jobs on O'ahu, for a total of about 70 indirect jobs (see Section 3.b of Table 3). Phase II will increase indirect employment to about 81 indirect jobs on Maui and about 40 indirect jobs on O'ahu, for a total of about 120 indirect jobs.

Total Direct and Indirect Jobs

Under Phase I, the School will generate about 190 direct and indirect jobs, of which about 167 jobs will be on Maui and 23 jobs on O'ahu (see Figure 3 and Section 3.b of Table 3). Under Phase II, employment will increase to nearly 290 direct and indirect jobs on Maui and 40 indirect jobs on O'ahu, for a total of nearly 330 jobs.

c. Payroll Related to Operations

Payroll of High School Jobs

Annual salaries at the School will range from less than $25,000 to over $100,000. Total payroll for Phase I jobs at the School is estimated at about $5.6 million per year (see Section 3.c of Table 3). Phase II will increase total payroll to about $9.8 million per year.

Payroll of Indirect Jobs

Total payroll for Phase I indirect jobs is estimated at about $2.8 million per year, of which about $1.8 million will be on Maui and about $1 million on O'ahu (see Section 3.c of Table 3). Phase II will increase total payroll of indirect jobs to over $3.1 million per year for Maui and over $1.7 million for O'ahu, for a total of nearly $4.9 million.

Payroll of Total Direct and Indirect Jobs

Total annual payroll for Phase I direct and indirect jobs is estimated at about $8.4 million, of which about $7.4 million will be on Maui and about $1 million on O'ahu (see

Section 3.c of Table 3). Phase II will increase total annual payroll of indirect jobs to about $13 million for Maui and about $1.7 million for O'ahu, for a total of about $14.7 million.

d. Consumption Expenditures Related to Operations

As mentioned above, families of School employees and those who hold indirect jobs generated by School operations will purchase goods and services. For Phase I, these consumption expenditures are estimated at about $4.1 million annually on Maui and over $500,000 on O'ahu, for a total of about $4.6 million (see Section 3.d of Table 3). Phase II will bring consumption up to about $7.1 million annually on Maui and over $900,000 on O'ahu, for a total of nearly $8.1 million.

e. Profits Related to Operations

For Phase I, profits on annual consumption sales are estimated at about $410,000 on Maui and over $50,000 on O'ahu, for a total of about $460,000 (see Section 3.e of Table 3). Phase II will bring annual profits up to over $710,000 on Maui and over $90,000 on O'ahu, for a total of nearly $810,000.

f. Population Supported by Operations

For Phase I, direct and indirect jobs provided by operations will support about 240 residents on Maui and about 50 residents on O'ahu, for a total of about 290 residents (see Section 3.f of Table 3). Phase II will bring the supported population to over 410 residents on Maui and over 80 residents on O'ahu, for a total of nearly 500 residents.

g. Housing for Supported Population

Housing for the residents supported by the Phase I direct and indirect jobs will total about 100 homes, of which about 80 will be on Maui and nearly 20 on O'ahu (see Section 3.g of Table 3). Phase II will bring these figures up to about 140 homes on Maui and about 30 homes on O'ahu, for a total of about 170 homes.

For Phase I, the Maui homes will have an estimated value of about $28.6 million, and the O'ahu homes will have an estimated value of about $7.1 million (see Section 3.h of Table 3). Phase II will bring these values up to about $49 million for the Maui homes and $12.1 million for the O'ahu homes.

h. Sources of School Professionals

Once the School becomes operational, experienced faculty, administrators, and professional staff will be recruited from other public and private schools in Hawai'i and, to a lesser extent, from mainland schools. Teachers and professional staff who are new to their fields will be recruited from the University of Hawai'i (UH) and other institutions.

Programs to increase the supply of teachers and professional staff will be the responsibility of UH and other organizations. UH coordinates with the Hawai'i Department of Education regarding future needs.

5. IMPACTS ON STATE AND COUNTY FINANCES

Table 4 shows the impact of the School on State and County tax revenues, including the change in the tax bases, tax revenues generated by construction activity, and tax revenues generated by operations.

a. Impacts of Construction Activity on State and County Finances

State

Phase I construction is expected to generate about $12.9 million in revenues for the State (see Section 4.b of Table 4). Revenues will be derived from excise taxes, and corporate and personal income taxes. Phase II construction will bring total tax revenues up to about $15.7 million. These tax revenues will offset about 9% of the cost of constructing the School.

The School will provide education services to accommodate population growth in the area, but will not contribute to population growth. Consequently, the School is not expected to require major additional support improvements from the State.

Also, State services for construction workers and their families are, for the most part, already provided since most of the needed construction workers are current residents of Maui.

Maui County

Unlike the State, Maui County derives negligible tax revenues from construction activity. However, the School is not expected to require major additional support improvements from the County since the School will not add significantly to Maui's population growth.

As with the State, County services for construction workers and their families are already provided since most of the needed construction workers are current residents of Maui. Also, the County will not incur costs for on-site security, sanitation, etc., since these services will be provided by the construction companies.

b. Impacts of Operations on State and County Finances

State

At the completion of Phase I construction, School operations will generate about $590,000 per year in tax revenues to the State (see Section 4.c of Table 4). Phase II will increase the tax revenues to the State to about $1 million per year. State revenues will include excise taxes, and corporate and personal income taxes paid by families and businesses that are directly and indirectly supported by School operations. These revenues will offset the cost of providing State services to these families and businesses.

Maui County

Phase I School operations will generate about $67,000 per year in tax revenues to the County (see Section 4.c of Table 4). Phase II will increase the tax revenues to the County to about $116,000 per year. County tax revenues will include property taxes paid by families supported directly and indirectly by School operations. These revenues will offset the cost of providing County services to these families.

County expenditures to support the School will include water and sewer service, solid waste disposal, public safety (police and fire), etc. The School will pay service charges to pay its fair share of water and sewer services, and solid waste disposal. Police and fire services are financed from the County general fund. Since the surrounding community already receives police and fire protection, only a fraction of a job may be required to cover police and fire protection for the School. This would include periodic inspection of safety equipment and fire hazards by the Fire Department during non-emergency periods.

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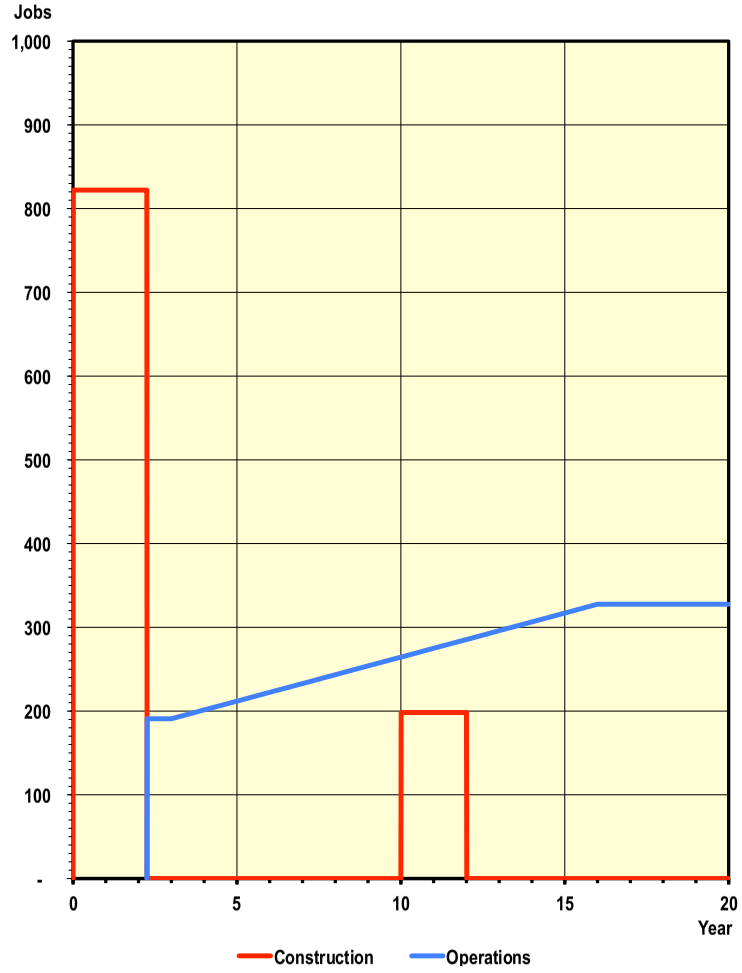
FIGURES

FIGURE 1. LOCATION, KĪHEI HIGH SCHOOL

FIGURE 2. SITE PLAN, KĪHEI HIGH SCHOOL

Figure 3. Direct and Indirect Jobs



TABLES

Table 1. Proposed Development
(Values in 2010 dollars)

Item	Source or Multiplier	Phase I	Phase II	Total	Units
1.a. LAND AREA					
Site	Group 70			77.33	acres
Campus	"			70.00	"
1.b. SCHOOL SIZE					
Students, Grades 9 to 12	DOE	800	850	1,650	Students
1.c. COMPONENTS					
Classroom Houses 1 & 2	DOE	x			
Administration & Student Center	"	x			
Library & Media Arts Center	"	x			
Cafeteria & Custodial Service Center	"	x			
Technology & Electives Center	"	x			
Music Building	"	x			
PE Locker Facilities	"	x			
Gymnasium & Locker Facilities	"	x			
Athletics Locker Facilities	"	x			
Athletics Storage Building	"	x			
Concession & Restroom Buildings	"	x			
JROTC (Army) Classroom Building	"	x			
Basketball Storage Building	"	x			
Football/Soccer Field	"	x			
Bleachers, Center Sections	"	x			
Synthetic Track	"	x			
Softball Field & Bleachers	"	x			
Baseball Field & Bleachers	"	x			
Basketball Courts	"	x			
Tennis Courts	"	x			
Practice Field	"	x			
Grassed Play Field	"	x			
Kulanihakoi Street Extension	"	x			
Piilani Highway Traffic Signal & Improvements	"	x			
Driveways, Fire Lanes, Parking, & Walkways	"	x			
Grading & Drainage	"	x			
Retaining walls	"	x			
Drainage	"	x			
Utilities (sewer, water, electrical, communications)	"	x			
Lighting	"	x			
Landscaping & Irrigation System	"	x			
Shade structures, Furnishings, Fencing, Gates, Etc.	"	x			
Classroom Houses 3 & 4	"		x		
Portable Classrooms	"		x		
Auditorium	"		x		
Swimming Pool Complex	"		x		
Specialty Classrooms, Technology & Electives Center	"		x		
Choral Room/Music Building	"		x		
Food Kiosk	"		x		
Bleachers, End Sections	"		x		

Table 2. Economic Impacts of Construction

(Values in 2010 dollars)

Item	Source or Multiplier	Phase I	Phase II	Total	Units
2.a. DURATION OF CONSTRUCTION	DOE	**2.25**	**2.00**		**years**
2.b. CONSTRUCTION EXPENDITURES					
Total Construction Expenditures	DOE and PEP	**$ 140,000,000**	**$ 30,000,000**	**$ 170,000,000**	
Per Student		$ 175,000	$ 35,294	$ 103,030	
Annual Construction Expenditures (average)		**$ 62,222,222**	**$ 15,000,000**		**per year**
2.c. INDIRECT SALES					
Indirect Sales Generated by Construction	98% of const. exp.	**$ 60,977,778**	**$ 14,700,000**		**per year**
Maui	67%	$ 40,855,111	$ 9,849,000		"
Oahu	33%	$ 20,122,667	$ 4,851,000		"
2.d. SUMMARY OF EXPENDITURES & SALES					
Final Sales (taxed at 4%)					
Construction Expenditures	Section 2.b	$ 62,222,222	$ 15,000,000		per year
Consumption	55% of payroll Section 2.g	$ 22,940,701	$ 5,530,348		"
Total Sales at 4%		$ 85,162,923	$ 20,530,348		per year
Intermediate Sales (taxed at 0.5%)					
Indirect Sales Related to Construction	Section 2.c	$ 60,977,778	$ 14,700,000		"
Less Consumption	above	$ (22,940,701)	$ (5,530,348)		"
Total Sales at 0.5%		$ 38,037,077	$ 9,169,652		per year
Total Sales		**$ 123,200,000**	**$ 29,700,000**		**per year**
2.e. PROFITS					
Profits on Total Expenditures & Sales	10.0%	$ 12,320,000	$ 2,970,000		per year
Risk Premium for Construction	5.0%	$ 3,111,111	$ 750,000		"
Total Profit from Construction & Related Activity		**$ 15,431,111**	**$ 3,720,000**		**per year**
2.f. EMPLOYMENT (on-site & off-site)					
Maui					
Construction Jobs	5.46 x sales/$1 mil	340	82		jobs
Indirect Jobs Generated by Construction	1.42 x direct jobs x 67%	323	78		"
Total Maui Employment		**663**	**160**		**jobs**
Oahu, Indirect Jobs Generated by Construction	1.42 x direct jobs x 33%	159	38		"
Total Employment		**822**	**198**		**jobs**
2g. PAYROLL					
Maui					
Construction Payroll	$ 65,900 per job	$ 22,388,427	$ 5,397,210		per year
Payroll for Indirect Employment	$ 38,600 "	$ 12,476,381	$ 3,007,699		"
Total Maui Payroll		**$ 34,864,807**	**$ 8,404,909**		**per year**
Oahu, Payroll for Indirect Employment	$ 43,000 per job	$ 6,845,559	$ 1,650,269		"
Total Payroll		**$ 41,710,366**	**$ 10,055,177**		**per year**
2h. POPULATION SUPPORTED BY DEVELOPMENT ACTIVITIES					
Maui					
Supported by Construction Jobs	2.03 per job	690	166		residents
Supported by Indirect Jobs	2.03 "	656	158		"
Total Residents, Maui		**1,346**	**324**		**residents**
Oahu Residents Supported by Indirect Jobs	2.08 per job	331	80		"
Total Residents Supported		**1,677**	**404**		**residents**

Table 2. Economic Impacts of Construction

(Values in 2010 dollars)

(continued)

Item	Source or Multiplier	Phase I	Phase II	Total	Units
2.i. HOUSING FOR SUPPORTED POPULATION					
Maui					
Supported by Construction Jobs	0.34 per resident	234	57		homes
Supported by Indirect Jobs	0.34 "	223	54		"
Total Homes, Maui		**458**	**110**		**homes**
Oahu Homes Supported by Indirect Jobs	0.33 per resident	109	26		"
Total Homes Supported		**567**	**137**		**homes**

Table 3. Economic Impacts of Operations
(Values in 2010 dollars)

Item	Source or Multiplier	Phase I	Phase II	Total	Units
3.a. ON-SITE POPULATION					
Students	Table 1, Section 1.b	800	850	1,650	
Employees	Table 3, Section 3.b	120	86	206	
Total On-site Population		**920**	**936**	**1,856**	
3.b. EMPLOYMENT					
High School Employment					
Teachers	DOE	70	68	138	jobs
Librarians	PEP	1	1	2	"
Counselors	"	4	4	8	"
Administrators	"	5	3	8	"
Support Staff	"	40	10	50	"
Total School Employment	DOE	**120**	**86**	**206**	**jobs**
Indirect Employment					
Maui	67% of total	47	34	81	jobs
Oahu	33% of total	23	17	40	"
Total Indirect Jobs	0.59 of High Sch Jobs	71	51	122	jobs
Direct and Indirect Employment					
Maui		**167**	**120**	**287**	jobs
Oahu		**23**	**17**	**40**	"
Total Jobs		**191**	**137**	**328**	**jobs**
3.c. PAYROLL					
High School Payroll					
Teachers	$ 49,100 per job	$ 3,437,000	$ 3,338,800	$ 6,775,800	per year
Librarians	$ 60,100 "	$ 60,100	$ 60,100	$ 120,200	"
Counselors	$ 50,000 "	$ 200,000	$ 200,000	$ 400,000	"
Administrators	$ 87,600 "	$ 438,000	$ 262,800	$ 700,800	"
Support Staff	$ 36,000 "	$ 1,440,000	$ 360,000	$ 1,800,000	"
Total Payroll, High School		**$ 5,575,100**	**$ 4,221,700**	**$ 9,796,800**	**per year**
Payroll, Indirect Employment					
Maui	$ 38,600 per job	$ 1,831,030	$ 1,312,238	$ 3,143,267	per year
Oahu	$ 43,000 "	$ 1,004,652	$ 720,001	$ 1,724,653	"
Total Payroll, Indirect Jobs		$ 2,835,682	$ 2,032,238	$ 4,867,920	per year
Payroll, Direct and Indirect Employment					
Maui		$ 7,406,130	$ 5,533,938	$ 12,940,067	per year
Oahu		$ 1,004,652	$ 720,001	$ 1,724,653	"
Total Payroll		**$ 8,410,782**	**$ 6,253,938**	**$ 14,664,720**	**per year**
3.d. CONSUMPTION EXPENDITURES					
Maui	55% of payroll	$ 4,073,371	$ 3,043,666	$ 7,117,037	per year
Oahu	55% "	$ 552,559	$ 396,000	$ 948,559	"
Total Consumption		**$ 4,625,930**	**$ 3,439,666**	**$ 8,065,596**	**per year**
3.e. PROFITS					
Maui	10% of consumption	$ 407,337	$ 304,367	$ 711,704	per year
Oahu	10% "	$ 55,256	$ 39,600	$ 94,856	"
Total Profits		**$ 462,593**	**$ 343,967**	**$ 806,560**	**per year**
3.f. POPULATION SUPPORTED BY OPERATIONS					
Maui					
Supported by School Jobs	2.03 per job	144	103	247	residents
Supported by Indirect Jobs	2.03 "	96	69	165	"
Total Residents, Maui		**240**	**172**	**412**	**residents**
Oahu Residents Supported by Indirect Jobs	2.08 per job	49	35	83	"
Total Residents Supported		**289**	**207**	**495**	**residents**

Table 3. Economic Impacts of Operations
(Values in 2010 dollars)

Item	Source or Multiplier	Phase I	Phase II	Total	Units
3.g. HOUSING FOR SUPPORTED POPULATION					
Maui					
Supported by Construction Jobs	0.34 per resident	49	35	84	homes
Supported by Indirect Jobs	0.34 "	33	23	56	"
Total Homes, Maui		**82**	**58**	**140**	**homes**
Oahu Homes Supported by Indirect Jobs	0.33 per resident	16	11	28	"
Total Homes Supported		**98**	**70**	**168**	**homes**
3.h. VALUE OF SUPPORTED HOUSING					
Maui					
Value of Homes Supported by School Jobs	$ 350,000 per home	$ 17,103,156	$ 12,257,262	$ 29,360,418	homes
Value of Homes Supported by Indirect Jobs	$ 350,000 "	$ 11,459,115	$ 8,212,365	$ 19,671,480	"
Total Homes, Maui		**$ 28,562,271**	**$ 20,469,627**	**$ 49,031,898**	**homes**
Oahu, Value of Homes Supported by Indirect Jobs	$ 440,000 per home	$ 7,056,302	$ 5,057,016	$ 12,113,318	"
Total Value of Homes		**$ 35,618,572**	**$ 25,526,644**	**$ 61,145,216**	**homes**

Table 4. Impacts on State and County Finances

(Values in 2010 dollars)

Item	Source or Multiplier	Phase I	Phase II	Total	Units
4.a. TAX & EXPENDITURE BASE					
Construction Activity					
Duration	Table 2, Section 2.a	2.25	2.00		years
Final Sales					
Annual Average	Table 2, Section 2.d	$ 85,162,923	$ 20,530,348		per year
Cumulative		$ 191,616,578	$ 41,060,695	$ 232,677,273	
Intermediate Sales					
Annual Average	Table 2, Section 2.d	$ 38,037,077	$ 9,169,652		per year
Cumulative		$ 85,583,422	$ 18,339,305	$ 103,922,727	
Profits					
Annual Average	Table 2, Section 2.e	$ 15,431,111	$ 3,720,000		per year
Cumulative		$ 34,720,000	$ 7,440,000	$ 42,160,000	
Payroll					
Annual Average	Table 2, Section 2.g	$ 41,710,366	$ 10,055,177		per year
Cumulative		$ 93,848,323	$ 20,110,355	$ 113,958,678	
Operations at Full Development					
Payroll	Table 3, Section 3.c	$ 8,410,782	$ 6,253,938	$ 14,664,720	per year
Sales Revenues (Consumption)	Table 3, Section 3.d	$ 4,625,930	$ 3,439,666	$ 8,065,596	"
Profits (on-site activities)	Table 3, Section 3.e	$ 462,593	$ 343,967	$ 806,560	"
Owner-occupied Homes, Maui	60% of homes	49	35	84	homes
Property Value, Maui					
Total Value	Table 3, Section 3.h	$ 28,562,271	$ 20,469,627	$ 49,031,898	
Less Home Owner Exemption	$ 300,000 per home	$ (14,689,168)	$ (10,527,237)	$ (25,216,405)	
Taxable Value		$ 13,873,103	$ 9,942,390	$ 23,815,493	
4.b. DEVELOPMENT ACTIVITIES					
State Revenues, Cumulative					
Excise Tax					
Final Sales	4.0% of sales	$ 7,664,663	$ 1,642,428	$ 9,307,091	
Intermediate Sales	0.5% "	$ 427,917	$ 91,697	$ 519,614	
Total Excise Tax		$ 8,092,580	$ 1,734,124	$ 9,826,705	
Corporate Income Taxes	1.0% of profits	$ 347,200	$ 74,400	$ 421,600	
Personal Income Taxes	4.8% of income	$ 4,504,720	$ 965,297	$ 5,470,017	
Total State Tax Revenues		**$ 12,944,500**	**$ 2,773,821**	**$ 15,718,321**	
Offset of Construction Costs		9%	9%	9%	
Maui County Revenues, Cumulative		**$ -**	**$ -**	**$ -**	
4.c. OPERATIONS AT FULL DEVELOPMENT					
State Revenues, Annual					
Excise Tax	4.0% of sales	$ 185,037	$ 137,587	$ 322,624	per year
Corporate Income Tax	1.0% of profit	$ 4,626	$ 3,440	$ 8,066	"
Personal Income Tax	4.8% income	$ 403,718	$ 300,189	$ 703,907	"
Total State Tax Revenues		**$ 593,381**	**$ 441,215**	**$ 1,034,596**	**per year**
Maui County Revenues, Annual	$ 4.85 per $1,000	**$ 67,285**	**$ 48,221**	**$ 115,505**	**per year**

Appendix M

Nonpotable Water System Alternatives Analysis

Gray, Hong, Nojima & Associates, Inc. – March 2012

KIHEI HIGH SCHOOL

NONPOTABLE WATER SYSTEM ALTERNATIVES ANALYSIS

TMK: (2) 2-2-002: 81 and 83
Kihei, Maui, Hawaii

March 30, 2012

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Chapter 1 – INTRODUCTION AND BACKGROUND

1.1 OVERVIEW OF PROJECT

The population of Kihei, Maui is significantly increasing and without a high school in the area, students must commute daily to Kahului and Wailuku. To relieve overcrowding in Central Maui schools and to reduce the commute time for students, the State of Hawaii Department of Education (DOE) proposes to develop the new Kihei High School on 77 acres of vacant land along Piilani Highway north of the Elleair Golf Course (refer to Figure 1). The school is scheduled to be open for the 2016-17 school year. Facilities would include approximately 215,000 square feet of educational buildings to support an enrollment capacity of 1,650 students at full build-out. Also proposed for the full build-out are a library, cafeteria, an administration building, a football/track stadium, gym, tennis courts, grassed playfields, a softball field, and a baseball field (refer to Figure 2).

Given the severe shortage of water on Maui, dual water systems are being planned for the proposed Kihei High School. The DOE will request connection to the Department of Water Supply's existing Central System for *potable water* and fire protection; a *nonpotable* system will be developed to irrigate the campus landscape and athletic fields. Due to the warm and arid climate of Kihei, the estimated nonpotable irrigation demand is significantly higher than that of typical high school campuses and is projected at 185,000 gallons per day (GPD). It is also expected that irrigation will take place daily within a 9 to 12 hour watering period.

Design-Build (DB) will be the method of delivery for the construction of Kihei High School. As such, Request for Qualifications (RFQ) and Request for Proposal (RFP) documents are being prepared for the DB procurement process. The winning Design-Build Entity (DBE) selected by the DOE will be responsible for design, construction, and commissioning of the new school.

1.2 PURPOSE AND LIMITATIONS

The purpose of this report is to analyze potential nonpotable water system alternatives including the necessary improvements that would need to be completed prior to the opening of the school. The review will examine the following nonpotable water sources and provide recommendations based a life cycle cost comparison and discussion of other site-specific and project-related considerations:

- R-1 recycled water from the County of Maui's existing Kihei Wastewater Reclamation Facility (WWRF)
- Onsite brackish groundwater wells

Prospective proposers and the winning DBE shall visit the site to become familiar with existing site conditions. Similar to other reports and documents associated with the project's RFP process, general characteristics and data provided herein are *not intended for use in the DBE's final design.*

1.3 SITE LOCATION

The proposed Kihei High School campus site encompasses approximately 77 acres of undeveloped land on the mauka (east) side of Piilani Highway across from the Piilani Village residential subdivision in Kihei. It is bordered on the south by Waipuilani Gulch and Elleair Golf

Course (refer to Figure 1). Further south are the Maui Research and Technology Park, Piilani Shopping Center, and the Kihei Wastewater Reclamation Facility. To the east are undeveloped properties owned by Kaonoulu Ranch Company and Haleakala Ranch. Kulanihakoi Gulch and undeveloped Kaonoulu Ranch lands form the northern boundary.

The property is comprised of two subdivided parcels which were recently acquired by the DOE (TMK 2-2-002:81 and 2-2-002:83 respectively, refer to Figure 3). Previous owners, Kaonoulu and Haleakala Ranches, have subdivided a portion of their respective properties for this transaction. The two subdivided parcels will be consolidated into the proposed Kihei High School site.

1.4 CLIMATE

The Kihei coast is known to be sunny, warm, and dry throughout the year. Annual temperatures for the Kihei region average in the mid to high 80s (degrees F). Average rainfall distribution in the region varies from under 10 inches per year along the coastline to more than 20 inches per year at higher elevations. Rainfall in Kihei is highly seasonal with most precipitation occurring during the winter months. The neighboring Kulanihakoi and Waipuilani Gulches are normally dry except during heavy rainfall events.

1.5 TOPOGRAPHPY AND SOILS

The proposed project site is currently undeveloped and consists of dry rolling foothills on west-facing lowland slopes of Haleakala. Vegetation on the site is primarily grassland currently utilized for grazing, with scattered shrubs and trees. In general, the site slopes toward the west and southwest. Elevation ranges from about 40 feet mean sea level (MSL) at Piilani Highway up to about 110 feet at the eastern boundary.

The U.S. Soil Conservation Service (SCS) Soil Survey (1972) identifies two general soil types at the project site (refer to Figure 4), including Alae sandy loam (AaB) and Waiakoa extremely stony silty clay loam (WID2).

The SCS describes the Alae (AaB) series as moderately deep, well-drained soils that formed in material weathered from basic igneous rock. The slopes vary from nearly level to gently sloping with elevations ranging from 50 to 600 feet. The mean annual soil temperature is 74°F. This sub-series are used for sugarcane and pasture with some small acreage used for truck crops. Permeability is rapid, runoff is slow, and the erosion hazard is no more than slight.

The Waikoloa (WID2) series comprises most of the project site. The SCS describes this series as moderately deep, well-drained soils that formed in material weathered from basic igneous rock. The slopes vary from gently sloping to moderately steep with elevations ranging from 100 to 1,000 feet. The mean annual soil temperature is 74°F. This sub-series are used for sugarcane, pasture, homes, and wildlife habitat. Permeability is moderate, runoff is medium, and the erosion hazard is severe. In most areas about 50 percent of the surface layer has been removed by erosion.

Chapter 2 – NONPOTABLE WATER SYSTEM ALTERNATIVES

2.1 BRACKISH WATER SYSTEM

Under this alternative, irrigation water would be supplied by brackish wells located on the campus grounds. Brackish water would be pumped from the underlying basal aquifer's lens or transition zone between the salt water and the fresh water into the campus irrigation system. The entire system would be owned and operated by the Department of Education (DOE).

2.1.1 Brackish Water Source

According to the *Groundwater Resources and Supply Report* prepared for this project by Water Resources Associates (2011), the project site is located approximately 3/4 mile inland of the coastline in the northern part of Maui's Kamaole Aquifer System. The State's *Water Resource Protection Plan* (2008) estimates that 11 million gallons of groundwater can be developed daily from the Kamaole system on a sustainable basis.

The *Groundwater Resources and Supply Report* (2011) indicates that existing wells along the Kihei coast have encountered salinity levels of approximately 2,000 mg/L chlorides. Reported chloride levels then drops at wells located 1/2 to 3/4 mile inland from the coast, ranging from 500 to 600 mg/L chlorides. Existing wells located north and south of the project site, at a distance roughly 3/4 to 1 mile from the coast, have reported salinities of about 300 to 350 mg/L chlorides (Water Resources Associates, 2011).

2.1.2 Infrastructure Improvements

The nonpotable water system for irrigation of the school site would include two brackish wells, pumps, motors, discharge assemblies (piping, valves, water meter, water sampling spigot, etc.), and electrical controls. The pressurized distribution lines, control valves, and other appurtenances would be configured to service the campus landscaping plan and various athletic fields.

A primary well would be located at the northeast corner of the site at an elevation of approximately 90 feet MSL (Water Resources Associates, 2011). The second well would serve as a supplemental/standby well located at the southeast corner of the property at roughly the same elevation as the first well (refer to Figure 2). It is projected that each well will have a capacity in the range of 250 to 350 GPM while producing suitable brackish water in the salinity range of 400 to 500 mg/L chlorides. Actual pumping capacities will be determined during well tests when the wells are drilled. Therefore, pending the test results, the system may run under alternating or simultaneous operation of the wells in order to meet the estimated demand of 185,000 GPD within a 9 to 12 hour irrigation period. According to Water Resources Associates (2011), the wells are not expected to have any adverse impact on the existing water supply (fresh and brackish) and nearby wells.

Dimensions and design parameters for each proposed well were provided by Water Resource Associates (2011):

Ground Elevation	90 feet mean sea level (MSL)
Total Depth	110 feet (-20 MSL)
Casing Diameter	12 inches
Solid Casing Depth	90 feet (0 MSL)

Louvered Screen Casing Depth	110 Feet (-20 MSL)
Casing Material	Corrosion-resistant steel
Anticipated Well Capacity	250 to 350 GPM
Anticipated Aquifer Head	2 feet MSL (approximate)
Anticipated Total Dynamic Head	118 PSI
Anticipated Salinity	400 to 500 mg/L chlorides

2.2 EFFLUENT REUSE SYSTEM

The Kihei WWRF is located approximately 2 miles south of the proposed high school site serving the area extending from Kihei to Wailea (refer to Figure 5). The facility has a treatment capacity of 8.0 million gallons per day (MGD) and produces R-1 quality effluent. R-1 water represents the highest grade of recycled water designated by the Hawaii Department of Health standards (Fukunaga and Associates, 2005) suitable for landscape and agricultural irrigation, fire control, toilet/urinal flushing, and dust control in construction projects. According to the County of Maui's Department of Environmental Services, the typical salinity of the Kihei WWRF's R-1 water is about 200 mg/L chlorides.

In December 2009, the Department of Environmental Management reported that the daily average demand for Kihei's R-1 recycled water or reclaimed effluent was 1.38 MGD which represented 38% of the total R-1 production. It should be noted that the R-1 water that is not used by current R-1 customers is disposed into injection wells located at the reclamation facility.

Among the current R-1 water customers are the Elleair Maui Golf Club, Monsanto Corporation (seed corn), Kihei Community Center, Kihei Elementary School, Lokelani Intermediate School, Haggai Institute, and the Piilani Community Center (http://www.hwea.org/kihei-effluent-reuse, November 2009). These R-1 water users are presently charged at a rate of $1.28/1,000 gallons.

2.2.1 Existing Kihei Effluent Reuse System Infrastructure

According to Fukunaga and Associates (2005) the existing Kihei WWRF R-1 system consists of the following infrastructure (refer to Figure 5):

- 1.8 million gallon (MG) effluent storage basin with polypropylene liner and cover,
- Effluent pumping station with 2 pumps and 1 standby pump, each rated at 2,000 gallons per minute at 240 feet total dynamic head (TDH),
- 1.0 MG concrete effluent storage tank with aluminum geodesic dome cover at a bottom elevation of 304.7 feet mean sea level (MSL),
- 18-inch ductile iron transmission line from the Kihei WWRF effluent pump station to the effluent storage tank,
- 12-inch ductile iron transmission and distribution line from the WWRF crossing Piilani Highway and running north along the North-South Collector Road to Waipuilani Road,
- 12-inch PVC transmission and distribution line from the North-South Collector Road/Waipuilani Road intersection, down Waipuilani Road to South Kihei Road, and
- Pressure reducing valve located at the intersection of East Welekahao Road and Welekahao Road.

Based on recent studies by other engineering consultants and discussions with the Department of Environmental Services, *it is surmised that the Kihei WWRF treatment, effluent pumping and storage facilities can adequately handle the additional nonpotable water demand associated*

with the new high school without requiring further improvements and upgrades. However, these assumptions are subject to review and verification by the DBE, if the R-1 alternative is pursued, for the following reasons:

(1) The proposed school's nonpotable irrigation requirements can only be finalized once the overall campus landscaping plan is designed.

(2) Demand for R-1 recycled water in the service area continues to increase among present users and new developments.

Additional nonpotable requirements at the school and/or increased demand for R-1 water in the South Maui area could warrant expansion of the Kihei WWRF treatment, pumping and/or storage capabilities.

2.2.2 Proposed R-1 Water System Improvements

To service the proposed Kihei High School, an approximate 3,100 LF extension of the existing 12-inch R-1 main. The existing R-1 main currently terminates at the intersection of Waipuilani Road and the North-South Collector Road. The extension must cross Piilani Highway, which is a State of Hawaii right-of-way under the jurisdiction of the Department of Transportation, Highways Division. A possible route for the Piilani Highway crossing would be at the Kulanihakoi Street intersection.

One other onsite improvement would include adding an onsite booster pumping system, since the residual line pressure at the Waipuilani Road/North-South Collector Road intersection is between 65 and 70 pounds per square inch (PSI) and existing ground elevations on the campus site ranges from about 40 to 100 feet MSL. The onsite R-1 water booster pumping system should have a minimum capacity 350 gallons per minute (GPM).

If the R-1 water system is capable of delivering an average of 185,000 gallons within a 9 to 12 hour irrigation period during non-school hours, it is unlikely that an onsite R-1 water storage tank will be necessary.

2.2.3 Backup Provisions

According to the Department of Environmental Services (December 2009), during winter months, wastewater flow rates to the Kihei WWRF are typically higher due to the influx of tourists in the South Maui area. Unfortunately, this also corresponds to the wetter months of the year when irrigation demands are lower, resulting in an excess of R-1 water supply.

Conversely, during the hotter and drier summer months, properties with large irrigated areas demand more R-1 water than can be produced at the Kihei WWRF (Department of Environmental Services, December 2009). The users in closer proximity to the facility tend to use most of the R-1 water produced, thus, other users must have alternate sources or back-up provisions available to provide irrigation water during this drier period.

Backup/alternate sources are also necessary during other periods of the year when the WWRF is not able to provide R-1 water. Occasional plant upsets occur due to the nature of the biological treatment processes in use at the WWRF. This can happen a few times a year and may typically last a few days to a week. In addition, there are occasional plant shutdowns to accommodate maintenance and/or cleaning of equipment.

Therefore, under this alternative, an onsite brackish well could serve as the R-1 water system backup when there is a shortage from the WWRF. The well pump would be manually activated as needed by DOE personnel and should also be tested on a routine basis to ensure that the system can be operated when the shortages occur. Depending on the severity of the situation, the single well may be operating on a daily basis until R-1 water becomes available.

Chapter 3 – COMPARISON OF ALTERNATIVES

3.1 LIFE CYCLE COST ANALYSIS

A summary of the 40-year life cycle cost analysis for each of the two alternatives is provided in Table 3.1. Detailed calculations are may be found in the Appendix.

TABLE 3.1 – 40-YEAAR LIFE CYCLE COST COMPARISON

	R-1 WATER WITH BRACKISH WELL BACKUP/ALTERNATE	BRACKISH WATER SYSTEM (2 WELLS)
Average power in KW (R-1)	13	0
Average power in KW (Brackish)	30	30
Average operating hours/year (R-1)	3,204	0
Average operating hours/year (Brackish)	81	3,285
PRESENT VALUES:		
Construction Cost	$2,160,860	$856,400
Energy Cost	$520,220	$1,163,007
Routine Operation & Maintenance Cost	$32,000	$0
Replacement Cost	$178,200	$210,000
R-1 Water Charge (Fees to County)	$5,125,761	$0
TOTAL LIFE CYCLE COST, Present Value	$8.0M	$2.2M

The following are assumptions and exclusions used in the analysis:

1. Downtime for R-1 water: 3 occurrences/year @3 days/occurrence =9 days/year
2. Average irrigation (nonpotable water) demand: 185,000 GPD
3. Daily watering period will be 9 hours.
4. No additional onsite treatment required for brackish or R-1 water.
5. Backup/alternate nonpotable water source will not be required for 2-well brackish water system.
6. Discount rate, excluding inflation: 3.0%
   Source: U.S. Dept. of Commerce, September 2011 (NISTIR 85-3273-26)
   Life Cycle Cost Analysis – 2011
7. Current cost of R-1 Water (County of Maui): $1.28/1,000 gallons
8. Current energy cost (Maui Electric Co.) = $0.35/KWH
9. No financing charges or loan interest payments.
10. Backup power will not be necessary; therefore, emergency generators are not included.
11. Cost for easements are <u>not</u> included.

Based on the data above, brackish water produced onsite is less expensive as a long-term source of nonpotable irrigation water than R-1 water from the Kihei WWRF. The DOE will save close to $6 M in the 40-year life cycle or approximately $150,000 per year.

3.2 OTHER FACTORS AND CONSIDERATIONS

While life cycle cost is a key consideration, it should not be the sole criteria used in evaluating the two alternatives. The following discussion reviews other factors that must be considered in the final recommendation.

3.2.1 Source Reliability

Brackish Wells

According to Water Resources Associates (2011), the proposed daily withdrawal of 185,000 gallons of brackish groundwater is not expected to have adverse impact on the recharge or sustainable yield of the underlying Kamaole Aquifer System. Except during periods of power outages or equipment maintenance and repairs, the brackish water wells should provide a reliable nonpotable water source for irrigation of the campus landscape and athletic fields.

R-1 Water

Conversely, the reliability of the R-1 water supply cannot be guaranteed throughout the year. There are inherent operational factors that may prevent the production of R-1 water. As mentioned previously, sporadic plant upsets are inevitable due to the nature of the biological treatment processes in use at the Kihei WWRF. This can happen a few times a year and may typically last a few days. In addition, there will be occasional plant shutdowns to accommodate maintenance and/or cleaning of equipment. However, because the maintenance-related shutdowns are planned in advance, they can be scheduled so as to minimize the inconvenience to R-1 users.

Of greater concern would be the shortage of R-1 water demand during the warmer and drier summer months when user irrigation demands are at their peak. Demand for R-1 water may exceed the supply produced at the Kihei WWRF. This is exacerbated by the fact that users in closer proximity to the plant have the heaviest irrigation demands.

Therefore, if the R-1 water alternative is selected, an alternate/backup source such as an onsite brackish water well must be provided to cover periods when the WWRF cannot produce a sufficient supply of R-1 water to meet the school's nonpotable water needs.

3.2.2 Management of Resources

Brackish Wells

A brackish nonpotable water system would be entirely owned and operated by the DOE. Department personnel would also be responsible for routine maintenance and necessary repairs of pumps, motors, and control systems.

R-1 Water

In addition to normal operation and maintenance of the R-1 booster pumping system, DOE personnel would be responsible for the backup/alternate brackish system. In the short-term there are two systems to become familiar with during the initial start-up. It should be noted that although the brackish wells will not be operating on a continuous basis, routine maintenance will

have to be performed in order to ensure that the backup system is fully functional when R-1 water is unavailable. Therefore, there would be two systems to operate and maintain on a permanent basis.

3.2.3 Construction Schedule

Although the DOE anticipates opening Kihei High School in time for the 2016-17 academic year, planting of the campus landscape and athletic fields will need to take place much in advance of the actual opening. Moreover, timely completion of the nonpotable water system is desirable, since the DBE must identify and obtain its own water source for all construction activities, including irrigation of plantings for the campus landscape and athletic fields.

Brackish Wells

Relying solely on brackish water for onsite irrigation will require permitting, drilling, and testing of two brackish wells located entirely onsite within DOE property. Construction of other offsite infrastructure improvements will not be required prior to start-up of the irrigation system or opening of the school. Therefore, this alternative would not be dependent on the design and construction schedule of the R-1 distribution line extension.

R-1 Water

The DOE will be relying on the County of Maui to fund and construct the extension of the existing R-1 system from the end of the existing 12-inch main at the intersection of Waipuilani Road and the North-South Collector Road. Reliance on the County of Maui to construct the R-1 water main extension has the potential to conflict with the DOE's aggressive delivery schedule for the opening of the new school. This is the result of the time typically required for the planning, permitting, design, and construction of the extension.

In addition, the proposed R-1 water main extension would need to cross Piilani Highway to reach the campus. At minimum, this will require, obtaining approvals and an easement from the Department of Transportation's Highways Division. This is a potential time consuming process. Additional easements may be required depending on the route selected for the R-1 line extension.

As mentioned previously, this alternative will also entail the construction of at least one onsite brackish water well as a backup/alternate source to be operated when adequate supply R-1 water is not available.

3.2.4 Elevated Salinity Levels in Nonpotable Irrigation Water

It should be noted that levels of salinity in the irrigation water (both from R-1 water and brackish water) can lead to a number of problems if the irrigation system is developed without careful consideration during the design and construction phases. In addition to the selection of salt-tolerant species in the campus landscaping plan by the DBE, use of corrosion-resistant materials will allow for longer system life and better performance of brackish pumping and irrigation system equipment. Elevated levels of sodium in the irrigation water could also lead to reduction in water infiltration depending on the quality of top soil or import material brought onto the site. Surface crusting and plugging of soil pores would impede the downward movement of water to plant roots.

As mentioned in Chapter 2, salinity levels in the *brackish well water are expected to range between 400 and 500 mg/L chlorides* compared to lower levels of *about 200 mg/L in Kihei WWRF's R-1 water*.

3.2.5 Public Health and Best Management Practices (BMP)

Protection of public health is the most important consideration in the distribution and use of recycled water for irrigation purposes because human contact with recycled water will take place. Reuse of treated wastewater effluent is governed by the State of Hawaii Department of Health (DOH) under the *Guidelines for Treatment and Use of Recycled Water* (2002). Prior to construction of a reuse system, the guidelines specify that an Engineering Design Report must be approved by the DOH for all projects involving areas greater than 5 acres. The report must also incorporate the following Best Management Practices (BMP) Plans to address site-specific mitigative measures and controls:

- Irrigation Plan
- Management Plan
- Public Education Plan
- Employee Training Plan
- Vector Control Plan
- Monitoring Plan

In contrast, there are no specific regulations governing brackish water irrigation systems in public places.

Chapter 4 – POTENTIAL APPROVALS AND PERMITS

This section outlines potential approvals and permits that are *specific to the construction and operation of the nonpotable water system (*refer to summary in Table 4.1); however, clearances required by other disciplines such as, but not limited to civil, electrical, historic preservation, land use, etc. are excluded. It should be noted that other approvals and permits related to the nonpotable water system could become necessary depending on the final layout by the DBE.

4.1 FEDERAL – U.S. GOVERNMENT

- There are no Federal clearances anticipated for either alternative.

4.2 STATE OF HAWAII

- State Department of Health
  - Community Noise Permit for Construction Activities.
  - Approval of Construction Plans for conformance with *Guidelines for Treatment and Use of Recycled Water*
  - NPDES General Permit Coverage for discharge of water system hydrotesting into State Waters
  - Approval of Water Reuse Engineering Report – Best Management Practices
    - Irrigation Plan
    - Management Plan
    - Public Education Plan
    - Employee Training Plan
    - Vector Control Plan
    - Monitoring Plan

- State Department of Land and Natural Resources Commission on Water Resource Management
  - Pump Installation Permit for the installation of brackish well pumps
  - Well Construction Permit for the installation of brackish wells for landscaping
  - Well Completion Report
  - Well Abandoning/Sealing Report

- State Department of Transportation Highways Division
  - Approval of construction plans for conformance with the State Highway standards
  - Permit to perform work within a State right-of way
  - Easement for R-1 water distribution line in State right-of-way
  - Discharge Permit for work that will generate construction runoff into the State Highway drainage system

4.3 COUNTY OF MAUI

- Department of Environmental Management
  - Approval of Construction Plans for conformance with County wastewater standards
  - Sewer connection to the County wastewater collection system

- Department of Public Works
  - Building Permit for site work
  - Approval of Construction Plans for conformance with County standards
  - Permit to Perform Work on a County highway for trenching and utility installation on County-owned roads

TABLE 4.1 SUMMARY OF POTENTIAL PERMITS AND APPROVALS

	Brackish Wells	R-1 Water
STATE OF HAWAII		
Department of Health		
Community Noise Permit for Construction Activities	Y	Y
Approval of Construction Plans		Y
NPDES General Permit Coverage - Hydrotesting Waters		Y
NPDES General Permit Coverage - Construction Storm Water		Y
Approval of Water Reuse Project - Best Management Practices		Y
Irrigation Plan		Y
Management Reuse Plan		Y
Public Education Plan		Y
Employee Training Plan		Y
Vector Control Plan		Y
Monitoring Plan		Y
Department of Land and Natural Resources Commission on Water Resource Management		
Pump Installation Permit	Y	Y
Well Construction Permit	Y	Y
Well Completion Report	Y	Y
Well Abandoning/Sealing Report		
Department of Transportation Highways Division		
Approval of Construction Plans		Y
Permit to perform work within a State right-of-way		Y
Easement for R-1 distribution line in State right-of-way		Y
COUNTY OF MAUI		
Department of Environmental Management		
Approval of Construction Plans		Y
Permit for Sewer Connection		Y
Department of Public Works		
Building Permit	Y	Y
Approval of Construction Plans		Y
Permit for Trenching and Utility Installation		Y

Chapter 5 – SUMMARY AND RECOMMENDATION

While cost has significant implications on the DOE's capital improvement budget, it is not the only factor to be considered selecting the recommended alternative. The following table summarizes the various factors and considerations discussed in Chapter 3.

TABLE 5.1 COMPARISON OF ALTERNATIVES

FACTOR/CONSIDERATION	R-1 WATER	BRACKISH WATER
Life Cycle Cost (40-year)	$8.0 M	$2.2 M
Source Reliability	Subject to WWRF output	Rechargeable/sustainable aquifer
Long-Term Resource Management	Two onsite systems	Single onsite system
Control of Construction Schedule	County and DOE'S DBE	DOE'S DBE
Salinity Level	200 mg/L	400+ mg/L
Public Health and Safety	R-1 use governed by DOH (Engineering design report required)	No governance

Of the two alternatives, brackish wells will provide a more reliable source and will not require an additional backup/alternate source. As such, school personnel can focus their efforts on the operation and maintenance of a single nonpotable water system.

In addition, there would be more uncertainty in the project schedule if the R-1 alternative is selected, since funding for design and construction of the distribution line extension is yet to be secured by the County of Maui. The use of R-1 recycled water would also require further approvals of Best Management Practices by the Department of Health which could add to the project delivery schedule. Therefore, there is the likelihood that the campus landscape and athletic fields may not be completed prior to the scheduled opening of the school.

A disadvantage of using brackish groundwater for irrigation is that its projected salinity is expected to be about double the level in the R-1 water from the Kihei WWRF. More careful consideration must be given to the following issues during the design phase:

- Selection of salt-tolerant species in campus landscaping plan
- Use of corrosion-resistant materials in pumping and irrigation equipment
- Quality of top soil or import material

Based on the given existing site and environmental conditions, brackish groundwater is the recommended nonpotable water source for the proposed high school. Brackish water wells would provide a reliable source of irrigation water that could be available when the school opens.

Chapter 6 – REFERENCES

County of Maui, Department of Environmental Management, Waste Water Reclamation Division and Department of Water Supply, Water Resource Planning Division. *South Maui R-1 Recycled Water Verification Study,* December 2009.

Fukunaga and Associates, Inc. *Kihei Effluent Reuse System Expansion Study*, Prepared for Department of Water Supply and Department of Public Works and Environmental Management Wastewater Reclamation Division, County of Maui, November 2005.

State of Hawaii, Department of Health. *Guidelines for the Treatment and Use of Recycled Water*, 2002.

State of Hawaii, Department of Land and Natural Resources, Commission of Water Resource Management. *Water Resource Protection Plan Update*, 2008.

U.S. Department of Agriculture, Soil Conservation Service. *Soil Survey for the Islands of Kauai, Oahu, Maui, Molokai, and Lanai, State of Hawaii,* August 1972.

U.S. Department of Commerce, Weather Bureau. *Technical Paper No. 43 – Rainfall Frequency Atlas of the Hawaiian Islands for Areas to 200 Square Miles, Durations to 24 Hours, and Return Periods from 1 to 100 Years*, 1962.

U.S. Department of Commerce. *Energy Price Indices and Discount Factors for Life-Cycle Cost Analysis – 2011, Annual Supplement to NIST Handbook 135 and NBS Special Publication 709.* Prepared for U.S. Department of Energy, Federal Energy Management Program, September 2011.

U.S. Environmental Protection Agency, Office of Water Program Operations. *Innovative and Alternative Technology Assessment Manual.* February 1980.

Water Resource Associates. *Groundwater Resources and Supply for Kihei High School Design Build Project, Kihei, Maui, Hawaii,* Prepared for Group 70 International and Department of Education, May 2011.

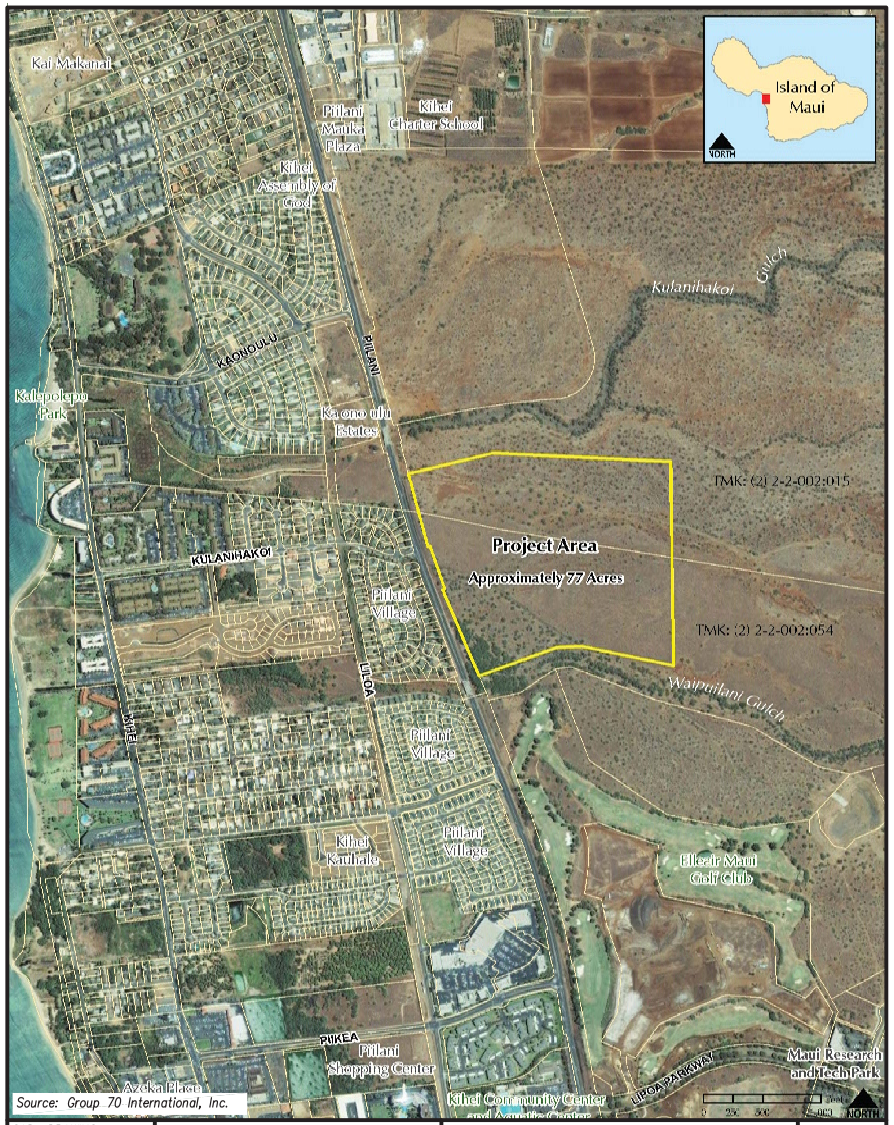
Websites

Hawaii Water Environment Association
Kihei Effluent Reuse (submitted on November 2, 2009)
http://www.hwea.org/kihei-effluent-reuse

U.S. Department of Agriculture, Natural Resource Conservation Service
Soil Data Mart
http://soildatamart.nrcs.usda.gov/

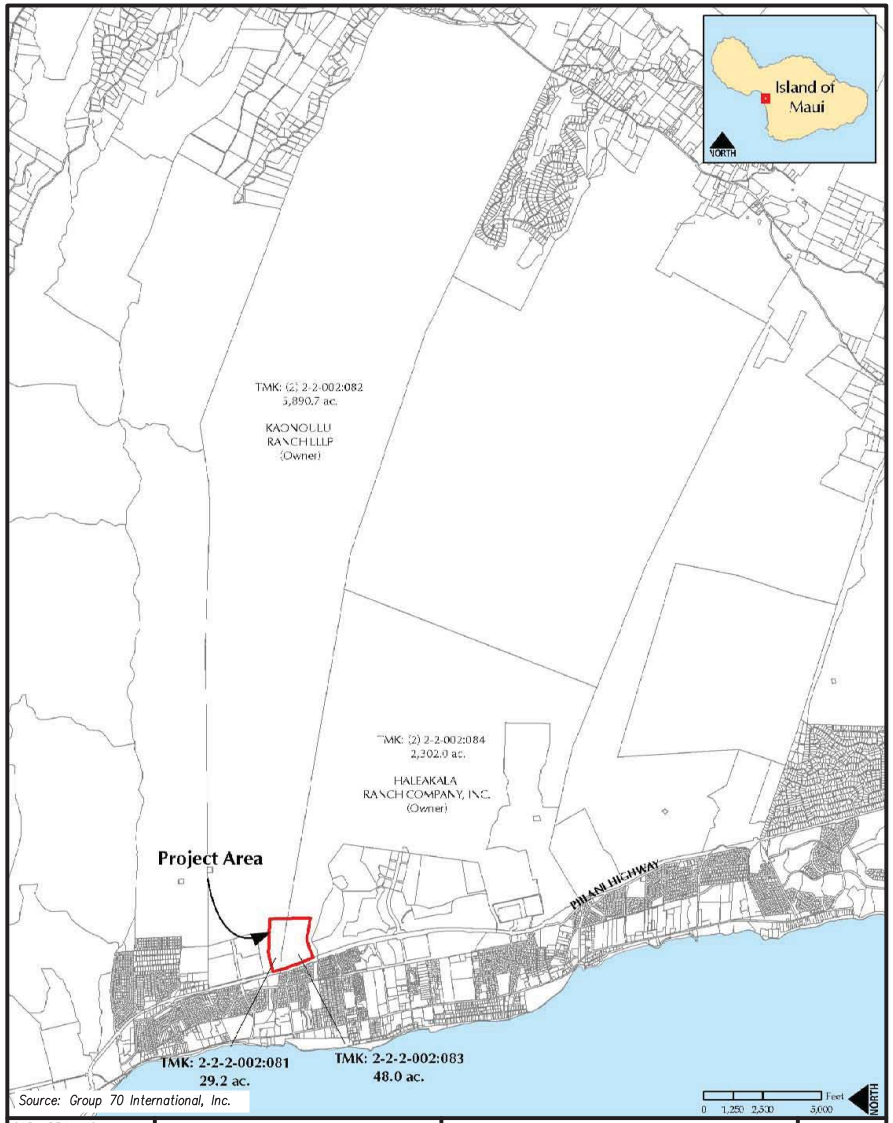
U.S. National Oceanic and Atmospheric Administration, National Weather Service
HDSC Precipitation Frequency Data Server
http://hdsc.nws.noaa.gov/hdsc/pfds/hi/hi_pfds.html

LIST OF FIGURES

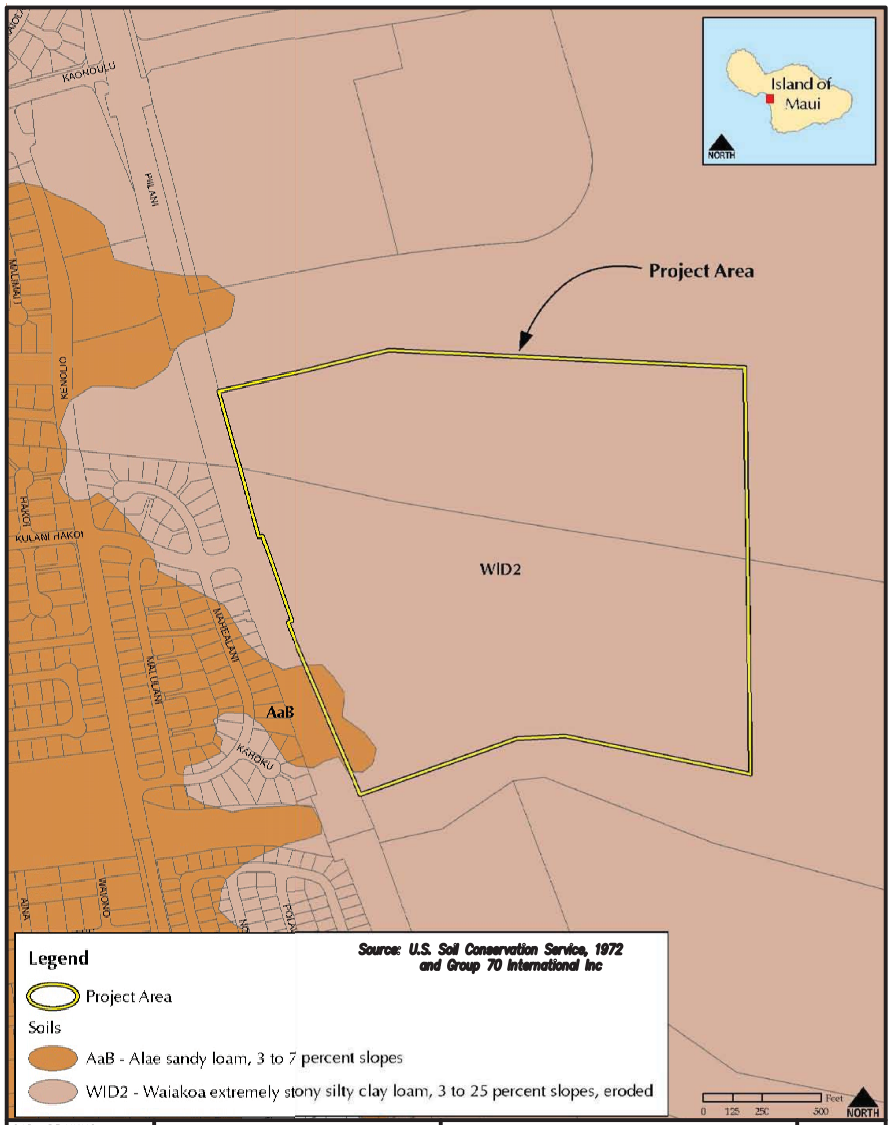


CAD DRAWING: FIG 1–R1 LOC DATE: FEB 7, 2012 SCALE: AS SHOWN PROJECT #: 2995–00	LOCATION MAP	Gray, Hong, Nojima & Associates, Inc. CONSULTING ENGINEERS 201 Merchant Street, Suite 1900 Honolulu, Hawaii 96813 Fax: (808) 531-8018 Telephone: (808) 521-0306	FIGURE 1

CAD DRAWING: FIG 2–R1 SITE DATE: FEB 13, 2012 SCALE: AS SHOWN PROJECT #: 2995–00	PROPOSED CAMPUS SITE PLAN	Gray, Hong, Nojima & Associates, Inc. CONSULTING ENGINEERS 201 Merchant Street, Suite 1900 Honolulu, Hawaii 96813 Fax: (808) 531-8018 Telephone: (808) 521-0306	FIGURE 2



CAD DRAWING: FIG 3–R1 TMK DATE: FEB 7, 2012 SCALE: AS SHOWN PROJECT #: 2995–00	TAX MAP KEY	Gray, Hong, Nojima & Associates, Inc. CONSULTING ENGINEERS 201 Merchant Street, Suite 1900 Honolulu, Hawaii 96813 Fax: (808) 531-8018 Telephone: (808) 521-0306	FIGURE 3



CAD DRAWING: FIG 4–R1 SOIL DATE: FEB 7, 2012 SCALE: AS SHOWN PROJECT #: 2995–00	SOILS MAP	Gray, Hong, Nojima & Associates, Inc. CONSULTING ENGINEERS 201 Merchant Street, Suite 1900 Honolulu, Hawaii 96813 Fax: (808) 531-8018 Telephone: (808) 521-0306	FIGURE 4

APPENDIX

Life Cycle Cost Calculations

Source: Fukunaga and Associates (2005), *Kihei Effluent Reuse System Expansion Study.*

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Honolulu, Hawaii 96813
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Telephone: (808) 521-0306

PROPOSED R-1 WATER SYSTEM

CAD DRAWING: FIG 5-R1 WATER
SCALE: 1"=1000' (11x17)
DATE: February 13, 2012
PROJECT #: 2995-00

FIGURE 5

Construction Cost for R-1 Water Alternative

Extension of 12" R-1 Line & Booster System Quantities

A.	**3,100**	**12" PVC C900 Pipe (feet)**
B.	**1,400**	**Trench Backfill Volume (Cu. Yd.)**
	3,100	Feet Long Trench
	2	Feet Wide Trench
	6	Feet Deep Trench
C.	**2,100**	**Pavement Restoration (Sq. Yd.)**
	3,100	Feet Long Trench
	6	Feet Wide Trench

Extension of 12" R-1 Line & Booster System Cost Estimate

ITEM NO.	ESTIMATED QUANTITY	DESCRIPTION	UNIT PRICE	TOTAL
1	3,100	LF, 12" PVC C900 Pipe	$70	$217,000
2	1,400	Cu. Yds., Trench Excavation & Backfill	$310	$434,000
3	2,100	Sq. Yds., Pavement Restoration	$120	$252,000
4	1	Ea., 4" Meter & Meter Box	$5,000	$5,000
5	1	350 GPM Booster Pump and Controls	$78,000	$78,000
6	1	Brackish Well Drilling and Testing	$120,000	$120,000
7	1	Brackish Well Pump and Controls	$200,000	$200,000
8	Lump Sum	Construction Mobilization (6% of Items 1-7)	Lump Sum	$78,360
9	Lump Sum	Best Management Practices (5% of Items 1-7)	Lump Sum	$65,300
10	Lump Sum	Construction Contingency (20% of Items 1-7)	Lump Sum	$261,200
11	Lump Sum	Traffic Control	Lump Sum	$200,000
12	Lump Sum	Design Fee	Lump Sum	$250,000
		Total		**$2,160,860**
		Summary of Extension of R-1 Line Cost		**$1,757,860**
		Summary of Booster System Cost		**$83,000**
		Summary of Backup Brackish Well Cost		**$320,000**

ASSUMPTIONS:

1. No storage tank.
2. Cost for Brackish Pump and Controls based on "Groundwater Resources and Supply for Kihei High School Design/Build Project" (Water Resources Associates, May 2011).
3. Cost for Booster Pump and Controls based on UFC 3-701-01 DOD Facilities Pricing Guide for a nonpotable water pump facility replacement cost and Hawaii average area cost factor of 2.14.

Construction Cost for Brackish Water Alternative

2 Well Brackish Water System Cost Estimate

ITEM NO.	ESTIMATED QUANTITY	DESCRIPTION	UNIT PRICE	TOTAL
1	2	Brackish Well Drilling and Testing	$120,000	$240,000
2	2	Brackish Well Pump and Controls	$200,000	$400,000
3	Lump Sum	Construction Mobilization (6% of Items 1-2)	Lump Sum	$38,400
4	Lump Sum	Construction Contingency (20% of Items 1-2)	Lump Sum	$128,000
5	Lump Sum	Design Fee	Lump Sum	$50,000
		Total		**$856,400**

ASSUMPTIONS:

1. No storage tank.
2. Cost for Brackish Pump and Controls based on "Groundwater Resources and Supply for Kihei High School Design/Build Project" (Water Resources Associates, May 2011).

Annual Energy Costs for R-1 Water Alternative

Flow =	350	GPM	
Efficiency =	67	percent	(Combined; Motor Eff x Pump Eff)
Hours of Operation/Day =	9	hours/day	
Energy Cost =	$0.35	$/KWH	
Days of Operation/Year =	356	days	(Assumed Downtime for R-1 water: 3 occur/yr @ 3 days/occur)

Pipe Size	Head Required		Water Horsepower	Motor Horsepower	Motor Horsepower	Motor Horsepower	Daily Cost	Annual Cost
Inches	PSI	feet	HP	HP	KW	KWH/Day	$/Day	$/Year
12	48.9	112.9	9.98	14.90	11.11	99.99	$35.00	$12,458.75
10	50.1	115.7	10.23	15.26	11.39	102.51	$35.88	$12,772.75
8	**53.9**	**124.5**	**11.00**	**16.42**	**12.25**	**110.25**	**$38.59**	**$13,737.15**
6	75.9	175.3	15.49	23.12	17.25	155.25	$54.34	$19,344.15
					Say 13 Kw	117	$40.95	$14,578

Brackish Water (Backup)

Flow =	350	GPM	
Efficiency =	60	percent	
Hours of Operation/Day =	9	hours/day	
Energy Cost =	$0.35	$/KWH	
Days of Operation/Year =	9	days	

Pipe Size	Head Required		Water Horsepower	Motor Horsepower	Motor Horsepower	Motor Horsepower	Daily Cost	Annual Cost
Inches	PSI	feet	HP	HP	KW	KWH/Day	$/Day	$/Year
12	**118.0**	**272.5**	**24.09**	**40.14**	**29.95**	**269.55**	**$94.34**	**$849.08**
					Say 30 Kw	270	$94.50	$851

Annual Energy Costs for Brackish Water Alternative

Flow =	350	GPM	
Efficiency =	60	percent	
Hours of Operation/Day =	9	hours/day	
Energy Cost =	$0.35	$/KWH	
Days of Operation/Year =	365	days	(Assume No Downtime)

Pipe Size	Head Required		Water Horsepower	Motor Horsepower	Motor Horsepower	Motor Horsepower	Daily Cost	Annual Cost
Inches	PSI	feet	HP	HP	KW	KWH/Day	$/Day	$/Year
12	**118.0**	**272.5**	**24.09**	**40.14**	**29.95**	**269.55**	**$94.34**	**$34,435.01**
					Say 30 Kw	270	$94.50	$34,493

Energy Costs

	R-1 WATER W/1-WELL BRACKISH BACKUP	BRACKISH WATER 2-WELL SYSTEM
Energy Cost (A)	$15,429	$34,493
Discount Rate (d)	3%	3%
Escalation Rate (e)	2.4%	2.4%
Time Period, yrs (n)	40	40
Present Value	$520,220	$1,163,007

NOTES AND ASSUMPTIONS:

1. Present Value from NISTIR 85-3276-26 and Table on next page.
   Electricity price index from Table Ca-4.
   Electricity price index after inflation from Energy Price Indices for Private Section LCC Analysis.
   Present values from the Single Present Value (SPV) formula.
2. Discount Rate from NISTIR 85-3276-26.
3. Assume electricity costs escalation rate of 2.4%.
   2.4% annual electrical inflation as of Jan 2012.
   Reference http://www.bls.gov/opub/ted/2012/ted_20120221.htm.
4. Fuel Price Index after 30 years assumed to be 1.00 (See Table next page).

Replacement Costs

	R-1 WATER W/1-WELL BRACKISH BACKUP	BRACKISH WATER 2-WELL SYSTEM
Replacement Cost (P)	$178,000	$200,000
Escalation Rate (e)	3%	3%
Replacement Cost at year 20 (C)	$321,488	$361,222
Discount Rate (d)	3%	3%
Present Value	$178,000	$200,000

NOTES AND ASSUMPTIONS:

1. Present Value formula from NISTIR 85-3276-26 - Single Present Value (SPV).
2. Replacement Cost at year 20 formula C=(1+e)^20.
3. Assume annual replacement costs escalation rate of 3%.
   2.9% annual inflation as of Jan 2012 from http://www.bls.gov/opub/ted/2012/ted_20120221.htm
4. Discount Rate from NISTIR 85-3276-26.
5. Assume equipment life of 20 years;
   Pumps and controls to be replaced in 20th year;
   R-1 distribution lines and well casings will not be replaced during the 40-year life cycle.

Energy Costs (Continued)

Table Ca-4 & S-4 from NISTIR 85-3276-26 for Commercial Sector Electricity

	Electricity	Electricity	R-1 Water/1-Brackish Well Backup System		Brackish Water 2-Well System	
	Price	Index After	Annual	Present Value	Annual	Present Value
Year (n)	Index	Inflation	Energy Cost	Energy Cost	Energy Cost	Energy Cost
2012	1.00	1.02	$15,799	$15,339	$35,320	$34,292
2013	0.99	1.04	$16,016	$15,097	$35,806	$33,751
2014	0.99	1.06	$16,401	$15,009	$36,666	$33,554
2015	0.98	1.08	$16,625	$14,771	$37,166	$33,022
2016	0.97	1.09	$16,850	$14,535	$37,670	$32,495
2017	0.95	1.10	$16,899	$14,152	$37,779	$31,639
2018	0.94	1.11	$17,122	$13,922	$38,278	$31,124
2019	0.94	1.14	$17,533	$13,841	$39,197	$30,942
2020	0.93	1.15	$17,763	$13,614	$39,711	$30,435
2021	0.93	1.18	$18,189	$13,534	$40,664	$30,258
2022	0.93	1.21	$18,626	$13,456	$41,640	$30,081
2023	0.93	1.24	$19,073	$13,377	$42,639	$29,906
2024	0.93	1.27	$19,530	$13,299	$43,662	$29,732
2025	0.94	1.31	$20,214	$13,364	$45,191	$29,877
2026	0.94	1.34	$20,699	$13,286	$46,276	$29,703
2027	0.93	1.36	$20,971	$13,068	$46,882	$29,215
2028	0.93	1.39	$21,474	$12,992	$48,007	$29,045
2029	0.92	1.41	$21,753	$12,778	$48,631	$28,565
2030	0.91	1.43	$22,033	$12,565	$49,257	$28,090
2031	0.91	1.46	$22,562	$12,492	$50,439	$27,927
2032	0.91	1.50	$23,103	$12,419	$51,649	$27,764
2033	0.90	1.52	$23,398	$12,211	$52,308	$27,299
2034	0.90	1.55	$23,959	$12,140	$53,563	$27,140
2035	0.91	1.61	$24,807	$12,203	$55,458	$27,282
2036	0.91	1.65	$25,402	$12,132	$56,789	$27,123
2037	0.91	1.69	$26,012	$12,062	$58,152	$26,965
2038	0.91	1.73	$26,636	$11,991	$59,548	$26,808
2039	0.90	1.75	$26,976	$11,790	$60,307	$26,359
2040	0.90	1.79	$27,623	$11,722	$61,754	$26,205
2041	0.90	1.83	$28,286	$11,653	$63,236	$26,052
2042	1.00	2.09	$32,183	$12,873	$71,949	$28,779
2043	1.00	2.14	$32,956	$12,798	$73,676	$28,611
2044	1.00	2.19	$33,746	$12,723	$75,444	$28,444
2045	1.00	2.24	$34,556	$12,649	$77,254	$28,279
2046	1.00	2.29	$35,386	$12,575	$79,109	$28,114
2047	1.00	2.35	$36,235	$12,502	$81,007	$27,950
2048	1.00	2.40	$37,105	$12,429	$82,951	$27,787
2049	1.00	2.46	$37,995	$12,357	$84,942	$27,625
2050	1.00	2.52	$38,907	$12,285	$86,981	$27,464
2051	1.00	2.58	$39,841	$12,213	$89,068	$27,304
			Total	**$520,220**		**$1,163,007**

Routine Operation and Maintenance Costs

Cost of Booster System Maintenance = $200 per quarter

Annual Maintenance (A)	$800
Discount Rate (d)	3%
Escalation Rate (e)	3%
Time Period, yrs (n)	40
Present Value	$32,000

NOTES AND ASSUMPTIONS:

1. Present Value formula from NISTIR 85-3276-26 - Modified Uniform Present Value (UPV*).
2. Discount Rate from NISTIR 85-3276-26.
3. Assume annual maintenance escalation rate of 3%.
   2.9% annual inflation as of Jan 2012 from http://www.bls.gov/opub/ted/2012/ted_20120221.htm
4. Minimal routine maintenance required for brackish well pumps (Doonwood Engineering).
5. Approximately $200 per quarter routine maintenance required for booster pumps (Doonwood Engineering).

R-1 Water Charge

Cost of R-1 Water, $/1,000 gallons	$1.28
Estimated Demand	185,000
Current Annual R-1 Water Cost (A)	$84,301
Escalation Rate (e)	5%
Discount Rate (d)	3%
Time Period (n)	40 years
Present Value	$5,125,761

NOTES AND ASSUMPTIONS:

1. Present Value formula from NISTIR 85-3276-26 - Modified Uniform Present Value (UPV*).
2. Discount Rate from NISTIR 85-3276-26.
3. Assume annual R-1 water escalation rate of 5% based on County R-1 water rates.

Fiscal Year 2010	$1.16/1,000 gallons
Fiscal Year 2011	$1.28/1,000 gallons
Fiscal Year 2012	$1.28/1,000 gallons

4. R-1 water available 356 days per year (9 days downtime).

Appendix N

Kīhei High School Project
Pedestrian and Bicycle Analysis

Stantec Consulting Services Inc. – August 2012

Kihei High School Project
Pedestrian and Bicycle Analysis

August 2012

Prepared for:
Wilson Okamoto Corporation
1907 S. Beretania St., Ste. 400
Honolulu, HI 96826

2073006430 x300

Kihei High School
Pedestrian and Bicycle Analysis

County of Maui

August 10, 2012

Prepared by:

Melissa Dugan, PTP

Transportation Planner
Stantec Consulting Services Inc.

Reviewed by:

Rock Miller, PE, PTOE

Principal, Traffic Engineering & Transportation Planning
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Stantec

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1.0 Introduction

The State of Hawaii, Department of Education (DOE) has proposed to construct a new High School in the Kihei Community of Maui County. There is limited capacity to serve high school students in the Kihei community. There is no DOE public high school in Kihei and most high school students attend Maui High School and Baldwin High School, located about 15 miles to the north in Kahului and Wailuku.

The high school site is proposed opposite to Kulanihakoi Street about one-quarter mile east (mauka) of Piilani Highway (State Highway 31). The project driveway entrance would take access to an extension of Kulanihakoi Street, which currently extends only west from Piilani highway. In addition, it is proposed that the intersection of Kulanihakoi Street and Piilani Highway will be signalized.

A traffic study was prepared in 2011 in conjunction with the Environmental Impact Statement for the proposed High School by Wilson Okamoto Corporation, a firm located in Honolulu that provides traffic engineering and civil engineering services throughout Hawaii. The traffic study focused upon motor vehicle traffic changes expected from construction of the high school. In response to community requests, Wilson Okamoto requested Stantec Consulting Services Inc. (Stantec) to prepare an analysis of potential bicycle and pedestrian circulation needs for the proposed High School. The Stantec team has been preparing bicycle and pedestrian analyses for many years, and the project manager for this project has done recent pedestrian and bicycle analysis in both Santa Monica and Long Beach, California, both of which have received awards and recognition for their pedestrian and bicycle friendliness. Stantec has also been working specifically in the state of Hawaii, and our staff has been working in various locations in the State of Hawaii for over ten years.

1.1 Background

Pedestrian travel is an important, but often overlooked, form of transportation. In fact, virtually all trips begin and end as pedestrian trips. Pedestrian trips are normally served by provision of sidewalks or similar pedestrian facilities alongside of roadways. Ideally, sidewalks would provide for a pleasant and comfortable walking experience, which can be enhanced by a well-maintained level surface, an interesting environment, multiple routes of direct and near-equal distance, intermittent shade, and appropriate provisions for crossing busy roadways.

Bicycling is a form of transportation that has existed for longer than motor vehicle transportation. Bicycling was very popular prior to 1900 and is credited with the initial program that resulted in paving of roadways. Its popularity as functional transportation declined steadily until it was largely viewed as a child's activity or an adult specialty sport by the 1980's, however this popularity has been reversed in the past 20 years. Many communities are now actively looking for ways to better serve bicycle transportation, whether as a utility vehicle, for fitness, or as a

more economic and environmentally friendly alternative to motor vehicles. It is especially appropriate for trips of up to about three miles, because it can often provide travel times, door-to-door, that are competitive to automobile transportation, especially when auto parking is not convenient.

The community of Kihei has directly experienced this growing bicycle trend. It has established many miles of new bikeways in the past few years, mostly by restriping existing roadways to make room for bicycle lanes, often by prohibiting parking. Stantec also observed some increase in walking, for both exercise and utility purposes, throughout the community.

Sidewalks and roadway crossings are generally the most significant elements of the pedestrian circulation system. An assessment of walkability begins with an analysis of the adequacy of the existing pedestrian circulation system to determine whether it can meet all reasonable needs and whether facilities provide for proper safety and comfort in meeting these needs. Sidewalks generally should be continuous, level, properly maintained, and of adequate width to meet the demand for usage. Superior sidewalk facilities provide a buffer from traffic, through provision of a landscaped area between the roadway curb and the sidewalk, together with the provision for parking to help separate moving traffic from pedestrians. They also provide walking routes between origins and destinations that do not require a significant amount of out-of-direction travel (i.e., travel that takes you out of the shortest route to your destination, such as u-turns or traveling around objects).

Pedestrian facilities generally are not divided into formal classification systems or designations. In contrast, bicycle facilities are divided into classification types that indicate their setting, usage type and determine their design characteristics.

Bicycle lanes are one of several forms of bicycle infrastructure. They are generally the most common and can be incorporated into planning for new roadways or retrofitted onto existing roadways if pavement space can be claimed from travel lanes, paved shoulders, turn lanes, or parking lanes. While other forms of bikeway may be more desirable, bicycle lanes generally constitute the majority of mileage of bikeway infrastructure in communities because of their advantages. One advantage is that they can be provided along many other types of roadways and thus can be located near origins and destinations used by bicyclists. Another important advantage is that they can be swept by street sweepers and by wind sweep from adjacent motor vehicles that tends to keep them clean and clear.

Bicycle paths (trails) are another important form of bicycle facility. These consist of exclusive roadways where motor vehicle traffic is prohibited, although often bicycle paths are shared with pedestrians, skate boarders, roller skaters, and other human powered transportation. They are generally the most expensive form of bicycle facility, since they require dedicated land and are generally constructed solely for use as trails. Bicycle paths rarely compose more than 10% of bikeway mileage in any community with a comprehensive bikeway network. Due to their nature, access is generally limited to intersections with streets and other bikeways. Also they can require

periodic sweeping to keep them free of debris, especially broken glass which is dreaded by bicyclists.

Bicycle paths are especially appropriate for long corridors that provide a minimum of crossing intersections. Waterfronts, drainage courses, former railroad rights of way, or utility easements are ideally suited. Routes with numerous street crossings are not as desirable, especially if bicyclists must frequently stop for cross traffic, in part because bicyclists lose their momentum and require additional energy to resume speed. For this reason, some bicyclists will avoid using a path with numerous stop intersections, if a nearby roadway is more convenient.

Signed Bicycle Route is a third important category of bicycle facility. Ideally, a bicycle route will be a relatively lightly used low-speed roadway that is desirable for bicycles. Signs are erected to advise bicyclists that this is the bike route and help to alert motorists to expect the presence of bicycles. In some cases, communities have signed bike routes along more heavily used high speed routes, when no alternative is available, but these tend to be valued only by experienced and courageous bicyclists.

In the past 10 years new technologies have been perfected to allow for different types of bicycle facilities. Two developments may be relevant to this study, sharrow markings used in conjunction with signs indicating Share-the-Road or Bikes Allowed Full Use of Lane (BAFUL) (shown in Figure 1-1), and bicycle boulevards. Sharrow markings indicate that travel lanes are intended for the use of both bicycles and motor vehicles. They include bike lane markings in the motor-vehicle travel way. A sample is shown in Figure 1-2.

Figure 1-1
BAFUL sign

Figure 1-2 Sharrow Lane

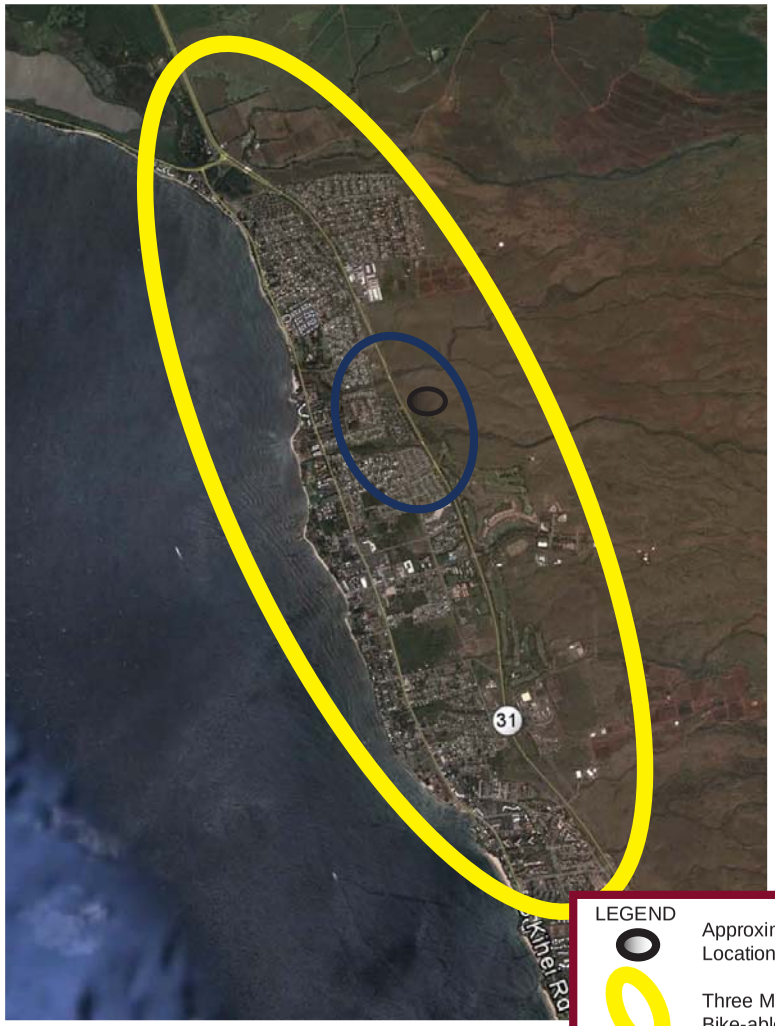
Sharrow markings and signs can be applied to Bicycle Routes to more clearly identify that motorists should expect and show greater courtesy to bicyclists. Sharrow markings also encourage bicyclists to ride clear of the dangers of opening car doors, the door zone, and indicate that cars may expect bicycles to ride further toward the street than normal.

Bicycle boulevards, also known as neighborhood greenways, are a treatment applied to a street to encourage bicycle travel while discouraging or slowing motor vehicle travel. Bicycle boulevards typically provide traffic devices that are also used for neighborhood traffic calming, such as speed humps, medians, landscaped circles, and other measures that discourage unnecessary traffic and reduce motor vehicle speeds to 15 mph while allowing bicycle speeds uninterrupted at 15 mph. Greenways place greater emphasis on landscape and water runoff management facilities than bicycle boulevards. The net effect is to transform a street into a facility where bicycles have priority while motor vehicles become secondary users. These facilities are largely responsible for increasing ridership in some of the most well-known bicycle communities, such as Portland, Oregon and in many college towns.

The primary approach for a study of potential bicycle usage and impacts is to evaluate the bicycle friendliness of existing infrastructure and to identify whether additional improvements may be suggested. The focus is normally placed within 3 miles of the study site, and especially the manner in which it connects to regional bikeway infrastructure.

Pedestrian activity is much more limited in terms of area of influence and distance. Most people will not want to walk for utility purposes for much more than one-half of a mile. There are also less potential conflict points between pedestrians and vehicles as compared to bicycles, as pedestrians do not need to use the same right of way as vehicles. However, as with bicycles, the primary approach for a study of impacts is to evaluate the pedestrian friendliness of existing infrastructure and to identify whether additional improvements may be suggested. The focus for pedestrians is normally placed within one-half mile of the study site, and especially the manner in which the site connects to existing pedestrian facilities and important pedestrian destinations (such as the proposed school, residential areas or shopping centers).

Figure 1.3 shows an aerial of the project vicinity, along with a 3-mile area, which would serve as the bike-able radius for the proposed school, and a half mile radius, which would be more appropriate for walking. Figure 1.4 shows the immediate project area, along with the roadways described in Section 2.



LEGEND

- Approximate Site Location
- Three Mile Bike-able Radius
- Half Mile Walkable Radius

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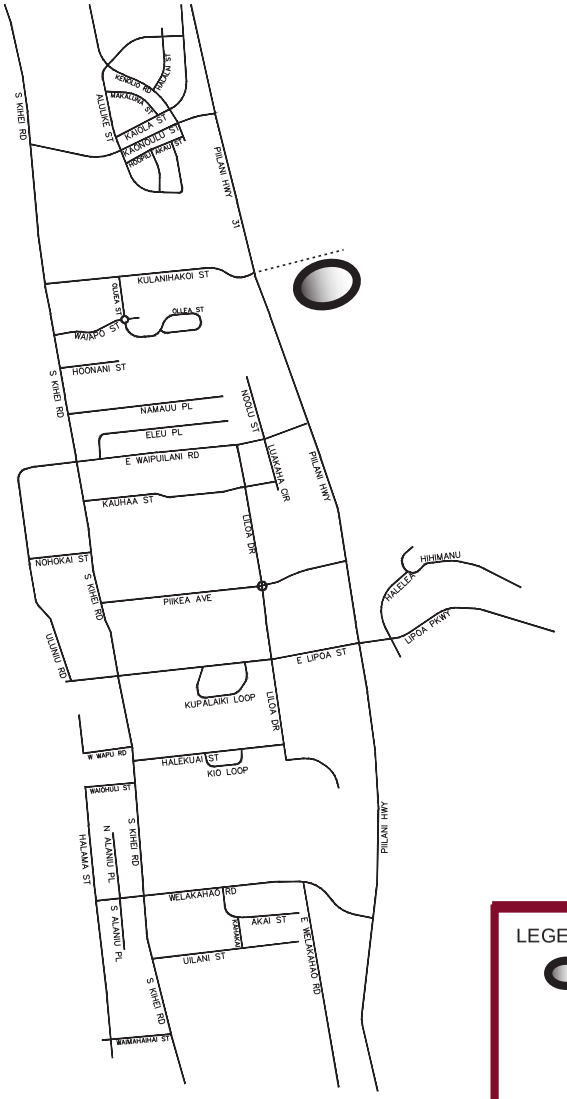
Kihei High School Pedestrian and Bicycle Analysis

Figure 1.3

Walk- and Bike-able radius



LEGEND

- Approximate Site Location

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Kihei High School Pedestrian and Bicycle Analysis

Figure 1.4

Project Area Roadways

2.0 Existing Conditions

This report section describes existing conditions in the project vicinity and highlights operational issues based upon visual surveys of the site.

2.1 Roadways

This report and section emphasizes non-motorized transportation. The traffic impact analysis prepared by Wilson Okamoto Corporation should be consulted for questions regarding motor vehicle transportation. All of the descriptions found within are based upon Stantec staff observations.

Kulanihakoi Street is a two-lane residential collector street. It currently exists beginning at a T intersection with Piilani Highway and extends for about one-half mile to South Kihei Road. It is 36 feet wide curb to curb for most of its length, but it is wider between Malulani Street and Piilani Highway. The widened area includes additional travel lanes and also features shoulder stripes that function as bicycle lanes.

There are nearly-continuous sidewalks for the full length of Kulanihakoi Street from Piilani Highway to Kihei Road. There is a significant but short gap in the sidewalk along the south curb of the roadway east of Hakoi Hema Place. This gap is less than 50 feet long but this gap will be along an important walking route to the proposed high school. It will provide the walking connection to the proposed North South bikeway/greenway indicated on the community's bikeway plan which has been recently constructed south of the site, as discussed below.

There are no bicycle facilities on Kulanihakoi Street west (makai) of Malulani Street to its end at South Kihei Road. Bicycle travel, when present would be required to share travel lanes with vehicles where on-street parking is in demand. Parking is allowed along most of the roadway and is intermittently used. There are typically 20-25 vehicles parked along the south curb and 15-20 vehicles parked along the north curb. The vehicles are concentrated in portions of the roadway and there are long stretches with low parking demand.

Figure 2-1 Kulanihakoi Street, facing west, at Kenolio Street

Figure 2-2 Kulanihakoi Road, looking west

The number of parked vehicles does not change between early and late morning, suggesting that many of the vehicles may be long term parked. The area does not generally appear to have a shortage of parking, so most vehicles are likely parked at the convenience of the owner. Parked vehicles include about 4 long limousines that are for hire which may be owned by a resident in the area. One area of low parking demand is adjacent to a church that likely generates higher parking demand on the street during services.

Bicycle usage for Kulanihakoi Street is not a significant factor at this time. It is typically about 1% of the motor vehicle flow on the street.

Piilani Highway is a 4-lane limited access state highway traveling north/south in the vicinity of the project. This highway begins to the north in Kahului and extends south to Wailea. The posted speed limit is 45 mph, but many vehicles appear to be traveling faster than this speed.

Piilani Highway does not provide access to adjacent properties in the project vicinity. Access is limited to specific intersecting roadways, at approximately one-half mile intervals. It provides for intersections with Kulanihakoi Road, as well as with Kaonoulu Street to the north and to Waipuilani Road to the south. All of these streets form T-intersections with Piilani Highway. None of these three intersections are currently signalized. Further south, the intersection with Piikea Avenue is signalized. Due to the high traffic volumes and speeds on Piilani Highway, it can be difficult to turn left onto Piilani Highway, especially during peak hours at intersections without traffic signals.

Piilani Highway provides 8-foot wide shoulders for most of its length, and these shoulders have been designated as bicycle lanes. While these shoulder bicycle facilitates are used by certain types of bicyclists, generally most potential bicyclists are not comfortable riding on the shoulders of high speed roadways. As a result, the bicycle lanes on Piilani Highway are not effective in meeting the needs of potential bicyclists for the proposed high school. Also, the shoulders narrow at two bridge structures across major drainages, providing less than 3 feet of width for bicycle lanes. The available width on these shoulders is less than the minimum required width for bicycle lanes. Spot surveys of usage suggest that the shoulders of Piilani Highway currently serve about 5 riders during peak hours, mostly experienced sport/exercise cyclists who are comfortable riding adjacent to high speed traffic and appreciate the minimum need to stop afforded by the highway.

Piilani Highway does not provide sidewalks or pedestrian facilities. It has not been planned or constructed in anticipation of pedestrian activity. Due to its limited access nature, it is not forecast that there will be a significant demand for pedestrian usage resulting from the high school or any other existing or proposed uses. No pedestrians were observed walking along the highway. There appears to be sufficient right of way to provide pedestrian facilities, but since blocks of controlled access highway are very long, the highway is unlikely to experience heavy pedestrian demand.

Long limited access roadways like Piilani Highway generally can serve as a barrier to cross traffic travel, in part by discouraging walking traffic between homes or land uses on opposite sides of the highway away from controlled intersections. This is due to the limited access nature of the highway, the distance betwwen intersections, and the difficulty in attempting to cross this type of highway without traffic controls that can stop vehicle traffic.

Figure 2-3 Piilani Highway at Pikea Avenue

The Kihei Greenway is a partially constructed bike path that is located varying from about 600 to 1000 feet west of Piilani Highway in the project vicinity. The State of Hawaii Bike Plan indicates that the Kihei Greenway is planned as a linear park, running through the middle of Kihei, with 12-feet wide asphalt paved paths. It was recently constructed to high standards from Waipuilani Road south to Lipoa Street. Improvements include a wide two-way bike path, landscaped heavily with architectural lighting, water fountains, and park benches. It also crosses Piikea Avenue at a newly constructed modern roundabout, offering the potential for bicyclists to be able to cross Piikea without stopping, if traffic gaps are timely. This

Figure 2-4 Kihei Greenway

bikeway is planned for potential extension north and south. The southerly extension is planned through a regional park site to where it will connect with a local street, Welakanao Road, which extends further to the south.

Although this improved bikeway/greenway does not extend at this time north beyond Waipuilani Road, a right of way exists to Kulanihakoi Street, as shown in Figure 2-5. The right of way is owned by the Hawaii State Department of Transportation (HDOT), per signage posted near Kulanihakoi. An unimproved gravel walkway already exists along this alignment, despite "No Trespassing" signs that are posted by HDOT at the north end. The unimproved path is quite suitable for walking and is also observed to be used by bicyclists using mountain bikes and beach cruisers with sturdy tires. It is less desirable for thin tired sport bikes due to the presence of broken glass. With the recent opening of the bikeway, usage of this unimproved route is likely increasing. Current spot usage was observed at approximately 10-20 walkers and 5-10 bicyclists during the AM peak hour, an hour when this type of activity is highest in Kihei. The unimproved path crosses a major drainage and is likely not passable during heavy rains, however locals have placed plywood boards across the drainage course, indicating its current popularity.

Figure 2-5 Kihei path south of Kulanihakoi Street

Figure 2-6 Kihei path north of Kulanihakoi Street

The bikeway also could potentially be extended north from Kulanihakoi Street, and is shown as a potential extension in the State of Hawaii bicycle plan, known as Bike Plan Hawaii. The right of way exists, but the unimproved path is more primitive, as shown in Figure 2-6. A trail is visible, but no users were observed during spot surveys. If extended north past Kenolio Street, it must cross another major drainage course. But it will align with another local street that will facilitate bicycle travel further into neighborhoods to the north.

Liloa Drive is roadway running adjacent to and east of the new greenway/bikeway. It provides mostly three lanes for vehicular traffic, including one lane per direction and a two-way left turn lane, or turn pockets. It runs from Waipuilani Road to Halekuai Street. At the intersection with Piikea Avenue there was recently a roundabout installed to control traffic. There is not currently a high demand for bicycle use on this facility, due to the proximity of the greenway bikeway. The sidewalk network in this area is complete and usable. No significant pedestrian issues were observed.

Figure 2-7 Roundabout at Liloa Drive and Piikea Avenue

South Kihei Road is a two-lane arterial traveling along the Kihei coastline, providing access to beaches, shopping centers, vacation residences, and other uses. It is the traditional main street for the community. It was bypassed by the construction of the Piilani Highway, but still serves as a very important regional and community thoroughfare.

South Kihei Road provides sidewalks intermittently through the community, but there are significant gaps in the continuous network. Relevant gaps near the site include the west side of the roadway north and south of the intersection with Kulanihakoi Street. Further south, there is a long gap on the east side near Hoonani Street. The sidewalk network is more continuous in the areas further to the south that are more heavily commercialized. But the incomplete network of sidewalks often requires pedestrians to cross from the east side to the west side of the roadway at uncontrolled locations. This does not create an attractive walkable environment.

South Kihei Road provides bicycle lanes for about 90% of its length from the north edge of the community to Wailea. There are a few gaps where pavement width was not sufficient to provide bicycle lanes in addition to travel lanes, parking, and turn lanes. One such gap is relevant to this study, on the southbound side from Kulanihakoi Road to Waipuilani Road. Other gaps are located near important intersections where the bicycle lanes must give way to right turn lanes.

Bicycle usage on Kihei Road is significant, 10-20 bicycles per hour in each direction for most of the day. Bicyclists observed include residents and tourists, and a significant number of women. This suggests that many persons find the route comfortable and attractive for bicycling, since the presence of woman cyclists normally indicates a comfortable and desirable route. While it would be desirable for the Kihei bike lane system to have no gaps, it is largely meeting the needs of the growing Kihei bicycling population. It is also worthy of note that many businesses located along Kihei Road rent bicycles, and bicycling is featured as an attraction for tourism.

2.2 Kihei Bicycle Planning

Several plans govern the planning of bicycle and pedestrian facilities in the State of Hawaii and on Maui. The State of Hawaii completed its Bike Plan Hawaii in 2003 as a tool to integrate bicycle facilities into the State's transportation network. The County of Maui Long Range Planning Division has published a Regional Transportation Map which includes existing and proposed bike paths. The South Maui Region Parks & Open Space Master Plan, prepared in 2006 by Chris Hart and Partners, provides a vision for open space corridors and an integrated system of bicycle and pedestrian paths. In this plan, the North Kihei map shows Kaonoulu Gulch and Waipuilani Gulch as secondary off-road connections in the vicinity of the project site. Piilani Highway and the North South Collector Road are shown as Primary Open Space Corridors for bicycle and pedestrian users.

Kihei has been developing a bikeway network aggressively in the past few years. The State of Hawaii completed a bicycle master plan for the area in 2003, that identified a network of desirable facilities. This was called Bike Plan Hawaii and is shown in Figure 3-1. Many of these bicycle facilities now exist on the ground, but they are not reflected on internet aerial photography that is only a few years old. The community is rapidly moving toward implementation of 90% of its planned bikeway infrastructure, and bicyclists can be readily observed on many roadways in the community.

Bike Plan Hawaii shows the planned extensions of the Kihei Greenway bikeway to the north and south, but bike path facilities of this type often require an aggressive search for funding. Also, sometimes residents with properties that back up to proposed corridors will express concern over improvement of bicycle facilities, due to security concerns. While they will frequently cite potential losses in property values, studies generally show that properties adjacent to properly maintained bike paths an actually rise in value compared to nearby properties.

Bike Plan Hawaii does not show bicycle facilities along Kulanihakoi Street. It also proposes no bike trail facilities running east/west along any of the various major watercourses (gulches, streams, etc.). The plan does not reflect the proposed high school site, yet community high schools are normally a consideration in bicycle master plans. The siting of the high school may suggest that it is appropriate to modify the plan to better serve the high school site.

The goal of a bicycle master plan is normally to plan for and take actions to achieve increases in bicycling. Plans typically set goals for a set proportion of all trips (10-20%) less than three miles long to be done by bicycle, at least for the near term. Since as many as half of all trips in a community such as Kihei can be less than three miles, there is a great potential to provide a bicycling alternative for many auto trips in the community. Bicycling typically represents less than 1% of trips in a typical community, while bicycle friendly communities can achieve commuter usage from 5% to 50% bicycling usage. Portland, Oregon, currently sees 6% bicycling and Minneapolis, Minnesota, gets near 4%, with up to 50% occurring in college towns with expensive or limited parking. At levels greater than 5%, bicycles become very common and motorists anticipate or expect to see bicycles everywhere. This helps reduce crash problems, because

motorists develop better habits, and bicycle infrastructure coupled with increasing numbers tends to reduce frequency of traffic violations.

Other portions of bicycle infrastructure (infrastructure being any facility: parking, shops, services, routes, trails, signs, etc.) are also growing in Kihei, but spot surveys indicate that bicycle parking may be limited. Few bicycle racks or parking areas were observed at private businesses, and many bicycles were observed to be locked to posts, street lights, bus stop furniture or any other convenient place. In contrast, many communities are now considering a requirement to provide bicycle parking to complement 10% of the automobile parking requirement, often with an accompanying reduction in auto parking.

2.3 Kihei Pedestrian Planning

There is no single formal plan that addresses and focuses upon existing conditions, needs, and a process for improving pedestrian circulation in Kihei. Standard plans for the roadways generally call for provision of sidewalks on both sides of all new facilities, but there is no comprehensive plan for retrofitting of facilities that were not constructed to provide pedestrian facilities.

Community groups in Kihei (namely the Kihei Community Association), have been working with nationally prominent walking and bicycling expert Dan Burden, Executive Director and Co-founder of the WALC Institute. As a result, the community is interested in taking steps toward increasing its walkability and bikeablity. Mr. Burden has counseled the community on various potential steps and made specific recommendations, but these activities have not yet resulted in a comprehensive adopted specific plan for improving walking on a community-wide basis.

A comprehensive pedestrian plan for the community would likely identify South Kihei Road as a significant deficiency and assign a high priority for improvement. It would also likely identify that provision of sidewalks continuously on both sides of the roadway will be difficult due to land use patterns, constrictions at existing bridges, trees and plants, and community concerns over the impact of provision of sidewalks. Such a plan would also determine that the frequency of controlled pedestrian crossings or enhanced crossings is not sufficient for optimum mobility. Blocks are too long between controlled intersections, and some of the uncontrolled crossing locations already have bus stops.

A cost estimate to provide all appropriate missing facilities would also be presented and potential funding sources would be identified. Based upon the length of missing sidewalk along South Kihei Road, the cost estimate to achieve walkability goals along South Kihei Road could exceed $1 million.

A comprehensive pedestrian plan for other roadways in Kihei would provide guidelines for provision of optimum pedestrian facilities, such as sidewalk and parkway design details, amenities, standards for pedestrian circulation across parking areas to commercial businesses, and other principles. Sidewalk and intersection improvements would likely be identified, especially for older portions of the community that are near commercial services.

3.0 Future Traffic Conditions

Walking is normally a significant form of travel to high schools, especially from residences with high school students within one half mile of the school. Walking is likely to be the most popular travel mode to the proposed Kihei High School for residences within this distance. Many students will walk even further than this distance if conditions are appropriate, but bicycling, automobile, or other modes will become more significant.

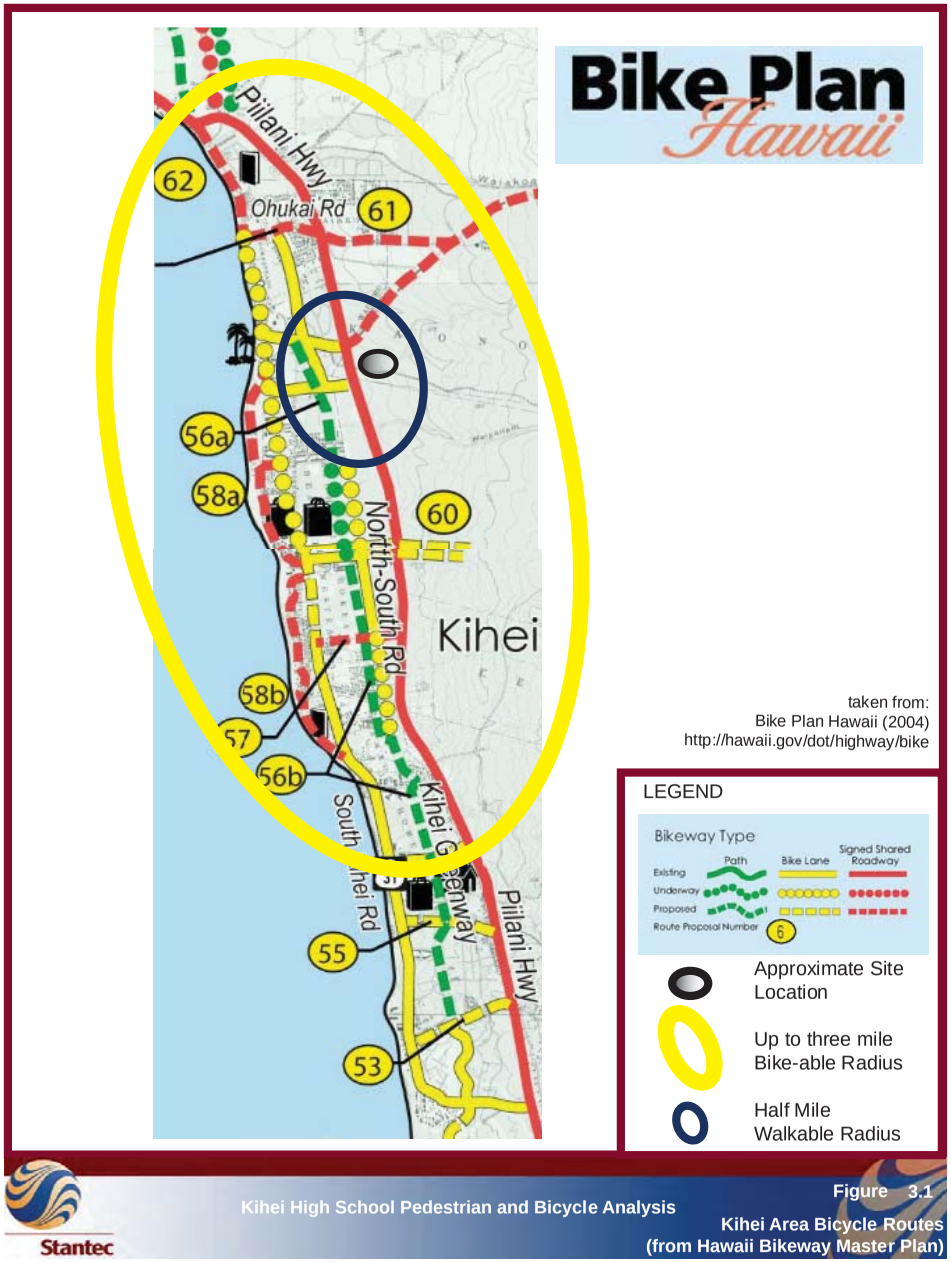
Bicycling can be an attractive form of transportation and competitive with auto travel times for up to 3 miles, especially when automobile parking is inconvenient. It is especially attractive for high school students, because auto ownership costs are significant. Also traditional cultural and psychological barriers to cycling are changing. It is reasonable to forecast that initially up to 10% of high school student trips could be made by bicycle in Kihei, especially to locations within three miles of the proposed school site. Opening year usage in the range of 50-80 cyclists could occur traveling inbound during the morning and outbound after classes and activities end. As the community moves further toward encouragement of walking and bicycling, this number could increase substantially.

Figure 1.1 showed a three mile radius around the school site. Much of Kihei falls within the three mile circle. This should not mean that nobody will ride a bicycle further, but analysis of infrastructure needs should be focused within the 3 mile circle.

Figure 3.1 shows the proposed network in the Hawaii Bicycle Plan. It shows some of the important existing routes that bicyclists may choose to reach the campus. It shows bicyclists accessing the campus via the planned extension of the Kulanihakoi Street. This extension is expected to have bicycle lanes provided as part of its initial construction. Also a traffic signal is expected for the Piilani intersection at Kulanihakoi Street. This would allow bicyclists to cross the highway readily.

Piilani Highway is not expected to experience significant usage. A few high school students or employees may be courageous and experienced cyclists, comfortable and skilled in riding on high speed roadways. But most potential users will find conditions along Piilani Highway to be discouraging. As a result, it is expected that most cyclists will cross Piilani Highway using the proposed traffic signal and continue along Kulanihakoi Street.

The immediate neighborhoods served by Kulanihakoi Street will become origins for some bicycle traffic, but most cyclists are expected to continue along Kulanihakoi Street to Kihei Road, where they can use the existing bicycle lanes to travel north and south. These bicyclists will find the traffic levels of Kulanihakoi Street to be within a comfortable range, but the presence of parked cars will make the route less attractive.



Kihei High School Pedestrian and Bicycle Analysis

Figure 3.1
Kihei Area Bicycle Routes (from Hawaii Bikeway Master Plan)

The unimproved path from Kulanihakoi Street south to Waipuilani will be used by some school bicyclists and pedestrians, but it will likely not be the favored route for more distant travel that is better served in the short range by Kihei Road. In the future, when the greenway bike trail is completed, it will become a more preferred route, providing an attractive alternative to Kihei Road for access to most existing neighborhoods. But in its current condition, it will only attract hardy cyclists heading to residences and shopping areas near the improved limits of the facility.

In the absence of the complete greenway path, bicyclists will be required to ride along the segments of Kihei Road that do not have bicycle lanes. The section south of Kulanihakoi Street is most significant. Fortunately, in the future this segment can be bypassed by the completion of the greenway path.

Walking will be most popular between the site and the neighborhoods along Kulanihakoi Street. There may also be limited walking along the unimproved greenway alignment, especially toward the improved section to the south. The sidewalk gap noted on Kulanihakoi Street will be significant for walkers, as an estimated 30-50 students or staff may walk through the unimproved area to access the greenway route or continue along Kulanihakoi Street.

3.1 Future Area Development

There is a large amount of development planned for the future in the project area. The Island of Maui Regional Transportation Network Map shows a proposed transit station near the intersection of Kulanihakoi Street and Piilani Highway. This could account for a large increase in the walking and cycling needs in the area, in addition to additional vehicular users.

The County of Maui Long Range Planning Division clso expects numerous potential developments throughout the area, including large developments on the eastern side of Piilani Highway. This development is shown from approximately two miles north of the project site to beyond the Kihei area. The proposed development plans show over 9,000 single family homes, 4,700 multi-family homes, and 1,400 timeshare and/or resort units being added to the project area. All of these may add substantial traffic, including vehicular, and pedestrian and bicycle traffic, tc the project area.

Figure 3-2 shows the proposed Regional Transportation Network Map, prepared by the Long Range Planning Division of the County of Maui. It shows the proposed transit lines, along with the proposed regional network additions.

Roadway cross sections for arterial roadways serving new development are expected to provide bicycle lanes. These will assure convenient access to the High School site from future developments inland (mauka) cf Piilani Highway.

Regional plans for new communities and roadways west of Piilani Highway do not show a significant network of bikeways. Also a network of recreational trails may also be appropriate for consideration in this area. These networks would be planned to complement the highway network and may also be planned to be compatible with waterway corridors that will likely serve as greenbelts for the planned growth areas.

Regional Transportation Network Map
Island of Maui

Prepared By:
Long Range Planning Division
Department of Planning
County of Maui
250 South High Street
Wailuku, Hawaii 96793

Map 6-2

LEGEND
- Primary Road
- Secondary Road
- Stream
- Cultural Resources Stream
- Bike Path

Proposed
- Transit Station
- Transit Corridor
- Lahaina Bypass
- Road or Highway
- Bike Path
- Upcountry Greenways Plan
- Maui Island Plan Greenway

Stantec

Kihei High School Pedestrian and Bicycle Analysis

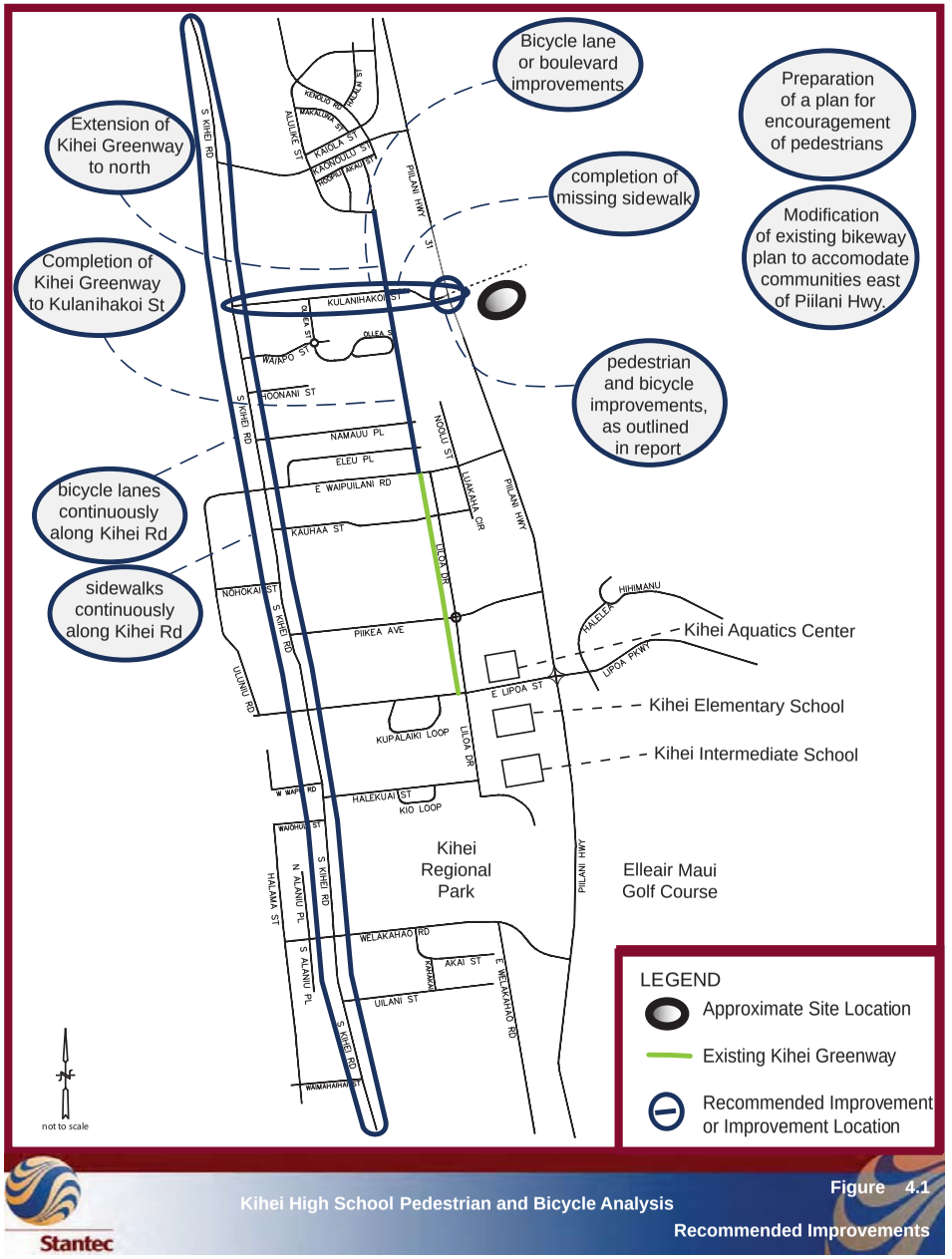
Figure 3.2
Maui Regional Transportation Network

4.0 Recommendations

The following improvements would be desirable for walking and bicycling infrastructure for the High School. The subsequent discussion includes recommendations and suggested responsibilities:

- Bicycle lane or bicycle boulevard improvements for Kulanihakoi Street from Piilani Highway to Kihei Road
- Construction of sidewalk on Kulanihakoi in the short gap east of the proposed Kihei Greenway Trail
- Completion of the Kihei Greenway Bicycle Trail from Kulanihakoi Street south to connect with the existing trail
- Completion of the Kihei Greenway Bicycle Trail from Kulanihakoi Street north to connect with the northern portions of the community
- Provision of bicycle lanes continuously along Kihei Road throughout the community
- Preparation of a plan for pedestrian enhancements to encourage walking throughout Kihei
- Modification of bikeway plans to suggest facilities cppropriate for planned communities east of Piilani Highway.
- Provision of sidewalks continuously along Kihei Road throughout the community.
- Design features for the proposed intersection and traffic signal at Kulanihakoi Street and Piilani Highway to provide optimum service and the highest level of protection for bicycles and pedestrians (additional detail provided below)
- High quality and direct access from the school to the pedestrians and bikeway networks (additional detail provided below)
- Bicycle friendly improvements on the school campus (additional detail provided below)

The improvements are also shown graphically on Figure 4.1.



Kihei High School Pedestrian and Bicycle Analysis
Figure 4.1
Recommended Improvements

4.1 Kulanihakoi Street Improvements

4.1.1 Intersection of Kulanihakoi Street and Piilani Highway

The Traffic Impact Analysis Report (TIAR) previously completed for the project recommended a traffic signal at the Kulahihakoi/Piilani intersection to meet traffic demands for the school and address intersection safety issues.

Kulanihakoi Street may experience increased traffic demands with the school project due to school related traffic and due to the proposed traffic signal at Piilani Highway. Because the intersection is not currently signalized, it is lightly used to turn left onto Piilani Highway today. In comparison, intersections with signalized accesses experience higher flows. The potential for traffic increases is considered undesirable by most residents, while the provision of a traffic signal will likely be appreciated by those same residents.

Provision of left turn phasing for Kulanihakoi Street also provides a safety benefit, since the left turns would normally be served right after the high speed through phases of Piilani Highway. Left turn signal phasing reduces the potential of a high speed vehicle running the fresh red and colliding with pedestrian or bicyclist. While this collision potential is considered remote, the precaution is justified on the basis of a heavily used high school crossing.

Concerns have been heard that traffic signals may not provide the highest level of safety for pedestrians desiring to cross Piilani Highway to access the school site. Grade separation via tunnels or overpasses has been suggested. Professional experience with grade separations does not suggest that they are superior treatments to traffic signals. Pedestrians will avoid bridges due to the effort to climb three flights of stairs to an elevation high enough to bridge across the highway and to return to street grade on the other side. Also such a bridge needs to be handicap accessible, requiring very long ramps or elevators to serve wheelchair users. Use of such a facility is virtually always disappointing. Tunnels have fewer construction issues, but they can result in security issues related to darkness and require maintenance to prevent accumulation of broken glass and litter. They are often closed, due to security and maintenance issues following construction. A more appropriate grade separation treatment may be the development of a greenbelt bikeway and recreational trail that would follow the watercourse that passes under Piilani Highway south of the intersection. This would be a facility appropriate for consideration in communitywide planning.

Although there can be no guarantee that a pedestrian involved collision would never occur, the provision of a traffic signal is considered an adequate counter-measure. It is not appropriate to call for provision of traffic signals to address pedestrian issues at some locations while dismissing them at other locations. There are numerous locations in Hawaii where similar conditions have been addressed as proposed.

Nationally, roundabouts are being considered as a potentially safer form of intersection traffic controls than traffic signals, but Hawaii does not have great experience with multi-lane roundabouts, as would be required for this intersection. The issue of roundabout vs. traffic signal is more suited to be considered by the State Department of Transpiration (DOT) as a policy issue, not as a site specific improvement. If the DOT felt that a roundabout treatment was superior to a traffic signal at the subject site, in conjunction with development of the high school it would be an appropriate substitute improvement. But a requirement to provide a roundabout without DOT concurrence is not appropriate, and DOT has not been contacted for their opinion at this time.

The right turn lane treatments common along Piilani Highway should also be evaluated carefully. It would be preferable for the right turns to be controlled by the traffic signal, with right turn lanes that are provided separately and to the right of the suggested through bicycle lanes. Figure 4.2 shows the suggested channelization. This treatment is also suggested for the existing leg of Kulanihakoi Street which will require change when the signal is constructed.

4.1.2 Sidewalk Access and Improvements

The sidewalk gap along Kulanihakoi Street near the site of the Kihei Greenway will be a substantial obstruction to pedestrian traffic walking from the school to the greenway. The school is expected to generate significant pedestrian traffic along this sidewalk gap, greatly increasing the need for this improvement. This improvement should also be completed in conjunction with the school.

4.1.3 Bicycle Access and Improvements

Kulanihakoi Street will also experience significant demand for school related pedestrians and bicyclists. It would be desirable to provide improvements that facilitate school usage, while discouraging undesirable traffic increases. Bicycle lanes already exist for the block nearest Piilani Highway. They could be provided for the rest of the segment, but this would require loss of parking. Alternatively, the roadway would be appropriate for designation as a bicycle route featuring bike route signs, Share the Road or Bikes Allowed Full Use of Lane (BAFUL) signs, and sharrow markings. But these measures will not be optimal for managing automobile traffic and potential increases. A bicycle boulevard treatment may be appropriate. Low cost bicycle boulevards can be provided through placement of traffic control devices such as speed humps that now exist on Waipuilani and other roadways in the community. Due to the potential impact to Kulanihakoi Street resulting from added high school traffic and signalization, these improvements should be completed in conjunction with development of the proposed school.

The planned extension of Kulanihakoi Street should be designed carefully with the expectation that it could be used by many bicyclists. The bicycle lanes should be at lecst 6 feet wide from curb to stripe, wider than most lanes found in Kihei today. The downhill lane will experience significant speeds by bicyclists. The uphill lane will experience more swerving as cyclists pedal up the hill. The additional width will be an amenity. Also the seam between the gutter and the

pavement should be carefully treated to minimize the potential for pinching the bicycle wheels. Some communities have used asphalt paving over concrete to the curb face to maximize the effective width for bicycling, since most bicyclists do not like to ride on the narrow gutter. Other communities are exploring the use of colored pavement or a rolled curb at the boundary between the bikeway and the vehicle lane.

The Kulanihakoi Street bicycle lanes should also be extended further mauka when the roadway is extended. They will become important for bicycle access to new developments whenever they occur. Also the community's bikeway master plan should be modified to show the proposed improvements for Kulanihakoi Street associated with the school. It would be appropriate to initiate a process to modify the community bicycle master plan to reflect planned developments inland from Piilani Highway. This should include consideration of the establishment of greenbelts providing recreational trails suitable for walking and bicycling on such greenbelts. One of the potential corridors is along the watercourse south of the school site. It is suggested that the school be planned to provide a corridor for a potential connection to a greenbelt along this watercourse. The process to update the bikeway plan generally needs to be a community effort, since it is not directly related to the high school.

The traffic signal and required additional improvements for Kulanihakoi Street and Piilani Highway should be carefully designed to maximize safety and bicycle friendliness. The proposed Kulanihakoi Street approach roadway should provide a left turn lane, a through lane, and a right turn lane at the highway. Crosswalks should be provided across both the north and south legs of Piilani Highway. Also, since turning vehicles will conflict with through pedestrians and bicyclists along Kulanihakoi Street, the traffic signal should be designed to serve left turn vehicles and through vehicles/pedestrians/bicyclists separately. This could be accomplished through various measures, but we would suggest separate left turn phasing for Kulanihakoi Street, so that left turns do not turn through pedestrian or vehicle streams.

4.2 Kihei Greenway

Extension of the Kihei Greenway bikeway from Kulanihakoi Street south to the existing bikeway at Waipuilani Road would be a very attractive improvement. It bypasses the bike lane gaps on Kihei Road and provides a direct route to the shopping area at Piikea Avenue, likely to become a popular destination for students after school. While a treatment comparable to the newly opened bikeway would be desirable, this would be a costly project. A more spartan improvement consisting of a paved bike trail from Kulanihakoi Street to Waipuilani Road, including a low flow dip crossing of the watercourse could be constructed for about $200-300,000. If provided, this facility would likely serve 70-80% of bicycle traffic for the high school. If funds become available in the future, additional improvements such as landscaping, an all-weather bridge, and security features could be added. This facility would be useful and attractive to the entire community, while also benefitting the school. It does not appear reasonable to require this improvement to be completed concurrently with school construction.

The trail extension could be supplemented by a landscaped traffic circle or small roundabout at the Kulanihakoi Street intersection that would be similar to but smaller than the new roundabout at Liloa Drive. This would also serve as a further traffic calming device for Kulanihakoi Street and its potential bicycle boulevard. This measure stems from changes attributable to the school, but these changes can be fully mitigated without this level of improvement. If landscaped features are incorporated into the intersection, it is not reasonable to attribute the needs the school.

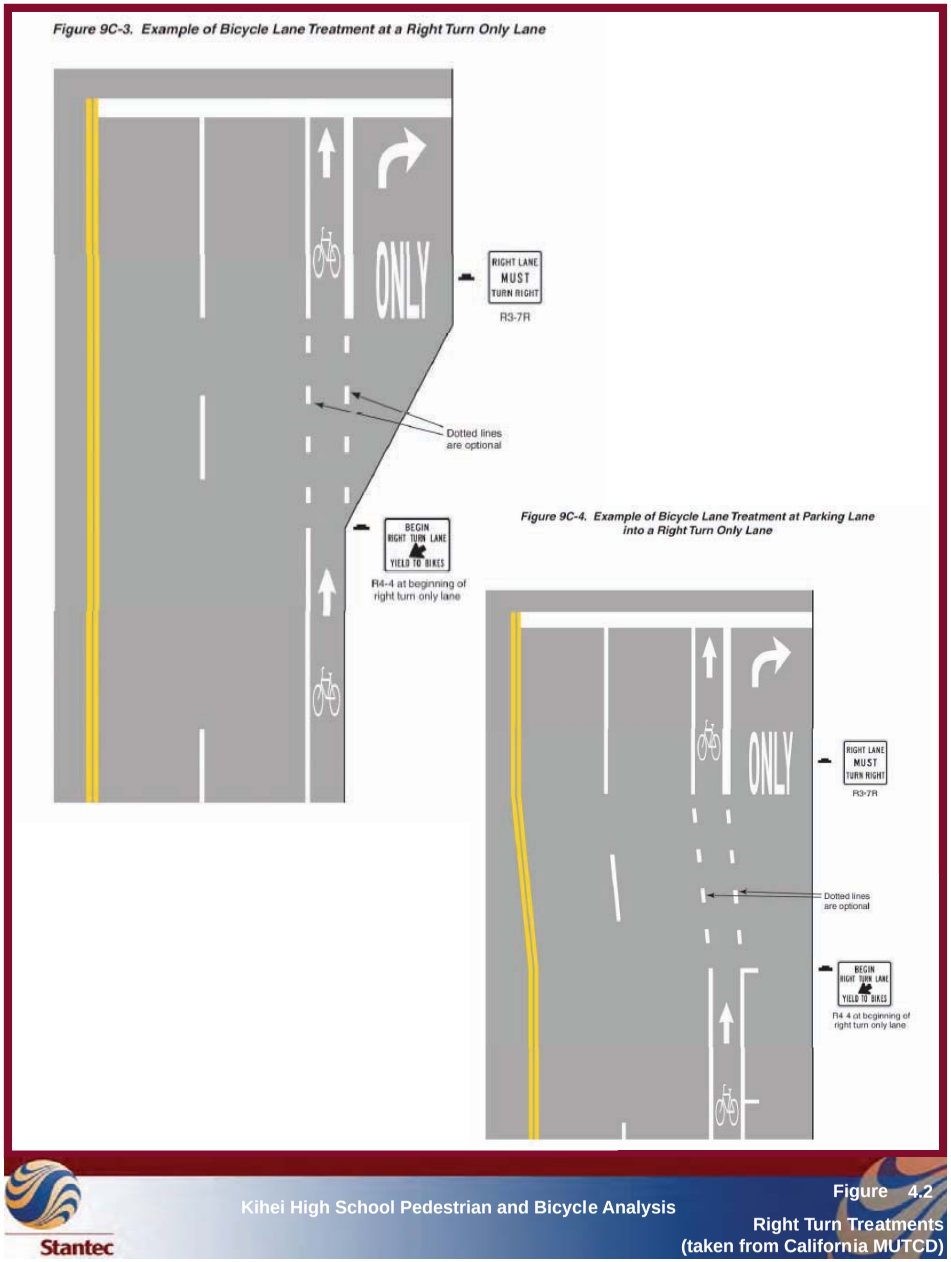
Extension of the bike trail to the north from Kulanihakoi Street is desirable, but it is not considered to be as attractive in the short term. While it would be desirable improvement for bicycling in general, the potential student population to the north is not as large, and the Kihei Road bike lanes serve most of this area effectively. This segment is not viewed as providing as much value to the school and its needs are not greatly increased by the proposed school.

4.3 Kihei Road

It would be desirable to address the missing segment without bicycle lanes on Kihei Road from Kulanihakoi Street to Waipuilani Road. However these lanes are not feasible based upon existing width, travel lanes, and the need to maintain a two way left turn lane to serve major driveways and intersections. In the short term, no simple solution is evident; however it would be appropriate for posting of bike route signs, sharrow markings, and special signage.

In the long term, the need for the left turn lane on Kihei Road could potentially be reduced through a more ambitious community program to provide roundabouts, such as the new installation at Piikea Avenue and Liloa Drive. Since roundabouts do not require space for left turn lanes, they can often free up space for bicycle lanes. In some cases, it may be necessary to prohibit left turns from intersections or driveways, but roundabouts make it much easier to make U turns. They also make it easier for pedestrians to cross due to median refuges and the shortened roadway width, features that are all evident at the new community's roundabout. In fact, some of the traffic signals and important uncontrolled intersections that now exist along Kihei Road could potentially be replaced by roundabouts. It should be noted that roundabouts are accepted to be one of the most efficient and safest forms of traffic control, while also providing other community, environmental, and aesthetic benefits.

South Kihei Road pedestrian improvements should be a high priority for the community based upon its goals and commitments toward walkability. However, the school will not significantly increase pedestrian flows in areas with greatest needs, and a plan for the entire community will be an ambitious undertaking.



Kihei High School Pedestrian and Bicycle Analysis

Figure 4.2
Right Turn Treatments
(taken from California MUTCD)

5.0 On-Site Campus Recommendations

There are features that should be considered for the new campus to facilitate or encourage bicycling. The most important infrastructure is bicycle parking. It should be located in a convenient area closer to school buildings than student parking. It is important for students who drive to see that students who don't drive are receiving the small favor of convenient parking. Bike racks should be provided in a semi fenced area (a bike corral), so that access is controlled and locks can provide basic security. It should be noted that about 16 bicycles can park in the space occupied by one vehicle parking stall. Placement of a closed circuit TV security camera aimed at the bike corral will deter thefts, a common problem with bicycle parking. If a camera is infeasible, it is recommended that the bike corral be located in a highly visible public location for security purposes.

Bicycle racks that provide optimum features should also be considered. The popular wave rack often selected by architects or others not experienced in bicycling, is not a good design for efficiency and security. Other bike rack types are preferred for this type of application. The designer should consult with a bicycle planning expert for proper ideas, which can be found in an excellent publication, *Bicycle Parking*, published by the Association of Pedestrian and Bicycle Professionals (APBP).

Walking/bicycling expert Dan Burden remarked that the school site does not seem ideally situated to serve the community. Placing it on the inland side of Piilani Highway limits the ability to access the school site from makai residential communities and will reduce the potential for walking and cycling.

However, there is likely no suitable site more centrally located to the existing community, without acquiring private properties and requiring residents to be relocated from their homes. Our recommendations are based upon the likelihood that there is no suitable alternative site on the west side of Piilani Highway that is more accessible to the existing community. Measures as suggested in this report will help to maximize the potential to access the site via walking and bicycling.

6.0 Conclusions

The proposed Kihei High School will place new demands on roadways in the vicinity of the school for pedestrians and bicycling. The bicycle lanes along Piilani Highway are not expected to serve much school traffic, but Kulanihakoi Street will become a very desirable route for pedestrians and bicycles. At minimum, bike route improvements, including sharrows and signs should be considered for Kulanihakoi Street, from Mahealani Street to South Kihei Road. (There are already bicycle lanes from Piilani Highway to Mahealani Street). Further improvements for traffic calming for a bicycle boulevard may also be appropriate.

A sidewalk gap on Kulanihakoi Street near Piilani Highway should be addressed. This segment will experience significant walking activity upon opening of the High School, while it is used negligibly at this time.

Improvement of the primitive trail from Kulanihakoi Street south to Waipuilani to link up with the new bike trail will be desirable. This route, if improved, would likely be used by up to 80% of school bicycle traffic. It would also bypass a significant gap in the Kihei Road bike lanes south of Kulanihakoi Street. If possible, it would be desirable to provide this improvement on a schedule that is compatible with school development. It will also greatly reinforce the community's commitment to bicycling and investment in the newly completed Kihei Greenway trail.

The school, the extension of Kulanihakoi Street, and the intersection with Piilani Highway should be planned and constructed with the expectation that bicycle traffic is expected and facilities should be provided desirable for bicycling and pedestrians. These include signal phasing, crosswalks, and channelization improvements as recommended in this study.

-----Original Message-----

From: Robert_Purdie/FacilDev/HIDOE@notes.k12.hi.us

Sent: Fri 9/7/2012 2:17 PM

To: Office of Environmental Quality Control

Cc: rshaak@group70int.com

Subject: Re: Publication of Kihei HS FEIS in OEQC Environmental Notice

DOE concurs with Group 70 International's request to publish the Kihei HS FEIS in the upcoming environmental notice.

Thank you for your action and service in this matter.

Robert W. Purdie, Jr., P.E.

Department of Education

Facilities Development Branch

Project Coordinator and

Acting Public Works Manager- CMS

586-0448