

ALAN M. ARAKAWA
Mayor



DAVID TAYLOR, P.E.
Director

PAUL J. MEYER
Deputy Director

DEPARTMENT OF WATER SUPPLY
COUNTY OF MAUI
200 SOUTH HIGH STREET
WAILUKU, MAUI, HAWAII 96793-2155
www.mauiwater.org

February 4, 2014

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FEB 23 2014

RECEIVED
COUNTY OF MAUI
DEPARTMENT OF WATER SUPPLY
14 FEB 10 P1:02
DIRECTOR

Director
Office of Environmental Quality Control
State of Hawaii
235 South Beretania Street, Suite 702
Honolulu, Hawaii 96813

SUBJECT: DRAFT ENVIRONMENTAL ASSESSMENT FOR THE PROPOSED WEST MAUI EXPLORATORY WELL NO. 2 PROJECT, KAHANA, MAUI, HAWAII

Dear Director:

With this letter, the County of Maui, Department of Water Supply hereby transmits the Draft Environmental Assessment and Anticipated Finding of No Significant Impact (DEA-AFNSI) for the proposed West Maui Exploratory Well No. 2 Project located in the Lahaina District on the Island of Maui for publication in the next available edition of the Environmental Notice.

Enclosed is a completed OEQC Publication Form, two (2) copies of the DEA-AFNSI, an Adobe Acrobat PDF file of the same, and an electronic copy of the publication form in MS Word. Simultaneous with this letter, we have submitted the summary of the action in a text file by electronic mail to your office.

Should you have any questions, please do not hesitate to contact Cheryl K. Okuma at Munekiyo & Hiraga, Inc. at (808) 244-2015.

Sincerely,

DAVID TAYLOR, P.E.
Director of Water Supply

DT DT/CE/jm

Enclosures

cc: Ronald Fukumoto, Fukumoto Engineering, Inc.
Cheryl K. Okuma, Munekiyo & Hiraga, Inc.

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"By Water All Things Find Life"

**AGENCY ACTIONS
SECTION 343-5(B), HRS
PUBLICATION FORM (FEBRUARY 2013 REVISION)**

Project Name West Maui Exploratory Well No. 2
Island: Maui
District: West Maui
TMK:
Permits: Department of Health Community Noise Permit, as applicable; Commission on Water Resource Management Well Construction Permits, Construction Permits (Grading and Grubbing)

Proposing/Determination

Agency: County of Maui, Department of Water Supply
(Address, 200 South High Street
Wailuku, Hawaii 96793
Contact Person, Contact: David Taylor, P.E., Director
Telephone) Phone No.: (808) 270-7816

Accepting Authority:
(for EIS submittals only)

Consultant: Munekiyo & Hiraga, Inc.
(Address, 305 South High Street, Suite 104
Wailuku, Hawaii 96793
Contact Person, Contact: Cheryl Okuma, Senior Associate
Telephone) Phone No.: (808) 244-2015

OFFICE OF ENVIRONMENTAL QUALITY CONTROL
14 FEB 10 P 1:02
PROJECT ROOM

Status (check one only):

- DEA-AFNSI** Submit the proposing agency notice of determination/transmittal on agency letterhead, a hard copy of DEA, a completed OEQC publication form, along with an electronic word processing summary and a PDF copy (you may send both summary and PDF to oeqchawaii@doh.hawaii.gov); a 30-day comment period ensues upon publication in the periodic bulletin.
- FEA-FONSI** Submit the proposing agency notice of determination/transmittal on agency letterhead, a hard copy of the FEA, an OEQC publication form, along with an electronic word processing summary and a PDF copy (send both summary and PDF to oeqchawaii@doh.hawaii.gov); no comment period ensues upon publication in the periodic bulletin.
- FEA-EISPN** Submit the proposing agency notice of determination/transmittal on agency letterhead, a hard copy of the FEA, an OEQC publication form, along with an electronic word processing summary and PDF copy (you may send both summary and PDF to oeqchawaii@doh.hawaii.gov); a 30-day consultation period ensues upon publication in the periodic bulletin.
- Act 172-12 EISPN** Submit the proposing agency notice of determination on agency letterhead, an OEQC publication form, and an electronic word processing summary (you may send the summary to oeqchawaii@doh.hawaii.gov). NO environmental assessment is required and a 30-day consultation period upon publication in the periodic bulletin.
- DEIS** The proposing agency simultaneously transmits to both the OEQC and the accepting authority, a hard copy of the DEIS, a completed OEQC publication form, a distribution list, along with an electronic word processing summary and PDF copy of the DEIS (you may send both the summary and PDF to oeqchawaii@doh.hawaii.gov); a 45-day comment period ensues upon publication in the periodic bulletin.
- FEIS** The proposing agency simultaneously transmits to both the OEQC and the accepting authority, a hard copy of the FEIS, a completed OEQC publication form, a distribution list, along with an electronic word processing summary and PDF copy of the FEIS (you may send both the summary and PDF to oeqchawaii@doh.hawaii.gov); no comment period ensues upon publication in the periodic bulletin.
- Section 11-200-23**

Determination

The accepting authority simultaneously transmits its determination of acceptance or nonacceptance (pursuant to Section 11-200-23, HAR) of the FEIS to both OEQC and the proposing agency. No comment period ensues upon publication in the periodic bulletin.

___Section 11-200-27

Determination

The accepting authority simultaneously transmits its notice to both the proposing agency and the OEQC that it has reviewed (pursuant to Section 11-200-27, HAR) the previously accepted FEIS and determines that a supplemental EIS is not required. No EA is required and no comment period ensues upon publication in the periodic bulletin.

___Withdrawal (explain)

Summary (Provide proposed action and purpose/need in less than 200 words. Please keep the summary brief and on this one page):

The West Maui Exploratory Well No. 2 consists of a 1.44 million gallon per day exploratory well, well pump, piping, temporary silt basin, and six (6) feet high chain link fence located on an approximately 0.9 acre site below the West Maui Mountains, between Kahana Stream and Kahanaiiki Gulch. The proposed exploratory well will draw water from the Honolua Aquifer which is located within the Lahaina Aquifer Sector. The purpose of the proposed project is to provide a potential new groundwater source. Water quality tests of the exploratory well will determine if the source meets drinking water standards. The project potentially provides an additional groundwater source and reliability to the West Maui service region during periods of reduced water availability. If the proposed exploratory well meets water quality standards it could potentially become a permanent production well.

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Draft Environmental Assessment

PROPOSED WEST MAUI EXPLORATORY WELL NO. 2, KAHANA, MAUI (TMK NO. (2)4-3-001:017)

Prepared for:

**County of Maui
Department of Water Supply**

Approving Agency:

**County of Maui
Department of Water Supply**

February 2014

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List of Acronyms

ALISH	Agricultural Lands of Importance to the State of Hawaii
BMP	Best Management Practices
CIA	Cultural Impact Assessment
CWRM	Commission on Water Resource Management
DBCP	1,2 Dibromo 3-chloropropane
Ditch	Honolua/Honokohau Ditch
DOE	Department of Education
DOH	Department of Health
DSM	Demand Side Management
DWS	Department of Water Supply
EA	Environmental Assessment
EPA	Environmental Protection Agency
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
FONSI	Finding of No Significant Impact
GPM	Gallons Per Minute
HAR	Hawaii Administrative Rules
HCZMP	Hawaii Coastal Zone Management Program
HRS	Hawaii Revised Statutes
LSB	Land Study Bureau
LWRF	Lahaina Wastewater Reclamation Facility

MCC	Maui County Code
MCL	Maximum Contaminant Levels
MECO	Maui Electric Company, Ltd.
MG	Million Gallon
MGD	Million Gallons Per Day
MIP	Maui Island Plan
MSL	Mean Sea Level
NPDES	National Pollutant Discharge Elimination System
RGB	Rural Growth Boundaries
SCS	Scientific Consultant Services, Inc.
SHPD	State Historic Preservation Division
SMA	Special Management Area
SRB	Small Town Boundaries
SWTF	Surface Water Treatment Facility
TCP	1, 2, 3-Trichloropropane
UGB	Urban Growth Boundaries
UH-Maui	University of Hawaii-Maui College
WDUP	Water Use and Development Plan
WTF	Water Treatment Facilities

Executive Summary

Project Name: West Maui Exploratory Well No. 2

Type of Document: Draft Environmental Assessment

Legal Authority: Chapter 343, Hawaii Revised Statutes

Anticipated Determination: Anticipated Finding of No Significant Impact

Applicable Environmental Assessment review “Trigger”: Use of County Funds

Location: Island of Maui
Lahaina
TMK No. (2) 4-3-001:017(por.)

Landowner: Maui Land & Pineapple Company, Inc.
200 Village Road
Lahaina, Hawaii 96761
Contact: Ryan Churchill
Phone: (808) 877-1608

Applicant: County of Maui
Department of Water Supply
200 South High Street, 5th Floor
Wailuku, Hawaii 96793
Contact: Curtis Eaton, P.E.
Phone: (808) 270-7835

Approving Agency: County of Maui
Department of Water Supply
200 South High Street, 5th Floor
Wailuku, Hawaii 96793
Contact: David Taylor, P.E., Director
Phone: (808) 270-7816

Consultant:

Munekiyo & Hiraga, Inc.
305 High Street, Suite 104
Wailuku, Hawaii 96793
Contact: Cheryl Okuma, Senior Associate
Phone: (808) 244-2015

Project Summary:

The County of Maui, Department of Water Supply (DWS) proposes to construct the West Maui Exploratory Well No. 2. The proposed construction consists of a 1.44 million gallon per day (mgd) exploratory well, well pump, piping, temporary silt basin, and a six (6) feet high chain link fence located on an approximately 0.9 acre site.

The project is located in the Lahaina District approximately 2.8 miles east of Honoapiilani Highway. The project site is accessed from an existing former pineapple field road.

Lands underlying the project site are classified as "Agricultural" by the State Land Use Commission, designated "Agricultural" by the West Maui Community Plan, and zoned "Agricultural" by the County of Maui.

The proposed action involves the use of County funds. As such, an Environmental Assessment (EA) is being prepared in accordance with the requirements set forth by Chapter 343, Hawaii Revised Statutes (HRS). The County of Maui, DWS is serving as the Approving Agency for the EA.

I. PROJECT OVERVIEW

I. PROJECT OVERVIEW

A. PROPERTY LOCATION, EXISTING USE, AND LAND OWNERSHIP

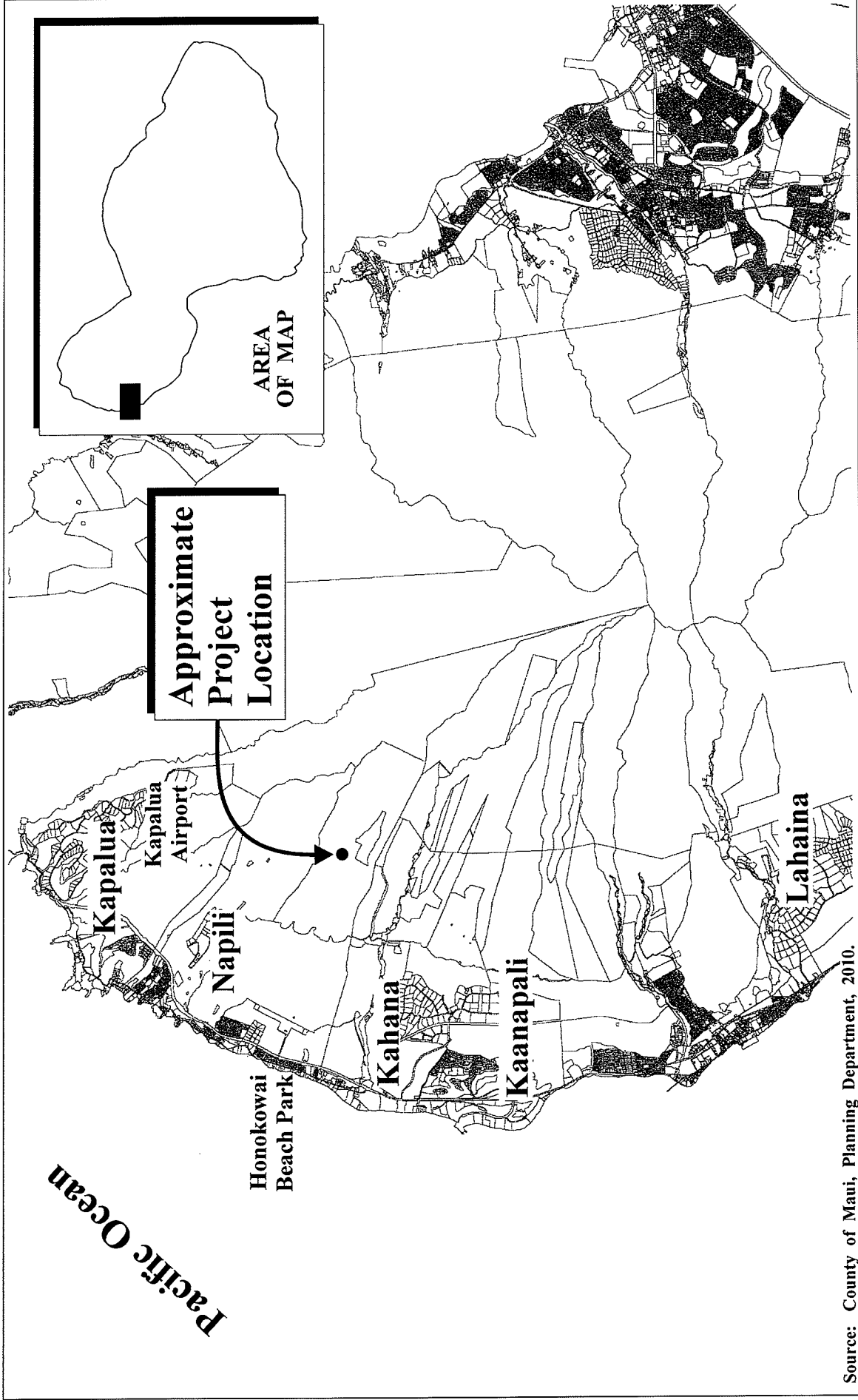
The County of Maui, Department of Water Supply (DWS) proposes the construction of the West Maui Exploratory Well No. 2. The project is located in the Lahaina District approximately four (4) miles east of Honokowai Beach Park and 3,300 feet north of the existing Mahinahina Exploratory Well. The area affected by the project is located within a portion of a privately owned parcel identified by TMK (2)4-3-001:017. See **Figure 1** and **Figure 2**. Parcel 17 is owned by Maui Land & Pineapple Company, Inc.

The project site encompasses an area formerly used for pineapple cultivation, but is now fallow and overgrown with shrubs and grasses. The 0.9-acre project area is situated at the upper limits of an old pineapple field between two (2) gulches, Kahana Stream and Kahanaiki Gulch, and is about 4,200 feet below the West Maui Forest Reserve. See **Figure 3**. The proposed West Maui Exploratory Well No. 2 site lies about 1,300 feet above mean sea level (msl) at the location where groundwater enters the area from the upper-level confined Honolua Aquifer. The Honolua Aquifer is located within the Lahaina Aquifer Sector and spans the west side of the West Maui Mountains. Rainfall is the primary source of groundwater recharge in this region. Groundwater in this area is assumed to flow in a general northwest direction from the peak rainfall distribution above Lahaina Town. Potential sources of water for the Honolua Aquifer include high-level dike-confined groundwater, partially confined intermediate-level groundwater, and basal groundwater (Fukunaga & Associates, Inc., 2011).

The lands underlying the project site are classified as "Agricultural" by the State Land Use Commission, designated "Agricultural" by the West Maui Community Plan, and zoned "Agricultural" by the County of Maui.

B. PROPOSED ACTION

DWS relies on groundwater and surface water sources to service the West Maui region. To provide reliability to the water system and meet community water demands, DWS seeks additional groundwater sources. The DWS proposes to drill an exploratory groundwater well on the site proposed for the West Maui Exploratory Well No. 2. After drilling and testing of the exploratory well in accordance with Department of Health (DOH) requirements in Chapter 174C Part VII, Hawaii Revised Statutes (HRS), water quality results will be submitted to DOH. Based on water quality test results and pump



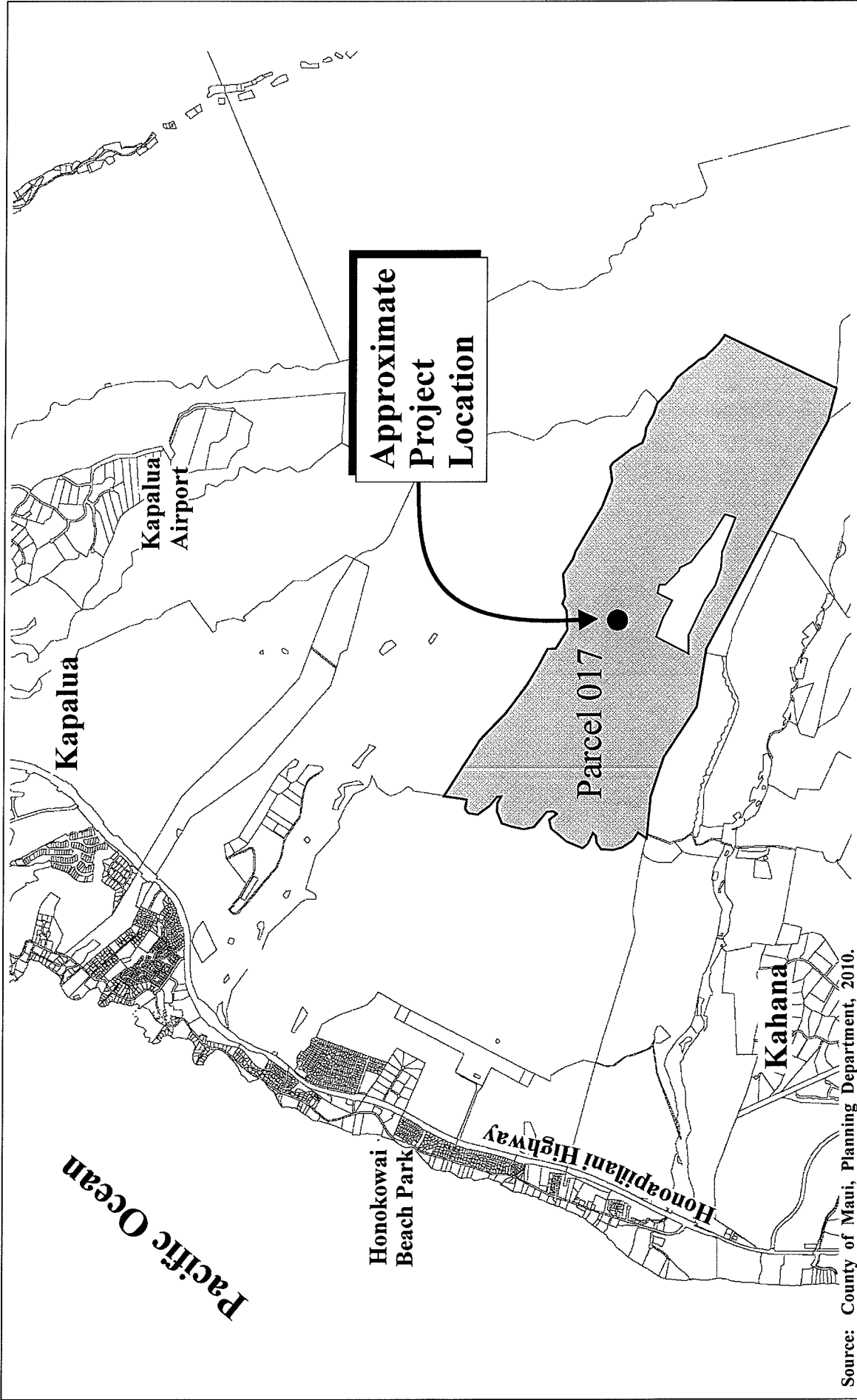
Source: County of Maui, Planning Department, 2010.

Figure 1

West Maui Exploratory Well No. 2
Regional Location Map

NOT TO SCALE





Source: County of Maui, Planning Department, 2010.

Figure 2

**West Maui Exploratory Well No. 2
Project Location Map**



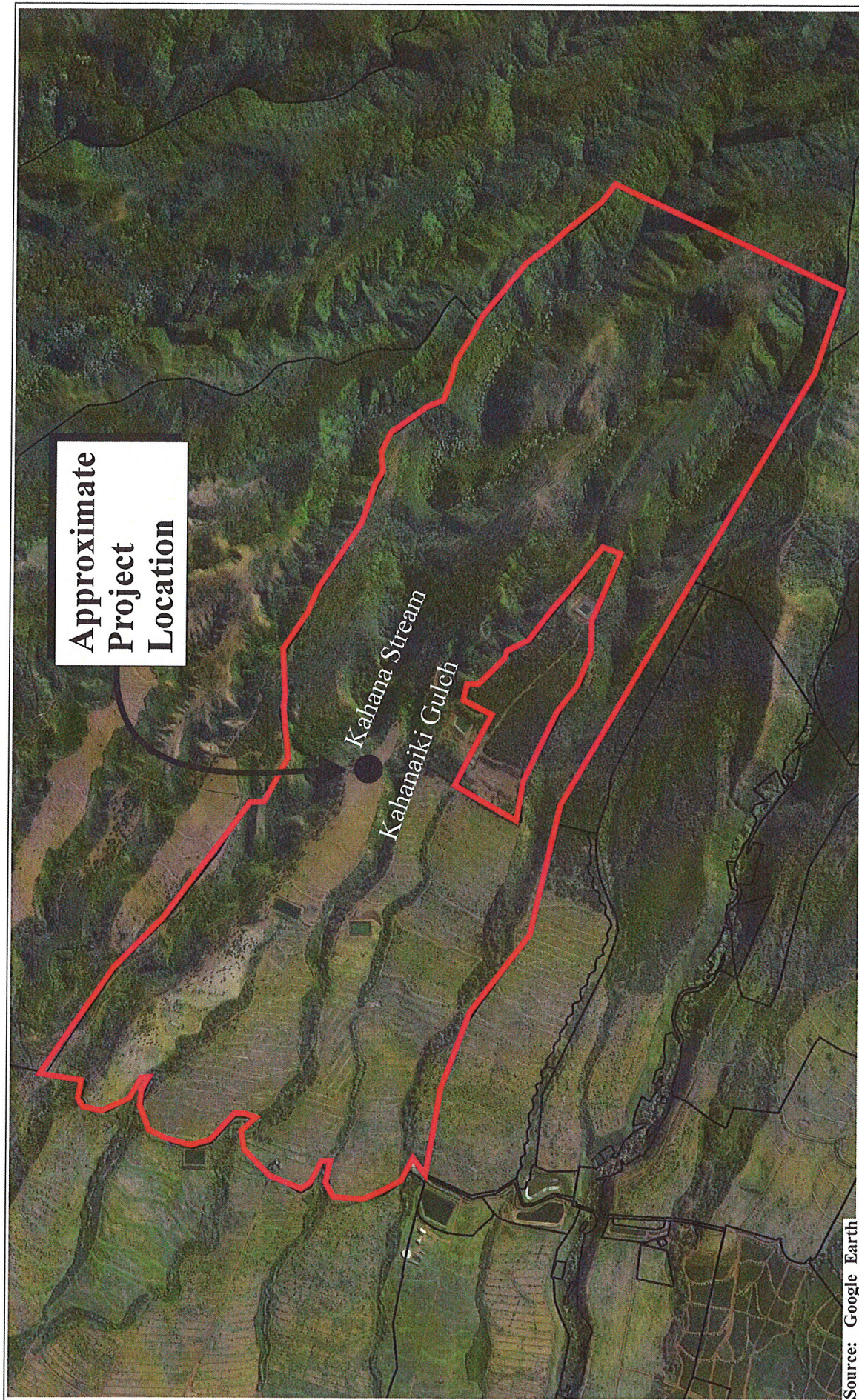
NOT TO SCALE

Prepared for: County of Maui, Department of Water Supply



MUNEKIYO & HIRAGA, INC.

RFE\W\maui\EXPL\Well2\Project Location



Source: Google Earth

Figure 3



West Maui Exploratory Well No. 2
Aerial View of Project Site

NOT TO SCALE

Prepared for: County of Maui, Department of Water Supply



MUNEKIYO & HIRAGA, INC.

RFE\W\Maui\EXPL\Well2\Aerial

tests to determine available source, DWS will determine if the location is suitable for conversion from an exploratory well to a permanent production well.

The proposed project consists of a 1.44 million gallon per day (mgd) exploratory well and attendant pump and piping, a temporary silt basin, and a six (6) foot high chain link fence. See **Figure 4** and **Appendix "A"** (Project Plans, Sheet C-4).

C. PURPOSE AND NEED FOR PROJECT

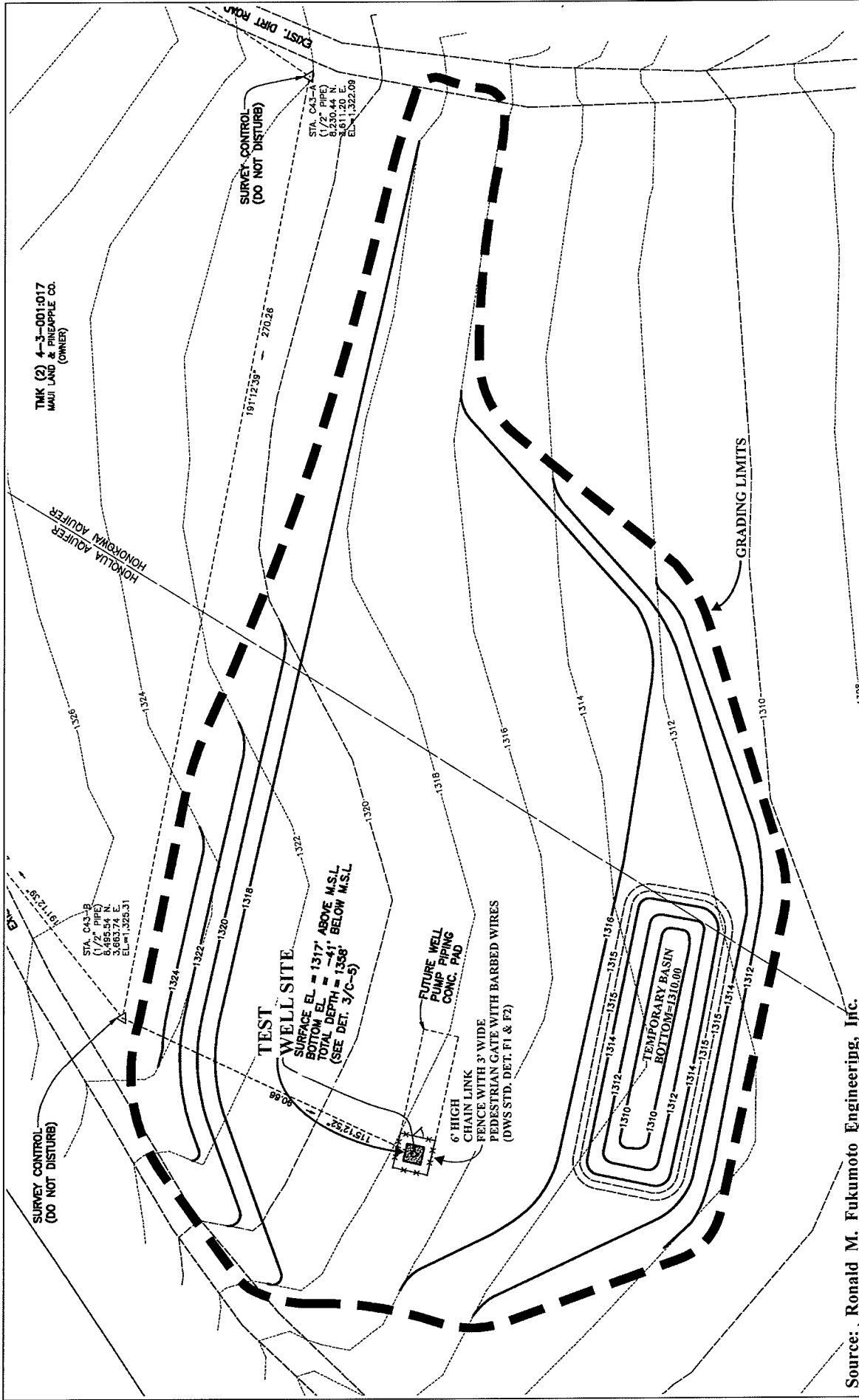
The proposed West Maui Exploratory Well No. 2 will provide a potential new source to address system reliability requirements of the DWS's West Maui Water System. As the proposed exploratory well site is located at the upper limits of abandoned pineapple fields, it is expected that this water is not adversely influenced by agricultural operations.

The region surrounding the project area is served by the Mahinahina Surface Water Treatment Facility (SWTF), owned by the County of Maui, which draws surface water from the Honolua/Honokohau Ditch (Ditch). The Ditch, owned by Maui Land and Pineapple Company, Inc., is located 1.5 miles from the project area, to the west. This surface water source is reduced during periods of reduced rainfall or drought, or cut off during times when the Ditch is scheduled for repair or maintenance work. When these situations occur, the system has difficulty meeting the water needs in the region. As the surface water availability is influenced by rain, groundwater provides an inherently more reliable source. The proposed project relies on groundwater and a future permanent production well on the proposed site allows for increased system reliability so that DWS is able to meet the water needs of residents during those times when water availability is reduced. The proposed well will also provide for a reliable source to accommodate future growth in the West Maui area.

D. REGULATORY CONTEXT

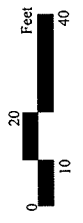
1. Chapter 343, Hawaii Revised Statutes

The proposed project will involve the use of County funds. The use of County funds is a trigger for the preparation of an Environmental Assessment (EA), pursuant to Chapter 343, HRS. Based on the scope of work for the proposed project, this Draft EA is being prepared in accordance with Chapter 200 of Title 11, DOH Administrative Rules, Environmental Impact Statement Rules in order to document and review the project's technical characteristics, environmental impacts, alternatives, and advance findings and conclusions relative to the



Source: Ronald M. Fukumoto Engineering, Inc.

Figure 4
 West Maui Exploratory Well No. 2
 Preliminary Site Plan and Test Well Location Map



MUNEKIYO & HIRAGA, INC.

Prepared for: County of Maui, Department of Water Supply

RFEW\Maui\EXPL\Well2\Site Plan

significance of the project. The DWS will serve as the Approving Agency for the project.

E. PROJECT COST AND IMPLEMENTATION SCHEDULE

The cost of the West Maui Exploratory Well No. 2 project is approximately \$1.4 million. The project will be implemented upon the completion of the EA process and receipt of applicable construction related permits.

II. DESCRIPTION OF THE EXISTING ENVIRONMENT, POTENTIAL IMPACTS, AND MITIGATION MEASURES

II. DESCRIPTION OF THE EXISTING ENVIRONMENT, POTENTIAL IMPACTS, AND MITIGATION MEASURES

A. PHYSICAL ENVIRONMENT

1. Surrounding Land Use

a. Existing Conditions

The project area is situated within the Honolua Aquifer area and lies eastward of the State's West Maui Kapalua Airport. The project area covers terrain that spans below the West Maui Mountains and lies between Kahana Stream to the north and Kahanaiki Gulch to the south. The proposed project involves construction of an exploratory well on a privately owned parcel that is under the ownership of Maui Land & Pineapple Company, Inc. An existing former agricultural field road will be used to gain access to the project site.

To the north and south of the project area are lands that were formerly in pineapple cultivation, but now lie fallow. The proposed exploratory well site is located at the foothills of the West Maui Mountains. The well site is approximately 1.3 miles east of the Mahinahina Surface Water Treatment Facility (SWTF) at an elevation of about 1,300 feet mean sea level (msl). The closest residential and commercial areas are situated across Honoapiilani Highway to the west and are approximately 2.8 miles away from the proposed project site.

b. Potential Impacts and Mitigation Measures

Land uses surrounding the project site consists of agricultural lands formerly used for pineapple cultivation. The project area sits below the conservation designated foothills of the West Maui Mountains and is located outside the existing urbanized areas that are within the coastal area of this region, about four (4) miles away. Department of Water Supply's (DWS) existing infrastructure in the vicinity of the proposed project sites includes the Mahinahina SWTF and the Honokowai two (2) million gallon (MG) reservoir which are located approximately 1.7 miles and 0.5 mile, respectively, eastward of Honoapiilani Highway and beyond the State

West Maui Kapalua Airport. The proposed West Maui Exploratory Well No. 2 project is a step towards adding reliability to DWS's existing water system and is beneficial to the community in this region. Structures involve an exploratory well, a concrete pad around the casing, a six (6) foot high chain link fence with a three (3) foot wide pedestrian gate, and a temporary basin. The project is compatible with the adjacent agriculture uses and is not anticipated to have an adverse impact on other surrounding land uses within the area.

2. Climate

a. Existing Conditions

Lahaina's climate is relatively uniform year-round. Lahaina's tropical latitude, its position relative to storm tracts and the Pacific anticyclone, and the surrounding ocean combine to produce this stable climate. Variations in climate among different regions on Maui are, therefore, dictated by the inherent characteristics of local terrain.

Average daily temperatures in Lahaina typically range between 66 degrees and 85 degrees Fahrenheit. August is historically the warmest month, while January and February are the coolest (County of Maui, 2011).

Rainfall in West Maui is both low and highly seasonal in nature, with most precipitation occurring between the months of October and April when winter storms hit the area. January is the wettest month, with 3.15 inches on average, and June is the driest, with 0.08-inch of precipitation. Situated on the leeward side of the West Maui Mountains, this dry region receives most of its rainfall in late afternoon and early evening, after seabreezes take moisture upslope during the day. Annual average rainfall for Lahaina is 14.62 inches as opposed to Kahului, which receives 18.82 inches (County of Maui, 2011).

The winds in the area are also seasonal, although northeasterly tradewinds are predominant and occur 90 percent of the time during the summer and just 50 percent of the time in winter with average wind speeds of approximately 16 miles per hour. Wind patterns also vary on a daily basis, with tradewinds generally being stronger in the afternoon. During the day, winds blow onshore toward the warmer land mass. This process reverses in the evening when breezes blow toward the relatively warm

ocean. Between October and March, the southerly winds of Kona storms may be experienced.

b. Potential Impacts and Mitigation Measures

The proposed project is surrounded by vegetation and fallow agricultural lands and includes infrastructure components that will occupy a combined area of about 0.9 acre. Included with the project is an exploratory well, a concrete pad around the casing, a six (6) foot high chain link fence with a three (3) foot wide pedestrian gate, and a temporary basin. The proposed project is low profile as it involves a well that is below grade. In this context, the proposed project is not anticipated to have an adverse effect on the area's micro-climate.

3. Topography and Soil Characteristics

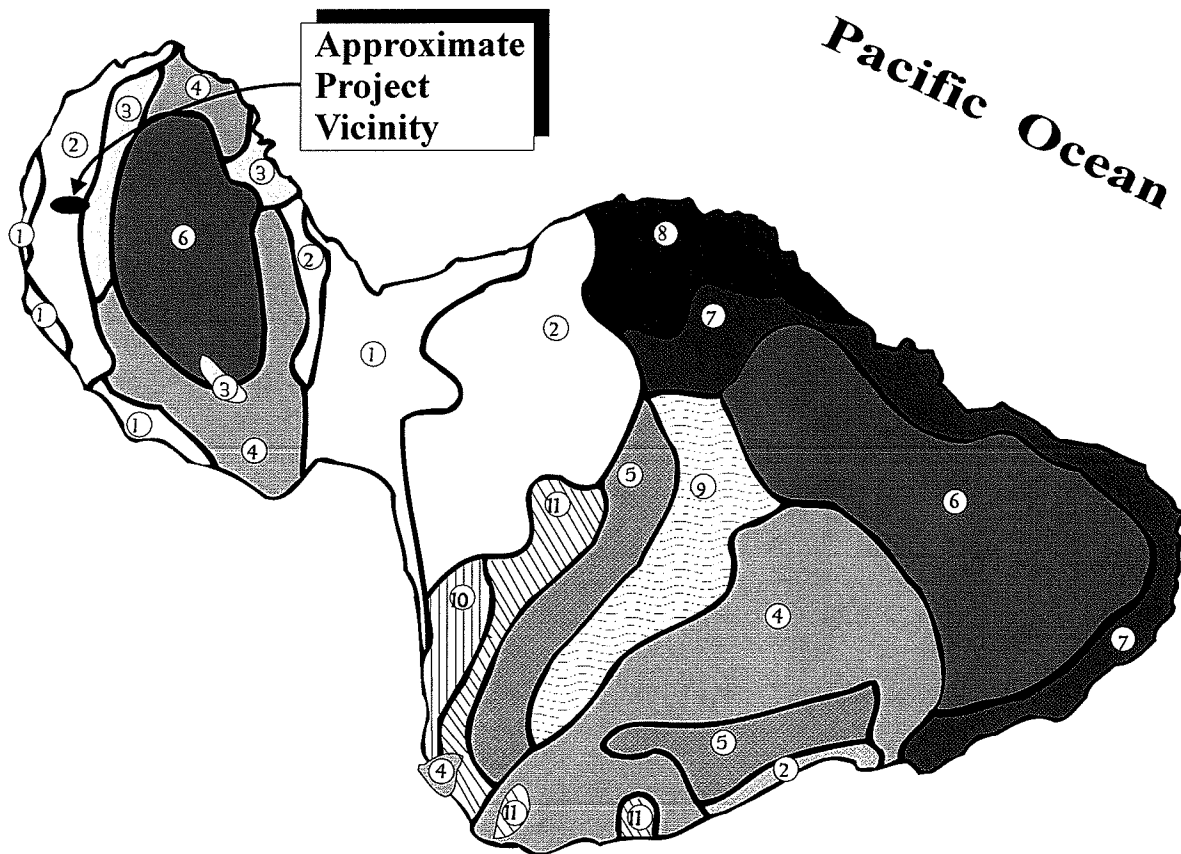
a. Existing Conditions

The project area gradually slopes westward from about 1,300 feet msl from the base of the West Maui Mountains. The expansive plain below the West Maui Mountain foothills is characterized by steep ravines, deep valleys, and streams. The proposed West Maui Exploratory Well No. 2 site was previously cultivated for pineapple. The other portions of the project area are currently vacant and isolated from urbanized coastal areas.

According to the U.S. Department of Agriculture Soil Conservation Service (1972), soils within the subject property belong to the Waiakoa-Keauhua-Molokai and Honolua-Olelo associations. See **Figure 5**. The Waiakoa-Keauhua-Molokai Association is characterized by material moderately deep, nearly level to moderately steep, well-drained soils that have a moderately fine textured subsoil. These soil types are typically used for sugar cane, pineapple, pasture, wildlife habitat and homesites. The Honolua-Olelo association is characterized by deep, gently sloping to moderately steep, well-drained soils that have a fine-textured subsoil, on intermediate uplands. These soil types are typically used for pineapple, pasture, woodland, waterlife habitat, and water supply. The specific soil type underlying the project site is Alaeloa Silty Clay (AeC, 7 to 15 percent slopes). See **Figure 6**. AeC soils are characterized by moderately rapid permeability and moderate to severe erosion hazard on steep slopes.

LEGEND

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



Source: USDA Soil Conservation Service (1972)

Figure 5 West Maui Exploratory Well No. 2 **NOT TO SCALE**
Soil Association Map



Prepared for: County of Maui, Department of Water Supply

MUNEKIYO & HIRAGA, INC.

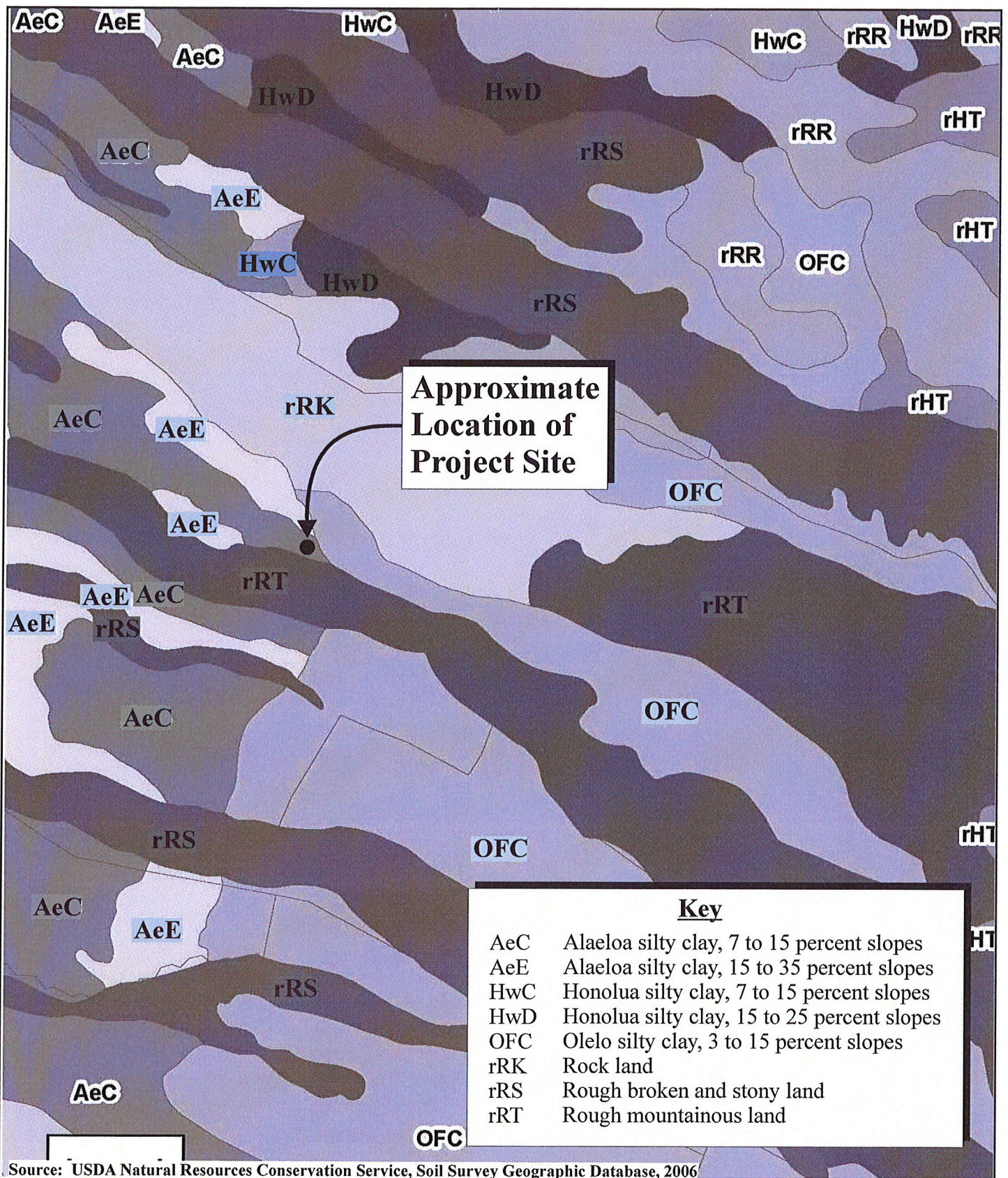


Figure 6 West Maui Exploratory Well No. 2 NOT TO SCALE
Soil Classification Map



These soil types are typically used for sugar cane, truck crops, and pasture (U.S. Department of Agriculture, 1972).

b. Potential Impacts and Mitigation Measures

The proposed exploratory well site is situated in an area where groundwater from the West Maui Mountains will be drawn from the Honolua Aquifer. This project area is located at the upper edge of former pineapple fields which has been fallow since 2005. This upper elevation is upgradient and above (mauka) where groundwater from former pineapple fields percolates into the aquifer. The potential for contamination from soil fumigant 1,2 Dibromo 3-chloropropane (DBCP) and the solvent 1,2,3-Trichloropropane (TCP) is anticipated to be minimal. This area is also expected to be a confined aquifer, independent of basal aquifer conditions, including contamination. The water drawn from the exploratory well will be tested in accordance with State Department of Health (DOH) requirements.

To prevent soil erosion during site work, the applicant will implement Best Management Practices (BMPs), which may include, but not be limited to, minimizing time of construction, sequencing construction to minimize exposure time of cleared surface area, installing and maintaining temporary sediment basins, temporary diversion berms and swales to intercept runoff, silt fences, dust fences and slope protection, and applying perennial vegetation for permanent soil stabilization as soon as practicable. The BMPs will be developed in compliance with the "Construction Best Management Practices for the County of Maui" (issued by the Department of Public Works and Waste Management in May 2001).

As the total disturbed area for the proposed improvements is estimated to be approximately 0.9 acre, a National Pollutant Discharge Elimination System (NPDES) permit is not anticipated to be required. To minimize soil erosion, the contractor will be required to submit a soil erosion control plan. A grubbing and grading permit will be obtained for the project, prior to construction.

While the terrain will be locally modified to implement the project, the proposed action is not anticipated to significantly adversely alter topographic characteristics in the vicinity of the project site.

4. **Agriculture**

a. **Existing Conditions**

The State Department of Agriculture has established three (3) categories of Agricultural Lands of Importance to the State of Hawaii (ALISH). The ALISH system classifies lands into “Prime”, “Unique”, and “Other Important Agricultural Land”. The remaining lands are “Unclassified”. Utilizing modern farming methods, “Prime” agricultural lands have the soil quality, growing season, and moisture supply needed to produce sustained crop yields economically, while “Unique” agricultural lands possess a combination of soil quality, location, growing season, and moisture supply currently used to produce sustained high yields of a specific crop. “Other Important Agricultural Land” includes those which have not been rated as “Prime” or “Unique”. The project area is located on lands that have been defined as “Prime” agricultural lands by the ALISH rating system. See **Figure 7**.

In addition, the University of Hawaii, Land Study Bureau (LSB) classifies productivity characteristics on a scale of “A” through “E”, with lands designated as “A” reflecting the highest productivity and “E” representing lands with the lowest productivity. Lands underlying the project site have been designated as “C” by the LSB (Land Study Bureau, 1967).

b. **Potential Impacts and Mitigation Measures**

The land underlying the proposed West Maui Exploratory Well No. 2 was taken out of pineapple production in 2005. The project area is estimated at about 0.9 acre, which is not significant in terms of the region’s vast agricultural areas. Development of the proposed West Maui Exploratory Well No. 2 project will not result in significant adverse impacts to agricultural endeavors in this region.

5. **Flood and Tsunami Hazard**

a. **Existing Conditions**

The Flood Insurance Rate Map (FIRM) for this area of the island designates the project site as being within Zone “X” (unshaded) and is not subject to the Flood Hazard District Ordinance, Chapter 19.62 of the Maui County Code (FIRM Map Panel ID 1500030358E). Zone “X” (unshaded)

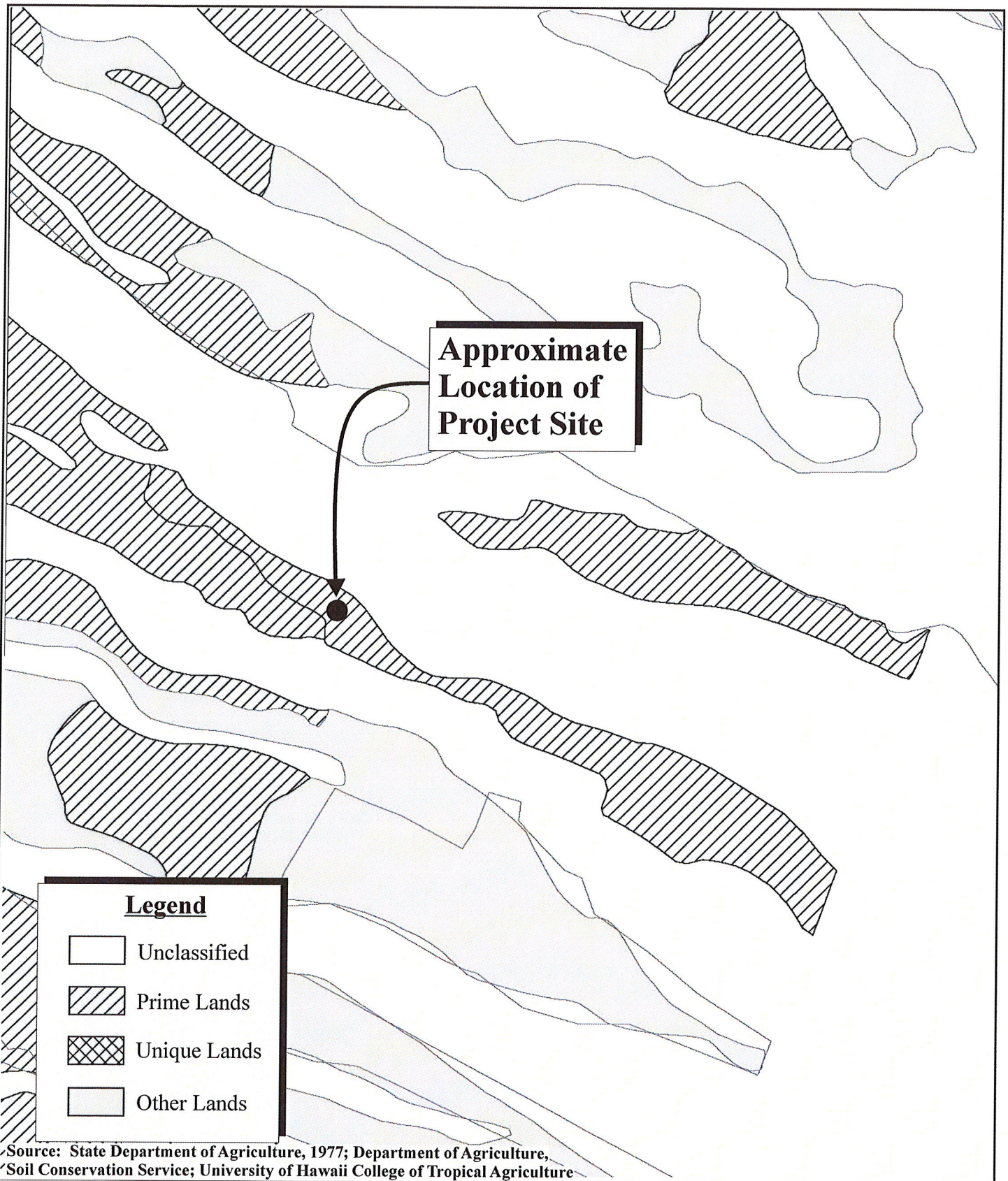


Figure 7 West Maui Exploratory Well No. 2 NOT TO SCALE
ALISH Designation Map



indicates an area of minimal flooding and has no restrictions placed on development. Specifically, the Federal Emergency Management Agency (FEMA) describes Flood Zone “X” to be areas of minimal flood hazard. Insurance purchase is not required in these zones.

The project site is not located within a tsunami evacuation area as identified by the Tsunami Flood Zone Evacuation Maps (County of Maui, Civil Defense Agency, 2013).

b. Potential Impacts and Mitigation Measures

The proposed project is not located within a Special Flood Hazard Area and is not located within a tsunami evacuation area. No adverse impacts with regard to flood and tsunami hazard parameters are anticipated with the implementation of the project.

6. Aquifer, Streams, and Wetlands

a. Existing Conditions

The proposed project is anticipated to provide the DWS with a ground water source within the Honolua Aquifer. DWS’s existing water system that serves the West Maui region relies primarily on surface water sources that feed the existing Mahinahina SWTF located within the Honokowai area. The proposed West Maui Exploratory Well No. 2 will draw groundwater from the Honolua Aquifer System. A hydrogeologic report prepared by Fukunaga & Associates, Inc. for the West Maui Source Development Site Selection Report concludes that the Honolua Aquifer contains: (1) high level, dike-confined groundwater; 2) intermediate-level groundwater; and 3) basal groundwater (Fukunaga and Associates, Inc. February 2011). The general movement of fresh groundwater is from the dike-confined water body into the basal system, the brackish water transition zone, and then to the ocean. To the north and south of the proposed project area are expansive areas that are characterized by streams, valleys, and gullies, sloping westward towards the coast.

The Commission on Water Resource Management (CWRM) has established a sustainable yield of 8 million gallons per day (mgd) for the Honolua Aquifer. About 2.3 mgd of this groundwater source has been in use by private source developers. The availability of groundwater for new well development in the Honolua Aquifer is about 5.7 mgd (Fukunaga &

Associates, Inc. February 2011). The proposed West Maui Exploratory Well No. 2 will be designed to pump up to 1.44 mgd and is expected to be within the aquifer's sustainable yield.

b. Potential Impacts and Mitigation Measures

The proposed West Maui Exploratory Well No. 2 is located at the far upper reaches of previously cultivated pineapple fields at the West Maui Mountain foothills. Well testing for the exploratory well will be done in accordance with DOH requirements contained in Hawaii Revised Statutes (HRS), Chapter 174C Part VII and CWRM requirements. Water quality tests of the exploratory well will determine if the source meets drinking water standards established by EPA and the State DOH.

Generally, chloride concentration trends are used as an indicator of the influence that well pumping may have on aquifer conditions. For drinking water, the Environmental Protection Agency (EPA) established a MCL of 250 mg/l for chloride. Water quality analysis during the testing of West Maui Exploratory Well No. 2 will determine whether chloride levels are within acceptable limits set by EPA. Exploratory well testing will include step testing and constant rate testing of the well to assess well capacity, aquifer drawdown, and water quality. The data from these tests will determine if the proposed location for the West Maui Exploratory Well No. 2 is suitable for drawing groundwater.

The West Maui Exploratory Well No. 2 requires a well construction permit from CWRM, which the DWS will secure. CWRM established standards for the construction of exploratory wells to measure ground water drawn. DWS will comply with applicable requirements of the State DOH and CWRM to operate the West Maui Exploratory Well No. 2 and its associated construction.

7. Flora and Fauna

a. Existing Conditions

Robert Hobdy prepared a Biological Resources Survey Report (September 2013) based on a walk through, including an evening visit to record crepuscular activities and vocalizations in the project area. See **Appendix "B"**. The vegetation on the well site consists of non-native, weedy species that have colonized the former agricultural lands. Eight (8) species were

noted during the survey, pineapple (*Ananas comosus*), broomsedge (*Andropogon virginicus*), molasses grass (*Melinis minutiflora*), Hilo grass (*Paspalum conjugatum*), Vasey grass (*Paspalum urvillei*), `iniko (*Indigofera suffruticosa*), cane tibouchina (*Tibouchina herbacea*), and flooded gum (*Eucalyptus rudis*) which were found to be the most common and together dominated the area.

The survey report notes one (1) non-native mammal on two (2) site visits, which includes the feral pig (*Sus scrofa*). An evening survey was conducted at the project area to look for signs of the Hawaiian hoary bat. No bats were seen though visibility was excellent and a detection device was used. The report also noted that no endangered or threatened insect species were found during the survey and no known hosts of such species were recorded.

The project area contains bird life that is moderate in species representation and total numbers. Four (4) non-native species were observed during two (2) site visits, including the zebra dove (*Geopelia striata*), spotted dove (*Streptopelia chinensis*), nutmeg manikin (*Lonchura punctulata*), and Japanese white-eye (*Zosterops japonicus*) that is common throughout the project area.

The survey report notes ten (10) species of insects observed during two (2) site visits. Most prevalent were the ambrosia beetle (*Euwallacea fornicateus*), dung fly (*Musca sorbens*), honey bee (*Apis mellifera*), big-headed ant (*Pheidole megacephala*) and passion flower butterfly (*Argaulis vanillae*). There were also five (5) other species that were rare which include the common garden spider (*Argiope appensa*), gray wall jumper (*Menemerus bivittatus*), western yellowjacket (*Vespula pennsylvanica*), beet webworm moth (*Spoladea recurvalis*), and the green darner (*Anax junius*).

An evening survey done at the proposed exploratory well site did not pick up any calls from the Hawaiian petrel or the Newell's shearwater. These seabird calls are loud and can be heard for great distances.

b. Potential Impacts and Mitigation Measures

The survey report concludes that the native plants in the project area do not present any particular environmental concern and that no special

native plant habitats were observed. There were no threatened insect species nor their known host species observed in the project area.

Of all the fauna observed during the survey, one (1) indigenous native species of dragonflies, the green darner, was observed. This insect is widespread and common in Hawaii and does not present concern. The survey concludes that the project area has been altered by over a century of agricultural activity and is currently overwhelmingly inhabited by non-native botanical species. The immediate surrounding habitat is similar.

The flora and fauna report notes that though not observed during the survey, the pueo, or Hawaiian owl might be expected to fly overhead in search of rodents. Although not seen during the field survey, the endangered seabirds, the Hawaii petrel (*Pterodroma sandwichensis*), and the threatened Newell's shearwater (*Puffinus newelli*) are known to fly over the project area to their nests in the higher elevations of the West Maui Mountains. As such, the flora and fauna report recommends that any significant outdoor flood lights or pole lights be hooded to direct light downward to minimize the distractions and dangers to these birds. DWS will implement these recommendations.

With implementation of the recommendations in the survey report, the proposed project is not expected to result in any adverse impacts to the botanical resources in the region. Refer to **Appendix "B"**.

8. Air Quality and Noise

a. Existing Conditions

The project area in general does not experience adverse air quality conditions. Airborne pollutants that do exist can largely be attributed to aircraft arriving and departing from the Kapalua Airport and automobile exhaust from Honoapiilani Highway which is about 2.8 miles from the exploratory well site. These sources, however, are intermittent and prevailing winds quickly disperse the particulates generated by these temporary sources. The cessation of large scale agriculture on the surrounding agricultural lands mauka of Honoapiilani Highway and the slopes of West Maui Mountains may contribute to temporary adverse air quality conditions from airborne dust due to wind and erosion.

The project area is located a distance away from the principal artery road (Honoapiilani Highway) and, as such, this area is not impacted by traffic movement. In general, there are no man-made noise sources in the project vicinity.

b. Potential Impacts and Mitigation Measures

In the short term, construction related activities will be the primary source of airborne pollutants and ambient noise. Site work involving clearing, grubbing, and grading operations will generate fugitive dust. Emissions and noise from construction equipment and other vehicles involved in construction activities may temporarily affect the ambient air quality and noise within the immediate vicinity. These effects, however, can be mitigated by proper maintenance of construction equipment and vehicles. Equipment mufflers or other noise attenuating equipment may also be utilized.

In addition, dust generated during construction, especially from earth-moving operations, such as excavating, trenching, and filling, may also result in a temporary decrease in ambient air quality. A program of BMPs will be implemented during construction to mitigate potential for dust-related impacts, including but not limited to, utilizing dust barriers, water wagons and/or sprinklers to control dust, and watering graded areas upon the completion of daily construction activities. On a long-term basis, the proposed project is not anticipated to generate adverse air quality impacts.

9. Historical and Archaeological Resources

a. Existing Conditions

In September 2013 Scientific Consultant Services, Inc. (SCS) conducted an archaeological field inspection of the project area. See **Appendix "C"**. No historic sites, features, midden scatters, or artifacts were identified. The pedestrian survey concluded that the historic and recent agricultural activities altered the natural topography of the general project area and that surrounding lands consist of undeveloped, old pineapple cultivation lands that are fallow and covered in cane grass, molasses grass, and generally noxious weeds.

The Honolua/Honokohau Ditch (Ditch) system is in use today, as it irrigates surrounding lands and provides potable water to the West Maui

region. Site 1591 has been designated by the State Historic Preservation Division (SHPD) Office for the Ditch and is a distance away and downslope of the project site. SCS notes the Ditch's history by Wilcox (1996). The Ditch is made of rock slab side walls and was originally constructed from 1902. The Ditch was built by Honolua Ranch, the owner, and Pioneer Mill financed the project and used the water. The Ditch began at 700 feet above msl and was re-built twice and renovated once over the years due to cracks, leakages, and sediment build up. The Honolua/Honokohau Ditch was constructed from 1912 and completed in 1913. Beginning in 1923, the Ditch was relined over a five (5) year period.

b. Potential Impacts and Mitigation Measures

The archaeological field inspection did not identify areas that would be amenable to locating subsurface cultural deposits through excavation work as SCS noted the project area has been intensively modified in the past for pineapple cultivation. No further work is recommended for the project area.

Should the inadvertent discovery of cultural materials occur during construction, DWS will halt all work in the immediate area of the find and notify SHPD to discuss mitigation, as appropriate. Refer to **Appendix "C"**.

10. Cultural Impact Assessment

a. Historical Context

The Lahaina District was a favored place to live by chiefs and commoners alike, because of its natural resources and favorable weather. The valleys of Kahoma, Kanaha, Kauaula, and Olowalu among others were filled with lo'i wherever there was water to sustain the flood-style irrigation of wetland lo'i. In other areas dryland taro, sugarcane, sweet potato, coconut, banana, and breadfruit were grown. Lahaina is well known for its cultivation of the breadfruit tree ('ulu). The original name for the Lahaina area was Lele and the famous saying of the area was "Ka Malu Ulu o Lele", the shade of the breadfruit trees at Lele (Handy, 190). Also, in the time of Piilani, the area was called Honoapiilani, meaning "the bays belonging to Piilani" (Sterling, 37).

The name Lahaina is a relatively recent name for the land and stems from the time of the chief Hua. During Hua's reign, when his kahuna Luaho'omoe was condemned to death, he cursed the lands of Hua, which resulted in a drought and famine that spread the lands. The name Lahaina means La (sun) and Haina (cruel or merciless).

Lahaina was an agriculturally productive area utilizing the ten (10) perennial watercourses of Kahoma, Kanaha, and Kauaula with miles upon miles of aqueducts spanning the lowlands, watering a quilt-work pattern of wet and dryland taro, sweet potato, bananas, breadfruit, and other crops. Handy relates that the majority of Lahaina was watered by two (2) streams, Kahoma and Kanaha (Handy, 492).

After consolidating his rule over the islands, Kamehameha returned to Lahaina to set up his seat of government for the Kingdom of Hawaii. Mokuula was the home of royalty until the capital was transferred to Honolulu under King Kamehameha III.

Also, with the reign of Kamehameha and an increase in foreign ships Lahaina became a port of call for the sandalwood trade and whaling era. The Lahaina whaling industry ended in 1860 with the onset of petroleum and kerosene fuel, and finally the development of San Francisco as a full-service port (Proposal for the Historical Restoration and Preservation of Lahaina, 1961).

With the decline of the whaling industry, which brought a new populace to Lahaina, the sugar industry began to evolve. The sugar industry was developed in the mid-1800's and over the next few years, further developed with the consolidation of multiple smaller mills into what is known today as Pioneer Mill Company, Ltd. (Pioneer Mill). As with other sugar plantation communities, the late 1800's and early 1900's experienced the rapid expansion and growth of Pioneer Mill. A 1919 map by W.E. Wall further shows that about 15,000 acres of land were under sugar cane cultivation by Pioneer Mill (Rosendahl, 1989). Sugar cane cultivation extended into areas that reach Ukumehame to Honokowai. Final Environmental Assessment for the Proposed Kahoma Village Project (August 2013).

In addition to sugar, pineapple was established as a viable commercial crop in the West Maui region. Baldwin Packers opened a cannery in

Lahaina to process the crop in 1919. This was in the location of the existing Lahaina Cannery Mall. Pineapple was generally cultivated in areas that stretched from Honokowai and north to Honokohau.

Consultation was conducted by Scientific Consultant Services Inc. (SCS) via telephone, email, personal interviews, and the U.S. Postal Service. Consultation was sought from Thelma Shimaoka, Office of Hawaiian Affairs, Maui; Roy Newton, Office of Hawaiian Affairs, Maui; Dr. Kamana`opono M. Crabbe, Chief Executive Officer, Office of Hawaiian Affairs; Vincent H. Rodrigues, State Historic Preservation Division, Maui; Torrie Nohara, Na Ala Hele Program; William Ho`ohuli, community member; Maui Tomorrow Foundation, Inc.; Maui Sierra Club; Matthew Erickson, Hawaiian Civic Club, Lahaina Chapter; Ke`eaumoku Kapu, Chair, Maui/Lana`i Islands Burial Council; Leslie Kuloloio, community member; Clifford Nae`ole, Cultural Resource Advisor, Ritz-Carlton, Kapalua; Patty Nishiyama, Nā Kupuna O Maui; Makalapua Kanuha, County of Maui Cultural Resources Commission; Maui Sierra Club, Silla Kaina, Cultural Ambassador; Uilani Kapu, community member; and Kimokeo Kapahulehua, President of Ao`ao O Na Loko O Maui.

In addition, a Cultural Impact Assessment Notice was published on October 6, 9, and 13, 2013, in *The Honolulu Star-Advertiser* and in *The Maui News*, which published on the same dates on Maui and in the November 2013 issue of the OHA newspaper, *Ka Wai Ola*.

Dr. Kamanaopono M. Crabbe, Chief Executive Officer of the Office of Hawaiian Affairs (OHA-Honolulu), responded that OHA is unaware of any historic properties assigned religious or cultural significance to the Hawaiian people in the project area, and recommended that that Kimokeo Kapahulehua, Hawaiian Culture Advisor be consulted. OHA requested to be consulted in the event of cultural encounters during the proposed project. See **Appendix “D”**.

b. Potential Impacts and Mitigation Measures

In addition to seeking consultations from individuals and organizations that may have knowledge or information pertaining to cultural resources and practices in proximity to the proposed project, historical and cultural source materials by scholars was extensively used by SCS. Refer to **Appendix “D”**. The works of these scholars and other authors were

consulted as well as land use document research supplied by the Waihona 'Aina Database (2013). Based on this consultation, SCS concluded the project area has not been used for traditional cultural purposes within recent times. As such, the project is not anticipated to adversely impact cultural resources and practices.

In the event of cultural or traditional deposit encounters during ground-altering activities associated with the project, all work will immediately cease and the appropriate agencies will be notified. OHA will be notified and consulted if human burials are encountered.

11. Scenic and Open Space Resources

a. Existing Conditions

The project site covers an area that runs westward in linear fashion from the foot of the West Maui Mountains, ending east of the Mahinahina SWTF. Approximately 2.3 miles west of the project area is the State's Kapalua West Maui Airport and Honoapiilani Highway. This highway is West Maui's principal access route to the central and southern areas of Wailuku, Kahului, and Kihei. Open space resources in the region seen from public roadways and facilities include the vast expanse of vacant agricultural lands that lie between the mountains and the existing urbanized coastal areas that include Lahaina Town and Kaanapali.

b. Potential Impacts and Mitigation Measures

The proposed West Maui Exploratory Well No. 2 project involves the construction of an exploratory well. The proposed project will be compatible with the surrounding character of this area which is characterized by agricultural and open space use. As the project is upland and east of Honoapiilani Highway, views from this major roadway are not expected to be adversely impacted. The project is not expected to have significant adverse impacts on scenic and open space resources.

12. Traditional Beach and Mountain Access

a. Existing Conditions

There are no known traditional beach and mountain access trails in or around the project area. There is a gated trail upland from the project area

that provides restricted access to Puu Kukui and higher elevation watershed areas of the West Maui Mountains. This restricted conservation designated area is managed by Maui Land and Pineapple Company.

b. Potential Impacts and Mitigation Measures

There are no impacts on traditional beach and mountain access trails anticipated as a result of the proposed improvements.

13. Chemical and Hazardous Materials

a. Existing Conditions

Portions of the project area are within previously cultivated agricultural fields for pineapple. There are areas of the West Maui Mountains that have indicated the presence of 1,2-Dibromo-3-chloropropane (DBCP) and 1,2,3-Trichloropropane (TCP). DBCP was used in the past as a soil fumigant and nematocide on pineapple crops. TCP was used as a pesticide in the past. DBCP was banned in the United States in 1977, except for use on pineapple crops, and further banned for pineapple cultivation in Hawaii in the 1980's.

b. Potential Impacts and Mitigation Measures

The proposed location of the West Maui Exploratory Well No. 2 is in the upper reaches of previously cultivated fields minimizing the presence of chemicals entering the basal aquifer. Water quality tests of the exploratory well will determine if the source meets drinking water standards established by EPA and the State DOH.

Water quality sampling will be completed by a sub-consultant with experience in water sampling for lab analysis and the data results will be submitted to DOH.

B. SOCIO-ECONOMIC ENVIRONMENT

1. Land Use and Community Character

a. Existing Conditions

The lands surrounding the project area that are located mauka of the Honoapiilani Highway and occupy the higher elevation areas located at

the base of the West Maui Mountains are characterized by fallow agricultural land and natural open space. Urbanized lands occupy the coastal plain below the Honoapiilani Highway and include the communities of Lahaina, Kaanapali, Honokowai, Kahana, Napili, and Kapalua. The resort communities north of Lahaina Town include hotels and visitor-oriented condominiums. Lahaina Town is the commercial center of the West Maui region. The town contains several shopping centers and retail business areas, and serves as a core for the region's residents.

Part of West Maui's attraction can be attributed to its year-round dry and warm climate, complimented by its many white-sand beaches and scenic landscape. Visitor accommodation can be found in Lahaina, as well as the resort communities of Kaanapali, Honokowai, Kahana, Napili, and Kapalua.

The Kapalua West Maui Airport at Mahinahina, owned by the State of Hawaii, Department of Transportation, connects West Maui to Oahu and other neighbor islands.

Diversified agriculture occupies a portion of the land in the West Maui region. Pioneer Mill's and Maui Land & Pineapple Company's vacant agricultural fields and the State-owned open spaces span below the slopes of the West Maui Mountains.

b. Potential Impacts and Mitigation Measures

The proposed project is consistent with existing surrounding agricultural land uses and open space and is not of a scale to significantly impact the regional setting of the area. This project provides an efficient and beneficial use of vacant, open space land within the area as it adds reliability to the existing DWS water system to serve the West Maui community.

2. Population

a. Existing Conditions

The population of the County of Maui has exhibited relatively strong growth over the past decade. According to the U.S. Census, the resident population of the County of Maui in 2000 was estimated to be 128,094

and was estimated to be 154,834 in 2010. This represents a 20.9 percent increase over the past decade (U.S. Census Bureau, 2010). By 2020, the population of the County of Maui is projected to reach 174,450 and 199,550 by 2030 (County of Maui, Department of Planning, 2006).

The project area is located about four (4) miles eastward of Honokowai Beach Park, within the West Maui Community Plan region. The County's population has grown, including the resident population of the West Maui region. The estimated population of Lahaina District in 2000 was approximately 18,000 and approximately 22,200 in 2010 (U.S. Census Bureau, 2010), comprising 14 percent of the island's population. The resident population for this region in 2010 increased by 23 percent since 2000. By 2020, the population for the region is projected to reach approximately 25,100 and 29,000 by 2030 (County of Maui, Department of Planning, 2006).

b. Potential Impacts and Mitigation Measures

The West Maui Exploratory Well No. 2 project represents a step towards a new water source and dependability to the DWS water system during times of drought or when the Honolua/Honokohau Ditch is undergoing repair or maintenance. By providing new source and system reliability, DWS can meet the water needs of the community in the West Maui region. The proposed exploratory well project will not impact population parameters.

3. Economy and Labor Force

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. Major hotels in this region include the Hyatt Regency Maui, Maui Marriott Resort and Ocean Club, Westin Maui, the Sheraton Maui, Westin Kaanapali Ocean Resort, Honua Kai, the Kapalua Bay Hotel & Villas, and the Ritz-Carlton.

West Maui's visitor orientation is reflected in the unique character and history of Lahaina Town, which serves as a center for retail outlets, as well as tourism activities. The 137,000 sq. ft. Lahaina Gateway Shopping Center located to the south of the project area on the mauka side of

Honoapiilani Highway and Keawe Street, currently represents the largest retail shopping center in Lahaina. The 120,000 sq. ft. Lahaina Cannery Mall is also located south of the project area.

The closure of the Pioneer Mill in 1999 marked the end of sugar cane cultivation in West Maui. In December 2009, Maui Land & Pineapple Company ceased larger scale pineapple cultivation. The cessation of these two (2) major plantation crops ended large scale plantation-style agriculture in the West Maui region. The largest agriculture operation in West Maui today is the 300-acre Kaanapali Coffee Farm.

As of July 2013, Maui County's non-seasonally adjusted unemployment rate stood at 4.9 percent, a reduction of 1.7 percent from July 2012. Similarly, Maui Island's non-seasonally adjusted unemployment rate for July 2013 stood at 4.8 percent, a reduction of 1.8 percent from July 2012 (DLIR, 2012).

b. Potential Impacts and Mitigation Measures

The West Maui Exploratory Well No. 2 project will provide short-term construction-related employment and services. In the long term, the project meets the water needs and supports the commercial and visitor oriented industries in the West Maui region.

4. Housing

a. Existing Conditions

As reported by the Realtors Association of Maui, Inc., in July 2012 the median sales price for a single-family home on Maui was \$545,000.00 and \$360,000.00 for a condominium. Housing prices in the West Maui region are higher, with median sales prices for single-family homes standing at \$880,000.00 in Lahaina, \$1.3 million in Kaanapali and \$2.7 million in Kapalua (October 2013). In October 2013, the median sales price for condominiums in West Maui was \$360,000.00 in Lahaina, \$842,400.00 in Kaanapali, and \$1.12 million in Kapalua (Realtors Association of Maui, October 2013).

Socio-economic forecast data prepared for the County of Maui's General Plan Update process reflect a continuing increase in housing demand. In the West Maui region in 2000 there was a resident housing demand for

6,348 units. By the year 2030, the demand for West Maui resident housing units was modified in the Maui Island Plan to 3,500 units (County of Maui, Department of Planning, Maui Island Plan, Chapter 8, amended December 2010).

b. Potential Impacts and Mitigation Measures

The proposed project involves construction of an exploratory well and as such, no adverse effects to housing are anticipated. The project potentially provides a new source and reliable water system thereby being a positive impact that serves the community and housing in this region.

C. PUBLIC SERVICES

1. Solid Waste Disposal

a. Existing Conditions

Single-family residential automated solid waste collection service is provided by the County of Maui on a twice-a-week basis. Residential solid waste collected by County crews is disposed at the County's 55-acre Central Maui Landfill, located four (4) miles southeast of the Kahului Airport. In addition to County-collected residential refuse, the Central Maui Landfill also accepts residential and commercial waste from private collection companies.

A recycling and refuse convenience center located about six (6) miles south of the project site at Olowalu serves West Maui residents and accommodates household refuse and green waste, as well as used oil and recyclable materials. No commercial waste is accepted at this facility. A private waste disposal service has been contracted by the County to transport waste from this facility to the Central Maui Landfill.

b. Potential Impacts and Mitigation Measures

During construction, solid waste will consist mainly of vegetation or green waste which is removed during grading and grubbing. As applicable, a solid waste management plan will be prepared in coordination with the County's Department of Environmental Management. According to the County of Maui's Integrated Solid Waste Management Plan (2009) there is available capacity at the Central Maui Landfill to accommodate solid

waste disposal until 2026. In the long-term, the proposed project is not anticipated to generate solid waste. As such, the proposed project is not anticipated to affect the service capabilities of County or private waste collection operations and disposal facilities.

2. **Medical Facilities**

a. **Existing Conditions**

The only major medical facility on the island is Maui Memorial Medical Center, located approximately 25 miles from Lahaina, midway between Wailuku and Kahului. The 231-bed facility provides general, acute, and emergency care services. Emergency ambulance services are located at the Lahaina Comprehensive Health Center at the Lahaina Civic Center Complex and in Napili at the Napili Fire Station.

In addition, medical services are offered by the Maui Medical Group, Lahaina Physicians, West Maui Healthcare Center, Kaiser Permanente's Lahaina Clinic, and other private medical and dental offices.

b. **Potential Impacts and Mitigation Measures**

As the proposed project is limited to DWS water infrastructure improvements, it will not adversely impact or affect the existing service capacities for medical services.

3. **Police and Fire Protection**

a. **Existing Conditions**

The project area is within the Maui Police Department's Lahaina District service area. The Department's Lahaina Station is located in the Lahaina Civic Center complex at Wahikuli, approximately four (4) miles southwest of the project area. The Lahaina Patrol includes 54 full-time personnel, including management-level officers and field officers. Additional personnel consist of public safety aides and administrative support staff.

Fire prevention, suppression, and protection services for the Lahaina District are provided by the Department of Fire and Public Safety's Lahaina Fire Station, in the Lahaina Civic Center and the Napili Fire Station, located north of the project area in Napili. The Lahaina Fire Station includes an engine and a ladder company, and is staffed by

approximately 30 full-time personnel. The Napili Fire Station consists of an engine company including 15 full-time firefighting personnel.

b. Potential Impacts and Mitigation Measures

The proposed project involves the development of an exploratory well, as a step towards providing reliable service to the West Maui region. In this context, the proposed action is not anticipated to create adverse impacts on the capabilities of existing police and fire services in the West Maui region. The exploratory well project will determine whether a dependable water source exists for the area. If conversion of the exploratory well to a permanent production facility is deemed viable, such a facility will support fire protection services in the area.

4. Schools

a. Existing Conditions

The West Maui area is served by four (4) public schools operated by the State of Hawaii, Department of Education (DOE): Lahainaluna High School, Lahaina Intermediate School, Princess Nahienaena Elementary School, and King Kamehameha III Elementary School. The region is also served by privately operated pre-elementary and elementary schools, such as Sacred Hearts Elementary School and Maui Preparatory Academy.

University of Hawaii-Maui College (UH-Maui), which is located in Kahului, is a part of the University of Hawaii system. In addition, there is a UH-Maui Lahaina Education Center that opened in Fall 2007. UH-Maui is the primary higher education institution serving Maui.

b. Potential Impacts and Mitigation Measures

The proposed project is limited in scope to the construction of a DWS exploratory well. As such, the project is not anticipated to impact regional public education facilities.

5. Recreational Facilities

a. Existing Conditions

West Maui has numerous recreational facilities offering diverse opportunities for the region's residents. These facilities include several

County and State parks and beach parks. Approximately one-third of the County parks are situated along the shoreline and offer excellent swimming, diving, and snorkeling areas. In addition, Kaanapali and Kapalua Resorts operate world-class golf courses available for public use.

Recreational facilities in Lahaina town include the Lahaina Aquatic Center, the West Maui Youth Center, the Lahaina Recreation Center, and the Lahaina Civic Center. The Lahaina Aquatic Center contains an Olympic-size swimming pool, a children's wading pool, a paved parking lot, and office and storage space, as well as shower, restroom, and changing room facilities. The 15-acre addition to the Lahaina Recreation Center includes fields, parking, and washroom facilities. The West Maui Youth Center has a building for youth activities, as well as paved parking, an outdoor playground, and a basketball court. The Lahaina Recreation Center has baseball fields and other playfields for soccer and football, as well as restrooms and paved parking facilities. The Lahaina Civic Center includes a gymnasium, amphitheater, and tennis courts complex, as well as restrooms and paved parking facilities.

The clear ocean waters and well-developed reef systems along the Lahaina and Kaanapali coastlines offer many recreational opportunities for residents and visitors. Fishing, by shorecasting and netting, is practiced in the waters near the outlet of Kauaula Stream and Makila Point. Edible seaweed collecting, octopus diving, and spearfishing occur along West Maui coastline as well. During periods of wave activity, the shore areas of West Maui is a good location for surfing.

b. Potential Impacts and Mitigation Measures

As the proposed project is located a distance away from urbanized and developed areas and the coastline, it is not anticipated to adversely impact recreational facilities or opportunities in the West Maui region.

D. INFRASTRUCTURE

1. Roadways

a. Existing Conditions

The project area is located off Honoapiilani Highway, with access to the project area via a private agricultural road owned by Maui Land and Pineapple Company.

b. Potential Impacts and Mitigation Measures

The project area is located in a remote location and is removed from urbanized areas. It is about 2.8 miles away from Honoapiilani Highway and 2.3 miles away from the State's Kapalua West Maui Airport. The proposed project will not increase the DWS workforce in the area and only involve regular maintenance by existing DWS staff. As such, adverse impact on traffic or the existing roads is not expected.

Traffic impacts during construction of the project are not anticipated. The project construction area is approximately 2.8 miles away from Honoapiilani Highway, the main public transit corridor in the area.

2. Water System

a. Existing Conditions

The West Maui region is served by DWS's water system and private water purveyors. The County water system services the coastal areas from Launiupoko to Kaanapali and from Honokowai to Napili. The County's system consists of ground and surface water sources.

In the West Maui region, DWS owns eight (8) active wells and two (2) water treatment facilities (WTF). In the southern area the Lahaina WTF draws water from the Kanaha Stream. The Lahaina WTF is supplemented by two (2) Kanaha Wells and two (2) Waipuka wells. In the northern area, the Mahinahina WTF draws water from the Honolulu/Honokohau Ditch. The Mahinahina WTF is supplemented by four (4) wells, Napili A, Napili B, Napili C, and Honokahua B. Several miles of 12- and 16-inch lines and two (2) in-line booster stations convey water from these sources to consumers from Lahaina to Napili. Storage is provided by a 1.5 MG

storage tank at the Lahaina WTF and Mahinahina WTF, a 2 MG storage tank at Honokowai, a 1.5 MG storage tank at Wahikuli, and 1.0 MG and 0.5 MG tank on Lahainaluna Road.

The Mahinahina WTF is located within the Honokowai area. Finished treated water from the Mahinahina WTF is stored in a tank at the plant site and feeds water to the 2.0 MG Honokowai tank located approximately 1.2 miles west of the WTF. The Honokowai tank provides water to the DWS water system which also serves the communities from Lahaina to Napili.

b. Potential Impacts and Mitigation Measures

The proposed West Maui Exploratory Well No. 2 represents the initial step in providing an additional groundwater source to the West Maui region. If results of testing at the well are successful, a production facility will be constructed to provide increased system source and reliability to the West Maui service region during periods of reduced water availability.

At the exploratory well development phase, however, there will be no direct impacts to the DWS system.

3. Wastewater System

a. Existing Conditions

The County of Maui, Department of Environmental Management's Wastewater Reclamation Division provides wastewater service for the West Maui region.

Wastewater from the Kaanapali and Lahaina areas is treated at the County's Lahaina Wastewater Reclamation Facility (LWRF) located approximately three (3) miles south of the project site on the east (mauka) side of Honoapiilani Highway. The LWRF's total treatment capacity is 9.0 mgd. The average daily flow is approximately 4.1 mgd.

A portion of the treated effluent is used to irrigate the Kaanapali Golf Courses. The remaining treated effluent is disposed into four (4) injection wells located within the facility. Under the conditions of its U.S. EPA permit, the County is allowed to dispose a maximum of 6.7 mgd of treated effluent into the injection wells.

b. Potential Impacts and Mitigation Measures

The proposed project scope of work is limited to the development of an exploratory well. There will be no wastewater facilities provided as part of the proposed action. As such, the project is not anticipated to impact regional wastewater treatment facilities or the related collection system.

4. Drainage

a. Existing Conditions

The project site is located in Flood Zone X, an area of minimal flooding. See **Appendix “E”**. Stormwater runoff at the proposed well site flows downslope into the surrounding agricultural fields following the existing topographic conditions. See **Appendix “F”**.

b. Potential Impacts and Mitigation Measures

All drainage improvements will conform to County standards and will be coordinated with the Department of Public Works to ensure there are no significant adverse effects on existing downstream properties.

Soil loss will be minimized during the construction period through the implementation of appropriate BMPs and erosion control measures, including but not limited to:

1. Minimizing the time of construction.
2. Sequencing construction activities to minimize exposure time of cleared surface area.
3. Initiating the early construction of drainage features.
4. Stationing a water truck on site during the construction period to provide for immediate sprinkling, as needed, in active construction zones (weekends and holidays included).
5. Stormwater flowing toward the construction area may be diverted by using temporary berms, filter berms, and cut-off ditches, or other appropriate measures, where needed, for control of erosion and pollution to protect surrounding water resources.

6. Ensuring graded areas are thoroughly watered after construction activity has ceased for the day and on weekends and holidays.
7. Applying perennial vegetation for permanent soil stabilization, as soon as practicable, after final grading to ensure all cut and fill slopes are sodded or planted.

The temporary silt basin component of the proposed project is a BMP measure for drainage and erosion control. Refer to **Exhibit "A"**.

5. Electrical, Telephone, and Cable Television (CATV) Services

a. Existing Conditions

Electrical, telephone, and CATV service to the West Maui region is provided by Maui Electric Company, Ltd. (MECO), Hawaiian Telcom, and Oceanic Time Warner Cable, respectively.

b. Potential Impacts and Mitigation Measures

The proposed project is not anticipated to have significant impacts to electrical, telephone, or cable TV services.

The well pump will be powered by a diesel generator, and will not require electrical service from MECO.

E. CUMULATIVE AND SECONDARY IMPACTS

Pursuant to the Hawaii Administrative Rules, Chapter 200, Section 11-200-2, entitled Environmental Impact Statement Rules, a cumulative impact means:

The impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

A key element in understanding the requirement for assessing cumulative impacts, therefore, is the need to recognize what constitutes "reasonably foreseeable actions".

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.

With respect to larger and foreseeable future actions, the County of Maui recently completed the updating of the County General Plan through the planning horizon of 2030. Among the components of the General Plan Update is the Maui Island Plan which was adopted December 28, 2012 and delineates urban and rural growth boundaries (UGBs and RGBs, respectively). The purpose of the UGBs and RGBs is to direct future urban and rural growth to select areas of Maui Island, taking into account population projections and future demands for housing infrastructure, services, and public facilities. According to the land use forecast used by the County Department of Planning for the Maui Island Plan, approximately 3,500 additional residential units are needed to accommodate the projected growth in West Maui to the year 2030. The inclusion of the urban growth areas to accommodate the future housing needs in the West Maui area in the Maui Island Plan indicates the need for infrastructure and services, such as the proposed exploratory well project to support this growth. Implementation and development of these new growth areas will be further refined and assessed through the West Maui Community Plan process.

The proposed West Maui Exploratory Well No. 2 is the initial step in further developing reliability in the West Maui water system. The proposed action is in consonance with the County General Plan and in the context of the cumulative impact definition, is not considered to have adverse cumulative effects.

Secondary impacts are those which have the potential to occur later in time or farther 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. The proposed action is not anticipated to result in significant adverse secondary impacts.

**III. RELATIONSHIP TO
LAND USE PLANS, POLICIES,
AND CONTROLS**

III. RELATIONSHIP TO LAND USE PLANS, POLICIES, AND CONTROLS

A. STATE LAND USE DISTRICTS

Pursuant to Chapter 205A, Hawaii Revised Statutes (HRS), all lands in the State have been divided and placed into one (1) of four (4) land use districts by the State Land Use Commission. These land use districts have been designated “Urban”, “Rural”, “Agricultural”, and “Conservation”. The West Maui Exploratory Well No. 2 project site is located within the State “Agricultural” district. The proposed action is compatible with, and deemed permissible within, the State “Agricultural” land use district. See **Figure 8**.

B. CHAPTER 226, HAWAII STATE PLAN

Chapter 226, HRS, also known as the Hawaii 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. The proposed action is consistent with the following goals of the Hawaii State Plan.

- *A strong, viable economy, characterized by stability, diversity, and growth, that enables the fulfillment of the needs and expectations of Hawaii’s present and future generations.*
- *A desired physical environment, characterized by beauty, cleanliness, quiet, stable natural systems, and uniqueness, that enhances the mental and physical well-being of the people.*

1. Objectives and Policies of the Hawaii State Plan

The proposed project is consistent with the following objectives and policies of the Hawaii State Plan:

Chapter 226-11, HRS, Objectives and Policies for the Physical Environment - Land-Based, Shoreline, and Marine Resources.

226-11 (b)(1), HRS: *Exercise an overall conservation ethic in use of Hawaii’s natural resources.*

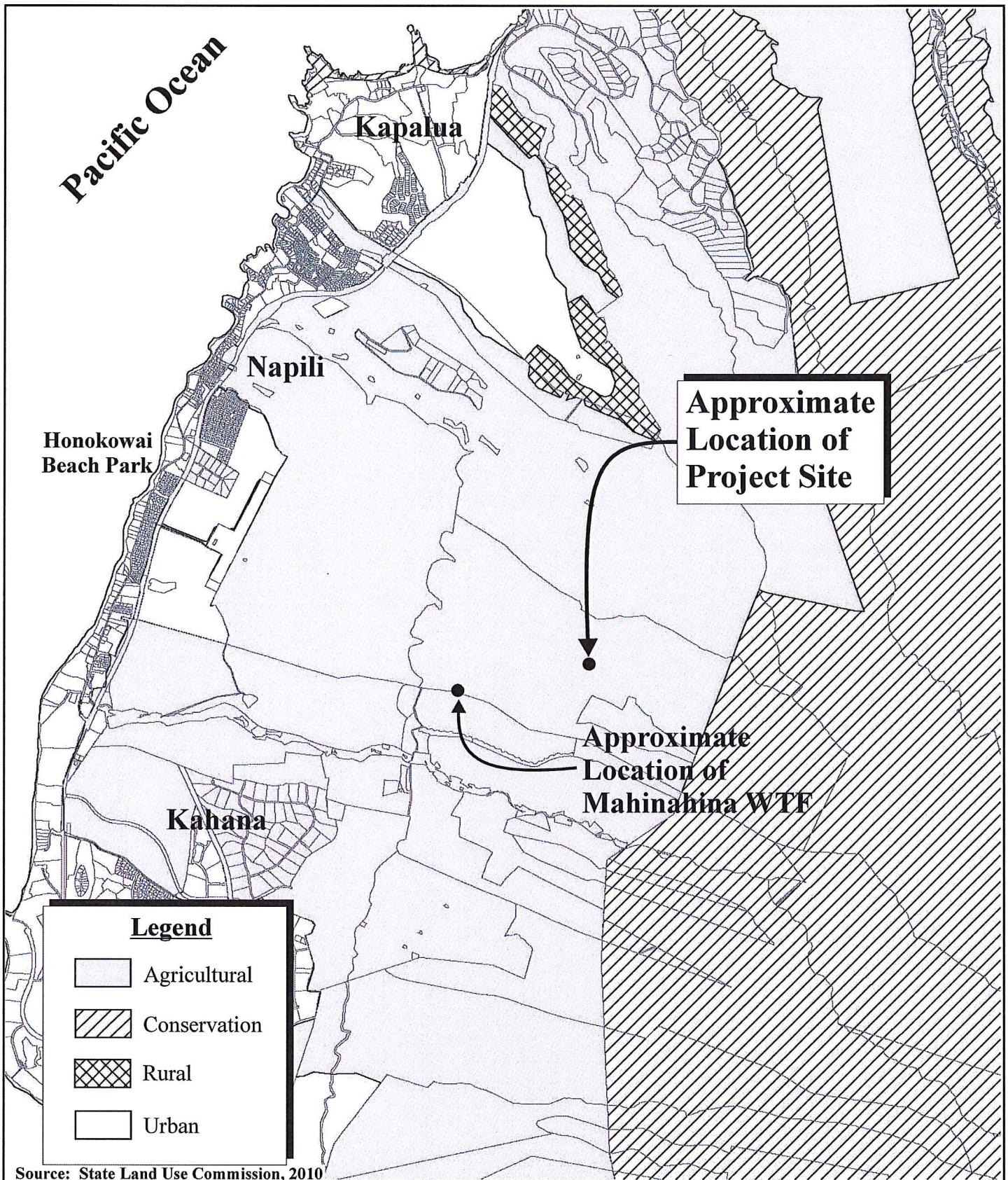


Figure 8 West Maui Exploratory Well No. 2 **NOT TO SCALE**
 State Land Use District Map



226-11 (b)(3), HRS: *Take into account the physical attributes of areas when planning and designing activities and facilities.*

226-11 (b)(4), HRS: *Manage natural resources and environs to encourage their beneficial and multiple use without generating costly or irreparable environmental damage.*

226-11 (b)(8), HRS: *Pursue compatible relationships among activities, facilities, and natural resources.*

Chapter 226-13, HRS, Objectives and Policies for the Physical Environment-Land, Air, and Water Quality.

226-13 (b)(2), HRS: *Promote the proper management of Hawaii's land and water resources.*

226-13 (b)(3), HRS: *Promote effective measures to achieve desired quality in Hawaii's surface, ground, and coastal waters.*

Chapter 226-14, HRS, Objectives and Policies for the Facility Systems-In General.

226-14 (b)(1), HRS: *Accommodate the needs of Hawaii's people through coordination of facility systems and capital improvement priorities in consonance with state and county plans.*

Chapter 226-16, HRS, Objectives and Policies for the Facility Systems-Water.

226-16 (b)(1), HRS: *Coordinate development of land use activities with existing and potential water supply.*

226-16 (b)(2), HRS: *Support research and development of alternative methods to meet future water requirements well in advance of anticipated needs.*

226-16 (b)(4), HRS: *Assist in improving the quality, efficiency, service, and storage capabilities of water systems for domestic and agricultural use.*

2. Priority Guidelines of the Hawaii State Plan

The proposed action coincides with the following priority guidelines of the Hawaii State Plan.

Chapter 226-103, HRS, Economic Priority Guidelines:

226-103 (e)(3), HRS: *Increase the support for research and development of economically feasible alternative water sources.*

226-103 (e)(4), HRS: *Explore alternative funding sources and approaches to support future water development programs and water system improvements.*

C. MAUI COUNTY GENERAL PLAN

As indicated by the Maui County Charter, the purpose of the General Plan shall be to:

...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 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 general plan shall identify objectives to be achieved, and priorities, policies, and implementing actions to be pursued with respect to population density; land use maps, land use regulations, transportation systems, public and community facility locations, water and sewage systems, visitor destinations, urban design, and other matters related to development.

Chapter 2.80B of the Maui County Code (MCC), relating to the general plan and community plans, implements the foregoing Charter provision through enabling legislation which calls for a Countywide Policy Plan and a Maui Island Plan. The Countywide Policy Plan was adopted as Ordinance No. 3732 and took effect on March 24, 2010. The Maui Island Plan was adopted December 28, 2012 by the Maui County Council.

1. Countywide Policy Plan

With regard to the Countywide Policy Plan, Section 2.80B.030 of the MCC states the following:

The countywide policy plan shall provide broad policies and objectives which portray the desired direction of the County's future. The countywide policy plan shall include:

- 1. A vision for the County;*
- 2. A Statement of core themes or principles for the county;
and*

3. *A list of countywide objectives and policies for population, land use, the environment, the economy, and housing.*

Core principles set forth in the Countywide Policy Plan are listed as follows:

1. *Excellence in the stewardship of the natural environment and cultural resources;*
2. *Compassion for and understanding of others;*
3. *Respect for diversity;*
4. *Engagement and empowerment of Maui County residents;*
5. *Honor for all cultural traditions and histories;*
6. *Consideration of the contributions of past generations as well as the needs of future generations;*
7. *Commitment to self-sufficiency;*
8. *Wisdom and balance in decision making;*
9. *Thoughtful, island-appropriate innovation; and*
10. *Nurturance of the health and well-being of our families and our communities.*

Congruent with these core principles, the Countywide Policy Plan identifies goals, objectives, policies and implementing actions for pertinent functional planning categories, which are identified as follows:

1. *Natural environment*
2. *Local cultures and traditions*
3. *Education*
4. *Social and healthcare services*
5. *Housing opportunities for residents*
6. *Local economy*
7. *Parks and public facilities*
8. *Transportation options*

9. *Physical infrastructure*
10. *Sustainable land use and growth management*
11. *Good governance*

With respect to the West Maui Exploratory Well No. 2 project, the following goals, objectives, policies, and implementing actions are illustrative of the project's compliance with the Countywide Policy Plan:

IMPROVE PHYSICAL INFRASTRUCTURE

Goal:

Maui County's physical infrastructure will be maintained in optimum condition and will provide for and effectively serve the needs of the County through clean and sustainable technologies.

Objective:

Improve water systems to assure access to sustainable, clean, reliable, affordable sources of water.

Policies:

- *Develop and fund improved water delivery systems.*
- *Retain and expand public control and ownership of water resources and delivery systems.*
- *Improve the management of water systems so that surface-water and groundwater resources are not degraded by overuse or pollution.*
- *Seek reliable long-term sources of water to serve developments that achieve consistency with appropriate Community Plans.*

Objective:

Direct growth in a way that makes efficient use of existing infrastructure and to areas where there is available infrastructure capacity.

Policies:

- *Capitalize on existing infrastructure capacity as a priority over infrastructure expansion.*

- *Utilize appropriate infrastructure technologies in the appropriate locations.*

Objective:

Improve the planning and management of infrastructure systems.

Policies:

- *Provide a reliable and sufficient level of funding to enhance and maintain infrastructure systems.*
- *Maintain inventories of infrastructure capacity, and project future infrastructure needs.*
- *Ensure that basic infrastructure needs can be met during a disaster.*

In summary, the West Maui Exploratory Well No. 2 project is intended to improve the Department of Water Supply (DWS) water infrastructure and allow for reliable service to the communities in this region during those times when the surface water source is not available. In this regard, the project is consistent with the theme and principles of the Countywide Policy Plan.

2. Maui Island Plan

The Maui Island Plan (MIP) is applicable to the island of Maui only, providing more specific policy-based strategies for population, land use, transportation, public and community facilities, water and sewage systems, visitor destinations, urban design, and other matters related to future growth.

As provided by Chapter 2.80B, the MIP shall include the following components:

1. *An island-wide land use strategy, including a managed and directed growth plan*
2. *A water element assessing supply, demand and quality parameters*
3. *A nearshore ecosystem element assessing nearshore waters and requirements for preservation and restoration*
4. *An implementation program which addresses the County's 20-year capital improvement requirements, financial program for implementation, and action implementation schedule*

5. *Milestone indicators designed to measure implementation progress of the MIP*

It is noted that the Ordinance No. 4004 does not address the component relating to the implementation program. Chapter 2.80B of the Maui County Code, relating to the General Plan, was amended via Ordinance No. 3979, October 5, 2012, to provide that the implementation program component be adopted no later than one (1) year following the effective date of Ordinance No. 4004, December 28, 2012. On December 20, 2013, the County Council approved a time extension until March 31, 2014 to adopt the implementation chapter.

The MIP addresses a number of planning categories with detailed policy analysis and recommendations which are framed in terms of goals, objectives, policies, and implementing actions. These planning categories address the following areas:

1. *Population*
2. *Heritage Resources*
3. *Natural Hazards*
4. *Economic Development*
5. *Housing*
6. *Infrastructure and Public Facilities*
7. *Land Use*

Additionally, an essential element of the MIP is its directed growth plan which provides a management framework for future growth in a manner that is fiscally, environmentally, and culturally prudent. Among the directed growth management tools developed through the MIP process are maps delineating urban growth boundaries (UGB), small town boundaries (SRB), and rural growth boundaries (RGB). The respective boundaries identify areas appropriate for future growth and their corresponding intent with respect to development character.

The project site is not located within the RGB or UGB. In addition, the proposed project has been reviewed with respect to pertinent goals, objectives, policies, and implementing actions of the MIP. A summary of these policy statements are provided below:

INFRASTRUCTURE AND PUBLIC FACILITIES – WATER

Goal:

6.3 *Maui will have an environmentally sustainable, reliable, safe, and efficient water system.*

Objectives:

6.31 *More comprehensive approach to water resources planning to effectively protect, recharge, and manage water resources including watersheds, groundwater, streams, and aquifers.*

Policies:

6.3.1.a *Ensure that DWS actions reflect its public trust responsibilities toward water.*

6.3.1.e *Where desirable, retain and expand public ownership and management of watersheds and fresh-water systems.*

Objective:

6.3.2 *Increase the efficiency and capacity of the water systems in striving to meet the needs and balance the island's water needs.*

Policies:

6.3.2.a *Ensure the efficiency of all water system elements including well and stream intakes, water catchment, transmission lines, reservoirs, and all other system infrastructure.*

In summary, the proposed West Maui Exploratory Well No. 2 project is consistent with the above-noted themes and principals of the Maui Island Plan.

D. WEST MAUI COMMUNITY PLAN

The project site is located in the West Maui Community Plan region, one (1) of the nine (9) Community Plan regions established in the County of Maui. Planning for each region is guided by the respective Community Plans, which are designed to implement the Maui County General Plan. Each Community Plan contains recommendations and standards which guide the sequencing, patterns, and characteristics of development in the region.

Land use guidelines are established by the West Maui Community Plan land use map. The land use map for the West Maui Community Plan designates the project area for “Agricultural” use. See **Figure 9**.

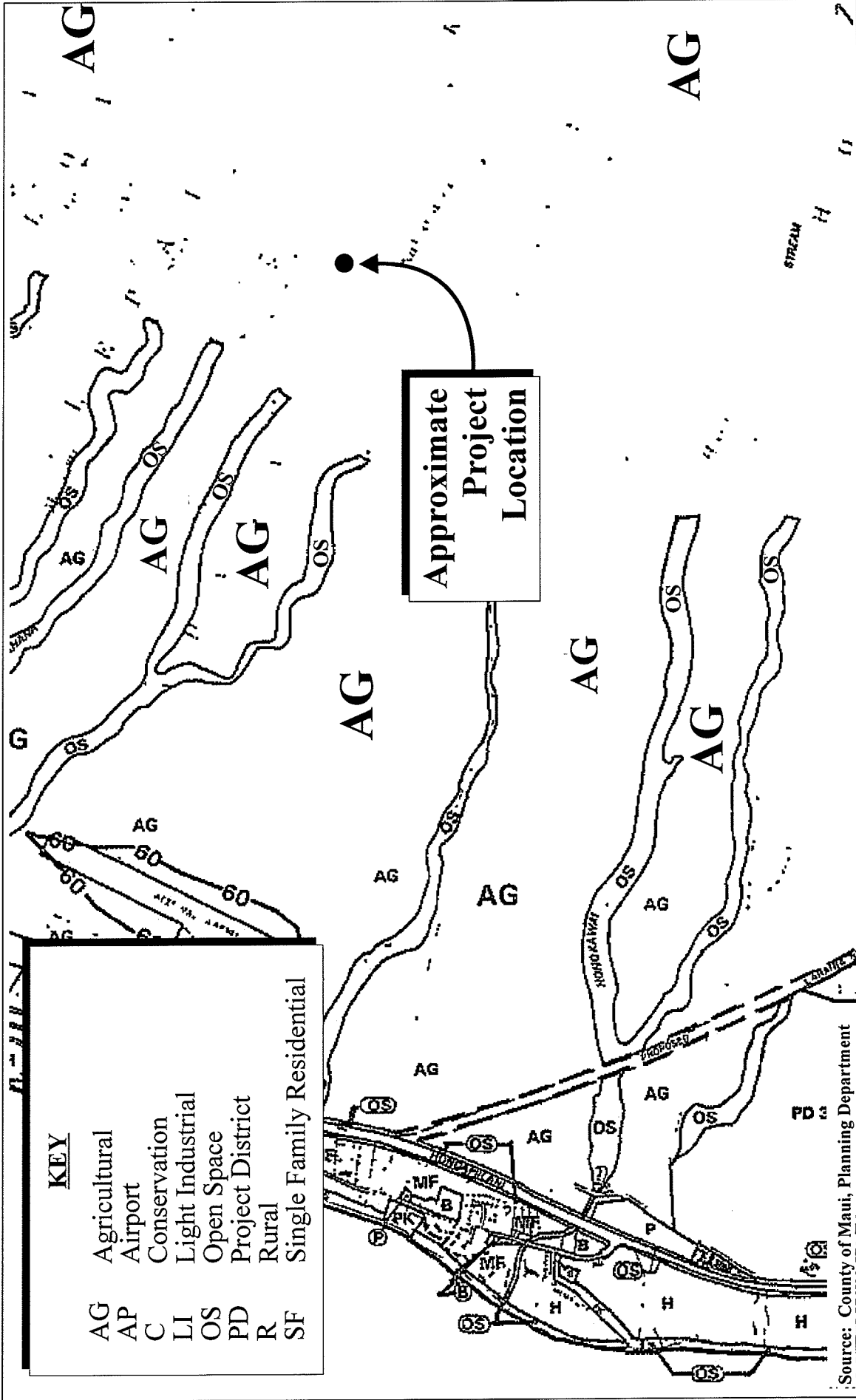


Figure 9
 West Maui Exploratory Well No. 2
 Community Plan Land Use Designations

NOT TO SCALE



Prepared for: County of Maui, Department of Water Supply



MUNEKIYO & HIRAGA, INC.

REF:WMAE12/PLUD

The proposed action is in keeping with the following West Maui Community Plan goals, objectives, policies, and implementing actions:

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 meets the needs of the community.

Water and Utilities

Objectives and Policies

- *Protect groundwater resources in the region.*
- *Improve the quality of domestic water.*
- *Improve and expand the West Maui water development program projected by the County to meet future residential expansion needs and establish water treatment facilities where necessary.*

GOVERNMENT

Goal

Government that demonstrates the highest standards of fairness, responsiveness to the needs of the community, fiscal integrity, effectiveness in planning and implementing programs and projects to accommodate a stable social and economic well-being for residents, a fair and equitable approach to taxation, and efficient and results-oriented management.

Objectives and Policies

- *Insure that adequate infrastructure is or will be available to accommodate planned development.*
- *Improve the availability of government services to the community.*

E. COUNTY ZONING

The subject property is designated as “Agricultural” by Maui County Zoning. Minor utility facilities are permitted within the “Agricultural” district. Section 19.04.040 of the MCC defines minor utility facilities as *“transmission lines used directly in the distribution of utility services that have minor impact on adjacent land uses which include, but which are not limited to, twenty-three kilovolt transmission substations, vaults, water wells, tanks and distribution equipment, sewage pump stations, and other similar type uses”*. The proposed West Maui Exploratory Well No. 2 project is a minor utility and permitted by Maui County Zoning. The maximum height for non-dwelling structures in the Agricultural district is 35 feet. The proposed project is low profile with a well that is below grade and related improvements that are well within the maximum height limit.

F. MAUI COUNTY WATER USE AND DEVELOPMENT PLAN

Hawaii State Law requires each County to prepare, periodically update, and adopt a Water Use and Development Plan (WUDP) to serve as the long-range planning blueprint for all water uses in each County. Maui County requires a WUDP update each time the County General Plan is amended or revised. The County’s General Plan includes the Countywide Policy Plan adopted as Ordinance No. 3732 on March 24, 2010 and the Maui Island Plan adopted on December 28, 2012. DWS is in the process of updating its WUDP for West Maui. DWS is in the process of analyzing the major strategies to be considered in the Maui County WUDP and is coordinating with the Commission on Water Resource Management to present the analysis of major strategies for public review.

G. COASTAL ZONE MANAGEMENT

The Hawaii Coastal Zone Management Program (HCZMP), as formalized in Chapter 205A, HRS, establishes objectives and policies for the preservation, protection, and restoration of natural resources of Hawaii’s coastal zone. The project area lies about four (4) miles away from the coast, outside of the County of Maui’s Special Management Area (SMA). As such, a SMA Use Permit for coastal zone management is not required for the project. Although the project area is not located in a coastal area, the proposed project has been assessed relative to the coastal zone management considerations, as set forth in Chapter 205A, HRS.

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, and county authorities; and crediting such dedication against the requirements of Section 46-6.

Response: The project area does not abut the shoreline, but is located inland about 3.0 miles from shoreline resources. The project site falls on former pineapple lands, below or makai of the West Maui Mountains Forest Reserve. The proposed action will not affect coastal recreational opportunities.

2. **Historic Resources**

Objective:

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

Policies:

- a. *Identify and analyze significant archeological 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: As stated previously, an archaeological field investigation of the proposed project area located in the Kahana uplands has been prepared. Refer to **Appendix "C"**. Based on archival research and previous archaeology done in the Kahana area, the survey determined it unlikely that traditional archaeological remains or surface artifacts and midden scatters would be identified as the project site is primarily located in fallow pineapple fields. A survey of the project area did not identify any archaeological sites. As such, no further archaeological work is recommended for the project area. Should there be an inadvertent discovery during ground altering activities, work will stop in the immediate area of the find and the State Historic Preservation Division (SHPD) will be contacted to establish the appropriate level of mitigation measures.

A cultural impact assessment conducted by Scientific Consultant Services, Inc. for this project includes archival and documentary research, as well as communication with organizations having knowledge of the project area, its

cultural resources, and practices and beliefs. Overall, the presence and documentation of archaeological features in the Kahana-Honokawai area indicates a strong history of settlement and land usage by traditional Hawaiians and Historic Period immigrants. Most of this occupation and land use occurred nearer to the coastline and in the Maui valleys, not the upland tablelands which is the location of the project site. The cultural impact assessment concluded the proposed project would not adversely impact cultural resources nor practices within recent times.

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 improvements are low profile and consist of an exploratory well and related improvements. The proposed action is located upland against the foothills of the West Maui Mountains and approximately 3.0 miles away from public roadways and the ocean. The project area is bordered by Kahana Stream Gulch to the north, pineapple fields to the east, Kahanaiki Gulch to the south, and vacant, former pineapple lands to the west. The proposed improvements will not have a significant adverse impact upon 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. *Exercise an overall conservation ethic, and practice stewardship in the protection, use, and development of marine and coastal resources;*
- b. *Improve the technical basis for natural resource management;*
- c. *Preserve valuable coastal ecosystems, including reefs, of significant biological or economic importance;*
- d. *Minimize disruption or degradation of coastal water ecosystems by effective regulation of stream diversions, channelization, and similar land and water uses, recognizing competing water needs; and*
- e. *Promote water quantity and quality planning and management practices that reflect the tolerance of fresh water and marine ecosystems and maintain and enhance water quality through the development and implementation of point and nonpoint source water pollution control measures.*

Response: The proposed project is not anticipated to result in any adverse impacts to coastal ecosystems as the project area is located about 3.0 miles away from the ocean, separated from the shoreline by Honoapiilani Highway which travels in a north-south direction along the coastal area. Applicable Best Management Practices (BMPs) and erosion-control measures will be implemented to mitigate runoff during temporary construction-related activities.

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 industry facilities and energy generating facilities, are located, designed, and constructed to minimize adverse social, visual, and environmental impacts in the coastal zone management area; and*
- 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 proposed project supports the objective and policies for economic uses and is supportive of the DWS's intent to improve system reliability. As the proposed project is located a distance away from coastal developed areas, it is in a suitable location to serve the region.

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 source pollution hazards;*
- c. *Ensure that developments comply with requirements of the Federal Flood Insurance Program; and*
- d. *Prevent coastal flooding from inland projects.*

Response: The project site is located upland of Kahana tablelands and outside of the coastal area and tsunami evacuation zone. The project area is located in Flood

Zone X, an area outside of the 1 percent annual chance floodplain. Appropriate BMPs will be implemented during construction to avoid adverse impact to downstream and adjacent properties

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 or 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: In compliance with the requirements of Chapter 343, HRS, this Environmental Assessment (EA) has been prepared to facilitate public understanding and involvement in project development. All aspects of the development will be conducted in accordance with Federal, State, and County standards, as applicable. Compliance with applicable regulatory requirements advances the objective and policies for managing development.

8. **Public Protection**

Objective:

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

Policies:

- a. *Promote public involvement in coastal zone management processes;*

- b. *Disseminate information on coastal management issues by means of educational materials, published reports, staff contact, and public workshops for persons and organizations concerned with coastal issues, developments, and government activities; and*
- c. *Organize workshops, policy dialogues, and site-specific mediations to respond to coastal issues and conflicts.*

Response: Opportunities for public awareness and participation for the project are facilitated through the notification, review and comment processes of the EA requirements of Chapter 343, HRS. The proposed project is not contrary to the objectives of public awareness, education, and participation.

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, minimize interference with natural shoreline processes, and 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 project is located 2.8 miles east of Honoapiilani Highway, is not in proximity to shoreline areas, and is not anticipated to impact shoreline activities or beach processes.

10. **Marine Resources**

Objective:

Promote the protection, use, and development of marine and coastal resources to assure their sustainability.

Policies:

- a. *Ensure that the use and development of marine and coastal resources are ecologically and environmentally sound and economically beneficial;*
- b. *Coordinate the management of marine and coastal resources and activities to improve effectiveness and efficiency;*
- c. *Assert and articulate the interests of the State as a partner with federal agencies in the sound management of ocean resources within the United States exclusive economic zone;*
- d. *Promote research, study, and understanding of ocean processes, marine life, and other ocean resources in order to acquire and inventory information necessary to understand how ocean development activities relate to and impact upon ocean and coastal resources; and*
- e. *Encourage research and development of new, innovative technologies for exploring, using, or protecting marine and coastal resources.*

Response: The proposed project is not anticipated to impact marine or coastal resources as the project site is located approximately 3.0 miles away from the ocean.

**IV. SUMMARY OF ADVERSE
ENVIRONMENTAL EFFECTS
WHICH CANNOT BE
AVOIDED**

IV. SUMMARY OF ADVERSE ENVIRONMENTAL EFFECTS WHICH CANNOT BE AVOIDED

The construction of the proposed project will result in certain construction-related impacts. Such impacts include those related to noise generation occurring from heavy equipment used for site preparation and construction activities. In addition, temporary air quality impacts associated with dust generation from construction activities and exhaust emissions discharged by construction equipment are also likely. However, these impacts are temporary and will be mitigated through the use of appropriate BMPs using water wagons and/or sprinklers to control dust, and watering graded areas upon completion of daily construction activities. Upon completion, the proposed project is not expected to be a source of long-term adverse air or noise conditions. The proposed project includes onsite drainage improvements designed as a mitigation control measure to protect downstream properties and coastal waters from storm water runoff.

Construction work on the project site will be coordinated with Maui Land and Pineapple Company, Inc., the owner of the underlying parcel. As the project site is 0.9 acre, a National Pollution Discharge Elimination System permit is not anticipated to be required.

The State Commission on Water Resource Management (CWRM) established a sustainable yield estimate for the Honolua aquifer systems as eight (8) million gallons per day (mgd). CWRM records show average groundwater use at an estimated 2.3 mgd (2005 through 2008) and available groundwater at an estimated 5.7 mgd. Refer to **Appendix "F"** (Preliminary Design Report, November 14, 2012 (Revised February 25, 2013, April 23, 2013)). The proposed West Maui Exploratory Well will draw up to 1.44 mgd from the aquifer. This rate of pumpage will not cause the sustainable yield of the Honolua Aquifer to be exceeded. Department of Water Supply (DWS) will apply for a CWRM Well Construction permit to drill the West Maui Exploratory Well No. 2.

V. ALTERNATIVES TO THE PROPOSED ACTION

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A. ALTERNATIVES

The proposed project, as outlined in Chapter I, Project Overview, is the preferred alternative and involves the construction of a new exploratory well. Refer to **Appendix “F”** (Preliminary Design Report). The proposed project is the initial step towards ensuring system reliability for the West Maui Water System. If successfully converted to a production facility, this source will help to meet water needs in the region during periods of drought or when the surface water source is reduced when the Honolua/Honokohau Ditch is undergoing maintenance and repair work.

The following two (2) alternatives have been evaluated by the Department of Water Supply (DWS) in an effort to increase water source availability and reliability for the West Maui region.

1. Demand Side Management Alternative

The demand side management (DSM) alternative uses water conservation or efficiency-based measures that improve existing infrastructure to reduce or eliminate leaky pipes, reduce waste, or reduce use. The Division of Water Resources and Planning section of DWS has a number of programs to address DSM. They are listed below with a brief description:

Leak Detection- The DWS has a proactive Leak Detection program surveying the infrastructure to locate pipe breaks, leaking pipes, leaking connections, etc.

Water System Audit- DWS conducts water audits on their own system to identify and correct areas showing high water loss.

Residential Water Audit- DWS provides assistance to residents with high water bills, to evaluate the source of the high water use and assist in reducing the high water use areas, (e.g., best management practice for irrigation use, repairing leaking customer laterals).

Fixture Retrofit- DWS has worked with high use customers to retrofit toilets and faucets to reduce water use.

Public Education- DWS staff educate customers and keiki by visiting schools to teach students about the value of water, participate in community events, encourage water conservation by running ads in the paper and on radio and conduct a student water conservation poster contest.

The Division of Water Resources and Planning also helps to fund watershed protection projects for watersheds in Maui County. Projects involve restoring degraded watersheds through proper planting, eradicating invasive species, and fencing to better manage feral unregulated populations.

The programs listed above help in many ways, but will not reduce water usage sufficiently to be a competitive alternative of a new water source from the West Maui Exploratory Well No. 2 project during times of reduced water availability due to drought or maintenance and repair work on Honolua/Honokohau Ditch. As such, DSM is not considered to be a viable alternative to the proposed West Maui Exploratory Well No. 2 project.

2. New Source Development Alternatives

The second alternative evaluated by DWS was the investigation of other potential sources for the West Maui water system including new surface water sources or groundwater sources.

a. New Surface Water Source Development

Surface water sources rely on rain water, and the West Maui Water System has an existing surface water treatment facility at Mahinahina along with raw water storage to maximize the water collected from surface water sources.

As the existing surface water source for potable water is dependent on climate conditions (e.g. rainfall, drought) and the source may be shut off during times when the Honolua/Honokohau Ditch is undergoing repair and maintenance work, developing a new groundwater source is considered to be the preferred alternative.

b. New Ground Water Source Development Alternative

The development of the West Maui Exploratory Well No. 2 provides DWS with a new groundwater source and is a viable preferred alternative for permanent source production. Other wells within the Honolua aquifer

include Napili A, Napili B, Napili C, Honokahua A, Honokahua B, Kapalua 1, and Kapalua 2. The development for a new groundwater source offers a reliable source to support the water demand in West Maui. Water drawn from the exploratory well will be tested to ensure that water quality is within the requirements of Department of Health, does not exceed maximum contaminant levels and does not adversely impact the Honolua aquifer.

B. NO ACTION ALTERNATIVE

The no action alternative maintains the West Maui water system in its existing condition.

The “no action” alternative is not deemed applicable as it does not allow the West Maui water system to reliably meet the water needs in this region during drought events or when the Honolua/Honokohau Ditch is undergoing maintenance and repair work shutting off the surface water source.

C. DEFERRED ACTION ALTERNATIVE

Similar to the no action alternative, the postponed action alternative maintains the West Maui water system in its current state and does not address improving the system to allow for reliability that meets the water demands during those times when the surface water source is diminished or not available.

**VI. IRREVERSIBLE AND
IRRETRIEVABLE
COMMITMENTS OF
RESOURCES**

VI. IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

The proposed project is anticipated to result in the irreversible and irretrievable commitment of natural and fiscal resources. Other resource commitments include energy, labor, and material resources. Impacts relating to the use of these resources are not considered significant when weighed against the expected positive socio-economic and community benefits derived from the project.

The State Commission on Water Resource Management (CWRM) established a sustainable yield estimated for the Honolua aquifer system at eight (8) million gallons per day (mgd). The proposed project will draw approximately 1.44 mgd from the aquifer. This rate of pumpage will not cause the sustainable yield of the aquifer to be exceeded.

VII. SIGNIFICANCE CRITERIA ASSESSMENT

VII. SIGNIFICANCE CRITERIA ASSESSMENT

The proposed project includes the use of County funds. As such, this Environmental Assessment (EA) has been prepared pursuant to Chapter 343, Hawaii Revised Statutes (HRS) and Chapter 200 of Title 11, Hawaii Administrative Rules (HAR) of the State Department of Health (DOH), Environmental Impact Statement Rules.

The “Significance Criteria”, Section 12 of the HAR, Title 11, Chapter 200, Environmental Impact Statement Rules, were reviewed and analyzed to determine whether the proposed project will have significant impacts to the environment. The following analysis is provided.

1. **The proposed action does not involve an irrevocable commitment to loss or destruction of any natural or cultural resources.**

An archaeological field inspection identified one (1) site designated as State Site No. 1591(Honolua/Honokohau Ditch) which is a distance away and downslope of the project area. No other sites were identified nor were areas identified that would be amenable to locating subsurface cultural deposits through excavation work, as Scientific Consultant Services, Inc. (SCS) noted the project area has been intensively modified for pineapple cultivation. No further work is recommended for the project area.

Should the inadvertent discovery of cultural materials occur during construction, Department of Water Supply (DWS) will halt all work in the immediate area of the find and notify State Historic Preservation Division (SHPD) to discuss mitigation, as appropriate.

The proposed project is not anticipated to result in the irrevocable commitment to loss or destruction of natural or cultural resources.

2. **The proposed action would not curtail the range of beneficial use of the environment.**

There are no adverse impacts to climate, topography, or soils anticipated as a result of the proposed project. There are also no known rare, threatened, or endangered species of flora, fauna, or critical habitats for such species within the project site.

The Biological Resources Survey Report concluded that the project area has been altered by over a century of agricultural activity and is currently overwhelmingly inhabited by non-native botanical species. The immediate surrounding habitat is

similar. The native plants in the project area do not present any particular environmental concern and no special native plant habitats were observed.

The proposed project is compatible with the surrounding uses and does not curtail any beneficial uses of the environment.

3. **The proposed action does not conflict 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. The project is located east of Honoapiilani Highway and about 3.0 miles away from the coastal shore. Best Management Practices (BMPs) will be implemented during project construction. Drainage systems included as part of the project are designed to protect downstream properties and coastal resources from stormwater runoff. The proposed action is not contrary to the policies and guidelines set forth in Chapter 344, HRS.

4. **The proposed action does not substantially affect the economic welfare, social welfare, and cultural practices of the community or State.**

As previously noted, the Honolua/Honokohau Ditch, State Site No. 1591, is a distance away and downslope from the project area, and no other sites were identified nor were areas identified that would be amenable to locating subsurface cultural deposits. No further work was recommended for the project area.

Should the inadvertent discovery of cultural materials occur during construction, DWS will halt all work in the immediate area of the find and notify SHPD to discuss mitigation, as appropriate.

A Cultural Impact Assessment was carried out for the proposed project. The presence and documentation of archaeological features in the Kahana-Honokowai area indicates a strong history of settlement and land usage by traditional Hawaiians and Historic Period immigrants. Most of this occupation and land use occurred nearer to the coastline and in the Maui valleys, not the upland tablelands which is the location of the project site. As such, the proposed project is not anticipated to adversely impact cultural resources or practices.

The proposed project will benefit the economy by providing construction and construction-related employment. There is benefit to the social welfare of the

community as the project will potentially allow water needs to be met when surface water sources are reduced.

5. **The proposed action does not substantially affect public health.**

No adverse impact to public health or welfare is anticipated as a result of the proposed project. Appropriate mitigation measures will be implemented to address anticipated temporary noise and air quality impacts in the area, resulting from project construction.

6. **The proposed action does not involve substantial secondary impacts, such as population changes or effects on public facilities.**

A secondary impact is generally defined as an impact which is caused by a specific action and which takes place later in time or further removed in distance but is still reasonably foreseeable. The proposed action is intended to provide an exploratory well to determine the potential for a new permanent source which would improve the reliability of the existing West Maui Water System, servicing the community during times of reduced water availability. No substantial secondary impacts or effects on public facilities or population changes are anticipated as a result of project implementation.

7. **The proposed action does not involve a substantial degradation of environmental quality.**

During the construction phase, there will be short-term air quality and noise quality impacts as a result of the project. In the long term, there will be no significant adverse impacts on air quality and ambient noise levels. The proposed action will not significantly affect the open space and scenic character of the region.

BMPs will be implemented as part of project construction to minimize impacts to topography, soils, downstream properties, and water bodies.

The project is not anticipated to involve a substantial degradation of environmental quality.

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

DWS will apply for a Commission on Water Resource Management (CWRM) Well Construction permit which sets requirements for well construction and

operations of the West Maui Exploratory Well No. 2 project. Well pumpage will be in accordance with the CWRM's permit and established sustainable yield for the Honolua aquifer. Water quality testing will be conducted to ensure that the new source meets DOH water quality requirements. DWS will install a CWRM approved meter or other appropriate means of measuring and reporting groundwater withdrawal.

The proposed project is presented in its entirety and is not part of a larger action.

9. **The proposed action does not substantially affects a rare, threatened, or endangered species of animal or plant, or its habitat.**

The Biological Resources Survey Report concluded that the native plants in the project area did not present any particular environmental concern and that no special native plant habitats were observed.

Of all the fauna observed during the survey, one (1) indigenous native species of dragonflies, the green darner, was observed. These insects are widespread and common in Hawaii and did not present concern. The survey concluded that the project area has been altered by over a century of agricultural activity and is currently overwhelmingly inhabited by non-native botanical species. The immediate surrounding habitat is similar.

As such, the proposed project is not anticipated to substantially adversely affect rare, threatened, or endangered species or its habitat.

10. **The proposed action does not detrimentally affect air or water quality or ambient noise levels.**

While construction activities will have an impact on air and noise quality, these impacts will be minimal and temporary. Dust control measures, such as regular watering and sprinkling, will be implemented to minimize wind-blown emissions. Noise impacts will be mitigated by limiting construction activities to daylight work hours. Implementation of drainage improvements designed in accordance with the Drainage Standards of the County of Maui to address storm water runoff from the project area will include permanent BMPs to protect water quality and coastal resources in the area.

In the long term, with appropriate mitigative measures in place, the proposed action is not anticipated to have a significant impact on air and water quality or ambient noise levels.

11. **The proposed action does not affect and is not likely to suffer damage by being located in an environmentally sensitive area such as a flood plain, tsunami zone, beach, erosion-prone area, geological hazardous land, estuary, fresh water, or coastal waters.**

The proposed project is not located within any environmentally sensitive areas, such as wetlands, coastal areas including beaches and coastal water, fresh water, estuaries, erosion-prone areas, or tsunami zone.

The proposed project is located about 3.0 miles away from shore and is located in Flood Zone X, an area of minimal flooding. Refer to **Appendix "E"**. The proposed project is not anticipated to affect any environmentally sensitive areas.

12. **The proposed Project does not substantially affect scenic vistas and viewplanes identified in county or state plans or studies.**

The project is limited to the installation of an exploratory well, with no attendant vertical structures (e.g., tanks and buildings). The project site is located upland and approximately 2.8 miles away from Honoapiilani Highway, the major roadway in West Maui and, as such, will not be visible from residences or roadways.

The proposed project is not expected to adversely affect scenic viewplanes.

13. **The proposed action does not require substantial energy consumption.**

The proposed action will involve the short-term commitment of fuel for equipment, vehicles and machinery during construction. The West Maui Exploratory Well No. 2 pumps will need to be capable of pumping 1,000 gallons per minute (gpm) (approximately 1.44 million gallons per day). Power for pump testing will be provided by a diesel generator. This use is not expected to result in substantial consumption of energy resources.

Based on the foregoing findings, it is anticipated that the proposed action will result in a Finding of No Significant Impact (FONSI) determination by the DWS as the approving agency.

VIII. LIST OF PERMITS AND APPROVALS

VIII. LIST OF PERMITS AND APPROVALS

The following list of permits and approvals are anticipated to be needed for project implementation:

State

1. Commission on Water Resource Management Well Construction Permit

County of Maui

1. Construction Permits (e.g., grading and grubbing)

**IX. PARTIES CONSULTED
DURING THE PREPARATION
OF THE DRAFT
ENVIRONMENTAL
ASSESSMENT; LETTERS
RECEIVED AND RESPONSES
TO SUBSTANTIVE
COMMENTS**

IX. PARTIES CONSULTED DURING THE PREPARATION OF THE DRAFT ENVIRONMENTAL ASSESSMENT; LETTERS RECEIVED AND RESPONSES TO SUBSTANTIVE COMMENTS

The following agencies were consulted during preparation of the Draft Environmental Assessment (EA). Agency comments and responses to substantive comments are included herein.

FEDERAL AGENCIES

1. Ranae Ganske-Cerizo, Soil Conservationist
Natural Resources Conservation Service
U.S. Department of Agriculture
77 Hookele Street, Suite 202
Kahului, Hawaii 96732
2. George Young, Chief, Regulatory Branch
U.S. Department of the Army
U.S. Army Engineer District, Honolulu
Regulatory Branch, Building 230
Fort Shafter, Hawaii 96858-5440
3. Loyal A. Mehrhoff, Field Supervisor
U. S. Fish and Wildlife Service
300 Ala Moana Blvd., Rm. 3-122
Box 50088
Honolulu, Hawaii 96813
6. Richard C. Lim, Director
State of Hawaii
Department of Business, Economic Development & Tourism
P.O. Box 2359
Honolulu, Hawaii 96804
7. Heidi Meeker, Planning Division
Office of Business Services
Department of Education
c/o Kalani High School
4680 Kalaniana'ole Highway, #T-B1A
Honolulu, Hawaii 96821
8. Jobie Masagatani, Chairperson
Hawaiian Home Lands Commission
P.O. Box 1879
Honolulu, Hawaii 96805

STATE AGENCIES

4. Dean H. Seki, Comptroller
Department of Accounting and General Services
1151 Punchbowl Street, #426
Honolulu, Hawaii 96813
5. Russell Kokubun, Chair
Department of Agriculture
1428 South King Street
Honolulu, Hawaii 96814-2512
9. Alec Wong, P.E., Chief
Clean Water Branch
State of Hawaii
Department of Health
919 Ala Moana Blvd., Room 300
Honolulu, Hawaii 96814
10. Patti Kitkowski, District Environmental Health Program Chief
State of Hawaii
Department of Health
Maui Sanitation Branch
54 South High Street, Room 300
Wailuku, Hawaii 96793

11. Laura McIntyre, AICP, Office Manager
Environmental Planning Office
Department of Health
919 Ala Moana Blvd., Suite 312
Honolulu, Hawaii 96814

12. Lene Ichinotsubo
Environmental Management Division
State of Hawaii
Department of Health
919 Ala Moana Blvd., Room 212
Honolulu, Hawaii 96814

13. William J. Aila, Jr., Chairperson
State of Hawaii
Department of Land and Natural Resources
P. O. Box 621
Honolulu, Hawaii 96809

14. Nicki Thompson, Interim Administrator
State of Hawaii
Department of Land and Natural Resources
State Historic Preservation Division
601 Kamokila Blvd., Room 555
Kapolei, Hawaii 96707

15. Jenny Pickett, Maui Archaeologist
State of Hawaii
Department of Land and Natural Resources
State Historic Preservation Division
130 Mahalani Street
Wailuku, Hawaii 96793

16. Glenn Okimoto, Director
State of Hawaii
Department of Transportation
869 Punchbowl Street
Honolulu, Hawaii 96813

cc: Ferdinand Cajjgal

17. Genevieve Salmonson, Acting Director
Office of Environmental Quality Control
235 S. Beretania Street, Suite 702
Honolulu, Hawaii 96813

18. Dr. Kamana`opono Crabbe, Chief
Executive Officer
Office of Hawaiian Affairs
711 Kapiolani Boulevard, Suite 500
Honolulu, Hawaii 96813

19. Jesse Souki, Director
State of Hawaii
Office of Planning
P. O. Box 2359
Honolulu, Hawaii 96804

20. Dan Orodener, Executive Officer
State of Hawaii
State Land Use Commission
P.O. Box 2359
Honolulu, Hawaii 96804

COUNTY AGENCIES

21. Teena Rasmussen, Coordinator
County of Maui
Office of Economic Development
2200 Main Street, Suite 305
Wailuku, Hawaii 96793

22. Anna Foust, Management Officer
Maui Civil Defense Agency
200 South High Street
Wailuku, Hawaii 96793

23. Jeffrey A. Murray, Fire Chief
County of Maui
Department of Fire and Public Safety
200 Dairy Road
Kahului, Hawaii 96732

24. Jo-Ann Ridao, Director
County of Maui
Department of Housing and Human Concerns
One Main Plaza
2200 Main Street, Suite 546
Wailuku, Hawaii 96793

25. Glenn Correa, Director
County of Maui
Department of Parks and Recreation
700 Halia Nakoia Street, Unit 2
Wailuku, Hawaii 96793

26. William Spence, Director
County of Maui
Department of Planning
2200 Main Street, Suite 315
Wailuku, Hawaii 96793

27. Gary Yabuta, Chief
County of Maui
Police Department
55 Mahalani Street
Wailuku, Hawaii 96793

28. David Goode, Director
County of Maui
Department of Public Works
200 South High Street
Wailuku, Hawaii 96793
29. Kyle Ginoza, Director
County of Maui
**Department of Environmental
Management**
One Main Plaza
2200 Main Street, Suite 100
Wailuku, Hawaii 96793
30. Jo Anne Johnson Winer, Director
County of Maui
Department of Transportation
200 South High Street
Wailuku, Hawaii 96793
31. Councilmember Elle Cochran
Maui County Council
200 South High Street
Wailuku, Hawaii 96793

UTILITIES

32. Dan Takahata, Manager – Engineering
Maui Electric Company, Ltd.
P.O. Box 398
Kahului, Hawaii 96733
33. **Hawaiian Telcom**
60 South Church Street
Wailuku, Hawai'i 96793

COMMUNITY ORGANIZATIONS

34. Donald Lehman, President
West Maui Taxpayers Association
P.O. Box 10338
Lahaina, Hawaii 96761

From: Ian Bordenave [mailto:ian_bordenave@fws.gov]
Sent: Wednesday, November 06, 2013 3:57 PM
To: General eMail
Subject: 2013-TA-0008 West Maui Well No. 2

In Reply Refer To:
2014-TA-0008

Mr. Michael T. Munekiyo
President
Munekiyo & Hiraga, Inc.
305 High Street, Suite 104
Wailuku, Hawaii 96793

Subject: Technical Assistance for the Proposed West Maui Well Number 2, Maui

Dear Mr. Munekiyo:

The U.S. Fish and Wildlife Service (Service) received your letter on October 17, 2013, requesting comment on the proposed construction of an exploratory well at about 1,300 feet in elevation between the Kahana and Kahanaiki gulches in West Maui [TMK (2) 4-3-001:017]. Due to a lapse in appropriations and the subsequent Federal government shutdown, the Service was unable to provide comment within the statutory time period under section 7 of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531 *et seq.*). A request for extension on the comment period was granted by your office on November 1, 2013. Thank you.

Project Description

The County of Maui, Department of Water Supply, proposes the development of an exploratory well (identified as the West Maui Well Number 2). The proposed project site lies above the Honolua Aquifer, approximately 3 miles inland from the ocean. If pump testing at the proposed exploratory well site proves to be successful, the Department of Water Supply will then work towards its eventual conversion into a production facility.

Species Affected

Based on information you provided and pertinent information in our files, including data compiled by the Hawaii Biodiversity and Mapping Program, four species protected by the ESA, may occur within, or transit through, the proposed action area and could be impacted by the proposed action: the endangered Hawaiian hoary bat (*Lasiurus cinereus semotus*), Hawaiian goose (*Branta sandvicensis*), Hawaiian petrel (*Pterodroma sandwichensis*), and the threatened Newell's shearwater (*Puffinus auricularis newelli*).

To help you minimize potential impacts to listed species, the Service is providing you the following avoidance and minimization measures. Please note that implementation of these measures does not ensure that impacts to listed species can be avoided, and further coordination with the Service on compliance with the ESA may be required.

- The Hawaiian hoary bat is known to occur throughout the island of Maui. This bat roosts in both exotic and native woody vegetation and, while foraging, leaves young unattended in "nursery" trees and shrubs. If trees or shrubs suitable for bat roosting are cleared during the hoary bat breeding season (June 1 to September 15), there is a risk that young bats could inadvertently be harmed or killed. As a result, the Service recommends that woody plants greater than 15 feet tall should not be removed or trimmed during the Hawaiian hoary bat breeding season.
- Due to its range and foraging behavior, the Hawaiian goose may be present in the vicinity of the proposed action at any time of the year. If a Hawaiian goose appears within 100 feet of ongoing construction work, all activity shall be temporarily suspended until the bird moves off to a safe distance of its own volition. Moreover, if any number of Hawaiian geese are observed loafing or foraging within the area of the proposed project during the Hawaiian goose breeding season (October through April), a biologist familiar with the nesting behavior of the Hawaiian goose should survey in and around the proposed construction footprint prior to the resumption of any work, or after any subsequent delay of work of three or more days (during which the birds may attempt to nest). If a nest is discovered within a radius of 150 feet of proposed construction work, or a previously undiscovered nest is found within said radius after work begins, all work must cease immediately and the Service contacted for further guidance.
- The Hawaiian petrel and Newell's shearwater, collectively referred to as seabirds, may transit through the proposed action area while flying between the ocean and nesting sites in the mountains during their breeding season (March through December). Seabird fatalities resulting from collisions with artificial structures that extend above the surrounding vegetation have been documented in Hawaii where high densities of transiting seabirds occur. Additionally, outdoor artificial lighting such as flood lighting for construction work, security, and outdoor illumination can adversely impact seabirds by causing disorientation which may result in collision with utility lines, buildings, fences, and vehicles. Fledging seabirds are especially affected by artificial lighting and have a tendency to exhaust themselves while circling the light sources and become grounded. Too weak to fly, these birds become vulnerable to depredation by feral predators such as dogs, cats, and mongoose. The Service recommends that a collision risk analysis study covering the proposed project footprint be conducted if the project involves the installation or re-location of power lines, or the installation of structures or appurtenances which may pose a collision risk to listed seabirds. Moreover, the Service also recommends that project-related lighting should be minimized. All project-related lights should be regulated by motion sensors and automatic timers to limit nighttime illumination. It is also recommended that project related lighting be shielded so that bulbs are not visible at or above bulb-height.

If you have any questions concerning the recommendations or comments provided in this correspondence, please feel free to contact me using the information provided below.

Regards,

Ian Bordenave

Biologist

U.S. Fish and Wildlife Service

Maui Nui Field Station

Milepost 6 Mokulele Highway

Kihei, HI. 96793

Phone: (808) 270-1439

E-Mail: ian_bordenave@fws.gov



MICHAEL T. MUNEKIYO
PRESIDENT

KARLYNN FUKUDA
EXECUTIVE VICE PRESIDENT

GWEN OHASHI HIRABA
SENIOR VICE PRESIDENT

MITSUBU "MICH" HIRANO
SENIOR VICE PRESIDENT

MARK ALEXANDER ROY
VICE PRESIDENT

February 5, 2014

Ian Bordenave, Biologist
U.S. Fish and Wildlife Service
Maui Nui Field Station
Milepost 6 Mokulele Highway
Kihei, Hawaii 96793

SUBJECT: Early Consultation Request for Proposed West Maui Well No. 2, Lahaina, Maui, Hawaii; DWS Job No. 11-06A; TMK (2)4-3-001:017(por.) (2014-TA-0008)

Dear Mr. Bordenave:

Thank you for your email, dated November 6, 2013, providing early consultation comments on the proposed West Maui Well No. 2. On behalf of the County of Maui, Department of Water Supply (DWS), we offer the following responses to your comments:

Comment No. 1:

The Hawaiian hoary bat is known to occur throughout the island of Maui. This bat roosts in both exotic and native woody vegetation and, while foraging, leaves young unattended in "nursery" trees and shrubs. If trees or shrubs suitable for bat roosting are cleared during the hoary bat breeding season (June 1 to September 15), there is a risk that young bats could inadvertently be harmed or killed. As a result, the Service recommends that woody plants greater than 15 feet tall shall not be removed or trimmed during the Hawaiian hoary bat breeding season.

Response: During project construction, measures will be implemented to avoid the removal or trimming of woody plants greater than 15 feet tall during the Hawaiian hoary bat breeding season.

MAUI

305 High St., Suite 104 Wailuku, Hawaii 96793

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KAHUI

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Comment No. 2:

Due to its range and foraging behavior, the Hawaiian goose may be present in the vicinity of the proposed action at any time of the year. If a Hawaiian goose appears within 100 feet of ongoing construction work, all activity shall be temporarily suspended until the bird moves off to a safe distance of its own volition. Moreover, if any number of Hawaiian geese are observed loafing or foraging within the area of the proposed project during the Hawaiian goose breeding season (October through April), a biologist familiar with the nesting behavior of the Hawaiian goose should survey in and around the proposed construction footprint prior to the resumption of any work, or after any subsequent delay of work of three or more days (during which the birds may attempt to nest). If a nest is discovered within a radius of 150 feet of the proposed construction work, all work must cease immediately and the Service contacted for further guidance.

Response: Activities will be temporarily suspended if a Hawaiian goose appears within 100 feet of the project during construction. As required, coordination will be undertaken with a qualified biologist during the breeding season of the Hawaiian goose. Additionally, construction work will immediately cease if a nest is found within a 150 feet radius of the construction work and the U.S. Fish and Wildlife Service will be contacted for guidance.

Comment No. 3:

The Hawaiian petrel and Newell's shearwater, collectively referred to as seabirds, may transit through the proposed action area while flying between the ocean and nesting sites in the mountains during their breeding season (March through December). Seabird fatalities resulting from collisions with artificial structures that extend above the surrounding vegetation have been documented in Hawaii where high densities of transiting seabirds occur. Additionally, outdoor artificial lighting such as flood lighting for construction work, security, and outdoor illumination can adversely impact seabirds by causing disorientation which may result in collision with utility lines, buildings, fences, and vehicles. Fledging seabirds are especially affected by artificial lighting and have a tendency to exhaust themselves while circling the light sources and become grounded. Too weak to fly, these birds become vulnerable to depredation by feral predators such as dogs, cats, and mongoose. The Service recommends that a collision risk analysis study covering the proposed project footprint be conducted if the project involves the installation or re-

location of power lines, or the installation of structures or appurtenances which may poses a collision risk to listed seabirds. Moreover, the Service also recommends that project-related lighting should be minimized. All project-related lights should be regulated by motion sensors and automatic timers to limit nighttime illumination. It is also recommended that project related lighting be shielded so that bulbs are not visible at or above bulb-height.

Response: The proposed exploratory well project does not involve the installation or re-location of power lines or installation of structures or appurtenances. A diesel generator will be used to operate the well pump. The project will include measures to manage lighting and limit nighttime illumination, including shielding lighting to avoid adverse impact to the listed seabirds.

We appreciate your input and a copy of your comment letter along with this response letter will be included in the Draft Environmental Assessment for the proposed project. Should you have any questions, please contact me at 244-2015.

Very truly yours,



Cheryl K. Okuma
Senior Associate

CKO:la

cc: Curtis Eaton, P.E., Department of Water Supply
Jeff Pearson, P.E., Department of Water Supply
Ronald Fukumoto, Fukumoto Engineering, Inc.

K:\DATA\RF\EW\Maui\EXPL\Well2\ECL\Response letters\USFWS.ltr.docx

OCT 24 2013

NEIL ABERCROMBIE
GOVERNOR



Dean H. Seki
Comptroller
Maria E. Zielinski
Deputy Comptroller

STATE OF HAWAII
DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES
P.O. BOX 119, HONOLULU, HAWAII 96810-0119

OCT 22 2013

(P)1242.3

Mr. Michael T. Munikiyo, AICP President
Munekiyo & Hiraga, Inc.
305 High Street, Suite 104
Wailuku, Hawaii 96793

Dear Mr. Munikiyo:

Subject: Early Consultation Request for Proposed West Maui Well No. 2
Lahaina, Maui, Hawaii, DWS Job No. 11-06A

Thank you for the opportunity to provide comments for the subject project. This project does not impact any of the Department of Accounting and General Services' projects or existing facilities in this area and we have no comments to offer at this time.

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

Sincerely,

DEAN H. SEKI
Comptroller

c: Mr. Ronald Fukumoto, Ronald M. Fukumoto Engineering, Inc.
Mr. Curtis Eaton, C of M, Dept. of Water Supply
Mr. Jeff Pearson, C of M, Dept. of Water Supply



MICHAEL T. MUNEKIYO
PRESIDENT

KARLYNN FUKUDA
EXECUTIVE VICE PRESIDENT

GWEN OHASHI HIRAGA
SENIOR VICE PRESIDENT

MITSUBU "MICH" HIRANO
SENIOR VICE PRESIDENT

MARK ALEXANDER ROY
VICE PRESIDENT

February 5, 2014

Dean H. Seki, Comptroller
Department of Accounting and General Services
State of Hawaii
P.O. Box 119
Honolulu, Hawaii 96810

**SUBJECT: Early Consultation Request for Proposed West Maui Well No. 2,
Lahaina, Maui, Hawaii; DWS Job No. 11-06A; TMK (2)4-3-
001:017(por.) ((P) 1242.3)**

Dear Mr. Seki:

Thank you for your letter, dated October 22, 2013, providing early consultation comments on the proposed West Maui Well No. 2. On behalf of the County of Maui, Department of Water Supply, we acknowledge that the Department of Accounting and General Services does not have any comments.

We appreciate your input and a copy of your comment letter along with this response letter will be included in the Draft Environmental Assessment for the proposed project. Should you have any questions, please contact me at (808) 244-2015.

Very truly yours,

Cheryl K. Okuma
Senior Associate

CKO:la

cc: Ronald Fukumoto, Fukumoto Engineering, Inc.
Curtis Eaton, P.E., Department of Water Supply
Jeff Pearson, P.E., Department of Water Supply

K:\DATA\RF\EW\Maui\EXPL\Well\2\IECL\Response letters\DAGS.ltr.docx

MAUI

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

In reply, please refer to:
EMD/CWB

11017PST.13

November 4, 2013

Mr. Michael T. Munekiyo, AICP
President
Munekiyo & Hiraga, Inc.
305 High Street, Suite 104
Wailuku, Hawaii 96793

Dear Mr. Munekiyo:

**SUBJECT: Early Consultation Request for the Proposed County of Maui,
Department of Water Supply,
West Maui Well No. 2 Project
Lahaina, Island of Maui, Hawaii**

The Department of Health (DOH), Clean Water Branch (CWB), acknowledges receipt of your letter, dated October 11, 2013, requesting comments on the project. The DOH-CWB has reviewed the subject document and offers these comments. Please note that our review is based solely on the information provided in the subject document and its compliance with the 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://health.hawaii.gov/epo/files/2013/05/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).
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). An application for an NPDES individual permit must be submitted at least 180 calendar days before the commencement of the discharge. To request NPDES permit coverage, you must submit the CWB Individual NPDES Form through the e-Permitting Portal and the hard copy

certification statement with \$1,000 filing fee. Please open the e-Permitting Portal website at: <https://eha-cloud.doh.hawaii.gov/epermit/View/home.aspx>. You will be asked to do a one-time registration to obtain your login and password. After you register, click on the Application Finder tool and locate the "CWB Individual NPDES Form." Follow the instructions to complete and submit this form.

3. If your project involves work in, over, or under waters of the United States, it is highly recommend that you contact the Army Corp of Engineers, Regulatory Branch (Tel: 438-9258) regarding their 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 of the Code of Federal Regulations, Section 122.2; and Hawaii Administrative Rules (HAR), Chapter 11-54.

4. 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://health.hawaii.gov/cwb>, or contact the Engineering Section, CWB, at (808) 586-4309.

Sincerely,


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

ST:jst

c: DOH-EPO [via email only]



MICHAEL T. MUNEKIYO
PRESIDENT

KARLYNN FUKUDA
EXECUTIVE VICE PRESIDENT

GWEN OHASHI HIRAGA
SENIOR VICE PRESIDENT

MITSURU "MICH" HIRANO
SENIOR VICE PRESIDENT

MARK ALEXANDER ROY
VICE PRESIDENT

February 5, 2014

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

SUBJECT: Early Consultation Request for Proposed West Maui Well No. 2, Lahaina, Maui, Hawaii; DWS Job No. 11-06A; TMK (2)4-3-001:017(por.) (EMD/CWB 1-1017PST.13)

Dear Mr. Wong:

Thank you for your letter, dated November 4, 2013, providing early consultation comments on the proposed West Maui Well No. 2. On behalf of the County of Maui, Department of Water Supply (DWS), we offer the following responses in the order of your comments:

Comment No. 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 11-54-5 through 11-54-8).*

Response: The proposed project is upland with no streams or wetlands on site, and approximately three (3) miles away from the ocean. Notwithstanding the project

MAUI

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appropriate Best Management Practices (BMPs) will be implemented to ensure compliance with HAR, Chapter 54.

Comment No. 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). An application for an NPDES individual permit must be submitted at least 180 calendar days before the commencement of the discharge. To request NPDES permit coverage, you must submit the CWB Individual NPDES Form through the e-Permitting Portal and the hard copy certification statement with \$1,000 filing fee. Please open the e-Permitting Portal website at: <https://eha-cloud.doh.hawaii.gov/epermit/View/home.aspx>. You will be asked to do a one-time registration to obtain your login and password. After you register, click on the Application Finder tool and locate the "CWB Individual NPDES Form." Follow the instruction to complete and submit this form.

Response: The DWS will ensure compliance with applicable NPDES requirements.

Comment No. 3:

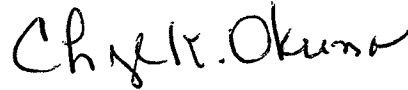
If your project involves work in, over, or under waters of the United States, it is highly recommend that you contact the Army Corp of Engineers, Regulatory Branch (Tel:438-9258) regarding their permitting requirements.

Response: The proposed exploratory well project does not involve work in, over, or under waters of the United States. Coordination with the Army Corp of Engineers, Regulatory Branch will be carried out, should it become necessary.

Alec Wong, P.E., Chief
February 5, 2014
Page 3

We appreciate your input and a copy of your comment letter along with this response letter will be included in the Draft Environmental Assessment for the proposed project. Should you have any questions, please contact me at (808) 244-2015.

Very truly yours,



Cheryl K. Okuma
Senior Associate

CKO:la

cc: Ronald Fukumoto, Fukumoto Engineering, Inc.
Curtis Eaton, P.E., Department of Water Supply
Jeff Pearson, P.E., Department of Water Supply

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OCT 22 2013

LORETTA J. FUDDY, A.C.S.W., M.P.H.
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, HAWAII 96793**

October 18, 2013

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

Dear Mr. Munekiyo:

**Subject: Early Consultation Request for Proposed West Maui
Well No. 2, Lahaina, Maui, Hawaii; DWS Job No.
11-06A**

Thank you for the opportunity to review this project. We have the following comments to offer:

National Pollutant Discharge Elimination System (NPDES) permit coverage maybe required for this project. The Clean Water Branch should be contacted at 808 586-4309.

It is strongly recommended that the Standard Comments found at the Department's website: www.state.hi.us/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 or E-mail me at patricia.kitkowski@doh.hawaii.gov.

Sincerely,

A handwritten signature in cursive script that reads "Patti Kitkowski".

Patti Kitkowski
District Environmental Health Program Chief
c: EPO



MICHAEL T. MUNEKIYO
PRESIDENT

KARLYNN FUKUDA
EXECUTIVE VICE PRESIDENT

GWEN OHASHI HIRAGA
SENIOR VICE PRESIDENT

MITSURU "MICH" HIRANO
SENIOR VICE PRESIDENT

MARK ALEXANDER ROY
VICE PRESIDENT

February 5, 2014

Ms. Patti Kitkowski
Maui District Health Office
Department of Health
54 High Street
Wailuku, Hawaii 96793

SUBJECT: Early Consultation Request for Proposed West Maui Well No. 2, Lahaina, Maui, Hawaii; DWS Job No. 11-06A; TMK (2)4-3-001:017(por.)

Dear Ms. Kitkowski:

Thank you for your letter, dated October 18, 2013, providing early consultation comments on the proposed West Maui Well No. 2. On behalf of the County of Maui, Department of Water Supply (DWS), we offer the following responses in the order of your comments:

Comment No. 1:

National Pollutant Discharge Elimination System (NPDES) permit coverage may be required for this project. The Clean Water Branch should be contacted at 808 586-4309.

Response: The DWS will ensure compliance with applicable NPDES requirements.

Comment No. 2:

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

Response: The Standard Comments on the Department's website will be reviewed and comments will be adhered to as may be applicable to the proposed project.

MAUI

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PH: (808)244-2015 FAX: (808)244-8729

HAUAI

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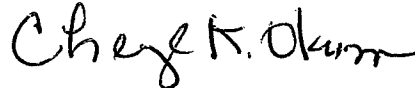
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Ms. Patti Kitkowski
February 5, 2014
Page 2

We appreciate your input and a copy of your comment letter along with this response letter will be included in the Draft Environmental Assessment for the proposed project. Should you have any questions, please contact me at 244-2015.

Very truly yours,



Cheryl K. Okuma
Senior Associate

CKO:la

cc: Ronald Fukumoto, Fukumoto Engineering, Inc.
Curtis Eaton, P.E., Department of Water Supply
Jeff Pearson, P.E., Department of Water Supply

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OCT 22 2013

LORETTA J. FUDDY, A.C.S.W., M.P.H.
DIRECTOR OF HEALTH

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

In reply, please refer to:
File:
13-200
West Maui Well No. 2

October 17, 2013

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

Dear Mr. Munekiyo:

**SUBJECT: Early Consultation Request for Proposed West Maui Well No. 2
Lahaina, Maui, Hawaii; DWS Job No. 11-06A**

The Department of Health (DOH), Environmental Planning Office (EPO), acknowledges receipt of your letter dated October 11, 2013. Thank you for allowing us to review and comment on the subject document. The document was routed to DOH's Safe Drinking Water Branch. They will provide specific comments to you if necessary. EPO recommends that you review the Standard Comments (www.health.hawaii.gov/epo/ under the land use tab). You are required to adhere to all Standard Comments specifically applicable to this application.

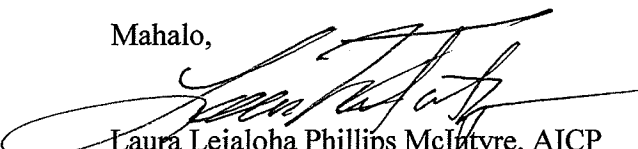
EPO suggests that you examine the many sources available on strategies to support the sustainable design of communities, including the following:

State of Hawaii, Office of Planning: www.planning.hawaii.gov and the new 2013 ORMP;
U.H., School of Ocean and Earth Science and Technology: www.soest.hawaii.edu;
U.S. Environmental Protection Agency's sustainability programs: www.epa.gov/sustainability;
U.S. Green Building Council's LEED program: www.usgbc.org/leed; and
State of Hawaii, Office of Planning, Coastal Zone Management website on adapting to climate change: <http://planning.hawaii.gov/czm/initiatives/adapting-to-climate-change-2/>.

The DOH encourages everyone, to apply these sustainability strategies and principles early in the planning and review of projects. We also request that for future projects you consider conducting a Health Impact Assessment (HIA). More information is available at www.cdc.gov/healthyplaces/hia.htm. We request you share all of this information with others to increase community awareness on sustainable, innovative, inspirational, and healthy community design.

We require a written response confirming receipt of this letter and any other letters you receive from DOH in regards to this submission. You may mail your response to 919 Ala Moana Blvd., Ste. 312, Honolulu, Hawaii 96814. However, we would prefer an email submission to epo@doh.hawaii.gov. We anticipate that our letter(s) and your response(s) will be included in the final document. If you have any questions, please contact me at (808) 586-4337.

Mahalo,


Laura Leialoha Phillips McIntyre, AICP
Manager, Environmental Planning Office



MICHAEL T. MUNEKIYO
PRESIDENT

KARLYNN FUKUDA
EXECUTIVE VICE PRESIDENT

SWEN OHASHI HIRAGA
SENIOR VICE PRESIDENT

MITSUBU "MICH" HIRANO
SENIOR VICE PRESIDENT

MARK ALEXANDER ROY
VICE PRESIDENT

February 5, 2014

Ms. Laura Leialoha Phillips McIntyre
Environmental Planning Office
Department of Health
State of Hawaii
919 Ala Moana Blvd., Ste. 312
Honolulu, Hawaii 96814

SUBJECT: Early Consultation Request for Proposed West Maui Well No. 2, Lahaina, Maui, Hawaii; DWS Job No. 11-06A; TMK (2)4-3-001:017(por.) (13-200 West Maui Well No. 2)

Dear Ms. McIntyre:

Thank you for your letter, dated October 17, 2013, providing early consultation comments on the proposed West Maui Well No. 2. On behalf of the County of Maui, Department of Water Supply (DWS), we offer the following responses in the order of your comments:

Comment No. 1:

EPO recommends that you review the Standard Comments (www.health.hawaii.gov/epo/ under the land use tab). You are required to adhere to all Standard Comments specifically applicable to this application.

Response: The Standard Comments on the department's website will be reviewed and adhered to by the DWS as may be applicable.

Comment No. 2:

EPO suggests that you examine the many sources available on strategies to support the sustainable design of communities including the following: State of Hawaii, Office of Planning: www.planning.hawaii.gov and the new 2013 ORMP;

Ms. Laura Leialoha Phillips McIntyre
February 5, 2014
Page 2

*U.H., School of Ocean and Earth Science and Technology:
www.soest.hawaii.edu;
U.S. Environmental Protection Agency's sustainability programs:
www.epa.gov/sustainability;
U.S. Green Building Council's LEED program: www.usgbc.org/leed; and
State of Hawaii, Office of Planning, Coastal Zone Management website on
adapting to climate change:
<http://planning.hawaii.gov/czm/initiatives/adapting-to-climate-change-2/>.*

The DOH encourages everyone to apply these sustainability strategies and principles early in the planning and review of projects. We also request that for future projects you consider conducting a Health Impact Assessment (HIA). More information is available at www.cdc.gov/healthyplaces/hia.htm. We request you share all this information with others to increase community awareness on sustainable, innovative, inspirational, and health community design.

Response: The sustainability sources mentioned by the department will be reviewed for applicability to the proposed project.

We appreciate your input and a copy of your comment letter along with this response letter will be included in the Draft Environmental Assessment for the proposed project. Should you have any questions, please contact me at (808) 244-2015.

Very truly yours,



Cheryl K. Okuma
Senior Associate

CKO:la

cc: Ronald Fukumoto, Fukumoto Engineering, Inc.
Curtis Eaton, P.E., Department of Water Supply
Jeff Pearson, P.E., Department of Water Supply

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OCT 25 2013

STATE OF HAWAII
DEPARTMENT OF HEALTH
SAFE DRINKING WATER BRANCH
919 ALA MOANA BLVD., ROOM 308
HONOLULU, HI 96814-4920

In reply, please refer to:
File: SDWB
WestMauiWell201.docx

October 23, 2013

Munekiyo & Hiraga, Inc.
Attn: Michael Munekiyo, Principal
305 High Street, Suite 104
Wailuku, Hawaii 96793

Dear Mr. Munekiyo:

SUBJECT: EARLY CONSULTATION REQUEST FOR
PROPOSED WEST MAUI WELL NO. 2
LAHAINA, MAUI, HAWAII, DWS JOB NO. 11-06A
TMK: (2)4-3-001:017

The Safe Drinking Water Branch (SDWB) has reviewed the subject document and has the following comments:

1. The project proposes to construct a new drinking water well to serve a County of Maui, Department of Water Supply drinking water system. This project must comply with the terms of Hawaii Administrative Rules (HAR), Title 11, Chapter 20, Section 29, "Use of new sources of raw water for public water systems." This section requires that all new public water system sources be approved by the Director of Health prior to its use. Such approval is based primarily upon the submission of a satisfactory engineering report which addresses the requirements set in HAR Section 11-20-29.
2. The engineering report must identify all potential sources of contamination and evaluate alternative control measures which could be implemented to reduce or eliminate the potential for contamination, including treatment of the water source. In addition, water quality analyses for all regulated contaminants, performed by a laboratory certified by the State Laboratories Division of the State of Hawaii, must be submitted as part of the report to demonstrate compliance with all drinking water standards. Additional parameters may be required by the Director for this submittal or additional tests required upon his or her review of the information submitted.

Mr. Michael Munekiyo
October 23, 2013
Page 2

3. All sources of public water systems must undergo a source water assessment which will delineate a source water protection area. This process is preliminary to the creation of a source water protection plan for that source and activities which will take place to protect the source of drinking water.

If there are any questions, please call Ms. Jennifer Nikaido of the SDWB Engineering Section, at 586-4258.

Sincerely,



for JOANNA L. SETO, P.E., CHIEF
Safe Drinking Water Branch

JN:slm



MICHAEL T. MUNEKIYO
PRESIDENT

KARLYNN FUKUDA
EXECUTIVE VICE PRESIDENT

OWEN OHASHI HIRAGA
SENIOR VICE PRESIDENT

MITSURU "MICH" HIRANO
SENIOR VICE PRESIDENT

MARK ALEXANDER ROY
VICE PRESIDENT

February 5, 2014

Joanna L. Seto, P.E., Chief
Safe Drinking Water Branch
Department of Health
State of Hawaii
919 Ala Moana Boulevard, Room 308
Honolulu, Hawaii 96814

SUBJECT: Early Consultation Request for Proposed West Maui Well No. 2,
Lahaina, Maui, Hawaii; DWS Job No. 11-06A; TMK (2)4-3-
001:017(por.) (SDWB West Maui Well 201.docx)

Dear Ms. Seto:

Thank you for your letter, dated October 24, 2013, providing early consultation comments on the proposed West Maui Well No. 2. On behalf of the County of Maui, Department of Water Supply (DWS), we offer the following information in response to your comments:

1. DWS acknowledges that this project must comply with the terms of Hawaii Administrative Rules (HAR), Title 11, Chapter 20, Section 29, "Use of new sources of raw water for public water systems." A satisfactory engineering report which addresses the requirements set in HAR Section 11-20-29 will be submitted to the Director of Health for approval.
2. DWS acknowledges that the engineering report must identify all potential sources of contamination and evaluate alternative control measures which could be implemented. Also, they understand that water quality analyses for all regulated contaminants must be performed by a laboratory certified by the State Laboratories Division of the State of Hawaii and must be submitted in compliance with drinking water standards. Additional parameters or tests will be done as applicable.
3. DWS acknowledges that all sources of public water systems must undergo a source water assessment in order to delineate a source water protection area.

MAUI

305 High St., Suite 104 Wailuku, Hawaii 96793

PH: (808)244-2015 FAX: (808)244-8729

CAHU

735 Bishop St., Suite 238 Honolulu, Hawaii 96813 | PH: (808)983-1233

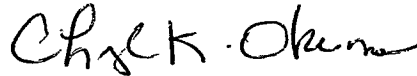
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Joanna L. Seto, P.E., Chief
February 5, 2014
Page 2

We appreciate your input and a copy of your comment letter along with this response letter will be included in the Draft Environmental Assessment for the proposed project. Should you have any questions, please contact me at (808) 244-2015.

Very truly yours,



Cheryl K. Okuma
Senior Associate

CKO:la

cc: Ronald Fukumoto, Fukumoto Engineering, Inc.
Curtis Eaton, P.E., Department of Water Supply
Jeff Pearson, P.E., Department of Water Supply

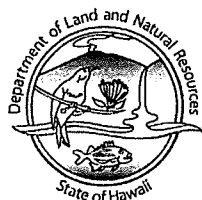
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NOV 01 2013

NEIL ABERCROMBIE
GOVERNOR OF HAWAII



WILLIAM J. AHLA, JR.
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

October 30, 2013

Munekiyo & Hiraga, Inc.
Attention: Mr. Michael T. Munekiyo, AICP, President
305 High Street, Suite 104
Wailuku, Hawaii 96793

via email: planning@mhplanning.com

Dear Mr. Munekiyo:

SUBJECT: Early Consultation Request for Proposed West Maui Well No. 2

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 (a) Engineering Division and (b) Gary Martin, Land Agent on the subject matter. Should you have any questions, please feel free to call Lydia Morikawa at 587-0410. Thank you.

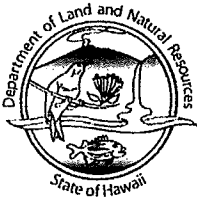
Sincerely,

A handwritten signature in black ink, appearing to read "Russell Y. Tsuji".

Russell Y. Tsuji
Land Administrator

Enclosure(s)

cc: Central Files



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

October 21, 2013

MEMORANDUM

TO: DLNR

- DLNR Agencies:**
- Div. of Aquatic Resources
 - Div. of Boating & Ocean Recreation
 - Engineering Division
 - Div. of Forestry & Wildlife
 - Div. of State Parks
 - Commission on Water Resource Management
 - Office of Conservation & Coastal Lands
 - Land Division – Maui District
 - Historic Preservation
- Gary Martin, Land Div. Admin.*

RECEIVED
 LAND DIVISION
 2013 OCT 25 PM 2:55
 DEPT. OF LAND & NATURAL RESOURCES
 STATE OF HAWAII
 13 OCT 22 AM 9:51 ENGINEERING

TO:

FROM: Russell Y. Tsuji, Land Administrator

SUBJECT: Early Consultation Request for Proposed West Maui Well No. 2

LOCATION: Lahaina, Island of Maui; TMK: (2) 4-3-001:017

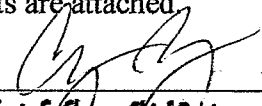
APPLICANT: Department of Water Supply, County of Maui

Transmitted for your review and comment on the above referenced document. We would appreciate your comments on this document. Please submit any comments by October 30, 2013.

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 Lydia Morikawa at 587-0410. Thank you.

Attachments

- We have no objections.
- We have no comments.
- Comments are attached

Signed: 

Print Name: Gary S. Chong, Chief Engineer

Date: 10/25/13

cc: Central Files

DEPARTMENT OF LAND AND NATURAL RESOURCES
ENGINEERING DIVISION

LD/LydiaMorikawa
RE: WestMauiWell2EarlyConsultation
Maui.612

COMMENTS

- () We confirm that the project site, according to the Flood Insurance Rate Map (FIRM), is located in Flood Zone ____.
- (X) **Please take note that the project site, according to the Flood Insurance Rate Map (FIRM), is located in Flood Zone X. The National Flood Insurance Program does not have any regulations for developments within Zone X.**
- () Please note that the correct Flood Zone Designation for the project site according to the Flood Insurance Rate Map (FIRM) is ____.
- () Please note that the project must comply with the rules and regulations of the National Flood Insurance Program (NFIP) presented in Title 44 of the Code of Federal Regulations (44CFR), whenever development within a Special Flood Hazard Area is undertaken. If there are any questions, please contact the State NFIP Coordinator, Ms. Carol Tyau-Beam, of the Department of Land and Natural Resources, Engineering Division at (808) 587-0267.

Please be advised that 44CFR indicates the minimum standards set forth by the NFIP. Your Community's local flood ordinance may prove to be more restrictive and thus take precedence over the minimum NFIP standards. If there are questions regarding the local flood ordinances, please contact the applicable County NFIP Coordinators below:

- () Mr. Mario Siu Li at (808) 768-8098 or Ms. Ardis Shaw-Kim at (808) 768-8296 of the City and County of Honolulu, Department of Planning and Permitting.
- () Mr. Frank DeMarco at (808) 961-8042 of the County of Hawaii, Department of Public Works.
- () Ms. Carolyn Cortez at (808) 270-7813 of the County of Maui, Department of Planning.
- () Mr. Stanford Iwamoto at (808) 241-4884 of the County of Kauai, Department of Public Works.

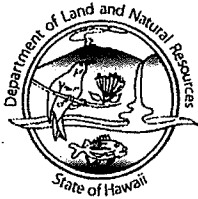
- () The applicant should include water demands and infrastructure required to meet project needs. Please note that projects within State lands requiring water service from the Honolulu Board of Water Supply system will be required to pay a resource development charge, in addition to Water Facilities Charges for transmission and daily storage.
- () The applicant should provide the water demands and calculations to the Engineering Division so it can be included in the State Water Projects Plan Update.
- () Additional Comments: _____

- () Other: _____

Should you have any questions, please call Ms. Suzie S. Agraan of the Planning Branch at 587-0258.

Signed: 
CARTY S. CHANG, CHIEF ENGINEER

Date: 10/25/13 _____



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

October 21, 2013

MEMORANDUM

TO:

DLNR Agencies:

- Div. of Aquatic Resources
- Div. of Boating & Ocean Recreation
- Engineering Division
- Div. of Forestry & Wildlife
- Div. of State Parks
- Commission on Water Resource Management
- Office of Conservation & Coastal Lands
- Land Division – Maui District
- Historic Preservation

RECEIVED
 LAND DIVISION
 2013 OCT 30 PM 1:29
 DEPT. OF LAND &
 NATURAL RESOURCES
 STATE OF HAWAII

FROM:

Gary Martin
Russell Y. Tsuji, Land Administrator

SUBJECT:

Early Consultation Request for Proposed West Maui Well No. 2

LOCATION:

Lahaina, Island of Maui; TMK: (2) 4-3-001:017

APPLICANT:

Department of Water Supply, County of Maui

Transmitted for your review and comment on the above referenced document. We would appreciate your comments on this document. Please submit any comments by October 30, 2013.

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 Lydia Morikawa at 587-0410. Thank you.

Attachments

- We have no objections.
- We have no comments.
- Comments are attached.

Signed:

Gary Martin

Print Name:

Gary Martin

Date:

10/30/13

cc: Central Files



MICHAEL T. MUNEKIYO
PRESIDENT

KARLYNN FUKUDA
EXECUTIVE VICE PRESIDENT

GWEN OHASHI HIRAGA
SENIOR VICE PRESIDENT

MITSURU "MICH" HIRANO
SENIOR VICE PRESIDENT

MARK ALEXANDER ROY
VICE PRESIDENT

February 5, 2014

Russell Y. Tsuji, Land Administrator
Department of Land and Natural Resources
State of Hawaii
P.O. Box 621
Honolulu, Hawaii 96809

SUBJECT: Early Consultation Request for Proposed West Maui Well No. 2,
Lahaina, Maui, Hawaii; DWS Job No. 11-06A; TMK (2)4-3-
001:017(por.)

Dear Mr. Tsuji:

Thank you for your letter, dated October 30, 2013, providing early consultation comments on the proposed West Maui Well No. 2. On behalf of the County of Maui, Department of Water Supply (DWS), we offer the following responses to the Department of Land and Natural Resources, Engineering Division comment:

Comment:

Please take note that the project site, according to the Flood Insurance Rate Map (FIRM), is located in Flood Zone X. The National Flood Insurance Program does not have any regulations for developments within Zone X.

Response: We acknowledge that the project site is located in Flood Zone X and that the National Flood Insurance Program does not have any regulations for developments within this flood zone.

MAUI

305 High St., Suite 104 Wailuku, Hawaii 96793

PH: (808)244-2015 FAX: (808)244-8729

HAULI

735 Bishop St., Suite 238 Honolulu, Hawaii 96813 PH: (808)983-1233

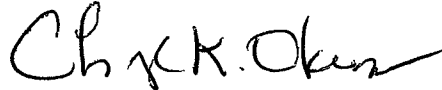
WWW.MHPLANNING.COM

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management

Russell Y. Tsuji, Land Administrator
February 5, 2014
Page 2

We appreciate your input and a copy of your comment letter and along with this response letter will be included in the Draft Environmental Assessment for the proposed project. Should you have any questions, please contact me at (808) 244-2015.

Very truly yours,



Cheryl K. Okuma
Senior Associate

CKO:la

cc: Ronald Fukumoto, Fukumoto Engineering, Inc.
Curtis Eaton, P.E., Department of Water Supply
Jeff Pearson, P.E., Department of Water Supply

K:\DATA\IRFE\W\Maui\EXPL\Well2\ECL\Response letters\DLNR Engineering.ltr.docx

NEIL ABERCROMBIE
GOVERNOR OF HAWAII



WILLIAM J. AILA, JR.
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

October 21, 2013

MEMORANDUM

2013 OCT 22 PM 4:04

TO: **DLNR Agencies:**
 Div. of Aquatic Resources
 Div. of Boating & Ocean Recreation
 Engineering Division
 Div. of Forestry & Wildlife
 Div. of State Parks
 Commission on Water Resource Management
 Office of Conservation & Coastal Lands
 Land Division – Maui District
 Historic Preservation
Berry Hawthorn, Land Div. Admin.

FROM: Russell Y. Tsuji, Land Administrator

SUBJECT: Early Consultation Request for Proposed West Maui Well No. 2

LOCATION: Lahaina, Island of Maui; TMK: (2) 4-3-001:017

APPLICANT: Department of Water Supply, County of Maui

Transmitted for your review and comment on the above referenced document. We would appreciate your comments on this document. Please submit any comments by October 30, 2013.

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 Lydia Morikawa at 587-0410. Thank you.

Attachments

- () We have no objections.
- () We have no comments.
- () Comments are attached.

Signed: _____
 Print Name: _____
 Date: _____

cc: Central Files

NEIL ABERCROMBIE
GOVERNOR OF HAWAII



WILLIAM J. AILA, JR.
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

November 14, 2013

Munekiyo & Hiraga, Inc.
Attention: Mr. Michael T. Munekiyo, AICP, President
305 High Street, Suite 104
Wailuku, Hawaii 96793

via email: planning@mhplanning.com

Dear Mr. Munekiyo:

SUBJECT: Early Consultation Request for Proposed West Maui Well No. 2

Thank you for the opportunity to review and comment on the subject matter. In addition to the comments previously sent you on October 30, 2013, enclosed are comments from the Commission on Water Resource Management on the subject matter. Should you have any questions, please feel free to call Lydia Morikawa at 587-0410. Thank you.

Sincerely,

A handwritten signature in black ink, appearing to read "Russell Y. Tsuji".

Russell Y. Tsuji
Land Administrator

Enclosure(s)
cc: Central Files



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT
P.O. BOX 621
HONOLULU, HAWAII 96809


November 12, 2013

WILLIAM J. AILA, JR.
CHAIRPERSON
WILLIAM D. BALFOUR, JR.
KAMANA BEAMER
LORETTA J. FUDDY, A.C.S.W., M.P.H.
MILTON D. PAVAO
JONATHAN STARR
TED YAMAMURA

WILLIAM M. TAM
DEPUTY DIRECTOR

RECEIVED
LAND DIVISION
NOV 13 10 13 AM '13
DEPT. OF LAND &
NATURAL RESOURCES
STATE OF HAWAII
PH 1-44

TO: Russell Tsuji, Administrator
Land Division

FROM: William M. Tam, Deputy Director 
Commission on Water Resource Management

SUBJECT: MDWS West Maui Well 2 Early Consult for EA, Lahaina, Maui

FILE NO.: N/A
TMK NO.: (2) 4-3-001:017

Thank you for the opportunity to review the subject document. The Commission on Water Resource Management (CWRM) is the agency responsible for administering the State Water Code (Code). Under the Code, all waters of the State are held in trust for the benefit of the citizens of the State, therefore, all water use is subject to legally protected water rights. CWRM strongly promotes the efficient use of Hawaii's water resources through conservation measures and appropriate resource management. For more information, please refer to the State Water Code, Chapter 174C, Hawaii Revised Statutes, and Hawaii Administrative Rules, Chapters 13-167 to 13-171. These documents are available via the Internet at <http://www.hawaii.gov/dlnr/cwrm>.

Our comments related to water resources are checked off below.

1. We recommend coordination with the county to incorporate this project into the county's Water Use and Development Plan. Please contact the respective Planning Department and/or Department of Water Supply for further information.
2. We recommend coordination with the Engineering Division of the State Department of Land and Natural Resources to incorporate this project into the State Water Projects Plan.
3. We recommend coordination with the Hawaii Department of Agriculture (HDOA) to incorporate the reclassification of agricultural zoned land and the redistribution of agricultural resources into the State's Agricultural Water Use and Development Plan (AWUDP). Please contact the HDOA for more information.
4. We recommend that water efficient fixtures be installed and water efficient practices implemented throughout the development to reduce the increased demand on the area's freshwater resources. Reducing the water usage of a home or building may earn credit towards Leadership in Energy and Environmental Design (LEED) certification. More information on LEED certification is available at <http://www.usgbc.org/leed>. A listing of fixtures certified by the EPA as having high water efficiency can be found at <http://www.epa.gov/watersense/>.
5. We recommend the use of best management practices (BMP) for stormwater management to minimize the impact of the project to the existing area's hydrology while maintaining on-site infiltration and preventing polluted runoff from storm events. Stormwater management BMPs may earn credit toward LEED certification. More information on stormwater BMPs can be found at <http://hawaii.gov/dbedt/czm/initiative/lid.php>.
6. We recommend the use of alternative water sources, wherever practicable.
7. We recommend participating in the Hawaii Green Business Program, that assists and recognizes businesses that strive to operate in an environmentally and socially responsible manner. The program description can be found online at <http://energy.hawaii.gov/programs/achieving-efficiency/green-business-program>

- 8. We recommend adopting landscape irrigation conservation best management practices endorsed by the Landscape Industry Council of Hawaii. These practices can be found online at http://landscapehawaii.org/library/documents/lich_irrigation_conservation_bmps.pdf
- 9. There may be the potential for ground or surface water degradation/contamination and recommend that approvals for this project be conditioned upon a review by the State Department of Health and the developer's acceptance of any resulting requirements related to water quality.

Permits required by CWRM:

Additional information and forms are available at http://hawaii.gov/dlnr/cwrm/info_permits.htm.

- 10. The proposed water supply source for the project is located in a designated water management area, and a Water Use Permit is required prior to use of water. The Water Use Permit may be conditioned on the requirement to use dual line water supply systems for new industrial and commercial developments.
- 11. A Well Construction Permit(s) is (are) required before any well construction work begins.
- 12. A Pump Installation Permit(s) is (are) required before ground water is developed as a source of supply for the project.
- 13. There is (are) well(s) located on or adjacent to this project. If wells are not planned to be used and will be affected by any new construction, they must be properly abandoned and sealed. A permit for well abandonment must be obtained.
- 14. Ground water withdrawals from this project may affect streamflows, which may require an instream flow standard amendment.
- 15. A Stream Channel Alteration Permit(s) is (are) required before any alteration(s) can be made to the bed and/or banks of a stream channel.
- 16. A Stream Diversion Works Permit(s) is (are) required before any stream diversion works is (are) constructed or altered.
- 17. A Petition to Amend the Interim Instream Flow Standard is required for any new or expanded diversion(s) of surface water.
- 18. The planned source of water for this project has not been identified in this report. Therefore, we cannot determine what permits or petitions are required from our office, or whether there are potential impacts to water resources.
- OTHER:

The proposed well is upgradient of four wells owned by the same owner. Its proposed pumpage is not indicated. The proposed well is most likely to impact two wells directly downgradient about 2/3 mile away at approximately the same depth. These two wells have a combined capacity of 3.4 mgd and current combined pumpage of about 1.2 mgd. Together the four existing wells are currently pumping nearly 2 mgd, with the capacity to pump 5 mgd from a small portion of the aquifer system area, whose sustainable yield is 6 mgd. Pump tests at these wells should be conducted to determine potential mutual interference.

If there are any questions, please contact Charley Ice at 587-0218.

NEIL ABERCROMBIE
GOVERNOR OF HAWAII



WILLIAM J. AILA, JR.
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

October 21, 2013

MEMORANDUM

2013 OCT 22 PM 4:04

TO: **DLNR Agencies:**
 Div. of Aquatic Resources
 Div. of Boating & Ocean Recreation
 Engineering Division
 Div. of Forestry & Wildlife
 Div. of State Parks
 Commission on Water Resource Management
 Office of Conservation & Coastal Lands
 Land Division – Maui District
 Historic Preservation
Betsy Maufm, Land Div. Admin.

FROM: Russell Y. Tsuji, Land Administrator

SUBJECT: Early Consultation Request for Proposed West Maui Well No. 2

LOCATION: Lahaina, Island of Maui; TMK: (2) 4-3-001:017

APPLICANT: Department of Water Supply, County of Maui

Transmitted for your review and comment on the above referenced document. We would appreciate your comments on this document. Please submit any comments by October 30, 2013.

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 Lydia Morikawa at 587-0410. Thank you.

Attachments

- We have no objections.
- We have no comments.
- Comments are attached.

Signed: _____
 Print Name: _____
 Date: _____

cc: Central Files



MICHAEL T. MUNEKIYO
PRESIDENT

KARLYNN FUKUDA
EXECUTIVE VICE PRESIDENT

GWEN OHASHI HIRAGA
SENIOR VICE PRESIDENT

MITSURU "MICH" HIRANO
SENIOR VICE PRESIDENT

MARK ALEXANDER ROY
VICE PRESIDENT

February 6, 2014

Russell Y. Tsuji, Land Administrator
Commission on Water Resource Management
Department of Land and Natural Resources
State of Hawaii
P.O. Box 621
Honolulu, Hawaii 96809

SUBJECT: Early Consultation Request for Proposed West Maui Well No. 2,
Lahaina, Maui, Hawaii; DWS Job No. 11-06A; TMK (2)4-3-
001:017(por.)

Dear Mr. Tsuji:

Thank you for your letter, dated November 14, 2013, providing early consultation comments on the proposed West Maui Well No. 2. On behalf of the County of Maui, Department of Water Supply (DWS), we offer the following responses in the order of the Department of Land and Natural Resources, Commission on Water Resource Management comments:

Comment No. 1:

1. We recommend coordination with the county to incorporate this project into the county's Water Use and Development Plan. Please contact the respective Planning Department and/or Department of Water Supply for further information.

Response: DWS is updating its Water Use and Development Plan. Should the proposed West Maui Exploratory Well project be determined suitable to convert to permanent production, DWS will include the well in its Water Use and Development Plan. DWS is coordinating with the Department of Planning on the proposed project.

Comment No. 2:

11. *A Well Construction Permit(s) is (are) required before any well construction work begins.*

MAUI

305 High St., Suite 104 Wailuku, Hawaii 96793

PH: (808)244-2015 FAX: (808)244-8729

KAHUI

735 Bishop St., Suite 238 Honolulu, Hawaii 96813 PH: (808)983-1233

WWW.MHPLANNING.COM

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process
management

Response: DWS will obtain a Well Construction Permit prior to project construction.

Comment No. 3:

12. *A Pump Installation Permit(s) is (are) required before ground water is developed as a source of supply for the project.*

Response: DWS will obtain a Pump Installation Permit before ground water is developed as a source for the project.

Comment No. 4:

Other: The proposed well is upgradient of four wells owned by the same owner. Its proposed pumpage is not indicated. The proposed well is most likely to impact two wells directly downgradient about 2/3 mile away at approximately the same depth. These two wells have a combined capacity of 3.4 mgd and current combined pumpage of about 1.2 mgd. Together the four existing wells are currently pumping nearly 2 mgd, with the capacity to pump 5 mgd from a small portion of the aquifer system area, whose sustainable yield is 6 mgd. Pump tests at these wells should be conducted to determine potential mutual interference.

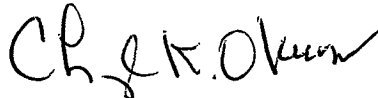
Response: The sustainable yield of Honolua Aquifer where the proposed well is located is 8 mgd. The proposed project is anticipated to have a capacity of 1.44 mgd. The four existing wells that are down gradient from the project site have a combined capacity of 5 mgd. Thus, the total capacity including the proposed well will have a capacity of 6.44 mgd which is within the sustainable yield. The proposed pumpage is not indicated since the proposed well is an exploratory well.

Pump tests will be completed at the exploratory well phase, and at that time, DWS can determine the effects, if any, on HWS (Hawaii Water Service) wells. DWS will work with HWS to monitor well water depths of the existing wells during the pump testing.

Russell Y. Tsuji, Land Administrator
February 6, 2014
Page 3

We appreciate your input and a copy of your comment letter and along with this response letter will be included in the Draft Environmental Assessment for the proposed project. Should you have any questions, please contact me at (808) 244-2015.

Very truly yours,



Cheryl K. Okuma
Senior Associate

CKO:la

cc: Ronald Fukumoto, Fukumoto Engineering, Inc.
Curtis Eaton, P.E., Department of Water Supply
Jeff Pearson, P.E., Department of Water Supply

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NOV 13 2013

NEIL ABERCROMBIE
GOVERNOR



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

GLENN M. OKIMOTO
DIRECTOR

Deputy Directors
JADE T. BUTAY
FORD N. FUCHIGAMI
RANDY GRUNE
JADINE URASAKI

IN REPLY REFER TO:

STP 8.1364

November 5, 2013

Mr. Michael Munekiyo, AICP
Principal
Munekiyo and Hiraga, Inc.
305 High Street, Suite 104
Wailuku, Hawaii 96793

Dear Mr. Munekiyo:

Subject: West Maui Well No. 2
Early Consultation for Environmental Assessment
TMK: (2) 4-3-001:017

Thank you for requesting the State Department of Transportation's (DOT) review of the subject project. DOT understands the Maui County Department of Water Supply (DWS) proposes the development of an exploratory well in West Maui.

Given the project location and the nature of the project it is not expected to significantly impact the State highway facility. However, the DWS is required to obtain a permit from DOT Highways Division, Maui District Office for the transport of oversized and /or overweight materials and equipment on State highway facilities.

DOT appreciates the opportunity to provide comments. If there are any questions, please contact Mr. Norren Kato of the DOT Statewide Transportation Planning Office at telephone number (808) 831-7977.

Very truly yours,

A handwritten signature in black ink, appearing to read "Glenn M. Okimoto".

GLENN M. OKIMOTO, Ph.D.
Director of Transportation



MICHAEL T. MUNEKIYO
PRESIDENT

KARLYNN FUKUDA
EXECUTIVE VICE PRESIDENT

GWEN OHASHI HIRAGA
SENIOR VICE PRESIDENT

MITSURU "MICH" HIRANO
SENIOR VICE PRESIDENT

MARK ALEXANDER ROY
VICE PRESIDENT

February 5, 2014

Glenn M. Okimoto, Director
Department of Transportation
State of Hawaii
869 Punchbowl Street
Honolulu, Hawaii 96813

SUBJECT: Early Consultation Request for Proposed West Maui Well No. 2,
Lahaina, Maui, Hawaii; DWS Job No. 11-06A; TMK (2)4-3-
001:017(por.) (STP 8.1364)

Dear Mr. Okimoto:

Thank you for your letter, dated November 5, 2013, providing early consultation comments on the proposed West Maui Well No. 2. On behalf of the County of Maui, Department of Water Supply (DWS), we offer the following responses to your comment:

Comment:

Given the project location and the nature of the project it is not expected to significantly impact the State highway facility. However, the DWS is required to obtain a permit from DOT Highways Division, Maui District Office for the transport of oversized and/or overweight materials and equipment on State highway facilities

Response: As applicable, the DWS will obtain a permit from Department of Transportation Highways Division, Maui District Office for the transport of oversized and/or overweight materials and equipment on State highway facilities.

MAUI

305 High St., Suite 104 Wailuku, Hawaii 96793

PH: (808)244-2015 FAX: (808)244-8729

OAHU

735 Bishop St., Suite 238 Honolulu, Hawaii 96813 | PH: (808)983-1233

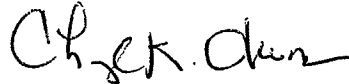
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Glenn M. Okimoto, Director
February 5, 2014
Page 2

We appreciate your input and a copy of your comment letter and along with this response letter will be included in the Draft Environmental Assessment for the proposed project. Should you have any questions, please contact me at (808) 244-2015.

Very truly yours,

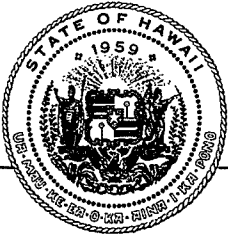


Cheryl K. Okuma
Senior Associate

CKO:la

cc: Ronald Fukumoto, Fukumoto Engineering, Inc.
Curtis Eaton, P.E., Department of Water Supply
Jeff Pearson, P.E., Department of Water Supply

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**OFFICE OF PLANNING
STATE OF HAWAII**

NOV 06 2013
NEIL ABERCROMBIE
GOVERNOR

JESSE K. SOUKI
DIRECTOR
OFFICE OF PLANNING

235 South Beretania Street, 6th Floor, Honolulu, Hawaii 96813
Mailing Address: P.O. Box 2359, Honolulu, Hawaii 96804

Telephone: (808) 587-2846
Fax: (808) 587-2824
Web: <http://planning.hawaii.gov/>

Ref. No. P-14159

November 1, 2013

Michael T. Munekiyo, AICP, President
Munekiyo & Hiraga, Inc.
305 High Street, Suite 104
Wailuku, Hawaii 96793

Dear Mr. Munekiyo:

Subject: Early Consultation Request for the Proposed West Maui Well No. 2, Lahaina, Maui, DSW Job. No. 11-06A, TMK: (2) 4-3-001:017

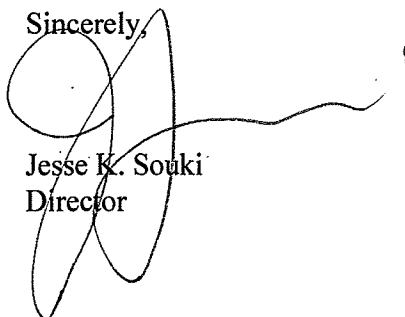
Thank you for the opportunity to provide comments on the Environmental Assessment Early Consultation for the proposed development of an exploratory well in West Maui.

We have reviewed the documents you submitted to us by letter dated October 15, 2013, and have the following comments to offer.

1. The entire state is defined to be within the Coastal Zone Management Area, pursuant to Hawaii Revised Statutes (HRS) §205A-1 (definition of "coastal zone management area"). The Draft Environmental Assessment (Draft EA) should include a discussion of the proposed project's ability to meet the objectives and policies set forth in HRS §205A-2.
2. The project may have nonpoint pollution impacts on coastal waters. The applicant should review the Hawaii Watershed Guidance, which provides a summary and links to management measures that may be implemented to minimize coastal nonpoint pollution impact. Since the region where this exploratory well is located is zoned "Agriculture," please review the Section 5.1, Agriculture (page 72), for information on controlling water runoff pollution. This guidance is available at [http://files.hawaii.gov/dbedt/op/czm/initiative/nonpoint/HI Watershed Guidance Final.pdf](http://files.hawaii.gov/dbedt/op/czm/initiative/nonpoint/HI_Watershed_Guidance_Final.pdf).

If you have any questions regarding this comment letter, please contact Josh Hekeka of our Hawaii CZM Program at (808) 587-2845.

Sincerely,



Jesse K. Souki
Director



MICHAEL T. MUNEKIYO
PRESIDENT

KARLYNN FUKUDA
EXECUTIVE VICE PRESIDENT

GWEN DHASHI HIRAGA
SENIOR VICE PRESIDENT

MITSUBU "MICH" HIRANO
SENIOR VICE PRESIDENT

MARK ALEXANDER ROY
VICE PRESIDENT

February 5, 2014

Jesse K. Souki, Director
Office of Planning
State of Hawaii
P.O. Box 2359
Honolulu, Hawaii 96804

SUBJECT: Early Consultation Request for Proposed West Maui Well No. 2, Lahaina, Maui, Hawaii; DWS Job No. 11-06A; TMK (2)4-3-001:017(por.) (Ref. No. P-14159)

Dear Mr. Souki:

Thank you for your letter, dated November 1, 2013, providing early consultation comments on the proposed West Maui Well No. 2. On behalf of the County of Maui, Department of Water Supply (DWS), we offer the following responses to your comments:

Comment No. 1:

The entire state is defined to be within the Coastal Zone Management Area, pursuant to Hawaii Revised Statutes (HRS) 205A-1 (definition of "coastal zone management area"). The Draft Environmental Assessment (Draft EA) should include a discussion of the proposed project's ability to meet the objectives and policies set forth in HRS 205A-2.

Response: As the entire state is defined to be within the Coastal Zone Management Area, a discussion of the proposed project's ability to meet the objectives and policies of HRS, Chapter 205A, will be addressed in the Draft EA.

Comment No. 2:

The project may have nonpoint pollution impacts on coastal waters. The applicant should review the Hawaii Watershed Guidance, which provides a summary and links to management measures that may be implemented to minimize coastal nonpoint pollution impact. Since the region where this

MAUI

305 High St., Suite 104 Wailuku, Hawaii 96793

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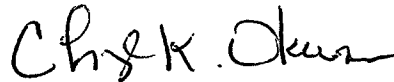
Jesse K. Souki, Director
February 5, 2014
Page 2

exploratory well is located is zoned "Agriculture," please review the Section 5.1, Agriculture (page 72), for information on controlling water runoff pollution. This guidance is available at [http://files.hawaii.gov/dbedt/op/czm/initiative/nonpoint/HI Watershed Guidance Final.pdf](http://files.hawaii.gov/dbedt/op/czm/initiative/nonpoint/HI_Watershed_Guidance_Final.pdf).

Response: The management measures that may be implemented to minimize coastal nonpoint pollution impact included in the Hawaii Watershed Guidance will be considered as applicable. Best Management Practices (BMPs) will be implemented during the construction phase to reduce impacts on air and water quality.

We appreciate your input and a copy of your comment letter along with this response letter will be included in the Draft Environmental Assessment for the proposed project. Should you have any questions, please contact me at (808) 244-2015.

Very truly yours,



Cheryl K. Okuma
Senior Associate

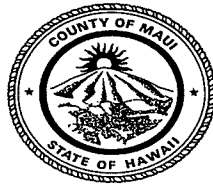
CKO:la

cc: Ronald Fukumoto, Fukumoto Engineering, Inc.
Curtis Eaton, P.E., Department of Water Supply
Jeff Pearson, P.E., Department of Water Supply

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NOV 18 2013

ALAN M. ARAKAWA
MAYOR



JEFFREY A. MURRAY
CHIEF

ROBERT M. SHIMADA
DEPUTY CHIEF

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

313 MANEA PLACE . WAILUKU, HAWAII 96793
(808) 244-9161 . FAX (808) 244-1363

November 14, 2013

Munekiyo & Hiraga, Inc
Attention: Michael Munekiyo, Principal
305 High St. Suite 104
Wailuku, HI 96793

Re: Proposed West Maui Well No. 2
Lahaina, Maui, Hawaii
DWS Job No. 11-06A

Dear Michael:

Thank you for allowing our office the opportunity to comment on this subject. At this time, our office provides the following comments:

- Should buildings be proposed for the facility, our office reserves the right to comment during the building permit process.

If there are any questions or comments, please feel free to contact me at 244-9161 ext. 23.

Sincerely,

A handwritten signature in black ink, appearing to read "Paul Haake", written in a cursive style.

Paul Haake
Captain, Fire Prevention Bureau



MICHAEL T. MUNEKIYO
PRESIDENT

KARLYNN FUKUDA
EXECUTIVE VICE PRESIDENT

OWEN OHASHI HIRAGA
SENIOR VICE PRESIDENT

MITSUBU "MICH" HIRANO
SENIOR VICE PRESIDENT

MARK ALEXANDER ROY
VICE PRESIDENT

February 5, 2014

Paul Haake, Captain
Fire Prevention Bureau
Department of Fire and Public Safety
County of Maui
313 Manea Place
Wailuku, Hawaii 96793

SUBJECT: Early Consultation Request for Proposed West Maui Well No. 2, Lahaina, Maui, Hawaii; DWS Job No. 11-06A; TMK (2)4-3-001:017(por.)

Dear Mr. Haake:

Thank you for your letter, dated November 14, 2013, providing early consultation comments on the proposed West Maui Well No. 2. On behalf of the County of Maui, Department of Water Supply (DWS), we offer the following responses to your comments:

Comment:

Should buildings be proposed for the facility, our office reserves the right to comment during the building permit process.

Response: The DWS understands that further review of the project will be undertaken by your Department should building permit requirements be triggered.

MAUI:

305 High St., Suite 104 Wailuku, Hawaii 96793

PH: (808)244-2015 FAX: (808)244-8729

KAHUI:

735 Bishop St., Suite 238 Honolulu, Hawaii 96813 PH: (808)983-1233

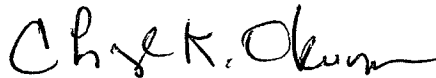
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Paul Haake, Captain
February 5, 2014
Page 2

We appreciate your input and a copy of your comment letter along with this response letter will be included in the Draft Environmental Assessment for the proposed project. Should you have any questions, please contact me at 244-2015.

Very truly yours,



Cheryl K. Okuma
Senior Associate

CKO:la

cc: Ronald Fukumoto, Fukumoto Engineering, Inc.
Curtis Eaton, P.E., Department of Water Supply
Jeff Pearson, P.E., Department of Water Supply

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DEPARTMENT OF
HOUSING AND HUMAN CONCERNS
HOUSING DIVISION
COUNTY OF MAUI

OCT 22 2013

ALAN M. ARAKAWA
Mayor

JO-ANN T. RIDAO
Director

JAN SHISHIDO
Deputy Director

35 LUNALILO STREET, SUITE 102 • WAILUKU, HAWAII 96793 • PHONE (808) 270-7351 • FAX (808) 270-6284

October 18, 2013

Mr. Michael Munekiyo, AICP, Principal
Munekiyo & Hiraga, Inc.
305 High Street
Wailuku, HI 96793

Dear Mr. Munekiyo:

Subject: Early Consultation Request for Proposed West Maui Well No. 2, Lahaina, Maui, Hawaii; DWS Job 11-06A

The Housing Department has reviewed the request for Early Consultation for the above subject project. Based on our review, we have determined that the subject project is not subject to Chapter 2.96, Maui County Code. At the present time, the Department has no additional comments to offer.

Please call me at 270-7355 if you have any questions.

Sincerely,

WAYDE T. OSHIRO
Housing Administrator

cc: Director of Housing and Human Concerns



MICHAEL T. MUNEKIYO
PRESIDENT

KARLYNN FUKUDA
EXECUTIVE VICE PRESIDENT

GWEN OHASHI HIRAGA
SENIOR VICE PRESIDENT

MITSUBURU "MICH" HIRANO
SENIOR VICE PRESIDENT

MARK ALEXANDER ROY
VICE PRESIDENT

February 5, 2014

Wayde T. Oshiro, Housing Administrator
Department of Housing and Human Concerns
County of Maui
35 Lunalilo Street, Suite 102
Wailuku, Hawaii 96793

SUBJECT: Early Consultation Request for Proposed West Maui Well No. 2,
Lahaina, Maui, Hawaii; DWS Job No. 11-06A; TMK (2)4-3-
001:017(por.)

Dear Mr. Oshiro:

Thank you for your letter, dated October 18, 2013, providing early consultation comments on the proposed West Maui Well No. 2. On behalf of the County of Maui, Department of Water Supply, we acknowledge the Department of Housing and Human Concerns determination that the proposed project is not subject to Chapter 2.96 Maui County Code and has no additional comments at this time.

We appreciate your input and a copy of your comment letter along with this response letter will be included in the Draft Environmental Assessment for the proposed project. Should you have any questions, please contact me at 244-2015.

Very truly yours,

Cheryl K. Okuma
Senior Associate

CKO:la

cc: Ronald Fukumoto, Fukumoto Engineering, Inc.
Curtis Eaton, P.E., Department of Water Supply
Jeff Pearson, P.E., Department of Water Supply

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MAUI

305 High St., Suite 104 Wailuku, Hawaii 96793

PH: (808)244-2015 FAX: (808)244-8729

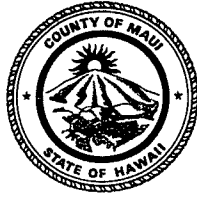
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ALAN M. ARAKAWA
Mayor



DEPARTMENT OF PARKS & RECREATION
700 Hali'a Nako'a Street, Unit 2, Wailuku, Hawaii 96793

OCT 30 2013
GLENN T. CORREA
Director
BRIANNE SAVAGE
Deputy Director
(808) 270-7230
FAX (808) 270-7934

October 23, 2013

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

Dear Mr. Munekiyo:

SUBJECT: EARLY CONSULTATION REQUEST
PROPOSED WEST MAUI WELL NO. 2
LAHAINA, MAUI, HAWAII; DWS JOB NO 11-06A

Thank you for the opportunity to review the subject project. Our Department has no comments to offer at this time.

Please feel free to contact me or Karla Peters, CIP Coordinator, at (808) 270-7981, if there are any questions.

Sincerely,

Brianne Savage
for
GLENN T. CORREA
Director

c: Brianne Savage, Deputy Director
Robert Halvorson, Chief of Planning and Development

GTC:RH:kp



MICHAEL T. MUNEKIYO
PRESIDENT

KARLYNN FUKUDA
EXECUTIVE VICE PRESIDENT

GWEN OHASHI HIRAGA
SENIOR VICE PRESIDENT

MITSURU "MICH" HIRANO
SENIOR VICE PRESIDENT

MARK ALEXANDER ROY
VICE PRESIDENT

February 5, 2014

Glenn T. Correa, Director
Department of Parks & Recreation
County of Maui
700 Hali`a Nako Street, Unit 2
Wailuku, Hawaii 96793

SUBJECT: Early Consultation Request for Proposed West Maui Well No. 2,
Lahaina, Maui, Hawaii; DWS Job No. 11-06A; TMK (2)4-3-
001:017(por.)

Dear Mr. Correa:

Thank you for your letter, dated October 23, 2013, providing early consultation comments on the proposed West Maui Well No. 2. On behalf of the County of Maui, Department of Water Supply, we acknowledge that the Department of Parks & Recreation does not have any comments at this time.

We appreciate your input and a copy of your comment letter along with this response letter will be included in the Draft Environmental Assessment for the proposed project. Should you have any questions, please contact me at 244-2015.

Very truly yours,

Cheryl K. Okuma
Senior Associate

CKO:la

cc: Ronald Fukumoto, Fukumoto Engineering, Inc.
Curtis Eaton, P.E., Department of Water Supply
Jeff Pearson, P.E., Department of Water Supply

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MAUI

305 High St., Suite 104 Wailuku, Hawaii 96793

PH: (808)244-2015 FAX: (808)244-8729

HAUAI

735 Bishop St., Suite 238 Honolulu, Hawaii 96813 | PH: (808)983-1233

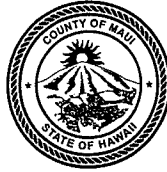
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ALAN M. ARAKAWA
Mayor

WILLIAM R. SPENCE
Director

MICHELE CHOUTEAU McLEAN
Deputy Director



OCT 25 2013

COUNTY OF MAUI
DEPARTMENT OF PLANNING

October 25, 2013

Mr. Michael T. Munekiyo, AICP, Principal
Munekiyo & Hiraga, Inc.
305 High Street, Suite 104
Wailuku, Hawaii 96793

Dear Mr. Munekiyo:

SUBJECT: EARLY CONSULTATION REQUEST FOR THE PREPARATION OF A DRAFT ENVIRONMENTAL ASSESSMENT (EA) FOR THE PROPOSED WEST MAUI WELL NO. 2 PROJECT, LOCATED IN LAHAINA, ISLAND OF MAUI, HAWAII; TMK: (2) 4-3-001:017 (POR) (RFC 2013/0150) (DWS JOB. NO. 11-06A)

The Department of Planning (Department) has reviewed the above-referenced letter dated October 11, 2013, and provides the following comments:

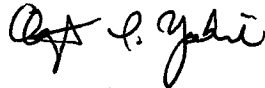
1. As part of the Draft EA, include a completed Zoning and Flood Confirmation Form which is available from the Zoning Administration and Enforcement Division (ZAED), County of Maui;
2. A Special Management Area (SMA) Assessment will not be required for this proposed project as the property is not located within the SMA;
3. Discuss how the project is consistent with the goals, objectives, and implementation strategy of the Countywide Policy Plan, the newly adopted Maui Island Plan, and the West Maui Community Plan;
4. It appears the location of the project is in proximity to two (2) gulches, Kahana and Kahanaiki. Discuss the Best Management Practices (BMPs) which will be implemented during the construction phases of the project to reduce impacts on air and water quality as well as promoting soil conservation;
5. It appears that the Department of Water Supply will be the approving agency of the Final EA;
6. Coordinate site construction with the Department of Land and Natural Resources-State Historic Preservation Division (DLNR-SHPD) to determine any archaeological, cultural, or historic sites that may need mitigation; and

Mr. Michael T. Munekiyo, AICP, Principal
October 25, 2013
Page 2

7. Please provide the Department with one (1) hard copy, and one (1) digital copy of the Draft EA when available.

Thank you for the opportunity to comment. Should you require further clarification, please contact Staff Planner Kurt Wollenhaupt at kurt.wollenhaupt@mauicounty.gov or at (808) 270-1789.

Sincerely,



CLAYTON I. YOSHIDA, AICP
Planning Program Administrator

for WILLIAM SPENCE
Planning Director

xc: John S. Rapacz, Planning Program Administrator (PDF)
Kurt F. Wollenhaupt, Staff Planner (PDF)
Department of Water Supply
Project File
General File

WRS:CIY:KFW: aj

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MICHAEL T. MUNEKIYO
PRESIDENT

KARLYNN FUKUDA
EXECUTIVE VICE PRESIDENT

GWEN OHASHI HIRAGA
SENIOR VICE PRESIDENT

MITSUBU "MICH" HIRANO
SENIOR VICE PRESIDENT

MARK ALEXANDER ROY
VICE PRESIDENT

February 5, 2014

William Spence, Director
Department of Planning
County of Maui
2200 Main Street, Suite 315
Wailuku, Hawaii 96793

SUBJECT: Early Consultation Request for Proposed West Maui Well No. 2, Lahaina, Maui, Hawaii; DWS Job No. 11-06A; TMK (2)4-3-001:017(por.) (RFC 2013/0150)

Dear Mr. Spence:

Thank you for your letter, dated October 25, 2013, providing early consultation comments on the proposed West Maui Well No. 2. On behalf of the County of Maui, Department of Water Supply (DWS), we offer the following responses to your comments:

Comment No. 1:

As part of the Draft EA, include a completed Zoning and Flood Confirmation Form which is available from the Zoning Administration and Enforcement Division (ZAED), County of Maui;

Response: A Zoning and Flood Confirmation form will be included as part of the Draft Environmental Assessment (EA).

Comment No. 2:

A Special Management Area (SMA) Assessment will not be required for this proposed project as the property is not located within the SMA;

Response: We acknowledge that a SMA Assessment will not be required for this proposed project.

MAUI

305 High St., Suite 104 Wailuku, Hawaii 96793

PH: (808)244-2015 FAX: (808)244-8729

MAUI

735 Bishop St., Suite 238 Honolulu, Hawaii 96813 PH: (808)983-1233

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Comment No. 3:

Discuss how the project is consistent with the goals, objectives, and implementation strategy of the Countywide Policy Plan, the newly adopted Maui Island Plan, and the West Maui Community Plan;

Response: The Draft EA will discuss the project's consistency with the goals, objectives, and implementation strategy of the Countywide Policy Plan, the Maui Island Plan, and the West Maui Community Plan.

Comment No. 4:

It appears the location of the project is in proximity to two (2) gulches, Kahana and Kahanaiki. Discuss the Best Management Practices (BMPs) which will be implemented during the construction phase of the project to reduce impacts on air and water quality as well as promoting soil conservation;

Response: Both gulches slope from east to west on each side of the project area which is at an elevation of 1,300 feet mean sea level (msl). Kahana gulch is situated on the north side of the project area, and is located about 70 feet away. Kahanaiki gulch is situated on the south side of the project area and located about 310 feet away.

One or more of the following Best Management Practices (BMPs), may be implemented during the construction phase of the project to reduce impacts on air and water quality, as well as promoting soil conservation:

- Minimizing the time of construction.
- Sequencing construction activities to minimize exposure time of cleared surface area.
- Initiating the early construction of drainage features.
- Stationing a water truck on site during the construction period to provide for immediate sprinkling, as needed, in active construction zones (weekends and holidays included).
- Stormwater flowing toward the construction area shall be diverted by using temporary berms, filter berms, and cut-off ditches, or other appropriate measures, where needed, for control of erosion and pollution to protect surrounding water resources.
- Ensuring graded areas are thoroughly watered after construction activity has ceased for the day and on weekends and holidays.

- Applying perennial vegetation for permanent soil stabilization, as soon as practicable, after final grading to ensure all cut and fill slopes are sodded and planted.

BMPs will be addressed in the Draft EA.

Comment No. 5:

It appears that the Department of Water Supply will be the approving agency of the Final EA.

Response: DWS will be the approving agency for the Final EA.

Comment No. 6:

Coordinate site construction with the Department of Land and Natural Resources-State Historic Preservation Division (DLNR-SHPD) to determine any archaeological, cultural, or historic sites that may need mitigation.

Response: An archaeological survey was conducted on September 19, 2013 of the project area and concluded that no further work is recommended. The survey report will be included in the Draft EA. In the event of any archaeological or cultural find, construction will be halted and the DLNR-SHPD contacted.

Comment No. 7:

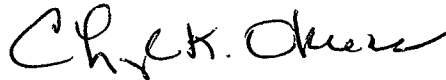
Please provide the Department with one (1) hard copy, and one (1) digital copy of the Draft EA when available.

Response: As requested one (1) hard copy and one (1) digital copy of the Draft EA will be provided to the Department when available.

William Spence, Director
February 5, 2014
Page 4

We appreciate your input and a copy of your comment letter along with this response letter will be included in the Draft EA for the proposed project. Should you have any questions, please contact me at 244-2015.

Very truly yours,



Cheryl K. Okuma
Senior Associate

CKO:la

cc: Ronald Fukumoto, Fukumoto Engineering, Inc.
Curtis Eaton, P.E., Department of Water Supply
Jeff Pearson, P.E., Department of Water Supply

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NOV 07 2013

ALAN M. ARAKAWA
Mayor

DAVID C. GOODE
Director

ROWENA M. DAGDAG-ANDAYA
Deputy Director



GLEN A. UENO, P.E., P.L.S.
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
Telephone: (808) 270-7845 • Fax: (808) 270-7955

November 4, 2013

Mr. Michael T. Munekiyo, AICP, President
MUNEKIYO & HIRAGA, INC.
305 High Street, Suite 104
Wailuku, Maui, Hawaii 96793

Dear Mr. Munekiyo:

**SUBJECT: EARLY CONSULTATION REQUEST FOR PROPOSED
WEST MAUI WELL NO. 2 - DWS JOB NO. 11-06A**

We reviewed the subject application and have the following comment:

1. The project site lies mauka of one of our dam structures at the convergence of the Kahana Stream and Kahananui Stream. We would be concerned about added water flow into the stream from test pumping or from emergency overflows. Additional water into the stream may negatively impact our dam which is regulated under the Department of Land and Natural Resources' (DLNR) Dam Safety Program. This same dam structure is periodically dewatered. We would be concerned if water is released when we remove the water from the dam's basin.

Please call Rowena M. Dagdag-Andaya at 270-7845 if you have any questions regarding this letter.

Sincerely,

A handwritten signature in black ink, appearing to read "D. Goode".

by DAVID C. GOODE
Director of Public Works

DCG:RMDA:ls

xc: Highways Division
Engineering Division

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MICHAEL T. MUNEKIYOD
PRESIDENT

KARLYNN FUKUDA
EXECUTIVE VICE PRESIDENT

GWEN OHASHI HIRAGA
SENIOR VICE PRESIDENT

MITSURU "MICH" HIRANO
SENIOR VICE PRESIDENT

MARK ALEXANDER ROY
VICE PRESIDENT

February 5, 2014

David C. Goode, Director
Department of Public Works
County of Maui
200 South High Street, Room No. 434
Wailuku, Hawaii 96793

SUBJECT: Early Consultation Request for Proposed West Maui Well No. 2, Lahaina, Maui, Hawaii; DWS Job No. 11-06A; TMK (2)4-3-001:017(por.)

Dear Mr. Goode:

Thank you for your letter, dated November 4, 2013, providing early consultation comments on the proposed West Maui Well No. 2. On behalf of the County of Maui, Department of Water Supply (DWS), we offer the following response to your comment:

Comment No. 1:

The project site lies mauka of one of our dam structures at the convergence of the Kahana Stream and Kahananui Stream. We would be concerned about added water flow into the stream from test pumping or emergency overflows. Additional water into the stream may negatively impact our dam which is regulated under the Department of Land and Natural Resources' (DLNR) Dam Safety Program. This same dam structure is periodically dewatered. We would be concerned if water is released when we remove the water from the dam's basin.

Response: The exploratory well project is approximately 2.6 miles upland of the convergence of the Kahana Stream and Kahananui Stream. The proposed improvement will not result in discharge into the Kahana and Kahananui streams. Water from test pumping will not enter the Kahana Stream. Kahananui Stream is referred to as Kahanaikei Stream on the U.S. Geological Survey map.

MAUI

305 High St., Suite 104 Wailuku, Hawaii 96793

PH: (808)244-2015 FAX: (808)244-8729

OAHU

735 Bishop St., Suite 238 Honolulu, Hawaii 96813 PH: (808)983-1233

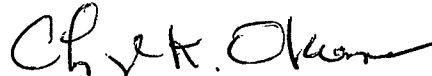
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David C. Goode, Director
February 5, 2014
Page 2

We appreciate your input and a copy of your comment letter along with this response letter will be included in the Draft Environmental Assessment for the proposed project. Should you have any questions, please contact me at 244-2015.

Very truly yours,



Cheryl K. Okuma
Senior Associate

CKO:la

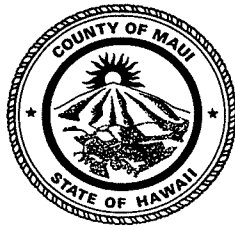
cc: Ronald Fukumoto, Fukumoto Engineering, Inc.
Curtis Eaton, P.E., Department of Water Supply
Jeff Pearson, P.E., Department of Water Supply

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OCT 25 2013

TRACY TAKAMINE, P.E.
Solid Waste Division
ERIC NAKAGAWA, P.E.
Wastewater Reclamation Division

ALAN M. ARAKAWA
Mayor
KYLE K. GINOZA, P.E.
Director
MICHAEL M. MIYAMOTO
Deputy Director



**COUNTY OF MAUI
DEPARTMENT OF
ENVIRONMENTAL MANAGEMENT**
2200 MAIN STREET, SUITE 100
WAILUKU, MAUI, HAWAII 96793

October 24, 2013

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

Dear Mr. Munekiyo

**SUBJECT: WEST MAUI WELL NO. 2
EARLY CONSULTATION
TMK (2) 4-3-001:017, LAHAINA**

We reviewed the subject application and have the following comments:

1. Solid Waste Division comments:
 - a. None.
2. Wastewater Reclamation Division (WWRD) comments:
 - a. None.

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

Sincerely,

A handwritten signature in black ink, appearing to read "Kyle K. Ginoza".

KYLE K. GINOZA, P.E.
Director of Environmental Management



MICHAEL T. MUNEKIYODO
PRESIDENT

KARLYNN FUKUDA
EXECUTIVE VICE PRESIDENT

GWEN OHASHI HIRAGA
SENIOR VICE PRESIDENT

MITSURU "MICH" HIRANO
SENIOR VICE PRESIDENT

MARK ALEXANDER ROY
VICE PRESIDENT

February 5, 2014

Kyle Ginoza, P.E., Director
Department of Environmental Management
County of Maui
2200 Main Street, Suite 100
Wailuku, Hawaii 96793

SUBJECT: Early Consultation Request for Proposed West Maui Well No. 2,
Lahaina, Maui, Hawaii; DWS Job No. 11-06A; TMK (2)4-3-
001:017(por.)

Dear Mr. Ginoza:

Thank you for your letter, dated October 24, 2013, providing early consultation comments on the proposed West Maui Well No. 2. On behalf of the County of Maui, Department of Water Supply, we acknowledge that the Department of Environmental Management does not have any comments.

We appreciate your input and a copy of your comment letter along with this response letter will be included in the Draft Environmental Assessment for the proposed project. Should you have any questions, please contact me at 244-2015.

Very truly yours,

Cheryl K. Okuma
Senior Associate

CKO:la

cc: Ronald Fukumoto, Fukumoto Engineering, Inc.
Curtis Eaton, P.E., Department of Water Supply
Jeff Pearson, P.E., Department of Water Supply

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MAUI

305 High St., Suite 104 Wailuku, Hawaii 96793

PH: (808)244-2015 FAX: (808)244-8729

OAHU

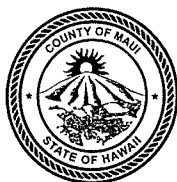
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NOV 12 2013

ALAN M. ARAKAWA
Mayor



JO ANNE JOHNSON-WINER
Director

MARC I. TAKAMORI
Deputy Director

Telephone (808) 270-7511

DEPARTMENT OF TRANSPORTATION

COUNTY OF MAUI
200 South High Street
Wailuku, Hawaii, USA 96793-2155

October 30, 2013

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

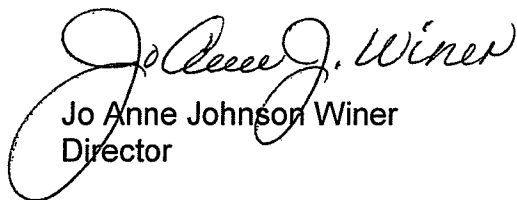
Subject: Proposed West Well No. 2 DWS Job No. 11-06A

Dear Mr. Munekiyo,

Thank you for the opportunity to comment on this project. We have no comments to make at this time.

Please feel free to contact me if you have any questions.

Sincerely,


Jo Anne Johnson Winer
Director



MICHAEL T. MUNEKIYO
PRESIDENT

KARLYNN FUKUDA
EXECUTIVE VICE PRESIDENT

GWEN OHASHI HIRAGA
SENIOR VICE PRESIDENT

MITSURU "MICH" HIRANO
SENIOR VICE PRESIDENT

MARK ALEXANDER ROY
VICE PRESIDENT

February 5, 2014

Jo Anne Johnson Winer, Director
Department of Transportation
County of Maui
200 South High Street
Wailuku, Hawaii 96793

SUBJECT: Early Consultation Request for Proposed West Maui Well No. 2,
Lahaina, Maui, Hawaii; DWS Job No. 11-06A; TMK (2)4-3-
001:017(por.)

Dear Ms. Winer:

Thank you for your letter, dated October 30, 2013, providing early consultation comments on the proposed West Maui Well No. 2. On behalf of the County of Maui, Department of Water Supply, we acknowledge that the Department of Transportation has no comments.

We appreciate your input and a copy of your comment letter and along with this response letter will be included in the Draft Environmental Assessment for the proposed project. Should you have any questions, please contact me at 244-2015.

Very truly yours,

Cheryl K. Okuma
Senior Associate

CKO:la

cc: Ronald Fukumoto, Fukumoto Engineering, Inc.
Curtis Eaton, P.E., Department of Water Supply
Jeff Pearson, P.E., Department of Water Supply

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MAUI

305 High St., Suite 104 Wailuku, Hawaii 96793

PH: (808)244-2015 FAX: (808)244-8729

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Vice-Chair
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Michael P. Victorino

Council Members
Elle Cochran
Donald G. Couch, Jr.
Stacy Crivello
Don S. Guzman
G. Riki Hokama
Mike White



Director of Council Services
David M. Raatz, Jr., Esq.

COUNTY COUNCIL
COUNTY OF MAUI
200 S. HIGH STREET
WAILUKU, MAUI, HAWAII 96793
www.mauicounty.gov/council

November 6, 2013

Munekiyo & Hiraga, Inc.
Attention: Michael Munekiyo, Principal
305 High Street, Suite 104
Wailuku, HI 96793

Dear Mr. Munekiyo:

**SUBJECT: EARLY CONSULTATION REQUEST FOR PROPOSED
WEST MAUI WELL NO. 2, LAHAINA, HAWAII; DWS JOB
NO. 11-06A**

I appreciate the opportunity to provide early consultation regarding this important West Maui project. I apologize for getting these comments to you slightly later than the requested Nov. 1, 2013 deadline and hope you can still utilize them as you prepare the Environmental Assessment.

I've had an opportunity to increase my knowledge of the West Maui water resources at the recent statewide Water Conference in Makena (October 23-25th) and wanted to incorporate that perspective into my comments on this project.

The following are topics that I would like to see the Draft EA address:

Remediation of any Potential Agricultural Contaminants

I understand that the well site has been selected at this elevation to minimize impacts of agricultural contaminants. Since the quality of the water is not yet known, the EA should include this discussion and address the following points:

- 1) Status of any County agreement or discussions with Shell, et al that a GAC filter system would be provided for this well should it have any DBCP contamination under the 1999 Settlement Agreement Maui County BWS has with Shell?
- 2) DWS remediation plan and estimated costs should other contaminants be found in the well water at levels exceeding DOH/EPA standards.

Impact on Other Existing or Proposed Wells in Honolua or Honokowai Aquifers

The maps provided in your summary, unfortunately, did not show the proposed well location in relationship to other wells. It does appear however, from the geographical location map provided, that Well no. 2 is proposed very near the “border” of the Honokowai-Honolua aquifer, where a number of other wells are located.

I request that the Draft EA include the following maps and discussions on this topic.

- 1) Maps that show the proposed well in relationship to the county's new Mahinahina well and any other existing or proposed public and private wells in the area, with a discussion of relative pumping rates and chloride levels of each existing well. Of special concern is sufficient information be provided concerning wells that have historically had water quality issues and could be adversely affected by additional pumping of the proposed well, and what mitigations would be proposed.

Note: Fig 16 Map in the USGS Groundwater Availability Study for Lahaina (Report 2012–5010) prepared for the Maui DWS shows seven existing wells in the Honolua aquifer and over a dozen wells in the neighboring Honokowai aquifer. Please utilize these types of maps in the DEA.

- 2) A discussion of any impacts the proposed West Maui Well No. 2 might have on private wells that would appear to be most directly downslope of it: wells 5739-02 and 5839-01 (Hawaii Water Co. P-5 and P-6 wells in Honokowai aquifer). These wells and others in the same area were shown as being vulnerable to rising chloride levels in various future water modeling and planning scenarios in USGS Report 2012–5010.
- 3) The same USGS report discusses a proposed future “Napili” well in Honolua Aquifer, but shows its location as further north than the proposed well No. 2. Are these one and the same proposed well? If not, the Draft EA should discuss how the demands of both proposed wells will be accommodated, as well as the existing County and private wells in Honolua aquifer.
- 4) Please discuss what is known about the connectivity or distinct separation of the Honokowai and Honolua aquifers and provide references for conclusions drawn.
- 5) Please discuss what investigations have been or will be done to determine if pumping from this well, although it appears to be located just inside the Honolua aquifer side of

the Honolua-Honokowai aquifer boundary, could affect the sustainable yield of Honokowai aquifer if its projected pumpage was combined with the County's Mahinahina well and the five other new wells already being proposed for the Honokowai aquifer.

Note: The 2011 DEA for the DWS Mahinahina exploratory well stated that the Honokowai aquifer, which lies immediately adjacent to the location of this proposed exploratory well, had a remaining capacity of 2.59 mgd. With Mahinahina and five additional wells proposed, including one or more for Hawaiian Homelands water supply, that capacity is likely to be utilized fully. Is this proposed well No. 2 distant enough to avoid further impacting Honokowai aquifer water levels? Please provide independent research to back up any conclusion.

Well Capacity, Expected Pumpage and Expected Demand

The Honolua-Honokowai aquifer border area proposed for the West Maui Well No. 2 is shown in various groundwater modeling simulation diagrams (Fig 23/ 25) in the USGS Groundwater Availability Study for Lahaina (Report 2012-5010) as having a high potential for diminished water quality if rainfall recharge levels continue to drop. This would be worsened if long range pumping demands are too great, as a result of unrealistic growth demands, impacting well head levels and causing rising salinity zones. Please discuss:

- 1) Well capacity and expected pumpage for the proposed new well No. 2 and include the same information for other proposed DWS or private wells in Honolua and Honokowai aquifer.
- 2) Level of future population growth and overall potable water demand the proposed well, and other new DWS wells in West Maui will be expected to meet.
- 3) What proportion of this new demand is expected to be met with additional surface water sources?

Long Term Sustainability of Proposed Well

The USGS Groundwater Availability study for Lahaina (Report 2012-5010) prepared for the Maui DWS notes that the groundwater levels in the Lahaina aquifer sector are higher and more reliable in the Launiupoko aquifer because coastal sediments act somewhat as a "capstone" to hold back freshwater discharge and allow head levels to build up for wells to reliably pump. The same information was recently presented by USGS at the recent water conference. The northern aquifers of the Lahaina Sector, Honokowai and Honolua, were described as having compromised water quality because they have "lava flow" geology that allowed "the water to run right through to the ocean."

November 6, 2013

Page 4

USGS representatives also noted that “current pumpage distribution in West Maui aquifers is not sustainable.” Given that researchers are advising a strategy shift, I would like to request that the DEA for this well discuss:

- 1) The rationale for choosing this particular well site in relationship to the long term sustainability and health of the aquifer.
- 2) How the proposed well helps distribute the pumpage more efficiently.
- 3) Alternative locations for DWS West Maui wells that are being considered if this location does not test favorably.
- 4) Testing planned or already completed to ensure the proposed well will not impact Kahana stream and its tributaries, and any traditional and customary practices that may be associated with the stream and ocean area.

Mahalo for a chance to offer these pre-consultation comments. I look forward to reviewing the Draft EA.

Sincerely,



Elle Cochran
Council Member



MICHAEL T. MUNEKIYO
PRESIDENT

KARLYNN FUKUDA
EXECUTIVE VICE PRESIDENT

GWEN OHASHI HIRAGA
SENIOR VICE PRESIDENT

MITSURU "MICH" HIRANO
SENIOR VICE PRESIDENT

MARK ALEXANDER ROY
VICE PRESIDENT

February 6, 2014

Councilmember Elle Cochran
County Council
County of Maui
200 S. High Street
Wailuku, Hawaii 96793

SUBJECT: Early Consultation Request for Proposed West Maui Well No. 2, Lahaina, Maui, Hawaii; DWS Job No. 11-06A; TMK (2)4-3-001:017(por.)

Dear Councilmember Cochran:

Thank you for your letter, dated November 6, 2013, providing early consultation comments on the proposed West Maui Well No. 2. On behalf of the County of Maui, Department of Water Supply (DWS), we offer the following responses in the order of your comments. Our responses refer to the Kahana Well also known as the proposed West Maui Exploratory Well No. 2.

A. REMEDIATION OF ANY POTENTIAL AGRICULTURAL CONTAMINANTS

Comment No. 1:

Status of any County agreement or discussions with Shell, et al that a GAC filter system would be provided for this well should it have any DBCP contamination under the 1999 Settlement Agreement Maui County BWS has with Shell?

Response: DWS is in the process of completing and submitting to the defendants, notification as required by the 1999 Settlement Agreement.

Comment No. 2:

DWS remediation plan and estimated costs should other contaminants be found in the well water as levels exceeding DOH/EPA standards.

MAUI

305 High St., Suite 104 Wailuku, Hawaii 96793

PH: (808)244-2015 FAX: (808)244-8729

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Response: The exploratory well is being drilled to determine if this location is suitable for a permanent production well. Water quality tests and testing on well capacity will be conducted after the exploratory well is constructed. Based on test results, DWS will determine the suitability of this location for a permanent well.

B. IMPACT ON OTHER EXISTING OR PROPOSED WELLS IN HONOLUA OR HONOKOWAI AQUIFERS

Comment No. 1:

Maps that show the proposed well in relationship to the county's new Mahinahina well and any other existing or proposed public and private wells in the area, with a discussion of relative pumping rates and chloride levels of each existing well. Of special concern is sufficient information provided concerning wells that have historically had water quality issues and could be adversely affected by additional pumping of the proposed well, and what mitigations would be proposed.

Response: Groundwater hydrology studies indicate that the proposed site for the Kahana Well is suitable in terms of its distance and drawdown effects on other wells in the region. The locations of wells in the region are shown on the enclosed Well Field Map from the Preliminary Design Report for West Maui Well No. 2 (Kahana Well) prepared by Fukumoto Engineering, Inc., dated April 23, 2013. See **Exhibit "A"**. The report is included in **Appendix "F"** in the Draft Environmental Assessment. The report considered alternative locations for the new well, and narrowed down the options to the "New Well Kahana Site" and the "New Well Mailepai Site" shown on the map. Both sites have similar hydrogeological characteristics. The Kahana site was selected since its overall construction cost would be less than the Mailepai site.

Another reason for selecting the Kahana site was the likelihood of encountering high-level groundwater due to its proximity to the recently drilled Mahinahina Well No. 1. The Kahana site with a ground elevation of 1,317 feet above mean sea level is at the same elevation as the Mahinahina site and about 3,300 feet to the north of the Mahinahina site. The static water level in the Mahinahina Well No. 1 is about 40 feet above mean sea level. This high-level groundwater elevation compares to an expected basal level of about 5 feet above mean sea level. Subsurface volcanic dikes are most likely the cause of the elevated water levels in that well. If dike-impounded water is encountered at the Kahana site, then

pumping from the well would not affect basal wells makai. Chloride content will remain low. If, by chance, the new Kahana well is basal, then there will be an effect on down-gradient wells.

Comment No. 2:

A discussion of any impacts the proposed West Maui Well No. 2 might have on private wells that would appear to be most directly downslope of it: wells 5739-02 and 5839-01 (Hawaii Water Co. P-5 and P-6 wells in Honokowai aquifer). These wells and others in the same area are shown as being vulnerable to rising chloride levels in various future water modeling and planning scenarios in USGS Report 2012-5010.

Response: If high-level water is encountered in the Kahana site, there should be minimal impact on the Hawaii Water Service Company (Kaanapali) Wells P-5 and P6 (5738-01 and 5739-02). How the dike-impounded groundwater interacts with the basal groundwater system down gradient of the Kahana site is unknown. Chloride changes in the basal wells can also be due to upconing of more saline water below the bottom of the wells and the local geologic structure influencing vertical and horizontal permeabilities of the lava flows within the basal aquifer.

Comment No. 3:

The same USGS report discusses a proposed future "Napili" well in Honolua Aquifer, but shows its location as further north than the proposed well No.2. Are these one and the same proposed well? If not, the Draft EA should discuss how the demands of both proposed wells will be accommodated, as well as the existing County and private wells in Honolua aquifer.

Response: The future "Napili" well in the Honolua Aquifer System is a different well. The sustainable yield of the Honolua Aquifer System is 8 million gallons per day (mgd). Average groundwater use based on Commission on Water Resource Management (CWRM) records from 2005 through 2008 is about 2.3 mgd or 29 percent of the total. The current available groundwater is about 5.7 mgd or 71 percent of the total.

The USGS report included the future "Napili" well in various scenarios that simulated future pumping rates and salinity of the wells. The withdrawal rate for the future "Napili" well was either 0.75 mgd or 1.2 mgd. The DWS does not have

specific plans at this time to implement the future "Napili" well; however, the withdrawal rate will be used in the following analysis.

The expected withdrawal rate for the Kahana Well is 1.44 mgd. This amount plus the expected largest withdrawal rate for the future "Napili" well of 1.2 mgd brings the total expected withdrawal rate to about 2.6 mgd for both wells. This amount plus the average groundwater use of 2.3 mgd results in a total of 4.9 mgd which is within the 8 mgd sustainable yield of the Honolua Aquifer System.

Comment No. 4:

Please discuss what is known about the connectivity or distinct separation of the Honokowai and Honolua aquifers and provide references for conclusions drawn.

Response: As defined by the CWRM, aquifer systems are subsets of aquifer sectors. In the case of the Lahaina Sector, the sector is composed of six (6) aquifer systems. Normally, aquifers within a sector are hydraulically connected. In order for CWRM to manage water resources within a sector, water balances and sustainable yields are computed for each aquifer system. As quoted in the 2008 update of the Water Resources Protection Plan (CWRM, p. 3-59).

*In 1993, CWRM adopted an Aquifer System Area approach to organize and manage ground water resources. This superseded the previous method of managing aquifers by larger Sector area boundaries. The Aquifer System Area approach allows for better optimization of well placement and is a better indicator of where water is located within a Sector area. It is the simplest method for optimizing development of the island's ground water resources while ensuring long-term sustainability from the planning and regulatory perspective. As a result of the new management approach, some aquifer system areas were subdivided into multiple systems and others were consolidated into single systems. This resulted in significant changes in the distribution of sustainable yields amongst affected aquifer system areas."
(http://www.state.hi.us/dlnr/cwrmp/planing_wrpp.htm).*

The Kahana Well will be located in the Honolua Aquifer System and therefore, from CWRM's perspective, will be counted against the remaining sustainable yield from that aquifer system.

Comment No. 5:

Please discuss what investigations have been or will be done to determine if pumping from this well, although it appears to be located just inside the Honolua side of the Honolua-Honokowai aquifer boundary, could affect the sustainable yield of Honokowai aquifer if its project pumpage was combined with the County's Mahinahina well and the five other new wells already being proposed for the Honokowai aquifer.

Note: The 2011 DEA for the DWS Mahinahina exploratory well stated that the Honokowai aquifer, which lies immediately adjacent to the location of this proposed exploratory well, had a remaining capacity of 2.59 mgd. With Mahinahina and five additional wells proposed, including one or more for Hawaiian Homelands water supply, that capacity is likely to be utilized fully. Is this proposed well No.2 distant enough to avoid further impacting Honokowai aquifer water levels? Please provide independent research to back up any conclusion.

Response: Until the well is drilled and tested, and water levels established (i.e. high level vs. basal), the effect on neighboring wells is unknown. The location of the Kahana Well was selected to provide adequate separation between it and existing wells. The three (3) closest wells lie within the Honokowai Aquifer System. These wells include Mahinahina Well No. 1, Hawaii Water Service Company (HWSC) P-5, and HWSC P-6 that are about 3,500 feet, 2,500 feet, and 3,000 feet, respectively, from the Kahana Well. The closest well within the Honolua Aquifer System is Napili B about 8,000 feet to the north of the Kahana Well.

To measure impacts of pumping the new well, a water-level measuring device can be installed in the Mahinahina Well No. 1 during the pump test. If the Kahana Well is basal, then there will be no impact on the Mahinahina Well No. 1. In addition, water level measurements in HWSC P-5 and HWSC P-6 can be done during the pump test if these wells were equipped with sounding tubes.

CWRM collects data and monitors long-term effects of wells on the aquifers. Owners of wells submit data including quantity pumped, chlorides or conductivity, temperature, and water table elevation to CWRM. CWRM manages water resources by reviewing this data and investigating changes that may adversely impact the aquifers. Since the existing wells are far from the Kahana Well, long-term changes may not be seen.

C. WELL CAPACITY, EXPECTED PUMPAGE AND EXPECTED DEMAND

Comment No. 1:

Well capacity and expected pumpage for the proposed new well No. 2 and include the same information for other proposed DWS or private wells in Honolua and Honokowai aquifer.

Response: DWS would like to obtain a capacity of 1.44 mgd for the Kahana Well. Final pumping capacity of the well will be determined after the step-drawdown test and constant rate tests are performed.

DWS is considering another new well within the Honolua Aquifer System to replace an existing well. DWS is currently developing the Mahinahina Well No. 1 with an estimated yield of about 1.0 mgd within the Honokowai Aquifer System. DWS does not have plans for additional wells within the Honokowai Aquifer System.

Comment No. 2:

Level of future population growth and overall potable water demand the proposed well, and other new DWS wells in West Maui will be expected to meet.

Response: The purpose of the exploratory well is to determine its suitability as a potential long term source of drinking water for the West Maui Community. While its utility may serve new populations in the region, the primary purpose of the well is to seek a new production source which can provide system reliability during shortfalls experienced during droughts or repair and maintenance work on the surface water infrastructure system.

Comment No. 3:

What proportion of this new demand is expected to be met with additional surface water sources?

Response: As previously explained, the proposed project meets the current water demand in the region, by providing a potential new source for system reliability. There are no near-term plans for expanding surface water sources.

D. **LONG TERM SUSTAINABILITY OF PROPOSED WELL**

Comment No. 1:

The rationale for choosing this particular well site in relationship to the long term sustainability and health of the aquifer.

Response: The well's location was deemed appropriate based on hydrogeological investigations which confirmed that the installation of a new source well at the selected site would maintain the health and integrity of the underlying aquifer.

Comment No. 2:

How the proposed well helps distribute the pumpage more efficiently.

Response: As noted above, the proposed well site was identified as being suitable based on hydrogeological considerations, including distance to surrounding wells and drawdown effects on those wells. Based on the investigations conducted, the proposed well site is suitably located in relationship to other wells in the region.

Siting the well in the Honolua Aquifer System also reinforces CWRM's objective to optimize aquifer system pumpage by spreading it out within an aquifer system. (See CWRM's approach in Comment 4, Paragraph B).

Comment No. 3:

Alternative locations for the DWS West Maui wells that are being considered if this location does not test favorably.

Response: In the event the proposed Exploratory Well 2 does not prove to be suitable for production well status, the DWS has considered a location at the Mailepai site which is located in the Honolua Aquifer system.

Comment No. 4:

Testing planned or already completed to ensure the proposed well will not impact Kahana stream and its tributaries, and any traditional customary practices that may be associated with the stream and ocean area.

Response: Stream water and aquifers are distinct systems. The Honolua Aquifer is a confined aquifer that serves as a groundwater source. A confined aquifer has no connection to surface water sources such as Kahana Stream which is supplied by rain. Thus, the proposed exploratory well will not impact Kahana Stream and its tributaries and as such, traditional customary practices that may be associated with these streams and ocean are not anticipated to be adversely impacted.

If the static water level in the well is about 40 feet above mean sea level, it is much lower than the elevation of Kahana Stream in the vicinity of the well which is about 1,040 feet above mean sea level.

We appreciate your input and a copy of your comment letter along with this response letter will be included in the Draft Environmental Assessment for the proposed project. Should you have any questions, please contact me at 244-2015.

Very truly yours,



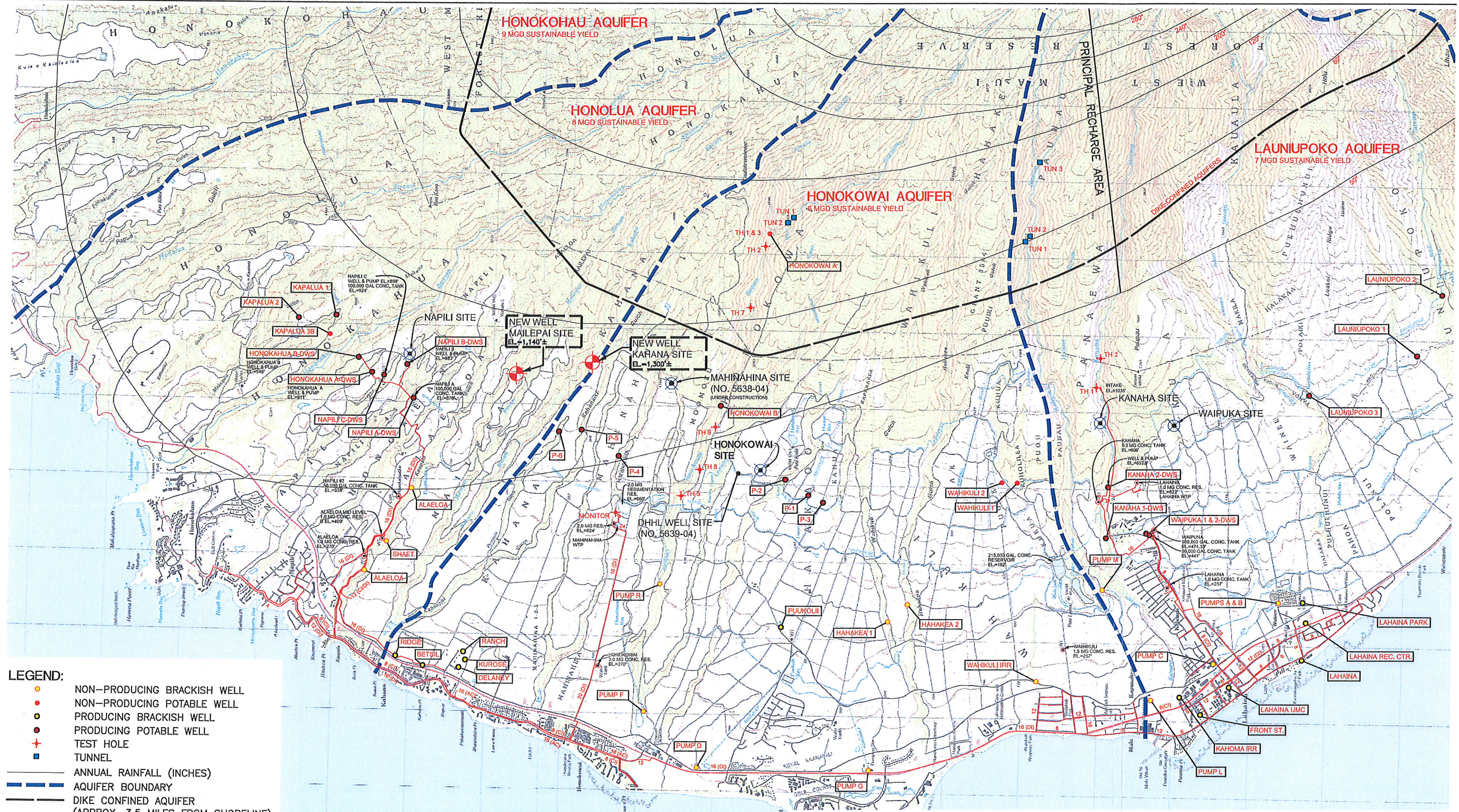
Cheryl K. Okuma
Senior Associate

CKO:la

Enclosure

cc: Ronald Fukumoto, Fukumoto Engineering, Inc. (w/out enclosure)
Curtis Eaton, P.E., Department of Water Supply (w/out enclosure)
Jeff Pearson, P.E., Department of Water Supply (w/out enclosure)

K:\DATA\AIRFEW\Maui\EXPL\Well2\ECL\Response letters\Cochran (Final).ltr.docx



- LEGEND:**
- NON-PRODUCING BRACKISH WELL
 - NON-PRODUCING POTABLE WELL
 - PRODUCING BRACKISH WELL
 - PRODUCING POTABLE WELL
 - + TEST HOLE
 - TUNNEL
 - ANNUAL RAINFALL (INCHES)
 - AQUIFER BOUNDARY
 - DIKE CONFINED AQUIFER (APPROX. 3.5 MILES FROM SHORELINE)
 - 16 (AC) WATERLINE W/SIZE
 - ⊗ SITE RECOMMENDED BY FUKUNAGA AND ASSOCIATES, INC.
 - ⊕ SITE RECOMMENDED BY RONALD M. FUKUMOTO ENGINEERING, INC. AND GLENN BAUER.

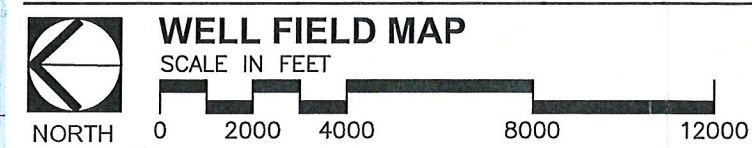


Figure 4
SOURCE: USGS LAHAINA & NAPILI QUADRANGLE

PREPARED FOR: DEPT. OF WATER SUPPLY, COUNTY OF MAUI

PREPARED BY: RONALD M. FUKUMOTO ENGINEERING, INC.
PRELIMINARY DESIGN REPORT FOR WEST MAUI WELL NO. 2

X. REFERENCES

X. REFERENCES

Council of Environmental Quality, Executive Office of the President, Considering Cumulative Impacts Under the National Environmental Policy Act, January 1997.

County of Maui, Department of Planning, Maui Island Plan, December 2012.

County of Maui, West Maui Community Plan, 1996.

County of Maui, The 2030 Countywide Policy Plan, 2010.

County of Maui, Office of Economic Development, Maui County Data Book 2011, December 2011.

County of Maui, Planning Department, Socio-Economic Forecast-The Economic Projection for the Maui County General Plan 2030, June 2006.

Federal Emergency Management Agency (FEMA), Flood Insurance Rate Map, Index Map 1500030358E, September 2012.

Fukunaga & Associates, Inc., Draft Environmental Assessment, Mahinahina Exploratory Well, February 2011.

Munekiyo & Hiraga, Inc., Final Environmental Assessment for the Proposed Improvements at Hamakuapoko Well Nos. 1 and 2, April 2013.

Munekiyo & Hiraga, Inc., Final Environmental Assessment for the Proposed Kahoma Village Project, August 2013.

Realtors Association of Maui, <http://www.ramaui.com/2012>.

Realtors Association of Maui, <http://www.ramaui.com/2013>.

State Land Use Commission, <http://www.state.hi.us/>, 2010.

State of Hawaii, Department of Labor and Industrial Relations, <http://hiwi.org>, 2013.

State of Hawaii, Department of Agriculture, Agricultural Lands of Importance to the State of Hawaii, January 1977.

University of Hawaii, Land Study Bureau, Detailed Land Classification – Island of Maui, L.S.B. Bulletin No. 7, May 1967.

U.S. Census Bureau, 2000 Census Summary File 1, accessed October 2013.

U.S. Census Bureau, 2010 Redistricting Data, accessed October 2013.

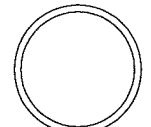
U.S. Department of Agriculture, Natural Resources Conservation Service, Soil Survey Geographic (SSURGO) Database for Maui, Hawaii. Available online at <http://soildatamart.nrcs.usda.gov>. Accessed October 2013.

U.S. Soil Conservation Service, Soil Survey of Islands of Kauai, Oahu, Maui, Molokai, and Lanai, State of Hawaii, U.S. Government Printing Office, 1972.

APPENDIX A.

Project Plans

WEST MAUI WELL NO. 2 EXPLORATORY



WEST MAUI WELL NO. 2
EXPLORATORY
DWS JOB NO. 11-06



RONALD M.
FUKUMOTO
ENGINEERING, INC.
Civil Engineering &
Land Surveying Consultants

1721 Wili Pa Loop, Suite 203
Wailuku, Hawaii 96793

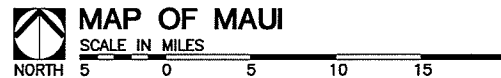
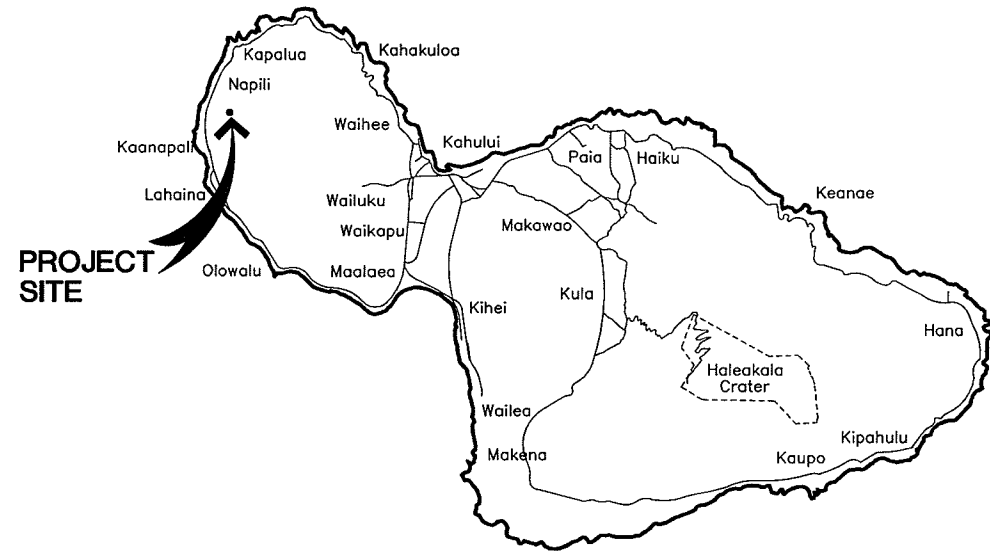
Phone: (808) 242-8611
Fax: (808) 244-7510
E-mail: office@rfemaui.com
Contact: Mandy Saito, P.E.

Prepared for:
Department of Water Supply
County of Maui
200 South High Street
Wailuku, Maui, Hawaii 96793
Contact: Curtis Eaton, P.E.

TAX MAP KEY (2) 4-3-001:017

DWS JOB NO. 11-06

LAHAINA, MAUI, HAWAII



PREPARED FOR:

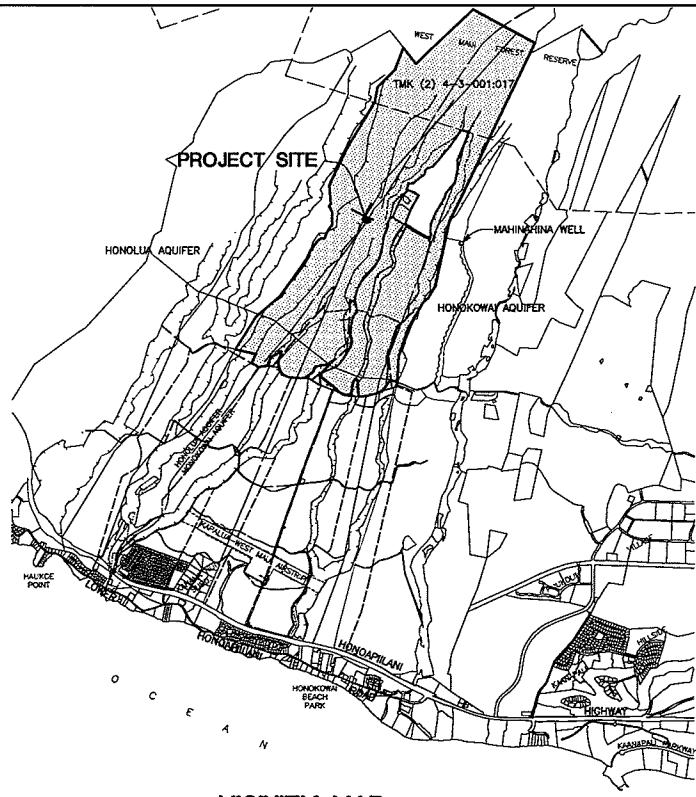
DEPARTMENT OF WATER SUPPLY
COUNTY OF MAUI
200 SOUTH HIGH STREET
WAILUKU, HAWAII 96793

PREPARED BY:



RONALD M. FUKUMOTO ENGINEERING, INC.
Civil Engineering & Land Surveying Consultants
1721 Wili Pa Loop, Suite 203 • Wailuku, Hawaii 96793

WEST MAUI WELL NO. 2 EXPLORATORY
 TAX MAP KEY (2) 4-3-001:017
 DWS JOB NO. 11-06
 LAHAINA, MAUI, HAWAII
TITLE SHEET



APPROVALS:

 DIRECTOR, DEPARTMENT OF WATER SUPPLY
 COUNTY OF MAUI
 (APPROVAL LIMITED TO WATER IMPROVEMENTS WHICH WILL
 BE DEDICATED TO THE DEPARTMENT OF WATER SUPPLY)

 DATE

INDEX OF DRAWINGS:

SHT.	SHT. NO.	DESCRIPTION
1	T-1	TITLE SHEET
2	C-1	CONSTRUCTION EROSION CONTROL BEST MANAGEMENT PRACTICES PLAN
3	C-2	CONSTRUCTION NOTES
4	C-3	GENERAL PLAN
5	C-4	SITE AND GRADING PLAN
6	C-5	WELL SECTION AND DETAILS



THIS WORK WAS PREPARED BY
 ME OR UNDER MY SUPERVISION,
 AND CONSTRUCTION OF THIS PROJECT
 WILL BE UNDER MY OBSERVATION AS
 DEFINED IN H.A.R. 18-115-2.
Ronald M. Fukumoto
 LICENSE EXPIRES: 4/30/2014

DESIGN BY: H.K.
 DRAWN BY: S.W.
 CHECKED BY: R.F.
 DATE: SEPTEMBER 21, 2013
 FILE NO: COM43

SHEET
T-1
 1 OF 6

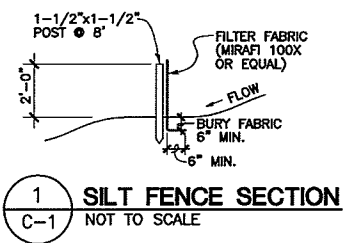
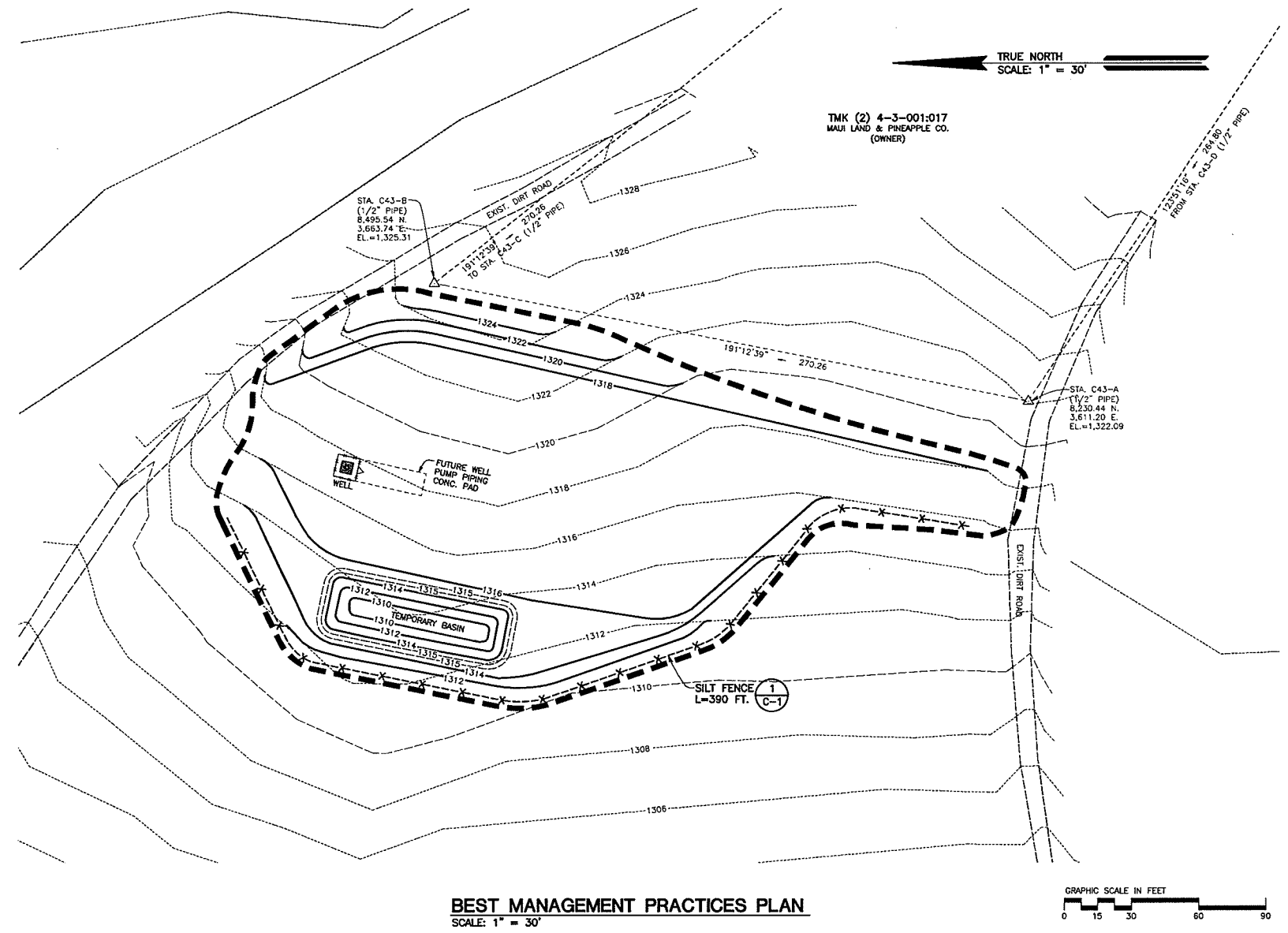
WEST MAUI WELL NO. 2 DWS JOB NO. 11-06

WEST MAUI WELL NO. 2 DWS JOB NO. 11-06

EROSION CONTROL NOTES

THE FOLLOWING IS AN OUTLINE OF THE EROSION CONTROL MEASURES THAT WILL BE IMPLEMENTED FOR THIS PROJECT.

1. GENERAL EROSION CONTROL MEASURES
 - A. MINIMIZE TIME OF CONSTRUCTION.
 - B. RETAIN EXISTING GROUND COVER UNTIL THE LATEST DATE TO COMPLETE CONSTRUCTION.
 - C. PROVIDE TEMPORARY GRAVEL APRON(S) (APPROXIMATELY 50' LONG BY 20' WIDE) AT POINT OF CONNECTION TO PAVED STREET TO PREVENT TRACKING OF SEDIMENTS ONTO STREET.
 - D. CONTROL DUST BY SPRINKLING WITH WATER WAGONS OR OTHER SUITABLE METHODS. GRADED AREAS SHALL BE THOROUGHLY WATERED AFTER CONSTRUCTION ACTIVITY HAS CEASED FOR THE DAY AND ON WEEKENDS.
 - E. USE TEMPORARY BERMS AND CUT-OFF DITCHES, WHERE NEEDED, FOR CONTROL OF EROSION.
 - F. CONSTRUCT PERMANENT EROSION AND DRAINAGE CONTROL FEATURES AS EARLY AS POSSIBLE. ALL CUT AND FILL SLOPES SHALL BE SODDED OR PLANTED IMMEDIATELY AFTER GRADING WORK HAS BEEN COMPLETED.
 - G. MAINTAIN EROSION CONTROL MEASURES UNTIL ESTABLISHMENT OF GRASS AND LANDSCAPE PLANTING.
2. SITE-SPECIFIC EROSION CONTROL MEASURES
 - A. INSTALL SILT FENCES AS NOTED ON PLAN. INSPECT FENCES WEEKLY AND AFTER STORMS. REMOVE AND STABILIZE SEDIMENT WHEN IT REACHES A HEIGHT OF 8 INCHES AT THE FENCE.
3. ADDITIONAL EROSION CONTROL NOTES
 - A. ALL CONTROL MEASURES SHALL BE CHECKED AND REPAIRED AS NECESSARY WEEKLY IN DRY PERIODS AND WITHIN 24 HOURS AFTER ANY RAINFALL OF 1/2 INCH OR GREATER WITHIN A 24-HOUR PERIOD. DURING PROLONGED PERIODS OF RAINFALL, DAILY CHECKING IS NECESSARY. THE PERMITTEE SHALL MAINTAIN RECORDS OF THE DURATION AND ESTIMATED VOLUME OF STORM WATER DISCHARGE(S), CHECKS, AND REPAIRS.
 - B. EROSION AND SEDIMENT CONTROL MEASURES SHALL BE IN PLACE AND FUNCTIONAL BEFORE EARTH MOVING OPERATIONS BEGIN. THESE MEASURES SHALL BE PROPERLY CONSTRUCTED AND MAINTAINED THROUGHOUT THE CONSTRUCTION PERIOD.
 - C. A SPECIFIC INDIVIDUAL SHALL BE DESIGNATED TO BE RESPONSIBLE FOR EROSION AND SEDIMENT CONTROLS ON EACH PROJECT.
 - D. TEMPORARY SOIL STABILIZATION WITH APPROPRIATE VEGETATION SHALL BE APPLIED ON AREAS THAT WILL REMAIN UNFINISHED FOR MORE THAN 30 CALENDAR DAYS.
 - E. PERMANENT SOIL STABILIZATION WITH PERENNIAL VEGETATION OR PAVEMENT SHALL BE APPLIED AS SOON AS PRACTICAL AFTER FINAL GRADING. IRRIGATION AND MAINTENANCE OF THE PERENNIAL VEGETATION SHALL BE PROVIDED FOR 30 DAYS OR UNTIL THE VEGETATION TAKES ROOT, WHICHEVER IS SHORTER.



WEST MAUI WELL NO. 2 EXPLORATORY
TAX MAP KEY (2) 4-3-001:017
DWS JOB NO. 11-06
LAHAINA, MAUI, HAWAII

CONSTRUCTION EROSION CONTROL BEST MANAGEMENT PRACTICES PLAN



THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION AS DEFINED IN HAW. 16-115-2.

Ronald M. Fukumoto
LICENSE EXPIRES: 4/30/2014

REVISED:	DECEMBER 27, 2013
DESIGN BY:	H.K.
DRAWN BY:	S.W.
CHECKED BY:	R.F.
DATE:	SEPTEMBER 21, 2013
FILE NO.:	COM43

CONSTRUCTION NOTES

GENERAL NOTES

- EXISTING CONTOURS AND FEATURES ARE BASED TOPOGRAPHIC SURVEY PERFORMED BY RONALD M. FUKUMOTO ENGINEERING, INC. ON APRIL 12 THROUGH MAY 6, 2013.
- ELEVATIONS SHOWN ARE BASED REFERENCE MARK (RM15) SHOWN ON FIRM COMMUNITY-PANEL 150003 0151 C. RM15 IS A SQUARE CUT ON TOP OF PARAPET AT THE NORTHEAST CORNER OF LOWER HONAPILANI ROAD BRIDGE OVER MAHINAHINA GULCH. ELEVATION = 22.6 FEET ABOVE MEAN SEA LEVEL. BENCH MARK CARRIED TO STREET MONUMENT LOCATED AT INTERSECTION OF MAHINAHINA STREET AND AKAHELE STREET. ELEVATION = 55.01 FEET ABOVE MEAN SEA LEVEL.
- PROJECT BENCH MARK IS A 1/2-INCH PIPE SET ON THE SOUTHERLY SIDE OF THE EXPLORATORY WELL SITE ALONG A DIRT ROAD. ELEVATION=1,322.09 FEET ABOVE MEAN SEA LEVEL.
- SHOULD HISTORIC SITES SUCH AS WALLS, PLATFORMS, PAVEMENTS AND MOUNDS, OR REMAINS SUCH AS ARTIFACTS, BURIALS, CONCENTRATION OF CHARCOAL OR SHELLS BE ENCOUNTERED DURING CONSTRUCTION WORK, WORK SHALL CEASE IN THE IMMEDIATE VICINITY OF THE FIND AND THE FIND SHALL BE PROTECTED FROM FURTHER DAMAGE. THE CONTRACTOR SHALL IMMEDIATELY CONTACT THE STATE HISTORIC PRESERVATION DIVISION (PH: 243-1285 OR 243-4640), WHICH WILL ASSESS THE SIGNIFICANCE OF THE FIND AND RECOMMEND MITIGATION MEASURES, IF NECESSARY.
- PURSUANT TO CHAPTER 6E OF THE HAWAII REVISED STATUTES, ALL CONTRACTORS SHALL ENSURE THAT IN THE EVENT THAT ANY HUMAN SKELETAL REMAINS ARE INADVERTENTLY DISCOVERED DURING CONSTRUCTION, THE REMAINS SHALL NOT BE MOVED AND ANY ACTIVITY IN THE IMMEDIATE AREA THAT COULD DAMAGE THE REMAINS OR THE POTENTIAL HISTORIC SITE SHALL CEASE AND THE DEPARTMENT OF LAND AND NATURAL RESOURCES' HISTORIC PRESERVATION DIVISION (PH: 243-1285 OR 243-4640), THE APPROPRIATE MEDICAL EXAMINER OR CORONER, AND THE POLICE DEPARTMENT (TELEPHONE: 244-6400), SHALL BE CONTACTED.

GRADING NOTES

- FINISH SPOT ELEVATIONS AND FINISH CONTOURS, AS SHOWN ON PLAN REPRESENTS FINISH GRADING.
- THE CONTRACTOR SHALL IMPLEMENT AND MAINTAIN THE MEASURES OF THE BEST MANAGEMENT PRACTICE (BMP) PLAN. ALL GRADING OPERATIONS SHALL BE PERFORMED IN CONFORMANCE WITH THE APPLICABLE PROVISIONS OF THE WATER POLLUTION CONTROL AND WATER QUALITY STANDARDS CONTAINED IN THE PUBLIC HEALTH REGULATIONS, STATE DEPARTMENT OF HEALTH, ON WATER POLLUTION CONTROL AND WATER QUALITY STANDARDS.
- THE CONTRACTOR SHALL REMOVE ALL SILT AND DEBRIS RESULTING FROM HIS WORK AND DEPOSITED IN DRAINAGE FACILITIES, ROADWAYS, AND OTHER AREAS. THE COSTS INCURRED FOR ANY NECESSARY REMEDIAL ACTION BY THE STATE DEPARTMENT OF HEALTH SHALL BE PAYABLE BY THE CONTRACTOR.
- THE CONTRACTOR, AT HIS EXPENSE, SHALL KEEP THE PROJECT AREA AND SURROUNDING AREA FREE OF DUST NUISANCE. THE WORK SHALL BE IN CONFORMANCE WITH THE AIR POLLUTION CONTROL STANDARDS AND REGULATIONS OF THE STATE DEPARTMENT OF HEALTH.
- CONSTRUCTION DEBRIS AND WASTES SHALL BE DEPOSITED AT AN APPROPRIATE SITE. THE CONTRACTOR SHALL INFORM THE ENGINEER OF THE LOCATION OF DISPOSAL SITES. THE DISPOSAL SITE MUST ALSO FULFILL REQUIREMENTS OF THE GRADING ORDINANCES.
- THE CONTRACTOR SHALL NOT DEMOLISH OR CLEAR ANY STRUCTURE, SITE OR VACANT LOT WITHOUT FIRST ASCERTAINING THE PRESENCE OR ABSENCE OF RODENTS WHICH MAY ENDANGER THE PUBLIC HEALTH BY DISPERSAL FROM SUCH PREMISES. SHOULD SUCH INSPECTION REVEAL THE PRESENCE OF SUCH RODENTS, THE CONTRACTOR SHALL ERADICATE SUCH RODENTS BEFORE DEMOLISHING OR CLEARING SAID STRUCTURE, SITE OR VACANT LOT.
- THE FOLLOWING MEASURES SHALL BE TAKEN TO CONTROL DUST AND EROSION DURING THE SITE DEVELOPMENT PERIOD:

- MINIMIZE TIME OF CONSTRUCTION.
- RETAIN EXISTING GROUND COVER UNTIL THE LATEST DATE TO COMPLETE CONSTRUCTION.
- CONSTRUCT REMAINING PERMANENT EROSION AND DRAINAGE CONTROL FEATURES AS EARLY AS POSSIBLE.
- USE TEMPORARY AREA SPRINKLERS IN NON-ACTIVE CONSTRUCTION AREAS WHEN GROUND COVER IS REMOVED.
- STATION WATER TRUCK ON-SITE DURING CONSTRUCTION PERIOD TO PROVIDE FOR IMMEDIATE SPRINKLING, AS NEEDED, IN ACTIVE CONSTRUCTION AREAS (WEEKENDS AND HOLIDAYS INCLUDED).
- USE TEMPORARY BERMS AND CUT-OFF DITCHES, WHERE NEEDED, FOR CONTROL OF EROSION. IMPLEMENT AND MAINTAIN THE MEASURES OF THE BMP PLAN.
- GRADED AREAS SHALL BE THOROUGHLY WATERED AFTER CONSTRUCTION ACTIVITY HAS CEASED FOR THE DAY AND ON WEEKENDS.
- ALL CUT AND FILL SLOPES SHALL BE SOGGED OR PLANTED IMMEDIATELY AFTER GRADING WORK HAS BEEN COMPLETED.

COMPACTION REQUIREMENTS

- TESTING OF MATERIALS SHALL BE CONDUCTED BY AN APPROVED INDEPENDENT TESTING AGENCY IN ACCORDANCE WITH ASTM STANDARD METHODS OR AS SPECIFIED BY THE DEPARTMENT OF PUBLIC WORKS, ENGINEERING DIVISION, AS FOLLOWS:
 - EMBANKMENT/SELECT BORROW AND SUBGRADE MATERIALS: ONE (1) COMPACTION TEST PER 600 SQUARE YARDS, PER LIFT OF MATERIAL.
 - AGGREGATE SUBBASE COURSE: ONE (1) COMPACTION TEST PER 400 SQUARE YARDS, PER LIFT OF MATERIAL; ONE (1) GRADATION AND SAND EQUIVALENT TEST PER PROJECT;
 - AGGREGATE BASE COURSE: ONE (1) COMPACTION TEST PER 300 SQUARE YARDS, PER LIFT OF MATERIAL; ONE (1) GRADATION AND SAND EQUIVALENT TEST PER PROJECT;
 - ASPHALT CONCRETE PAVEMENT OR ASPHALT TREATED BASE COURSE: THREE (3) A.C. CORES FOR THICKNESS AND DENSITY TESTS PER PROJECT;
 - TRENCH BACKFILL MATERIAL: ONE (1) TEST FOR EACH 300 LINEAL FEET OF TRENCH PER LIFT OF MATERIAL.
- CONTRACTOR SHALL SUBMIT ALL TESTING REPORTS INCLUDING RESULTS TO THE COUNTY'S INSPECTION AGENCY FOR REVIEW AND APPROVAL PRIOR TO COUNTY'S ACCEPTANCE OF WORK.
- THE CONTRACTOR SHALL BE REQUIRED TO NOTIFY THE COUNTY OF ANY TESTING FAILURES AND CORRECT EACH FAILURE PRIOR TO PROCEEDING TO THE NEXT PHASE OF CONSTRUCTION. NONCOMPLIANCE WILL REQUIRE REMOVAL OF ALL SUBSEQUENT WORK TO CORRECT THE AREA OF FAILURE. ALL COSTS OF TESTING, REMOVAL, AND RECONSTRUCTION, SHALL BE BORNE BY THE CONTRACTOR.

WATER SYSTEM

- THE CONTRACTOR SHALL NOTIFY THE DEPARTMENT OF WATER SUPPLY (DWS), IN WRITING, ONE (1) WEEK PRIOR TO COMMENCEMENT OF WORK.
- ALL MATERIALS USED AND METHOD OF CONSTRUCTION OF WATER SYSTEM FACILITIES SHALL BE IN ACCORDANCE WITH THE LATEST REVISIONS OF DWS STANDARDS. CONTRACTOR SHALL OBTAIN THE LATEST REVISIONS OF THE DWS STANDARD DETAILS BEFORE COMMENCING CONSTRUCTION.
- ALL WATER SYSTEM WORK SHALL BE PERFORMED BY CONTRACTORS POSSESSING VALID STATE OF HAWAII CONTRACTOR'S LICENSES, REGARDLESS OF THE VALUE OF THE WORK.
- THE EXACT DEPTH AND LOCATION OF EXISTING WATERLINES, SERVICE LATERALS AND OTHER UTILITIES ARE NOT KNOWN. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO LOCATE SAME PRIOR TO TRENCHING FOR THE NEW WATERLINE. THE COST OF LOWERING, RELOCATING OR ADJUSTING EXISTING WATERLINES, SERVICE LATERALS AND OTHER UTILITIES SHALL BE CONSIDERED INCIDENTAL TO THE COST OF THE NEW WATERLINE, UNLESS NOTED OTHERWISE, AND WILL NOT BE PAID FOR SEPARATELY.
- CONCRETE FOR REACTION BLOCKS AND ANCHOR BLOCKS SHALL BE DWS CLASS 2500.
- THE MAXIMUM DISTANCE BETWEEN VALVE NUT AND TOP OF VALVE MAN-HOLE COVER SHALL BE THREE (3) FEET.
- THE CONTRACTOR SHALL SUBMIT A MATERIALS LIST TO DWS FOR APPROVAL PRIOR TO CONSTRUCTION.
- CONNECTION TO DWS SYSTEM:
 - THE CONTRACTOR SHALL BE RESPONSIBLE FOR FURNISHING ALL NECESSARY FITTINGS AND OTHER MATERIALS AND EQUIPMENT REQUIRED FOR THE HOOK-UP. HE SHALL VERIFY THE EXACT LOCATION, DEPTH, TYPE, AND CONDITION OF THE EXISTING LINE BEFORE ORDERING MATERIALS FOR THE HOOK-UP. HE SHALL, HOWEVER, CHECK WITH DWS BEFORE EXCAVATING FOR VERIFICATION PURPOSES.
 - WHENEVER FEASIBLE, MECHANICAL JOINT FITTINGS SHALL BE USED FOR BURIED APPLICATIONS, AND FLANGED JOINT FITTINGS SHALL BE USED FOR EXPOSED APPLICATIONS.
 - AUTHORIZED DWS PERSONNEL MAY BE REQUIRED TO MAKE THE FINAL CONNECTION TO THE EXISTING LINE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL COSTS INCURRED BY DWS FOR SAID WORK, INCLUDING THE COST OF PRESSURE TESTING AND DISINFECTION.
 - IF THE DWS PROVIDES ONLY INSPECTION AND SUPERVISING OPERATORS, AND DOES NOT PROVIDE PERSONNEL FOR THE ACTUAL CONNECTION, THE CONTRACTOR SHALL PROVIDE ALL PIPEFITTERS AND LABORS TO MAKE THE CONNECTION.
 - THE CONTRACTOR SHALL BE RESPONSIBLE FOR FURNISHING ALL MATERIAL, EQUIPMENT AND LABOR FOR TRENCH EXCAVATION, BACKFILLING, CLEANING AND CHLORINATION, PAVING, AND OTHER WORK NECESSARY TO COMPLETE THE HOOK-UP, AS DIRECTED BY AND TO THE SATISFACTION OF DWS.
 - MINIMUM COVER OVER WATER MAIN, 6" DIAMETER OR LARGER, SHALL BE 3'-0". MINIMUM COVER FOR 4" DIAMETER SHALL BE 2'-6". MINIMUM COVER FOR DIAMETERS LESS THAN 4" SHALL BE 1'-6".
 - BOLTS FOR EXPOSED FLANGED DUCTILE IRON PIPE JOINTS SHALL BE EITHER SILICON BRONZE BOLTS AND NUTS OR 316 STAINLESS STEEL BOLTING WITH THE HEAVY DUTY STAINLESS STEEL NUTS (ONLY) FURNISHED WITH TRIPAC 2000 BLUE COATING SYSTEM. ANTI-SIZE SHALL NOT BE USED. T-BOLTS FOR DUCTILE IRON MECHANICAL JOINT (MJ) PIPE AND FITTING CONNECTIONS IN UNDERGROUND SITUATIONS SHALL BE ONE OF THE FOLLOWING SYSTEMS:
 - 316 STAINLESS STEEL T-BOLTS WITH THE HEAVY DUTY STAINLESS STEEL NUTS (ONLY) FURNISHED WITH TRIPAC 2000 BLUE COATING SYSTEM. ANTI-SIZE SHALL NOT BE USED.
 - COR-TEN T-BOLTS AND NUTS WITH HIGH GRADE ZINC SACRIFICIAL ANODES, EQUIVALENT TO "DURATRON" SACRIFICIAL "SAC-NUT" MODULES, INSTALLED ON THE NUTS FOR ALL STANDARD COR-TEN T-BOLTS.
 - COR-TEN T-BOLTS AND NUTS BOTH FACTORY COATED WITH TRIPAC 2000 BLUE COATING SYSTEM BY "TRIPAC FASTENERS".
 - ALL BURIED METALS SHALL BE WRAPPED WITH POLY-WRAP. FOR ALL BURIED INSTALLATIONS OF DUCTILE IRON PIPE AND FITTINGS, POLY-WRAP IS REQUIRED EXCEPT WITHIN CONCRETE JACKETS.
 - LUBRICATE HYDRANT NOZZLE THREADS WITH NON-TOXIC GREASE.
 - THE CONTRACTOR SHALL PAINT AND NUMBER THE FIRE HYDRANT. NUMBERING TO BE FURNISHED BY DWS.
 - WATER MAINS AND APPURTENANCES SHALL BE SUBJECT TO HYDROSTATIC TESTING IN ACCORDANCE WITH THE LATEST REVISION OF AWWA C600, UNDER THE "HYDROSTATIC TESTING" SECTION, TO A PRESSURE OF AT LEAST 1.5 TIMES THE WORKING PRESSURE, UNLESS OTHERWISE STATED IN THE CONSTRUCTION DOCUMENTS OR LIMITED BY THE PRESSURE RATING OF EQUIPMENT. THE PRESSURE TEST AND LEAKAGE TEST SHALL BE PERFORMED AT 225 POUNDS PER SQUARE INCH PRESSURE.
 - THE DEVELOPER SHALL SUBMIT A COST LIST ALONG WITH AN AFFIDAVIT FOR THE WATER SYSTEM PRIOR TO ACCEPTANCE.
 - THE CONTRACTOR SHALL SUBMIT TWO SETS OF RECORD DRAWINGS VIA A CONSULTANT PRIOR TO ACCEPTANCE OF THE WATER SYSTEM. AN ELECTRONIC IMAGE FILE IN TIF FORMAT SHALL BE PROVIDED TO THE DWS FOR ALL PROJECTS.

REVISED: 12/1/07



RONALD M. FUKUMOTO ENGINEERING, INC.
Civil Engineering & Land Surveying Consultants

1721 Wili Pa Loop, Suite 203
Wailuku, Hawaii 96793

Phone: (808) 242-8611
Fax: (808) 244-7510
E-mail: office@rfemaui.com
Contact: Mandy Saito, P.E.

Prepared for:
Department of Water Supply
County of Maui
200 South High Street
Wailuku, Maui, Hawaii 96793
Contact: Curtis Eaton, P.E.

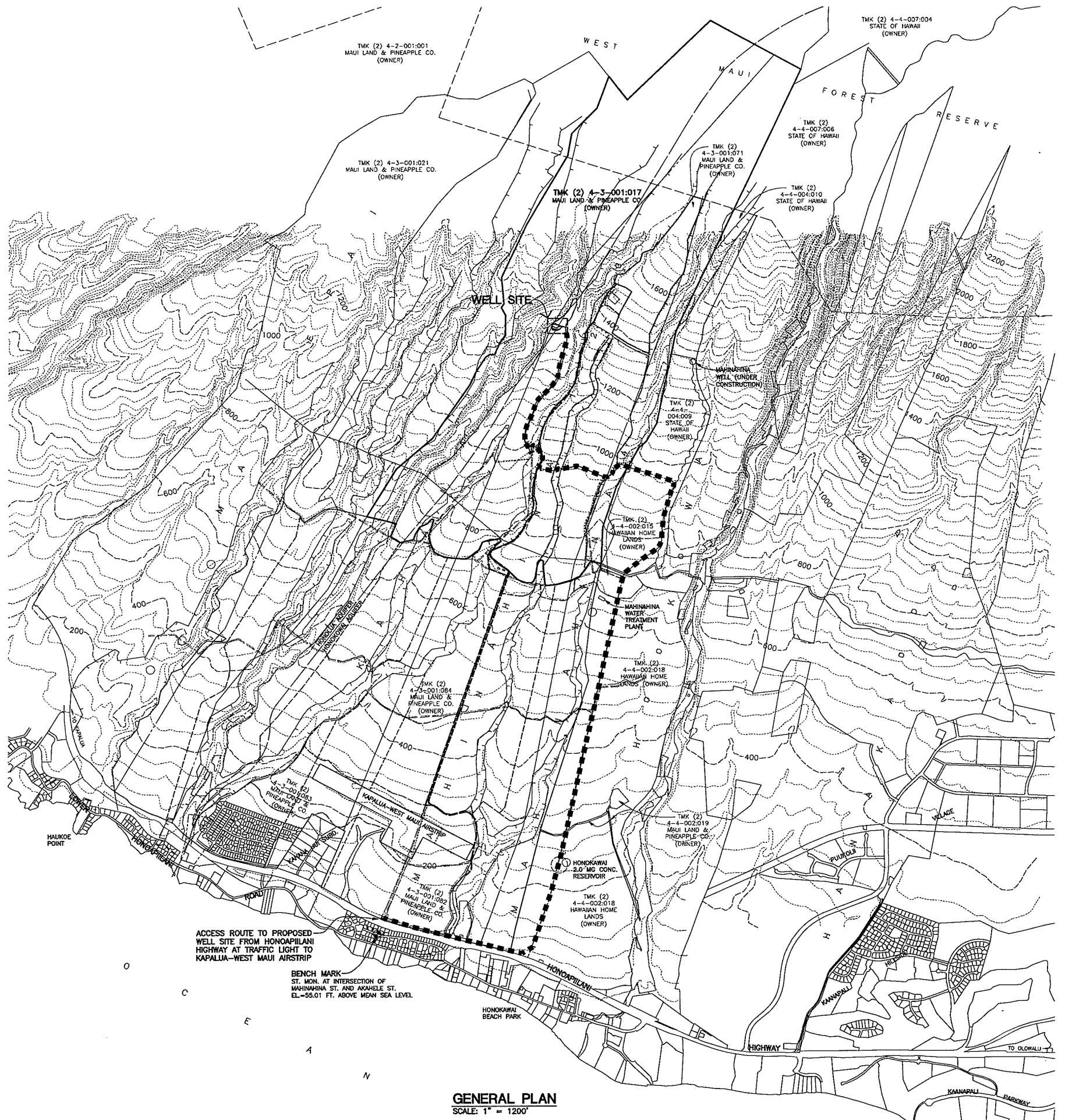
WEST MAUI WELL NO. 2 EXPLORATORY
 TAX MAP KEY (2) 4-3-00107
 DWS JOB NO. 11-06
 LAHAINA, MAUI, HAWAII
CONSTRUCTION NOTES



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FILE NO: COM43

SHEET
C-2
3 OF 6



TRUE NORTH
SCALE: 1" = 1200'

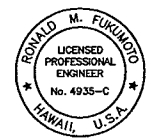


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Civil Engineering & Land Surveying Consultants
1721 Wili Pa Loop, Suite 203
Wailuku, Hawaii 96793

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Wailuku, Maui, Hawaii 96793
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WEST MAUI WELL NO. 2 EXPLORATORY
TAX MAP KEY (2) 4-3-001017
DWS JOB NO. 11-06
LAHAINA, MAUI, HAWAII
GENERAL PLAN



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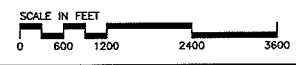
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SHEET C-3
4 OF 6

ACCESS ROUTE TO PROPOSED WELL SITE FROM HONOAPILANI HIGHWAY AT TRAFFIC LIGHT TO KAPALUA-WEST MAUI AIRSTRIP

BENCH MARK
ST. MON. AT INTERSECTION OF MAHINAHINA ST. AND AKAHELE ST.
EL. = 55.01 FT. ABOVE MEAN SEA LEVEL

GENERAL PLAN
SCALE: 1" = 1200'



TRUE NORTH
SCALE: 1" = 20'

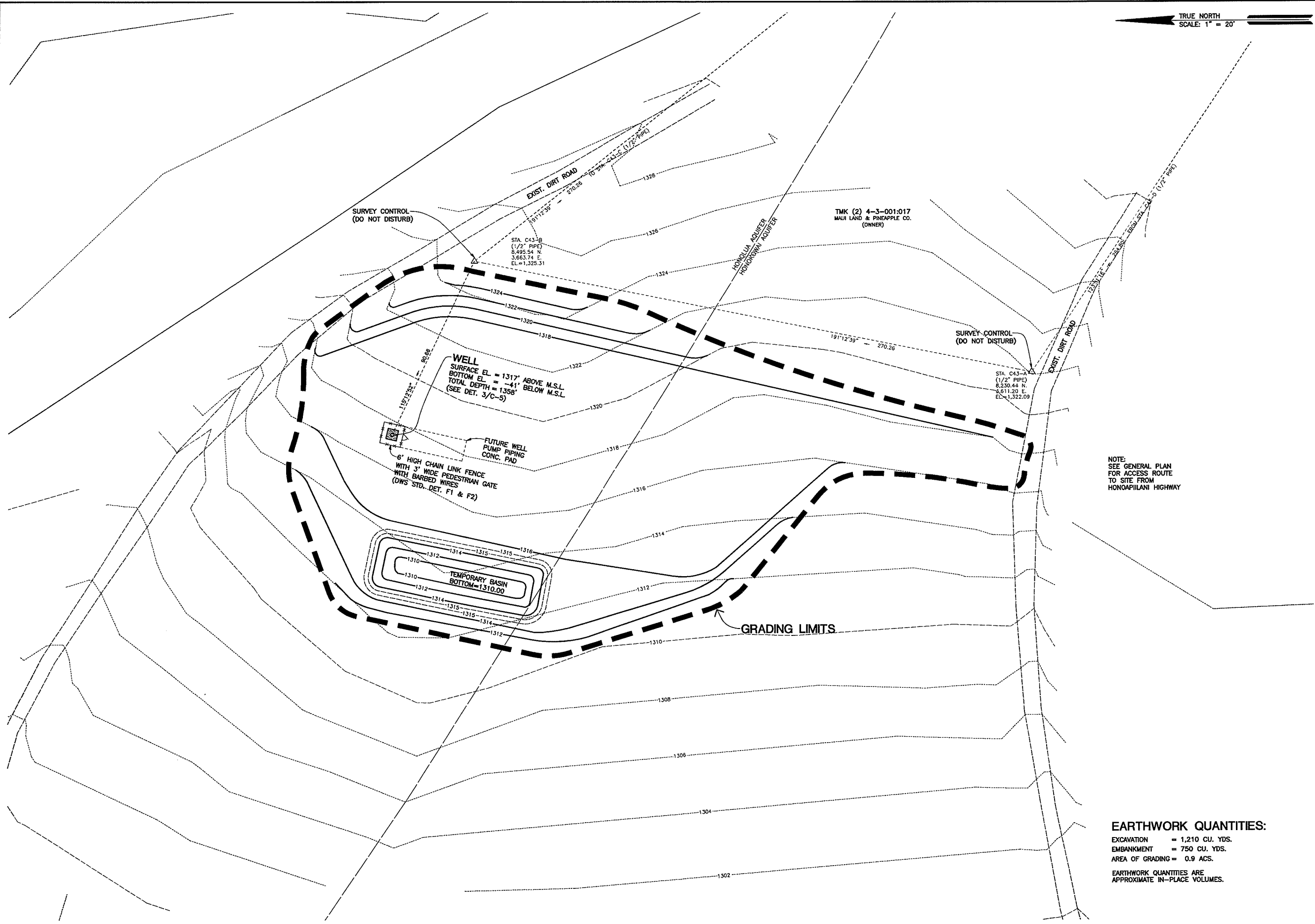


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ENGINEERING, INC.
Civil Engineering &
Land Surveying Consultants
1721 Wil Pa Loop, Suite 203
Waikuku, Hawaii 96793

Phone: (808) 242-8611
Fax: (808) 244-7510
E-mail: office@rfemaui.com
Contact: Mandy Saito, P.E.

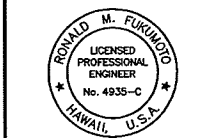
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Department of Water Supply
County of Maui
200 South High Street
Waikuku, Maui, Hawaii 96793
Contact: Curtis Eaton, P.E.

WEST MAUI WELL NO. 2 EXPLORATORY
TAX MAP KEY (2) 4-3-001017
DWS JOB NO. 11-06
LAHAINA, MAUI, HAWAII
SITE AND GRADING PLAN



NOTE:
SEE GENERAL PLAN
FOR ACCESS ROUTE
TO SITE FROM
HONOAPILANI HIGHWAY

EARTHWORK QUANTITIES:
EXCAVATION = 1,210 CU. YDS.
EMBANKMENT = 750 CU. YDS.
AREA OF GRADING = 0.9 ACS.
EARTHWORK QUANTITIES ARE
APPROXIMATE IN-PLACE VOLUMES.



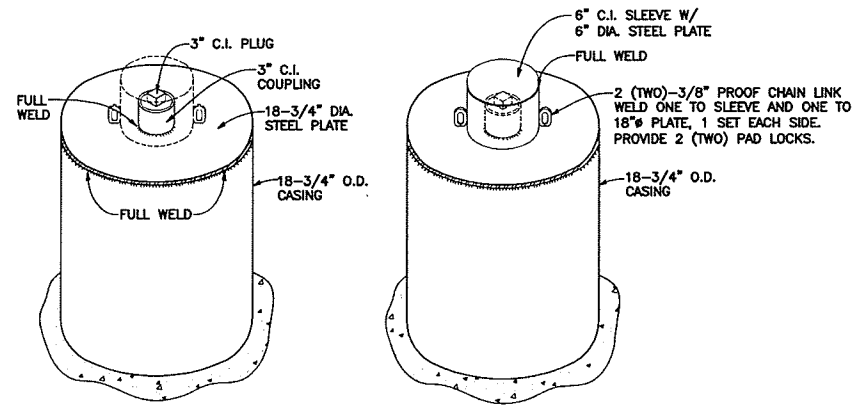
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WILL BE UNDER MY OBSERVATION AS
DEFINED IN H.A.R. 16-115-2.
Ronald M. Fukumoto
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REVISED: DECEMBER 27, 2013
DESIGN BY: H.K.
DRAWN BY: S.W.
CHECKED BY: R.F.
DATE: SEPTEMBER 21, 2013
FILE NO: COM43

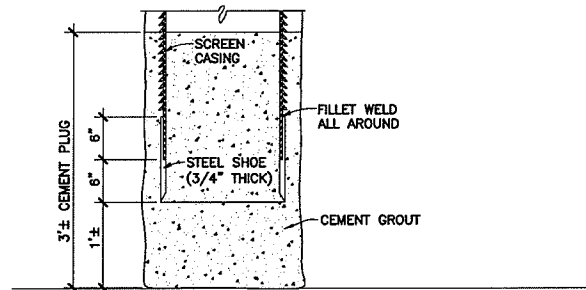
SHEET
C-4
5 OF 6

SITE AND GRADING PLAN
SCALE: 1" = 20'





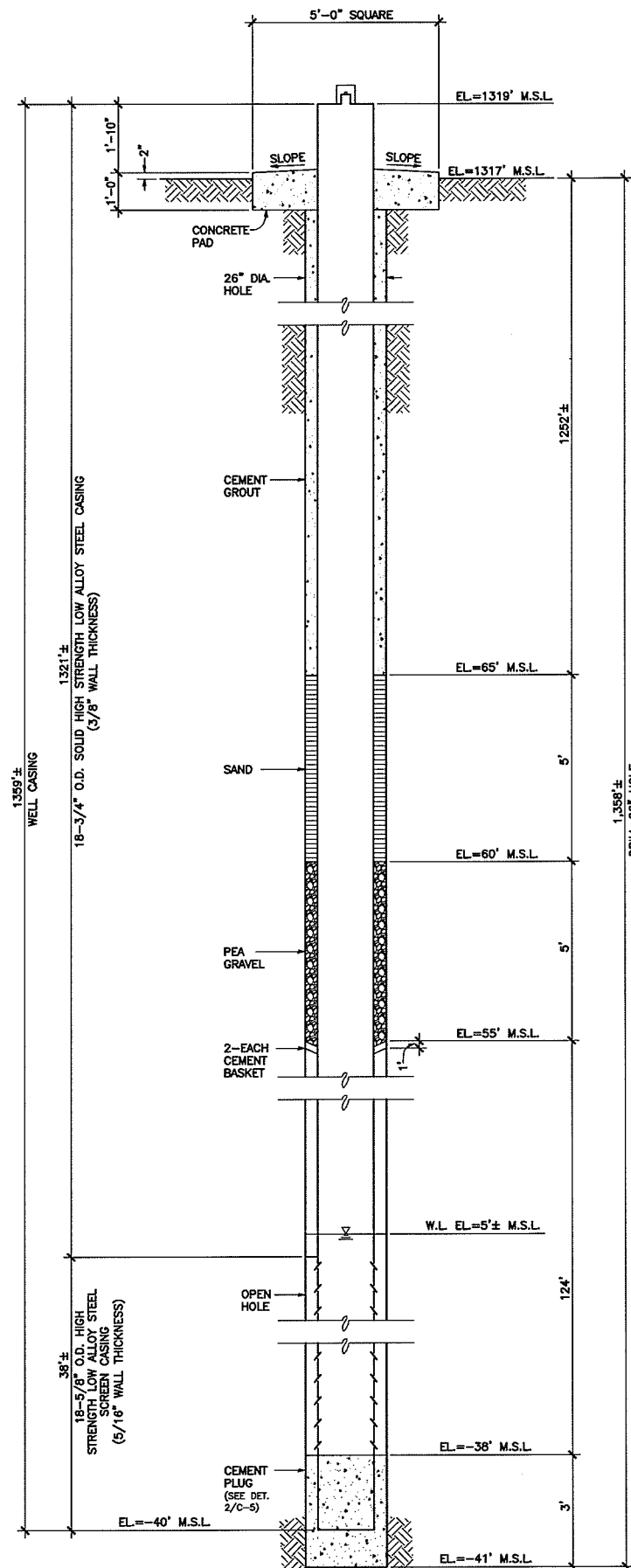
1 **WELL CAPPING DETAIL**
C-5 NOT TO SCALE



2 **STEEL SHOE WITH CEMENT PLUG**
C-5 SCALE: 1" = 1'-0"

SEQUENCE OF WORK

1. DRILL 12-INCH PILOT HOLE. MEASURE WATER LEVELS WHEN AQUIFER IS ENCOUNTERED. CLEAN AND VIDEO LOG PILOT HOLE. CONTINUOUSLY CHECK PLUMBNESS WHILE DRILLING HOLE.
2. REAM PILOT HOLE TO 26 INCHES AND BAIL TO REMOVE SEDIMENT TO BOTTOM OF REAMED HOLE.
3. DETERMINE AQUIFER HEAD AND SALINITY.
4. RUN PRELIMINARY PLUMBNESS AND ALIGNMENT TEST OF COMPLETED DRILLED HOLE AS DEEMED NECESSARY TO ASSURE HOLE ALIGNMENT AND PLUMBNESS.
5. RUN VIDEO LOG AFTER WELL WATER HAS CLEARED.
6. INSTALL WELL CASING AND DOUBLE CEMENT BASKETS.
7. SET WELL CASING TO FINAL DEPTH AND POUR CEMENT PLUG. RUN PRELIMINARY PLUMBNESS AND ALIGNMENT TEST OF CASED HOLE AS DEEMED NECESSARY.
8. INSTALL TEST PUMP OR VIDEO CAMERA.
9. FILL ANNULAR SPACE WITH AGGREGATE, SAND AND CEMENT GROUT. OPERATE TEST PUMP OR VIDEO CAMERA TO MONITOR OPERATIONS WHILE FILLING THE ANNULAR SPACE.
10. MEASURE STATIC WATER LEVEL.
11. DEVELOP THE WELL BY PUMP SURGING THE WELL.
12. CONDUCT STEP-DRAWDOWN TEST AS DIRECTED BY DWS.
13. CONDUCT CONSTANT-RATE (96 HOURS) TEST AS DIRECTED BY DWS.
14. OBTAIN WATER QUALITY SAMPLES DURING THE CONSTANT-RATE PUMP TEST.
15. RUN PLUMBNESS AND ALIGNMENT TEST OF THE CASED WELL IN THE PRESENCE OF DWS.
16. CAP WELL, CLEAN UP, AND DEMOBILIZE. ESTABLISH A PERMANENT BENCH MARK ADJACENT TO THE WELL AND DETERMINE THE TOP OF CASING ELEVATION. BENCH MARK ELEVATION AND TOP OF CASING ELEVATION SHALL BE ESTABLISHED BY A LICENSED PROFESSIONAL LAND SURVEYOR LICENSED IN THE STATE OF HAWAII.



3 **WELL SECTION**
C-5 SCALE: 1/2" = 1'-0"



RONALD M. FUKUMOTO
ENGINEERING, INC.
Civil Engineering & Land Surveying Consultants
1721 Wai Pa Loop, Suite 203
Wailuku, Hawaii 96793

Phone: (808) 242-8611
Fax: (808) 244-7510
E-mail: office@rfermaui.com
Contact: Mandy Saito, P.E.

Prepared for:
Department of Water Supply
County of Maui
200 South High Street
Wailuku, Maui, Hawaii 96793
Contact: Curtis Eaton, P.E.

WEST MAUI WELL NO. 2 EXPLORATORY
TAX MAP KEY (2) 4-3-00107

DWS JOB NO. 11-06
LAHAINA, MAUI, HAWAII

WELL SECTION AND DETAILS



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SHEET
C-5

APPENDIX B.
Biological Resources Survey

BIOLOGICAL RESOURCES SURVEY
for the
WEST MAUI WELL No.2 EXPLORATORY PROJECT
KAHANA, LAHAINA, MAUI

by

Robert W. Hobdy
Environmental Consultant
Kokomo, Maui
September 2013

Prepared for:
Department of Water Supply
Maui County

**BIOLOGICAL RESOURCES SURVEY
WEST MAUI WELL No.2 EXPLORATORY PROJECT
KAHANA, LAHAINA, HAWAII**

INTRODUCTION

The West Maui Well no. 2 Exploratory Project lies on a narrow ridge top in upper Kahana, West Maui, TMK (2) 4-3-01:17 (por.). This approximately one acre site is situated on abandoned agricultural land that is overgrown with grass (see Figures 1 and 2). This biological study was initiated in fulfillment of environmental requirements of the planning process.

SITE DESCRIPTION

This site lies on gently sloping former pineapple field land that is now overgrown with four-foot deep grass and a few scattered young trees. Two steep-sided forested gulches, Kahana Gulch and Kahana iki Gulch, run down on either side of this narrow ridge top (see Figures 3 and 4). This site lies between the elevations of 1,310 feet and 1,325 feet above sea level. The soil is classified as Olelo Silty Clay, 3 – 15% slopes (OFC) (Foote et al, 1972) which is a deep, well-drained, dark reddish-brown, strongly-acid soil. Annual rainfall averages between 70 inches and 75 inches with most falling during winter storms (Armstrong, 1983).

SITE HISTORY

This ridge top was once a native forest with a great variety of trees, shrubs, vines and ferns, including : 'ōhi'a (*Metrosideros polymorpha*), 'a'ali'i (*Dodonaea viscosa*), alahe'e (*Psychrax odorata*), lama (*Diospyros sandwicensis*), pūkiawe (*Leptecophylla tameiameia*), ūlei (*Osteomeles anthyllidifolia*), 'ākia (*Wikstroemia oahuensis*), kilau fern (*Pteridium aquilinum* var. *decompositum*), 'ōkupukupu (*Nephrolepis exaltata*) and uluhe fern (*Dicranopteris linearis*). All of these and others still thrive in the nearby gulches.

In the early 1900s this ridge top was cleared and converted to pineapple agriculture. The site has been plowed, planted and cultivated for over 70 years. These fields were abandoned in the 1990s and the land has lain fallow for over 15 years.

Today the site is overgrown with a dense layer of grass and a few small trees are scattered throughout the area.

SURVEY OBJECTIVES

This report summarizes the findings of a flora and fauna survey of the West Maui Well No.2 Exploratory project that was conducted in September 2013. The objectives of the survey were to:

1. Document what plant and animal species occur on the property or may likely occur in the existing habitat.
2. Document the status and abundance of each species.
3. Determine the presence or likely occurrence of any native flora and fauna, particularly any that are Federally listed as Threatened or Endangered. If such occur, identify what features of the habitat may be essential for these species.
4. Determine if the project area contains any special habitats which if lost or altered might result in a significant negative impact on the flora and fauna in this part of the island.

BOTANICAL SURVEY REPORT

SURVEY METHODS

A walk-through botanical survey method was used following routes that would ensure complete coverage of the property. Areas most likely to harbor native or rare plants were more intensively examined. Notes were made on plant species, distribution and abundance as well as on terrain and substrate.

DESCRIPTION OF THE VEGETATION

The vegetation on the entire project area is a nearly monotypic stand of molasses grass (*Melinis minutiflora*) that is very dense and about four feet deep. Two other species are uncommon, the flooded gum (*Eucalyptus rudis*) and cane tibouchina (*Tibouchina herbacea*).

A total of only 8 non-native plant species were recorded during the survey. No native plant species were found in the project area.

DISCUSSION AND RECOMMENDATIONS

The vegetation within this project area is dominated by molasses grass, an aggressive, non-native species that forms a dense growth that covers 95% of the site. The remaining seven species are all non-native plants as well, and are of no conservation interest or concern. No native plant species were recorded.

As mentioned above, several common native species thrive in the nearby, steep-sided gulches where they have always grown. None of these are rare and none have protected status.

PLANT SPECIES LIST

Following is a checklist of all those vascular plant species inventoried during the field studies. Plant families are arranged alphabetically within two groups: Monocots and Dicots. Taxonomy and nomenclature of the flowering plants are in accordance with Wagner et al. (1999).

For each species, the following information is provided:

1. Scientific name with author citation
2. Common English or Hawaiian name.
3. Bio-geographical status. The following symbols are used:

endemic = native only to the Hawaiian Islands; not naturally occurring anywhere else in the world.

indigenous = native to the Hawaiian Islands and also to one or more other geographic area(s).

Polynesian introduction = plants introduced to Hawai'i in the course of Polynesian migrations and prior to western contact.

non-native = all those plants brought to the islands intentionally or accidentally after western contact.

4. Abundance of each species within the project area:

abundant = forming a major part of the vegetation within the project area.

common = widely scattered throughout the area or locally abundant within a portion of it.

uncommon = scattered sparsely throughout the area or occurring in a few small patches.

rare = only a few isolated individuals within the project area.

SCIENTIFIC NAME	COMMON NAME	STATUS	ABUNDANCE
MONOCOTS			
BROMELIACEAE (Bromeliad Family)			
<i>Ananas comosus</i> (L.) Merrill	pineapple	non-native	rare
POACEAE (Grass Family)			
<i>Andropogon virginicus</i> L.	broomsedge	non-native	rare
<i>Melinis minutiflora</i> P. Beauv.	molasses grass	non-native	abundant
<i>Paspalum conjugatum</i> Bergius	Hilo grass	non-native	rare
<i>Paspalum urvillei</i> Steud.	Vasey grass	non-native	rare
DICOTS			
FABACEAE (Pea Family)			
<i>Indigofera suffruticosa</i> Mill.	'inikō	non-native	rare
MELASTOMATACEAE (Melastoma Family)			
<i>Tibouchina herbacea</i> (DC.) Cogn.	cane tibouchina	non-native	uncommon
MYRTACEAE (Myrtle Family)			
<i>Eucalyptus rudis</i> Endl.	flooded gum	non-native	uncommon

FAUNA SURVEY REPORT

SURVEY METHODS

A walk-through survey method was conducted in conjunction with the botanical survey. All parts of the project area were covered. Field observations were made with the aid of binoculars and by listening to vocalizations. Notes were made on species, abundance, activities and location as well as observations of trails, tracks, scat and signs of feeding. In addition an evening visit was made to the area to record crepuscular activities and vocalizations and to see if there was any evidence of occurrence of the Hawaiian hoary bat (*Lasiurus cinereus semotus*), the Hawaiian petrel (*Pterodroma sandwichensis*) or the Newell's shearwater (*Puffinus newelli*) in the area.

RESULTS

MAMMALS

Sign of just one non-native mammal species was seen during two site visits to the project area. Taxonomy and nomenclature follow Tomich (1986).

Rooting activity of feral pigs (*Sus scrofa*) was seen along the margin of the project area. A few other non-native mammals would be expected to occur in the project area. These include rats (*Rattus* spp.), mice (*Mus domesticus*), mongoose (*Herpestes auropunctatus*) and possibly feral cats (*Felis catus*). Rats and mice feed on seeds, fruits, herbaceous vegetation and bird eggs, while mongoose and cats feed on these rodents and birds.

A special effort was made to look for sign of the Hawaiian hoary bat by making an evening survey at two locations in the project area. When present in an area these bats can be easily identified as they forage for insects, their distinctive flight patterns clearly visible in the glow of twilight. No bats were seen though visibility was excellent. In addition a bat detection device (Batbox IIID) was employed, set to the frequency of 27,000 hertz which these bats are known to use in echolocation. No bats were detected using this device either.

BIRDS

Birdlife was rather sparse on and around this dense molasses grass habitat. Taxonomy and nomenclature follow American Ornithologists' Union (2011). Just four bird species were seen. This included zebra dove (*Geopelia striata*), nutmeg mannikin (*Lonchura punctulata*), Japanese white-eye (*Zosterops japonicus*) and spotted dove (*Streptopelia chinensis*). None of these were common. A few other non-native bird species might be expected to occur here, including the house finch (*Carpodacus mexicanus*) and the common myna (*Acridotheres tristis*).

The native pueo or short-eared owl (*Assio flammeus sandwichensis*) was not seen but might be expected to be occasionally seen flying overhead looking for rodents. This site is too low in elevation for Hawaii's native forest birds that are restricted to higher elevations, beyond the range of mosquitoes and the avian diseases they carry and transmit.

The habitat here has nothing that would attract Endangered waterbirds, the ae'o or black-necked stilt (*Himantopus mexicanus knudseni*) and the 'alae ke'oke'o or Hawaiian coot (*Fulica alai*), or the Endangered nene or Hawaiian goose (*Branta sandvicensis*). None of these birds were seen.

An evening survey conducted at the proposed well site failed to pick up any calls from either the Endangered Hawaiian petrel or the Threatened Newell's shearwater. In West Maui these seabirds have their nesting burrows high in the mountains in wet fern forest. One adult bird in a pair, returning to its burrow with food for its young, will call out to its mate in the burrow which returns the call. These calls are loud and can be heard at great distances. No calls were heard.

INSECTS

A total of 10 species of insects representing six insect Orders were observed in the project area during two site visits. Taxonomy and nomenclature follow Nishida et al (1992). Most prevalent were the Asian ambrosia beetle (*Euwallacea fornicateus*), dung fly (*Musca sorbens*), honey bee (*Apis mellifera*), big-headed ant (*Pheidole megacephala*) and passion flower butterfly (*Argaulis vanillae*). Five other species were rare.

One indigenous green darner dragonfly (*Anax junius*) was seen flying over the project area. The green darner is widespread and common in Hawaii as well as across the southern USA and in Mexico. It is not of any particular conservation concern.

DISCUSSION AND RECOMMENDATIONS

The habitat on this one acre project area is nearly monotypic grassland. This is not conducive to biological diversity of animal life. Of a total of one mammal, four bird and ten insect species, only one dragonfly, the indigenous green darner was native in Hawaii and is common on all of the main islands.

No Threatened or Endangered animal species were found on the project site and none are known to occur in the adjacent gulches. No special animal Critical Habitats occur on the project area or on nearby lands.

One potential threat posed by the project involves the Endangered seabirds the Hawaiian petrel (*Pterodroma sandwichensis*) and the Threatened Newell's shearwater (*Puffinus newelli*). These seabirds nest high in the mountains during the spring, summer and fall months. These birds fly over the lowlands during the late evening hours to reach their burrows and fly back to the ocean in the early dawn hours. These birds can be confused by bright lights and crash into poles, wires and other structures and be injured or killed by the strike or by vehicles or animals such as cats, dogs or mongoose. Young inexperienced birds, taking their inaugural fledgling flights in the late fall are particularly vulnerable. It is recommended that any significant outdoor flood lights or pole lights be hooded to direct the light downward to minimize the distractions and dangers to these birds.

ANIMAL SPECIES LIST

Following is a checklist of the animal species inventoried during the field work. Animal species are arranged in descending abundance within three groups: Mammals, Birds and Insects. For each species the following information is provided:

1. Common name
2. Scientific name
3. Bio-geographical status. The following symbols are used:

endemic = native only to Hawaii; not naturally occurring anywhere else in the world.

indigenous = native to the Hawaiian Islands and also to one or more other geographic area(s).

non-native = all those animals brought to Hawaii intentionally or accidentally after western contact.

migratory = spending a portion of the year in Hawaii and a portion elsewhere. In Hawaii the migratory birds are usually in the overwintering/non-breeding phase of their life cycle.

4. Abundance of each species within the project area:

abundant = many flocks or individuals seen throughout the area at all times of day.

common = a few flocks or well scattered individuals throughout the area.

uncommon = only one flock or several individuals seen within the project area.

rare = only one or two seen within the project area.

SCIENTIFIC NAME	COMMON NAME	STATUS	ABUNDANCE
MAMMALS			
<i>Sus scrofa</i> L.	feral pig	non-native	rare
BIRDS			
<i>Geopelia striata</i> L.	zebra dove	non-native	uncommon
<i>Lonchura punctulata</i> L.	nutmeg mannikin	non-native	uncommon
<i>Zosterops japonicus</i> Temminck & Schlegel	Japanese white-eye	non-native	uncommon
<i>Streptopelia chinensis</i> Scopoli	spotted dove	non-native	uncommon

SCIENTIFIC NAME	COMMON NAME	STATUS	ABUNDANCE
INSECTS			
Order ARANAE - true spiders			
ARANEIDAE (Orb weaver Family)			
<i>Argiope appensa</i> Walkenaer	common garden spider	non-native	rare
SALTICIDAE (Jumping Spider Family)			
<i>Menemerus bivittatus</i> Dufour	gray wall jumper	non-native	rare
Order COLEOPTERA - beetles			
SCOLYTIDAE (Bark Beetle Family)			
<i>Euwallacea fornicatus</i> Eichhoff	Asian ambrosia beetle	non-native	uncommon
Order DIPTERA - flies			
MUSCIDAE (Housefly Family)			
<i>Musca sorbens</i> Wiedemann	dung fly	non-native	uncommon
Order HYMENOPTERA - bees, wasps, ants			
APIDAE (Honey Bee Family)			
<i>Apis mellifera</i> L.	honey bee	non-native	uncommon
FORMICIDAE (Ant Family)			
<i>Pheidole megacephala</i> Fabricius	big-headed ant	non-native	uncommon
VESPIDAE (Vespid Wasp Family)			
<i>Vespula pennsylvanica</i> Saussure	western yellowjacket	non-native	rare
Order LEPIDOPTERA - butterflies, moths			
CRAMBIDAE (Grass Moth Family)			
<i>Spoladea recurvalis</i> Fabricius	beet webworm moth	non-native	rare
NYMPHALIDAE (Brush Footed Butterfly Family)			
<i>Agraulis vanillae</i> L.	passion flower butterfly	non-native	uncommon
Order ODONATA - dragonflies, damselflies			
AESHNIDAE (Hawker Dragonfly Family)			
<i>Anax junius</i> Drury	green darner	indigenous	rare

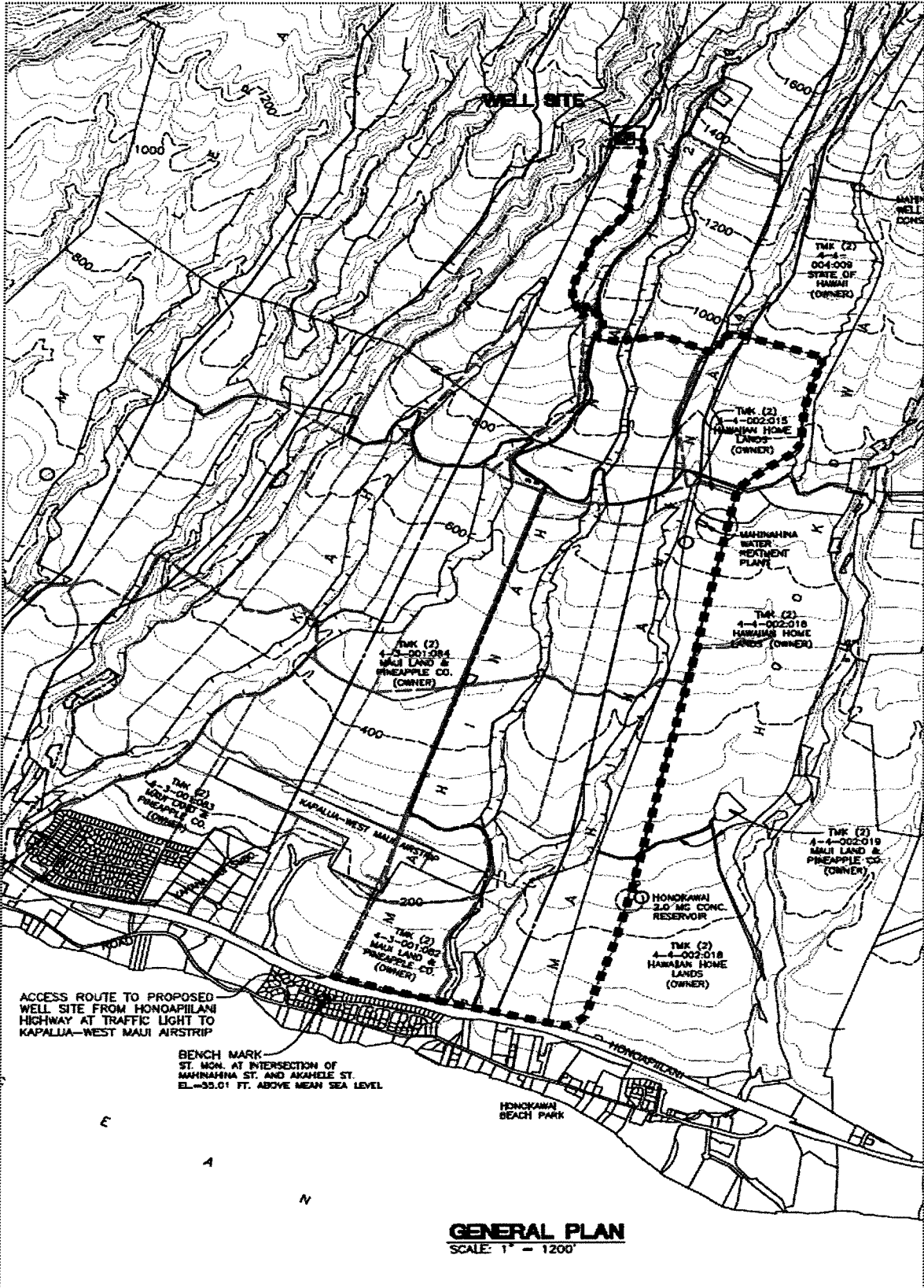


Figure 1. Project area in upper Kahana, West Maui.

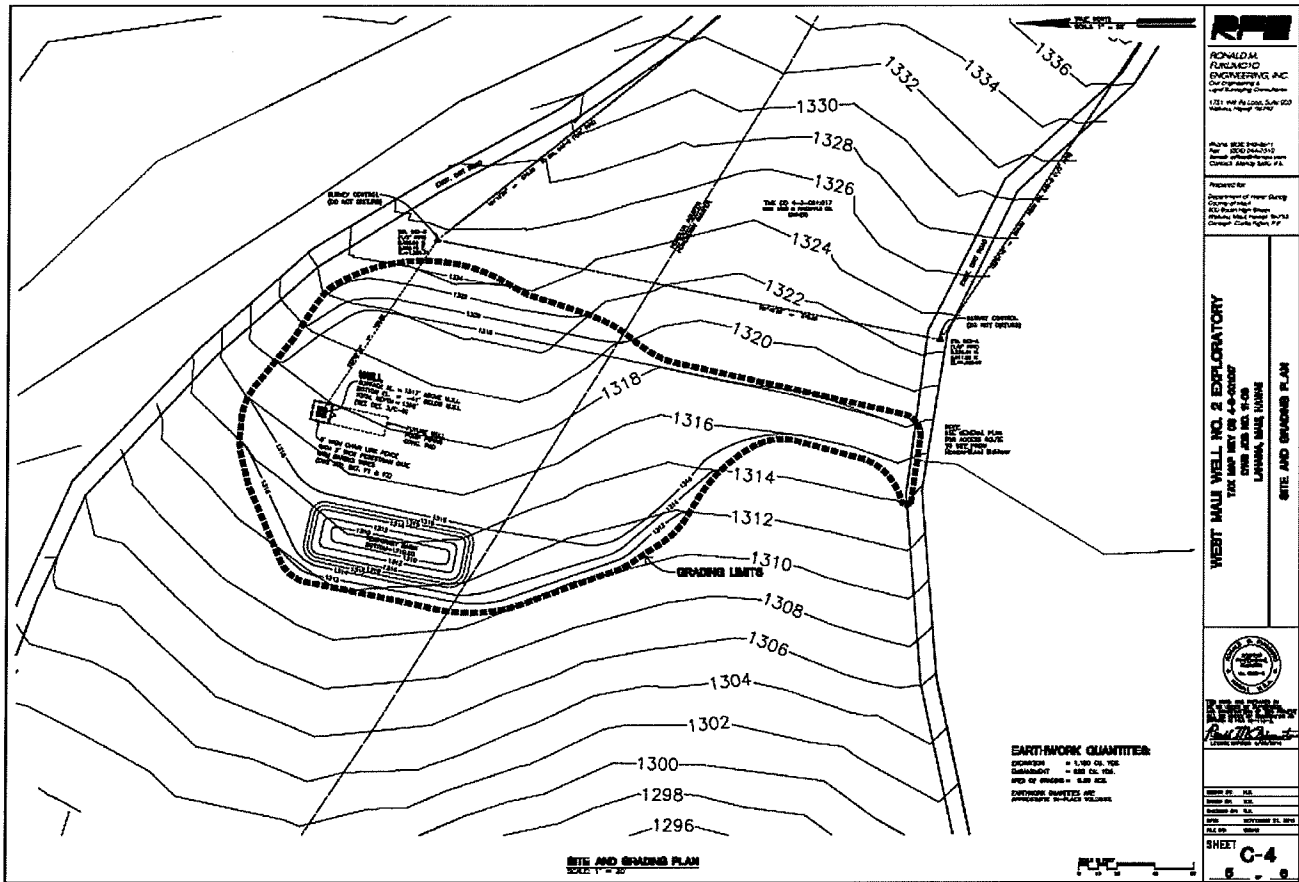


Figure 2. Project area is approximately 1 acre on a gently sloping ridge top.



Figure 3. Project area is a dense growth of molasses grass and a few trees.



Figure 4. The densely forested Kahana Gulch running down along the north side of the project area on the adjacent ridge top.

LITERATURE CITED

- American Ornithologists' Union 2011. Check-list of North American Birds. 7th edition.
American Ornithologists' Union. Washington D.C.
- Armstrong, R. W. (ed.) 1983. Atlas of Hawaii. (2nd. ed.). University of Hawaii Press.
- Foote, D.E. , E.L. Hill, S. Nakamura, and F. Stephens. 1972.
Soil survey of the islands of Kauai, Oahu, Maui, Molokai, and Lanai,
State of Hawaii. U.S. Dept. of Agriculture, Soil Conservation Service. Washington, D.C.
- Nishida, G.M., G.A. Samuelson, J.S. Strazanac and K.S. Kami. 1992.
Hawaiian Terrestrial Arthropod Checklist. Hawaii Biological Survey.
- Tomich, P.Q. 1986. Mammals in Hawaii. Bishop Museum Press, Honolulu.
- U.S. Fish and Wildlife Service. 2009. Endangered and threatened wildlife and Plants.
Occurrences and Listings for Hawaii. www.fws.gov/endangered.
- Wagner, W. L., D.R. Herbst, and S. H. Sohmer. 1999. Manual of the flowering plants of Hawai'i.
University of Hawai'i Press and Bishop Museum Press. Honolulu.

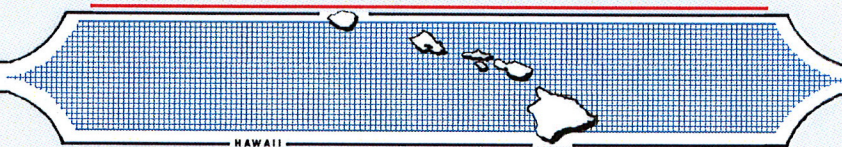
APPENDIX C.
Archaeological Assessment

**AN ARCHAEOLOGICAL ASSESSMENT
FOR THE WEST MAUI WELL NO. 2 EXPLORATORY,
DWS JOB NO. 11-06,
LAHAINA, KAHANA AHUPUA'A,
LAHAINA (KĀ'ANAPALI) DISTRICT, MĀUI, HAWAI'I
[TMK (2) 4-3-001:017]**

Prepared by:
David Perzinski, B.A.,
and
Michael Dega, Ph.D.
September 2013
DRAFT

Prepared for:
Ronald M. Fukumoto Engineering, Inc.
1721 Wili Pa Loop, Suite 203
Wailuku, HI 96793

SCIENTIFIC CONSULTANT SERVICES Inc.



1347 Kapiolani Blvd., Suite 408 Honolulu, Hawai'i 96814

ABSTRACT

At the request of Ronald M. Fukumoto Engineering, Inc., for the County of Maui Department of Water Supply, Scientific Consultant Services, Inc. (SCS) conducted Archaeological Inventory Survey on a c. 1-acre land parcel in Kahana Ahupua'a, Lahaina District, Māui [TMK: (2) 4-3-001:017]. Fieldwork did not lead to the identification of any historic properties, this presumed to be a function of wide-scale, industrial-level pineapple cultivation across the project area and beyond. No further archaeological work is recommended for the project area.

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INTRODUCTION

At the request of Ronald M. Fukumoto Engineering Inc, Scientific Consultant Services, Inc. (SCS) conducted an Archaeological Inventory Survey for a proposed County of Maui, Department of Water Supply exploratory well. The project area consists of a 0.89-acre portion of land owned by Maui Land and Pineapple Company, Inc., that is the proposed location for a well and construction staging area. The project area is located in Kahana Ahupua`a, Lāhainā District, Maui Island, Hawai`i (TMK (2) 4-03-001:017) (Figures 1, 2, 3, and 4). The work was requested to assess the presence/absence of archaeological sites in the project area, document the sites, and provide recommendations and significance assessments for the sites.

The overall purpose of the project was to determine the presence or absence of architecture, midden deposits, and/or artifact deposits on the surface of the project area, as well as assess the potential for the presence of subsurface cultural deposits. In addition, the report provides significance assessments and recommendations to the State Historic Preservation Division (SHPD) for the project. This Archaeological Assessment Report was written in lieu of an Archaeological Inventory Survey report due to the determination of “no findings” during fieldwork within the project area, per the State of Hawai`i Historic Preservation Division Guidelines for an Archaeological Assessment.

In brief, full pedestrian survey of the project area did not lead to the identification of any archaeological sites/historic properties. The project area occurs in fields previously subject to industrial-level pineapple production. Plastic remnants of this cultivation occur across the surface. The following provides an abbreviated environmental and historic background to the area, the results of the project, and recommendations.

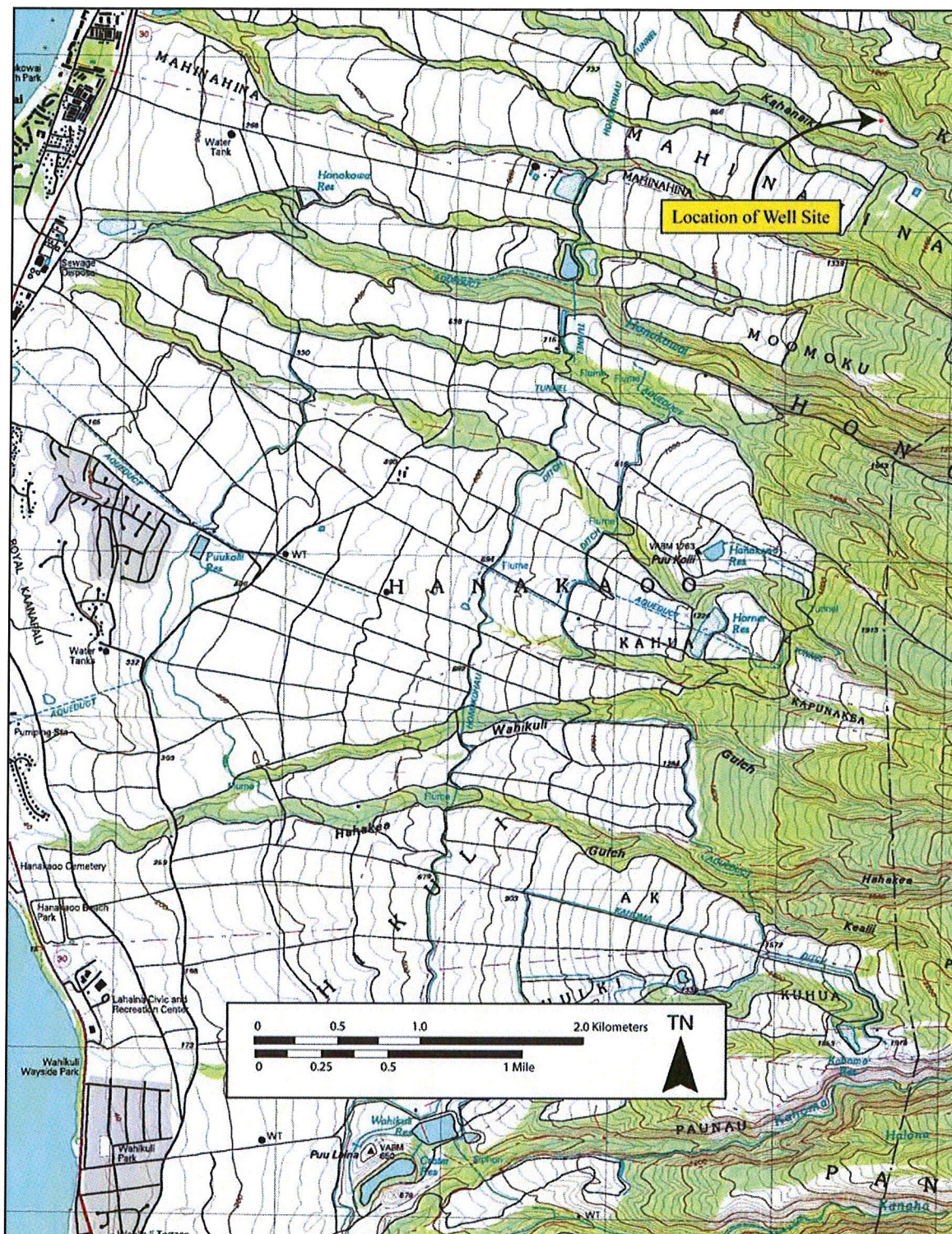


Figure 1: Portion of USGS Map Showing Location of Project Area.

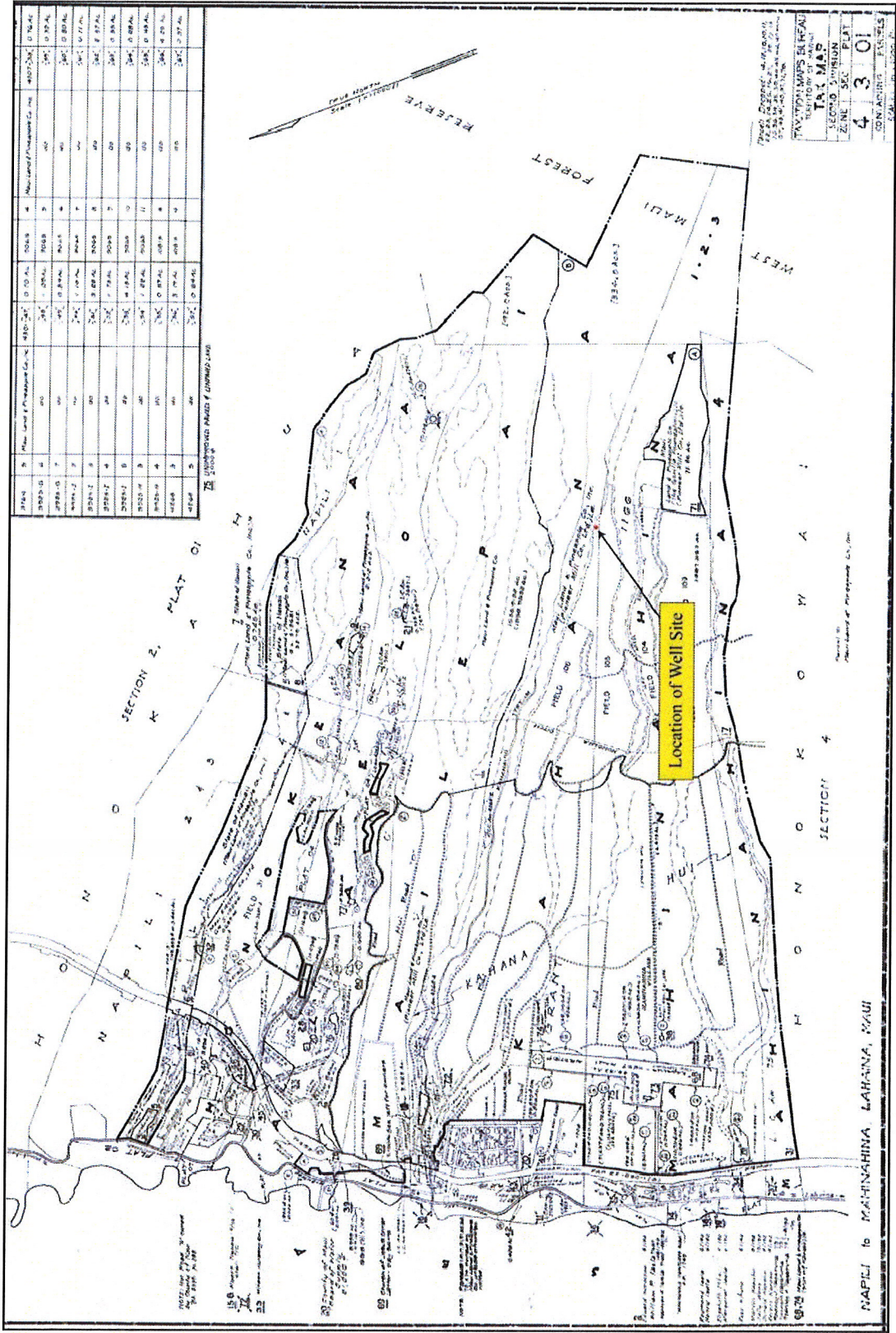


Figure 2: TMK (2) 2-1-08 Showing Location of Project Area.

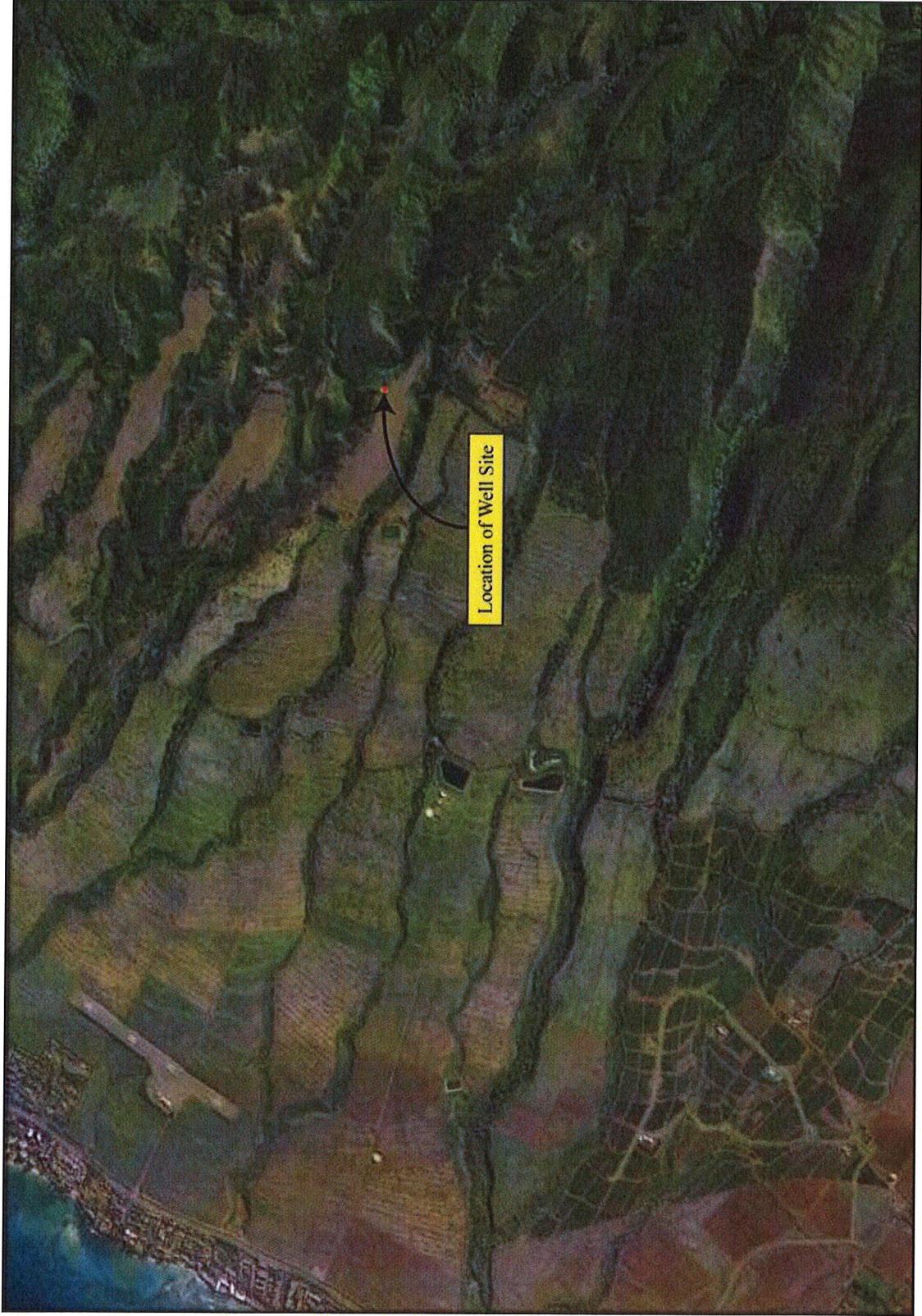




Figure 3: Aerial Photograph Showing Location of Project Area (Google Earth 2013).

 <p>RONALD R. FUKUMOTO ENGINEERING, INC. Civil Engineering & Surveying 1721 Wai'alealae, Suite 202 Honolulu, Hawaii 96815</p>	<p>Prepared for: Department of Water Supply DWS JOB NO. 11-08 WEST MAU WELL NO. 2 EXPLORATORY</p>	 <p><i>Ronald R. Fukumoto</i> License No. 1101 State of Hawaii</p>	<table border="1"> <tr> <td>DESIGN BY: N.C.</td> <td>DATE: 11/11/11</td> </tr> <tr> <td>DRAWN BY: N.C.</td> <td>SCALE: AS SHOWN</td> </tr> <tr> <td>CHECKED BY: N.C.</td> <td>PROJECT: WEST MAU WELLS</td> </tr> <tr> <td>DATE: 11/11/11</td> <td>SHEET: C-4</td> </tr> <tr> <td>TOTAL SHEETS: 6</td> <td></td> </tr> </table>	DESIGN BY: N.C.	DATE: 11/11/11	DRAWN BY: N.C.	SCALE: AS SHOWN	CHECKED BY: N.C.	PROJECT: WEST MAU WELLS	DATE: 11/11/11	SHEET: C-4	TOTAL SHEETS: 6	
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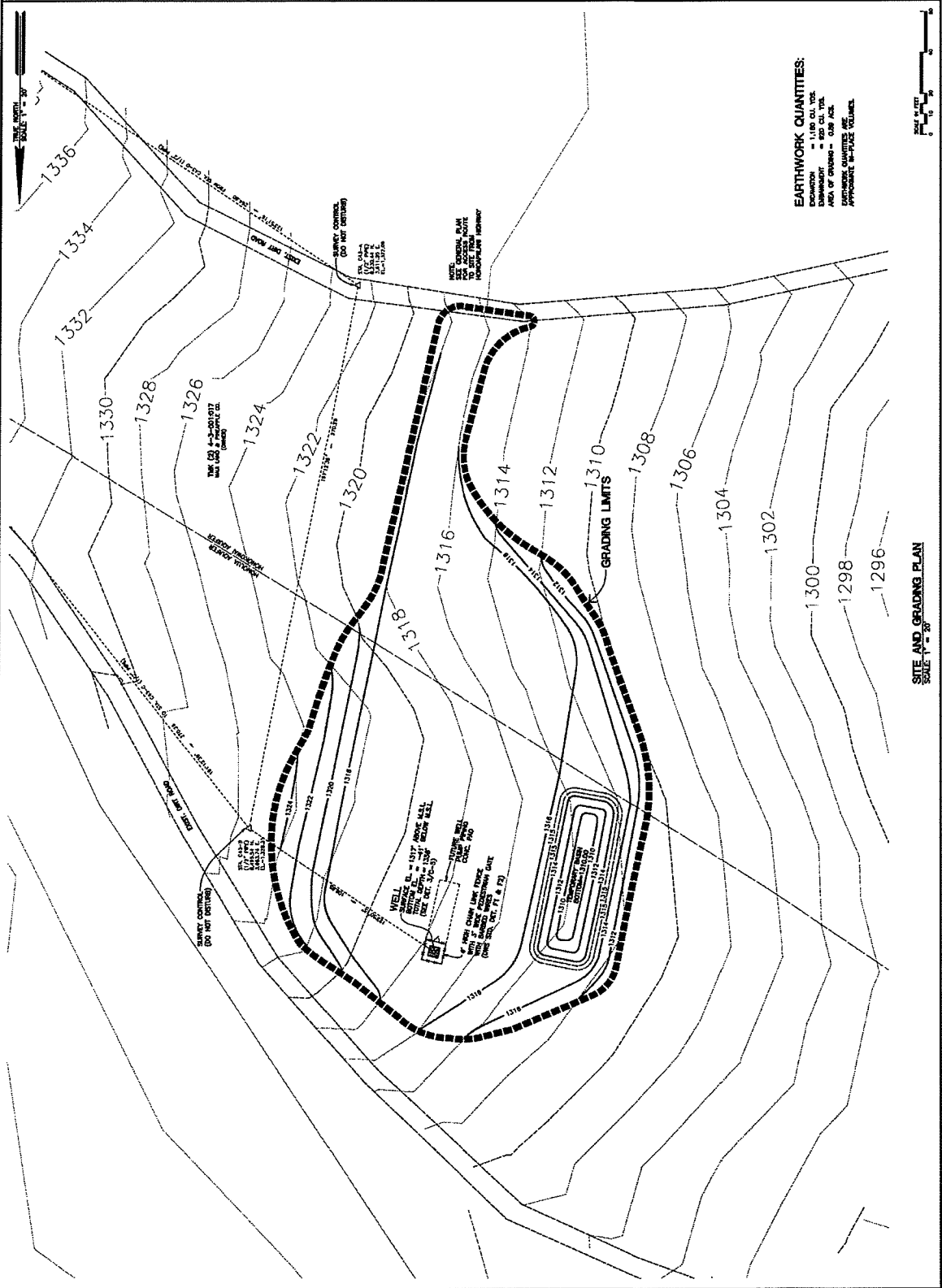


Figure 4: Plan Showing Layout of Proposed Well Site.

ENVIRONMENTAL SETTING

PROJECT AREA LOCATION AND ENVIRONMENT

The undeveloped subject parcel is located at an elevation of approximately 1315 feet A.M.S.L. and lies 4.8 km (3.0 miles) from the coast line (see Figure 1). The entire parcel is within a gently sloping, fallow pineapple field that is nearly completely overgrown with molasses grass (Figure 5). The subject parcel is bounded by Kahana Stream Gulch to the north, pineapple fields to the east, Kahanaiki Gulch to the south and fallow pineapple fields to the west (see Figure 4).

Within the fallow agricultural fields were non-native eucalyptus trees and molasses grass. Just outside the project area along the edge of the gulch were several species of native plants including *pukiawe* (*Leptecophylla tameiameia*), *ohia* (*Metrosideros sp.*), *ulei* (*Osteomeles anthyllidifolia*), *kilau* (*Pteridium aquilinum*) and *huehue* (*Cocculus orbiculatus*).

Soils in the project area primarily consist of the Alaeloa Series (Foote *et al.* 1972:Sheet 92). These are well-drained soils occurring in upland locations and have developed in material weathered from in situ igneous rock (Ibid. 26). The basic stratigraphic profile consists of dark reddish brown silty clays overlying bedrock. The soils are fairly homogeneous. Rainfall associated with this area is estimated at 35" to 60" per year, and the soils are most commonly associated with pineapple, pasture, wildlife, house lots, and water supply. In addition to the Alaeloa Series, ranges of the Kahana Series occurs in the area (Ibid. Sheet 92). These soils are very similar in texture and composition to the Alaeloa series and occur on smooth uplands.

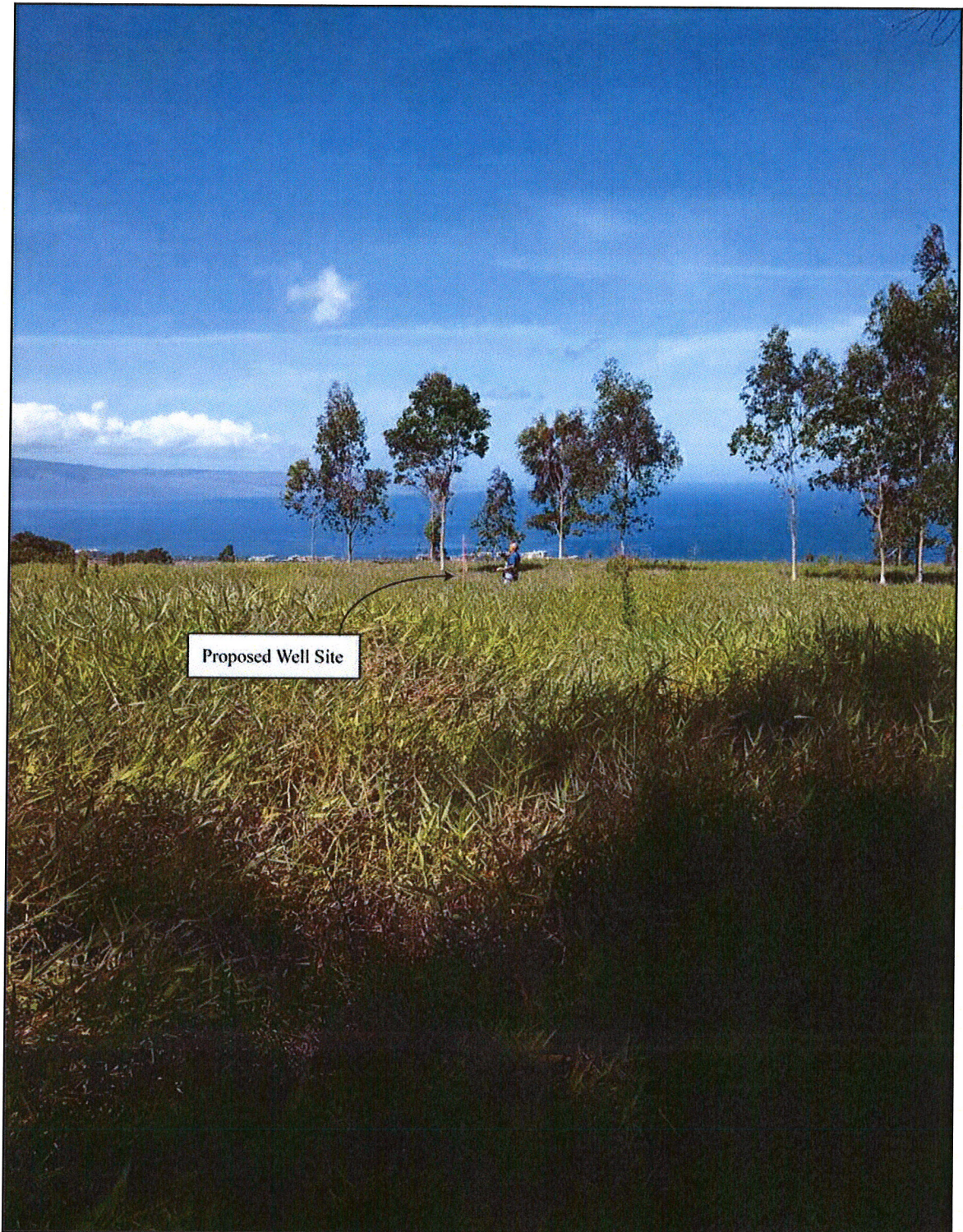


Figure 5: View West of Proposed Well Site.

TRADITIONAL AND HISTORIC SETTING

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 above mean sea level), is composed of large, heavily eroded amphitheater valleys that contain well-developed permanent stream systems that watered fertile agricultural lands extending to the coast. The deep valleys of the West Maui Mountains 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 fifteenth century or the beginning of the sixteenth century [Fornander 1919-20, Vol. 6:248]). Land was considered the property of the king or *ali`i`ai moku* (the *ali`i* who eats the island/district), which he held in trust for the gods. The title of *ali`i`ai moku* ensured rights and responsibilities pertaining to the land, but did not confer absolute ownership. The king kept the parcels he wanted, his higher chiefs received large parcels from him and, in turn, distributed smaller parcels to lesser chiefs. The *maka`āinana* (commoners) worked the individual plots of land.

In general, several terms, such as *moku*, *ahupua`a*, *ili* or *ili`āina* were used to delineate various land sections. A district (*moku*) contained smaller land divisions (*ahupua`a*) which customarily continued inland from the ocean and upland into the mountains. Extended household groups living within the *ahupua`a* were therefore, able to harvest from both the land and the sea. Ideally, this situation allowed each *ahupua`a* to be self-sufficient by supplying needed resources from different environmental zones (Lyons 1875:111). The *ili`āina* or *ili* were smaller land divisions next to importance to the *ahupua`a* and were administered by the chief who controlled the *ahupua`a* in which it was located (*ibid*: 33; Lucas 1995:40). The *mo`o`āina* were narrow strips of land within an *ili*. The land holding of a tenant or *hoa`āina* residing in an *ahupua`a* was called a *kuleana* (Lucas 1995:61). The project area is located in the *ahupua`a* of Kahana, which literally translates to "cutting", as in a valley cutting through the mountain (Pukui *et al.* 1989:202).

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 provided ideal conditions for wetland *kalo* (*Colocasia esculenta*) agriculture that incorporated pond fields and irrigation canals. Other cultigens, such as *kō* (sugarcane, *Saccharum officinarum*) and *mai`a* (banana, *Musa* sp.), were also grown and, where appropriate, such crops as *uala* (sweet potato, *Ipomoea batatas*) were produced. This was the typical agricultural pattern seen during traditional times on all the Hawaiian Islands (Kirch and Sahlins 1992, Vol. 1:5, 119; Kirch 1985). Between A.D. 600 and 1100, a period sometimes referred to as the Developmental Period, was the major focus of permanent settlement continued to be the fertile and well-watered windward valleys, such as those in the West Maui Mountains (Kirch 1985).

A general settlement model based on archaeological evidence has been suggested for the Kā`anapali District (Chapman and Kirch 1979; Kirch 1985). This model includes coastal marine foraging and fishing with more upland agricultural pursuits. In typical native Hawaiian fashion, dating at least from the later pre-Contact period (if not earlier), people in this area would have moved between the coast and the upland agricultural fields, exploiting the full range of resources available within the *ahupua`a*. Semi-permanent and permanent habitation probably occurred in both coastal and upland settings.

There are six bays located on Maui's west shore whose names begin with *Hono-*. These bays and coves include Honokahua, Honokeana, Honokōhau, Honokōwai, Honolua, and Hononana and are collectively known as *Hono a Pi`ilani*, literally meaning bays (*hono*) acquired or ruled by Pi`ilani (Pukui and Ebert 1985, Pukui *et al.* 1989, and Clark 1980). Kapalua is situated along this coast between Honokahua and Honokeana. The coastal and marine environments adjacent to the project area would have provided rich resources for traditional subsistence foragers and fishermen in ancient times.

A large number of fish species are found in the near-coastal waters: weke, surmullet (*Mulloidichthys auriflamma*); *kūmū* (goatfish, *Parupeneus prophyreus*); *mamo* (sergeant fish, *Abudefduf abdominalis*); *manini* (surgeonfish, *Acanthurus triostegus*); *palani* (surgeonfish, *Acanthurus bariene*); *nenue* (rudder or pilot fish, *Kyphosus fuscus*); *kōkala* (porcupine fish, *Diodon hystrix*); *hinalea* (wrasse, Family, Labridae); *uhu* (parrot fish, *Scarus perspicillatus*);

ʻala`ihi (squirrel fish, *Holocentrus* sp.); *kala* (surgeonfish or unicorn fish, *Acanthurus* sp.); and *nehu* (anchovy, *Anchoviella purpurea*). In addition to a relatively high density of gastropods and pelecypods (including *pipipi*, black nerita, (*Nerita picea*) and *Littorina pintado*), at least five species of sea urchin have been noted: *Centrochinus paucispinus*, *Tripneustes gratilla*, *Podophora atrata*, *Heterocentrotus mammillatus*, and *Echinometra mathaei* (Kirch 1973).

Early archaeological surveys identified seven religious shrines (*heiau*) from Mahinahina to Honokōhau Ahupua`a (Thrum 1909, 1917; Walker 1931). Two *heiau*, both destroyed, were recorded between Kahana and Mailepai and to the northeast, in Honokahua Ahupua`a, Kahauiki Heiau, (Walker Site 16) was situated. *Heiau* indicate the presence of political power and the appropriate population to support it.

Traditionally, trails extended from the coast to the mountains, linking the two for both economic and social reasons. Kā`anapali District is noted for an *alaloa* (a long path or trail) that reportedly encircled the entire island. Walker (cited in Sterling 1998:46) wrote:

The north end of Maui also is traversed by a paved trail. Sections of it can be seen from Honolua to Honokohau to Kahakuloa. It is paved with beach rocks and has a width of four to six feet....This trail is also spoken of as the Kihapiilani Trail.

In Maui (Walker Site 20), a large *luakini heiau* (*heiau* for human sacrifice), was reportedly located on a cliff on the east side of Honokōhau Valley, approximately 60 m above the shoreline just east of the Honokahua Burial Site, State Site No. 50-50-01-1342 (Walker in Sterling 1998:54). Most significantly, Kamakau (in Sterling 1998:55) reported oral history accounts of Waiuli Pit, a large 'death pit', at least one mile deep and extending below the water table. According to Kamakau, the bodies of dead commoners who resided in the areas from Lahaina to Kahakuloa, and the islands of Moloka`i and Lanai, were thrown into this pit.

Kamakau states:

Waiuli was a death pit wherein the dead bodies of commoners were thrown. . . .At Waiuli (on Maui) directly back of Honkohau, Honolua, and Honokahua is a deep pit which was used as a burial place for bodies of the common people from Lahaina to Kahakuloa. The body of anyone from those regions who died on Moloka`i [*and Lanai*] was brought back and thrown into that pit. . . [*ibid*].

A *ko`a* (fishing shrine, Walker Site No. 17), located “[*makai*] to Honolulu Park along the shore” (Honolulu Ahupua`a), was described by Walker (Sterling 1998:53). He also reported oral history accounts of a *hōlua* (slide or sledding ramp) at Honolulu Ahupua`a that was destroyed by the time of his survey (1920s–30s) by commercial agriculture.

Kamakau recounts the results of a war between Kauhi-pumai-kahoaka (or Kauhi-`aimoku-a-Kama) and Kamehameha-nui in 1735, both children of Kekaulike. Alapa`i of Hawai`i Island had joined forces with Kamehameha-nui and a year was spent preparing for the war “which swept the country” (Kamakau 1961:74). Alapa`i tactics included drying up some of the main streams, which in turn dried up the brooks and taro patches. This reduced food not only for Kahui’s forces, but also the *maka`āinana*. His fighting force consisted of 8,440 warriors from all of the six districts of Hawai`i Island (*ibid*). Honokahua and Honolulu Bays north of the project area became the gathering place for the forces of Peleioholani who had arrived from O`ahu with only 640 men to assist Kauhi. While attempting to unite its warriors with those of Kauhi, Peleioholani became surrounded by the army of Alapa`i.

Kamakau recorded:

The hardest fighting even compared with that of Napili and at Honokahua in Kā`anapali, took place on the day of the attack at Pu`unēnē [in Honolulu]. Pele-io-holani was surrounded on all sides, *mauka* and *makai*, by the forces of Alapa`i, led by Ka-lani-`opu`ū and Keoua. The two ruling chiefs met there again, face to face, to end the war and became friends again, so great had been the slaughter on both sides [Kamakau 1961].

Fornander stated:

The fortune of the battle swayed back and forth from Honokawai to near into Lahaina; and to this day heaps of human bones and skulls, half buried in various places in the sand, attest the bitterness of the strife and the carnage committed... [1969:142]

EARLY HISTORIC

The traditional district of Kā`anapali, where the project area is located, consisted of five major stream valleys (Honokōwai, Kahana, Honokahua, Honolulu, and Honokōhau), all of which were extensively terraced for wetland (*lo`i*) taro in early historic and later times (in Honokōhau, well into the 1930s). Honokahua Valley, to the north, was described as having wet taro lands, although of no great abundance (according to Handy quoting D.L. Fleming, in Sterling 1998:52).

Sweet potatoes were reportedly grown between Honokōhau and Kahakuloa Ahupua`a, presumably on lower *kula* lands and, south of the project area, Kahana Ahupua`a was known as a place of salt gathering for the people of Lāhainā (old spelling for village; Sterling 1998).

Most of the *ahupua`a* on the coast have been overshadowed by the famous roadstead and village that served as the capitol of the Hawaiian Kingdom after the conquest of Kamehameha I until 1855. The ethnographic and historic literature, often our only link to the past, reveal that the lands around Lāhainā were rich agricultural areas irrigated by aqueducts originating in well-watered valleys with permanent occupation predominately on the coast. Crops cultivated included coconut, breadfruit, paper mulberry, banana, taro, sweet potato, sugar cane, and gourds.

THE MĀHELE

In the 1840s, traditional land tenure shifted drastically with the introduction of private land ownership based on Western law. While it remains a complex issue, many scholars believe that in order to protect Hawaiian sovereignty from foreign powers, 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 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* (commoners), if they had been made aware of the procedures, were then able to claim the plots which they had been cultivating and living. These claims did not include any previously cultivated but presently fallow land, 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 were issued a Royal Patent after which they could take possession of the property (Chinen 1961:16). There are no LCA's associated with the current project area. Rather, land use records mostly reflect historic-era use of the lands.

HISTORIC LAND USE

An 1831 census estimated the entire population of Kā`anapali District to be 2,980 people, which was reduced to less than half (1,341) only five years later probably due to introduced diseases (Schmidt 1973). Whaling (centered on Lahaina Town) was the first commercial enterprise in West Maui, but it had more or less collapsed by the 1860s. Commercial sugarcane

production was the next large capitalist venture in West Maui, starting as early as 1863, and it was focused between Kā`anapali and Lahaina.

The general area around and below the project area, which was located at the margins of sugar cane enterprises in West Maui (Dorrance and Morgan 2000), was most important as a center of commercial ranching (cattle raising) and, subsequently, pineapple production.

In the later nineteenth century, lands in West Maui became part of the Campbell Estate. This was also the time that the Honolua Ranch was first established. Cattle ranching began then and was continued by Henry Perrine Baldwin, who acquired the lands from the Campbell Estate in 1890 (Fredricksen and Fredricksen 2001). In addition to ranching, other early commercial activities included coffee farming.

David T. Fleming became manager of Honolua Ranch in 1911 (or 1912). Fleming was well-versed in pineapple production from the Ha`iku area and gradually began shifting the ranch's initiative to pineapple production. The Honolua Ranch/Baldwin Packers complex shifted from Honolua to Honokahua in 1915, and a pineapple cannery was constructed. A major commercial pineapple industry emerged in West Maui during the 1920s. The plantation communities of Honokahua and Nāpili emerged and developed as Honolua Ranch/Baldwin Packers pineapple operations grew. The population of the Lahaina area increased with the successful economic operations of the pineapple plantation. Baldwin Packers merged with Maui Pineapple Company in 1962 to form Maui Land and Pineapple Company, Inc. After this time, much of the Honolua Ranch lands were converted for resort development, a process that continues to this day. Both the Ritz-Carlton Kapalua and the Residences at Kapalua Bay are part of this ongoing process.

The Honokahua Historic District (Site 50-50-01-1591) is located north of the project area. This historic district includes the plantation village of Honokahua, the Baldwin Packers cannery and associated facilities, Honolua Ranch Stables, Honolua Ditch (constructed in 1902), the Maui Pineapple Company offices, the Honolua Store, plantation camp housing, and two churches (Fredricksen 2001).

The Honokahua Burial Site (50-50-01-1342), which contained over 2,000 Hawaiian burials, is included with five other traditional sites in the Honokahua Archaeological District (50-50-01-1340). The cemetery is included on the National Registry of Historic Places. The

cemetery was used by Native Hawaiians from as early as A.D. 700 to 800 to as late as the early nineteenth century (Donham 2000).

Evidence of historic-era activity in and around the project area is evidenced by fallow pineapple fields and water transport ditches. For instance, located several hundred meters down slope (west) from the current project area, Honokohau Ditch is present. Designated as State Site No. -1591, the ditch runs perpendicular to the slope through multiple *ahupua`a* at the c. 700-750 ft. elevation level. The ditch itself has an interesting history, as noted by Wilcox (1921). The ditch, primary composed of rock slab side walls, was originally constructed from 1902 and was completed in June, 1904. The ditch was built by Honolua Ranch, who also owned it, but Pioneer Mill financed the project and used the water. The ditch started at 700 feet above mean sea level and was completely re-built twice and renovated one time. Due to cracks, leakages, and sediment built up over time, a "new" Honokohau Ditch was constructed from June, 1912 and completed in November, 1913. The ditch was called "Honolua Ditch" by Maui Land and Pineapple Company and designated as Honokohau Ditch by the Pioneer Mill Company, even though it was the same ditch [Note: the current project area is noted as "Field 105" and when in use as field, was owned by Maui Land and Pineapple Company, Inc., although maps notate "Pioneer Mill Company, Ltd" beneath the ML&P designation]. In September, 1923 the entire ditch was re-lined, a process that took five years to complete. During this re-lining process, water was diverted from this ditch to the old, 1904 Honokohau Ditch which had been abandoned. The ditch still retains an important water transfer capacity today as it irrigates neighboring lands and brings potable water to the Lahaina area. At present times, the area contains fallow pineapple fields, and the area remains undeveloped.

PREVIOUS ARCHAEOLOGY

A majority of the previous archaeological work conducted in the Kahana-Ka`anapali area has occurred nearer the coastline, a symptom of much increased development from the 1980s through present times. A short history of these projects is presented, with a focus on the few projects conducted in more upland locations of the Kahana area, in more similar settings to the current project area.

The first study of the Kahana area, as with a vast majority of coastal Maui, was conducted by W. Walker on an island-wide survey that took place in 1931. Focused on monumental coastal sites, Walker noted a destroyed *heiau* at Kahana Point (Walker Site No. 12), one *heiau* that was washed away at Mailepai Point (Walker Site No. 13), and another destroyed *heiau*, named Hihoho which was located along a country road near Kalaeokaea Point (Walker

Site 14). There has been no on-ground confirmation of these structures since Walker's initial survey (Walker 1931).

Much archaeological work has been located in the gulches of the Kahana area, and provides overlapping lines of evidence for land use and habitation in the area. In 1974, Michael Kaschko of the Bishop Museum conducted a walk-through of select gulches for the U.S. Soil Conservation Service in conjunction with the Wailuku Flood Prevention Project and the Honolulu Watershed. Kaschko's survey "noted numerous stone walls, terraces, alignments and a historic midden," (Kaschko 1974: 4, 5).

In 1977, Mikk Kaschko, Bion P. Griffin, George Lovelace and other employees of the Archaeological Research Center Hawai'i, Inc. (ARCH, Inc.) conducted survey and salvage excavations on select areas of Mahinahina Gulch for the Hawai'i Department of Transportation. Five gulches were surveyed and a total of five archaeological sites were located (Griffin and Lovelace 1977:11), and given State Site numbers. All of the sites detected by ARCH, Inc. were identified as prehistoric walls, one of which was previously detected in Kaschko's 1974 survey of the area (*ibid*: 14).

An Archaeological Reconnaissance Survey was performed by Robert J. Hommon and Hamilton M. Ahlo in 1982 ahead of an airstrip proposal by the Royal Hawaiian Air Service. Hommon and Ahlo did not identify any archaeological sites (Hommon and Hamilton 1982:8).

In 1983, Eric Komori of the Bishop Museum carried out archaeological investigations that included surface surveys and inspections of backhoe-disturbed soil in Kahana gulch. The work was done under contract to the U.S. Soil Conservation Service and was a follow-up to Kaschko's 1974 project. Seven sites were recorded by Komori's during these investigations: an overhang/shelter coupled with a 10 meter long segment of terraced earth, a platform bordered by terraces, a wall segment and two stone alignments, wall segments and terraces, a floodplain partitioned off from the rest of the landscape by stone walls and terraces, walls of stacked stone and a rock shelter containing a "hammer stone or unfinished 'ulu maika (prehistoric Hawaiian game stone)" (Komori 1983:8).

Four projects overseen by Joseph Kennedy (two in 1986, one in 1990 and one in 1992) were located on properties nearer the coastline. Kennedy's first visit to the area in September of 1986 investigated and confirmed the ruins of a stone church dating to the mid-nineteenth century. Although Kennedy could find no record of a graveyard attached to the church, nor marked graves at the site, he could not discount the possibility of unmarked graves near the church (Kennedy 1986a:1-5). In November of 1986 Kennedy made a return visit to the area to take photographs, map the site, and search for burials. No burials were found on the property

(Kennedy 1986b:1–5). In 1990, Kennedy returned to the area for the third time to conduct an archaeological inventory survey of 50 acres of land near Kahana. The survey found two new sites: “a two tiered basalt rock platform and a single, crude petroglyph” (Kennedy 1991:4). At the behest of the State Historical Preservation Division, a test unit was placed near the rock platform in 1992. Excavations there found a burial, which was left *in situ* (Kennedy 1991:22).

In 1995, Fredericksen and Fredericksen (1995) conducted extensive investigations of a 4-acre parcel located to on the *makai* side of Honoapi`ilani Highway, down slope from the current project area, in TMK: (2) 4-3-005:071. A total of twenty-two stratigraphic trenches were mechanically (backhoe) excavated and two test units were manually excavated by researchers, all of which produced negative results. One historic site (50-50-01-4069) consisting of a stone bridge footing and retaining wall, a section of the old Pioneer Mill railway (Site -6478), and an historic grave site (Site 50-50-01-4072) were identified during the investigations. Fredericksen and Fredericksen (1995:20) state that there was no evidence of *in situ* historic or indigenous cultural deposits across the investigated parcel, as a majority of the parcel was grubbed and filled in recent times.

In 1999, Xamanek Researches conducted Archaeological Inventory Survey on a 1.4 mile (2.25 km) long by 40 feet (12 m) wide section of Honoapi`ilani Highway. During the survey three newly identified sites were documented. These sites include are: Site 50-50-01-4797, a pre-Contact habitation area; -4797 and -4798, two wall associated with Lower Honoapi`ilani Highway. Radiocarbon dating of a charcoal sample collected from Site -4797 yielded a date ranging from AD 1420 to 1660 with an intercept radiocarbon age of AD 1490 (Fredericksen and Fredericksen 2001:2). Site -4797 was interpreted as a coastal habitation site probably associated with marine resource utilization and as a “rare example of a surviving coastal habitation site along this heavily developed portion of the West Maui Coastline (*ibid*: 16). Thus, Site -4797 was found to be significant under Criteria A, C, and D of Federal and State historic preservation guidelines (*ibid*: 2 and 16).

Subsurface testing of Site -4797 could not be conducted during the Inventory Survey due to safety and access to private property issues. Thus, the extent of the site could not be determined. In 2001, Xamanek Researches returned to Site -4797 and conducted subsurface in the form of one 1.0 by 1.0 m hand excavated test unit, on private property, and four backhoe trenches within the County of Maui Right of Way (*ibid*: 3). The findings of the additional Inventory level work indicate a cultural layer interpreted as Site -4797 extended 150 m along the eastern side of Honoapi`ilani Highway between 1.1 to 1.5 m below the ground surface. A total

of five pit features and two possible features extending approximately 78.0 m were noted in a wave cut profile on the west side of Honoapi`ilani Highway (*ibid*: 15).

None were dated due to the lack of datable material. Furthermore, no traditional Hawaiian artifacts were recovered during the excavation of three test units and nineteen trenches. Historic components of the sites (e.g., ceramics, glass) showed that the area was likely more intensively utilized during historic times, as was also evidenced by the lack of traditional-period artifacts at the sites.

In 2000, Scientific Consultant Services, Inc. conducted Archaeological Inventory Survey of approximately three acres of land (see Figure 7) located within the *ahupua`a* of Kahana, Kā`anapali District, Maui Island, Hawai`i [TMK: (2)-4-3-005:070] (Dega 2000), adjacent to previously mentioned Xamanek project area located in TMK: (2) 4-3-005:071 discussed in Fredericksen and Fredericksen (1995). A 100 percent pedestrian survey of the project area was conducted and revealed a section of the Old Pioneer Mill Railroad easement (Site -6478) running across the southeastern portion of the parcel. The existing railroad bed probably dates to 1919, when the railroad line ran from the Kā`anapali area to the Kahana area, and beyond. The second identified site (Site -4069) consisted of stone bridge footings and retaining walls. This site was identified in the northeastern portion of the project area and had previously been documented (Fredericksen and Fredericksen 1995). Limited testing in the form of six trenches was accomplished within undisturbed portions of the project area. Three trenches were sterile, one trench contained concrete water conduits and strata likely associated with the aforementioned railroad easement, and two trenches exhibited a profile of intensive oxidation and reduction layers. The clarity and breadth of the strata in the latter two trenches provides some evidence for a long-term commitment to agriculture. Several Land Commission Awards occurring on the parcel also attest to traditional agricultural practices on the parcel (taro and sweet potato cultivation). Overall, within a majority of the project area, the lack of surface and subsurface remains was partially attributable to historic-period, intensive landscape alterations. During the late 1800s to early 1900s, sugarcane was cultivated across the parcel. Railroad construction occurred in the early 1900s along the eastern portion of the project area. The expansion of the Honoapi`ilani Highway was completed in more recent times. The western flank of the parcel nearer the current project area was subject to limited grading and dumping activities.

Overall, the presence and documentation of a varied abundance of archaeological features in the general Kahana-Honokawai area indicates a strong history of settlement and land usage both by traditional Hawaiian peoples and Historic Period immigrants. Most of this occupation and land use occurred nearer the coastline and in the west Maui valleys, not the upland tablelands as is the current project area.

PROJECT AREA EXPECTATIONS

Based on archival research and previous archaeology conducted in the general upland, Kahana area, given the location of the project area, it was unlikely that traditional architectural remains or surface artifacts and midden scatters would be identified. This was primarily based on location within fallow pineapple fields. If the project area were in the gulches/valleys (i.e., Kahana Valley), expectations would have easily increased, given previous records of *lo'i* and house sites in those areas. Historic-era landscape alterations through industrial-level cultivation were thought to preclude significant findings within the project area. There was also limited expectation for locations in the project area that would be amenable to yielding significant subsurface cultural deposits, given the absence of finds on such upland areas located above valleys/drainages in the past.

METHODS

Fieldwork was conducted on September 19, 2013 by SCS Archaeologist David Perzinski, B.A. under the overall guidance of Michael Dega, Ph.D. (Principal Investigator). The project area was delineated by survey flags within the fallow pineapple fields. UTM coordinates were entered into a Garmin GPS map 60CSx Global Positioning System for the flagged center of proposed well. Pedestrian survey consisted of a 100% visual inspection of the project area. Transects were spaced c. 5-10 m apart and laid on a north-south axis to cover the entirety of the project area. Surface visibility was low-moderate (see Figure 5). Photographs were taken of the project area, in addition to written notes pertaining to topography, the natural environment, and potential for sites. Given the location of the project area, within the fallow pineapple field, no subsurface testing was conducted.

Laboratory work was conducted in the Maui and Oahu offices of SCS and included drafting of project area locations maps, digitizing photographs, and reporting. All documentary materials are currently being curated at the SCS office on Oahu.

RESULTS OF FIELDWORK

Survey commenced in the southern portion of the subject parcel and stayed on the north-south axis through the project area. The area was transected multiple times, even though it was clear that the area of potential effect was a former pineapple field now completely covered in molasses grass, the latter a common secondary growth in fallow agricultural fields (see Figure 5). Below the thick ground cover, the soil consisted of dark reddish brown silty clay (Alaeloa

Series). Abundant plastic irrigation lines, common to pineapple cultivation, were scattered across the ground surface. No traditional Hawaiian or historic sites or deposits were encountered during the survey.

The current archaeological work did not lead to the identification of any historic properties. This may be the result of either Historic and/or modern era agricultural activities, which disturbs sites, and/or the fact that this area was not a primary location for pre-Contact habitation, agriculture, etc. These sites are most likely present in neighboring valleys (*i.e.*, Kahana Valley) and not on the tablelands.

The current project area was wholly constituted within a portion of "Field 105" as shown on plantation maps and TMK maps for the area (see Figure 2). Given plantation activities within the entirety of the project area, the lack of significant sites was somewhat expected prior to fieldwork.

CONCLUSION AND RECOMMENDATIONS

Inventory-level survey of the proposed West Maui Well No. 2 Exploratory, occurring on a c. 1-acre parcel in the Kahana uplands, did not lead to the identification of any significant sites. It is our estimation that the proposed undertaking, described above, would not have an adverse impact on any archaeological sites or features. No further archaeological/historical work is recommended for the project area. However, should the inadvertent discovery of significant cultural materials and/or burials occur during construction, all work in the immediate area of the find must cease and the SHPD be notified to discuss mitigation.

REFERENCES CITED

- Beckwith, Martha
1940 *Hawaiian Mythology*. The University of Hawaii. Honolulu.
- Chapman, Peter S. and Patrick V. Kirch
1979 *Archaeological excavations at seven sites, southeast Maui, Hawaiian Islands*.
Honolulu, Hawai'i. Dept. of Anthropology, Bernice P. Bishop Museum.
- Chinen, Jon
1961 Original Land Titles in Hawaii. Copyright 1961 Jon Jitsuzo Chinen.
Library of Congress Catalogue Card No. 61-17314.
- Clark, John
1980 *The Beaches of Maui County*. A Kolowalu Book, University Press of
Hawaii: Honolulu.
- Daws, G.
1968 *Shoal of Time: History of the Hawaiian Islands*. University of Hawai'i
Press.
Honolulu.
- Dega, M.F.
2000 *Archaeological Inventory Survey of a 3-acre Parcel in Kahana-Kai,
Kahana Ahupua`a, Kaanapali District, Island of Maui, Hawai'i (TMK:
(2)-4-3-05:70)*. Scientific Consultant Services, Inc., Honolulu.
- Donham, T.K.
2000 *Data Recovery Excavations at the Honokahua Burial Site, Land of
Honokahua, Lahaina District, Island of Maui*. PHRI, Inc., Hilo, HI. On
file at SHPD, Kapolei, HI.
- Dorrance, W.H., and F.S. Morgan
2000 *Sugar Islands: The 165-Year Story of Sugar in Hawai'i*. Mutual
Publishing, Inc., Honolulu, HI.
- Foote, D.E., E. Hill, S. Nakamura, and F. Stephens
1972 *Soil Survey of the Islands of Oahu, Maui, Molokai, and Lanai, State of
Hawaii*. U.S. Department of Agriculture Soil Conservation Service,
Washington, D.C.
- Fornander, Abraham
1919-1920 *Fornander Collection of Hawaiian Antiquities and Hawaiian
Folklore: Translations by Thomas G. Thrum, Memoirs of the
Bernice Pauahi Bishop*

Museum Vol. 6. Bishop Museum Press. Honolulu, HI.

1969 *An Account of the Polynesian Race, Its Origins and Migrations.* Vol. 1 to 3. Charles E. Tuttle Co. Inc.: Jutland.

Fredericksen, W.M., and D.L. Fredericksen

1995 *Archaeological Inventory Survey for Kahana-Kai Subdivision, Kahana Ahupua`a,*

Kaanapali District, Maui Island (TMK:4-3-05:71). MS. on file State Historic

Preservation Division, Kapolei, Hawaii.

2001 *Additional Archaeological Inventory Level Work for Site 50-50-03-4797, Lower Honoapi`ilani Road Improvements Project Corridor; Alaeloa, Mailepai, and Kahana Ahupua`a, Lahaina District, Maui Island (TMK: 4-3-15).* MS. on file State Historic Preservation Division, Kapolei, Hawaii.

Griffin, B. P. and G. Lovelace, (eds.)

1977 *Survey and Salvage-Honoapi`ilani Highway, The Archaeology of Ka`anapali,*

Maui. Archaeological Research Center Hawaii, Inc. Prepared for the State

of Hawaii Dept. of Transportation.

Handy, E.S.C.

1940 *The Hawaiian Planter, Vol. 1: His Plants, Methods and Areas of Cultivation.* B.P.B.M. Museum Bulletin 161, Honolulu.

Hommon, R. J. and Hamilton M. A.

1982 *An Archaeological Reconnaissance Survey of the Site of a Proposed Airstrip at*

Mahinahina, West Maui. Prepared for Royal Hawaiian Air Service.

Kamakau, Samuel

1961 *Ruling Chiefs of Hawaii.* The Kamehameha Schools Press: Honolulu.

Kame`eleihiwa, Lilikalā

1992 *Native Land and Foreign Desires: Pehea La E Pono Ai?* Bishop Museum Press. Honolulu.

Kaschko, M. W.

1974 *Archaeological Walk-Through Survey of Specified Areas in the Wailuku Flood Prevention Project and the Honolua Watershed, Maui.* Ms. in Dept. of Anthropology, Bishop Museum.

Kelly, Marion

1983 *Nā Māla o Kona: Gardens of Kona*. Dept. of Anthropology Report Series 83-2. Bishop Museum. Honolulu.

1998 A Gunboat Diplomacy, Sandalwood Lust and National Debt. In *Ka Wai Ola o OHA*, Vol. 15, No. 4, April 1998.

Kennedy, J.

1986a *Field Inspection: Stone Building at Kahana, Maui*. Prepared for Jack Kelley and Peter Martin of Whalers Realty, Lahaina, Maui.

1986b *Archaeological Investigations at Kahana, Maui (TMK: 4-3-5:13)*. Prepared for Jack Kelley and Peter Martin of Whalers Realty, Lahaina, Maui.

1991 *Archaeological Inventory Survey Report for TMK: 4-3-01: 31, Located at Kahana, Island of Maui*. Prepared for Mr. R.T. Tanaka of Tanaka Engineers, Inc., Wailuku, Maui.

Kirch, P.V.

1973 Archaeological Survey of the Honolulu Development Area, Maui. TMK 4-2-01: 12, 19, 22, 23, 24, 25, 30, 31. Manuscript on file, B.P. Bishop Museum, Honolulu.

1985 *Feathered Gods and Fishhooks: An Introduction to Hawaiian Archaeology and Prehistory*. University of Hawaii Press, Honolulu.

Kirch, Patrick V. and Marshall Sahlins

1992 *Anahulu*. Vol. 1 and 2. University of Chicago Press. Chicago.

Komori, E.

1983 *Archaeological Investigations at Kahana Gulch, Lahaina District, Maui*. Prepared for the Soil Conservation Service, U.S. Dept. of Agriculture.

Kuykendall, R.S.

1938 *The Hawaiian Kingdom*. Vol. 1. University of Hawai'i Press. Honolulu.

Lucas, Paul F. Nahoa

1995 *A Dictionary of Hawaiian Legal Land-terms*. Native Hawaiian Legal Corporation. University of Hawai'i Committee for the Preservation and Study of Hawaiian Language, Art and Culture... University of Hawai'i Press.

- Lyons, C.J.
1875 Land Matters in Hawaii. *The Islander*, Vol. I. Honolulu.
- Pukui, M.K., S.H. Elbert, and E.T. Mookini
1989 *Place Names of Hawaii*. University of Hawaii Press. Honolulu. HI.
- Pukui, Mary Kawena and Samuel H. Elbert
1984 *Hawaiian Dictionary: Hawaiian-English English-Hawaiian*. University of Hawaii Press. Honolulu. HI.
- Price, S.
1973 Climate. In *Atlas of Hawaii*, ed. by W. Armstrong, pp. 62. The University Press of Hawaii, Honolulu.
- Schmidt, R.C.
1973 *The Missionary Censuses of Hawai'i*. Pacific Anthropological Records #20. Department of Anthropology, B.P. Bishop Museum, Honolulu, HI.
- Sterling, E.P.
1998 *Sites of Maui*. Bishop Museum Press, Honolulu.
- Thrum, T.G.
1909 Heiau and Heiau Sites throughout the Hawaiian Islands. *Hawaiian Almanac and Annual for 1909*: 36-48.

1917 Maui's Heiaus and Heiau Sites Revisited. *Hawaiian Almanac and Annual for 1917*: 52-62.
- Walker, W.
1931 *Archaeology of Maui*. B.P.B.M. Department of Anthropology, Honolulu.
- Wilcox, Charles
1921 Kalepolepo. *Paradise of the Pacific*. 34 (12):65-67.

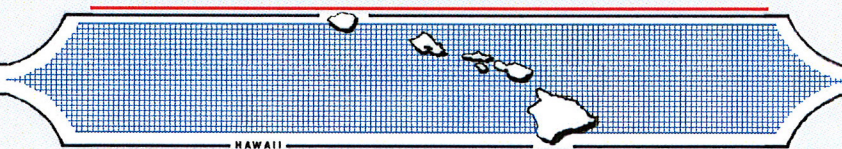
APPENDIX D.
Cultural Impact Assessment

**A CULTURAL IMPACT ASSESSMENT FOR
THE WEST MAUI WELL NO. 2 EXPLORATORY,
DWS JOB NO. 11-06A
KAHANA AHUPUA`A, LĀHAINĀ (KĀ`ANAPALI) DISTRICT
ISLAND OF MAUI, HAWAI`I
[TMK (2) 4-3-001:017]**

Prepared by:
Cathleen A. Dagher, B.A.
and
Robert L. Spear, Ph.D.
January 2014

Prepared for:
Ronald Fukumoto
Fukumoto Engineering, Inc.
1721 Wili Paa Loop, Suite 203
Wailuku, Hawai`i 96793

SCIENTIFIC CONSULTANT SERVICES Inc.



1347 Kapiolani Blvd., Suite 408 Honolulu, Hawai`i 96814

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Figure 3: Google Earth (2013) Image Showing Project Area Location. 4

INTRODUCTION

At the request of Fukumoto Engineering, Inc., for the County of Maui Department of Water Supply (landowner), Scientific Consultant Services, Inc. (SCS), has prepared a Cultural Impact Assessment (CIA) for the proposed West Maui Well No. 2 Exploratory Well on a c. 1-acre land parcel in Kahana Ahupua`a, Lāhainā (Kā`anapali District, Maui [TMK: (2) 4-3-001:017] (Figures 1 through 3).

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 (2000) 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.” 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 (HB) 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].

Articles IX and XII of the state constitution, other state laws, and the courts of the State impose on government agencies a duty to promote and protect cultural beliefs and practices, and resources of Native Hawaiians as well as other ethnic groups. Act 50 also requires state agencies and other developers to assess the effects of proposed land use or shore line developments on the

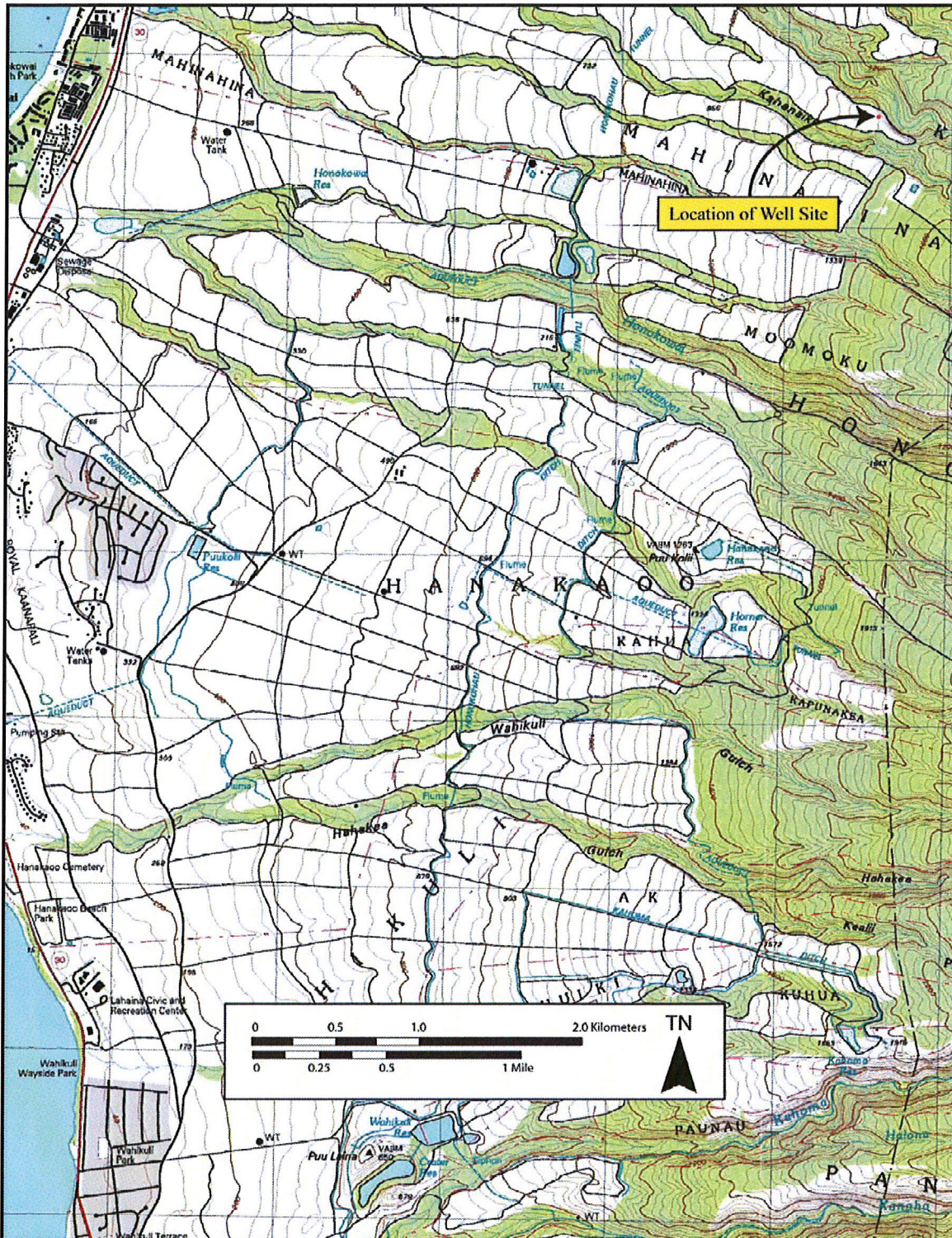


Figure 1: USGS Quadrangle (Lahaina 1992) Map Showing Project Area Location.

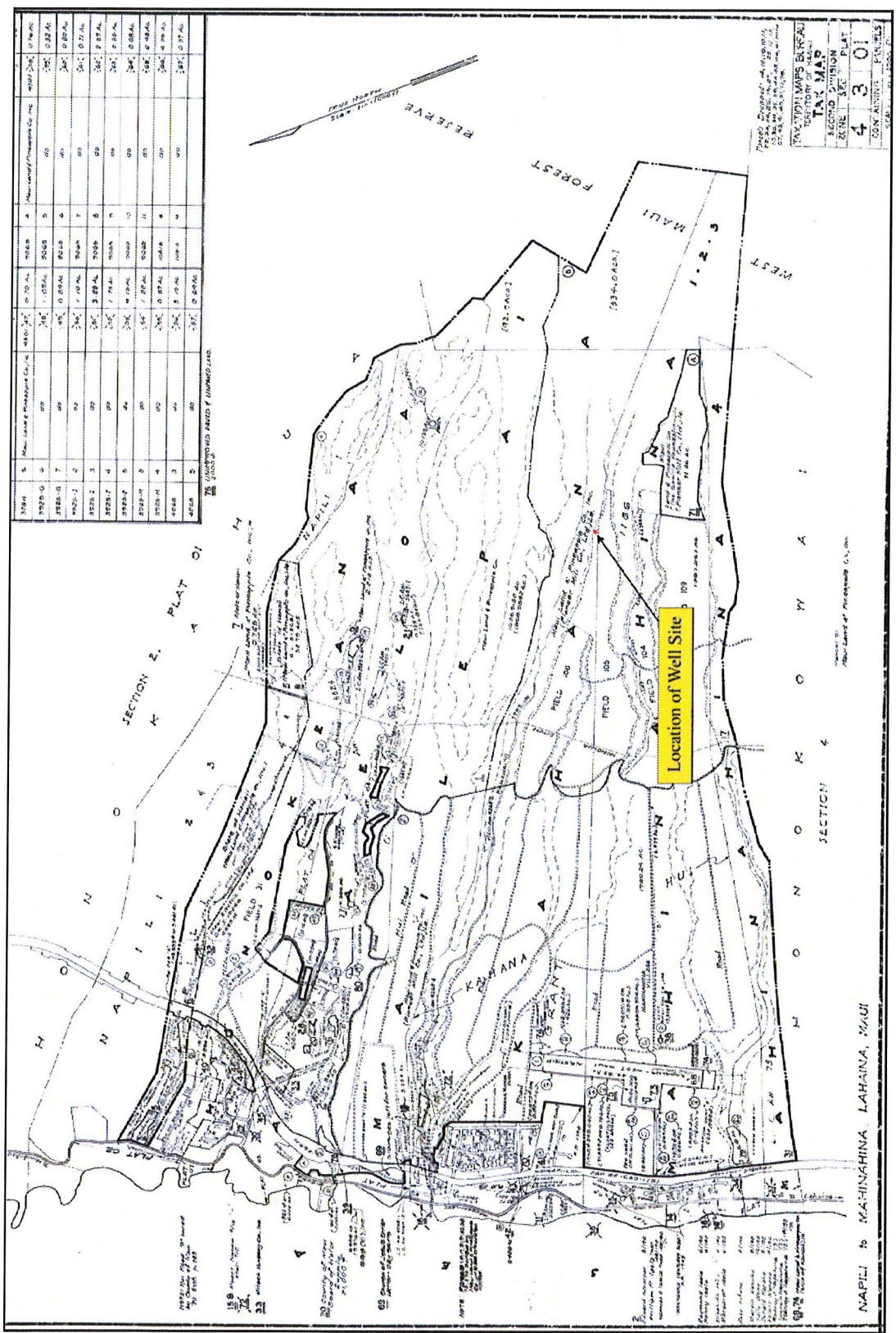


Figure 2: Tax Map Key [TMK: (2) 4-3-001] Showing Project Area Location.

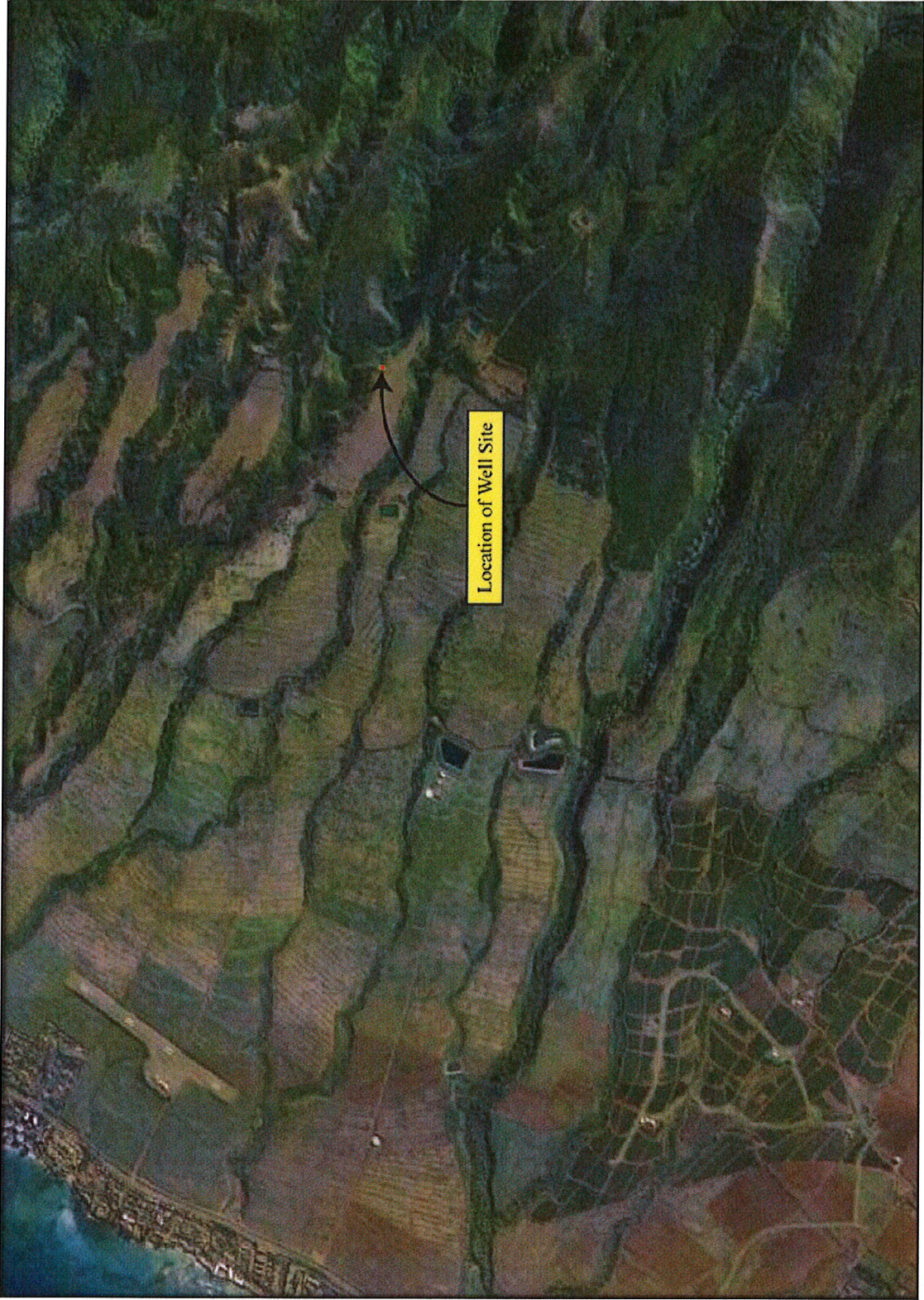


Figure 3: Google Earth (2013) Image Showing Project Area Location.

“cultural practices of the community and State” as part of the HRS Chapter 343 (2001) environmental review process.

It also re-defined the definition of “significant effect” to include “the sum of effects on the quality of the environment including actions impacting a natural resource, limit the range of beneficial uses of the environment, that are contrary to the State’s environmental policies . . . or adversely affect the economic welfare, social welfare or cultural practices of the community and State” (H.B. 2895, Act 50, 2000). Cultural resources can include a broad range of often overlapping categories, including places, behaviors, values, beliefs, objects, records, stories, etc. (H.B. 2895, Act 50, 2000).

Thus, Act 50 requires that an assessment of cultural practices and the possible impacts of a proposed action be included in Environmental Assessments and Environmental Impact Statements, and to be taken into consideration during the planning process. As defined by the Hawaii State Office of Environmental Quality Control (OEQC), the concept of geographical expansion is recognized by using, as an example, “the broad geographical area, e.g. district or *ahupua`a*” (OEQC 2012:12). It was decided that the process should identify ‘anthropological’ cultural practices, rather than ‘social’ cultural practices. For example, *limu* (edible seaweed) gathering would be considered an anthropological cultural practice, while a modern-day marathon would be considered a social cultural practice.

Therefore, the purpose of a Cultural Impact Assessment is to identify the possibility of on-going cultural activities and resources within a project area, or its vicinity, and then assessing the potential for impacts on these cultural resources. The CIA is not intended to be a document of in depth archival-historical land research, or a record of oral family histories, unless these records contain information about specific cultural resources that might be impacted by a proposed project.

According to the Guidelines for Assessing Cultural Impacts established by the Hawaii State Office of Environmental Quality Control (OEQC 2012:12):

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 as much as possible in accordance with the suggested methodology and content protocol in the Guidelines for Assessing Cultural Impacts (OEQC 2012:11-13). In outlining the “Cultural Impact Assessment Methodology”, the OEQC (2012:11) states that:

“...information may be obtained through scoping, community meetings, ethnographic interviews and oral histories...”

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. An example of the letters of inquiry is presented in Appendix A, copies of the posted legal notice and Affidavit are presented in Appendix B, responses to the inquiries are presented in Appendix C, and the information release forms are presented in Appendix D. This Cultural Impact Assessment was prepared in accordance with the suggested methodology and content protocol provided in the Guidelines for Assessing Cultural Impacts (OEQC 2012:13), whenever possible. The assessment concerning cultural impacts may include, but not be limited to:

- A. 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 or limitations which might have affected the quality of the information obtained.
- B. 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.

- C. 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.
- D. 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 interviewed, their particular knowledge and cultural expertise, if any, and their historical and genealogical relationship to the project area.
- E. A discussion concerning historical and cultural source materials consulted, the institutions and repositories searched and the level of effort undertaken. This discussion should include, if appropriate, the particular perspective of the authors, any opposing views, and any other relevant constraints, limitations or biases.
- F. A discussion concerning the cultural resources, practices and beliefs identified, and, for 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.
- G. 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.
- H. An explanation of confidential information that has been withheld from public disclosure in the assessment.
- I. A discussion concerning any conflicting information in regard to identified cultural resources, practices and beliefs.
- J. 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.
- K. A bibliography of references, and attached records of interviews which were allowed to be disclosed.

If on-going cultural activities and/or resources are identified within the project area, assessments of the potential effects on the 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, land records, such as Land Commission Awards, Royal Patent Grants, and Boundary Commission records; historic accounts, and previous archaeological reports.

INTERVIEW METHODOLOGY

Interviews are conducted in accordance with Federal and State laws, and guidelines, when knowledgeable individuals are able to identify cultural practices in, or in close proximity to, the project area. If they have knowledge of traditional stories, practices and beliefs associated with a project area or if they know of historical properties within the project area, they are sought out for additional consultation and interviews. Individuals who have particular knowledge of traditions passed down from preceding generations and a personal familiarity with the project area are invited to share their relevant information concerning particular cultural resources. Often people are recommended for their expertise, and indeed, organizations, such as Hawaiian Civic Clubs, the Island Branch of Office of Hawaiian Affairs (OHA), historical societies, Island Trail clubs, and Planning Commissions are depended upon for their recommendations of suitable informants. These groups are invited to contribute their input, and suggest further avenues of inquiry, as well as specific individuals to interview. It should be stressed again that this process does not include formal or in-depth ethnographic interviews or oral histories as described in the OEQC's *Guidelines for Assessing Cultural Impacts* (2012). The assessments are intended to identify potential impacts to on-going cultural practices, or resources, within a project area or in its close vicinity.

If knowledgeable individuals are identified, personal interviews are sometimes taped and then transcribed. These draft transcripts are returned to each of the participants for their review and comments. After corrections are made, each individual signs a release form, making the interview 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.

ENVIRONMENTAL SETTING

PROJECT AREA LOCATION AND ENVIRONMENT

The undeveloped subject parcel is located at an elevation of approximately 1315 feet above mean sea level (amsl) and lies 4.8 km (3.0 miles) from the coast line (see Figure 1). The entire parcel is within a gently sloping, fallow pineapple field that is nearly completely overgrown with molasses grass. The subject parcel is bounded by Kahana Stream Gulch to the north, pineapple fields to the east, Kahanaiki Gulch to the south and fallow pineapple fields to the west.

VEGETATION

Within the fallow agricultural fields were non-native eucalyptus trees and molasses grass. Just outside the project area along the edge of the gulch were several species of native plants including *pukiawe* (*Leptecophylla tameiameia*), *ohia* (*Metrosideros* sp.), *ulei* (*Osteomeles anthyllidifolia*), *kilau* (*Pteridium aquilinum*) and *huehue* (*Cocculus orbiculatus*).

SOILS AND CLIMATE

Soils in the project area consist primarily of the Alaeloa Series (Foote *et al.* 1972: Map Sheet 92). These are well-drained soils occurring in upland locations and have developed in material weathered from in situ igneous rock (*ibid*: 26). The basic stratigraphic profile consists of dark reddish brown silty clays overlying bedrock. The soils are fairly homogeneous. Rainfall associated with this area is estimated at 35" to 60" per year, and the soils are most commonly associated with pineapple, pasture, wildlife, house lots, and water supply. In addition to the Alaeloa Series, ranges of the Kahana Series occurs in the area (*ibid*: Map Sheet 92). These soils are very similar in texture and composition to the Alaeloa series and occur on smooth uplands.

TRADITIONAL AND HISTORIC SETTING

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 watered fertile agricultural lands extending to the coast. The deep valleys of the West Maui Mountains 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 fifteenth

century or the beginning of the sixteenth century [Fornander 1969, Vol. 6:248]). Land was considered the property of the king or *ali`i`ai moku* (the *ali`i* who eats the island/district), which he held in trust for the gods. The title of *ali`i`ai moku* ensured rights and responsibilities pertaining to the land, but did not confer absolute ownership. The king kept the parcels he wanted, his higher chiefs received large parcels from him and, in turn, distributed smaller parcels to lesser chiefs. The *maka`āinana* (commoners) worked the individual plots of land.

In general, several terms, such as *moku*, *ahupua`a*, *`ili* or *`ili`āina* were used to delineate various land sections. A district (*moku*) contained smaller land divisions (*ahupua`a*) which customarily continued inland from the ocean and upland into the mountains. Extended household groups living within the *ahupua`a* were therefore, able to harvest from both the land and the sea. Ideally, this situation allowed each *ahupua`a* to be self-sufficient by supplying needed resources from different environmental zones (Lyons 1875:111). The *`ili`āina* or *`ili* were smaller land divisions next to importance to the *ahupua`a* and were administered by the chief who controlled the *ahupua`a* in which it was located (*ibid*: 33; Lucas 1995:40). The *mo`o`āina* were narrow strips of land within an *`ili*. The land holding of a tenant or *hoa`āina* residing in an *ahupua`a* was called a *kuleana* (Lucas 1995:61). The project area is located in the *ahupua`a* of Kahana, which literally translates to "cutting", as in a valley cutting through the mountain (Pukui *et al.* 1974:202).

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 the pre-Contact (pre- 1178) Period, there were primarily two types of agriculture, wetland and dry land, both of which were dependent upon geography and physiography. River valleys provided ideal conditions for wetland *kalo* (*Colocasia esculenta*) agriculture that incorporated pond fields and irrigation canals. Other cultigens, such as *kō* (sugarcane, *Saccharum officinaruma*) and *mai`a* (banana, *Musa* sp.), were also grown and, where appropriate, such crops as *`uala* (sweet potato, *Ipomoea batatas*) were produced. This was the typical agricultural pattern seen during traditional times on all the Hawaiian Islands (Kirch and Sahlins 1992, Vol. 1:5, 119; Kirch 1985). Between A.D. 600 and 1100, a period sometimes referred to as the Developmental Period, was the major focus of permanent settlement continued to be the fertile and well-watered windward valleys, such as those in the West Maui Mountains (Kirch 1985).

A general settlement model based on archaeological evidence has been suggested for the Kā'anapali District (Chapman and Kirch 1979; Kirch 1985). This model includes coastal marine foraging and fishing with more upland agricultural pursuits. In typical native Hawaiian fashion, dating at least from the later pre-Contact period (if not earlier), people in this area would have moved between the coast and the upland agricultural fields, exploiting the full range of resources available within the *ahupua`a*. Semi-permanent and permanent habitation probably occurred in both coastal and upland settings.

There are six bays located on Maui's west shore whose names begin with *Hono-*. These bays and coves include Honokahua, Honokeana, Honokōhau, Honokōwai, Honolua, and Hononana and are collectively known as *Hono a Pi'ilani*, literally meaning bays (*hono*) acquired or ruled by Pi'ilani (Pukui and Ebert 1986, Pukui *et al.* 1974, and Clark 1980). Kapalua is situated along this coast between Honokahua and Honokeana. The coastal and marine environments adjacent to the project area would have provided rich resources for traditional subsistence foragers and fishermen in ancient times.

A large number of fish species are found in the near-coastal waters: weke, surmullet (*Mulloidichthys auriflamma*); *kūmū* (goatfish, *Parupeneus prophyreus*); *mamo* (sergeant fish, *Abudefduf abdominalis*); *manini* (surgeonfish, *Acanthurus triostegus*); *palani* (surgeonfish, *Acanthurus bariene*); *nenu* (rudder or pilot fish, *Kyphosus fuscus*); *kōkala* (porcupine fish, *Diodon hystrix*); *hinalea* (wrasse, Family, Labridae); *uhu* (parrot fish, *Scarus perspicillatus*); *`ala`ihi* (squirrel fish, *Holocentrus* sp.); *kala* (surgeonfish or unicorn fish, *Acanthurus* sp.); and *nehu* (anchovy, *Anchoviella purpurea*). In addition to a relatively high density of gastropods and pelecypods (including *pipipi*, black nerita, (*Nerita picea*) and *Littorina pintado*), at least five species of sea urchin have been noted: *Centrochinus paucispinus*, *Tripneustes gratilla*, *Podophora atrata*, *Heterocentrotus mammillatus*, and *Echinometra mathaei* (Kirch 1973).

Early archaeological surveys identified seven religious shrines (*heiau*) from Mahinahina to Honokōhau Ahupua`a (Thrum 1909, 1917; Walker 1931). Two *heiau*, both destroyed, were recorded between Kahana and Mailepai and to the northeast, in Honokahua Ahupua`a, Kahauiki Heiau, (Walker Site 16) was situated. *Heiau* indicate the presence of political power and the appropriate population to support it.

Traditionally, trails extended from the coast to the mountains, linking the two for both economic and social reasons. Kā'anapali District is noted for an *alaloa* (a long path or trail) that reportedly encircled the entire island. Walker (1931 cited in Sterling 1998:46) wrote:

The north end of Maui also is traversed by a paved trail. Sections of it can be seen from Honolulu to Honokohau to Kahakuloa. It is paved with beach rocks and has a width of four to six feet....This trail is also spoken of as the Kihapiilani Trail.

Walker Site 20, a large *luakini heiau* (*heiau* for human sacrifice), was reportedly located on a cliff on the east side of Honokōhau Valley, approximately 60 m above the shoreline just east of the Honokahua Burial Site, State Site 50-50-01-1342 (Walker in Sterling 1998:54). Most significantly, Kamakau (in Sterling 1998:55) reported oral history accounts of Waiuli Pit, a large 'death pit', at least one mile deep and extending below the water table. According to Kamakau, the bodies of dead commoners who resided in the areas from Lāhainā to Kahakuloa, and the islands of Moloka`i and Lanai, were thrown into this pit.

Kamakau (in Sterling 1998:55) states:

Waiuli was a death pit wherein the dead bodies of commoners were thrown. . . .At Waiuli (on Maui) directly back of Honokohau, Honolulu, and Honokahua is a deep pit which was used as a burial place for bodies of the common people from Lahaina to Kahakuloa. The body of anyone from those regions who died on Moloka`i [*and Lanai*] was brought back and thrown into that pit. . .

A *ko`a* (fishing shrine, Walker Site 17), located “[*makai*] to Honolulu Park along the shore” (Honolulu Ahupua`a), was described by Walker (1931 in Sterling 1998:53). He also reported oral history accounts of a *hōlua* (slide or sledding ramp) at Honolulu Ahupua`a that was destroyed by the time of his survey (1920s–30s) by commercial agriculture.

Kamakau recounts the results of a war between Kauhi-pumai-kahoaka (or Kauhi-`aimoku-a-Kama) and Kamehameha-nui in 1735, both children of Kekaulike. Alapa`i of Hawai`i Island had joined forces with Kamehameha-nui and a year was spent preparing for the war “which swept the country” (Kamakau 1961:74). Alapa`i tactics included drying up some of the main streams, which in turn dried up the brooks and taro patches. This reduced food not only for Kahui’s forces, but also the *maka`āinana*. His fighting force consisted of 8,440 warriors from all of the six districts of Hawai`i Island (*ibid*). Honokahua and Honolulu Bays north of the project area became the gathering place for the forces of Peleioholani who had arrived from O`ahu with only 640 men to assist Kauhi. While attempting to unite its warriors with those of Kauhi, Peleioholani became surrounded by the army of Alapa`i.

Kamakau (1961:74) recorded:

The hardest fighting even compared with that of Napili and at Honokahua in Kā`anapali, took place on the day of the attack at Pu`unēnē [in Honolua]. Pele-io-holani was surrounded on all sides, *mauka* and *makai*, by the forces of Alapa`i, let by Ka-lani-`opu`ū and Keoua. The two ruling chiefs met there again, face to face, to end the war and became friends again, so great had been the slaughter on both sides .

Fornander (1969:142) stated:

The fortune of the battle swayed back and forth from Honokawai to near into Lahaina; and to this day heaps of human bones and skulls, half buried in various places in the sand, attest the bitterness of the strife and the carnage committed...

EARLY HISTORIC

The traditional district of Kā`anapali, where the project area is located, consisted of five major stream valleys (Honokōwai, Kahana, Honokahua, Honolua, and Honokōhau), all of which were extensively terraced for wetland (*lo`i*) taro in early historic and later times (in Honokōhau, well into the 1930s). Honokahua Valley, to the north, was described as having wet taro lands, although of no great abundance [according to Handy (1940) quoting D.L. Fleming, in Sterling 1998:52] Sweet potatoes were reportedly grown between Honokōhau and Kahakuloa Ahupua`a, presumably on lower *kula* lands and, south of the project area, Kahana Ahupua`a was known as a place of salt gathering for the people of Lāhainā (old spelling for village; Pukui *et al.* 1974:127, Sterling 1998).

Most of the *ahupua`a* on the coast have been overshadowed by the famous roadstead and village that served as the capitol of the Hawaiian Kingdom after the conquest of Kamehameha I until 1855. The ethnographic and historic literature, often our only link to the past, reveal that the lands around Lāhainā were rich agricultural areas irrigated by aqueducts originating in well-watered valleys with permanent occupation predominately on the coast. Crops cultivated included coconut, breadfruit, paper mulberry, banana, taro, sweet potato, sugar cane, and gourds.

THE MĀHELE

In the 1840s, traditional land tenure shifted drastically with the introduction of private land ownership based on Western law. While it remains a complex issue, many scholars believe that in order to protect Hawaiian sovereignty from foreign powers, Kauikeaouli (Kamehameha

III) was forced to establish laws changing the traditional Hawaiian economy to that of a market economy (Kame`eleihiwa 1992:169–70, 176; Kelly 1983:45, 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* (commoners), if they had been made aware of the procedures, were then able to claim the plots which they had been cultivating and living. These claims did not include any previously cultivated but presently fallow land, 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 were issued a Royal Patent after which they could take possession of the property (Chinen 1961:16). There are no LCA's associated with the current project area. Rather, land use records mostly reflect historic-era use of the lands.

HISTORIC LAND USE

An 1831 census estimated the entire population of Kā`anapali District to be 2,980 people, which was reduced to less than half (1,341) only five years later probably due to introduced diseases (Schmidt 1973). Whaling (centered on Lahaina Town) was the first commercial enterprise in West Maui, but it had more or less collapsed by the 1860s. Commercial sugarcane production was the next large capitalist venture in West Maui, starting as early as 1863, and it was focused between Kā`anapali and Lāhainā.

The general area around and below the project area, which was located at the margins of sugar cane enterprises in West Maui (Dorrance and Morgan 2000), was most important as a center of commercial ranching (cattle raising) and, subsequently, pineapple production.

In the later nineteenth century, lands in West Maui became part of the Campbell Estate. This was also the time that the Honolulu Ranch was first established. Cattle ranching began then and was continued by Henry Perrine Baldwin, who acquired the lands from the Campbell Estate in 1890 (Fredricksen and Fredricksen 2001). In addition to ranching, other early commercial activities included coffee farming.

David T. Fleming became manager of Honolulu Ranch in 1911 (or 1912). Fleming was well-versed in pineapple production from the Ha`iku area and gradually began shifting the ranch's initiative to pineapple production. The Honolulu Ranch/Baldwin Packers complex shifted

from Honolulu to Honokahua in 1915, and a pineapple cannery was constructed. A major commercial pineapple industry emerged in West Maui during the 1920s. The plantation communities of Honokahua and Nāpili emerged and developed as Honolulu Ranch/Baldwin Packers pineapple operations grew. The population of the Lāhainā area increased with the successful economic operations of the pineapple plantation. Baldwin Packers merged with Maui Pineapple Company in 1962 to form Maui Land and Pineapple Company, Inc. After this time, much of the Honolulu Ranch lands were converted for resort development, a process that continues to this day. Both the Ritz-Carlton Kapalua and the Residences at Kapalua Bay are part of this ongoing process.

The Honokahua Historic District (State Site 50-50-01-1591) is located north of the project area. This historic district includes the plantation village of Honokahua, the Baldwin Packers cannery and associated facilities, Honolulu Ranch Stables, Honolulu Ditch (constructed in 1902), the Maui Pineapple Company offices, the Honolulu Store, plantation camp housing, and two churches (Fredricksen and Fredericksen 2001).

The Honokahua Burial Site (State Site 50-50-01-1342), which contained over 2,000 Hawaiian burials, is included with five other traditional sites in the Honokahua Archaeological District (50-50-01-1340). The cemetery is included on the National Registry of Historic Places. The cemetery was used by Native Hawaiians from as early as A.D. 700 to 800 to as late as the early nineteenth century (Donham 2000).

Evidence of historic-era activity in and around the project area is evidenced by fallow pineapple fields and water transport ditches. For instance, located several hundred meters down slope (west) from the current project area, Honokohau Ditch is present. Designated as State Site No. -1591, the ditch runs perpendicular to the slope through multiple *ahupua`a* at the c. 700-750 ft. elevation level. The ditch itself has an interesting history, as noted by Wilcox (1996). The ditch, primary composed of rock slab side walls, was originally constructed from 1902 and was completed in June, 1904. The ditch was built by Honolulu Ranch, who also owned it, but Pioneer Mill financed the project and used the water. The ditch started at 700 feet above mean sea level and was completely re-built twice and renovated one time. Due to cracks, leakages, and sediment built up over time, a "new" Honokohau Ditch was constructed from June, 1912 and completed in November, 1913. The ditch was called "Honolulu Ditch" by Maui Land and Pineapple Company and designated as Honokohau Ditch by the Pioneer Mill Company, even though it was the same ditch. [Note: the current project area is noted as "Field 105" and when in use as field, was owned by Maui Land and Pineapple Company, Inc., although maps notate

"Pioneer Mill Company, Ltd" beneath the ML&P designation]. In September, 1923 the entire ditch was re-lined, a process that took five years to complete. During this re-lining process, water was diverted from this ditch to the old, 1904 Honokohau Ditch which had been abandoned. The ditch still retains an important water transfer capacity today as it irrigates neighboring lands and brings potable water to the Lāhainā area. At present times, the area contains fallow pineapple fields, and the area remains undeveloped.

PREVIOUS ARCHAEOLOGY

A majority of the previous archaeological work conducted in the Kahana-Kā`anapali area has occurred nearer the coastline, a symptom of much increased development from the 1980s through present times. A short history of these projects is presented, with a focus on the few projects conducted in more upland locations of the Kahana area, in more similar settings to the current project area.

The first study of the Kahana area, as with a vast majority of coastal Maui, was conducted by W. Walker on an island-wide survey that took place in 1931. Focused on monumental coastal sites, Walker noted a destroyed *heiau* at Kahana Point (Walker Site 12), one *heiau* that was washed away at Mailepai Point (Walker Site 13), and another destroyed *heiau*, named Hihoho which was located along a country road near Kalaeokaea Point (Walker Site 14). There has been no on-ground confirmation of these structures since Walker's initial survey (Walker 1931).

Much archaeological work has been located in the gulches of the Kahana area, and provides overlapping lines of evidence for land use and habitation in the area. In 1974, Michael Kaschko of the Bishop Museum conducted a walk-through of select gulches for the U.S. Soil Conservation Service in conjunction with the Wailuku Flood Prevention Project and the Honolulu Watershed. Kaschko's survey "noted numerous stone walls, terraces, alignments and a historic midden," (Kaschko 1974: 4, 5).

In 1977, Mikk Kaschko, Bion P. Griffin, George Lovelace and other employees of the Archaeological Research Center Hawai'i, Inc. (ARCH, Inc.) conducted survey and salvage excavations on select areas of Mahinahina Gulch for the Hawai'i Department of Transportation. Five gulches were surveyed and a total of five archaeological sites were located (Griffin and Lovelace 1977:11), and given State Site numbers. All of the sites detected by ARCH, Inc. were

identified as prehistoric walls, one of which was previously detected in Kaschko's 1974 survey of the area (*ibid*: 14).

An Archaeological Reconnaissance Survey was performed by Robert J. Hommon and Hamilton M. Ahlo in 1982 ahead of an airstrip proposal by the Royal Hawaiian Air Service. Hommon and Ahlo did not identify any archaeological sites (Hommon and Hamilton 1982:8).

In 1983, Eric Komori of the Bishop Museum carried out archaeological investigations that included surface surveys and inspections of backhoe-disturbed soil in Kahana gulch. The work was done under contract to the U.S. Soil Conservation Service and was a follow-up to Kaschko's 1974 project. Seven sites were recorded by Komori's during these investigations: an overhang/shelter coupled with a 10 meter long segment of terraced earth, a platform bordered by terraces, a wall segment and two stone alignments, wall segments and terraces, a floodplain partitioned off from the rest of the landscape by stone walls and terraces, walls of stacked stone and a rock shelter containing a "hammer stone or unfinished 'ulu maika (prehistoric Hawaiian game stone)" (Komori 1983:8).

Four projects overseen by Joseph Kennedy (1986a, 1986b, 1990, 1992) were located on properties nearer the coastline. Kennedy's first visit to the area in September of 1986 investigated and confirmed the ruins of a stone church dating to the mid-nineteenth century. Although Kennedy could find no record of a graveyard attached to the church, nor marked graves at the site, he could not discount the possibility of unmarked graves near the church (Kennedy 1986a:1-5). In November of 1986 Kennedy made a return visit to the area to take photographs, map the site, and search for burials. No burials were found on the property (Kennedy 1986b:1-5). In 1990, Kennedy returned to the area for the third time to conduct an archaeological inventory survey of 50 acres of land near Kahana. The survey found two new sites: "a two tiered basalt rock platform and a single, crude petroglyph" (Kennedy 1991:4). At the behest of the State Historical Preservation Division, a test unit was placed near the rock platform in 1992. Excavations there found a burial, which was left *in situ* (Kennedy 1991:22).

In 1995, Fredericksen and Fredericksen (1995) conducted extensive investigations of a 4-acre parcel located to on the *makai* side of Honoapi'ilani Highway, down slope from the current project area, in TMK: (2) 4-3-005:071. A total of twenty-two stratigraphic trenches were mechanically (backhoe) excavated and two test units were manually excavated by researchers, all of which produced negative results. One historic site (50-50-01-4069) consisting of a stone bridge footing and retaining wall, a section of the old Pioneer Mill railway (Site -6478), and an

historic grave site (Site 50-50-01-4072) were identified during the investigations. Fredericksen and Fredericksen (1995:20) state that there was no evidence of *in situ* historic or indigenous cultural deposits across the investigated parcel, as a majority of the parcel was grubbed and filled in recent times.

In 1999, Xamanek Researches conducted Archaeological Inventory Survey on a 1.4 mile (2.25 km) long by 40 feet (12 m) wide section of Honoapi`ilani Highway (Fredericksen and Fredericksen 2001). During the survey three newly identified sites were documented. These sites include are: State Site 50-50-01-4797, a pre-Contact habitation area; State Sites 50-50-01 - 4797 and -4798, two wall associated with Lower Honoapi`ilani Highway. Radiocarbon dating of a charcoal sample collected from State Site 50-50-01 -4797 yielded a date ranging from AD 1420 to 1660 with an intercept radiocarbon age of AD 1490 (Fredericksen and Fredericksen 2001:2). State Site 50-50-01 -4797 was interpreted as a coastal habitation site probably associated with marine resource utilization and as a “rare example of a surviving coastal habitation site along this heavily developed portion of the West Maui Coastline (*ibid*: 16). Thus, State Site 50-50-01-4797 was found to be significant under Criteria A, C, and D of Federal and State historic preservation guidelines (*ibid*: 2 and 16).

Subsurface testing of State Site 50-50-01-4797 could not be conducted during the Inventory Survey due to safety and access to private property issues. Thus, the extent of the site could not be determined. In 2001, Xamanek Researches returned to State Site 50-50-01-4797 and conducted subsurface in the form of one 1.0 by 1.0 m hand excavated test unit, on private property, and four backhoe trenches within the County of Maui Right of Way (*ibid*: 3). The findings of the additional Inventory level work indicate a cultural layer interpreted as State Site 50-50-01-4797 extended 150 m along the eastern side of Honoapi`ilani Highway between 1.1 to 1.5 m below the ground surface. A total of five pit features and two possible features extending approximately 78.0 m were noted in a wave cut profile on the west side of Honoapi`ilani Highway (*ibid*: 15). None were dated due to the lack of datable material. Furthermore, no traditional Hawaiian artifacts were recovered during the excavation of three test units and nineteen trenches. Historic components of the sites (e.g., ceramics, glass) showed that the area was likely more intensively utilized during historic times, as was also evidenced by the lack of traditional-period artifacts at the sites.

In 2000, Scientific Consultant Services, Inc. conducted Archaeological Inventory Survey of approximately three acres of land located within the *ahupua`a* of Kahana, Kā`anapali District, Maui Island, Hawai`i [TMK: (2)-4-3-005:070] (Dega 2000), adjacent to previously mentioned

Xamanek project area located in TMK: (2) 4-3-005:071 discussed in Fredericksen and Fredericksen (1995). A 100 percent pedestrian survey of the project area was conducted and revealed a section of the Old Pioneer Mill Railroad easement (State Site 50-50-01-6478) running across the southeastern portion of the parcel. The existing railroad bed probably dates to 1919, when the railroad line ran from the Kā`anapali area to the Kahana area, and beyond. The second identified site (State Site 50-50-01-4069) consisted of stone bridge footings and retaining walls. This site was identified in the northeastern portion of the project area and had previously been documented (Fredericksen and Fredericksen 1995). Limited testing in the form of six trenches was accomplished within undisturbed portions of the project area. Three trenches were sterile, one trench contained concrete water conduits and strata likely associated with the aforementioned railroad easement, and two trenches exhibited a profile of intensive oxidation and reduction layers. The clarity and breadth of the strata in the latter two trenches provides some evidence for a long-term commitment to agriculture. Several Land Commission Awards occurring on the parcel also attest to traditional agricultural practices on the parcel (taro and sweet potato cultivation). Overall, within a majority of the project area, the lack of surface and subsurface remains was partially attributable to historic-period, intensive landscape alterations. During the late 1800s to early 1900s, sugarcane was cultivated across the parcel. Railroad construction occurred in the early 1900s along the eastern portion of the project area. The expansion of the Honoapi`ilani Highway was completed in more recent times. The western flank of the parcel nearer the current project area was subject to limited grading and dumping activities.

Overall, the presence and documentation of a varied abundance of archaeological features in the general Kahana-Honokawai area indicates a strong history of settlement and land usage both by traditional Hawaiian peoples and Historic Period immigrants. Most of this occupation and land use occurred nearer the coastline and in the west Maui valleys, not the upland tablelands as is the current project area.

CONSULTATION

Consultation was conducted via telephone, e-mail, personal interviews, and the U.S. Postal Service. Consultation was sought from Thelma Shimaoka, Office of Hawaiian Affairs, Maui; Roy Newton, Office of Hawaiian Affairs, Maui; Dr. Kamana`opono M. Crabbe, Chief Executive Officer, Office of Hawaiian Affairs; Vincent H. Rodrigues, State Historic Preservation Division, Maui; Torrie Nohara, Na Ala Hele Program; William Ho`ohuli, community member; Maui Tomorrow Foundation, Inc.; Maui Sierra Club; Matthew Erickson, Hawaiian Civic Club,

Lahaina Chapter; Ke`eaumoku Kapu, Chair, Maui/Lana`i Islands Burial Council; Leslie Kuloloio, community member; Clifford Nae`ole, Cultural Resource Advisor, Ritz-Carlton, Kapalua; Patty Nishiyama, Nā Kupuna O Maui; Makalapua Kanuha, County of Maui Cultural Resources Commission; Maui Sierra Club, Silla Kaina, Cultural Ambassador; Uilani Kapu, community member; and Kimokeo Kapahulehua, President of Ao`ao O Na Loko O Maui (see Appendices A and C) .

In addition, a Cultural Impact Assessment Notice was published on October 6, 9, and 13, 2013, in *The Honolulu Star-Advertiser* and in *The Maui News*, which published on the same dates on Maui, and in the November 2013 issue of the OHA newspaper, *Ka Wai Ola* (see Appendix B). These notices requested information of cultural resources or activities in the area of the proposed project, stated the Tax Map Key (TMK) number, and where to respond with pertinent information. Based on the responses, an assessment of the potential effects on cultural resources in the project area and recommendations for mitigation of these effects can be proposed.

CULTURAL IMPACT ASSESSMENT INQUIRY RESPONSES

Analysis of the potential effect of the project on cultural resources, practices or beliefs, the potential to isolate cultural resources, maintain practices or beliefs in their original setting, and the potential of the project to introduce elements that may alter the setting in which cultural practices take place is a requirement of the OEQC (No. 10, 2012). As stated earlier, this includes the cultural resources of the different groups comprising the multi-ethnic community of Hawai`i. The responses to inquiries made in an effort to obtain information pertaining to traditional cultural practices in the vicinity are summarized below and presented in Appendix D.

The Office of Hawaiian Affairs, Honolulu

Dr. Kamana`opono M. Crabbe, Chief Executive Officer of the Office of Hawaiian Affairs (OHA), responded via a letter, dated October 15, 2013. In the letter, OHA indicated that they were in receipt of the SCS letter of inquiry "...seeking assistance and comments ahead of a cultural impact assessment for the proposed Maui Well No. 2 Exploratory Well Project". The Office of Hawaiian Affairs stated that "OHA is unaware of any historic properties assigned religious or cultural significance to the Hawaiian people in this area" and recommended that SCS consult with Kimokea Kapahulehua, Hawaiian Culture Advisor. In addition, OHA applauded SCS's effort in performing the CIA and requested assurances that the Office of Hawaiian Affairs would be consulted in the event that *iwi kūpuna* or Native Hawaiian cultural or

traditional deposits are identified during ground-altering activities associated with the proposed undertaking. The Office of Hawaiian Affairs also requested that should *iwi kūpuna* or Native Hawaiian cultural or traditional deposits be encountered during ground-altering activities associated with the proposed undertaking, all work will immediately cease and the appropriate agencies be notified. The Office of Hawaiian Affairs requested to be notified and consulted if human burials are encountered.

The Office of Hawaiian Affairs, Maui

Mrs. Thelma Shimaoka, of the Maui Island Office of Hawaiian Affairs Community Outreach Coordinator, responded via an electronic e-mail transmission, dated October 15, 2013. Mrs. Shimaoka referred SCS to Silla Kaina, Cultural Ambassador, as an individual "familiar with her sense of place" and knowledgeable about the history of Kahana Ahupua`a. Mrs. Shimaoka also recommended that SCS consult Makalapua Kanuha, as she is on the Maui County Cultural Resources Commission's board.

SUMMARY

The "level of effort undertaken" to identify potential effect by a project to cultural resources, places or beliefs (OEQC 2012) 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 may be affected by the project or who know its history, 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 current undertaking, letters of inquiry were sent to individuals and organizations that may have knowledge or information pertaining to the collection of cultural resources and/or practices currently, or previously conducted in close proximity to the proposed West Maui Well No. 2 Exploratory Well site. The subject property consists of an approximately 1-acre parcel located in Kahana Ahupua`a, Lāhainā (Kā`anapali) District, Maui [TMK: (2) 4-3-001:017], which is owned by Maui Land & Pineapple Company, Inc.

Historical and cultural source materials were extensively used and can be found listed in the References Cited portion of the report. Such scholars as Samuel Kamakau, Martha Beckwith, Jon J. Chinen, Lilikalā Kame`eleihiwa, R. S. Kuykendall, Marion Kelly, E. S. C. Handy and E.G. Handy, Elspeth P. Sterling, and Mary Kawena Puku`i and Samuel H. Elbert 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 Database (2013).

CULTURAL ASSESSMENT AND RECOMMENDATIONS

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 also a suggested guideline of the OEQC (No. 10, 2012). To our knowledge, the project area has not been used for traditional cultural purposes within recent times. Based on historical research and no additional suggestion for contacts, 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, 2012). To our knowledge, the project area has not been used for traditional cultural purposes within recent times.

Based on the above 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 the proposed West Maui Well No. 2 Exploratory Well site. The subject property consists of an approximately 1-acre parcel located in Kahana Ahupua`a, Lāhainā (Kā`anapali) District, Maui [TMK: (2) 4-3-001:017], which is owned by Maui Land & Pineapple Company, Inc.

REFERENCES

- Beckwith, Martha
1940 *Hawaiian Mythology*. New Haven, CT: Yale University Press.
- Chapman, Peter S. and Patrick V. Kirch
1979 *Archaeological excavations at seven sites, southeast Maui, Hawaiian Islands*. Honolulu, Hawai'i. Dept. of Anthropology, Bernice P. Bishop Museum, Honolulu.
- Chinen, J.J.
1961 *Original Land Titles in Hawaii*. Copyright 1961. Jon Jitsuzo Chinen.
- Clark, John
1980 *The Beaches of Maui County*. A Kolowalu Book, University Press of Hawaii, Honolulu.
- Daws, G.
1968 *Shoal of Time: History of the Hawaiian Islands*. University of Hawai'i Press, Honolulu.
- Dega, M.F.
2000 *Archaeological Inventory Survey of a 3-acre Parcel in Kahana-Kai, Kahana Ahupua`a, Kaanapali District, Island of Maui, Hawai'i (TMK: (2)-4-3-05:70)*. Scientific Consultant Services, Inc., Honolulu.
- Donham, T.K.
2000 *Data Recovery Excavations at the Honokahua Burial Site, Land of Honokahua, Lahaina District, Island of Maui*. Paul H. Rosendahl Inc., Inc., Hilo. On file at the State Historic Preservation Division, Kapolei, HI.
- Dorrance, W.H., and F.S. Morgan
2000 *Sugar Islands: The 165-Year Story of Sugar in Hawai'i*. Mutual Publishing, Inc., Honolulu.
- Foote, D.E., E. Hill, S. Nakamura, and F. Stephens
1972 *Soil Survey of the Islands of Oahu, Maui, Molokai, and Lanai, State of Hawaii*. U.S. Department of Agriculture Soil Conservation Service, Washington, D.C.
- Fornander, Abraham
1969 *An Account of the Polynesian Race: Its Origins and Migrations*, Charles Tuttle, Rutland, Vermont.
- Fredericksen, W.M., and D.L. Fredericksen
1995 *Archaeological Inventory Survey for Kahana-Kai Subdivision, Kahana Ahupua`a, Kaanapali District, Maui Island (TMK:4-3-05:71)*. MS. on file State Historic

Preservation Division, Kapolei, Hawaii.

2001 *Additional Archaeological Inventory Level Work for Site 50-50-03-4797, Lower Honoapi`ilani Road Improvements Project Corridor; Alaeloa, Mailepai, and Kahana Ahupua`a, Lahaina District, Maui Island (TMK: 4-3-15)*. MS. on file State Historic Preservation Division, Kapolei, Hawaii.

Griffin, B. P. and G. Lovelace, (eds.)

1977 *Survey and Salvage-Honoapi`ilani Highway, The Archaeology of Ka`anapali, Maui*. Archaeological Research Center Hawaii, Inc. Prepared for the State of Hawaii Dept. of Transportation.

Handy, E.S.C.

1940 *The Hawaiian Planter, Vol. 1: His Plants, Methods and Areas of Cultivation*. B.P.B.M. Museum Bulletin 161, Honolulu.

Hommon, R. J. and Hamilton M. A.

1982 *An Archaeological Reconnaissance Survey of the Site of a Proposed Airstrip at Mahinahina, West Maui*. Prepared for Royal Hawaiian Air Service.

Kamakau, Samuel

1961 *Ruling Chiefs of Hawaii*. The Kamehameha Schools Press, Honolulu.

Kaschko, M. W.

1974 *Archaeological Walk-Through Survey of Specified Areas in the Wailuku Flood Prevention Project and the Honolua Watershed, Maui*. Ms. in Dept. of Anthropology, Bishop Museum.

Kame`eleihiwa, L.

1992 *Native Land and Foreign Desires*. Bishop Museum Press, Honolulu.

Kelly, Marion

1983 *Nā Māla o Kona: Gardens of Kona*. Dept. of Anthropology Report Series 83-2. Bishop Museum. Bishop Museum Press, Honolulu.

1998 *A Gunboat Diplomacy, Sandalwood Lust and National Debt*. In *Ka Wai Ola o OHA*, Vol. 15, No. 4, April 1998.

Kennedy, J.

1986a *Field Inspection: Stone Building at Kahana, Maui*. Prepared for Jack Kelley and Peter Martin of Whalers Realty, Lahaina, Maui.

1986b *Archaeological Investigations at Kahana, Maui (TMK: 4-3-5:13)*. Prepared for Jack Kelley and Peter Martin of Whalers Realty, Lahaina, Maui.

- 1991 *Archaeological Inventory Survey Report for TMK: 4-3-01: 31, Located at Kahana, Island of Maui.* Prepared for Mr. R.T. Tanaka of Tanaka Engineers, Inc., Wailuku, Maui.
- Kirch, P.V.
 1973 *Archaeological Excavations at Site D13-1, Hawea Point, Maui, Hawaiian Islands. TMK 4-2-01:3, por. 22.* Manuscript on file at the Bernice Pauahi Bishop Museum, Honolulu.
- 1985 *Feathered Gods and Fishhooks: An Introduction to Hawaiian Archaeology and PreHistory.* University of Hawaii Press, Honolulu.
- Kirch P.V., and M. Sahlins
 1992 *Anahulu: The Anthropology of History in the Kingdom of Hawaii, Volume 1: Historical Ethnography.* University of Chicago Press, Chicago.
- Komori, E.
 1983 *Archaeological Investigations at Kahana Gulch, Lahaina District, Maui.* Prepared for the Soil Conservation Service, U.S. Dept. of Agriculture.
- Kuykendall, R.S.
 1938 *The Hawaiian Kingdom.* Vol. 1. University of Hawai'i Press, Honolulu.
- Lucas, Paul F. Nahoia
 1995 *A Dictionary of Hawaiian Legal Land-Terms.* Native Hawaiian Legal Corporation, Honolulu.
- Lyons, C. J.
 1875 "Land Matters in Hawaii 2," *The Islander*, June 9, 1875. Honolulu, Hawai'i.
- Parker, Patricia L., and Thomas F. King
 1990 *Guidelines for Evaluating and Documenting Traditional Cultural Properties.* National Register Bulletin 38. Washington, D.C.: National Park Service.
- Pukui, M.K. and S.H. Elbert
 1986 *Hawaiian Dictionary.* University of Hawaii Press, Honolulu.
- Pukui, M.K., S.H. Elbert, and E.T. Mookini
 1974 *Place Names of Hawaii.* Revised and expanded edition. University of Hawaii Press, Honolulu.

Schmidt, R.C.

- 1973 *The Missionary Censuses of Hawai'i*. Pacific Anthropological Records #20. Department of Anthropology, Bernice Pauahi Bishop Museum, Honolulu.

State of Hawaii Office of Environmental Quality Control

- 2012 *Guide to the Implementation and Practice of the Hawaii Environmental Policy Act, 2012 Edition*. State of Hawaii, Office of Environmental Quality Control, Honolulu. ([http:// www.hawaii.gov/health/environmental/oeqc/index.html](http://www.hawaii.gov/health/environmental/oeqc/index.html)).

Sterling, E.P.

- 1998 *Sites of Maui*. Bishop Museum Press, Honolulu.

Thrum, T.G.

- 1909 Heiau and Heiau Sites throughout the Hawaiian Islands. *Hawaiian Almanac and Annual for 1909*: 36-48.

- 1917 Maui's Heiaus and Heiau Sites Revisited. *Hawaiian Almanac and Annual for 1917*: 52-62.

U.S. Geological Survey

- 1992 *Lahaina Quadrangle, HI* [map]. 1:24,000. 7.5 Minute Series. Washington D.C.

Walker, W. M.

- 1931 *Archaeology of Maui*. Department of Anthropology, B.P. Bishop Museum, Honolulu.

Wilcox, Carol

- 1996 *Sugar Water: Hawaii's Plantation Ditches*. University of Hawai'i Press, Honolulu.

APPENDIX A: EXAMPLE LETTER OF INQUIRY

In compliance with the State of Hawai'i Revised Statute (HRS) Chapter 343 Environmental Impact Statements Law, and in accordance with the State of Hawai'i Department of Health's Office of Environmental Quality Control (OEQC) Guidelines for Assessing Cultural Impacts as adopted by the Environmental Council, State of Hawai'i on November 19, 1997, Scientific Consultant Services, Inc. (SCS) is in the process of preparing a Cultural Impact Assessment (CIA) pertaining to the proposed West Maui Well No. 2 Exploratory Well on a c. 1-acre land parcel in Kahana Ahupua`a, Lāhainā District, Maui [TMK: (2) 4-3-001:017] (Figures 1 through 3).

Scientific Consultant Services has conducted an Archaeological Assessment (*i.e.*, Archaeological Inventory Survey with negative findings) of the subject property (Perzinski and Dega 2013, in prep.) in order to determine the presence of archaeological cultural materials.

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 you or other individuals have which might contribute to the knowledge of traditional cultural activities that were, or are currently, conducted in the vicinity of the project area. We are also asking for any information pertaining to traditional cultural activities or traditional rights which may be impacted by the proposed exploratory well. The results of the cultural impact assessment are dependent on the response and contributions made by individuals and organizations, such as yourself.

Enclosed are maps showing the proposed project areas. Please contact me at the Scientific Consultant Services, Honolulu, office at (808) 597-1182 or via e-mail (cathy@scshawaii.com) with any information or recommendations concerning this Cultural Impact Assessment.

Sincerely,

Cathleen Dagher
Senior Archaeologist
Enclosures (3)

Cc: Dr. Kamana`opono M. Crabbe, Chief Executive Officer, Office of Hawaiian Affairs; Hinano Rodrigues, State Historic Preservation Division, Maui; Roy Newton, Office of Hawaiian Affairs, Maui; Ke`eaumoku Kapu, Chair, Maui/Lana`i Islands Burial Council; Torrie Nohara, Na Ala Hele Program; Thelma Shimaoka, Office of Hawaiian Affairs, Maui; Maui Tomorrow Foundation, Inc.; Maui Sierra Club; Matthew Erickson, Hawaiian Civic Club, Lahaina Chapter; Patty Nishiyama, Nā Kupuna O Maui; Leslie Kuloloio, community member; Clifford Nae`ole, Cultural Resource Advisor, Ritz-Carlton, Kapalua; William Ho`ohuli, community member

APPENDIX B: LEGAL NOTICES

Information requested by Scientific Consultant Services, Inc. (SCS) on cultural resources or on-going cultural activities on or near the proposed West Maui Well No. 2 Exploratory Well on a c. 1-acre land parcel in Kahana Ahupua`a, Lāhainā District, Maui [TMK: (2) 4-3-001:017]. Please respond within 30 days to Cathleen Dagher at (808) 597-1182.

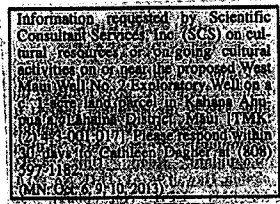
1481

AFFIDAVIT OF PUBLICATION

STATE OF HAWAII, }
County of Maui. } ss.

Rhonda M. Kurohara being duly sworn
deposes and says, that she is in Advertising Sales of
the Maui Publishing Co., Ltd., publishers of THE MAUI NEWS, a
newspaper published in Wailuku, County of Maui, State of Hawaii;
that the ordered publication as to _____
Information requested

of which the annexed is a true and correct printed notice, was
published 3 times in THE MAUI NEWS, aforesaid, commencing
on the 6th day of October, 2013, and ending
on the 10th day of October, 2013, (both days
inclusive), to-wit: on _____
October 6, 9, 10, 2013

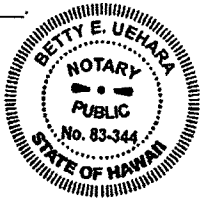


and that affiant is not a party to or in any way interested in the above
entitled matter.

[Signature]

This 1 page Information Requested, dated
October 6, 9, 10, 2013,
was subscribed and sworn to before me this 10th day of
October, 2013, in the Second Circuit of the State of Hawaii,
by Rhonda M. Kurohara

[Signature]
Notary Public, Second Judicial
Circuit, State of Hawaii



BETTY E. UEHARA
My Commission expires 09-28-15

(1481)

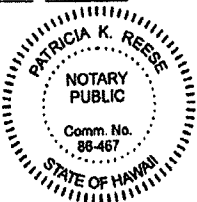
AFFIDAVIT OF PUBLICATION

IN THE MATTER OF
SCS Proj 1481 CIA for West Maui Well No. 2 Exploratory Well

STATE OF HAWAII

} SS.

City and County of Honolulu

Doc. Date: OCT 10 2013 # Pages: 1
 Notary Name: Patricia K. Reese First Judicial Circuit
 Doc. Description: Affidavit of
Publication
 Notary Signature: *Patricia K. Reese* Date: OCT 10 2013


Information provided by Scientific Consultant Services, Inc. (SCI), an cultural resource of an-going cultural resources on, near the proposed West Maui Well No. 2 Exploratory Well on a 0.31-acre land parcel in Kahuna Ahupua'a, Lanihale District, Maui (TRM: 2) 4-3-2013(17). Please respond within 30 days to Catherine Dwyer at (808) 897-1123. (84864374 10/6, 10/6, 10/10/13)

Rose Rosales being duly sworn, deposes and says that she is a clerk, duly authorized to execute this affidavit of Oahu Publications, Inc. publisher of The Honolulu Star-Advertiser and MidWeek, that said newspapers are newspapers of general circulation in the State of Hawaii, and that the attached notice is true notice as was published in the aforementioned newspapers as follows:

Honolulu Star-Advertiser 3 times on:

10/06, 10/09, 10/10/2013

Midweek Wed. 0 times on:

_____ times on:

And that affiant is not a party to or in any way interested in the above entitled matter.

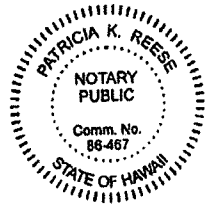
RR
 Rose Rosales

Subscribed to and sworn before me this 10th day

of Oct A.D. 20 13

Patricia K. Reese
 Patricia K. Reese, Notary Public of the First Judicial Circuit, State of Hawaii

My commission expires: Oct 07 2014



Ad # 0000564374

LN: _____

APPENDIX C: EXAMPLE FOLLOW-UP LETTER

This is our follow-up letter to our October 1, 2013 letter which was in compliance with the statutory requirements of the State of Hawai'i Revised Statute (HRS) Chapter 343 Environmental Impact Statements Law, and in accordance with the State of Hawai'i Department of Health's Office of Environmental Quality Control (OEQC) Guidelines for Assessing Cultural Impacts as adopted by the Environmental Council, State of Hawai'i, on November 19, 1997.

Scientific Consultant Services, Inc. (SCS) is in the process of preparing a Cultural Impact Assessment (CIA) pertaining to the proposed West Maui Well No. 2 Exploratory Well on a c. 1-acre land parcel in Kahana Ahupua'a, Lāhainā District, Maui [TMK: (2) 4-3-001:017].

Scientific Consultant Services has conducted an Archaeological Assessment (*i.e.*, Archaeological Inventory Survey with negative findings) of the subject property (Perzinski and Dega 2013, in prep.) in order to determine the presence of archaeological cultural materials.

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 you or other individuals have which might contribute to the knowledge of traditional cultural activities that were, or are currently, conducted in the vicinity of the project area. We are also asking for any information pertaining to traditional cultural activities or traditional rights which may be impacted by the proposed exploratory well. The results of the cultural impact assessment are dependent on the response and contributions made by individuals and organizations, such as yourself.

Please contact me at the Scientific Consultant Services, Honolulu, office at (808) 597-1182 or via e-mail (cathy@scshawaii.com) with any information or recommendations concerning this Cultural Impact Assessment.

Sincerely,

Cathleen Dagher
Senior Archaeologist

Cc: Dr. Kamana`opono M. Crabbe, Chief Executive Officer, Office of Hawaiian Affairs; Hinano Rodrigues, State Historic Preservation Division, Maui; Roy Newton, Office of Hawaiian Affairs, Maui; Ke`eaumoku Kapu, Chair, Maui/Lana`i Islands Burial Council; Torrie Nohara, Na Ala Hele Program; Thelma Shimaoka, Office of Hawaiian Affairs, Maui; Maui Tomorrow Foundation, Inc.; Maui Sierra Club; Matthew Erickson, Hawaiian Civic Club, Lahaina Chapter; Patty Nishiyama, Nā Kupuna O Maui; Leslie Kuloloio, community member; Clifford Nae`ole, Cultural Resource Advisor, Ritz-Carlton, Kapalua; Silla Kaina, Cultural Ambassador; Makalapua Kanuha, community member; William Ho`ohuli, community member

APPENDIX D: RESPONSES



STATE OF HAWAII
OFFICE OF HAWAIIAN AFFAIRS
711 KAPI'OLANI BOULEVARD, SUITE 500
HONOLULU, HAWAII 96813

HRD13/6912

October 15, 2013

Cathleen Dagher
Senior Archaeologist
Scientific Consultant Services
1347 Kapiolani Boulevard Suite 408
Honolulu, HI 96814

Re: Cultural Impact Assessment Consultation
Proposed West Maui Well No. 2 Exploratory Well
Kahana Ahupua'a, Lahaina District, Maui Island

Aloha e Cathleen Dagher,

The Office of Hawaiian Affairs (OHA) is in receipt of your October 1, 2013 letter seeking assistance and comments ahead of a cultural impact assessment (CIA) for the proposed West Maui Well No. 2 Exploratory Well Project. Based on the information contained within your letter, the area for the assessment is located in the ahupua'a of Kahana, moku of Lahaina, moku of Maui. The project is situated on a one-acre parcel in Kahana.

As mentioned in your letter, an Archaeological Assessment of the subject property has been conducted and found no potential historic properties. OHA is unaware of any historic properties assigned religious or cultural significance to the Hawaiian people within this area.

OHA recommends consultation be initiated with the following individual that may be willing to share his mana'o regarding this assessment Kimokeo Kapahulehua, Hawaiian Culture Advisor.

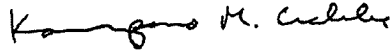
Please know that this list is not all encompassing and we are sure additional individuals will be identified as you move forward with your consultation process

We applaud your efforts to perform a CIA. OHA does request assurances that should iwi kūpuna or Native Hawaiian cultural or traditional deposits be identified during ground altering activities related to this project, all work will immediately cease and the appropriate agencies will be contacted pursuant to applicable law. OHA would like to be notified and consulted if burials are found.

Cathleen Dagher
October 15, 2013
Page. 2

Thank you for initiating consultation and providing an opportunity to provide comments. We look forward to the opportunity to review the completed CIA. Should you have any questions, please contact Kathryn Keala at 594-0272 or kathyk@oha.org.

'O wau iho nō me ka 'oia'i'o,



Kamana'o pono M. Crabbe, Ph.D.
Ka Pouhana, Chief Executive Officer
Office of Hawaiian Affairs

KMC:kk

C: OHA-Maui Community Outreach Coordinator (*via email*)

Aloha Cathleen,

Maui Aha Moku, Inc. has surfaced and each member or members are responsible for their ahupua'a so I am referring you to a person who is familiar with her sense of place. Her name is Silla Kaina, she is employed by Residences at Kapalua Bay, and her official title is Cultural Ambassador; ph# 808-662-6600; email: skaina@residenceatkapaluabay.com. The other party to contact is Makalapua Kanuha, she is employed at Kaanapali Oceans Resorts Spa and Villa. I do not have a phone number, she sits on the Maui County Cultural Resource Commissions Board. Hope this is helpful. Mahalo.

OFFICE OF HAWAIIAN AFFAIRS

Thelma M. Shimaoka

Community Outreach Coordinator III

33 Lono Avenue. Suite 480

Kahului, Hi 96732

P: 808-873-3364 F: 808-873-3361

APPENDIX E.

Zoning and Flood Confirmation Form

H/3006-G

JAN 30 2014

COUNTY OF MAUI
DEPARTMENT OF PLANNING
One Main Plaza Building
2200 Main Street, Suite 335
Wailuku, Hawaii 96793



Zoning Administration and
Enforcement Division (ZAED)
Telephone: (808) 270-7533
Facsimile: (808) 270-7634
E-mail: planning@maui-county.gov

RECEIVED
JAN 28 2:35

ZONING AND FLOOD CONFIRMATION FORM

(This section to be completed by the Applicant)

APPLICANT NAME Munekiyo & Hiraga, Inc. TELEPHONE _____
PROJECT NAME West Maui Exploratory Well No. 2 E-MAIL planning@mhplanning.com
PROPERTY ADDRESS See Attached Maps TAX MAP KEY (2)4-3-001:017

Yes No Will this Zoning & Flood Confirmation Form be used with a Subdivision Application?
IF YES, answer questions A and B below and comply with instructions 2 & 3 below:

A) Yes No Will it be processed under a consistency exemption from Section 18.04.030(B), MCC?
IF YES, which exemption? (No. 1, 2, 3, 4 or 5) _____

B) State the purpose of subdivision and the proposed land uses (ie 1-lot into 2-lots for all land uses allowed by law):

INSTRUCTIONS:

- 1) Please use a separate Zoning & Flood Confirmation Form for each Tax Map Key (TMK) number.
- 2) If this will be used with a subdivision application AND the subject property contains multiple districts/designations of (1) State Land Use Districts, (2) Maui Island Plan Growth Boundaries, (3) Community Plan Designations, or (4) County Zoning Districts; submit a signed and dated Land Use Designations Map, prepared by a licensed surveyor, showing the metes & bounds of the subject parcel and of each district/designation including any subdistricts.
- 3) If this will be used with a subdivision application AND the subject property contains multiple State Land Use Districts; submit an approved District Boundary Interpretation from the State Land Use Commission.

(This section to be completed by ZAED)

LAND USE DISTRICTS/DESIGNATIONS (LUD) AND OTHER INFORMATION: ¹

(SMA)
Special
Management Area

STATE DISTRICT: Urban Rural Agriculture Conservation

MAUI ISLAND Growth Boundary: ² Urban Small Town Rural Planned Growth Area Outside Growth Boundaries

PLAN Protected Area: ² Preservation Park Greenbelt Greenway Sensitive Land Outside Protected Areas

COMMUNITY PLAN: ² Agriculture, Conservation + open space

COUNTY ZONING: Agriculture, Interim

(PD)
Planned
Development
 (PH)
Project District
 See
Additional
Comments (Pg.2)
 See
Attached LUD Map

OTHER/COMMENTS:

FEMA FLOOD INFORMATION:

FLOOD HAZARD AREA ZONES ³ A & X
& BASE FLOOD ELEVATIONS:

FEMA DESIGNATED FLOODWAY For Flood Zone AO, FLOOD DEPTH:
 FLOOD DEVELOPMENT PERMIT REQUIRED (Zones V, VE, A, AO, AE, AH, D, & Floodways)

SUBDIVISION LAND USE CONSISTENCY: Not Consistent, (LUDs appear to have NO permitted uses in common).

Not Applicable, (Due to processing under consistency exemption No. 1, 2, 3, 4, 5).

(Signature)

Interim Zoning, (The parcel or portion of the parcel that is zoned interim shall not be subdivided).

⁴ Consistent, (LUDs appear to have ALL permitted uses in common).

⁴ Consistent, upon obtaining an SMA, PD, or PH subdivision approval from Planning.

⁴ Consistent, upon recording a permissible uses unilateral agreement processed by Public Works (See Pg.2).

NOTES:

- 1 The conditions and/or representations made in the approval of a State District Boundary Amendment, Community Plan Amendment, County Change In Zoning, SMA Permit, Planned Development, Project District and/or a previous subdivision, may affect building permits, subdivisions, and uses on the land.
- 2 Please review the Maui Island Plan and the Community Plan document for any goals, objectives, policies or actions that may affect this parcel.
- 3 Flood development permits might be required in zones X and XS for any work done in streams, gulches, low-lying areas, or any type of drainageway; Flood development permits are required for work in all other zones. Subdivisions that include/adjoin streams, gulches, low-lying areas, or any type of drainageway might require the following designations to be shown on the subdivision map: 100-year flood inundation limits; base flood elevations; drainage reserves.
- 4 Subdivisions will be further reviewed during the subdivision application process to verify consistency, unilateral agreement requirements, and the conditions associated with a unilateral agreement [Section 18.04.030.D, Maui County Code].

REVIEWED & CONFIRMED BY:

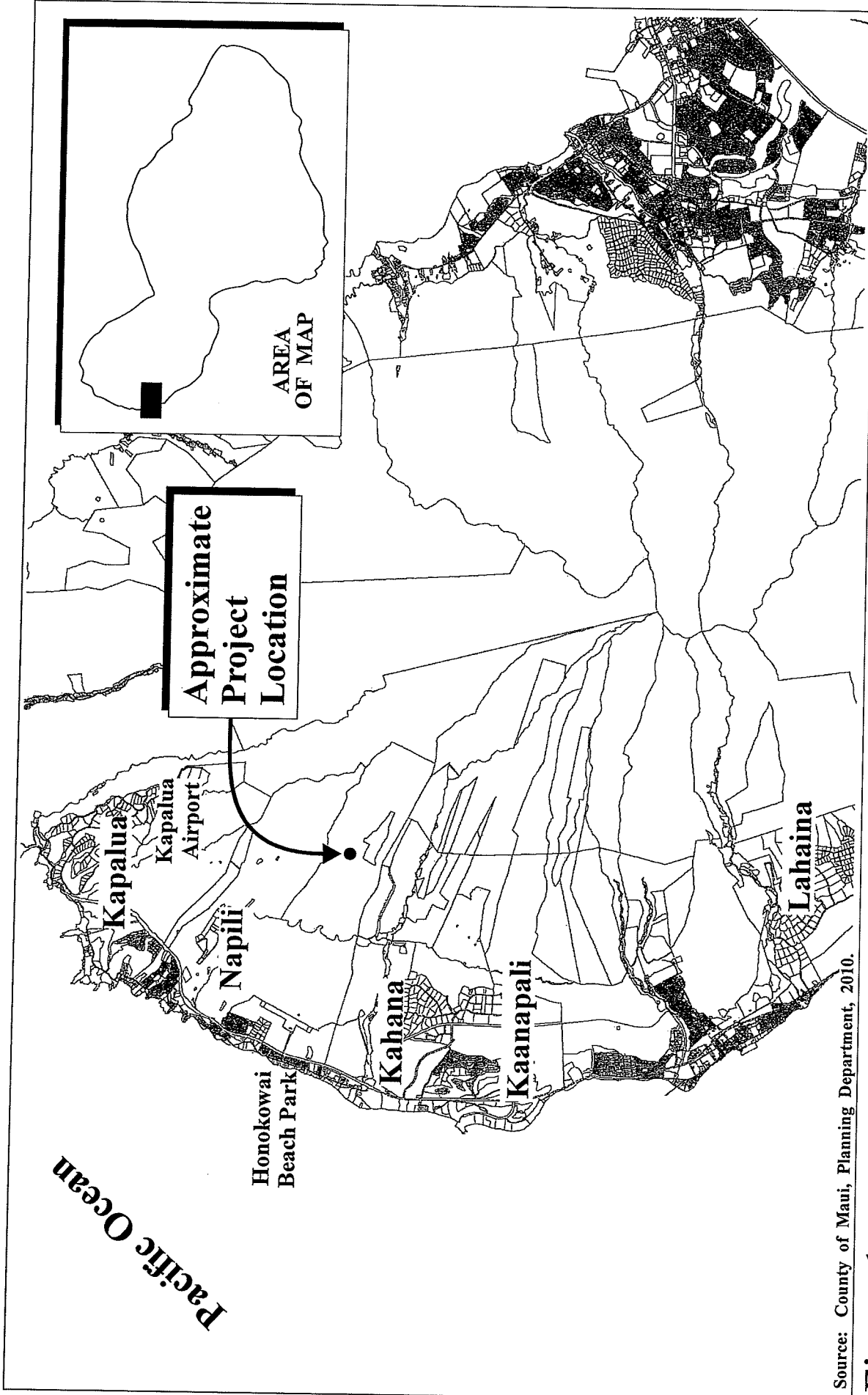
John S. Rapacz

1/29/14

(Signature)

(Date)

For: John S. Rapacz, Planning Program Administrator, Zoning Administration and Enforcement Division



Source: County of Maui, Planning Department, 2010.

Figure 1



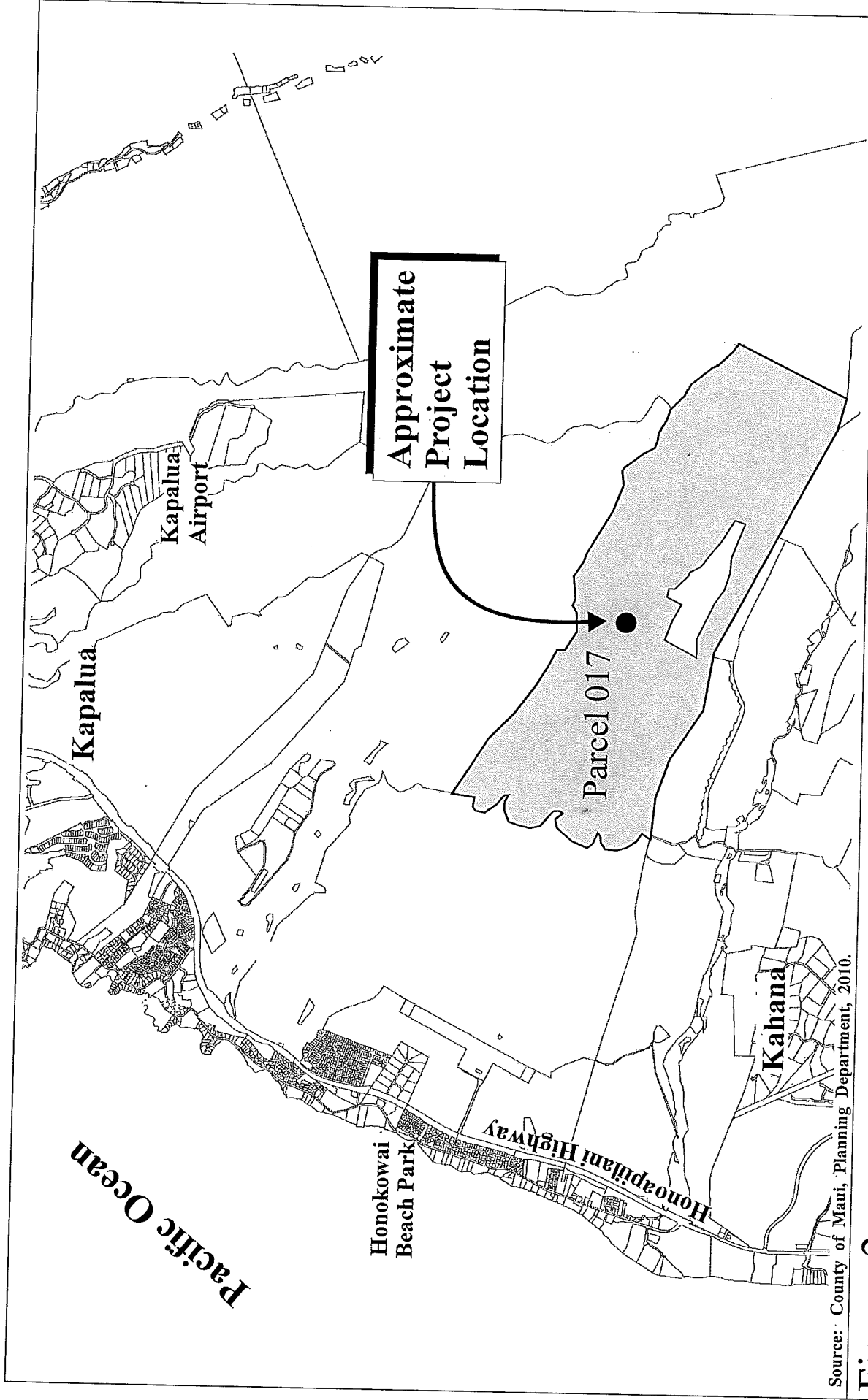
West Maui Exploratory Well No. 2
Regional Location Map

NOT TO SCALE

Prepared for: County of Maui, Department of Water Supply



REFW/maui/EXPL/Well/2/Regional Location



Source: County of Maui, Planning Department, 2010.

Figure 2



West Maui Exploratory Well No. 2
Project Location Map

NOT TO SCALE

Prepared for: County of Maui, Department of Water Supply



MUNEKIYO & HIRAGA, INC.

APPENDIX F.
Preliminary Design Report

PRELIMINARY DESIGN REPORT For West Maui Well No. 2

Lahaina, Maui, Hawaii



Prepared for:

**Department of Water Supply
County of Maui**
200 South High Street
Wailuku, Hawaii 96793

**Date: November 14, 2012
Revised: February 25, 2013
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Prepared by:



Ronald M. Fukumoto Engineering, Inc.
1721 Wili Pa Loop, Suite 203
Wailuku, Hawaii 96793
Phone: (808) 242-8611
Fax: (808) 244-7510
E-Mail: office@rfemaui.com

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- Appendix 3 - Bauer, Glenn, "Letter Report of Recommendations for Locating Second West Maui Exploratory Well," July 2, 2012
- Appendix 4 - Bauer, Glenn, "Memorandum of A Second Preferred Location for Mahinahina Exploratory Well No. 2 Based Upon New Water Level Information," July 16, 2012
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I. PURPOSE

The purpose of this report is to provide recommendations on the location, size, and capacity of a new exploratory well in West Maui. This report will supplement the *Final West Maui Source Development Site Selection Report* (Fukunaga Report), prepared for the Maui Department of Water Supply by Fukunaga and Associates, Inc. in July 2011. The Fukunaga Report considered five potential sites for drilling an exploratory well in West Maui and resulted in the selection of the Mahinahina Exploratory Well. The Mahinahina Exploratory Well is currently under construction.

II. DESCRIPTION

The Maui County Department of Water Supply (DWS) plans to construct another exploratory well in West Maui within the Lahaina Sector shown on the Hydrologic Units Map. (See Figure 1 – CWRM Hydrologic Units Map, page 10.) If the exploratory well is successful, DWS intends to develop the well to provide additional source capacity for its Lahaina System.

This report re-examined the alternative sites in the Fukunaga Report and identified two additional alternative sites. Glenn Bauer, Geologist, (Bauer) was retained to provide hydrogeological consulting services for the project. Bauer performed the hydrogeological analysis for this report and narrowed down the alternatives to two sites, Mailepai and Kahana. The Mailepai site lies on Tax Map Key (2) 4-3-001: 001. The Kahana site lies on Tax Map Key (2) 4-3-001:017. Maui Land & Pineapple Company, Inc. is the owner of both sites. (See Figure 2 – Location Map, page 11 and Figure 3 – Vicinity Map, page 12.)

III. BACKGROUND

A. Existing Wells

The State Commission of Water Resource Management (CWRM) established groundwater hydrologic units or sustainable yields for each island to manage groundwater resources. CWRM divided each island into broad regions or sectors, and further divided each region into sub-regions or systems. These dividing lines serve as management tools and do not necessarily represent subsurface boundaries as evidenced by communication of groundwater between these areas.

Wells within the Lahaina Sector are shown on the Well Field Map (See Figure 4 – Well Field Map, page 13.) The map also shows the DWS distribution system. In addition, the map shows the proposed alternatives which lie within the Honolua Aquifer of the Lahaina Sector.

The State Department of Health collects and publishes information on contamination of groundwater sources throughout the State. Agricultural chemicals including the soil fumigant, DBCP, or solvent, TCP, used to control nematodes in pineapple production were

found in these existing wells within the Honolua Aquifer and Honokowai Aquifer: P-4, P-5, P-6, Napili A, Napili C, and Honokohau A.

B. DHHL Honokowai Well

The Department of Hawaiian Home Lands drilled a well in Honokowai (State Well No. 5639-04) to supply water for its future residential project in Lahaina. The well lies in the Honokowai Aquifer about 2.7 miles from the ocean at an elevation of about 926 feet above mean sea level. Drilling began in August 2010. Pump tests, plumbness and alignment tests, and water quality sampling were completed in March 2011. Analysis of the pump tests indicates a sustainable yield of 1.0 mgd at a continuous pumping rate of 700 gallons per minute or 1,000 gallons per minute for 16 hours per day. The water quality test results indicate water of excellent quality with low chlorides (12 milligrams per liter).

C. Mahinahina Well

The Department of Water Supply drilled an exploratory well in Mahinahina (State Well No. 5638-04) to serve as an additional source of water for its Lahaina System. An additional source is needed since DWS relies on surface water to meet about 60 percent of the total demand for its Lahaina System. DWS has surface water treatment plants at Mahinahina and at Lahaina. Droughts, maintenance of the ditches that convey water to surface water treatment plants, and maintenance of the surface water treatment plants may create periodic shortfalls.

The Mahinahina Well lies in the Honokowai Aquifer about 3.0 miles from the ocean at an elevation of about 1,315 feet above mean sea level. The well site is within a 148.394-acre parcel owned by the State of Hawaii and designated on the tax maps as Tax Map Key (2) 4-4-004:009. Construction of the well is in progress. The estimated yield from the well is 1.0 mgd.

Data obtained during construction indicates that the water level is approximately 40 feet above mean sea level. This elevation was measured after drilling of the pilot hole and re-confirmed after the well was reamed to full width. This water level is high in comparison to the elevations of basal wells in the area which range from about 5 to 6 feet above mean sea level. This high water level may indicate a partially-confined dike aquifer which is advantageous for developing the well.

D. Honolua Aquifer

The Honolua Aquifer has a sustainable yield of 8 million gallons per day (mgd). Average groundwater use based on CWRM records from 2005 through 2008 is about 2.3 mgd. Available groundwater is therefore about 5.7 mgd.

E. Honokowai Aquifer

The Honokowai Aquifer has a sustainable yield of 6 mgd. Average groundwater use based on CWRM record from 2005 through 2008 is about 3.4 mgd. Available groundwater is therefore about 2.6 mgd.

Activation of the DHHL Honokowai Well and the Mahinahina Well will reduce the available groundwater in the Honokowai Aquifer. Test results for the DHHL Honokowai well confirmed a sustainable yield of 1.0 mgd. Initial estimates for the Mahinahina Well indicated a sustainable yield of 1.0 mgd. Therefore, activation of these wells may result in a 2.0 mgd reduction in available groundwater with 0.6 mgd remaining. The ongoing pump tests for the Mahinahina Well may result in a higher yield than initially anticipated and could possibly tap into the remaining 0.6 mgd.

IV. ANALYSIS

A. Hydrogeological Reports

Glenn Bauer reviewed previous reports, analyzed hydrogeological conditions, and provided recommendations for locating the exploratory well. He provided the following exhibit, memorandums, and letter report for this project.

January 12, 2012 Exhibit: Bauer reviewed the Fukunaga Report and prepared an exhibit showing locations of possible well sites in the vicinity of the Mahinahina Exploratory Well. (See Appendix 1.)

June 1, 2012 Memorandum: Bauer prepared a memorandum explaining the use of the "Q/s/d" parameter of existing wells in the Lahaina Sector as a guide for locating the new exploratory well. "Q" is pumping rate in gallons per minute, "s" is drawdown in feet, and "d" length of exposed aquifer in feet (either open hole or perforated casing section). This parameter is an indication of the productivity of the well. A high value of "Q/s/d" indicates high productivity. The memorandum concluded that wells in the northwest portions of the Lahaina Sector are more productive than wells in the southeast portion. (See Appendix 2.)

July 2, 2012 Letter Report: Bauer prepared a letter report with recommendations for the new exploratory well. The letter report included an assessment of the alternative sites identified in the Fukunaga Report. The letter report also included comments on the U. S. Geological Survey Scientific Investigation Report 2012-5010, *Groundwater Availability in the Lahaina District, West Maui, Hawaii*, prepared by Stephen B. Gingerich and John A. Engott (Gingerich/Engott Report). The U. S. Geological Survey published the Gingerich/Engott Report earlier this year. (See Appendix 3.)

July 16, 2012 Memorandum: Bauer prepared a memorandum to clarify the names

of the two alternative sites under consideration and their approximate coordinates (latitude, longitude, and elevation). The Mailepai site to the North and the Kahana site to the South were designated to correspond to their locations within the regional Hawaiian land divisions (ahupuaa). The memorandum also stated that the water level encountered at the Mahinahina Exploratory Well was about 40 feet above mean sea level and explained this may be due to volcanic dikes impounding groundwater at a much higher level than expected. (See Appendix 4.)

September 18, 2012 Memorandum: Bauer prepared a memorandum to document the field reconnaissance of the Mailepai and Kahana sites conducted on September 13, 2012. The approximate coordinates of the sites were confirmed during the field reconnaissance with the use of a handheld geographic positioning device. Observations during the field investigation included difficult access to the Mailepai site due to narrow, curvy dirt roads and two gulch crossings, and easy access to the Kahana site due to wider dirt roads. Additional observations included long electrical line extensions to bring power to the Mailepai site and much shorter electrical line extensions for the Kahana site. (See Appendix 5.)

The following descriptions of the Mailepai and the Kahana sites are based on Bauer's work and additional technical information.

B. Mailepai Site

The Mailepai site lies within the Honolua Aquifer about 2.6 miles from the ocean and about 6,700 feet to the north of the existing Mahinahina Exploratory Well. Other wells in the area include P-5 Kaanapali and P-6 Kaanapali about 3,700 feet and 3,100 feet, respectively, to the southwest, and Napili B about 4,700 feet to the north. The site is a portion of Tax Map Key (2) 4-3-001:001, a 1,378-acre parcel, owned by Maui Land & Pineapple Company, Inc.

Table 1 below shows data of the existing wells in the vicinity of the Mailepai site.

Well Name	State Well No.	Aquifer	Installed Capacity (mgd)	Initial Head (feet amsl)
P-5 Kaanapali	5738-01	Honokowai	1.296	5.6
P-6 Kaanapali	5739-02	Honokowai	1.116	5.8
Napili B	5838-02	Honolua	1.008	6.3

The well site is suitable for construction of a future pumping station. The elevation of the site is about 1,140 feet above mean sea level. The site generally slopes down from East to West with a surface slope of about 16 percent. There are no flood hazards at the site. The flood insurance rate map of the area shows that the area is within Zone X, an area subject to minimal flooding.

According to the Soil Conservation Service, the on-site soil consists of Honolua silty clay, 15 to 25 percent slopes (HwD). The Honolua series consists of well-drained soils on uplands on the island of Maui derived from basic igneous rock. The survey characterizes the soil as having a dark-brown surface layer about 12 inches thick, a dark reddish-brown and reddish brown subsoil layer about 58 inches thick, moderately rapid permeability, slow to medium runoff, and slight to moderate erosion hazard. (See Figure 5 - Soil Map, page 14.)

The well site is at the upper limits of an old pineapple field between two gulches and is about 5,800 feet below the West Maui Forest Reserve. The location minimizes the potential for contamination from agricultural chemicals used in previous pineapple production. Access to the site from Honoapiilani Highway begins at the Napilihau Street intersection, continues across various "hui" roads, and traverses old field roads to the site. The route becomes narrow and steep where it crosses through Kaopala Gulch and a tributary of Mailepai Stream.

Approximately 40,000 square feet of land will be acquired for the well site. This land area allows for future construction of a pumping station consisting of pump pad and piping, control building, reservoir, and paved service yard. (See Figure 6 – Pump Station – Conceptual Plan, page 15.) Interim site improvements include grading of the immediate work area to create a gently sloping pad and constructing a chain link security fence around the site.

After preparation of the site, the exploratory well will be drilled, cased, and tested. The drilling process involves drilling a pilot hole with a small-diameter bit, and enlarging or reaming the hole with larger bits. The casing process involves welding sections of casing, installing the sections in the drilled hole, and placing gravel, sand, and grout in the space between the drilled hole and the casing. The testing process involves installing a test pump in the well, performing a step-drawdown test and constant-rate test, taking water samples and performing water quality tests, and removing the test pump. The pump test and water quality data will then be analyzed to determine the feasibility of developing the exploratory well as a new potable water source.

Design of an exploratory well will conform to requirements of the CWRM, State Department of Health (DOH) wellhead protection protocols, and DWS standards. CWRM standards will limit the depth of the well to one-fourth the thickness of the theoretical thickness of the basal freshwater lens or 41 times the basal head. In its Well Construction/Pump Installation Permit, CWRM provides the following formula for computing the maximum bottom elevation of a well:

$$\text{Bottom Elevation of Well Limit} = \text{Water Elevation} - (41 \times \text{Water Elevation} / 4)$$

As shown in Table 1, the initial water elevations of nearby wells ranged from 5.6 feet to 6.3 feet above mean sea level. The water elevation at Honokowai B (State Well No. 5638-03), another nearby well, measured in 2009 was 5.43 feet above mean sea level.

(See Appendix 5.) Based on the above data, a basal head of 5 feet above mean sea level will be adopted. This results in a maximum bottom elevation of 46 feet below mean sea level. Instead of extending the well to its maximum allowable depth, an elevation of 40 feet below mean sea level will be adopted. Preliminary design of the well involves drilling 1,180 feet to 40 feet below mean sea level. DOH wellhead protection standards include grouting of the annular space between the drilled hole and the solid well casing, protecting the well from flooding, and preventing polluting activities around the site and upstream of the site. Anticipated installed peak capacity is 1,000 gpm. A well with a drilled diameter of 29 inches and a casing outside diameter of 22.5 inches will accommodate such a pump.

C. Kahana Site

The Kahana site lies within the Honolua Aquifer about 3.0 miles from the ocean and is about 3,300 feet to the north of the existing Mahinahina Exploratory Well. Other existing wells in the area include P-5 Kaanapali and P-6 Kaanapali about 2,900 feet and 3,200 feet, respectively, to the northwest. Table 1 above shows data of the existing wells in the vicinity of the Kahana site. The site is a portion of Tax Map Key (2) 4-3-001:017, a 1,388-acre parcel, owned by Maui Land & Pineapple Company, Inc.

The well site is suitable for construction of a future pumping station. The elevation of the site is about 1,300 feet above mean sea level. The site generally slopes down from East to West with a surface slope of about 10 percent. There are no flood hazards at the site. The flood insurance rate map of the area shows that the area is within Zone X, an area subject to minimal flooding.

According to the Soil Conservation Service, the on-site soil consists of Olelo silty clay, 3 to 15 percent slopes (OFC). The Olelo series consists of well-drained soils on uplands on the islands of Molokai and Maui derived from basic igneous rock. The survey characterizes the soil as having a dark reddish-brown surface layer about 10 inches thick, a dark reddish-brown and dark-red subsoil layer about 27 inches thick, moderately rapid permeability, slow runoff, and slight erosion hazard. (See Figure 5 - Soil Map, page 14.)

The well site is also at the upper limits of an old pineapple field between two gulches, Kahana Stream and Kahanaiki Gulch, and is about 4,200 feet below the West Maui Forest Reserve. The location minimizes the potential for contamination from agricultural chemicals used in previous pineapple production. Access to the site from Honoapiilani Highway begins at the Akahela Street intersection, continues South about 3,600 feet along a field road, heads East about 9,500 feet to the Mahinahina Water Treatment Plant, and continues about 8,500 feet along various field roads to the site.

Approximately 40,000 square feet of land will be acquired for the well site. This land area allows for future construction of a pumping station consisting of pump pad and piping, control building, reservoir, and paved service yard. (See Figure 6 – Pump Station – Conceptual Plan, page 15.) Interim site improvements include grading of the immediate

work area to create a gently sloping pad and constructing a chain link security fence around the site.

Drilling of the Kahana well will be similar to the proposed construction of the Mailepai well except for the increase in depth of drilling 1,340 feet to 40 feet below mean sea level.

Table 2 below summarizes the preliminary well design data for both alternatives.

Description	Mailepai	Kahana	Unit
Installed Peak Capacity	1,000	1,000	gallons per minute
24-hour Capacity	1.44	1.44	million gallons per day (mgd)
16-hour Capacity	0.96	0.96	mgd
Well Diameter	26	26	inches
Casing Diameter	18.75	18.75	inches outside diameter
Surface Elevation	1,140	1,300	feet above mean sea level
Water Elevation	5	5	feet above mean sea level
Bottom Elevation	40	40	feet below mean sea level
Total Depth of Well	1,180	1,340	feet
Bottom of Basal Lens	200	200	feet below mean sea level

D. Connections to Existing Infrastructure

Development of the Mailepai site or the Kahana site will require connections to existing water, power, and communications infrastructure. (See Figure 7 – Conceptual Water System Plan, page 16 and Figure 8 – Conceptual Electrical System Plan, page 17.)

The Mailepai site is isolated and requires long extensions of existing infrastructure. The connection to the nearest existing water transmission pipeline requires about 7,700 feet of 12-inch transmission pipeline. The transmission pipeline will follow along existing field roads. Besides providing a corridor for the transmission pipeline, the existing field roads will provide construction access to the site. To provide adequate construction access, about 1,500 feet of the road that crosses through Kaopala Gulch will need to be widened and about 1,400 feet of the road that crosses a tributary of Mailepai Stream will need to be widened. Because the site is isolated with no nearby reservoir, a new reservoir will be provided to store the pumped water. For cost analysis purposes, an assumed 200,000-gallon reservoir will be used. The connection to the nearest 3-phase power requires about 2,500 feet of new distribution lines that run along Maui Electric Company's transmission line corridor and about 4,200 feet of new distribution lines that run uphill to the new well site.

The Kahana site is also isolated and requires long extensions of existing infrastructure. The connection to the nearest water transmission pipeline requires about 7,400 feet of 12-inch transmission pipeline. Because the site is isolated with no nearby reservoir, a new

reservoir will be provided to store the pumped water. For cost analysis purposes, an assumed 200,000-gallon reservoir will be used. Two options for extending 3-phase power to the site are shown on the electrical system plan. The shortest route, Option 1, requires about 500 feet of line extension. Option 2 requires about 3,200 feet of line extension.

E. Project Costs

Table 3 below provides a summary of order-of-magnitude project costs for each alternative. (See Figure 9 – Order-of-Magnitude Opinion of Probable Project Costs, page 18, for a breakdown.)

Alternative	Construc- tion	Engineering & Permitting	Land	Total
Mailepai	\$8,870,000	\$710,000	\$320,000	\$9,900,000
Kahana – Option 1	\$8,074,000	\$646,000	\$320,000	\$9,040,000
Kahana – Option 2	\$8,311,000	\$665,000	\$320,000	\$9,296,000

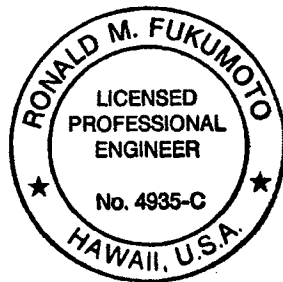
V. RECOMMENDATIONS

The Mailepai and Kahana sites have similar hydrogeological characteristics; therefore, the least cost option should be selected. DWS should proceed with the Kahana site with electrical system Option 1.

VI. REFERENCES

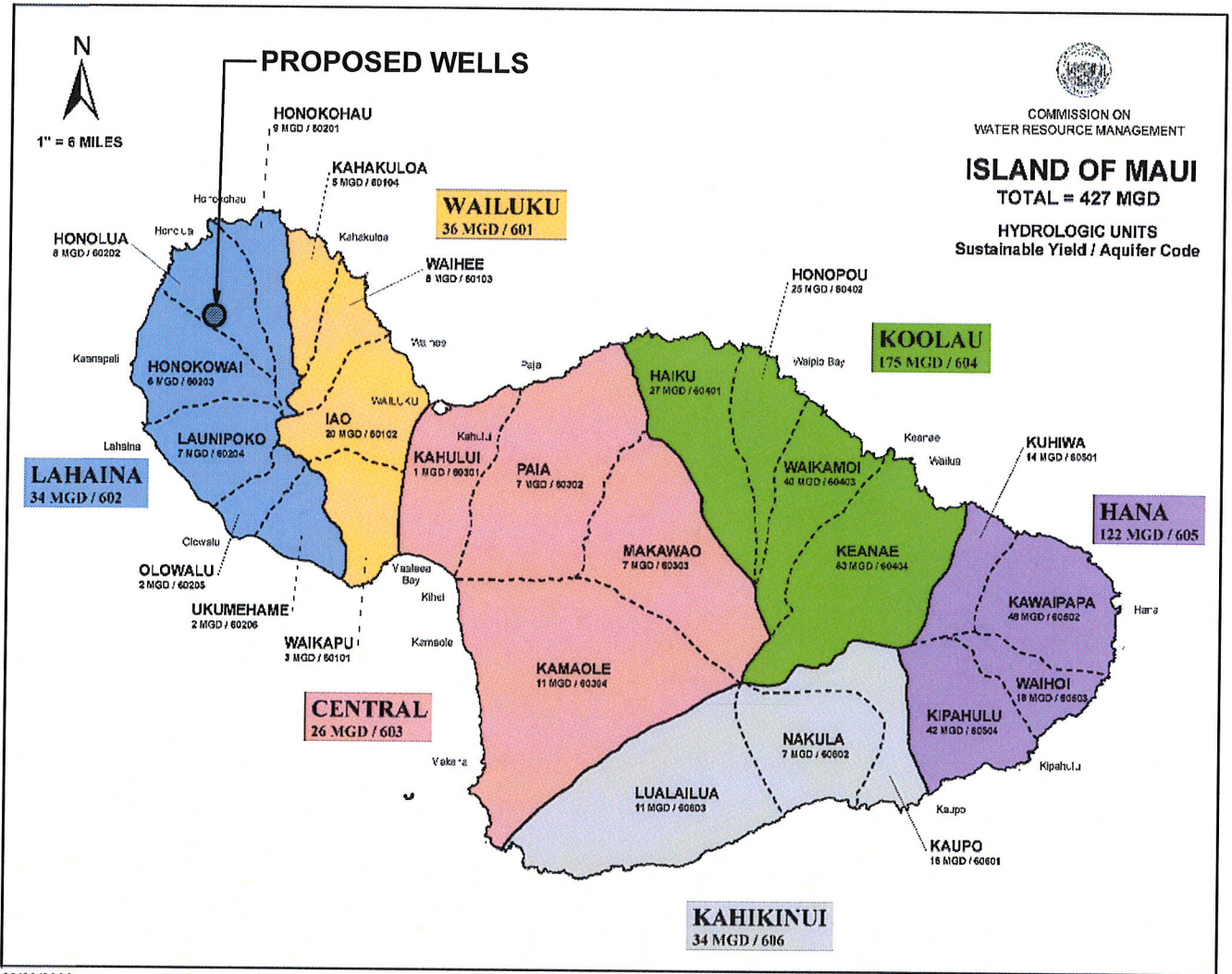
1. Bauer, Glenn, "Exhibit of Possible Well Sites for Exploratory Well 2," January 12, 2012.
2. Bauer, Glenn, "Memorandum of Use of the Q/s/d Parameter as a Means to Aid in the Location of a New Exploratory Well Site in West Maui," June 1, 2012.
3. Bauer, Glenn, "Letter Report of Recommendations for Locating Second West Maui Exploratory Well," July 2, 2012.
4. Bauer, Glenn, "Memorandum of A Second Preferred Location for Mahinahina Exploratory Well No. 2 Based Upon New Water Level Information," July 16, 2012.
5. Bauer, Glenn, "Memorandum of Field Reconnaissance Visit of September 13, 2012 to Mailepai and Kahana Well Sites," September 18, 2012.
6. Fukunaga & Associates, Inc., *Final West Maui Source Development Site Selection Report*, Honolulu, Hawaii, prepared for County of Maui Department of Water Supply, July 2011.

7. Fukunaga & Associates, Inc., *Mahinahina Exploratory Well Final Environmental Assessment*, Honolulu, Hawaii, prepared for County of Maui Department of Water Supply, July 2011.
8. Gingerich, Stephen B. and Engott, John A., *Groundwater Availability in the Lahaina District, West Maui, Hawaii*, U. S. Geological Survey Scientific Investigation Report 2012-5010, prepared in cooperation with the County of Maui Department of Water Supply, 2012.
9. Haiku Design & Analysis, *Maui County Water Use and Development Plan, Central District, Final Candidate Strategies Report (Report Review Draft)*, Haiku, Hawaii, prepared for County of Maui Department of Water Supply, June 17, 2009.
10. State of Hawaii, Department of Health, 2005 Groundwater Contamination Maps for the State of Hawaii, July 28, 2006.
11. Waimea Water Services, Inc., *Well Completion Report, DHHL-Honokowai Well (State Well No. 5639-04)*, prepared for Department of Hawaiian Home Lands, May 20, 2011.
12. Wilson Okamoto Corporation, *Hawaii Water Plan, Water Resource Protection Plan*, Honolulu, Hawaii, prepared for State of Hawaii, Department of Land and Natural Resources, Commission on Water Resource Management, June 2008.



This work was prepared by
me or under my supervision.

Ronald M. Fukumoto



CWRM HYDROLOGIC UNITS MAP

SCALE IN MILES



NORTH

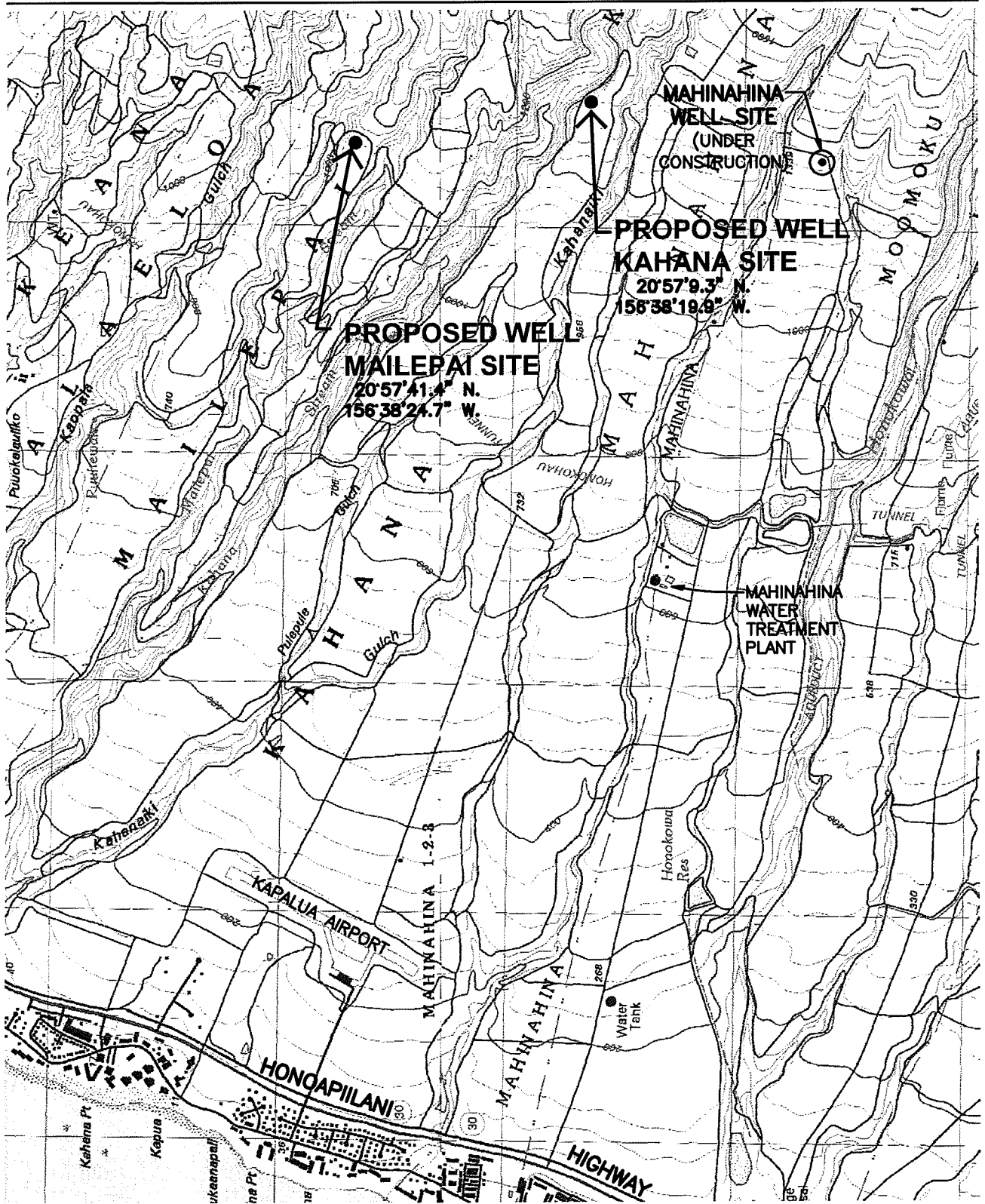
SOURCE: COMMISSION ON WATER RESOURCE MANAGEMENT

Figure 1



PREPARED FOR: DEPT. OF WATER SUPPLY, COUNTY OF MAUI

PREPARED BY: RONALD M. FUKUMOTO ENGINEERING, INC.
PRELIMINARY DESIGN REPORT FOR WEST MAUI WELL NO. 2



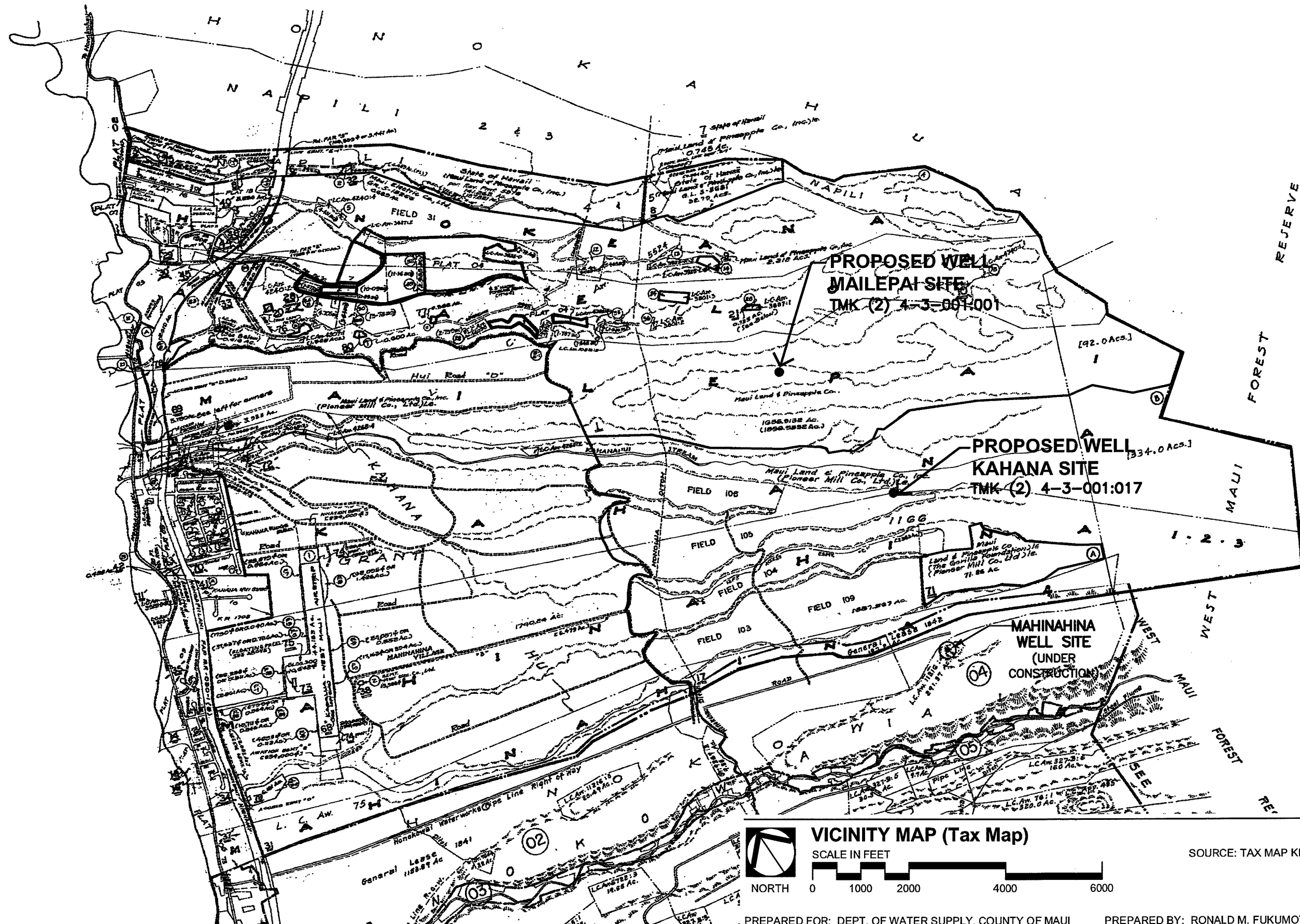
LOCATION MAP (USGS Map)



Figure 2

SOURCE: USGS LAHAINA & NAPILI QUADRANGLE MAP

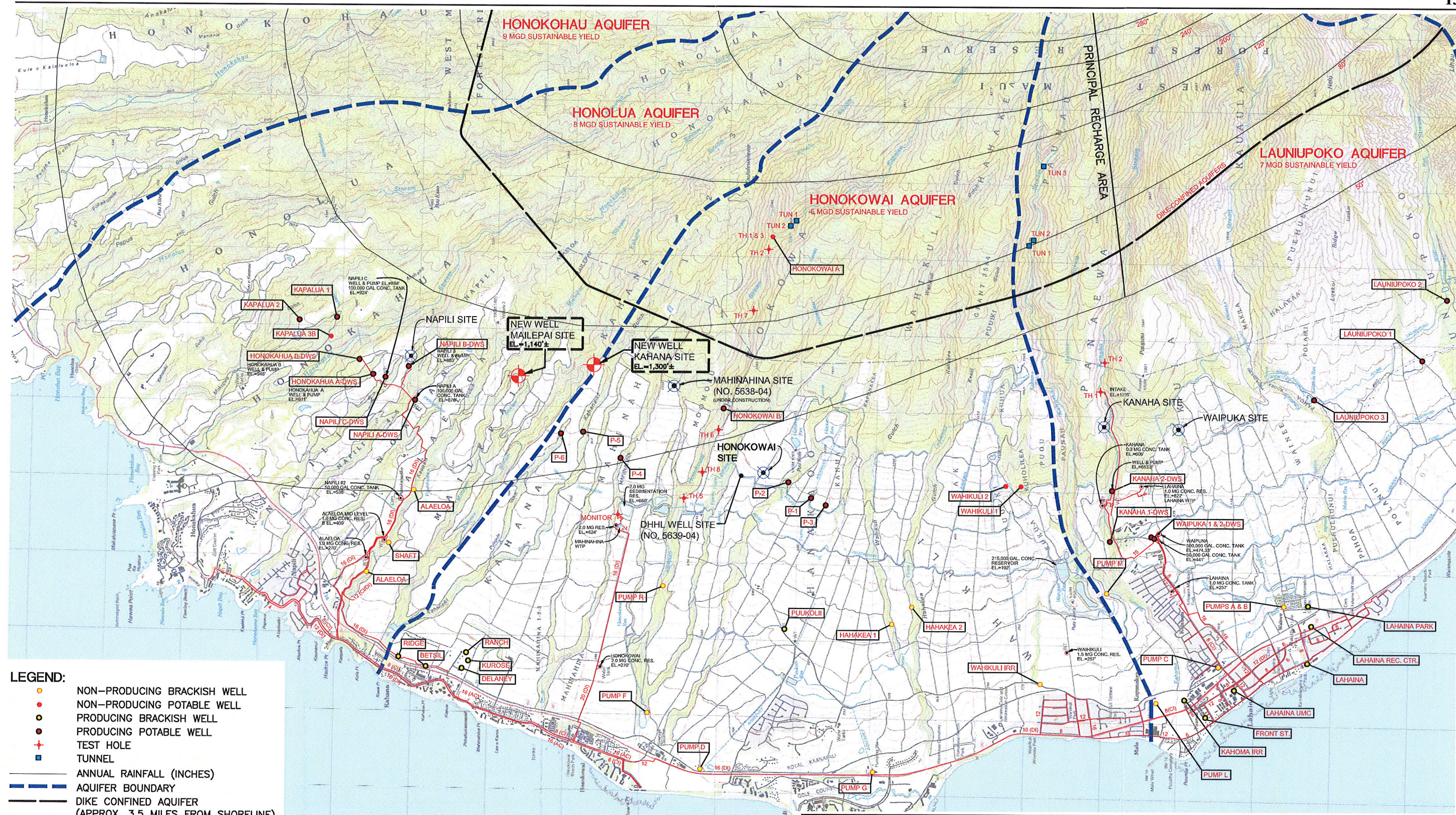




VICINITY MAP (Tax Map)
 SCALE IN FEET
 NORTH 0 1000 2000 4000 6000

Figure 3
 SOURCE: TAX MAP KEY (2) 4-3-001 & 4-4-000





- LEGEND:**
- NON-PRODUCING BRACKISH WELL
 - NON-PRODUCING POTABLE WELL
 - PRODUCING BRACKISH WELL
 - PRODUCING POTABLE WELL
 - + TEST HOLE
 - TUNNEL
 - ANNUAL RAINFALL (INCHES)
 - AQUIFER BOUNDARY
 - DIKE CONFINED AQUIFER (APPROX. 3.5 MILES FROM SHORELINE)
 - 16 (AC) WATERLINE W/SIZE
 - SITE RECOMMENDED BY FUKUNAGA AND ASSOCIATES, INC.
 - SITE RECOMMENDED BY RONALD M. FUKUMOTO ENGINEERING, INC. AND GLENN BAUER.

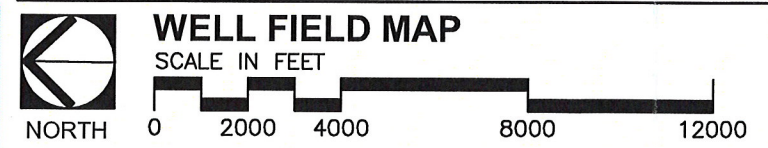


Figure 4
SOURCE: USGS LAHAINA & NAPILI QUADRANGLE



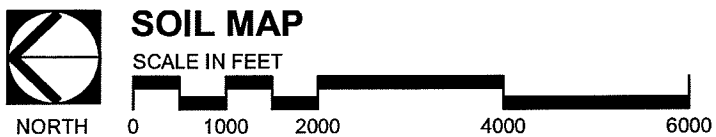
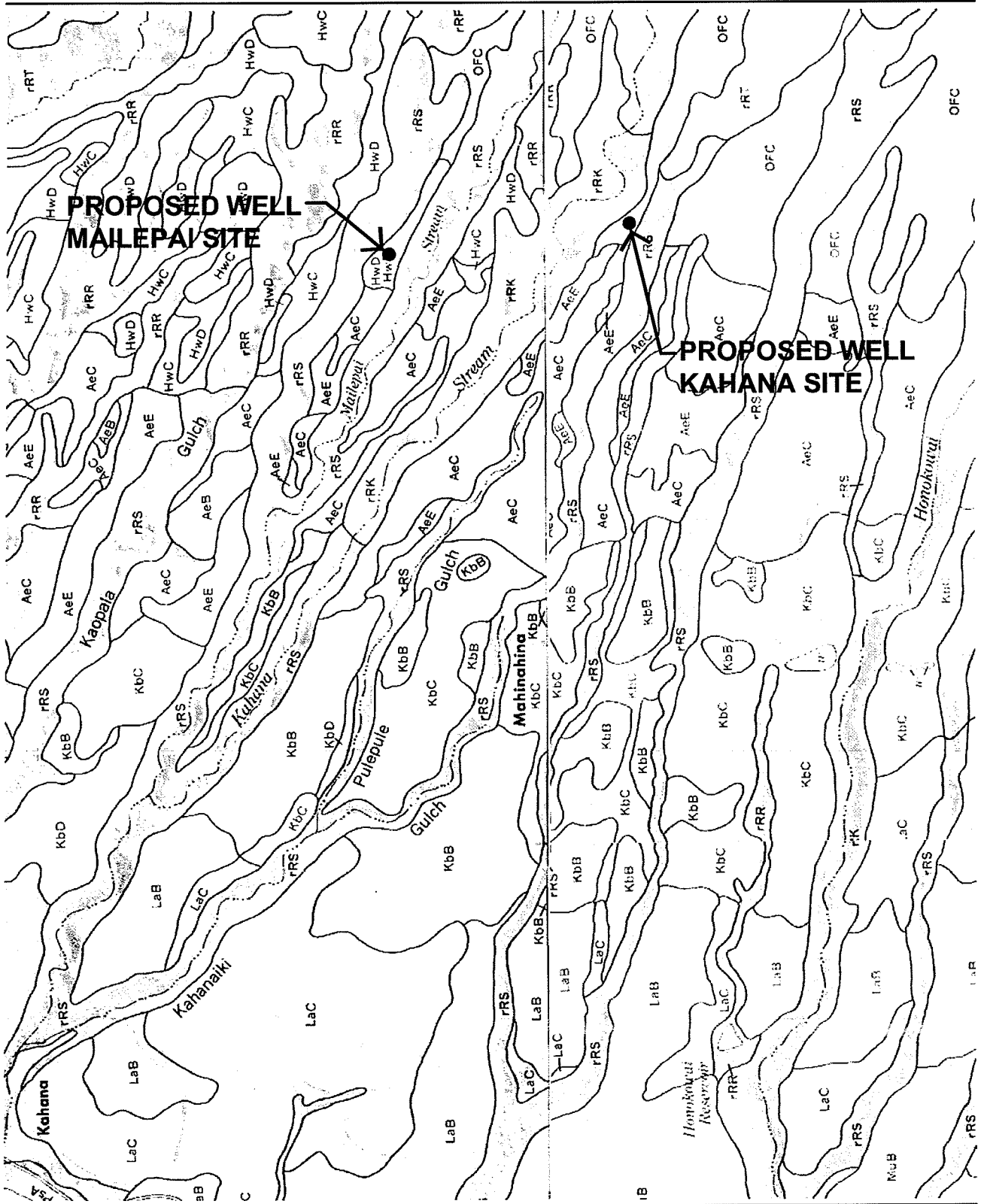
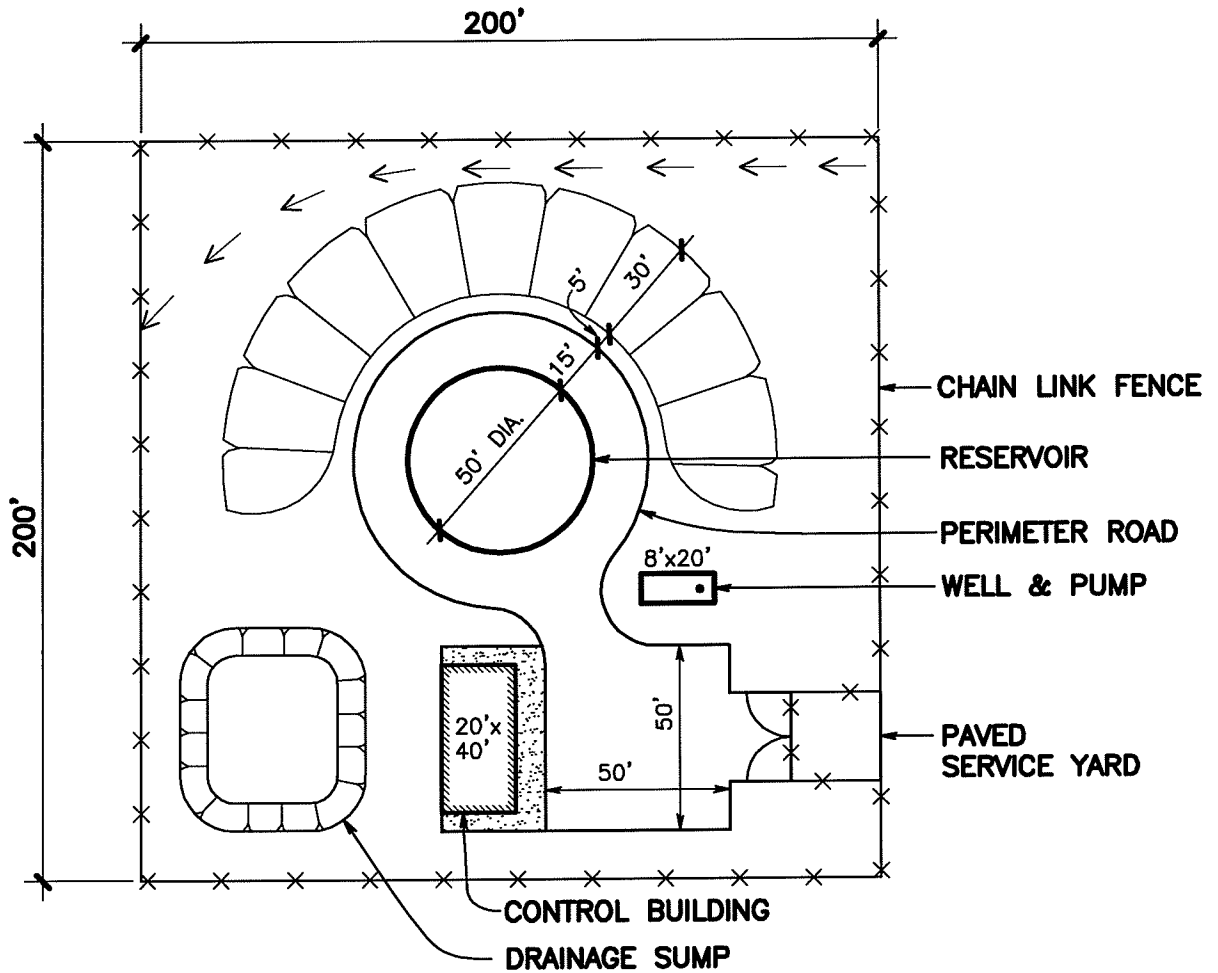


Figure 5
SOURCE: SOIL SURVEY





SITE AREA = 40,000 SQ. FT.



NORTH

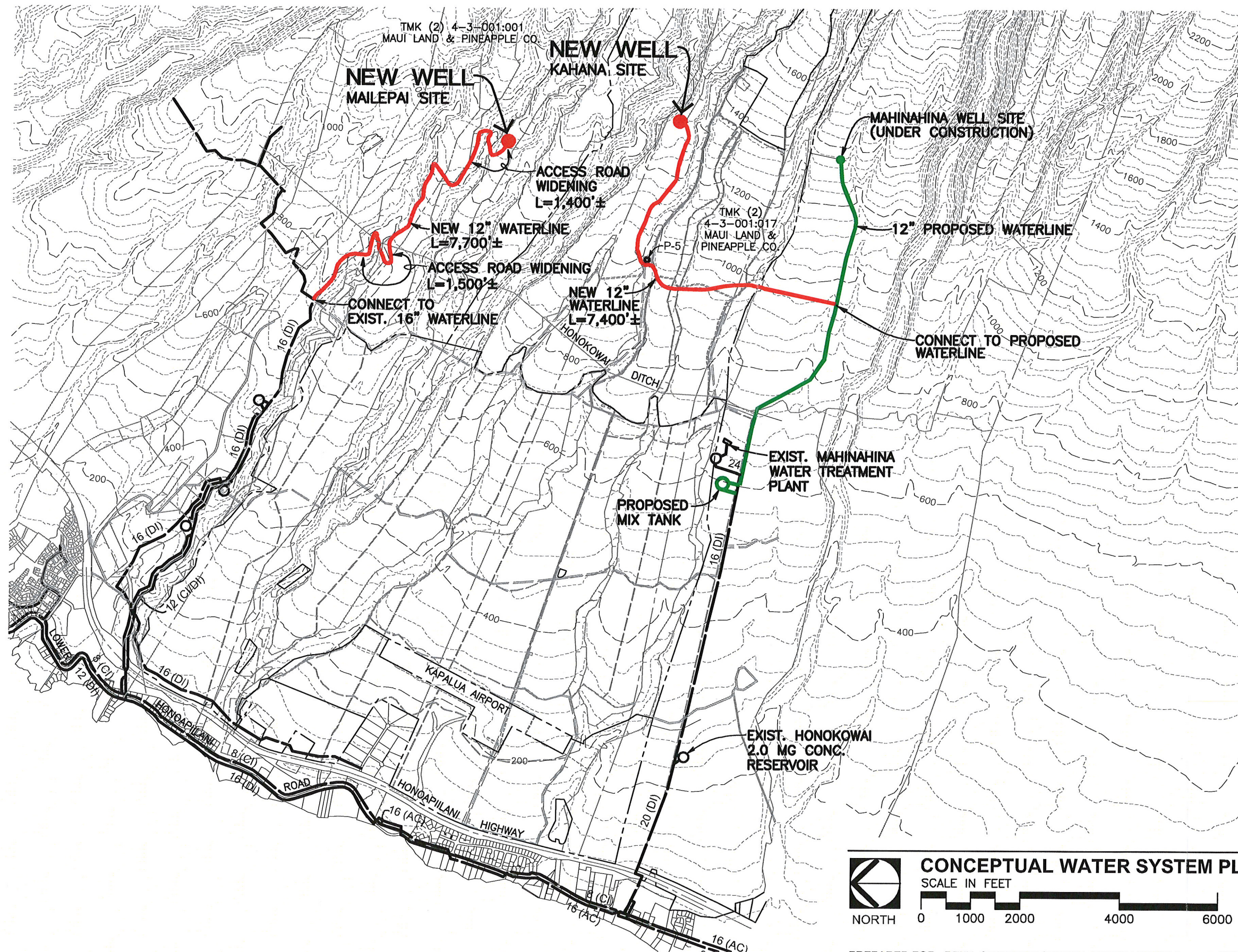
PUMP STATION - CONCEPTUAL PLAN

SCALE IN FEET



Figure 6



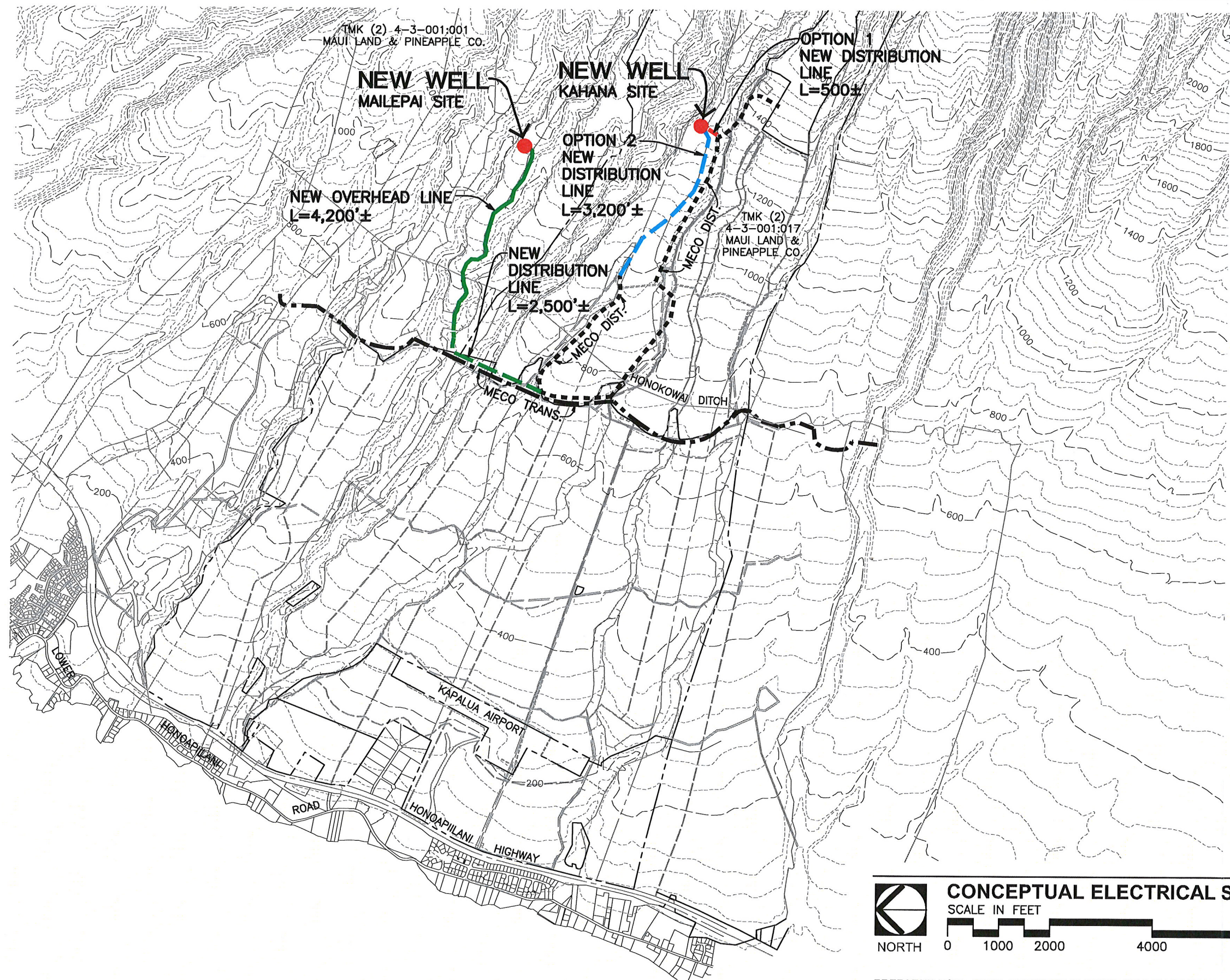


- LEGEND:**
- PROPERTY LINE
 - 16 (AC) --- EXISTING WATERLINE W/SIZE
 - NEW WATERLINE
 - MAHINAHINA WELL SITE PROPOSED IMPROVEMENTS

CONCEPTUAL WATER SYSTEM PLAN
 SCALE IN FEET
 NORTH 0 1000 2000 4000 6000

Figure 7





- LEGEND:**
- — — — — EXISTING TRANSMISSION LINE
 - — — — — EXISTING DISTRIBUTION LINE
 - — — — — MAILEPAI SITE DISTRIBUTION LINE
 - — — — — MAILEPAI SITE OVERHEAD LINE
 - — — — — KAHANA SITE OPTION 1 DISTRIBUTION LINE
 - — — — — KAHANA SITE OPTION 2 DISTRIBUTION LINE

CONCEPTUAL ELECTRICAL SYSTEM PLAN
 SCALE IN FEET

0 1000 2000 4000 6000

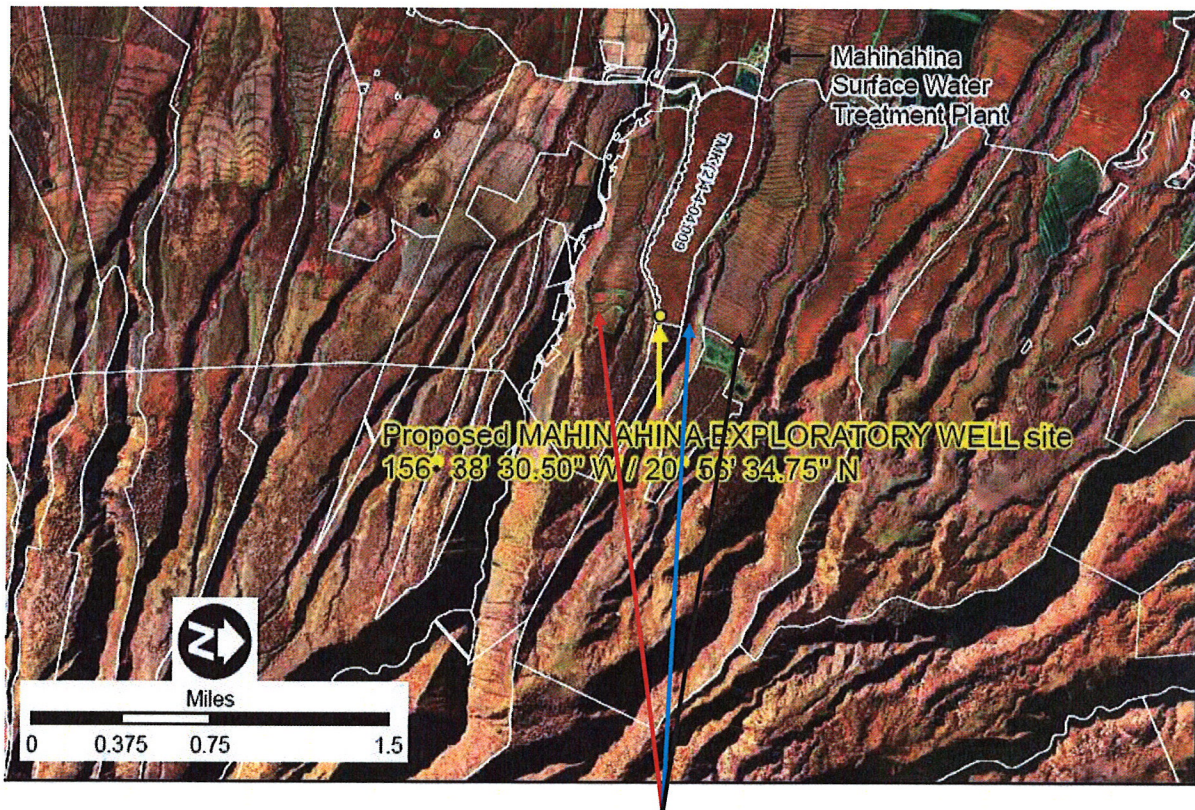
Figure 8

FIGURE 9
ORDER-OF-MAGNITUDE OPINION OF PROBABLE PROJECT COSTS

Project: Preliminary Design Report for West Maui Well No. 2
 Prepared for: Department of Water Supply
 Prepared by: Ronald M. Fukumoto Engineering, Inc.

Item	Description	Unit	Unit Price	New Well Mailepai Site		New Well Kahana Site Option 1		New Well Kahana Site Option 2	
				Quantity	Price	Quantity	Price	Quantity	Price
	EXPLORATORY WELL								
1	Exploratory well drilling, casing (18.75" o.d), and testing well	lin. ft.	1,200	1,180	\$ 1,416,000	1,340	\$ 1,608,000	1,340	\$ 1,608,000
2	Exploratory well general contractor fee and contingencies (20±%)				283,000		322,000		322,000
	Subtotal Exploratory Well				1,699,000		1,930,000		1,930,000
	WELL DEVELOPMENT								-
3	Site preparation	acre	100,000	1.0	100,000	1.0	100,000	1.0	100,000
4	Site piping	each	40,000	1	40,000	1	40,000	1	40,000
5	Site drainage	each	80,000	1	80,000	1	80,000	1	80,000
6	Access road improvements	lin. ft.	200	2,900	580,000	-	-	-	-
7	Pump (1,000 gpm) and motor	lin. ft.	1,000	1,170	1,170,000	1,330	1,330,000	1,330	1,330,000
8	Pump discharge piping	each	270,000	1	270,000	1	270,000	1	270,000
9	Chain link fence	lin. ft.	50	800	40,000	800	40,000	800	40,000
10	Control building (20'x40')	sq. ft.	250	800	200,000	800	200,000	800	200,000
11	Chlorination equipment	each	50,000	1	50,000	1	50,000	1	50,000
12	Water level monitoring equipment	each	60,000	1	60,000	1	60,000	1	60,000
13	Safety equipment	each	12,000	1	12,000	1	12,000	1	12,000
14	Electrical system	each	900,000	1	900,000	1	900,000	1	900,000
15	Paving	sq. ft.	20	7,000	140,000	7,000	140,000	7,000	140,000
16	Grassing	sq. ft.	1.00	29,000	29,000	29,000	29,000	29,000	29,000
17	Testing and chlorination	each	14,000	1	14,000	1	14,000	1	14,000
18	Reservoir	gal.	4.00	200,000	800,000	200,000	800,000	200,000	800,000
19	Off-site 12" waterline	lin. ft.	200	7,700	1,540,000	7,400	1,480,000	7,400	1,480,000
20	Off-site electrical distribution line extension	lin. ft.	80	2,500	200,000	500	40,000	3,200	256,000
21	Off-site electrical overhead line extension	lin. ft.	70	4,200	294,000	-	-	-	-
22	Well development contingencies (10±%)				652,000		559,000		580,000
	Subtotal Well Development				7,171,000		6,144,000		6,381,000
	CONSTRUCTION				8,870,000		8,074,000		8,311,000
	ENGINEERING & PERMITTING (8±% of construction cost)	l.s.			710,000		646,000		665,000
	LAND ACQUISITION	sq. ft.	8	40,000	320,000	40,000	320,000	40,000	320,000
	TOTAL PROJECT COSTS				\$ 9,900,000		\$ 9,040,000		\$ 9,296,000

APPENDIX 1



Possible well sites for Exploratory Well No. 2

Assuming the Mahinahina well being drilled now is at the location shown, three possible well sites for well 2 are shown as red, blue, and black arrows.

The blue arrow is probably the best because it is on the same ridge as the well being drilled. If Exploratory Well 2 is located at the northern corner, it looks to be about 0.1 mile (500± ft separation) from the existing well. Depending on the results of the pump test, well interference should be minimal.

The red arrow is better than the black arrow location mainly because of the shallower gulch between the existing well and a new well. If a pipeline has to cross the gulch this location should be easier.

As we discussed, the landowner(s) for the red and black arrow sites are unknown. If the red arrow location is owned by the state, then that site may be preferable to the blue arrow location because well spacing is greater.

APPENDIX 2

GLENN BAUER, GEOLOGIST

182 Kuualala Street
Kailua, Hawaii 96734
808-256-5473

MEMORANDUM

June 1, 2012

TO: Ronald Fukumoto, Ronald M. Fukumoto Engineering, Inc.

FROM: Glenn Bauer

SUBJECT: Use of the Q/s/d Parameter as a Means to Aid in the Location of
A New Exploratory Well Site in West Maui

Attached is a short report which examines West Maui DWS and private wells using the Q/s/d parameter. The calculation of Q/s/d is the specific capacity of a well divided by the length of the exposed aquifer. The resulting number normalizes the productivity of individual wells within the West Maui basal aquifer in addition to identifying areas where aquifer yield seems better.

The report states that the Q/s/d number can be used as one guideline to aid in locating a new exploratory well for West Maui. I believe plotting these numbers on the map with existing wells and infrastructure, may make the job of selecting a new well site easier.

Background

The Fukunaga and Associates, Inc. report, "Final West Maui Source Development Site Selection Report", dated July 2011, identified five possible locations at Mahinahina, Napili, Waipuka, Honokowai, and Kanaha, which will be the basis for further review in the future.

This short report does not choose any one site over the other at this time, but perhaps can add a level of discrimination to help decide where a new water source should be drilled. This report is not a substitute for field work or for locating a possible well site near Maui DWS infrastructure, which may in the long-term be the most expedient.

Appendix A in the Fukunaga report is a Hydrogeologic Study of the well sites authored by Water Resource Associates. The report discusses the geologic setting of the Lahaina (West Maui) district and the hydrologic conditions found in the area. Many of the existing Maui DWS and private water companies pump basal groundwater that is in contact with denser underlying saline water. Test holes drilled in Honokowai Valley show a progression (Figure 1 of the Hydrogeologic Study) of water levels from an unconfined basal aquifer (Test Hole 8 at 5.9 ft., msl water level), partially-confined dike aquifer (Well B at 17.9 ft., msl water level), to the dike-confined aquifer. Water levels in test holes and tunnel invert elevations are hundreds of feet above sea level.

Included in Appendix A is a map showing the location of water sources in the Lahaina area as well as Table 1, which lists the wells depicted and their physical dimensions, ownership, year drilled, pumping rates, drawdowns, and chloride values. All wells shown in Table 1 appear to be basal wells. The Mahinahina well, that is currently being drilled, is thought to be in the partially-confined dike aquifer. As of this

writing, there is no information regarding the well's water level and pumping and drawdown data.

Aquifer Performance and Pumping Capacity

Table 1 was used as a basis to analyze aquifer performance within the Lahaina district. To do this, additional data was obtained using the Commission on Water Resource Management's (CWRM) well database and well files. Some of the numbers used in Table 1 were not accurate and were changed to reflect the data in CWRM's database.

In order to normalize the basal aquifer performance throughout, the specific capacity (pumping rate (Q) divided by drawdown (s)), is divided by the exposed aquifer (either open hole or perforated casing section) length (d). The exposed aquifer length incorporates the basaltic aquifer's permeability, porosity, but also potential well construction constraints (i.e. how the well was developed and designed). This parameter is known as "Q/s/d". Table 1 (this report) shows that the Q/s/d numbers range from a low of 0.341 (Kaanapali P-1) to a high of 19.563 (Kaanapali P-3). The higher the number, the more productive the well.

The data compiled in Table 1 was transferred to the map included in Appendix A. Figure 3 (this report) shows the Q/s/d numbers for individual wells and batteries from Honokahua/Kapalua/Napili wells in the northwest to Launiupoko wells in the southeast. The values for well sites were averaged. Generally, the northwest well batteries of Honokahua, Kapalua, and Napili and some of the Kaanapali wells have generally higher Q/s/d numbers than wells to the southeast. There are some anomalies like Waipuka wells 1 and 2, where the average is between a good producing well and one that is not as good.

Table 1: determination of the Q/s/d parameter

Well Name	Well No.	Owner/User	Q	s	Q/s	d	Q/s/d
			Test Rate (gpm)	Drawdown (ft)	Specific Capacity (Q/s)	Open hole/Perforated Casing Interval (ft)	Specific Capacity Per Foot of Open Hole Interval (gpm/ft/ft)
Honokahua A	5838-03	Maui DWS	500	7.8	64	31	2.065
Honokahua B	5938-01	Maui DWS	700	2.4	292	20	14.600
Kaanapali P-1	5539-01	California Water Svc Group	420	31.0	14	41	0.341
Kaanapali P-3	5539-03	California Water Svc Group	714	0.76	939	48	19.563
Kaanapali P-4	5739-01	California Water Svc Group	1000	11.5	87	57	1.526
Kaanapali P-5	5738-01	California Water Svc Group	1100	15.2	72	40	1.800
Kaanapali P-5A	5739-04	Hawaii Water Svc Company	538	0.90	455	46	9.891
Kaanapali P-6	5739-02	California Water Svc Group	1000	3.03	303	48	6.313
Kanaha 1	5339-03	Maui DWS	340 ¹	2.6	131	45 ¹	2.911
Kanaha 2	5339-04	Maui DWS	350	3.7	95	98	0.969
Kapalua 1	5938-02	Maui Land & Pine Co., Inc.	800	1.6	500	65	7.692
Kapalua 2	5938-03	Maui Land & Pine Co., Inc.	780	3.3	236	40	10.900
Kapalua 3B	5938-04	Maui Land & Pine Co., Inc.	800	1.7	470	66	7.121
Launiupoko 1	5138-01	Launiupoko Assn.	740	6.9	107	43	2.488
Launiupoko 2	5137-01	Launiupoko Assn.	107	1.46	73	31	2.355
Launiupoko 3	5238-02	Makila Land Co.	709	2.8	253	54	4.685
Napili A	5838-01	Maui DWS	1000	4.5	222	33	6.727
Napili B	5838-02	Maui DWS	1000	4.7	213	33	6.455
Napili C	5838-03	Maui DWS	1400	6.0	233	20	11.650
Wahikuli 1	5439-01	State HFDC	700	18.7	37	65	0.569
Wahikuli 2	5439-02	State HFDC	1000	3.1	323	66	4.894
Wahikuli Irr.	5341-01	State HFDC	250	1.2	208	15	13.867
Waipuka 1	5339-01	Maui DWS	375	1.2	313	60	5.217
Waipuka 2	5339-02	Maui DWS	600	0.6	1000	57	17.544

¹Original Kanaha 1 well data from 1971. Well deepened in 1977.
Source for Table: CWRM Wellphys database and CWRM well files.

Knowing the Q/s/d parameter of existing wells in an area can also be a predictor of the drawdown for a new well, given the exposed aquifer interval and the pumping rate. Therefore, if $A = Q/s/d$ then, $s = Q/(A*d)$. In the Fukunaga report, a design open hole length for some of the possible well sites is 50± ft. (-50 ft., msl). Figures 1 and 2 plot two scenarios where the open hole length is held constant and the pumping rate is held

constant at 1,000 and 700 gpm, respectively. The $Q/s/d$ (A) varies from 0.5 to 20. Drawdown decreases rapidly to an A value of roughly 5.

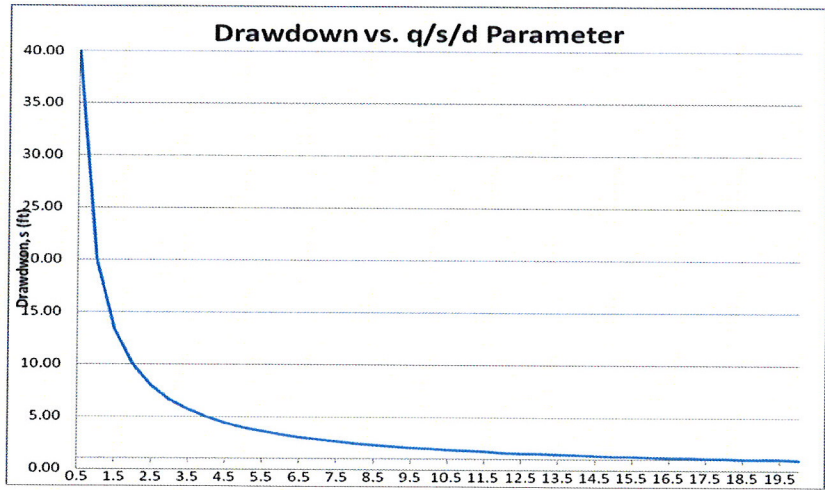


Figure 1: 1,000 gpm pump and 50 ft. of exposed aquifer

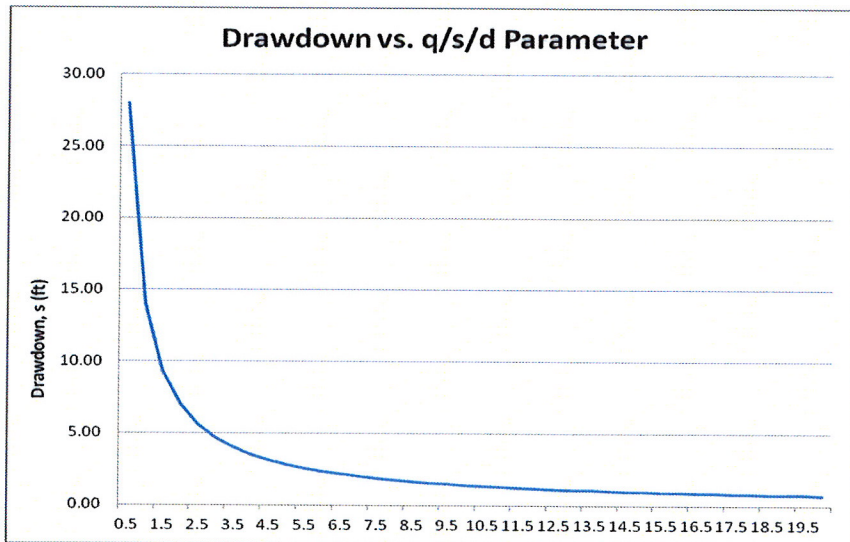


Figure 2: 700 gpm pump and 50 ft. of exposed aquifer

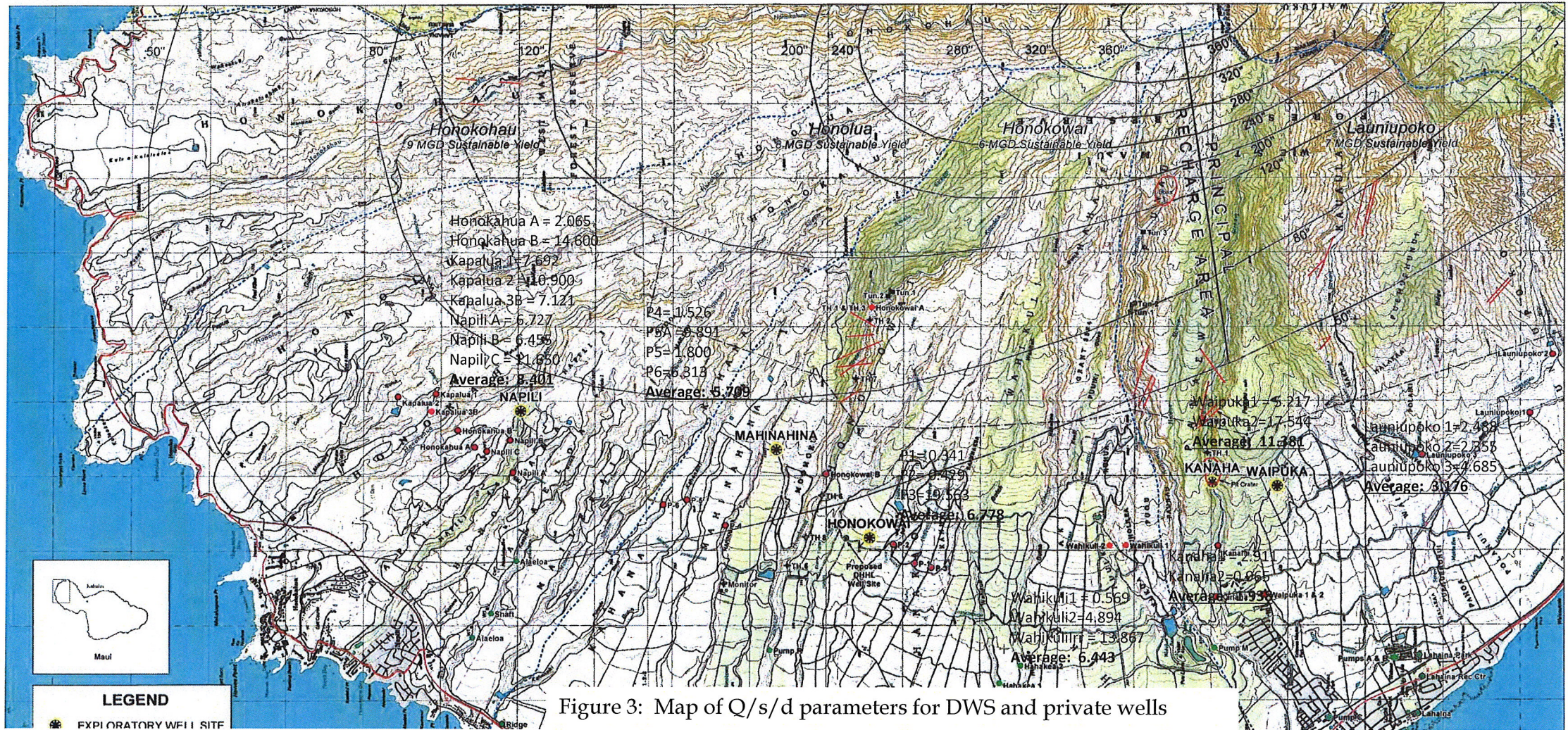


Figure 3: Map of Q/s/d parameters for DWS and private wells

Summary

The $Q/s/d$ parameter is useful in determining the productivity of an individual well, or in the case of a well battery, the aquifer. It can be useful in estimating the drawdown in a well of a given design and pumpage rate where the average $Q/s/d$ is known in the vicinity of the new well. The number can also be used as one guideline to aid in locating a new source for West Maui. Other guidelines include engineering considerations such as existing infrastructure, groundwater availability within aquifer systems, and finally, the results of the new Mahinahina well currently being drilled and tested in the partially-confined dike aquifer.

APPENDIX 3

GLENN BAUER, GEOLOGIST

182 Kuualala Street
Kailua, Hawaii 96734
808-256-5473

July 2, 2012

Mr. Ronald Fukumoto, PE, LS
President, Ronald M. Fukumoto
Engineering, Inc.
1721 Wili Pa Loop, Suite 203
Wailuku, Hawaii 96793

Dear Mr. Fukumoto:

I am pleased to send the letter report requested by you and the Maui Department of Water Supply in regards to recommendations locating the second West Maui Exploratory Well. This report is a review of the sites suggested by Water Resources Associates (Appendix A) in your July 2011 site selection report, and other sources including well files, previous reports, and the new numerical model prepared by the U. S. Geological Survey for the Lahaina region. My recommendation for the location of the second well is stated in the Site Recommendation section at the end of this report.

Background

The following letter report assesses the hydrological and geological feasibility of well sites identified in the "Final West Maui Source Development Site Selection Report," prepared by Fukunaga and Associates, Inc. July 2011 (Appendix A). Appendix A is the hydrogeological report (written by Water Resource Associates) that identified five potential sites after reviewing available well records in Commission on Water Resource Management (CWRM) files, field reconnaissance, and other criteria associated with fieldwork. These other criteria include (in order of priority):

1. Land ownership;
2. Hydrogeologic considerations for quantity and quality of potable water;
3. Proximity to DWS systems and water use;
4. Accessibility of the site, and
5. Proximity to electric power.

Another criteria not mentioned, but implied in the hydrogeological report, is that potential sites should be located upgradient of pineapple cultivated lands, thereby minimizing groundwater contamination from soil fumigants.

Appendix A identified possible well sites at Napili, Mahinahina, Waipuka, Honokowai, and Kanaha. The Mahinahina Exploratory Well No. 1 site is currently being drilled (State Well No. 5638-04), and as of this writing, groundwater conditions at this site are unknown. However, in Appendix A of the Fukunaga and Associates, Inc. report estimated a water level for the new well to be 18± feet above mean sea level (ft., msl). This is based on an initial water level measured in Honokowai Well B (5638-03) when it was drilled in 1976, and is reported in the CWRM Wellphys database. This well is located about three miles inland from the coast and thought to be in the marginal dike zone (see Figure 1, Appendix A). The other identified potential well sites are plotted on the "Exploratory Well Sites Map" that accompanies Appendix A.

Prior to this assessment, I wrote a short memorandum and report to you (dated June 1, 2012) that uses a parameter referred to as "Q/s/d" (QSD). QSD is defined as the specific capacity of a well (gallons per minute per foot of drawdown) divided by the length of the open hole interval (including perforated casing). The exposed aquifer length incorporates not only the basaltic aquifer's permeability and porosity, but also potential well construction constraints (i.e. how the well was developed and designed). The resulting number normalizes the ability of an aquifer to supply water to the well bore. The larger the calculated number, the more efficient the well. The QSD number for existing wells near the potential well sites identified in Appendix A will also be taken into account when discussing the location of the new exploratory well.

Appendix A described each well site in the following descending order of preference: 1) Mahinahina; 2) Napili; 3) Waipuka; 4) Honokowai; and 5) Kanaha. This site assessment will follow the same order.

Mahinahina Site

As mentioned above, the new Mahinahina well is still being constructed, and data pertaining to it, such as the static water level and aquifer test data, are unknown. The Mahinahina well is presumed to be located in the marginal dike zone. This was based on the CWRM Wellphys database entry that indicates an initial water level of 17.9 ft., msl in Honokowai Well B (5638-03). However, Gingerich and Engott (2012, p. 17) write in their numerical groundwater model report for the Lahaina District that an April 2, 2009 water level measurement for Honokowai B was 5.43 ft., msl, indicating that it is basal. Because it is basal, Yamanaga and Huxel's (1969) map that shows the boundary between basal wells and those wells affected by dikes in Honokowai Valley, was adjusted in the numerical model to take into accounts the new water level data.

A water level measurement from the new Mahinahina well will provide additional information as to the location of the boundary. If a 5± ft., msl water level occurs in the Mahinahina Exploratory well, then the design bottom elevation of -90 ft., msl, may be too deep and the well may have to be backfilled.

The CWRM Wellphys database shows that Honokowai B was tested at 1,100 gpm and had a drawdown of 5.3 feet (ft.). The specific capacity of the well is 208 gpm/ft. of drawdown. There is 53 ft. of exposed aquifer in the well so the calculated QSD is 3.925.

Honokowai B was pumped (see Gingerich and Engott, 2012, Figure C1) from 1985 to at least 2010. The average withdrawal rate was about 1.0 mgd over the period of record. Chlorides concentration from water pumped from the well after 2000 varied from <25 to 225± Mg/L (Gingerich and Engott, 2012, Figure 10). The CWRM well file for Honokowai B shows chloride during the long-term 145 hour aquifer test hovered around 85 Mg/L; however, the well database shows an initial chloride value of 25 Mg/L. The variability of the chloride data suggests that the well is tapping from the basal groundwater system.

Gingerich and Engott (2012) estimate the hydraulic conductivity (k) in the vicinity of well 5638-03 to be between 1,600 to <2,400 ft./day (assume an average of 2,000 ft./day), which indicates a permeable aquifer as evidenced by the results of the long-term pump test.

In January 2012, I sent a preliminary location map to you showing possible sites for a second exploratory well near the Mahinahina Exploratory well. The three possible well sites are represented by red, blue, and black arrows. The scale used in the Google Earth photograph puts the red and black arrows approximately 1,500 ft. from the new well. The blue arrow is about 900 ft. north of it.

Without actually measuring the effect of a steady-state drawdown, s, by pumping the Mahinahina Exploratory well on other wells located 900 and 1,500 ft. away, an analytical approach can be used to estimate it. The Gingerich and Engott (2012) model assumes storage coefficients of 0.04 and 0.15. For an unconfined aquifer, the following drawdown-distance equation can be used:

$$s = Q / (4\pi T) * \ln\{(2.25Tt / (r^2S))\}$$

For this analysis the assumptions are: 1) Q is in ft³/day (1,400 gpm = 269,519 cu. ft./day); 2) T, transmissivity, is the average hydraulic conductivity multiplied by the thickness of the freshwater lens which is 2,000 ft./day times 200 ft. (assume a water level of 5± ft., msl) or 200,000 ft²/day; 3) the distance from the pumping well, r, is taken at 1,500 ft. and 900 ft.; 4) S, the storage coefficient, is taken at 0.10; and 5) time, t, is

10,000 days or steady-state. The aquifer is also assumed to be isotropic and homogeneous.

If a basal well were drilled 900 ft. from the new Mahinahina well, the steady-state drop in water level is 1.17 ft. If both wells pump at 1,400 gpm the decline half way between them would double. For 1,500 ft. away, the water level decline would be 1.06 ft. The location of a new exploratory well in this area will depend upon the groundwater conditions encountered in the new Mahinahina well and the aquifer test results.

According to Appendix A there is about 2.59 mgd of groundwater available in Honokowai Aquifer System after removing the average pumpage from the aquifer's sustainable yield of 6 mgd as defined by the CWRM updated 2008 Water Resources Protection Plan. If the new Mahinahina well taps basal groundwater, the amount available will be less than the suggested pumpage rate of 1,400 gpm.

Napili Site

The Napili site location suggested in Appendix A is at an elevation of 1,100± ft., msl and on a parcel of land owned by the State. The well site is about 1,500 ft. inland from Maui DWS' Napili B (5838-02) and 2,800 ft. inland from Honokahua B (5938-01). Examination of chloride records on file at CWRM show that Honokahua B is somewhat fresher than Napili B, though both wells exhibit chloride concentrations less than 90 Mg/L. The Napili site should produce water less saline than either Napili B or Honokahua B. However, a new well upgradient from producing wells will cause increasing salinity changes to wells downgradient. Due to possible downgradient well interference, I suggest that the well site be located at the same elevation, but 0.75 miles south of the Napili site. See Figure 1. Hydrologically this is a better location as it spreads out the concentration of pumpage in the Napili area, and the wells will be spaced in a north-south alignment which is perpendicular to the direction of groundwater flow.

This alternative site is still within the Honolua Aquifer System, which has a sustainable yield of 8 mgd (CWRM, 2008) and water availability of 5.67 mgd (Appendix A).

Gingerich and Engott (2012, p. 17) calculated a hydraulic groundwater gradient of 1.7 ft./mile in the Honolua area. Assuming the new Napili site is about three miles from the coast, the static water level would be 5± ft., msl. The average QSD parameter calculated for the wells in the Napili-Honokahua-Kapalua area is 8.401 (June 1, 2012 Memorandum), though the range is from 2± to 11±. This range in QSD suggest that a 700 gpm pump drawing from a well with 50 ft. of exposed aquifer would have a drawdown of less than 5 ft. (see Figure 2 of June 1, 2012 Memorandum).

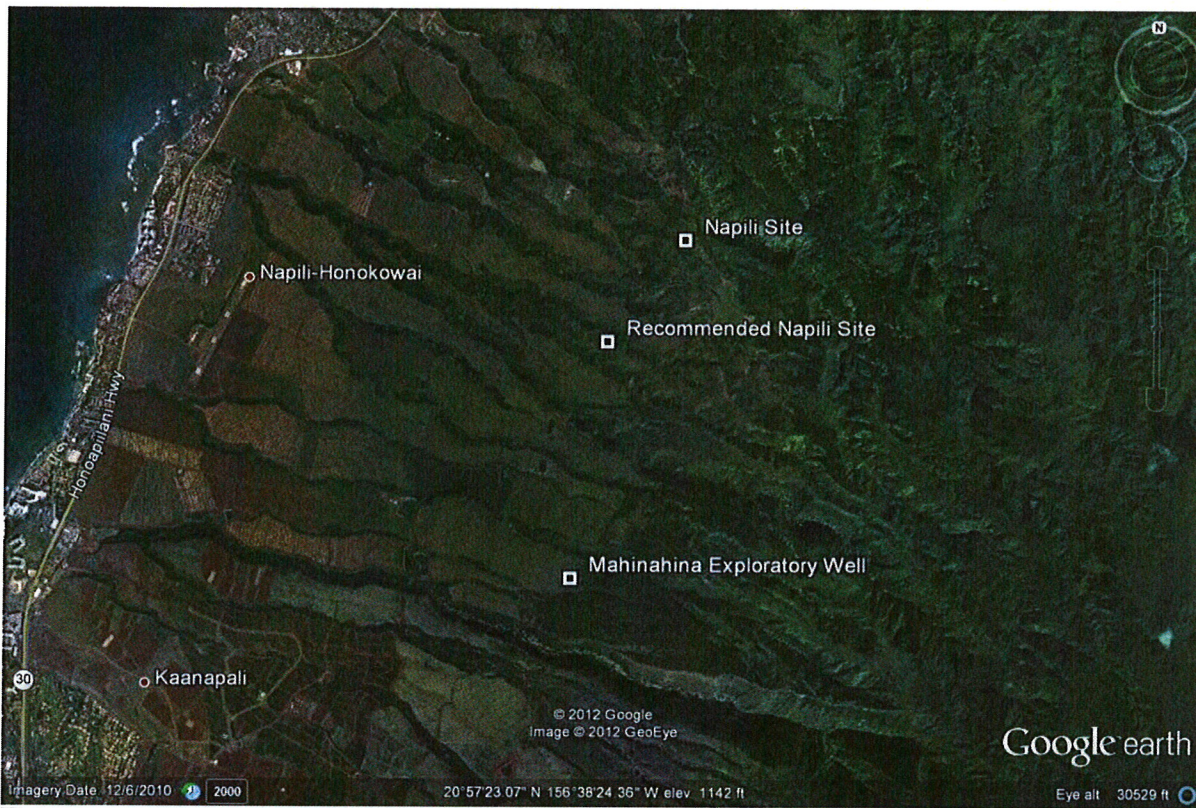


Figure 1: Location map of recommended Napili Site.

Waipuka Site

Appendix A places the Waipuka site at an elevation of 1,180 ft., msl but was not visited by Water Resource Associates. From its location on the map, the site appears to be upgradient from Maui DWS' Waipuka Wells 1 and 2 (5339-01, 02). Combined pumpage from the Waipuka wells can be as much as 0.5 mgd for specific months, though the 4-year average shown in Appendix A is 0.212 mgd. Chlorides are usually below 100 Mg/L, though Waipuka Well 2 has periodically pumped groundwater greater than 100 Mg/L. However, Gingerich and Engott (2012, Figure 10) show that though in the 1980's and 90's, chlorides ranged between 100 and 250 Mg/L. This is despite the fact that Waipuka Well 2 had a QSD number of 17.544.

South of the Waipuka site is Launiupoko Well 3 (5238-01). As noted in Appendix A, this well was tested at 709 gpm with a drawdown of 2.8 ft. and chlorides at 18 Mg/L (CWRM Wellphys Database). Though this well was drilled in 2003, the reporting of pumpage and chlorides from Launiupoko Well 3 began in September 2009. The well's water use averaged 0.019 mgd, and Launiupolo Water Company reported a chloride concentration of 138 Mg/L. In July 2011 the average pumpage was 0.127 mgd

resulting in a chloride concentration of 292 Mg/L (CWRM files of water use data). This well appears to be very sensitive to pumping.

Though Gingerich and Engott (2012, p. IV) state that Launiupoko Aquifer System is a promising area for future groundwater development, the historical sensitivity of the lens to upconing, as evidenced by Launiupoko Well 3, and the possible interference to the existing Waipuka wells, the Waipuka site is not recommended as a viable location for a second West Maui exploratory well.

Honokowai Site

The Honokowai site is located at elevation 1,000± ft., msl and appears to be located mid-way (1,000± ft.) between the new Department of Hawaiian Home Lands (DHHL) well (5639-04) and the Kaanapali P2 well (5539-02). Salinity records at CWRM and in Figure 10 (Gingerich and Engott, 2012) show that chlorides range from <100 to >200 Mg/L in Kaanapali P2, and that salinity appears to increase with an increase in pumpage. The original pump test rate was 500 gpm with 18.5 ft. of drawdown. The test chlorides were 70 Mg/L. Another well 1,000± ft. south of Kaanapali P2 is Kaanapali P1 (5539-01), which pumps about 0.5 mgd with chlorides hovering around 100 Mg/L (Figure 10).

By contrast, the new DHHL well was test pumped to a maximum rate of 960 gpm with 4.0 ft. of drawdown, and the chlorides fluctuated between 13 and 15 Mg/L, and the water temperature was 66.8° F. The lower than normal water temperature for basal groundwater indicates that the source of water to the well is probably from leakage into the basal lens from high-level dike-impounded compartments that are recharged from a ground elevations greater than 2,000 ft., msl (see discussion in Visher and Mink, 1964, p. 120). The static water level is about 3.4± ft., msl. DHHL is requesting 0.5 mgd water use (installed 500 gpm capacity pump) from CWRM.

A second West Maui exploratory well at this site with the expectation of 0.5 to 1 mgd (Appendix A) of additional pumpage is not recommended for the following reasons: 1) chlorides consistently greater than 200 Mg/L at Kaanapali P2; 2) combined average daily pumpage at Kaanapali P1 and P2 is about 0.7 mgd; and 3) the DHHL well plans to pump 0.5 mgd from a source with a head of <4 ft., msl. A new DWS well in this area will probably develop water with higher chlorides and will be sensitive to pumping.

Kanaha Site

Though last in the descending order of preference (Appendix A), the Kanaha site is thought to be a reasonable location for a basal well that would 350 to 500 gpm, and if a dike-impounded aquifer is found, a greater producing well without saline water

intrusion. The well site is located at an elevation of 920 ft., msl, and about 0.5 miles inland from Maui DWS' Kanaha 2 well (5539-04). Both Kanaha 2 and Kanaha 1 (5539-03) have had a history of greatly fluctuating chlorides. Figure 10 in Gingerich and Engott (2012) shows that chlorides vary between 100 Mg/L to over 800 Mg/L.

One reason for the extreme variability in chlorides is the geologic conditions that occur inland and seaward from the Kanaha wells. Figure 2 (below) shows dike locations (red lines), a pit crater outcropping in Kanaha Stream (QTwpc), lavas that

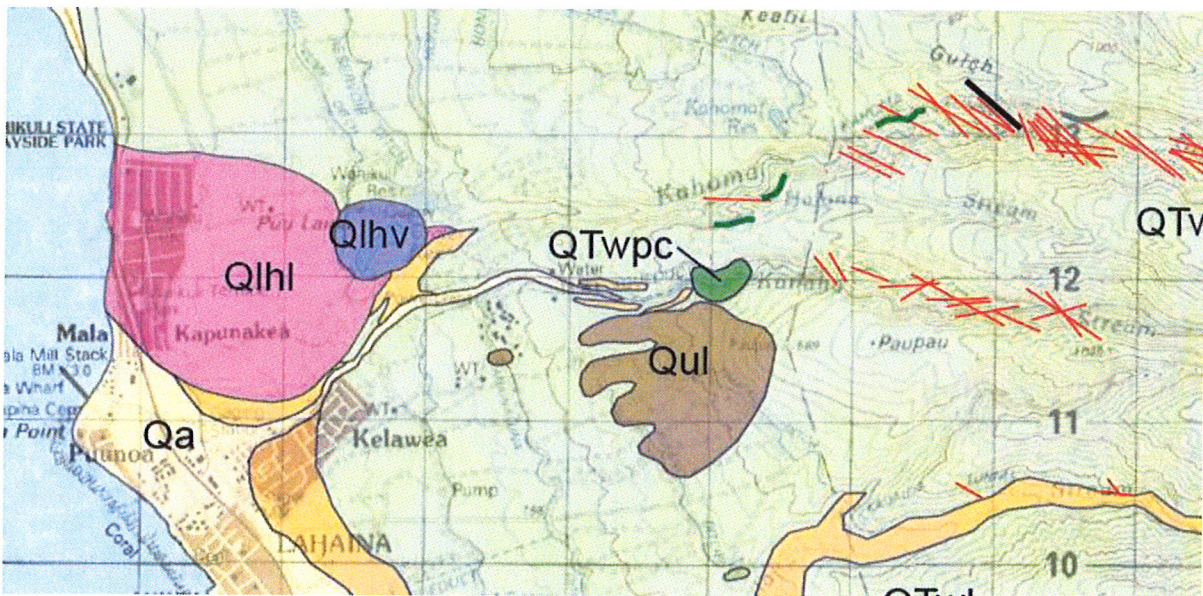


Figure 2: Geologic map from Sherrod and others (2007)

belong to the post-shield Honolua Volcanics (Qul), and to the lava and vent of the rejuvenated Lahaina Volcanics (Qlhl and Qlhv, respectively). Mink (1990) discusses the implications of the dikes' orientations, the pit crater, and the rejuvenated lavas on the anomalous salinities found at the Kanaha wells. The Honolua Volcanics lava flow shown in Figure 2 probably does not affect groundwater flow because its source vent was far inland.

Stearns and Macdonald (1942) mapped 24 dikes in Kanaha Stream (not all shown in Figure 2). Mink (1990) examined G. A. Macdonald's 1940 field notes and plotted dike orientations and thicknesses as his Figure 8. Fifteen dikes are trending between northwest and west-northwest, and nine dikes are east-northeast and east-west. The dikes are sub-parallel to the direction of the stream. Mink (1990) suggests that the massive lava flows ponded within the 1,000-foot diameter pit crater which is bounded by faults and breccia zones, and cut by Kanaha Stream, forces any dike-impounded groundwater to the surface adding to the baseflow of the stream, thus depriving any leakage of groundwater into the basal aquifer upstream of the wells. In addition, the rejuvenated Lahaina Volcanics vent downstream of the Kanaha wells is likely to cause a

disruption of groundwater flow to the coast due to impermeable subsurface feeder dikes.

It is for the geological reasons outlined above, and for the salinity history of the Kanaha wells, that a site in the Kanaha region is not recommended.

Comments on the USGS Numerical Model

Gingerich and Engott's numerical groundwater model presents seven scenarios. Table 5 (Gingerich and Engott, 2012, p.36) summarizes the scenarios. Six of the scenarios use a recharge value of 89 mgd, while Scenario 6 includes 16 mgd from streambed recharge for 105 mgd. Rainfall for the period from 1926 to 2004 is used, and land use patterns from 2000 to 2004 are used. This excludes plantation scale agriculture. The scenarios also include injection of treated sewage effluent from the Lahaina Sewage Treatment Plant (STP). From the early 1980's through 2009, 4 to 6 mgd of mildly brackish effluent was injected. Gingerich and Engott (2012, p.14) state that injection of treated effluent at the STP acts as a barrier to inflow of saline ocean water to wells inland of the STP. The base case is Scenario 1, which uses the above recharge and land use parameters, but also the average 2008-09 pumpage of 6.3 mgd and an injection rate of 2 mgd. All other scenarios, except Scenario 3, use an injection rate of 7 mgd. Figure 25 in the report summarizes the effects of pumping and changes in salinity in wells at the end of 30-year simulations.

According to the Gingerich and Engott model, Scenario 4 assumes the most likely future condition and probably the worst case. It includes the recharge (natural and injection) and land use assumptions, and the effects increasing pumpage incrementally to 17.1 mgd for planned development with no distributive pumping increases south of Lahaina. Scenario 4 predicts threatened changes in salinity in wells in the Honokowai and Honolulu Aquifer Systems (see Figure 25).

Most scenarios show a projected withdrawal rate of 11.2 mgd for 28 wells including proposed wells. For Scenario 5 pumpage at existing wells is increased to 20.7 mgd and redistributed south into the Launiupoko and Olowalu Aquifer Systems allowing the wells to the north to remain in the precautionary salinity status. However, as shown in the above discussion on the Waipuka Site, pumpage and salinity histories in the Launiupoko wells show sensitivity to pumpage and increases in salinity.

Site Recommendation

Depending upon what the pump test data show and if the water level encountered at the new Mahinahina well is 17+ ft., msl, a second well could be located 900 to 1,500 ft. from it. However, if the water level is basal (i.e. 5± ft., msl), then I recommend the second Mahinahina Exploratory well site be located 0.75 miles south of the Napili Site and approximately 1.6 miles north of the Mahinahina Exploratory Well

as shown in Figure 1. This location depends upon land availability and access, but I believe that is location will be superior to the site chosen.

If you have any questions about the content of this report and my recommendation, please contact me on my cell phone, (808)256-5473. Thank you for your assistance in providing available documents.

Sincerely yours,

A handwritten signature in black ink, appearing to read "Glenn Bauer". The signature is fluid and cursive, with a long horizontal stroke at the beginning.

Glenn Bauer, LG, CPG

References

- Bauer, G. R., 2012, Use of the Q/s/d Parameter as a Means to Aid in the Location of A New Exploratory Well Site in West Maui: June 1, 2012, memorandum report to Ronald M. Fukumoto, Engineering, Inc., 7 p.
- Commission on Water Resource Management, 2008, Hawaii Water Resources Protection Plan: 12 sections and appendices. Can be found online at: (http://hawaii.gov/dlnr/cwrp/planning_wrpp.htm)
- Commission on Water Resource Management, Wellphys Database and well files.
- Fukunaga and Associates, Inc., 2011, Final West Maui Source Development Site Selection Report: prepared for the County of Maui Department of Water Supply, 17 pages plus Appendices A, B, & C.
- Mink, J. F., 1990, West Maui Water Study, Lahaina District Sources and Systems, Honokohau to Launiupoko: Appendix A, in Final Draft West Maui Masterplan, prepared for the Maui Department of Water Supply by Austin Tsutsumi and Associates, 1991.
- Gingerich, S. A. and J. A. Engott, 2012, Groundwater availability in the Lahaina District, West Maui, Hawaii: U. S. Geological Survey Scientific Investigations Report 2012-5010, 90 pages.
- Sherrod, D. R., Sinton, J. M., Watkins, S. E., and Brunt, K. M., 2007, Geologic map of the State of Hawaii: U. S. Geological Survey Open-File Report 2007-1089.
- Stearns, H. T. and Macdonald, G. A., 1942, Geology and ground-water resources of the island of Maui, Hawaii: Hawaii Div. Hydrography Bull. 7, 344 p.
- Visher, F. N. and J. F. Mink, 1964, Ground-water resources in southern Oahu, Hawaii: U. S. Geological Survey Water Supply Paper 1778, 133 p.
- Yamanaga, G. and C. J. Huxel, 1969, Preliminary Report on the Water Resources of the Lahaina District, Maui: Circular C51, prepared by the U. S. Geological Survey in cooperation with Department of Land and Natural Resources, State of Hawaii, 47 p.

APPENDIX 4

GLENN BAUER, GEOLOGIST

182 Kuualala Street
Kailua, Hawaii 96734
808-256-5473

MEMORANDUM

July 16, 2012

TO: Ronald Fukumoto, Ronald M. Fukumoto Engineering, Inc.

FROM: Glenn Bauer

SUBJECT: A Second Preferred Location For Mahinahina Exploratory Well No. 2
Based Upon New Water Level Information

In my July 2, 2012 letter report to you, I proposed a recommended site for the Mahinahina Exploratory Well No. 2. The new suggested location is now called the "Mailepai" site. This site location is 20° 57' 41.9" N and 156° 38' 23.7" W, with an approximate ground elevation of 1,140± ft., msl (Google Map location).

At the time of my report, a water level for the new Mahinahina Exploratory well was unknown, and due to the new water level taken at Honokowai B (5638-03) showing it to be basal (5.43 ft., msl on April 2, 2009), the possibility that the water level at the new Mahinahina well could also be basal. Since my report was submitted, I learned that Michael Robertson of Wailani Drilling measured a water level of 40+ ft., msl, in the open and uncased hole of the new well. This water level measurement should be reconfirmed, but assuming it is true, then the higher water level is the result of volcanic dikes impounding groundwater above the <6 ft., msl basal groundwater elevations of West Maui. Low head basal groundwater is normal in dike-free basaltic lava in this area. It is possible that the 40+-foot water level represents a dike-basal situation where higher than normal groundwater elevations are still in contact with underlying saline water, but not as sensitive to upconing and sea water intrusion.

If the step-drawdown and constant rate aquifer tests for the new Mahinahina well show that the well is capable of high yield with little or no increases in chloride concentration, then the Mailepai site should be moved closer to Mahinahina Well No. 1. Moving the site closer assumes that the dike-basal groundwater situation continues north. This adjusted well site (called the "Kahana" site) should still be in the Honolua Aquifer System where there is a greater availability of unused groundwater against the sustainable yield of 8 mgd. Figure 1 shows the Mailepai site and the proposed new

Kahana site. The new site's location is 20° 57' 6.2" N and 156° 38' 18.6" W at an elevation of 1,300± ft., msl. The Kahana site is 0.65± miles from the new Mahinahina well and about the same distance to the Mailepai site. The new Kahana site, as well as the Mailepai site, still needs to be ground checked. The final location for the second Mahinahina well must meet the needs of Maui DWS (land ownership, infrastructure, etc.). The outcome of the aquifer testing phase of the new Mahinahina well will also influence the final location.

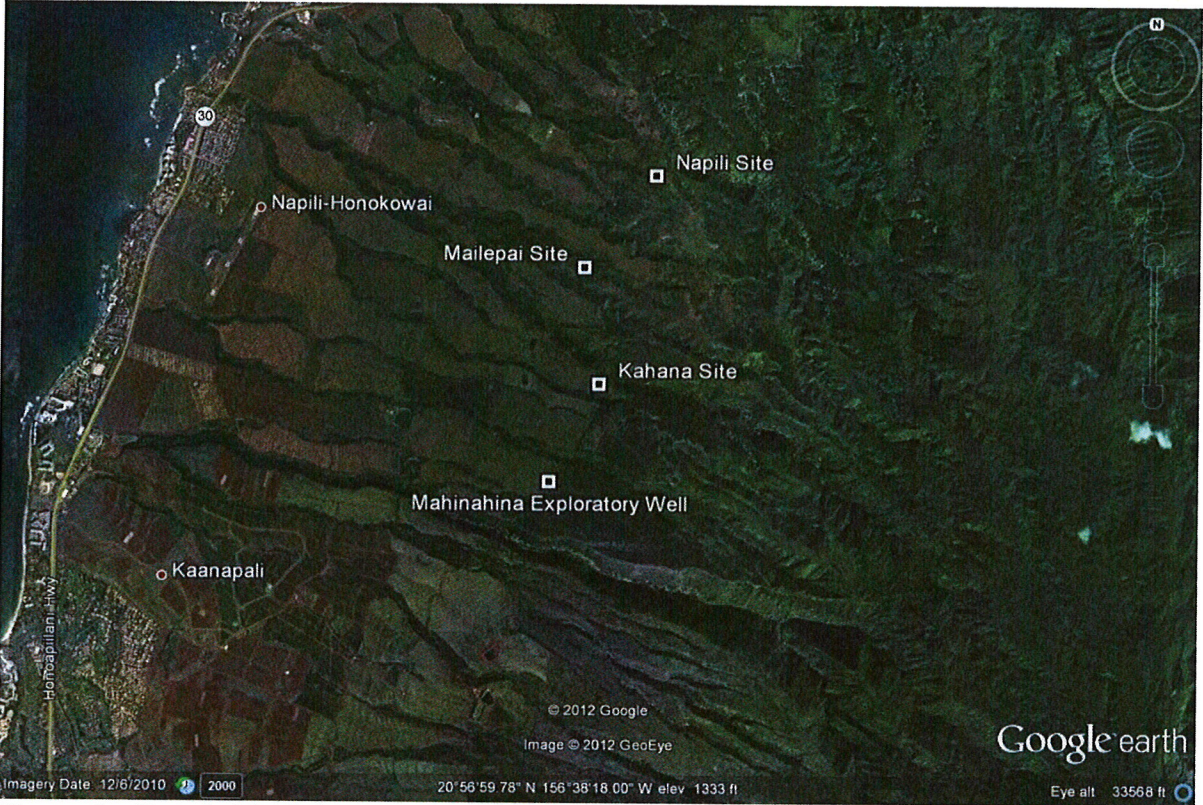


Figure 1: Google Earth location map showing the location of the Mailepai site, the Kahana site, and the Mahinahina Exploratory Well No. 1

Please let me know when a site visit is appropriate and if Maui DWS would like to meet to discuss these two possible locations.

APPENDIX 5

GLENN BAUER, GEOLOGIST

182 Kuualala Street
Kailua, Hawaii 96734
808-256-5473

MEMORANDUM

September 18, 2012

TO: Ronald Fukumoto, Ronald M. Fukumoto Engineering, Inc.

FROM: Glenn Bauer

SUBJECT: Field Reconnaissance Visit of September 13, 2012 to the Mailepai and Kahana Well Sites

In my July 16, 2012 memorandum to you regarding the location of the second exploratory well at Mailepai (formally the Mahinahina Exploratory Well No. 2), I also suggested that with the future testing the new Mahinahina Well and its confirmed 40± ft., msl water level, the second exploratory well, called the Kahana site, may be better than Mailepai. This well location is approximately 0.65 miles from the new exploratory well.

The September 13 field reconnaissance visit of the Mailepai and Kahana sites included Mandy Saito of your staff, Jeff Pearson and Curt Eaton of Maui DWS. The field inspection provided useful information in regards to site access and electrical power. I used a Garmin GPSmap 60Cx to better locate the sites and to determine elevation. The GPS was averaged about 60 feet higher than known elevations that were used to check differences. Accurate elevations will be determined by a surveyor.

The Mailepai site is located above Napili. Access to the site is difficult as two gulches have to be crossed (Kaopala and the west branch of Mailepai). Moreover, the jeep road is too narrow and curvy for a drilling rig to negotiate. Electrical power would have to be brought in to the site which would be very expensive. Figure 1 in the Appendix shows the location of the well in relationship to the valleys. The GPS elevation at the site is 1,198 ft., msl or 1,138 ft., msl which is similar to the Google Map elevation of 1,140 ft., msl (July 16, 2012 memorandum). Figure 2 shows the site itself.

The Kahana site by contrast is relatively easy to approach. The access road is wide enough for a drilling rig as several Ka'anapali wells were drilled (P4 and P5) along it. Electrical power is available and can be extended to the Kahana site. The site itself

was determined to be at 1,325 ft., msl using Google Map. The Google Map elevation at the top of the road and above the site location is 1,385 ft., msl, while the GPS elevation is 1,454 ft., msl (1,396 ft., msl by subtracting 60 feet). The parcel is large, and the well site located on Google Map (July 16, 2012 memorandum) is fine. Perhaps the location can be adjusted slightly downhill to match the elevation of the Mahinahina Exploratory well (1,315.77 ft., msl benchmark elevation). Figure 3 shows the Kahana site from the top of the parcel. The Google Earth measured map length from the top of the parcel to the well site is about 725 feet.

APPENDIX

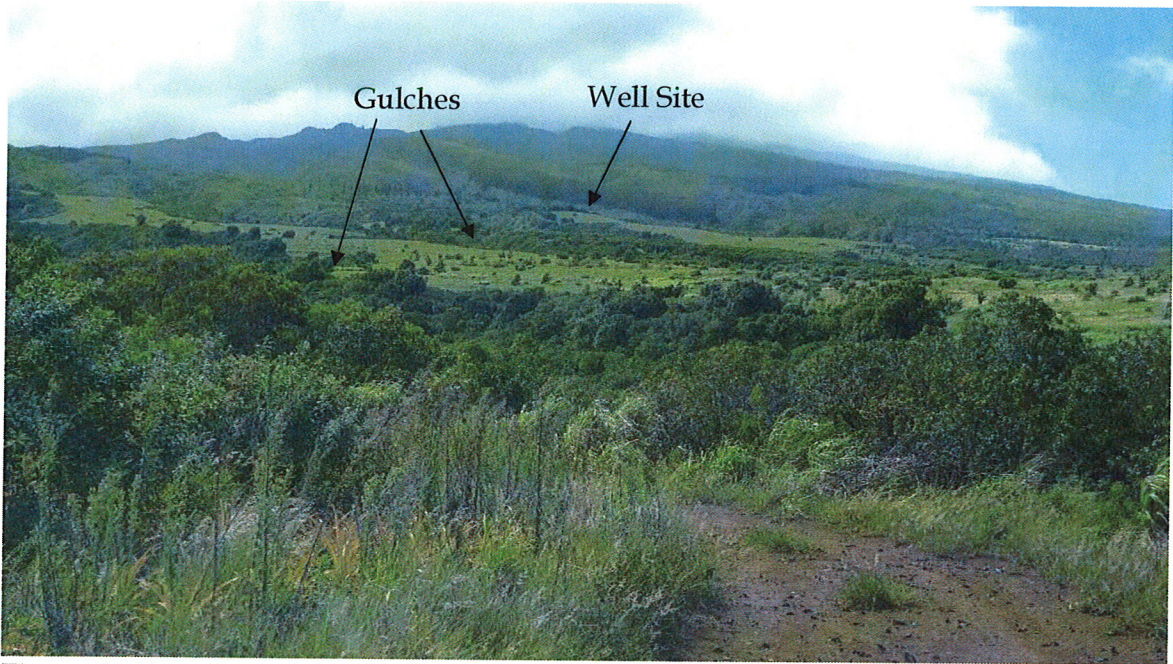


Figure 1: Overview of the Mailepai site from the north, showing the two gulches.

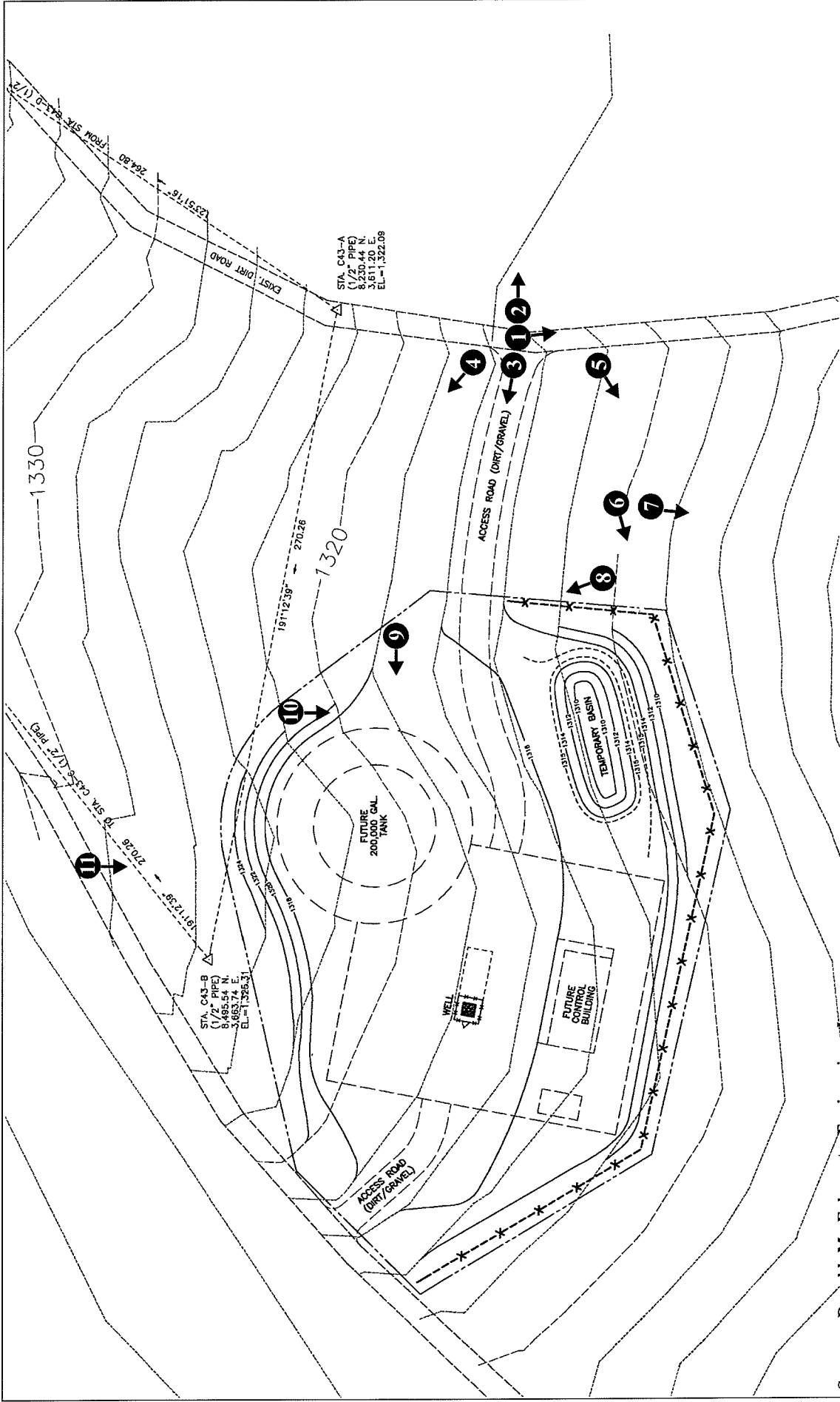


Figure 2: Mailepai site at 1,140 ft., msl



Figure 3: Approximate location of the Kahana Well, about 725 feet downhill from where this photograph was taken.

APPENDIX G.
Photo Reference Map and Photos



Source: Ronald M. Fukumoto Engineering, Inc.

West Maui Exploratory Well No. 2 Site Photographs Reference Map

NOT TO SCALE



Prepared for: County of Maui Department of Water Supply

RFEWMAuiEXPLWell2PhotoReferenceMap



Photo No. 1: The existing dirt road (West View).



Photo No. 2: The existing dirt road (South View).



Photo No. 3: North View toward the proposed access road from the existing dirt road.

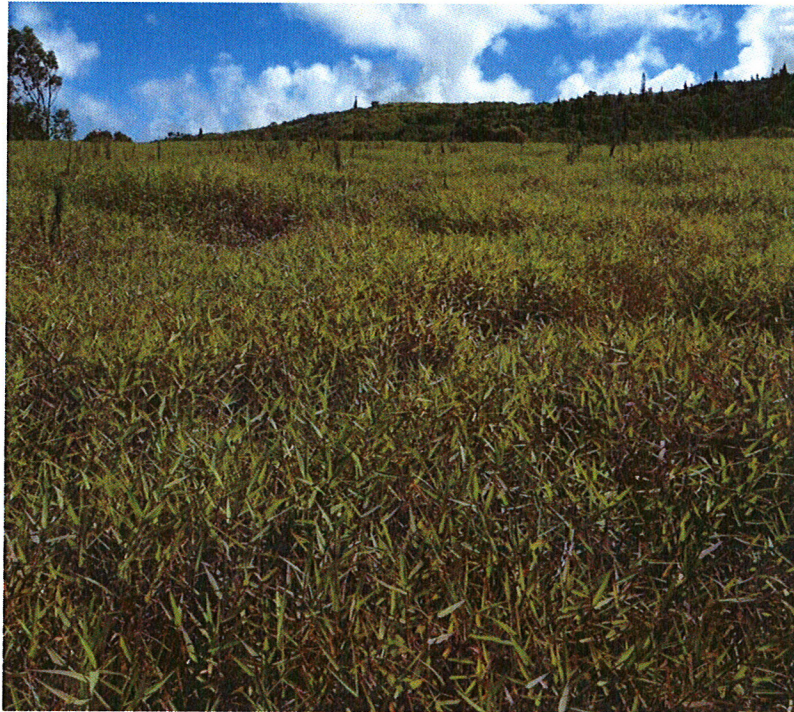


Photo No. 4: Northeast View toward the pineapple fields from the existing dirt road.



Photo No. 5: Northwest View toward the existing pineapple fields from the existing dirt road.

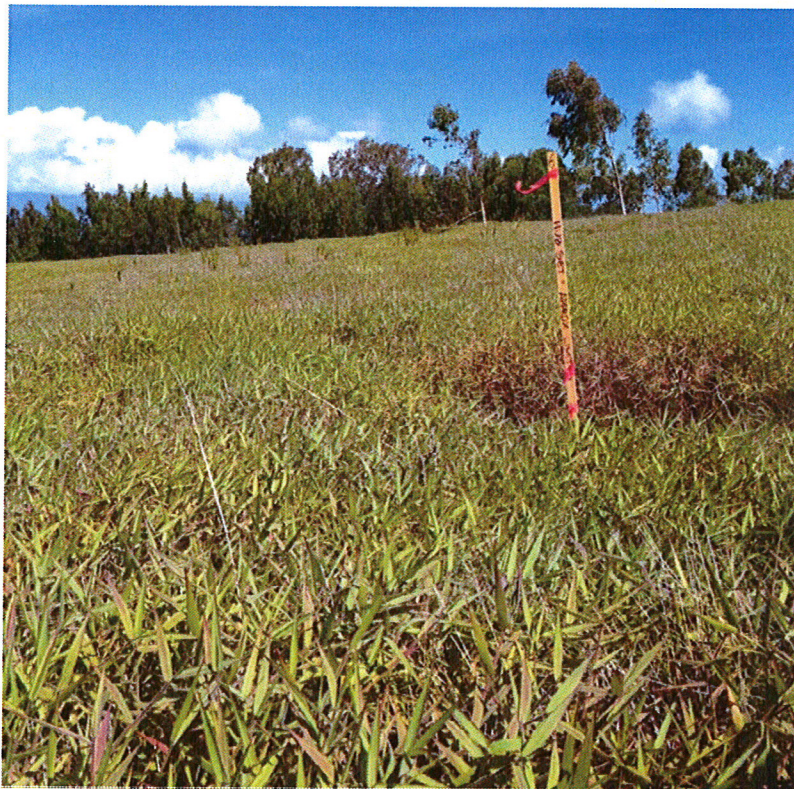


Photo No. 6: Northwest View of proposed project site.



Photo No. 7: The pineapple fields (West View).



Photo No. 8: The pineapple fields (East View).



Photo No. 9: The proposed well site location (North View).



Photo No. 10: The proposed well site location (West View).



Photo No. 11: West View of the proposed project site.