Draft Environmental Assessment

PROPOSED HONOAPI`ILANI HIGHWAY SHORELINE PROTECTION, OLOWALU, MAUI (TMK: (2)4-8-003:006(por.))

Approving Agency:

State Department of Transportation

Applicant:

State of Hawai`i
Department of Transportation

March 2009

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Executive Summary

Project Name:	Proposed Honoapi`ilani Highway Shoreline Protection
Type of Document:	Draft Environmental Assessment
Legal Authority:	Chapter 343, Hawai`i Revised Statutes
Agency Determination:	Anticipated Finding of No Significant Impact (FONSI)
Applicable Environmental Assessment Review "Trigger":	Work within the Shoreline Setback; Use of State Conservation District Lands; and Use of State Funds and Lands
Location:	TMK: (2) 4-8-003:006(por.) Olowalu Maui Island
Applicant:	State of Hawai`i Department of Transportation Ali`i Aimoku Building 869 Punchbowl Street Honolulu, Hawai`i 96813
Approving Agency:	State of Hawai`i Department of Transportation Ali`i Aimoku Building 869 Punchbowl Street Honolulu, Hawai`i 96813
Consultant:	Munekiyo & Hiraga, Inc. 305 High Street, Suite 104 Wailuku, Hawai`i 96793 Contact: Rowena Dagdag Andaya Phone: (808) 244-2015  Sato & Associates, Inc. 2046 South King Street Honolulu, Hawai`i 96813 Contact: Richard Sato Phone: (808) 955-4441
Project Summary:	The State of Hawai`i, Department of Transportation proposes to undertake shoreline protection for a 900 feet stretch of

Honoapi`ilani Highway between Launiupoko Point and Hekili Point, south of Lahaina on the west coast of Maui, in Olowalu. Site work related to the shoreline protection involves the placement of large boulders and geotextile fabric along the shoreline slope, the filling of rock under the large boulders, widening of the existing road shoulder, and the installation of jersey crash barriers.

This Draft Environmental Assessment (DEA) has been prepared to satisfy the requirements of Chapter 343, Hawai`i Revised Statutes and Title 11, Chapter 200, Environmental Impact Statement Rules of the Hawai`i Administrative Rules.

The proposed action triggered the rules and regulations for environmental review for the following reasons:

- Use of public funds and public lands
- Use of land classified as Conservation District
- Use within the shoreline setback area

The DEA also documents compliance with applicable federal laws and regulations due to the proposed use of funds administered by the Federal Highway Administration (FHWA). The DEA and comments received during the public review period will be used as decision tools to determine appropriate compliance action pursuant to the National Environmental Policy Act of 1969 (NEPA), as amended.

Lands affected by the proposed action include the Honoapi`ilani Highway right-of-way and a portion of a government beach reserve identified as TMK (2) 4-8-003:006(por.). The government beach reserve falls under the jurisdiction of the State Department of Land and Natural Resources.

A portion of the project site is located within the regulatory jurisdiction of the United States Department of Army. The commencement of work in this jurisdiction will require a Department of Army (DA) permit pursuant to Section 404 of the Clean Water Act. Coordination with the DA will be undertaken to prepare and process a Section 404 permit application. In addition to the DA permit, a Section 401 Water Quality Certification and Coastal Zone Management Consistency Review approval will be required.

The project site falls within the County of Maui's Special Management Area (SMA) and Shoreline Setback Area. Therefore, both a SMA Use Permit and a Shoreline Setback Variance will be required for the proposed action. Additionally, portions of the work fall within the State Conservation District, prompting the need for a Conservation District Use Permit.

I. PROJECT OVERVIEW

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A. PROPERTY LOCATION, CURRENT LAND USE, AND OWNERSHIP

The State of Hawai`i, Department of Transportation (DOT) proposes to provide shoreline protection along a 900 feet stretch of shoreline along Honoapi`ilani Highway in Olowalu, Maui on a parcel identified as TMK (2)4-8-003:006(por.). The project site is located makai of Honoapi`ilani Highway between Launiupoko Point and Hekili Point. See **Figure 1, Figure 2** and **Figure 3**.

Land uses in proximity to the subject property include the former Pioneer Mill Plantation Manager's residence property and the Olowalu General Store/Chez Paul Restaurant building and Camp Olowalu (formerly known as Camp Pecusa), to the southwest. Honoapi`ilani Highway borders the shoreline to the east along with undeveloped land used for agricultural purposes. The Pacific Ocean is located to the west.

Honoapi`ilani Highway is the only fully improved road into West Maui and provides access between the West Maui communities of Lahaina, Kahana, Ka`anapali, Kapalua, and the Central and eastern portions of the island. The project site was once an area established as a roadway right-of-way of Honoapi`ilani Highway. Coastal erosion and wave action have impacted the area, resulting in the relocation of the roadway inland. Today, approximately 900 feet of Honoapi`ilani Highway are endangered by erosion of the fronting shoreline. In January 2009, the Governor of the State of Hawai`i in accordance with Chapter 264-1.5, Hawai`i Revised Statutes, declared this portion of Honoapi`ilani Highway as a Traffic Emergency Zone, which allowed the DOT to initiate and undertake a shoreline protection project in the subject area.

Honoapi`ilani Highway falls under the jurisdiction of the DOT, while TMK (2) 4-8-003:006(por.), the government beach reserve, falls under the jurisdiction of the State Department of Land and Natural Resources.

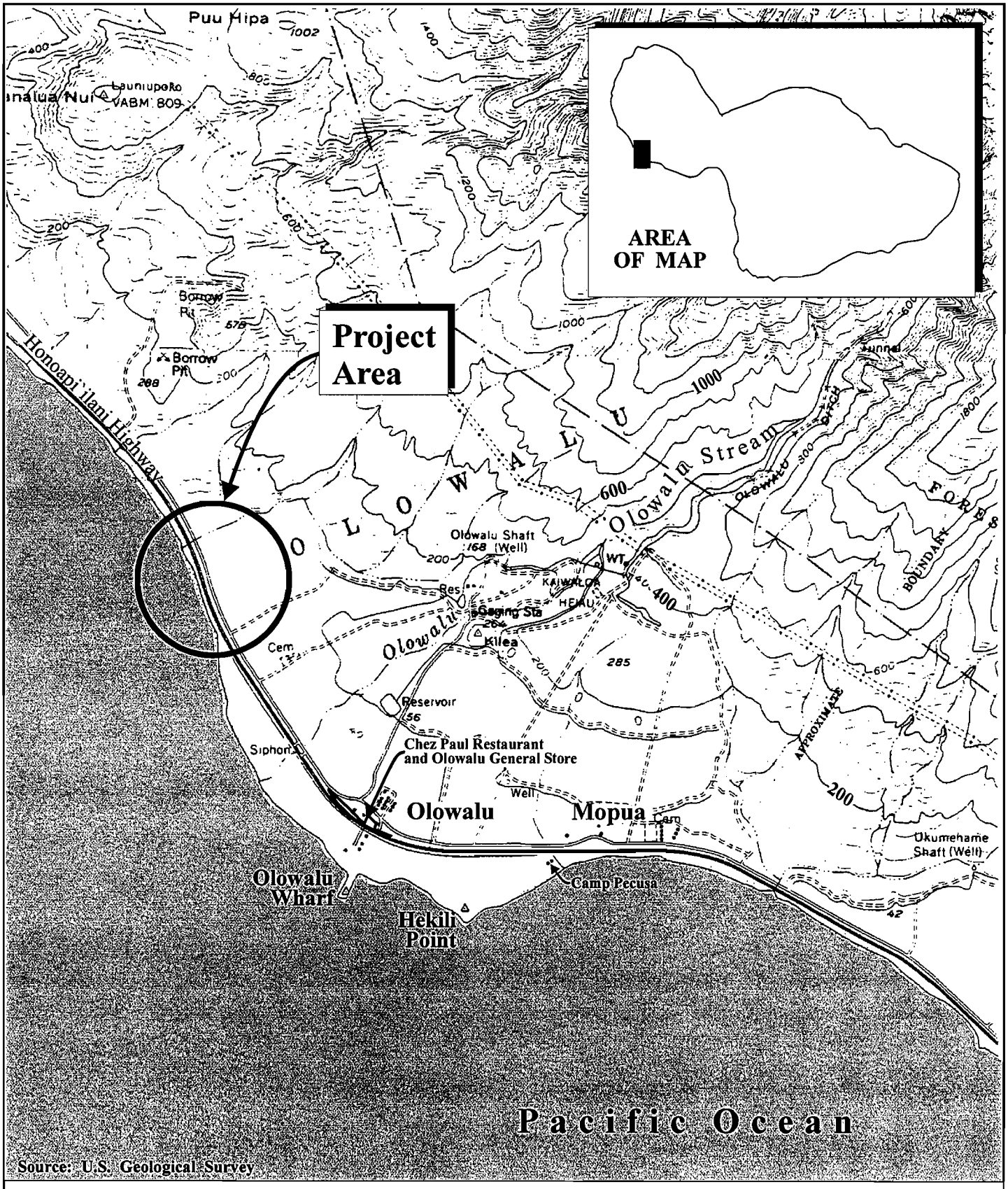


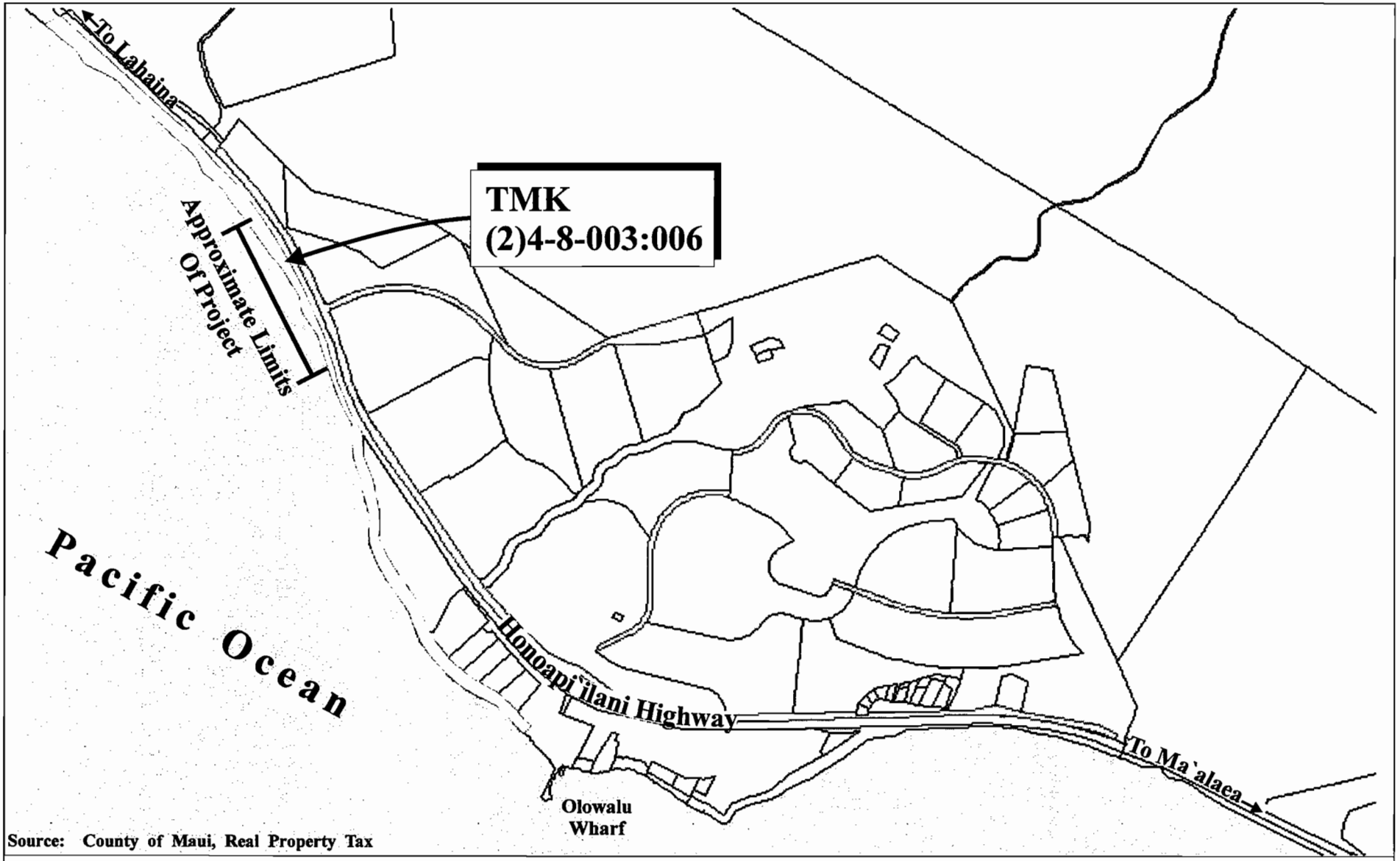
Figure 1 Proposed Honoapi`ilani Highway Shoreline Protection

Regional Location Map

1000 Feet
0 500 2000

Prepared for: State of Hawai`i, Department of Transportation

SATO\Olowalu Erosion\regloca



Source: County of Maui, Real Property Tax

Figure 2

Proposed Honoapi`ilani Highway Shoreline Protection

Site Location Map

NOT TO SCALE

Prepared for: State of Hawai`i, Department of Transportation

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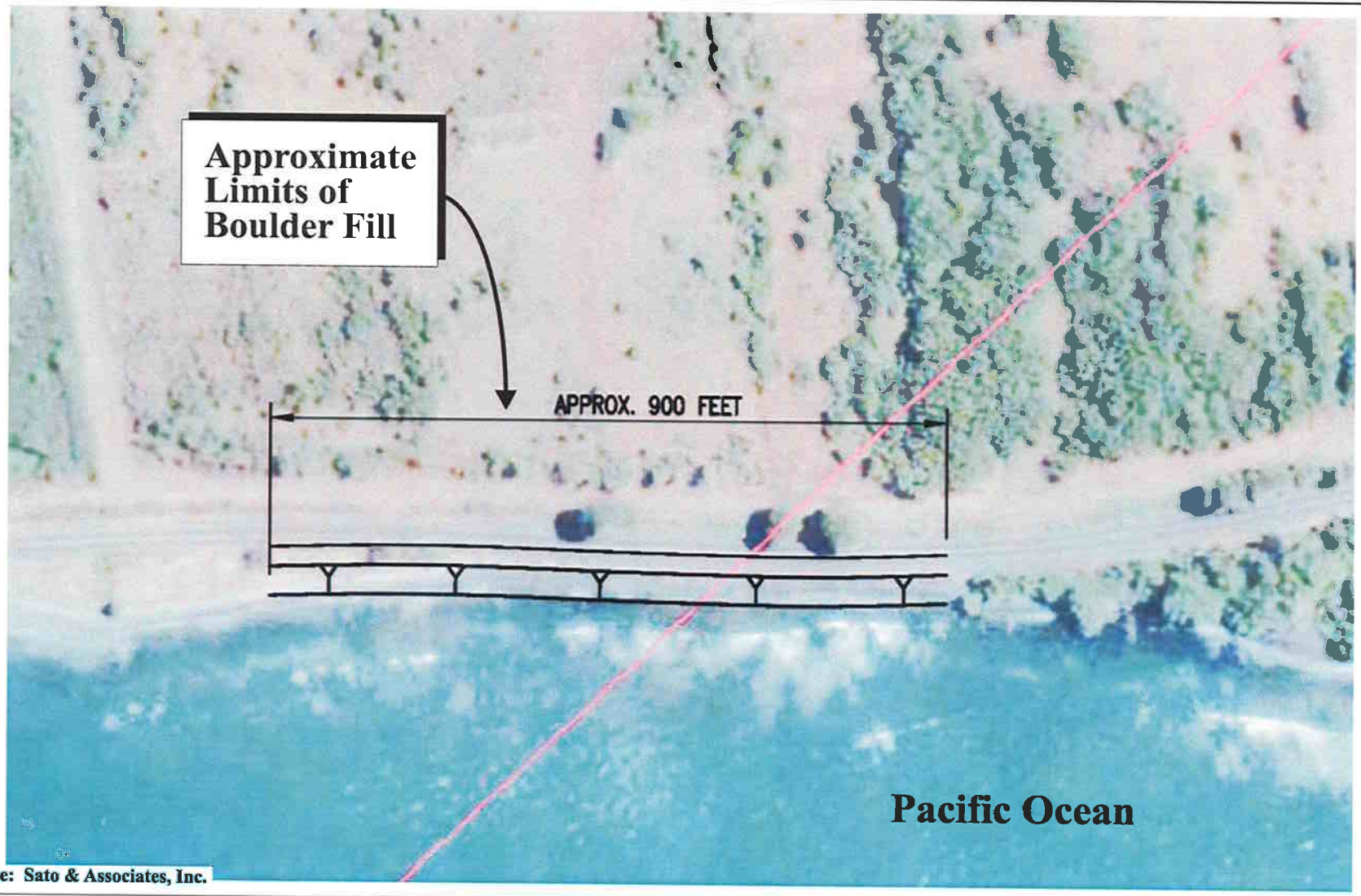


Source: Sato & Associates, Inc.

Figure 3

Proposed Honoapi`ilani Highway Shoreline Protection

Aerial Photograph of Project Area

NOT TO SCALE

Prepared for: State of Hawai`i, Department of Transportation

SATO\Olowalu Erosion\AerialPhotograph

B. PROJECT DESCRIPTION

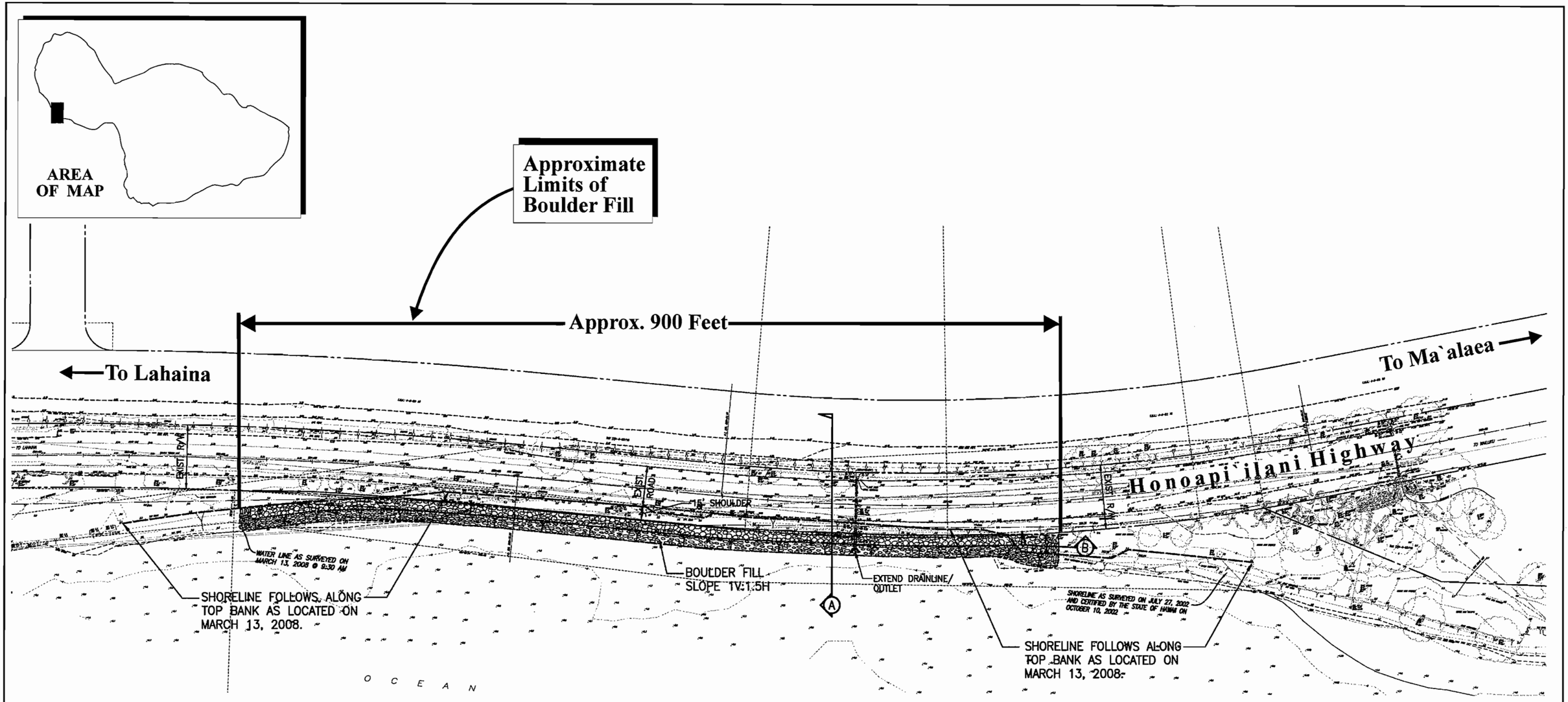
The proposed action involves the placement of large boulders along an eroding shoreline to mitigate erosion damage to the highway shoulder. See **Appendix "A"** and **Appendix "B"**. Elements of the project involve the use of boulders ranging in size between 2.3 to 3.8 tons to stabilize the shoreline slope and the extension of an existing 30-inch drainline that crosses beneath the roadway and outlets to the ocean. See **Figure 4**, **Figure 5** and **Figure 6**. The boulders will be underlain with smaller rock and geotextile fabric to prevent leaching of the backfill through the voids between the large stones. The crest elevation is approximately eight (8) feet mean sea level (MSL), which is approximately the same elevation as the edge of the highway pavement. The low crest elevation will minimize the horizontal footprint of the boulder fill. Although the boulder slope will reduce runup and overtopping compared to the existing shoreline condition, there will still be considerable overtopping during storm wave attack. Therefore, jersey barriers will be placed along the edge of the boulder slope to mitigate damage to the highway from wave overtopping. Minor filling of approved non-expansive well graded material will be used. Approximately 900 cubic yards of varying depth and width will be placed at the project site to restore the shoreline and provide sufficient shoulder width (15 feet) between the jersey barriers and the travel lane because of safety and constructability concerns.

The boulder fill will provide protection to the shoreline and highway from seasonal high surf and the infrequent waves from passing hurricanes, and will replace the cobble shoreline with a boulder slope.

C. PROJECT NEED

Honoapi`ilani Highway is the major access road into the West Maui region from Central and East Maui and is an essential link in the island's transportation system for residents, visitors, and emergency vehicles. Damage or loss of the highway may potentially create significant delays and traffic congestion between Central Maui and West Maui. Emergency measures have been undertaken over the past five (5) to seven (7) years to mitigate erosion damage to the highway shoulder. See **Figure 7**.

In recent years, concrete jersey barriers have been placed along the seaward edge of the highway pavement to mitigate wave overtopping and to prevent closure of the highway during high surf conditions. This and other mitigation measures have been determined to be inadequate in addressing the present imminent collapse of the roadway pavement along this



Source: Sato & Associates, Inc.

Figure 4

Proposed Honoapi`ilani Highway Shoreline Protection

Boulder Fill Plan

NOT TO SCALE

Prepared for: State of Hawai`i, Department of Transportation

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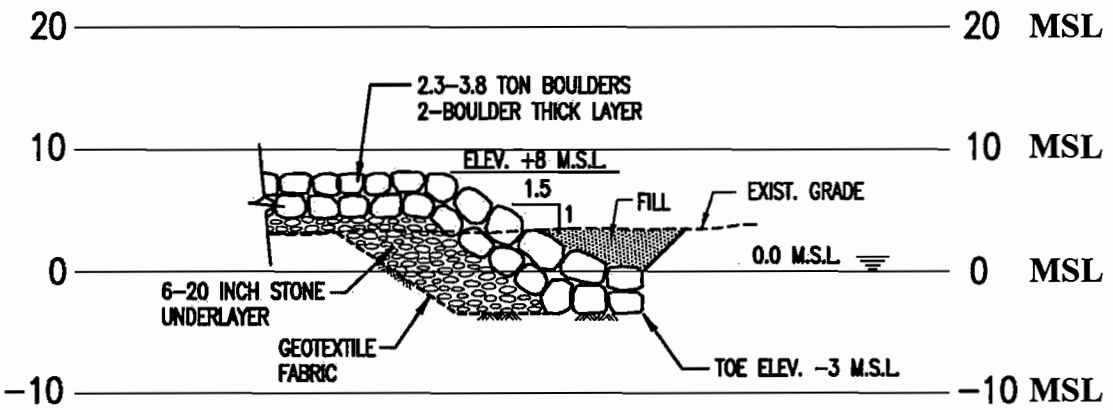
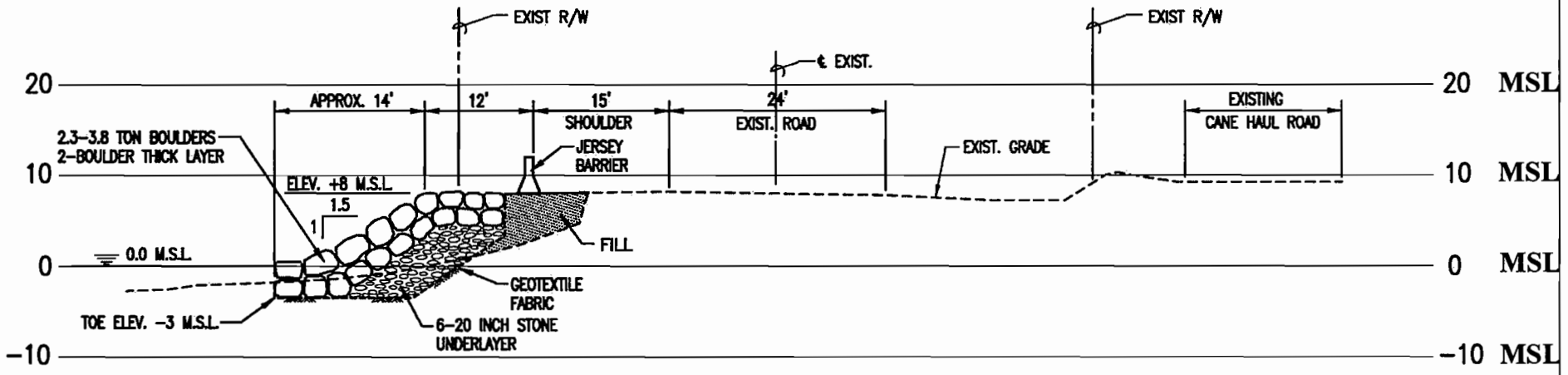


End Section



Typical Section

Source: Sato & Associates, Inc.

Figure 5

Proposed Honoapi`ilani Highway Shoreline Protection

End and Typical Sections

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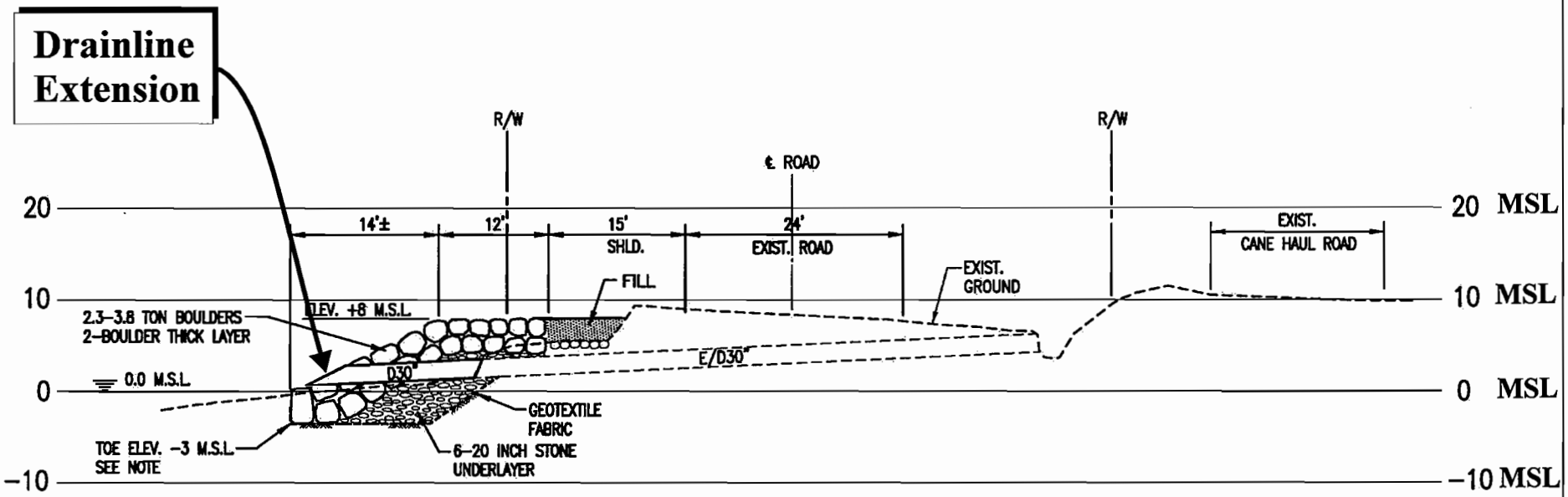
SATO\Olowalu Erosion\TypicalandEndSections



Source: Sato & Associates, Inc.

Figure 6

Proposed Honoapi`ilani Highway Shoreline Protection

Drainline Section

NOT TO SCALE

Prepared for: State of Hawai`i, Department of Transportation

SATO\Olowalu Erosion\Drain Line Section

Photo No. 1. View of Shoreline Facing South

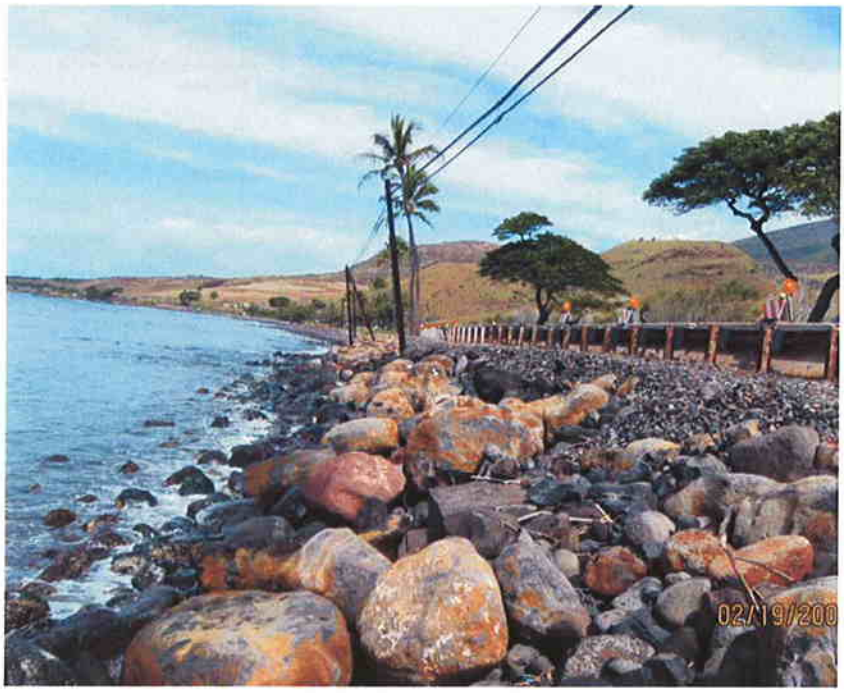


Photo No. 2. View of Shoreline Facing North

Source: Munekiyo & Hiraga, Inc.

Figure 7 Proposed Honoapi`ilani Highway Shoreline Protection
Site Photos

Prepared for: State of Hawai`i, Department of Transportation

SATO\Olowalu Erosion\SitePhotos

900 feet section of Honoapi`ilani Highway. According to the Maui Shoreline Atlas, erosion rates in this area range from approximately 0.0 to -0.8 foot per year. Wave action and coastal erosion continue to threaten the stability of the roadway pavement, posing a public safety concern for residents and visitors of the West Maui region.

Long-term plans are currently in progress to relocate the highway further inland to mitigate the hazards from storm waves and shoreline erosion. The highway relocation alternative is viewed as a long-term solution. Consequently, the immediate action to provide shoreline protection is necessary to maintain the functional integrity of the highway.

D. REGULATORY CONTEXT

1. Special Management Area Use Permit and Shoreline Setback Variance

The project site is situated within the limits of the County of Maui's Special Management Area, or SMA. In addition, work performed will include actions within the County's Shoreline Setback Area. Thus, both a SMA Use Permit and a Shoreline Setback Variance (SSV) will be required from the Maui Planning Commission.

2. Conservation District Use Permit

Since a portion of project site lies makai (seaward) of the certified shoreline, State "Conservation" district lands ("Limited" subzone) are affected, and the DOT will be required to obtain a Conservation District Use Permit from the Department of Land and Natural Resources to allow the commencement of the shoreline protection measures. Erosion control measures, which include shoreline protection, is an identified, permitted use within this subzone of the "Conservation" district upon approval by the Board of Land and Natural Resources.

3. Department of Army Permit

A portion of the project area is located within the Pacific Ocean, a waterbody recognized by the United States Department of Army Corps of Engineers. The Pacific Ocean is identified as a navigable water of the United States and is within the regulatory jurisdiction of the United States Department of Army. The placement of fill within the navigable waters of the United States will require a Department of Army (DA) permit pursuant to Section 404 of the Clean Water Act. In addition to

the DA Permit, a Section 401 Water Quality Certification and a Coastal Zone Management Consistency Review approval will be required for the proposed action.

4. Environmental Assessment

Lands affected by the proposed action include the Honoapi`ilani Highway right-of-way and a portion of a government beach reserve identified as TMK (2) 4-8-003:006(por.). The government beach reserve falls under the jurisdiction of the State Department of Land and Natural Resources.

As noted, the project site falls within the County of Maui's Special Management Area (SMA) and Shoreline Setback Area. Therefore, both an SMA Use Permit and a Shoreline Setback Variance will be required for the proposed action. Additionally, portions of the work fall within the State Conservation District, prompting the need for a Conservation District Use Permit.

Multiple triggers for a Chapter 343, Hawai`i Revised Statutes, Environmental Assessment are, therefore, invoked. These include the use of State lands and funds, the use of State Conservation District lands, and work within the Shoreline Setback. The DOT, as the agency with the greatest responsibility for supervising or approving the action as a whole, will be the approving agency for the EA.

E. NATIONAL ENVIRONMENTAL POLICY ACT COORDINATION

Federal funding for the shoreline protection is proposed to be provided by the United States, Department of Transportation, Federal Highways Administration (FHWA). The DOT will coordinate with the FHWA to determine an appropriate format for National Environmental Policy Act (NEPA) compliance. Consultation with other federal agencies is being undertaken pursuant to Section 7 of the Endangered Species Act and to Section 106 of the National Historic Preservation Act. Coordination with other federal agencies will be initiated as necessary.

F. PROJECT FUNDING AND SCHEDULING

The estimated construction cost for the proposed project is approximately $2.0 million. Construction of the project is expected to commence upon the receipt of State/FHWA funding, and all regulatory permits and approvals.

II. ALTERNATIVES CONSIDERED

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Pursuant to Chapter 343, HRS, alternatives to the proposed project were identified and evaluated. The analysis of the alternatives presented in this environmental assessment was, therefore, based on the following criteria:

1. Impacts on public recreational facilities are considered because Section 4(f) of the U.S. Department of Transportation Act of 1966 requires that these resource sites should be avoided unless there are no other feasible alternative. Such resources include public park and recreation lands, wildlife refuges, and historic sites.

2. Impacts on historic sites pursuant to Section 4(f) are considered and should be avoided unless there are no other feasible alternatives.

3. The evaluation of coastal engineering and design issues that require additional and frequent maintenance of the project area, and feasibility in implementation of the design.

A coastal engineering assessment prepared by EKNA Services, Inc. in June, 2008 provides an analysis of alternatives considered for the proposed shoreline protection. Refer to **Appendix "B"**. The following presents an analysis of each alternative relative to the foregoing evaluation factors. The alternatives presented discuss the rationale for selection and/or elimination from further consideration.

A. NO ACTION OR NO BUILD ALTERNATIVE

The project area is suffering chronic erosion and the highway pavement is in imminent danger of collapsing due to undermining by erosion of the fronting shoreline. This is a serious public safety issue as well as a socio-economic problem as the highway is the primary access road into the Lahaina/Kapalua area from Central Maui. The no action alternative would prolong the threat of coastal erosion and wave undermining in this shoreline area. Accordingly, the "No Action"/"No Build" alternative were not considered.

B. SANDBAG REVETMENT

Large geotextile bags filled with sand have been used as temporary erosion control measures at several coastal erosion hot spots over the past years. Sandbags are often the preferred choice of regulators because they appear to be a more "natural" alternative to conventional hard structures, such as rocks and concrete, and are easy to remove. Sandbags, however, are considered temporary when used in a shore protection structure because they can be easily damaged. The bags are prone to damage from storm wave attack and vandalism, and require frequent maintenance.

The project site is comprised of a cobble shoreline and exposed to large south swell and storm waves. The use of sandbags in this area is not a suitable alternative. The sandbags would need to be stacked on a slope, similar to a rock revetment, and would have a similar horizontal footprint. The geotextile fabric of the sandbags would not be aesthetically compatible with the cobble shoreline.

C. COBBLE BEACH

Beach restoration and nourishment is commonly cited as a preferred alternative to protecting eroding shorelines and beaches. Beach nourishment utilizes wave energy to redistribute small quantities of beach material within a littoral cell. Beach containment structures, such as groins, are built to confine the beach fill fronting the area of concern.

There is no record of a wide dry sand beach at the project site, and it would be difficult to estimate the rate of beach nourishment that would be required to maintain a design beach profile that will sufficiently protect the highway. For the beach to provide adequate protection during storm wave events, it must have adequate beach width, elevation, and length along the shoreline reach within the defined shoreline area or littoral cell.

Cobbles, which comprise the existing shoreline and which form many of the "beaches" along this West Maui Coast, will be more stable on the shoreline than sand size sediment. Therefore, any beach restoration effort at this location should use cobble sized material, preferably of similar gradation (or with slightly larger median size) than the existing material on the shoreline.

It is estimated that this cobble beach profile will dissipate storm wave energy sufficiently to prevent significant wave over wash of the highway. In the long term, however, there will likely be a need for future nourishment in order to maintain this design profile.

D. MAUKA SHIFT OF THE HIGHWAY

In this alternative, a portion of Honoapi`ilani Highway would be realigned and relocated inland, approximately ten (10) to fifteen (15) feet. This is the maximum distance that the road can be moved given the existing highway right-of-way. The realignment of the highway within the project reach will address the immediate issue of undermining and collapse of the existing highway pavement due to the present state of erosion damage to the shoreline. This alternative will not address the continuing erosion damage to the shoreline, nor is it a timely solution for addressing imminent collapse of the highway.

E. PREFERRED ALTERNATIVE - BOULDER FILL

The proposed boulder fill alternative will require the placement of boulders ranging in size from 2.3 to 3.8 tons to remain stable on the shoreline slope. The boulders would be underlain with smaller rock and geotextile fabric to prevent leaching of the backfill through the voids between the large stones. The crest elevation is approximately eight (8) feet Mean Sea Level (MSL), which is approximately the same elevation as the edge of the highway pavement. The low crest elevation will minimize the horizontal footprint of the boulder fill. The boulder slope will reduce runup and overtopping compared to the existing shoreline condition. Jersey barriers will be placed along the edge of the boulder slope to mitigate damage to the highway in the event of wave overtopping during storm wave attacks.

The boulder fill will provide protection to the shoreline and highway from seasonal high surf and the infrequent waves from passing hurricanes. The boulder fill will replace the cobble shoreline with a boulder slope. There will be no impacts to existing shoreline processes due to the boulder fill. The proposed action is not anticipated to have an adverse effect on public use of the subject area. Furthermore, the subject area is not considered as a Section 4(f) resource listed on the National Register of Historic Places.

III. DESCRIPTION OF THE EXISTING ENVIRONMENT AND POTENTIAL IMPACTS/MITIGATION MEASURES

III. DESCRIPTION OF THE EXISTING ENVIRONMENT AND POTENTIAL IMPACTS/MITIGATION MEASURES

A. PHYSICAL SETTING

1. Existing and Surrounding Land Use

a. Existing Conditions

The subject property, located in the vicinity of Olowalu Wharf and Olowalu, is approximately 15 miles from Wailuku and five (5) miles from Lahaina town.

The project area is located along a cobble shoreline which is subject to long-term coastal erosion and wave action. The coastline is comprised of black sand and cobble block with patches of calcareous sand. A portion of this shoreline is a government beach reserve which provides public access to recreational opportunities which include, but are not limited to, swimming, fishing, and snorkeling. The affected shoreline area is not a public park.

In a regional context, Olowalu has historically been a plantation settlement. Prior to 1999 and the closure of Pioneer Mill, significant acreages of lands within the Olowalu area were cultivated in sugar cane. Land uses currently surrounding the subject property include two (2) acre agricultural lots associated with the Olowalu Makai (Komohana and Hikina) subdivisions, Chez Paul restaurant, Olowalu General Store, Camp Olowalu (formerly known as Camp Pecusa), and Olowalu Village with various existing single-family residences reminiscent of the plantation era in the Olowalu area. Olowalu Wharf (consisting of a pier and breakwater), formerly used for the loading and unloading of sugar into barges, is located along the shoreline to the south of the subject property.

b. Planned Future Land Uses

The project site also lies makai of the proposed redesignation of public and private land for the proposed Pali to Puamana Parkway (P2P) project. The proposed parkway is intended to preserve open space and access shoreline along the coastline of West Maui. Implementation of the P2P plan may require changes in land use designation and the purchase of several land parcels in Launiupoko, Olowalu, and Ukumehame. The plan also proposes the relocation of Honoapi`ilani Highway further inland to ensure safe access through the parkway area.

c. Potential Impacts and Mitigation Measures

The proposed action is not anticipated to curtail the beneficial uses of the existing environment. Lateral access is possible along the northern boundary of the project site. Recreational shoreline activities are not expected to be adversely affected after the boulder fill has been placed along the shoreline. Lateral access along this 900 feet stretch is expected to remain. The proposed project is considered to be compatible with the existing and surrounding land uses and is not expected to adversely affect the proposed Pali to Puamana Parkway Plan. The P2P plan for a mauka or inland shift of Honoapi`ilani Highway is consistent with the state's long-term plans for relocation of the highway. As stated previously, the immediate action to provide shoreline protection is necessary to maintain the functional integrity of the current highway alignment.

2. Climate

a. Existing Conditions

Like most areas of Hawai`i, Olowalu's climate is relatively uniform year round. This stability is attributed to its tropical latitude, its position relative to storm tracts and the Pacific anticyclone, and the surrounding ocean. Variations in climate among different regions, then, are largely left to local terrain.

Wind patterns affecting the islands are typically out of the northeast which occur 90 percent of the time during the summer, and 50 percent of the time in the winter.

Recorded temperatures in Lahaina, located approximately 5.5 miles to the north of Olowalu, range from an average high temperature in the high 80's (degrees Fahrenheit) to an average low temperature in the low 60's. Rainfall in the Olowalu area ranges between 15 to 20 inches per year (Maui County Data Book, 2007).

b. Potential Impacts and Mitigation Measures

The scope of the proposed project is limited to the placement of boulder fill and related improvements within a rocky shoreline. As such, there will be no impacts generated by the project which would be expected to have an adverse effect on local climatic and meteorological conditions.

3. Topography

a. Existing Conditions

Most of the Olowalu area surrounding the subject property was formerly utilized for sugar cultivation and is now fallow. The topography of this area reflects the general topographical patterns of the West Maui region. Near the shoreline, the topography is generally flat to slightly sloping. Proceeding mauka, the land slopes gently higher to the foothills of the West Maui mountains. Elevations in the Olowalu area generally range from sea level to approximately 300 feet above sea level. The topography of the subject property is generally flat to slightly sloping in a southerly direction towards the ocean at about a three (3) percent gradient (Soil Conservation Service, 1972).

b. Potential Impacts and Mitigation Measures

As noted previously, minor excavation work will be undertaken prior to the initiation of shoreline protection improvements. All earth-altering work will comply with applicable requirements of Chapter 20.08, Soil Erosion and Sedimentation of the Maui County Code. Minor fill required for the proposed project will be approved, non-expansive material of approximately 900 cubic yards. The proposed project will not present any significant adverse impacts on the existing topography and landform of the surrounding area.

4. Soils and Agricultural Productivity Characteristics

a. Existing Conditions

Underlying the subject property are soils from the Pulehu-Ewa-Jaucas association. See **Figure 8**. This series consists of well-drained soils on alluvial fans and stream terraces and in basins. These soils were developed in alluvium washed from basic igneous rock. The soil types specific to the subject property consist of Pulehu Cobbly Clay Loam, 0 to 3 percent slopes (PtA), and Pulehu Clay Loam, 0 to 3 percent slopes (PsA). See **Figure 9**.

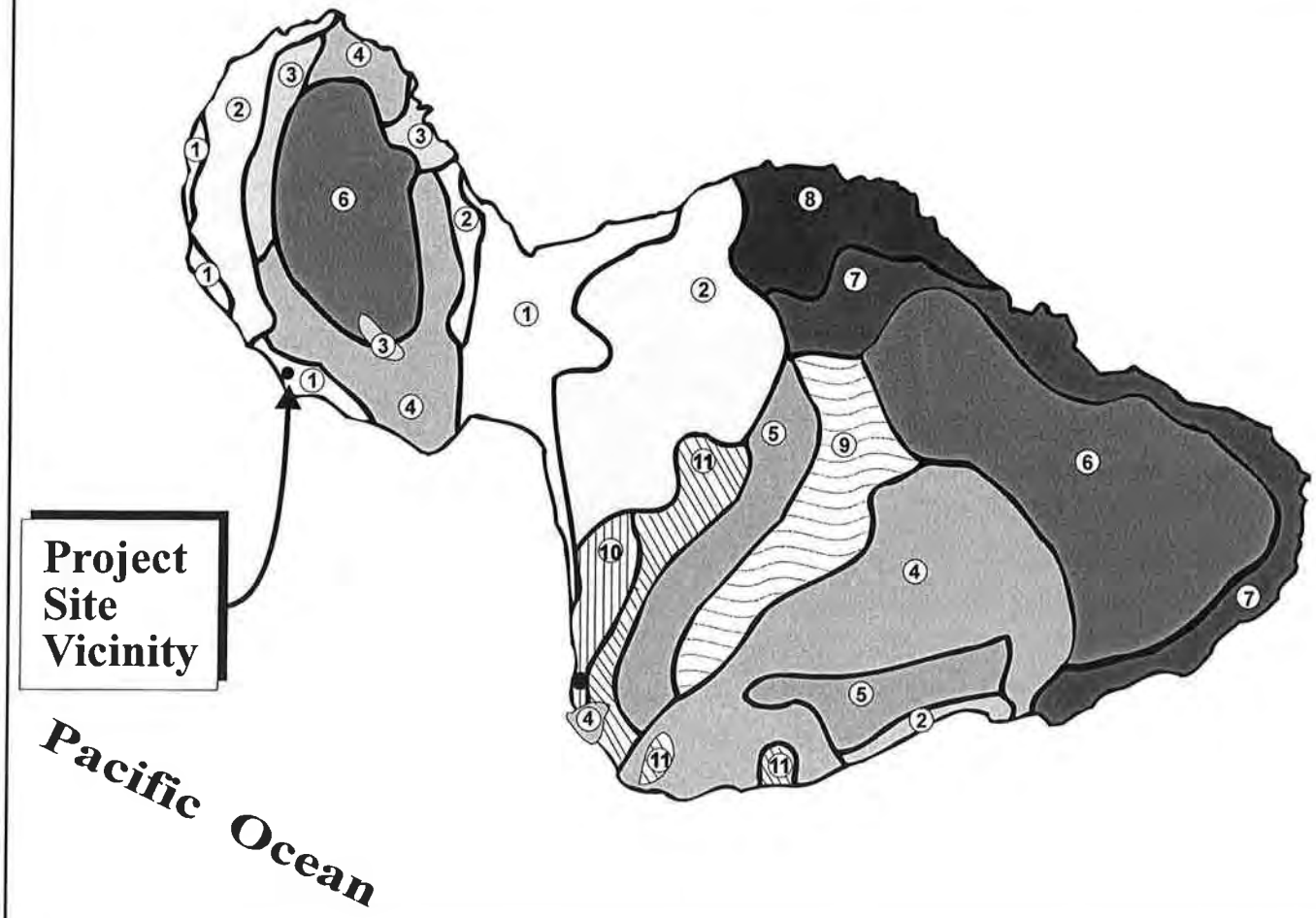
PtA is a well-drained soil commonly found on alluvial fans and stream terraces and in basins. Permeability is moderate, runoff is slow, and the erosion hazard is no more than slight. This soil is similar to Pulehu Clay Loam, except that it is cobbly (Soil Conservation Service, 1972).

PsA is an excessively drained, calcareous soil that occurs as narrow strips on coastal plains adjacent to the ocean. It is characterized by moderate permeability, slow runoff, and slight water erosion hazard. Low areas are subject to flooding (Soil Conservation Service, 1972).

In 1977, the State Department of Agriculture developed a classification system to identify Agricultural Lands of Importance to the State of Hawai`i (ALISH). The classification system is based primarily, though not exclusively, upon the soil characteristics of the lands. The three (3) classes of ALISH lands are: "Prime", "Unique", and "Other Important" agricultural lands, with all remaining lands termed "Unclassified". When utilized with modern farming methods, "Prime" agricultural lands have a soil quality, growing season, and moisture supply necessary to produce sustained crop yields economically. "Unique" agricultural lands possess a combination of soil quality, growing season, and moisture supply to produce sustained high

LEGEND

- ① Pulehu-Ewa-Jaucas association
- ② Waiakoa-Keahua-Molokai association
- ③ Honolua-Olelo association
- ④ Rock land-Rough mountainous land association
- ⑤ Puu Pa-Kula-Pane association
- ⑥ Hydrandepts-Tropaquods association
- ⑦ Hana-Makaalae-Kailua association
- ⑧ Pauwela-Haiku association
- ⑨ Laumaia-Kaipoipoi-Olinda association
- ⑩ Keawakapu-Makena association
- ⑪ Kamaole-Oanapuka association



Source: U.S.D.A., Soil Conservation Service

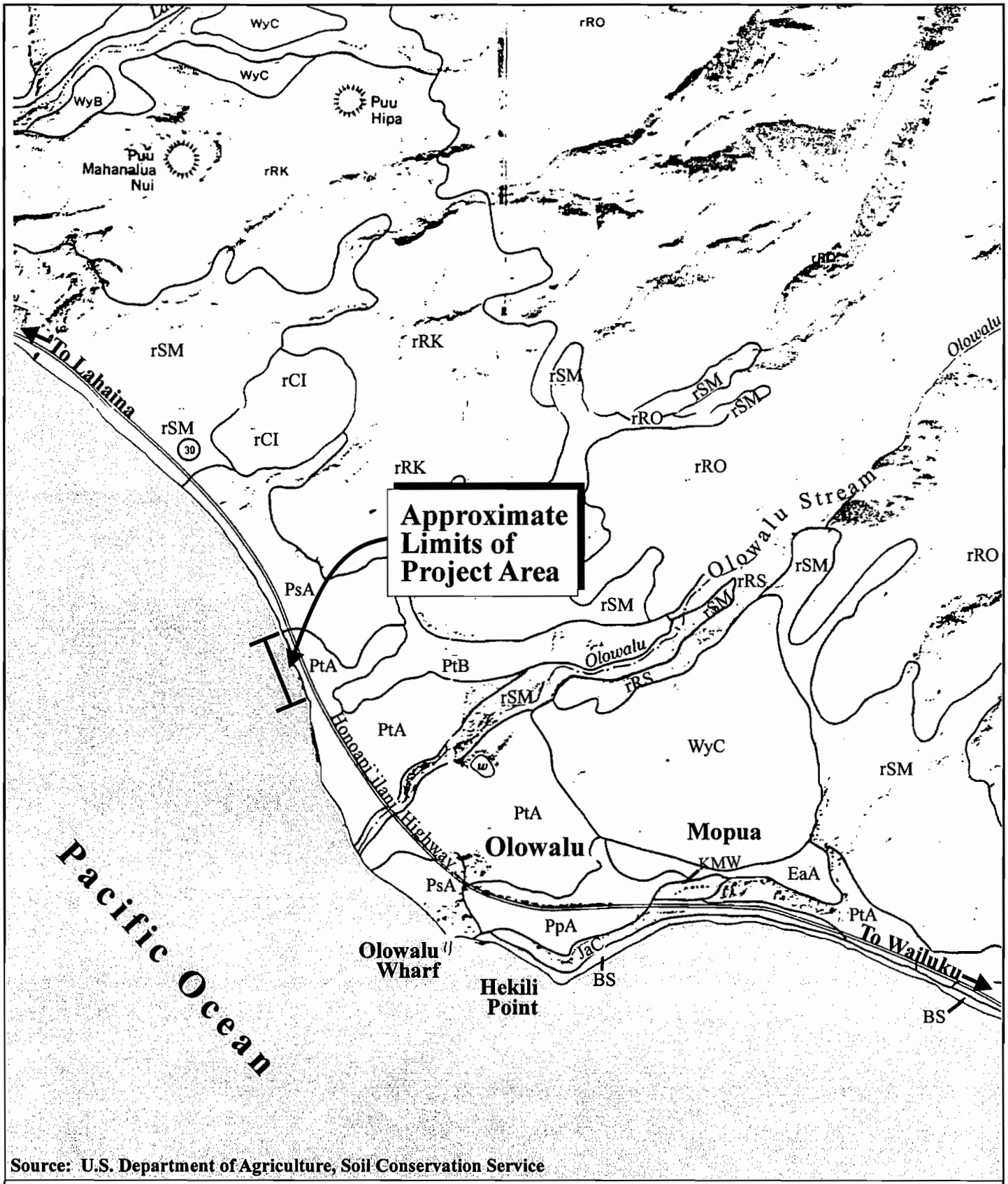
Figure 8 Proposed Honoapi`ilani Highway Shoreline Protection

Soil Association Map

NOT TO SCALE

Prepared for: State of Hawai`i, Department of Transportation

SATO\Olowalu Erosion\SoilAssoc



Source: U.S. Department of Agriculture, Soil Conservation Service

Figure 9 Proposed Honoapi`ilani Highway Shoreline Protection

Soil Classification Map

0 1000 Feet
500 2000

Prepared for: State of Hawai`i, Department of Transportation

SATO\Olowalu Erosion\SOILCLASS

yields of a specific crop. "Other Important" agricultural lands include those that have not been rated as "Prime" or "Unique". Analysis of the ALISH map for the Olowalu area indicates that the subject property comprises of lands that have been defined as "Unclassified" agricultural lands. See **Figure 10**.

b. Potential Impacts and Mitigation Measures

The scope of the proposed project is limited to the placement of boulder fill within an eroding shoreline. The project area is a rocky shoreline that was once utilized as part of the roadway alignment for Honoapi`ilani Highway.

The proposed project is not anticipated to have a significant adverse effect on the inventory of lands available for agricultural cultivation, nor is it expected to affect the inventory of land for diversified agricultural use. Best Management Practices, which includes the use of silt fencing, will be implemented both prior to and during grading and construction to minimize opportunities for soil erosion at the site. Daily inspection at the project site will also be conducted to ensure that erosion control measures are maintained. Upon completion of construction, geotextile fabric and smaller rocks will be installed under the large boulders to stabilize the ground. With implementation of the foregoing mitigation measures, the proposed project is not anticipated to present significant adverse impacts on soil conditions at the subject property. Moreover, the soil types found on the property do not present any limitations to the placement of boulders as a shoreline protection measure. The proposed action is anticipated to reduce terrigenous inputs or clay substrate into the marine environment. Refer to **Appendix "A"** and **Appendix "B"**.

5. Flood and Tsunami Hazards

a. Existing Conditions

The subject property is principally located within Flood Zone "V12". Zone "V12" is an area of the 100-year coastal flood with velocity (wave action). See **Figure 11**.

According to the State Civil Defense Agency maps, in the Olowalu region, the tsunami evacuation area extends from the shoreline to Honoapi`ilani

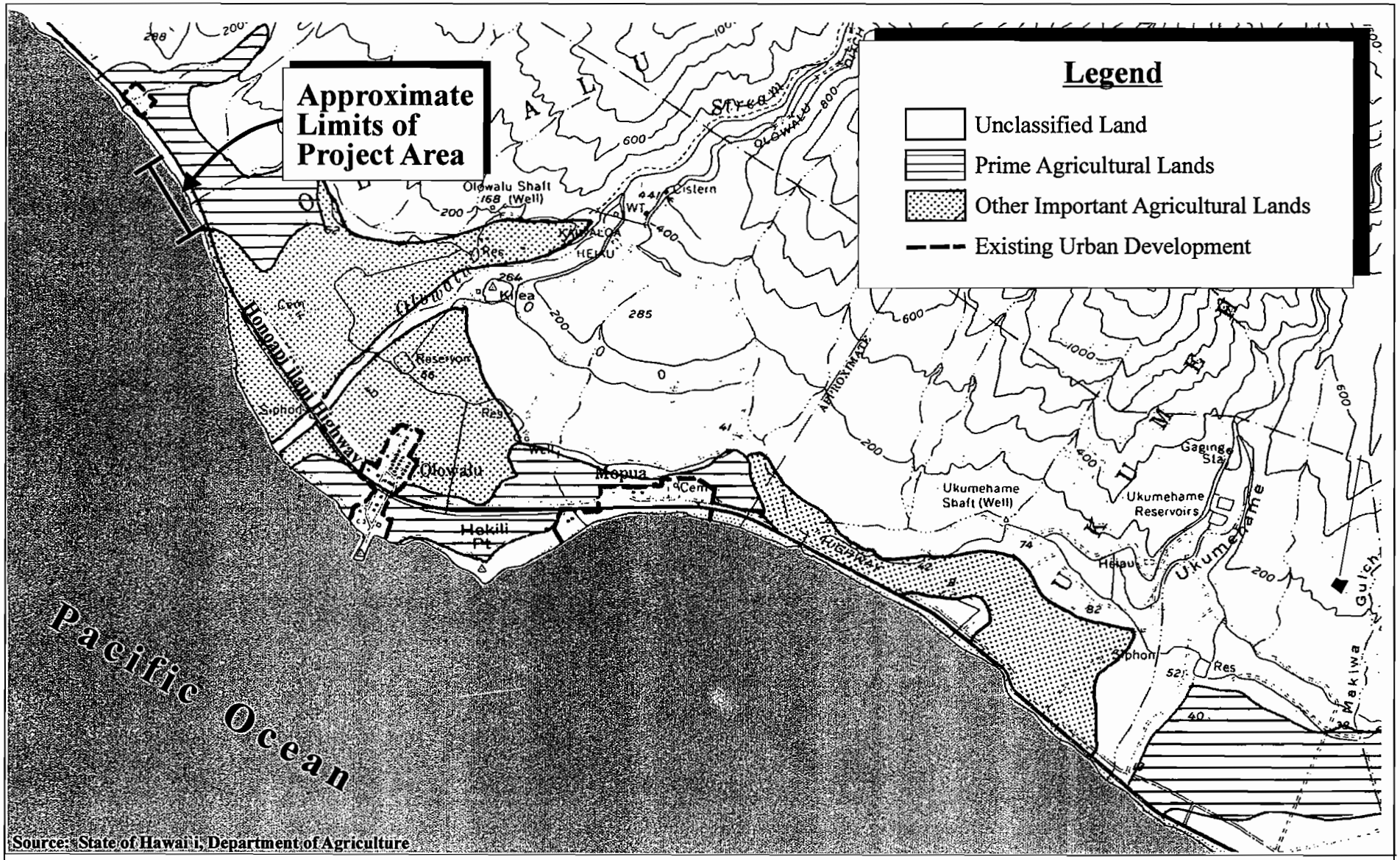


Figure 10

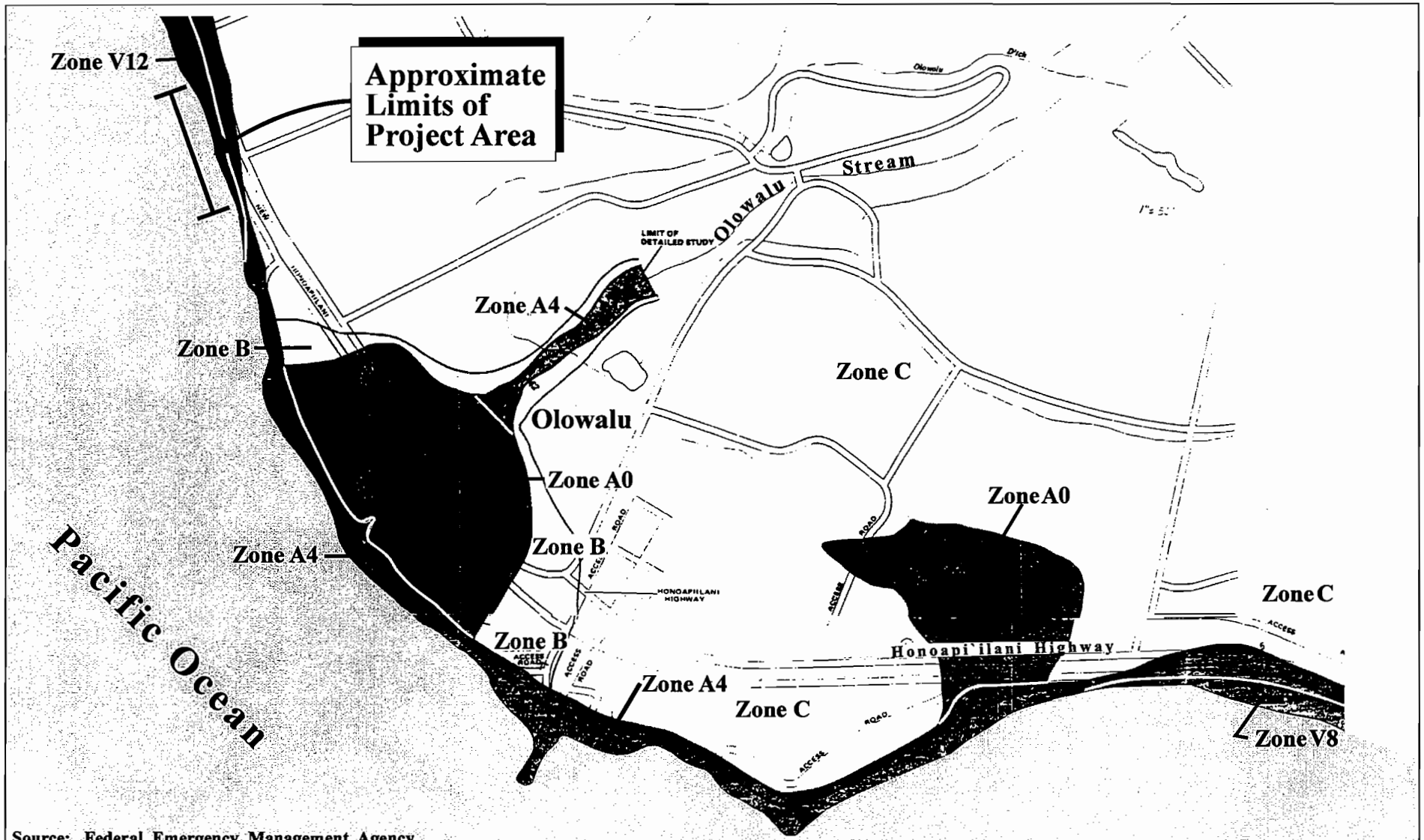
Proposed Honoapi`ilani Highway Shoreline Protection

Agricultural Lands of Importance to the State of Hawai`i

0 500 1000 2000 Feet

Prepared for: State of Hawai`i, Department of Transportation

SATO\Olowalu Erosion\ALISH



Source: Federal Emergency Management Agency,
Flood Insurance Rate Map Community Panel #150003 0227B and 0229B

Figure 11

Proposed Honoapi`ilani Highway Shoreline Protection

Flood Insurance Rate Map

NOT TO SCALE

Prepared for: State of Hawai`i, Department of Transportation

SATO\Olowalu Erosion\firm

Highway. The subject property is situated within a defined tsunami evacuation area.

b. Potential Impacts and Mitigation Measures

The proposed action involves a shoreline protection measure designed to ensure the continued operational integrity of the Honoapi`ilani Highway. The proposed action does not involve habitable uses nor will it encourage such uses. In this regard, there are no anticipated adverse impacts to flooding or tsunami conditions created by the project.

6. Coastal Environmental Setting

The coastal processes, marine water quality and nearshore biological investigations for the proposed project were carried out by AECOS, Inc. Field work was carried out in April 2008. See **Appendix "C"**. A summary of the AECOS, Inc. assessment follows:

a. Existing Conditions

The project shoreline, located on the southwest flank of the West Maui Mountains, trends northwest-southeast. This leeward coast is generally quite dry and is exposed to southerly swells, generally in the summer months. South of the project site, near the middle of Hekili Point, perennial Olowalu Stream discharges into nearshore waters and particularly during high rainfall events, contributing to terrigenous sediment to the nearshore environment.

The southwest facing shore ranges from large boulders and rock rubble in the south to water worn cobbles and deposits of black sand in the north. There is no shallow fringing reef fronting this shoreline reach to provide protection from deep water wave energy. The shallow nearshore waters in the project area are generally less than 2.8 ft. deep and create a broad intertidal zone. Swells sweep up along the coast from the south forming waves suitable for surfing of the north end of the project area.

b. Potential Impacts and Mitigation Measures

The proposed boulder fill alternative would cover the 900 feet length of the project site and extend up to 40 feet offshore. The boulder fill is anticipated to improve water quality by halting adverse effects on water quality of the erosion of the backshore and acting as a trap for particulates washed on to the beach by high surf events.

A monitoring program of the project area shoreline will be carried out to establish pre-construction and post-construction conditions and will determine if more specific mitigation measures will be warranted. Refer to **Appendix "C"**.

7. Marine Resources

a. Existing Conditions

The marine biology assessment by AECOS, Inc. was carried out in April 2008. The scope of the marine survey included an assessment of flora and fauna of the intertidal and shallow nearshore zones located in the project area. Species of fishes, algae, coral, and other invertebrates were recorded in three (3) distinct nearshore zones: The Supralittoral (uppermost, wave splash) zone, the Littoral (intertidal) zone, and the Sublittoral (shallow subtidal) zone.

The Supralittoral zone is made up of a stone cobble beach which is seldom awash. Desiccated molts of various crustaceans and algae lay cast onto this uppermost part of the shore. Also found in the transition between the wave splash and upper intertidal are typical invertebrates such as pipipi, blackfoooted `opihi, and dotted periwinkle, which tend to cluster on existing boulders and cobbles.

The Littoral zone is dominated by algae which include green alga called sea lettuce and brown alga named hulu`ilio. Spotted drupes graze algae on the rocks and boulders in this zone.

In the shallow Sublittoral zone, a red alga was identified on boulders, where the giant `opihi and shingle urchin also occur. A lush growth of a red-orange

alga was also identified on lower intertidal boulders. Four (4) fish species were observed: the endemic Hawaiian white-spotted toby, the endemic Hawaiian sergeant major, the reef triggerfish, and an unidentified slender silver fish, resembling an `iao. Subtidal algal growth is prominent toward the south end of the project site where many species of algae occur. Much of the shallow bottom offshore of the north end of the project area is shifting sand, unsuitable for algal colonization.

In all, a total of 37 algal taxa were identified across the area. This listing includes five (5) green alga, seven (7) brown algae, and 25 red algae. Invertebrates and fishes of the nearshore subtidal find shelter from the waves within the existing boulders and cobbles. A total of 25 invertebrate taxa were observed throughout the survey area. Corals are rare with live coral cover much less than one percent. No sea turtles or other endangered or threatened species were observed in or near the project area during the marine survey. Refer to **Appendix "C"**.

b. **Potential Impacts and Mitigation Measures**

Direct biological impacts associated with placement of boulder fill include burial of parts of the existing and intertidal environment which is primarily boulders and cobbles. Benthic organisms that include algae, snails, crustaceans, and other invertebrates may suffer direct burial during the placement of the boulder fill. The shallow intertidal zone with cobble and boulder substrate is important fish habitats used by all fish life stages providing food resources, egg laying surfaces, and shelter. Most fishes are mobile and will leave the area during construction activities. Fishes and benthic invertebrates will return after construction is complete and organisms will readily re-colonize the new exposed hard surfaces. Effects on the marine environment will be minimized by conducting construction work during low tide and by using a silt curtain to mitigate potential increased turbidity and siltation. No rare or endangered species would be lost in this marine environment. Pursuant to the Endangered Species Act [50 CFR section 7(a)(2)], consultation with the U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS) are being undertaken to ensure that the proposed action will not likely jeopardize the continued existence of listed species or result in the destruction or adverse modification of critical habitats of species listed as endangered or threatened.

8. Water Quality

a. Existing Conditions

An assessment of the inshore and offshore water quality in the project area was carried out by AECOS, Inc. Refer to **Appendix "C"**. The field work for the water quality assessment was conducted in April 2008. Water samples were collected at the north end, middle, and south end of the project area at three (3) offshore stations and three (3) nearshore stations. The results of the water quality analysis in the project area are summarized as follows.

(1) Temperature and Salinity

Temperature and salinity showed small variation from place to place. Temperatures ranged from 26.1 to 26.4 degrees Celsius. Salinity measured at 34 parts per thousand (ppt). The reading measurements were sufficient to establish that no great influence from terrestrial drainage or groundwater seepage was evident in the samples taken.

(2) Dissolved Oxygen

Dissolved oxygen (DO) values measured in April 2008 were normal in the range of 106 to 108 percent saturation (percentage present as a function of oxygen solubility at the given temperature and salinity). The range of dissolved oxygen values is adequate for good water quality.

(3) pH

The pH values in the April 2008 samples measured 8.14 to 8.28 with very little variation and is very ordinary for sea water samples.

(4) Turbidity and Suspended Solids

Turbidity and total suspended solids (TSS) are measures of the concentrations of fine particulates in the water. Turbidity is a measure of the light reflecting off the small particles and TSS is the dry weight of the suspended material. Particulates were high in the northern nearshore portion of the project and decreased progressively to the southern end of the study area. Turbidities measured from spot samples ranged from 2.07 to

9.12 ntu, with the highest values always at inshore locations. Suspended solids varied from 15.9 to 50.7 mg/l and appear to reasonably correlate with the turbidity values.

(5) Nutrients

Nutrients are measured because of the influence these chemicals have on growth rates and abundance of phytoplankton and benthic algae. Nutrient values collected in April 2008 tended to be fairly consistent among all stations. Ammonia was undetectable at all stations, whereas nitrate + nitrate concentrations were slightly higher at nearshore stations when compared with offshore stations. Total phosphorous decreased from north to south in the nearshore stations and showed no specific trend in the offshore station.

(6) Chlorophyll

The measurement of chlorophyll in water samples provides an estimate of the relative abundance of phytoplankton. Chlorophyll values measured were somewhat variable. Low values (range 1.06 to 2.04 ug/l) characterized all of the offshore stations in the April sample while elevated values characterized the inshore samples, where contamination with small benthic algae fragments in the wave washed waters is a possibility.

b. Potential Impacts and Mitigation Measures

Activities involving mechanical equipment in the vicinity of the shoreline can lead to increased turbidity during the construction period. Best Management Practices will be implemented to reduce impacts relating to construction activities. These measures include the following, but not necessarily limited to:

(1) Proper storage, handling, and disposal of construction and waste materials
(2) Washing of construction equipment done in a manner that allows for the proper disposal of the resultant wastewater
(3) Ensure heavy machinery is not leaking fluids of any kind
(4) The proper use of silt curtains during construction activities
(5) Curtailing construction activities during adverse seas and high rainfall conditions

(6) Water quality monitoring during construction activities to ensure compliance with permit requirements

Temporary increases in turbidity as a result of construction activities will cease once the project is complete. Further, the proposed boulder fill is anticipated to reduce the amount of sediment input into the marine environment resulting in an improvement to water quality. Coordination with the State Department of Health, Clean Water Branch, will be undertaken to address applicable National Pollutant Discharge Elimination System (NPDES) permit requirements.

9. Flora and Fauna

a. Existing Conditions

Coastal vegetation in the Olowalu area occurs as a narrow band along the seaward front of the lands between the ocean and the Honoapi`ilani Highway. Formerly cultivated sugar cane fields are typically located mauka of this coastal vegetation zone.

In proximity to the subject property, the beaches consist of rounded, waterworn basalt and bleached coral rubble. In places, a few pockets of grayish-colored, fine sand are found along the black and white colored cobble beaches. The coastal vegetation mostly ruderal weeds, with the exception of several native plants which include the following: Hau (Hibiscus Tiliaceus), `ilima (Sida fallax) and sandalwood or naio (Myoporum sandwicense). The coconut palm (Cocos nucifera) is considered an early Polynesian introduction. Other types of vegetation found in the project area consist of false kamani trees (Terminalia catappa), Kiawe (Prosopis pallada), small shrubs (Pluchea carolinensis, Leucaena leucocephala, and Sida fallax), and grasses (Cenchrus ciliaris, and Chloris barbata). Refer to **Appendix "C"**.

The project site is devoid of coastal vegetation except for a few coconut palms, and scattered roadside weeds and grasses. Refer to **Figure 7** (Site Photographs).

Avi-fauna present within the Olowalu area include a host of introduced species, including the Japanese White-eye (Zosterops japonicus), Zebra-dove (Geopelia striata), spotted dove (Streptopelia chinensis), and common Myna

(Acridotheres tristis). Mammals common to this area include rats, mice, and mongoose.

b. Potential Impacts and Mitigation Measures

There are no known habitats of rare, endangered, or threatened species of flora or fauna located within the project site. No significant adverse impacts on flora and fauna in the area are expected to be generated through implementation of the proposed project.

Terrestrial vegetation at the project site consists of plant species common to West Maui and is dominated by introduced trees and ruderal weeds. There are no particular concerns regarding this terrestrial vegetation, although replacement of lost trees would be an important improvement to the coastline between the highway and the shore. Species now present, such as the kiawe, should be permanently removed and replaced by indigenous trees and shrubs, such as kou, milo, and naupaka, that are more appropriate to the setting, provide better shade for beach users, and unlike kiawe, lack spines. Refer to **Appendix "C"**. Consultation with the USFWS will continue to be carried out to ensure that the proposed action will not produce adverse effects on the continued existence of species listed as endangered or threatened or result in the destruction or adverse modification of designated critical habitats pursuant to the Endangered Species Act [50 CFR Section 7(a)(2)].

10. Archaeological Resources

a. Existing Conditions

The subject property is located in the ahupua`a of Olowalu, meaning literally "many hills". Olowalu was an important agricultural area in pre-contact times, with ideal conditions for wetland kalo agricultural production that incorporated pond fields and irrigation canals.

In the post-contact period, the Olowalu area was notable for the infamous Olowalu Massacre perpetrated by Captain Simon Metcalf of the ship Eleanora in 1790. This involved a cultural misunderstanding which resulted in tragic consequences.

As foreign influence became more pervasive following the unification of the Hawaiian Islands under Kamehameha, Lahaina became the center for West Maui because of favorable conditions for sailing craft. An 1832 missionary census showed the population of Lahaina at 4,028, Olowalu at 832, and Ukumehame at 573.

Following the Great Mahele in 1848, there were 45 individual Land Commission awards granted in the ahupua'a of Olowalu. The majority are in the upper reaches of the property, along Olowalu Stream.

The Olowalu Sugar Company is said to have been an enterprise of King Kamehameha V, who reigned from 1863 to 1872. He began the operation sometime during his reign. It was incorporated as the Olowalu Sugar Company in May 1881 and eventually was sold to Pioneer Mill Company, Ltd. in 1931. Lands in Olowalu eventually became a part of the former Pioneer Mill lands until the closure of the mill in the late 1990's. Since then, much of the former sugar lands have laid fallow.

b. <u>Potential Impacts and Mitigation Measures</u>

With respect to the project site itself, there are no evidence of archaeological features given the historic shoreline erosion patterns affecting the coastline. The proposed action involves minor grading to establish the proper ground setting for the boulder fill. However, this grading work will occur in areas already disturbed by coastal erosion or previous highway grading and construction. Grading work will only occur on the makai side of Honoapi`ilani Highway.

An Archaeological Inventory Survey was prepared for the proposed project in June, 2008 by Scientific Consultant Services, Inc. See **Appendix "D"**.

The following significance evaluations are broad criteria established for the State and National Register of Historic Places. These criteria area as follows:

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 to an ethnic group; examples include religious structures, burials, major traditional trails, and traditional cultural places.

During the survey, three (3) subsurface features, consisting of a single site, Site 50-50-08-6480 (TS-1), were located during the pedestrian survey of the project area within a naturally occurring bank-cut. The features identified in the survey include charcoal concentrations and a fire hearth. Site -6480 has been interpreted as a temporary habitation site, possibly associated with the procurement of marine resources.

Site -6480 has been assessed as significant under Criterion D, for information content only. The findings suggest the potential for additional sites or site remnants, including human burials and habitation, to be present in the subsurface deposits of the surrounding area. Archaeological monitoring has been recommended as a precautionary measure, during all construction related ground alterations within the project area and the adjacent sections of Honoapi`ilani Highway.

Pursuant to Section 106 of the National Historic Preservation Act (1966), consultation with the State Historic Preservation Officer, Federal Highways Administration, and Native Hawaiian cultural groups will be undertaken to outline procedures for identification of, preservation of, and if required, mitigation of effects on cultural material and/or human burials that may be discovered during project construction.

In accordance with Section 6E-43.6, Hawai`i Revised Statutes and Chapter 13-300, Hawai`i Administrative Rules, if any significant cultural deposits or human skeletal remains are encountered, work will stop in the immediate vicinity and the State Historic Preservation Division of the Department of Land and Natural Resources and the Office of Hawaiian Affairs will be contacted.

Consultation with the State Historic Preservation Division regarding the review of the Archaeological Inventory Survey report yielded concurrence to the report's findings and recommendations. Additionally, archaeological monitoring will be undertaken during all ground altering disturbances within the project area. See **Appendix "D-1"**.

11. Cultural Assessment

a. Existing Conditions

The project site is located within the Olowalu Ahupua`a in the Lahaina District of the island of Maui. The Olowalu area is perhaps best known for its fertile agricultural areas which encompass the largely agricultural landscape. Along the coast, fishing, diving, and shoreline gathering activities supplemented agricultural cultivation and provided additional resources to the inhabitants of the ahupua`a. Many of the fishing, diving, and shoreline gathering activities still occur in the present day.

During pre-contact times, there were primarily two (2) types of agriculture in the ahupua`a: wetland and dryland. Both types of agriculture were dependent largely on geography and access to a sustainable water source. Olowalu, located downstream of a river valley, contained ideal conditions for wetland kalo (taro) cultivation, which incorporated pond fields and irrigation canals. In areas where water was not as abundant, sugar cane, banana, and sweet potato were grown. Agriculture in this area of the island was believed to have started early in the Expansion Period (1200-1400 A.D.).

In modern times, the agrarian society of Olowalu continued with the advent of large-scale sugar cane cultivation. Although organized sugar production commenced on Maui in the early 1800's, such sugar production in West Maui did not occur until years later. The Olowalu Sugar Company was organized

in 1881 on lands given up by the West Maui Plantation. Lands in Olowalu eventually became a part of the former Pioneer Mill lands until the 1990's. Upon the closure of Pioneer Mill in 1999, much of the former sugar lands, have laid fallow. See **Appendix "E"**.

b. Potential Impacts and Mitigation Measures

A Cultural Impact Assessment was completed for the project site in May 2008 by Scientific Consultant Services, Inc. Refer to **Appendix "E"**. The assessment report was based on a variety of sources, including agency consultation and archival research. Some of the entities consulted include the Office of Hawaiian Affairs, Maui; Cultural Resources Commission of the Maui Planning Department; the Office of Hawaiian Affairs, Oahu; Na Kupuna O Maui; the Hawaiian Civic Club, Lahaina; and the State Historic Preservation Division, Cultural Historian. These entities did not respond, to date, with information concerning significant cultural resources which would be impacted by the proposed project.

Further, archival review of the project site and surrounding vicinity did not indicate adverse cultural impacts arising from the proposed action.

The subject project will not affect lateral shoreline access and ocean recreational opportunities. Based on the foregoing, cultural practices and resources are not anticipated to be adversely impacted by the proposed project.

12. Air Quality

a. Existing Conditions

There are no point sources of airborne emissions within close proximity of the subject property. Although minimal, airborne pollutants are largely attributable to vehicular exhaust from traffic along the region's roadways, as well as dust from unplanted or recently plowed agricultural lands. However, sources are intermittent and prevailing winds quickly disperse particulates generated by these temporary sources.

The State of Hawai`i, Department of Health maintains one (1) air quality monitoring station on the island of Maui, located in Kihei. The site monitors for particulate matter less than or equal to 10 micrometers (PM_{10}) and 2.5 micrometers ($PM_{2.5}$). The measurement of air quality is expressed as mass per unit volume or micrograms per cubic meter ($\mu g/m^3$).

According to data collected at the station in 2006, the annual average concentration of PM_{10} over a 24-hour period was 23 $\mu g/m^3$ and the average annual concentration of $PM_{2.5}$ over a 24-hour period was 4 $\mu g/m^3$ (State of Hawai`i, Department of Health Clean Air Branch, 2006 Annual Summary Hawai`i Air Quality Data). These readings are well below the State standard of 150 $\mu g/m^3$ for the average concentration of PM_{10} over a 24-hour period and the national standard of 65 $\mu g/m^3$ of $PM_{2.5}$ over a 24-hour period. Although levels of particulate matter increase when agricultural burning takes place, prevalent tradewinds from the north and northeast minimize nuisance air quality problems in the vicinity. In 2006, the entire State of Hawai`i was in attainment for all National Ambient Air Quality Standards.

b. Potential Impacts and Mitigation Measures

The scope of the proposed project is limited to the placement of boulder fill along the rocky shoreline. Exhaust gases from construction equipment or dust from transport and handling of construction materials near the project site may cause a temporary reduction of air quality during construction.

This project will not result in any changes in traffic volumes, vehicle mix, location of the existing facility, or any other factor that would cause an increase in emissions impacts relative to existing conditions. As such, this project will generate minimal air quality impacts for Clean Air Act criteria pollutants and has not been linked with any special concerns regarding mobile source air toxins.

13. Noise

a. Existing Conditions

Existing noise in the project vicinity is primarily generated from traffic noise from vehicles traveling along Honoapi`ilani Highway. Ambient noise

conditions are generally attributable to natural conditions such as ocean waves, wind, and rain. Surrounding land uses include agricultural lands. There are no noise sensitive uses or receptors located in close proximity to the project site.

b. Potential Impacts and Mitigation Measures

There are no long-term impacts to ambient noise levels associated with the proposed project. Similar to air quality, ambient noise conditions may be temporarily impacted by construction activities. Heavy construction equipment, such as material transport vehicles, will be the dominant sources of noise during the construction period. Impacts to noise conditions are temporary and limited to the construction period. All construction activities will be in compliance with State Department of Health community noise standards.

14. Scenic and Open Space Resources

a. Existing Conditions

The shoreline in the vicinity of the subject property offers views and vistas of the Pacific Ocean, as well as the islands of Lana`i and Kahoolawe. The Kihei-Makena coastline and the islet of Molokini are also visible from this locale. The West Maui Mountains and Olowalu Valley can be seen to the northeast of the subject property.

b. Potential Impacts and Mitigation Measures

The proposed project, limited in scope to the placement of boulder fill along a rocky shoreline is not anticipated to affect the long-term aesthetic and visual character of the surrounding Olowalu area. Given the existing characteristics of the shoreline area, it is anticipated that the proposed action will not affect views from Honoapi`ilani Highway.

15. Shoreline Access

a. Existing Conditions

A portion of the project area is utilized by fishermen and surfers for recreational purposes. Informal, lateral access to the shoreline is provided off of Honoapi`ilani Highway. There is no direct shoreline access along the project limits as the highway abuts the shoreline in this area. Direct access to the shoreline along the project site is not recommended given the shoreline's immediate adjacency to the Honoapi`ilani Highway. Vehicular access to the project site is provided along a strip of land located north of the project area. This strip of land consists of cobble beach. There is no sand beach along this coastal reach between Launiupoko Point and Hekili Point.

b. Potential Impacts and Mitigation Measures

The proposed project involves the placement of boulder fill on an existing rocky shoreline. Public use of the shoreline may be restricted during the construction period. Lateral shoreline access will be available over the boulder and rock fill. Public access along the shoreline area is expected to continue upon completion of the shoreline improvement. The proposed project will not impact access and recreational opportunities which exist along the coastline.

B. SOCIO-ECONOMIC ENVIRONMENT

1. Population

a. Existing Conditions

The resident population of the West Maui Community Plan region has demonstrated a substantial increase over the last two (2) decades. Population gains were especially evident in the 1970's as the rapidly developing visitor industry attracted many new residents. The population of the Lahaina District increased from 14,574 in 1990 to 17,967 in 2000. Projections of the resident population in the Lahaina District for the years 2010, 2020, and 2030 are 21,577, 25,096, and 28,903, respectively (County of Maui, June 2006).

Growth at the County level exhibits a similar pattern. The County's resident population increased from 101,709 in 1990 to 128,968 in 2000. Projections for the resident County population in 2010, 2020, and 2030 are 151,300, 174,450 and 199,550, respectively (County of Maui, June 2006).

b. Potential Impacts and Mitigation Measures

The proposed project will not have an adverse impact upon population parameters.

2. Economy

a. Existing Conditions

The economy of Maui is heavily dependent upon the visitor industry. The dependency on the visitor industry is especially evident in West Maui, which is one of the State's major resort destination areas. The Ka`anapali Resort includes a number of hotels, including the Maui Marriott Resort (720 rooms), Hyatt Regency Maui (816 rooms), the Westin Maui (761 rooms), and the Sheraton Maui (510 rooms). In addition, the ongoing development of the North Beach Subdivision comprises over 1,600 visitor accommodation units to the north of the Ka`anapali Resort.

West Maui's visitor orientation is reflected in the character of Lahaina town, which serves as a center for visitor-related retail outlets, as well as visitor-related activities.

In terms of the agriculture industry, Pioneer Mill Company, Inc. ceased sugar cane cultivation on its lands in 1999. Of its 6,700 acres, approximately 500 acres are currently utilized for the growing of coffee. Other crops, such as seed corn, are being planned. Additionally, Maui Land and Pineapple Company's pineapple fields in the Honolua region are an important component of the region's agricultural base.

b. Potential Impacts and Mitigation Measures

The proposed project, in the short term, will provide tangible economic benefits to the West Maui region in the form of construction employment.

As previously stated, Honoapi`ilani Highway is the major road into the West Maui region from Central, South and East Maui. Honoapi`ilani Highway provides a link for residents and visitors to access employment centers, medical facilities, public services, cultural areas and events, and higher educational facilities throughout the island.

In the long term, the proposed action will allow for the reliable movement of goods, services, residents and visitors over a highway segment currently threatened by closure during storm or emergency events.

C. PUBLIC SERVICES

1. Solid Waste Disposal

a. Existing Conditions

Single-family residential solid waste collection service is provided by the County of Maui. Residential solid waste collected by County crews is disposed at the County's Central Maui Landfill, located four (4) miles southeast of the Kahului Airport. In addition to County-collected refuse, the Central Maui Landfill accepts commercial waste from private collection companies.

To facilitate solid waste collection services for the West Maui region, a refuse transfer station has been established at the former County Olowalu Landfill site, which is located to the north of the subject property.

b. Potential Impacts and Mitigation Measures

There is no significant quantity of solid waste anticipated to be generated by the proposed shoreline erosion mitigation project. The project will involve the import of boulders and rock fill to stabilize an approximately 900 feet segment of coastline along Honoapi`ilani Highway.

2. Medical Facilities

a. Existing Conditions

The only major medical facility on the island is Maui Memorial Medical Center, located approximately 16 miles from Olowalu, midway between Wailuku and Kahului. The 231-bed facility provides general, acute, and emergency care services.

Regular hours are offered by private medical practices in Lahaina, which include the Maui Medical Group, Lahaina Physicians, West Maui Healthcare Center, and Kaiser Permanente Lahaina Clinic.

b. Potential Impacts and Mitigation Measures

Medical services will not be adversely impacted by the proposed project. The project will not extend existing service area limits. The proposed action will allow for reliable access to the major medical facilities in Central Maui from West Maui.

3. Police and Fire Protection

a. Existing Conditions

The subject property is within the Lahaina Police Station service area, which services all of the Lahaina district. The Lahaina Station is located in the Lahaina Civic Center complex at Wahikuli, approximately 7.5 miles from the subject property.

Fire prevention, suppression, and protection services for the Lahaina District are provided by the Lahaina Fire Station, also located in the Lahaina Civic Center, and the Napili Fire Station, located in Napili. The Lahaina Fire Station includes an engine and a ladder company. The Napili Fire Station consists of an engine company.

b. Potential Impacts and Mitigation Measures

Police and fire protection services will not be adversely impacted by the proposed project. Emergency vehicles will have continuous access through

the project area during construction. The project will not extend existing service area limits for the Police Department and the Department of Fire and Public Safety.

4. Educational Facilities

a. Existing Conditions

The West Maui area is served by four (4) public schools operated by the State of Hawai`i, Department of Education: Lahainaluna High School, Lahaina Intermediate School, King Kamehameha III Elementary School, and Princess Nahi`ena`ena Elementary School. All of these public schools are located within the Lahaina town area.

b. Potential Impacts and Mitigation Measures

The subject project will not adversely affect educational services and facilities.

5. Recreational Facilities

a. Existing Conditions

West Maui is served by numerous recreational facilities offering diverse opportunities for the region's residents. There are seventeen (17) County parks and three (3) State beach parks in West Maui. Approximately one-third of the County parks are situated along the shoreline.

In addition, Ka`anapali and Kapalua Resorts operate world-class golf courses which are available for public use.

The governmental beach reserve, which runs south of the subject property, provides public access to the recreational opportunities (including swimming, surfing, fishing, snorkeling, and diving) available along the Olowalu shoreline.

b. Potential Impacts and Mitigation Measures

Informal, lateral access is possible along the project site. The placement of the boulder and rock fill is intended to stabilize the shoreline abutting the highway. The proposed rock fill will not impede lateral access, as traversing the shoreline over the boulder fill will still be possible. Given the limited scope and nature of the proposed action, adverse impacts to recreational opportunities are not anticipated.

D. INFRASTRUCTURE

1. Roadways

a. Existing Conditions

The only major roadway facility providing vehicular access to and from the Olowalu area is Honoapi`ilani Highway, a State-owned and maintained highway linking West Maui with the central valley of the island. This highway through Olowalu primarily serves as access for vehicles traveling to and from the Lahaina, Ka`anapali, and Kapalua resort areas. Access to the project site is provided via Honoapi`ilani Highway.

Honoapi`ilani Highway is federally recognized as part of the National Highway System. The highway provides access to a major port (Kahului Harbor), as well as an airport (Kahului Airport).

In the vicinity of the subject property, Honoapi`ilani Highway is a two-lane rural highway generally aligned in an east to west direction following the coastline. The highway has a posted speed limit of 45 miles per hour (mph) in the vicinity of the subject property. The highway has 12-foot-wide lanes with paved shoulders varying in widths from about six (6) to 10 feet.

b. Potential Impacts and Mitigation Measures

As the scope of the proposed project is limited to boulder rock fill as a shoreline protection measure, there are no significant long-term impacts expected to adversely affect traffic flow conditions along Honoapi`ilani Highway in the vicinity of the access road. Appropriate traffic control devices and plans to be used during construction will be identified prior to

commencement of work. During construction, traffic control will be implemented to ensure the safe passage of vehicles using the highway during construction hours. Such traffic control may include the use of flag persons and police officers to allow the maneuvering of materials carrying trucks in unloading rock material. Additionally, appropriate signage and placement of traffic cones will be utilized to inform the traveling public of construction conditions. While such conditions may delay traffic, the delay is not anticipated to cause adverse impacts to traffic operations along the highway. Construction duration is anticipated to be six (6) months, with work to be conducted so as not to adversely impact traffic flow.

2. Water, Wastewater, Electrical, Telephone, and CATV Considerations

a. Existing Conditions

The County of Maui, Department of Water Supply presently does not service the Olowalu area. Water supply for the limited number of residential and commercial uses (including the subject property) in the Olowalu area is provided by Olowalu Water Company, LLC (OWC). OWC is a public water system (ID# 209) and provides both potable and non-potable irrigation water for residents and agricultural users within the 700-acre region known as Olowalu. The OWC received a Certificate of Public Convenience and Necessity (CPCN) from the State of Hawai`i Public Utilities Commission to provide potable water service in August 2000. In November 2003, the OWC amended the CPCN to add the sale of irrigation water.

There are no County operated wastewater disposal facilities in the Olowalu area, including the subject property. Individual wastewater disposal needs in the Olowalu area are currently addressed either by cesspools, septic tanks, or individual wastewater treatment systems.

Electrical power and telephone service are provided to the Olowalu area by Maui Electric Company, Ltd. (MECO) and Hawaiian Telcom, respectively, via overhead lines along Honoapi`ilani Highway. MECO's 69 kilovolt overhead transmission lines from Central Maui to the Lahaina-Kapalua area extend along lands mauka of Honoapi`ilani Highway. Oceanic Time Warner does not currently provide cable service to the Olowalu area, including the subject property.

b. Potential Impacts and Mitigation Measures

Given its limited scope, the proposed action will not have a substantial impact on existing systems or result in any significant increase demand on infrastructure in the area.

The removal of existing utility poles along the project shoreline will be undertaken by Hawaiian Telcom. While the removal of the utility poles is a separate action from the placement of boulder fill in the same location, coordination between Hawaiian Telcom and the applicant will be carried out to ensure that existing and future utilities will not be affected by the proposed project. It is anticipated that the existing telephone lines will be relocated mauka of Honoapi`ilani Highway.

No impact to electrical, telephone, and cable TV systems is anticipated to result from the proposed project. Additionally, the project will not involve the use and installation of highway lighting during and after construction.

3. Drainage

a. Existing Conditions

Storm water runoff generated onsite flows off the roadway and to an existing headwall with a 24-inch drainline crossing beneath the roadway. The runoff eventually discharges into the ocean. Other than existing culverts which convey drainage beneath Honoapi`ilani Highway, the Olowalu area contains no other drainage improvements. Runoff generally sheet flows from the northeast to the southwest collecting in various swales and gullies. The Olowalu area, including the subject property, contains no engineered drainage systems.

b. Potential Impacts and Mitigation Measures

The existing storm water runoff flow patterns will not be altered by the proposed improvements. The existing 24-inch drainline crossing Honoapi`ilani Highway will be extended to accommodate the shoreline improvements and a new headwall will be installed at the outlet. The proposed improvements associated with the boulder fill is not anticipated to adversely affect any of the adjacent properties. See **Appendix "F"**.

A Best Management Practices program will be implemented both prior to and during construction to prevent drainage flows from entering the ocean.

4. Cumulative and Secondary Impacts

Cumulative impacts are defined as the impact on the environment which results from the incremental impact of an action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency or person undertakes such other actions. The proposed project is part of a larger action involving the relocation of Honoapi`ilani Highway further inland. The time frame for the relocation of the highway is on the order of approximately five (5) to ten (10) years. However, there are no direct community growth impacts resulting from or occurring with the project.

Secondary impacts are those which have the potential to occur later in time or father in distance, but are still reasonably foreseeable. They can be viewed as actions of others that are taken because of the presence of the project. Secondary impacts from highway projects, for example can occur because they can induce development by removing one of the impediments to growth-transportation access.

There are minimal traffic impacts associated with the project. In all, the proposed action is not anticipated to result in the substantive, adverse cumulative or secondary impacts.

IV. RELATIONSHIP TO GOVERNMENTAL PLANS, POLICIES, AND CONTROLS

IV. RELATIONSHIP TO GOVERNMENTAL PLANS, POLICIES, AND CONTROLS

A. STATE LAND USE DISTRICTS

Chapter 205, Hawai`i Revised Statutes, relating to the Land Use Commission, establishes four (4) major land use districts in which all lands in the State are placed. These districts are designated "Urban", "Rural", "Agricultural", and "Conservation". The subject property encompasses lands classified as "Conservation". See **Figure 12**.

Lands within the State Conservation District are under the jurisdiction of the Department of Land and Natural Resources. Title 13, Hawai`i Administrative Rules (HAR), establishes rules and procedures which regulate land use in the Conservation District. Title 13 also establishes subzones within the Conservation District. These subzones are designated "Protective" (P), "Limited" (L), "Resource" (R), "General" (G), and "Special" (S). The project is located on lands falling in the "Limited" subzone of the Conservation District.

B. CONSERVATION DISTRICT USE ANALYSIS

The subject project, which is an identified use within the "Limited" subzone of the Conservation District, requires a Conservation District Use Permit from the Board of Land and Natural Resources (BLNR). Accordingly, a Conservation District Use Application (CDUA) for the project will be prepared in accordance with HAR, Title 13.

Thus, with regard to the subject property's consistency with the purposes of the Conservation District, the following criteria are addressed below.

1. The proposed land use is consistent with the purpose of the Conservation District:

The proposed project is consistent with the purposes of the Conservation District. The subject property is not located near a watershed area and will not, therefore, impact watersheds or water sources. Coastal access, areas of shoreline recreational value, and scenic resources are expected to occur and resume upon project

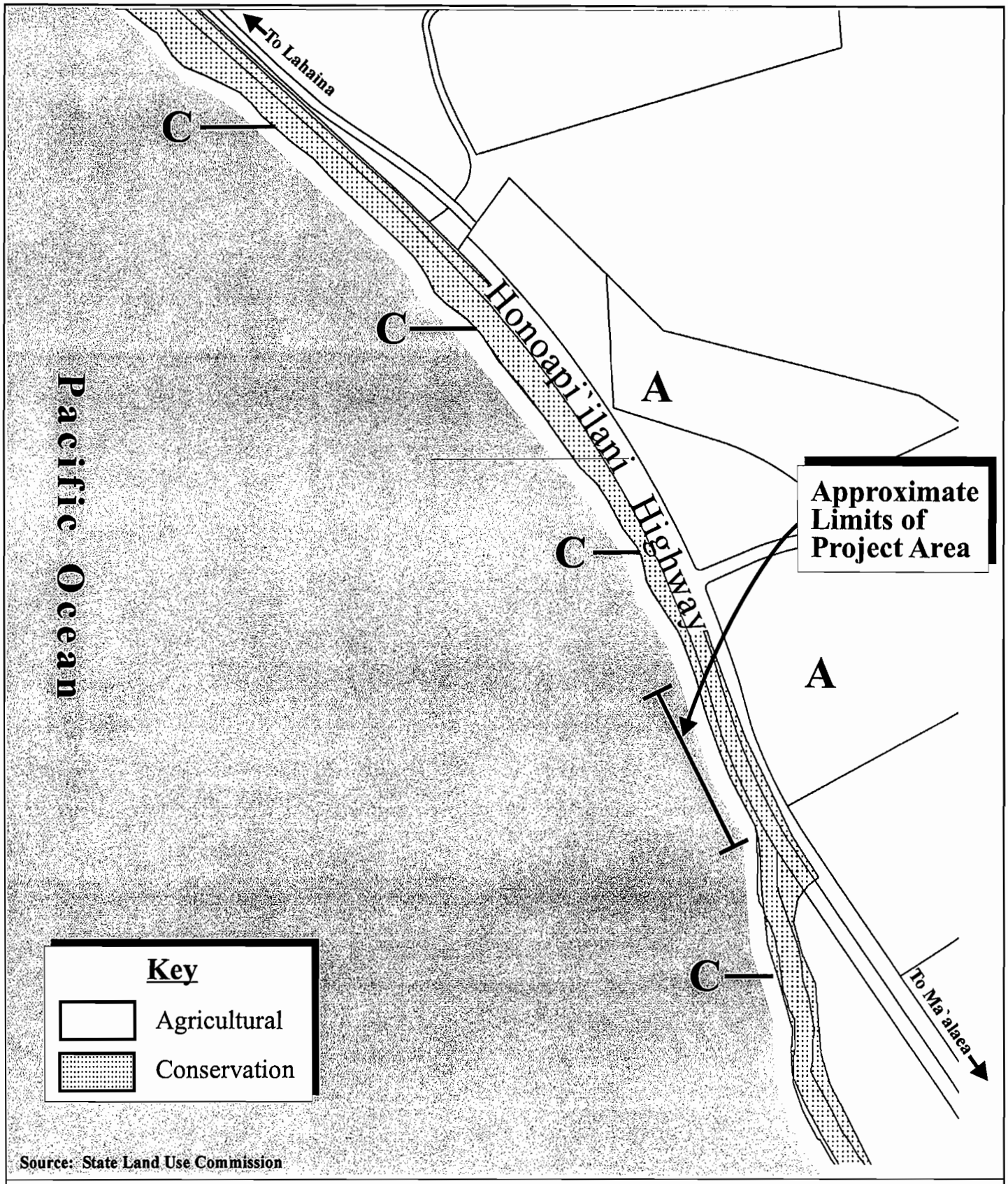


Figure 12 Proposed Honoapi`ilani Highway Shoreline Protection
State Land Use Designations

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completion. In addition, drainage and erosion control measures will be implemented to minimize impacts to adjacent and downstream properties and marine waters.

2. **The proposed land use is consistent with the objectives of the subzone of the land on which the use will occur:**

The proposed project is the placement of boulder fill as a shoreline protection measure within the "Limited" subzone of the Conservation District. Erosion control and other hazard prevention devices are permissible use within the "Limited" subzone of the Conservation District.

3. **The proposed land use complies with provisions and guidelines contained in Chapter 205A, HRS, entitled "Coastal Zone Management", where applicable:**

The subject project complies with provisions and guidelines in Chapter 205A, HRS. An application for a Special Management Area (SMA) assessment review for the subject project will be prepared and submitted to the County of Maui, Department of Planning for processing. Issuance of SMA approval for the project is anticipated to occur at least 45 days prior to the 180-day expiration deadline on the CDUA.

4. **The proposed land use will not cause substantial adverse impact to existing natural resources within the surrounding area:**

The proposed action is anticipated to result in the reduction of clay substrate deposits into the marine environment, thereby improving the quality of marine resources in the area. Best Management Practices relating to drainage and erosion control measures, will be implemented to ensure that potential adverse impacts to existing natural resources in the area are appropriately mitigated during construction. Consequently, the proposed action is not anticipated to cause substantial adverse impact to local natural resources within the surrounding area, community, or region.

5. **The proposed land use, including buildings, structures, and facilities shall be compatible with the locality and surrounding areas, appropriate to physical conditions and capabilities of the specific parcel or parcels:**

The proposed action is limited in scope and scale, affecting an approximately 900 feet segment of shoreline which now threatens the Honoapi`ilani Highway. The proposed action is deemed a viable alternative in protecting the shoreline and the highway from seasonal high surf until a mauka highway alignment can be

constructed. As a boulder and rock fill design, the proposal is considered compatible with the surrounding cobble and rocky shorelines.

6. **The existing physical and environmental aspects of the land, such as natural beauty and open space characteristics, will be preserved or improved upon, whichever is applicable:**

The proposed boulder fill will replace the cobble shoreline with a boulder slope and will be aesthetically compatible with the existing nature of the area. As a result, physical and environmental aspects of the land will be preserved.

7. **Subdivision of land will not be utilized to increase the intensity of land uses in the Conservation District:**

The subject project does not involve the subdivision of land nor does the applicant intend on subdividing the parcel in the future.

8. **The proposed land use will not be materially detrimental to public health, safety, and welfare:**

The proposed action is intended to maintain the functional integrity of the Honoapi`ilani Highway. No impacts to public health, safety, and welfare are anticipated to result from the proposed project. Best Management Practices will be utilized to ensure that potential impacts to neighboring properties are appropriately mitigated.

C. HAWAI`I STATE PLAN

Chapter 226, HRS, also known as the Hawai`i State Plan, is a long-range comprehensive plan which serves as a guide for the future long-term development of the State by identifying goals, objectives, policies, and priorities, as well as implementation mechanisms. As reflected by Section 226-13, HRS, the plan outlines objectives and policies for the physical environment, specifically land, air, and water quality.

More specifically, the State objectives include the maintenance and pursuit of improved quality in Hawaii's land, air, and water resources. To achieve this objective, it shall be the State's policy to:

Reduce the threat to life and property from erosion, flooding, tsunamis, hurricanes, earthquakes, volcanic eruptions, and other natural or man-induced hazards and disasters (Hawai`i State Plan, Section 226-13(b)(5)).

D. MAUI COUNTY GENERAL PLAN

The Maui County General Plan (1990 Update) sets forth broad objectives and policies to help guide the long-range development of the County. As stated in the Maui County Charter:

> *"The general plan shall indicate desired population and physical development patterns for each island and region within the county; shall address the unique problems and needs of each island and region; shall explain the opportunities and the social, economic, and environmental consequences related to potential developments; and shall set forth the desired sequence, patterns, and characteristics of future developments".*

The subject project is in keeping with the following General Plan objectives and policies:

Objective (Environment)

To preserve and protect the County's unique and fragile environmental resources.

Policies

- Preserve for present and future generations the opportunity to experience the natural beauty of the islands.
- Preserve scenic vistas and natural features.

Objective (Environment)

To use the County's land-based physical and ocean-related coastal resources in a manner consistent with sound environmental planning practice.

Policies

- Preserve, enhance, and establish traditional and new environmentally sensitive access opportunities for mountain and ocean resources.
- Evaluate all land based development relative to its impact on the County's land and ocean ecological resources.

Objective (Transportation)

To develop a program for anticipating and enlarging the local street and highway systems in a timely response to planned growth.

Policy

- Streamline maintenance methods for public highways to encourage a prompt response to road repair needs.

The DOT is pursuing the proposed project to mitigate erosion damage along a 900 feet portion of Honoapi`ilani Highway in Olowalu. The proposed shoreline mitigation measure is anticipated to be aesthetically compatible with the surrounding area and the shoreline characteristic of this region. Further, the use of appropriate Best Management Practices to reduce soil erosion, will also serve to curb other impacts to neighboring properties. The proposed project is in conformance with the Maui County General Plan.

E. WEST MAUI COMMUNITY PLAN

Within Maui County, there are nine (9) Community Plan regions. From a General Plan implementation standpoint, each region is governed by a Community Plan which sets forth desired land use patterns, as well as goals, objectives, policies, and implementing actions for a number of functional areas including infrastructure-related parameters. The subject property is located within the West Maui Community Plan region.

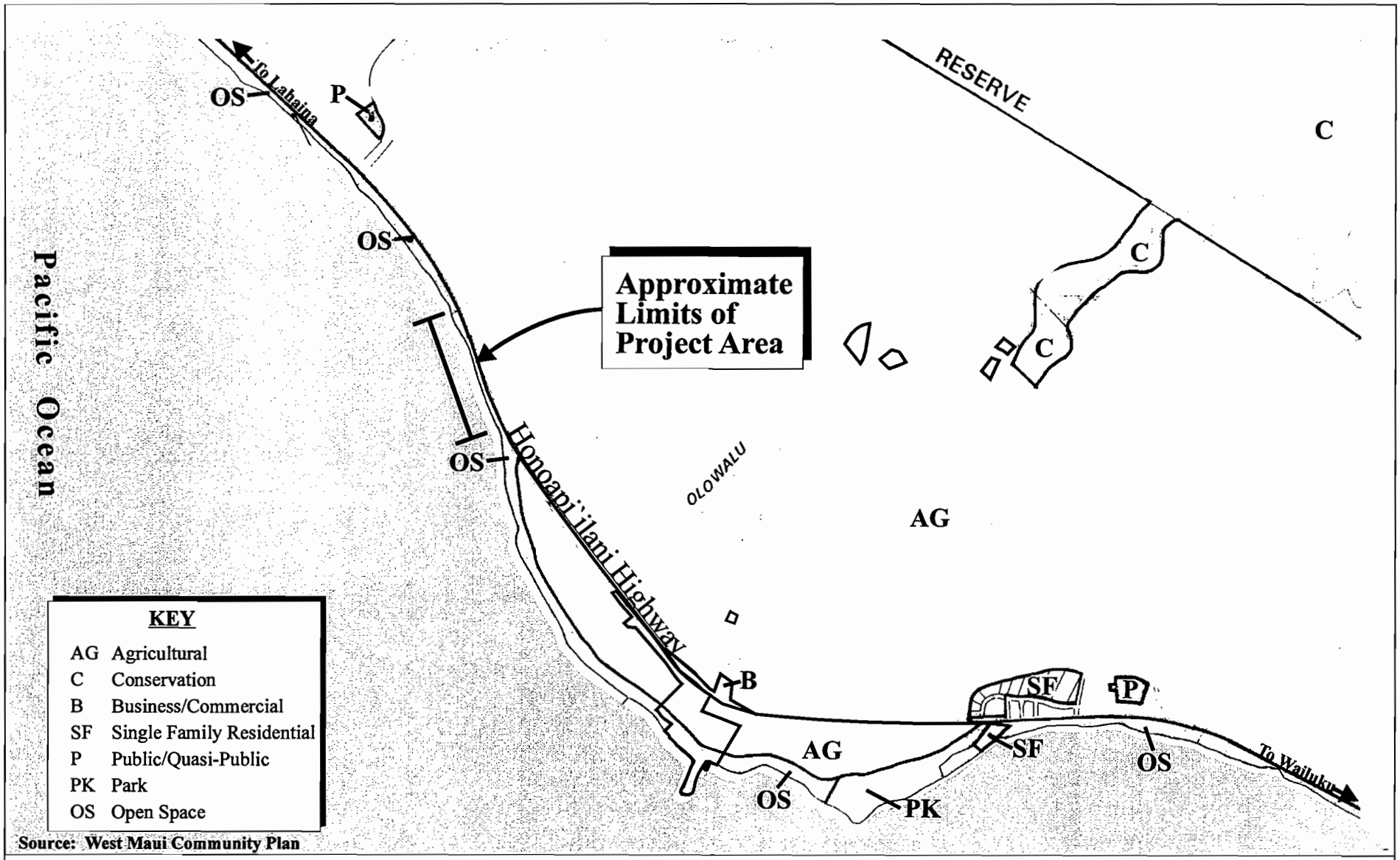
The subject property is located within the West Maui Community Plan region and is currently designated "Open Space". See **Figure 13**.

Applicable goals, objectives, and policies of the West Maui Community Plan with regard to the proposed project are cited below.

LAND USE

Goal

An attractive, well-planned community with a mixture of compatible land uses in appropriate areas to accommodate the future needs of residents and visitors in a manner that provides for



Source: West Maui Community Plan

Figure 13

Proposed Honoapi`ilani Highway Shoreline Protection

West Maui Community Plan Map

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the stable social and economic well-being of residents and the preservation and enhancement of the region's open space areas and natural environmental resources.

Objectives and Policies for the West Maui Region in General

- Protect and enhance the quality of the marine environment.

- Preserve and enhance the mountain and coastal scenic vistas and the open space areas of the region.

ENVIRONMENT

Goal

A clean and attractive physical, natural, and marine environment in which man-made developments on or alterations to the natural and marine environment are based on sound environmental and ecological practices, and important scenic and open space resources are preserved and protected for public use and enjoyment.

Objectives and Policies

- Protect all waters and wetland resources. Such resources provide open space and habitat for plant and animal life in the aquatic environment. They are also important for flood control and natural landscape.

- Protect the quality of nearshore and offshore waters. Monitor outfall systems, streams and drainage ways and maintain water quality standards. Continue to investigate, and implement appropriate measures to mitigate, excessive growth and proliferation of algae in nearshore and offshore waters.

- Encourage soil erosion prevention measures and the installation of siltation basins to minimize downstream sedimentation and degradation of nearshore and offshore water quality.

- Promote drainage and stormwater management practices that prevent flooding and protect coastal water quality.

- Prohibit the construction of vertical seawalls and revetments except as may be permitted by rules adopted by the Maui Planning Commission governing the issuance of Special Management Area (SMA) emergency permits, and encourage beach nourishment by building dunes and adding sand as a sustainable alternative.

INFRASTRUCTURE

Goal

Timely and environmentally sound planning, development, and maintenance of infrastructure systems which serve to protect and preserve the safety and health of the region's residents, commuters and visitors through the provision of clean water, effective waste disposal and efficient transportation systems which meet the needs of the community.

TRANSPORTATION

Objective and Policy

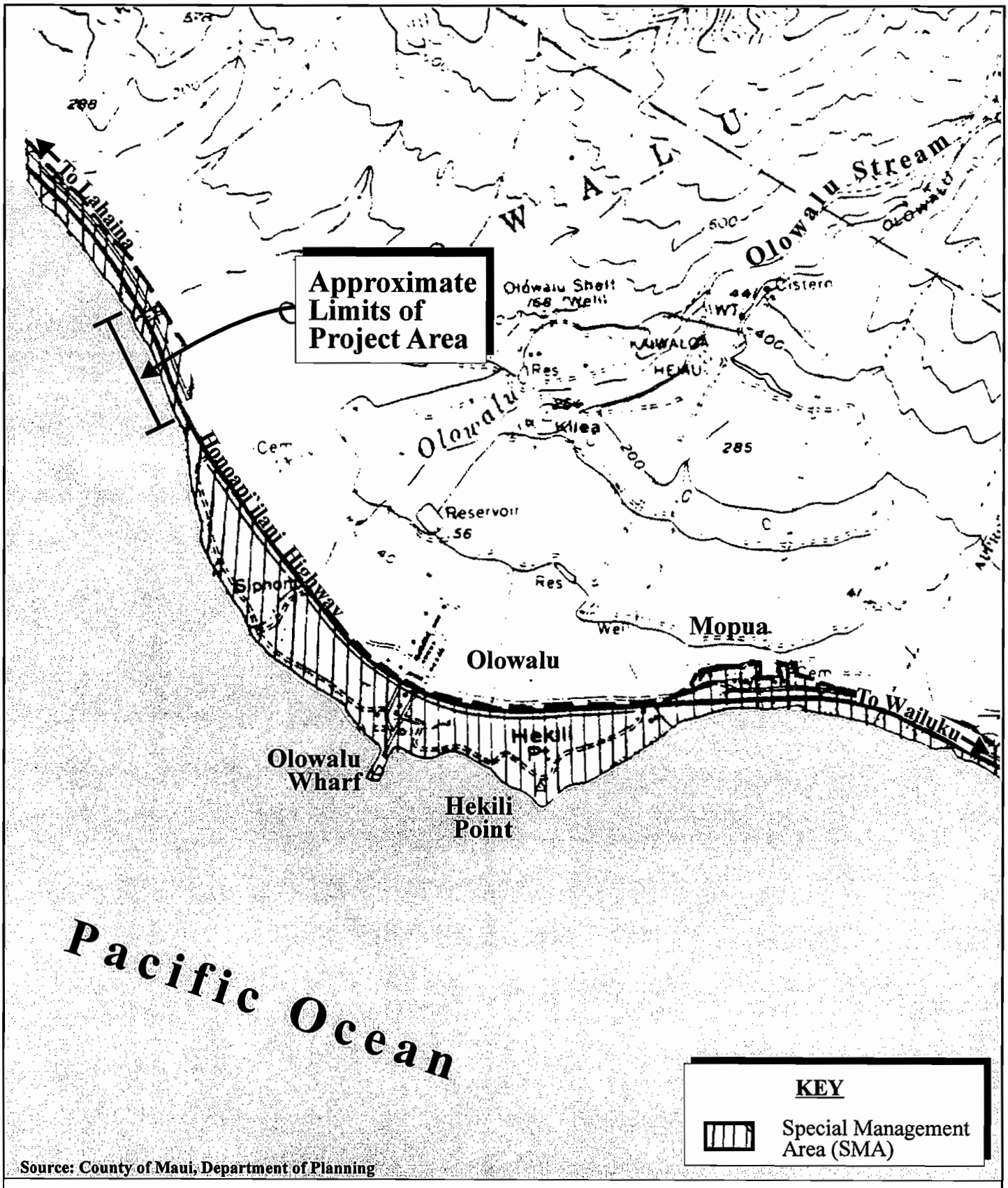
Support improvements for the safe and convenient movement of people and goods, pedestrians, and bicyclists in the Lahaina region, particularly along Honoapi`ilani Highway, Front Street, and Lower Honoapi`ilani Road and seek to establish a regional network of bikeways and pedestrian paths.

F. COUNTY ZONING

The project site involves a State right-of-way and adjoining shoreline areas. Honoapi`ilani Highway falls within the County's Agricultural zoning district. The adjacent shoreline falls within the State Conservation District. There is no County zoning designation on State Conservation lands.

G. SPECIAL MANAGEMENT AREA OBJECTIVES AND POLICIES

Pursuant to Chapter 205A, Hawai`i Revised Statutes, and the Rules and Regulations of the Planning Commission of the County of Maui, actions located within the SMA are evaluated with respect to SMA objectives, policies, and guidelines. As mentioned in Chapter I, the subject property is located within the County SMA. See **Figure 14**. As such, it is anticipated that the proposed action will require a SMA Use Permit and approval for work in the Shoreline Setback area. This section addresses the proposed project's relationship to



Source: County of Maui, Department of Planning

Figure 14 Proposed Honoapi`ilani Highway Shoreline Protection

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Special Management Area Boundary Map

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applicable coastal zone management considerations, as set forth in Chapter 205A and the Rules and Regulations of the Maui Planning Commission.

(1) Recreational Resources

Objective:

Provide coastal recreational opportunities accessible to the public.

Policies:

(A) Improve coordination and funding of coastal recreational planning and management; and

(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;

(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;

(iii) Providing and managing adequate public access, consistent with conservation of natural resources, to and along shorelines with recreational value;

(iv) Providing an adequate supply of shoreline parks and other recreational facilities suitable for public recreation;

(v) Ensuring public recreational use of county, state, and federally owned or controlled shoreline lands and waters having recreational value consistent with public safety standards and conservation of natural resources;

(vi) Adopting water quality standards and regulating point and non-point sources of pollution to protect, and where feasible, restore the recreational value of coastal waters;

(vii) Developing new shoreline recreational opportunities, where appropriate, such as artificial lagoons, artificial beaches, and artificial reefs for surfing and fishing; and

(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, county planning commissions; and crediting such dedication against the requirements of Section 46-6, HRS.

Response: As noted previously, lateral access is possible along the project site, though not recommended, given the uneven shoreline terrain and immediate proximity to the high-speed Honoapi`ilani Highway. The placement of the boulder and rock fill is intended to stabilize the shoreline abutting the highway. The proposed action will not impede lateral access, as traversing the shoreline over the boulder fill will still be possible. Given the limited scope and nature of the proposed action, adverse impacts to recreational opportunities are not anticipated.

(2) Historic Resources

Objective:

Protect, preserve, and where desirable, restore those natural and man-made historic and prehistoric resources in the coastal zone management area that are significant in Hawaiian and American history and culture.

Policies:

(A) Identify and analyze significant archaeological resources;

(B) Maximize information retention through preservation of remains and artifacts or salvage operations; and

(C) Support state goals for protection, restoration, interpretation, and display of historic resources.

Response: There are no evidences of archaeological features given the historic shoreline erosion patterns affecting the coastline. The proposed action involves minor grading to establish the proper ground setting for the boulder fill. However, this grading work will occur in areas already disturbed by coastal erosion or previous highway grading and construction. In accordance with Section 6E-43.6, HRS and Chapter 13-300, Hawai`i Administrative Rules, should any significant cultural

deposits or human skeletal remains be encountered during ground altering activities, work will stop in the immediate vicinity and the State Historic Preservation Division of the Department of Land and Natural Resources and Office of Hawaiian Affairs will be contacted.

(3) Scenic and Open Space Resources

Objective:

Protect, preserve, and where desirable, restore or improve the quality of coastal scenic and open space resources.

Policies:

(A) Identify valued scenic resources in the coastal zone management area;

(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;

(C) Preserve, maintain, and where desirable, improve and restore shoreline open space and scenic resources; and

(D) Encourage those developments which are not coastal dependent to locate in inland areas.

Response: The proposed action involving the placement of boulders along a rocky shoreline will not adversely impact scenic or open space resources.

(4) Coastal Ecosystems

Objective:

Protect valuable coastal ecosystems, including reefs, from disruption and minimize adverse impacts on all coastal ecosystems.

Policies:

(A) Improve the technical basis for natural resource management;

(B) Preserve valuable coastal ecosystems, including reefs, of significant biological or economic importance;

(C) 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

(D) Promote water quantity and quality planning and management practices which reflect the tolerance of fresh water and marine ecosystems and prohibit land and water uses which violate State water quality standards.

Response: The proposed action will require minor grading to set the boulder fill material. During grading operations, Best Management Practices will be employed to ensure that runoff which may occur during construction is prevented from entering the adjacent marine waters.

The proposed action is anticipated to reduce terrigenous or sediment inputs to the marine environment thus improving water quality.

(5) Economic Uses

Objective:

Provide public or private facilities and improvements important to the State's economy in suitable locations.

Policies:

(A) Concentrate coastal dependent development in appropriate areas;

(B) Ensure that coastal dependent development such as harbors and ports, and coastal related development such as visitor 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

(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:

(i) Use of presently designated locations is not feasible;

(ii) Adverse environmental effects are minimized; and

(iii) The development is important to the State's economy.

Response: The subject project will provide beneficial impacts to the local economy through the provision of construction employment. The proposed action will allow for the reliable movement of goods and services over a highway segment currently threatened by closure during storm events. In this regard, the proposal is viewed as holding economic benefit for Maui island residents and visitors.

(6) Coastal Hazards

Objective:

Reduce hazard to life and property from tsunami, storm waves, stream flooding, erosion, subsidence, and pollution.

Policies:

(A) Develop and communicate adequate information about storm wave, tsunami, flood, erosion, subsidence, and point and nonpoint source pollution hazards;

(B) Control development in areas subject to storm wave, tsunami, flood, erosion, hurricane, wind, subsidence, and point and nonpoint pollution hazards;

(C) Ensure that developments comply with requirements of the Federal Flood Insurance Program;

(D) Prevent coastal flooding from inland projects; and

(E) Develop a coastal point and nonpoint source pollution control program.

Response: The proposed action is designed to reduce hazards to life and property. As a coastal erosion mitigation measure, the proposal will ensure that Honoapi`ilani Highway will continue to serve as a safe and functional arterial connecting West Maui with Central Maui and regions beyond.

(7) Managing Development

Objective:

Improve the development review process, communication, and public participation in the management of coastal resources and hazards.

Policies:

(A) Use, implement, and enforce existing law effectively to the maximum extent possible in managing present and future coastal zone development;

(B) Facilitate timely processing of applications for development permits and resolve overlapping of conflicting permit requirements; and

(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.

Response: All aspects of the subject project will be conducted in accordance with applicable State and County requirements. Opportunity for review of the subject project is offered through the HRS, Chapter 343 Environmental Assessment (EA) review process, the SMA and SSV permitting process, and the Conservation District Use Permit process.

(8) Public Participation

Objective:

Stimulate public awareness, education, and participation in coastal management.

Policies:

(A) Maintain a public advisory body to identify coastal management problems and to provide policy advice and assistance to the coastal zone management program;

(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-related issues, developments, and government activities; and

(C) Organize workshops, policy dialogues, and site-specific mediations to respond to coastal issues and conflicts.

Response: As noted above, opportunities for public awareness, education, and participation in coastal management are provided through the EA, SMA, SSV and Conservation District Use Permit review and approval processes.

(9) Beach Protection

Objective:

Protect beaches for public use and recreation.

Policies:

(A) Locate new structures inland from the shoreline setback to conserve open space and to minimize loss of improvements due to erosion;

(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

(C) Minimize the construction of public erosion-protection structures seaward of the shoreline.

Response: The proposed action is a public shoreline erosion-protection project designed to ensure the continued functional integrity of Honoapi`ilani Highway. The project will not affect shoreline access, nor will it affect a beach having park service utility (e.g., picnicking and landside recreational functions). The erosion process at this locale has progressed to a point where the highway substructure is being threatened and protection measures are needed to maintain this critical infrastructure component.

(10) Marine Resources

Objective:

Implement the State's ocean resources management plan.

Policies:

(A) Exercise an overall conservation ethic, and practice stewardship in the protection, use, and development of marine and coastal resources;

(B) Assure that the use and development of marine and coastal resources are ecologically and environmentally sound and economically beneficial;

(C) Coordinate the management of marine and coastal resources and activities management to improve effectiveness and efficiency;

(D) 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;

(E) 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

(F) Encourage research and development of new, innovative technologies for exploring, using, or protecting marine and coastal resources.

Response: As noted previously, the proposed action will involve minor grading to set the boulder fill. Once in place, there are no adverse impacts to the marine environment anticipated. Boulder and rock fill material will be specified for cleanliness to ensure that wave action does not result in washing of dirt, mud or debris into the marine waters. No impacts to marine resources along the Olowalu coastline are, therefore, anticipated to result from the subject project. Best Management Practices will be carried out to ensure that construction materials and related fluids do not enter into the adjacent marine waters.

In addition to the foregoing objectives and policies, SMA permit review criteria pursuant to Hawai`i Revised Statutes §205A-30.5 provides that:

"no special management area use permit or special management area minor permit shall be granted for structures that allow artificial light from floodlights, uplights, or spotlights used for decorative or aesthetic purposes when the light:

(1) Directly illuminates the shoreline and ocean waters; or

(2) Is directed to travel across property boundaries toward the shoreline and ocean waters."

There is no lighting proposed in connection with the proposed action. Accordingly, the proposal is in concert with policies for light impact mitigation.

H. SHORELINE SETBACK CONSIDERATIONS

The following improvements are proposed within the shoreline setback:

1. Placement of large boulders to stabilize the shoreline slope.

2. Minor grading to prepare an even surface for the placement of the large boulders.

3. Placement of smaller rocks and geotextile fabric to prevent leaching of the backfill through the voids between the large boulders.

4. Placement of jersey barriers to mitigate damage to the highway from wave overtopping.

5. Minor filling to provide sufficient shoulder width between the jersey barriers and the travel lane.

These improvements are detailed in **Appendix "A"**.

Application and approval criteria required for a Shoreline Setback Variance (SSV) are set forth in the "Shoreline Rules for the Maui Planning Commission", Chapter 203, Sections 14 and 15. The proposed actions within the shoreline setback have been analyzed with respect to these criteria, as discussed below.

1. **A shoreline area variance may be granted for a structure or activity, if the commission finds that the proposed structure or activity is necessary for or ancillary to certain uses.**

   Response: The placement of the boulder fill along the shoreline to protect the functional integrity of the highway is deemed to be in the public interest. The proposed boulder fill and related improvements will stabilize shoreline conditions to ensure the continued functional integrity of Honoapi`ilani Highway. The proposed ungrouted boulder fill as a mitigation measure is essential for maintaining public health and safety.

2. A structure or activity may be granted a variance upon grounds of hardship if:

a. The applicant would be deprived of reasonable use of land if required to fully comply with the shoreline setback rules.

Response: The proposed action within the shoreline setback is needed to enable the functional operations of the existing Honoapi`ilani Highway. The boulder fill will provide protection to the shoreline and highway from seasonal high surf and the infrequent waves from passing hurricanes. The boulders are anticipated to absorb wave energy and halt adverse effects on water quality on the erosion of the shore. Given the existing critical infrastructure system being impacted and shoreline condition within the shoreline setback, the applicant would be deprived of reasonable use of the land if these actions could not be implemented.

b. The applicant's proposal is due to unique circumstances and does not draw into question the reasonableness of the shoreline setback rules.

Response: The existing conditions of the property pose a unique circumstance which warrants the need for the proposed action. The provision of the boulder fill is intended to maintain the functional viability of this portion of Honoapi`ilani Highway. The use of boulder fill will also ensure that the visual and scenic integrity of the shoreline setback area is maintained. In summary, the unique circumstances affecting the subject property do not draw into question the reasonableness of the shoreline setback rules.

c. The proposal is the practical alternative which best conforms to the purpose of the shoreline setback rules.

Response: Given the unique circumstances affecting the shoreline, the proposed actions represent a practical alternative which best conforms to the purpose of the shoreline setback rules. In particular, the proposed work will stabilize shoreline conditions to enable continued functional operations of Honoapi`ilani Highway; the proposed actions ensure the continued enjoyment of the shoreline area for the public; the proposed actions will maintain the quality of scenic and open space resources fronting the subject property; and adequate public lateral access will continue to be maintained.

3. **Before granting a hardship variance, the commission must determine that the applicant's proposal is a reasonable use of the land.**

Response: The proposed actions are designed to stabilize conditions along the shoreline, through the provision of a boulder slope. The actions do not intensify the use of the shoreline with respect to the current conditions, nor do they pose a risk to individuals or to the public health and safety. The proposed actions are essential elements in allowing Honoapi`ilani Highway to be functionally viable, while maintaining a context of reasonableness, as prescribed by the shoreline rules.

4. **For purposes of the shoreline rules, hardship shall not include economic hardship to the applicant; county zoning changes, planned development permits, cluster permits or subdivision approvals after June 16, 1989; any other permit or approval which may have been issued by the commission.**

Response: The proposed actions are not being sought as relief to economic hardship to the applicant. The actions are intended to stabilize conditions along the shoreline while ensuring the continued functional integrity of Honoapi`ilani Highway.

5. **No variance shall be granted unless appropriate conditions are imposed.**

Response: The proposed actions comply with conditions relating to the provision of safe lateral access; minimization of risk to beach processes; minimization of risk relating to structural failure and loose rock and rubble; and minimization of impacts on public views to, from, and along the shoreline.

In summary, the proposed actions within the shoreline setback are considered necessary for the viable operation of Honoapi`ilani Highway and the protection of the adjacent shoreline. The actions are in keeping with the purpose and criteria set forth in the shoreline rules.

I. DEPARTMENT OF THE ARMY PERMIT AND RELATED REGULATORY APPROVALS

Activities necessitating requirements for Department of Army (DA) permitting and Section 401 Water Quality Certification are anticipated. A portion of the proposed action falls within the regulatory jurisdiction of the United States Department of Army. The commencement of the proposed action will require a DA Permit. Application of a DA permit will also trigger a Section 401 Water Quality Certification from the State Department of Health and a Coastal Zone Management Consistency Assessment from the Office of Planning, State

Department of Business, Economic Development, and Tourism. Coordination with respective departmental staff will be carried out to prepare and process the applications, as applicable.

The Clean Water Act was enacted to restore and maintain the chemical, physical, and biological integrity of the Nation's water. Section 404 of the Clean Water Act regulates the discharge of dredge and fill materials into the waters of the United States and establishes a permit process to ensure that such actions comply with environmental criteria used by the Corps of Engineers in evaluating all Section 404 permit applications.

The Section 404(b)(1) Guidelines direct the Corps of Engineers to permit the least damaging practicable alternative. Generally, this is the practicable alternative that either avoids waters of the United States or impacts the smallest areas. Minimization of impacts may occur where avoidance is not practical after due consideration of costs, existing technology, or logistics.

The alternatives evaluated to meet the stated project purpose and needs included an assessment of a "no action" alternative, and four (4) development alternatives. See Chapter II. The boulder fill option was deemed to be the "least environmentally damaging practicable alternative".

The proposed boulder fill within the shoreline will trigger the Department of Army permitting requirements as a result of the placement of fill within the navigable waters of the United States pursuant to Section 404 of the Clean Water Act. Therefore, coordination will be undertaken with the staff of the Corps of Engineers to prepare and process a Section 404 permit application. The Section 404 permit application will conform to the Section 404(b)(1) Guidelines.

Early coordination with Federal and State agencies, in this regard, namely The Department of Army and State Department of Health, will be carried out pursuant to the Memorandum of Understanding, National Environmental Policy Act and the Clean Water Act, Section 404, Integration Process for Surface Transportation Projects in the State of Hawai`i pertaining to waters of the United States and sensitive species. The objective of the coordination is to seek concurrence from the agencies on the site and project alternatives and evaluation and selection of the least environmentally damaging practical alternative during preparation of the EA document.

J. NATIONAL ENVIRONMENTAL POLICY ACT COORDINATION

Compliance with the National Environmental Policy Act (NEPA) is required because the Federal Highway Administration (FHWA) is a participant in the proposed action. FHWA will use the DEA and comments received during the public review period as decision tools to determine the appropriate format for NEPA compliance. To implement the procedural requirements of NEPA, consultation will be undertaken with the U.S. Fish and Wildlife Service and the National Marine Fisheries Service, pursuant to Section 7 of the Endangered Species Act and with the State Historic Preservation Officer, pursuant to Section 106 of the National Historic Preservation Act. Coordination with other federal agencies will be initiated as necessary.

K. DEPARTMENT OF TRANSPORTATION ACT, SECTION 4F

Section 4(f) of the Department of Transportation Act (DOT Act) of 1966 stipulates that the Federal Highway Administration (FHWA) and other DOT agencies cannot approve the use of land from publicly owned parks, recreational areas, wildlife and waterfowl refuges, or public and private historical sites unless the following conditions apply:

- There are no feasible and prudent alternatives to the use of land, and
- The action includes all possible planning to minimize harm to the property resulting from use.

This policy prohibits federal aid projects of the U.S. Department of Transportation from using, traversing, taking right-of-way from or even adversely affecting lands or properties afforded protection under Section 4(f) unless under special circumstances.

Properties that are afforded protection under Section 4(f) are often called Section 4(f) or 4(f) resources. The following criteria are addressed below.

Park or Recreational Area. The park or recreational area or facility must be publicly owned (e.g., owned by a government agency) and open to the public. The question of openness to the public is to be determined by the official(s) having jurisdiction over the property (i.e., designates function as a park or recreational area). If a fee is charged to use the property (e.g., public golf course), the fee must be reasonable or nominal.

Response: Lands affected by the proposed action include the Honoapi`ilani Highway right-of-way and a portion of a government beach reserve. The project area provides public access to recreational opportunities (including swimming, surfing, fishing, snorkeling, and diving) available along the Olowalu shoreline. The proposed project is intended to stabilize the shoreline abutting the highway.

Historic sites. To be considered a 4(f) resource, the site must be listed on or eligible for the National Register of Historic Places.

Response: The project area is not listed on the National Register of Historic Places, nor is it considered eligible for the register.

Site within a historic district. The site must either be individually historic or an integral or contributing factor that makes the overall district historic.

Response: The project area is not considered a historic site.

Archaeological site. To be considered a 4(f) resource, the archaeological site must be on or eligible for the National Register and important for preservation in place.

Response: No archaeological features identified at the project site were considered important for preservation in place.

School playground. The playground must have substantial walk-on recreational activities unrelated to the school or school activities.

Response: The project site is an existing shoreline and is not in close proximity to a school playground.

Bikeway. The primary function of the bikeway must be for recreation, not transportation.

Response: The primary function of the project area is not a bikeway.

In summary, the proposed action will not affect Section 4(f) resources. As such, the proposed action will not adversely affect the activities, features, and attributes of park or recreation areas, wildlife or waterfowl refuge areas, or historic sites eligible for protection under Section 4(f).

L. ENVIRONMENTAL JUSTICE EXECUTIVE ORDER 12898

Executive Order 12898, dated February 11, 1994, requires federal agencies, and requests other independent agencies, to address the potential for disproportionately high and adverse environmental effects of their action on minority and low-income populations. Agencies are required to ensure that their programs and activities that affect human health or the environment do not directly use criteria, methods, or practices that discriminate on the basis of race, color, or national origin.

The process used by the DOT in their environmental documentation does not discriminate against low-income or minority populations in Hawai`i. The proposed action does not discriminate against these populations directly or inadvertently. This EA document assesses the human health, economic, social, and environmental effects of the various alternatives.

The proposed action will benefit the County residents who rely on the use of Honoapi`ilani Highway to commute from West Maui to other parts of the island to access employment, government and health services, cultural opportunities, and educational opportunities.

Given the confined scope and nature of the proposed action, there are no adverse impacts to minority and low-income populations.

V. SUMMARY OF ADVERSE ENVIRONMENTAL EFFECTS WHICH CANNOT BE AVOIDED

V. SUMMARY OF ADVERSE ENVIRONMENTAL EFFECTS WHICH CANNOT BE AVOIDED

The proposed project will result in unavoidable construction-related impacts which include noise-generated impacts occurring from the proposed improvements. There may be temporary air quality impacts associated with dust generated from site work and exhaust emissions discharged by construction equipment. These impacts will be mitigated by erosion control measures and best management practices designed to minimize dust and erosion. Construction of the proposed project will be carried out in compliance with State Department of Health Community Noise Control standards. During construction, traffic control will be implemented to ensure the safe passage of vehicles using the highway during construction hours. Such traffic control may include the use of flag persons and police officers to allow the maneuvering of materials carrying trucks in unloading rock material. Additionally, appropriate signage and placement of traffic cones will be utilized to inform the traveling public of construction conditions. While such conditions may delay traffic, the delay is not anticipated to cause adverse impacts to traffic operations along the highway.

The subject project is not anticipated to create any significant, long-term adverse environmental impacts.

VI. IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

VI. IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

Major resource commitments include the land on which the proposed action will occur, as well as fuel, labor, funding, and material resources. Impacts relating to the use of these resources should be weighed against the expected positive socio-economic benefits to be derived from the project versus the consequences of taking no action.

The proposed project is not anticipated to require commitment of government services or facilities. In general, the proposed action is not anticipated to place significant additional requirements upon public services and infrastructure. There are no other significant irreversible commitment of resources associated with the proposed project.

VII. SIGNIFICANCE CRITERIA ASSESSMENT

VII. SIGNIFICANCE CRITERIA ASSESSMENT

The "Significance Criteria", Section 12 of the Administrative Rules, Title 11, Chapter 200, "Environmental Impact Statement Rules", were reviewed and analyzed to determine whether the proposed project has significant impacts on the environment. The following criteria and analysis are provided:

1. **Involves an irrevocable commitment to loss or destruction of any natural or cultural resource.**

   The proposed project does not result in any adverse environmental impacts. There are no known rare, endangered, or threatened species of flora or fauna located within the subject property. There are no known wetlands located within the subject property. Archaeological and cultural resources are not anticipated to be affected by the proposed action. In accordance with Section 6E-43.6, HRS and Chapter 13-300, Hawai`i Administrative Rules, if any significant cultural deposits or human skeletal remains are encountered, work will stop in the immediate vicinity and the State Historic Preservation Division of the Department of Land and Natural Resources and Office of Hawaiian Affairs will be contacted. Archaeological monitoring during ground-altering activity is proposed.

2. **Curtails the range of beneficial uses of the environment.**

   The use of the subject property for the proposed shoreline protection measure will not curtail the range of beneficial uses of the environment.

3. **Conflicts with the state's long-term environmental policies or goals and guidelines as expressed in Chapter 344, HRS, and any revisions thereof and amendments thereto, court decisions, or executive orders.**

   The State's Environmental Policy and Guidelines are set forth in Chapter 344, HRS and were reviewed in connection with the proposed project. The proposed project is in consonance with the guidelines.

4. **Substantially affects the economic welfare, social welfare, and cultural practices of the community or State.**

The proposed action is viewed as a needed and beneficial project to ensure the continued functional operations of Honoapi`ilani Highway in Olowalu. The successful completion of the project will preserve the economic and social welfare of island residents and businesses which rely on infrastructure reliability.

5. **Substantially affects public health.**

No adverse impacts to the public's health and welfare are anticipated to result from the proposed project. As noted previously, the proposed action is essential to the public health and safety.

6. **Involves substantial secondary impacts, such as population changes or effects on public facilities.**

The proposed project, which involves the placement of boulder fill along an eroding shoreline, will not affect the island's population base.

The proposed project will not adversely impact public services such as police, fire, and medical services. Impacts upon educational, recreational, and solid waste parameters are also not expected to result from the improvements to the shoreline.

7. **Involves a substantial degradation of environmental quality.**

During the construction phase of the project, there will be short-term air quality and noise impacts generated. No long-term degradation of environmental quality is anticipated from the proposed project.

8. **Is individually limited but cumulatively has considerable effect upon the environment or involves a commitment for larger actions.**

The proposed project, limited in scope to a shoreline protection measure, does not represent a commitment to larger actions. There are no cumulative impacts associated with the subject project which would result in considerable effects on the environment.

9. **Substantially affects a rare, threatened, or endangered species, or its habitat.**

There are no known significant habitats or rare, endangered, or threatened species of flora and fauna that will be adversely affected by the proposed project.

10. **Detrimentally affects air or water quality or ambient noise levels.**

Construction activities for the proposed project will result in short-term air quality and ambient noise impacts. These impacts, however, are not considered significant in the context of the project's scale, scope and locale.

In the long-term, the proposed project is not anticipated to have a significant impact on air, noise, and water quality.

11. **Affects or is likely to suffer damage by being located in an environmentally sensitive area such as a flood plain, tsunami zone, beach, erosion-prone area, geologically hazardous land, estuary, fresh water, or coastal waters**.

The subject property is located within Flood Zone "V12". Zone "V12" is designated as areas of 100 year coastal flood, with velocity (wave action); base flood elevation, and flood hazard factors determined. The subject property is also located within a tsunami evacuation zone.

The proposed action involves a shoreline protection measure designed to ensure the continued operational integrity of the Honoapi`ilani Highway. The proposed action does not involve habitable uses, nor will it encourage such uses. In this regard, there are no anticipated adverse impacts to flooding or tsunami conditions created by the project.

12. **Substantially affects scenic vistas and viewplanes identified in county or state plans or studies.**

The subject property is an existing strip of coastal land. Views of the Pacific Ocean from the highway are currently available. The proposed shoreline protection measure is not anticipated to adversely affect scenic vistas and viewplanes.

13. **Requires substantial energy consumption.**

The proposed project will involve a limited commitment of fuel for construction equipment, vehicles, and machinery during construction activities. This consumption, however, is not considered detrimental in the context of the benefits accrued by the action.

Based on the foregoing findings, it is anticipated that the assessment of the subject project will result in the issuance of a Finding of No Significant Impact (FONSI).

VIII. LIST OF PERMITS AND APPROVALS

VIII. LIST OF PERMITS AND APPROVALS

The following Federal, State and County permits and approvals will be required for the subject project.

Federal

1. Department of the Army Permit

State of Hawai`i

1. Conservation District Use Permit (CDUP)
2. Section 401 Water Quality Certification
3. Coastal Zone Management Consistency Review
4. National Pollutant Discharge Elimination System (NPDES)

County of Maui

1. Special Management Area (SMA) Use Permit
2. Shoreline Setback Variance
3. Applicable Grading and Construction Permits

IX. AGENCIES/ ORGANIZATIONS CONSULTED DURING THE PREPARATION OF THE DRAFT ENVIRONMENTAL ASSESSMENT, COMMENTS RECEIVED, AND RESPONSES TO SUBSTANTIVE COMMENTS

IX. AGENCIES/ORGANIZATIONS CONSULTED DURING THE PREPARATION OF THE DRAFT ENVIRONMENTAL ASSESSMENT, COMMENTS RECEIVED, AND RESPONSES TO SUBSTANTIVE COMMENTS

The following agencies were contacted prior to or during the preparation of the Draft Environmental Assessment. Comments received from these agencies, as well as responses to substantive comments, are included in this chapter.

1. Larry Yamamoto, State Conservationist
U.S. Department of Agriculture
Natural Resources Conservation Service
P.O. Box 50004
Honolulu, Hawai`i 96850-0001

2. Ranae Ganske-Cerizo, Soil Conservationist
Natural Resources Conservation Service
U.S. Department of Agriculture
210 Imi Kala Street, Suite 209
Wailuku, Hawai`i 96793-2100

3. George Young
Chief, Regulatory Branch
U.S. Department of the Army
U.S. Army Engineer District, Honolulu
Regulatory Branch
Building 230
Fort Shafter, Hawai`i 96858-5440

4. Patrick Leonard
Field Supervisor
U. S. Fish and Wildlife Service
300 Ala Moana Blvd., Rm. 3-122
Box 50088
Honolulu, Hawai`i 96813

5. Russ K. Saito, State Comptroller
Department of Accounting and General Services
1151 Punchbowl Street, #426
Honolulu, Hawai`i 96813

6. Sandra Lee Kunimoto, Chair
Department of Agriculture
1428 South King Street
Honolulu, Hawai`i 96814-2512

7. Theodore E. Liu, Director
State of Hawai`i
Department of Business, Economic Development & Tourism
P.O. Box 2359
Honolulu, Hawai`i 96804

8. Patricia Hamamoto, Superintendent
State of Hawai`i
Department of Education
P.O. Box 2360
Honolulu, Hawai`i 96804

9. Ron Okumura
Complex Area Superintendent
(Lanai/Molokai/Hana/Lahaina)
Department of Education
54 High Street, 4th Floor
Wailuku, Hawai`i 96793

10. Micah Kane, Chairman
Department of Hawaiian Home Lands
P. O. Box 1879
Honolulu, Hawai`i 96805

11. Chiyome Fukino, M.D., Director
State of Hawai`i
Department of Health
919 Ala Moana Blvd., Room 300
Honolulu, Hawai`i 96814

12. Alec Wong, P.E., Acting Chief
Clean Water Branch
State of Hawai`i
Department of Health
919 Ala Moana Blvd., Room 300
Honolulu, Hawai`i 96814

13. Herbert Matsubayashi
District Environmental Health
Program Chief
State of Hawai`i
Department of Health
54 High Street
Wailuku, Hawai`i 96793

14. Laura Thielen, Chairperson
State of Hawai`i
Department of Land and Natural Resources
1151 Punchbowl Street
Honolulu, Hawai`i 96813

15. Dr. Puaalaokalani Aiu, Administrator
State of Hawai`i
Department of Land and Natural Resources
State Historic Preservation Division
601 Kamokila Blvd., Room 555
Kapolei, Hawai`i 96707

16. Brennon Morioka, Interim Director
State of Hawai`i
Department of Transportation
869 Punchbowl Street
Honolulu, Hawai`i 96813
cc: Fred Cajigal

17. Katherine Kealoha
Office Of Environmental Quality Control
235 S. Beretania Street, Suite 702
Honolulu, Hawai`i 96813

18. Clyde Namu`o, Administrator
Office of Hawaiian Affairs
711 Kapiolani Boulevard, Suite 500
Honolulu, Hawai`i 96813

19. Abbey Seth Mayer, Director
State of Hawai`i
Office of Planning
P.O. Box 2359
Honolulu, Hawai`i 96804

20. Jeffrey A. Murray, Chief
County of Maui
Department of Fire and Public Safety
200 Dairy Road
Kahului, Hawai`i 96732

21. Vanessa A. Medeiros, Director
County of Maui
Department of Housing and Human Concerns
200 South High Street
Wailuku, Hawai`i 96793

22. Tamara Horcajo, Director
County of Maui
Department of Parks and Recreation
700 Halia Nakoa Street, Unit 2
Wailuku, Hawai`i 96793

23. Jeffrey Hunt, Director
County of Maui
Department of Planning
250 South High Street
Wailuku, Hawai`i 96793

24. Thomas Phillips, Chief
County of Maui
Police Department
55 Mahalani Street
Wailuku, Hawai`i 96793

25. Milton Arakawa, Director
County of Maui
Department of Public Works
200 South High Street
Wailuku, Hawai`i 96793

26. Cheryl Okuma
County of Maui
Department of Environmental Management
2200 Main Street, Suite 176
Wailuku, Hawai`i 96793

27. Donald Medeiros, Director
County of Maui
Department of Transportation
200 South High Street
Wailuku, Hawai`i 96793

28. Jeffrey Eng, Director
County of Maui
Department of Water Supply
200 South High Street
Wailuku, Hawai`i 96793

29. Sheri Tihada
Hawaiian Telcom
60 South Church Street
Wailuku, Hawai`i 96793

30. Greg Kauhi, Manager, Customer Operations
Maui Electric Company, Ltd.
P.O. Box 398
Kahului, Hawai`i 96733

31. Theo Morrison, Executive Director
Lahaina Bypass Now
505 Front Street, Suite 202
Lahaina, Hawai`i 96761

32. Keoki Freeland, Executive Director
Lahaina Restoration Foundation
120 Dickenson Street
Lahaina, Hawai`i 96761

33. Karee Karlucci, Executive Director
Lahaina Town Action Committee
648 Wharf Street, Suite 102
Lahaina, Hawai`i 96761

34. Joe Pluta, President
West Maui Improvement Foundation
P. O. Box 10338
Lahaina, Hawai`i 96761

35. Zeke Kalua, Executive Director
West Maui Taxpayers Association
P.O. Box 10338
Lahaina, Hawai`i 96761

JUN 17 2008

LINDA LINGLE
GOVERNOR

RUSS K. SAITO
COMPTROLLER

BARBARA A. ANNIS
DEPUTY COMPTROLLER

(P)1152.8

STATE OF HAWAII
DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES
P.O. BOX 119, HONOLULU, HAWAII 96810

JUN 16 2008

Ms. Rowena Dagdag, Planner
Munekiyo & Hiraga, Inc.
305 High Street, Suite 104
Wailuku, Hawaii 96793

Dear Ms. Dagdag:

Subject: Early Consultation Request for
Proposed Honoapi'ilani Highway Shoreline Protection at
Olowalu, Maui
TMK (2)4-8-003:118(por.)

Thank you for the opportunity to provide early consultation comments on the proposed Honoapi'ilani Highway Shoreline Protection at Olowalu, Maui.

This proposed project does not impact any of the Department of Accounting and General Services' projects or existing facilities, and we have no comments to offer.

If you have any questions, please call me at 586-0400 or have your staff call Mr. Clarence Kubo of the Public Works Division at 586-0488.

Sincerely,

RUSS K. SAITO
State Comptroller

JUN 2 5 2008

LINDA LINGLE
GOVERNOR
STATE OF HAWAII

MICAH A. KANE
CHAIRMAN
HAWAIIAN HOMES COMMISSION

KAULANA H. PARK
DEPUTY TO THE CHAIRMAN

ROBERT J. HALL
EXECUTIVE ASSISTANT

STATE OF HAWAII
DEPARTMENT OF HAWAIIAN HOME LANDS
P.O. BOX 1879
HONOLULU, HAWAII 96805

June 23, 2008

Ms. Rowena Dagdag
Planner
Munekiyo & Hiraga, Inc.
305 High Street, Suite 104
Wailuku, Hawaii 96793

Dear Ms. Dagdag:

Subject: Proposed Honoapi`ilani Highway Interim Shoreline Protection at Olowalu, Maui

This letter is to inform you that the Department of Hawaiian Home Lands (DHHL) has received your letter and the accompanying attachments of June 3, 2008, regarding the State of Hawaii, Department of Transportation's (DOT's) proposed interim shoreline protection plan at Olowalu, Maui.

After a careful review of your preliminary plan by our Land Management and Land Development Divisions, the department has no comments on the proposal at this time.

DHHL appreciates being given the opportunity to comment on the proposed action.

Aloha and mahalo,

Micah A. Kane, Chairman
Hawaiian Homes Commission

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JUN 2 3 2008

LINDA LINGLE
GOVERNOR OF HAWAII

CHIYOME L. FUKINO, M.D.
DIRECTOR OF HEALTH

STATE OF HAWAII
DEPARTMENT OF HEALTH
P.O. BOX 3378
HONOLULU, HAWAII 96801-3378

In reply, please refer to
EMD / CWB

06046PDCL.08

June 19, 2008

Ms. Rowena Dagdag
Planner
Munekiyo & Hiraga, Inc.
305 High Street, Suite 104
Wailuku, Hawaii 96793

Dear Ms. Dagdag:

Subject: Early Consultation Comments on the Proposed Honoapi`ilani Highway Interim Shoreline Protection at Olowalu, Maui, Hawaii

The Department of Health (DOH), Clean Water Branch (CWB), acknowledges receipt of your letter, dated June 3, 2008, submitting a project description and a request for early consultation comments for the preparation of an Environmental Assessment. The CWB has reviewed the project description and offers these comments on your project. Please note that our review is based solely on the limited information provided in the subject document 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://www.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. Antidegradation 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).

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2. You may be 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 excavation, grading, clearing, demolition, uprooting of vegetation, equipment staging, and storage areas 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. An NPDES permit is required before the start of the construction activities.

   b. Discharges associated with construction activity dewatering. This NOI does not cover return flow or overflow from dredged material dewatering process that is regulated by the U.S. Army Corps of Engineers (COE) under Section 404 of the Clean Water Act.

   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 must be submitted 30 calendar days before to the start of construction activities. The NOI forms may be picked up at our office or downloaded from our website at http://www.hawaii.gov/health/environmental/water/cleanwater/forms/genl-index.html.

3. For types of wastewater not listed in Item No. 2 above or wastewater discharging into Class 1 or Class AA waters, you must obtain an NPDES individual permit. 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://www.hawaii.gov/health/environmental/water/cleanwater/forms/indiv-index.html.

4. You must also submit a copy of the NOI or NPDES permit application to the State Department of Land and Natural Resources, State Historic Preservation Division (SHPD), or demonstrate to the satisfaction of the CWB that SHPD has or is in the process of evaluating your project. Please submit a copy of your request for review by SHPD or SHPD's determination letter for the project along with your NOI or NPDES permit application, as applicable.

5. Please consult with the Honolulu Engineer District of the COE with respect to the Department of Army permitting requirements.

   Pursuant to Federal Water Pollution Control Act [commonly known as the "Clean Water Act" (CWA)], Paragraph 401(a)(1), a Section 401 Water Quality Certification (WQC) is required for "[a]ny applicant for Federal license or permit to conduct any activity including, but not limited to, the construction or operation of facilities, which may **result** in any discharge into the navigable waters..." (emphasis added). The term "discharge" is defined in CWA, Subsections 502(16), 502(12), and 502(6); Title 40, Code of Federal Regulations, Section 122.2; and HAR, Chapter 11-54.

6. Clarify what are the existing uses at the proposed project site. Also, clarify the impact the proposed project may have on existing uses and water quality.

7. Please provide the post construction physical and chemical impacts updrift and downdrift of the project site.

8. Clarify what will be done with the existing debris on the project site shoreline.

9. Clarify where the boulders, stones, and fill material will be obtained and how they will be cleaned. Washing construction material and equipment/vehicles in the ocean or other State waters is prohibited.

10. Clarify how the 2.3 to 3.8 ton boulders were sized. Are these boulders adequate?

11. Clarify if this project involves any dredging and dredged material dewatering.

12. Please provide upland and in-water Best Management Practices (BMPs). The upland BMPs shall prevent sediment and debris from all upland construction activities from entering the ocean and other State waters. The in-water BMPs shall properly **isolate and confine** the proposed in-water discharge activity. Appropriate BMPs shall also be utilized if construction equipment/vehicles will be operated in water.

13. Please provide an applicable water quality monitoring plan with Data Quality Objectives and Quality Assurance Project Plan.

14. The project title is "Proposed Honoapi'ilani Highway **Interim** Shoreline Protection." Please clarify what is meant by "Interim."

15. The project TMK parcel provided in the Subject Line of your June 3, 2008 letter does not match the TMK parcel provided in the first sentence of your June 3, 2008 letter. Please clarify.

16. The last paragraph of your June 3, 2008 letter states: "On behalf of the applicant, we are seeking early consultation comments on the proposed action in accordance with the requirements of the Hawaii Administrative Rules, Title 11, Chapter 22." Please note that the CWB administers HAR, Chapters 11-54 and 11-55. It is recommended that the DOH, Sanitation Branch [Tel: (808) 586-8000] be contacted regarding HAR, Chapter 11-22 (Mortuaries, Cemeteries, Embalmers, Undertakers and Mortuary Authorities) requirements.

17. Please note that all discharges related to the project construction or operation activities, whether or not NPDES permit coverage and/or Section 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://www.hawaii.gov/health/environmental/water/cleanwater/index.html, or contact the Engineering Section, CWB, at (808) 586-4309.

Sincerely,

Joanna M Seto

for ALEC WONG, P.E., CHIEF
Clean Water Branch

DCL:np

MUNEKIYO & HIRAGA, INC.

MICHAEL T. MUNEKIYO
GWEN OHASHI HIRAGA
MITSURU "MICH" HIRANO
KARLYNN FUKUDA

MARK ALEXANDER ROY

March 19, 2009

Alec Wong, P.E., Chief
State of Hawai`i
Clean Water Branch
Department of Health
P.O. Box 3378
Honolulu, Hawai`i 96801

SUBJECT: Proposed Honoapi`ilani Highway Shoreline Protection at Olowalu, Maui, Hawai`i (TMK (2)4-8-003:006(por.))

Dear Mr. Wong:

Thank you for your letter dated June 19, 2008, regarding the proposed Honoapi`ilani Highway Shoreline Protection at Olowalu, Maui, Hawai`i.

The applicant's civil engineer will review the branch's standard comments and will incorporate applicable recommendations into the construction plans. With regards to the specific comments provided by you, please see our responses below.

1. The applicant's civil engineer will evaluate potential impacts to State waters to determine whether or not specific sections of Hawai`i Administrative Rules (HAR), Chapter 11-54 are applicable. All discharges related to project construction or operation activities will comply with relevant State Water Quality Standards. Discharges will be kept at a minimum through the application of engineering Best Management Practices (BMPs).

2. The applicant's civil engineer will coordinate with the Clean Water Branch to address applicable National Pollutant Discharge Elimination System (NPDES) permit requirements for the project, including the possible submittal of a Notice of Intent (NOI) for general permit coverage.

3. The applicant's civil engineer will coordinate with the Clean Water Branch to address applicable NPDES permit requirements for wastewater discharge into Class I or Class AA waters.

4. The NOI will be submitted for review by the State Historic Preservation Division of the Department of Land and Natural Resources. The applicant will submit a copy of its request for review by SHPD or SHPD's determination letter for the project along with the NOI or NPDES permit application, as applicable.

5. Coordination will be undertaken with the Army Corps of Engineers regarding the preparation of a Department of Army Permit and a Section 401 Water Quality Certification for the proposed action.

6. The project area is along a cobble shoreline and is primarily used for recreational purposes by fishermen and surfers. The project area was once an established roadway right-of-way. Coastal erosion and wave action have impacted the area, resulting in the relocation of the roadway inland. A summary of the impacts on existing uses and water quality within the project area will be provided in the Draft Environmental Assessment(Draft EA).

7. A Biological and Water Quality Assessment has been prepared and will be included in the Draft EA. The report identifies sensitive biological resources present in and around the project area that may be adversely impacted by the project. A discussion on impacts to the biological resources in the project area will be included in the Draft EA.

8. Cleanup will be done. The existing debris will be removed and disposed of at proper disposal site.

9. A description of the location of origin of the boulders, stones, and fill material that will be used for the proposed project will be provided in the Draft EA. BMPs will also be implemented to reduce impacts relating to construction activities. The applicant confirms that proper handling of construction equipment will be undertaken to ensure that impacts to water quality are minimized.

10. A coastal engineering assessment was prepared to assess potential alternatives used to mitigate wave overtopping and shoreline erosion. According to the coastal engineering assessment, it is estimated that the breaking wave height at the shoreline during a hurricane wave attack is approximately seven (7) feet. The required boulder size to absorb wave attacks at this magnitude is approximately 2.3 to 3.8 tons. A copy of the coastal engineering assessment will be provided in the Draft EA.

11. The proposed project will involve minimal dredging and dreged material dewatering. A description of the proposed action is provided in the Draft EA.

12. As previously mentioned, BMPs will be prepared and implemented to reduce impacts to construction activities. A copy of your letter will be provided to the project engineer for consideration of upland and in-water BMPs.

13. The applicant confirms that an applicable water quality monitoring plan with Data Quality Objectives and a Quality Assurance Project Plan will be provided.

14. The State Department of Transportation has identified the proposed action as part of an overall long-term plan in relocating Honoapi`ilani Highway further inland to mitigate the hazards from storm waves and shoreline erosion. In this instance, the proposed project is an interim solution while planning and construction of the relocated Honoapi`ilani Highway are undertaken.

15. We acknowledge the discrepancy in the citing of the correct TMK number in the Subject Line of our letter dated June 3, 2008. The correct TMK is (2)4-8-003:006 (por.) and will be used on final documents.

16. Your comment relating to the Clean Water Branch administration of HAR, Chapter 11-54 and 11-55 is noted. The proposed action will be coordinated in accordance with the requirements of the HAR, Title 11, Chapter 54 and 55.

17. All discharges related to project construction or operation activities will comply with the applicable State Water Quality Standards as specified in HAR, Chapter 11-54 and/or permitting requirements as specified in HAR, Chapter 11-55. Discharges will be kept to a minimum through the application of engineering BMPs.

We appreciate the input we received from you. A copy of the Draft EA will be provided for your review and comment.

Should you have any questions, please do not hesitate to contact me at (808) 244-2015.

Very Truly Yours,

Rowena Dagdag Andaya, Planner

RD:lh
cc: Brennon Morioka, State of Hawai`i, Department of Transportation
Karen Chun, State of Hawaii, Department of Transportation
Ferdinand Cajigal, State of Hawai`i, Department of Transportation
Richard Sato, Sato & Associates, Inc.
Elaine Tamaye, EKNA, Inc.
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JUN 3 0 2008

LINDA LINGLE
GOVERNOR OF HAWAII

CHIYOME L. FUKINO, M.D.
DIRECTOR OF HEALTH

LORRIN W. PANG, M. D., M.P.H.
DISTRICT HEALTH OFFICER

STATE OF HAWAII
DEPARTMENT OF HEALTH
MAUI DISTRICT HEALTH OFFICE
54 HIGH STREET
WAILUKU, MAUI, HAWAII 96793-2102

June 27, 2008

Ms. Rowena Dagdag
Munekiyo & Hiraga, Inc.
305 High Street, Suite104
Wailuku, Hawai`i 96793

Dear Ms. Dagdag:

Subject: **Proposed Honoapi`ilani Highway Interim Shoreline Protection at Olowalu, Maui**
TMK: (2) 4-8-003: 118 (por.)

Thank you for the opportunity to participate in the early consultation process for the proposed Honoapi`ilani Highway Interim Shoreline Protection project, we have no comments to offer at this time.

It is strongly recommended that the Standard Comments found at the Department's website: http://hawaii.gov/health/environmental/env-planning/landuse/landuse.html be reviewed, and any comments specifically applicable to this project should be adhered to.

Should you have any questions, please call me at 808 984-8230.

Sincerely,

Herbert S. Matsubayashi
District Environmental Health Program Chief

c: EPO

10

MUNEKIYO & HIRAGA, INC.

MICHAEL T. MUNEKIYO
GWEN OHASHI HIRAGA
MITSURU "MICH" HIRANO
KARLYNN FUKUDA

MARK ALEXANDER ROY

March 19, 2009

Patti Kitkowski
Acting District Environmental Health Program Chief
State of Hawai`i
Department of Health
Maui District Office
54 South High Street
Wailuku, Hawai`i 96793

SUBJECT: Proposed Honoapi`ilani Highway Shoreline Protection at Olowalu, Maui, Hawai`i (TMK (2)4-8-003:006(por.))

Dear Ms. Kitkowski:

Thank you for the letter from your office dated June 27, 2008 responding to our request for early consultation comments for the proposed Honoapi`ilani Highway Shoreline Protection at Olowalu, Maui.

As requested, standard comments to the State Department of Health will be reviewed and comments specifically applicable to this project will be adhered to. In this regard, we note that coordination with the State of Hawai`i Environmental Planning Office will be carried out to ensure that policy regulations are carefully adhered to. As such, a Coastal Zone Management Consistency Application will be prepared for the proposed project.

We also note that the Department of Army has been provided with the opportunity to review the proposed action. Coordination with the Army Corps of Engineers will be carried out regarding the preparation of a Department Army Permit and Section 401 Water Quality Certification.

As required by the Clean Air Branch, Best Management Practices (BMPS) will be carried out to control fugitive dust during construction activities.

Thank you again for your comments. A copy of the Draft Environmental Assessment will be provided to your office for review and comment. Should you have any questions, please do not hesitate to contact me at 244-2015.

Very Truly Yours,

Rowena Dagdag Andaya, Planner

RD:lh
cc: Brennon Morioka, State of Hawai`i, Department of Transportation
Karen Chun, State of Hawai`i, Department of Transportation
Ferdinand Cajigal, State of Hawai`i, Department of Transportation
Richard Sato, Sato & Associates, Inc.
Elaine Tamaye, EKNA, Inc.
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LINDA LINGLE
GOVERNOR OF HAWAII

JUN 2 7 2008
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

June 26, 2008

Munekiyo & Hiraga, Inc.
305 High Street, Suite 104
Wailuku, HI 96793

Attention: Ms. Rowena Dagdag

Dear Ms. Dagdag:

SUBJECT: Proposed Honoapi'ilani Highway Interim Shoreline Protection at Olowalu, Island of Maui; TMK: (2) 4-8-003:118 (por.)

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 the Division of Boating & Ocean Recreation on the subject matter. Should you have any questions, please feel free to call Darlene Nakamura at 587-0417. Thank you.

Sincerely,

Darlene E. Nakamura

Morris M. Atta
Administrator

Enclosures

13-

MUNEKIYO & HIRAGA, INC.

MICHAEL T. MUNEKIYO
GWEN OHASHI HIRAGA
MITSURU "MICH" HIRANO
KARLYNN FUKUDA

MARK ALEXANDER ROY

March 19, 2009

Samuel J. Lemmo
Office of Conservation and Coastal Lands
State of Hawai`i
Department of Land and Natural Resources
P.O. Box 621
Honolulu, Hawai`i 96809

SUBJECT: Proposed Honoapi`ilani Highway Shoreline Protection at Olowalu, Maui, Hawai`i (TMK (2)4-8-003:006(por.))

Dear Mr. Lemmo:

Thank you for your letter of June 26, 2008 responding to our request for early consultation comments for the proposed Honoapi`ilani Highway Interim Shoreline Protection at Olowalu, Maui. We would like to provide the following information in response to your comments.

We acknowledge that an After the Fact Emergency Conditional Use Permit (CDUP) was approved by the Board of Land and Natural Resources for proposed emergency shoreline erosion and control measures along a portion of Honoapi`ilani Highway on October 24, 2003. A portion of the project site was also affected by the shoreline action covered in the CDUP. A copy of your letter has been forwarded to the State of Hawai`i Department of Transportation (DOT) for review and comment. Coordination with the DOT will be carried out to ensure that a status update to the CDUP MA-3138 will be provided to your office.

The DOT has identified this project as part of an overall long-term plan in relocating Honoapi`ilani Highway further inland to mitigate the hazards from storm waves and shoreline erosion. A discussion on proposed alternatives for shoreline protection, including the relocation of the highway will be provided in the Draft EA. The proposed project is deemed necessary in the meantime for maintaining the functional integrity of the existing highway and to ensure public safety.

Thank you again for your comments. A copy of the Draft Environmental Assessment will be provided to your office for review and comment. Should you have any questions, please do not hesitate to contact me at (808)244-2015.

Very Truly Yours,

Rowena Dagdag Andaya, Planner

RD:lh
cc: Brennon Morioka, State of Hawai`i, Department of Transportation
Karen Chun, State of Hawai`i, Department of Transportation
Ferdinand Cajigal, State of Hawai`i, Department of Transportation
Richard Sato, Sato & Associates, Inc.
Elaine Tamaye, EKNA, Inc.
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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

July 11, 2008

Munekiyo & Hiraga, Inc.
305 High Street Suite 104
Wailuku, Hawaii 96793

Attention: Ms. Rowena Dagdag

Gentlemen:

Subject: Proposed Honoapi'ilani Highway Interim Shoreline Protection at Olowalu, Maui, Tax Map Key: (2) 4-8-3:portion 118

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 Land Division-Maui District for their review and comment.

The Department of Land and Natural Resources has no other comments to offer on the subject matter. Should you have any questions, please feel free to call our office at 587-0433. Thank you.

Sincerely,

Morris M. Atta
Administrator

16

LINDA LINGLE
GOVERNOR OF HAWAII

LAURA H. THIELEN
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

MAUI DISTRICT
LAND DIVISION

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STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

June 9, 2008

MEMORANDUM

RECEIVED
LAND DIVISION
2008 JUL -8 A 11:41
DEPT. OF LAND & NATURAL RESOURCES
STATE OF HAWAII

TO: **DLNR Agencies:**
___Div. of Aquatic Resources
x Div. of Boating & Ocean Recreation
x Engineering Division
___Div. of Forestry & Wildlife
___Div. of State Parks
___Commission on Water Resource Management
x Office of Conservation & Coastal Lands
x Land Division – Maui District

FROM: Morris M. Atta, Administrator
SUBJECT: Proposed Honoapi'ilani Highway Interim Shoreline Protection
LOCATION: Olowalu, Island of Maui; TMK: (2) 4-8-003:118(por.)
APPLICANT: Munekiyo & Haraga, Inc.

Transmitted for your review and comment on the above referenced document. We would appreciate your comments on this document. Please submit any comments by June 25, 2008.

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: 7/3/08

cc: Central Files

MDLO has been encouraging Maui Electric / Hawaiian Telcom to relocate their poles + lines away from the shoreline We support the project + are willing + able to issue ROE

17

MUNEKIYO & HIRAGA, INC.

MICHAEL T. MUNEKIYO
GWEN OHASHI HIRAGA
MITSURU "MICH" HIRANO
KARLYNN FUKUDA

MARK ALEXANDER ROY

March 19, 2009

Laura H. Thielen, Chairperson
State of Hawai`i
Department of Land and Natural Resources
Land Division
P.O. Box 621
Honolulu, Hawai`i 96809

SUBJECT: Proposed Honoapi`ilani Highway Shoreline Protection at Olowalu, Maui, Hawai`i (TMK (2)4-8-003:006(por.))

Dear Ms. Thielen:

Thank you for your letter of July 11, 2008 responding to our request for early consultation comments for the proposed Honoapi`ilani Highway Shoreline Protection at Olowalu, Maui. We would like to provide the following information in response to your comments.

Hawaiian Telcom has secured an approval to construct new telephone poles and lines on the mauka side of Honoapiilani Highway. Hawaiian Telcom is also currently undertaking efforts to remove the existing telephone poles and have submitted regulatory applications for permits in this regard. A copy of your letter will be forwarded to Hawaiian Telcom and Maui Electric for their information and consideration.

Thank you again for your comments. A copy of the Draft Environmental Assessment will be provided to your office for review and comment. Should you have any further questions, please do not hesitate to contact me at (808)244-2015.

Very Truly Yours,

Rowena Dagdag Andaya, Planner

RD:lh
cc: Brennon Morioka, State of Hawai`i, Department of Transportation
Karen Chun, State of Hawai`i, Department of Transportation
Ferdinand Cajigal, State of Hawai`i, Department of Transportation
Richard Sato, Sato & Associates, Inc.
Calvin Choy, Hawaiian Telcom
Greg Kauhi, Maui Electric
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LINDA LINGLE
GOVERNOR

JUN 1 7 2008

BRENNON T MORIOKA
DIRECTOR

Deputy Directors
MICHAEL D FORMBY
FRANCIS PAUL KEENO
BRIAN H SEKIGUCHI

IN REPLY REFER TO:

STP 8.2905

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
869 PUNCHBOWL STREET
HONOLULU, HAWAII 96813-5097

June 12, 2008

Ms. Rowena Dagdag
Munekiyo & Hiraga, Inc.
305 High Street, Suite 104
Wailuku, Hawaii 96793

Dear Ms. Dagdag:

Subject: Honoapiilani Highway Interim Shoreline Protection at Olowalu, Maui
Early Consultation

The subject interim shoreline protection project is being undertaken by the Highways Division, Department of Transportation (DOT), State of Hawaii.

DOT is in full support of the project.

DOT appreciates the opportunity to provide comments.

Very truly yours,

Francis Paul Keeno

for BRENNON T. MORIOKA, PH.D., P.E.
Director of Transportation

AUG 1 5 2008

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

HRD08/3380B

August 13, 2008

Rowena Dagdag
Munekiyo & Hiraga, Inc.
305 High Street, Suite 104
Wailuku, Hawai'i 96793

RE: Request for preliminary comments on the proposed Honoapi'ilani Highway interim shoreline protection, Olowalu, Maui, TMK: 4-8-003: 118.

Aloha e Rowena Dagdag,

The Office of Hawaiian Affairs (OHA) is in receipt of the above-mentioned letter dated June 3, 2008. OHA has reviewed the project and offers the following comments.

OHA notes that this is a request for preliminary comments and as such we will reserve our detailed comments and speak generally. We see that this is an interim proposal, which is good. It is good because this proposal is by no means a permanent solution to a growing concern in this state.

Sea level rise and associated shoreline erosion is no longer a question, but a reality that we must face. In actuality, the only questions regarding this issue realistically seem to be how bad will the effects be and how can we best prepare for them.

Building a rock wall along a segmented stretch of coastline that is currently eroding (OHA notes that the highway has past been relocated mauka) in its entirety is not a solution. Certainly, hardening the shoreline in one area will have effects on the natural shoreline processes on either side of this proposal. Additionally, proposing to build a wall that has "the potential for overtopping during storm wave events" in contemporary conditions makes this proposal even less attractive in terms of a response to this worsening situation.

Therefore, and because this is introduced as an interim proposal, OHA asks what is the plan for this general area after the interim. Responses to this type of problem exist that go well beyond this typical response, and Hawai'i's future requires that applicants seek them out and propose them in an environmental review so that comments can guide these types of projects and make them the best that they can be. OHA looks forward to reviewing the mentioned conservation district use permit application, Department of the Army permit reviews, as well as the forthcoming environmental assessment (particularly the alternatives analysis section).

Thank you for the opportunity to comment. If you have further questions, please contact Grant Arnold 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: Maui CRC

MUNEKIYO & HIRAGA, INC.

MICHAEL T. MUNEKIYO
GWEN OHASHI HIRAGA
MITSURU "MICH" HIRANO
KARLYNN FUKUDA

MARK ALEXANDER ROY

March 19, 2009

Clyde Namu`o
State of Hawai`i
Office of Hawaiian Affairs
711 Kapi`olani Boulevard, Suite 500
Honolulu, Hawai`i 96813

SUBJECT: Proposed Honoapi`ilani Highway Shoreline Protection at Olowalu, Maui, Hawai`i (TMK (2)4-8-003:118 (por.))

Dear Mr. Namu`o:

Thank you for your letter of August 13, 2008 responding to our request for early consultation comments for the proposed Honoapi`ilani Highway Interim Shoreline Protection at Olowalu, Maui. We would like to provide the following information in response to your comments.

1. The applicant acknowledges your comments regarding the proposed action as an interim solution to mitigate the hazards of storm waves and shoreline erosion for Honoapi`ilani Highway. The proposed action is part of an overall long-term plan in relocating Honoapi`ilani Highway further inland to mitigate the hazards from storm waves and shoreline erosion. The proposed project is a viable alternative while planning for the relocation of the highway and construction are undertaken.

2. The State Department of Transportation (State DOT) prepared and reviewed alternatives to ensure that all operational and performance standards of the highway can be addressed and to address current conditions due to sea level rise and shoreline erosion. Several alternatives were discounted due to cost and functional considerations. As such, the preferred alternative of a boulder fill is considered necessary for the viable operation of Honoapi`ilani Highway and the protection of the adjacent shoreline. An analysis of the alternatives will be provided in the Draft Environmental Assessment.

3. Long term plans for the area include the relocation of Honoapi`ilani Highway further inland to address the issue of undermining and collapse of the existing highway. The time frame for the relocation of the highway is on the order of 5-10 years; therefore, immediate action is necessary to keep the highway open. As such, the State DOT is pursuing the boulder fill as an interim solution to protect the shoreline.

Thank you again for your comments. A copy of the Draft Environmental Assessment will be provided to your office for review and comment. Should you have any questions, please do not hesitate to contact me at (808)244-2015.

Very Truly Yours,

Rowena Dagdag Andaya, Planner

RD:lh
cc: Brennon Morioka, State of Hawai`i, Department of Transportation
Ferdinand Cajigal, State of Hawai`i, Department of Transportation
Karen Chun, State of Hawai`i, Department of Transportation
Richard Sato, Sato & Associates, Inc.
Elaine Tamaye, EKNA, Inc.
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JUN 17 2008

CHARMAINE TAVARES
MAYOR

JEFFREY A. MURRAY
CHIEF

ROBERT M. SHIMADA
DEPUTY CHIEF

COUNTY OF MAUI
DEPARTMENT OF FIRE AND PUBLIC SAFETY
FIRE PREVENTION BUREAU

780 ALUA STREET
WAILUKU, HAWAII 96793
(808) 244-9161
FAX (808) 244-1363

June 12, 2008

Munekiyo & Hiraga, Inc.
Attention: Rowena Dagdag
305 High Street, Suite 104
Wailuku, Hawaii 96793

Subject: Proposed Honoapiilani Highway Interim Shoreline Project
TMK: (2)4-8-003:118 Lahaina, Maui , Hawaii

Dear Ms. Dagdag,

I have received your comment request concerning the proposed Honoapiilani Highway Interim Shoreline Project. We anticipate the design engineers doing a great job to accommodate the weight of heavy vehicles. We have no further comments at this time.

Sincerely,

Valeriano F. Martin
Captain
Fire Prevention Bureau

CHARMAINE TAVARES
Mayor

TAMARA HORCAJO
Director

ZACHARY Z. HELM
Deputy Director

(808) 270-7230
Fax (808) 270-7934

JUL 15 2008

DEPARTMENT OF PARKS & RECREATION

700 Hali'a Nakoa Street, Unit 2 , Wailuku, Hawaii 96793

June 26, 2008

Munekiyo & Hiraga
Attention: Rowena Dagdag
305 High Street Suite 104
Wailuku, HI 96793

Dear Ms. Rowena Dagdag:

Subject: Proposed Honoapi'ilani Highway Interim Shoreline Protection at Olowalu, Maui, TMK (2) 4-8-003-118 (por.)

We have reviewed the proposed improvements for the Honoapi'ilani Highway Interim Shoreline Protection at Olowalu, and have no comments or objections to the proposed actions.

Thank you for the opportunity to comment. Please contact me or Patrick Matsui, Chief of Planning and Development, at 270-7387 if there are any questions.

Sincerely,

TAMARA HORCAJO
Director of Parks & Recreation

xc: Patrick Matsui, Chief of Planning & Development

TH:PM:ak

CHARMAINE TAVARES
Mayor

JEFFREY S. HUNT
Director

COLLEEN M. SUYAMA
Deputy Director

COUNTY OF MAUI
DEPARTMENT OF PLANNING

June 27, 2008

Ms. Rowena Dagdag
Munekiyo & Hiraga, Inc.
305 High Street, Suite 104
Wailuku, HI 96793

Dear Ms. Dagdag:

SUBJECT: **COMMENT LETTER REGARDING INTERIM SHORELINE PROTECTION AT OLOWALU, ISLAND OF MAUI, HAWAI'I TMK (2) 4-8-003:118 (Por.) (EAC 2008/0028)**

The Department of Planning (Department) is in receipt of your letter regarding issues arising along the Honoapi'ilani Highway between Launiupoko and Kehili Point. We appreciate your recognition of the applicability of County rules including the necessity to obtain a Special Management Area (SMA) Use Permit, Shoreline Setback Variance, and Environmental Assessment accepted by the Maui Planning Commission.

We further note that in contrast to paragraph one, the lands located to the east are proposed for a large subdivision development and highway relocation, as well as a public coastal park area for which the County has already allocated funds and initiated permit activities. Please address and incorporate these proposed actions fully into your proposal. Further, please provide context of this project in relation to other eroded portions of the highway between Lahaina and the Honoapi'ilani Highway tunnel, and other public-private ventures such as the recently completed Ukumehame Subdivision and Coastal Park lands purchased by the County. Your second paragraph suggests the actions are improvements to the shoreline area. Shoreline hardening may not be viewed by members of the public as an "improvement", and thus should be referenced accordingly. Please describe the expected life span of the revetment. Also, please describe in detail the quantity of "minor" fill, in terms of length, width, volume and type of material. Finally, you note that the proposed hardening will not prevent wave overtopping and thus will not enhance the resiliency of communities relying on the highway for transportation. Please frame your discussions in context of the overall timing, location, cost, public meetings and comment, and agency efforts (DOT, etc.) to improve coastal community resiliency relative to the transportation network of West Maui.

If you have any questions about this letter, please contact Staff Planner Thorne Abbott via email at thorne.abbott@mauicounty.gov or by phone at (808) 270-7520.

Sincerely,

CLAYTON I. YOSHIDA, AICP
Planning Program Administrator

For: JEFFREY S. HUNT
Planning Director

xc: Jeffrey S. Hunt, AICP, Director
Clayton I. Yoshida, AICP, Planning Program Administrator
Thorne Abbott, Staff Planner
EAC File
General File

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MUNEKIYO & HIRAGA, INC.

MICHAEL T. MUNEKIYO
GWEN OHASHI HIRAGA
MITSURU "MICH" HIRANO
KARLYNN FUKUDA

MARK ALEXANDER ROY

March 18, 2009

Jeffrey S. Hunt, Director
Department of Planning
County of Maui
250 South High Street
Wailuku, Hawai`i 96793

SUBJECT: Proposed Honoapi`ilani Highway Shoreline Protection at Olowalu, Maui, Hawai`i (TMK (2)4-8-003:006(por.))

Dear Mr. Hunt:

Thank you for your letter of June 27, 2008 responding to our request for early consultation comments for the proposed Honoapi`ilani Highway Shoreline Protection at Olowalu, Maui. We would like to note that a meeting was held with Clayton Yoshida and Thorne Abbott of your department on July 16, 2008 to discuss the proposed project. The following information is provided in response to your comments.

1. The applicant acknowledges that lands to the east have been designated for future development of the Olowalu Mauka and Makai masterplan, which involves the mauka relocation of Honoapi`ilani Highway. A discussion on land uses in the vicinity of the project area will be included in the Draft Environmental Assessment (EA).

2. The Draft EA will also provide an analysis of this project in relation to other eroded portions of Honoapi`ilani Highway.

3. A discussion on the amount of fill required for the proposed project as well as the origin of the fill material will be provided in the Draft EA. Additionally, the armor stones have been sized for stability under depth limited wave conditions. A discussion on the proposed design of the boulder fill will be provided in the Draft EA.

4. As noted in our early consultation letter, jersey barriers will be required along the edge of the boulder slope as part of the shoreline protection measure to mitigate damage to the highway from wave overtopping.

5. We note your concern regarding efforts to improve coastal community resiliency relative to the transportation network of West Maui. With respect to these issues,

the State Department of Transportation has identified this project as an interim solution to an overall long-term plan in relocating Honoapi`ilani Highway further inland to address the issue of undermining and collapse of the existing highway. A discussion on proposed alternatives for shoreline protection, including the relocation of the highway will be provided in the Draft EA. Immediate action however, is necessary to keep the highway open. The proposed project is deemed necessary for maintaining the functional integrity of the existing highway and public safety.

Thank you again for your comments. A copy of the Draft Environmental Assessment will be provided to your office for review and comment. Should you have any further questions, please do not hesitate to contact me at 244-2015.

Very Truly Yours,

Rowena Dagdag Andaya, Planner

RD:lh
cc: Brennon Morioka, State of Hawai`i, Department of Transportation
Karen Chun, State of Hawai`i, Department of Transportation
Ferdinand Cajigal, State of Hawai`i, Department of Transportation
Richard Sato, Sato & Associates, Inc.
Elaine Tamaye, EKNA, Inc.
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JUN 17 2008

POLICE DEPARTMENT
COUNTY OF MAUI

CHARMAINE TAVARES
MAYOR

OUR REFERENCE
YOUR REFERENCE

55 MAHALANI STREET
WAILUKU, HAWAII 96793
(808) 244-6400
FAX (808) 244-6411

THOMAS M. PHILLIPS
CHIEF OF POLICE

GARY A. YABUTA
DEPUTY CHIEF OF POLICE

June 12, 2008

Ms. Rowena Dagdag
Planner
Munekiyo & Hiraga, Inc.
305 High Street, Suite 104
Wailuku, HI 96793

Dear Ms. Dagdag

SUBJECT: Proposed Honoapi'ilani Highway Interim Shoreline Protection at Olowalu, Maui TMK: 4-8-003:118 (por.)

This is in response to your letter June 3, 2008, requesting comments on the above subject.

We have reviewed the information for the above mentioned subject and offer the enclosed comments.

Thank you for giving us the opportunity to comment on this project.

Very truly yours,

AC Wayne T. Ribao

Assistant Chief Wayne T. Ribao
for: Thomas M. Phillips
Chief of Police

c: Jeffrey Hunt, Maui County Dept. of Planning

COPY

TO : **THOMAS PHILLIPS, CHIEF OF POLICE, MAUI POLICE DEPARTMENT**

VIA : **CHANNELS**

FROM : **CHARLES M. HIRATA, CAPTAIN, LAHAINA PATROL**

SUBJECT : **PROPOSED HONOAPIILANI HWY. INTERIM SHORELINE PROTECTION AT OLOWALU**

CONCUR WITH CAPT. HIRATA. BOTH LANES SHOULD BE KEPT FLOWING.
AC 06/12/08

Sir,

Although we would like to wait for the Environmental Assessment to review prior to submitting comments, I am recommending that the Hawaii DOT minimize disruption to traffic by realigning the roadway through the use of temporary traffic control devices while work is being done. It is important to maintain the flow of traffic in this area by keeping both lanes open instead of alternating traffic.

We recognize the importance of this work in light of the shoreline erosion that is taking place.

Respectfully submitted,

Charles M. Hirata E-4855
Captain, Lahaina Patrol
6/10/2008 10:29 AM

MUNEKIYO & HIRAGA, INC.

MICHAEL T. MUNEKIYO
GWEN OHASHI HIRAGA
MITSURU "MICH" HIRANO
KARLYNN FUKUDA

MARK ALEXANDER ROY

March 18, 2009

Thomas Phillips, Chief
County of Maui
Maui Police Department
55 Mahalani Street
Wailuku, Hawai`i 96793

SUBJECT: Proposed Honoapi`ilani Highway Shoreline Protection at Olowalu, Maui, Hawai`i (TMK (2)4-8-003:006(por.))

Dear Chief Phillips:

Thank you for your letter of June 12, 2008 responding to our request for early consultation comments for the proposed Honoapi`ilani Highway Shoreline Protection at Olowalu, Maui. We would like to provide the following information in response to your comments.

We note your recommendations for using traffic control devices and the temporary realignment of Honoapi`ilani Highway to facilitate two-way traffic while work is conducted along the shoreline. To address traffic concerns, consultation with applicable State and County agencies will be carried out to identify appropriate temporary traffic control devices and plans to be utilized during construction.

Thank you again for your comments. A copy of the Draft Environmental Assessment will be provided to your office for review and comment. Should you have any further questions, please do not hesitate to contact me at 244-2015.

Very Truly Yours,

Rowena Dagdag Andaya, Planner

RD:lh
cc: Brennon Morioka, State of Hawai`i, Department of Transportation
Karen Chun, State of Hawai`i, Department of Transportation
Ferdinand Cajigal, State of Hawai`i, Department of Transportation
Richard Sato, Sato & Associates, Inc.
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CHARMAINE TAVARES
Mayor

MILTON M. ARAKAWA, A.I.C.P.
Director

MICHAEL M. MIYAMOTO
Deputy Director

Telephone: (808) 270-7845
Fax: (808) 270-7955

JUL 0 7 2008

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

June 30, 2008

Ms. Rowena Dagdag
MUNEKIYO & HIRAGA, INC.
305 High Street, Suite 104
Wailuku, Maui, Hawaii 96793

Dear Ms. Dagdag:

SUBJECT: EARLY CONSULTATION FOR THE PROPOSED HONOAPIILANI HIGHWAY INTERIM SHORELINE PROTECTION AT OLOWALU; TMK: (2) 4-8-003:118 (POR.)

We reviewed the subject application and have no comments at this time.

Please call Michael Miyamoto at 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
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JUN 2 4 2008

CHARMAINE TAVARES
Mayor

CHERYL K. OKUMA, Esq.
Director

GREGG KRESGE
Deputy Director

TRACY TAKAMINE, P.E.
Solid Waste Division

DAVID TAYLOR, P.E.
Wastewater Reclamation Division

COUNTY OF MAUI
DEPARTMENT OF
ENVIRONMENTAL MANAGEMENT
2200 MAIN STREET, SUITE 175
WAILUKU, MAUI, HAWAII 96793

June 19, 2008

Ms. Rowena Dagdag
Munekiyo & Hiraga, Inc.
305 High Street, Suite 104
Wailuku, Hawaii 96793

SUBJECT: HONOAPIILANI HIGHWAY INTERIM SHORELINE PROTECTION EARLY CONSULTATION
TMK (2) 4-8-003:118 (POR.), OLOWALU

We reviewed the subject request and have the following comments:

1. Solid Waste Division comments

   a. None.

2. Wastewater Reclamation Division comments:

   a. None. No County sewer in the area.

If you have any questions regarding this memorandum, please contact Gregg Kresge at 270-8230.

Sincerely,

Cheryl K. Okuma

Cheryl Okuma, Director

JUL 0 7 2008
Maui Electric Company, Ltd. • 210 West Kamehameha Avenue • PO Box 398 • Kahului, Maui, HI 96733-6898 • (808) 871-84€

July 3, 2008

Ms. Rowena Dagdag
Munekiyo & Hiraga, Inc.
305 High Street, Suite 104
Wailuku, Hawaii 96793

Dear Ms. Dagdag,

Subject: Proposed Honoapi'ilani Highway Interim Shoreline Protection at Olowalu
Olowalu, Maui, Hawaii
Tax Map Key: (2) 4-8-003:118 (por.)

Thank you for allowing us to comment on the Proposed Honoapi'ilani Highway Interim Shoreline Protection project at Olowalu.

In reviewing our records and the information received, Maui Electric Company (MECO) has no objections to the subject project as it is anticipated that there will be no impact to MECO's facilities.

Should you have any questions or concerns, please call me at 871-2340.

Sincerely,

Ray Okazaki
Staff Engineer

JUN 2 5 2008

Lahaina Bypass

June 23, 2008

Rowena Dagdag
Munekiyo & Hiraga, Inc.
305 High Street, Suite 104
Wailuku, Hawaii 96793

Subject: Proposed Honoapi'ilani Highway Interim Shoreline Protection at Olowalu, Maui, TMK: 4-8-003:118 (por)

Dear Ms. Dagdag:

Thank you for the opportunity on the early consultation of the proposed Honoapi'ilani Highway Interim Shoreline Protection at Olowalu. Lahaina Bypass Now would like to offer the following comments:

1. LBN would like to see in the analysis a study of the root cause of the coastal erosion.

2. LBN hopes that all alternatives are explored prior to choosing this proposed hardening action. The analysis should review the possibility of realigning the road mauka, shoreline enhancement, restoration, and/or replenishment and other approaches to mitigating the shoreline erosion.

3. LBN understands as part of the Environmental Assessment process a study of the impacts on natural resources will be conducted. LBN is particularly interested in the impacts on limu gathering, fishing and surfing.

4. LBN would like to see a study to determine what will happen to the adjacent shoreline in the future if the hardening is completed.

5. If, after a thorough analysis of the proposed action, there is clear and convincing evidence that the hardening should be approved, the approval should be granted on the condition that the applicant monitor the shoreline response to the hardening. Moreover, the planning authorities shall retain the ability to require the removal of the hardening if future events do not require it.

Again, thank you for allowing LBN this opportunity. We look forward to reviewing the upcoming Environmental Assessment.

Sincerely,
Lahaina Bypass Now

505 Front Street, Suite 202 • Lahaina, HI 96761
Telephone: 808-667-2516 • Fax: 808-661-2058
www.lahainabypassnow.com • info@lahainabypassnow.com

MUNEKIYO & HIRAGA, INC.

MICHAEL T. MUNEKIYO
GWEN OHASHI HIRAGA
MITSURU "MICH" HIRANO
KARLYNN FUKUDA

MARK ALEXANDER ROY

March 18, 2009

Lahaina Bypass Now
505 Front Street, Suite 202
Lahaina, Hawai`i 96761

SUBJECT: Proposed Honoapi`ilani Highway Shoreline Protection at Olowalu, Maui, Hawai`i (TMK (2)4-8-003:006(por.))

Dear Sir or Madam:

Thank you for your letter of June 23, 2008 responding to our request for early consultation comments for the proposed Honoapi`ilani Highway Shoreline Protection at Olowalu, Maui. We would like to provide the following information in response to your comments.

1. A coastal engineering report will be provided in the Draft Environmental Assessment (EA). The report is intended to provide an analysis of existing shoreline characteristics and coastal processes of the project area. The report will also provide a summary of historical changes to the shoreline area.

2. The proposed action involves the placement of boulder fill to stabilize the eroding shoreline slope. These boulders will not be cast in concrete and are intended to compliment the existing shoreline characteristic of this area. An analysis of proposed alternatives that were explored prior to the selection of the boulder fill alternative will be provided in the Draft EA.

3. A biological and water quality survey will be prepared to identify any sensitive biological resources present in and around the project area that may be adversely impacted by the project. In addition, a Cultural Impact Assessment has been conducted to assess the impacts of the proposed action on any cultural practices and gathering rituals that occur in the project area. The Water Quality Survey and the Cultural Impact Assessment will be provided in the Draft EA.

4. Results of the coastal engineering report will examine the littoral processes due to the proposed mitigation measure using an ungrouted boulder fill.

5. The proposed action does not involve concrete rubble masonry or cast-in-place reinforced concrete resulting in a seawall or a hardened shoreline. The proposed alternative involves the use of ungrouted boulder fill that is removable. The

proposed action is the preferred alternative since it allows public lateral shoreline access and is consistent with the existing shoreline characteristic of the project area, while providing protection to the shoreline from seasonal high surf and waves.

Thank you again for your comments. A copy of the Draft EA will be provided to your office for review and comment. Should you have any further questions, please do not hesitate to contact me at 244-2015.

Very Truly Yours,

Rowena Dagdag Andaya, Planner

RD:lh
cc: Brennon Morioka, State of Hawai`i, Department of Transportation
Karen Chun, State of Hawai`i, Department of Transportation
Ferdinand Cajigal, State of Hawai`i, Department of Transportation
Richard Sato, Sato & Associates, Inc.
Elaine Tamaye, EKNA, Inc.
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X. REFERENCES

X. REFERENCES

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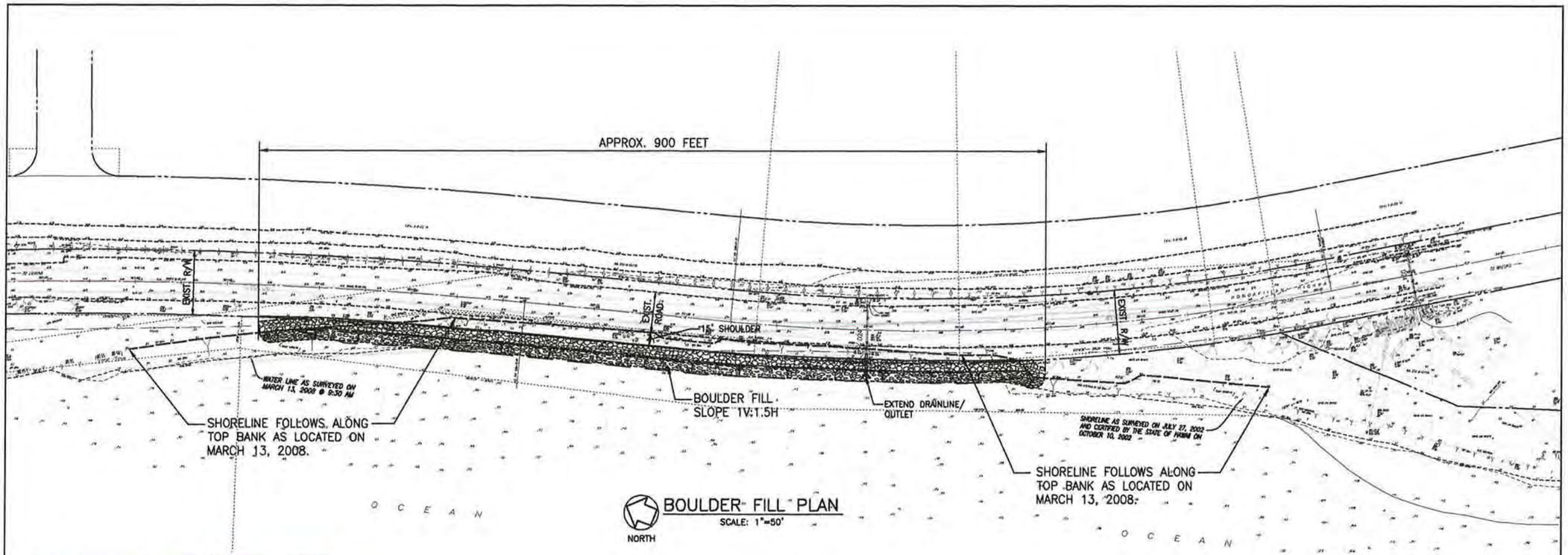
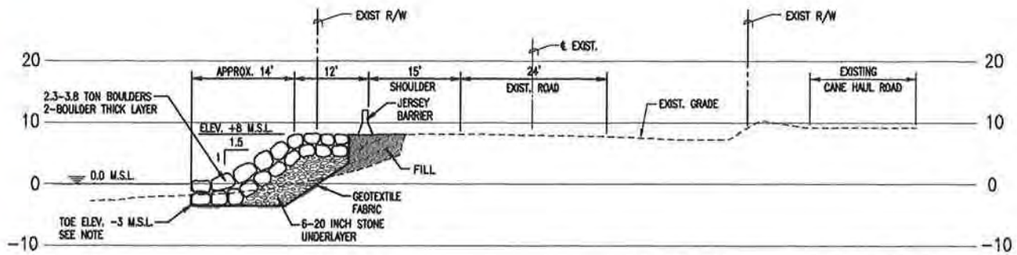
APPENDIX A.

Preliminary Project Plans



BOULDER FILL PLAN
SCALE: 1"=50'

LOCATION MAP
NO SCALE

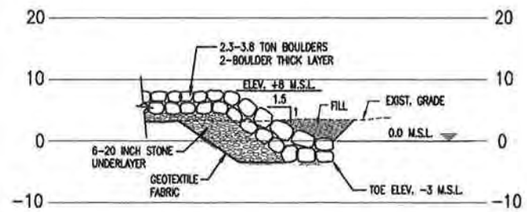


NOTE:
EXCAVATE TOE TO -3.0 M.S.L. OR PLACE ON HARD SUBSTRATE. SUBSTRATE IS TYPICALLY FOUND AT -3.0' OR SHALLOWER.

APPROXIMATE 2.4 C.Y./L.F. UNDERLAYER STONE (6-20 INCH STONES)
APPROXIMATE 4.5 C.Y./L.F. ARMOR STONE (2.3-3.8 TON BOULDERS)
APPROXIMATE TOTAL 6.9 C.Y./L.F. ROCK

ASSUME 900 L.F. FILL = 6,210 C.Y. ROCK

A TYPICAL SECTION
SCALE: 1"=10'



B END SECTION
SCALE: 1"=10'

SATO & ASSOCIATES, INC.
CONSULTING ENGINEERS • CIVIL & STRUCTURAL
HONOLULU, OAHU, HAWAII • WAILUKU, MAUI, HAWAII

SCALE:	AS SHOWN
DESIGN BY:	R.M.S.
DRAWN BY:	R.J.M.
CHECKED BY:	R.M.S.

1"=50' 50' 25' 0 50' 100'
1"=10' 10' 5' 0 10' 20'
SCALE IN FEET

OPTION 1
BOULDER FILL

HONOAPIILANI HIGHWAY SHORELINE PROTECTION
OLOWALU, MAUI, HAWAII
MARCH 2009

Proj. No. 04031-00
Mar 03, 2009 - 4:36pm
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APPENDIX B.

Coastal Engineering Assessment

COASTAL ENGINEERING ASSESSMENT
Honoapiilani Highway Shoreline Protection
Olowalu, Maui, Hawaii

Prepared for:

Sato & Associates, Inc.
2046 South King Street
Honolulu, Hawaii 96826

on behalf of:

State of Hawaii
Department of Transportation

Prepared by:

EKNA Services, Inc.
615 Piikoi Street, Suite 300
Honolulu, Hawaii 96814

(EKNA Control No. 2634-00F#)

June 2008

TABLE OF CONTENTS

Coastal Engineering Assessment
Honoapiilani Highway Shoreline Protection
Olowalu, Maui, Hawaii

1 LOCATION AND PROBLEM IDENTIFICATION

The project site is located in Olowalu, between Launiupoko Point and Hekili Point, south of Lahaina on the west coast of Maui (Figure 1). About 1000 feet of highway is endangered by erosion of the fronting shoreline. Emergency measures have been undertaken over the past 5-7 years to mitigate erosion damage to the highway shoulder, and concrete jersey barriers have been placed along the seaward edge of the highway pavement to mitigate wave overtopping and closure of the highway during high surf conditions. However, these measures are inadequate to address the present imminent collapse of the roadway pavement along a short section of the highway due to undermining from the shoreline erosion.

The State of Hawaii, Department of Transportation, desires to remedy the problem by constructing shoreline protection. In the long term, plans are underway to relocate the highway inland to mitigate the hazards from storm waves and shoreline erosion. However, the time frame for the highway relocation is on the order of 5-10 years. Therefore, immediate action is necessary to keep the highway open. This report describes the coastal processes affecting this shoreline area and assesses the potential impacts on coastal processes due to various identified alternatives. This report is intended to support the Environmental Assessment that is in preparation by others.

2 SHORELINE CHARACTERISTICS AND COASTAL PROCESSES

Coastal Processes

The project site is located on the west coast of Maui on the Lahaina side of Hekili Point, at the base of the West Maui mountain range. This coastal reach is sheltered from the predominant tradewinds by the West Maui Mountains, and shielded from the tradewind-generated waves by the island mass. The site is also somewhat protected from the winter North Pacific swell and westerly storm waves by the islands of Molokai and Lanai. However, it is exposed to summer southern swell, local Kona storm waves from the southwesterly direction, and infrequent hurricanes passing south and west of the island chain. Figure 2 is a recent aerial photograph taken during south swell conditions. As can be seen on the aerial photo, the angle of swell wave approach along this coastal reach results in northward longshore transport at the project site.

There is no shallow fringing reef fronting this shoreline reach to provide protection from deepwater wave energy. The 60-foot depth contour is located less than 2,000 feet offshore. Therefore, deepwater waves will break relatively close to shore, at depths governed by the offshore bottom slope and deepwater wave characteristics. Because of the higher wave energy at the shoreline compared to the shoreline reaches fronted by shallow reefs, there is no sand beach along this coastal reach between Launiupoko Point and Hekili Point. The shoreline is comprised of a cobble beach (see Figure 3 ground photos).

Figure 4 is excerpted from a study by NOAA[1] which mapped the shallow-water benthic habitats of the main Hawaiian Islands. The geomorphological structure fronting the project site is classified as *Pavement*, which is flat, low-relief, solid carbonate rock with coverage of macroalgae, hard coral, zoanthids, and other sessile invertebrates that are dense enough to begin to obscure the underlying surface. *Aggregate Reef* (high relief lacking sand channels of spur and groove) lie offshore beyond the 18-foot depth contour towards Hekili Point. There are no sand channels that can serve as a major source of sand for this project area, and the large areas of sandy bottom offshore the site are situated in water depths too deep for normal wave activity to transport it to shore. Sandy bottom areas north of the site, offshore Awalua, are situated closer to shore. However, the predominant longshore transport at the project site is northward.

Historical Shoreline Changes

Figure 5 displays historical aerial photographs of the project area from 1949 to 1997. The shoreline configuration has shown little change over this period of time, although it is evident that shoreline recession has occurred. A study for the State of Hawaii, Department of Transportation by Edward K. Noda and Associates, Inc. (now EKNA Services, Inc.) identified several problem areas along Honoapiilani Highway that were recommended for shoreline protection.[2] The project site was identified as an area of concern and a high priority for shoreline protection measures. Analysis of historical aerial photographs from 1971 to 1999 indicated that within a 4000 foot long shoreline reach extending from Hekili Point northward to Awalua, erosion was occurring at the south end (within the project reach) while the north end was accreting, resulting in little net change. It was expected that continued transport northward would result in progressive potential erosion damage to the

[1]"Atlas of the Shallow-Water Benthic Habitats of the Main Hawaiian Islands", U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Ocean Service, National Centers for Coastal Ocean Science, Center for Coastal Monitoring and Assessment, Biogeography Branch, NOAA Technical Memorandum NOS NCCOS 61, September 2007.

[2]Edward K. Noda and Associates, Inc. (2003), "Statewide Highway Shoreline Protection Study", prepared for State of Hawaii, Department of Transportation, Highways Division.

highway at the south end.

Figure 6 is excerpted from a study by the University of Hawaii for the County of Maui[3], which mapped the erosion rates for Maui shoreline reaches. For this Olowalu area, six aerial photographs spanning the period November 1949 to May 1997 were used in the analysis, together with 1912 and 1925 topographic survey charts from the National Ocean Survey and measurements along shore-normal transects conducted as part of this study. The low water mark was used as the historical shoreline, or shoreline change reference feature (SCRF). The Annual Erosion Hazard Rates (AEHR) indicated on the map are spatially smoothed, center weighted averages (using 5 transects) of calculated erosion rates of the SCRF. For the vicinity of the project site, this study indicates AEHR of zero to -1 foot/year between transects 60 and 80 (average of -0.4 feet/year). Where complete beach loss has occurred, erosion rate calculations apply only to the time period when a beach existed. Therefore, for much of the shoreline in the vicinity of the project site where the shoreline is rocky and devoid of beach, the AEHR would be zero.

3 ALTERNATIVES AND POTENTIAL IMPACTS

No Action

This project area is suffering chronic erosion and the highway pavement is in imminent danger of collapsing due to undermining by erosion of the fronting shoreline. This is a serious public safety issue as well as a socio-economic problem as the highway is the only access road into the Lahaina/Kapalua area from Central Maui. Allowing the highway to be damaged by wave erosion is not an acceptable option.

Boulder Fill

Figure 7 (from Sato & Associates) shows the proposed boulder fill alternative. For the estimated design breaking wave height at the shoreline of about 7 feet due to hurricane wave attack, the required boulder size is 2.3 - 3.8 tons to remain stable on the shoreline slope. The boulders are underlain with smaller rock and geotextile fabric to prevent leaching of the backfill through the voids between the large stones. The crest elevation is +8' MSL, which is approximately the same elevation as the edge of the highway pavement. The low crest elevation will minimize the horizontal footprint of the boulder fill. Although the boulder slope will reduce runup and overtopping compared to the existing shoreline

[3]Maps showing smoothed erosion rates, produced for the County of Maui by the Coastal Geology Group, Department of Geology and Geophysics, School of Ocean and Earth Science and Technology, University of Hawaii at Manoa.

condition, there will still be considerable overtopping during storm wave attack[4]. Therefore, jersey barriers will be placed along the edge of the boulder slope to mitigate damage to the highway from wave overtopping. The toe of the boulder slope will be placed on hard substrate or will be excavated and placed at elevation -3' MSL to mitigate scouring and undermining by large waves. Minor filling to restore the shoreline will be required to provide sufficient shoulder width (15 feet) between the jersey barriers and the travel lane because of safety and constructability concerns.

The boulder fill will provide protection to the shoreline and highway from seasonal high surf and the infrequent waves from passing hurricanes. The boulder fill will replace the cobble shoreline with a boulder slope. There will be no impacts to existing littoral processes due to the boulder fill.

Cobble Beach

Beach restoration and nourishment is commonly cited as a preferred alternative to protecting eroding shorelines and beaches. Unfortunately, this alternative is costly (due to lack of suitably large quantities of natural beach sand to serve as a commercial source of material). Beach nourishment would be required for a long stretch of shoreline reach within the littoral cell, since wave energy will quickly redistribute small quantities of beach material unless beach containment structures (such as groins) are built to confine the beach fill fronting the area of concern.

There is no record of a wide dry sand beach at the project site. It would be difficult to estimate the rate of beach nourishment that would be required to maintain a design beach profile that is sufficiently protective of the highway. For the beach to provide adequate protection during storm wave events, it must have adequate beach width, elevation and length along the shoreline reach within the defined littoral cell. Cobbles, which comprise the existing shoreline and which form many of the "beaches" along this West Maui coast, will be more stable on the shoreline than sand-size sediment. Therefore, any beach restoration effort at this location should use cobble-sized material, preferably of similar gradation (or with slightly larger median size) than the existing material on the shoreline.

Figure 8 (from Sato & Associates) shows a conceptual plan for a cobble beach fronting the project site. The top-of-beach elevation is +9' MSL with a beach berm width of about 25 feet. The beach slope is 1V:6H. As an measure, it is estimated that this cobble beach profile will dissipate storm wave energy sufficiently to prevent significant wave overwash of the highway. In the long term, there will likely be a need for future nourishment in order

[4]The estimated non-overtopping crest elevation for a 1V:1.5H rock slope is about +14' MSL for the design hurricane wave conditions and super-elevated stillwater levels.

to maintain this design profile. The historical data would indicate a loss of up to 1 foot per year, however, other factors include the gradation of the cobble fill and the frequency and severity of storms affecting this coastal area in the future.

Mauka Shift of the Highway

Figure 9 (from Sato & Associates) shows a mauka shift of the highway of about 10-15 feet, which is the maximum distance that the road can be moved given the existing highway right-of-way. This realignment of the highway within the project reach will address the immediate issue of undermining and collapse of the existing highway pavement due to the present state of erosion damage to the shoreline. However, this alternative will not address the continuing erosion damage to the shoreline. The historical data would indicate potential shoreline recession of up to 1 foot per year. However, the frequency and severity of storms affecting this coastal area in the future is an unknown factor.

Sandbag Revetment

Large geotextile bags filled with sand have been used as temporary erosion control measures at several coastal erosion hot spots over the past years. Sandbags are often the preferred choice of regulators because they appear to be a more "natural" alternative to conventional hard structures such as rocks and concrete. They are easy to remove - you simply cut the bags to release the sand. Because sandbags are easily damaged, intentionally or not, they are considered temporary if used in a shore protection structure. The bags are prone to damage from storm wave attack and vandalism, and require frequent maintenance. Therefore, for the project site, which is comprised of a cobble shoreline and exposed to large south swell and storm waves, the sandbags are not a suitable alternative. They would need to be stacked on a slope, similar to a rock revetment, and would have a similar horizontal footprint. The geotextile fabric of the sandbags would not be aesthetically compatible with the cobble shoreline.

Also, a sandbag revetment is not a "soft" structure in its as-built state. In fact, the large sand bags are solid, hard building materials when fully filled, and a sand bag revetment structure is more reflective than a rock revetment, for the same slope. Although the bag material is permeable (meaning that water will pass through the bag material), once the bags are filled and stacked to form a structure, the overall porosity (ratio of void space to hard surface) of the structure is very low. Therefore, because there are few voids between the stacked bags, wave energy is more readily reflected rather than dissipated within the structure slope as would be for a rock revetment. The smooth slope will also result in greater runup/overtopping than a rock revetment.

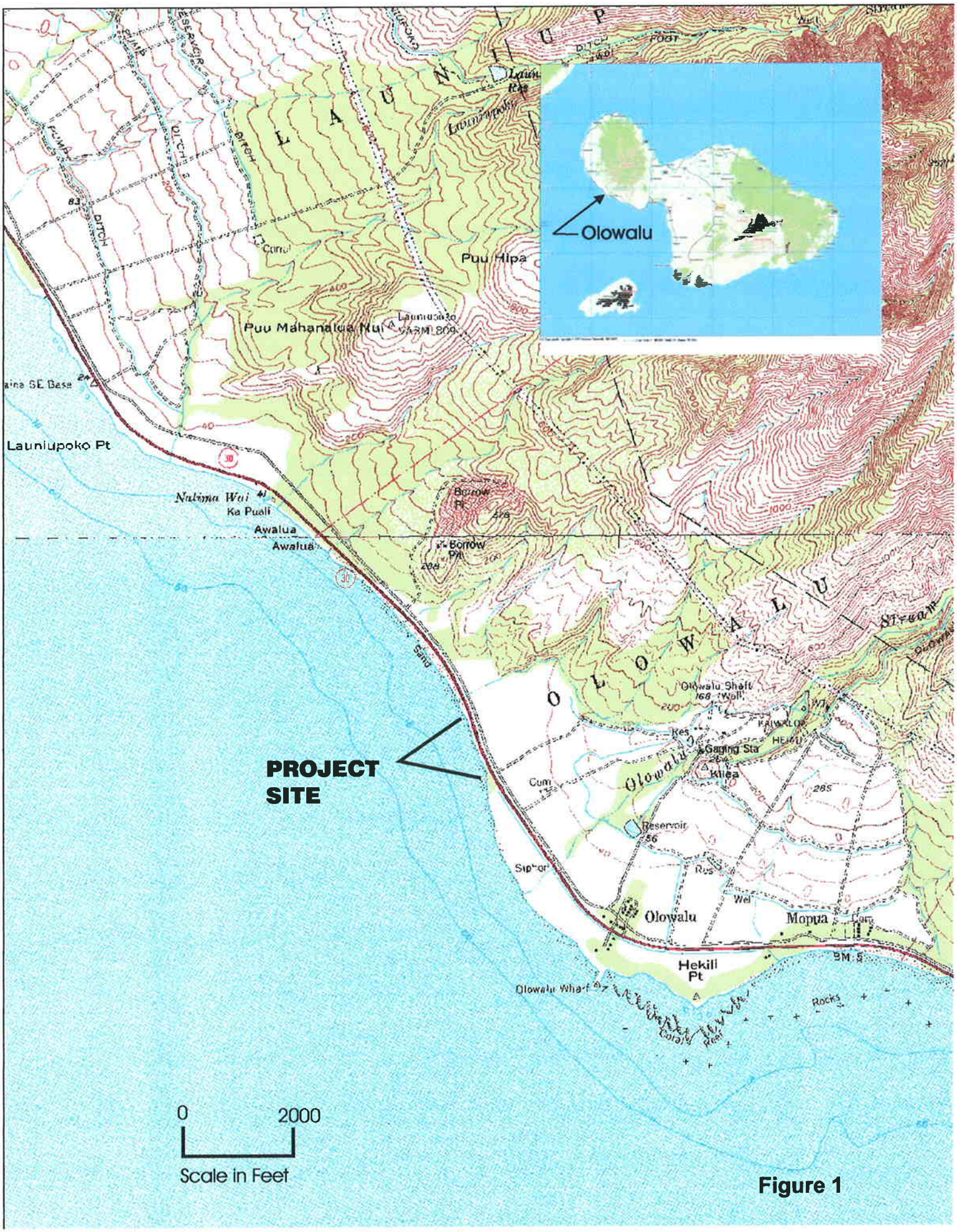

Olowalu
PROJECT SITE
Launiupoko Pt
Puu Hipa
Puu Mahanalua Nui
Olowalu Shaft
Olowalu
Mopua
Hekili Pt
Olowalu Wharf
Reservoir
Gaging Sta
Borrow Pit
Awalua
Ka Puali
0
2000
Scale in Feet

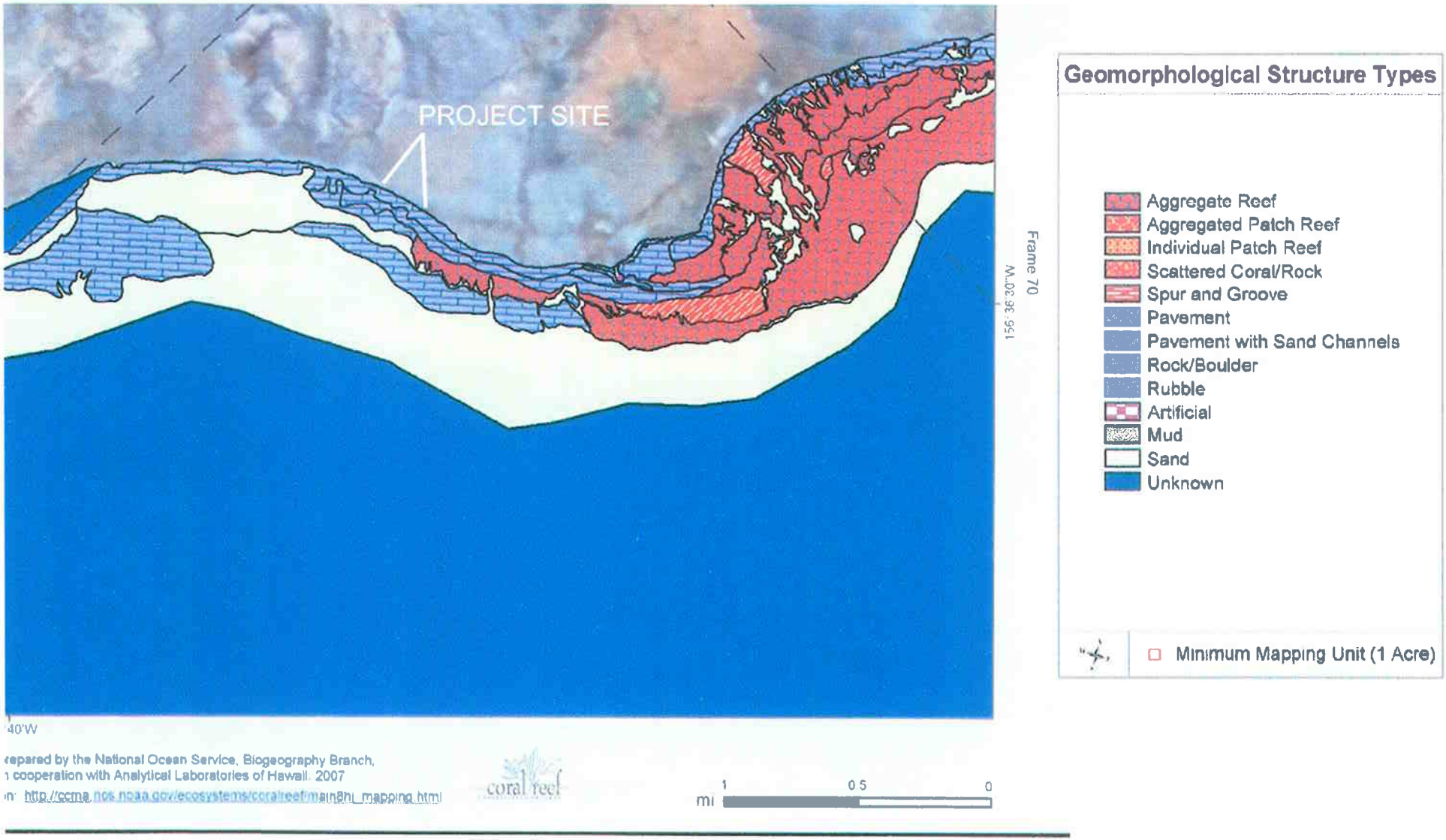
Figure 1


N
PROJECT SITE
Approx. Highwater Line
April 22, 2007 Aerial
NOAA C77272
0
500
Scale in Feet

Figure 2

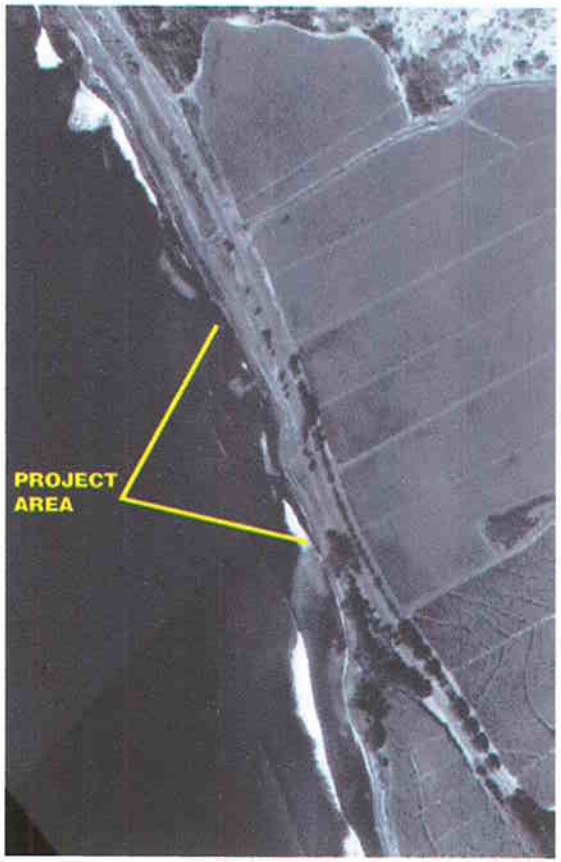
Photo taken August 14, 2000.

Photo taken November 26, 2007

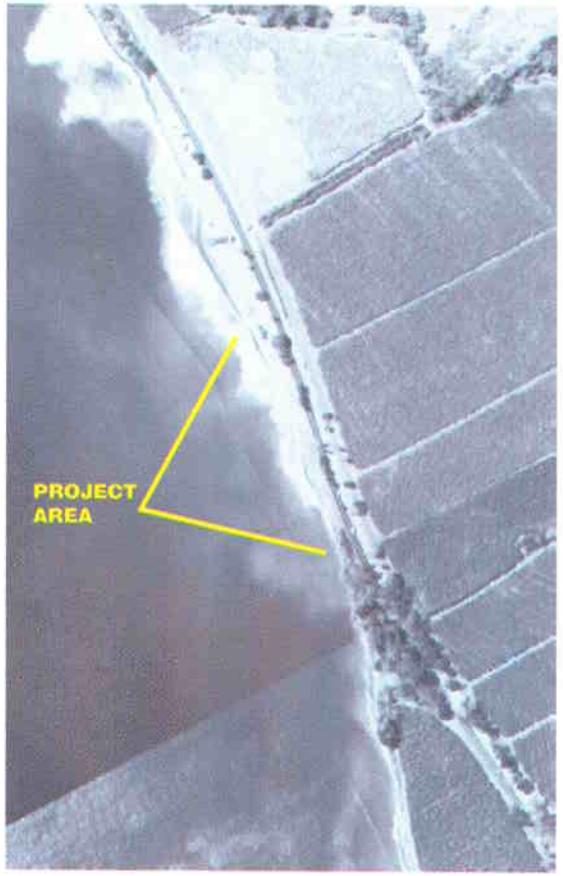


From "Atlas of the Shallow-Water Benthic Habitats of the Main Hawaiian Islands"
U.S. Dept. Of Commerce, NOAA, National Ocean Service, National Centers for Coastal Ocean Science, Center for Coastal Monitoring and Assessment, Biogeography Branch, NOAA Technical Memorandum NOS NCCOS 61, September 2007

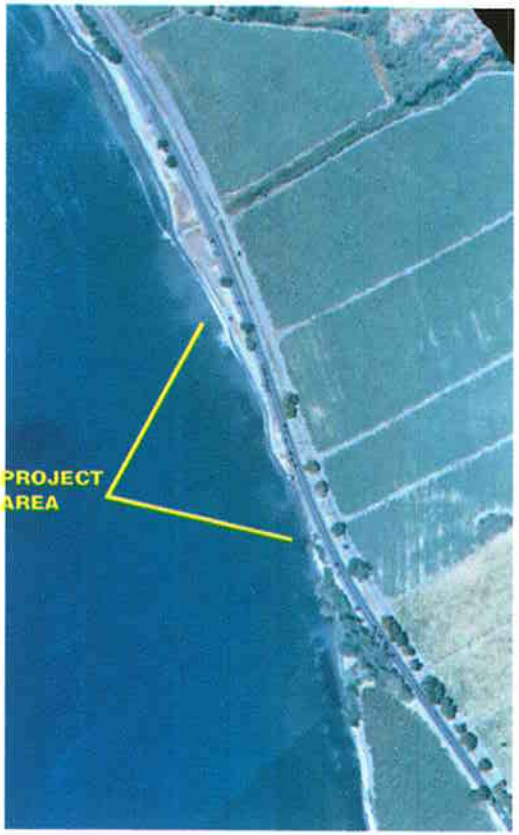
Figure 4



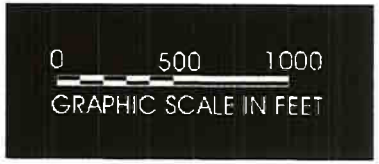
1949 Aerial



1987 Aerial



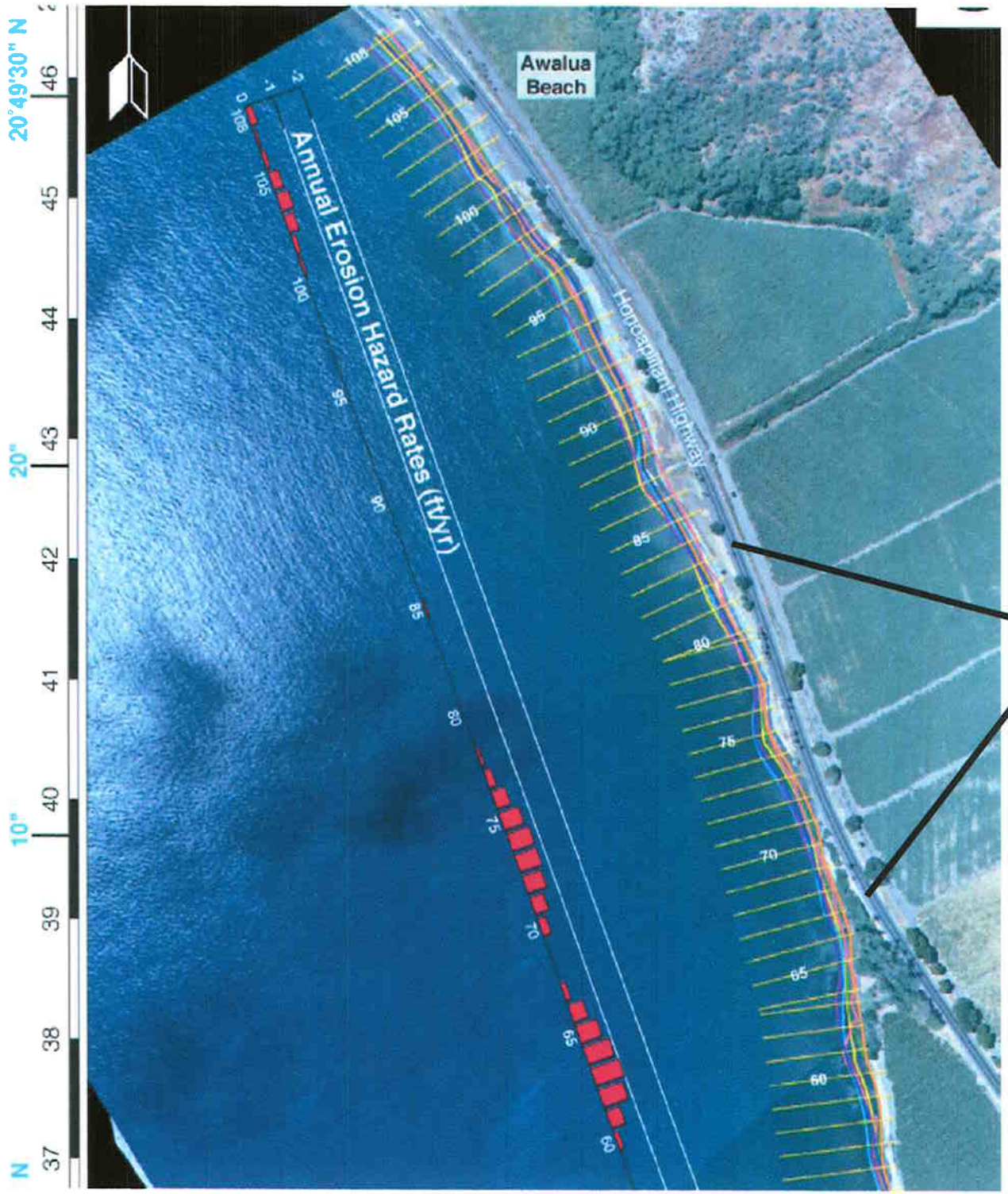
1997 Aerial



OLOWALU HISTORICAL AERIAL PHOTOGRAPHS

Ortho-rectified mosaics developed by the University of Hawaii Coastal Geology Group under contract from Maui County.

Figure 5



EROSION RATES

Annual Erosion Hazard Rates (AEHR)

Erosion rates are measured every 20 m along the shoreline. These sites are denoted by yellow shore normal transects. The Annual Erosion Hazard Rate (red), is a spatially smoothed center weighted average of calculated erosion rates. Five contiguous transects are incorporated in the smoothing process. The transects are weighted: 1-3-5-3-1 with the smoothed rate assigned to the center transect. The AEHRs are shown on the shore-parallel histogram graph. Colored bars on the graph correspond to shore-normal transects; approximately every fifth transect and bar are numbered. Where necessary, some transects have been purposely deleted during data processing; as a result, transect numbering is not consecutive everywhere. Where complete beach loss has occurred, erosion rate calculations apply only to the time period when a beach existed.

AEHRs for the Olowalu area were calculated using all data available between 1912 and 1997. Despite some scatter, shorelines between 1912 and 1997 show a reasonably consistent trend and are used to calculate AEHRs for this area.

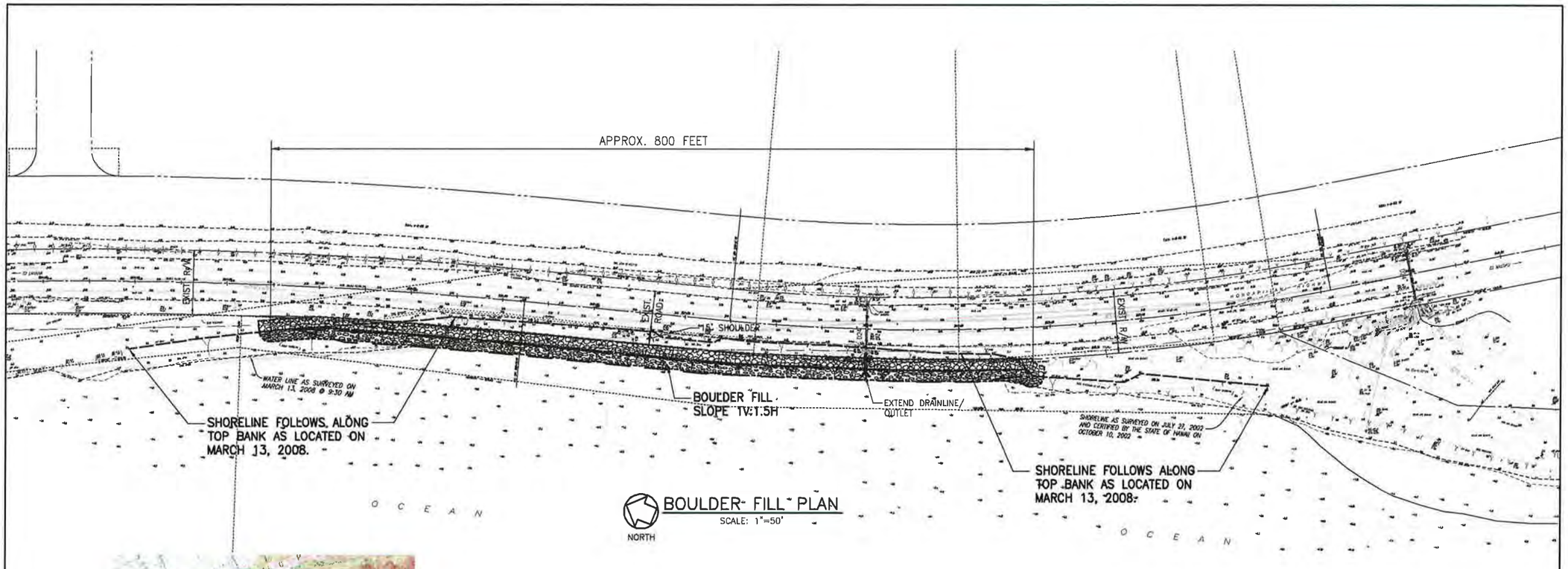
PROJECT SITE

HISTORICAL SHORELINES

- 1912
- 1925
- Nov 1949
- Oct 1960
- Mar 1975
- Aug 1987
- Mar 1988
- May 1997
- Erosion rate measurement locations (shore normal transects)

Extracted from map produced
for the County of Maui
by the Coastal Geology Group
Dept. of Geology & Geophysics
SOEST, Univ. of Hawaii at Manoa

Figure 6



NORTH

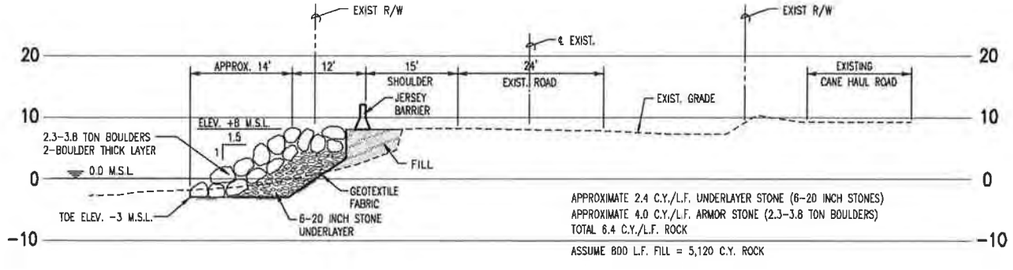
BOULDER FILL PLAN

SCALE: 1"=50'

NORTH

LOCATION MAP

NO SCALE



TYPICAL SECTION

SCALE: 1"=10'

SATO & ASSOCIATES, INC.
CONSULTING ENGINEERS • CIVIL & STRUCTURAL
HONOLULU, OAHU, HAWAII • WAILUKU, MAUI, HAWAII

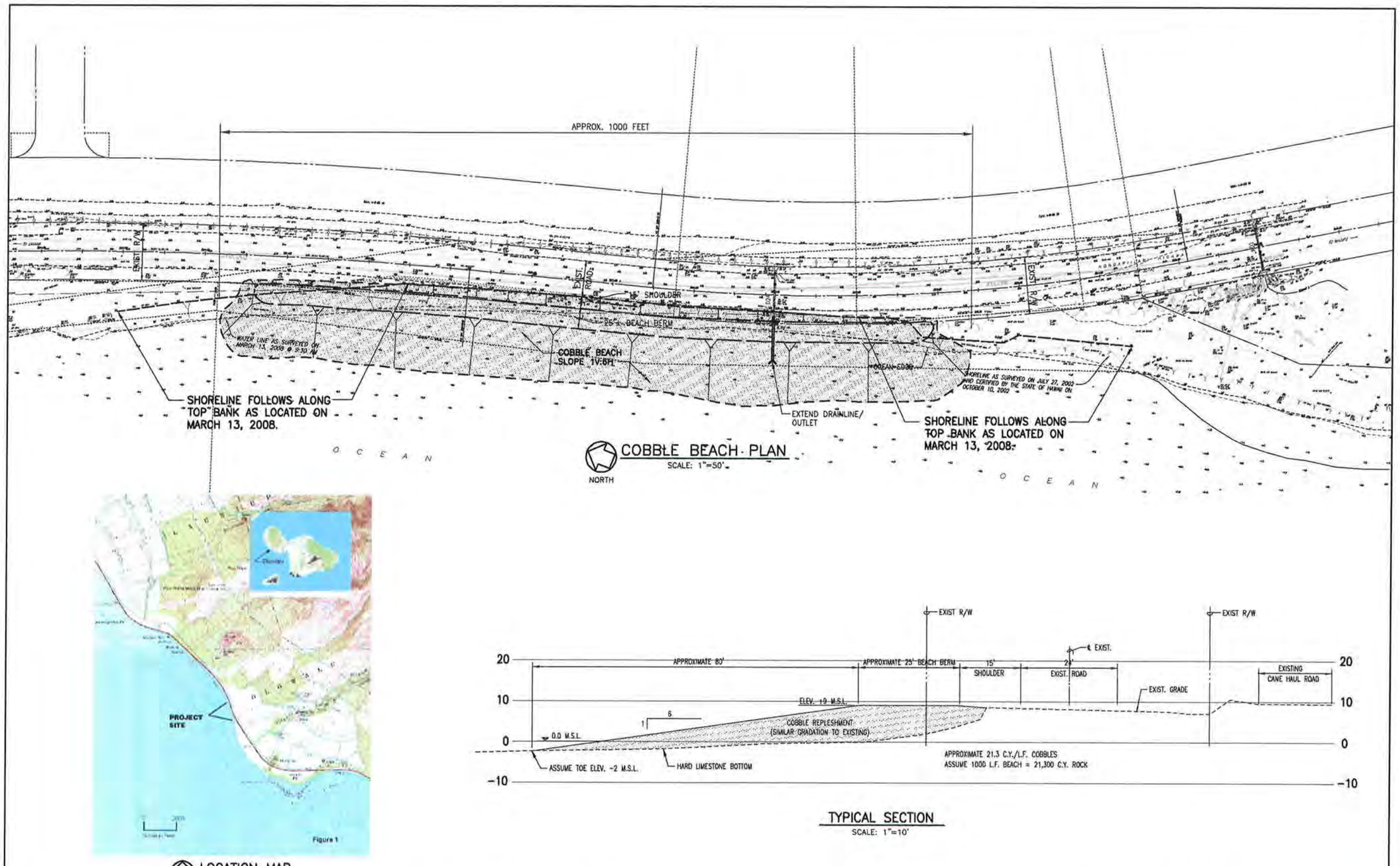
SCALE:	AS SHOWN
DESIGN BY:	R.M.S.
DRAWN BY:	R.J.M.
CHECKED BY:	R.M.S.

1"=50' 50' 25' 0 50' 100'
1"=10' 10' 5' 0 10' 20'
SCALE IN FEET

OPTION 1
BOULDER FILL

HONOAPIILANI HIGHWAY SHORELINE PROTECTION
OLOWALU, MAUI, HAWAII
NOVEMBER 2008

Proj No. 04031-00
Nov 11, 2008 - 9:04am
R:\Olowalu\DWG\Options1-3.dwg



NORTH

COBBLE BEACH - PLAN

SCALE: 1"=50'

NORTH

LOCATION MAP

NO SCALE

TYPICAL SECTION

SCALE: 1"=10'

SATO & ASSOCIATES, INC.
CONSULTING ENGINEERS • CIVIL & STRUCTURAL
HONOLULU, OAHU, HAWAII • WAILUKU, MAUI, HAWAII

SCALE:	AS SHOWN
DESIGN BY:	R.M.S.
DRAWN BY:	R.J.M.
CHECKED BY:	R.M.S.

1"=50' 50' 25' 0 50' 100'
1"=10' 10' 5' 0 10' 20'
SCALE IN FEET

OPTION 2
COBBLE BEACH

HONOAPIILANI HIGHWAY SHORELINE PROTECTION
OLOWALU, MAUI, HAWAII
NOVEMBER 2008

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Nov 11, 2008 - 9:06am
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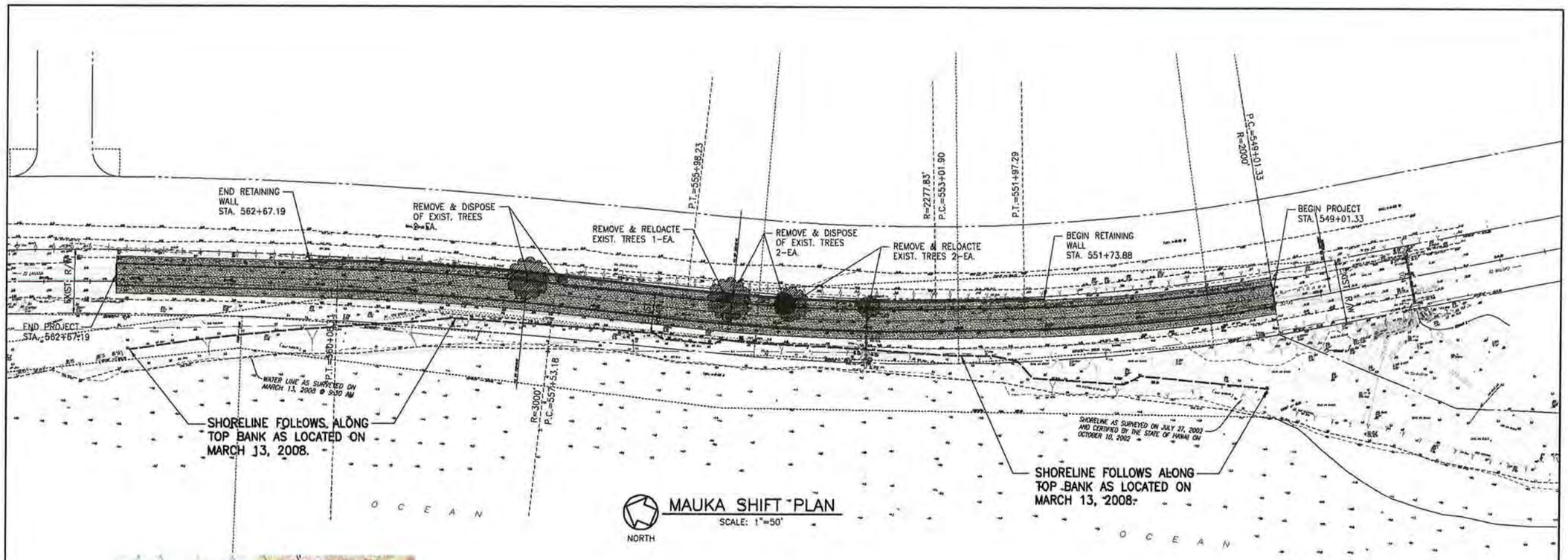
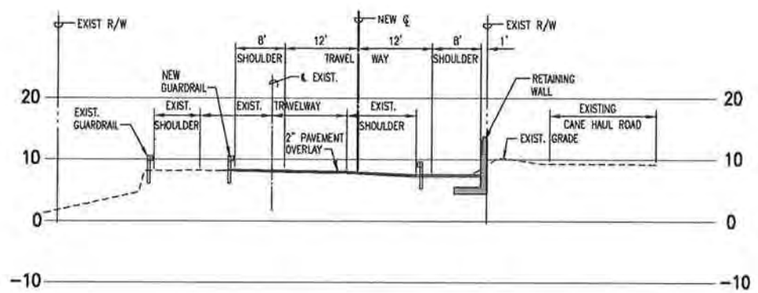


MAUKA SHIFT PLAN
SCALE: 1"=50'

LOCATION MAP
NO SCALE



TYPICAL SECTION
SCALE: 1"=10'

Proj No. 04031-00
Nov 11, 2008 - 9:07am
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SATO & ASSOCIATES, INC.
CONSULTING ENGINEERS • CIVIL & STRUCTURAL
HONOLULU, OAHU, HAWAII • WAILUKU, MAUI, HAWAII

SCALE:	AS SHOWN
DESIGN BY:	R.S.
DRAWN BY:	R.K.
CHECKED BY:	R.S.

1"=50' 50' 25' 0 50' 100'
1"=10' 10' 5' 0 10' 20'
SCALE IN FEET

OPTION 3
MAUKA SHIFT

HONOAPIILANI HIGHWAY SHORELINE PROTECTION
OLOWALU, MAUI, HAWAII
NOVEMBER 2008

APPENDIX C.

Water Quality and Marine Biota Report

Biological and water quality surveys for Honoapi'ilani Highway improvements at Olowalu, Maui, Hawai'i[1]

November 18, 2008 *AECOS* No. 1176

Katie Laing, Susan Burr, Dr. S. A. Cattell, and Eric B. Guinther
45-939 Kamehameha Highway, No. 104
Kāne'ohe, Hawai'i 96744
Phone: (808) 234-7770 Fax: (808) 234-7775 Email: aecos@aecos.com

Table of Contents

[1] This document has been prepared for Sato and Associates for inclusion in an Environmental Assessment (EA) of the project and will, therefore, become part of the public record.

Introduction

The project site along Honoapi'ilani Highway is located in West Maui immediately northwest of Hekili Point and Olowalu (Fig. 1). The highway serves as the primary conduit for vehicular access to West Maui resort and population centers and is the main road connecting commuters in this region to the economic centers of East Maui and the central plain. Some sections of Honoapi'ilani Highway in West Maui lie close to the ocean shore and are at risk from an eroding shoreline; one such area is in the vicinity of Olowalu, just north of Hekili Point. The southwestern West Maui shoreline has been eroding an average of 0.5 ft/yr (UHCGG, 2008), which has resulted in some places in the highway pavement becoming undercut and utility poles and mature trees standing in the upper intertidal zone. Numerous protective measures have been employed over the years, including basalt boulders, poured concrete, and concrete pylons; these have generally proven ineffective over time. Therefore, design alternatives are being studied to find a solution to protect Honoapi'ilani Highway from erosion damage in the Olowalu area (see EKNA, 2008).

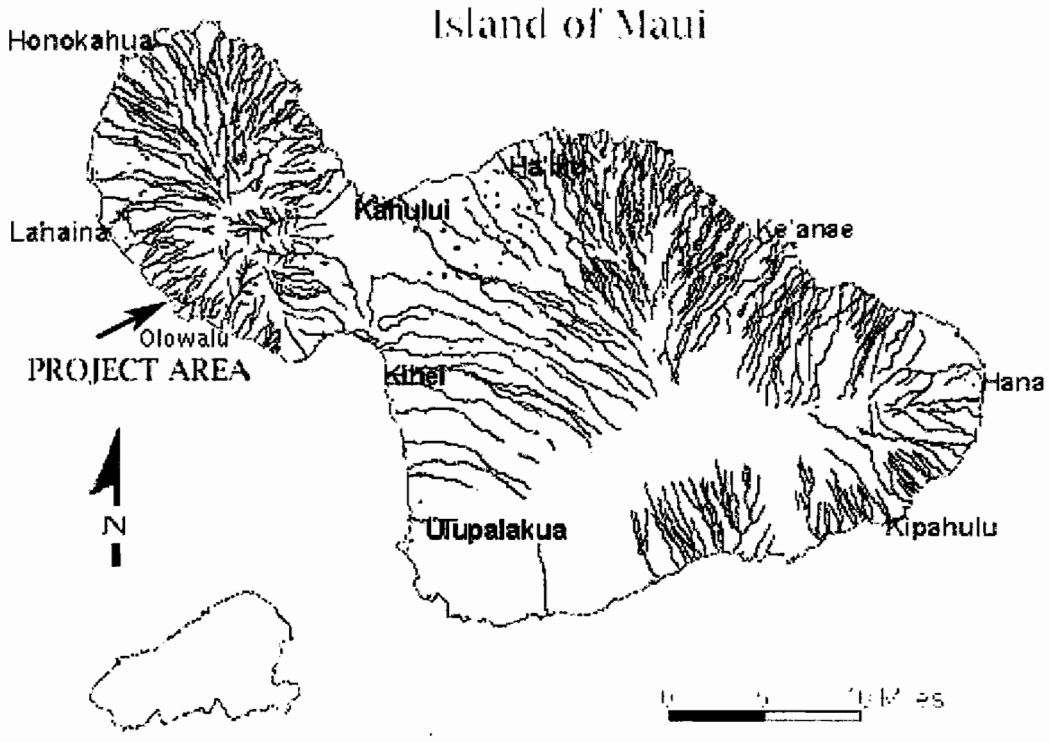

Figure 1. Project location north of Hekili Pt. and Olowalu on the Island of Maui.

Proposed alternatives include constructing a boulder fill barrier, placing cobbles along the shoreline and nearshore waters, and relocating the highway 15 ft (4.6 m) inland of the receding shoreline (see Appendices A and B). The shoreline beach is widest at the two ends of the project area and narrowest at the middle. The footprint of the preferred boulder fill alternative would cover the 1000- ft (305- m) length of the project area and extend seaward up to 40 ft (12 m) from the existing shoreline. The footprint of the cobble beach alternative would also cover the entire length of the project area and extend up to 90 ft (27 m) out from the high tide shoreline.

Figure 2. Biological survey area along Honoapi'ilani Highway north of Hekili Point at Olowalu, Maui (photo from UHCGG, 2008).

A field reconnaissance survey for this project was conducted on April 16, 2008 by *AECOS* biologists, Katie Laing and Susan Burr. The two biologists conducted—within the survey area as shown in Fig. 2, above—surveys of the backshore, intertidal zone, and inshore sub- tidal environment for flora and fauna and collected water samples for physical and chemical analysis. The purpose of this report is to identify any sensitive

biological resources present in and around the project area that may be adversely impacted by the project. This report includes results from a marine biological survey, a shoreline biological survey, and water quality sampling in the project area.

Results

Environment Descriptions

The Olowalu coastline is used by surfers, swimmers, snorkelers, kayakers, and campers. Numerous parking areas and trails are available along the highway to access the shore. This shoreline is exposed to southerly swells, generally in the summer months, but otherwise a small shore break allows easy entry to the ocean. The flat and narrow coastal plain inland of the beach was, until recently, planted in sugar cane. Inland of the coastal plain, the topography gradually slopes up to the steep West Maui Mountains. This leeward coast is generally quite dry. South of the project site, near the middle of Hekili Point, perennial Olowalu Stream discharges into nearshore waters and, particularly during high rainfall events, contributes terrigenous sediment to the nearshore environment.

Figure 3. Shoreline fronting Honoapi'ilani Highway in project area. Note eroding shore reaches the roadway in this location. (Photograph taken around mid- tide, facing north).

The southwest facing shore in the project area (Fig. 3, above) ranges from large boulders and rock rubble in the south to water worn cobbles and deposits of black sand in the north (Fig. 4). Fronting the shoreline is a fringing reef and rocky shoals that extend seaward into deeper waters (UHCGG, 2008). The shallow nearshore waters in the project area are generally less than 2.8 ft (1 m) deep and create a broad intertidal zone. Swells sweep up along the coast from the south forming waves suitable for surfing off the north end of the project area.

Figure 4. Project area viewed looking south on April 16, 2008 during a 2- 3 ft south swell and high tide (LHW) of roughly 1 ft.

Olowalu is within the boundaries of the Hawaiian Islands Humpback Whale National Marine Sanctuary. The sanctuary was established in 1992 to protect endangered humpback whales (*Megaptera novaengliae*) and their habitat (HIHWNMSA, 2008).

Terrestrial Vegetation

A terrestrial vegetation survey was conducted by the two biologists walking the project coastline on the seaward side of Honoapi'ilani Highway. Photographs and samples were taken to aid in identification of plants not immediately recognized in the field. A list of observed taxa are provided in Table 1.

Table 1. Terrestrial plant species observed along backshore at Honoapi'ilani Highway Improvement Project area at Olowalu, Maui.

FAMILY Species	Common name	Status	Abundance	Area
	FLOWERING PLANTS DICOTYLEDONE			
ASTERACEAE				
Crassocephalum crepidioides (Benth.) S. Moore		Nat	R	1
Pluchea carolinensis (Jacq.) G. Don	sourbush	Nat	C	2
CHENOPODIACEAE				
Atriplex semibaccata R. Br.	Australian salt bush	Nat	A, A	1,2
Chenopodium murale L.	lamb's quarters	Nat	C, R	1,2
COMBRETACEAE				
Terminalia catappa L.	false *kamani*	Nat	O	1
CUCURBITACEAE				
Coccinia grandis (L.) Voigt	scarlet- fruited gourd	Nat	U	1
EUPHORBIACEAE				
Chamaesyce hirta (L.) Millsp.	garden spurge	Nat	U	1
Ricinus communis L.	castor bean	Nat	U	2
FABACEAE				
Indigofera hendecaphylla Forssk.	creeping indigo	Nat	R	1
Leucaena leucocephala (Lam.) deWit	*koa haole*	Nat	U	1
Macropitilium atropurpureum (DC) Urb.			R	1
Pithecellobium dulce (Roxb.) Benth.	*'opiuma*, Manila tamarind	Nat	R	1
Prosopis pallida (Humb.&Bonpl. ex Willd.) Kunth	*kiawe*	Nat	U	2
MALVACEAE				
Hibiscus tiliaceus L.	*hau*	**Ind?**	O	1
Sida fallax Walp.	*'ilima*	**Ind**	R	2
MYOPORACEAE				
Myoporum sandwicense A. Gray	*naio*	**Ind**	R	2
SOLANACEAE				
Nicotiana glauca R.C. Graham	tree tobacco	Nat	R	1
	MONOCOTYLEDONES			
ARECACEAE				
Cocos nucifera L.	*niu*, coconut	**Pol**	C	1
POACEAE				
Cenchrus ciliaris L.	buffel grass	Nat	O, O	1,2
Chloris barbata (L.) Sw.	swollen fingergrass	Nat	A, O	1,2
Cynodon dactylon (L.) Pers.	Bermuda grass	Nat	O	1

Legend to Table 1

Status = distributional status
- **End.** = endemic; native to Hawaii and found naturally nowhere else.
- **Ind.** = indigenous; native to Hawaii, but not unique to the Hawaiian Islands.
- **Ind.?** = believed indigenous, but uncertain; may be an early Polynesian introduction.
- Nat. = naturalized, exotic, plant introduced to the Hawaiian Islands since the arrival of Cook Expedition in 1778, and well-established outside of cultivation.
- Orn. = exotic, ornamental or cultivated; plant not naturalized (not well-established outside of cultivation).
- **Pol.** = Polynesian introduction before 1778.

Abundance = occurrence ratings for plants by area on April 16, 2008.
- R – Rare - only one or two plants seen.
- U - Uncommon - several to a dozen plants observed.

Table 1 (continued)

	O - Occasional -	found regularly, but not abundant anywhere.
	C - Common -	considered an important part of the vegetation and observed numerous times.
	A - Abundant -	found in large numbers; may be locally dominant.
	AA - Abundant -	abundant and dominant; defining vegetation type.
Notes:		
	(1) - Project area in general, makai of highway.	
	(2) - Along *muliwai* (drainage ditch) located just north of project site.	

The narrow strip of land between the Honoapi'ilani Highway and the ocean is altered due to extensive vehicular use and occasional high wave conditions. The terrestrial habitat is generally dry, and the substratum is a mixture of basalt and carbonate sands overlaying hard- packed clay. The plant assemblage is dominated by species adapted to harsh dry coastal conditions, being mostly ruderal weeds (Fig. 5), with the exception of several native plants observed along the sides of a drainage ditch (*muliwai*; Figs. 6 and 7) at the north end of the survey area. Of the 21 plant species recorded in the area, three plants are indigenous to the Hawaiian Islands: *hau* (*Hibiscus tiliaceus*), *'ilima* (*Sida fallax*) and bastard sandalwood or *naio* (*Myoporum sandwicense*). The coconut palm (*Cocos nucifera*) is considered an early Polynesian introduction. All other plants observed are considered naturalized plants: non- natives that have become established in the wild since the arrival of Captain Cook in 1778.

Figure 5. Ruderal weeds adjacent to parking area at north end of Honoapi'ilani Highway project site at Olowalu, Maui on April 16, 2008.

Figure 6. Vegetation associated with outlet and *muliwai* of north drainage ditch.

False *kamani* (*Terminalia catappa*) trees occur beyond the backshore near the highway. Coconut palms (*Cocos nucifera*) line the shoreline where erosion has brought the tides closest to the highway (Figs. 3 and 4, above). At the north end of the area, a stand of *kiawe* (*Prosopis pallida*) trees, small shrubs (*Pluchea carolinensis, Myoporum sandwicense, Leucaena leucocephala,* and *Sida fallax*), and grasses (*Cenchrus ciliaris,* and *Chloris barbata*) occur along the margins of a *muliwai* of a drainage ditch (Fig. 5 and 8). Across the mid- section of the project area common ruderal weeds (*Coccinia grandis, Chamaesyce hirta,* and *Indigofera hendecaphylla*) and grasses occur among false *kamani* trees and coconut palms. A mixed stand of *kiawe* and *hau* mark the south end of the project area.

Marine Survey

On April 16, 2008, two biologists surveyed flora and fauna of the intertidal and shallow nearshore zones located in the proposed highway improvement project area by walking the area and recording flora and fauna encountered. The high wave conditions during the site visit, allowed only for a series of spot checks in shallow subtidal area. The species of fishes, algae, coral, and other invertebrates were recorded and estimates of relative abundance were noted as provided in Table 2. Photographs were taken to assist

with identifications as necessary. The following sources were used to provide names for the organisms encountered: *Hawaii's Sea Creatures* (Hoover, 1998), *Hawaiian Reef Plants* (Huisman et al., 2007), *Marine Green and Brown Algae of the Hawaiian Islands* (Abbott and Huisman, 2004), and *Marine Red Algae of the Hawaiian Islands* (Abbott, 1999), *Corals of Hawaii* (Fenner, 2005), *Hawaii's Fishes* (Hoover, 1993) and *Shore Fishes of Hawai'i* (Randall, 1996).

Figure 7. *Muliwai* (a brackish pool behind a beach) at the mouth of a drainage ditch beyond north end of project area. Surf site waves and Lana'i are seen in the background.

Table 2. Checklist of marine biota observed in the intertidal and inshore reef environments off the Olowalu project site on April 16, 2008.

PHYLUM, CLASS, ORDER, FAMILY *Genus species*	Common name	Abundance
CYANOPHYTA	BLUE- GREEN ALGAE	
Lyngbya majuscula		R
CHLOROPHYTA	GREEN ALGAE	
Codium edule		U
Halimeda opuntia		U
Microdictyon sp.		R
Neomeris annulata		R
Ulva fasciata	sea lettuce	A
HETEROKONTOPHYTA	BROWN ALGAE	
Asteronema breviarticulatum	*hulu `ilio*	A
Colpomenia sinuosa		R
Dictyota acutiloba		A
Dictyota ceylanica		C
Dictyota friabilis		C
Padina sanctae-crusa		O
Ralfsia pangoensis		O
RHODOPHYTA	RED ALGAE	
Acanthophora pacifica		O
Acanthophora spicifera **	spiny seaweed	C
Ahnfeltiopsis flabelliformis		O
Amphiroa beauvoisii		R
Asparagopsis taxiformis		O
Chondrophycus sp.		C
Dichotomaria marginata		O
Gelidiella sp.		R
Hydrolithon gardineri		C
Hydrolithon onkodes		C
Hydrolithon reinboldii		O
Hypnea cervicornis		C
Hypnea musciformis **	hookweed	A
Hypnea sp.		O
Laurencia mcdermidiae		C
Laurencia nidifica		O
Laurencia sp.		O
Liagora sp.		O
Lithophyllum sp.		R
Lithophyllum kotschyanum		R
Martenisa fragilis		R
Melanamansia glomerata		C
Pterocladiella capillacea		A
RHODOPHYTA (continued)	RED ALGAE	
Trichogloea sp.		R
Yamadaella caenomyce		R
PORIFERA	SPONGES	
indet.	yellow sponge	R
CNIDARIA, ANTHOZOA, ALCYONACEA SCLERACTINIA, POCILLOPORIDAE		
Pocillopora meandrina	cauliflower coral	R

Table 2 (continued).

PHYLUM, CLASS, ORDER, FAMILY *Genus species*	Common name	Abundance
SCLERACTINIA, PORITIDAE		
Porites lobata	lobe coral	R
ANELLIDA, POLYCHAETA	WORMS	
SERPULIDAE		
indet.	tube worm	C
SIPUNCULA	PEANUT WORMS	
indet.	peanut worm	R
MOLLUSCA, GASTROPODA	MOLLUSKS	
PATELLIDAE		
Cellana exarata	black- foot *'opihi*	C
Cellana sandwicensis	yellow- foot *'opihi*	O
Cellana talcosa	giant *'opihi*	R
SIPHONARIIDAE		
Siphonaria normalis	false limpet	R
NERITIDAE		
Nerita picea	black nerite, *pipipi*	A
Theodoxus neglectus	speckled nerite	U
LITTORINIDAE		
Littoraria pintado	dotted periwinkle	C
VERMETIDAE		
Serpulorbis variabilis	variable worm snail	U
MURICIDAE		
Drupa ricina	spotted drupe	R
CONIDAE		
Conus flavidus	yellow cone	R
ARTHOPODA, CRUSTACEA, ISOPODA		
LIGIIDAE		
Ligia sp.	isopod	U
ARTHOPODA, CRUSTACEA, DECAPODA		
XANTHIDAE		
indet.	xanthid crab	R
GRAPSIDAE		
Grapsus tenuicrustatus	*'a'ama*	U
PALINULARIDAE		
Panularis sp.	spiny lobster †	R
ECHINODERMATA, OPHIUROIDEA	BRITTLE STARS	
OPHIOCOMIDAE		
Ophiocoma erinaceus	spiny brittle star	R
ECHINODERMATA, ECHINOIDAE	SEA URCHINS	
DIADEMATIDAE		
Echinothrix calamaris	banded urchin †	R
ECHINOMETRIDAE		
Colobocentrotus atratus	helmet urchin	R
Echinometra mathaei	rock- boring urchin	C
Echinometra oblonga	oblong urchin	U
ECHINODERMATA, HOLOTHUROIDAE		
HOLOTHURIIDAE		
Holothuria atra	black sea cucumber	R

Table 2 (continued).

PHYLUM, CLASS, ORDER, FAMILY *Genus species*	Common name	Abundance
CHORDATA, ASCIDIACEA		
POLYCLINIDAE		
indet.	colonial tunicate	R
VERTEBRATA, PICES	FISHES	
POMOCENTRIDAE		
Abudefduf abdominalis (E)	Hawaiian sergeant, *mamo*	R
Rhinecanthus rectangulus	Picasso triggerfish	R
Canthigaster jactator (E)	Hawaiian whitespotted toby	R

KEY TO SYMBOLS USED IN TABLE 2:

Abundance categories:

R - Rare - Only one or two individuals observed in area.
U - Uncommon - Three to no more than a dozen individuals seen in area.
O- Occasional – Seen irregularly and always in small numbers; more than a dozen individuals in area.
C - Common – Seen regularly, although generally in small numbers.
A - Abundant - Found in large numbers and widely distributed.

Other symbols and categories:

† - Shell, carapace, or test only (not seen alive).
** – Invasive algae – Introduced and invasive (see Smith, 2000)
E – Endemic – Found in Hawai'i and nowhere else.

QC:

Animals were identified in the field on April 16, 2008 by S. Burr and K. Laing.

The purpose of the marine survey is to characterize the various marine organisms in the project area. On the day of the survey there was a light offshore breeze with breakers rolling across the shallows and breaking again on the shore. Conditions offshore were calm. The beach fronting the project area is made up of basalt cobbles with some limestone cobbles. At the north end, just offshore, the bottom is sand. A turbidity plume or zone of turbid water—most evident towards the south end of the project area—discolored the nearshore waters out to just beyond the surf break (Fig. 8).

The marine survey area can be divided into three distinct zones: the supralittoral (uppermost, wave splash) zone, the littoral (intertidal) zone, and the sublittoral (shallow subtidal) zone. The supralittoral zone is made up of a stone cobble beach which is seldom awash. Dessicated molts of various crustaceans (*Echinothrix calamaris, Panularis* sp.) and algae lay cast onto this uppermost part of the shore. A recently dead *Pocillopora meandrina* coral colony was observed washed up here. *'A'ama* (*Grapsus tenuicrustatus*) crabs and isopods (*Ligia* sp.) scurry amongst shoreline boulders. Also found in the transition between the wave splash and upper intertidal are typical supralittoral invertebrates such as *pipipi* (*Nerita picea*), black-footed *'opihi* (*Cellana exarata*), and dotted periwinkle (*Littoraria pintado*), which tend to cluster on boulders and cobbles (Fig. 9).

Figure 8. Turbidity plume extending to just beyond the breakers off the south end of project area.

Dominant algae in the littoral zone (Fig. 10) include a green alga called sea lettuce (*Ulva fasciata*), and a brown alga, *hulu'ilio* (*Asteronema breviarticulatum*). Spotted drupes (*Drupa ricina*) graze algae on the intertidal rocks and boulders. A 10 in (25 cm) diameter, partially live, *Porites lobata* colony was washed into the intertidal zone, the dead portions colonized by algae (*Halimeda* sp., *Neomeris* sp., and *Codium edule*).

In the shallow subtidal zone the crustose coralline red alga, *Hydrolithon onkodes* forms an adherent pink swath on boulders, where the giant *'opihi* (*Cellana talcosa*) and shingle urchin (*Colobocentrotus atratus*) also occur. A conspicuously lush growth of a red-orange alga (*Pterocladiella capillacea*) occurs on lower intertidal boulders off the south end of the project. Four fish species were observed: the endemic Hawaiian white-spotted toby (*Canthigastor jactator*), the endemic Hawaiian sergeant major (*Abudefduf abdominalis*), the reef triggerfish (*Rhinecanthus rectangulus*), and an unidentified slender silver fish, likely an *'iao* (*Pranesus insularum*). Much of the shallow bottom offshore of the north end of the project area is shifting sand, unsuitable for algal colonization. Where boulders exist, an invasive alga (*Hypnea musciformis*) is present. Subtidal algal growth is prominent towards the south end, where a diverse assemblage

of many species (including *Dictyota acutiloba, Codium edule, Laurencia nidifica, Liagora* sp., and *Amphiroa* sp.) occurs. Roughly 30 ft (10 m) from shore, *Dictyota ceylanica* and *Acanthophora spicifera* are dominant on subtidal boulders and cobbles.

Figure 9. Intertidal boulders with two littoral mollusk species: a black nerite (*Nerita picea*) and black- foot *'opihi* (*Cellana exarata*).

In all, a total of thirty- seven algal taxa were identified across the area. This listing includes five green algae (Chlorophyta), seven brown algae (Heterokontophyta), and twenty- five red algae (Rhodophyta). Invertebrates and fishes of the nearshore subtidal find shelter from the impinging waves among a sparse field of boulders and cobbles on a mixture of basalt and carbonate sand. A total of twenty- five invertebrate taxa were observed throughout the survey area including *Holothuria atra, Ophiocoma* sp., various xanthid crabs, and *Echinometra mathaei.* Corals are rare with live coral cover much less than one percent of the bottom; only a few small *Porites lobata* colonies were observed.

Figure 10. Intertidal boulders and cobbles with the green alga, sea lettuce (*Ulva fasciata*).

No sea turtles or other endangered or threatened species were observed in or near the project area during our survey.

Water Quality Survey

Three paired ("shoreline" and 82 ft or 25 m from shore) surface water samples were collected at the north end, middle, and south end of the project area. Shoreline samples were collected in knee-deep water a couple yards (meters) from the shore. The corresponding 25-m samples were collected by swimming out from shore. The location

of the six water quality sampling stations are shown in Fig. 11. The North stations were located off the south end of a parking lot at north end of the project area. The Middle stations were situated off telephone pole No. 371. The South stations were situated offshore of a culvert near the south end of the project area.

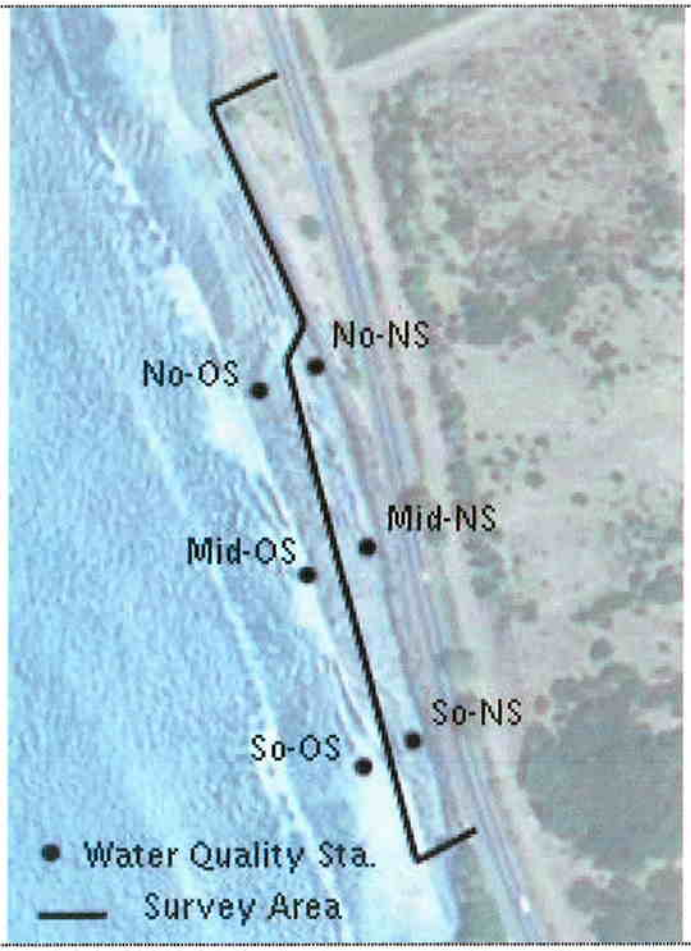

Figure 11. April 16, 2008 biological survey limits and water quality sampling stations.

Samples were collected in appropriate sample containers and placed on ice until transported to the *AECOS* laboratory for analyses (Laboratory Log No. 24021). The following parameters were measured with instruments in the field at the time of sample collection: temperature, dissolved oxygen, pH, and salinity. The parameters measured in the laboratory include salinity, turbidity, total suspended solids, ammonia, nitrate+nitrite, total nitrogen, total phosphorus, and chlorophyll α. All parameters were measured within appropriate hold times. Table 3 lists the instruments and analytical methods used for field and laboratory analyses.

Table 3. Analytical methods and instruments used for water samples collected off of Olowalu on April 16, 2008.

Analysis	Method	Reference	Instrument
Ammonia	alkaline phenol	Karoleff in Grasshoff et al. (1986)	Technicon AutoAnalyzer II
Chlorophyll α	10200 H	Standard Methods, 18th Edition (1992)	Turner Model 112 fluorometer
Dissolved Oxygen	EPA 360.1	EPA (1979)	YSI Model 85 DO meter
Nitrate + Nitrite	EPA 353.2	EPA (1993)	Technicon AutoAnalyzer II
pH	EPA 150.1	EPA (1979)	Hannah Pocket pH Meter
Salinity	bench salinometer	Grasshoff in Grasshoff et al. (1986)	AGE Model 2100 salinometer
Temperature	thermister calibrated to NBS cert. Thermomet. (EPA 170.1)	EPA (1979)	YSI Model 85 DO meter
Total Nitrogen	persulfate digestion /EPA 353.2	D'Elia et al. (1977) / EPA (1993)	Technicon AutoAnalyzer II
Total Phosphorus	persulfate digestion /EPA 365.1	Koroleff in Grasshoff et al. (1986) / EPA (1993)	Technicon AutoAnalyzer II
Total Suspended Solids	Method 2540D (EPA 160.2)	Standard Methods 18th Edition (1992); EPA (1979)	Mettler H31 balance
Turbidity	Method 2130B (EPA 180.1)	Standard Methods 18th Edition (1992); EPA (1993)	Hach 2100P Turbidimeter

D'Elia, C.F., P.A. Stendler, & N. Corwin. 1977. *Limnol. Oceanogr.* 22(4): 760- 764.
EPA. 1979. Methods for Chemical Analysis of Water and Wastes. U.S. Environmental Protection Agency, EPA 600/4- 79- 020.
EPA. 1993. Methods for the Determination of Inorganic Substances in Environmental Samples. EPA 600/R-93/100.
EPA. 1994. Methods for Determination of Metals in Environmental Samples, Supplement 1. EPA/600/R-94/111. May 1994.
Grasshoff, K., M. Ehrhardt, & K. Kremling (eds). 1986. Methods of Seawater Analysis (2nd ed). Verlag Chemie, GmbH, Weinheim.
Standard Methods. 1992. Standard Methods for the Examination of Water and Wastewater. 18th Edition. 1992. (Greenberg, Clesceri, and Eaton, eds.). APHA, AWWA, & WEF. 1100 p.

The primary purpose of the April 16, 2008 water quality measurements was to characterize the existing marine environment, not to set baseline values or determine compliance with State of Hawai'i Water Quality Standards (HDOH, 2004). In fact, the state criteria for all nutrient measurements, chlorophyll α, and turbidity require comparison of geometric mean values, so a minimum of three separate samples per

station would be needed to generate the proper statistics (HDOH, 2004). Ideally, multiple samplings would encompass a "typical" range of conditions for the location, including but not limited to such events as rising, and ebbing tide, wet and dry weather periods, and even storm events. Nonetheless, our results can be reviewed against the water quality criteria for open coastal waters, realizing that limitations as to the representativeness of these samples must exist.

For the April 16, 2008 sampling event, the predicted low tide of 0.2 feet (lower low water or LLW) occurred at 7:36 am and the afternoon high tide was predicted at 1.2 feet (lower high water or LHW) around 1:34 pm (NOAA/NOS, 2008; corrected for Lahaina). According to the predicted tidal information, the samples were collected during a rising tide. The winds were calm to light from the east (offshore wind). The weather was sunny and no significant rainfall was recorded for the region within the 10 days preceding the water sampling event (NOAA, 2008). Seas were calm offshore and surf break was located approximately 80 to 160 ft (25 to 50 m) offshore. A turbidity plume extending to about 490 ft (150 m) offshore was noted during the morning hours. This plume appeared to be coming from the south and dissipating towards the north. The plume was still evident during the afternoon water quality sampling period. This plume appeared to be the result of suspension of nearshore bottom sediments due to wave action; i.e., the plume did not appear to be the result of ongoing runoff. Sand grains were suspended in the water during collection of the nearshore water quality samples.

The results of the April 16 water quality sampling effort are shown in Table 4. There was little variation in water temperature either alongshore or offshore with total variation between all stations being only 0.3 C°. Dissolved oxygen (DO) levels were somewhat more variable, but supersaturated conditions (saturation greater than 100%) were measured at all stations on this date and time. pH was fairly constant across the survey area, ranging from 8.23 to 8.28 at all stations except Station No- NS (North-nearshore) where a low of 8.14 was recorded. Salinity was also fairly constant in the survey area, ranging from 34.1 to 34.5 ‰.

Particulates (turbidity and TSS) were high in the northern nearshore portion of the project (Station No- NS) and decreased progressively to the southern end of the study area (Station South- nearshore or So- NS). This pattern was not evident at the offshore stations for TSS but was for the turbidity results. High TSS values at shallow, wave washed stations typically reflect fine sand suspended by wave action. This sand settles in the instrument during the measurement of turbidity, and may not show up in turbidity results. Since TSS is a weight measurement, this fine sand strongly influences TSS results.

Table 4. Water quality characteristics at the Olowalu project site north of Hekili Pt. from samples collected on April 16, 2008.

STATION	Time Sampled	Temp. (°C)	Dissolved Oxygen (mg/l)	Dissolved Oxygen (% sat.)	pH --	Salinity (o/oo)
No-NS	1205	26.4	7.19	108	8.14	34.3
Mid-NS	1245	26.3	7.08	106	8.28	34.5
So-NS	1225	26.3	7.14	107	8.25	34.1
No-OS	1315	26.3	7.05	106	8.23	34.4
Mid-OS	1250	26.1	7.25	108	8.26	34.4
So-OS	1235	26.3	7.22	108	8.23	34.4

STATION	Turbidity (NTU)	TSS (mg/L)	Ammonia (µg N /L)	Nitrate + Nitrite (µg N/L)	Total N (µg N/L)	Total P (µg P/L)	Chl α (µg /L)
No-NS	9.12	50.7	< 1	3	275	75	1.34
Mid-NS	7.20	23.5	< 1	4	280	56	2.04
So-NS	2.80	15.9	< 1	5	313	43	1.14
No-OS	4.22	19.2	< 1	1	254	44	1.16
Mid-OS	2.84	19.0	< 1	1	282	52	1.06
So-OS	2.07	20.3	< 1	1	281	39	1.10

Ammonia was undetectable at all stations, whereas nitrate + nitrite concentrations were slightly higher at nearshore stations (NS stations) when compared with the offshore stations (OS stations). Total nitrogen (Total N) tended to increase in concentration from north to south in both the nearshore and offshore stations. Total phosphorus (Total P) decreased from north to south in the nearshore stations and showed no specific trend in the offshore stations. There was no particular pattern in chlorophyll α distribution except that it tended to be somewhat higher at the nearshore stations, where contamination with small benthic algal fragments in the wave washed waters is a possibility.

Discussion

Alternative Actions

Proposed alternative actions for shore protection include: 1) constructing a low wall of large boulders (boulder fill), 2) building a wide cobble beach along the shoreline, and 3) shifting the highway 10 to 15 ft (3.0 - 4.6 m) inland of the eroding shore (see Appendix A). The existing beach is widest at the two ends of the project area and narrowest at the middle. The footprint of the preferred boulder fill alternative would cover the 1000 ft (305 m) length of the project site and extend up to 40 ft (12 m) offshore. The footprint of the cobble beach alternative would also cover the entire length of the project site and extend up to 90 ft (27 m) offshore.

Direct biological impacts associated with placement of boulder fill include burial of parts of the existing and intertidal environment which is primarily boulders and cobbles. Benthic organisms that would suffer direct burial include algae, snails, crustaceans, and other invertebrates. The shallow intertidal zone with cobble and boulder substrate is important fish habitat used by all fish life stages providing food resources (algae, corals, invertebrates, other fishes, etc.), egg laying surfaces, and shelter. Most fishes are mobile and will leave the area during construction activities. Fishes and benthic invertebrates will return after construction is complete and organisms will readily re-colonize the new exposed hard surfaces. No rare or endangered species would be lost in this already disturbed environment.

The basalt boulder design would require placement of materials within the supratidal and intertidal zones, while the cobble design would extend well out into the shallow subtidal zone. None of the designs would extend past the shallow subtidal boulder field to the offshore part of the reef flat.

Table 5. Area of direct impact by ecological zone for two alternative actions (provided by Sato and Assoc.).

Boulder Fill Alternative:
Intertidal Area (+2.0 to -1.0 ft) = 13,700 sf
Subtidal Area (-1 ft & deeper) = 0

Cobble Beach Alternative:
Intertidal Area (+2.0 to -1.0 ft) = 34,700 sf
Subtidal Area (-1 ft & deeper) = 42,600 sf

The beach at the project site is naturally composed of cobbles and sand. Moving the highway further inland and making no other shoreline improvements will result in

continued erosion at the shore with sediment loading into the nearshore environment. Replacing or adding cobbles could be at best a temporary solution, while armoring the high erosion areas with boulder fill is a long- term solution. Armoring the beach with boulders should improve water quality (particulate levels) by halting adverse effects on water quality of the erosion of the backshore and perhaps act as a trap for particulates washed onto the beach by high surf events.

Marine Biota

Minimal background information is available for the immediate stretch of coastline involved in the Honoapi'ilani Highway improvements at Olowalu. However, surveys have been conducted on the reefs just south of the project site (Olowalu Reef) and 3.3 miles (8 km) to the north (Puamana Reef) near Lahaina.

The project site is impacted by terrigenous sediment runoff, occasional wave events, and bottom sediment resuspension. Many years of sugar cane cultivation and related runoff have led to deposits of terrigenous sediments in the nearshore environment, which are known to impair coral settlement (Hodgson, 1990; Te, 1992), growth and survival (Piniak, 2007). Terrigenous sediments are more deleterious than resuspended carbonate sands. Corals can show signs of impairment when exposed to sediment burial for as little as six hours and periods of longer exposure (30 hr) can lead to extensive tissue damage (Piniak, 2007). The shallow subtidal zone fronting the project site can become quite dynamic during high wave events, toppling coral heads and washing entire colonies onto the shore, as observed in one case in the present survey. Continued erosion of soils along the project area compounds the nearshore sedimentation problem.

Similar problems with coastal erosion occur at Puamana, where the reef is impaired by run- off and sedimentation events and is also an area of coastal erosion causing potential encroachment on the highway. Puamana is located immediately south of Lahaina Small Boat Harbor and is downstream from an upland region which, until recently, was extensively under sugar cane cultivation. Puamana Reef has been surveyed several times over the last three decades (Grigg, 1991; SEI, 2002; CRAMP, 2008). These reef surveys took place in waters greater than 9 ft (3 m) deep, unlike the present survey area at Olowalu which is generally an intertidal zone or less than 3 ft deep. CRAMP (2008) describes Puamana as having low coral cover (less than 10 percent), high sedimentation rates, low topographic complexity, low fish abundance, high levels of fine sediments with a high content of terrigenous material, moderate algal cover and no rare or unusual species. *Porites lobata* and *Pocillpora meandrina* are the common corals at Puamana.

Another site nearby the Olowalu Reef is located immediately south of Hekili Point. Olowalu Reef is located upcurrent (USGS, 2003) from Olowalu Stream and in contrast to

the project area has a topographically complex reef with moderate to high coral cover (CRAMP, 2008). It is a popular diving and snorkeling destination regularly visited by shore divers and charter boats. The gradual slope of the reef slope attenuates wave energy over the complex reef flat. Coral cover is roughly 20 percent at a depth of 9 ft (3.3 m) and roughly 50 percent at a depth of 28 ft (10 m). The dominant coral species in the shallow depths are encrusting *Montipora flabellata* and the mound forming *Porites lobata.* The deeper areas of Olowalu Reef have substantially higher coral cover than do the shallow areas and rank 8th out of 60 sites surveyed across the state; Puamana reef ranked 35th (CRAMP, 2008). Greater coral cover occurs in deeper water at Olowalu reef, where suspended sediments and wave action are less of a hindrance to coral growth. However, high turbidity levels exist during south swells due to the resuspension of fine sediments deposited on the bottom. Further, an abundance of algae suggests elevated nutrient levels in the nearshore waters. The most abundant fishes are the lavender tang (*Acanthurus nigrofuscus*) and the saddle wrasse (*Thallasoma duperrey*), two of the most common shore fishes of Hawai'i.

Four species—the humpback whale (*Megaptera novaeangliae*), the spinner dolphin (*Stenella longirostris*), the hawksbill sea turtle (*Eretmochelys imbricata*), and the green sea turtle (*Chelonia mydas*)—protected under the Endangered Species Act of 1973 (Federal Register, 1999a, 1999b, and 2001) and Hawaii Administrative Rule (DLNR, 1998), are known from the marine environment in the project vicinity. Prior to initiating our survey, a pod of approximately seven humpback whales and a pod of several spinner dolphins were observed 7 miles south of the project area at Ma'alaea Bay. The shallow waters of west Maui are important calving, breeding, and nursing areas for the humpback whale between December and May each year (Forestell and Brown, 1991). When not migrating, the humpback whales occur close to shore. The threatened green sea turtle (*Chelonia mydas*) and the endangered hawksbill sea turtle (*Eretmochelys imbricata*) are known to frequent nearby Ma'alaea Bay (SRGII, 2004).

Water Quality

Waters of the Olowalu coastline are designated as Class A (HDOH, 2004) with state water quality criteria pertaining to either "wet" and "dry" conditions (Table 6). The coastal waters off Olowalu fall into the "dry" set of criteria due to a low rainfall climate on this leeward coast. As stated in the water quality regulations, it is the objective of Class A waters that their use for recreation and aesthetic enjoyment be protected (HDOH, 2004).

Water temperatures were essentially the same at Ukumehame and Puamana and only about 1 C° higher at Olowalu. Salinities were similar at all three sites, as were pH levels. The highest particulate levels (turbidity and TSS) occurred at Olowalu on April 16, being somewhat lower at Puamana and lowest at Ukemehame. Inorganic nitrogen levels were elevated at Ukumehame compared with rather low concentrations recorded at Olowalu

and Puamana. The levels of total N and total P at Olowalu were notably higher compared with these moieties at both Ukumehame and Puamana. Elevated chlorophyll α levels were noted at Ukumehame and Olowalu compared with very low concentrations at Puamana.

Table 6. Selected state of Hawai'i water quality criteria for open coastal waters for both dry (upper value) and wet (*lower value*) coastal areas (HAR §11- 54-05.2; HDOH, 2004).

Parameter	Geometric Mean value not to exceed this value	Value not to be exceeded more than 10% of the time	Value not to be exceeded more than 2% of the time
Nitrate+Nitrite (µg N/l)	3.50 *5.00*	10.00 *14.00*	20.00 *25.00*
Total Nitrogen (µg N/l)	110.00 *150.00*	180.00 *250.00*	250.00 *350.00*
Total Phosphorus (µg P/l)	16.00 *20.00*	30.00 *40.00*	45.00 *60.00*
Chlorophyll α, (µg/l)	0.15 *0.30*	0.50 *0.90*	1.00 *1.75*
Turbidity (NTU)	0.20 *0.50*	0.50 *1.25*	1.00 *2.00*

Two values: upper, "dry" criteria apply when the open coastal waters receive less than three million gallons per day of freshwater discharge per shoreline mile; lower, "wet" (italicized) criteria apply when the open coastal waters receive more than three million gallons per day of freshwater discharge per shoreline mile.

Other "standards":

- pH units shall not deviate more than 0.5 units from a value of 8.1.
- Dissolved oxygen shall not decrease below 75% of saturation.
- Temperature shall not vary more than 1C° from ambient conditions.
- Salinity shall not vary more than 10% from natural or seasonal changes.

For the purpose of comparing the April 16 results with other water quality surveys, statistics were generated combining all six station results (Table 7). These statistics are not valid for comparisons with the water quality criteria in Table 5. Indeed, a cursory examination of the results as presented in Table 4 would suggest the offshore and nearshore samples cannot be justifiably combined, but have been here simply for ease of comparison with water quality results representing two other nearshore waters near the Olowalu project area. These two locations are the Puamana area (SEI, 2002), 3.2 miles (5.2 km) northwest of the Olowalu project site, and off Ukumehame, 3.5 miles (5.6

km) southeast of the project site and monitored by the HDOH for a number of years (STORET, 2008). Results from these surveys are summarized in Table 8.

Table 7. A statistical summary of water quality conditions on 16 April 2008 at the Olowalu project site north of Hekeli Pt.

	Temp. (°C)	Dissolved Oxygen (% sat.)	pH --	Salinity (o/oo)	Turbidity† (NTU)	TSS† (mg/L)
mean	26.3	107	8.23	34.4	4.07	22.79
range	26.1 - 26.4	106 - 108	8.14 - 8.26	34.1 - 34.5	2.07 - 9.12	15.9 - 50.7
count (n)	*6*	*6*	*6*	*6*	*6*	*6*
	Ammonia † (µg N /L)	Nitrate + Nitrite† (µg N/L)	Total N† (µg N/L)	Total P† (µg P/L)	Chl α† (µg /L)	
mean	<1	2	280	50	1.27	
range		1 - 5	254 - 313	39 - 75	1.06 - 2.04	
count (n)	*6*	*6*	*6*	*6*	*6*	

† Denotes geometric mean. See text for limitations on using these values.

Conclusions

Terrestrial Vegetation

Terrestrial vegetation at the project site consists of plant species common to West Maui and is dominated by introduced trees and ruderal weeds. There are no particular concerns regarding this terrestrial vegetation, although replacement of lost trees would be an important improvement to the coastline between the highway and the shore. Species now present, such as the *kiawe* should be permanently removed and replaced by indigenous trees and shrubs such as *kou* (*Cordia subcordata*), *milo* (*Thespesia populnea*) and *naupaka* (*Scaevola sericea*), that are more appropriate to the setting, provide better shade for beach users, and (unlike *kiawe*) lack spines.

Marine water quality off the Olowalu project site is generally comparable with two nearby reference sites, the main exceptions being higher turbidity, total N and total P levels at Olowalu. It is certainly possible that these higher levels are related to the eroding shoreline conditions at this site, causing particulates and nutrients to be loaded into the nearshore coastal waters.

Table 8. A statistical summary of water quality conditions from marine waters in the vicinity of Olowalu project site (data after SEI, 2002 and STORET, 2008).

	Temp. (°C)	DO (% sat.)	pH --	Salinity (o/oo)	Turbidity (NTU)	TSS (mg/L)
Ukumehame (Sta. ID 000698)						
mean	25.2	88	8.2	33.8	1.15	
range	19.0 - 28.8	36 - 116	7.7 - 8.8	11.6 - 35.0	0.10 - 30.0	
count (n)	*62*	*50*	*50.00*	*105*	*44*	
Puamana						
mean	25.3	104	8.2	35	3.27	9.8
range	24- 3 - 26.4	92 - 115	7.7 - 8.1	34 - 36	0.44 - 15.6	1.8 - 223
count (n)	*7*	*7*	*7*	*7*	*14*	*14*

	Ammonia (µg N /L)	Nitrate + Nitrite (µg N/L)	Total N (µg N/L)	Total P (µg P/L)	Chl α (µg /L)
Ukumehame (Sta. ID 000698)					
mean	9	9	86	11	1.00
range	2 - 58	1 - 100	48 - 162	5 - 40	0.04 - 2.50
count (n)	*46*	*57*	*43*	*32*	*46*
Puamana					
mean	<1	1	127	22	0.18
range		<1 - 2	104 - 226	11 - 69	0.05 - 2.14
count (n)	*14*	*14*	*14*	*14*	*14*

Reef Flora and Fauna

The project will require placement of large basalt boulders on top of existing boulders, cobble, and sand along the shore and intertidal zone fronting the project area. Intertidal and shore organisms within the footprint of the boulder fill will be displaced. No unusual, rare, or remarkable organisms were observed here and the fauna and flora will quickly recolonize newly available substrata. Fishes observed at the project site are common species that were also observed at nearby Olowalu Reef. Most fish species should be able to leave the area during construction. Very little interstitial space occurs in the cobble and boulder field for fishes and invertebrates to hide. Placed boulders could provide a more stable substratum for intertidal flora and fauna. Interstitial spaces created by large boulders of will provide additional habitat and hiding spaces for intertidal fauna.

Coral cover at the project area is very low. The two corals, *Porites lobata* and *Pocillopora meandrina*, observed within the project area are two of the most common nearshore

corals found throughout the main Hawaiian Islands. *Porites lobata* and *Poc. meandrina* are the most abundant corals at Puamana, to the north, and *P. lobata* is the most common coral south of the project area at Olowalu Reef. Corals observed in the project area exist in a dynamic intertidal/shallow subtidal zone and show signs of recurrent damage with many dead portions within individual colonies. The coral heads in this area are not large and the species are not rare or unusual. Coral growth is compromised by impinging waves, scour by rubble and sand, reduced light conditions associated with sedimentation events, and burial with fine sediment. Although placement of boulders in the intertidal area may bury some coral heads these are not highly functional, providing minimal shelter or gametes.

Sea Turtles and Whales

The shoreline in the area of the proposed improvements is mostly rocky, with virtually no sand backshore where turtles might lay eggs. Inland from the cobble beach and rocky shoreline, is an eroding embankment that rises steeply up to the highway (Fig. 3). In a similar coastal area nearby, Grigg (1991) concluded that shoreline alterations would not "pose any significant negative impacts to endangered or threatened species in the area including the Hawaiian green sea turtle, *Chelonia mydas*." Turtles might use the shallow intertidal zone for feeding on algae and the boulder fill would not alter the abundance or types of algae growing here. Either alternative would reduce only the shallowest part of the nearshore environment, least (or not at all) utilized by turtles for feeding.

With respect to humpback whales (*Megaptera novaeangliae*), these animals do not utilize the shallow nearshore waters directly off the proposed project or even the waters close in where turbidity, influenced by runoff, may remain high for long periods of time. The purpose of the project is to reduce shoreline erosion, which should reduce the amount of sediment being contributed to these waters. Therefore, the impact on the waters offshore where whales seasonally occur should be one of no change or improved water quality conditions.

Water Quality

Potential exists for short term impacts from construction activities on the water quality of the nearshore environment. Activities involving mechanical equipment in the vicinity of the shoreline can lead to increased turbidity during the construction period, but construction effects can be mitigated through the use of silt curtains and the curtailment of these construction activities during adverse seas and high rainfall conditions. Elevated wave energy generally occurs during the spring and summer months on south facing shores and heavy rains are generally restricted to winter months.

Temporary increases in suspended sediments as a result of construction activities will cease once the project is complete. More significantly, stabilizing the backshore will reduce terrigenous inputs to the marine environment, a management priority identified and pursued in West Maui (SEI, 2002).

Care must be taken to avoid depositing construction materials and related fluids into the marine environment. Impacts from the discharge of oil, grease, hydraulic fluid, fuel and/or other noxious chemicals could result. Discharges can be mitigated by best management practices (BMPs) including, but not necessarily limited to:

1) the proper storage, handling, and disposal of construction and waste materials
2) ensure washing of construction equipment and other similar activities is done in a manner that allows for the proper disposal of the resultant wastewater
3) ensure heavy machinery is not leaking fluids of any kind
4) the proper use of silt curtains during construction activities
5) water quality monitoring during construction activities to ensure compliance with permit requirements.

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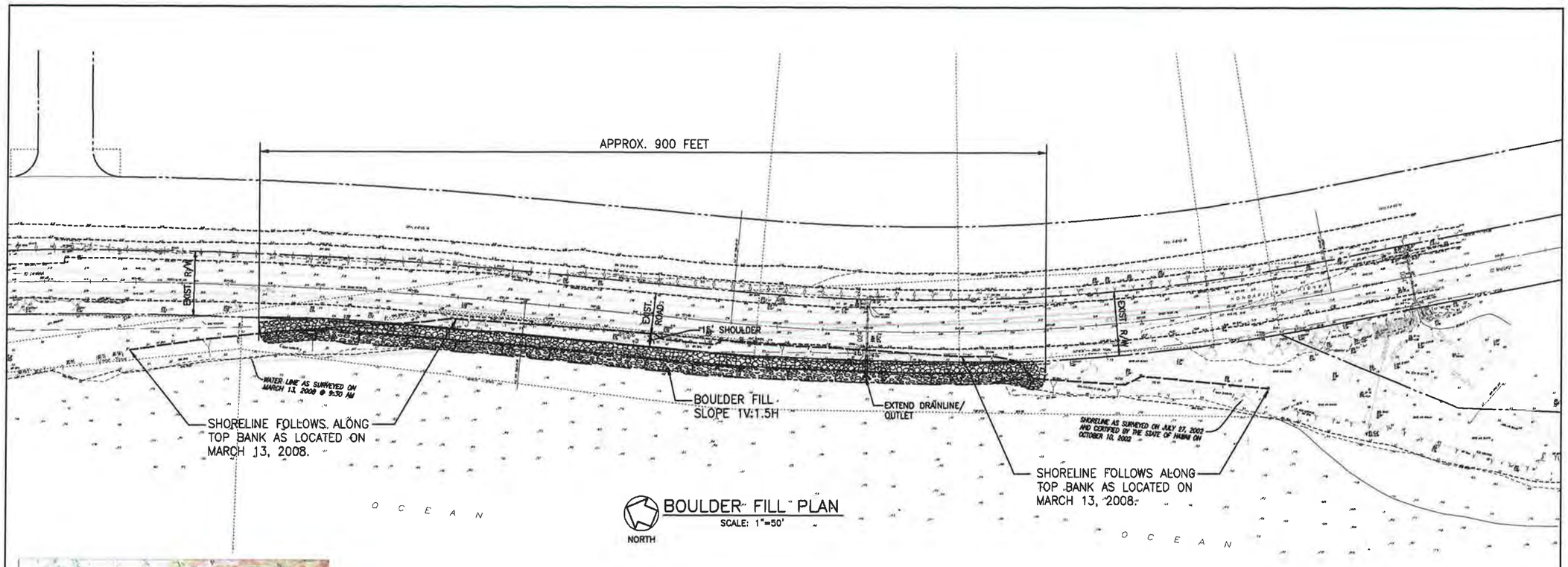

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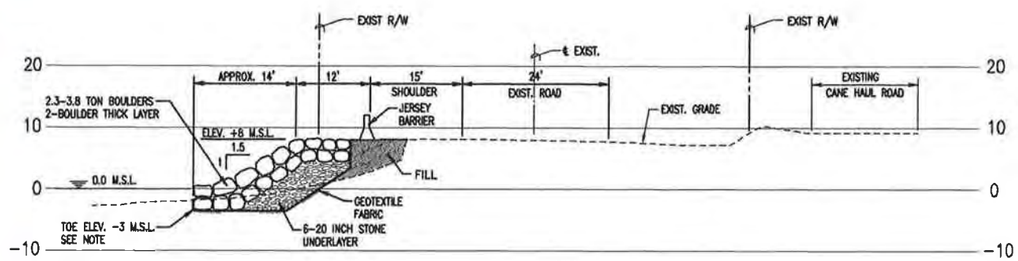

NOTE:
EXCAVATE TOE TO -3.0 M.S.L. OR PLACE ON HARD SUBSTRATE. SUBSTRATE IS TYPICALLY FOUND AT -3.0' OR SHALLOWER.

APPROXIMATE 2.4 C.Y./L.F. UNDERLAYER STONE (6-20 INCH STONES)
APPROXIMATE 4.5 C.Y./L.F. ARMOR STONE (2.3-3.8 TON BOULDERS)
APPROXIMATE TOTAL 6.9 C.Y./L.F. ROCK

ASSUME 900 L.F. FILL = 6,210 C.Y. ROCK

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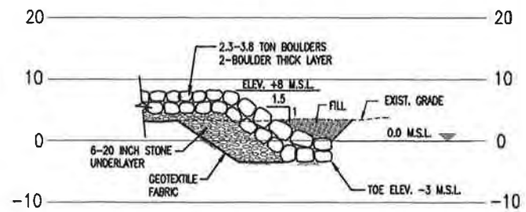

(B) END SECTION
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DRAWN BY:	R.J.M.
CHECKED BY:	R.M.S.

1"=50' 50' 25' 0 50' 100'
1"=10' 10' 5' 0 10' 20'
SCALE IN FEET

SATO & ASSOCIATES, INC.
CONSULTING ENGINEERS • CIVIL & STRUCTURAL
HONOLULU, OAHU, HAWAII • WAILUKU, MAUI, HAWAII

OPTION 1
BOULDER FILL

HONOAPIILANI HIGHWAY SHORELINE PROTECTION
OLOWALU, MAUI, HAWAII
MARCH 2009

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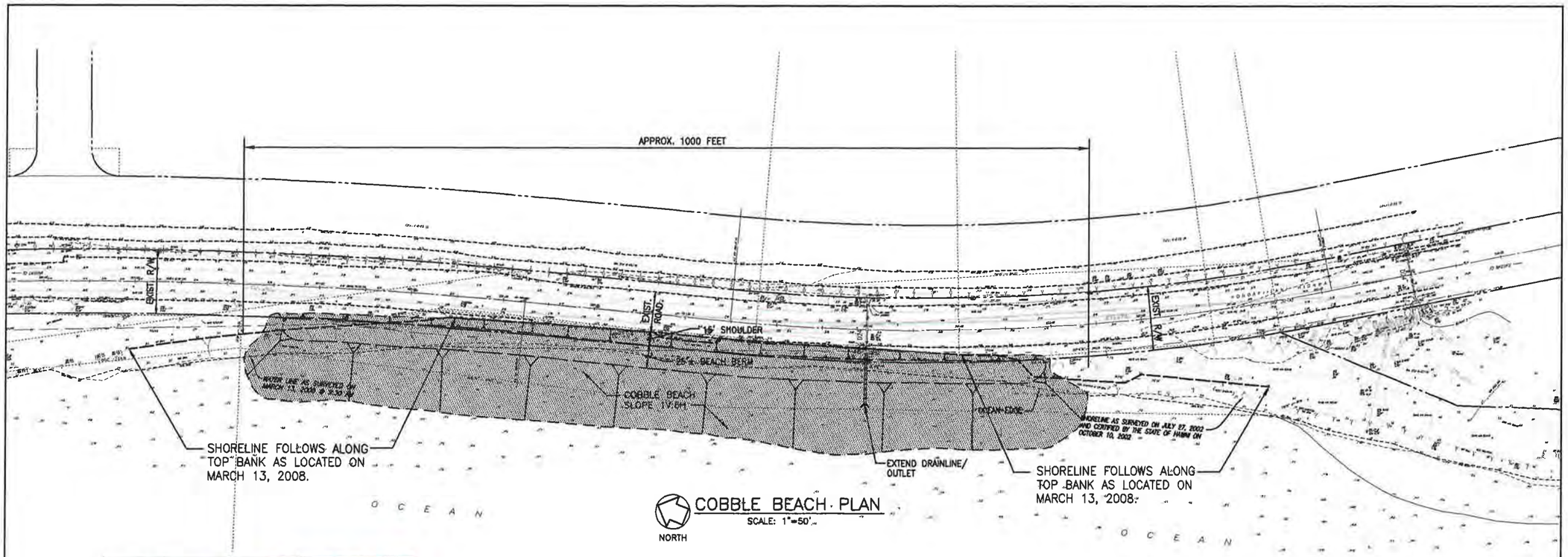

NORTH

COBBLE BEACH - PLAN

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NORTH

LOCATION MAP

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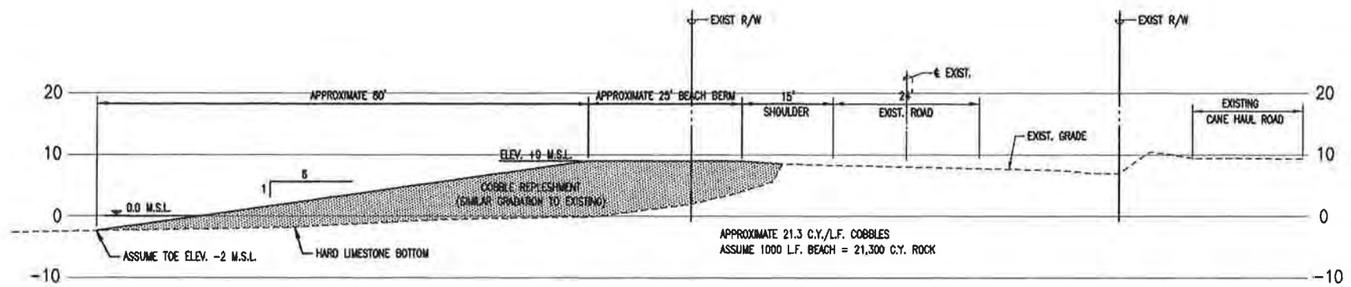

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SATO & ASSOCIATES, INC.
CONSULTING ENGINEERS • CIVIL & STRUCTURAL
HONOLULU, OAHU, HAWAII • WAILUKU, MAUI, HAWAII

SCALE:	AS SHOWN
DESIGN BY:	R.M.S.
DRAWN BY:	R.J.M.
CHECKED BY:	R.M.S.

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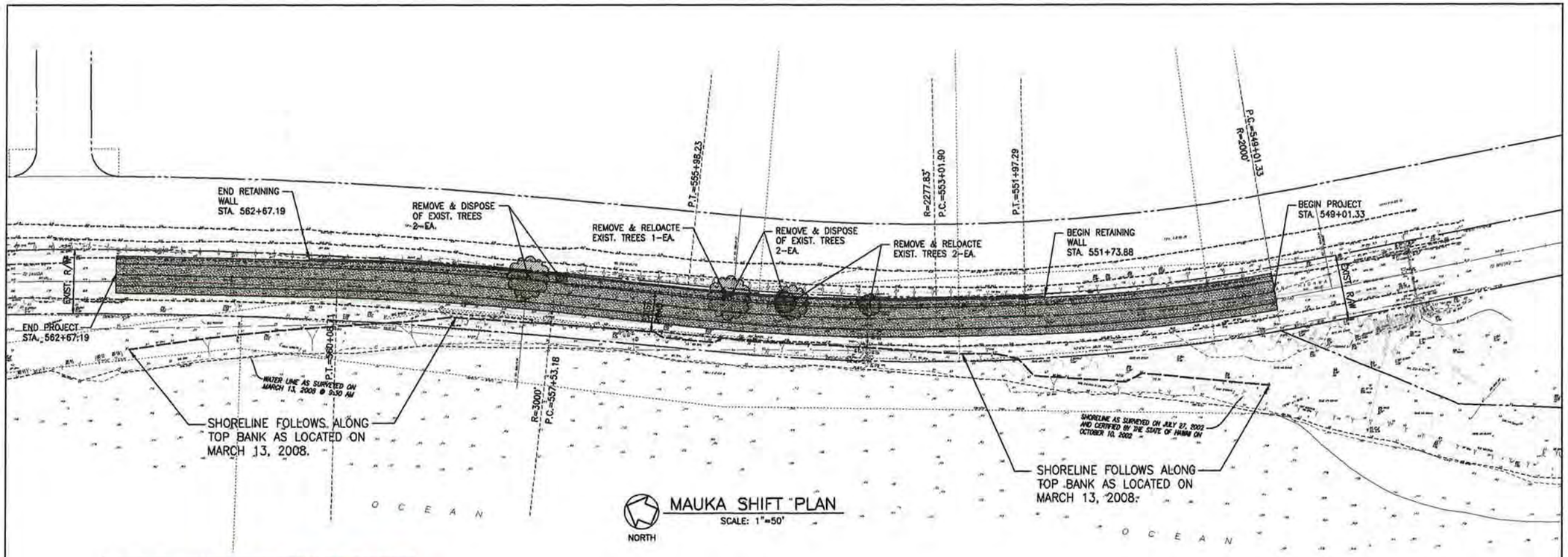
1"=10' 10' 5' 0 10' 20'
SCALE IN FEET

OPTION 2
COBBLE BEACH

HONOAPIILANI HIGHWAY SHORELINE PROTECTION
OLOWALU, MAUI, HAWAII
MARCH 2009



MAUKA SHIFT PLAN
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LOCATION MAP
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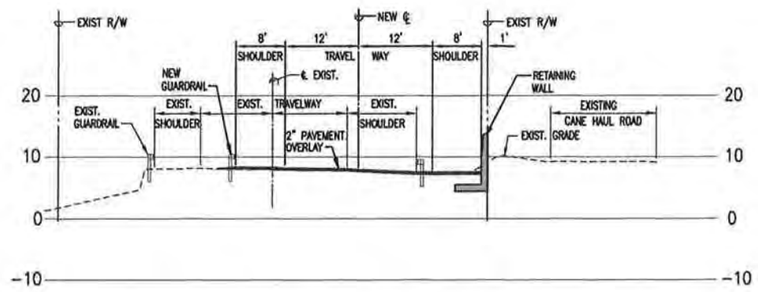

TYPICAL SECTION
SCALE: 1"=10'

SATO & ASSOCIATES, INC.
CONSULTING ENGINEERS • CIVIL & STRUCTURAL
HONOLULU, OAHU, HAWAII • WAILUKU, MAUI, HAWAII

SCALE:	AS SHOWN
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DRAWN BY:	R.K.
CHECKED BY:	R.S.

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SCALE IN FEET

OPTION 3
MAUKA SHIFT

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APPENDIX D.

Archaeological Inventory Survey

SCS Project Number 938-2

ARCHAEOLOGICAL INVENTORY SURVEY OF AN APPROXIMATELY 15,000 SQUARE FOOT CORRIDOR LOCATED IN OLOWALU AHUPUA`A, LAHAINA DISTRICT, MAUI ISLAND, HAWAI`I [TMK: (2) 4-8-003:006 por.]

Prepared by:
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and
Michael Dega, Ph.D.

Revised February 2009

Prepared for:
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711 Kapiolani Blvd. Suite 975 Honolulu, Hawai`i 96813

ABSTRACT

Scientific Consultant Services, Inc. (SCS) conducted Archaeological Inventory Survey of a 15,000 square foot section of coastal land positioned between the western (*makai*) edge of Honoapi`ilani Highway and the eastern edge of the Pacific Ocean [TMK (2) 4-8-003:006 por]. The project area is a portion of the larger (13.802 acres) State of Hawaii owned parcel [TMK: (2) 4-8-003:006] located within Olowalu Ahupua`a, Lahaina District, Maui Island, Hawai`i. During the Inventory Survey one site consisting of three distinct subsurface features (two charcoal concentrations, SSF-1 and SSF-2, and a fire hearth, SSF-3) was newly identified. These features were observed by SCS archaeologists in a naturally occurring profile which was exposed as result of wave action eroding away a small section of the bank. Based on the close spatial relationship of these features, they have been consolidated into a single site and designated State Inventory of Historic Properties (SIHP) Site No. 50-50-08-6480. Site -6480 has been interpreted as temporary, traditional-period (pre-Contact) habitation site associated with the procurement of marine resources. Please note that due to the location of the project area in the shore-break and the high potential of impact to the exposed strata due to wave action, no test excavations were performed. In addition, due to the high potential of contamination resulting from years of being impacted by wave action, no charcoal samples were submitted for radiocarbon dating

Site-6480 is considered significant for information content only under Criterion D of the Hawaii State and National Register of Historic Places. Given the close proximity of Site -6480 to Honoapi`ilani Highway, an active highway, the extent of the site could not be definitively established. It is possible a portion of the site may extend beneath the highway. Furthermore, given the coastal location of the project area there is a high probability that additional significant historic sites, such as habitation and human burials may be inadvertently encountered in the subsurface deposits of the project area. Thus, a program of Archaeological Monitoring is recommended during all ground altering construction activities conducted in the project area and within the Honoapi`ilani Highway corridor.

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INTRODUCTION

Scientific Consultant Services, Inc. (SCS) conducted Archaeological Inventory Survey on approximately 15,000 square feet portion [TMK (2) 4-8-03: 006 por.] of coastal land within Olowalu Ahupua`a, Lahaina District, Maui Island, Hawai`i [TMK (2) 4-8-03: 006 por] (Figures 1, 2, and 3). The project area is a portion of the larger (13.802 acre) State of Hawaii owned parcel located along the western Maui coast between the western edge of Honoapi`ilani Highway and the eastern edge of the Pacific Ocean. Fieldwork was conducted prior to construction of a retaining wall for the exposed and undercut portion of this coastal stretch of the Honoapi`ilani Highway by SCS Archaeologist, Tomasi Patolo, B.A., between April 21 and April 25, 2008, under supervision of Michael Dega, Ph.D., Principal Investigator (Figure 4).

Archaeological Inventory Survey of the project area was conducted to determine the presence/absence of archaeological deposits in surface and subsurface contexts. The Inventory Survey included historic background research and settlement pattern analysis prior to fieldwork.. The fieldwork included a complete (100 percent) pedestrian survey of the project area, recording, mapping, documenting, and photo-documenting the newly identified pre-contact archaeological site. It is important to note the close proximity of the project area to the ocean created an environment nonconductive to subsurface excavations ior to the collection of datable materials. However, a naturally eroded portion of the bank did reveal stratigraphy for the SCS archaeologist to record. The ultimate goal of the Inventory Survey was to determine the presence/absence of significant archaeological sites occurring within the project area and to provide recommendations to the State Historic Preservation Division (SHPD) concerning site mitigation during planned development within the project area.

ENVIRONMENTAL SETTING

LOCATION AND LANDFORM

West Maui is composed of a single volcano, with rift and fracture zones that radiate north to southeast from the caldera. One ridge separates Lahaina District from Wailuku District. Erosion of the volcanic basaltic lava flows that came from the ancient volcano, has formed alluvial soils, which are the predominant soils within the Olowalu region (Macdonald, Abbott and Peterson, 1983 as cited in Fredericksen and Fredericksen, 2000b:3).

Located on in Lahaina district, Olowalu, according to Handy (as cited in Sterling, 1998:24) is, "the largest and deepest valley on the southwest side of Maui and used to support extensive terraced cultivation." Many of these terraces were completely obliterated by canfields.

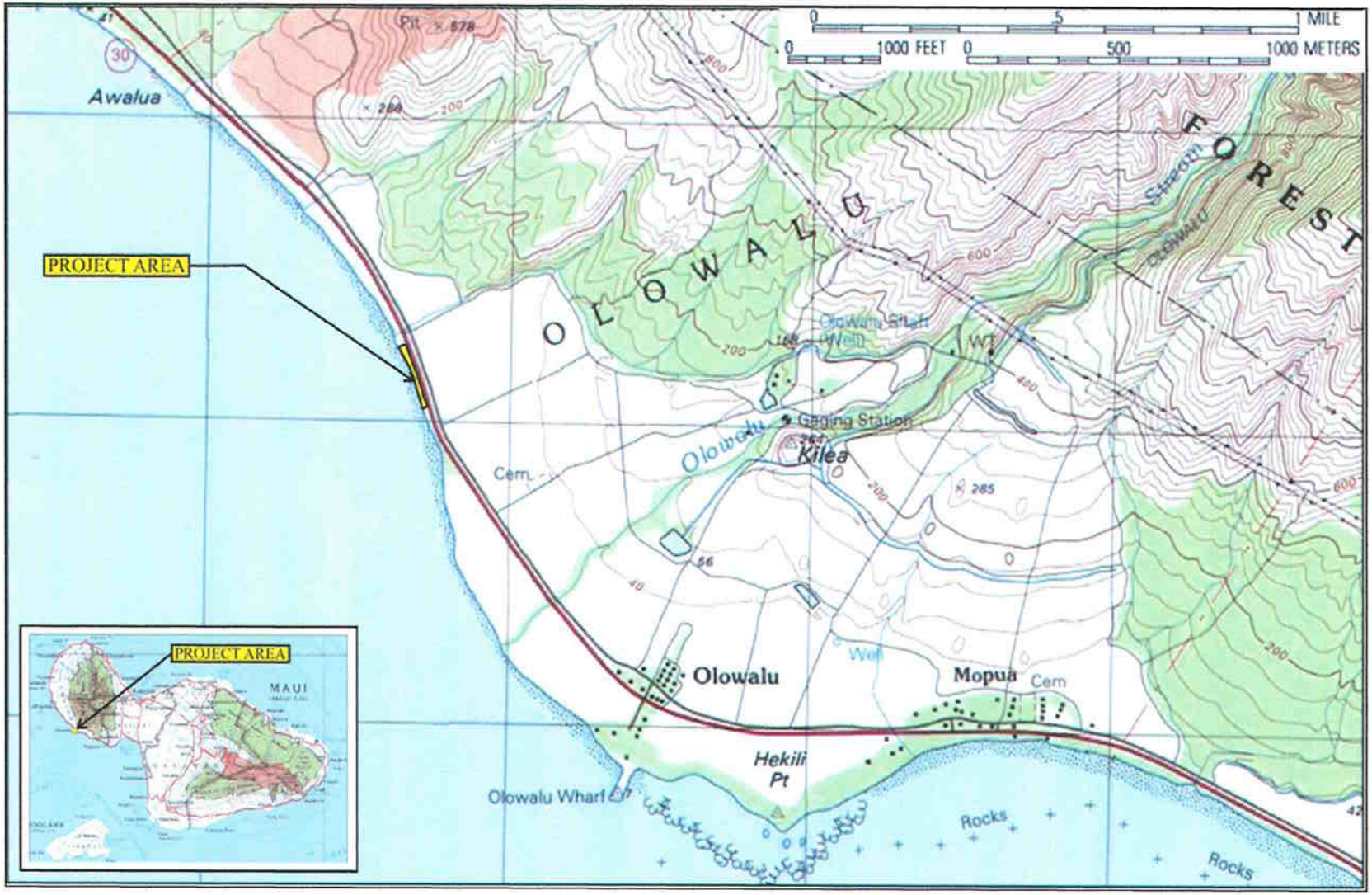

Figure 1: USGS Quadrangle Map Showing Project Area..

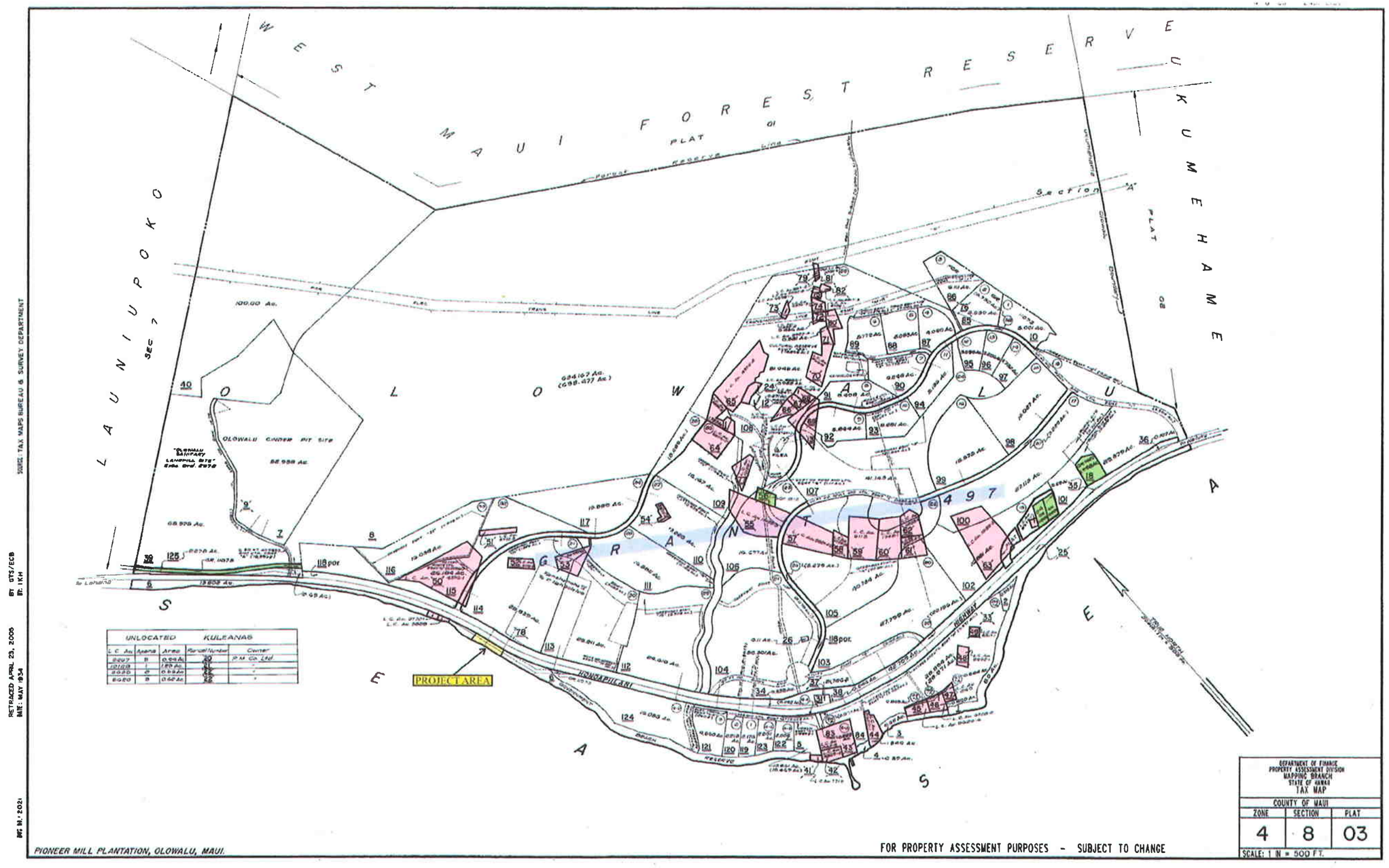

Figure 2: Tax Map Key [TMK] Depicting Project Area in Yellow, LCAs in Pink, and Land Grant Locations in Green.

Figure 3: Aerial Photograph Showing Project Area.

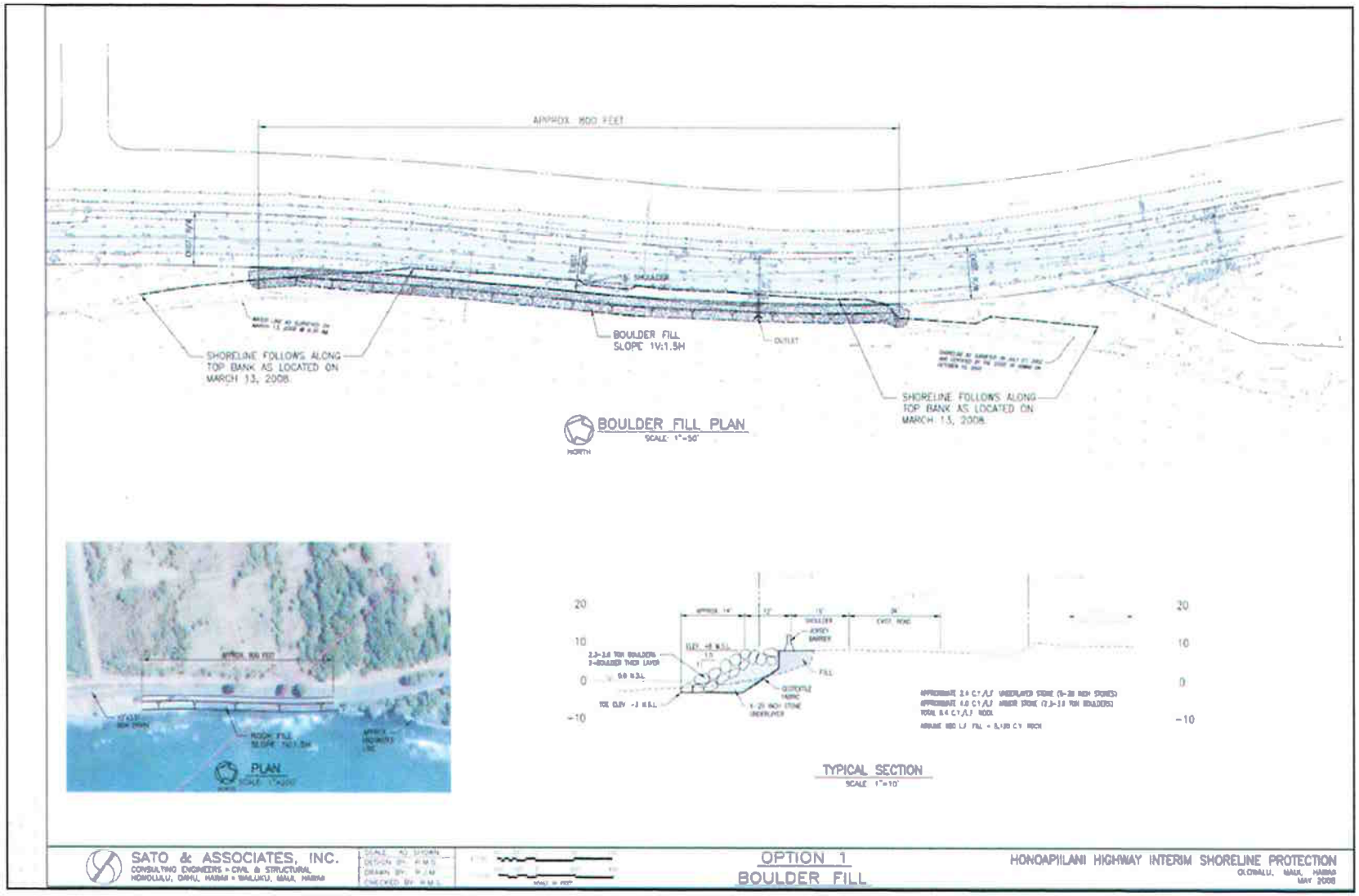

Figure 4: Project Area Construction Plans, Courtesy of Sato and Associates, Inc.

The project area is positioned along the *makai* (ocean-side) portion of the Honoapi`ilani Highway stretching for approximately 1,000 ft, and stretches from the highways's *makai*, or southwest, border to the ocean, for an area of approximately 15,000 ft^2. The project area lies within the USGS Olowalu Quadrangle, and is located approximately one half mile northwest from the Olowalu Stream if traveling on the Honoapi`ilani Highway.

The topography of the project area is most influenced by the ocean to the southwest and the road to the northeast which border the subject parcel. Environs surrounding this small stretch of land are composed primarily of a gentle slope of 0-3 percent grade (Foote et al., 1972:115-116). Elevation within the project area ranges between sea level to less than 10 feet above sea level (from sea level to the southwest border of the Honoapi`ilani Highway).

VEGETATION, SOILS, AND CLIMATE

Vegetation in the project area and the immediate surrounds consists of mostly introduced, post-Contact species. Described by Prince (1983: 70), the project area lies within the "Kiawe and lowland shrubs" zone typical below 1000 feet in altitude. Characteristically, the vegetation in this zone contains *kiawe (Prosopis pallida)*, *koa haole* (*Leucaena leucocephala*), finger grass (*Eustachys* sp.), and pili grass (*Heteropogon contours*) (*ibid.*). Vegetation in the project area is limited given its coastal setting and limited size. Here, introduced low lying shrubs and grasses including Swollen Finger Grass (*Chloris inflate*) as well as several isolated coconut palms (*Cocos nucifera* L.) are present. Within the project area's vicinity, various grasses and low shrubs cover this gentle sloping terrain, and monkey pod trees (*Pithecellobium dulce*) dot the surrounding region's landscape (Plants Database, 2008, Merlin, 1980:42,59) (Figure 5).

As determined by Foote *et al.* (1972), soils in the project area are classified within the Pulehu Series (PtA and PsA) which generally consists of "well-drained soils on alluvial fans and stream terraces and in basins," (Foote *et al.*1972:115). Typically these soils are nearly level to moderately sloping (Figure 6). Pulehu clay loam (PsA) is characteristic of alluvial fans and stream terraces and in basins. In this soil type, permeability is moderate with runoff slow and erosion hazard no more than slight. Available water capacity is about 1.4 inches per food in the surface layer and subsoil. Pulehu cobbly clay loam (PtA) is similar to Pulehu clay loam except that it is cobbly (*ibid.*).

Hydrology of the project area is through rainfall. Given its close proximity to the ocean, the project is exposed to waves and ocean water as well. Foote *et al.* (1972) project these types of soil as receiving approximately 10-35 inches of rain annually, this is further supported by Prince (1983:62) with his given projection of annual rainfall ranging between 10-15 inches.

Figure 5: Photograph Depicting Project Area's and Surrounding Region's Vegetation. View to North.

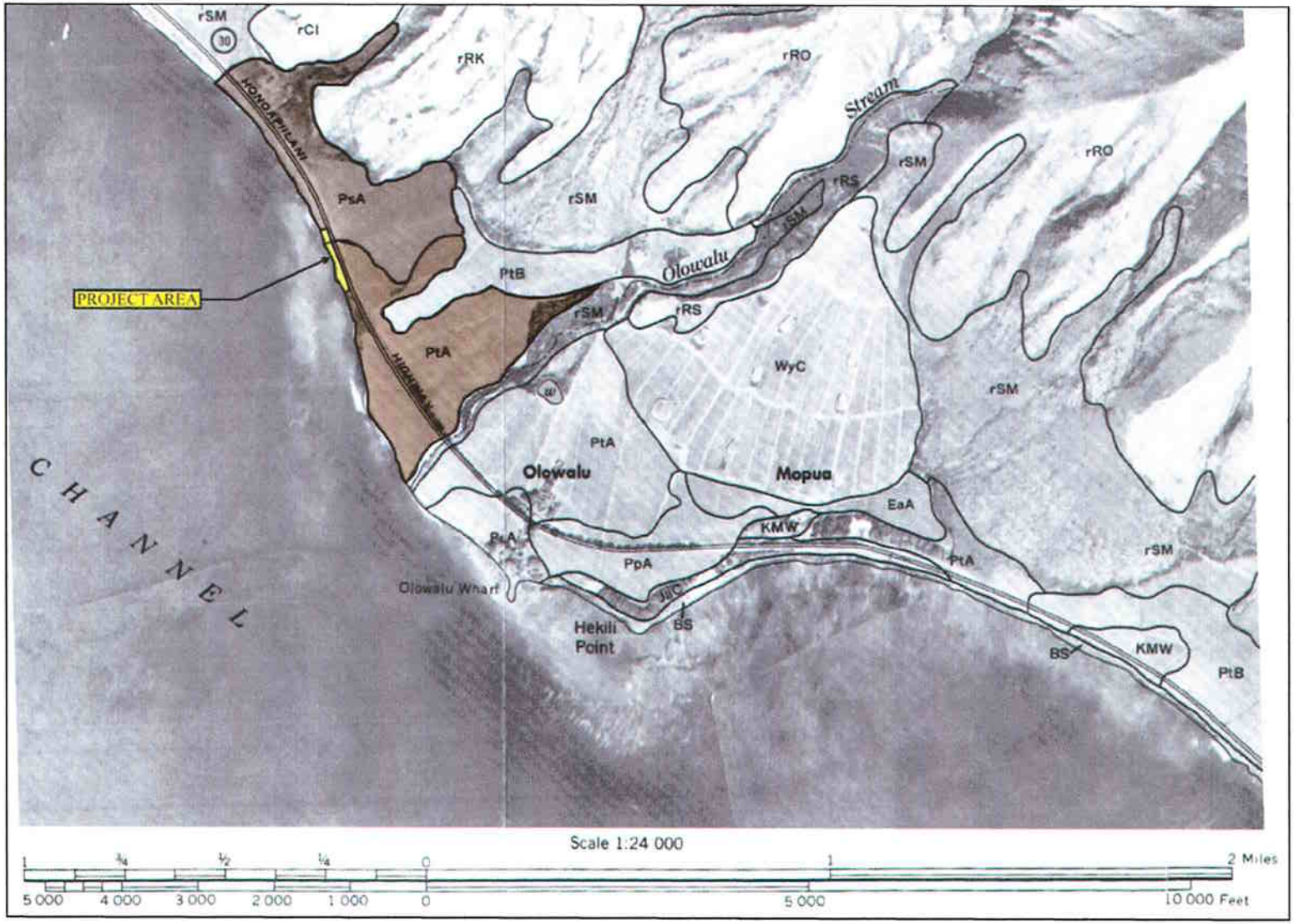

Figure 6: USDA Soil Survey Map Showing Soil Types in the Project Area.

Rainfall studies of Maui conducted by Giambelluca *et al.* (1986: 19,112-124) reveal that during the winter months, this region of Maui receives most of its rain, with the months of December, through February receiving over 30 mm monthly, and January receiving over 60 mm of rain. The months from April to November receive less than 15mm of rainfall per month (*ibid.*: 19).

CULTURAL AND HISTORICAL CONTEXT

The island of Maui ranks second in size of the eight main islands in the Hawaiian Archipelago. Pu`u Kukui, forming the west end of the island (1,215 m amsl), is composed of large, heavily eroded amphitheater valleys that contain well-developed, permanent stream systems that water fertile agricultural lands extending to the coast. The deep valleys of West Maui and their associated coastal regions have been witness to many battles in ancient times and were coveted productive landscapes.

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 *ai`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 and were next to importance to the *ahupua`a*. They 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 Olowalu, meaning literally "many hills" (Pukui *et al.* 1974:170).

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*. 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, such as Olowalu, 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 cultivated. 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 (A.D. 1200-1400) (Kirch 1985:303-306).

WAHI PANA (LEGENDARY PLACES)

Scattered amongst the agricultural and habitation sites were other places of cultural significance to the *kama`āina* (those familiar with the area) of the district. Information concerning only a few has been retained. Three *heiau* were recorded in Olowalu Ahupua`a in the 1920s (Thrum 1908, 1916, 1917; Walker 1930, Sterling 1998). Petroglyphs were inscribed and are still visible on the bare stone sides of a hill about a mile in from the highway past the present Olowalu Store. The figures are of several types, including those of dogs, women, children, letters from the English alphabet, having been drawn during different periods. It was suggested by one *kama`āina* (John Ka`aea Fujishiro, pers. Comm; McGerty and Spear 2005) that this area had functioned as a rest stop before attempting the crossing of the Olowalu mountains to `Īao Valley. As Olowalu is the largest and deepest valley on the southwest side of Maui, Handy recorded in the 1930s:

> ...[Olowalu] used to support extensive terraced cultivation. The lower ranges of terraces have been completely obliterated by canefields; by just where the sugar cane ends and the valley begins there is a little spot where five Hawaiian families, all of them intermarried, raise several varieties of taro in flourishing wet patches. Some of it is sold, but most is pounded by hand for the family poi. There are said to be abandoned terraces far up in Olowalu [1940: 103].

Indeed, in the valley, Walker recorded old taro patches and house sites, a lookout site, and a traditional *`auwai* still in use by the sugar plantation to bring water from the valley to the cane fields as the plantation did with the old *`auwai* in Ukumehame Ahupua`a, next door (Walker 1930; McGerty and Spear 2005).

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. A path along Kealaloa ridge leads to the summit of Pu`u Kukui, the headwaters of many streams, and continues beyond. The Lahaina Pali Trail, constructed in 1841, provided access to other parts of the island, including Wailuku (Tomonari Tuggle 1991, 1995). The most famous of the trails is that used to cross from `Īao Valley to Olowalu and was used by the surviving warriors and *ali`i* (Kalola, Keopolani, Kalanikupule, etc.) of Maui to escape the forces of Kamehameha in the battle of *Kepaniwai* in the 1790s (Kamakau 1961).

Historically, Olowalu is known for the Olowalu Massacre perpetrated by Capt. Simon Metcalf of the ship *Eleanora* in 1790 (*ibid.*). Instead of seeking out and punishing those natives guilty of a crime, Metcalf chose to retaliate on the innocent inhabitants of Olowalu Village. Placing all his ship's guns on the starboard side of the ship, Metcalf encouraged the natives to come in their canoes to trade at which time he fired on them, slaughtering men, women and children (Kuykendall 1938, Vol. I).

Most of the *ahupua`a* on the southern coast have been overshadowed by the famous roadstead and village of Lāhainā which served as the capitol of the Hawaiian Kingdom after the conquest of Kamehameha until 1855. The ethnographic and historic literature, often our only link to the past, reveals that the lands around Lāhainā were rich agricultural areas irrigated by aqueducts originating in well-watered valleys with permanent occupation predominately on the coast. Handy and Handy have stated the space cultivated by the natives of Lāhainā (district) at about "...three leagues [9 miles] in length, and one in its greatest breadth. Beyond this all is dry and barren; everything recalls the image of desolation" (1972:593). Crops cultivated included coconut, breadfruit, paper mulberry, banana, taro, sweet potato, sugar cane, and gourds.

Olowalu Valley, with its permanent stream, was one of the sources along with Ukumehame, Launiupoko, and Kaua`ula, providing agricultural opportunities for the growing leeward population. Handy and Handy reported:

> Southeastward along the coast from the *ali`i* settlement [Lāhainā] were a number of areas where dispersed populations grew taro, sweet potato, breadfruit and coconut on the slopes below and in the sides of valleys which had streams with constant flow. All this area, like that around and above Lahaina, is now sugar-cane land...[1972].

THE 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 1983:4 5, 1998:4; Daws 1968:111; Kuykendall 1938 Vol. I: 145). The 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 made available and private ownership was instituted, the *maka`āinana*, 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).

There were 88 claims for land in Olowalu during the Māhele, 2 of which are in close proximity of the project area (Waihona `Aina Database 2008). LCA 3772:1 (see Appendix A4-A6) and LCA 3888 (see Appendix A6-A8) are of the nearest in proximity to the current project area, only several hundred feet to the northwest and situated within the project area's parcel. Table I lists the contents of these claims. As described in the documents, the boundaries of these two LCAs located within parcel 6 of this TMK, were only a section of the claimant's LCA claim. The two properties were both house lots bounded *mauka* by Government road (Waihona `Aina Database, 2008).

Table 1: LCA and Land Grant Data.

LCA	Awardee	Land Use	Comments
3772	Alapai	Apana: 5; Loi: 8; House lot: 1; Hala: 4; Sweet Potatoes: 3	"The Claimant had these lands from his ancestors in the days of Kamehameha I and his title has never been disputed."
3888	Panioi	Apana: 3; Loi: 13; House Lot: 1; Sweet Potatoes: 2	"The claimant received these lands from Naea in the year 1834 and his title has never been disputed"

[1]Source: Waihona Aina website (www.waihona.com), information obtained in May 2008.

Given the large acreage sold, it is worth noting, a Land Grant, number 4973 (see Appendix A1-A3), was awarded to Walter M. Giffard encompassing 970 acres of the ahupua`a of Olowalu and Ukumehame, as seen in Figure 2 (highlighted in purple). The land was sold at a public auction on July 9, 1906 and the transaction sealed on July 23, 1906 (see Appendix A1-A3 for further detail).

To further understand land use in Olowalu, Fredericksen and Fredericksen (2000b:17) discuss a larger picture of the LCAs awarded within the region (Figure 7). Therein, Fredericksen and Fredericksen found that of the 45 land grant awards in their study parcel, 36 are located in the *mauka* portion of the property, 33 grants located along the Olowalu Stream and were taro lands and houselots; only 3 were for other purposes (*ibid.*, 200:14). Nine additional awards were located along the *makai* portion of the Fredericksen and Fredericksen study, and "it should be noted that several *taro/kula kuleana* awards in the *mauka* area correspond to houselot awards on the *makai* portion," (ibid. 2000:14).

Sugar was to be the economic future of Hawai`i and as early as 1828, two Chinese brothers, Ahung and Atai, of Honolulu's Hungtai Company arrived in Wailuku to explore the possibility of setting up one of its earliest sugar mills. Atai soon created a plant that processed sugar cane cultivated by Hawaiians, named the Hungtai Sugar Works (Dorrance and Morgan 2000:15–16). Ahung later joined Kamehameha III's sugar producing enterprise, although by 1844 both operations had ceased. The Wailuku Sugar Company was the next to follow, in 1862, and would expand sugar production over the next 126 years of its existence—4,450 acres by 1939. The Olowalu Company was organized in 1881 on lands given up by the West Maui Plantation. A small company, it produced a maximum of 2, 969 tons of sugar in 1931 (Dorrance and Morgan 2000:64). At this time, it was purchased by the Pioneer Mill and became a part of their acreage. All the LCAs eventually became a part of the sugar lands belonging to the Pioneer Mill Company Ltd.

PREVIOUS ARCHAEOLOGY

Several archaeological studies have been conducted in the Olowalu region, most significant to discuss were investigations by Fredericksen and Fredericksen (2000a and 2000b) (Figures 8 and 9). Prior to Fredericksen and Fredericksen study, only four other recent studies had been carried out, and only the survey of *heiau* on the island of Maui conducted by Winslow Walker in 1929 to 1930, and the Statewide Inventory carried out in 1973-74 were conducted. However, since 2000, several additional archaeological studies have been conducted. These projects are

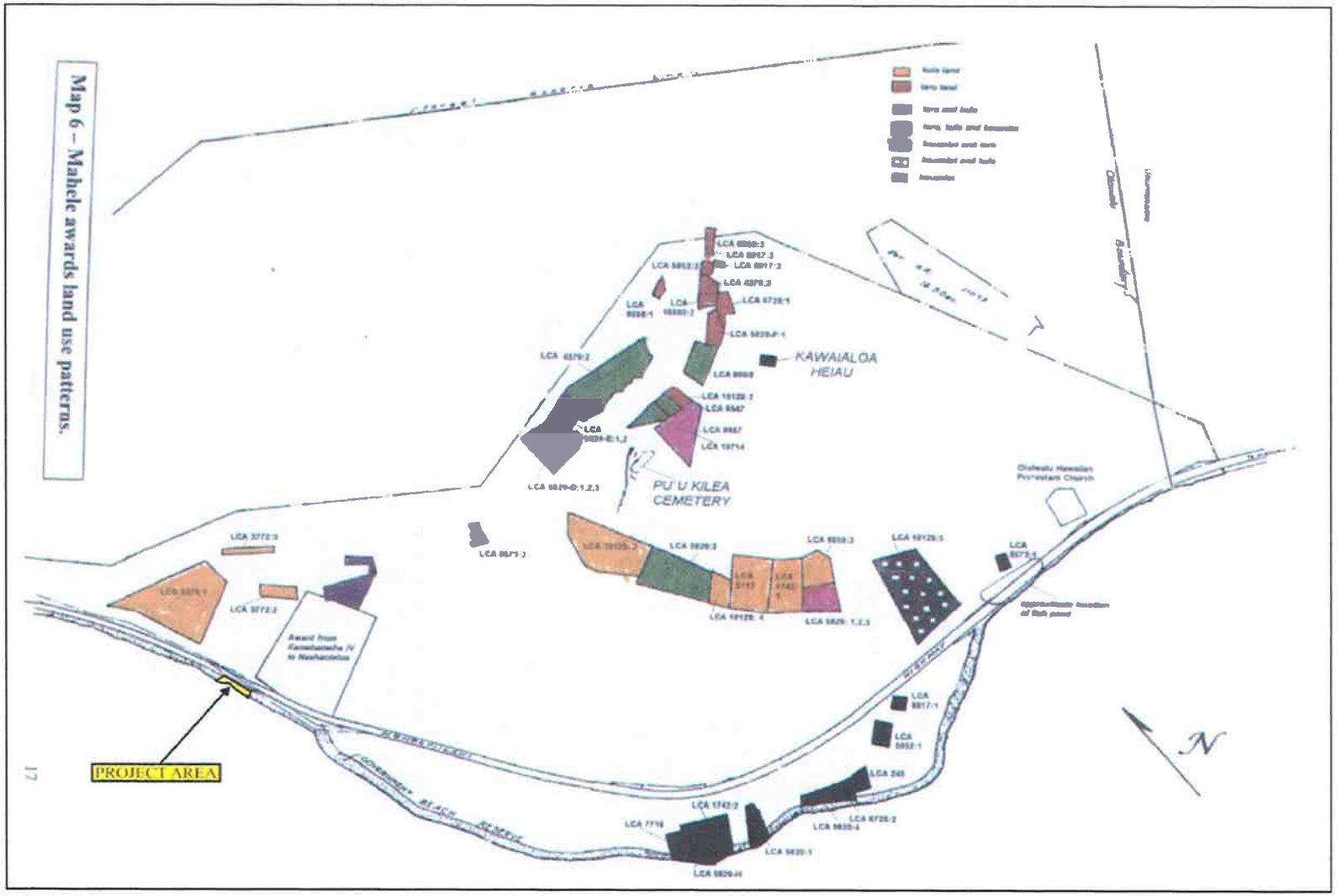

Figure 7: LCA Use Patterns of Olowalu. Adapted From Fredericksen and Fredericksen (2000b: 17).

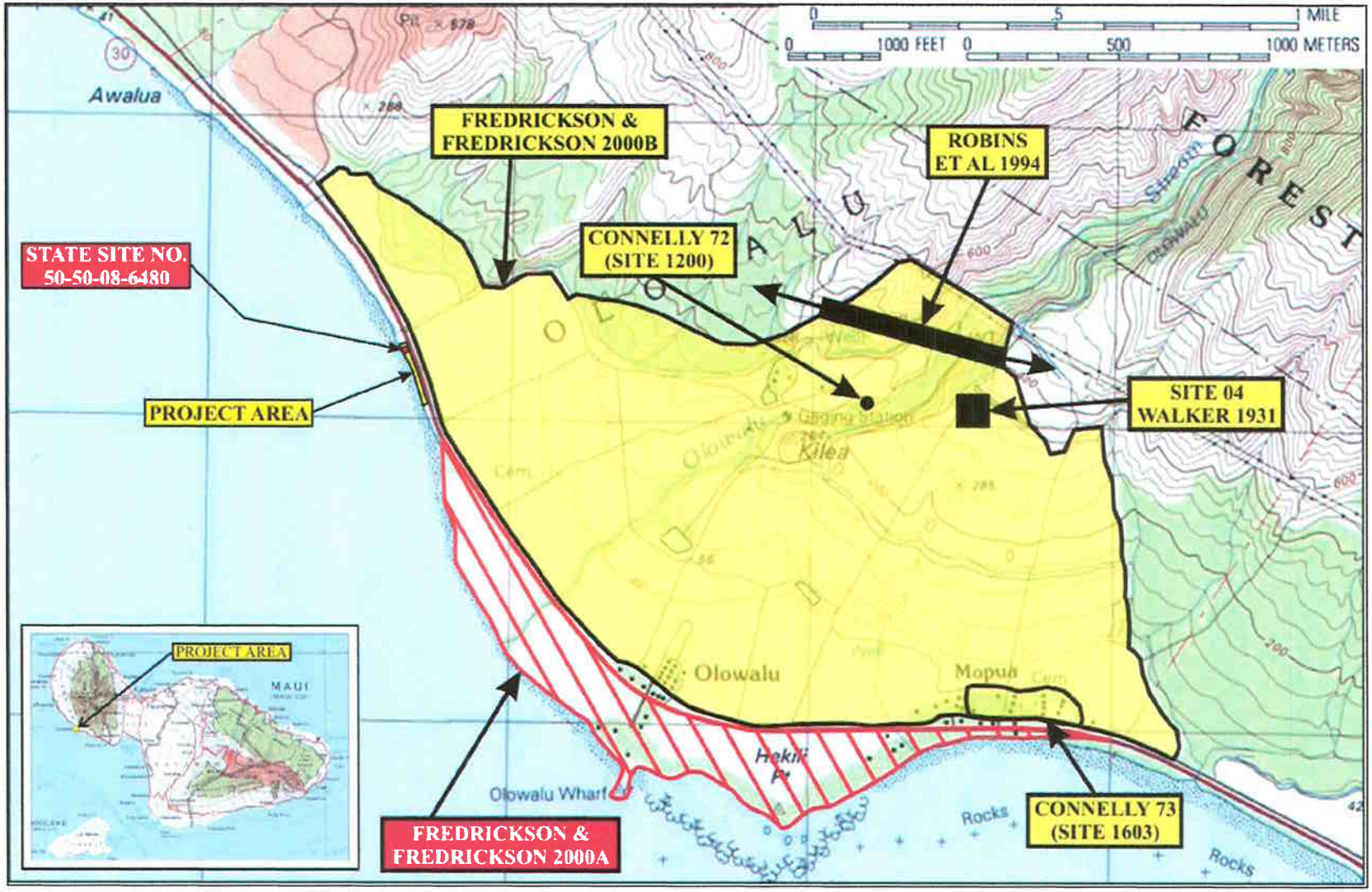

Figure 8: Previous Archaeological Investigations in Olowalu Ahupua`a.

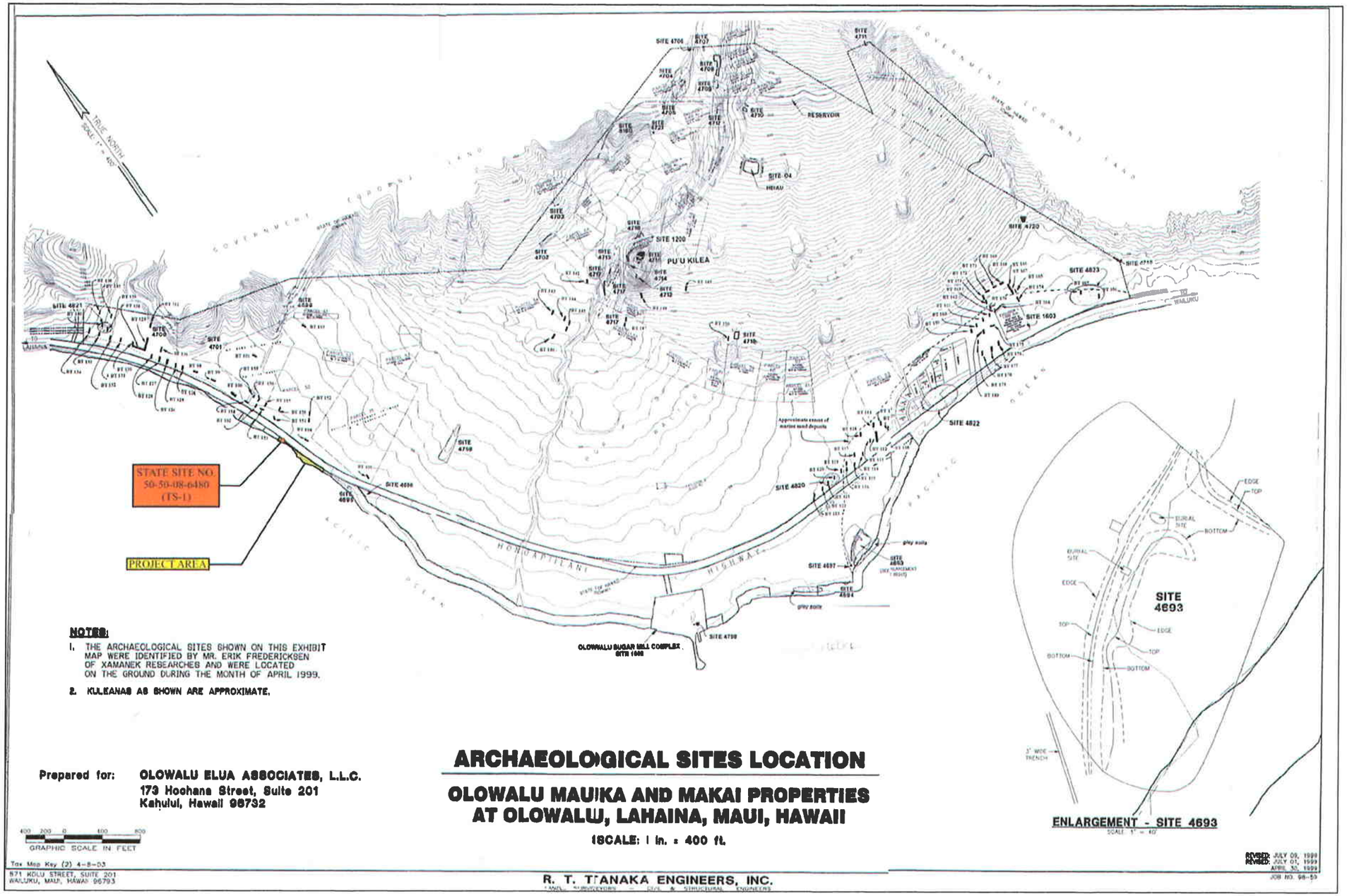

Figure 9: Map Showing Previous Archaeological Sites Near Project Area (Adapted from Olowalu Elu Associates).

important as they reflect the activities and settlement patters in the general Olowalu region and help to build on the extending pool of knowledge of the pre-Contact and historic era in this region of Maui.

WALKER INVENTORY OF OLOWALU

During his Inventory of Maui Island, Winslow Walker (1929-1930) identified several sites, and also took note of several others, within Olowalu. Walker Sites 4, the Kawaialoa Heiau site was located within Olowalu region on, "the rising ground south of Kilea Hill above the ditch," (Walker, 1930:108). Walker's description of this site follows, please note the second heiau discussed in this description was designated as Walker Site 5:

> A large walled heiau in good condition. It measures 156 x 110 feet. The walls range in thickness from 8 ½ feet on the west to 12 feet on the south and east where it is composed of two terraces. The highest part is 10 feet high. The north wall is lower and ranges from 5 to 8 feet thick. Several low terraces and enclosures are found inside. The low platforms in the western part are probably graves of recent date. The entrance evidently was at the north. At a point on the west wall and at two points on the south wall are piles of stones cone-shaped whose use or purpose could not be determined. Rough red vesicular basalt is the material used in the heiau construction and no coral is found. No artifacts were found there.
>
> Another small heiau [is located in the cane lands below the ditch. It measures 40 x 60 feet but all interior structures have been destroyed. No name was learned for this heiau (Walker, 1930: 108).

Although several house sites were identified during Walker's inventory, the following were not assigned site numbers, however they are important to note here. "Mrs. Nahooikaika's house," where there was evidence of old taro patches. The site is described to be composed of the, "ancient ditch bringing down water from Olowalu Gulch [which] is now used for the modern ditch supplying the cane fields. At the edge of a house platform measuring 15 x 28 feet, is a large flat stone of red basalt used as a papamu for the game of konane." Walker goes on to describe several other houses:

> On the hill north of Olowalu just above the corner of the Forest Reserve line is a site which might easily have been a lookout. It is little more than a pile of rocks and an enclosure 15 x18 feet with a smaller on adjoining it. Indications of stone walls on other parts of the hill suggest its possible use as a fortified hill or a Hill of Refuge (Walker, 1930: 77).

STATEWIDE INVENTORY OF HISTORIC PROPERTIES, ISLAND OF MAUI

In 1973 a Statewide inventory of known historic properties was conducted in order to relocate, document, record, and to assess the condition of previously identified sites (Connolly 1973). Connolly (1973) report that the Kawaialoa Heiau (Walker Site 4) was relocated, however the smaller *heiau* (Walker Site 5) was not relocated during this survey. Additionally, the survey documented the Olowalu Complex (Site 50-50-08-1200) which is located roughly 0.5 miles mauka of Highway 30 (Honoapi`ilani Highway) on the north side of Pu`u Kilea. Site -1200 is made up of two features, the Olowalu Petroglyphs and a natural rock overhang at the bas of a cliff (HRHP, Connolly, 1973 as cited in Fredericksen and Fredericksen, 2000b). It was noted that the petroglyphs had been vandalized, which was not noted in the 1962 Bishop Museum undertaking of excavations at the adjacent rock overhang (Site -1201). At that time, the petroglyph site was placed on the National Register quality site, but was to undergo a cleaning program to remove these recent disturbances to the site (Connolly, 1973 as cited in Fredericksen and Fredericksen, 2000b:31).

The Olowalu petroglyphs were recorded as having over 70 petroglyphs in two areas. At the time of the state wide survey, the first area had been turned into a small park next to the access road where a viewing platform was located. The petroglyphs extended about 8 m across and about 1-4.7 m up the rock face. Area 1 contains at least 41 figures, including, "human bone forms with stick and triangular bodies; animals (probably dogs and horses); circles; a sail, and other indistinct forms," ranging in size from 2 x 2 cm to 35 x 55 cm (Connolly, 1973 as cited in Fredericksen and Fredericksen, 2000b:30).

Area 2 lies about 15 m south of Area 1, is adjacent to the road, and the petroglyphs extend along the cliff and are placed on large rocks in front of the cliff for approximately 60 m, extending 0.5 to 3.3 m up the face. Here there are at least 31 petroglyphs including, "human forms with stick and triangular bodies, historic writing, animals including dogs and horses, a figure resemling a coffee pot, a large fish or whale, a figure with five lines radiating from the head, an outrigger canoe with sail, and many indistinct forms," ranging in size from 4 x 6 cm to 40 x 40 cm (ibid. :30-31).

In 1962 the rock shelter, Bishop Museum site number 50-Ma-M-4. Located in Olowalu, "at the base and on the northwest side of Kilea Puu" near the petroglyphs was described by Sterling (Sterling, 1998: 26-27)

> The main part of the sheltered bluff runs about 60 feet mauka-makai and from about 12-15 feet from the wall to the irregular sloping edge. It is about 20 feet up on the side of the hill from the road. ...
>
> Makai of the main area the bluff slopes down to a little open terraced area about 3' x 5' against the wall of the bluff. Makai and below this is another level somewhat protected area (*ibid.*: 26-27).

The material cultural findings of Sterling's excavations included, "some shell, kukui, ti or sugar cane leaf, obsidian, Hawaiian diamonds, etc," along with ashy fire pits. These resulted in the conclusion that the, "area was not lived in but merely used as a camp site or resting place," (*ibid.*,: 27).

Two historic sites were also identified during the Statewide Survey, the Olowalu Sugar Company Mill (Site 50-50-08-1602) and the Olowalu Stone Church ruins at Mopua (Site 50-50-08-1603). The Olowalu Sugar Company Mill (Site -1602) is said to have been an enterprise of King Kamehameha V, who reigned from 1863 to 1872. The mill was probably constructed in the 1870s. Included in this mill was a 2 foot gauge railroad, a manager's house, and 3 other plantation houses. The Olowalu Stone Church at Mopua (Site -1603) was built in 1837 located half way between Maalea and Lahaina and composed of a small adobe and thatch roof church. It is important to note that during the Fredericksen and Fredericksen (2000b) Inventory Survey a historic historic coffin burial was recovered in a back hoe trench (BT 164) within the proximity of the church ruins; this is discussed further below.

RECENT ARCHAEOLOGY

Several archaeological projects have been conducted within Olowalu following the years since the Statewide Survey. A brief discussion of the projects conducted as well as their findings follows.

In 1994, Cultural Surveys Hawaii (CSH) conducted an inventory survey along a 14.7 mile long corridor extending through the *ahupua`a* of Waikapu, Ukumehame, Olowalu, Launiupoko, Polanui, Polaiki, Wainee, and Kuia for the Maui Electric Company's Lahaina to Maalea Transmission Line (Robins, Folk and Hammatt, 1994 as cited in Fredericksen and Fredericksen, 2000b: 33). During this survey a total of 34 archaeological sites were identified, all evaluated as significant archaeological resources. Additional survey of access roads and monitoring of the pole replacement process was conducted in 1996 and 1997 by CSH (Deveraux, Colin and Hammatt, 1997, as cited in Fredericksen and Fredericksen, 2000b). In Olowalu, the

transmission line crossed through the mauka portion at approximately 350-400 feet AMSL (poles 40-56) and two sites (-3180 and -3172) are located in the Olowalu stream area, beneath the power lines between poles 52 and 54.

Site -3180 is a wall stacked and vertically faced with basalt boulders measuring an average width and height of 1.0 m, attributed to ranching. It is located just beyond the west side of the Olowalu Stream extending along the mauka perimeter of the cane fields, "probably constructed to keep cattle outside of the cane fields and kuleana," (Robins, Folk and Hammatt, 1994:82, as cited in Fredericksen and Fredericksen, 2000b:33).

Site -3172 is a plantation era historic ditch canal associated with cane irrigation in excellent condition. Located on the southeast side of Olowalu Stream measuring 0.8 m x 0.5 m deep and at the time of the survey, it was used for cane irrigation (*ibid.*).

XAMANEK RESEARCHES INENTORY SURVEYS

During a 2 phase Inventory Survey, Xamanek Researches conducted an archaeological inventory survey on the *makai* (phase I) and *mauka* (phase II) portions of the Olowalu Development Parcel.

Phase I, conducted on the Makai portion of a 73 acre portion identified 6 previously unrecorded sites (Sites -4693 through -4698), additionally, the ruins of the Olowalu Sugar Mill (Site -1602) were mapped. The following is the description given in the abstract of Fredericksen and Fredericksen, 2000a:

> Site 4693, a precontact burial ground, is considered to be the most significant cultural resource on the subject parcel. Other sites include a probable precontact wall remnant partially enclosing a habitation area (Site 4694); a probable post-contact sea wall (Site 4695); a remnant of the Old Government Road, which followed the route of the traditional Pi`ilani coastal trail (Site 4696); a probable early post-contact subsurface habitation deposit (Site 4697); and a late precontact subsurface habitation deposit (Site 4698). All of the above sites qualify for significance under Criterion D of the Federal and State historic preservation guidelines.
>
> The Olowalu Sugar Mill (Site 1602) also is deemed significant under Criterion A. Finally, the Site 4693 burial ground qualifies for significance under Criterion E- for its traditional cultural value (Fredericksen and Fredericksen, 2000a:Abstract).

Phase II of the Inventory Survey was conducted over a 660-acre portion of the mauka property (Fredericksen and Fredericksen, 2000b). While sugarcane had been actively cultivated on much of the subject parcel, 30 archaeological sites were present on the property, of which 6 were previously were known and 24 were previously not recorded. The following describes their findings:

> The known cultural resources include Kawaialoa *heiau* (Site 50-50-08-04), the Olowalu Petroglyph Complex (Site 1200), the Olowalu Petroglyph Rock Shelter (Site 1201), the Hawaiian Protestant Church (Site 1603), an *ahupua`a* boundary wall (Site 3180), and a plantation era irrigation ditch (Site 3172).
>
> The 28 previously unidentified sites include precontact and post-contact cultural resources, and were assigned SIHP number 50-50-08-4699 through 4721, 4758, and 4820-4823. Precontact sites include rock overhang shelters, platforms, terraces, a petroglyph panel, possible burial mounds, a burial cave, Pu`u Kilea burial ground, 2 *heiau*, a possible *ko`a*, permanent habitation features, remnant *taro lo`i,* other agricultural features, boundary walls, surface scatters of human remains, a fishpond and subsurface marsh soils. Post-contact sites include a coffin burial associated with the Site ~~1603~~ -1511 stone church cemetery, a Japanese cemetery, retaining walls, property markers, an old hydrogenation facility, a house platform. All of the cultural resources on the project area are deemed significant under Criterion "D" of the Federal and State historic preservation guidelines. In addition, several sites qualify for significance under multiple cirtera. Recommended mitigation measures range from no further work for a few post-contact sites, to data recovery and preservation (Fredericksen and Fredericksen, 2000b: Abstract).

Since these investigations, Preservation Plans have been prepared by Olowalu Elua Associates, LLC (2002), as well as Fredericksen and Fredericksen (2001) which discuss the proposed mitigation regarding the numerous significant sites and burials located within the property.

Following a brush fire within this property, Scientific Consultant Services, Inc. (SCS), had the rare opportunity to conduct an Archaeological Field Inspection of a burned area within the undeveloped parcel (approximately 500-acres of a total 660 acres) in Olowalu Ahupua`a, Lahaina District, Island of Maui [TMK: 4-8-3:10 por.] (Shefcheck and Dega, 2007). During the Field Inspection SCS Archaeologists relocated those sites which were known within the burned area, and recorded a GPS point for each of these relocated sites.

Only two sites were adversely impacted by the fire. At Site -4758, a Historic cemetery, several of the headstones became fire-cracked and spalled in the heat. Site -1200, a petroglyph complex located on the *mauka* (northeast) side of Pu`u Kilea, was partially damaged by smoke and some petroglyphs were spalled in the heat. Push-piles were noted off the northwest corner of Site -04, Kawaialoa Heiau. These push-piles were not specifically mentioned in Fredericksen and Fredericksen (2000a and 2000b) and may be modern, pertaining to fire fighting. Testing was not completed to determine their origin.

One new feature was identified during the Field Inspection. The feature consists of a series of agricultural terraces located to the northeast of Site -4708, a site that was originally documented as containing two features. Fredericksen and Fredericksen (2000b) report Feature A as a faced retaining wall and Feature B as a series of agricultural terraces. The morphological similarity and geographic proximity of this newly identified feature has led it to be recorded as Site -4708 as Feature C. In other terms, the new agricultural terraces have been subsumed under Site -4708. All other sites/features noted during the Field Inspection were previously recorded.

All the sites previously documented on the parcel were assessed per varying levels of significance (Fredericksen and Fredericksen 2000b:67). These significance evaluations remain unchanged after the current Field Inspection. Previously stated recommendations still apply to these sites as well.

Per the additional agricultural terraces identified during the current work, now designated as Feature C of Site -4708, the addition of another *lo`i* terrace complex does not change the original interpretation or significance of this site (see Fredericksen and Fredericksen 2000b). The site was originally interpreted as a *heiau* with associated *lo`i*. The new features simply add to the breadth of the site. Site -4708 remains significant under Criterion E, due to its interpreted status as a religious site.

While the Field Inspection provided a tremendous opportunity to view the landscape in an unusual form (without vegetation), only one new agricultural complex was identified. The previous archaeology conducted within the project area proved to be quite thorough and accurate. Please see the following (Table 2) for site description and subsequent field inspection comments for Fredericksen and Fredericksen (2000a and 2000b) and Shefcheck and Dega (2007) discussion.

Table 2: Previously Identified Sites, Description, Comments, and GPS Points from the Field Inspection.

SIHP 50-50-08-	# Features	Description	Field Inspection Comments	GPS Point
4	1	*Heiau*	Some dozer push-piles noted near the northwest corner of the site. These were not documented in previous work.	e04748400, n2303972
1603	1+ (?)	Lanakila Hawaiian Protestant Church	not relocated during this work	-
3180	1	Rock wall	not relocated during this work	-
4699	9	8 rockshelters, 1 modified outcrop	not relocated during this work	-
4700	10	8 rockshelters, 1 rock wall, 1 C-shape	not relocated during this work	e0746592, n2304654
4701	1	Platform remnant	Site relocated, no comments	e0746649, n2304558
4702	1	L-shape	Site relocated, no comments	-
4703	3	U-shape, rock alignment, and modified outcrop	not relocated during this work	-
4704	7	Petroglyph Complex	not relocated during this work	-
4705	2	Rockshelters	not relocated during this work	-
4706	1	Rockshelter	Site relocated, no comments	e0748449, n2304374
4707	2	Rock wall and rock mound	Site relocated, no comments	e0748507, n2304388
*4708	3	Platform and two series of agricultural terraces	Newly documented feature: Feature C, a series of agricultural mounds located on the *makai* (west) side of Feature A	e0748476, n2304278
4709	4	Two concrete foundations, rock wall/terrace, and series of irrigation ditches	not relocated during this work	-
4710	7	Habitation Complex	Site relocated, no comments	e0748491, n2304141
4711	2	Linear rock pile and terrace	not relocated during this work	-
4712	2	Modified outcrop, rock pile	Site relocated, no comments	-
4713	1	Rockshelter	Site relocated, no comments	-
4714	1	Rockshelter	Site relocated, no comments	-
4715	1+ (?)	Burial ground	Site relocated, no comments	-
4716	2	Terrace and rock wall\	Site relocated, no comments	-
4717	4	Walls	not relocated during this work	-
4718	3	Heiau, consisting of enclosure and two burials	Site relocated, no comments	e0748050, n2303568
4719	1	Boundary marker	not relocated during this work	-
4720	1	Historic retaining wall	not relocated during this work	-
4721	1	Platform	not relocated during this work	-

SIHP 50-50-08-	# Features	Description	Field Inspection Comments	GPS Point
4758	1+ (?)	Historic Cemetery	Some headstones have cracked and spalled in recent fire	e0747089, n2303787
4820	1+ (?)	Surface scattering of Human Remains	not relocated during this work	-
4821	1+ (?)	Surface scattering of Human Remains	not relocated during this work	-
4822	1	Pond	not relocated during this work	-
4823	1	Subsurface gleyed deposits	not relocated during this work	-
1200	1+ (?)	Petroglyph Complex	Some of the petroglyphs have been damaged by smoke and spall in fire	e0748369, n2304322
* newly documented feature				
(?) Precise number of features is not reported in Fredericshen and Fredericksen 2000				

NEARBY AHUPUA`A ARCHAEOLOGY UKUMEHAME AHUPUA`A

In 1993, Cultrual Surveys Hawaii, Inc. conducted an archaeological inventory survey for 14.7 mile long Ma`alea to Lahaina transmission line. During this project, a total of 18 site complexes were identified within the 440-acre project area. These sites were grouped into class-types including agricultural, habitation, *heiau* (of which one included the Hiki`i *Heiau* discussed below), petroglyphs, human graves, irrigation ditches, and a basalt quarry. (Deveraux, *et al.*, 1997 as cited in Fredericksen and Fredericksen, 2000b: 36).

Following this Inventory Survey, a total of 10 archaeological sites were preserved according to the Preservation Plan (Hammatt, 2000). The sites to be preserved included -3165 (temporary habitation), -3184 (permanent habitation/ possible burial), -4367 (permanent habitation), -4381 (permanent habitation), -4438 (agricultural), -4451 (permanent habitation), -4452 (agriculture), -4454 (temporary habitation), -4455 (historic agriculture), and -4456 (permanent habitation).

In 1998, reconstruction of walls at Hiki`i *Heiau* in Ukumehame Ahupua`a was completed (Masterson and Hammatt, 1999). The *heiau* was originally recorded by John F.G. Stokes in 1916, and subsequently described by Thomas G. Thrum in the Hawaiian Annual. In 1930, W. Walker mapped and described the *heiau* (Walker Site -2) (as cited in Masterson and Hammatt, 1999). The *heiau* is located on the east side of the Ukumehame Gulch at an elevation of about 200 feet. Described by Walker as, "a good sized heiau built of rough blocks of red basalt," it ranged in height to 6 feet and 9-12 feet in thickness. An open terrace fronts the sea on the other sides and is 130 feet long and 81 feet wide (Walker, 1930: 60-61). In 1973, the DLNR, State Parks Division mapped and recorded Hiki`i *Heiau* in part of their island wide survey and a documented nine platforms and two enclosures were recorded within the *heiau*, and 3 platforms

and a mound inside the *heiau* were believed to have been the modern graves recorded by Thrum and Walker.

In 1997, Aki Sinoto Consulting preformed Archaeological Assessment during a conservation project referred to as the Native Plant Conservatory, undertaken by the Hawaii Army National Guard in Ukumehame, Lahaina District, [TMK: 4-8-2:47]. In this project a surface survey was completed but no archaeological remains were encountered (Sinoto, 1997).

In 2005, a Preservation Plan for Site -5232 was presented by Tomonari-Tuggle and Rasmussen (2005). The plan entailed the mitigation to be followed for the preservation of the traditional Hawaiian upland temple (heiau) adjacent to a planned wind energy development project on a high ridge west of Maalea Small Boat Harbor at TMK: 4-8-01:1 (Tomonari-Tuggle and Rasmussen, 2005).

LAUNIUPOKO AHUPUA`A

In 1990, Paul H. Rosendahl, Inc. (PHRI) conducted an Archaeological Inventory Survey of a 440-acre parcel for a proposed golf course in Launiupoko Ahupua`a (Graves and Goodfellow, 1991, as cited in Fredericksen and Fredericksen, 2000b) to the north of Olowalu. In total, 47 sites containing 70 features were identified. The site types included terrace, clearing pile, agricultural plot, rock pile, canal, retaining wall, flume, flaked boulder, alignment, rock shelter, C-shape, wall upright, L-shape, petroglyph panel, corral, fence, cairn, and road. Habitation sites comprised 19% of the sites identified within this survey, while 60% of the sites identified were agricultural in nature. Radiocarbon dates ranged from 1200-1650 A.D. (Graves and Goodfellow, 1991, as cited in Fredericksen and Fredericksen, 2000b).

In 1998, the site was revisited by PHRI and the authors concluded that the pre-contact population of Launiupoko ahupua`a was probably limited, a conclusion supported by the lack of kuleana land claims made during the Mahele (Graves, Goodfellow, Haun, April 1998 p ii, as cited in Fredericksen and Fredericksen, 2000b).

SETTLEMENT PATTERN

Archaeological settlement data indicates that initial colonization and occupation of the Hawaiian Islands first occurred on the windward sides of the main islands, with populations eventually settling into drier leeward areas at later periods (Kirch 1985). Archaeological dates for initial occupation of the Hawaiian Islands far pre-date accepted ranges gathered from

palynological data. A more conservative estimate for initial occupation of the islands is the A.D. 9th century (Athens 1997), if one is to lay more credibility with the pollen record than the archaeological record. In the Waihe`e and Wai`ehu areas of Wailuku, Kirch (1985:87) notes that "a number of coastal dune midden sites have been reported, and at least one of these contained pearl-shell fishhooks similar to those from the Bellows Site, eroding from the wave-cut midden." (The Bellows site, located on the windward coast of O`ahu, has yielded the controversial data of occupation dates from A.D. 300 to 600 [Pearson *et al.* 1971], one of the earliest dated sites in the Hawaiian Islands. For the most part, these dates have now been diagnosed as problematic and are no longer considered valid.)

The earliest populations purportedly used local resources and seldom ventured into upland valleys. Cordy (in Creed 1993) suggests, however, that upper valley areas on windward coasts were likely populated before the A.D. 1100s. Coastal settlement was still dominant, but populations began exploiting and living in more upland *kula* zones. Greater population expansion to inland areas did not occur until the *c.* A.D. 12th century but continued through the 16th century. Large scale or intensive agricultural endeavors were implemented in association with habitation. Coastal lands were used for settlement and taro was cultivated in near-coastal reaches and in the uplands. Upland areas of Maui such as the Waiohuli-Kula area contained large garden enclosures, ceremonial structures, and permanent habitation sites by *c.* A.D. 1600.

As discussed above, it was suggested by one *kama`āina* (John Ka`aea Fujishiro, pers. Comm; McGerty and Spear 2005) that the Olowalu area had functioned as a rest stop before attempting the crossing of the Olowalu mountains to `Īao Valley. As Olowalu is the largest and deepest valley on the southwest side of Maui:

Handy and Handy (1972:272) discuss the project area's region, on the southeast and east part of Maui, as one of the five great centers of prehistoric settlement on Maui. "On the southwest coast of West Maui, beginning at Olowalu and continuing through Launiupoko, Laupakanui, Waine'e, and Lahaina and on to the small terraced valleys of Honokawai and Honokahau, were taro lands irrigated from streams out of the West Maui mountains," (Handy and Handy, 1972:272).

Site type and density leads to conclusions regarding settlement patterns. The most common and numerous of site types involve agriculture, be it in the form of walls, terraces, or mounds. These structures do not always suggest permanent habitation. In the 1960s, Hawai`i's archaeologists began noting the importance of C-shaped structures, small temporary (and

sometimes frequently used) shelters found intermixed with farming-related architecture. These shelters were found most commonly on the leeward sides of islands, where dryland agriculture was practiced. The archaeological assemblage from such structures might include small amounts of midden and stone tools, such as adzes, hammerstones, or flake tools (Kirch 1985:251).

Second only to agricultural structures, housing units are the most common of site types. Similar to patterns of contemporary times, those with wealth, power, or influence lived in larger, more stately lots, which included separate buildings for cooking, canoes, men and women's eating and sleeping houses, among others. People of lesser status, but of "respectable standing" (Kamakau 1976:96, cited in Kirch 1985:251) nonetheless, had multiple houses for all functions considered necessary at the time. The lowest of people had only a tiny dwelling in which to complete their tasks and share with their families (Malo 1951:122, cited in Kirch 1985:251).

The two final types of sites that provide information about settlement patterns are trails and *heiau*. Trails were not built for beasts of burden or for wheeled carts, but rather for pedestrian travel. Navigating the *a`a* was no doubt just as difficult in traditional times as it is today, and so the Hawaiians gathered smooth, waterworn stones from the ocean and placed them over the rocky terrain in order to connect *ahupua`a*, villages, and agricultural land (Kirch 1985:267). It seems reasonable to assume that such paths would not have been constructed if it were not necessary to connect significant bodies of population.

On Maui, the most noted trail improvements were in the 16th century and were attributed in traditional accounts to paramount chief Kilapi`ilani. Although often referred to as Pi`ilani Trail, Pi`ilani was the father of Kilapi`ilani but was not involved with the trail building in traditional literature. Historic accounts discuss the use of trails in Olowalu. "From Olowalu travelers were ferried by canoe to Maalaea, thence to Makena, where the Alaloa followed the long sandy beach."

EXPECTED SITE TYPES

Archaeological studies have compared sites located at higher elevations in the ahupua`a of both Ukumehame and Launiupoko , to the east and west of Olowalu Ahupua`a. These provide interesting comparisons. In the higher elevations (for example see the Launiupoko study), water is more readily available for crop cultivation and thus, evidence of more wet crop (taro) agricultural remains are seen as well as earlier permanent habitation sites. This contrasts with dryer environs where sweet potato cultivation is more prominent; and less permanent habitation sites (including C and L shaped enclosures) are seen in the archaeological record. It is of note

that after plantation agriculture began, ancient water systems within the *ahupua`a* were used to irrigate the sugar can fields.

Given this general settlement pattern associated with the *ahupua`a* system, researchers should expect to find pre-Contact habitation sites (both temporary and permanent) along the water sources as well as wet cultivation crops like terraces for taro. Following trails marked with petroglyphs, one would expect to find temporary habitation sites like C and L shaped enclosures. In dryer regions of the islands, one would expect to find dry cultivation of dry crops like sweet potato. Additionally, given its close proximity to the sea, burials would also be a site type that may or may not exist within the substrata at this project area as most coastal sites have high concentrations of burials given the sandy strata.

As seen in the LCA locations within Olowalu, patterns of pre-contact settlement tend to follow the Olowalu Stream, near which two *heiau* were identified by Walker in 1930 (see Previous Archaeology section above). The shift to a market-based economy during the *Māhele* forced many rural farmers to move to the commercial centers. The general plantation system consisted of a processing mill located near the shore, which a wharf or pier extended into the ocean for small ships to load raw sugar. Surrounding the mills were mule stables to the east, and houses of the managers and important supervisory personnel to the west. Mauka the mill were homes of plantation workers, and recreational areas like schools and churches.

Irrigation ditches and rock clear-piles transformed the landscape of the area as the water delivery system brought water from the upper valley to irrigate the lower fields. Railroad systems can also be seen related to the sugar plantation. Four miles of track ran mauka-makai from the mill and to the east to link fields of Ukumehame to Olowalu. Clearing the land using man/mule power was done for the cultivation of sugar, and in doing this, many of the traditional sites would have been obliterated leaving no archaeological footprint. Expected historic sites include sites related to the sugar cane plantation activities including irrigation systems, walls, sugarcane fields, roads, and rock clearing piles.

It is important to note that given the extremely limited space of this project area, and the presence of the nearby highway, only minimal results are expected to be identified during Inventory. Presumably no surface features or sites will be identified given the probable disturbance of the installation of the highway, and sites, if found, are expected to be observed in subsurface stratigraphy.

METHODOLOGY

SCS field archaeologist, Tomasi Patolo, B.A., conducted an Archaeological Inventory Survey of the current project area between April 21 and April 25, 2008, under the direct supervision of Michael Dega, Ph.D., Principal Investigator, prior to construction of a retaining wall for the exposed and undercut portion of this coastal stretch of the Honoapi`ilani Highway. The primary goal of Inventory Survey was to determine the presence or absence of archaeological sites within the project area through systematic surface survey. There were four main field components to Inventory Survey: pedestrian survey of the entire project area, site clearing, plotting located sites on a project area map, individual site mapping and recording.

FIELD METHODS

Multiple field tasks were completed, including a pedestrian survey covering 100 percent of the project area; site mapping; and recording (utilizing both tape and compass, during this Archaeological Inventory Survey. The pedestrian survey was conducted by walking parallel to the roadway along the beach, which allowed the entire property to be systematically surveyed by the SCS archaeologist. No surface structures, artifacts, or intriguing topographical changes were identified. Three distinct subsurface features (two charcoal concentrations, SSF-1 and SSF-2, and a fire hearth, SSF-3 were visible in the exposed stratigraphy of the wave-cut bank. These features were flagged and plotted on an overall site map (Figure 10). The features were documented via stratigraphic layer profiles, photography (color photographs taken with a 3.2 mega-pixel digital camera), and their locations plotted on a project area map. Given the project area's small size (1500 sq. ft) and that location on the shoreline immediately adjacent to the ocean; it was not possible to perform subsurface testing due to the threat of waves destroying exposed strata. In addition, datable materials were not collected given the high potential of contamination due to years of being impacted by wave action.

The cultural materials noted during the Inventory Survey consist of charcoal comprising the subsurface features (not collected) and a non-diagnostic historic glass bottle fragment (not collected) observed in SSF-3. However, given the likelihood of contamination due to years of high wave action, no charcoal samples were collected or submitted for radiocarbon dating. Soils were described in conformance with U.S. Soil Conservation Service using Munsell Soil Color Notation, and stratigraphic profiles were drawn. Overview photographs were taken of the individual features, the site, and the project area.

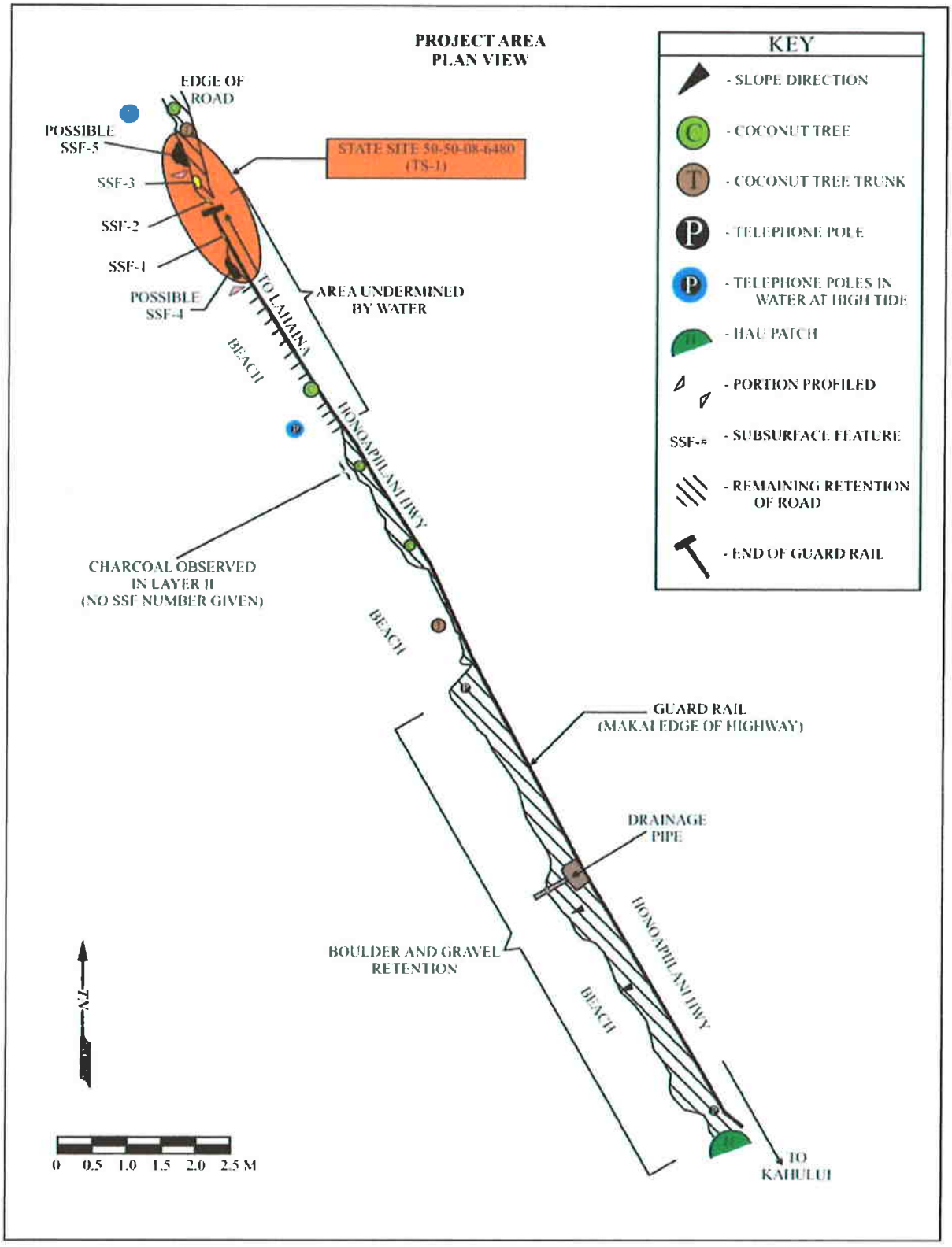

Figure 10: Project Plan View Map Depicting State Site 50-50-08-6480 (TS-1) Location.

Following completion of the pedestrian survey, the features (T-1) were recorded. Subsequently, the three subsurface features were consolidated into one newly identified site and designated State Inventory of Historic Properties (SIHP) Site 50-50-08-6480. Site boundaries were determined by the spatial relationship between the surface features. That is, a discrete cluster of surface features were grouped together to form a "site".

LABORATORY METHODS

Laboratory work included digital drafting of plan view maps and stratigraphic profiles for publishing and archival storage. Because no cultural material was collected there was no lithic or artifact analysis conducted. All field notes, maps, and photographs pertaining to this project are currently being curated at the SCS facilities in Honolulu.

ARCHAEOLOGICAL INVENTORY SURVEY RESULTS

During the Inventory Survey one site was newly identified. Site 50-50-08-6480 (TS-1), consisting of several pre-Contact deposits, was located within the exposed section of the open bank-cut facing the ocean on the west side of Honoapi`ilani Highway. This single site has been assessed as significant under Criterion D.

STATE SITE 50-50-08-6480 (TS-1)

Site -6480 (TS-1) was composed of three distinct subsurface features which were observed in a naturally occurring profile resulting from wave action eroding a section of the bank (see Figure 10). Two charcoal concentrations (SSF-1 and SSF-2) and a fire hearth (SSF-3) were observed in the exposed bank cut. No GPS points were taken at this site. Based on the spatial relationship these features have been combined into a single site. The function of this site has been interpreted as temporary habitation possibly associated with the procurement of marine resources. The site is approximately 1.5 m in width and 2.5 m in length for a total of 3.75 square meters.

Due to the project area being located within the shore-break and the high potential of impact to the exposed strata due to wave action, no test excavations were performed during the Inventory Survey. In addition, datable materials were not collected from any of the identified subsurface features given the high potential of these materials to have been contaminated from years of being subject to wave action. Because the road lay on top of the subsurface features, SCS Archaeologists were unable to determine the extent of the site beneath the Highway, only depth and width of these features were recorded at this time. Additionally, two possible

subsurface features (possible SSF-4 and possible SSF-5 discussed below) were noted by SCS field personnel. However, given the location of these potential features in relationship to the Highway, we were unable to obtain sufficient data to determine whether they were naturally occurring or man-made, cultural significant, age, etcetera.

Below is a description of the stratigraphy and subsurface features identified within this site/ project area (Figure 11).

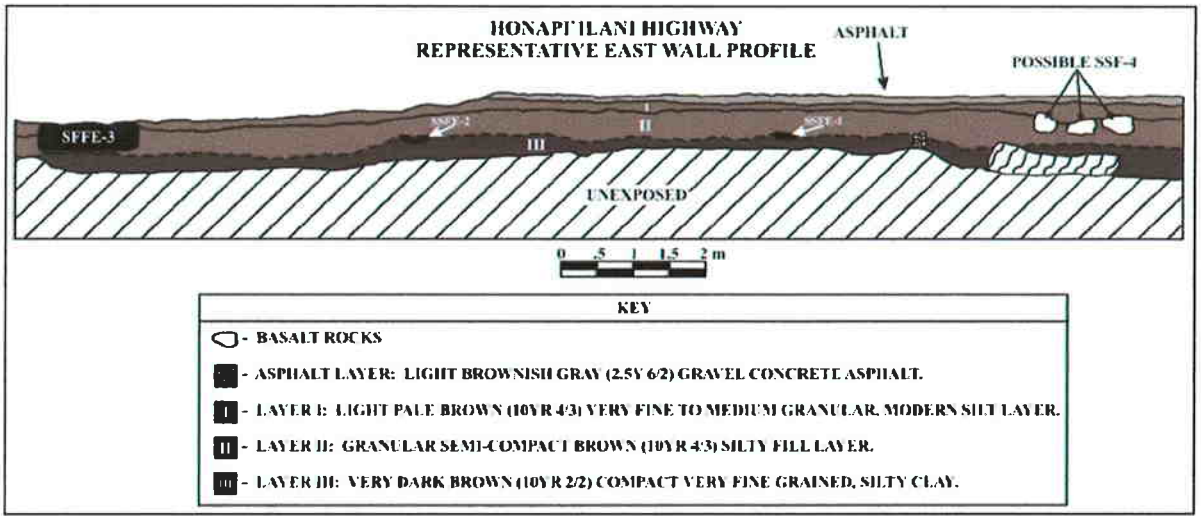

Figure 11: Project Area Exposed Stratigraphy Depicting Site -6480 (TS-1). East Wall Profile.

Soil Description

- Ashplat Layer (0-18 cmbs) was composed of a modern asphalt layer composed of a light brownish gray (2.5 YR 6/2) gravel concrete mixture. This layer was only observed in approximately 60% of the profile view and was culturally sterile.

- Layer I (0-29 cmbs) was composed of a very fine to medium granular, compact light very pale brown (10 YR 4/3) modern silt fill layer with 20 % small rock and cobble gravel fill content. This layer was interpreted as a fill layer and contained no cultural materials.

- Layer II (7-76 cmbs) was composed of a granular semi-compact brown (10 YR 4/3) silty fill layer with 15-60% small rocks and cobble gravel fill content. This layer was interpreted as a fill layer and contained remnants of a fire pit designated SSF-3. Given the nature of this location, it was difficult to determine with certainty the lower boundary of this fill layer.

- Layer III: (31-117 cmbs) was composed of a compact very fine grained, damp very dark brown (10 YR 2/2) silty clay. This layer was interpreted as undisturbed. This layer contained SSF-1 and SSF-2, charcoal concentrations, SSF-3, fire pit, borders this layer, but does not impede into it.

Subsurface Features

- SSF-1: (57-62 cmbs) was composed of a black (10 YR 2/1) charcoal concentration at the interface of modern till Layer II and undisturbed Layer III. Unfortunately, given the nature of this project area, no test excavations conducted or collection of datable materials were made from this or any of the identified subsurface features (Figure 12).

- SSF-2: (32-53 cmbs) was composed of a black (10 YR 2/1) charcoal concentration at the interface of modern till Layer II and undisturbed Layer III. Unfortunately, given the nature of this project area, no test excavations were performed or collection of datable materials made from this or any of the identified subsurface features (Figure 13).

- SSF-3: (0-48 cmbs) historic fire pit consisted of small to medium sized basalt cobbles and boulders. Soil deposits within the feature are dark gray with some charcoal, additionally marine shells were present. The presence of a non-diagnostic historic glass bottle fragment (not collected) observed in SSF-3, suggests this feature is historic in age. Unfortunately, given the location of the project area and the high potential of impact to the exposed strata due to wave action, no test excavations were performed. In addition, datable materials were note collected from any of the identified subsurface features given the high potential of these materials to have been contaminated from years of being subject to wave action (Figure 14).

- Possible SSF-4 and Possible SSF-5 are depicted on the plan view of the project area (see Figure 10). These possible subsurface features consisted of isolated small to medium size boulder concentrations. However because we cannot conclude their form or how far they reach under the road, it is important to note their presence, but no further cultural significant conclusions can be made at this time.

Site 50-50-08-6480 has been assessed as significant under Criterion D.

Figure 12: Photograph of SSF-1, Charcoal Concentration. View to East.

Figure 13: Photograph of SSF-2, Charcoal Concentration. View to East.

Figure 14: Photograph of SSF-3, Fire Pit. View to East.

DISCUSSION AND CONCLUSIONS

During the Archaeological Inventory Survey, one site was newly identified. Site 50-50-08-6480 (TS-1), a prehistoric, temporary habitation loci, is composed of three subsurface features which were exposed in a naturally occurring bank-cut. Subsurface Feature 1 (SSF-1) and Subsurface Feature 2 (SSF-2) are charcoal concentrations and Subsurface Feature 3 (SSF-3) consists of a fire hearth. Site -6480 has been interpreted as a temporary habitation site, possibly associated with the procurement of marine resources, consisting of three subsurface features. No charcoal samples were collected for radiocarbon dating due to the high potential of contamination resulting from high wave action over many years. While a non-diagnostic historic glass bottle fragment (not collected) was observed in SSF-3, the overall site interpretation remains as a temporary, pre-Contact site associated with marine procurement.

Expectations prior to field work were limited due to the small size of the project area and its close proximity to the Honoapi`ilani Highway. Given the limited amount of cultural material recovered, the results held mostly true. However it is important to note that at this time, only minimal subsurface observance was possible at the time the fieldwork was conducted.

The site has been evaluated for significance according to the criteria established for the Hawai`i State Register of Historic Places. The five criteria are classified 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 to an ethnic group; examples include religious structures, burials, major traditional trails, and traditional cultural places

Site -6480 has been assessed as significant under Criterion D, for information content only. Site -6480 has only been observed minimally, the extent of the site could not be determined, given the close proximity of Honoapi`ilani Highway. However, the findings of the current Archaeological Inventory Survey, as well as the coastal location of the project area, suggests the potential for additional sites or site remnants, including human burials and habitation, to be present in the subsurface deposits of the surrounding area. Thus, a program of Archaeological Monitoring is recommended, as a precautionary measure, during all construction related ground alterations within the current project area and the adjacent section(s) of Honoapi`ilani Highway.

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Tomonari-Tuggle, M.J., and Coral Rasmussen
2005 *Preservation Plan for Site 50-50-09-5232, an Ipland Heiau in Ukumehame Ahupua`a, Island of Maui, TMK: 4-8-01:01.* Honolulu.

Tomonari-Tuggle, M. J., and H. D. Tuggle
1991 *Archaeological Survey of Two Demonstration Trails of the Hawaii StatewideTrail and Access System: Lahaina Pali Trail, Island of Maui; Kaiolohia-Kahue Trail, Island of Lana`i.* International Archaeological Research Institute, Inc., Honolulu, HI. On file at SHPD, Kapolei, HI.

Waihona `Aina Corporation
2008 Mahele Database, www.waihona.com. Kaneohe, HI.

Walker, W.M.
1930 *Archaeology of Maui.* Ms. On file State Historic Preservation Division. Honolul.

APPENDIX A: LCA DESCRIPTIONS

Land Grants Documents

Grant Number(LG)	**4973**	Source Book:	**24**
Grantee:	**Giffard, Walter M.**	Acreage::	**970** Acs
Ahupua`a	**Olowalu, Ukumehame**	Year	
District:	**Lahaina**	Cancelled	**False**
Island	**Maui**	TMK	
Miscellaneous			

No. 4973, Giffard, Walter M., Olowalu and Ukumehame Ahupuaa, District of Lahaina, Island of Maui, Vol. 24, pps. 309-311 [LG Reel 9, 00039-00041.tif]

Land Patent No. 4973 (Grant)

On Cash Purchase.

By this Patent the Governor of the Territory of Hawaii, in Conformity with the Laws of the United States of America and of the Territory of Hawaii, makes known to all men that he has this day granted and confirmed unto Walter M. Giffard for the consideration of Thirty seven thousand Seven Hundred and Fifty 00/100 Dollars, $37750 00/100, paid into the Treasury.

And in conformity with Part IV Section 17 of the Land Act of 1895

all of the Land, situate at Olowalu and Ukumehame in the District of Lahaina, Island of Maui, bounded and described as follows:

Sold at Public Auction July 9th 1906
Portion of the Ahupuaa of Olowalu:
Commencing at a iron rail driven into the sand at high water mark at the West end of the Awalua beach, from which the true azimuth and distance to a similar iron rail on the beach about 175 feet west of a small wooden bridge is 322° 25' 955 feet, and from this point to the Kilea Triangulation Station 292° 19' 5001 feet, the boundary runs by true azimuths

1. 216° 00' 500 feet
2. 316° 28' 1024 feet to an iron rail on rocky bridge,
3. 285° 5' 1240.5 feet to an iron rail on rocky bridge from which Kilea Triangulation Station bears 303 31' 3613 feet
4. 303° 39' 30" 2201 feet to an iron rail
5. 254° 20' 30" 2676 feet to an iron rail above end of flume, from which Kilea Triangulation Station bears 42° 59' 30" 2046.5 feet
6. 257° 42' 172.5 feet to an iron rail above flume
7. 302° 46' 889 feet across valley to iron rail from which Kilea Triangulation bears 65° 31' 2540 feet
8. 336° 08' 30" 4442.5 feet to end of stone wall

9. 19° 10' 386 feet to iron rail 199° 10' 10 feet from centre of railroad track

[page 310]

10. 295° 46' 833 feet along a line parallel to ana 10 feet from centre line of plantation railroad, to iron rail
11. 303° 00' 720 feet to corner of stone wall and fence
12. 24° 51' 130 feet to the sea shore at high water mark
13. Northwesterly along the seashore at high water mark to the initial point, the direct azimuth and distance being 123° 20' 25" 12559 feet

Area 684.7 acres, a little more or less, exclusive of included L.C.A., School Lots and land sold by Kamehameha IV to Kahaulelio, amounting in all to 95.4 acres.

Portion of Ahupuaa of Ukumehame
Commencing on upper side of the Government road at the corner of a stone wall along the road and a fence running mauka, the coordinates of this point referred to the Kilea Triangulation Station being South 4129.5 feet and East 5335.5 feet, and running by true azimuths:
1. 204° 51' 144 feet along fence to corner of same
2. 256° 38' 2180 feet to an iron rail driven into the ground, the coordinates referred to Kilea Triangulation Station are South 3495.0 feet and East 7517.0 feet
3. 280° 10' 1640 feet
4. 295° 50' 347 feet
5. 209° 28' 1519.5 feet to iron rail
6. 206° 4' 894 feet to iron rail on West side of stream above head of auwai
7. 349° 45' 1460.5 feet to iron rail on East side of valley, on West side of stone wall
8. 18° 50' 1463 feet to iron rail on East side of stone wall
9. 305° 52' 3819 feet to fence corner
10. 324° 17' 447.5 feet to fence corner
11. 28° 17' 330 feet to fence corner
12. 92° 53' 1490.5 feet to point on fence 42° 5' 17.5 feet from corner of same
13. 42° 5' 1352 feet along fence and across salt marsh to the sea shore at high water mark
14. Northwesterly along sea shore to high water mark to a point 24° 51' 130 feet, from initial point, the direct azimuth and distance being 125° 29' 35" 7241 feet
15. 204° 51' 130 feet to the initial point.

Area 335.3 acres a little more or less, exclusive of included L.C.A. and School Lot, amounting in all to 123.1 acres.

(1) The Government Belt Road, length about 22000 feet by width of 50 feet and all public road and trails.

(2) A Right of way, 50 feet in width (or so much of said 50 feet as may be deemed necessary for public use,) extending from Government Belt Road to Olawalu Landing

(3) All the Public land between the Western boundary of Olawalu as shown on Registered Map No. 2346, and the Eastern boundary of that portion of Ukemahame as shown on Registered Map No. 2347, and between the sea and a line 100 feet distant and parallel to the high water mark

(4) 1 Church Lot (about 2 acres)

Total area of these reserves 50 acres, a little more or less.

[page 311]

[Diagram]

Containing 970 Acres, more or less, To have and to hold the above granted Land, unto the said Walter M. Giffard and his Heirs and Assigns forever,

In Witness whereof, The Governor of the Territory of Hawaii, has hereto set his hand, and caused the Great Seal of the Territory to be hereunto affixed, this 23rd day of July, A.D. 1906.

(Great Seal)

(sign) G. R. Carter
By the Governor
(sign) Jas. W. Pratt, Commissioner of Public Lands

[Land Patent Grant No. 4973, Giffard, Walter M., Olowalu and Ukumehame Ahupuaa, District of Lahaina, Island of Maui, 970 Acres, 1906]

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Mahele Database Documents
Number: 03772

Claim Number:	**03772**		
Claimant:	**Alapai**		
Other claimant:			
Other name:			
Island:	**Maui**		
District:	**Lahaina**		
Ahupuaa:	**Olowalu**		
Ili:	**Puukolohilo**		
Apana:	**5**	Awarded:	**1**
Loi:	**8**	FR:	
Plus:		NR:	**122v6**
Mala Taro:		FT:	**206v7**
Kula:		NT:	**86v5**
House lot:	**1**	RP:	**6285**
Kihapai/Pakanu:		Number of Royal Patents:	**1**
Salt lands:		Koele/Poalima:	**Yes**
Wauke:		Loko:	**No**
Olona:		Lokoia:	**No**
Noni:		Fishing Rights:	**No**
Hala:	4	Sea/Shore/Dunes:	**No**
Sweet Potatoes:	3	Auwai/Ditch:	**No**
Irish Potatoes:		Other Edifice:	**No**
Bananas:		Spring/Well:	**No**
Breadfruit:		Pigpen:	**No**
Coconut:		Road/Path:	**No**
Coffee:		Burial/Graveyard:	**No**
Oranges:		Wall/Fence:	**No**
Bitter Melon/Gourd:		Stream/Muliwai/River:	**No**
Sugar Cane:		Pali:	**No**
Tobacco:		Disease:	**No**

Koa/Kou Trees:		Claimant Died:	**No**
Other Plants:		Other Trees:	
Other Mammals:	**No**	Miscellaneous:	**government road**

No. 3772, Alapai
N.R. 122v6

Greetings to the Land Commissioners: I hereby write my claim for 8 lo`i, 3 potato mo`o, and one house site. I received this lo`i claim from Moku; it is at Puukoleaohilo /Puukuliolio in Indices/. In the ahupua`a are four potato mo`o and a house site, four hala clumps of the mat making variety and the trees. No one has disputed this until this time. My potato mo`o claim was received from Pikao.
ALAPAI
Olowalu, 20 January 1848

F.T. 206v7
No. 3772, Alapai

Keahi, sworn, I know the lands of the claimant. They are in the ili of Puukoleohilo and Keamokua, Olowalu.

No. 1 is a house lot in Puukolaohilo.
No. 2 is a kula land in Puukolaohilo.
No. 3 is a kula land in Puukolaohilo.
No. 4 is a kalo land in Puukolaohilo.
No. 5 is a kalo land in Keamokua.

The claimant had these lands from his ancestors in the days of kamehameha I and his title has never been disputed.

No. 1 is bounded:
Mauka by the Alanui aupuni
Hana by Paniol's lot
Makai by the sea shore
Kaanapali by my land.

No. 2 is bounded:
Mauka by Paahao land
Hana by my land
Makai by the same
Kaanapali by the poalima of Naea.

No. 3 is bounded:
Mauka by Paahao land
Hana by my land
Makai by the same
Kaanapali by the pali of Olowalu.

No. 4 is bounded:
Mauka by Naea's poalima
Hana by paahao land
Makai by my land
Kaanapali by the same.

No. 5 is bounded:
Mauka by my land
Hana by Z. Kaauwai's land
On the other two sides by my land.

N.T. 87v5
No. 3772, Alapai

Keeahi, sworn, He has seen 4 sections in the ili of Puukoleohilo, 1 section in the ili of Keomokua in Olowalu. Interest from Alapai's parents at the time of Kamehameha I. No objections.

The boundaries are:

Section 1 - House lot.
Mauka by Government road
Hana by Panioi
Makai by Sea
Kaanapali by Keahi.

Section 2 - Pasture.
Mauka by Paahao
Hana and Makai by Keahi
Kaanapali by Naea's land.

Section 3 - Pasture.
Mauka by Paahao
Hana and Makai by Keahi
Kaanapali by Pali.

Section 4 - Taro.
Mauka by Poalima
Hana by Paahao
Makai and Kaanapali by Keahi.

Section 5 - Taro at Keomakua.
Mauka by Keahi
Hana by Z. Kaauwai's land
Makai and Kaanapali by Keahi.

[Award 3772; R.P. 6285; Puukoliolio Olowalu Lahaina; 3 ap.; 1.85 Acs]

Number: 03888

Claim Number:	**03888**		
Claimant:	**Panioi**		
Other claimant:			
Other name:	Paniooi		
Island:	**Maui**		
District:	**Lahaina**		
Ahupuaa:	**Olowalu**		
Ili:	**Kuekue, Paapa, Puukoleahilo**		
Apana:	3	Awarded:	1
Loi:	**13**	FR:	
Plus:		NR:	**133v6**
Mala Taro:		FT:	**213v7**

Kula:		NT:	**92v5**
House lot:	**1**	RP:	**6620**
Kihapai/Pakanu:		Number of Royal Patents:	**1**
Salt lands:		Koele/Poalima:	**No**
Wauke:		Loko:	**No**
Olona:		Lokoia:	**No**
Noni:		Fishing Rights:	**No**
Hala:		Sea/Shore/Dunes:	**No**
Sweet Potatoes:	2	Auwai/Ditch:	**No**
Irish Potatoes:		Other Edifice:	**No**
Bananas:		Spring/Well:	**No**
Breadfruit:		Pigpen:	**No**
Coconut:		Road/Path:	**No**
Coffee:		Burial/Graveyard:	**No**
Oranges:		Wall/Fence:	**No**
Bitter Melon/Gourd:		Stream/Muliwai/River:	**No**
Sugar Cane:		Pali:	**No**
Tobacco:		Disease:	**No**
Koa/Kou Trees:		Claimant Died:	**No**
Other Plants:		Other Trees:	
Other Mammals:	**No**	Miscellaneous:	**government road**

No. 3888, Paniooi
N.R. 133v6

Greetings to the Land Commissioners: I, Panioi, hereby state my claim for 13 lo'i at Kuekue. I received my right from Kaea and Kahue. At Papa are two potato mo'o. They have been undisputed until the present.
PANIOI
Oloalu, 18 January 1848

F.T. 213v7
Cl. 3888, Panioi

Keahi, sworn, The claimants lands in "Kuekue," Olowalu consist of a kalo land. He had besides this a house lot in Puukoleohilo and a kula land in "Paapa," all in Olowalu.

The claimant received these lands from Naea in the year 1834 and his title has never been dsiputed.

The first piece is bounded:
Mauka by Kahue's land
Hana by Naea's land
Makai by Kahue's land
Kaanapali by Makaimoli's land.

The house lot is bounded:
Mauka by Government road
Hana y the Government land
Makai by the sea shore
Kaanapali by Alapai's yard.

N.T. 92v5
No. 3888, Panioi /Pila, Index name/

Keahi, sworn, he has seen 3 sections in the following lils of Olowalu, taro sections at Kuekue, house lot at Puukoleohilo and pasture lands at Papa. Land from Naea and Pikao in 1834. No objections and the boundaries are:

Section 1 - Taro in Kuekue.
Mauka by Kahue
Hana by Naea's land
Makai by Kahue
Kaanapali by Makaimoli.

Section 2 - House lot.
Mauka by Government road
Hana by Government
Makai by Beach
Kaanapali by Naea's land.

[Award 3888; R.P. 6620; Kuekue Olowalu Lahaina; 1 ap.; .31 Ac.]

APPENDIX D-1.

State Historic Preservation Review of Archaeological Inventory Survey Report

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

February 25, 2008

Michael F. Dega, Ph.D.
Scientific Consultant Services, Inc.
711 Kapiolani Boulevard, Suite 975
Honolulu, Hawai'i 96813

LOG NO: 2009.0250
DOC NO: 0902PC48
Archaeology

Dear Dr. Dega:

SUBJECT: **Chapter 6E-8 Historic Preservation Review –**
REVISED Archaeological Inventory Survey of an Approximately 15,000 Square Foot Corridor along Honoapi'ilani Highway
Olowalu Ahupua'a, Lahaina District, Island of Maui
TMK: (2) 4-8-003:006 por.

Thank you for the opportunity to again review this report, which our staff received on February 23, 2009 (Cordle and Dega 2009): *Archaeological Inventory Survey of an Approximately 15,000 Square Foot Corridor*...Scientific Consultant Services, Inc.

The report was first reviewed by SHPD staff on August 7 of 2008 (SHPD LOG NO: 2008.2384; DOC NO: 0808PC13), resulting in a series of requested revisions. The most recent version of the report was reviewed in PDF format to confirm completion of those revisions and suggestions.

The survey area as described in the report consists of an approximately 15,000 square foot (0.139 hectare) portion of land situated at TMK (2) 4-8-003:006, within which the State of Hawai'i plans to construct a roadside retaining wall. Fieldwork, conducted between April 21 and 25 of 2008, was comprised of a 100% pedestrian survey of the project area. One new site observed eroding from a wave cut bank, now on record as SIHP #50-50-08-6480 [two charcoal concentrations (SSF-1 and -2) and a fire hearth (SSF-3) with two possible boulder concentrations (SSF-4 and SSF-5)], was identified; however, due to its location alongside Honoapi'ilani Highway and the Pacific Ocean, no subsurface testing or radiocarbon age determination of exposed charcoal was conducted. The site has been interpreted as a traditional period temporary habitation deposit associated with the procurement of marine resources.

The report now contains the required information as specified in HAR §13-276-5 regarding report documentation of inventory level field work completed in general and is acceptable.

As stated in the initial review letter, with respect to the Hawai'i and National Registers of Historic Places, we concur that SIHP #50-50-08-6480 is significant under Criterion D for its potential to yield information important to history or prehistory.

We also agree, especially in light of the fact that the horizontal extent of the site is unknown, that precautionary archaeological monitoring be undertaken during all ground altering disturbance within the

project area because of the potential that culturally significant subsurface deposits will be found in the process.

Now that the archaeological inventory survey report has been accepted pursuant to HAR §13-276, please send one hardcopy of the current version, clearly marked **FINAL**, along with a copy of this review letter and a text-searchable PDF file on CD to the attention of "**SHPD Library**" at the Kapolei SHPD office.

Should you have any questions or comments regarding this letter, please contact Patty Conte (Patty.J.Conte@hawaii.gov).

Aloha,

Nancy A. McMahon

Nancy McMahon, Deputy SHPO/State Archaeologist
State Historic Preservation Division

c: Jeff Hunt, Director, Dept. of Planning, 250 S. High Street, Wailuku, Hawai'i 96793
Maui CRC, Dept. of Planning, 250 S. High Street, Wailuku, Hawai'i 96793

APPENDIX E.

Cultural Impact Assessment

SCS Project Number 937-CIA-2

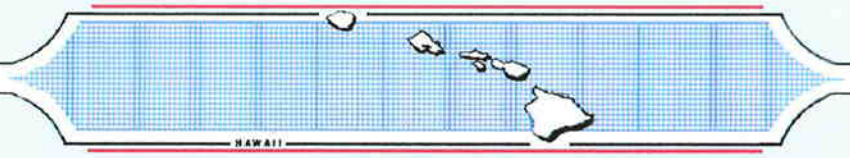
A CULTURAL IMPACT ASSESSMENT OF APPROXIMATELY 1,000 FEET OF LAND IN OLOWALU AHUPUA`A, LAHAINA DISTRICT, MAUI, HAWAI`I [TMK 4-8-003:6, 10, 78 por.]

Prepared by:
Leann McGerty, B.A.
and
Robert L. Spear, Ph.D.

Revised January 2009

Prepared for:
Sato and Associates, Inc.
2046 South King Street
Honolulu, Hawaii 96826

SCIENTIFIC CONSULTANT SERVICES Inc.



711 Kapiolani Blvd. Suite 975 Honolulu, Hawai`i 96813

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INTRODUCTION

Scientific Consultant Services, Inc. (SCS) has been contracted by Sato & Associates to conduct a Cultural Impact Assessment on approximately 1,000 feet of land along Honoapi`ilani Highway in Olowalu Ahupua`a, Lahaina District, Maui TMK: 4-8-003:6, 10, 78 por. (Figures 1).

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).

Act 50, enacted by the Legislature of the State of Hawai`i (2000) with House Bill 2895, relating to Environmental Impact Statements, proposes 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].

Act 50 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). Its purpose has broadened, "to promote and protect cultural beliefs, practices and resources of native Hawaiians [and] other

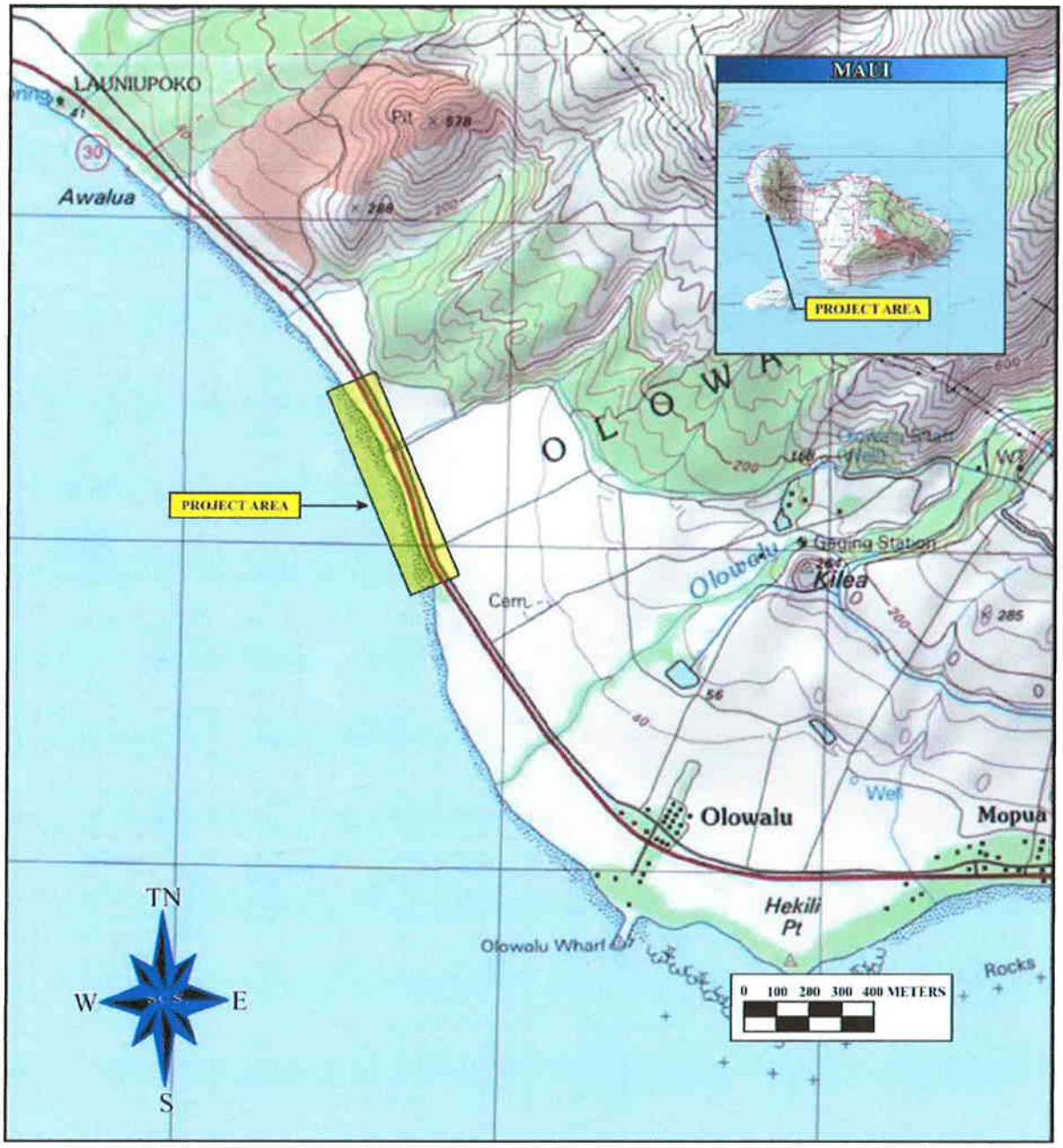

Figure 1: USGS Olowalu Quadrangle Map Showing Project Area.

ethnic groups, and it also amends the definition of "significant effect" to be re-defined as "the sum of effects on the quality of the environment including actions 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 be included in the Environmental Assessments and the 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.

The purpose of a Cultural Impact Assessment is to identify the possibility of any cultural resources associated with different Ethnic groups within a project area, and then assessing the potential for impacts on these resources from the proposed project. The CIA is not intended to be a document of in depth archival-historical land research or a record of oral family histories unless they contain information about specific cultural resources that might be impacted by a proposed project. Cultural resources can cover a broad range of categories and may include values, rights, beliefs, objects, records, properties, and stories associated with the project area (H.B. 2895, Act 50, 2000.

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 methodology and content protocol suggested 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 methodology and content protocol provided in the Guidelines for Assessing Cultural Impacts (OEQC 1997). 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 knowledgeablel individuals are able to identify cultural resources 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 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. No interviews were conducted for the present project as there were no responses from any of the contacted organizations and/or individuals.

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.

In this case, letters were sent to organizations whose jurisdiction included knowledge of the area. Consultation was sought from Kai Markell, Office of Hawaiian Affairs, O`ahu; Thelma Shimaoka, Maui Office of Hawaiian Affairs, Community Resource Coordinator; the Cultural Resources Commission of the Maui Planning Department; Hawaiian Civic Club, Lahaina Branch; Nā Kupuna O Maui; and Hinano Rodrigues, Cultural Historian with the State Historic Preservation Division, Maui Office (SHPD). 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 located along the *makai* side of Honoapi`ilani Highway and incorporates about 1,000 feet of highway (Figures 2 and 3).

CULTURAL AND HISTORICAL CONTEXT

The island of Maui ranks second in size of the eight main islands in the Hawaiian Archipelago. Pu`u Kukui, forming the west end of the island (1,215 m amsl), is composed of large, heavily eroded amphitheater valleys that contain well-developed, permanent stream systems that water fertile agricultural lands extending to the coast. The deep valleys of West Maui and their associated coastal regions have been witness to many battles in ancient times and were coveted productive landscapes.

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 *ai`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`* ā*ina* 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 and were next to importance to the *ahupua`a*. They 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 Olowalu, meaning literally "many hills" (Pukui *et al.* 1974:170).

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*. 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, such as Olowalu, 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 cultivated. 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 (A.D. 1200-1400, Kirch 1985).

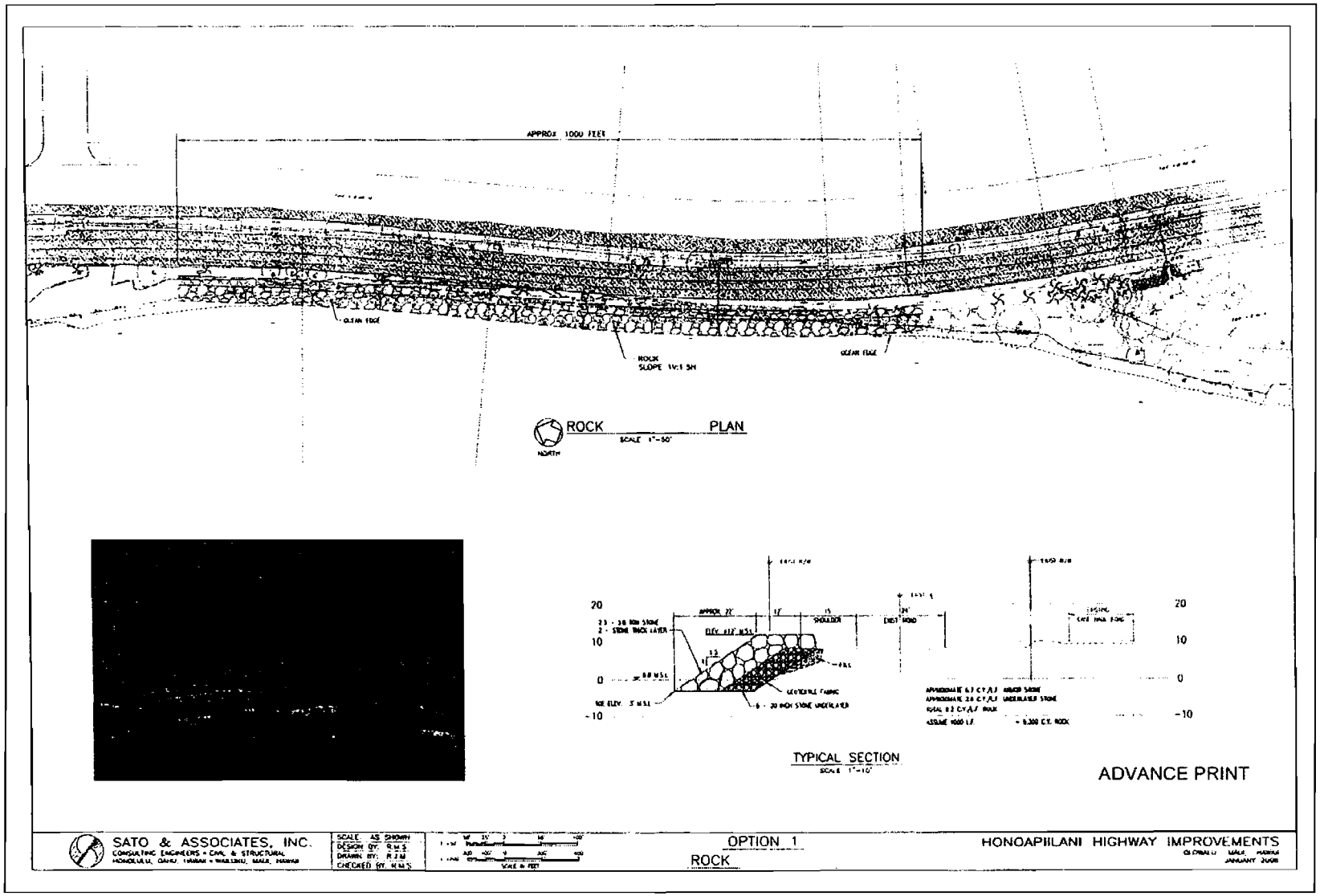

Figure 2: Figure Showing Highway Improvements.

Figure 3: Location of Project Area.

WAHI PANA (LEGENDARY PLACES)

Scattered amongst the agricultural and habitation sites were other places of cultural significance to the *kama`āina* (those familiar with the area) of the district. Information concerning only a few has been retained. Three *heiau* were recorded in Olowalu Ahupua`a in the 1920s (Thrum 1908, 1916, 1917; Walker 1930, Sterling 1998). Petroglyphs were inscribed and are still visible on the bare stone sides of a hill about a mile in from the highway past the present Olowalu Store. The figures are of several types, including those of dogs, women, children, letters from the English alphabet, having been drawn during different periods. It was suggested by one *kama`āina* (John Ka`aea Fujishiro, pers. Comm; McGerty and Spear 2005) that this area had functioned as a rest stop before attempting the crossing of the Olowalu mountains to `Īao Valley. As Olowalu is the largest and deepest valley on the southwest side of Maui, Handy recorded in the 1930s:

> ...[Olowalu] used to support extensive terraced cultivation. The lower ranges of terraces have been completely obliterated by canefields; by just where the sugar cane ends and the valley begins there is a little spot where five Hawaiian families, all of them intermarried, raise several varieties of taro in flourishing wet patches. Some of it is sold, but most is pounded by hand for the family poi. There are said to be abandoned terraces far up in Olowalu [1940: 103].

Indeed, in the valley, Walker recorded old taro patches and house sites, a lookout site, and a traditional *`auwai* still in use by the sugar plantation to bring water from the valley to the cane fields as the plantation did with the old *`auwai* in Ukumehame Ahupua`a, next door (Walker 1930; McGerty and Spear 2005).

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. A path along Kealaloa ridge leads to the summit of Pu`u Kukui, the headwaters of many streams, and continues beyond. The Lahaina Pali Trail, constructed in 1841, provided access to other parts of the island, including Wailuku (Tomonari Tuggle 1991, 1995). The most famous of the trails is that used to cross from `Īao Valley to Olowalu and was used by the surviving warriors and *ali`i* (Kalola, Keopolani, Kalanikupule, etc) of Maui to escape the forces of Kamehameha in the battle of *Kepaniwai* in the 1790s (Kamakau 1961).

Historically, Olowalu is known for the Olowalu Massacre perpetrated by Capt. Simon Metcalf of the ship *Eleanora* in 1790 (*ibid.*). Instead of seeking out and punishing those natives

guilty of a crime, Metcalf chose to retaliate on the innocent inhabitants of Olowalu Village. Placing all his ship's guns on the starboard side of the ship, Metcalf encouraged the natives to come in their canoes to trade at which time he fired on them, slaughtering men, women and children (Kuykendall 1980, Vol. I).

Most of the *ahupua`a* on the southern coast have been overshadowed by the famous roadstead and village of Lāhainā which served as the capitol of the Hawaiian Kingdom after the conquest of Kamehameha until 1855. The ethnographic and historic literature, often our only link to the past, reveals that the lands around Lāhainā were rich agricultural areas irrigated by aqueducts originating in well-watered valleys with permanent occupation predominately on the coast. Handy and Handy have stated the space cultivated by the natives of Lāhainā (district) at about "...three leagues [9 miles] in length, and one in its greatest breadth. Beyond this all is dry and barren; everything recalls the image of desolation" (1972:593). Crops cultivated included coconut, breadfruit, paper mulberry, banana, taro, sweet potato, sugar cane, and gourds.

Olowalu Valley, with its permanent stream, was one of the sources along with Ukumehame, Launiupoko, and Kaua`ula, providing agricultural opportunities for the growing leeward population. Handy and Handy reported:

> Southeastward along the coast from the *ali`i* settlement [Lāhainā] were a number of areas where dispersed populations grew taro, sweet potato, breadfruit and coconut on the slopes below and in the sides of valleys which had streams with constant flow. All this area, like that around and above Lahaina, is now sugar-cane land...[1972].

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 1968:111; 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 made available and private ownership was instituted, the *maka`āinana*, 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).

There were 88 claims for land in Olowalu during the Māhele (Waihona `Aina Database 2006). There were several LCA's, a church and school along this section of the highway (Mahele Database 2008).

Sugar was to be the economic future of Hawai`i and as early as 1828, two Chinese brothers, Ahung and Atai, of Honolulu's Hungtai Company arrived in Wailuku to explore the possibility of setting up one of its earliest sugar mills. Atai soon created a plant that processed sugar cane cultivated by Hawaiians, named the Hungtai Sugar Works (Dorrance and Morgan 2000:15–16). Ahung later joined Kamehameha III's sugar producing enterprise, although by 1844 both operations had ceased. The Wailuku Sugar Company was the next to follow, in 1862, and would expand sugar production over the next 126 years of its existence—4,450 acres by 1939. The Olowalu Company was organized in 1881 on lands given up by the West Maui Plantation. A small company, it produced a maximum of 2, 969 tons of sugar in 1931 (Dorrance and Morgan 2000:64). At this time, it was purchased by the Pioneer Mill and became a part of their acreage. All the LCAs eventually became a part of the sugar lands belonging to the Pioneer Mill Company Ltd.

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 of inquiry were sent to organizations whose expertise would include the project area. Consultation was sought from Kai Markell, Office of Hawaiian Affairs, O`ahu; Thelma Shimaoka, Maui Office of Hawaiian Affairs, Community Resource Coordinator; the Cultural Resources Commission of the Maui Planning Department; Hawaiian Civic Club, Lahaina Branch; Nā Kupuna O Maui; and Hinano Rodrigues, Cultural Historian with the State Historic Preservation Division, Maui Office (SHPD).

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, 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 2005 Data base.

CIA INQUIRY RESPONSE

As suggested in the "Guidelines for Accessing Cultural Impacts" (OEQC 1997), CIAs incorporating personal interviews should include ethnographic and oral history interview procedures, circumstances attending the interviews, as well as the results of this consultation. It is also permissible to include organizations with individuals familiar with cultural practices and features associated with the project area.

As stated above, consultation was sought from Kai Markell, Office of Hawaiian Affairs, O`ahu; Thelma Shimaoka, Maui Office of Hawaiian Affairs, Community Resource Coordinator; the Cultural Resources Commission of the Maui Planning Department; Hawaiian Civic Club, Lahaina Branch; Nā Kupuna O Maui; and Hinano Rodrigues, Cultural Historian with the State Historic Preservation Division, Maui Office (SHPD). None of the native Hawaiian organizations, or the Maui Planning Department that is mandated "to preserve and protect customary and traditional practices of Native Hawaiians" (94 Haw. 31, 45, 2000) responded with information concerning the potential for cultural resources to occur in the project area (TMK 4-8-03:6, 10, 78 por.), or with additional suggestions for further contacts. Therefore, no interviews were conducted for this property, as there were no interviewees identified.

Ms. Cayan, the History and Culture Branch Chief with SHPD, was informed of a site visit by Hinanao Rodrigues and a conversation he had with an SCS archaeologist who was working in the area. According to Ms. Cayan, Mr. Rodrigues discussed *limu* and *a`ama* gathering by his family as part of the cultural lifestyle. It has been determined that the present project will have no adverse impact upon those gathering rights.

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. Based on historical research and the lack of response from the previously listed contacts, it is reasonable to conclude that Hawaiian rights related to gathering, access or other customary activities within the project area will not be affected and there will be no direct adverse effect upon cultural practices or beliefs. The visual impact of the project from surrounding vantage points, e.g. the highway, mountains, and coast is minimal as it is incorporated in an already subdivided and developed land section.

CULTURAL ASSESSMEMNT

Based on organizational lack of response, and 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 highway improvements within the project area. Because there were no cultural activities identified within the specific project area, and because those cultural activities that do take place in the vicinity will not be impacted by the highway project, there are no adverse effects.

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APPENDIX A: CONSULTATION INQUIRES

SCIENTIFIC CONSULTANT SERVICES, Inc.
711 Kapiolani Blvd., Suite 975 Honolulu, Hawai'i 96813

Patty Nishiyama
Nā Kupuna O Maui
320 Kaeo Place
Lahaina, Hawaii 96761

March 25, 2008

Dear Ms. Nishiyama:

Scientific Consultant Services, Inc. (SCS) has been contracted by Sato and Associates, to conduct a Cultural Impact Assessment (CIA) on approximately 1000 feet of land located along Honoapi'ilani Highway in Olowalu, Maui Island (TMK?). According to documents supplied by Sato and Associates, the proposed project consists of the improvements to the Honoapi'ilani Highway. As you know, this involves assessing the probability of impacting cultural values and rights within the project area and vicinity.

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 contribute to the knowledge of traditional activities, or traditional rights that might be impacted by development of the property. The assessment results are dependent on the response and contributions made by 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)

SCIENTIFIC CONSULTANT SERVICES, Inc.
711 Kapiolani Blvd., Suite 975 Honolulu, Hawai'i 96813

Hinano Rodrigues, Cultural Historian
DLNR Maui Office
130 Mahalani Street
Wailuku, HI 96791

March 25, 2008

Dear Hinano:

Scientific Consultant Services, Inc. (SCS) has been contracted by Sato and Associates, to conduct a Cultural Impact Assessment (CIA) on approximately 1000 feet of land located along Honoapi`ilani Highway in Olowalu, Maui Island (TMK?). According to documents supplied by Sato and Associates, the proposed project consists of the improvements to the Honoapi`ilani Highway. As you know, this involves assessing the probability of impacting cultural values and rights within the project area and vicinity.

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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

County of Maui
Department of Planning
Cultural Resources Commission
250 S. High Street
Wailuku, HI 96793

March 25, 2008

Dear Sir or Madam:

Scientific Consultant Services, Inc. (SCS) has been contracted by Sato and Associates, to conduct a Cultural Impact Assessment (CIA) on approximately 1000 feet of land located along Honoapi'ilani Highway in Olowalu, Maui Island (TMK?). According to documents supplied by Sato and Associates, the proposed project consists of the improvements to the Honoapi'ilani Highway. As you know, this involves assessing the probability of impacting cultural values and rights within the project area and vicinity.

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Leann McGerty

Leann McGerty
Senior Archaeologist
Enclosures (2)

SCIENTIFIC CONSULTANT SERVICES, Inc.
711 Kapiolani Blvd., Suite 975 Honolulu, Hawai'i 96813

Thelma Shimaoka
c/o Office of Hawaiian Affairs
140 Hoohana St.
Suite 206
Kahului, HI 96732

March 25, 2008

Dear Ms. Shimaoka:

Scientific Consultant Services, Inc. (SCS) has been contracted by Sato and Associates, to conduct a Cultural Impact Assessment (CIA) on approximately 1000 feet of land located along Honoapi'ilani Highway in Olowalu, Maui Island (TMK?). According to documents supplied by Sato and Associates, the proposed project consists of the improvements to the Honoapi'ilani Highway. As you know, this involves assessing the probability of impacting cultural values and rights within the project area and vicinity.

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Leann McGerty

Leann McGerty
Senior Archaeologist
Enclosures (2)

SCIENTIFIC CONSULTANT SERVICES, Inc.
711 Kapiolani Blvd., Suite 975 Honolulu, Hawai'i 96813

Kai Markell
Director of Native Rights
C/o Office of Hawaiian Affairs
711 Kapi`olani Blvd, Suite 500
Honolulu, HI 96813

March 25, 2008

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Leann McGerty

Leann McGerty
Senior Archaeologist
Enclosures (2)

SCIENTIFIC CONSULTANT SERVICES, Inc.
711 Kapiolani Blvd., Suite 975 Honolulu, Hawai'i 96813

Holouamoku Ralar
Hawaiian Civic Club, Lahaina Chapter
P.O. Box 10965
Lahaina, Hawai'i 96761

March 25, 2008

Dear Holouamoku:

Scientific Consultant Services, Inc. (SCS) has been contracted by Sato and Associates, to conduct a Cultural Impact Assessment (CIA) on approximately 1000 feet of land located along Honoapi'ilani Highway in Olowalu, Maui Island (TMK?). According to documents supplied by Sato and Associates, the proposed project consists of the improvements to the Honoapi'ilani Highway. As you know, this involves assessing the probability of impacting cultural values and rights within the project area and vicinity.

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 contribute to the knowledge of traditional activities, or traditional rights that might be impacted by development of the property. The assessment results are dependent on the response and contributions made by 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)

APPENDIX F.

Drainage Report

DRAINAGE REPORT

HONOAPIILANI HIGHWAY SHORELINE PROTECTION
OLOWALU, MAUI, HAWAII

TMK: (2) 4-8-03

Prepared for

State of Hawaii
Department of Transportation, Highways Division

Prepared by

Sato & Associates, Inc.
Consulting Engineers

2046 South King Street
Honolulu, Hawaii 96826

JASON Y. KAGE
LICENSED PROFESSIONAL ENGINEER
No. 9930-C
HAWAII, U.S.A.

This work was prepared by me or under my supervision.
Expiration Date: 4/30/10

March 2009

TABLE OF CONTENTS

PROJECT LOCATION

This project is located in Olowalu, on the southern coast of the Island of Maui. The project is located along Honoapiilani Highway, between approximate stations 552+00 and 559+00. Mile marker 16 is located at approximate station 567+50. The roadway is bordered by the shoreline to the west and undeveloped land used for agricultural purposes to the east.

PROJECT DESCRIPTION

At the project area, Honoapiilani Highway is a two-lane, paved roadway with shoulder areas on both sides. The project includes improvements to reduce the potential for erosion of the roadway caused by wave action. These proposed improvements include placing boulders, geotextile fabric, filling and widening the existing road shoulder, and installing jersey crash barriers.

FLOOD HAZARD

Flood Insurance Rate Map (FIRM) published by the Federal Emergency Management Agency (FEMA), panel number 150003 0227B, indicates that the project site is located within Zone V12. Zone V12 is designated as areas of 100-year coastal flood with velocity (wave action); base flood elevation and flood hazard factors determined.

EXISTING DRAINAGE CONDITIONS

The project site is a two lane highway. For the majority of the area of improvement, the roadway slopes away from the ocean. The storm water runoff generated on site flows off the roadway and flows along the roadway to an existing headwall with a 24" drainline that crosses beneath the roadway and outlets to the ocean. An existing earth berm is located east of the roadway intercepts offsite runoff from flowing onto the roadway. A portion of the roadway on the north side of the improvements transitions from sloping away from the ocean to sloping towards the ocean.

Refer to Appendix A for a runoff map showing existing runoff conditions and Appendix B for a runoff summary.

DEVELOPED DRAINAGE SYSTEM

The proposed improvements do not alter the existing storm water runoff flow patterns. The existing 24" drainline that crosses beneath the roadway and outlets to the ocean will be extended to accommodate the shoreline improvements. A new headwall will be installed at the 24" drainline outlet.

Refer to Appendix A for a runoff map showing developed runoff conditions and Appendix B for a runoff summary.

HYDROLOGIC DESIGN CRITERIA

The hydrologic design criteria for the proposed drainage system is outlined in Title MC-15, Chapter 4, *Rules for the Design of Storm Drainage Facilities in the County of Maui*, Department of Public Works and Waste Management. Hydrologic calculations for both existing and developed conditions, were done using the Rational Method.

Recurrence Interval (Tm)

A recurrence interval of 10 years was used to evaluate the system.

Recurrence Interval = 10 years
1-Hour Rainfall = 2.0 inches (Plate 4)

Runoff Quantity

The rational method (Q=CIA) is used to estimate the storm runoff from drainage areas, where:

- Q = design rate of flow in cubic feet per second
- C = weighted rational coefficient for the drainage area
- I = rainfall intensity in inches per hour for a duration equal to the time of concentration
- A = drainage area in acres

Runoff Coefficient (C)

The runoff coefficient was determined by the weighted average of the paved areas and grassed areas. A "C" value of 0.95 is used for the paved areas and a "C" value of 0.40 is used for the grassed areas. A summary of the runoff calculations are attached in the Appendix B.

Time of Concentration (Tc)

Overland flow time is determined by using the hydraulic length and slope of the ultimate developed area to the intake point of the drainage system (Plate 1).

Rainfall Intensity (I)

Rainfall intensity is determined by the storm's duration and frequency for each drainage sub-area (Plate 2).

A summary of the hydrologic calculations are provided in Appendix B.

SUMMARY

Existing storm water runoff flow patterns are not altered by the proposed improvements. The existing 24"drainline crossing Honoapiilani Highway will be extended to accommodate the shoreline improvements and a new headwall will be installed at the outlet. The proposed improvements do not adversely impact any of the adjacent properties.

APPENDIX A
Exhibits

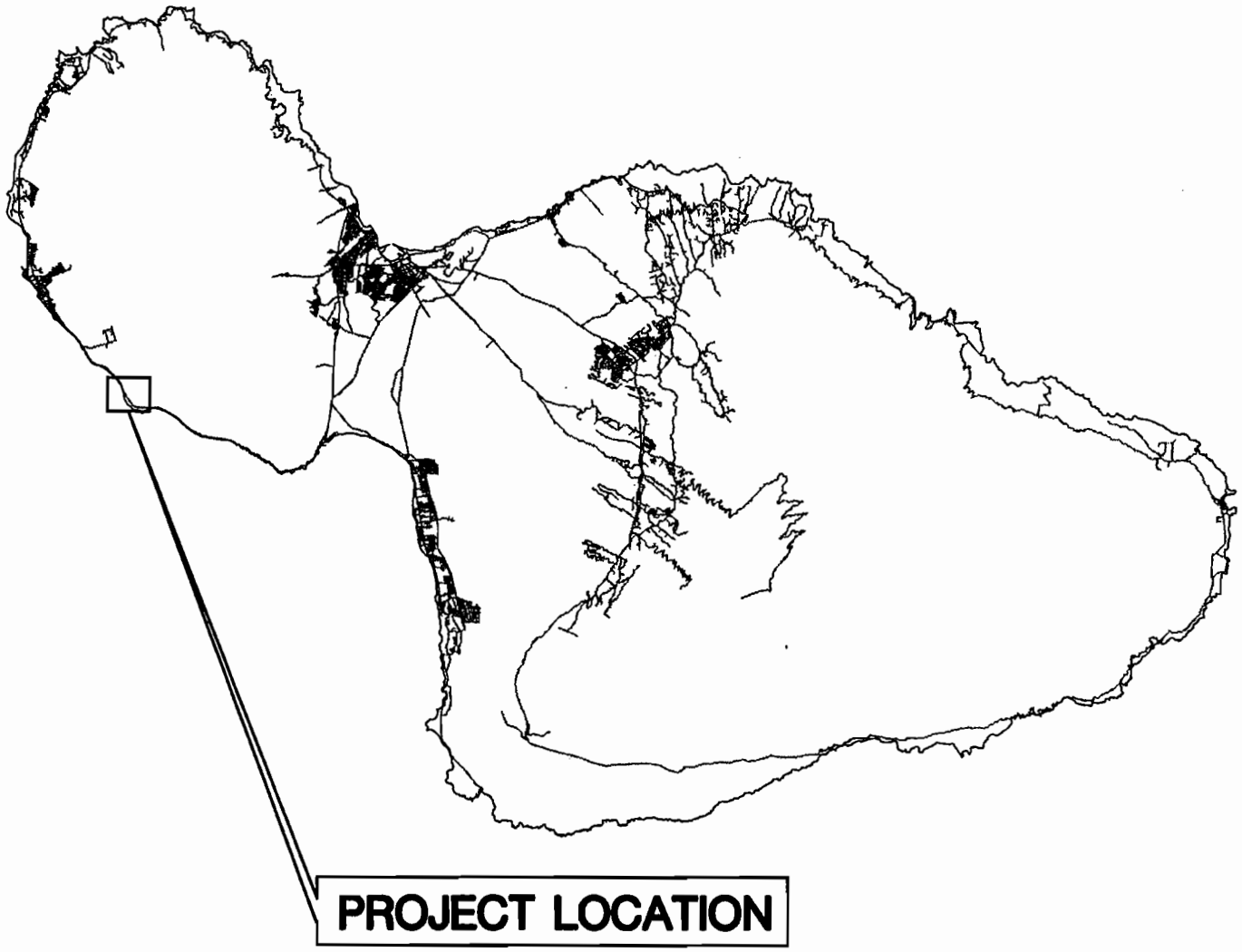
Vicinity Map – Exhibit A

Location Map – Exhibit B

Typical Section – Exhibit C

Runoff Map – Existing Conditions – Exhibit D

Runoff Map – Developed Conditions – Exhibit E



NORTH

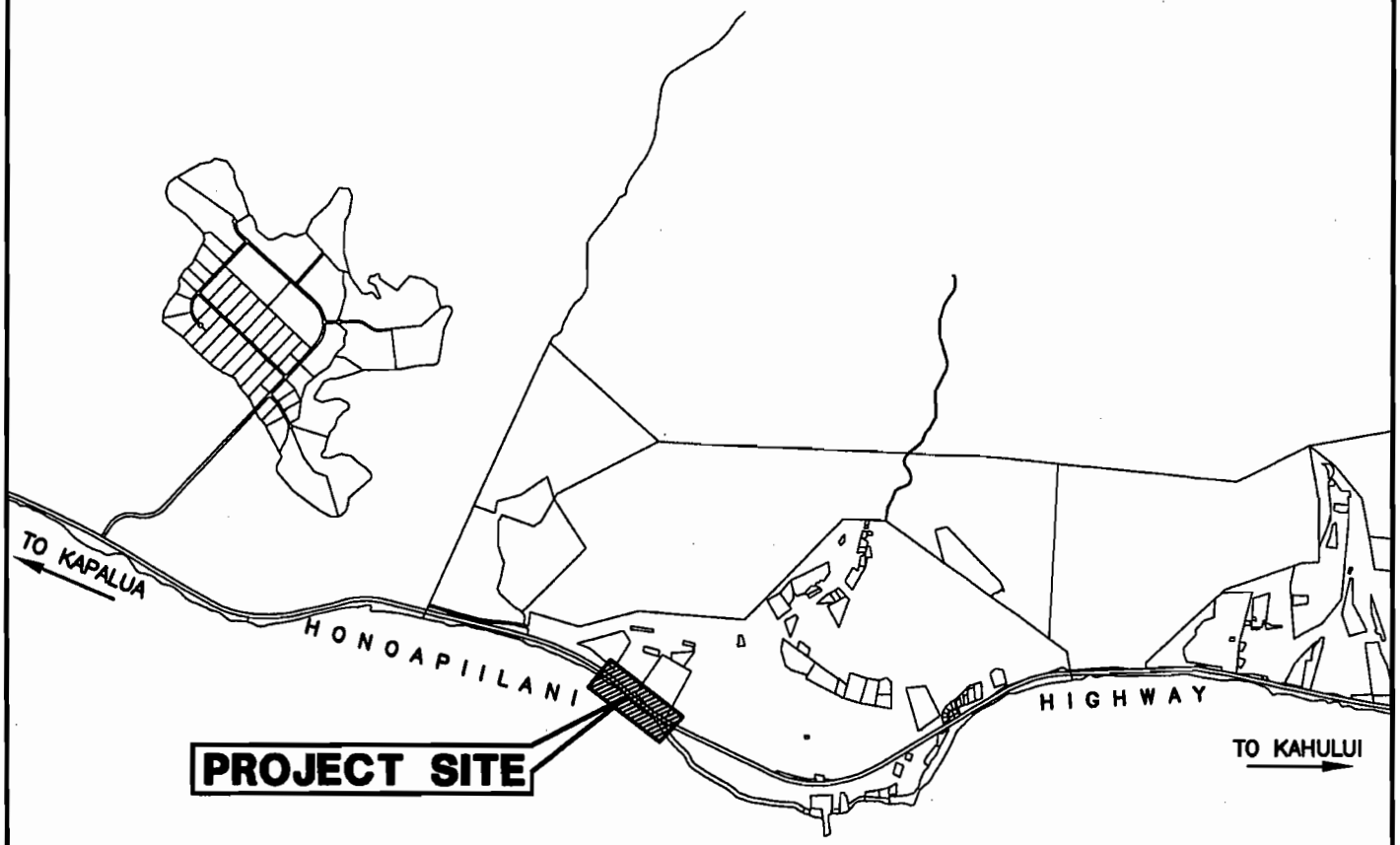
ISLAND OF MAUI

NOT TO SCALE

HONOAPIILANI HIGHWAY SHORELINE PROTECTION
Drainage Report

SATO AND ASSOCIATES, INC.
CONSULTING ENGINEERS • CIVIL & STRUCTURAL
HONOLULU, OAHU, HAWAII • WAILUKU, MAUI, HAWAII

VICINITY MAP	
SCALE: NTS	**EXHIBIT A**



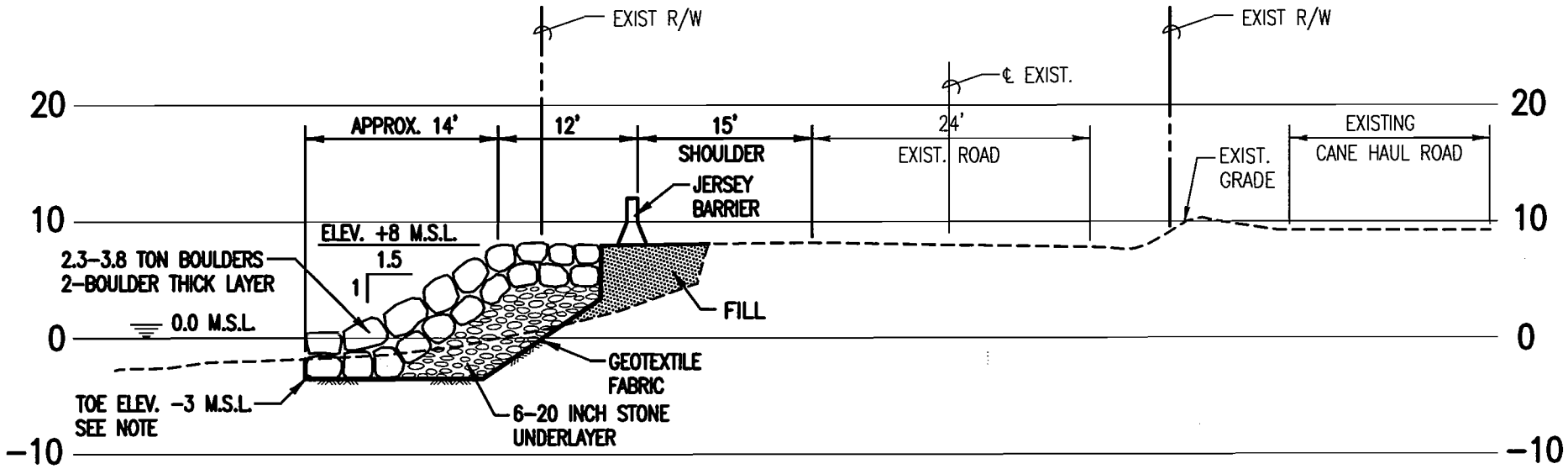
NORTH

LOCATION MAP

NOT TO SCALE

HONOAPIILANI HIGHWAY SHORELINE IMPROVEMENTS
Drainage Report

SATO AND ASSOCIATES, INC. CONSULTING ENGINEERS • CIVIL & STRUCTURAL HONOLULU, OAHU, HAWAII • WAILUKU, MAUI, HAWAII	LOCATION MAP	
	SCALE: As Shown	EXHIBIT B

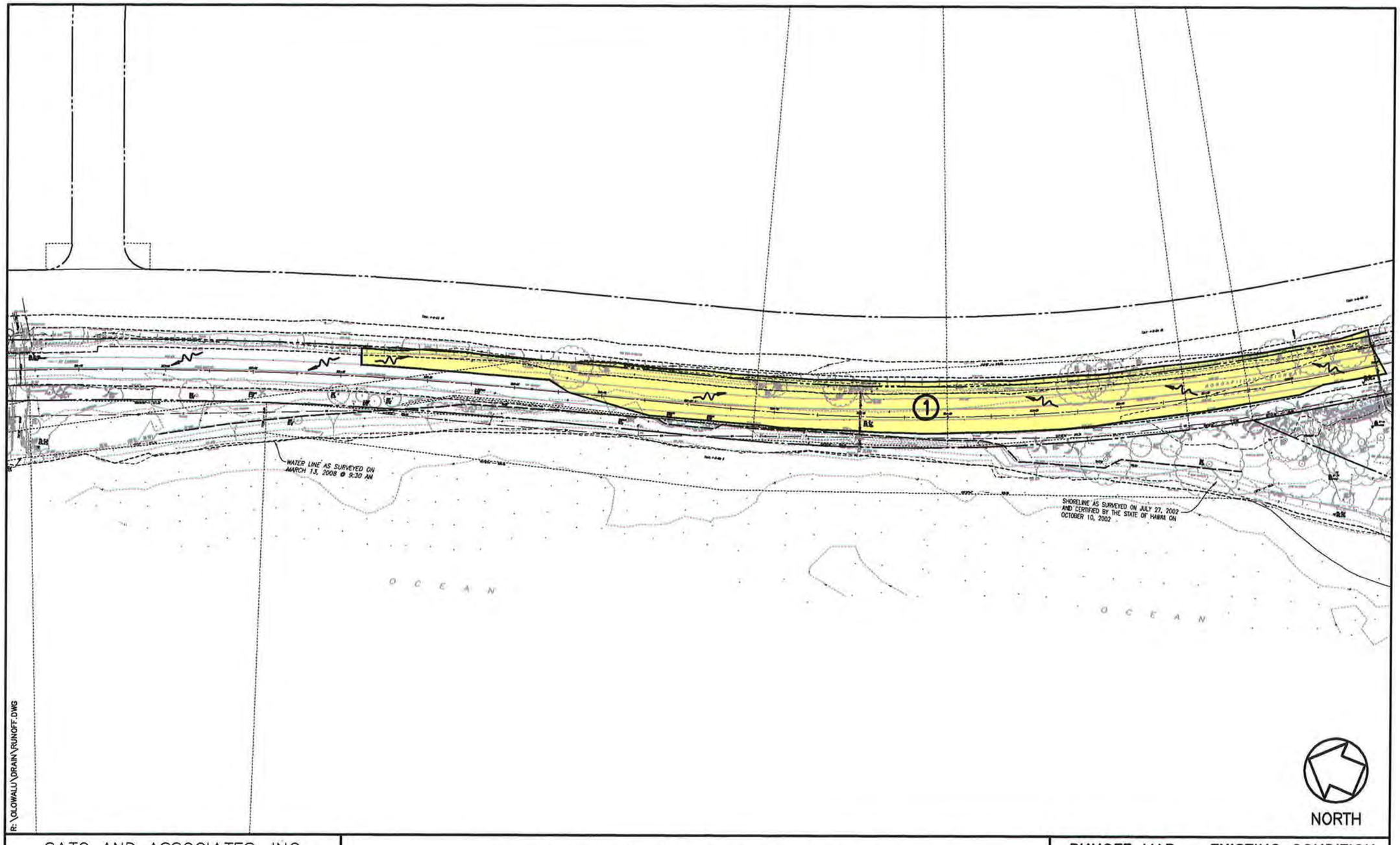


NOTE:
EXCAVATE TOE TO -3.0 M.S.L. OR PLACE ON HARD SUBSTRATE. SUBSTRATE IS TYPICALLY FOUND AT -3.0' OR SHALLOWER.

TYPICAL SECTION

NOT TO SCALE

EXHIBIT C



R: \OLOWALU \DRAIN \RUNOFF.DWG

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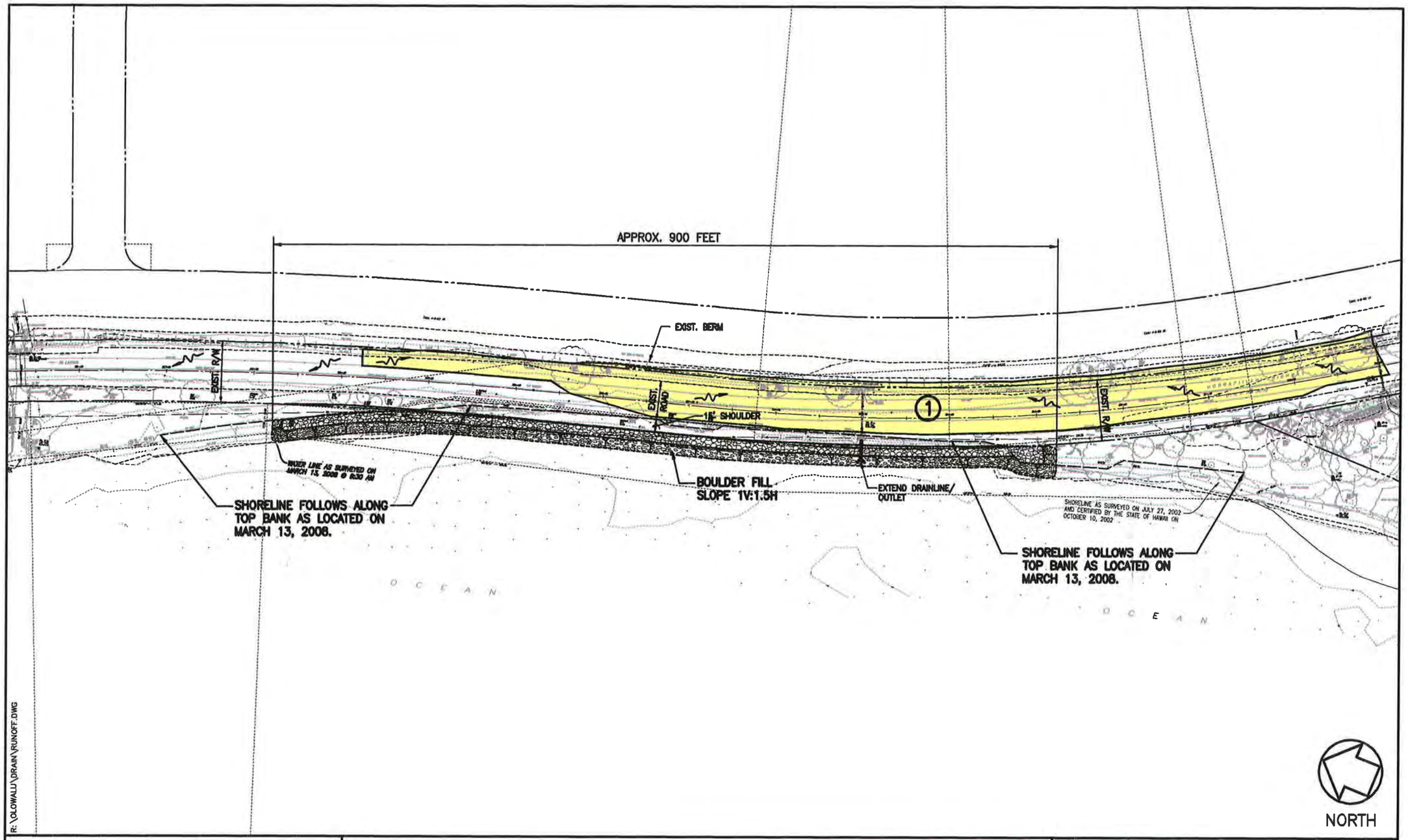
HONOLULU, OAHU, HAWAII WAILUKU, MAUI, HAWAII

HONOAPIILANI HIGHWAY SHORELINE PROTECTION

RUNOFF MAP – EXISTING CONDITION

SCALE: 1"=100'

EXHIBIT D



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HONOAPIILANI HIGHWAY SHORELINE PROTECTION

RUNOFF MAP – DEVELOPED CONDITION

SCALE: 1"=100'

EXHIBIT E

APPENDIX B

Hydrologic Runoff Calculations

Storm Runoff Calculations, Existing Conditions

Storm Runoff Calculations, Developed Conditions

Storm Runoff Calculations, Existing Conditions

PROJECT: HONOAPIILANI HIGHWAY SHORELINE PROTECTION
LOCATION: OLOWALU, MAUI, HAWAII
STORM WATER RUNOFF, EXISTING CONDITIONS

CALCULATIONS BY: DM
CHECKED BY: JK
DATE: 5/2/2008

Tm = 10 YR

1-HR. RAINFALL, i = 2 INCHES

AREA	AREA (SQ.FEET)	OVERLAND FLOW TIME Tc (MIN.)	ADJUSTED I (IN./HR.)	C	A (ACRES)	Q (CFS)	INLET
1	57,563	10.5	4.0	0.80	1.32	4.23	D24"
					1.32	4.23	

Storm Runoff Calculations, Developed Conditions

PROJECT: HONOAPIILANI HIGHWAY SHORELINE PROTECTION
LOCATION: OLOWALU, MAUI, HAWAII
STORM WATER RUNOFF, DEVELOPED CONDITIONS

CALCULATIONS BY: DM
CHECKED BY: JK
DATE: 5/2/2008

Tm = 10 YR

1-HR. RAINFALL, i = 2 INCHES

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					1.32	4.23	