

# **Draft Environmental Impact Statement**

## **PROPOSED WAI ALE WATER TREATMENT FACILITY (TMK No. (2)3-8-046:020 (por.))**

**Prepared for:**

**A&B Properties, Inc.**

**Accepting Authority**

**Department of Water Supply,  
County of Maui**

**March 2009**



**Draft Environmental  
Impact Statement**

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TREATMENT FACILITY  
(TMK No. (2)3-8-046:020 (por.))**

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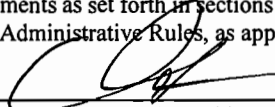
**A&B Properties, Inc.**

**Accepting Authority:**

**Department of Water Supply,  
County of Maui**

**March 2009**

This document was prepared under my supervision and the information submitted, to the best of my knowledge, fully addresses document content requirements as set forth in sections 11-200-17 and 11-200-18 of the Hawai'i Administrative Rules, as appropriate.



Michael T. Munekiyo, A. I. C. P.  
Principal

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**Executive Summary**

**Project Name:** Proposed Wai`ale Water Treatment Facility

**Type of Document:** Draft Environmental Impact Statement

**Legal Authority:** Chapter 343, Hawai`i Revised Statutes

**Agency Determination:** Environmental Impact Statement to be prepared

**Applicable Environmental Assessment review “Trigger”:** Use of County Lands

**Location:** Island of Maui  
Wailuku  
TMK 3-8-046:020 (por.)

**Landowner:** A&B Properties, Inc.  
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Kahului, Hawai`i 96733  
Contact: Diane Bevilacqua  
Phone: (808) 872-4302

**Applicant:** A&B Properties, Inc.  
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**Accepting Authority:** Department of Water Supply  
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**EIS Preparer:** Munekiyo & Hiraga, Inc. (under contract to A&B  
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**Project Summary:**

The applicant proposes the development of a water treatment facility (WTF) adjacent to the Wai`ale Reservoir in Wailuku, Maui. The facility will treat surface water to supply potable water. A total of three (3) filter units are proposed to yield a sustained average production capacity of approximately nine (9) million gallons per day (MGD). The plant's design and layout will provide space for capacity expansion if needed in the future. However, the scope of the proposed action is limited to the use of three (3) filter units only. Treated water is proposed to be conveyed to the nearby, existing 3.0 million gallon Wai`ale Storage Tank owned by the County of Maui. Daily operational access to the WTF will be via a new driveway from the Kuikahi Drive Extension. The water treatment facility and access driveway will be dedicated to the County of Maui upon completion. Emergency access from Waiinu Road is also proposed as part of the overall site plan.

Detailed engineering designs are being undertaken for the proposed action, including designs for piping connections to the County of Maui's Wai`ale Storage Tank, and utility connections to County infrastructure systems. Although the extent and scope of these interface components are currently in the process of being finalized, the impact from that work affecting the storage tank site and the County rights-of-way are included in this environmental disclosure document pursuant to Chapter 343, Hawai`i Revised Statutes (HRS).

The project is anticipated to provide much needed water source capacity for planned projects in Central and South Maui. The proposed project will provide the necessary water supply for these projects.

One unresolved issue regarding project development is the Commission on Water Resource Management (CWRM) review and processing of a petition to amend Interim Instream Flow Standards (IIFS) for the four (4) streams that make up the Na Wai `Eha area on Maui. Included in this review is the Waihe`e Stream, which provides the water source for the proposed project.

The applicant has evaluated among others, the no action alternative, alternative process designs, and alternative site locations. However, these options will not address the need for an additional water source in the needed time frame.



In order to implement the project, the following approvals and permits are anticipated: National Pollutant Discharge Elimination System Permits; Department of Health, Safe Drinking Water Branch, New Source Approval and Construction Plan approval; Department of Health Emergency Planning and Community Right-to-know Act Compliance; CWRM Surface Water Use Permit for Proposed New Use; Air Pollution Control Permit; Noise Permit; Combustible Liquid Storage Tank Permit and Hazardous Material Permit from County of Maui, Department of Fire and Public Safety; Maui County Council approval of water source development agreement; and construction permits.

The project site is situated at a central location in Wailuku, near existing water infrastructure (Wai`ale storage tank and existing transmission lines). The site would be situated in an area near existing urban development and is considered appropriate for the area.

**LIST OF DOCUMENT AUTHORS**

<u>Document</u>	<u>Author</u>
Archaeological Assessment Survey Report:	Xamanek Researches, LLC
Archaeological Monitoring Plan:	Xamanek Researches, LLC
Biological Resources Survey:	Robert W. Hobdy
Cultural Impact Assessment Report:	Xamanek Researches, LLC
Environmental Impact Statement:	Munekiyo & Hiraga, Inc.
Preliminary Drainage Report:	Austin, Tsutsumi & Associates, Inc.

## LIST OF ACRONYMS

ACH	Aluminum Chlorohydrate
AMSL	Above Mean Sea Level
BMP	Best Management Practices
CCT	Chlorine Contact Tank
CFS	Cubic Feet Per Second
CIP	Clean-in-Place
CMU	Concrete Masonry Units
CWRM	Commission on Water Resource Management
DLNR	State Department of Land and Natural Resources
DOH	State Department of Health
DPW	County Department of Public Works
DWS	County Department of Water Supply
EIS	Environmental Impact Statement
EISPN	Environmental Impact Statement Preparation Notice
EPA	Environmental Protection Agency
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
FRP	Fiberglass Reinforced Plastic
GFD	Gallons Per Square Foot per Day
GPAC	General Plan Advisory Committee
GPM	Gallons Per Minute
GRP	Grouted Rubble Pavement
HAR	Hawai`i Administrative Rules
HC&S	Hawaiian Commercial & Sugar Company
HCZMP	Hawai`i Coastal Zone Management Program
HDPE	High-Density Polyethylene
HRS	Hawai`i Revised Statutes
KPA	Kilopascals
LOS	Level of Service
MCC	Maui County Code
MECO	Maui Electric Company
MG	Million Gallon
MGD	Million Gallons Per Day
MG/L	Milligrams Per Liter
MPD	Maui Police Department
NaOH	Sodium Hydroxide
NOM	Natural Organic Matter
NPDES	National Pollutant Discharge Elimination System
OHA	Office of Hawaiian Affairs
PDT	Pressure Decay Test
PPM	Parts Per Million
PSI	Pounds Per Square Inch

PSIG	Pounds Per Square Inch (Gauge)
PVDF	Polyvinylidene Fluoride
PZUE	Puuone Sand
RGB	Rural Growth Boundaries
SCADA	Supervisory Control and Data Acquisition
SF	Square Feet
SHPD	State Historic Preservation Division
SMA	Special Management Area
TMK	Tax Map Key
TMP	Transmembrane Pressure
UGB	Urban Growth Boundaries
VFD	Variable Frequency Drive
WAC	Water Advisory Committee
WTF	Water Treatment Facility
WUDP	Water Use and Development Plan
WWC	Wailuku Water Company

# **I. PROJECT OVERVIEW**

# I. PROJECT OVERVIEW

## A. PROJECT LOCATION, EXISTING USE, AND LAND OWNERSHIP

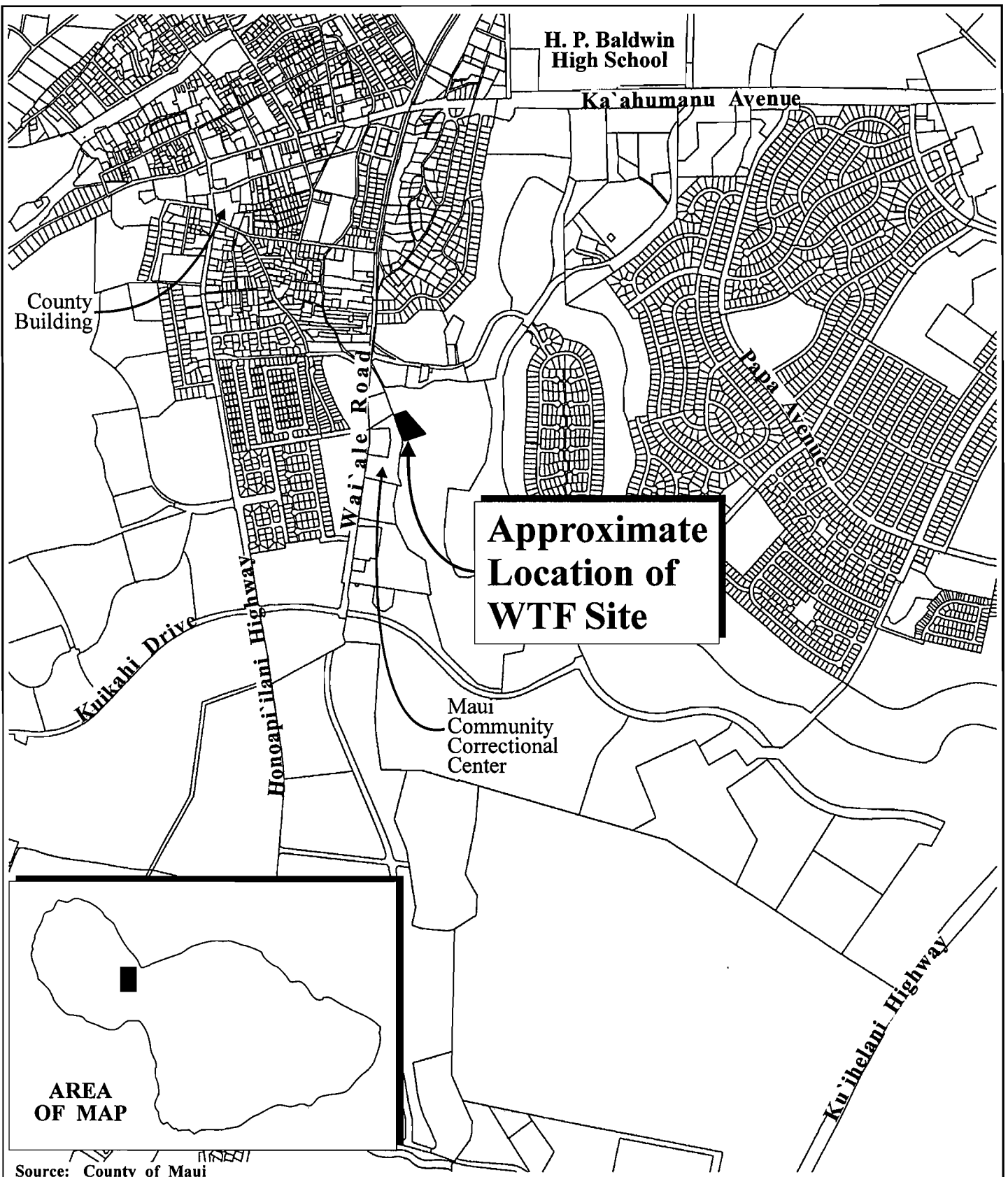
A&B Properties, Inc. (applicant), in collaboration with the County Department of Water Supply (DWS), proposes the development of a new water treatment facility (WTF) on lands adjacent to the Wai`ale Reservoir, in Wailuku, Maui. See **Figure 1**, and **Figure 2**. These lands are identified by Tax Map Key (2)3-8-046:020. The Reservoir occupies approximately 79.93 acres of land, divided into the Upper and Lower Wai`ale Reservoirs. The proposed project would cover an area approximately 3.5 acres in size. The WTF is proposed to be located near the northern property boundary of the Reservoir site, in the vicinity of the Maui Community Correctional Center. The subject property is owned by the applicant. These lands are undeveloped and currently contain flora common to the area such as kiawe trees and scrub brush.

## B. CHAPTER 343, HAWAII REVISED STATUTES APPLICABILITY

Detailed engineering designs are being undertaken for the proposed action, including designs for piping connections to the County of Maui's Wai`ale Storage Tank, and utility connections to County infrastructure systems. Although the extent and scope of these interface components are currently in the process of being finalized, it is assumed that work affecting either the water tank site or the County rights-of-way will require environmental review pursuant to Chapter 343, Hawaii Revised Statutes (HRS).

The County of Maui, Department of Water Supply, as the Chapter 343, HRS accepting entity, has determined that the preparation of an Environmental Impact Statement (EIS) is warranted. The EIS, prepared in accordance with Chapter 200 of Title 11, Department of Health Administrative Rules, Environmental Impact Statement Rules, advances findings and conclusions relative to the significance of the proposed action.

The Environmental Impact Statement Preparation Notice (EISPN) was published in the July 8, 2008 edition of the Office of Environmental Quality Control's Environmental Notice. Comments received in response to the EISPN are included in this document.



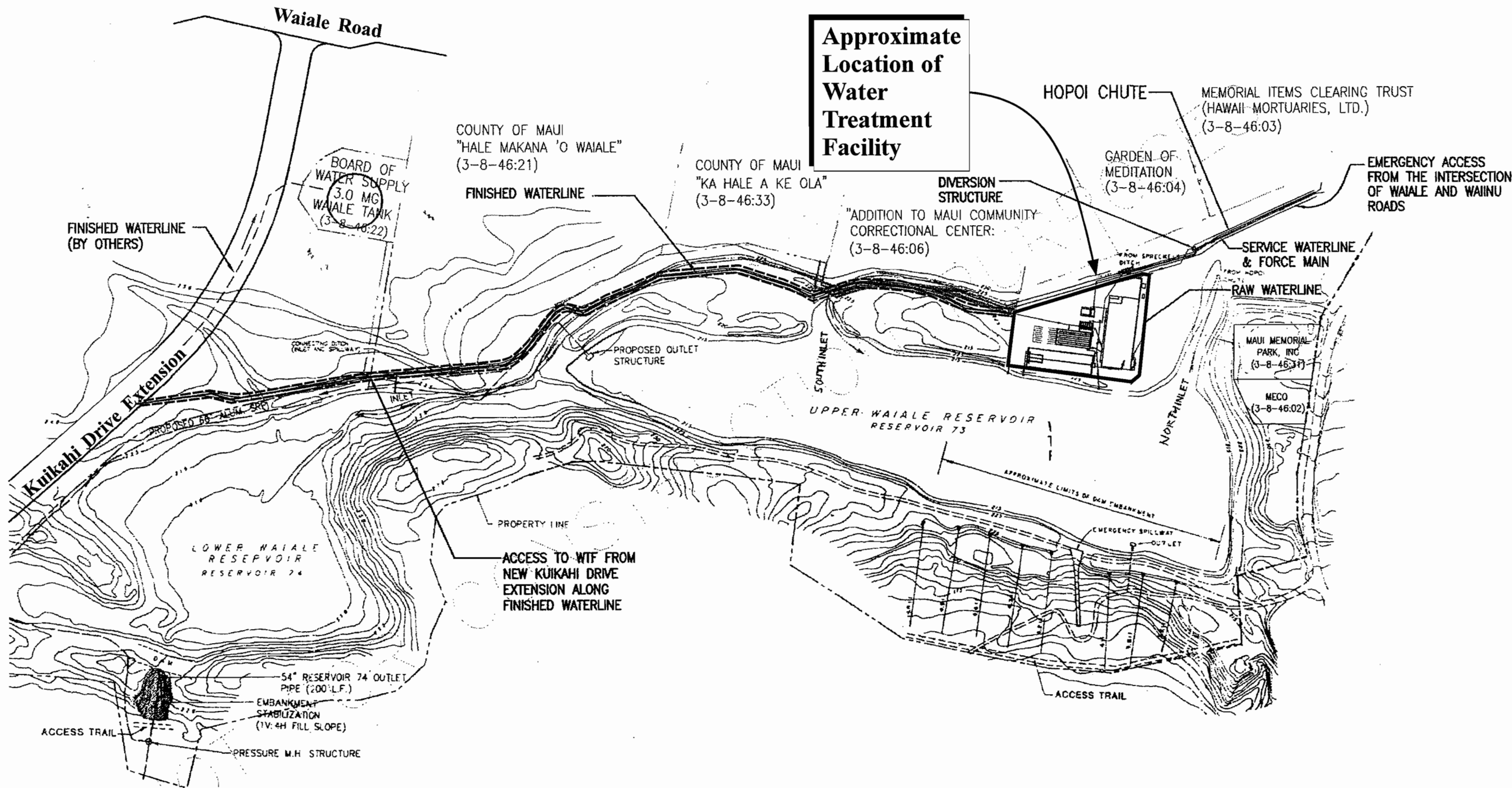
Source: County of Maui

Figure 1

Proposed Wai'ale Water Treatment Facility  
Regional Location Map

NOT TO SCALE





Source: Austin, Tsutsumi & Associates, Inc.

Figure 2

Proposed Wai'ale Water Treatment Facility  
Area Location Plan

NOT TO SCALE



Prepared for: A&B Properties, Inc.





## **C. WATER USE AND DEVELOPMENT CONTEXT FOR CENTRAL MAUI**

The DWS is the principal purveyor of domestic water to Central Maui residents and businesses. The DWS's Central Maui system, serving the Kihei-Makena and Wailuku-Kahului Community Plan regions, as well as Paia, currently consists primarily of groundwater sources, storage tanks, transmission lines, and a network of distribution lines. The DWS is in the process of updating its Water Use and Development Plan (WUDP) which addresses the Central Maui system. The updated WUDP will serve as the long-range planning blueprint for all uses of water for the County of Maui.

The County's strategic objective in meeting water needs for its residents is reflected in its WUDP update process. Specifically, the WUDP will identify resource strategies or options for meeting water source needs. Such options will include short-term resource options that could mitigate immediate capacity reserve shortfalls.

Planning for water use is critical for the island's short-term and long-term social well being and economic viability, as water demands have taxed the current availability of source and attendant delivery infrastructure. The significance of water use and development is reflected in public policy which includes the County's recently adopted Ordinance No. 3502 relating to water availability. This ordinance specifically requires verification of a long-term, reliable supply of water before subdivisions can be approved.

The proposed WTF is a viable component of an integrated approach to the provision of new source both for the short term and long term.

The DWS draft WUDP includes a chapter on "Candidate Strategies for the Central Maui District" (Haiku Design & Analysis, September 2006). Within the chapter, the proposed WTF was reviewed as a candidate strategy to provide for long-term water source for the Central Maui water system. Included in the analysis was a summary of the scope of the project, a financial analysis on the costs associated with the development of the project, as well as a comparison of the WTF project with the baseline water source project, which was identified as Northward Basal Well Development (i.e. the development of new wells within the Waihe'e and Kahakuloa aquifers). Additionally, the analysis also reviewed the option of the Wai'ale WTF as one segment of a combination of water source solutions versus the baseline water source option (i.e. Northward Basal Well Development).

The Candidate Strategies chapter of the draft WUDP noted that the design of the WTF is

ongoing, and is sponsored by the applicant. However, at this point in time, there is no contractual agreement for the development of the WTF between the DWS and the applicant.

The proposed Wai`ale WTF has been selected as one of the final candidates strategies in the WUDP formulation process to provide new water source for the Central Maui system. Variables in the project were noted, including the cost of the raw water, the raw water storage reservoir size and location, as well as partnership on the project between the County of Maui and private developers, and resulting developer source credits. Based on the WUDP's alternatives analysis, the Wai`ale WTF has been determined a final candidate strategy by the DWS to provide future water source for the Central and South Maui areas.

## **D. PROPOSED ACTION**

### **1. Treatment Plant and Source Overview**

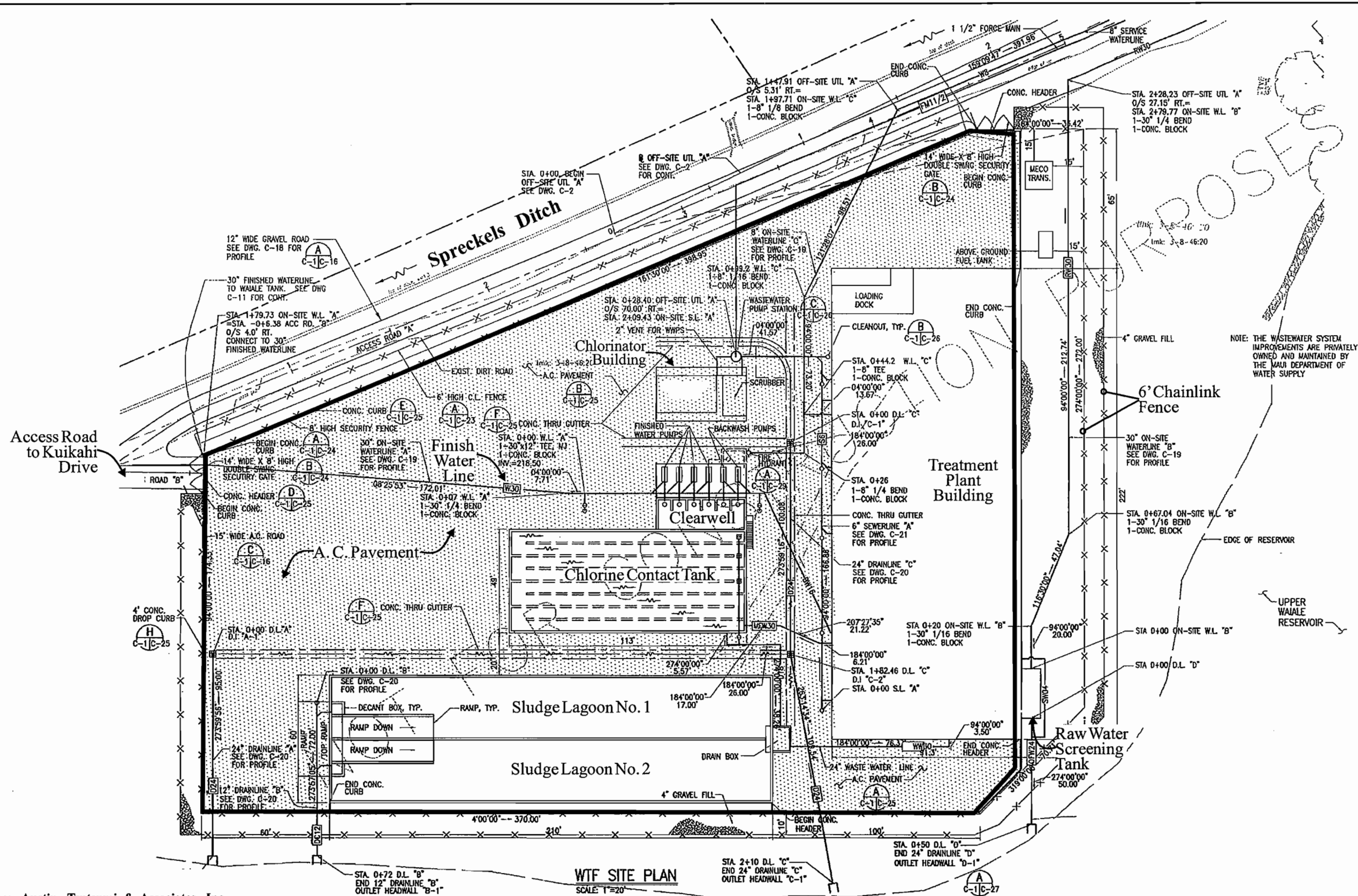
The proposed project is the development of a new Wai`ale WTF that will process surface water into potable water. See **Figure 3**. A total of three (3) filter units are proposed for the Wai`ale WTF. Implementation of the three (3) filter units is anticipated to occur in a single phase, yielding a sustained average production capacity of approximate nine (9) million gallons per day (MGD). The plant's design and layout will provide space for capacity expansion if needed in the future. However, the scope of the proposed action is limited to the use of the three (3) filters only.

All water to be treated at the WTF will be received from the Hopoi Chute, a 36-inch diameter corrugated metal pipe which conveys water from the Waihe`e Ditch. The Hopoi Chute is a component of the West Maui Ditch System which is comprised of irrigation infrastructure utilizing flows from the Waihe`e Stream and other sources<sup>a</sup>. Other system components include reservoirs, intakes, Kuleana ditches, system connectors, and gauging stations. Upstream of Hopoi Chute, the Waihe`e Ditch receives water from Waihe`e Stream and the North Waiehu Stream<sup>b</sup>. The proposed project will not treat any water from the Wai`ale Reservoir or the Spreckels Ditch.

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<sup>a</sup> The West Maui Ditch System utilizes water from Waihe`e Stream, Waiehu Stream (including North and South branches), Iao Stream, and Waikapu Stream. Original ditch components of the system include the Waihe`e Ditch, Spreckels Ditch, Iao Maniania Ditch, Iao Waikapu Ditch, Everett Ditch, and Kama Ditch.

<sup>b</sup> While the original system design provided for a feed from the Iao Maniania Ditch (whose source is the Iao Stream) into the Waihe`e Ditch, this connection is no longer in operation. Thus, there is normally no water from Iao Stream contributing to the Hopoi Chute diversion. Iao Stream water is fed into the Waihe`e Ditch, via the Iao Waikapu Ditch, downstream of Hopoi Chute. Thus, it does not contribute to the Hopoi Chute diversion.



Source: Austin, Tsutsumi & Associates, Inc.

Figure 3

### Proposed Wai'ale Water Treatment Facility Preliminary Site Plan

NOT TO SCALE



Prepared for: A&B Properties, Inc.

MUNEKIYO HIRAGA, INC.

The water source for the Wai`ale WTF will be the Waihe`e Ditch, via the Hopoi Chute. The majority of the water in the Waihe`e Ditch is diverted from the Waihe`e Stream. The United States Geological Service has a gauge installed at the Waihe`e Stream near the existing dam structure. Water flow has been recorded per day, per month, per year since 1983 through 2005. Within the 22 year period, the lowest minimum daily mean flow recorded in Waihe`e River ranges from 31.0 MGD in the month of February to 41.8 MGD in the month of July. See **Appendix "A"**.

The amount of water flowing through the Hopoi Chute is controlled by the operation of the Waihe`e Ditch system. Average daily flow through the Hopoi Chute between January 1994 and December 2003 was 22.02 MGD. Refer to **Appendix "A"**. The ditch system will be operated to provide sufficient water to the WTF from the Hopoi Chute.

The Hopoi Chute conveys water from the Waihe`e Ditch to the Upper Wai`ale Reservoir. A new diversion structure will be constructed upstream of the Hopoi Chute discharge into the Upper Wai`ale Reservoir. A portion of the water from the Hopoi Chute will be diverted to the WTF, with the remaining water entering the Wai`ale Reservoir.

A new screening tank at the WTF will screen-out large debris that may pass through the bar grate on the entrance to the Hopoi Chute. An overflow line from the screening tank will discharge directly into the Upper Wai`ale Reservoir. This overflow concept will allow for continuous diversion of water from the Hopoi Chute to the WTF, with whatever water is not being processed by the WTF will flow into the Upper Wai`ale Reservoir.

Treated water from the WTF is proposed to be conveyed to the nearby 3.0 MG Wai`ale Tank, owned by the County of Maui. A new access driveway into the Wai`ale WTF will be developed to connect to the Kuikahi Drive extension. Additionally, an emergency access will be provided to connect to Wainu Road, near its intersection with Wai`ale Road. Refer to **Figure 2** and **Figure 3**.

## **2. Treatment Process Description**

The Wai`ale WTF will treat surface water from the Waihe`e Ditch, via the Hopoi Chute, using membrane filtration. Descriptions of the treatment process components follow:

a. **Diversion Structure**

A new diversion structure will be constructed to divert a majority of the water from the Hopoi Chute to the WTF. However, a portion of the water in the Hopoi Chute will continue to be discharged to the north inlet of the Wai`ale Reservoir. Approximately 450 feet of 30-inch ductile iron pipe will convey the water from the diversion structure, via gravity, to a raw water screening tank outside the Treatment Plant Building.

b. **Raw Water Screening Tank**

A band screen will be installed in the screening tank to screen-out large debris that may pass through the bar grate on the entrance to the Hopoi Chute. Screened water then flows by gravity into the adjacent raw water wet well located within the Treatment Plant Building. The purpose of the screen is to remove debris that may clog, or damage, the raw water inlet pumps or strainers.

The overflow and washout lines from the Screening Tank will discharge directly into the Upper Wai`ale Reservoir. This overflow concept would allow for continuous diversion of water to the WTF, with the remainder that is not being processed by the WTF being returned to the Upper Wai`ale Reservoir.

c. **Raw Water Pumps**

Two (2) vertical turbine pumps, with a third on standby, will pump the raw water from the wet well into the flocculation tanks. Each pump will have variable frequency drive (VFD) that will allow the WTF to operate during low and high demand periods.

d. **Strainers**

Two (2) low-differential pressure, automatic backwashing strainers (one acting as a standby), will remove unwanted solid material from the raw water that passes through the bandscreen. The purpose of the strainers is to remove particles that may damage the membranes. The strainer backwash water, which is void of any chemical additives, will connect to the overflow from the Raw Water Screening Tank for conveyance to the Upper Wai`ale

Reservoir.

e. **Raw Water Venturi Flow Meter**

A venturi flow meter will be utilized to determine the raw water flow rate and total flow.

f. **Static Mixer**

After the flow meter, a static mixer will be utilized to mix aluminum chlorohydrate (ACH) that will be injected into the raw water, prior to entering the flocculation tanks. The coagulated raw water, after injection of the ACH, will be analyzed by a streaming current monitor for optimization of ACH dosing. The need for chemical addition and flocculation is predicated on monitoring and testing of the raw water quality, via a program that will be implemented throughout the operation of the WTF.

g. **Flocculation Tanks**

After the raw water passes through the static mixer, the coagulated water enters the flocculation tanks via an inlet channel. Slide gates will control the flow into the flocculation tanks. Six (6) flocculation tanks, two (2) in series for each membrane tank, will be utilized to generate floc that are big enough to be removed by the membranes. Flocculation is necessary for removal of natural organic matter (NOM) present in the raw water that is smaller than the pore size of the membranes. The flocculation process enables coagulation of the NOM to allow their removal by the membranes. The hydraulic retention time within each flocculation tank will be approximately six (6) minutes.

The flocculation tanks will be 11 feet x 11 feet and will have a water depth of approximately 15.5 feet. The flocculation tanks will have fiberglass reinforced plastic (FRP) grated covers on which the operators can walk. A turbine agitator, constant speed mixer will be provided for gentle mixing of the floc. The motor will be mounted just above the FRP grating, and the shaft will extend into the flocculation tank, with the impeller positioned approximately six (6) feet above the tank floor.

A 2-foot wide by 2-foot high opening between the two (2) tanks in series will

allow the water to pass from the first tank into the second tank. An 18-inch square by 18-inch deep sump will be located in each of the first flocculation tanks. A portable pump can be placed in the sump for draining of the two (2) flocculation tanks in series for cleaning or repair.

In the event that there is a failure, and the raw water pumps continue to operate when the membrane units are not in operation, a 30-inch overflow pipe will convey the overflow from the flocculation tanks to the sludge lagoons.

#### **h. Filtration Unit**

##### **(1) General Description**

The WTF will utilize a Siemens Memcor CMF-S submerged, vacuum-type microfiltration system with polyvinylidene fluoride (PVDF) membranes that are resistant to chlorine. This membrane system is designed to produce water that meets or exceeds all water quality requirements of the DOH and the Environmental Protection Agency (EPA).

##### **(2) CMF-S Cell Components**

The main components of the CMF-S cell are the membrane sub-modules. For the Wai'ale WTF, S10V modules will be used. The membrane sub-modules are grouped by four (4) in a sub-manifold arrangement called a "clover". The sub-manifolds are connected to a filtrate header on a rack. The rack is made of stainless steel 316L and provides all necessary connections (filtrate, air, etc.). Each rack contains nine (9) sub-manifolds, corresponding to a total of 36 sub-modules in each rack.

Each sub-module forms a serviceable filter element that can be removed from the rack for inspection, repair, or replacement. The sub-modules contain a number of hollow fibers with an outside diameter of 800  $\mu\text{m}$ , surrounded by a protective screen and sealed at both ends with polyurethane. Water flows from the outside to the inside of the fibers, and the filtrate is collected at the top of the

module where it flows through the rack header to the filtrate pump. At the bottom of the module, the potting material is perforated to allow low-pressure air to pass through the module, distributing an air scour to the fiber bundle during backwash.

A clover isolation valve is located above each sub-manifold and can be used to shut-off the connection between the filtrate side of each of these four modules and the filtrate pump.

The rack assemblies are manifolded together via a cell filtrate header and an air header to form a filter cell. For the Wai`ale WTF, each cell will have room for 14 racks with 36 modules on each rack. The racks are populated with modules, for a total of 504 modules (14 populated racks x 36 modules per rack). The filter cells will be within stainless steel tanks that are 16 ft. - 2 <sup>11</sup>/<sub>16</sub> inches long by 13 ft. - 5 <sup>5</sup>/<sub>8</sub> inches wide by 11 ft. - 2 inches tall. The water level in the tanks will be 8 ft. - 2 inches deep.

(3) **Flux**

Flux is a measure of the rate at which the treated water passes through the membrane per unit of outside surface area of membrane. For the Wai`ale WTF, the design flux rate per module will be 40 gallons per square foot per day (gfd). The maximum flux rate of 60 gfd, has been approved by DOH. The average area per module is approximately 272 square feet (sf). A summary of the membrane units is shown in **Table 1.**



**Table 1.** Summary of Membrane Units

<b>Description</b>	<b>Number</b>
No. of cells (membrane units)	3
No. of racks per cell	14
No. of clovers per rack	9
No. of modules per clover	4
No. of modules per cell	504
Design flux rate	40 gfd
Maximum flux rate	60 gfd
Average area per module	272 sf
Average flow per cell*	4 to 5 MGD
* Flow takes into account loss of production due to backwashing, cleaning, etc.	

(4) **Filtration**

During filtration, the filtrate pump maintains the filtration flow regardless of the state of fouling of the modules, up to a transmembrane pressure of 85 kPa. The water level in the cell is maintained by the feed flow control valve that modulates to maintain a constant operating level above the modules.

Vacuum refers to the transmembrane pressure (TMP) required to pull clean water through the membrane. Since the membrane system is designed to maintain a constant flux, the transmembrane pressure increases as the membranes become fouled. The theoretical maximum TMP achievable is complete vacuum, or -14.7 psi. The filtrate pumps are sized to produce a range of TMPs from -2 to -12.3 psi, with a typical operating TMP of -1 to -8 psi. A cleaning is typically required once the TMP reaches -10 psi.

(5) **Backwash**

Over time, particles rejected by the filtering action of the membranes build up on the outside of each fiber. As a result, the resistance to flow increases until a backwash is performed. The backwash sequence removes the build-up of solids and restores the resistance to filtration flow. A backwash can either be initiated after a pre-set period of time or when the resistance to flow reaches a pre-determined set point.

The backwash is usually less than three (3) minutes in duration and involves the following: (a) the water level is lowered in the cell by shutting off the feed valve while maintaining filtration until the water level in the cell reaches the backwash level, (b) liquid backwash water (from the chlorine contact tank via the backwash pumps) is pumped into the modules, flowing from the inside to the outside of membrane fibers, (c) reverse filtration is combined with air scour to loosen accumulated solids, and (d) the cell is completely drained to remove the wastewater and solids from the modules.

(6) **Maintenance Wash**

The maintenance wash procedure is used to extend the time between Clean-in-Place (CIP) chemical cleans. (See the following section for discussion on CIP cleans.) The typical frequency is between two (2) times per day to once a week, depending on plant demand.

The maintenance wash sequence is a short-cycle chemical membrane clean, which uses a chlorine solution and citric acid or sulfuric acid. The operators intend to perform two (2) maintenance washes per day per unit. One (1) wash would use chlorine, and the other wash would most likely use sulfuric acid, which is less expensive and requires fewer chemicals than washing with citric acid. Maintenance washes occur automatically and do not require operator attention or presence onsite.

The maintenance wash sequence involves the following steps:

### **Step 1 - Backwash.**

The cell is backwashed to remove excess solids and maximize chemical efficiency, and then drained to waste.

### **Step 2 - Chemical Solution Fill.**

The cell is filled with finished water from the chlorine contact tank, via the backwash pumps. The cell is filled until the water level in the cell reaches the backwash level (i.e., the top of the modules to minimize chemical waste.)

### **Step 3 - Recirculation and Chemical Dosing.**

The CIP pump starts to recirculate the water to the cell in a closed loop. The cell is fully isolated from the rest of the system by an air gap on the filtrate and CIP manifold sides. The dosing of the cleaning chemical starts at the beginning of the recirculation process.

### **Step 4 - Soak/Aeration and Recirculation.**

The modules are left to soak for a preset time. The soak and recirculation phases alternate automatically. The number of soak and recirculation sequences is operator adjustable through the Supervisory Control and Data Acquisition (SCADA) system.

### **Step 5 - Maintenance Wash Solution Draindown.**

The cleaning solution is drained away from the cell to the CIP Neutralization Tank.

### **Step 6 - Rinse Backwash.**

The cell is refilled with feed water and backwashed to remove residual chemicals. All rinse water is directed to the CIP Neutralization Tank. On completion of the rinse step, the cell returns to standby or filtration mode.

The complete maintenance wash sequence usually takes 30 minutes for completion. However, shorter or longer maintenance wash sequences can be enabled if deemed necessary.

i. **Clean-In-Place (CIP) Chemical Clean**

The CIP sequence is used to maintain long-term membrane performance. The CIP sequence is usually initiated based on time, but can also be based on transmembrane pressure, resistance, or the volume being filtered by the membranes. The CIP sequence is similar to the maintenance wash, but with longer recirculation and soak sequences, and utilization of filtered water heated to a set temperature. In addition, the CIP sequence includes two (2) sequential chemical cleanings. The first clean would be with citric acid and sulfuric acid together, and the second clean would be with chlorine. The steps in the cleaning process are as follows:

**Step 1 - Backwash.**

The cell is backwashed to remove excess solids and maximize chemical efficiency, and then drained to waste.

**Step 2 - Chemical Solution Fill.**

Filtrate is routed to the CIP Hot Water Tank where it is heated to 35 degrees Celsius with an in-tank heater. The cell is then filled with water from the CIP Hot Water Tank until the water level in the cell reaches the backwash level.

**Step 3 - Recirculation and Chemical Dosing.**

The CIP pump starts to recirculate the water to the cell in a closed loop. The cell is fully isolated from the rest of the system by an air gap on the filtrate and CIP manifold sides. Citric acid and sulfuric acid (first clean) or chlorine (second clean) is added in the recirculation loop to reach the appropriate concentration, which generally takes less than 30 minutes.

**Step 4 - Soak/Aeration and Recirculation.**

The modules are left to soak for a preset time. The soak and recirculation phases alternate automatically. Aeration can be used to improve cleaning efficiency after a period of high turbidity. The number of soak and recirculation sequences is operator adjustable through the SCADA system.

**Step 5 - CIP Solution Draindown.**

The cleaning solution is drained away from the cell to the CIP Neutralization Tank.

### **Step 6 - Rinse Backwash.**

The cell is refilled with feed water and backwashed to remove residual chemicals. All rinse water is directed to the CIP Neutralization Tank. On completion of the rinse step, the cell returns to standby or filtration mode.

The second cleaning regime uses chlorine containing typically 200 to 500 parts per million (ppm) of free chlorine. For chlorine cleans, the sequence is similar to that of the maintenance wash, but with a longer duration of approximately two (2) hours. The entire CIP cleaning process, using both citric/sulfuric acid and chlorine, takes approximately eight (8) hours.

#### **j. Pressure Decay Test (PDT)**

The PDT is used to confirm the integrity of the membrane fibers. The test includes filtering to the backwash level (top of the modules), pressurizing the inside of the module fibers and header with air at 15 psig, isolating the cell from the air supply and monitoring the pressure decay over a period of time (typically 2 to 3 minutes.) The PDT results are logged on SCADA and displayed for each cell. The test confirms integrity of the membranes when the rate of pressure decay is 4.3 psi/min at the initial TMP, and 1 psi/min at the terminal TMP. Each cell is tested at regular time intervals, usually every 24 hours, adjustable by the operator.

#### **k. Air Leak Test**

If the PDT returns an alarm, the Air Leak Test is used to assist in determining in which cell the integrity loss has occurred. The operator will then initiate the Air Leak Test on the cell and look for a stream of air bubbles to identify the source of the leak. The air bubbles can come from either a group of modules (clover) or from a rack connection or any other connection located under the water level.

Standing on the platform, the faulty group of sub-modules can easily be isolated using a specially designed tool. The isolation does not require the cell to be drained or shutdown or the rack to be lifted out of the cell. The interruption of the stream of bubbles confirms that the leak has been properly located and isolated.

**l. Filtrate Pumps**

The membrane filtration system operates under a low-pressure vacuum that is induced within the hollow fiber membranes by a connection to the inlet (suction) side of a centrifugal filtrate pump. The range of pressure applied to the membranes is between -2 and -12.3 psi. The treated water (filtrate) is drawn through the membranes by vacuum, enters the hollow fibers and is pumped outside to the Chlorine Contact Tank (CCT) by the filtrate pumps. Each membrane tank will have its own filtrate pump. The filtered water will be injected with chlorine and, if necessary, soda ash for disinfection and pH adjustment prior to entering the CCT.

The filtrate flow is measured by magnetic flow meters installed in the discharge line of the filtrate pumps. The flow of treated water is regulated according to the water levels in the membrane tanks and the CCT. The pumpage rate of the filtrate pumps is automatically controlled by means of the VFDs for each pump.

In the event that there is a failure in the system and the filtrate pumps are not able to keep up with the supply of raw water, the water will back up into the flocculation tanks, then overflow the tanks through the flocculation tank overflow line, and discharge to the sludge lagoons.

**m. Chemical System**

**(1) Aluminum Chlorohydrate (ACH)**

ACH will be utilized for coagulation/flocculation to generate floc that are big enough to be removed by the membranes. Flocculation is necessary for removal of NOM present in the raw water that is smaller than the pore size of the membranes. The ACH will be injected into the raw water prior to the static mixer at a dosage rate of 10 mg/l. However, upon operational experience, this dosage may be reduced – or even totally eliminated – if it is determined that flocculation is not necessary, due to low amounts of NOM in the raw water.

A package duplex metering pump assembly (with one (1) pump on

standby) will be used to pump the ACH to the injection port on the raw water line. The ACH will be stored in the Water Treatment Building in 375-gallon totes on spill containment pallets.

(2) **Soda Ash**

Soda ash may be used for two (2) purposes: (1) to adjust the pH of the filtered water prior to the CCT to help achieve the necessary chlorine contact time, and (2) to adjust the pH (alkalinity) of the finished water after the CCT for corrosion control, if necessary. For the first purpose, the soda ash will be injected into the combined filtrate line within the Treatment Plant Building. For the second purpose, the soda ash will be injected after the CCT into the discharge line from the finished water pumps. The dosage for the soda ash will vary depending on the usage and conditions, but is expected to be in the range of 15 mg/l. The pH of the combined filtrate and finished water will be measured after the soda ash injection points for monitoring and control purposes.

Two (2) soda ash mixing tanks, used for mixing the dry soda ash with water, will be located in the Soda Ash Room in the Treatment Plant Building. A package duplex metering pump assembly, mounted on the side of the soda ash mixing tanks, will be used to pump the soda ash to the filtered water injection port.

The soda ash will be stored in bags on pallets in the Soda Ash Room. A diesel-powered forklift will be utilized for loading and unloading of the soda ash pallets. A dust collector will be installed for collection of dust from the bag loaders.

(3) **Chlorine Gas**

Chlorine gas will be injected into water to make a chlorine solution that will be used for three purposes: (1) disinfection of the filtrate, (2) maintenance washes of the membrane units, and (3) CIP cleans of the membrane units. The gas will be stored in ton containers and 150-pound cylinders in the Chlorinator Building. The ton containers will

be used for disinfection, and the cylinders will be used for the maintenance washes and CIP cleans. A chlorine scrubber will be located next to the Chlorinator Building for “scrubbing” the air in the event of a chlorine gas leak.

Chlorinators will be used to control the injection of the chlorine gas into the water lines. The chlorinators will be housed in the Chlorinator Building, in a separate room from the gas containers.

For disinfection of the filtrate, a targeted finished water chlorine residual (i.e., after the CCT) will be 1.0 mg/l, in order to maintain a minimum chlorine residual concentration of 0.2 mg/l in the water throughout the distribution system.

The injection port for the maintenance cleans and CIP cleans will be on the CIP pump discharge line. The concentration of the chlorine for the maintenance washes and CIP cleans will be 100 mg/l and 500 mg/l, respectively.

(4) **Sodium Bisulfite**

Sodium bisulfite will be used to de-chlorinate the chlorinated water used for maintenance washes and CIP cleans. The sodium bisulfite will be stored in a 120-gallon container on a spill containment pallet in the Filter Unit Area near the CIP tanks. A single, panel-mounted, air diaphragm pump will be used to convey the sodium bisulfite to an injection port on the neutralization pump discharge line.

Approximately 1.3 gallons of sodium bisulfite will be used for each filter unit for maintenance wash neutralization. Approximately 6.4 gallons will be used for each filter unit for the CIP process neutralization.

(5) **Citric Acid**

Citric acid will be used for cleaning the membranes during the CIP process. Dry bags of citric will be stored in the Filter Unit Area near



the CIP tanks. The dry citric will be mixed with water in a 120-gallon tank, and a single, panel-mounted, air diaphragm pump will convey the citric acid to an injection port on the CIP pump discharge line. Approximately 72 gallons of citric per filter unit will be used for the CIP process. The tanks will be located on a spill containment pallet.

(6) **Sulfuric Acid**

Sulfuric acid will be used for cleaning the membranes during maintenance washes, and will be used with citric acid during the CIP process. Approximately 1.2 gallons and 0.6 gallons of sulfuric acid will be used for each filter unit during maintenance washes and the CIP process, respectively. The sulfuric acid will be stored in a 120-gallon tank on a spill containment pallet in the Filter Unit Area of the Treatment Plant Building, and a single, wall-mounted, metering pump will convey the sulfuric acid to an injection port on the CIP pump discharge line.

(7) **Sodium Hydroxide (NaOH)**

NaOH will be used to neutralize the citric and sulfuric acids. A single, panel-mounted, air diaphragm pump, located near the CIP tanks in the Filter Unit Area of the Treatment Plant Building, will be used to pump the NaOH to the injection port on the CIP neutralization pipe. The NaOH will be stored in two 120-gallon tanks on spill containment pallets. Approximately 2.4 gallons and 49 gallons of sodium hydroxide will be used for each filter unit during maintenance washes and the CIP process, respectively.

n. **Chlorine Contact Tank (CCT)**

Disinfection of the filtered water will take place in a covered rectangular chlorine contact tank with baffles to optimize the chlorine contact time. The CCT will be located outside the Treatment Plant Building, and will be constructed of concrete, with a concrete roof. The CCT will be sized to ensure adequate disinfection of the finished water. The CCT is designed to allow for the two (2) halves of the tank to be isolated from each other so that one half (½) can be cleaned while the other half is used for

disinfection.

**o. Finished Water Pumps**

The disinfected water from the CCT flows into the Finished Water Pump Wet Well from which the water will be pumped with four (4) finished water pumps (one (1) pump on standby) through approximately 4,000 feet of 30-inch ductile iron transmission main to the new Kuikahi Drive Extension. The 30-inch finished waterline will connect to the new 16-inch ductile iron transmission from the new Maui Lani Wells that has recently been installed. A new 24-inch ductile iron transmission main will then convey the combined WTF water and Maui Lani well water to DWS's existing 3.0 million gallon (MG) Wai`ale Tank. The water will enter through the side of the tank near the top via two new 16-inch inlet pipes.

Two (2) pumps will be constant speed, each with an approximate capacity of five (5) million gallons per day (MGD), and two (2) pumps will have VFDs, each with a capacity of approximately seven (7) MGD. The combination of constant speed and VFD pumps will allow for variations in system demand while maintaining optimum efficiency.

The finished water pumps will be located on a concrete pad adjacent to the CCT, with a roof to protect the pumps from the elements.

A 16-inch line, with a pressure reducing valve, will tap off of the finished water line to supply backwash water for the membrane units.

**p. Backwash Pumps**

Two (2) backwash pumps (one on standby), each with a capacity of approximately 4,000 gpm at 40 feet of head, will pump disinfected water to the membrane units for backwashing. The backwash pumps will be located adjacent to the finished water pumps.

**q. Treatment Plant Building**

The Treatment Plant Building will be a 222-foot long x 90-foot wide x 20-foot high pre-engineered rigid-frame structure with metal siding. The

Treatment Plant Building will be divided into two main areas – the Filter Unit area and the Auxiliary Rooms area. The Filter Unit area will house the raw water wet well and pumps, flocculation tanks, membrane units, filtrate pumps, and CIP system (including tanks, pumps and chemicals). The Filter Unit area will have natural ventilation through louvers and a ridge vent.

The Auxiliary Rooms area will include the following spaces: (1) office/laboratory; (2) lunchroom; (3) restroom; (4) maintenance room; (5) soda ash room; (6) air blower room; (7) electrical room; and (8) generator room.

The office/laboratory, lunchroom, maintenance room, restroom, and the electrical room will be air-conditioned. The remaining rooms of the Auxiliary Rooms area will have natural ventilation through louvers. The rooms will be constructed of concrete masonry units (CMU) with gypsum board ceilings, with the exception of the generator room and air blower room, which will have concrete roofs for sound attenuation.

A loading dock with ramp that will be located outside of the soda ash room will be utilized for delivery of the soda ash palettes.

r. **Chlorinator Building**

A 28 feet x 17 feet x 14 feet high CMU Chlorinator Building will house the gas chlorination system. A chlorine scrubber, which would be activated in the event of a chlorine gas leak, will be installed just outside of the Chlorine Storage Room on a concrete slab with double containment wall. Chlorine gas will be used for disinfection of the filtered water and for cleaning of the membrane units during maintenance washes and CIP cleans. A monorail will be installed for loading and unloading of the chlorine ton containers. A sprinkler system will provide fire protection within the building.

s. **Sludge Lagoons**

Dual sludge lagoons, 30 feet wide x 210 feet long and with a water depth of 5 feet, will be utilized for gravity solids-liquid separation of backwash water from the membrane units. The overflow and drain waters from raw water screening tank, raw water wet well, flocculation tanks, CCT, and Finished

Water Pump Wet Well will also be conveyed to the lagoons.

Each sludge lagoon will have an approximate capacity of 250,000 gallons. Sludge from the lagoons will be processed by shutting down one (1) cell of the lagoon to allow for gravity settlement of the solids. The decanted liquid will discharge into the Upper Wai`ale Reservoir, and the sludge would then be allowed to dry via percolation through the dirt bottom of the cell, and through evaporation. When the sludge dries to a solids content of approximately 35 percent, the dried sludge will be removed with machinery from the cell, and transported for offsite disposal at the County of Maui landfill. The expected quantity of dried solids is estimated to be approximately 15,000 gallons, or 2,000 cubic feet per cell per cleaning. The frequency of cleaning will vary, based on the production rate of the WTF and the raw water quality.

t. **Wastewater System**

Wastewater generated from the restroom, lunchroom and office/laboratory, and water from floor drains throughout the Treatment Plant Building and Chlorinator Building, will flow by gravity to a package grinder pump station. The wastewater will then be pumped to the County's wastewater system in Wai`ale Road via a 1 ½ inches high-density polyethylene (HDPE) force main. As currently designed, the force main will run parallel to Spreckels Ditch.

u. **Service Waterline**

An 8-inch service waterline will tap into DWS's 12-inch main in Wai`ale Road and run parallel to Spreckels Ditch to provide service water to the WTF. The service line will provide source water for the WTF plumbing fixtures, washdown facilities, etc. The service line will also provide for fire protection for the WTF via the onsite fire hydrant and sprinkler system within the Chlorinator Building.

**E. PROJECT PURPOSE AND NEED**

Water source development is a key element in sustaining the economic and social well-being of the Island of Maui. Availability of production capacity in the Central Maui service area is particularly significant in the context of historical potable water consumption data which shows

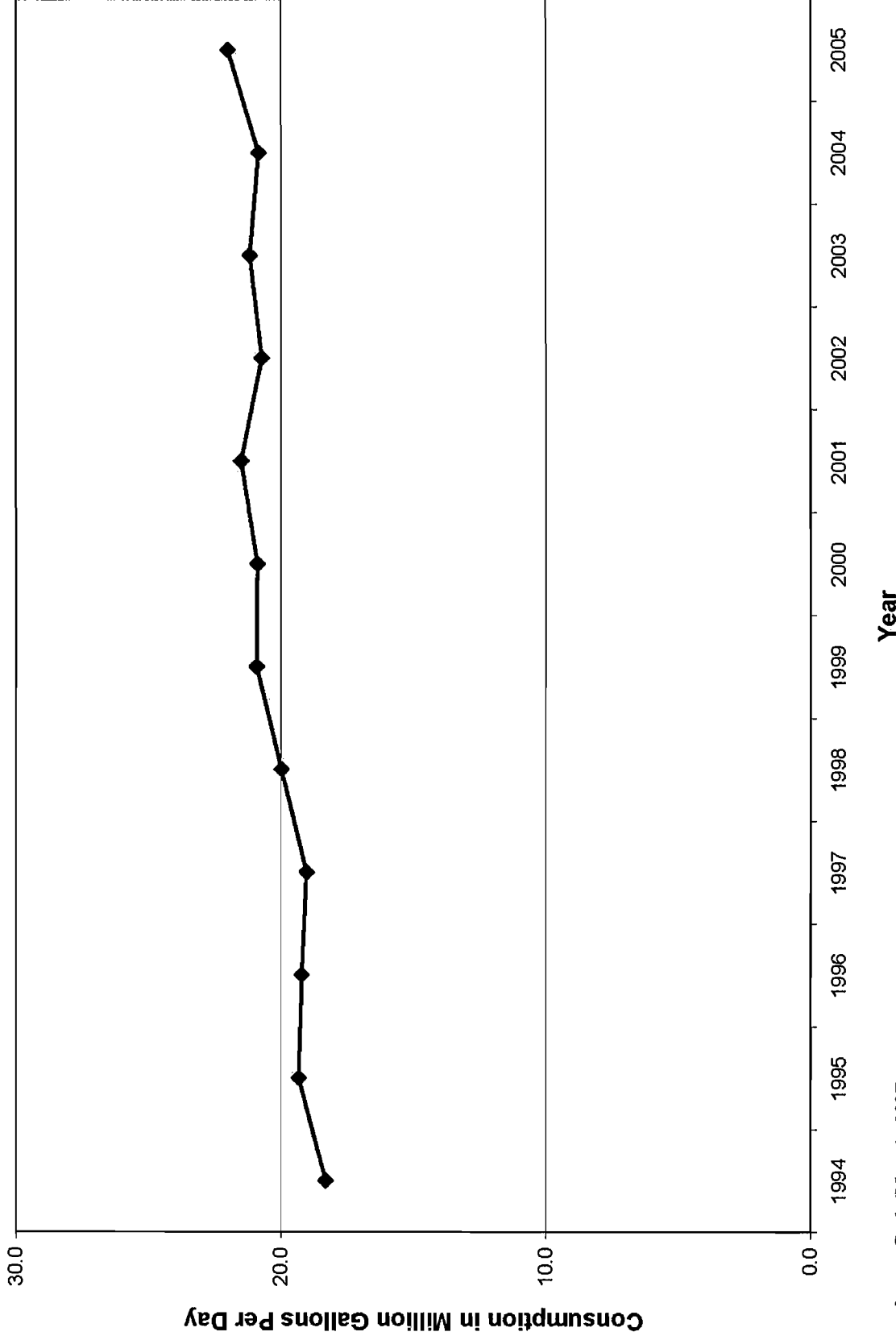
a steady pattern of increasing demand for water (Freedman, 2007). See **Figure 4**. Between 1994 and 2005, the Central Maui system's potable water demand increased by approximately 20 percent, from 18.3 MGD to 22.0 MGD.

According to water demand projection analyses prepared for the DWS, water consumption over the next several years will continue to hold the pattern of increasing use (Freedman, 2007). The DWS projections covered a range of possible demand outcomes over time, including three (3) projection scenarios utilizing the County of Maui's socio-economic forecast prepared for the General Plan Update process. According to the DWS projections for the Central Maui service area, water demand in the year 2030 under the three (3) scenarios would range between 29.5 MGD and 46.5 MGD. The projected demand for the base case or mid-projection estimate in the year 2030 is 34.1 MGD. See **Figure 5**. In the near-term projection year of 2015, the estimated water consumption demand would range between 23.8 MGD and 29.2 MGD. The projected demand for the base case or mid-projection estimate for the year 2015 is 25.5 MGD.

When comparing the 2005 historical Central Maui service area demand of 22.0 MGD against the base case or mid-projection demand for 2015 of 25.5 MGD, the additional water requirement is approximately 3.5 MGD, or a 16 percent increase. Similarly, the additional water requirement using the base case projection for the year 2020 is 28.2 MGD, or a 28 percent increase over the 2005 historical demand figure.

There is a current need for new sources of water. Current source availability is limited, as evidenced by the recent adoption of Ordinance 3502 relating to Water Availability which requires verification of a long-term reliable supply of water before subdivision approval can be granted.

In the context of existing supply and public policy considerations, and future water demand requirements, the development of new sources is deemed necessary for the continued economic and social well-being of the County. With this background, the applicant has coordinated with the DWS to develop the proposed WTF as an appropriate new source for the County's public water system.

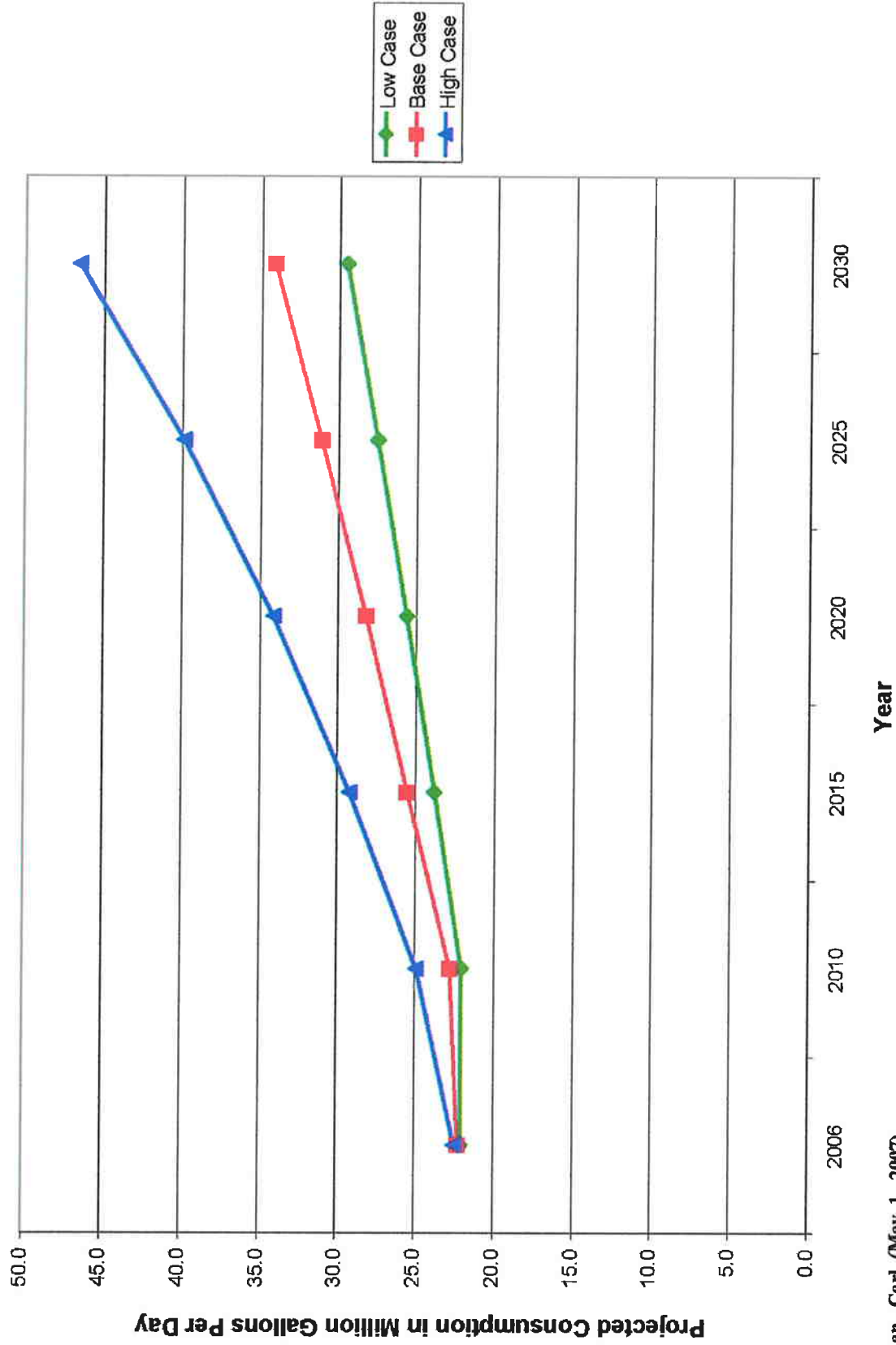


Source: Freedman, Carl (May 1, 2007)

**Figure 4 Proposed Wai`ale Water Treatment Facility**  
 Historical Potable Water Metered Consumption for  
 Central Maui Service Area

Prepared for: A&B Properties, Inc.





Source: Freedman, Carl (May 1, 2007)

**Figure 5 Proposed Wai`ale Water Treatment Facility  
Composite Water Consumption Projections for  
Central Maui Service Area**

Prepared for: A&B Properties, Inc.

**F. PROJECT SCHEDULE AND COST**

The construction of the proposed WTF will commence upon receipt of all regulatory permits and approvals. Construction of the WTF is anticipated to take approximately 15 months. The target year to have the WTF operational is 2011. A 2008 estimated cost for the construction of the WTF is approximately \$30 million.



**II. DESCRIPTION OF  
EXISTING CONDITIONS,  
POTENTIAL IMPACTS,  
AND PROPOSED  
MITIGATION MEASURES**

## **II. DESCRIPTION OF EXISTING CONDITIONS, POTENTIAL IMPACTS, AND PROPOSED MITIGATION MEASURES**

### **A. PHYSICAL ENVIRONMENT**

#### **1. Surrounding Land Use**

##### **a. Existing Conditions**

The project area is located in the Wailuku-Kahului area. Wailuku is the seat of government within the County. Wailuku, located on the foothills of the West Maui Mountains, encompasses a diverse range of commercial, light industrial, and public uses, as well as older established and newly developed residential areas. Kahului includes the island's only deep water port and the second busiest airport in the State. With its proximity to Kahului Harbor and the Airport, the Kahului region contains a variety of heavy industrial, light industrial, and commercial wholesale and retail activities and services. Three (3) major shopping areas, the Queen Ka`ahumanu Center, Maui Mall, and the Kahului Shopping Center, are located in Kahului.

The subject property is adjacent to the Wai`ale Reservoir to the east, and the Maui Community Correctional Center, the Ka Hale A Ke Ola Homeless Resource Center, and the Hale Makana O Wai`ale low-income housing facility to the south. Various commercial properties, such as T.J. Gomes Trucking, are located to the north and west.

In the near vicinity are the Maui Police Department (MPD) headquarters, the State Department of Land and Natural Resources (DLNR) Annex, Kaiser Permanente Medical Clinic, Maui Memorial Medical Center, and the Wailuku Health Center. Multi-family and single-family residential uses of the Kehalani Project District are located west of the project site.

Located to the north, beyond the subject property, is Ka`ahumanu Avenue and the War Memorial Complex. Baldwin High School is located to the north of

the subject property and west of the War Memorial Center Complex. The Maui Lani Project District, which is currently being developed, and the Sand Hills residential area are located to the east and north of the project area, respectively.

**b. Potential Impacts and Proposed Mitigation Measures**

The proposed project is surrounded by residential, commercial, public/quasi-public, agricultural, and industrial uses. The proposed project is not anticipated to have an adverse effect on surrounding land uses and activities. The proposed WTF will be limited to approximately 3.5 acres in size and as previously noted, processing equipment will be contained in enclosed buildings. The proposed project site is currently vacant land and is not utilized for any activities.

**2. Climate, Topography, and Soils**

**a. Existing Conditions**

Like most areas of Hawai'i, Maui's climate is relatively uniform year round. Characteristic of Hawai'i's climate, the project area experiences mild and uniform temperatures, moderate humidity, and relatively consistent tradewinds. Variations in the island's climate are largely left to local terrain.

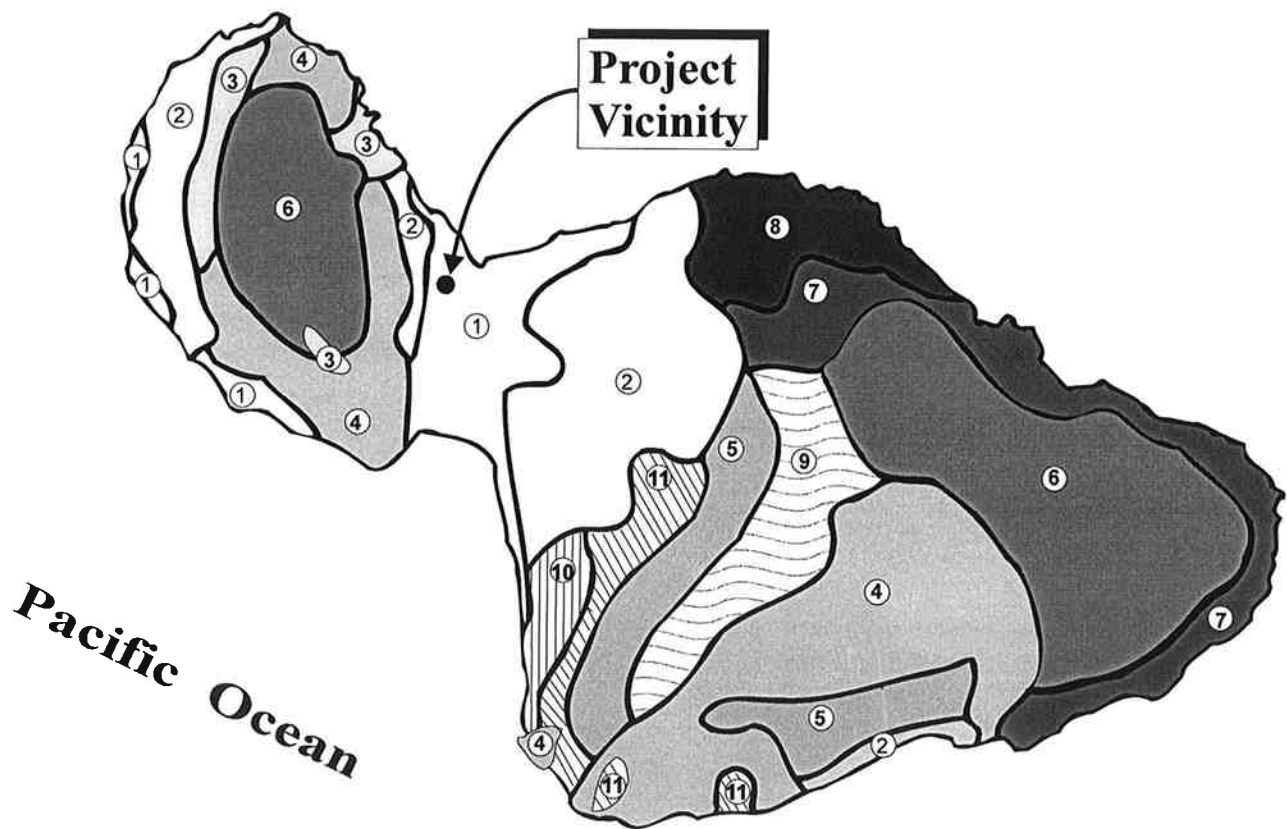
Average temperatures in the project area (based on temperatures recorded at Kahului Airport) range from low 60s to the high 80s. August is historically the warmest month, while January and February are the coolest. Rainfall in the project area averages approximately 20 inches per year. Winds in the Kahului region are predominantly out of the north and northeast (Maui County Data Book, 2007).

The proposed Wai`ale WTF would be located at an approximate elevation of 225 feet mean sea level.

Underlying the project area and surrounding lands are soils belonging to the Pulehu-Ewa-Jaucas association. See **Figure 6**. This soil association is characteristically deep and well-drained and located on alluvial fans and basins. The soil type specific to the project area is of the Puuone Sand classification

# 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           |                                     |



Map Source: USDA Soil Conservation Service

Figure 6

Proposed Wai`ale Water Treatment Facility Soil Association Map

NOT TO SCALE



Prepared for: A&B Properties, Inc.

MUNEKIYO & HIRAGA, INC.

(PZUE). See **Figure 7**. PZUE soils are predominant in the region and are typified by a sandy layer and a cemented sand underlayment.

Vegetation associated with this series include bermuda grass, kiawe, and lantana.

The project area is situated within lands that are designated Zone "C" by the Flood Insurance Rate Map. See **Figure 8**. Zone "C" is an area of minimal flooding.

**b. Potential Impacts and Proposed Mitigation Measures**

The proposed improvements are not anticipated to adversely alter topographic characteristics in the vicinity. Some grading and grubbing will be required for project implementation. No tsunami or flood-related impacts are associated with the proposed project.

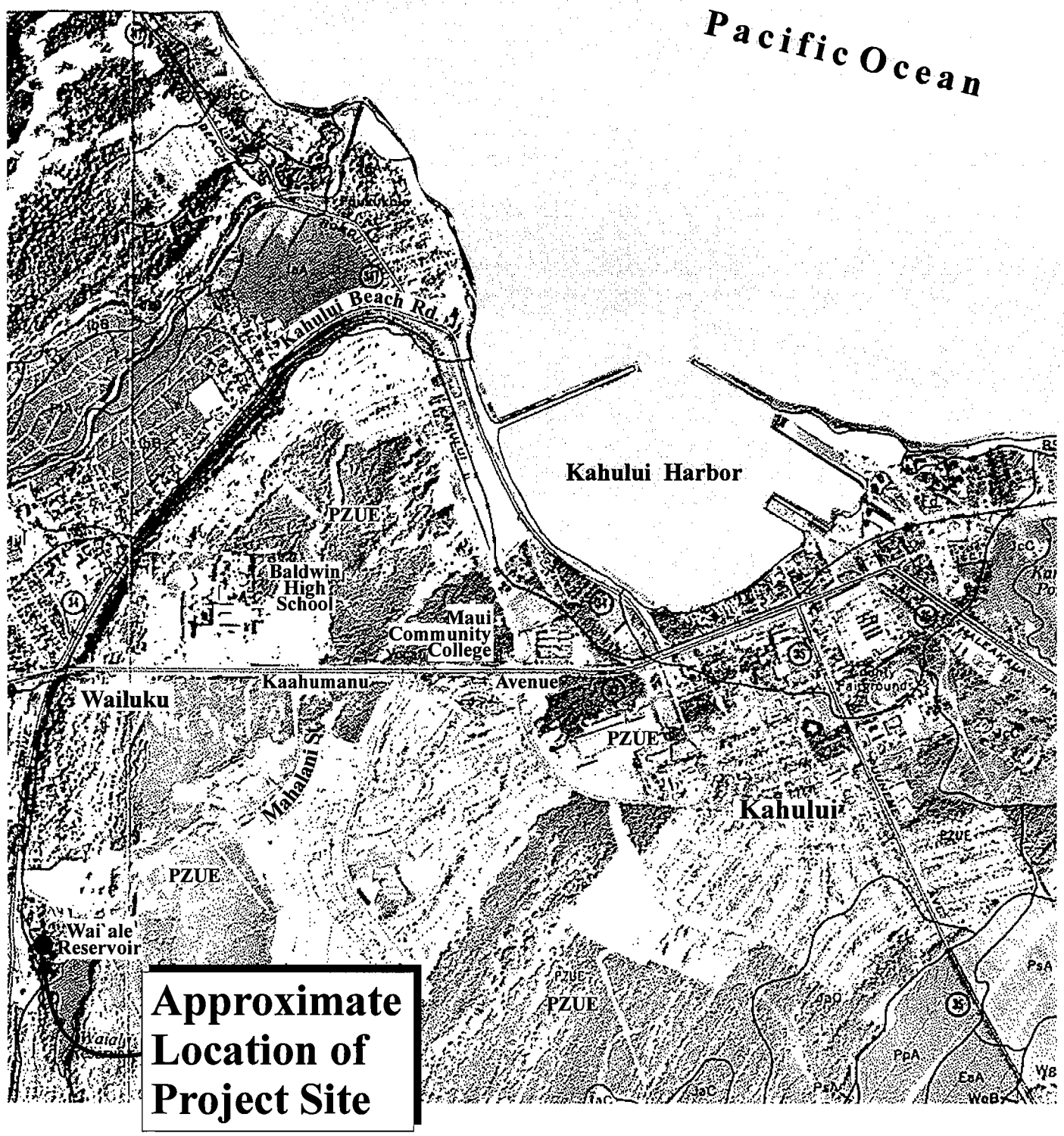
**3. Relationship to Agricultural Productivity**

**a. Existing Conditions**

The Central Maui region has historically served as an area rich in agricultural production, principally sugar cane and pineapple cultivation, and to a lesser extent, macadamia nut production. With the island's economy less reliant on large scale agricultural endeavors, present-day agriculture in Central Maui is by HC&S's sugar plantation which encompasses approximately 35,000 acres of cultivated lands. In addition to its sugar fields, HC&S operates its sugar processing mill and power plant in Pu'unene.

A major component of HC&S' sugar operations is its irrigation systems, which includes surface water collection and transmission systems in East Maui and West Maui. The Hopoi Chute, the proposed source for the WTF is part of the West Maui ditch system, as described in Chapter I.

Pacific Ocean



Approximate Location of Project Site

Source: USDA, Soil Conservation Service

Figure 7 Proposed Wai'ale Water Treatment Facility Soil Classification Map



Prepared for: A&B Properties, Inc.



**Figure 8 Proposed Wai'ale Water Treatment Facility  
Flood Insurance Rate Map**



NOT TO SCALE

Prepared for: A&B Properties, Inc.



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b. **Potential Impacts and Proposed Mitigation Measures**

Existing Kuleana uses and HC&S's agricultural uses will not be affected by the proposed WTF. Kuleana users are currently afforded first priority to the Waihe'e Ditch water for their current usage which has been estimated to be 5.0 to 6.0 MGD<sup>c</sup>. These users receive their water upstream of the Hopoi Chute. Their withdrawal rights will not be affected by the proposed WTF. When the WTF is constructed and operational, a portion of the water currently used by HC&S for sugar cane cultivation will be diverted to the WTF. HC&S currently obtains an average of 50 MGD from the West Maui Ditch System, 9 MGD of which could be diverted to the WTF, should the project be developed. To mitigate the reduction in irrigation source attributed to treatment plant use, HC&S will utilize brackish water from its plantation Well No. 7. It is noted that Well No. 7 has excess capacity to provide more than 9 MGD of brackish water for agricultural irrigation purposes. Additionally, HC&S will take advantage of the normally higher winter ditch flows to maintain current productivity levels.

With the mitigative measures proposed by HC&S, the diversion of approximately 9 MGD for the WTF is not expected to adversely impact agricultural productivity of the sugar plantation.

4. **Flora and Fauna**

a. **Existing Conditions**

The site is undeveloped and overgrown with weeds and grasses. A biological resources survey of the project site was conducted in June 2008. A walk through botanical survey of all three (3) acres of the property was conducted. The survey analyzed the flora found at the site, which included Java plum (*Syzygium cumini*), 'opiuma (*Pithecellaobium dulce*), and koa haole (*Leucaena leucocephala*). Guinea grass (*Panicum maximum*) comprised a majority of the understory. Two (2) native Hawaiian plants were identified at the site: 'ilima (*Sida fallax*) and 'uhaloa (*Waltheria indica*). Both plants are widespread and common indigenous species in Hawai'i as well as other Pacific islands. No endangered or threatened plant species were found, nor were any seen that are candidates for protected Federal status. See **Appendix "B"**, Biological

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<sup>c</sup> Wailuku Water Company Water Use Report, 2006.



Resources Survey. Fauna and avifauna that were found in the project area are typical of Wailuku's urban setting. Fauna identified in the survey included mongoose, a cat, and a rat. Additionally, a special effort was made to examine the area for the presence of the native Hawaiian hoary bat with an evening visual survey. An electronic bat detecting device was utilized in the survey as well. No evidence of the species was observed, although visibility was clear and there was an abundance of flying insects (typical food source).

Avifauna identified during the survey included a moderate amount of birds in total numbers and in the diversity of species. The variety of bird life was thought to be attracted to the area due to the large body of fresh water (Wai`ale Reservoir), as well as a variety of habitats and food sources. Sixteen (16) species of birds were identified during the survey, including 14 non-native species, one (1) indigenous water bird, and one (1) endemic/Endangered water bird. Among the bird species identified at the site were Cattle Egret (*Bubulcus ibis*); Spotted Dove (*Streptopelia chinensis*); Myna (*Acridotheres tristis*); Gray Francolin (*Francolinus pondicerianus*); Chicken (*Gallus gallus*); *Ae`o*, Black-necked stilt (*Himantopus mexicanus knudseni*); and *Auku`u*, Black-crowned night heron (*Nycticorax nycticorax hoactli*). The survey noted that the project site may be utilized by other non-native bird species, however, it would be unsuitable for such Endangered Species such as the *nene* goose (*Branta sandvicensis*) or for seabirds, such as the *ua`a* (*Pterodroma sandwichensis*) or *`a`o* (*Puffinus newellii*). While the project site was found to be unsuitable for endangered water birds, such as the *ae`o* and *`alae ke`oke`o*, they may be viewed nearby within the Wai`ale Reservoir. It was also determined that the project site is too low in elevation for native Hawaiian forest birds.

Lastly, while a survey of insects was not specifically conducted on the project site, a diversity of species were seen. One (1) native insect, the Blackburn's sphinx moth (*Manduca blackburni*), was searched for in particular as it has been designated on the endangered species list. The moths' native host plants are species of *`aiea* (*Nothocestrum spp.*). Some non-native host plants are tobacco (*Nicotiana tabacum*) and tree tobacco (*Nicotiana glauca*). There were no *`aiea* plants identified on or near the property. Two (2) small tree tobacco plants were seen on the margins of the property. Each plant was carefully examined, however, no Blackburn's sphinx moths or larvae were observed.

b. **Potential Impacts and Proposed Mitigation Measures**

The Biological Resources Survey concluded that the vegetation in the project area was dominated by non-native species. Only two (2) plant species at the project site were native to Hawai'i. Both of the plants are widespread and common indigenous species in Hawai'i, as well as other Pacific islands. No endangered or threatened plant species were found, nor were any seen that are candidates for such protected Federal status. No special native plant habitats were found at the project site. There were no wetlands identified on the property, although it lies adjacent to an active agricultural ditch and reservoir complex which brings riparian influences into close proximity.

The survey concluded that there were no special recommendations or considerations for plant life at the project site due to the domination of non-native species. The proposed project is not anticipated to have a significant negative impact to botanical resources in the area. Refer to **Appendix "B"**.

Regarding fauna and avifauna, the study concluded that there was a diverse array of mostly non-native mammals and birds, associated with disturbed habitats. Of the four (4) water bird species observed at the margins of the property, one (1) bird, the ae'o or Hawaiian stilt, is an endemic and endangered bird species. While the report noted that the project site is not a habitat for the ae'o, the proximity of the bird species to the site merited consideration for mitigation. The report recommended that when the WTF is developed, a dense screen of vegetation between the WTF and the Wai'ale reservoir be maintained to minimize human interaction and disturbance for the birds. While no other endangered or threatened seabird species were identified during the survey, it was recommended that any outdoor lights for the proposed project be shielded to direct the light downward, so as not to confuse any fledglings which may cross the lowland property in the evenings to get to their burrows in the mountains.

The applicant will comply with the recommendations of the Botanical Resources Survey and will insure that a vegetation buffer is maintained between the Wai'ale reservoir and the proposed WTF. Further, the applicant will insure that any outdoor lighting proposed for the project will comply with the requirements of the Maui County Code, Chapter 20.35, "Outdoor Lighting", which defines shielding requirements for various lamp types.

**5. Streams and Wetlands**

**a. Existing Conditions**

There are no streams or wetlands in the immediate vicinity of the WTF project site. The source water for the Wai`ale Reservoirs is the Spreckels Ditch and Hopoi Chute (Waihe`e Ditch sources). There are emergency overflows from the Wai`ale Reservoirs that lead to the Maui Lani golf course. The Wai`ale Reservoirs are also connected to an internal HC&S distribution ditch, which discharges to HC&S Reservoir 91. The HC&S Reservoir 91 also has an overflow to an unnamed gulch which discharges to Kealia Pond. The Waihe`e Ditch also has an overflow to Waikapu Gulch, which discharges to Kealia Pond that ultimately leads to the Pacific Ocean. The Wai`ale Reservoirs are connected to Kealia Pond and are regulated as waters of the United States. Iao Stream is located approximately one (1) mile to the north of the project site, while Waikapu Stream is located about one and one and one-fourth (1-1/4) miles from the property. The Kealia Pond, a National Wildlife refuge, is located roughly five (5) miles to the south of the property, while the Kanaha Wildlife Sanctuary is located in Kahului, approximately three (3) miles from the WTF site.

The Commission of Water Resource Management (CWRM) designated the waters of the Na Wai `Eha (four (4) streams of the Wailuku District) as a surface water management area in March 2008. The CWRM also has before it, a petition to amend the Interim Instream Flow Standards (IIFS) for these four (4) streams. The IIFS is currently undergoing a contested case process. The contested case concerns whether any additional water from the Waihe`e Stream (which feeds the Waihe`e Ditch system and therefore the Hopoi Chute) should be retained to provide for in-stream purposes. A decision on the IIFS by the CWRM is anticipated in mid-2009.

**b. Potential Impacts and Proposed Mitigation Measures**

There are no anticipated impacts to streams and wetlands from the proposed WTF. As previously noted, there are no stream or wetlands in close proximity to the WTF site.

## 6. Historical and Archaeological Resources

### a. Existing Conditions

An archaeological assessment was performed for the project site. See **Appendix "C"**. The archaeological assessment for the project included a pedestrian survey and subsurface testing. No evidence of significant cultural remains were located during the pedestrian survey and the subsurface testing. Intact sand dune deposits were present in all but three (3) test trenches. Soil cores also indicated that sand dune deposits are relatively thick in all test instances.

While there were no historic properties located during the survey, the assessment noted that the Spreckels Ditch (Site 50-50-04-1508) lies to the west of the project site. However, this site will not be impacted by the proposed project.

### b. Potential Impacts and Proposed Mitigation Measures

The archaeological assessment concluded that the Pu'uone Sand Dune is known to contain occasional human burials and that burials have been recovered in the past. Therefore, the possibility exists that human remains could be present in untested areas of the project site. As such, the report recommended archaeological monitoring during all ground altering activities for the project. The archaeological assessment report was submitted to the State Historic Preservation Division (SHPD) for review and approval. By letter dated December 30, 2005, the SHPD approved the assessment report for the project and concurred with the recommendation for archaeological monitoring during ground altering activity. See **Appendix "C-1"**.

The applicant's archaeological consultant prepared an archaeological monitoring plan for the proposed project. The plan was submitted to SHPD for review and approval. The archaeological monitoring plan includes provisions for monitoring during all grubbing, grading and subsurface earthmoving activities within the project area. Protocols are included in the plan in the event of an inadvertent discovery during construction including human burial remains. Field methodology during archaeological monitoring will include photographic recordation, artifact excavation (in the event of an inadvertent cultural discovery), profile documentation of cultural layers and stratigraphy,

and mapping of all pertinent features on an appropriate site map. Within 180 days of completion of ground altering activities, the archaeologist will submit a monitoring report to the SHPD for review and approval. See **Appendix "D"**. The SHPD approved the archaeological monitoring plan, via letter dated July 21, 2006. See **Appendix "D-1"**.

As recommended, the applicant will conduct archaeological monitoring in accordance with the approved monitoring plan.

7. **Cultural Assessment**

a. **Existing Conditions**

(1) **Geopolitical Division**

Prior to Western contact in Hawai'i, land was divided into units called *ahupua'a*. Ideally, each *ahupua'a* was self-sufficient, running from *mauka*, the mountain, to *makai*, the ocean (MacKenzie). These divisions served as both cultural and settlement systems as traditional Hawaiian life was tied intimately to the land. Hunting, gathering, cultivation, and habitation took place within three (3) zones which characterized the *ahupua'a*: the *Mauka Zone*, the *Agricultural Zone*, and the *Coastal Zone*. The *Mauka Zone* provided access to a variety of trees, plants, and herbs for various needs, customs, and practices. Planting of yams, sweet potato, sugar cane, taro, and other foods took place in the *Agricultural Zone* where gradual slopes of land allowed terraces to be constructed for more efficient irrigation. The *Coastal Zone* and low-lying areas were where most of the *kauhale*, group of houses, were found, as well as temples, fishing shrines, and fishponds (Minerbi).

Western contact brought changes to the Hawaiian land system along with the introduction of private ownership of land, a concept foreign to the native Hawaiians. A Board of Land Commissioners was established in 1845 to uphold or reject all private land claims of both foreigners and Hawaiians. The Commission adopted rules pertaining to the proof of claims, right of tenants, and commutation to the government in attempts to achieve the goal of totally partitioning

undivided lands. All lands not claimed by February of 1848 were to be forfeited to the government (MacKenzie).

Following the enactment of these rules, the *Mahele* division of 1848 divided all lands of Hawai'i between the king and chiefs. Two (2) years later the *Kuleana* act completed the *Mahele* process by authorizing the Land Commission to award fee simple titles to native tenants for their land. These *kuleana* parcels, also known as Land Commission Awards (LCA), were generally among the richest and most fertile in the islands and came from king, government, or chief's land. All claims and awards were numbered and recorded in the *Mahele* Book (MacKenzie). In addition, government lands were sold as "Royal Patent Grants" or "Grants" in order to meet the increasing costs of government. These grants differed from LCAs, as it was not necessary for the recipients to obtain an award for their land from the Land Commission (Chinen).

## (2) **Traditional and Customary Rights**

The traditional and customary rights of native Hawaiians can be broken down into access rights, gathering rights, burial rights, and religious rights.

### **Access**

Native Hawaiians generally share the same access rights as the general public. However, they have the unique access rights to *kuleana* parcels and between *ahupua'a*. Access to *kuleana* parcels may involve access along ancient trails or expanded access not limited to any route. Additionally, the *Kuleana* Act granted unobstructed access within the *ahupua'a* to obtain items necessary to make the *kuleana* parcel productive. Access rights between *ahupua'a* involve access along ancient or well established trails (MacKenzie).

### **Gathering**

In terms of gathering rights, the Hawai'i Supreme Court has upheld gathering rights within an *ahupua'a* for firewood, house-timber, *aho*

cord, thatch, and *ki*-leaf under three (3) conditions. The tenant must physically reside within the *ahupua'a*, the right to gather can only be exercised upon undeveloped lands within the *ahupua'a*, and the right must be exercised only for the purpose of practicing native Hawaiian customs and traditions (MacKenzie).

### **Burial**

According to traditional Hawaiian burial beliefs, following death, the *'uhane*, or spirit, must remain near the *na iwi*, or bones. Burial sites are chosen by Hawaiians for symbolic purposes in places for safekeeping. Often bones were hidden in caves, cliffs, sand dunes, or deposited in the ocean. Today, federal and state laws protect both unmarked and marked burial sites. Island Burial Councils assist the State Historic Preservation Division with inventory and identification of unmarked Hawaiian burial sites and determine the preservation or relocation of native Hawaiian burial sites (MacKenzie).

### **Religious**

Hawaiian religion and beliefs were intimately tied to the land. While some practices and traditions were lost over the years, basic Hawaiian religious concepts remain. The terms "*aloha 'aina*," love the land and "*malama 'aina*," care for and protect the land, convey the unity of humans, nature, and the gods in Hawaiian philosophy (Minerbi). Furthermore, Hawaiians honored and worshiped *aumakua*, deities, and *akua*, gods. There were numerous *akua* of farming, fishing, tapa making, dancing, sports, and other activities of Hawaiian life. The concept of *mana* or sacred attachment to places, people, or things also remains as a significant aspect of Hawaiian religion (MacKenzie). To the native Hawaiians, freedom to practice religion includes a freedom to practice a way of life which acknowledges the sacredness of places, animals, and natural forces (MacKenzie).

Based on historical research of the project area and archaeological review, there are no traditional native Hawaiian uses for the general project area, with the possible exception of traditional burials. Previous construction in the area, including the Wai'ale Reservoir in the early 1900s, likely impacted the area.

There are no known modern day cultural uses of the project site.

**b. Potential Impacts and Proposed Mitigation Measures**

The cultural impact assessment concluded, based on historical research of the project area and an interview conducted, that there were no traditional native Hawaiian uses for the general project area, with the possible exception of traditional internment of burials. Previous construction in the area, including the Wai`ale Reservoir in the early 1900s likely impacted the area. However, it was noted that there were no known modern day uses of the project site. See **Appendix "E"**.

The applicant's archaeological consultant prepared and submitted an archaeological assessment survey for the project site to the SHPD. Additionally, the archaeologist submitted an archaeological monitoring plan to the SHPD and received approval of the plan. Refer to **Appendix "D"** and **Appendix "D-1"**. The monitoring plan included provisions for an inadvertent discovery of human burials during ground altering activities associated with the proposed project. The applicant will insure that the monitoring plan is administered during construction of the project and that approved protocols are followed. As such, no impacts to cultural practices are anticipated by the proposed project.

**8. Air Quality and Noise**

**a. Existing Conditions**

Air quality in the Wailuku-Kahului region is considered good, as point sources (e.g., Maui Electric Power Plant, HC&S Mill) and non-point sources (e.g., automobile emissions) of emissions do not generate problematic high concentrations of pollutants. The relatively high quality of air can also be attributed to the region's near constant exposure to winds which quickly disperse emissions. This rapid dispersion is evident during sugar cane burning operations in fields south and east of the project site.

Traffic noise generated by vehicles traveling along Wai`ale Road is a source of background noise in the vicinity of the project. Other sources of noise include the recreational activity from the Iron Maehara Baseball Stadium, War Memorial Little League fields, and War Memorial gym, tennis courts, and



swimming pool. To the east, Kahului Harbor and Kahului Airport operations occasionally add to the background noise level in the surrounding region. The foregoing conditions, however, are not considered to be intrusive given their intermittent and distant locations.

**b. Potential Impacts and Proposed Mitigation Measures**

Fugitive dust generated during construction activities may temporarily affect the air quality within the immediate vicinity. Mitigation measures include utilizing dust barriers, waterwagons, and/or sprinklers to control dust, and watering graded areas upon the completion of daily construction activities and/or weekends and holidays, as required.

It is noted that there is a single air monitoring station on the island of Maui, located in North Kihei within the Hale Pi'ilani Park. While the location of the monitoring station is approximately eight (8) miles from the project site, ambient conditions can generally be considered to be similar between the two (2) locations in terms of proximity to point and non-point sources of emissions. As with all monitoring stations in the State of Hawai'i, air quality data for the year 2006 for the Kihei monitoring station, shows that air quality is well within State and National Ambient Air Quality Standards.

There are two (2) stationary sources which may fall within the purview of the Department of Health's Hawaii Administrative Rules, Chapter 60.1, relating to air pollution control. These are the chlorine scrubber and the emergency diesel generator. The specific design parameters for these units are currently in design. Review of the units will be coordinated with the Department of Health to determine the need for air permits. On a long-term basis the proposed project is not anticipated to adversely impact air quality.

Ambient noise conditions may be temporarily affected by construction activities. Heavy construction machinery, such as backhoes, dump trucks, front-end loaders, paving equipments, and material-transport vehicles, are anticipated to be the dominant noise-generating sources during the construction period.

Proper equipment and vehicle maintenance are anticipated to minimize noise levels. Equipment mufflers or other noise attenuating equipment may also be

employed as required. Site work and building erection activities will be limited to daylight working hours. As needed, interior work (after vertical shell construction is completed) may be undertaken. Such work, however, is not expected to generate noise audible outside of the buildings.

On an ongoing post-construction operational basis, noise will be generated by some equipment associated with the WTF, with the primary noise generators being the air blowers and, more so, the generator. Therefore, these equipment will be housed in separated rooms, constructed of CMU walls and concrete ceilings, to provide noise abatement. In addition, sound attenuation panels and silencers will be installed in the generator room and blower room (as appropriate) to minimize noise. Once constructed, the proposed project is not anticipated to generate adverse noise impacts.

In light of the foregoing, a community noise permit pursuant to the Department of Health's Hawaii Administrative Rules, Chapter 46, is not anticipated to be required.

**9. Scenic and Open Space Resources**

**a. Existing Conditions**

Scenic resources to the west of the project area include Iao Valley and the West Maui Mountains. The view to the north and south is effectively blocked by Maui Community Correctional Center and other buildings. The subject property is overgrown and presents limited scenic resources. See **Figure 9**.

**b. Potential Impacts and Proposed Mitigation Measures**

The subject property is not part of a scenic corridor and will not affect views from inland vantage points. In addition, in the context of surrounding public/quasi-public and baseyard uses, the proposed project will not adversely affect the scenic and visual character of the area. The site is currently overgrown and does not present any notable scenic resources. Given existing



Source: Munekiyo & Hiraga, Inc.

Figure 9

Proposed Wai`ale Water  
Treatment Facility  
Site Photos

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conditions as it relates to scenic resources, the proposed WTF will not adversely affect mauka-makai or mountain views.

**10. Hazardous Materials**

**a. Chemicals to be Used in the Treatment Process**

The WTF will utilize various chemicals in the plant operations, cleaning and water treatment process. These chemicals include aluminum chlorohydrate, soda ash, chlorine gas, sodium bisulfite, citric acid, sulfuric acid, and sodium hydroxide.

**b. Hazard Mitigation Measures**

The chemicals used will be secured within buildings, with all handling performed by trained personnel only. With the exception of the chlorine gas, chemicals will be secured in the Treatment Plant Building. Separate storage areas for each chemical will be provided in the building and include spill containment pallets. Building areas where chemicals are proposed to be used will also feature raised concrete containment curbs.

The chlorine gas containers will be stored in a separate CMU chlorinator building. The chlorination system will include leak detection mechanisms. The chlorinator building will be equipped with a chlorine scrubber in the event of a chlorine leak. The chlorinator building and all internal operating systems will be designed to meet all applicable life safety and code requirements. The systems will comply with requirements of the State of Hawai'i, Department of Health and County of Maui, Department of Fire and Public Safety.

**B. SOCIO-ECONOMIC ENVIRONMENT**

**1. Population Parameters**

**a. Existing Conditions**

Maui County has experienced strong growth in recent years. The resident population has increased approximately 24 percent in the ten-year span from 1992 to 2002, from 108,585 in 1992 to 134,139 in 2002. Growth in the County is expected to continue with the resident population projected to rise to 151,300

by 2010 and 174,450 by 2020 (County of Maui, June 2006).

The Wailuku district has seen even greater growth over this period. The resident population of the district increased approximately 34 percent in the span from 1990 to 2000, from 45,685 in 1990 to 61,346 in 2000 (Maui County Data Book, 2007).

**b. Potential Impacts and Proposed Mitigation Measures**

The new WTF will allow the County to supply Central and South Maui with potable water more efficiently and in consonance with projected demand. In particular, the County of Maui’s Socio-Economic Forecast prepared for its General Plan Update process reflects a continued pattern of growth on the island through the year 2030 (County of Maui, 2006). The baseline or mid-point projection indicates that the island’s population will grow from approximately 129,400 in the year 2005 to an estimated 186,200 in the year 2030. This projection also estimates an attendant increase in the number of island households from about 45,500 in the year 2005 to 70,000 in the year 2030.

Similar patterns of growth are projected for the Kihei-Makena Community Plan Region and the Wailuku-Kahului Community Plan Region, as depicted in **Table 2** and **Table 3**.

**Table 2. Population Projections for Kihei-Makena and Wailuku-Kahului Community Plan Regions**

Community Plan Region	Year					
	2005	2010	2015	2020	2025	2030
Kihei-Makena	25,609	28,114	30,597	33,227	35,962	38,757
Wailuku-Kahului	46,626	51,312	55,957	60,877	65,995	71,223
<b>Totals</b>	<b>72,235</b>	<b>79,426</b>	<b>86,554</b>	<b>94,104</b>	<b>101,957</b>	<b>109,980</b>
Source: County of Maui, 2006						

**Table 3. Household Projections for Kihei-Makena and Wailuku-Kahului Community Plan Regions**

Community Plan Region	Year					
	2005	2010	2015	2020	2025	2030
Kihei-Makena	10,204	11,286	12,353	13,506	14,705	15,897
Wailuku-Kahului	15,205	17,229	19,226	21,383	23,625	25,855
<b>Totals</b>	<b>25,409</b>	<b>28,515</b>	<b>31,579</b>	<b>34,889</b>	<b>38,330</b>	<b>41,752</b>

Source: County of Maui, 2006.

**2. Economy**

**a. Existing Conditions**

The Kahului region is the island's center of commerce. Combined with neighboring Wailuku, the region's economic character encompasses a broad range of commercial, service, and governmental activities. Key elements of the local economy found in Central Maui include the Kahului Airport, Kahului Harbor, Maui Memorial Medical Center and Maui Community College. In addition, the region is surrounded by agricultural lands which include sugar cane fields.

**b. Potential Impacts and Proposed Mitigation Measures**

On a short-term basis, the project will support construction and construction-related employment. Accordingly, the project will have a beneficial impact on the local economy during the period of construction.

From a long-term perspective, the proposed WTF will provide a water source to meet projected demands in resident and business growth. With the currently anticipated growth in the Central and South Maui regions, infrastructure systems, including water source capacity, will need to be developed. Provision of such capacity via the proposed action will support the community's social well-being and sustain housing and employment associated with an increasing resident population.

## **C. PUBLIC SERVICES**

### **1. Recreational Facilities**

#### **a. Existing Conditions**

The Wailuku-Kahului region provides a range of recreational opportunities, including shoreline and boating activities at Kahului Harbor and nearby beach parks, and individual and organized athletic activities available at numerous County parks. The War Memorial complex includes an Olympic-sized swimming pool, locker room, a gymnasium, five (5) Little League baseball fields, a practice soccer field, tennis courts, sumo ring, baseball stadium, as well as the football stadium. The project area is in close proximity to County facilities such as Keopuolani Park, Kahului Community Center, and Kanaha Beach Park, as well as Iao Valley State Park.

#### **b. Potential Impacts and Proposed Mitigation Measures**

There are no impacts to recreation facilities anticipated from the proposed WTF. It is noted, however, that the provision of additional potable water resources for Central and South Maui may allow for the development of new or improved recreational facilities for the public. Among the projects that may benefit from the additional water resources are the proposed Kihei Regional Park and the Kanaha Beach Park restroom addition.

### **2. Police and Fire Services**

#### **a. Existing Conditions**

Police protection for the Wailuku-Kahului region is primarily based at the Maui Police Department (MPD) headquarters in Wailuku, nearby the project site. The region is served by the MPD's Wailuku patrol division.

Fire prevention, suppression, and protection services for the Wailuku-Kahului region are provided by the Maui Fire Department's (MFD) Wailuku Station, located approximately one (1) mile from the project site. In addition, the MFD's Kahului Station (located on Dairy Road), is approximately three (3) miles from the project site.

**b. Potential Impacts and Proposed Mitigation Measures**

Police and fire services are not expected to be adversely impacted by the proposed project. The proposed project will not affect the service capabilities or extend the existing service area limits for emergency services. The proposed WTF would be beneficial for police and fire protection services. Additional water source for the Central and South Maui area, may allow for construction of needed public facility improvements. These facilities will provide vital public safety services for the community.

**3. Solid Waste**

**a. Existing Conditions**

Single-family residential solid waste collection service is provided by the County of Maui on a once or twice-a-week basis. Residential solid waste collected by County crews is transported to the County's Central Maui Landfill, located 4.0 miles southeast of the Kahului Airport. The Central Maui Landfill also accepts commercial waste from private collection companies.

It is noted that illegal dumping has occurred on the project site with abandoned vehicles, industrial machinery, and construction debris.

**b. Potential Impacts and Proposed Mitigation Measures**

A solid waste management plan will be developed in coordination with the Solid Waste Division of the County Department of Environmental Management for the disposal of demolition and construction material during construction. For example, abandoned vehicles and industrial machinery will be taken to an on-island metal recycling facility, while construction waste will be hauled to an approved construction waste site. Materials from clearing and grubbing will be taken to an approved composting facility.

Solid waste generated by the operation of the WTF will primarily be limited to sludge derived from the dual sludge lagoons. When the sludge is dried, it will be removed by machinery and transported to the County's Central Maui Landfill for disposal. The expected quantity of dried solids is estimated to be 75 cubic yards per cleaning. The frequency of sludge removal will vary, based on the production rate of the WTF and the raw water quality.



#### 4. **Medical Services**

##### a. **Existing Conditions**

Maui Memorial Medical Center, the island's only major medical facility, also services the Wailuku-Kahului region. Acute, general, and emergency care services are provided by the 231-bed facility. In addition, numerous privately operated medical/dental clinics and offices are located in the area to serve the region's residents. A new Kaiser Permanente medical facility at the corner of Ka'ahumanu Avenue and Maui Lani Parkway was recently opened.

##### b. **Potential Impacts and Proposed Mitigation Measures**

No impacts to medical services are anticipated from the proposed action.

Similar to police and fire protection services, medical services may also benefit from the proposed WTF. The additional water source can facilitate improvements for the Maui Memorial Medical Center, the only full-service hospital on the island. Additionally, the proposed South Maui Ambulance station in Wailea may benefit as well.

#### 5. **Schools**

##### a. **Existing Conditions**

The Wailuku-Kahului region is served by the State Department of Education's (DOE) public school system as well as several privately operated schools. DOE facilities in the Kahului area include Lihikai, Kahului, and Pomaikai Elementary Schools (Grades K-5), Maui Waena Intermediate School (Grades 6-8), and Maui High School (Grades 9-12). Existing facilities in the Wailuku area include Wailuku Elementary School (Grades K-5), Iao Intermediate School (Grades 6-8), and Baldwin High School (Grades 9-12). Maui Community College, a branch of the University of Hawai'i, serves as the island's primary higher education facility.

##### b. **Potential Impacts and Proposed Mitigation Measures**

The school nearest to the project site is Iao Intermediate School, located about half-a-mile (0.5) away, to the northwest. No impacts to school resources are anticipated from the proposed action.

While there are no anticipated impacts on school resources by the proposed WTF project, the provision of additional water source may actually assist in the construction of new school facilities.

## **D. INFRASTRUCTURE**

### **1. Roadways**

#### **a. Existing Conditions**

Wai`ale Road is a two-way, two-lane County Roadway, with a posted speed limit of 20 miles per hour in the project area. It terminates to the south at its intersection with Waiko Road and to the north, it becomes Lower Main Street.

Ka`ahumanu Avenue is the main highway arterial that links Wailuku to Kahului and for the most part, is a four-lane, east-west, divided, major State arterial. East of Kahului Beach Road, Ka`ahumanu Avenue is a six-lane divided arterial to Hana Highway. Traffic signal systems, left-turn lanes, and right-turn lanes are provided at the major intersections on Ka`ahumanu Avenue. The posted speed on Ka`ahumanu Avenue, in the project vicinity, is 45 miles per hour.

Traffic level-of-service (LOS) analysis in the vicinity of the proposed WTF indicates that existing traffic operations LOS for nearby intersections are operating at acceptable levels (Parsons Brinkerhoff, 2004). (LOS is a measure of traffic operations effectiveness which uses a rating system of "A" through "F". A LOS "A" measure reflects the best conditions for traffic flow, while a LOS "F" measure characterizes the highest level of congestion.) LOS results are summarized in **Table 4**.

**Table 4. Existing Levels of Service at Intersections in Proximity to WTF Project Location**

Intersection		AM		PM	
		LOS	Delay (sec/veh)	LOS	Delay (sec/veh)
Honoapi`ilani/Kuikahi		C	21.2	B	19.6
NB Approach		C	25.2	B	17.7
SB Approach		C	20.1	B	18.0
EB Approach		B	11	B	11.6
WB Approach		C	22.2	C	26.6
<b>Honoapi`ilani/Kehalani</b>	<b>Unsignalized</b>				
SB Honoapi`ilani	Left	A	9.0	A	8.8
WB Kehalani	Left	C	16.2	C	16.7
WB Kehalani	Right	C	15.1	B	12.3
<b>Wai`ale/Olomea</b>	<b>Unsignalized</b>				
NB Wai`ale	Left	A	8.6	A	8.8
SB Wai`ale	Left	A	9.5	A	8.3
EB Olomea	Left/Thru	D	30.5	D	28.2
EB Olomea	Right	B	11.0	B	11.4
WB MCCC	Left/Thru/Right	C	17.7	B	13.9
<b>Wai`ale/Waiinu</b>	<b>Unsignalized</b>				
SB Wai`ale	Left/Thru	A	8.4	A	7.8
WB Waiinu	Left	E	50.1	E	47.7
WB Waiinu	Right	B	11.3	A	9.8
Source: Parsons Brinckehoff, 2004					

**b. Potential Impacts and Proposed Mitigation Measures**

As previously noted, a new access driveway to the WTF will be constructed by the applicant. The access driveway will be located on the north side of the new Kuikahi Drive extension. Refer to **Figure 3**. The applicant has secured an

access agreement with the owner of the new Kuikahi Drive extension. Additionally, an emergency access will be provided to connect to Wainu Road, near its intersection with Wai`ale Road. Refer to **Figure 2**.

Construction traffic duration is anticipated to be approximately 15 months, with the following construction phasing:

1. Site work: 2 Months;
2. WTF Construction: 12 Months; and
3. WTF Finish Work: 1 Month.

The average number of construction workers anticipated during the construction period is ten (10). Construction personnel are expected to be at the site approximately nine (9) hours per day, five (5) days a week. As needed, traffic controllers will be posted at the construction ingress and egress point to ensure safe movement of construction vehicles.

Once the WTF is completed and in operation, staffing for WTF operations is anticipated to be between four (4) and eight (8) people, eight (8) hours a day, seven (7) days a week. Neither of these staffing requirements are deemed to be sufficient to create adverse traffic impacts in the area.

## 2. Wastewater

### a. Existing Conditions

There are no wastewater facilities on the currently undeveloped subject property.

Domestic wastewater generated in the Wailuku-Kahului region is conveyed to the County's Wailuku-Kahului Wastewater Treatment Facility located one-half mile east of Kahului Harbor. The design capacity of the facility is 7.9 MGD. Average daily flow currently processed through the plant is approximately 5.2 MGD.

**b. Potential Impacts and Proposed Mitigation Measures**

Wastewater generated from the site, including the restroom facilities and water from the floor drains throughout the Treatment Plant Building and Chorinator Building, will flow by gravity to a package grinder pump station. The wastewater will be conveyed via a 1-1/2 inch force main to a cleanout, just outside of the Wai`ale Road right-of-way. From that point, the effluent will flow via a 6-inch gravity line which connects to an existing 18-inch sewer main within the Wai`ale Road right-of-way.

**3. Water**

**a. Existing Conditions**

The Wailuku-Kahului, South Maui and Paia regions are served by the DWS's domestic water system. The majority of the water for the Central Maui water system is provided by wells in Mokuhau, in Iao Valley, and in Upper Waiehu. These well sources draw water from the basal lens referred to as the Iao Aquifer, which has an estimated sustainable yield of 20 MGD. These wells are augmented by the Iao Water Treatment Facility which draws water from the Iao-Waikapu Ditch. The balance of the water is withdrawn from the adjacent Waihe`e Aquifer to supplement that from Iao.

It is noted that the Iao Aquifer has been designated a groundwater management area by the CWRM. The DWS is therefore managing and limiting the allocation of pumpage to ensure that its allocated source is not exceeded. New source development is being pursued by the DWS in the form of new surface treatment capabilities, new wells, and reallocation of pumping from wells within the Iao Aquifer system.

The Na Wai `Eha (Four Waters) of the Wailuku District were designated as a surface water management area by the CWRM in March 2008. As such, any withdrawal, diversion, impoundment, or consumptive use of water from the Iao, Waiehu, Waihe`e, or Waikapu streams will require a CWRM water use permit. It is noted that the CWRM is currently reviewing a petition to amend Interim Instream Flow Standards (IIFS) for the four (4) streams. The IIFS is currently undergoing a contested case process. The contested case concerns whether any additional water from the four (4) streams including, Waihe`e Stream (which feeds the Waihe`e Ditch system and therefore the Hopoi Chute)

should be retained to provide for in-stream purposes. A decision on the IIFS is anticipated in mid-2009 by the CWRM.

The water in Waihe`e Ditch is currently being used by HC&S Wailuku Water Company (WWC), kuleana users, and others mainly for irrigation purposes. The Waihe`e Ditch is owned by WWC, and is used, maintained, and operated by both HC&S and WWC. An agreement between HC&S and WWC, entered into in 1924, sets forth the sharing of water use and ditch maintenance responsibilities between the two (2) companies. Currently, approximately 90 percent of the water from the Waihe`e Ditch, as measured at the Hopoi Gauging Station, is being diverted to the Hopoi Chute, 24 hours per day, for HC&S use.

Kuleana users and some small diversified agriculture (totaling less than 0.1 MGD) currently use approximately 5.0 to 6.0 MGD.

**b. Potential Impacts and Proposed Mitigation Measures**

The DWS is the principal purveyor of domestic water to Central Maui residents and businesses. The DWS' Central Maui system serves the Kihei-Makena and Wailuku-Kahului, as well as a portion of the Paia-Haiku Community Plan regions. Historically, potable water consumption in the Central Maui region has been steadily increasing. Between 1994 and 2005, Central Maui's potable water demand increased by approximately 20 percent, from 18.3 MGD to 22.0 MGD. According to water demand projection analyses prepared for the DWS in 2007 by Carl Freedman in a report titled, "Draft Maui County Water Use and Development Plan, Water Use and Demand, Department of Water Supply System" (WUDP), the water consumption over the next several years will continue the pattern of increasing use. The demand projection analyses covered a range of possible demand outcomes over time, including three (3) projection scenarios. The project demand for the base case or mid-projection estimate for the year 2015 is 25.5 MGD, which is a 16 percent increase over the 2005 historical Central Maui demand of 22.0 MGD.

There is a current need for new sources of water for the Central Maui system. Current source availability is limited as evidenced by the recent adoption of Ordinance 3502 relating to Water Availability which requires verification of a long-term reliable supply of water before subdivision approval can be granted.

The draft WUDP report also reviewed alternatives for the provision of water to meet the future projected demand. Included in the five (5) candidates studied was the proposed WTF system, which has been identified as a final candidate. Thus, the proposed project is recognized as a viable alternative to providing potable water for Central and South Maui, as well as the Paia area.

As previously noted, a large portion of the water diverted from the Waihe`e Ditch is used by HC&S for the growing of sugar cane. Should the Wai`ale WTF be approved, once operational, a portion of the water that currently goes to HC&S for sugar cane irrigation will be diverted to the treatment plant and will be replaced by water from a brackish well owned by the HC&S (Well 7). Besides replacing some of the fresh stream water with brackish well water for cane irrigation, HC&S will also take advantage of the normally higher winter ditch flows to lessen the impact to their crop.

Water service for the Treatment Building and facilities will be provided via an 8-inch service waterline, which will tap into the DWS main in Wai`ale Road. The service waterline will run parallel to the Spreckels Ditch. The service line will provide source water for the WTF plumbing fixtures, washdown facilities, etc. The service line will also provide for fire protection for the WTF via the onsite fire hydrant and sprinkler system within the chlorinator building.

#### **4. Drainage**

##### **a. Existing Conditions**

There are no drainage improvements on the undeveloped property. Storm water generally flows from the northern boundary of the site to the southern boundary where it discharges directly into the Upper Wai`ale Reservoir or percolates into the ground.

Based on the hydraulic calculations of the undeveloped site, the existing storm runoff is 4.58 cubic feet per second (cfs) for a 50-year, 1-hour storm. See **Appendix "E"**, Preliminary Drainage Report.

##### **b. Potential Impacts and Proposed Mitigation Measures**

The project involves grading of approximately 3.9 acres of land within and around the fenced WTF site. The proposed onsite grading will continue to

direct and discharge storm water runoff into the Upper Wai`ale Reservoir. This will be accomplished by the construction of a drainage system to collect and discharge storm water runoff. Included in the drainage improvements are concrete gutters which direct storm water into inlets before being discharged at headwalls with grouted rubble pavement (GRP) aprons to avoid erosion of the outlets.

The Upper Wai`ale Reservoir is located adjacent to the proposed WTF site, with no existing, or potential for future development between the reservoir and the site. All storm water runoff from the WTF site will continue to be discharged directly into the Upper Wai`ale Reservoir, including any additional flow due to the development of the WTF. Therefore, the Upper Wai`ale Reservoir will serve as the retention basin that would otherwise have to be constructed to retain the additional runoff from the WTF site.

The storm runoff calculated for the existing onsite condition was approximately 4.58 cfs. Projected runoff for the improved site condition was calculated to be 14.11 cfs. However, the proposed grading and drainage design for the WTF should not produce negative effects to adjacent and downstream properties. This is primarily due to not having any existing or potential future developments between the areas to be graded and the existing Upper and Lower Wai`ale Reservoirs.

Although the result of the project will create an additional storm water discharge of 9.53 cfs, this is only a small percentage increase when compared to the total discharge from the Wai`ale Watershed. There should be no impact to any downstream properties as the areas to be graded are located immediately adjacent to the Upper Wai`ale Reservoir, into which storm water will immediately discharge after leaving the graded areas. Soil erosion and drainage mitigation measures (Best Management Practices or BMPs) will be implemented during construction, as required by the Chapter 20.08, Maui County Code, relating to Soil Erosion and Sediment Control. Additionally, compliance with the National Pollutant Discharge Elimination System Permit (NPDES) will be required to manage discharges of storm water associated with construction activities.



5. **Electricity and Telephone System**

a. **Existing Conditions**

Electrical and telephone overhead distribution lines are available on Wai`ale Road. Electrical service is provided by Maui Electrical Company, Ltd. Telephone service is provided by Hawaiian Telcom.

b. **Potential Impacts and Proposed Mitigation Measures**

Electrical power and telephone system services will be provided by Maui Electric Company, Ltd. and Hawaiian Telcom, respectively. Coordination with these utility companies will be undertaken during the engineering design phase of work.

E. **CUMULATIVE AND SECONDARY IMPACTS**

A cumulative impact is defined as

*"the impact on the environment which results from the incremental impact of an action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such other actions."*

The implementation of the Wai`ale WTF is included in a list of five (5) of final candidate water source development strategies incorporated as part of the ongoing formulation of the County's WUDP. While the DWS has not unilaterally initiated work on any of the other final candidate strategies at this point in time, they have been coordinating and cooperating with A&B Properties, Inc. in the planning and design of the WTF. The WTF is intended to provide a sustained average production of 9 MGD to help address Central Maui's planned water needs. There are no recent past or present source development capital projects by the DWS or another party which would affect surface water source systems in Central Maui. While the implementation of the WTF will not preclude programming, planning, design and construction of other alternatives identified in the WUDP, the WTF is considered a logical initial step in meeting water needs based on water source availability, technical viability and site control parameters. Other future surface water projects for Central Maui are not foreseeable at this time.

A "secondary impact" or "indirect effect" from the proposed action means

*"effects which are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable."*

The need for new source development, as proposed by the WTF, will address current and presently planned needs for the Central Maui service area. None of these needs are caused by the WTF. Rather, the new WTF source will serve current users and allow planned projects to proceed. Examples of planned projects include A&B Properties, Inc.'s Maui Business Park Phase II in Kahului, and other public and private projects of benefit to the Maui community. Impacts associated with the development of these projects have been or will be separately addressed by their respective Chapter 343, HRS environmental impact analysis reports. For example, the Maui Business Park Phase II project has completed its Final EIS for the project. While there may be other projects which may be permitted to be developed in the future due to the availability of water from the WTF, the viability of such projects is not solely dependent on water source. Other factors affecting project viability include discretionary approvals required, off-site infrastructure improvements needed, and future market conditions for the product being developed.

**III. RELATIONSHIP TO  
GOVERNMENTAL PLANS,  
POLICIES, AND  
CONTROLS**

### III. RELATIONSHIP TO GOVERNMENTAL PLANS, POLICIES, AND CONTROLS

#### A. STATE LAND USE DISTRICTS

Chapter 205, HRS, relating to the Land Use Commission, establishes the four major land use districts in which all lands in the State are placed. These districts are designated "Urban", "Rural", "Agricultural", and "Conservation". The subject property is within the "Urban" district. See **Figure 10**. The proposed action is consistent with the provisions of the "Urban" district.

#### B. HAWAII STATE PLAN

Chapter 226, HRS, also known as the Hawai'i State Plan, is a long-range comprehensive plan which serves as a guide for the future long-range development of the State by identifying goals, objectives, policies, and priorities, as well as implementation mechanisms. The goals, objectives, policies, and priority guidelines which contribute to the development of the proposed project include the following:

- a. Goal: Physical, social, and economic well-being, for individuals and families in Hawai'i, that nourishes a sense of community responsibility, of caring, and of participating in community life.

The proposed project also promotes the following State Plan objectives, policies, and priority guidelines:

<b>Sec. 226-5</b>	<b><u>Objectives and policies for population.</u></b>
<b>Policy (b)(7)</b>	Plan the development and availability of land and water resources in a coordinated manner to provide for the desired levels of growth in each geographic area.
<b>Sec. 226-11</b>	<b><u>Objectives and policies for the physical environment-land-based, shoreline, and marine resources.</u></b>
<b>Policy (b)(2)</b>	Ensure compatibility between land-based and water-based activities and natural resources and ecological systems.

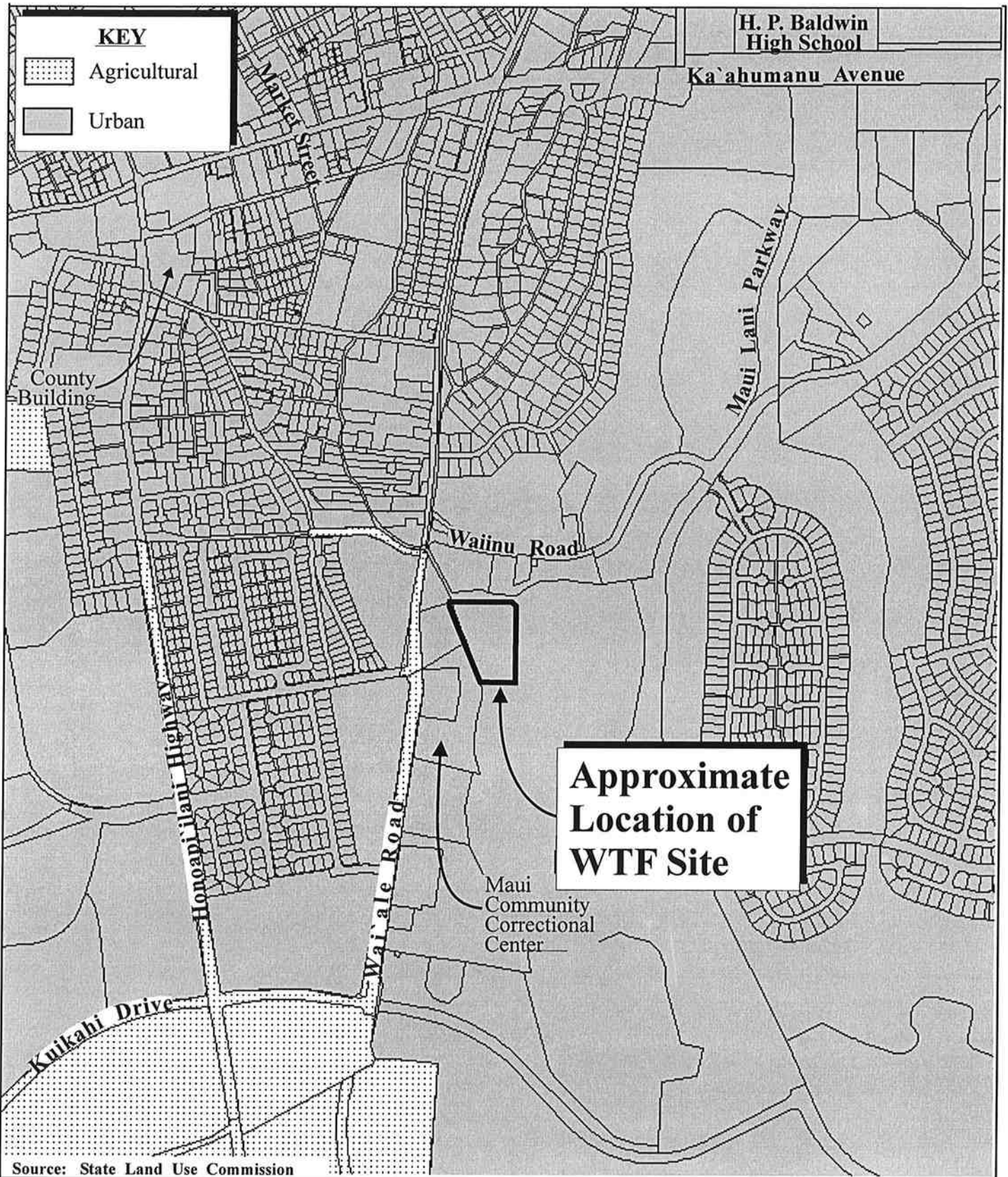


Figure 10

Proposed Wai'ale Water  
Treatment Facility  
State Land Use Designations

NOT TO SCALE



- Policy (b)(3)** Take into account the physical attributes of areas when planning and designing activities and facilities.
- Policy (b)(4)** Manage natural resources and environs to encourage their beneficial and multiple use without generating costly or irreparable environmental damage.
- Sec. 226-13** **Objectives and policies for the physical environment-land, air, and water quality.**
- Policy (b)(2)** Promote the proper management of Hawai`i's land and water resources.
- Sec. 226-14** **Objective and policies for facility systems--in general.**
- Objective (a)** Planning for the State's facility systems in general shall be directed towards achievement of the objective of water, transportation, waste disposal, and energy and telecommunication systems that support statewide social, economic, and physical objectives.
- Policy (b)(1)** Accommodate the needs of Hawai`i's people through coordination of facility systems and capital improvement priorities in consonance with State and County plans.
- Sec. 226-16** **Objective and policies for facility systems-water.**
- Objective (a)** Planning for the State's facility systems with regard to water shall be directed towards achievement of the objective of the provision of water to adequately accommodate domestic, agricultural, commercial, industrial, recreational, and other needs within resource capacities.
- Policy (b)(4)** Assist in improving the quality, efficiency, service, and storage capabilities of water systems for domestic and agricultural use.
- Sec. 226-27** **Objectives and policies for socio-cultural advancement-government.**
- Policy (b)(1)** Provide for necessary public goods and services not assumed by the private sector.

## C. MAUI COUNTY GENERAL PLAN

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

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

The proposed action is in keeping with the following General Plan objectives and policies:

### ENVIRONMENT

#### **Objective:**

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

#### **Policy:**

Evaluate all land based development relative to its impact on the County's land and ocean ecological resources.

### WATER

#### **Objective:**

To provide an adequate supply of potable and irrigation water to meet the needs of Maui County's residents.

#### **Policy:**

Monitor growth activities throughout Maui County in order that development of new water sources is concurrent with approval of new developments.

## **PUBLIC UTILITIES AND FACILITIES**

### **Objectives:**

- To anticipate and provide public utilities which will meet community needs in a timely manner.
- To improve the quality and availability of public facilities throughout Maui County.

It is noted that the County of Maui is currently preparing an update to the General Plan. Initiated in 2005, the update to the General Plan is being revised according to the provisions of Chapter 2.80B of the Maui County Code (MCC). Included in the provisions is the development of a countywide policy plan, as well as island plans for each of the three (3) islands in Maui County. The General Plan Advisory Committee (GPAC) for Maui Island is currently reviewing a draft of the Maui Island Plan, which contains goals, policies, and objectives on a variety of topics, such as the environment, infrastructure, and housing. Additionally, the GPAC is reviewing a draft map of the island, Maui Island Development Map, which will ultimately set locations for Urban Growth Boundaries (UGB) and Rural Growth Boundaries (RGB) for the horizon of the year 2030. In the current draft of the Maui Island Development Map, the proposed WTF site is located within the UGB.

### **D. WAILUKU-KAHULUI COMMUNITY PLAN**

The subject parcel is located in the Wailuku-Kahului Community Plan region which is one of nine 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 future development.

Land use guidelines are set forth by the Wailuku-Kahului Community Plan Land Use Map. The subject property is designated "Project District I" by the Community Plan. See **Figure 11**. The proposed improvements are consistent with the following goals, objectives, and policies of the Wailuku-Kahului Community Plan.



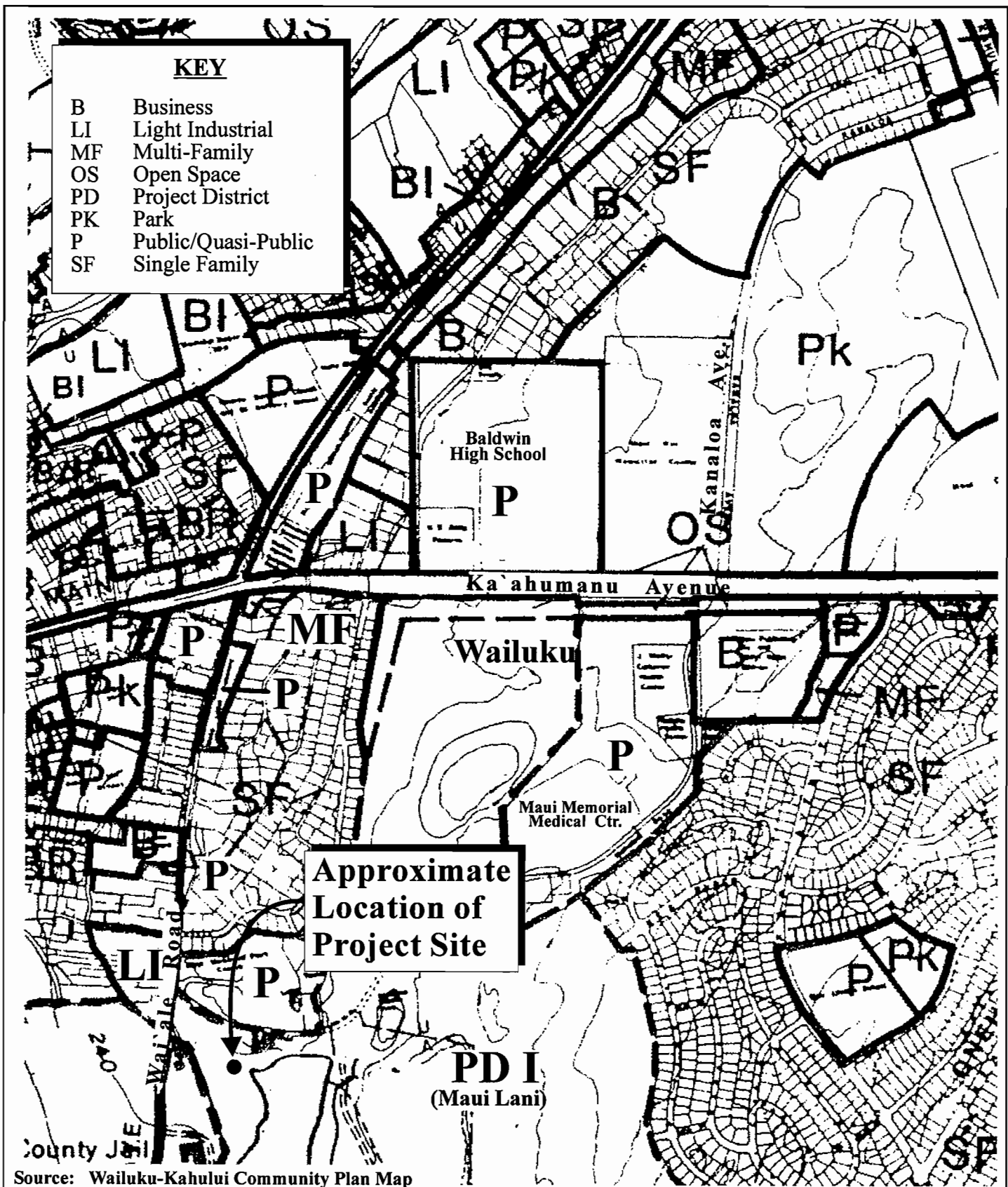


Figure 11

Proposed Wai'ale Water Treatment Facility  
Community Plan Designations

NOT TO SCALE



## **CULTURAL RESOURCES**

### **Goal:**

Identification, protection, preservation, enhancement, and where appropriate, use of cultural practices and sites, historic sites and structures, and cultural landscapes and view planes that:

1. Provide a sense of history and define a sense of place for the Wailuku-Kahului region; and
2. Preserve and protect native Hawaiian rights and practices customarily and traditionally exercised for subsistence, cultural and religious purposes in accordance with Article XII, Section 7, of the Hawai'i State Constitution, and the Hawai'i Supreme Court's PASH opinion, 79 HAW. 425 (1995).

### **Objectives and Policies:**

Require development projects to identify all cultural resources located within the project area as part of initial project studies. Further, require that all proposed activity include recommendations to mitigate potential adverse impacts on cultural resources.

## **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 drainage systems, and efficient transportation systems which meet the needs of the community.

### **Objectives and Policies:**

- Coordinate water system improvement plans with growth areas to ensure adequate supply and a program to replace deteriorating portions of the distribution system. Future growth should be phased to be in concert with the service capacity of the water system.
- Coordinate expansion of and improvements to the water system to coincide with the development of residential expansion areas.

**E. COUNTY ZONING**

The existing County zoning for the subject property is "M-1, Light Industrial". The proposed project is consistent with the underlying light industrial zoning designation.

**F. COUNTY WATER USE AND DEVELOPMENT PLAN**

The DWS is in the process of updating its WUDP. The updated WUDP will be adopted by ordinance and serve as the long-range planning blueprint for all uses of water in the county. The WUDP must also be adopted by the State of Hawai`i's CWRM. As previously noted, the Wai`ale WTF was included as one of the "Candidate Strategies" reviewed for the Central Maui water system. The draft WUDP reviewed the Wai`ale WTF on its own, but also included a case model analysis, comparing the WTF to the baseline strategy (Northward Basal Well Development), various scenarios regarding the Wai`ale WTF construction (DWS payment of capital costs versus contributions by the applicant), as well as the Wai`ale WTF as one of the strategies considered in a combination of strategies. The DWS provided a presentation to the Central Maui Water Advisory Committee (WAC) in January 2008, regarding the Final Candidate Strategies being considered in the draft WUDP. Included in the presentation was an analysis of the Wai`ale WTF. Thus, the DWS has advanced the Wai`ale WTF as a final candidate strategy for inclusion in the final WUDP.

**G. COASTAL ZONE**

The Hawai`i 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 Hawai`i's coastal zone.

As set forth in Chapter 205A, HRS, this section addresses the project's relationship to applicable coastal zone management considerations. It is noted, that the subject property is not located within the County of Maui's Special Management Area (SMA).

**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 uses 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, HRS.

**Response:** The proposed action is not anticipated to impact coastal recreational opportunities or affect existing public access to the shoreline. The project is intended to improve the supply of potable water to residents of Central Maui. The project is not a direct generator of, nor does it create a demand for, regional recreational resources.

## 2. **Historical/Cultural 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:** There are no known or suspected historic sites to be affected by the proposed action. The project site has been extensively altered in the past by grubbing and grading activities. Archaeological monitoring parameters for the project site are set forth in the project's Archaeological Monitoring Plan. Refer to **Appendix "D"**. In addition, the Cultural Impact Assessment noted that there were no traditional native Hawaiian uses in the general project area. It is noted that should human remains be inadvertently discovered during earth moving activities, work shall cease at once in the immediate area of the find, and the find shall be protected from further disturbance. The SHPD shall also be immediately notified and procedures for the treatment of inadvertently discovered human remains shall be followed pursuant to Chapter 6E, HRS.

## 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 that are not coastal dependent to locate in inland areas.

**Response:** The proposed action is not contrary to the objectives and policies for scenic and open space resources. The subject property does not occupy a scenic viewplane corridor. In the context of surrounding Public/Quasi-Public and baseyard uses, the proposed WTF will not adversely affect the scenic and visual character of the area.

4. **Coastal Ecosystem**

**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 action is not expected to adversely impact coastal ecosystems. Appropriate erosion control measures, BMPs, will be implemented to minimize the effects of storm water runoff during construction of the project and to ensure that coastal ecosystems are not adversely impacted. The project contractor shall comply with provisions and conditions of Chapter 20.08 of the MCC and the NPDES permit.

5. **Economic Use**

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

**Policies:**

- a. Concentrate coastal dependent development in appropriate areas;
- b. Ensure that coastal dependent development such as harbors and ports, and coastal related development such as visitor facilities and energy generating facilities, are located, designed, and constructed to minimize adverse social, visual, and environmental impacts in the coastal zone management area; and
- c. Direct the location and expansion of coastal dependent developments to areas presently designated and used for such developments and permit reasonable long-term growth at such areas, and permit coastal dependent development outside of presently designated areas when:
  - (i) Use of presently designated locations is not feasible;
  - (ii) Adverse environmental effects are minimized; and
  - (iii) The development is important to the State's economy.

**Response:** The proposed project provides a facility that is important to the local economy. The proposed action is not coastal dependent and is not contrary to the objective and policies for economic use.

6. **Coastal Hazards**

**Objective:** Reduce hazard to life and property from tsunamis, storm waves, stream flooding, erosion, subsidence and pollution.

**Policies:**

- a. Develop and communicate adequate information about storm wave, tsunami, flood, erosion, subsidence, and point and nonpoint source pollution hazards;
- b. Control development in areas subject to storm wave, tsunami, flood, erosion, hurricane, wind, subsidence, and point and nonpoint pollution hazards;

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

**Response:** The project site falls within Zone C, an area of minimal flooding. Drainage improvements will be designed in accordance with the Drainage Standards of the County of Maui to ensure that the project will not adversely affect downstream and adjoining properties from the effects of flooding and erosion.

## 7. **Managing Development**

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

**Policies:**

- a. Use, implement, and enforce existing law effectively to the maximum extent possible in managing present and future coastal zone development;
- b. Facilitate timely processing of applications for development permits and resolve overlapping of conflicting permit requirements; and
- c. Communicate the potential short and long-term impacts of proposed significant coastal developments early in their life cycle and in terms understandable to the public to facilitate public participation in the planning and review process.

**Response:** This Draft EIS was prepared for public review in compliance with Chapter 343, HRS, and Chapter 200 of Title 11, Administrative Rules, Environmental Impact Statement Rules.

In addition, all aspects of development will be conducted in accordance with applicable State and County requirements.

## 8. **Public Participation**

**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, education, and participation in coastal management are provided through the Chapter 343, HRS, environmental review process.

**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 subject property is not adjacent to or in the near vicinity of the shoreline and will not impact shoreline 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:** BMP's will be incorporated during construction to control runoff in support of the policies of effective management of marine resources.

It is noted that the proposed project is located inland, approximately two (2) miles away from the nearest shoreline.

In addition to the foregoing objectives and policies, SMA permit review criteria pursuant to Act 224 (2005) provides that

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

- (1) Directly illuminates the shoreline and ocean waters; or
- (2) Is directed to travel across property boundaries toward the shoreline and ocean waters.

**Response:** The proposed project is not located on or near the shoreline. Exterior lighting for the project will be shielded in conformance with the County's outdoor lighting ordinance.

## **H. OTHER REGULATORY REQUIREMENTS**

The proposed project will comply with applicable regulatory requirements for site work and construction, including but not limited to obtaining the necessary grubbing, grading, building, plumbing, and electrical permits.

## **IV. ALTERNATIVES TO THE PROPOSED ACTION**

## **IV. ALTERNATIVES TO THE PROPOSED ACTION**

### **A. NO ACTION ALTERNATIVE**

The “no action” alternative would see the near-term availability of potable water for the Central Maui service area remain at current levels. Without the project, impacts identified in earlier sections of this document would not occur. The "no action" alternative, however, will not address the purpose and need for the project. An additional source of water is needed to meet current and projected needs for the Central Maui region. An insufficient water supply is deemed an undesirable alternative and the "no action" option was rejected.

### **B. DEFERRED ACTION ALTERNATIVE**

A “deferred action” alternative would have similar consequences to the “no action” alternative in terms of near-term production capacity for potable water. This alternative could result in potentially higher cost of water due to increases in labor and material costs. Project-related impacts will occur at a later time under this option, and the provision of a new source will be delayed, thus delaying the achievement of the social and economic goals of the County. Accordingly, the "deferred action" option was not considered beneficial as it does not meet the purpose of the project.

### **C. ALTERNATIVE DESIGNS**

Other design alternatives were considered in the planning of the project, including alternative systems and configurations of the site. The alternative site layouts and system designs can be accommodated within the existing site footprint and are not expected to result in impacts different from the selected alternative. The proposed action was selected based on its process efficiency and operational characteristics.

The water treatment process developed for the WTF is considered a state of the art technology. Within the parameters of engineering treatment processes, alternative system components were considered. These components, for example, included variations to microfiltration systems

(i.e., non-immersed pressure-type versus immersed vacuum type). In evaluating the components of the treatment process, the design engineers examined the types of systems in place at existing DWS treatment facilities, as well as operation and maintenance requirements for system components. Based on these evaluative criteria, which support the objective of ensuring plant operations efficiency, the system and components proposed for the project are considered most appropriate. Thus, system design alternatives which detract from the goal of achieving system commonality among DWS water treatment plants were rejected.

#### **D. ALTERNATIVE WTF SITES**

Site alternatives are limited for the proposed WTF primarily due to the governing criteria relating to proximity to surface water infrastructure and availability of lands owned by the source developer, A&B Properties, Inc. The Wai`ale Reservoir represents an ideal location with respect to the foregoing project development criteria. With the Wai`ale Reservoir location, consideration was given to locating the WTF on the east (makai) side of the property, however, this location would not allow for reasonable access to the plant facility. Specifically, the existing dirt road within the property on the makai side of the reservoir traverses the reservoir spillway, and therefore, would not allow for access to the WTF should the reservoir be in an overflow condition. This makai site is also farther away from the Hopoi Chute source and the Wai`ale Storage Tank location, which would require higher infrastructure connection costs. The makai location does not present any environmental benefits over the proposed project. For these reasons, the makai location was not selected.

#### **E. ALTERNATIVE NEW SOURCE PROJECTS**

There are alternative sources of water for Central Maui being considered by the DWS in its formulation of the WUDP. These alternatives include investigation of a northward basal well development, eastward basal well development, brackish water desalinization, and conservation and recycling. The northward basal well development alternative involves the development of new basal wells in the Waihe`e and Kahakuloa aquifers together with supporting transmission and storage infrastructure. The eastward basal well development alternative encompasses development of new groundwater wells in the Haiku and/or Honopou aquifers in East Maui, together with supporting transmission and storage infrastructure needed to tie into the Central Maui System. The desalinization alternative involves desalinization processing of brackish groundwater from a Central Maui source. Finally, the conservation and recycling alternative involves maximizing recycled water use and implementation of conservation measures. Each of these alternatives are considered final candidate strategies as is the proposed project, and will

be further studied by the Department as the WUDP is finalized. Specific criteria for evaluation for alternatives analysis include, but are not limited to, efficiency, sustainability, reliability, environmental and cultural resources protection, water quality and management equity.

These options will not satisfy the objective of providing adequate water source quantity in the needed time frame.

The WUDP offers a comprehensive list of potential solutions, and the implementation of one option does not necessarily preclude implementation of another. Given the need to develop new source in a timely manner, the Wai`ale WTF project is an appropriate option for immediate consideration.

**V. SUMMARY OF  
UNAVOIDABLE IMPACTS  
AND COMMITMENT OF  
RESOURCES**



## **V. SUMMARY OF UNAVOIDABLE IMPACTS AND COMMITMENT OF RESOURCES**

The proposed action will involve the commitment of fuel, labor, funding, and material resources. The development of the proposed project would also involve a commitment of land which would preclude other land use options for the project site. The commitment of land for the proposed improvements is consistent with the existing and Community Plan land uses surrounding the subject property.

The proposed project will result in temporary construction-related impacts. Potential effects include noise-generated impacts occurring from site preparation and construction activities. In addition, there may be temporary air quality impacts associated with dust generated from construction activities, and exhaust emissions discharged by construction equipment.

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

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

The proposed action will involve the commitment of fuel, labor, funding and material resources. The development of the proposed project would also involve the commitment of land which would preclude other land use options for the project site. The commitment of land for the proposed improvements is consistent with the existing and Community Plan land uses surrounding the subject property.

As previously noted, the CWRM is currently addressing a petition to amend IIFS standards for the four (4) streams that comprise the Na Wai 'Eha (Four Waters) area. The IIFS is currently undergoing a contested case process. The contested case concerns whether any additional water from the four (4) streams, including Waihe`e Stream (which feeds the Waihe`e Ditch system and therefore the Hopoi Chute) should be retained to provide for in-stream purposes. A decision on the IIFS by the CWRM is anticipated in mid-2009.

**VII. RELATIONSHIP  
BETWEEN SHORT-TERM  
USES OF THE  
ENVIRONMENT AND THE  
MAINTENANCE AND  
ENHANCEMENT OF LONG-  
TERM PRODUCTIVITY**

## **VII. RELATIONSHIP BETWEEN SHORT-TERM USES OF THE ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY**

The subject property is undeveloped land, with the exception of the Upper and Lower Wai'ale Reservoirs. There are residential, public/quasi-public and industrial uses surrounding the project site. The existing reservoirs on the property limit the future use of the site as the reservoirs play an important role in the irrigation systems used for existing agricultural operations.

In light of the need to provide for reliable long-term water sources for the Central Maui service area and the passage of Ordinance No. 3502 by the Maui County Council, the use of the land for a WTF presents a beneficial opportunity for the community at large.

The project's anticipated short- and long-term economic benefits are expected to outweigh that from the current undeveloped use of the land at the project site. The project's estimated construction cost of onsite/offsite infrastructure, site work and building construction cost is approximately \$30 million (2008 dollars). As a result, the construction of the WTF is anticipated to inject at least \$30 million into the local economy. Further, the County of Maui will have an additional water source to supply existing and planned development in Central and South Maui.

It is unlikely that short-term use of the subject property would yield a more beneficial use considering its limitation in size and the existing reservoirs on the property which would need to be maintained. In evaluating the option of retaining the project site as undeveloped land versus the use of the project site for the WTF, which may include the community benefit of additional public facilities, the use of the site for the WTF is anticipated to result in greater long-term productivity for the region.

# **VIII. UNRESOLVED ISSUES**

## **VIII. UNRESOLVED ISSUES**

As previously noted, the Commission on Water Resource Management (CWRM) is currently addressing a petition to amend the Interim Instream Flow Standards (IIFS) for the four (4) Na Wai `Eha streams. Any withdrawal, diversion, impoundment, or consumptive use of water from the Iao, Waichu, Waihe`e, and Waikapu streams will require a CWRM water use permit. The IIFS is currently undergoing a contested case process. The contested case concerns whether any additional water from the four (4) streams including, Waihe`e Stream (which feeds the Waihe`e Ditch system and therefore the Hopoi Chute) should be retained to provide for in-stream purposes. A decision on the IIFS by the CWRM is anticipated in mid-2009.

# **IX. LIST OF PERMITS AND APPROVALS**



## **IX. LIST OF PERMITS AND APPROVALS**

The following State and County permits and approvals will be required prior to the implementation of the project.

### **State of Hawai`i**

1. NPDES Permit for Discharges of Storm Water from Construction Activities
2. NPDES Permit New Sources and New Discharges Application for Permit to Discharge Process Wastewater (Wai`ale Reservoirs)
3. Department of Health, Safe Drinking Water Branch, New Source Approval and Construction Plan Approval
4. Commission on Water Resource Management (CWRM) Surface Water Use Permit for Proposed New Use
5. Air Pollution Control Permit, if required, for the Emergency Diesel Generator and/or Chlorine Scrubber
6. Department of Health Emergency Planning and Community Right-to-know Act, as applicable

### **County of Maui**

1. Construction Permits (e.g., grubbing, grading, building, electrical, plumbing)
2. Combustible Liquid Storage Tank Permit from Maui Fire Department
3. Hazardous Materials Permit from the Maui Fire Department
4. Maui County Council approval of Water Development Agreement

**X. INITIAL EARLY  
CONSULTATION  
COMMENTS**

# X. INITIAL EARLY CONSULTATION COMMENTS

An initial request for early comments was sent to agencies and organizations at the outset of project planning in January 2005. This section incorporates the list of agencies receiving the initial request for early comments, comments received, and letter responses provided to substantive comments.

- |  |  |
|--|--|
| 1. Ranae Ganske-Cerizo, Acting District Conservationist<br><b>Natural Resources Conservation Service</b><br><b>U.S. Department of Agriculture</b><br>210 Imi Kala Street, Suite 209<br>Wailuku, Hawai'i 96793-2100 | 6. Peter Young<br>State of Hawai'i<br><b>Department of Land and Natural Resources</b><br>P. O. Box 621<br>Honolulu, Hawai'i 96809  |
| 2. George Young<br>Chief, Regulatory Branch<br><b>U.S. Department of the Army</b><br>U.S. Army Engineer District, Honolulu<br>Building 230<br>Fort Shafter, Hawai'i 96858-5440                                     | 7. Melanie Chinen, Administrator<br>State of Hawai'i<br><b>Department of Land and Natural Resources</b><br><b>State Historic Preservation Division</b><br>601 Kamokila Blvd., Room 555<br>Kapolei, Hawai'i 96707 |
| 3. Robert P. Smith<br>Pacific Islands Manager<br><b>U. S. Fish and Wildlife Service</b><br>300 Ala Moana Blvd.<br>Rm. 3-122, Box 50088<br>Honolulu, Hawai'i 96813  | 8. Rodney Haraga, Director<br>State of Hawai'i<br><b>Department of Transportation</b><br>869 Punchbowl Street<br>Honolulu, Hawai'i 96813   |
| 4. Chiyome L. Fukino, M.D., Director<br>State of Hawai'i<br><b>Department of Health</b><br>P. O. Box 3378<br>Honolulu, Hawai'i 96814   | 9. Ferdinand Cajigal, Maui District Engineer<br>State of Hawai'i<br><b>Department of Transportation</b><br><b>Highways Division</b><br>650 Palapala Drive<br>Kahului, Hawai'i 96732                              |
| 5. Herbert Matsubayashi<br>District Environmental Health<br>Program Chief<br>State of Hawai'i<br><b>Department of Health</b><br>54 High Street<br>Wailuku, Hawai'i 96793   | 10. Clyde Namu'o, Administrator<br><b>Office of Hawaiian Affairs</b><br>711 Kapiolani Boulevard, Suite 500<br>Honolulu, Hawai'i 96813  |
|  | 11. Carl Kaupalolo, Chief<br>County of Maui<br><b>Department of Fire and Public Safety</b><br>200 Dairy Road<br>Kahului, Hawai'i 96732   |

12. Michael W. Foley, Director  
County of Maui  
**Department of Planning**  
250 South High Street  
Wailuku, Hawai'i 96793
13. Glenn Correa, Director  
County of Maui  
**Department of Parks and Recreation**  
1580-C Kaahumanu Avenue  
Wailuku, Hawai'i 96793
15. Gilbert Coloma-Agaran, Director  
County of Maui  
**Department of Public Works and  
Environmental Management**  
200 South High Street  
Wailuku, Hawai'i 96793
16. Thomas Phillips, Chief  
County of Maui  
**Police Department**  
55 Mahalani Street  
Wailuku, Hawai'i 96793
17. George Tengan, Director  
County of Maui  
**Department of Water Supply**  
200 South High Street  
Wailuku, Hawai'i 96793
18. Kyle Ginoza, Director  
County of Maui  
**Department of Transportation**  
200 South High Street  
Wailuku, Hawai'i 96793
19. Jimmy Lawrence  
**Kahului Town Association**  
117 West Papa Avenue  
Kahului, Hawai'i 96732
20. Ed Reinhardt  
**Maui Electric Company, Inc.**  
P. O. Box 398  
Kahului, Hawai'i 96733
21. **Maui Lani Community Association**  
c/o Barbara Kojima, Property Manager  
P. O. Box 1642  
Kahului, Hawai'i 96733



DEPARTMENT OF THE ARMY  
U. S. ARMY ENGINEER DISTRICT, HONOLULU  
FT. SHAFTER, HAWAII 96858-5440

REPLY TO  
ATTENTION OF

February 7, 2005

Regulatory Branch

Mr. Daren Suzuki  
Project Planner  
Munekiyo & Hiraga, Inc.  
305 High Street, Suite 104  
Wailuku, HI 96793

Dear Mr. Suzuki:

This responds to a request for a pre-assessment consultation prior to preparing a draft Environmental Assessment (dEA) which will address activities and impacts of the proposed Wailuku Water Treatment Facility, Wailuku, Maui Island (TMK (2) 3-8-046: por. 20).

The dEA should indicate that no waters of the United States, as represented by the presence of perennial or intermittent streams and wetlands, are in, or adjacent to, the proposed project area. The dEA should state in appropriate sections that the source waters for the Waiale reservoirs are provided by diversions of water from Waihee Ditch via the Hopoi Chute and Waiehu Stream, South Fork **AND** that there is no existing surface connection for the drainage of Waiale reservoir waters back into waters that are tributary to the Pacific Ocean. When the dEA addresses this information, it can be determined, upon receipt of the dEA, that a Department of Army (DA) permit for Section 404 activities of the Clean Water Act will not be required for the proposed water treatment improvements at this location in Wailuku.

Thank you for your consideration of potential impacts to the aquatic environment of the Iao and Waihee watersheds. Please contact Mr. Farley Watanabe of my staff at 808-438-7701, or facsimile 808-438-4060, if you have any questions or need additional information. Please refer to File Number **POH-2005-33** in any future correspondence regarding this project.

Sincerely,

A handwritten signature in black ink, appearing to read "George P. Young".

George P. Young, P.E.  
Chief, Regulatory Branch

April 4, 2005

George Young, Chief  
**Department of the Army**  
Regulatory Branch  
U. S. Army Engineer District, Honolulu  
Building 230  
Ft. Shafter, Hawaii 96858

**SUBJECT: Proposed Waiale Reservoir Water Treatment Facility, Wailuku, Maui,  
TMK (2) 3-8-046:020**

Dear Chief Young:

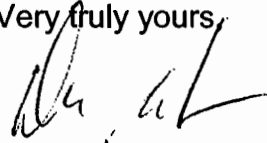
Thank you for your letter of February 7, 2005, responding to our request for early consultation comments for the proposed water treatment facility at TMK (2) 3-8-046:020, Wailuku, Maui. In response to your comments, we note the following:

1. The Draft Environmental Assessment (EA) will indicate that no waters of the United States, including perennial or intermittent streams or wetlands, are in or adjacent to the proposed project.
2. The Draft EA will also note the source waters for the Waiale Reservoir and that there is no surface connection for the drainage of reservoir waters into the Pacific Ocean, directly or indirectly.
3. We acknowledge that the above information will allow the Department of the Army to make a determination regarding permitting under Section 404 of the Clean Water Act.

George Young, Chief  
April 4, 2005  
Page 2

Thank you again for providing your input to the proposed action. A copy of the Draft Environmental Assessment will be provided to your office for review and comment.

Very truly yours,



Daren Suzuki, Planner

DS:yp

cc: Ivan Nakatsuka, Austin, Tsutsumi & Associates, Inc.

Atalwaialewf ealdpwem.res

JAN 27 2005

LINDA LINGLE  
GOVERNOR OF HAWAII



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

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

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

January 25, 2005

Mr. Daren Suzuki, Planner  
Munekiyo & Hiraga, Inc.  
305 High Street, Suite 104  
Wailuku, Hawai'i 96793

Dear Mr. Suzuki:

Subject: **Proposed Water Treatment Facility**  
**TMK: (2) 3-8-046: 020**

Thank you for the opportunity to participate in the early consultation process for the environmental assessment. The following comments are offered:

1. The treated surface water produced by the water treatment facility will supplement the sources that supply the Department of Water Supply's Wailuku Water System. Review and approval of the construction plans by the Safe Drinking Water Branch of the Department of Health is required.
2. 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.
3. The noise created during the construction phase of the project may exceed the maximum allowable levels as set forth in Hawaii Administrative Rules, Chapter 11-46, "Community Noise Control". A noise permit may be required and should be obtained before the commencement of work.

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

Sincerely,

A handwritten signature in black ink, appearing to read "H. Matsubayashi", enclosed in a hand-drawn oval.

Herbert S. Matsubayashi  
District Environmental Health Program Chief

c: SDWB  
CWB





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

April 4, 2005

Herbert Matsubayashi  
State of Hawaii  
Department of Health  
**Maui District Health Office**  
54 High Street  
Wailuku, Hawaii 96793

**SUBJECT: Proposed Waiale Reservoir Water Treatment Facility, Wailuku, Maui,  
TMK (2) 3-8-046:020**

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Dear Mr. Matsubayashi:

Thank you for your letter of January 31, 2005, responding to our request for early consultation comments for the proposed water treatment facility at TMK (2) 3-8-046:020, Wailuku, Maui. In response to your comments, we note the following:

1. Coordination will be undertaken with the Department of Health's Safe Drinking Water Branch for appropriate review and approval of the proposed project.
2. We acknowledge your comments regarding National Pollutant Discharge Elimination System (NPDES) permits. Appropriate permitting will be sought for the proposed project.
3. We acknowledge that a noise permit may be required for the proposed action. The applicant shall comply with all applicable requirements of Chapter 11-46, Hawaii Administrative Rules.

Thank you again for providing your input to the proposed action. A copy of the Draft Environmental Assessment will be provided to your office for review and comment.

Very truly yours,

Daren Suzuki, Planner

DS:yp

cc: Ivan Nakatsuka, Austin, Tsutsumi & Associates, Inc.

Atalwalalewtf ea\meco.res

LINDA LINGLE  
GOVERNOR



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

FEB 09 2005

RODNEY K. HARAGA  
DIRECTOR

Deputy Directors  
BRUCE Y. MATSUI  
BARRY FUKUNAGA  
BRENNON T. MORIOKA  
BRIAN H. SEKIGUCHI

IN REPLY REFER TO:

STP 8.1570

January 31, 2005

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

Dear Mr. Suzuki:

Subject: Proposed Water Treatment Facility, Waiale Reservoir, Wailuku, Maui

In reply to your request for our review of the subject proposed project to construct a water treatment facility, this is to advise you that the facility will not have an impact on our State transportation facilities.

We appreciate the courtesy of your advance consultation notice and the opportunity to provide our comments.

Very truly yours,

A handwritten signature in black ink, appearing to read "Rodney K. Haraga", written over a horizontal line.

RODNEY K. HARAGA  
Director of Transportation



**STATE OF HAWAII**  
**OFFICE OF HAWAIIAN AFFAIRS**  
711 KAPI'OLANI BOULEVARD, SUITE 500  
HONOLULU, HAWAII 96813

HRD05/1702

January 25, 2005

Munekiyo & Hiraga, Inc.  
Attention: Daren Suzuki, Planner  
305 High Street, Suite 104  
Wailuku, HI 96793

**RE: Request for Pre-Consultation for a Proposed Water Treatment Facility, Wailuku, Maui, TMK: 3-8-046:020**

Dear Daren Suzuki,

The Office of Hawaiian Affairs (OHA) is in receipt of your January 11, 2005, request for comments on the above project, which would include the development of a surface water treatment facility to provide a supplement to domestic water supply from Iao and Waihee aquifers. OHA has no comments at this time, but looks forward to reviewing your forthcoming Draft Environmental Assessment.

Thank you for the opportunity to comment. If you have further questions, please contact Heidi Guth at 594-1962 or e-mail her at [heidig@oha.org](mailto:heidig@oha.org).

Sincerely,

A handwritten signature in black ink, appearing to read "Clyde W. Nāmu'o".

Clyde W. Nāmu'o  
Administrator

JUN 24 2005

LINDA LINGLE  
GOVERNOR OF HAWAII



STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES  
STATE HISTORIC PRESERVATION DIVISION  
601 KAMOKILA BOULEVARD, ROOM 555  
KAPOLEI, HAWAII 96707

PETER T. YOUNG  
CHAIRPERSON  
BOARD OF LAND AND NATURAL RESOURCES  
COMMISSION ON WATER RESOURCE MANAGEMENT  
ROBERT K. MASUDA  
DEPUTY DIRECTOR - LAND  
DEAN NAKANO  
ACTING DEPUTY DIRECTOR - WATER  
AQUATIC RESOURCES  
BOATING AND OCEAN RECREATION  
BUREAU OF CONVEYANCES  
COMMISSION ON WATER RESOURCE MANAGEMENT  
CONSERVATION AND COASTAL LANDS  
CONSERVATION AND RESOURCES ENFORCEMENT  
ENGINEERING  
FORESTRY AND WILDLIFE  
HISTORIC PRESERVATION  
KAHOOLAWE ISLAND RESERVE COMMISSION  
LAND  
STATE PARKS

June 20, 2005

Mr. Darren Suzuki  
Munekiyo & Hiraga, Inc.  
305 South High Street, Suite 104  
Wailuku, Hawaii 96793

LOG NO: 2005.1225  
DOC NO: 0506CD25

Dear Mr. Suzuki:

**SUBJECT: Chapter 6E-8 Historic Preservation Review – Early Consultation for a Proposed Water Treatment Facility  
Wailuku Ahupua`a, Wailuku District, Island of Maui  
TMK: (2) 3-8-046:020**

Thank you for the opportunity to provide comments for the Early Consultation for a Proposed Water Treatment Facility, which was received by our staff on January 14, 2005. Our review is based on reports, maps, and aerial photographs maintained at the State Historic Preservation Division; no field inspection was conducted of the subject property.

Based on the submitted document, we understand the proposed undertaking consists of the development of a water treatment facility (WTF) to be located within the property of the Waiale Reservoir in Wailuku. We understand an Environmental Impact Statement will be prepared for the proposed project in accordance with the Hawaii Revised Statutes, Chapter 343 and Chapter 200 of Title 11, Department of Health Administrative Rules, Environmental Impact Statement Rules. We look forward to reviewing this document.

A search of our records indicates an archaeological inventory survey has not been conducted of the subject property. This area in general is likely to have once been the location of pre-contact farming, perhaps with scattered houses. The USDA Soil Survey indicates the subject property is located in the Pu'uone Sand Dune Deposit, which is known to contain both isolated and clustered human burials. Numerous burials have been recovered from the near-by Maui Lani development. Our records indicate a burial site (SIHP 50-50-04-2916, which represents a minimum of two individuals) on a property immediately to the west of this property. Our records also indicate the Waiale Reservoir was constructed over 50 years ago, thus it is considered to be an historic property and must be treated accordingly. Given the above information, we believe it is likely historic sites may be present on the subject property.

Darren Suzuki  
Page 2

Therefore, in order to determine the effect of the proposed undertaking on historic sites, we recommend that no action be taken on the subject permit application until an archaeological inventory survey has been conducted of the subject property to determine whether significant historic sites are present. An acceptable report documenting the findings of the survey will need to be submitted to this office for review. If significant historic sites are identified, a mitigation plan may need to be developed, in consultation with this office, and executed.

If you have any questions, please call Cathleen A. Dagher at 692-8023.

Aloha,

  
Melanie Chinen, Administrator  
State Historic Preservation Division

CD:jen

FEB 03 2005

LINDA LINGLE  
GOVERNOR OF HAWAII



PETER T. YOUNG  
CHAIRPERSON  
BOARD OF LAND AND NATURAL RESOURCES  
COMMISSION ON WATER RESOURCE MANAGEMENT

YVONNE Y. IZU  
DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES  
BOATING AND OCEAN RECREATION  
BUREAU OF CONVEYANCES  
COMMISSION ON WATER RESOURCE MANAGEMENT  
CONSERVATION AND COASTAL LANDS  
CONSERVATION AND RESOURCES ENFORCEMENT  
ENGINEERING  
FORESTRY AND WILDLIFE  
HISTORIC PRESERVATION  
KAHOOLAWE ISLAND RESERVE COMMISSION  
LAND  
STATE PARKS



STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES  
LAND DIVISION

POST OFFICE BOX 621  
HONOLULU, HAWAII 96809

February 1, 2005  
LD-NAV

RESERVOIRWAILUKU.RCM

Munekiyo and Hiraga, Inc.  
Daren Suzuki, Planner  
305 High Street, Suite 104  
Wailuku, Hawaii 96793

Dear Mr. Suzuki:

Subject: Pre-Assessment Consultation for Preparation of a Draft Environmental  
Assessment for Proposed Water Treatment Facility, Wailuku, Maui, Hawaii

Thank you for the opportunity to review and comment on the subject matter.

The Department of Land and Natural Resources' (DLNR) Land Division distributed a copy of your letter and maps dated January 11, 2005 pertaining to the subject matter to the following DLNR Divisions for their review and comment:

- Division of Forestry and Wildlife
- Engineering Division
- Commission on Water Resource Management
- Office of Conservation and Coastal Lands
- Land-Maui District Land Office
- Land-Planning and Development

Enclosed please find a copy of the Engineering Division comment and Maui District Land Office and State Parks response.

The Department of Land and Natural Resources has no other comment to offer on the subject matter. If you have any questions, please feel free to contact Nicholas A. Vaccaro of the Land Division Support Services Branch at 1-808-587-0384.

Very truly yours,

A handwritten signature in black ink, appearing to read "Warren Wegesend".

WARREN WEGESEND  
Administrator

C: MDLO

LINDA LINGLE  
GOVERNOR OF HAWAII



PETER T. YOUNG  
CHAIRPERSON  
BOARD OF LAND AND NATURAL RESOURCES  
COMMISSION ON WATER RESOURCE MANAGEMENT

YVONNE Y. IZU  
DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES  
BOATING AND OCEAN RECREATION  
BUREAU OF CONVEYANCES  
COMMISSION ON WATER RESOURCE MANAGEMENT  
CONSERVATION AND COASTAL LANDS  
CONSERVATION AND RESOURCES ENFORCEMENT  
ENGINEERING  
FORESTRY AND WILDLIFE  
HISTORIC PRESERVATION  
KAHOOLAWE ISLAND RESERVE COMMISSION  
LAND  
STATE PARKS



RECEIVED  
LAND DIVISION

2005 JAN 26 P 3: 20

STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES  
LAND DIVISION  
POST OFFICE BOX 621  
HONOLULU, HAWAII 96809

January 21, 2005  
LD/NAV  
MUNEKIYO&HIRAGA

RESERVOIRWAILUKU.CMT  
Suspense Date: 1/27/05

MEMORANDUM:

TO: XXX Division of Forestry and Wildlife  
✓XXX Engineering Division  
XXX Land-Maui District Land Office  
XXX Land-Planning and Development  
XXX Office of Conservation and Coastal Lands  
XXX Commission on Water Resource Management

FROM: Dierdre S. Mamiya, Administrator  
Land Division

SUBJECT: Pre-Assessment Consultation for Draft Environmental Assessment for Proposed Water Treatment Facility, Wailuku, Maui, Hawaii  
Applicant: A&B Wailea, LLC  
Location: Wailuku, Island of Maui, Hawaii  
Consultant: Munekiyo & Hiraga, Inc. (808-244-2015)  
TMK: 2<sup>nd</sup>/ 3-8-046: 020

Please review the attached letter dated January 11, 2005 (general overview of project) and maps pertaining to the subject matter and submit your comment (if any) on Division letterhead signed and dated by the suspense date.

Should you have any questions, please contact Nicholas A. Vaccaro at ext.: 7-0384. If this office does not receive your comments by the suspense date, we will assume there are no comments.

( ) We have no comments.

Comments attached.  
Signed: *Eric T. Hirano*

Division: Engineering

Print Name: for ERIC T. HIRANO, CHIEF ENGINEER

Date: 1/25/05

05 JAN 21 PM 02:32 ENGINEERING

**DEPARTMENT OF LAND AND NATURAL RESOURCES  
ENGINEERING DIVISION**

**REF.: RESERVOIRWAILUKU.CMT  
Maui. 390**

**COMMENTS**

- We confirm that the project site, according to the Flood Insurance Rate Map (FIRM), is located in Zone, area determined to be outside the 500-year flood plain. The Flood Insurance Program does not have any regulations for development within Zone X.
- Please take note that the project site, according to the Flood Insurance Rate Map (FIRM), are located in Zone C. The Flood Insurance Program does not have any regulations for development within Zone C**
- Please note that the correct Flood Zone Designation for the project site according to the Flood Insurance Rate Map (FIRM) is \_\_\_\_.
- Please note that the project must comply with the rules and regulations of the National Flood Insurance Program (NFIP) presented in Title 44 of the Code of Federal Regulations (44CFR), whenever development within a Special Flood Hazard Area is undertaken. If there are any questions, please contact the State NFIP Coordinator, Ms. Carol Tyau-Beam, of the Department of Land and Natural Resources, Engineering Division at (808) 587-0267.

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

- Mr. Robert Sumimoto at (808) 523-4254 or Mr. Mario Siu Li at (808) 523-4247 of the City and County of Honolulu, Department of Planning and Permitting.
- Mr. Kelly Gomes at (808) 961-8327 (Hilo) or Mr. Kiran Emler at (808) 327-3530 (Kona) of the County of Hawaii, Department of Public Works.
- Mr. Francis Cerizo at (808) 270-7771 of the County of Maui, Department of Planning.
- Mr. Mario Antonio at (808) 241-6620 of the County of Kauai, Department of Public Works.
  
- The applicant should include project water demands and infrastructure required to meet water demands. Please note that the implementation of any State-sponsored projects requiring water service from the Honolulu Board of Water Supply system must first obtain water allocation credits from the Engineering Division before it can receive a building permit and/or water meter.
- The applicant should provide the water demands and calculations to the Engineering Division so it can be included in the State Water Projects Plan Update.
  
- Additional Comments: \_\_\_\_\_  
\_\_\_\_\_
  
- Other: \_\_\_\_\_  
\_\_\_\_\_

Should you have any questions, please call Mr. Andrew Monden of the Planning Branch at 587-0229.

Signed: Eric T. Hirano  
for ERIC T. HIRANO, CHIEF ENGINEER  
Date: 1/25/05



LINDA LINGLE  
GOVERNOR OF HAWAII



PETER T. YOUNG  
CHAIRPERSON  
BOARD OF LAND AND NATURAL RESOURCES  
COMMISSION ON WATER RESOURCE MANAGEMENT

YVONNE Y. IZU  
DEPUTY DIRECTOR - WATER



RECEIVED  
LAND DIVISION

2005 JAN 24 A 10:50

STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES  
LAND DIVISION  
DEPT. OF LAND & NATURAL RESOURCES  
STATE OF HAWAII  
POST OFFICE BOX 621  
HONOLULU, HAWAII 96809

AQUATIC RESOURCES  
BOATING AND OCEAN RECREATION  
BUREAU OF CONVEYANCES  
COMMISSION ON WATER RESOURCE MANAGEMENT  
CONSERVATION AND COASTAL LANDS  
CONSERVATION AND RESOURCES ENFORCEMENT  
ENGINEERING  
FORESTRY AND WILDLIFE  
HISTORIC PRESERVATION  
KAHOOLAWE ISLAND RESERVE COMMISSION  
LAND  
STATE PARKS

January 21, 2005  
LD/NAV  
MUNEKIYO&HIRAGA

RESERVOIRWAILUKU.CMT  
Suspense Date: 1/27/05

MEMORANDUM:

TO: XXX Division of Forestry and Wildlife  
XXX Engineering Division  
✓ XXX Land-Maui District Land Office  
XXX Land-Planning and Development  
XXX Office of Conservation and Coastal Lands  
XXX Commission on Water Resource Management

FROM: Dierdre S. Mamiya, Administrator *[Signature]*  
Land Division

SUBJECT: Pre-Assessment Consultation for Draft Environmental  
Assessment for Proposed Water Treatment Facility,  
Wailuku, Maui, Hawaii  
Applicant: A&B Wailea, LLC  
Location: Wailuku, Island of Maui, Hawaii  
Consultant: Munekiyo & Hiraga, Inc. (808-244-2015)  
TMK: 2<sup>nd</sup>/ 3-8-046: 020

Please review the attached letter dated January 11, 2005 (general overview of project) and maps pertaining to the subject matter and submit your comment (if any) on Division letterhead signed and dated by the suspense date.

Should you have any questions, please contact Nicholas A. Vaccaro at ext.: 7-0384. If this office does not receive your comments by the suspense date, we will assume there are no comments.

We have no comments.

Comments attached.

Division: Land

Signed: \_\_\_\_\_

Date: 1/21/05

Print Name: \_\_\_\_\_

*Chanelle E. Urdaci*

#1532

LINDA LINGLE  
GOVERNOR OF HAWAII



RECEIVED  
LAND DIVISION

2005 JAN 25 P 3:17

STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES  
LAND DIVISION  
POST OFFICE BOX 621  
HONOLULU, HAWAII 96809

PETER T. YOUNG  
CHAIRPERSON  
BOARD OF LAND AND NATURAL RESOURCES  
COMMISSION ON WATER RESOURCE MANAGEMENT

YVONNE Y. IZU  
DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES  
BOATING AND OCEAN RECREATION  
BUREAU OF CONVEYANCES  
COMMISSION ON WATER RESOURCE MANAGEMENT  
CONSERVATION AND COASTAL LANDS  
CONSERVATION AND RESOURCES ENFORCEMENT  
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KAHOOLAWE ISLAND RESERVE COMMISSION  
LAND  
STATE PARKS



January 21, 2005  
LD/NAV  
MUNEKIYO&HIRAGA

RESERVOIRWAILUKU.CMT  
Suspense Date: 1/27/05

MEMORANDUM:

TO:  XXX Division of Forestry and Wildlife  
XXX Engineering Division  
XXX Land-Maui District Land Office  
XXX Land-Planning and Development  
XXX Office of Conservation and Coastal Lands  
XXX Commission on Water Resource Management

FROM: Dierdre S. Mamiya, Administrator *[Signature]*  
Land Division

SUBJECT: Pre-Assessment Consultation for Draft Environmental  
Assessment for Proposed Water Treatment Facility,  
Wailuku, Maui, Hawaii  
Applicant: A&B Wailea, LLC  
Location: Wailuku, Island of Maui, Hawaii  
Consultant: Munekiyo & Hiraga, Inc. (808-244-2015)  
TMK: 2<sup>nd</sup>/ 3-8-046: 020

Please review the attached letter dated January 11, 2005  
(general overview of project) and maps pertaining to the subject  
matter and submit your comment (if any) on Division letterhead  
signed and dated by the suspense date.

Should you have any questions, please contact Nicholas A.  
Vaccaro at ext.: 7-0384. If this office does not receive your  
comments by the suspense date, we will assume there are no  
comments.

We have no comments.

Comments attached.

Division: \_\_\_\_\_

Signed: *Paul J Conry*

Date: JAN 24 2005

Print Name: **PAUL J. CONRY, ADMINISTRATOR**  
**DIVISION OF FORESTRY AND WILDLIFE**

FEB 16 2005

LINDA LINGLE  
GOVERNOR OF HAWAII



PETER T. YOUNG  
CHAIRPERSON  
BOARD OF LAND AND NATURAL RESOURCES  
COMMISSION ON WATER RESOURCE MANAGEMENT

YVONNE Y. IZU  
DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES  
BOATING AND OCEAN RECREATION  
BUREAU OF CONVEYANCES  
COMMISSION ON WATER RESOURCE MANAGEMENT  
CONSERVATION AND COASTAL LANDS  
CONSERVATION AND RESOURCES ENFORCEMENT  
ENGINEERING  
FORESTRY AND WILDLIFE  
HISTORIC PRESERVATION  
KAHOOLAWE ISLAND RESERVE COMMISSION  
LAND  
STATE PARKS



STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES  
LAND DIVISION

POST OFFICE BOX 621  
HONOLULU, HAWAII 96809

February 14, 2005

LD-NAV  
RESERVIORWAILUKUHIRAGE.RCM

Munekiyo and Hiraga, Inc.  
Daren Suzuki, Planner  
305 High Street, Suite 104  
Wailuku, Hawaii 96793

Dear Mr. Suzuki:

SUBJECT: Pre-Assessment Consultation for Preparation of A Draft Environmental Assessment for the Proposed Water Treatment Facility, Wailuku, Island of Maui, Hawaii

Thank you for the opportunity to review and comment on the subject matter.

The Department of Land and Natural Resources' (DLNR) Land Division distributed a copy of your letter dated January 11, 2005 and maps pertaining to the subject matter to the following DLNR Divisions for their review and comment:

- Division of Forestry and Wildlife
- Engineering Division
- Commission on Water Resource Management
- Office of Conservation and Coastal Lands
- Land-Maui District Land Office
- Land-Planning and Development

Enclosed please find a copy of the Commission on Water Resource Management's response.

The Department of Land and Natural Resources has no other comment to offer on the subject matter at this time.

If you have any questions, please feel free to contact Nicholas A. Vaccaro of the Land Division Support Services Branch at 1-808-587-0384.

Very truly yours,

A handwritten signature in black ink, appearing to read "Warren F. WegeSend Jr.".

WARREN F. WEGESEND JR.  
Administrator

C: MDLO

LINDA LINGLE  
GOVERNOR OF HAWAII



PETER T. YOUNG  
CHAIRPERSON  
BOARD OF LAND AND NATURAL RESOURCES  
COMMISSION ON WATER RESOURCE MANAGEMENT

YVONNE Y. IZU  
DEPUTY DIRECTOR - WATER



RECEIVED

JAN 21 P2:44

2005 FEB -7 A 10:45

STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES  
LAND DIVISION

POST OFFICE BOX 621  
HONOLULU, HAWAII 96809

AQUATIC RESOURCES  
BOATING AND OCEAN RECREATION  
BUREAU OF CONVEYANCES  
COMMISSION ON WATER RESOURCE MANAGEMENT  
CONSERVATION AND COASTAL LANDS  
CONSERVATION AND RESOURCES ENFORCEMENT  
ENGINEERING  
FORESTRY AND WILDLIFE  
HISTORIC PRESERVATION  
KAHOOLAWE ISLAND RESERVE COMMISSION  
LAND  
STATE PARKS

COMMISSION ON WATER  
RESOURCE MANAGEMENT

January 21, 2005  
LD/NAV  
MUNEKIYO&HIRAGA

RESERVOIRWAILUKU.CMT  
Suspense Date: 1/27/05

MEMORANDUM:

TO: ~~XXX Division of Forestry and Wildlife~~  
~~XXX Engineering Division~~  
~~XXX Land-Maui District Land Office~~  
~~XXX Land-Planning and Development~~  
FR: ~~XXX Office of Conservation and Coastal Lands~~  
~~XXX Commission on Water Resource Management~~

TO: FROM: Dierdre S. Mamiya, Administrator  
Land Division

SUBJECT: Pre-Assessment Consultation for Draft Environmental  
Assessment for Proposed Water Treatment Facility,  
Wailuku, Maui, Hawaii  
Applicant: A&B Wailea, LLC  
Location: Wailuku, Island of Maui, Hawaii  
Consultant: Munekiyo & Hiraga, Inc. (808-244-2015)  
TMK: 2<sup>nd</sup>/ 3-8-046: 020

Please review the attached letter dated January 11, 2005  
(general overview of project) and maps pertaining to the subject  
matter and submit your comment (if any) on Division letterhead  
signed and dated by the suspense date.

Should you have any questions, please contact Nicholas A.  
Vaccaro at ext.: 7-0384. If this office does not receive your  
comments by the suspense date, we will assume there are no  
comments.

( ) We have no comments.

(✓) Comments attached.

Division: \_\_\_\_\_

Signed:

Date: \_\_\_\_\_

Print Name: YVONNE Y. IZU

(Letter dated 2/7/05 mailed to: D. Suzuki @  
Munekiyo & Hiraga, Inc.)

LINDA LINGLE  
GOVERNOR OF HAWAII



PETER T. YOUNG  
CHAIRPERSON  
MEREDITH J. CHING  
CLAYTON W. DELA CRUZ  
JAMES A. FRAZIER  
CHIYOME L. FUKINO, M.D.  
LAWRENCE H. MIIKE, M.D., J.D.  
STEPHANIE A. WHALEN

YVONNE Y. IZU  
DEPUTY DIRECTOR

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

February 7, 2005

Mr. Daren Suzuki, Planner  
Munekiyo & Hiraga, Inc.  
305 High Street, Suite 104  
Wailuku, HI 96793

Dear Mr. Suzuki:

Waiale Water Treatment Facility Draft EA

Thank you for the opportunity to review the subject document. Our comments related to water resources are marked below.

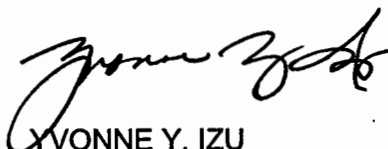
In general, the CWRM strongly promotes the efficient use of our water resources through conservation measures and use of alternative non-potable water resources whenever available, feasible, and there are no harmful effects to the ecosystem. Also, the CWRM encourages the protection of water recharge areas, which are important for the maintenance of streams and the replenishment of aquifers.

- We recommend coordination with the county government to incorporate this project into the county's Water Use and Development Plan.
- 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.
- We are concerned about 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.
- A Well Construction Permit and/or a Pump Installation Permit from the Commission would be required before ground water is developed as a source of supply for the project.
- The proposed water supply source for the project is located in a designated water management area, and a Water Use Permit from the Commission would be required prior to use of this source.
- Groundwater withdrawals from this project may affect streamflows, which may require an instream flow standard amendment.

- [ ] We are concerned about the potential for degradation of instream uses from development on highly erodible slopes adjacent to streams within or near the project. We recommend that approvals for this project be conditioned upon a review by the corresponding county's Building Department and the developer's acceptance of any resulting requirements related to erosion control.
- [ x ] If the proposed project includes construction of a stream diversion, the project may require a stream diversion works permit and amend the instream flow standard for the affected stream(s).
- [ ] If the proposed project alters the bed and banks of a stream channel, the project may require a stream channel alteration permit.
- [ x ] OTHER: We have no objections to the proposed use of treated surface water as a source for domestic water supply. However, the source of this water is Waihee Stream, and diversions therefrom are subject to a pending petition to restore stream flow. In addition, the irrigation ditch system is also subject to a separate petition to cease alleged waste of the resource. Accordingly, the Applicant and the County of Maui, Department of Water Supply, should be advised that long-term reliance upon water from Waihee Stream as a source for the surface water treatment facility shall be subject to the resolution of these pending petitions and the determination of Instream Flow Standards.

If there are any questions, please contact Charley Ice at (808) 587-0251 or toll-free at 984-2400, extension 70251.

Sincerely,



YVONNE Y. IZU  
Deputy Director



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

April 4, 2005

Warren Wegesend Jr., Administrator  
State of Hawaii  
**Department of Land and Natural Resources**  
Land Division  
Post Office Box 621  
Honolulu, Hawaii 96809

**SUBJECT: Proposed Waiale Reservoir Water Treatment Facility, Wailuku, Maui,  
TMK (2) 3-8-046:020**

---

Dear Mr. Wegesend:

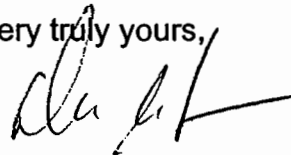
Thank you for your letters of February 1 and February 14, 2005, responding to our request for early consultation comments for the proposed water treatment facility at TMK (2) 3-8-046:020, Wailuku, Maui. In response to your comments, we note the following:

1. We acknowledge your confirmation that the subject property is located on lands designated as Flood Zone "C" and are without developmental regulations.
2. Coordination has been undertaken with the County of Maui, as the proposed facility will be dedicated to the County upon its completion.
3. Coordination will be undertaken with the Department of Health's Safe Drinking Water Branch for appropriate review and approval of the proposed project.
4. There are no plans for any stream diversions in the project at present. Should such elements be included, the proper permitting will be obtained for the proposed action.
5. We acknowledge your comments regarding the pending legal actions concerned with the Waihee Stream and the irrigation ditch system and the impacts that such could have on the proposed project.

Warren Wegesend Jr., Administrator  
April 4, 2005  
Page 2

Thank you again for providing your input to the proposed action. A copy of the Draft Environmental Assessment will be provided to your office for review and comment.

Very truly yours,



Daren Suzuki, Planner

DS:yp

cc: Ivan Nakatsuka, Austin, Tsutsumi & Associates, Inc.

Ata\waialewff ea\dlnr.res

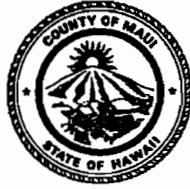


JAN 26 2005

GLENN T. CORREA  
Director

JOHN L. BUCK III  
Deputy Director

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



ALAN M. ARAKAWA  
Mayor

**DEPARTMENT OF PARKS & RECREATION**

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

January 18, 2005

Mr. Daren Suzuki, Planner  
Munekiyo & Hiraga, Inc.  
305 High Street, Suite 104  
Wailuku, Hawaii 96793

Dear Mr. Suzuki:

**SUBJECT: Pre-Consultation for a Proposed Water Treatment Facility  
TMK 3-8-046:020, Wailuku, Maui**

Thank you for the opportunity to review and comment on the proposed development of a water treatment facility within the property of the Waiale Reservoir in Wailuku, Maui, Hawaii.

We have reviewed the proposed project and have no comments to offer. Please contact me or Mr. Patrick Matsui, Chief of Parks Planning and Development at 270-7387, should you have any questions.

Sincerely,

Glenn T. Correa  
DIRECTOR

c: Patrick Matsui, Chief of Planning and Development

FEB 08 2005

ALAN M. ARAKAWA  
Mayor

RALPH NAGAMINE, L.S., P.E.  
Development Services Administration

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

TRACY TAKAMINE, P.E.  
Wastewater Reclamation Division

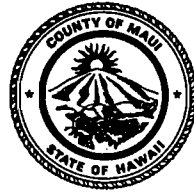
MICHAEL M. MIYAMOTO  
Deputy Director

CARY YAMASHITA, P.E.  
Engineering Division

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

BRIAN HASHIRO, P.E.  
Highways Division

Solid Waste Division



COUNTY OF MAUI  
**DEPARTMENT OF PUBLIC WORKS  
AND ENVIRONMENTAL MANAGEMENT**  
200 SOUTH HIGH STREET  
WAILUKU, MAUI, HAWAII 96793

February 1, 2005

Mr. Mich Hirano, A.I.C.P.  
MUNEKIYO & HIRAGA, INC.  
305 High Street, Suite 104  
Wailuku, Maui, Hawaii 96793

Dear Mr. Hirano:

**SUBJECT: PRE-CONSULTATION - PROPOSED WATER  
TREATMENT FACILITY WITHIN WAIALE RESERVOIR  
PROPERTY IN WAILUKU  
TMK: (2) 3-8-046:020**

We reviewed the subject application and have the following comments:

1. Address sludge disposal and construction waste disposal/recycling.
2. The access to the site has not been determined. There are several proposals, but nothing concrete. We may have concerns depending upon the selected access. For example, Alternative 3 may have significant impact to traffic congestion at the intersection of Waiinu Road and Waiale Drive.
3. Although wastewater system capacity is currently available as of January 31, 2005, the developer should be informed that wastewater system capacity cannot be ensured until the issuance of the building permit.
4. Wastewater contribution calculations are required before building permit is issued.
5. Developer shall pay assessment fees for treatment plant expansion costs in accordance with ordinance setting forth such fees.

Mr. Mich Hirano, A.I.C.P.  
February 1, 2005  
Page 2

6. Developer is required to fund any necessary off-site improvements to collection system and wastewater pump stations.
7. The project construction plans shall be reviewed and approved by our office before the building permit is issued.
8. Plans should show the installation of a service manhole near the property line prior to connection to the County sewer.
9. Non-contact cooling water, condensate, etc. should not drain to the wastewater system.
10. Indicate on the plans the ownership of each easement (in favor of which party). Note: County will not accept sewer easements that traverse private property.

If you have any questions regarding this letter, please call Michael Miyamoto at (808) 270-7845.

Sincerely,



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

MMA:MMM:da  
S:\LUCA\ZM\Prop\_Water\_Trtmt\_Fac\_Pre-Con\_38046020\_da.wpd



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

April 4, 2005

Milton Arakawa, Director  
County of Maui  
**Department of Public Works  
and Environmental Management**  
200 South High Street  
Wailuku, Hawaii 96793

**SUBJECT: Proposed Waiale Reservoir Water Treatment Facility, Wailuku, Maui,  
TMK (2) 3-8-046:020; File Number POH-2005-33**

Dear Mr. Arakawa:

Thank you for your letter of February 1, 2005, responding to our request for early consultation comments for the proposed water treatment facility at TMK (2) 3-8-046:020, Wailuku, Maui. In response to your comments, we note the following:

1. Production of waste disposal will be addressed in the Draft Environmental Assessment (EA). Construction waste management plans will be submitted to your Department during the construction permitting phase of the proposed process.
2. The access to the site and impacts on traffic will be further addressed in the Draft EA.
3. We acknowledge that wastewater capacity cannot be ensured until the issuance of the construction permits.
4. Wastewater calculation will be provided in the Draft EA.
5. We acknowledge that the applicant may be required to pay treatment plant expansion fees.
6. We acknowledge that the applicant may be required to fund necessary offsite improvements to wastewater systems.
7. We acknowledge that the project plans will be reviewed and approved prior to the issuance of construction permits.

Milton Arakawa, Director  
April 4, 2005  
Page 2

8. The plans will show the installation of a service manhole.
9. Non-contact cooling water and condensate will not drain into the wastewater system.
10. The plans submitted for construction permits will indicate the ownership of each easement.

Thank you again for providing your input to the proposed action. A copy of the Draft EA will be provided to your office for review and comment.

Very truly yours,



Daren Suzuki, Planner

DS:yp

cc: Ivan Nakatsuka, Austin, Tsutsumi & Associates, Inc.

Atalwaialewtf eatdpwem.res

JUL 24 2007

CHARMAINE TAVARES  
Mayor



JEFFREY K. ENG  
Director  
ERIC H. YAMASHIGE, P.E., L.S.  
Deputy Director

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

July 20, 2007

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

Dear Ms. Kawahara:

**Subject: DRAFT ENVIRONMENTAL ASSESSMENT FOR  
WAIALE WATER TREATMENT FACILITY**

Thank you for the opportunity to review the Draft Environmental Assessment. Attached are two copies of the (DRAFT) report with staff comments. We offer the following:

**Proposed Action:**

The EA should clarify the area or acreage of land removed from agricultural production resulting from the removal of 10 MGD of irrigation water. A reduction in irrigation may also affect aquifer recharge, and should be considered in the Water Use and Development Plan. The term "undeveloped" to describe the site of the proposed development should be further defined.

We share the Department of Health's concern of treating water from the Waiale Reservoir. The water quality from the Spreckels Ditch flowing through a developed urban area is subject to potential contamination of the reservoir.

**Alternatives to the Proposed Action:**

In light of ongoing efforts and the petition to restore stream flow to the Na Wai Eha streams, in-stream uses should be identified as alternative uses of the source water.

*"By Water All Things Find Life"*

The Department of Water Supply is an Equal Opportunity provider and employer. To file a complaint of discrimination, write: USDA, Director, Office of Civil Rights, Room 326-W, Whitten Building, 14th and Independence Avenue, SW, Washington DC 20250-9410. Or call (202) 720-5964 (voice and TDD)

24



Draft Environmental Assessment  
Waiale Water Treatment Facility  
July 20, 2007  
Page 2 of 2

**Discussion of Water Rights and Future Uses:**

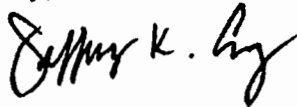
A discussion on source reliability and provisions for future expansion should be addressed. Impacts of anticipated stream flow standards of Waihee Stream, and allegations of waste from current diversions should be mentioned.

**Sludge Lagoon:**

The quantity and method of off-site sludge disposal should be discussed.

Please contact our Water Resources and Planning Division at 244-8550 if you have any questions.

Sincerely,



JEFFREY K. ENG  
Director

Attachment



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

MARK ALEXANDER ROY

September 13, 2007

Mr. Jeffrey K. Eng, Director  
Department of Water Supply  
200 South High Street  
Wailuku, Hawai'i 96793

SUBJECT: (Draft) Draft Environmental Assessment for the Proposed Waiale Water Treatment Facility

Dear Mr. Eng:

We are in receipt of your comment letter dated July 20, 2007, with regards to the (draft) Draft Environmental Assessment (Draft EA) we prepared for the subject project. On behalf of our client, A&B Properties, Inc. (Applicant), we would like to offer the following responses to your comments.

1. At this point in time, HC&S will continue its agricultural operations at its current level and does not plan to decrease the cultivation of lands. In order to maintain the level of existing agricultural cultivation, assuming no other significant changes, HC&S will employ farming methodologies related to the timing of planting and irrigation. Additionally, HC&S plans to supplement a portion of the agricultural water with brackish water from an existing well. The description of the existing lands at the proposed project site will be expanded in the Draft EA.
2. We note the Department's comments on the treatment of water from Waiale Reservoir and Spreckels Ditch. However, we would like to clarify that the proposed Waiale Water Treatment Facility (WTF) will not treat water from the Waiale Reservoir or the Spreckels Ditch. The WTF will be designed to take water directly from the Waihee Ditch via a direct intake from the Hopoi Chute.
3. We note the Department's comment regarding the in-stream use of water as an alternative use for the source of water (Waihee Ditch). It is possible that the water currently collected by the West Maui ditch system could be ordered to be alternatively used in-stream, pursuant to ongoing regulatory procedures, however, we understand that the yield of the West Maui system greatly exceeds the 10 million gallon per day (MGD) contemplated to be used by the Waiale WTF. Further, we note that domestic use of water has been recognized as a public trust use of water



Mr. Jeffrey K. Eng, Director  
September 13, 2007  
Page 2

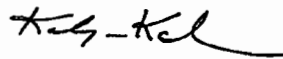
and, therefore, we believe that the WTF project will be supported. This discussion will be added to the Draft EA.

4. Regarding the Department's comment on source reliability and provisions for future expansion of the WTP, the historic flow figures for the Waihee Ditch show that the average daily yield, over the last 30 years, is well over 10 MGD. As such, the Applicant believes that the Waihee Ditch has sufficient capacity to provide water resource for the proposed WTF. Please see attached Exhibit "A". These figures further support the available capacity for the future expansion of the plant with one (1) additional filter unit.
5. Regarding the comment on the quantity of sludge and off-site sludge disposal, a further description will be provided in the Draft EA. The project's civil engineering consultant noted that the general method of disposal would be to shut down one (1) of the sludge lagoon cells for gravity settlement of the solids. When the sludge dries, via percolation and evaporation, it would be loaded into trucks and hauled to the County of Maui landfill. The estimated quantity of dried solids is approximately 15,000 gallons or 2,000 cubic feet per cell per cleaning. The frequency of cleaning is expected to vary, depending on the quality and quantity of the raw water.

We will be revising the Draft EA to incorporate the Department's comments and will resubmit the revised pages to you for review. If the pages are acceptable, then we will finalize the Draft EA and process it with the Office of Environmental Quality Control.

Should you have any questions, please do not hesitate to call me at 244-2015.

Very truly yours,



Karlynn Kawahara  
Project Manager

KK:yp  
Enclosure

cc: Meredith Ching, A&B Hawai'i (w/enclosure)  
Diane Bevilacqua, A&B Properties, Inc. (w/enclosure)  
Clyde Murashige, A&B Wailea LLC (w/enclosure)  
Ivan Nakatsuka, Austin Tsutsumi & Associates, Inc. (w/enclosure)

F:\DATA\ATA\Waialea\WTF EA\dwa.res.wpd

WAIHEE DITCH DELIVERY IN MILLION GALLONS

<u>Year</u>	<u>JAN</u>	<u>FEB</u>	<u>MAR</u>	<u>APR</u>	<u>MAY</u>	<u>JUN</u>	<u>JUL</u>	<u>AUG</u>	<u>SEP</u>	<u>OCT</u>	<u>NOV</u>	<u>DEC</u>	<u>TOTAL</u>
1994	737.72	659.32	645.53	994.64	719.23	825.71	994.31	950.84	901.50	708.68	833.17	711.42	9682.07
1995	628.65	454.48	419.98	791.48	717.37	463.01	767.67	905.20	587.49	749.61	674.13	525.29	7684.36
1996	633.94	750.00	590.77	901.63	703.75	608.48	634.86	679.10	579.31	372.46	602.37	486.24	7542.91
1997	363.92	612.93	552.92	605.04	820.81	876.24	1121.49	985.60	894.92	668.25	822.21	496.52	8820.85
1998	614.91	598.33	639.77	1063.75	1078.35	1147.16	1026.17	869.02	914.38	1145.96	955.67	711.10	10764.57
1999	654.82	620.40	717.00	674.90	546.22	468.98	642.35	671.28	485.61	497.98	508.80	718.07	7206.41
2000	395.46	542.37	499.62	762.59	437.44	451.28	565.33	688.79	847.40	830.01	504.52	442.65	6967.46
2001	343.10	426.47	489.85	579.98	759.80	669.52	492.61	867.25	624.42	751.22	820.43	839.22	7663.87
2002	841.58	859.96	926.23	643.01	923.33	741.89	884.03	794.40	638.68	541.96	449.60	534.62	8779.29
2003	430.15	312.43	421.54	496.07	385.54	272.15	496.09	443.30	378.40	383.79	507.72	772.36	5299.54
<b>TOTAL</b>	<b>5644.25</b>	<b>5836.69</b>	<b>5903.21</b>	<b>7513.09</b>	<b>7091.84</b>	<b>6524.42</b>	<b>7624.91</b>	<b>7854.78</b>	<b>6852.11</b>	<b>6649.92</b>	<b>6678.62</b>	<b>6237.49</b>	<b>80411.33</b>
<b>AVG (mo)</b>	<b>564.43</b>	<b>583.67</b>	<b>590.32</b>	<b>751.31</b>	<b>709.18</b>	<b>652.44</b>	<b>762.49</b>	<b>785.48</b>	<b>685.21</b>	<b>664.99</b>	<b>667.86</b>	<b>7417.38</b>	<b>14834.77 mgd</b>
<b>AVG(day)</b>	<b>18.21</b>	<b>20.85</b>	<b>19.04</b>	<b>25.04</b>	<b>22.88</b>	<b>21.75</b>	<b>24.60</b>	<b>25.34</b>	<b>22.84</b>	<b>21.45</b>	<b>22.26</b>	<b>239.27</b>	<b>40.64 mgd</b>

Note: Gaging station is at Waihee Ditch @ Field 63 (Hopoi)  
 Total water delivery goes to HC&S

FEB 01 2005



January 31, 2005

Mr. Daren Suzuki, Planner  
Munekiyo & Hiraga, Inc.  
305 High Street, Suite 104  
Wailuku, Hawaii 96793

Dear Mr. Suzuki,

Subject: Pre-Consultation for a Proposed Water Treatment Facility –  
Waiale Reservoir in Wailuku, Maui, Hawaii  
TMK: (2) 3-8-046:020

Thank you for allowing us to comment on the general overview documents for the subject project, which was received on January 24, 2005.

In reviewing our records and the information received, Maui Electric Company (MECO) will be requiring access and electrical easements for our facilities to serve the subject project site. We encourage the customer's electrical consultant to meet with us as soon as practical to verify the project's electrical demand requirements and indicate the desired service location so that service can be provided on a timely basis.

If you have any questions or concerns, please call Ray Okazaki at 871-2340.

Sincerely,

A handwritten signature in black ink that reads "Neal Shinyama". The signature is written in a cursive, flowing style.

Neal Shinyama  
Manager, Engineering

NS/ro:lh



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

April 4, 2005

Neal Shinyama, Manager, Engineering  
**Maui Electric Company, Ltd.**  
P. O. Box 398  
Kahului, Hawaii 96733

**SUBJECT: Proposed Waiale Reservoir Water Treatment Facility, Wailuku, Maui,  
TMK (2) 3-8-046:020**

---

Dear Mr. Shinyama:

Thank you for your letter of January 31, 2005, responding to our request for early consultation comments for the proposed water treatment facility at TMK (2) 3-8-046:020, Wailuku, Maui. We acknowledge that the Maui Electric Company will require easements to serve the new facility and the applicant's electrical consultant will coordinate with your office on this matter, as soon as it is practicable.

Thank you again for providing your input to the proposed action. A copy of the Draft Environmental Assessment will be provided to your office for review and comment.

Very truly yours,

Daren Suzuki, Planner

DS:yp

cc: Ivan Nakatsuka, Austin, Tsutsumi & Associates, Inc.

Ata\waialewtf ea\mecc.res

**XI. PARTIES RECEIVING  
COPIES OF THE  
ENVIRONMENTAL  
IMPACT STATEMENT  
PREPARATION NOTICE;  
LETTERS RECEIVED; AND  
RESPONSES TO  
SUBSTANTIVE  
COMMENTS**

# XI. PARTIES RECEIVING COPIES OF THE ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE; LETTERS RECEIVED; AND RESPONSES TO SUBSTANTIVE COMMENTS

The following agencies were consulted during the preparation of the Draft EIS. Agency comments and responses to substantive comments are also included in this section.

- |   |   |
|---|---|
| <p>1. Ranae Ganske-Cerizo, Acting District Conservationist<br/><b>Natural Resources Conservation Service</b><br/><b>U.S. Department of Agriculture</b><br/>700 Hookele Street, Suite 202<br/>Kahului, Hawai'i 96732</p> | <p>6. Laura Thielen<br/>State of Hawai'i<br/><b>Department of Land and Natural Resources</b><br/>P. O. Box 621<br/>Honolulu, Hawai'i 96809</p>  |
| <p>2. George Young<br/>Chief, Regulatory Branch<br/><b>U.S. Department of the Army</b><br/>U.S. Army Engineer District, Honolulu Building 230<br/>Fort Shafter, Hawai'i 96858-5440</p>                                  | <p>7. Dr. Puaalaokalani Aiu, Administrator<br/>State of Hawai'i<br/><b>Department of Land and Natural Resources</b><br/><b>State Historic Preservation Division</b><br/>601 Kamokila Blvd., Room 555<br/>Kapolei, Hawai'i 96707</p> |
| <p>3. Patrick Leonard<br/>Pacific Islands Manager<br/><b>U. S. Fish and Wildlife Service</b><br/>300 Ala Moana Blvd., Rm. 3-122, Box 50088<br/>Honolulu, Hawai'i 96813</p>  | <p>8. Brennon Morioka, Acting Director<br/>State of Hawai'i<br/><b>Department of Transportation</b><br/>869 Punchbowl Street<br/>Honolulu, Hawai'i 96813</p>  |
| <p>4. Chiyome L. Fukino, M.D., Director<br/>State of Hawai'i<br/><b>Department of Health</b><br/>P. O. Box 3378<br/>Honolulu, Hawai'i 96814</p>   | <p>cc: Ferdinand Cajigal, Maui District Engineer</p>  |
| <p>5. Herbert Matsubayashi<br/>District Environmental Health Program Chief<br/>State of Hawai'i<br/><b>Department of Health</b><br/>54 High Street<br/>Wailuku, Hawai'i 96793</p>                                       | <p>9. Clyde Nāmu`o, Administrator<br/><b>Office of Hawaiian Affairs</b><br/>711 Kapiolani Boulevard, Suite 500<br/>Honolulu, Hawai'i 96813</p>  |
|   | <p>10. Jeffrey A. Murray, Fire Chief<br/>County of Maui<br/><b>Department of Fire and Public Safety</b><br/>200 Dairy Road<br/>Kahului, Hawai'i 96732</p>   |

11. Jeffrey S. Hunt, Director  
County of Maui  
**Department of Planning**  
250 South High Street  
Wailuku, Hawai'i 96793
12. Tamara Horcajo, Director  
County of Maui  
**Department of Parks and Recreation**  
700 Hali'a Nako Street, Unit 2  
Wailuku, Hawai'i 96793
13. Milton Arakawa, Director  
County of Maui  
**Department of Public Works**  
200 South High Street  
Wailuku, Hawai'i 96793
14. Cheryl Okuma, Director  
County of Maui  
**Department of Environmental  
Management**  
One Main Plaza  
2200 Main Street, Suite 175  
Wailuku, Hawai'i 96793
15. Thomas Phillips, Chief  
County of Maui  
**Police Department**  
55 Mahalani Street  
Wailuku, Hawai'i 96793
16. Jeffrey Eng, Director  
County of Maui  
**Department of Water Supply**  
200 South High Street  
Wailuku, Hawai'i 96793
17. Don Medeiros, Director  
County of Maui  
**Department of Transportation**  
200 South High Street  
Wailuku, Hawai'i 96793
18. Jimmy Lawrence  
**Kahului Town Association**  
117 West Papa Avenue  
Kahului, Hawai'i 96732
19. Ed Reinhardt, President  
**Maui Electric Company, Ltd.**  
P. O. Box 398  
Kahului, Hawai'i 96733
20. **Maui Lani Community Association**  
c/o Barbara Kojima, Property Manager  
P. O. Box 1642  
Kahului, Hawai'i 96733
21. **Maui Tomorrow**  
P.O. Box 299  
Makawao, Hawai'i 96768
22. Earthjustice  
223 S. King Street, Suite 400  
Honolulu, Hawai'i 96813



## United States Department of the Interior



### FISH AND WILDLIFE SERVICE

Pacific Islands Fish and Wildlife Office  
300 Ala Moana Boulevard, Room 3-122, Box 50088  
Honolulu, Hawaii 96850

In Reply Refer To:  
2008-TA-0259

AUG 07 2008

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

Subject: Technical Assistance for Proposed Waiale Water Treatment Facility, Maui County  
Department of Water Supply, TMK (2) 3-8-046:020 (por.)

Dear Mr. Munekiyo:

Thank you for your July 3, 2008, letter indicating that you are compiling information that will be incorporated into an Environmental Impact Statement addressing development of a new water treatment facility in the vicinity of the Waiale Reservoir, in Wailuku, Maui. We received your request on July 7, 2008. The proposed water treatment facility will process surface water to provide potable water to the Maui County Department of Water Supply's Central Maui system, which will serve residential and business customers in the Kihei-Makena and Wailuku-Kahului regions. Your document indicates the water facility is required to enable future residential and business development in Central Maui.

Based on the project information you provided and pertinent information in our files, including data compiled by the Hawaii Biodiversity and Mapping Program, endangered Hawaiian stilts (*Himantopus mexicanus knudseni*) occur in the vicinity of the Wahikuli Reservoir, within the project area. In addition, the threatened Newell's shearwater (*Puffinus auricularis newelli*) and endangered Hawaiian petrel (*Pterodroma phaeopygia sandwichensis*) (collectively referred to as seabirds), and endangered Hawaiian goose (*Branta sandvicensis*) are known to occur and use habitats within the vicinity of the proposed project. It is also likely that shorebirds and waterfowl protected under the Migratory Bird Treaty Act (16 U.S.C. 703-712) forage and loaf in the wetlands adjacent to the proposed water treatment facility.

In addition, the proposed project would serve as a growth-inducing feature by providing a water source for development in dry areas of Maui. Development that will occur as a result of the proposed water supply is related to the proposed project. We recommend that effects to federally listed species and their critical habitats that result from interrelated development be evaluated in the Environmental Impact Statement. Potential effects to Federal trust resources from development that would be facilitated by the proposed water treatment plant include but are not limited to: 1) direct effects of habitat alteration or loss due to construction, and 2) indirect

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IN AMERICA 



Mr. Michael T. Munekiyo

2

effects from increased predators, non-native invasive species introduction and spread, and increased fire risk.

We also recommend you coordinate with our office for assistance in determining your action area for the proposed project and to develop appropriate measures for incorporation into your Environmental Impact Statement to avoid or minimize effects to Federal trust resources. If a Federal agency is involved in funding or permitting the proposed project, then you and the Federal agency should begin coordination with our office pursuant to section 7(a)2 of the Endangered Species Act of 1973 (16 U.S.C. 1531 et seq.), as amended (ESA). If a Federal agency is not involved with the proposed project and endangered or threatened species may be taken, an "Incidental Take Permit" should be obtained pursuant to section 10(a)1(B) of the ESA. If you have questions or would like additional information, please contact Consultation and Technical Assistance Program Fish and Wildlife Biologist Dawn Greenlee (phone: 808-792-9400; fax: 808-792-9581).

Sincerely,

*Christa Russer*

*for* Patrick Leonard  
Field Supervisor

cc: Jeffrey Eng, Director County of Maui Department of Water Supply



MICHAEL T. MUNEKIYO  
GWEN OKASHI HIRAGA  
MITSURU "MICH" HIRANO  
KARLENN HIRAGA

MARK ALEXANDER PEE  
RYL BULLER

October 8, 2008

Patrick Leonard, Field Supervisor  
United States Department of the Interior  
**Fish and Wildlife Service**  
Pacific Islands and Wildlife Office  
300 Ala Moana Boulevard, Room 3-122, Box 50088  
Honolulu, Hawai'i 96850

SUBJECT: Environmental Impact Statement Preparation Notice for Proposed  
Wai'ale Water Treatment Facility at Tax Map Key No. (2) 3-8-046:020  
(por.), Wailuku, Maui, Hawai'i

---

Dear Mr. Leonard:

Thank you for your letter of August 7, 2008, providing technical assistance comments on the Environmental Impact Statement Preparation Notice for the Proposed Wai'ale Water Treatment Facility. We provide following information to address the comments noted.

**1. Endangered Species**

Thank you for your office's email correspondence of August 20, 2008, clarifying that the referenced area pertains to the Waiale Reservoir. With respect to other endangered and protected avifauna species which are known to occur and use habitats within the vicinity of the project site, these will be cited in the Draft Environmental Impact Statement (EIS).

**2. Growth Inducement**

You note that Federal trust resources which may be affected through growth inducement include, but are not limited to: (1) direct effects of habitat alteration or loss due to construction; and (2) indirect effects from increased predators, non-native invasive species and spread, and increased fire risk. The Draft EIS will examine the effects of the project, if any, to federally listed species and their critical habitats.

Patrick Leonard, Field Supervisor  
October 8, 2008  
Page 2

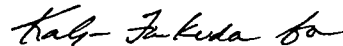
3. **Coordination with the U.S. Fish and Wildlife Service**

There are no Federal funds or permits required in connection with the proposed action. Consultation with the U.S. Fish and Wildlife Service (U.S.F.W.S.) will be sought to determine the action area for the proposed project and to develop appropriate measures to avoid or minimize effects to Federal trust resources, as applicable.

Thank you again for commenting on the proposed action. Further coordination with the U.S.F.W.S. will be undertaken in connection with your review and comment on the Draft EIS. A copy of the Draft EIS will be provided to your office in this regard.

In the mean time, if there are any questions or if additional information is needed, please let me know.

Very truly yours,



Michael T. Munekiyo, A. I. C. P.  
Project Manager

MTM:yp

cc: Jeffrey Eng, Department of Water Supply  
Diane Bevilaqua, A&B Properties, Inc.  
Robert Hobdy

F:\DATA\ATAI\WaialeWTF EA\USFWS.EISP\res.wpd

JUL 28 2008

LINDA LINGLE  
GOVERNOR OF HAWAII



Katherine Puana Kealoha  
DIRECTOR

STATE OF HAWAII  
DEPARTMENT OF HEALTH  
OFFICE OF ENVIRONMENTAL QUALITY CONTROL  
235 SOUTH BERETANIA STREET  
LEIOPAPA A KAMEHAMEHA, SUITE 702  
HONOLULU, HAWAII 96813  
Telephone (808) 586-4185  
Facsimile (808) 586-4186  
Electronic Mail: OEQC@doh.hawaii.gov

July 25, 2008

Jeffrey K. Eng, Director  
Department of Water Supply  
County of Maui  
200 South High Street  
Wailuku, Hawaii 96793

Subject: Environmental Impact Statement Preparation Notice (EISPN) For The Proposed  
Wai'ale Water Treatment Facility (TMK No. (2)3-8-046:020)

Dear Mr. Eng:

Thank you for the opportunity to review the subject document. The Office of Environmental Quality Control (OEQC) offers the following comments:

1. On page 7, OEQC looks forward to a full discussion and description of the Waihe'e Ditch Source in the draft environmental impact statement (DEIS).
2. On pages 27 to 29, please include any positive secondary impacts of the water treatment facility to recreational facilities, fire protection, medical services, and schools.

Please call Herman Tuiolosega at (808) 586-4185 if you have any questions.

Sincerely,

A handwritten signature in black ink, appearing to read "Katherine Puana Kealoha". The signature is fluid and cursive, written over a circular stamp.

Katherine Puana Kealoha  
Director

c: Diane Bevilacqua, A&B Properties, Inc.  
Ivan Nakatsuka, Austin, Tsutsumi & Associates  
Michael Munekiyo, Munekiyo & Hiraga, Inc.



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

MARK ALEXANDER RUI  
KYLE GINZA

October 8, 2008

Katherine Puana Kealoha, Director  
State of Hawai'i  
Department of Health  
**Office of Environmental Quality Control**  
235 South Beretania Street  
Leiopapa A Kamehameha, Suite 702  
Honolulu, Hawai'i 96813

SUBJECT: Environmental Impact Statement Preparation Notice for Proposed  
Wai'ale Water Treatment Facility at Tax Map Key No. (2) 3-8-046:020  
(por.), Wailuku, Maui, Hawai'i

---

Dear Ms. Kealoha:

Thank you for your letter of July 25, 2008, providing comments on the Environmental Impact Statement Preparation Notice for the Proposed Wai'ale Water Treatment Facility. We provide following information to address the comments noted.

**1. Discussion of Waihee Ditch System**

The Waihee Ditch system will be more fully discussed and described in the Draft Environmental Impact Statement (EIS).

**2. Positive Secondary Impacts of Proposed Action**

The Draft EIS will include a discussion of applicable positive secondary impacts to public service parameters such as, recreational facilities, fire protection, medical services and schools.

Thank you again for commenting on the proposed action. Further coordination with the Office of Environmental Quality Control will be undertaken in connection with your review and comment on the Draft EIS. A copy of the Draft EIS will be provided to your office in this regard.

Katherine Puana Kealoha, Director  
October 8, 2008  
Page 2

In the mean time, if there are any questions or if additional information is needed, please let me know.

Very truly yours,



Michael T. Munekiyo, A. I. C. P.  
Project Manager

MTM:yp

cc: Jeffrey Eng, Department of Water Supply  
Diane Bevilacqua, A&B Properties, Inc.  
Ivan Nakatsuka, Austin Tsutsumi & Associates, Inc.

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LINDA LINGLE  
GOVERNOR OF HAWAII



RECEIVED  
2008 AUG 18

DEPT. OF WATER SUPPLY  
COUNTY OF MAUI  
DEPARTMENT OF LAND AND NATURAL RESOURCES  
LAND DIVISION

POST OFFICE BOX 621  
HONOLULU, HAWAII 96809

August 1, 2008

0808025  
080808

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

County Of Maui  
Planning Department

DIRECTOR  
DEPUTY DIRECTOR  
CURRENT  
ZAED  
LONG RANGE  
DEPT. SECRETARY  
*Water Dept*

	FM	COMMENTS	SEE ME	ASSIGN	FILE	DRAFT RESPONSE
DIRECTOR	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DEPUTY DIRECTOR	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CURRENT	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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DEPT. SECRETARY	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<i>Water Dept</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Due Date: \_\_\_\_\_  
By: *cy* Date: *8/1/08*

County of Maui  
Department of Water Supply  
200 South High Street  
Wailuku, Hawaii 96793

Attention: Mr. Jeffrey Eng, Director

Gentlemen:

Subject: Environmental Impact Statement Preparation Notice for Proposed Wai'ale Water Treatment Facility

Thank you for the opportunity to review and comment on the subject matter. The Department of Land and Natural Resources' (DLNR), Land Division distributed or made available a copy of your report pertaining to the subject matter to DLNR Divisions for their review and comment.

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

Sincerely,

Morris M. Atta  
Administrator

LINDA LINGLE  
GOVERNOR OF HAWAII



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



STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES  
LAND DIVISION

POST OFFICE BOX 621  
HONOLULU, HAWAII 96809

July 11, 2008

RECEIVED  
STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES  
LAND DIVISION

JUL 22 P 3 10

LAND DIVISION

PROPOSED ENGINEERING

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

FROM: *for* Morris M. Atta *Maalene*  
SUBJECT: Environmental impact statement preparation notice for Proposed Wai'ale Water Treatment Facility  
LOCATION: Wailuku, Maui, TMK: (2) 3-8-46:20  
APPLICANT: Munekiyo & Hiraga, Inc. on behalf of A & B Properties, Inc.

Transmitted for your review and comment on the above referenced document. We would appreciate your comments on this document. Please submit any comments by August 1, 2008.

If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact my office at 587-0433. Thank you.

Attachments

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

Signed: *C. T. Heine*  
Date: *7/21/08*



DEPARTMENT OF LAND AND NATURAL RESOURCES  
ENGINEERING DIVISION

LM/MorrisAtta  
REF.:EISPNWaialeWaterTreatmentFacility  
Maui.423

COMMENTS

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

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

- ( ) Mr. Robert Sumitomo at (808) 768-8097 or Mr. Mario Siu Li at (808) 768-8098 of the City and County of Honolulu, Department of Planning and Permitting.
- ( ) Mr. Kelly Gomes at (808) 961-8327 (Hilo) or Mr. Kiran Emler at (808) 327-3530 (Kona) of the County of Hawaii, Department of Public Works.
- ( ) Mr. Francis Cerizo at (808) 270-7771 of the County of Maui, Department of Planning.
- ( ) Mr. Mario Antonio at (808) 241-6620 of the County of Kauai, Department of Public Works.
  
- ( ) The applicant should include water demands and infrastructure required to meet project needs. Please note that projects within State lands requiring water service from the Honolulu Board of Water Supply system will be required to pay a resource development charge, in addition to Water Facilities Charges for transmission and daily storage.
- ( ) 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:   
ERIC T. HIRANO, CHIEF ENGINEER

Date: 7/21/08

LINDA LINGLE  
GOVERNOR OF HAWAII



LAURA H. THIELEN  
COMMISSIONER  
BOARD OF LAND AND NATURAL RESOURCES  
COMMISSION ON WATER RESOURCE MANAGEMENT  
MAUI DISTRICT  
LAND DIVISION

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STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES  
LAND DIVISION

POST OFFICE BOX 621  
HONOLULU, HAWAII 96809

July 11, 2008

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

RECEIVED  
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LAND DIVISION

FROM: *for* Morris M. Atta *Maalaea*  
SUBJECT: Environmental impact statement preparation notice for Proposed Wai'ale Water Treatment Facility  
LOCATION: Wailuku, Maui, TMK: (2) 3-8-46:20  
APPLICANT: Munekiyo & Hiraga, Inc. on behalf of A & B Properties, Inc.

Transmitted for your review and comment on the above referenced document. We would appreciate your comments on this document. Please submit any comments by August 1, 2008.

If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact my office at 587-0433. Thank you.

Attachments

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

Signed: *[Signature]*  
Date: 7/17/08

**DEPARTMENT OF LAND AND NATURAL RESOURCES  
LAND DIVISION**

**M E M O R A N D U M**

To: Morris Atta  
Administrator

From: Charlene Unoki *Charlene*  
Assistant Administrator

Date: August 2, 2008

Re: Environmental Impact Statement Preparation Notice for proposed Wai'ale  
Water Treatment Facility

---

The following recommendations should be included in any comments regarding the above-referenced project:

1. If any portion of the project includes hillsides or cliffs with a slope grade of 20% or greater, a slope study to determine the risks of rockfalls or landslides should be required as a condition of approval.
2. If a rockfall or landslide risk is determined or is suspected to exist, the developer should be required to create a hazard buffer zone in areas susceptible to such hazards that is of sufficient width to protect the health and safety of future homeowners in the vicinity of those risks.
3. If a rockfall or landslide risk is determined or is suspected to exist, the developer should be required to provide a written disclosure of those risks to all potential homeowners.

Should you have any questions, please call me at 587-0426.



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

MARK ALEXANDER ROY  
KYLE GINZA

November 10, 2008

Morris M. Atta, Administrator  
Department of Land and Natural Resources  
P. O. Box 621  
Honolulu, Hawai'i 96809

SUBJECT: Environmental Impact Statement Preparation Notice for Proposed  
Wai'ale Water Treatment Facility at Tax Map Key No. (2) 3-8-046:020  
(por.), Wailuku, Maui, Hawai'i

Dear Mr. Atta:

Thank you for the comments from the Engineering Division and the Land Division of the Department of Land and Natural Resources (DLNR) dated July 11, 2008, providing comments on the Environmental Impact Statement Preparation Notice for the Proposed Wai'ale Water Treatment Facility. Additionally, we received a copy of the comments from the Commission on Water Resource Management (CWRM), dated August 11, 2008. A response to the CWRM comments will be provided to them directly. We provide the following information to address the comments noted.

1. **Engineering Division Comments**

We appreciate the Engineering Division's comment confirming the proposed project site's Flood Zone designation of Zone C.

2. **Land Division - Maui District Comments**

The project site will not involve the use of lands with hillsides or cliffs with a slope grade of 20 percent (20%) or greater. As such, we are not anticipating a risk of rockfalls or landslides associated with the proposed water treatment facility.

Morris M. Atta, Administrator  
November 10, 2008  
Page 2

Thank you again for commenting on the proposed action. A copy of the Draft EIS will be provided to your office for review and comment. In the meantime, if there are any questions or if additional information is needed, please let me know.

Very truly yours,



Michael T. Munekiyo, A.I.C.P.  
Project Manager

MTM:lfm

cc: Jeffrey Eng, Department of Water Supply  
Diane Bevilacqua, A&B Properties, Inc.  
Ivan Nakatsuka, Austin, Tsutsumi & Associates, Inc.

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AUG 06 2008

LINDA LINGLE  
GOVERNOR OF HAWAII



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

LDRRIN W. PANG, M. D., M. P.  
DISTRICT HEALTH OFFICER

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

August 5, 2008

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

Dear Mr. Eng:

Subject: **Environmental Impact Statement Preparation Notice for  
Proposed Wai'ale Water Treatment Facility  
TMK: (2) 3-8-46: 020**

Thank you for the opportunity to comment on the Environmental Impact Statement Preparation Notice for the proposed Wai'ale Water Treatment Facility. Comments from this office were submitted during the early consultation process. The comments were adequately addressed. We have no further comments to offer at this time.

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

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

Sincerely,

A handwritten signature in black ink, appearing to read "H. Matsubayashi".

Herbert S. Matsubayashi  
District Environmental Health Program Chief

c: Michael Munekiyo  
Stuart Yamada  
Jiacai Liu



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

MARK ALEXANDER RUIY  
KYLE GONZA

October 8, 2008

Herbert S. Matsubayashi  
District Environmental Health Program Chief  
State of Hawaii  
Department of Health  
**Maui District Health Office**  
54 High Street  
Wailuku, Hawai'i 96793-2102

SUBJECT: Environmental Impact Statement Preparation Notice for Proposed  
Wai'ale Water Treatment Facility at Tax Map Key No. (2) 3-8-046:020  
(por.), Wailuku, Maui, Hawai'i

---

Dear Mr. Matsubayashi:

Thank you for your letter of August 5, 2008, providing comments on the Environmental Impact Statement Preparation Notice for the Proposed Wai'ale Water Treatment Facility. We provide following information to address the comments noted.

**1. Standard Comments of the State Department of Health**

The project's design engineer has been provided a copy of your letter and recommendation. Comments which apply to the proposed water treatment facility will be addressed.

Thank you again for commenting on the proposed action. A copy of the Draft EIS will be provided to your office for review and comment.

Herbert S. Matsubayashi  
October 8, 2008  
Page 2

In the mean time, if there are any questions or if additional information is needed, please let me know.

Very truly yours,



Michael T. Munekiyo, A. I. C. P.  
Project Manager

MTM:yp

cc: Jeffrey Eng, Department of Water Supply  
Diane Bevilacqua, A&B Properties, Inc.  
Ivan Nakatsuka, Austin Tsutsumi & Associates, Inc.

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AUG 11 2008

PHONE (808) 594-1888

FAX (808) 594-1865



**STATE OF HAWAII**  
**OFFICE OF HAWAIIAN AFFAIRS**  
711 KAPI'OLANI BOULEVARD, SUITE 500  
HONOLULU, HAWAII 96813

HRD08/3750

August 6, 2008

Karlynn Fukuda  
Project Manager  
Munekiyo & Hiraga, Inc.  
305 High Street, Suite 104  
Wailuku, Hawai'i 96793

**RE: Request for comments on the proposed Wai'ale water treatment facility and environmental impact statement preparation notice (EISPN), Wailuku, Maui, TMK: 3-08-046: 020.**

Aloha e Karlynn Fukuda,

The Office of Hawaiian Affairs (OHA) is in receipt of the above-mentioned letter. OHA has reviewed the EISPN and offers the following comments.

OHA understands that this project proposes to process surface water into potable water with a yield of up to 9 million gallons per day with the capacity to expand. (EISPN, pages five and six) OHA is unclear if there is a shortfall for Central Maui sufficient to justify a project of this size.

We do, however, agree with page nine of the EISPN in that water resources are limited, as evidenced by the recent adoption of Ordinance 3502 relating to Water Availability which requires verification by the applicant of a long-term reliable supply of water before subdivision approval can be granted. We also realize that water is not only limited, but it is necessary to support a host of competing uses, including the continued exercise of Native Hawaiian traditional and customary rights and practices. Therefore, OHA does have serious concerns regarding the use of this water and the various effects this proposed project will have in and around the project area.

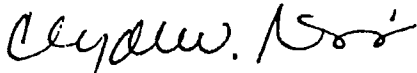
Karlynn Fukuda  
August 6, 2008  
Page 2

OHA would like to point out a material, although perhaps inadvertent, omission from Section VIII of the EISPN, the "List of Permits and Approvals." The Commission on Water Resource Management's designation of Nā Wai 'Ehā as a surface water management area became effective on April 30, 2008. Therefore, pursuant to HRS § 174C-48, a water use permit is required for any "withdrawal, diversion, impoundment, or consumptive use of water" from Waihe'e, Waiehu, 'Īao, or Waikapū streams. A water use permit must be listed in Section VIII of the EISPN as a required permit.

Given that many important issues have been deferred for discussion in the draft environmental impact statement (DEIS) rather than being addressed in this EISPN, OHA reserves further comment for the DEIS, which we look forward to reviewing.

Thank you for the opportunity to comment. If you have further questions, please contact Grant Arnold at (808) 594-0263 or e-mail him at [granta@oha.org](mailto:granta@oha.org).

'O wau iho nō me ka 'oia'i'o,



Clyde W. Nāmu'o  
Administrator

C: Maui CRC

C: Jeffrey Eng  
Department of Water Supply  
200 South High Street  
Wailuku, Hawai'i 96793-2155



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

MARK ALEXANDER REILLY  
KYLE GENOVA

October 8, 2008

Clyde W. Nāmu`o, Administrator  
State of Hawai`i  
**Office of Hawaiian Affairs**  
711 Kapi`olani Boulevard, Suite 500  
Honolulu, Hawai`i 96813

SUBJECT: Environmental Impact Statement Preparation Notice for Proposed  
Wai`ale Water Treatment Facility at Tax Map Key No. (2) 3-8-046:020  
(por.), Wailuku, Maui, Hawai`i

Dear Mr. Nāmu`o:

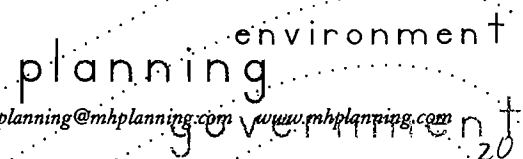
Thank you for your letter of August 6, 2008, providing comments on the Environmental Impact Statement Preparation Notice for the Proposed Wai`ale Water Treatment Facility. We provide following information to address the comments noted.

**1. Plant Capacity and Water Need**

The Draft Environmental Impact Statement (Draft EIS) for the proposed water treatment facility will discuss the need for potable supply in Central Maui. For example, in the year 2005, the average daily Central Maui demand was 22 million gallons. In the year 2015, the demand is projected by the Department of Water Supply to be 25.5 million gallons per day, increasing to 28.2 million gallons per day in the year 2020. To meet future planned water needs for Central Maui, the DWS' consultant identified the proposed action as a final candidate strategy in its preparation of the County's Water Use and Development Plan.

**2. Competing Water Needs**

The issue of competing water needs will be resolved when the State Commission on Water Resource Management (CWRM) makes a decision on the Interim Instream Flow Standards for the four (4) Na Wai`Eha streams, which is expected in 2009. A&B Properties understands that the outcome of this proceeding will form a basis for water use in the Central Maui region.



Clyde W. Nāmu`o, Administrator  
October 8, 2008  
Page 2

**3. List of Permits and Approvals**

The Draft EIS will cite applicable permits required by the CWRM.

Thank you again for commenting on the proposed action. A copy of the Draft EIS will be provided to your office for review and comment.

In the mean time, if there are any questions or if additional information is needed, please let me know.

Very truly yours,



Michael T. Munekiyo, A. I. C. P.  
Project Manager

MTM:yp

cc: Jeffrey Eng, Department of Water Supply  
Diane Bevilacqua, A&B Properties, Inc.  
Ivan Nakatsuka, Austin Tsutsumi & Associates, Inc.

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LINDA LINGLE  
GOVERNOR OF HAWAII



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

RECEIVED

2008 AUG 12 PM 3:28

STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES COUNTY OF MAUI  
LAND DIVISION

DEPT. OF WATER SUPPLY

POST OFFICE BOX 621  
HONOLULU, HAWAII 96809

August 11, 2008

County of Maui  
Department of Water Supply  
200 South High Street  
Wailuku, Hawaii 96793

Attention: Mr. Jeffrey Eng, Director

Gentlemen:

Subject: Environmental Impact Statement Preparation Notice for Proposed Wai'ale  
Water Treatment Facility

Thank you for the opportunity to review and comment on the subject matter. The Department of Land and Natural Resources' (DLNR), Land Division distributed or made available a copy of your report pertaining to the subject matter to DLNR Divisions for their review and comment.

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

Sincerely,

A handwritten signature in cursive script, appearing to read "Morris M. Atta".

For Morris M. Atta  
Administrator

Cc: HCDA

LINDA LINGLE  
GOVERNOR OF HAWAII



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



STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES  
LAND DIVISION

POST OFFICE BOX 621  
HONOLULU, HAWAII 96809

July 11, 2008

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

ER:

to:

FROM:

Morris M. Atta *Chalene*

SUBJECT:

Environmental impact statement preparation notice for Proposed Wailuku Water Treatment Facility

LOCATION:

Wailuku, Maui, TMK: (2) 3-8-46:20

APPLICANT:

Munekiyo & Hiraga, Inc. on behalf of A & B Properties, Inc.

RECEIVED  
08 JUL 14 P2 51  
DEPT. OF LAND & NATURAL RESOURCES  
STATE OF HAWAII

Transmitted for your review and comment on the above referenced document. We would appreciate your comments on this document. Please submit any comments by August 1, 2008.

If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact my office at 587-9411. Thank you.

Attachments

- We have no objection
- We have no comments
- Comments are attached

Signed:

Date:

*Kan C. Kawol*  
08/07/08

RECEIVED  
LAND DIVISION  
AUG - 7 A 10:47  
DEPT. OF LAND & NATURAL RESOURCES  
STATE OF HAWAII

LINDA LINGLE  
GOVERNOR OF HAWAII



LAURA H. THIELEN  
CHAIRPERSON  
MEREDITH J. CHING  
JAMES A. FRAZIER  
NEAL S. FUJIMURA  
CHIYOME I. FUKINO, M.D.  
DONNA FAY K. KIYOSAKI, P.E.  
LAWRENCE H. MIIKE, M.D., J.D.  
KEN C. KAWAHARA, P.E.  
DEPUTY DIRECTOR

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

August 7, 2008

TO: Morris Atta, Administrator  
Land Division

FROM: Ken C. Kawahara, P.E., Deputy Director  
Commission on Water Resource Management

SUBJECT: EIS Preparation Notice for Proposed Waiale Water Treatment Facility

LOCATION: Wailuku, Maui

TMK NO.: (2) 3-8-046:020

A handwritten signature in black ink that reads "Ken C. Kawahara".

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/cwrn>.

Our comments related to water resources are checked off below.

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

DRF-IA 06/19/2008

Morris Atta, Administrator  
Page 2  
August 7, 2008

- 6. We recommend the use of alternative water sources, wherever practicable.
- 7. There may be the potential for ground or surface water degradation/contamination and recommend that approvals for this project be conditioned upon a review by the State Department of Health and the developer's acceptance of any resulting requirements related to water quality.

Permits required by CWRM:

Additional information and forms are available at [http://hawaii.gov/dlnr/cwrm/resources\\_permits.htm](http://hawaii.gov/dlnr/cwrm/resources_permits.htm).

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

If there are any questions, please contact Charley Ice at 587-0225.

DRF-IA 06/19/2008





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

MARK ALEXANDER ROY  
KYLE GINDZA

November 10, 2008

Ken C. Kawahara, P.E., Deputy Director  
Department of Land and Natural Resources  
Commission on Water Resource Management  
P. O. Box 621  
Honolulu, Hawai'i 96809

SUBJECT: Environmental Impact Statement Preparation Notice for Proposed  
Wai`ale Water Treatment Facility at Tax Map Key No. (2) 3-8-046:020  
(por.), Wailuku, Maui, Hawai'i

Dear Mr. Kawahara:

Thank you for the comments from the Commission on Water Resources Management dated August 11, 2008, providing comments on the Environmental Impact Statement Preparation Notice for the Proposed Wai`ale Water Treatment Facility. We provide the following information to address the comment noted.

1. **Coordination With County Department of Water Supply**

We note your comment regarding coordination with the County of Maui, Department of Water Supply (DWS) to incorporate the proposed water treatment facility in the County's Water Use and Development Plan. The DWS is currently updating the Water Use and Development Plan and the preliminary report includes the proposed facility as an option for providing potable water source for Central Maui.

Ken C. Kawahara, P.E., Deputy Director  
November 10, 2008  
Page 2

Thank you again for commenting on the proposed action. A copy of the Draft Environmental Impact Statement will be provided to your office for review and comment. In the meantime, if there are any questions or if additional information is needed, please let me know.

Very truly yours,



Michael T. Munekiyo, A.I.C.P.  
Project Manager

MTM:lfm

cc: Jeffrey Eng, Department of Water Supply  
Diane Bevilacqua, A&B Properties, Inc.  
Ivan Nakatsuka, Austin, Tsutsumi & Associates, Inc.

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AUG 26 2008

LINDA LINGLE  
GOVERNOR OF HAWAII



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

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

In reply, please refer to  
EPO-08-102

August 19, 2008

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

Dear Mr. Munekiyo:

**SUBJECT:** Environmental Impact Statement Preparation Notice (EISPN) for Proposed  
Wai'ale Water Treatment Facility, Wailuku, Maui, Hawaii  
TMK: (2) 3-8-046: 020 (por.)

Thank you for allowing us to review and comment on the subject application. The document was routed to the various branches of the Department of Health (DOH) Environmental Health Administration. We have the following Safe Drinking Water Branch and General comments.

Safe Drinking Water Branch (SDWB)

1. **General Comment:** The SDWB continues to express concerns over unresolved source water quality and protection issues relating to the use of the Waihee Ditch source. More specifically, the Draft EIS should address mitigation measures for both recreational uses of upstream and source intake in Waihee Valley, as well as for contaminated runoff contributed by agricultural subdivisions (e.g., Wailuku Country Estates) being developed adjacent to and immediately upstream of the ditch source as it flows towards the water treatment facility's intake off Hopoe Chute.
2. **Section VIII. LIST OF PERMITS AND APPROVALS:** The EISPN does not include the SDWB's New Source Approval process and construction plan approval as required under Hawaii Administrative Rules Title 11, Chapter 20, Sections 29 and 30.
3. **Section IX. AGENCIES AND ORGANIZATIONS CONSULTED FOR THE PREPARATION OF THE EISPN:** As a critical agency involved in the approval and long term regulation of this facility, we are disappointed that SDWB was not initially consulted for this EISPN. We request that a copy of all future submittals be forwarded directly to our branch office at 919 Ala Moana Boulevard, Room 308, Honolulu, Hawaii 96814, Attention: Stuart Yamada, P.E., Branch Chief.

If you have any questions, please call Michael Miyahira at 586-4258.

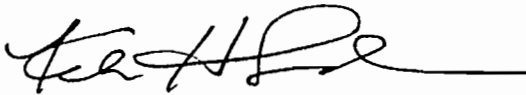
Mr. Munekiyo  
August 19, 2008  
Page 2

General

We strongly recommend that you review all of the Standard Comments on our website:  
[www.hawaii.gov/health/environmental/env-planning/landuse/landuse.html](http://www.hawaii.gov/health/environmental/env-planning/landuse/landuse.html). Any comments specifically applicable to this project should be adhered to.

If there are any questions about these comments please contact Jiakai Liu with the Environmental Planning Office at 586-4346.

Sincerely,

A handwritten signature in black ink, appearing to read 'Kelvin H. Sunada', with a long horizontal line extending to the right.

KELVIN H. SUNADA, MANAGER  
Environmental Planning Office

c: EPO  
SDWB



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

MARK ALEXANDER RUI  
KYLE GINER

October 8, 2008

Kelvin H. Sunada, Manager  
Environmental Planning Office  
State of Hawai'i  
Department of Health  
P. O. Box 3378  
Honolulu, Hawai'i 96801-3378

SUBJECT: Environmental Impact Statement Preparation Notice for Proposed  
Wai'ale Water Treatment Facility at Tax Map Key No. (2) 3-8-046:020  
(por.), Wailuku, Maui, Hawai'i

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Dear Mr. Sunada:

Thank you for your comments dated August 19, 2008, providing comments on the Environmental Impact Statement Preparation Notice for the Proposed Wai'ale Water Treatment Facility. We provide the following information to address the comments noted.

**1. Source Water Quality and Protection Issues**

We note the comments from the Safe Drinking Water Branch (SDWB) regarding the water quality issues related to water from the Waihee Ditch. Members of the project team have met with SDWB personnel to discuss this topic. The Draft Environmental Impact Statement (Draft EIS) will address both recreational uses of upstream and source intake in Waihee Valley, as well as, contaminated runoff contributed by agricultural subdivisions upstream of the Waihee ditch source.

**2. Lists of Permits and Approvals**

As applicable, the SDWB's New Source Approval process will be cited in the Draft EIS under the "Permit and Approvals" section.

**3. Agency Review of the Draft EIS**

We will add the SDWB to the list of consulted agencies and will insure that a separate copy of the Draft EIS is sent to their office directly for review and comment.

Kelvin H. Sunada, Manager  
October 8, 2008  
Page 2

**4. Standard Comments for Department of Health**

We will review the Standard Comments list at the Department's website for applicability to the proposed project.

Thank you again for commenting on the proposed action. A copy of the Draft EIS will be provided to your office for review and comment.

In the mean time, if there are any questions or if additional information is needed, please let me know.

Very truly yours,



Michael T. Munekiyo, A. I. C. P.  
Project Manager

MTM:yp

cc: Jeffrey Eng, Department of Water Supply  
Diane Bevilacqua, A&B Properties, Inc.  
Ivan Nakatsuka, Austin Tsutsumi & Associates, Inc.  
Stuart Yamada, Safe Drinking Water Branch

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AUG 27 2008

LINDA LINGLE  
GOVERNOR OF HAWAII



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

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

In reply, please refer to  
EMD / CWB

08030PJF.08

August 21, 2008

Mr. Michael T. Munekiyo, A.I.C.P.  
Project Manager  
Munekiyo & Hiraga, Inc.  
305 High Street, Suite 104  
Wailuku, Hawaii 96793

Dear Mr. Munekiyo:

**Subject: Environmental Impact Statement Preparation Notice for Proposed  
Wai`ale Water Treatment Facility  
Wailuku, Island of Maui, Hawaii  
TMK (2) 3-8-046:020**

The Department of Health (DOH), Clean Water Branch (CWB), has reviewed the subject document and offers these comments on your project. Please note that our review is based solely on the information provided in the subject document and its compliance with Hawaii Administrative Rules (HAR), Chapters 11-54 and 11-55. You may be responsible for fulfilling additional requirements related to our program. We recommend that you also read our standard comments on our website at <http://www.hawaii.gov/health/environmental/env-planning/landuse/CWB-standardcomment.pdf>.


1. You are required to obtain a National Pollutant Discharge Elimination System (NPDES) permit for discharges of wastewater, including storm water runoff, into State surface waters (HAR, Chapter 11-55). For the following types of discharges into Class A or Class 2 State waters, you may apply for NPDES general permit coverage by submitting a Notice of Intent (NOI) form:
  - a. Storm water associated with construction activities, including clearing, grading, and excavation, that result in the disturbance of equal to or greater than one (1) acre of total land area. The total land area includes a contiguous area where multiple separate and distinct construction activities may be taking place at different times on different schedules under a larger common plan of development or sale. An NPDES permit is required before the start of the construction activities.
  - b. Hydrotesting water.

You must submit a separate NOI form for each type of discharge at least 30 calendar days prior to the start of the discharge activity, except when applying for coverage for discharges of storm water associated with construction activity. For this type of discharge, the NOI must be submitted 30 calendar days before to the start of construction activities. The NOI forms may be picked up at our office or downloaded from our website at <http://www.hawaii.gov/health/environmental/water/cleanwater/forms/genl-index.html>.

2. For types of wastewater not listed in Item No. 1 above or wastewater discharging into Class 1 or Class AA waters, you may need an NPDES individual permit. An application for an NPDES individual permit must be submitted at least 180 calendar days before the commencement of the discharge. The NPDES application forms may be picked up at our office or downloaded from our website at <http://www.hawaii.gov/health/environmental/water/cleanwater/forms/indiv-index.html>.
3. You must also submit a copy of the NOI or NPDES permit application to the State Department of Land and Natural Resources, State Historic Preservation Division (SHPD), or demonstrate to the satisfaction of the CWB that SHPD has or is in the process of evaluating your project. Please submit a copy of your request for review by SHPD or SHPD's determination letter for the project along with your NOI or NPDES permit application, as applicable.
4. Please note that all discharges related to the project construction or operation activities, whether or not NPDES permit coverage is required, must comply with the State's Water Quality Standards. Noncompliance with water quality requirements contained in HAR, Chapter 11-54, and/or permitting requirements, specified in HAR, Chapter 11-55, may be subject to penalties of \$25,000 per day per violation.

If you have any questions, please visit our website at <http://www.hawaii.gov/health/environmental/water/cleanwater/index.html>, or contact the Engineering Section, CWB, at 586-4309.

Sincerely,

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

c: Mr. Jeffrey Eng, County of Maui, Department of Water Supply





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

MARK ALEXANDER REY  
KYLE BRIDZA

October 8, 2008

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

SUBJECT: Environmental Impact Statement Preparation Notice for Proposed Wai'ale Water Treatment Facility at Tax Map Key No. (2) 3-8-046:020 (por.), Wailuku, Maui, Hawai'i

Dear Mr. Wong:

Thank you for your comments dated August 21, 2008, providing comments on the Environmental Impact Statement Preparation Notice for the Proposed Wai'ale Water Treatment Facility. We provide the following information to address the comments noted.

**1. Required Permits**

We note the comments regarding the requirement for a National Pollutant Discharge Elimination Systems (NPDES) permit for the project. All applicable permits will be secured for the proposed water treatment facility, prior to construction. The project's engineering consultant will insure that the NPDES permit application is submitted to the Department of Land and Natural Resources, State Historic Preservation Division for review and comment. As applicable, compliance with the State's Water Quality Standards, will be adhered to for the project.

**2. Standard Comments for Clean Water Branch**

We will review the Standard Comments list at the Department of Health's website for applicability to the proposed project.

Thank you again for commenting on the proposed action. A copy of the Draft EIS will be provided to your office for review and comment.

Alec Wong, P.E., Chief  
October 8, 2008  
Page 2

In the mean time, if there are any questions or if additional information is needed, please let me know.

Very truly yours,



Michael T. Munekiyo, A. I. C. P.  
Project Manager

MTM:yp

cc: Jeffrey Eng, Department of Water Supply  
Diane Bevilacqua, A&B Properties, Inc.  
Ivan Nakatsuka, Austin Tsutsumi & Associates, Inc.

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NOV 24 2008

LINDA LINGLE  
GOVERNOR OF HAWAII



STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES

STATE HISTORIC PRESERVATION DIVISION  
601 KAMOKILA BOULEVARD, ROOM 555  
KAPOLEI, HAWAII 96707

LAURA H. THIELEN  
CHAIRPERSON  
BOARD OF LAND AND NATURAL RESOURCES  
COMMISSIONER OF WATER RESOURCES MANAGEMENT

RUSSELL Y. TSUJI  
FIRST DEPUTY

KEN C. KAWAHARA  
DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES  
BOARD OF LAND AND NATURAL RESOURCES  
DIRECTOR OF COUNTY AFFAIRS  
COMMISSIONER OF WATER RESOURCES MANAGEMENT  
CONSERVATION AND RESTORATION LANDS  
CONSERVATION AND RESTORATION PROGRAMS

FISH AND WILDLIFE  
HISTORIC PRESERVATION  
NATIONAL ANTI-CORROSION COMMISSION  
LAND  
STATE PARKS

November 20, 2008

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

LOG NO: 2008.2819  
DOC NO: 0811JP12  
Archaeology

Dear Mr. Munekiyo,

**SUBJECT: Chapter 6E Historic Preservation Review [County/Department of Water Supply] – Environmental Impact Statement Preparation Notice for the Proposed Wai'ale Water Treatment Facility Project Wailuku Ahupua'a, Wailuku District, Island of Maui  
TMK: (2) 3-8-046:020 (Portion)**

Thank you for the opportunity to review and comment on the environmental impact statement preparation notice for the proposed project, which was received by our staff on July 7, 2008. Our review is based on reports, maps, and aerial photographs maintained at the State Historic Preservation Division (SHPD).

The proposed project consists of the development of a Water Treatment Facility (WTF) adjacent to the Wai'ale Reservoir in Wailuku. The proposed WTF will treat surface water to supply potable water involving three filter units. The plant's design and layout will provide space for capacity expansion if needed in the future. Access to the WTF will be via a new driveway from the Kuikahi Drive Extension.

According to the most recent Tax Map Key information, the total area of subject parcel 020 is 76.932 acres. The current submittal *Project Overview* section defines the parcel as 79.93 acres. Archaeological work only concentrated on 2.25 acres of the overall approximately 80 acre parcel. Any future work proposed for the parcel outside of the 2.25 acres, will need to have an archaeological assessment/inventory survey conducted prior to any land disturbances. In other words, construction activities related to the proposed project shall be contained within the previously studied 2.25 acres.

We wish to clarify that there may be undocumented historic properties located within the subject parcel. According to a Department of Land and Natural Resources (DLNR) inventory report (1992); there may be two undocumented historic reservoirs associated with the subject parcel: the *Upper Wai'ale Reservoir* (73) an earth irrigation system completed in 1908, and the *Waiale Reservoir* (74) an earth irrigation system completed in 1916. The Hopoi Chute and the Spreckels Ditch (SIHP 50-50-04-1508) are also located in the vicinity.

We also wish to elucidate the high probability for encountering human burial features during any construction work associated with the proposed project. Adjacent parcel 021 contains two documented human burials (SIHP 50-50-04-2916) and a monitoring program for the adjacent Wai'ale Road sewer pipeline project documented three sites with multiple component features including cultural layers, a hearth, multiple human burial features, pits, and postholes (SIHP 50-50-04-4005, -4067, and -4068).

Mr. Michael Munekiyo  
Page 2

Several significant archaeological sites have been documented within the immediately adjacent on-going multi-phased Maui Lani Development project. Most relevant to the proposed WTF project, is a portion of the Kuikahi Drive Extension easement, where several significant archaeological findings were identified. A Burial Site Component of a Data Recovery Plan and Preservation Plan has been accepted by our office, specific to some of the most recent findings (LOG NO: 2007.3020/ DOC NO: 0804HR04). Proposed construction work near this area is considered extremely culturally sensitive. Proposed permanent preservation areas for the inadvertent findings appear to be included in (or immediately adjacent to) a portion of the current subject area, or proposed access road. On-going cultural and archaeological consultation is critical in order to mitigate potential negative impacts to significant historic properties that may be identified throughout the duration of the proposed project.

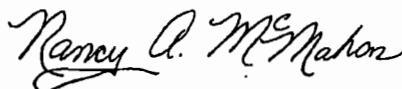
We previously recommended and accepted an archaeological assessment report and an archaeological monitoring plan specific to the proposed project (LOG NO: 2005.1225/ DOC NO: 0506CD25, LOG NO: 2005.2708/ DOC NO: 0512MK50, and LOG NO: 2006.2313/ DOC NO: 0607MK05).

The accepted archaeological monitoring plan conforms to Hawaii Administrative Rules Chapter 13-279 which governs the standards for archaeological monitoring. The subject plan includes the following provisions: an archaeologist will be on site on a full-time basis and will have the authority to halt excavation in the event that cultural materials are identified. Consultation with the Maui State Historic Preservation Division (SHPD) will occur in this event, to determine an acceptable course of action. If human burials are identified, work will cease, the SHPD Burial Sites Program, Maui SHPD, O'ahu SHPD and the Maui/Lana'i Islands Burial Counsel will be notified, and compliance with procedures outlined in HRS 6.E-43 will be followed. Coordination meetings with the construction crew(s), including an explanation of their responsibilities, will be held prior to project initiation.

An acceptable archaeological monitoring report will be submitted to our offices within 180 days of project completion. We look forward to future communication and consultation regarding any archaeological and cultural concerns with respect to the proposed project.

We anticipate notification to our Maui and O'ahu offices, via facsimile, at the onset and completion of the construction project and monitoring program. Please direct any inquiries about this review or any archaeological concerns to Jenny Pickett at the Maui office of the SHPD at (808) 243-4641. The Maui section of the SHPD may also be contacted at (808) 243-1285 or (808) 243-4640.

Aloha,



Nancy McMahon  
Historic Preservation Manager  
State Historic Preservation Division

JP

c: Mr. Jeffrey Eng, County of Maui, Dpt. of Water Supply, 200 South High St., Wailuku HI 96793  
Dept of Planning, FAX 270-7634  
Maui Cultural Resources Commission, Dept. of Planning, 250 S. High Street, Wailuku, HI 96793  
SHPD Architecture (re: potential undocumented historic reservoirs & associated)



MICHAEL T. MENEKIND  
GWEN DORIS HIRAGA  
MITSURU HIRAGA  
KAWAII, HAWAII

MARIE ANN S. RYAN  
KAWAII, HAWAII

January 23, 2009

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

**SUBJECT: Environmental Impact Statement Preparation Notice for Proposed  
Wai`ale Water Treatment Facility at Tax Map Key No. (2) 3-8-046:020  
(por.), Wailuku, Maui, Hawai'i, Log No. 2008:2819, Doc No.  
0811JP12**

Dear Dr. Aiu:

Thank you for the comments from your Division dated November 20, 2008, providing comments on the Environmental Impact Statement Preparation Notice for the Proposed Wai`ale Water Treatment Facility (WTF). We would like to provide the following information to address the comments received. We note your comment regarding the summary of archaeological discoveries in the surrounding area including the proposed Kuikahi Drive extension, as well as the neighboring Maui Lani master planned project. As noted in your letter, an Archaeological Assessment Report and an Archaeological Monitoring Plan were prepared for the proposed Wai`ale WTF project and both reports were accepted by the State Historic Preservation Division (SHPD). We concur and confirm that the applicant will implement the provisions of the approved archaeological monitoring plan during construction of the project.

Dr. Puaalaokalani Aiu, Administrator  
January 23, 2009  
Page 2

Thank you again for commenting on the proposed action. A copy of the Draft EIS will be provided to your office for review and comment. In the mean time, if there are any questions or if additional information is needed, please let me know.

Very truly yours,

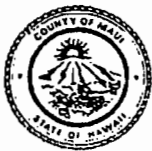


Karlynn Fukuda  
Principal

MTM:yp

cc: Nancy McMahon, State Historic Preservation Division  
Jeffrey Eng, Department of Water Supply  
Diane Bevilacqua, A&B Properties, Inc.  
Ivan Nakatsuka, Austin Tsutsumi & Associates, Inc.  
Erik Fredericksen, Xamanek Researches, LLC

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CHARMAINE TAVARES  
MAYOR

OUR REFERENCE  
YOUR REFERENCE

# POLICE DEPARTMENT COUNTY OF MAUI

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



THOMAS M. PHILLIPS  
CHIEF OF POLICE

GARY A. YABUTA  
DEPUTY CHIEF OF POLICE

July 17, 2008

## MEMORANDUM

TO: JEFFREY ENG, DIRECTOR  
DEPARTMENT OF WATER SUPPLY

FROM : THOMAS M. PHILLIPS, CHIEF OF POLICE

SUBJECT : ENVIRONMENTAL IMPACT STATEMENT PREPARATION  
NOTICE FOR PROPOSED WAI'ALE WATER TREATMENT  
FACILITY

No recommendation or comment to offer.

Refer to enclosed comments and/or recommendations.

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

Assistant Chief Wayne T. Ribao  
For: THOMAS M. PHILLIPS  
Chief of Police

Enclosure

c: ✓ Michael T. Munekiyo, Munekiyo & Hiraga, Inc.  
Jeffrey Hunt, Maui County Planning Department

# COPY

TO : THOMAS PHILLIPS, CHIEF OF POLICE, COUNTY OF MAUI  
VIA : CHANNELS  
FROM : STEPHEN ORIKASA, ADMINISTRATIVE SERGEANT,  
WAILUKU PATROL DIVISION  
SUBJECT : RESPONSE TO REQUEST FOR COMMENTS REGARDING THE EIS  
PREPARATIONS NOTICE FOR PROPOSED WAI'ALE WATER  
TREATMENT FACILITY

CONCUR.  
AC [Signature]  
07/14/08

This communication is submitted as a response to a request for comments by Munekiyo & Hiraga, Inc., Project Manager, Michael T. Munekiyo in regards to the Environmental Impact Statement Preparation Notice for Proposed Wai'ale Water Treatment Facility.

## RESPONSE:

In review of the provided documents, the project area in itself is well off the nearest roadway which is Waiinu Road. Despite this, Waiinu Road is only a two-lane two-way roadway which had heavy vehicular and pedestrian flow throughout the normal work day, and becomes inundated during the morning and afternoon commuter traffic.

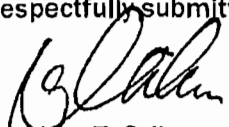
During the construction phases of this project, it is strongly suggested that measures be taken to reduce any impacts upon the normal vehicular and pedestrian movement on Waiinu Road from heavy equipment and vehicles during their ingress and egress from the area. The use of traffic control devices and personnel is also suggested.

Additionally, precautions must be taken to minimize health impacts to nearby residences and businesses from the noise, dust and debris so not to inhibit those whose health and well being may be affected.

## CONCLUSION:

There are no objections to the progression of this project at this time. Although, it is of utmost importance to be cognizant of any health and safety impacts, directly and indirectly, which may arise from this project.

Respectfully submitted for your review and approval.

  
Stephen T. Orikasa E#716  
Administrative Sergeant/Wailuku Patrol Division  
07/11/08 @ 0840 Hours

for [Signature]  
2nd. Page  
07/14/08 @ 0837





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

MARK ALEXANDER REE  
KYLE BODDAR

October 8, 2008

Thomas M. Phillips, Chief of Police  
County of Maui  
**Police Department**  
55 Mahalani Street  
Wailuku, Hawai'i 96793

**SUBJECT:** Environmental Impact Statement Preparation Notice for Proposed  
Wai`ale Water Treatment Facility at Tax Map Key No. (2) 3-8-046:020  
(por.), Wailuku, Maui, Hawai'i

---

Dear Chief Phillips:

Thank you for your memorandum of July 17, 2008, providing comments on the Environmental Impact Statement Preparation Notice for the Proposed Wai`ale Water Treatment Facility. We provide following information to address the comments noted.

**1. Construction Traffic Impacts**

The applicant and its design engineer will work with County agencies to develop and implement required construction traffic management measures, including the use of traffic control personnel, where appropriate.

**2. Construction Noise and Dust**

The applicant and its design engineer will incorporate Best Management Practices (BMPs) in the project construction documents to ensure that the contractor implements measures required to minimize and manage the health and nuisance effects associated with construction noise and dust.

Thank you again for commenting on the proposed action. A copy of the Draft EIS will be provided to your office for review and comment.

Thomas M. Phillips, Chief of Police  
October 8, 2008  
Page 2

In the mean time, if there are any questions or if additional information is needed, please let me know.

Very truly yours,



Michael T. Munekiyo, A. I. C. P.  
Project Manager

MTM:yp

cc: Jeffrey Eng, Department of Water Supply  
Diane Bevilacqua, A&B Properties, Inc.  
Ivan Nakatsuka, Austin Tsutsumi & Associates, Inc.

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CHARMAINE TAVARES  
Mayor

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

MICHAEL M. MIYAMOTO  
Deputy Director

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



JUL 30 2008  
RALPH NAGAMINE, L.S., P.E.  
Development Services Administration

CARY YAMASHITA, P.E.  
Engineering Division

BRIAN HASHIRO, P.E.  
Highways Division

COUNTY OF MAUI  
**DEPARTMENT OF PUBLIC WORKS**  
200 SOUTH HIGH STREET, ROOM NO. 434  
WAILUKU, MAUI, HAWAII 96793

July 24, 2008

Mr. Michael T. Munekiyo, A.I.C.P.  
MUNEKIYO & HIRAGA, INC.  
305 High Street, Suite 104  
Wailuku, Maui, Hawaii 96793

Dear Mr. Munekiyo:

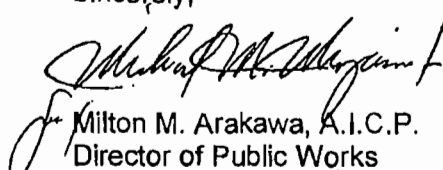
**SUBJECT: ENVIRONMENTAL IMPACT STATEMENT PREPARATION  
NOTICE FOR PROPOSED WAIALE WATER TREATMENT  
FACILITY; TMK: (2) 3-8-046:020 (POR.)**

We reviewed the subject application and have the following comment:

1. Access to the Kuikahi Drive Extension needs to be coordinated with Maui Lani.

Please call Michael Miyamoto at 270-7845 if you have any questions regarding this letter.

Sincerely,

  
Milton M. Arakawa, A.I.C.P.  
Director of Public Works

MMA:MMM:ls

xc: Department of Water Supply  
Highways Division  
Engineering Division

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

MARK ALEXANDER RUS  
KEELI ISHIZAKA

October 8, 2008

Milton M. Arakawa, A. I. C. P.  
Director of Public Works  
County of Maui  
Department of Public Works  
200 South High Street, Room No. 434  
Wailuku, Hawai'i 96793

SUBJECT: Environmental Impact Statement Preparation Notice for Proposed  
Wai`ale Water Treatment Facility at Tax Map Key No. (2) 3-8-046:020  
(por.), Wailuku, Maui, Hawai'i

---

Dear Mr. Arakawa:

Thank you for your letter of July 24, 2008, providing comments on the Environmental Impact Statement Preparation Notice for the Proposed Wai`ale Water Treatment Facility. We provide following information to address the comments noted.

**1. Access Coordination for Kuikahi Drive**

The project civil engineer has been coordinating with Maui Lani to ensure that access via Kuikahi Drive will be available once the water treatment facility is constructed and becomes operational.

Thank you again for commenting on the proposed action. A copy of the Draft EIS will be provided to your office for review and comment.

Milton M. Arakawa, A. I. C. P.  
Director of Public Works  
October 8, 2008  
Page 2

In the mean time, if there are any questions or if additional information is needed, please let me know.

Very truly yours,



Michael T. Munekiyo, A. I. C. P.  
Project Manager

MTM:yp

cc: Jeffrey Eng, Department of Water Supply  
Diane Bevilacqua, A&B Properties, Inc.  
Ivan Nakatsuka, Austin Tsutsumi & Associates, Inc.

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AUG 07 2008

CHARMAINE TAVARES  
Mayor  
CHERYL K. OKUMA, Esq.  
Director  
GREGG KRESGE  
Deputy Director



TRACY TAKAMINE, P.E.  
Solid Waste Division  
DAVID TAYLOR, P.E.  
Wastewater Reclamation  
Division

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

August 5, 2008

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

**SUBJECT: WAIALE WATER TREATMENT FACILITY  
ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE  
TMK (2) 3-8-046:020 (POR.)**

Dear Mr. Munekiyo,

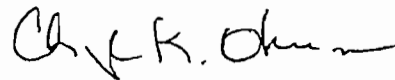
We reviewed the subject project as a pre-application consultation and have the following comments:

1. Solid Waste Division comments:
  - a. Sludge must pass paint filter test for Central Maui Landfill disposal.
  - b. Section II.C.3.b. addresses other disposed/recycled materials.
2. Wastewater Reclamation Division (WWRD) comments:
  - a. Although wastewater system capacity is currently available as of 8/5/2008, the developer should be informed that wastewater system capacity cannot be ensured until the issuance of the building permit.
  - b. Wastewater contribution calculations are required before building permit is issued.
  - c. Developer shall pay assessment fees for treatment plant expansion costs in accordance with ordinance setting forth such fees.
  - d. Developer is required to fund any necessary off-site improvements to collection system and wastewater pump stations.
  - e. Plans should show the installation of a service manhole near the property line prior to connection to the County sewer. Wastewater should gravity flow into the existing County sewer facilities.

- f. Project construction plans should be reviewed and approved by our division before the building permit is issued.
- g. Indicate on the plans the ownership of each easement (in favor of which party). Note: County will not accept sewer easements that traverse private property. Wastewater facilities in the easements will remain privately owned and maintained.
- h. Non-contact cooling water and condensate should not drain to the wastewater system.

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

Sincerely,

A handwritten signature in black ink, appearing to read "Cheryl Okuma". The signature is fluid and cursive, with a long horizontal stroke at the end.

Cheryl Okuma, Director

xc: Jeffery Eng, Director, Department of Water Supply



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

MARK ALEXANDER RUI  
KEELI HIRAGA

October 8, 2008

Cheryl Okuma, Director  
County of Maui  
**Department of Environmental Management**  
2200 Main Street, Suite 100  
Wailuku, Hawai'i 96793

**SUBJECT:** Environmental Impact Statement Preparation Notice for Proposed  
Wai`ale Water Treatment Facility at Tax Map Key No. (2) 3-8-046:020  
(por.), Wailuku, Maui, Hawai'i

---

Dear Ms. Okuma:

Thank you for your letter of August 5, 2008, providing comments on the Environmental Impact Statement Preparation Notice for the Proposed Wai`ale Water Treatment Facility. We provide following information to address the comments noted.

**1. Solid Waste Division Comments**

Sludge from the water treatment facility will meet paint filter tests prescribed by the County of Maui.

**2. Wastewater Reclamation Division Comments**

- a. The applicant understands that wastewater system capacity cannot be ensured until the issuance of the building permit for the project.
- b. As required, wastewater contribution calculations will be provided in connection with the building permit process.
- c. The applicant understands compliance requirements with applicable sections of Chapter 14.35 of the Maui County Code, relating to wastewater assessment fees.
- d. Should off-site improvements to collection and pump station facilities be required, the applicant understands its obligations for its fair-share contribution to such improvements.



Cheryl Okuma, Director  
October 8, 2008  
Page 2

- e. A service manhole will be reflected in the project plans as required by the County. Additionally, the proposed wastewater improvements will involve a gravity sewer connecting to the County system.
- f. Project plans will be submitted to the Wastewater Reclamation Division as part of the building permit review and approval process.
- g. As applicable, construction plans will reflect easements and ownerships. The applicant understands that wastewater facilities in the easements will remain privately owned and maintained.
- h. The applicant confirms that non-contact cooling water and condensate will not drain into the wastewater system.

Thank you again for commenting on the proposed action. A copy of the Draft EIS will be provided to your office for review and comment.

In the mean time, if there are any questions or if additional information is needed, please let me know.

Very truly yours,



Michael T. Munekiyo, A. I. C. P.  
Project Manager

MTM:yp

cc: Jeffrey Eng, Department of Water Supply  
Diane Bevilacqua, A&B Properties, Inc.  
Ivan Nakatsuka, Austin Tsutsumi & Associates, Inc.

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**By Email and Facsimile Transmittal**

August 06, 2008

Daren Suzuki, Planner  
Munekiyo & Hiraga, Inc.  
305 High St. Suite 104  
Wailuku, Hawai'i 96793  
Email: [planning@mhplanning.com](mailto:planning@mhplanning.com)  
Fax: (808) 244-8729

**RE: Proposed Wai'ale Water Treatment Facility**

Aloha Daren:

Please include Hui o Nā Wai `Ehā on your list of organizations who will receive information on water issues in Nā Wai `Ehā, including A&B Properties Inc's proposed development of a surface water treatment plant. I am the President of Hui o Nā Wai `Ehā and my contact information is provided below. The Hui is a community-based organization established to promote the conservation and appropriate management of Hawai'i's natural and cultural resources, including streams, oceans, estuaries, native flora and fauna, and related traditional and customary Native Hawaiian practices, educational opportunities, and scientific activities. Hui supporters live, work, and play in and around Nā Wai `Ehā and rely on, routinely use, or hope to use Nā Wai `Ehā and their nearshore marine waters for fishing, swimming, agriculture, aquaculture, research, photography, educational programs, aesthetic enjoyment, traditional and customary Native Hawaiian practices, and other recreational, scientific, cultural, educational, and religious activities.

In 2004, the Hui, together with Maui Tomorrow Foundation, Inc., initiated a series of legal actions with the State Water Commission to restore mauka to makai stream flow to Waihe`e, Waiehu, `Īao, and Waikapū streams and communities. Although the contested case on our petition for Interim Instream Flow Standard ("IIFS") Amendments is still ongoing, in April 2008, the Water Commission granted a separate petition and designated Nā Wai `Ehā the first surface water management area in Hawai'i.

Given our extensive work and background in this area, as well as the ongoing legal proceedings over Nā Wai `Ehā water, we are unsure what amount of water, if any, will be available to support A&B's proposed surface water treatment plant. We strongly oppose the construction of this plant at least until the IIFS issue is settled. We urge you to suspend further work on the plant until after the State

Letter to Munekiyo & Hiraga, Inc. re EISPN  
August 6, 2008  
Page 2 of 2

Water Commission issues decisions on both the IIFS amendment for each Nā Wai `Ehā stream, and individual water use permit applications for water from those streams.

Please keep in mind that our State Constitution and Water Code recognize “that the waters of the State are held for the benefit of the citizens of the State. It is declared that the people of the State are beneficiaries and have a right to have the water protected for their use.” Our laws say nothing about protecting water for private companies.

Given the preliminary nature of your Environmental Impact Statement (“EIS”) Preparation Notice and the fact that much of the analysis was deferred to the draft EIS, it is difficult to provide more substantive comments at this stage. The Hui will, however, closely review your draft EIS. Given the tremendous cultural significance of this area, we also look forward to reviewing your cultural impact assessment. Please provide us with hard copies of both your draft EIS and cultural impact assessments when they are completed, and keep us apprised of any meetings or other opportunities for public comment on this issue.

Sincerely,

/s/

John V. Duey, President  
Hui O Nā Wai `Ehā  
575-A `Īao Valley Rd.  
Wailuku, Maui, Hawai`i 96793-3007  
Phone: 808-242-8565  
Fax: 808-242-8565  
Email: [jduey@maui.net](mailto:jduey@maui.net)

cc: Jeff Eng, Director  
Maui County Department of Water Supply  
(via email: [Jeffrey.Eng@co.maui.hi.us](mailto:Jeffrey.Eng@co.maui.hi.us))

Mayor Charmaine Tavares  
(via email: [Charmaine.Tavares@co.maui.hi.us](mailto:Charmaine.Tavares@co.maui.hi.us))



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

MARK ALEXANDER REED  
KEEL BRADY

October 8, 2008

John V. Duey, President  
**Hui O Na Wai `Eha**  
575-A Iao Valley Road  
Wailuku, Hawai'i 96793-3007

SUBJECT: Environmental Impact Statement Preparation Notice for Proposed  
Wai`ale Water Treatment Facility at Tax Map Key No. (2) 3-8-046:020  
(por.), Wailuku, Maui, Hawai'i

Dear Mr. Duey:

Thank you for your letter of August 6, 2008, providing comments on the Environmental Impact Statement Preparation Notice for the Proposed Wai`ale Water Treatment Facility. We provide following information to address the comments noted.

**1. Request for Consulted Party Status**

Hui O Na Wai `Eha will receive a copy of the Draft Environmental Impact Statement (EIS) for review and comment.

**2. Construction of the Water Treatment Facility**

The water treatment facility will not be constructed until a decision is made on the Na Wai `Eha Interim Instream Flow Standard (IIFS) petition and applicable regulatory permits/approvals are secured. As part of the regulatory approval protocols, A&B Properties, Inc. is currently undertaking the preparation and processing of the Chapter 343, Hawai'i Revised Statutes, Environmental Impact Statement (EIS). As will be noted in the Draft EIS, the proposed water treatment facility will be dedicated to the County of Maui once the facility is constructed.

Thank you again for your initial comments on the proposed action. As noted previously, a copy of the Draft EIS, including the cultural impact assessment, will be provided to you for review and comment.

John V. Duey, President  
October 8, 2008  
Page 2

In the mean time, if there are any questions or if additional information is needed, please let me know.

Very truly yours,



Michael T. Munekiyo, A. I. C. P.  
Project Manager

MTM:yp

cc: Jeffrey Eng, Department of Water Supply  
Diane Bevilacqua, A&B Properties, Inc.  
Ivan Nakatsuka, Austin Tsutsumi & Associates, Inc.

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**MAUI TOMORROW FOUNDATION, INC.**

Protecting Maui's Future

August 7, 2008

Judith  
Michaels  
*President*

Mr. Michael Munekiyo, Project Manager  
Munekiyo & Hiraga, Inc.  
305 High Street, #104  
Wailuku, HI. 96793

Rob  
Parsons  
*Vice President*

Tripp  
Lynch  
*Treasurer*

Mr. Jeffrey Eng, Director  
County of Maui  
Department of Water Supply  
200 South High Street  
Wailuku, HI 96793

Maury  
King  
*Secretary*

**RE: Official Comments on Preparation Notice for Draft Environmental Impact Statement for Proposed Wai'ale Water Treatment Facility**

Lucienne  
de Naie

Lance  
Hofer

Aloha;

Mark  
Sheehan

Thank you for the opportunity to provide official comments on the Environmental Impact Statement Preparation Notice (EISPN) for the proposed Wai'ale Water Treatment Facility (WTF) from applicant A&B Properties, Inc., in collaboration with the County Department of Water Supply (DWS). Maui Tomorrow Foundation, Inc., a 501(c)(3) organization promoting responsible planning and sustainable development, offers the following comments:

Ed  
Lindsey

Richard  
Michaels

**Request for Consulted Party Status**

Michael  
Howden

Elle  
Cochran

Maui Tomorrow Foundation (MTF) is one of the parties with standing in the Na Wai Eha contested case hearings with Wailuku Water Company, before the State Commission on Water Resources Management (CWRM). Since the proposed source for the WTF is part of the surface waters of Na Wai Eha, which were designated by the CWRM as a water management area, MTF would like to be a consulted party in the Environmental Impact Statement (EIS) review. MTF believes that preparation of the EIS for the proposed WTF before a final ruling on the Interim Instream Flow Standards for the four streams of Na Wai Eha is premature and ill-advised.

Irene  
Bowie  
*Executive Director*

Maui Tomorrow comments: Waiale Water Treatment Facility, page 2

**Overview**

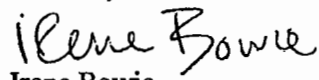
The stated Project Purpose and Need is to meet future water demand requirements for the continued economic and social well-being of Maui County (page 9). While MTF agrees it is useful to identify new potential sources of potable water, that process is guided by the County Water Use and Development Plan (WUDP), which is in the process of being updated. Until that update is complete, and approved by the Maui County Council, it is premature to assume that the proposed WTF is the best choice for increasing potable water sources for Central Maui.

Projections for potable water demand through 2030 are based on DWS projections for growth (page 9, 25-26). While the Maui General Plan Advisory Committee (GPAC) is still considering revisions to the Maui Island Plan, it is possible that those projections may overstate actual future demand. Until these guiding plans to our island's future run their course of citizen participation and are finalized, Maui Tomorrow Foundation reserves its comments on this aspect of the proposed WTF.

Finally, there is not sufficient information in the EISPN to provide detailed comments on a variety of issues. We look forward to providing more substantive comments upon the disclosure of more complete information in your draft EIS.

Mahalo nui loa for the opportunity to share our organization's perspective on this proposal.

Sincerely,

  
Irene Bowie  
Executive Director

c: Mayor Charmaine Tavares



MICHAEL T. MUNEKIYO  
GWEN DRASCH HIRAGA  
MITSURU "MICH" HIRANO  
KARLYNE FORDGA

MARK ALEXANDER RUI  
KYLE BENJAMIN

October 8, 2008

Irene Bowie, Executive Director  
**Maui Tomorrow**  
P. O. Box 299  
Makawao, Hawai'i 96768

SUBJECT: Environmental Impact Statement Preparation Notice for Proposed  
Wai'ale Water Treatment Facility at Tax Map Key No. (2) 3-8-046:020  
(por.), Wailuku, Maui, Hawai'i

---

Dear Ms. Bowie:

Thank you for your letter of August 7, 2008, providing comments on the Environmental Impact Statement Preparation Notice for the Proposed Wai'ale Water Treatment Facility (WTF). We provide following information to address the comments noted.

**1. Request for Consulted Party Status**

The Maui Tomorrow Foundation will receive a copy of the Draft Environmental Impact Statement (EIS) for review and comment.

**2. Timing of Environmental Impact Statement**

As you note, the State Commission on Water Resource Management (CWRM) has yet to rule on the Interim Instream Flow Standards for the four (4) Na Wai'Eha streams, which is anticipated in 2009. Separate from the CWRM process, A&B Properties, Inc. and the Department of Water Supply (as approving agency) have determined that it is appropriate to begin the preparation of the Draft EIS to address Chapter 343, Hawai'i Revised Statutes (HRS) requirements for environmental impact analysis. In general, construction elements (e.g., chlorinator building, sludge lagoons, contact and clearwell facilities, etc.) and the environmental impacts of these elements will not be affected by the CWRM process. Any action/decisions made by the CWRM will be incorporated into the Final EIS.



**3. County Water Use and Development Plan**

The proposed action has been identified as one (1) of five (5) final candidate strategies for new sources for Central Maui. In this context, the preparation of the Chapter 343, HRS EIS for the WTF is not meant to disregard the Water Use and Development Plan formulation process. Rather the Chapter 343, HRS process is being undertaken in recognition that this proposal is a viable alternative and that implementation of this or any other of the five (5) candidate strategies will require Chapter 343, HRS compliance.

**4. Potable Water Demand**

The applicant is aware of and has been following the progress of the General Plan Update process. Moreover, the applicant respects Maui Tomorrow Foundation's desire to reserve comment on potable water demand projections in its comments on the Draft EIS.

Thank you again for your initial comments on the proposed action. As noted, a copy of the Draft EIS will be provided to you for review and comment.

In the mean time, if there are any questions or if additional information is needed, please let me know.

Very truly yours,



Michael T. Munekiyo, A. I. C. P.  
Project Manager

MTM:yp

cc: Jeffrey Eng, Department of Water Supply  
Diane Bevilacqua, A&B Properties, Inc.  
Ivan Nakatsuka, Austin Tsutsumi & Associates, Inc.

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AUG 0 8 2008



**SIERRA CLUB  
HAWAII CHAPTER**

P.O. Box 2577, Honolulu, HI 96803  
tel: 808.538.6616 fax: 808.537.9019

Aug 7, 2008

Daren Suzuki, Planner  
Munekiyo & Hiraga, Inc.  
305 High St. Suite 104  
Wailuku, Hi. 96793

Mr. Jeffrey Eng, Director  
County of Maui  
Department of Water Supply  
200 South High Street  
Wailuku, HI 96793

**RE: Request for comments on the proposed Wai'ale water treatment facility and environmental impact statement preparation notice (EISPN), Wailuku, Maui, TMK: 3-08-046: 020.**

Thank you for the opportunity to provide official comments on the Environmental Impact Statement Preparation Notice (EISPN) for the proposed Wai'ale Water Treatment Facility (WTF) from applicant A&B Properties, Inc., in collaboration with the County Department of Water Supply (DWS). Sierra Club, Maui Group, on behalf of our 700 members, offers the following comments:

**Request for Consulted Party Status**

Sierra Club Maui Group has long been involved in issues affecting the state's public trust resources and would like to be a consulted party in the Environmental Impact Statement (EIS) review for this project.

**Timing of EISPN**

We believe that preparation for this EIS for the proposed WTF is premature, since it is being discussed before a final ruling on the Interim Instream Flow Standards for the four streams of Na Wai Eha. Without the key information that will be provided by the Commission's decision, preparation of any Draft EIS should be deferred and the proposed action reconsidered.

Please provide us with hard copies of any Draft of final EIS documents you may prepare and keep us informed about any future opportunities for public comment.

Mahalo Nui loa,

A handwritten signature in cursive script that reads 'Lucienne de Naie'.

Lucienne de Naie  
Chair, Sierra Club Hawaii Chapter  
On behalf of: Sierra Club, Maui Group  
PO Box 791180  
Paia. HI 96779



MICHAEL T. MUNEKIYO  
GWEN CHASEE HIRAGA  
MITSURU "MICH" HIRANO  
KARLYNN HIRAGA

MARK ALEXANDER RUI  
KEEL BIRDA

October 8, 2008

Lucienne de Naie, Chair  
**Sierra Club Hawai'i Chapter, Maui Group**  
P. O. Box 791180  
Paia, Hawai'i 96779

SUBJECT: Environmental Impact Statement Preparation Notice for Proposed  
Wai'ale Water Treatment Facility at Tax Map Key No. (2) 3-8-046:020  
(por.), Wailuku, Maui, Hawai'i

Dear Ms. de Naie:

Thank you for your letter of August 7, 2008, providing comments on the Environmental Impact Statement Preparation Notice for the Proposed Wai'ale Water Treatment Facility (WTF). We provide following information to address the comments noted.

**1. Request for Consulted Party Status**

The Sierra Club Maui Group will receive a copy of the Draft Environmental Impact Statement (EIS) for review and comment.

**2. Timing of the Environmental Impact Statement**

As you note, the State Commission on Water Resource Management (CWRM) has yet to rule on the Interim Instream Flow Standards for the four Na Wai'Eha streams, which is anticipated in 2009. Separate from the CWRM process, A&B Properties, Inc. and the Department of Water Supply (as the approving agency) have determined that it is appropriate to begin the preparation of the Draft EIS to address Chapter 343, Hawai'i Revised Statutes (HRS) requirements for environmental impact analysis. In general, construction elements (e.g., chlorinator building, sludge lagoons, contact and clearwell facilities, etc.) of the proposed water treatment facility and the environmental impacts of these elements will not be affected by the CWRM process. Any action/decisions made by the CWRM will be incorporated into the Final EIS.

Thank you again for your initial comments on the proposed action. As noted above, a copy of the Draft EIS will be provided to you for review and comment.

Lucienne de Naie, Chair  
October 8, 2008  
Page 2

In the mean time, if there are any questions or if additional information is needed, please let me know.

Very truly yours,



Michael T. Munekiyo, A. I. C. P.  
Project Manager

MTM:yp

cc: Jeffrey Eng, Department of Water Supply  
Diane Bevilacqua, A&B Properties, Inc.  
Ivan Nakatsuka, Austin Tsutsumi & Associates, Inc.

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## **XII. REFERENCES**

## **XII. REFERENCES**

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County of Maui, The General Plan of the County of Maui, September 1990 Update.

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# **APPENDIX A.**

## **Waihe`e Stream and Waihe`e Ditch Water Data**



USGS 16614000 Waihee River at Dam near Waihee, Maui, HI												
Mean daily mean values for this day for 22 years of record, from 1983 to 2005 in MGD												
Day of Month	January	February	March	April	May	June	July	August	September	October	November	December
1	59.2	35.7	55.9	66.6	52.0	44.1	43.0	46.2	44.8	39.8	39.0	57.9
2	52.4	35.4	37.9	53.6	43.6	44.7	42.4	48.3	62.2	43.3	43.8	43.4
3	47.7	36.5	46.2	51.5	61.3	40.1	45.8	53.6	58.4	35.0	41.0	41.8
4	38.1	47.2	44.9	40.3	45.6	42.9	48.3	47.1	59.8	36.5	55.8	44.5
5	39.6	34.3	44.9	55.0	80.1	42.9	48.7	39.3	45.7	35.2	42.0	44.3
6	36.5	34.8	65.9	52.6	68.5	44.2	54.4	43.5	45.9	31.7	34.3	61.5
7	39.8	35.4	59.3	58.0	57.2	50.9	56.2	59.6	48.9	43.2	39.1	51.4
8	38.4	43.6	67.9	76.9	54.7	38.8	56.2	48.6	39.0	41.3	43.8	55.3
9	44.2	31.0	57.5	73.0	43.4	39.1	55.7	50.6	41.8	39.4	45.4	63.3
10	43.2	31.4	50.9	89.8	40.6	42.6	48.5	42.3	38.5	34.6	37.2	45.2
11	35.0	36.8	44.9	47.4	54.4	41.4	51.8	56.9	38.0	38.1	57.2	48.3
12	35.4	47.3	50.3	48.7	55.2	42.9	46.0	55.5	40.4	36.8	59.9	48.6
13	55.8	52.3	45.8	55.5	61.0	37.0	50.0	50.3	42.1	37.2	70.5	47.1
14	62.7	64.1	56.4	67.9	50.0	40.3	56.2	43.1	41.8	37.0	82.1	42.7
15	52.5	60.1	58.9	44.9	51.1	41.0	62.2	46.5	37.8	48.3	51.8	36.2
16	56.2	47.4	42.7	53.0	44.5	51.1	46.0	60.1	37.0	54.7	49.0	41.6
17	53.7	42.1	57.8	52.7	44.9	51.1	50.9	43.8	46.9	55.8	41.7	42.0
18	50.1	34.8	46.1	45.4	41.4	47.5	48.1	37.9	58.5	69.2	61.5	35.9
19	51.1	50.4	53.9	58.5	46.8	46.1	60.3	43.6	57.3	44.1	65.3	36.6
20	60.7	44.0	65.3	69.8	49.6	58.6	60.2	51.4	38.3	39.6	54.5	34.6
21	40.8	33.6	68.5	43.4	42.1	42.8	56.9	51.7	40.7	33.1	60.6	41.6
22	43.5	44.7	92.4	51.6	41.9	42.0	71.7	47.6	34.1	37.4	48.0	39.5
23	35.3	34.3	86.0	54.9	41.8	36.6	46.1	50.8	53.1	49.8	52.7	49.6
24	35.5	36.6	61.0	48.5	42.3	46.7	50.2	47.1	36.5	47.6	42.7	43.2
25	48.5	65.3	49.9	56.6	36.1	64.6	44.6	40.0	34.2	46.5	56.8	54.5
26	65.3	47.5	43.2	58.9	38.4	49.1	69.2	47.1	37.8	44.0	40.1	47.8
27	62.6	48.7	60.2	53.8	38.1	44.1	72.4	57.7	49.5	42.2	50.2	41.3
28	64.4	47.6	53.5	56.6	37.6	40.7	58.0	41.4	33.6	55.3	50.2	32.2
29	49.5	40.1	51.1	65.3	42.0	37.8	54.5	46.9	35.8	41.4	55.3	37.9
30	40.5	40.5	57.0	45.5	47.5	42.9	50.5	40.7	42.3	37.8	66.6	46.3
31	42.5		69.8	48.1	48.1	41.8	41.8	42.7	37.9	37.9	37.9	49.5
Min. mean flow/Month	35.0	31.0	37.9	40.3	36.1	36.6	41.8	37.9	33.6	31.7	34.3	32.2

WAIHEE DITCH DELIVERY IN MILLION GALLONS

<u>Year</u>	<u>JAN</u>	<u>FEB</u>	<u>MAR</u>	<u>APR</u>	<u>MAY</u>	<u>JUN</u>	<u>JUL</u>	<u>AUG</u>	<u>SEP</u>	<u>OCT</u>	<u>NOV</u>	<u>DEC</u>	<u>TOTAL</u>	<u>AVG.</u> <u>MGD</u>
1994	737.72	659.32	645.53	994.64	719.23	825.71	994.31	950.50	901.50	708.68	833.17	711.42	9681.73	26.51
1995	628.65	454.48	419.98	791.48	717.37	463.01	767.67	905.20	587.49	749.61	674.13	525.29	7684.36	21.04
1996	633.94	750.00	590.77	901.63	703.75	608.48	634.86	679.10	579.31	372.46	602.37	486.24	7542.91	20.65
1997	363.92	612.93	552.92	605.04	820.81	876.24	1121.49	985.60	894.92	668.25	822.21	496.52	8820.85	24.15
1998	614.91	598.33	639.77	1063.75	1078.35	1147.16	1026.17	869.02	914.38	1145.96	955.67	711.10	10764.57	29.47
1999	654.82	620.40	717.00	674.90	546.22	468.98	642.35	671.28	485.61	497.98	508.80	718.07	7206.41	19.73
2000	395.46	542.37	499.62	762.59	437.44	451.28	565.33	688.79	847.40	830.01	504.52	442.65	6967.46	19.08
2001	343.10	426.47	489.85	579.98	759.80	669.52	492.61	867.25	624.42	751.22	820.43	839.22	7663.87	20.98
2002	841.58	859.96	926.23	643.01	923.33	741.89	884.03	794.40	638.68	541.96	449.60	534.62	8779.29	24.04
2003	430.15	312.43	421.54	496.07	385.54	272.15	496.09	443.30	378.40	383.79	507.72	772.36	5299.54	14.51
TOTAL	5644.25	5836.69	5903.21	7513.09	7091.84	6524.42	7624.91	7854.44	6852.11	6649.92	6678.62	6237.49	80410.99	
AVG/YEAR	564.43	583.67	590.32	751.31	709.18	652.44	762.49	785.44	685.21	664.99	667.86	623.75	8041.10	
AVG. MGD	18.21	20.85	19.04	25.04	22.88	21.75	24.60	25.34	22.84	21.45	22.26	20.12	22.02	

Note: Gaging station is at Waihee Ditch @ Field 63 (Hopoi)  
Total water delivery goes to HC&S

# **APPENDIX B.**

## **Biological Resources Survey**

**BIOLOGICAL RESOURCES SURVEY**  
**for the**  
**WAI'ALE WATER TREATMENT FACILITY**  
**Wailuku – Maui - Hawaii**

**by**

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**July 2008**

**Prepared for:**  
**A & B Properties Inc. and**  
**County of Maui, Dept. of Water Supply**

# **BIOLOGICAL RESOURCES SURVEY**

## **Wai'ale Water Treatment Facility**

### **INTRODUCTION**

The Wai'ale Water Treatment Facility site lies on approximately 3 acres of undeveloped land TMK (2) 3-8-46:20 (por.) just southeast of Wailuku town. The site is bounded by Wai'ale Reservoir on the east and south, by Spreckels Ditch on the west and by an industrial baseyard on the north. This study was initiated to fulfill environmental requirements of the planning process.

### **SITE DESCRIPTION**

The project area is adjacent to an active ditch system and a large water storage reservoir. Terrain is relatively level but has a few low berms and ridges. The area is densely forested with a variety of trees but has a few grassy openings. Soils are uniformly of the Pu'u One Sand, 7-30% slopes (PZUE) series (Foote et al, 1972) which consists of pure lithified or loose sand. Elevations range from 200 to 220 feet above sea level. Rainfall averages 20 to 23 inches per years with the bulk falling during the winter months (Armstrong, 1983).

### **BIOLOGICAL HISTORY**

In pre-contact times this sandy area would have been less stabilized than it is at present. The shifting sands would have been sparsely vegetated with a variety of low, wind shaped native shrubs, vines and grasses with a few scattered trees. The project area escaped intensive agricultural use but was a peripheral area that was used for grazing. The Wai'ale Reservoir and Spreckels Ditch have been in place for over a century. These activities and uses have drastically changed the landscape and vegetation. The native plant species are now almost completely gone and are replaced by many hardy weed species that dominate the site.

## **SURVEY OBJECTIVES**

This report summarizes the findings of a flora and fauna survey of the proposed Wai'ale Water Treatment Facility which was conducted in June, 2008.

The objectives of the survey were to:

1. Document what plant, bird and mammal 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.
5. Note which aspects of the proposed development pose significant concerns for plants or for wildlife and recommend measures that would mitigate or avoid these problems.

## **BOTANICAL SURVEY REPORT**

### **SURVEY METHODS**

A walk-through botanical survey method was used to cover all parts of this 3- acre property. All representative habitats were examined including dense forest, grass and brushlands as well as riparian areas. Close attention was made in ascertaining the presence of any native Hawaiian plant species.

### **DESCRIPTION OF THE VEGETATION**

Much of this site is densely forested. Most common species include Java plum (*Syzygium cumini*), 'öpiuma (*Pithecellaobium dulce*) and koa haole (*Leucaena leucocephala*). Also common is Guinea grass (*Panicum maximum*) which forms much of the understory. Less common are California grass (*Brachiaria mutica*), Japanese lovegrass (*Eragrostis amabilis*), Chinese violet (*Asystasia gangetica*), moonflower (*Ipomoea alba*), kiawe (*Prosopis pallida*), maunaloa (*Canavalia cathartica*), monkeypod (*Samanea saman*), glycine (*Neonotonia wightii*), lion's ear (*Leonotis nepetifolia*) and hairy abutilon (*Abutilon grandifolium*).

A total of 55 plant species were recorded during the survey. Two of these were native Hawaiian plants: 'ilima (*Sida fallax*) and 'uhaloa (*Waltheria indica*). The remaining 53 species were non-native trees, shrubs, vines and grasses.

#### **DISCUSSION AND RECOMMENDATIONS**

The vegetation in this project area is totally dominated by non-native species. Only two plant species were native to Hawai'i: 'ilima and 'uhaloa. Both of these are widespread and common indigenous species in Hawai'i as well as other Pacific islands. No Endangered or Threatened plant species were found, nor were any seen that are candidates for such protected Federal status. No special native plant habitats were found either. There are no wetlands on the property, although it lies adjacent to an active agricultural ditch and reservoir complex that brings riparian influences into close proximity.

Because the vegetation on this site is dominated by common non-native plants and because there are no rare or protected native species within the project area, there is little of botanical concern with regard to this property, and the proposed project is not expected to have a significant negative impact on the botanical resources in this part of Maui.

No special recommendations with reference to plants are deemed appropriate or necessary.

## PLANT SPECIES LIST

Following is a checklist of all the 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 = those plant species brought to Hawaii by the Polynesians during the course of their migrations.
  - 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.



<u>SCIENTIFIC NAME</u>	<u>COMMON NAME</u>	<u>STATUS</u>	<u>ABUNDANCE</u>
<b>MONOCOTS</b>			
POACEAE (Grass Family)			
<i>Washingtonia robusta</i> H. Wendland	Mexican Washingtonia	non-native	rare
CYPERACEAE (Sedge Family)			
<i>Cyperus rotundus</i> L.	nut sedge	non-native	rare
POACEAE (Grass Family)			
<i>Brachiaria mutica</i> (Forssk.) Stapf	California grass	non-native	uncommon
<i>Cynodon dactylon</i> L.	Bermuda grass	non-native	rare
<i>Eragrostis amabilis</i> (L.) Wight & Arnott	Japanese lovegrass	non-native	uncommon
<i>Eragrostis pectinacea</i> (Michx.) Nees	Carolina lovegrass	non-native	rare
<i>Panicum maximum</i> Jacq.	Guinea grass	non-native	common
<i>Pennisetum purpureum</i> Schumach.	Napier grass	non-native	rare
<b>DICOTS</b>			
ACANTHACEAE (Acanthus Family)			
<i>Asystasia gangetica</i> (L.) T. Anderson	Chinese violet	non-native	uncommon
<i>Thunbergia fragrans</i> Roxb.	sweet clock-vine	non-native	rare
AMARANTHACEAE (Amaranth Family)			
<i>Amaranthus spinosus</i> L.	spiny amaranth	non-native	rare
<i>Chenopodium carinatum</i> R. Br.	keeled goosefoot	non-native	rare
ANACARDIACEAE (Mango Family)			
<i>Schinus terebinthifolius</i> Raddi	Christmas berry	non-native	rare
ARALIACEAE (Ginseng Family)			
<i>Schefflera actinophylla</i> (Endl.) Harms	octopus tree	non-native	rare
ASTERACEAE (Sunflower Family)			
<i>Elephantopus mollis</i> Kunth	elephantopus	non-native	rare

<u>SCIENTIFIC NAME</u>	<u>COMMON NAME</u>	<u>STATUS</u>	<u>ABUNDANCE</u>
<i>Pluchea carolinensis</i> (Jacq.) G. Don	sourbush	non-native	rare
<i>Verbesina encelioides</i> (Cav.) Benth. & Hook.	golden crown-beard	non-native	rare
<b>BORAGINACEAE (Borage Family)</b>			
<i>Carmona retusa</i> (Vahl) Masam.	Fukien tea	non-native	rare
<i>Heliotropium procumbens</i> Mill.	fourspike heliotrope	non-native	rare
<b>CARICACEAE (Papaya Family)</b>			
<i>Carica papaya</i> L.	papaya	non-native	rare
<b>CONVOLVULACEAE (Morning Glory Family)</b>			
<i>Ipomoea alba</i> L.	moonflower	non-native	uncommon
<b>CUCURBITACEAE (Gourd Family)</b>			
<i>Momordica charantia</i> L.	balsam pear	non-native	rare
<b>EUPHORBIACEAE (Spurge Family)</b>			
<i>Aleurites moluccana</i> (L.) Willd.	kukui	Polynesian	rare
<i>Chamaesyce hirta</i> (L.) Millsp.	hairy spurge	non-native	rare
<i>Chamaesyce hypericifolia</i> (L.) Millsp.	graceful spurge	non-native	rare
<i>Macaranga tanarius</i> (L.) Mull. Arg.	parasol leaf tree	non-native	rare
<i>Ricinus communis</i> L.	Castor bean	non-native	rare
<b>FABACEAE (Pea Family)</b>			
<i>Canavalia cathartica</i> Thouars	<i>maunaloa</i>	non-native	uncommon
<i>Crotalaria incana</i> L.	fuzzy rattlepod	non-native	rare
<i>Crotalaria pallida</i> Aiton	smooth rattlepod	non-native	rare
<i>Desmanthus pernambucanus</i> (L.) Thellung	slender mimosa	non-native	rare
<i>Indigofera hendecaphylla</i> Jacq.	creeping indigo	non-native	rare
<i>Indigofera suffruticosa</i> Mill.	'inikö	non-native	rare

<u>SCIENTIFIC NAME</u>	<u>COMMON NAME</u>	<u>STATUS</u>	<u>ABUNDANCE</u>
<i>Leucaena leucocephala</i> (Lam.) de Wit	<i>koa haole</i>	non-native	common
<i>Macroptilium atropurpureum</i> (DC.) Urb.	siratro	non-native	rare
<i>Neonotonia wightii</i> (Arnott ex Wight & Arnott) Lackey	glycine	non-native	uncommon
<i>Pithecellobium dulce</i> (Roxb.) Benth.	' <i>öpiuma</i>	non-native	common
<i>Prosopis pallida</i> (Humb.& Bonpl. ex Willd.) Kunth	kiawe	non-native	uncommon
<i>Samanea saman</i> (Jacq.) Merr.	monkeypod	non-native	uncommon
<i>Senna alata</i> (L.) Roxb.	candle bush	non-native	rare
LAMIACEAE (Mint Family)			
<i>Leonotis nepetifolia</i> (L.) R.Br.	lion's ear	non-native	uncommon
MALVACEAE (Mallow Family)			
<i>Abutilon grandifolium</i> (Willd.) Sweet	hairy abutilon	non-native	uncommon
<i>Malvastrum coromandelianum</i> (L.) Garcke	false mallow	non-native	rare
<i>Sida fallax</i> Walp.	' <i>ilima</i>	indigenous	rare
<i>Sida rhombifolia</i> L.	Cuban jute	non-native	rare
<i>Waltheria indica</i> L.	' <i>uhaloa</i>	indigenous	rare
MELIACEAE (Mahogany Family)			
<i>Melia azedarach</i> L.	' <i>inia</i>	non-native	rare
MORACEAE (Mulberry Family)			
<i>Ficus microcarpa</i> L.fil.	Chinese banyan	non-native	rare
MYRTACEAE (Myrtle Family)			
<i>Syzygium cumini</i> (L.) Skeels	Java plum	non-native	common
PASSIFLORACEAE (Passion Flower Family)			
<i>Passiflora edulis</i> Sims	passion fruit	non-native	rare
SOLANACEAE (Nightshade Family)			
<i>Datura stramonium</i> L.	jimson weed	non-native	rare

<u>SCIENTIFIC NAME</u>	<u>COMMON NAME</u>	<u>STATUS</u>	<u>ABUNDANCE</u>
<i>Nicandra physalodes</i> (L.) Gaertn.	apple of Peru	non-native	rare
<i>Nicotiana glauca</i> R.C. Graham	tree tobacco	non-native	rare
<i>Solanum seafortianum</i> Andr.	Brazilian nightshade	non-native	rare
<i>Solanum torvum</i> Sw.	pea aubergine	non-native	rare

# FAUNA SURVEY REPORT

## SURVEY METHODS

A walk-through fauna 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*) in the area.

## RESULTS

### MAMMALS

Three species of mammals were observed in the project area during two site visits. Taxonomy and nomenclature follow Tomich (1986).

Mongoose (*Herpestes auropunctatus*) – One mongoose was seen running into deep grass. These animals hunt for rodents and birds in such habitat.

Rat (*Rattus rattus*) – A rat was seen in a small tree in the forest. These rodents find abundant seeds, fruits and herbaceous vegetation in this area.

Cat (*Felis catus*) – One large cat was flushed from cover in the forest where it was hunting for rodents and birds. Many domestic cats go wild and become feral predators.

Other mammals one might expect to see here include mice (*Mus domesticus*) and axis deer (*Axis axis*) which are spreading across the central valley and are multiplying.

A special effort was made to look for the native Hawaiian hoary bat by making an evening survey of the 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 evidence of such activity was observed though visibility was excellent and plenty of flying insects were seen.

In addition, an electronic bat detecting device was employed set to the frequency range of 27,000 to 28,000 hertz which these bats are known to utilize. No bats were detected using this device.

## **BIRDS**

Birdlife was moderate in total numbers and diverse in species, no doubt in response to the proximity of the project area to a large body of fresh water and a variety of habitats and food sources. Sixteen species of birds were identified in and about the project area including fourteen non-native species, one indigenous waterbird and one endemic/Endangered waterbird. Taxonomy and nomenclature follow American Ornithologists' Union (2005).

Chicken (*Gallus gallus*) – Many chickens inhabited the understory of the forest and they could be seen and heard everywhere.

Cattle egret (*Bubulcus ibis*) – Several flocks of these white egrets totaling in excess of a hundred birds flew into the reservoir margin and were seen roosting in trees for the night.

Zebra dove (*Geopelia striata*) – These small doves were common throughout the property in small flocks. Their calls could be heard at all times.

Spotted dove (*Streptopelia chinensis*) – These large doves were scattered throughout the area seen alone or in pairs in trees.

Northern cardinal (*Cardinalis cardinalis*) – These red cardinals were common throughout the forest. Their loud calls were heard at all times of day.

Myna (*Acridotheres tristis*) – Pairs of these mynas could be seen at all times of the day but most frequently during the evening.

House finch (*Carpodacus mexicanus*) – A few pairs of these finches were seen flying between trees in the forest where they feed on insects and their grubs.

Japanese white-eye (*Zosterops japonica*) – A few of these energetic small green birds were seen in trees and heard making their scolding high-pitched calls.

Red-crested cardinal (*Paroaria coronata*) – One large family group of these brilliantly red headed cardinals was seen in a tree on the west side of the property.

Gray francolin (*Francolinus pondicerianus*) – A family of these francolins was heard making their distinctive calls during the evening survey.

House sparrow (*Passer domesticus*) – A few sparrows were seen during the evening survey along the north side of the property.

Ae'o, Black-necked stilt (*Himantopus mexicanus knudseni*) – One flock of six of these endemic and Endangered ae'o were seen in flight over the reservoir. They may periodically utilize the margins of this reservoir, but the project area does not represent suitable habitat for these waterbirds.

Mallard duck (*Anas platyrhynchos*) – A family of these common ducks was seen along the margins of Wai'ale Reservoir.

Muscovy duck (*Cairina moschata*) – A family of all-black Muscovy ducks was also seen along the margins of Wai'ale Reservoir.

Auku'u, Black-crowned night-heron (*Nycticorax nycticorax hoactli*) – One of these indigenous herons was flushed from the margin of Wai'ale Reservoir where he was stalking small fish.

Rock dove, Domestic pigeon (*Columba livia*) – One pigeon was seen in flight over the property. This is probably a domestic bird that frequents the area.

The habitat in the project area might be utilized by a few other non-native species but it is not suitable for such Endangered Species such as the nene goose (*Branta sandvicensis*) or for seabirds such as the ua'u (*Pterodroma sandwichensis*) or 'a'o (*Puffinus newellii*). It is also too low in elevation for Hawaii's native forest birds. The habitat is also unsuitable for Endangered waterbirds such as the ae'o and 'alae ke'oke'o, although they might be viewed nearby within the Wai'ale Reservoir.

## INSECTS

While insects in general were not tallied, a diversity of them were seen throughout the area, helping to fuel the bird activity observed. One native insect, Blackburn's sphinx moth (*Manduca blackburni*) has been put on the Endangered Species list (USFWS 2000) and this designation requires special focus to ascertain if it is present. None were found. This insects' native host plants are species of 'aiea (*Nothocestrum spp.*) and some non-native host plants are tobacco (*Nicotiana tabacum*) and tree tobacco (*Nicotiana glauca*). There are no 'aiea on or near the property. Two small tree tobacco plants were seen on the margins of the property. Each of these were carefully examined and no Blackburn's sphinx moths or their larvae were observed.

## **DISCUSSION AND RECOMMENDATIONS**

The fauna survey documented a diverse array of mammals and birds, mostly non-native and associated with disturbed habitats. Four bird species were waterbirds associated with the nearby reservoir and which were seen from the margins of the property. One of these, the ae'o or Hawaiian stilt, is an endemic and Endangered bird species. While the project area is not habitat for the ae'o, their proximity to the project site merits consideration. It is recommended that when the water treatment facility is developed, plans stipulate the maintenance of a dense screen of vegetation between the facility and reservoir to minimize human interactions and disturbance.

Seabirds including the Endangered ua'u and the Threatened 'micha'o were not found on this property and are highly unlikely to utilize such an area. Yet these birds are known to fly over these lowlands in the evenings to get to their burrows high in the mountains. Young birds which are fledgling during the fall months are particularly vulnerable to being confused by bright lights upon which they are prone to crash and be injured or killed. It is recommended that any outdoor lights in the proposed project be hooded to direct the light downward so the light is not visible from above.



## ANIMAL SPECIES LIST

Following is a checklist of the animal species inventoried during the field work. Animal species are arranged in descending abundance within two groups: Mammals and Birds. 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.

<u>COMMON NAME</u>	<u>SCIENTIFIC NAME</u>	<u>STATUS</u>	<u>ABUNDANCE</u>
<b><u>MAMMALS</u></b>			
Mongoose	<i>Herpestes auropuntatus</i>	non-native	rare
Rat	<i>Rattus rattus</i>	non-native	rare
Cat	<i>Felis catus</i>	non-native	rare
<b><u>BIRDS</u></b>			
Chicken	<i>Allus gallus</i>	non-native	common
Cattle egret	<i>Bubulcus ibis</i>	non-native	common
Zebra dove	<i>Geopelia striata</i>	non-native	common
Spotted dove	<i>Streptopelia chinensis</i>	non-native	common
Northern cardinal	<i>Cardinalis cardinalis</i>	non-native	common
Common myna	<i>Acridotheres tristis</i>	non-native	uncommon
House finch	<i>Carpodacus mexicanus</i>	non-native	uncommon
Japanese white-eye	<i>Zosterops japonicus</i>	non-native	uncommon
Red-crested cardinal	<i>Paroaria coronata</i>	non-native	uncommon
Gray francolin	<i>Francolinus pondicerianus</i>	non-native	uncommon
House sparrow	<i>Passer domesticus</i>	non-native	uncommon
Ae'o, Black-necked stilt	<i>Himantopus mexicanus knudseni</i>	endemic	rare
Mallard duck	<i>Anas platyrhynchos</i>	non-native	rare
Muscovy duck	<i>Cairina moschata</i>	non-native	rare
'Auku'u, Black-crowned night-heron	<i>Nycticorax nycticorax hoactli</i>	indigeneous	rare
Rock dove, Domestic pigeon	<i>Columba livia</i>	non-native	rare

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# **APPENDIX C.**

## **Archaeological Assessment Survey Report**

**AN ARCHAEOLOGICAL ASSESSMENT SURVEY  
REPORT FOR THE WAIALE SURFACE WATER  
TREATMENT PLANT PROJECT, WAILUKU *AHUPUA`A*,  
WAILUKU DISTRICT, ISLAND OF MAUI  
(TMK: (2) 3-8-46: 020)**

**Prepared at the request of:**

**Austin, Tsutsumi & Associates, Inc.  
Honolulu, Hawaii.**

**Prepared on behalf of:**

**A & B Properties, Inc.  
Wailuku, Maui**

**Prepared by:**

**Xamanek Researches, LLC  
Pukalani, Maui  
Erik Fredericksen**

*14 October 2005*

## ABSTRACT

Xamanek Researches, LLC conducted an archaeological assessment survey for a planned project, known as the Waiale Surface Water Treatment Plant facility. The study area is located in Wailuku *Ahupua'a*, Wailuku District, Maui (TMK: (2) 3-8-46: 020). Project plans call for the construction of a surface water treatment facility on a c. 2.25 acre parcel of land and the placement of c. 1,600 lineal feet of new 12-inch diameter line. This survey was carried out periodically during February through April of 2005.

There was no evidence of an intact cultural deposit encountered during subsurface testing on the project area. Test results indicate that the upper c. 50-70 cm of the study area has been impacted by previous activities associated non-permitted dumping, the construction of a HC & S Co. access road, and previous development of a County of Maui (COM) water tank. Stratigraphy observed in all but Backhoe Trenches 1, 3 and 4 indicates that intact sand dune deposits are present in tested portions of the study area. Information obtained from this archaeological assessment survey indicates that exposed sand dune deposits exist in the HC & S Co. access road and on the sand dune where the COM water tank is located. Disturbed zones with intact subsurface deposits of dune sand were also noted in tests conducted for the proposed water treatment facility. Soil cores indicate that sand dune deposits are relatively thick in sample areas.

One previously identified plantation-era water ditch, the Spreckels Ditch (Site 50-50-04-1508), lies adjacent to and west of portions of the project area. This previously documented site, which is not on the study area, should not be affected by project actions.

The Pu'uone Sand Dune formation is known to contain occasional human burials. Burials have been identified in the Maui Lani Development project, near the Maui Lani Parkway corridor, and in the nearby Ka Hale A Ke Ola facilities—all within the near vicinity of the present study area. The possibility therefore exists that human remains could be present in the untested areas of the project area. Based on the results of this archaeological assessment survey, it is recommended that precautionary archaeological monitoring take place during grading, grubbing and trenching in the proposed waterline corridor, as well as the proposed water treatment facility. This mitigation measure is considered to be appropriate, because Native Hawaiian burials have been encountered in this portion of Maui.

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## INTRODUCTION

Mr. Daren Suzuki, staff planner at Munekiyo & Hiraga, Inc. contacted Xamanek Researches<sup>1</sup> during the late fall of 2004 about an archaeological survey for a planned project, known as the Waiale Surface Water Treatment Plant project. The study area was located in Wailuku *Ahupua`a*, Wailuku District, Maui (TMK: (2) 3-8-46: 020). Project plans called for the construction of a surface water treatment facility on c. 2.25 acres of land and the placement of c. 1,600 lineal feet of new 12-inch diameter line. This waterline will serve to connect the proposed surface water treatment facility to an existing 3 million gallon County of Maui (COM) water tank. Given that the project area was located in a portion of the Pu`uone dunes complex, the State Historic Preservation Division (SHPD) was contacted. Based on discussions with Dr. Melissa Kirkendall, SHPD Maui staff archaeologist, it was determined that an archaeological inventory/assessment survey was needed.

We were asked to submit a proposal for the scope of work for this project, and submitted our cost estimate for review. We were subsequently given the notice to proceed with this small inventory/assessment survey.

As noted above, the project area lies in Wailuku *Ahupua`a*, Wailuku District, Maui (Figures 1 and 2). The current study area is a portion of a larger parcel that is owned by A & B Properties, Inc. The field portion of this archaeological study was carried out during February, March and April of 2005. The following report presents the results of this archaeological study, which is an assessment survey under the new SHPD rules. The report has been prepared on behalf of A & B Properties, Inc. at the direction of Austin, Tsutsumi & Associates, Inc., Honolulu, Hawaii.

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<sup>1</sup> Xamanek Researches became Xamanek Researches, LLC—a Hawaii-based Limited Liability Company—in February 2005.



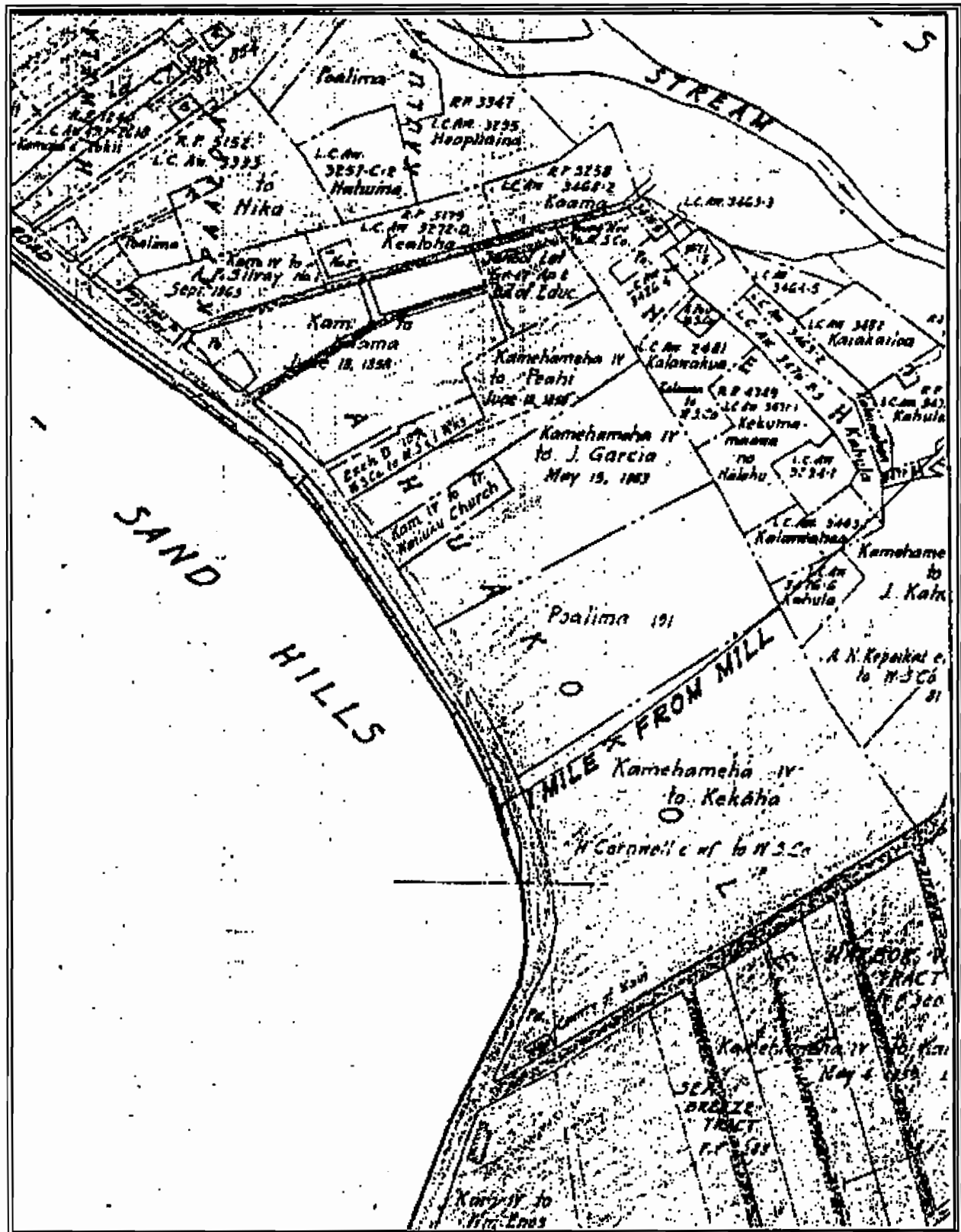


Figure 4 – Section of a 1937 Wailuku Sugar Company map, made by R.M. Towill Company.

## THE STUDY AREA

The project area lies on the western side of the Kahului Isthmus, on the alluvial flank of the West Maui Mountains, in an area that is generally referred to as Wailuku Sand Hills (Figure 3). The Sand Hills area makes up part of the Pu'uone Sand Dune Formation—a large feature which extends from Kahului Harbor to Waikapu. The surface soils are classified as Pu'uone sands. Lava flows from Haleakala and alluvial sediments from the West Maui Mountains underlie these soils (Stearns and Macdonald, 1942, P.54). The underlying soils are classified as Pulehu-Ewa-Jaucas association. They are described as “Deep, nearly level to moderately sloping, well-drained and excessively drained soils that have a moderately fine-textured to coarse-textured subsoil or underlying material; on alluvial fans and in basins.” (Foote, et. al., 1972, p. 8)

The overlying Pu'uone sand is typically grayish-brown to light brown in color, and forms layers of strongly alkaline cemented sand hard pan (referred to as lithified sand in this report), occurring 20 to 40 inches below the surface. In some instances, the loose sand has blown away, making this feature much closer to the surface. Old root molds filled with hard, white alkaline deposits are a common feature in the sands (Ibid., p. 117). Pu'uone sands occur on slopes of 7 to 30 degrees, and develop in material derived from coral and seashells (Ibid.).

The annual precipitation in this area of Maui averages 20 to 30 inches. The highest monthly rainfall occurs during the winter and spring months. Temperatures range from 60 to 80 degrees Fahrenheit in January to 68 to 90 degrees Fahrenheit in July. Winds are generally trade winds from the northeast, averaging 16 to 18 miles per hour (University of Hawaii, 1983, p. 56).

In general, the study area is fairly heavily vegetated, with the exception of the actively used portion of an H C & S Co. access road, and the area immediately around a section of the Spreckels Ditch (Site 50-50-04-1508) that lies adjacent and west of portions of the access road. Areas of the project impacted by post-contact and modern activities (i.e. former construction/current maintenance of the Spreckels Ditch, the H C & S Co. access road, and previous grubbing) tend to be bordered by dense alien grass species including Guinea grass (*Panicum maximum*), elephant grass (*Pennisetum purpureum*) and buffelgrass (*Cenchrus ciliaris*). The area that will hold the water treatment facility also contains *koa haole* (*Leucaena leucocephala*), scattered immature *kiawe* (*Prosopis pallida*) trees, mature banyan trees, and Java plum trees.

The portions of the study area that contain relatively undisturbed dune deposits (i.e. near the existing COM water tank) are covered by *kiawe* trees, *koa haole*, alien

grasses, and 2 scattered indigenous plant species—`ilima (Sida fallax) and `uhaloa (Watheria americana).

### **Present Usage**

At the time of the assessment survey, the study area was utilized for a variety of purposes (Photographs 1-4). The area of the proposed water treatment facility appears to have been primarily utilized as an informal dump. Abandoned vehicles, industrial machinery, commercial agricultural items, construction spoil, road debris, and piles of backdirt were noted on portions of the project area. An HC & S Co. access road is currently maintained and contains an access gate. This road lies adjacent to portions of the Spreckels Ditch, which is not located on the project area. The Waiale Reservoir lies to the east of the bulk of the project area. The dune area near the COM water tank appears to have been impacted by previous construction activities, although the area along the nearby boundary with the assisted housing facility to the north yielded relatively intact sand dune deposits.<sup>2</sup>

## **BACKGROUND RESEARCH**

### **Precontact Period**

The *ahupua'a* of Wailuku is a large land unit stretching around Kahului Bay from Paukukalo to Kaukaulua. It includes Iao Valley and the northern half of the Kahului Isthmus. This single land division comprises nearly half of the District of Wailuku, and is noted as a place where chiefs were buried and wars were fought. The word itself can be translated as "water of destruction" (Pukui, et. al., 1974, p. 225), and the name Wailuku refers to the battles which took place in the area.

Iao Valley and the two associated dunes on the north and south sides of the river constituted the core area of Wailuku. This was the central place of religious and political power on Maui, which culminated during the time of Pi`ilani (c. 1600 AD). In the late precontact period warfare increased as the chiefs from Maui, Oahu and Hawaii vied for political and military dominance. High Chief Pi`ilani unified the districts of Maui by warfare, but after his death, his sons fought with one another—each to establish political control. Eventually Kiha-a-Pi`ilani became victorious, establishing his political dominance (Speakman, 1978, pp. 9-13). Each succeeding generation of chiefs had to struggle through warfare to secure their positions of political preeminence.

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<sup>2</sup> This area will be impacted by the planned installation of a line, which will feed water into the existing County of Maui water tank.

During the reign of the last powerful paramount chief or king, Kahekili (who ruled from 1765 to 1790), Wailuku again became the site of intense warfare. Kahekili's royal residence, Kalanihale, was located in Wailuku.<sup>3</sup> In the mid-1770s it was marched upon by a Big Island chief named Kalani`opu`u and his *alapa* (the name given to his warriors). News of his coming preceded him, and Kahekili hid his warriors in the sand dunes above Haleki`i *heiau* to surprise the invading troops. Kalani`opu`u's army was pushed to the sea and slaughtered (Speakman, pp. 16-17).

By 1786, Kahekili controlled Maui, Moloka`i, Lana`i, and Oahu as well. This undisputed political control lasted for only 4 years, however. In 1790, Kamehameha the Great made his move on Kahekili's domain, an action, which ended in the battle of Kepaniwai<sup>4</sup> and the defeat of the Maui ruler. The word Kahului can be translated as "the winning", and the Bay takes this name because Kamehameha gathered his warriors there prior to fighting the battle in Iao Valley (Pukai, et. al., 1974).

### **Early Post-Contact Period**

The reign of Kamehameha was intertwined with the increasing presence of foreigners (*haoles*). The arrival of Captain Cook offshore at Kahului Bay in 1778 began the steady flow of outside influences, which would forever alter the indigenous population and environment. One of the first of these influences came with missionaries, whose charge it was to save heathen souls. The first missionaries arrived in Wailuku in 1832, and the traditional religion began to wane under their influence. A girls' seminary (Central Female Boarding School) was established by Rev. Jonathan Green in 1836, where young Hawaiian women were taught the language and customs of the foreigners, as well as their religion.

Another influence to bring change was foreign commercialism, and it came initially in the form of sugar production. The first sugar cane crops grown in the *ahupua`a* were harvested and processed in 1828. Kamehameha III, with the help of two Chinese technicians, established a water-powered mill in Wailuku. This was known as Hungtai Sugar Works, and its location was fairly close to the later location of the Wailuku Sugar Mill, which was established in 1862. Hungtai Sugar Works continued to operate until the opening of the new mill.

The population of the *ahupua`a* of Wailuku in the 1831-32 census was listed as 2,256, with most of it being in the northern portion, presumably in Iao Valley (Cordy, 1978, p. 59).

On the southern and eastern side of the Iao Valley dunes (Pu`uone Dunes), commercial activity took the form of cattle ranching. This sizable area was used for pasturage. By as early as 1845, large herds of cattle were roaming the Kahului Isthmus

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<sup>3</sup> The location is said to be somewhere near the intersection of High Street and the road leading into Iao Valley in Wailuku town.

<sup>4</sup> Kepaniwai means literally "water dam" in reference to Iao Stream, because the stream was choked with human bodies after the slaughter there (Pukai, et. al., 1974, p. 109).

(cattle had been introduced on the Big Island by Vancouver in 1793). The Maui cattle were under royal *kapu* so could not be molested. They were so destructive to the environment that Native Hawaiian landowners protested, but to no avail (Barrere, 1975, p. 52). In addition to the commercial raising of cattle, there were also brief attempts at the production of cotton in the 1830s. This endeavor met with little commercial success however<sup>5</sup>, and further adversely impacted the landscape.

### Post-1850s Period

After the Mahele in 1848, much of the *ahupua`a* was designated as Crown Land, to be used in support of the royal "state and dignity". In 1872 Kamehameha V died, and his sister Princess Ruth Ke'elikolani inherited the land. She was designated as the owner of the *Ka'a* lands of Wailuku, the southern portion of the *ahupua'a*. The *ili* of *Owa* comprised of 743.40 acres, LCA 420) was granted to Kuihelani, a steward to Kamehameha I. A much smaller northern section (the *ili* of *Kalua*-LCA 7713, Apana 23-391 acres) was awarded to Princess Ruth's half-sister, Victoria Kamamalu. In 1882, Princess Ruth sold one-half of the Crown Lands of Hawaii to sugar producer, Claus Spreckels, in order to settle her debts with him. Spreckels already held a lease for 16,000 acres of Wailuku *ahupua`a*, dating from 1878. Worried about what Spreckels might do with half of the Crown Lands, King Kalakaua gave him Land Grant 3343, a 24,000 acre portion of the southeastern section of Wailuku *ahupua`a*, in return for the surrender of his claim (Adler, 1966, pp. 262-264).

The Reciprocity Treaty of 1876 with the United States had given a boost to the sugar industry by increasing prices. The dry eastern part of the *ahupua`a* would be attractive as potential sugar land if water could be brought to it. In 1880, Spreckels began construction of what was called "Spreckels' Ditch", located *makai* of the Hamakua Ditch, built earlier by Alexander and Baldwin to water their Maui Agricultural Company's fields. The "Spreckels' Ditch" brought Haleakala water to the arid Kahului isthmus. The ditch was 30 miles long, and delivered about 60 million gallons of water a day, and cost \$500,000. Spreckels also built another ditch, the Waihe'e ditch in 1882, which tapped the water resources from the West Maui Mountains, thus bringing water to both sides of the Wailuku Commons isthmus area (Adler, 1966, pp. 48-49). These endeavors enabled him, in 1882, to found Hawaiian Commercial and Sugar Company. He continued involvement in that company until 1898, when control was wrested from his hands. The parent company still bears the name of Alexander and Baldwin, the principal participants in the transfer of corporate control. The production of sugar cane continues to be an

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<sup>5</sup>The Anglican Church felt that "the Hawaiian people, freed from their service to and dependence on the chiefs should be self-supporting and thought that the encouragement of the manufacture of cloth from the superior cotton which grew luxuriantly in the islands would be a means to that end. They therefore suggested that a manufacturer be sent with sufficient machinery to get the project started. They felt that the people would continue to work with the encouragement and cooperation of the chiefs." (Lemmon et. al., 1973, p. 2.B.3). To this end they sent Miss Lydia Brown in 1835 with "a quantity of domestic spinning apparatus' (presumably spinning wheels and a loom)" (Ibid.), and "charged with the responsibility of teaching the Hawaiian girls the arts of carding, spinning, weaving and knitting locally grown cotton and wool." (Ibid.) As each class grew proficient enough to teach others, a new class was formed (Ibid., 2.B.4).

activity in the isthmus area to this day, although some portions operated by C. Brewer and Company have shifted to pineapple production.

The environmental conditions in the lower Iao Valley, which in precontact times were ideal for agricultural support of a large population, were a wide valley floor, rich alluvial soils, and a constant water supply from Iao Stream. These combined with the access to Kahului Harbor, rich in marine resources, made this area the prime precontact location on West Maui for a political and religious center. The lower portion of Iao Valley contained some of the most productive taro land on the island, and the abundance of Land Commission Awards in the lower valley attest to this. There are 66 LCA's, primarily taro patch *kuleana*, and 39 *po'alima* located between the old Wailuku Mill site and Paukukalo, on the southern side of Iao stream. In addition, Kamehameha IV made 13 awards directly to individual chiefs.<sup>6</sup>

Lower Main Street was built along the route of an old government road, which very likely followed the course of existing transportation routes from the ocean to the inland portions of Iao Valley. Nearly all of the LCAs in this area have borders aligned with the road, indicating it was an important transportation corridor at the time the *kuleana* were granted. This corridor follows the natural boundary between the sand dune and the alluvial deposits of the valley. The Kahului Railroad paralleled Lower Main Street, and was one of the earliest known projects that impacted the dune itself.

The route of the railroad from Kahului Harbor to Wailuku Sugar Mill is shown on both the 1954 USGS map, and the 1937 Towill Map. The remnants of this old railroad bed can still be noted along Lower Main and Waiale Road. Railroad construction was begun in the late 1870s and continued for nearly 2 decades, as routes were added and service expanded. The railroad continued operations until after World War II. Then slowly, demands began to change, and segments of the system were phased out. An article in **The Maui News** of October 15, 1957 bore the headline "Iron Horses Bow Out As Wailuku Sugar Company Discontinues Use of Railroad". The railroad continued to serve other areas until 1966, when it ceased operation.

The commercial and residential growth along Lower Main Street is related, no doubt, to the growth of the railroad. After the railroad's closure, development on the southern side of the street began, and generally the dune was cut down to street level in the developed portions. At the time of this construction and development, little or no attention was paid to archaeological sites impacted by such construction. If burials were encountered, the bones were simply turned over to the local mortuary for disposal.

In the central Maui area to the south and east, development did not occur until later. During World War II, portions were used by the military. There was a large Marine Base in the area occupied by Maui Community College and the Maui Arts and

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<sup>6</sup> This is in contrast to the area south and east of Lower Iao Valley, in which the study parcel lies. Here there were 2 LCAs awarded—one to Victoria Kamamalu (7713), and one to Kuihelani (420). The largest portion is Grant 3343 to Claus Spreckels.

Cultural Center. After the war, several housing developments were built in the Kahului and Wailuku area.

Alexander and Baldwin began planning the Maui Lani Development in the 1970s and 1980s, a project which covers more than 1000 acres. It includes 634.2 acres for residential use; c. 200 acres for recreational use, including an 18-hole golf course; 68 acres for public/quasi-public use; 21.7 acres for commercial use; and 67.8 acres for circulation and open space. The Maui Lani Development project borders the Waiale Reservoir, which lies adjacent to and east of the present study area

## PREVIOUS ARCHAEOLOGICAL WORK

### Iao Valley/Pu`uone Dunes Area

The earliest archaeological work in the Wailuku area was part of the island-wide survey done by Winslow Walker in 1931. He reported that there were a number of *heiau* in the general area of Wailuku. Two lie on the northern side of Iao Stream atop the large dune formation there--Pihana and Haleki'i. Both have been restored and are designated as the Halekii-Pihana Heiau State Monument, under the supervision of the Division of State Parks (DLNR). Walker also reported that there were a number of other *heiau* in this area of Wailuku, which were said to have been consecrated by Liholiho during his visit to Maui for that purpose in 1801 (Walker, 1931, pp. 146-147). At the time of his survey, none of these reported *heiau* (named Keahuku, Olokua, Olopio, Malena, Pohakuokahi, Lelemako, Kawelowelo, Kaulupala, Palamaihiki, and Oolokalani) could be found (Ibid., p. 148).

A personal communication (1992) from Mr. Charles Keau, a well-respected authority on history and prehistory of Maui, provides more information about some of these *heiau* that Walker could not find. By Mr. Keau's account, there were 3 *heiau* located in the Lower Main Street corridor from Kahului Harbor to the intersection of Lower Main and Mill Streets. One was situated across the street from the Maui Soda Company. Another was located on parcel 83 (TMK: 3-4-39) between the Maui Electric Power Station and the County of Maui Wailuku Government cemetery. A third may have been located near the Home Maid Bakery. During the construction of the parking lot next to the bakery, Mr. Keau reported that Wesley Wong, a well-known local antiquity collector, found 5 adzes of "Tahitian" style. He did not specify when this was, but thought there might still be portions of the *heiau* there as well as some burials. Recent archaeological work has corroborated at least the latter part of this supposition (see discussion below).

## **Nisei Veterans Memorial Center**

In February of 1992, the present authors began an inventory survey on the site for the Nisei Veterans Memorial Center, a 2 acre parcel of land at the intersection of Lower Main and Wai`ehu Beach Road (Fredericksen and Fredericksen, December 1992). The most notable feature was the railroad bed which runs the length of the property (Site 3112). Another historic site (Site 3119A) was a refuse disposal area about 20 cm. below the surface. The predominant historic items were bottles and ceramics dating from the late 1800s, about the time the railroad was in use. A subsurface excavation that cut through the historic site located a subsurface precontact site designated as Site 3119B.<sup>7</sup>

This site became extremely interesting when a very early radiocarbon date of AD 233-410 was obtained. However, later data recovery work did not produce material of a comparable date. The deposits from which it came turned out to have been previously disturbed by excavations done during the construction of the railroad bed, and the original source was not located.

In another area of the site, test excavations produced a number of artifacts, including coral files, bone picks, an unfinished fishhook, and worked bone, along with large quantities of food midden. This was designated as Site 3120. Data recovery research has shown this to be a large habitation site, which contains a cluster of burials. The latter have remained *in situ* and will be preserved as a permanent burial/grave site. A number of fire pit features have been recovered and a series of 12 radiocarbon dates were obtained. They range from the very early date mentioned above (AD 233-410) to AD 1200-1740, with the majority of the precontact dates falling in a AD 1400 to 1700 range. An interim report was prepared (Fredericksen, et. al., November 1995), and the final data recovery report is nearing completion.

The entire subsurface habitation site will be preserved and the Nisei Veterans Memorial Center grounds will be landscaped in such a way as to ensure that the site will not be impacted by future activity.

## **Home Maid Bakery**

Recent grading work at the Home Maid Bakery uncovered human remains. State Historic Preservation Division archaeologist, Theresa Donham ordered that an inventory survey be undertaken. During this survey, two sites were identified. Site 3924 contained 2 *in situ* burials, and a thin remnant of a cultural layer. Much of the cultural layer had been displaced by previous bulldozer action. Marine shell, 2 edge altered flakes, small waterworn stones, 6 basalt flakes, and 6 pieces of volcanic glass were found, along with a piece of coal and a chert flake (Burgett and Spear, 1995, pp. 20-24), which most likely have an historic origin.

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<sup>7</sup>Later data recovery work at this site has caused a revision in numbering. All precontact components of the site are designated as Site 3120, while the historic components bear the Site 3119 designation.



Another site, Site 3925, represents a site with 2 primary cultural layers, and three very narrow, restricted cultural layers, along with 6 features. These are interpreted as hearth features, pits, and a possible posthole. A radiocarbon date from one fire pit yielded a date of AD 1436 to 1671. Another fire pit produced charcoal dated at AD 1430 to 1529. Ninety-nine artifacts were recovered, 87 pieces of basalt debitage, 4 basalt flakes with polish, 3 coral abraders, 2 edge altered flakes, 1 adze perform, 1 chert flake, and 1 worked mammal bone (Ibid., pp. 24-30). Quantities of shell midden were also recovered.

Theresa Donham spoke at the June meeting of the Maui County Cultural Resources Commission, and described these recent archaeological projects in Wailuku to commissioners. She feels that these two sites mentioned above are probably part of the same site that has been significantly disturbed. It was most likely part of a complex habitation and activity area, which was associated with the *heiau* reported by Mr. Keau (Minutes, MCCRC, June 1, 1995).

Another site on the same Home Maid Bakery property, Site 4066 was identified during archaeological monitoring of a County of Maui road-widening project along Lower Main, in 1995. A test trench, just 2 feet from the roadway bisected an intact portion of the dune that contained boulder alignments, fire pits, artifacts, and midden. An area c. 10 feet wide by 134 feet long was impacted. The remains of 4 individuals recovered were reburied in a crypt, along with the 2 *in situ* burials around which the crypt was built (Spear, December 1995).

#### **Additional Sites along Lower Main Street**

Other burial sites along Lower Main include Site 3556, which contained both historic and prehistoric burials; Site 3996, which is an identified human burial that is eroding from the face of the dune; Site 3928 is a remnant of a habitation site which contained burials. A radiocarbon date from that site gives a range from AD 1424 to 1635 (Donham, n. d.).

A Bishop Museum archaeological team identified site 1172 in 1971, as the Lower Main Street site. It consists of at least one cultural layer containing shell (*opihi*, *pipipi*, drupe, cowrie and land shells), coral, charcoal and water-worn stones. Three precontact artifacts included a coral file, a hammer stone fragment, and a possible hammer stone, triangular in shape (Connolly, 1973). Later sand mining activity apparently uncovered burials that were reburied upslope from the existing excavation, but their exact location is not known (Personal communication, Theresa Donham, recorded in minutes of the Cultural Resources Commission, June 1, 1995). Two additional burials were discovered eroding from this site in June 1994. They were recorded and disinterred by Ms. Donham, and have since been reinterred on the property (Burgett and Spear, 1995, p. 17).

## **The Oceanhouse Site**

In 1990, the present authors surveyed a half-acre commercial parcel in the Lower Main corridor (TMK: 3-4-39: 77). At the time of the study a good portion of the dune had been excavated to street level. No significant surface archaeological finds were made, but monitoring was recommended during any subsurface excavation, since the inventory survey did not include subsurface testing (Fredericksen and Fredericksen, 1990). This parcel was studied again in 1996, for Oceanhouse, Inc. by Scientific Consultant Services, Inc., following considerable alteration by grading. A site remnant was identified on the lip of the dune (Site 4004), and a few fragments of human bone were also found on the cliff face. A radiocarbon date range from AD 1420 to 1640 was established for the site remnant (Burgett and Spear, 1996).

## **Lower Main and Mill Street Intersection**

Xamanek Researches conducted a surface archaeological survey on parcel 82 (TMK 3-4-39). Again, no surface features were found, with the exception of the raised railroad bed directly adjacent to Lower Main Street. Monitoring was recommended because of the lack of subsurface testing (Fredericksen and Fredericksen, January 1992). In 1995, an inventory survey, with subsurface testing, was conducted on a narrow strip of this parcel alongside Lower Main Street, as well as on parcels 81 and 83 (Fredericksen and Fredericksen, 1995). This was in response to a County of Maui Public Works project to widen and install traffic signals at the intersection of Lower Main and Mill Streets.

Seven backhoe trenches were excavated along with 5 auger tests and one manual test unit. The dominant surface feature was the Kahului Railroad Bed, which rose c. 1 to 1.5 meters above the street level. Beneath this historic feature, a fairly extensive subsurface habitation site was located in the 2 most northern backhoe tests (Site 4127). An unfinished bone fishhook and a dense basalt hammer stone were recovered from Backhoe Trench 1, along with shell midden. In Backhoe Trench 2, a large pit was identified, which was thought to possibly be associated with a human burial. Data recovery was recommended and completed on the site. Radiocarbon dates indicated that Site 4127 was occupied in late precontact times (AD 1570-1780). Material culture remains included artifacts associated with fishhook manufacture, lithic tool use and production, and food preparation. While no human burials were found, the remains of an intentionally buried Hawaiian monk seal (*Monachus schauinslandi*) were present (Fredericksen and Fredericksen, September 1996). Monitoring was recommended during the excavation phase of the road widening project, since the possibility of human burials is high.

Xamanek Researches has conducted a series of studies on parcel 82 (TMK 3-4-39) at the intersection of Lower Main and Mill Streets (Fredericksen and Fredericksen, January 1992; July 1995; September 1996; September 1997; September 1998). A large habitation site has been identified along Lower Main Street, at about the same level as the street (Site 4127). Radiocarbon dates indicated that Site 4127 was occupied in late precontact times (AD 1570-1780). Human burials are associated with this site. Another

large habitation site (Site 4414) was found on the slope of the dune. A total of 14 human burials were located during subsequent data recovery and monitoring work. Some were preserved in place, while others were disinterred, as they were in the area being excavated for a large retaining wall. All disinterred remains have been reinterred at this time. Radiocarbon dates for Site 4414 are somewhat earlier—ranging from c. AD 1375 to 1670.

Another inventory survey was undertaken at a property located on top of the dune c. 100 meters southeast of Site 4414. Here a fairly extensive habitation site was identified (Site 4418). Radiocarbon samples indicated that this site was contemporaneous with Site 4414 (Fredericksen and Fredericksen, January 1998). The previously disturbed remains of 2 individuals were found during subsequent monitoring on this parcel (designated Site 4493).

### **Waiale Road Corridor/Pu`uone Dunes**

A precontact human burial was found while road crews were excavating under the Ka`ahumanu Avenue bridge, which crosses Waiale Road. This burial was designated Site 4126.

Along Waiale Road, which forms the western border of the Wailuku Sand Hills (Pu`uone Sand Dunes), monitoring for a drainage project for C. Brewer identified human remains that had been previously disturbed by the excavation of a former pipe line trench that runs perpendicular to this road. This find was designated as Site 4005. Site 3502 also contains burials, an historic coffin burial and another disturbed burial that is thought to be precontact. Site 4067 consists of the remnant of a habitation site identified during the monitoring for the pipeline that revealed Site 4005. Site 4068 is a habitation site with an associated cluster of human burials (Dunn and Spear, 1995).

During construction for the Ka Hale A Ke Ola Homeless Resource Center in May of 1992, 3 human burials were inadvertently disturbed (Site 50-50-04-2916). Theresa Donham, former SHPD Maui staff archaeologist, investigated these skeletal remains. She found the remains of an adult male in a grading cut, roughly 2 feet below the original surface (Burial 1). No cultural materials were associated, and a burial pit could not be identified. On May 21, a cranium (Burial 2) was exposed during construction of a desilting basin located along the lower slope of the dune at the southeastern<sup>8</sup> corner of the project area (Donham, 1992, p. 3). A test unit measuring 5 by 3 meters was excavated to a depth of 0.50 to 0.75 meters below the surface. All sand material was screened and a total of 280 identifiable elements or fragments were recovered, along with 235 miscellaneous fragments. Two individuals were represented, an adult female, and a smaller adult individual of undetermined sex.

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<sup>8</sup> This desilting basin extends to the border shared by the Homeless Shelter and the Ka Hale A Ke Ola affordable housing development.

Xamanek Researches surveyed the parcel adjacent to the south in 1995 (Fredericksen and Fredericksen, June 1995). While no sites or human remains were located during the survey, it was recommended that archaeological monitoring take place during construction. Human remains were located in April of 1996, but not before they had been seriously disturbed by unmonitored grading activity during initial construction of the Ka Hale A Ke Ola affordable housing development. The remains were scattered over a 100 by 10 meter strip near the fence of the Ka Hale A Ke Ola Homeless Resource Center where the burials had been discovered earlier. It is felt that these remains may be part of that burial complex (Site 2916), but have been issued a separate Site number—50-50-04-4192. The sands in which they were found were collected and moved across Waiale Road, so that construction work could continue. A mechanical sifter sifted approximately 9 truckloads of sand containing human remains. This activity was completed in September of 1996, and skeletal remains of at least 4 individuals were identified, 3 adults and 1 child (Fredericksen, February 1997).

Another series of burials was encountered at a sand mining operation located ca. 1 km. to the south, at the Maui Scrap Metal Company in Waikapu. Sand from the site was transported to Lahaina for use at the Sewer Plant, and was found to contain human remains. Their origin was established, and for a period of several months, from November 1994 to March of 1995, a large mechanical sifter was utilized to screen sand in an effort to recover the human remains disturbed by the sand mining activities. The burial site bears the number 50-50-04-3525. A minimum number of 22 individuals were dislocated by sand mining activity, and were reinterred at the site by members of the Maui and Lana'i Islands Burial Council in early March of 1995. The site was fenced and preserved as a precontact burial area (Fredericksen and Fredericksen, February 1996).

### **Maui Lani Development Project Area**

Early surveys by Barrera (1976) of the 1,000 acre Maui Lani project which surrounds the present study parcel, and of the Hale Laulea Subdivision (Barrera, 1983) in Kahului did not identify any sites. Neller (1984) investigated the area known as the "sand borrow site" after sand from there, used at a construction site in Lahaina, was discovered to contain human remains. His research revealed one complete *in situ* burial, and skeletal fragments of at least 3 other individuals scattered in the vicinity.

In 1987, in response to a call from the Maui Police Department, Walter and demaris Fredericksen visited this same general area ("sand borrow site") to determine the nature of skeletal material reported by local residents. The disturbed, flexed burial of a young female (18 to 25 years of age), and a 4 or 5 year old child nearby, lay partially exposed in a trail used by dirt bikers. At the request of the Police Department, the burials were removed. The presence of a shattered 4th thoracic rib and lower scapula blade on the left side, suggested that a frontal, traumatic puncture wound caused the death of the young female. The remains were curated at Maui Community College until they were turned over to SHPD on Maui for permanent disposition.

In 1990, the Anthropology Department of the Bishop Museum under contract to Maui Lani Partners conducted test excavations on 4 sites that had been identified in a reconnaissance survey done in January 1990 (Rotunno and Cleghorn, February 1990). The sites included 2 parallel alignments, 2 adjacent rock mounds, and a single rock mound. These sites were determined to be of recent origin related to off-road vehicular traffic, and not archaeologically significant. The fourth site (Site 50-50-04-2797) is a human burial site found at the sand borrow pit near the eastern boundary of the Maui Lani project area. No intact burials were recovered, but the scattered remains of at least 3 individuals were recovered in the surface layer (Rotunno-Hazuka et. al., May 1994a). A subsequent burial search was undertaken. These investigations resulted in the identification of at least 12 individuals from 10 burial features. Six features were preserved *in situ* (Rotunno-Hazuka et. al., May 1994b).

The most recent work has been archaeological subsurface sampling of the Maui Land Development Phases 1 and 1A, conducted by Aki Sinoto Consulting. The objective of the work was to implement a strategy for subsurface sampling to test for the predictability of burials based on topographic features within the unmodified dune areas, and to address the deficiencies in the inventory survey (Pantaleo and Sinoto, January 1996).

A total of 90 backhoe trenches, 2 shovel scrapes and 1 manual trench were excavated in 58 localities (Ibid., p. iii). Six previously unrecorded burials were found—4 associated with the sand borrow site (Site 2797); one on top of a high dune (Site 4146), and another exposed in a road cut (Site 4147). All of these sites lie within 1 mile east/southeast of the study area. The authors state: “No predictable pattern of traditional interment of the dead based on preference for topographic features was established during the current investigation. Rather, the resultant data indicates only one concentration or complex of multiple burials at Site 2797 and isolated individual burials at the top of dunes in the highest locations in the project area”. (Ibid.)

No further archaeological work was recommended, but monitoring was recommended during the grading phase of construction.

### **Maui Lani Parkway and Lot 11-A**

Xamanek Researches completed two inventory surveys in the immediate vicinity of the project area in the late 1990s.

Maui Lani Parkway is a roadway that connects Ka`ahumanu Avenue to the north with Mahalani Road to the south. This corridor is c. 2,500 feet in length and ranges from c. 200 to 300 feet in width, and encompasses approximately 12 acres. It crosses two dune features. A 172-acre 18-hole golf course is planned for the area to the west, as part of the Maui Lani Development project discussed above.

Subsurface testing included 31 backhoe test trenches, placed in areas that appeared to be have a relatively high potential for locating archaeological finds.

However, no significant material cultural remains were encountered in the project area during the inventory survey. Human remains were discovered on the western flank of one of the dunes in the vicinity of Hole #10 on the adjacent golf course (Site 4368). The scattered surface remains consisted of several cranium fragments and a cervical vertebra. These were turned over to the SHPD Maui office immediately after their discovery.

Because of this find of human remains, and the fact that burials have been reported in the Pu'uone Dune formation elsewhere, monitoring during grubbing and earthmoving activities was recommended for the Maui Lani construction project (Fredericksen and Fredericksen, January, 1997).

Another inventory survey was carried on a 20.7-acre parcel through which the Maui Lani Parkway corridor passes in a north-south direction. This study area fronts on Ka'ahumanu Avenue, and was formerly know as Lot 11-A. Following a pedestrian survey of the property, a series of 53 backhoe test trenches were excavated, along with 2 manual test units. No evidence of cultural material was discovered in 52 of the trenches, but in Backhoe Trench #41 an *in situ* flexed human burial was found, as a ramp was being excavated to allow partial access to the test trench. This burial is located about 100 feet south of Ka'ahumanu Avenue and 150 feet west of Maui Lani Parkway. It is identified as Site 50-50-04-4401, and is that of a large, adult male. The burial was stabilized and covered with sand as a temporary mitigation measure. A burial treatment plan was prepared, and a request for disinterment made. Final mitigation treatment for this burial is under the jurisdiction of the Maui and Lana'i Islands Burial Council (Fredericksen, letter report, February 15, 1997). Monitoring was recommended during ground moving and grubbing activities.

### **Mahalani Street Extension**

The Mahalani Street Extension project is a roadway that connects the Maui Lani Parkway discussed above, Mahalani Street and Waiale Road. This corridor was c. 1,800 feet in length and ranged from c. 75-150 feet in width, and encompassed approximately 7 acres. The study corridor crossed partially intact dune features, and lies to the north of the present project area.

Subsurface testing included 8 backhoe test trenches, placed in areas that appeared to be have a relatively high potential for locating archaeological finds. However, no significant material cultural remains were encountered in the project area during the inventory survey. However, monitoring was also recommended for the subsequent construction project, due to the presence of intact sand dune deposits.

### **Summary**

The pattern seems to be one of intensive land usage in the Iao Valley and the Waiale Road corridor, along the northern and western sides of the Pu'uone Dunes formation. However, in the central area to the east of the dunes, very few sites other than scattered burials have been found. Studies undertaken by Xamanek Researches at Maui

Community College (Fredericksen and Fredericksen, December 1992; Fredericksen, et. al., 1994), and at the Keiki Zoo Maui (Fredericksen and Fredericksen, September 1995), did not yield any significant material culture remains. Archaeological Consultants of Hawaii conducted a survey for the Maui Arts and Cultural Center, again without significant findings (Kennedy, 1990). Cultural Surveys Hawaii, Inc. carried out an inventory survey of the 110-acre Keopuolani Park area, which contains a large intact dune. There no indigenous cultural sites located during this survey.<sup>9</sup> However, scattered human remains (Site 50-50-04-4211) were found on the surface near the Maui Arts and Cultural Center, but no additional remains were located, and the site was evaluated as no longer significant (Heidel, Pyle and Hammatt, January 1997, p. 97). Other historic sites noted include Site 4232, a former WW II military facility, and Site 3112, the Kahului Railroad Berm. Both sites will be partially preserved by being incorporated into the landscaping of the Park (Ibid., p. 96).

While the extensive military activity associated with World War II could have altered the landscape, thereby destroying archaeological sites, it is also possible that this area of Maui was simply not used much in precontact times.

### **Settlement Pattern and Land Use**

The lower Iao Valley portion of Wailuku *ahupua'a* was a central political and religious area of West Maui, because of its fertile taro lands and close proximity to the sea. Given these conditions, a large population could be supported, and wherever large population clusters are found, the social framework of chiefly importance and religious expression is also present. This is attested to by the existence of the 2 *heiau* (Haleki'i and Pihana) atop the northern dune system, and others reported by Walker (1931) and Keau (1992, oral communication) within the Iao Stream corridor. The middle and upper reaches of Iao Valley were also rich in *lo'i* and *'auwai* which produced additional food stuffs to support political and religious activities. The Upper Iao Valley had been traditionally known as a very significant sacred place in the history of Maui (Donham, MCCRC minutes, June 1, 1995). Coastal sites, such as Site 3120, have been occupied since the 1200s (and possibly much earlier), and no doubt provided the complex with marine resources. There seems to be a pattern whereby sites closer to the ocean have earlier dates than the ones farther inland, suggesting that settlement occurred first along the sea shore and gradually moved inland as the population numbers increased.

An intensification of usage appears to have occurred during the 16th century, and seems to have peaked around the time of Pi'ilani, ca. 1600 AD (Ibid.). All radiocarbon dates that have been recovered from the sites along this corridor fall into this temporal framework.

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<sup>9</sup> The Kanaloa Avenue construction-monitoring/inventory project located a previously unidentified precontact habitation area (Site 5496) along with three *in situ* human burials and the remains of two previously disturbed individuals (Site 5495)[Fredericksen, March 2005]. Both of these sites lie in the northeastern portion of Keopuolani Park.



The central Maui area to the southeast, in which the present survey took place, is a part of the island, which apparently was not used extensively in precontact times, because of its aridity and general hospitability. Given such an arid climate and resultant poor soil conditions, one would not expect large permanent settlements to occur. There simply was not a constant water supply to provide for agricultural activities necessary to support permanent habitation. None of the archaeological studies conducted in the immediate environs have produced midden or architectural features suggesting habitation activities. On the other hand, the literature is replete with references to human burials, and the likelihood of their occurrence is possible.

**TABLE 1**  
**List of Archaeological Studies Done in Lower Iao Valley, Waiale Road, and the Central Maui Area.**

AUTHORS	LOCATION	FINDINGS
Burgett and Spear, 1995	TMK: 3-8-37: 48, Lower Main St., Home Maid Bakery. Sites 3924 and 3925	Habitation sites; human burials. Dated c. AD 1430 to 1671.
Burgett and Spear, 1996	TMK: 3-4-39: 77, Lower Main St., Oceanhouse, Inc., Site 4004	Habitation site remnant; human burials. Dated 1420 to 1640 AD.
Connolly, 1973	TMK: 3-8-36: 94, Lower Main St., Site 1171	Habitation site; burials discovered 1994 eroding from dune face.
Donham, 1994	TMK: 3-8-37: 49, Lower Main St., , Home Maid Bakery, Site 3556	Inadvertent burial discovery, both historic and precontact burials
Donham, 1992	TMK: 3-8-46: 21, Waiale Road, Maui Homeless Shelter, Site 2916.	Human burials.
Dunn and Spear, 1995	TMK: 3-4-02: 36, RR bed along Waiale Rd. Sites 4068, 4067; Site 3502 at Waiale Rd. and Kaohu Street	Habitation site and burials (4068); Habitation (4067).
Fredericksen, W. and Fredericksen, D, December 1992a	TMK:3-8-07: 40 and 43; Maui Community College Parking Lot Extension.	Historic sites from WWII. No precontact cultural materials.
Ibid., September 1995	TMK: 3-8-07: por. 1; Keiki Zoo Maui.	No findings of significance.
Ibid., February 1996	TMK: 3-8-07: 104; Maui Scrap Metal Company, Waikapu. Borrow Site, Site 3525.	Remains of at least 22 individuals recovered from mined sand.
Fredericksen D. and Fredericksen, W. December 1992b Fredericksen, et. al., November 1995	Inventory Survey and Data Recovery: TMK: 3-8-07: 123, at Lower Main and Wai'ehu Road, Nisei Veterans Memorial Center.	Historic site, Kahului Railroad (Site 3112); large precontact habitation site, with continuous occupation from c. 1200 AD to c. 1740 (Site 3120); numerous burials to be preserved <i>in situ</i> .
Fredericksen, et. al., July 1995 and Fredericksen, E. and Fredericksen, D. September 1996	Inventory Survey and Data Recovery: TMK: 3-4-39: por. 81, 82, 83 at Lower Main and Mill Streets, Site 4127	Habitation site; dated c. AD 1450 to 1675.



**Table 1 cont.**

Fredericksen, E., D., and W., August 1994	TMK: 3-8-46: 30; Maui Memorial Park	No significant findings.
Fredericksen, E., W., and D., September 1994	TMK: 3-8-07: por. 125; Maui Central Park, 10 acres along Kahului Beach Road	No significant findings.
Fredericksen E., and Fredericksen, D., June 1995	TMK: 3-8-46: 21, Waiale Road; Ka Hale A Ke Ola.	No significant findings during inventory survey—monitoring recommended.
Ibid., January 1997	TMK: 3-4-07: por. 121, Maui Lani Parkway corridor	No precontact finds in corridor—human remains (Site 4368) on Golf Course Hole #10—monitoring recommended.
Fredericksen, E., February 1997 (post-field summary)	TMK: 3-4-07: por. 121, Lot 11-A, Maui Lani Project—20.7 acres	One indigenous <i>in situ</i> burial (Site 4401)—Monitoring recommended
Fredericksen, D. February 1997	TMK: 3-8-46: 21, Waiale Road; Ka Hale Ke Ola.	Human burials uncovered during grading—remains of at least four individuals recovered.
Heidel, Pyle and Hammatt, 1997	TMK: 3-8-07: 1 and 3-7-01: 2; Maui Central Park	Historic sites: 4232-WW II military camp; 3112-Kahului Rail-road Berm; 4211-scattered human remains.
Kennedy, 1992	TMK: 3-8-07; Maui Arts and Cultural Center.	No findings.
Pantaleo, J. and A. Sinoto, January 1996	TMK: 3-8-07: 2, 110; Phase 1 and Phase 1A, Maui Lani Development, Wailuku.	No habitation sites. Human burials in several locations. Monitoring recommended. Additional burials during monitoring.
Rotunno and Cleghorn, 1990 Rotunno-Hazuka, et. al. May 1994a	TMK: 3-8-07: 2, 110: Maui Lani Development Property.	No precontact sites other than burials (Site 2797).
Spear, 1995	TMK: 3-8-37: 48; Lower Main St., Site 4066.	Human burials and habitation.

## **ARCHAEOLOGICAL METHODOLOGY**

The present study was carried out in three phases. Due to the location of the project, Dr. Melissa Kirkendall of the SHPD Maui office indicated that scheduled soil testing would need to be monitored. These results are included in this report. The project area was first covered with a pedestrian surface inspection. The subsurface sampling phase of the archaeological assessment survey included monitoring of the 18 soil bores and as well as 9 randomly placed backhoe test trenches.

This archaeological assessment took place in February-March 2005. Hugh Coflin conducted the soils monitoring and much of the assessment fieldwork, with assistance from Erik Fredericksen. Erik Fredericksen was also the project director for this archaeological assessment study.

## **ARCHAEOLOGICAL RESULTS**

The pedestrian survey of the study area yielded no surface evidence of significant cultural resources, although it is important to note that Spreckels Ditch (Site 50-50-04-1508) lies adjacent to portions of the H C & S Co. access road, to the west. Inspection of the water line corridor indicates that portions of it have been impacted by earth moving activities in the 20<sup>th</sup> century (i.e. construction of the H C & S, Inc. access road, as well as the County of Maui water tank). It appears that the bulk of the project area that will contain the proposed water treatment facility has been partially disturbed and/or filled. However, intact sand dune deposits were located in several of the backhoe trenches in the proposed water treatment facility. The bulk of the access road appears to be largely intact below the immediate road impact area.

The subsurface testing phase of the inventory survey followed the pedestrian inspection of the project area. Subsurface testing consisted of a series of 9 backhoe trenches that were located in selected portions of the proposed water line corridor, as well as the building site. In addition, 18 soil bores were monitored, and the results are included in this report. All of the backhoe trenches were halted in sterile soil/sand and/or lithified sand deposits. No evidence of significant material culture remains was located during the subsurface sampling phase of this project (Figure 4). Refer to Table 3 for a

summary of backhoe trench results, and Table 4 for a summary of soil bore results. See Figure 3 for locations of the 9 trenches and 18 soil bores. Refer to Appendix A for photographs and Appendix B for trench profiles. A brief discussion of subsurface findings in the project area follows.

### **Backhoe Trenches 1-9 (Appendix A, Photographs 5-11)**

These backhoe trenches were placed in accessible portions of the project area, care being taken not to block access along the H C & S Co. field road. These trenches were typically 6 meters in length by 0.8 meter in width and ranged from c. 2.2 to as much as 4.5 meters in depth.

#### **Backhoe Trench 1 (Figure 5)**

Trench dimensions were c. 6 m. in length by 0.8 m. in width by a maximum of 2.2 m. in depth. Unit orientation was N/S. Two soil layers were encountered before BT 1 was abandoned at its maximum depth.

Layer I consisted of brown (7.5 YR 5/3) silty clay that was up to 90 cm. thick. This layer appeared to have been partially disturbed and contained modern materials including wood, bottle glass, metal and PVC pipe fragments. Layer II was composed of brown (7.5 YR 4/4) sandy silty clay that appeared to be undisturbed. This stratum did not yield any significant material remains, and it extended to the bottom of BT 1 (220 cmbs).

#### **Backhoe Trench 2 (Figure 5)**

Dimensions for this trench were c. 6 m. in length by 0.8 m. in width by a maximum of 3.1 m. in depth. Unit orientation was to the northeast. Three soil layers were encountered before BT 2 was abandoned at a maximum depth of 3.1 m.

Layer I was composed of brown (7.5 YR 4/4) silty clay that was up to 180 cm. in thickness. This stratum appeared to have been partially disturbed and contained scattered modern materials at the surface. Layer II (180-240 cmbs) was made up of sterile, brown (7.5 YR 4/4) silty clay that contained some cemented sand inclusions. Layer III was composed of light brown (10 YR 6/3) lithified sand that appeared to be undisturbed. This concreted stratum did not yield any significant material remains, and it extended to the bottom of BT 2.

#### **Backhoe Trench 3 (Figure 6)**

Trench dimensions were c. 6 m. in length by 0.8 m. in width by a maximum of 4.5 m. in depth. Unit orientation was N/E-S/W. Two strata were located before BT 3 was halted at a maximum depth of 4.5 m.

Layer I consisted of dark brown (7.5 YR 3/3) silty loam that was up to 90 cm. thick. This layer appeared to have been partially disturbed and contained modern

materials including wood, bottle glass, metal and PVC pipe fragments. Layer II was composed of brown (7.5 YR 4/4) sandy silty clay that appeared to be intact. This layer did not yield any significant material remains, and it extended to the bottom of BT 3 (4.5 mbs).

#### **Backhoe Trench 4 (Figure 6)**

Backhoe Trench 4 was c. 6 m. in length by 0.8 m. in width by up to 3.4 m in depth. This trench was orientated to the NE. Two layers were encountered before BT 4 was halted at a maximum depth of 3.4 m.

Layer I consisted of dark brown (7.5 YR 3/3) silty loam that was up to 80 cm. thick. This layer appeared to have been partially disturbed and contained scattered modern materials including wood, bottle glass, and rusted metal near the surface. Layer II was made up of brown (7.5 YR 4/4) sandy silty clay with some cemented sand. This stratum appeared to be undisturbed, and did not yield any significant material remains. It extended to the bottom of BT 3 (3.4 mbs).

#### **Backhoe Trench 5 (Figure 7)**

Dimensions for BT 5 were 6 m. (length) by 0.8 m. (width) by up to 2.6 m (depth). This trench was orientated to the NE. Three layers were encountered before BT 5 was halted at its maximum depth.

Layer I consisted of light brown (10 YR 6/3) sand that was c. 90 cm. thick. The upper portion of this layer appeared to have been partially disturbed and several pieces of modern bottle glass fragments were located near the surface. Layer II was made up of brown (7.5 YR 4/4) silty clay with some scattered lithified sand. This layer appeared to be intact and was sterile in this test location. Layer III consisted of light brown (10 YR 6/3) lithified sand. This very hard layer was undisturbed, and did not yield any significant material remains. Excavation was abandoned because of very difficult subsurface conditions.

#### **Backhoe Trench 6 (Figure 7)**

Dimensions for this trench were 6 m. (length) by 0.8 m. (width) by up to 3.25 m (depth). Trench orientation was E/W. Two layers were located before BT 6 was halted in lithified sand.

Layer I consisted of brown (7.5 YR 4/3) silty sandy loam that was c. 45 cm. in thickness. The upper portion of this stratum also appeared to have been partially disturbed, and 1 piece of rusted metal was located near the surface of BT 6. Layer II consisted of light brown (10 YR 6/3) sand. Bands of unconsolidated as well as lithified sand were present in this stratum. The layer was intact and sterile in this test location. Excavation was halted in lithified sand.

### **Backhoe Trench 7 (Figure 8)**

Backhoe Trench 7 was 6 m. long by 0.8 m. wide by up to 3.2 m deep. Trench orientation was NW/SE. Two layers were encountered before excavation was halted at maximum depth.

Layer I was composed of brown (10 YR 5/3) sand that was c. 80 cm. thick. This layer appeared to have been previously disturbed. Layer II was consisted of light brown (10 YR 6/3) lithified sand. This very hard stratum was intact and no significant material culture remains were found in this test instance. The trench was halted because of very difficult excavation conditions.

### **Backhoe Trench 8 (Figure 8)**

Dimensions for BT 8 were 6 m. (length) by 0.8 m. (width) by up to 3.1 m (depth). Trench orientation was N/S. Two strata were located before BT 8 was halted in lithified sand.

Layer I consisted of brown (10 YR 5/3) silty sand that was c. 180 cm. thick. Much of this stratum had been previously disturbed. Some scattered modern materials were present in this layer. Layer II was composed of very light brown (10 YR 8/3) lithified sand. This sterile stratum extended to the bottom of BT 8.

### **Backhoe Trench 9 (Figure 9)**

This final backhoe trench was 6 m. long by 0.8 m. wide by up to 2.7 m deep. Trench orientation was N/S. Two layers were encountered before excavation was halted at maximum depth.

Layer I was composed of brown (10 YR 5/3) silty sand that was c. 80 cm. in thickness. The upper portion of this stratum appeared to have been partially disturbed. Layer II was consisted of very light brown (10 YR 7/4) compact sand that transitioned into very light brown (10 YR 8/3) lithified sand. This very hard stratum was intact and did not yield any significant material culture remains in this test instance. Some scattered metal and refuse were noted on the surface in the vicinity of BT 9. Excavation was halted due to very compact subsurface conditions.

## **Discussion**

Subsurface test results did not locate any significant material culture remains in any of the backhoe subsurface tests. In general, intact sand dune deposits were present in all test instances in the proposed water transmission line corridor. Test results in the proposed water treatment plant site indicate that this portion of the project area has been previously impacted by un-permitted filling and dumping activities. There was no evidence of any intact cultural layers or significant material culture remains located during backhoe testing in this area.

**TABLE 2**  
**SUMMARY OF BACKHOE TEST RESULTS**

BT	Length <sup>10</sup>	Stratigraphy	cmbs <sup>11</sup>	Remarks
1	6	Layer I: brown (7.5 YR 5/3), silty clay	0-90	Layer I: modern materials
		Layer II: brown (7.5 YR 4/4) sandy silty clay	90-220	Layer II: sterile
2	6	Layer I: dark brown (7.5 YR 3/3) silty loam	0-180	L I: sterile
		Layer II: brown (7.5 YR 4/4) silty clay with some cemented sand	180-240	LII: sterile
		Layer III: light brown (10 YR 6/3) lithified sand	240-310	LIII: sterile
3	6	Layer I: dark brown (7.5 YR 3/3) silty loam	0-220	L I: some modern materials
		Layer II: brown (7.5 YR 4/4) silty clay with some cemented sand inclusions	220-450	L II: sterile
4	6	Layer I: dark brown (7.5 YR 3/3) silty loam	0-80	L I: modern materials
		Layer II: brown (7.5 YR 4/4) silty clay with some cemented sand inclusions	80-340	L II: sterile
5	6	Layer I: light brown (10 YR 6/3) sand	0-90	L I: some modern glass
		Layer II: brown (10 YR 4/4) silty clay	90-120	L II: sterile
		Layer III: light brown (10 YR 6/3) lithified sand	120-260	LIII: sterile
6	6	Layer I: light brown (7.5 YR 4/3) silty sandy loam	0-45	LI: 1 piece of metal
		Layer II: light brown (10 YR 6/3) unconsolidated sand with bands of lithified sand	45-325	LII: sterile
7	6	Layer I: brown (10 YR 5/3), loose, fine-grained sand	0-80	LI: disturbed
		Layer II: light brown (10 YR 6/3) compact sand	80-320	LII: sterile
8	6	Layer I: brown (10 YR 5/3), loose, fine-grained silty sand	0-180	LI: disturbed
		Layer II: very light brown (10 YR 8/3) lithified sand	180-310	LII: sterile
9	6	Layer I: brown (10 YR 5/3), loose, fine-grained silty sand	0-80	Both layers sterile, metal and refuse on surface near trench
		Layer II: very light brown (10 YR 7/4) compact sand transitioning into very light brown (10 YR 8/3) lithified sand	25-270	

### Soil Bores 1-18

As previously noted, a total of 18 soil bores were utilized to test the proposed locations of the water treatment facility and the waterline. The archaeological monitor was on site during all soil coring activities for this project. Table 3 below provides a summary of soil bore results. During the course of the archaeological monitoring

<sup>10</sup> Lengths are in meters; all trenches were 80 c. cm in width.

<sup>11</sup> cmbs = centimeters below surface

component of this assessment survey, previously disturbed soil and fill areas were located in the upper portions of several of the soil cores in the proposed location of the water treatment facility. However, intact dune sand deposits were encountered in the deeper portions of all of the soil sample cores. In addition, essentially all of the bores in the proposed waterline corridor yielded intact dune sand deposits.

**TABLE 3  
SUMMARY OF SOIL BORE RESULTS**

BH <sup>12</sup>	W x D <sup>13</sup>	Stratigraphy	Remarks
1	30 x 457	Layer I: very light brown (10 YR 7/3) sand	Sterile, slightly concreted
2	30 x 457	Layer I: very light brown (10 YR 7/3) sand	Sterile, slightly concreted
3	30 x 441	Layer I: very light brown (10 YR 7/3) sand	Sterile, slightly concreted
4	30 x 457	Layer I: very light brown (10 YR 8/3) sand	Sterile, slightly concreted
5	30 x 457	Layer I: very light brown (10 YR 7/3) sand	Sterile, slightly concreted
6	30 x 457	Layer I: very light brown (10 YR 7/3) sand	Sterile, slightly concreted
7	30 x 460	Layer I [0-304 cmbs]: brown (7.5 YR 4/3) silty clay Layer II [304-460 cmbs]: very light brown (10 YR 7/3) sand	L I: some modern materials present L II: sterile, slightly compact
8	30 x 610	Layer I [0-50 cmbs]: very light brown (10 YR 7/3) sand Layer II [60-120 cmbs]: brown (7.5 YR 5/3) silty clay Layer III [120-180 cmbs]: brown (7.5 YR 4/4) sandy silt with gravel Layer IV [180-395 cmbs]: brown (7.5 YR 5/4) fine grained sand Layer V [395-550 cmbs]: light brown (7.5 YR 6/4) sand Layer VI [550-610 cmbs]: brown (7.5 YR 5/4) cemented sand	L I: sterile, slightly concreted L II-L IV: sterile
9	30 x 610	Layer I [0-150 cmbs]: brown (7.5 YR 5/3) silt and gravel Layer II [150-485 cmbs]: brown (7.5 YR 4/4) silty sand with gravel Layer III [485-610 cmbs]: light brown (7.5 YR 6/4) fined grained sand	All layers sterile

<sup>12</sup> Bore Hole

<sup>13</sup> Widths and depths are in centimeters.

**Table 3 cont.**

10	30 x 760	Layer I [0-150 cmbs]: brown (7.5 YR 5/3) silty clay Layer II [150-450]: brown (7.5 YR 4/4) sandy silty clay Layer III [450-490 cmbs]: brown (7.5 YR 5/4) silt with fine gravel Layer IV [490-610 cmbs]: brown (7.5 YR 5/3) silty clay Layer VI [610-760 cmbs]: light brown (7.5 YR 6/4) cemented sand	All layers sterile
11	30 x 610	Layer I [0-590 cmbs]: brown (7.5 YR 4/3) silty clay Layer II [590-610cmbs]: light brown (10 YR 6/3) sand	Both layers sterile
12	30 x 775	Layer I [0-210 cmbs]: dark brown (7.5 YR 3/4) sand Layer II [210-610 cmbs]: brown (7.5 YR 5/3) silty clay with brown (7.5 YR 5/4) sand banding Layer III 610-685 cmbs]: brown (7.5 YR 4/4) sandy silt Layer IV [685-777 cmbs]: brown (7.5 YR 5/4) cemented grained sand	All layers sterile
13	30 x 472	Layer I [0-120 cmbs]: brown (7.5 YR 5/3) silt and gravel Layer II [120-180 cmbs]: brown (7.5 YR 4/4) silty clay with gravel Layer III [180-472 cmbs]: light brown (7.5 YR 6/4) cemented sand	All layers sterile
14	30 x 472	Layer I [0-275 cmbs]: brown (7.5 YR 4/3) silty clay Layer II [275-472 cmbs]: very light brown (10 YR 7/3) sand	Both layers sterile
15	30 x 610	Layer I [0-272 cmbs]: brown (7.5 YR 5/3) silty clay Layer II [274-441 cmbs]: brown (7.5 YR 4/4) silty clay with gravel Layer III [441-610 cmbs]: light brown (7.5 YR 6/4) cemented sand	All layers sterile
16	30 x 470	Layer I: light brown (10 YR 6/3) cemented sand	Sterile
17	30 x 620	Layer I [0-150 cmbs]: dark brown (10 YR 3/3), compact, fine-grained silty sand Layer II [150-620]: Layer II: very light brown (10 YR 7/4) cemented sand	Both layers sterile
18	30 x 770	Layer I [0-370 cmbs]: dark brown (10 YR 3/3), compact, fine-grained silty sand Layer II [370-770 cmbs]: very light brown (10 YR 7/4) sand	Both layers sterile

## Discussion of Subsurface Results

There was no evidence of an intact cultural layer found during subsurface investigation on any portion of the study area. It appears that much of the project area in the proposed location of the water treatment facility has been covered by fill and/or disturbed, while much of the proposed waterline corridor appears to have been only



partially disturbed by previous actions associated with the construction of the unpaved HC & S Co. access road and the COM water tank.

## **SUMMARY AND CONCLUSIONS**

No evidence of an indigenous cultural deposit or other significant material culture remains were located during subsurface testing in the project area. In addition, no significant cultural materials were encountered during the surface walkover of the project area. While there were no historic properties located during on the survey area, it is important to note that Spreckels Ditch (Site 50-50-04-1508) lies to the west of the proposed waterline corridor. This site has been previously documented and maintains its significance under Federal and State guidelines—Criterion “a” (association with plantation-era water delivery system) and Criterion “d” (information content). However, it appears that this site will not be impacted by the actions of the project.

Stratigraphy observed in all but BTs 1, 3 and 4 indicates that intact sand dune deposits are present in tested portions of the study area. Information obtained from this archaeological assessment survey indicates that exposed sand dune deposits exist in the HC & S Co. access road and on the sand dune where the COM water tank is located. Disturbed zones with intact subsurface deposits of dune sand were also noted in tests conducted for the proposed water treatment facility. Soil cores indicate that sand dune deposits are relatively thick in all test instances.

The Pu'uone Sand Dune formation is known to contain occasional human burials. Burials have been found on the Maui Lani Development project, near the Maui Lani Parkway corridor, and in the nearby Ka Hale A Ke Ola facilities—all within the near vicinity of the present study area. The possibility therefore exists that human remains could be present in the untested areas of the project area.

## Site Significance Evaluations

The following significance evaluations are based on the Rules Governing Procedures for Historic Preservation Review (DLNR 1996; Chapter 275). According to these rules, a site must possess integrity of location, design, setting, materials, workmanship, feeling and association and shall meet one or more of the following criteria:

**Criterion “a”**—Be associated with events that have made an important contribution to the broad patterns of our history;

**Criterion “b”**—Be associated with the lives of persons important in our past;

**Criterion “c”**—Embody the distinctive characteristics of a type, period, or method of construction; represent the work of a master; or possess high artistic value;

**Criterion “d”**—Have yielded, or is likely to yield, important information for research on prehistory or history;

**Criterion “e”**—Have an important traditional cultural value to the native Hawaiian people or to another ethnic group of the state due to associations with traditional cultural practices once carried out, or still carried out, at the property or due to associations with traditional beliefs, events or oral accounts.

As mentioned earlier in this report, we did not locate any significant material culture remains on the project area during this assessment study. Consequently, there can be no site significance assessments made at this point in time.

## Site Mitigation Recommendations

Based on the results of this archaeological assessment survey, it is recommended that an archaeological monitor be present during all grading, grubbing and trenching in the proposed waterline corridor, as well as the proposed water treatment facility. This mitigation measure is considered to be appropriate, because Native Hawaiian burials have been encountered in the Pu'uone Sand Dune area on Maui.

If significant historic sites, or human burials are encountered during construction activities, work must cease in the immediate area until appropriate mitigation measures can be determined by the SHPD Maui office and the Maui/Lana'i Islands Burial Council.

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**APPENDIX A**  
**Project Photographs**





**Photograph 1: View to the southeast across intake in left foreground. Project area southeast of equipment.**



**Photograph 2: General view to the northeast along HC & S Co. access road. Project area is to the right.**



**Photograph 3: General view to the southeast along section of Spreckels Ditch.  
HC & S Co. access road is at left, project area is to left of road.**



**Photograph 4: General view to the northeast of Upper Waiale Reservoir 73,  
HC & S Co. access road is in foreground.**



**Photograph 5: View to the north of BT 1.**





**Photograph 6: View to the northeast of BT 2.**



**Photograph 7: View to the northeast of BT 4.**



**Photograph 8: View to the west of BT 5.**



**Photograph 9: View to the west of BT 6.**



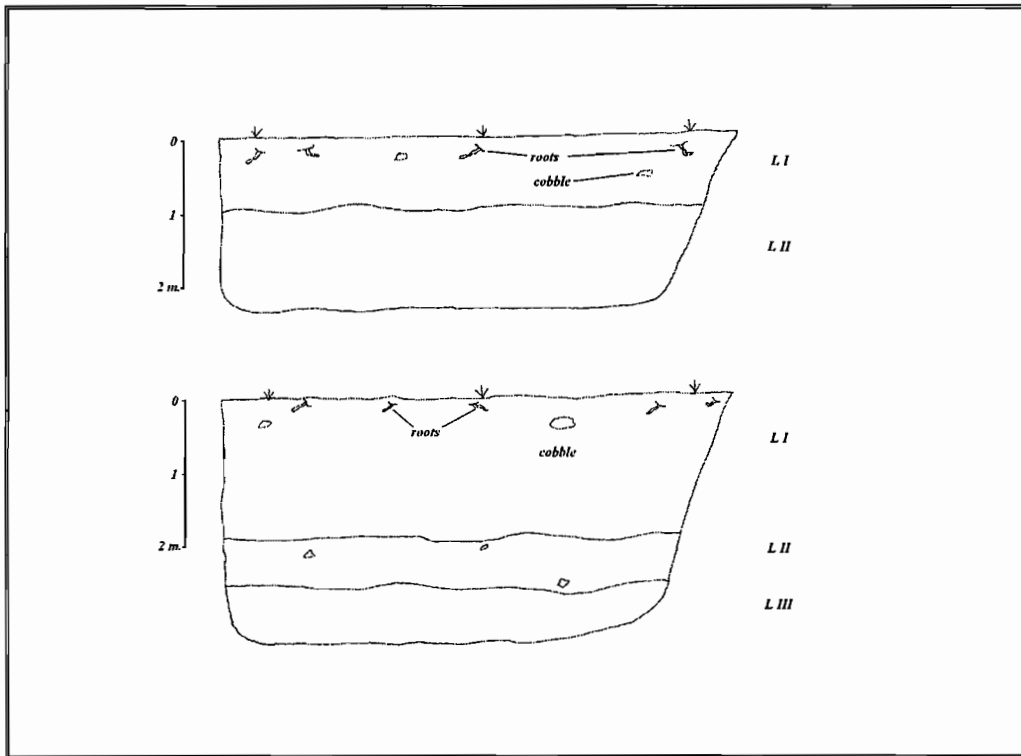
**Photograph 10: View to the northeast of BT 7.**



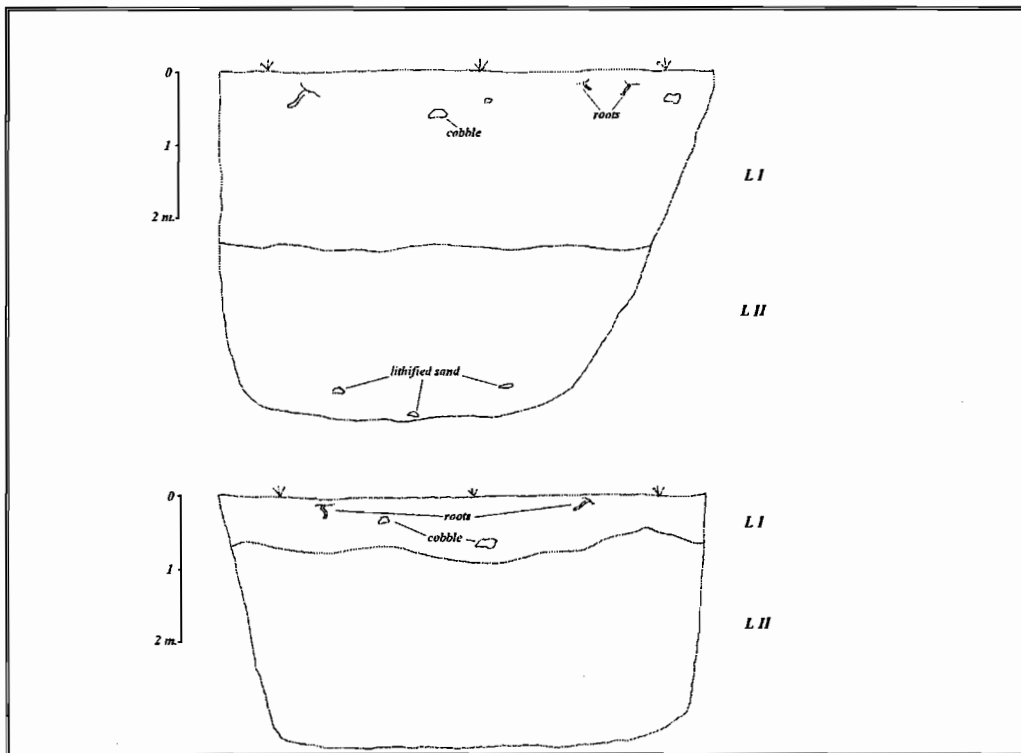
**Photograph 11: View to the north of BT 9.**

**APPENDIX B**  
**Backhoe Trench Figures**  
**Figures 5-9**



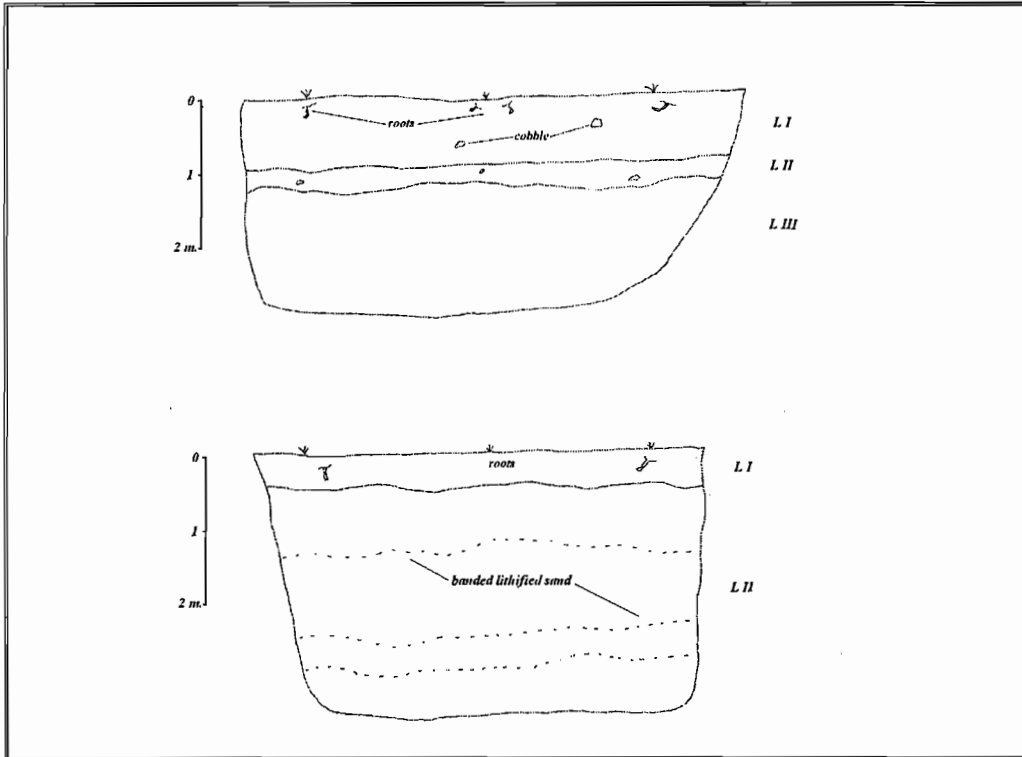


**Figure 5: West face profile of Backhoe Trench 1 (top) and SW face profile BT 2 (bottom).**

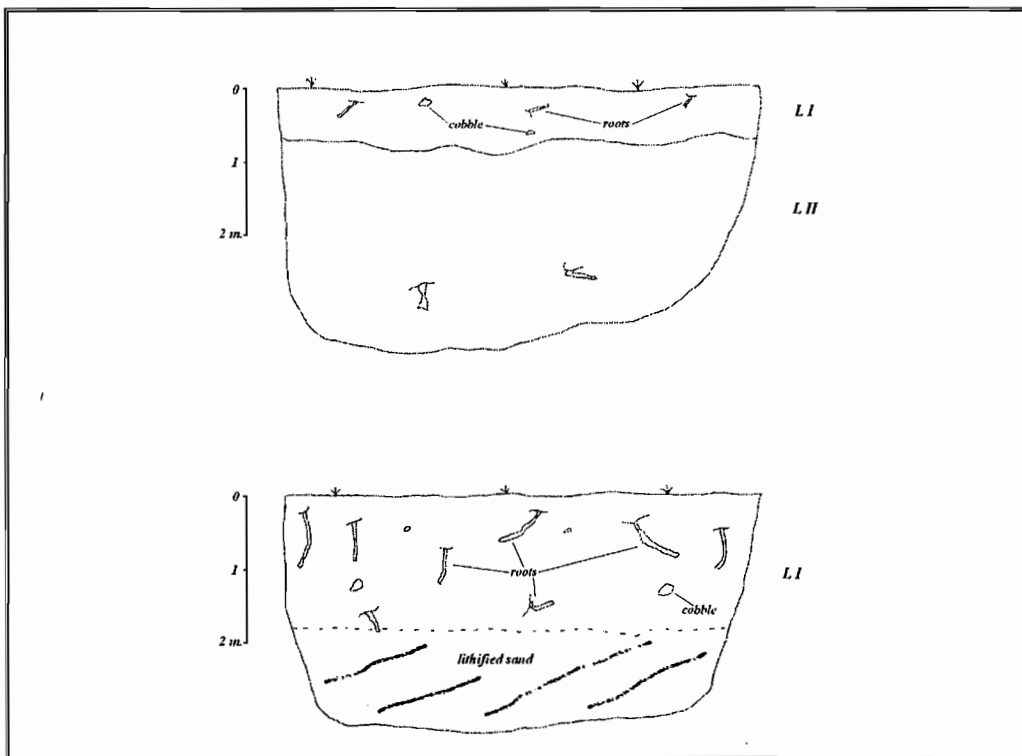


**Figure 6: Northeast face profile of BT 3 (top) and SW profile of BT 4 (bottom).**

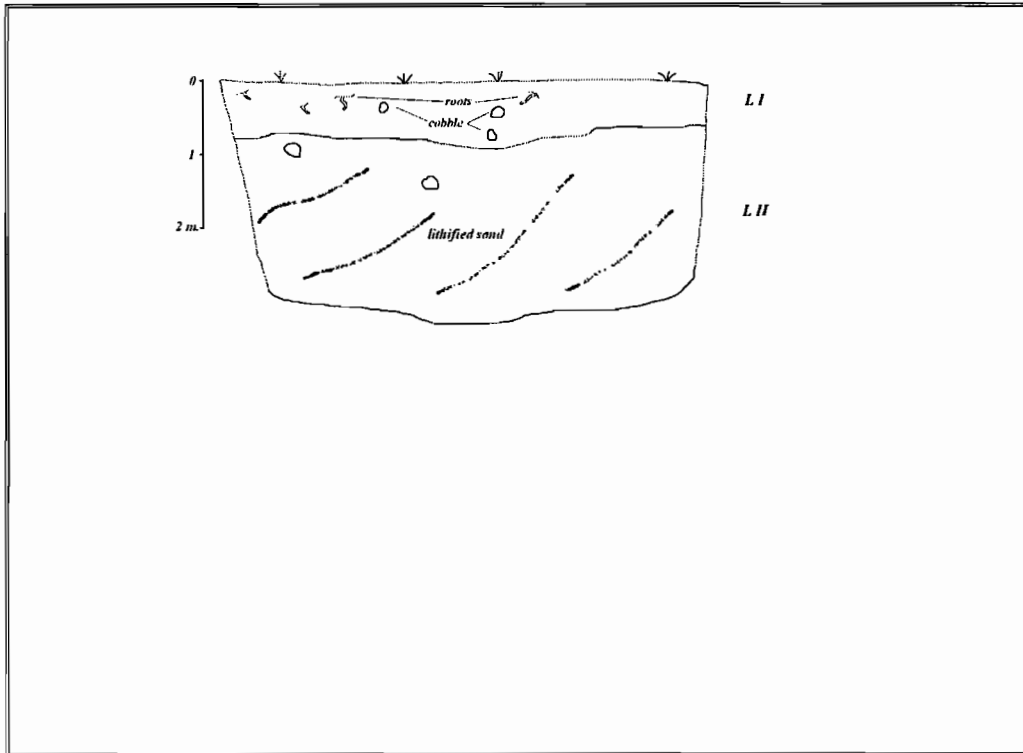




**Figure 7: South face profile of BT 5 (top) and N profile of BT 6 (bottom).**



**Figure 8: Southwest face profile of BT 7 (top) and E profile of BT 8 (bottom).**



**Figure 9: East face profile of BT 9.**

## **APPENDIX C-1.**

**Letter from State Historic  
Preservation Division, Dated  
December 30, 2005**

3-8-046:020

LINDA LINGLE  
GOVERNOR OF HAWAII



**STATE OF HAWAII**  
**DEPARTMENT OF LAND AND NATURAL RESOURCES**

STATE HISTORIC PRESERVATION DIVISION  
601 KAMOKILA BOULEVARD, ROOM 555  
KAPOLEI, HAWAII 96707

**PETER T. YOUNG**  
CHAIRPERSON  
BOARD OF LAND AND NATURAL RESOURCES  
COMMISSION ON WATER RESOURCE MANAGEMENT

**ROBERT K. MASUDA**  
DEPUTY DIRECTOR - LAND

**DEAN NAKANO**  
ACTING DEPUTY DIRECTOR - WATER

**AQUATIC RESOURCES**  
BOATING AND OCEAN RECREATION  
BUREAU OF CONVEYANCE  
COMMISSION ON WATER RESOURCE MANAGEMENT  
CONSERVATION AND COASTAL LANDS  
CONSERVATION AND RESOURCES ENFORCEMENT  
ENGINEERING  
FORESTRY AND WILDLIFE  
HISTORIC PRESERVATION  
KAOHOLAWE ISLAND RESERVE COMMISSION  
LAND  
STATE PARULS

December 30, 2005

Mr. Erik Fredericksen  
Xamanek Researches  
P.O. Box 880131  
Pukalani, Hawai'i 96788

Log No: 2005.2708  
Doc No: 0512MK50  
Archaeology

Dear Mr. Fredericksen:

**SUBJECT: Chapter 6E-42 Historic Preservation Review –  
Archaeological Assessment Survey for the Waiale Surface Water Treatment Plant  
Project Prepared for Austin, Tsutsumi & Associates on Behalf of A & B Properties  
Wailuku Ahupua'a, Wailuku District, Maui  
TMK (2) 3-8-046:020**

Thank you for the opportunity to review this report which our staff received on October 25, 2005 (Fredericksen 2005, *An Archaeological Assessment Survey Report for the Waiale Surface Water Treatment Plant Project, Wailuku Ahupua'a, Wailuku District, Island of Maui [TMK (2) 3-8-46:020]*...Xamanek Researches, LLC, ms).

The background section acceptably establishes the ahupua'a settlement pattern and predicts the likely site pattern in the project area. The historical information provided summarizes the history of the post-contact period land uses. The summary of previous archaeological work in the area provides a baseline for the current work. The project area is situated adjacent to the Spreckels Ditch (SIHP 50-50-04-1508), and an access road used by H C & S Co. The parcel is also situated within the Pu'uone Dune system, and includes approximately 2.25 acres of land within which 1,600 lineal feet of new 12 inch diameter line is proposed.

The assessment meets our minimum requirements, as set forth in HAR 276-5 (a) and (c).

The survey has adequately covered the project area documenting no historic properties. Subsurface testing (nine backhoe trenches) were also negative for evidence of cultural deposits. However six (6) of the trenches exhibited intact sand deposits. In other areas of the parcel, the surface deposit has been disturbed, and exposed sand dune deposits are visible within the previously impacted area.

We concur with the mitigation recommendation that monitoring is warranted during all ground altering activities on the subject parcel. The Pu'uone Dune system is known to contain both isolated and clustered burials. We will await the submittal of a monitoring plan prior to recommending issuance of permits pertaining to the proposed project.

Mr. Erik Fredericksen

Page 2

We find this report to be acceptable. As always, if you disagree with our comments or have questions, please contact Dr. Melissa Kirkendall (Maui/Lana'i SHPD 243-5169) as soon as possible to resolve these concerns.

Aloha,



MELANIE A. CHINEN, Administrator  
State Historic Preservation Division

MK: kf

c: Bert Ratte, DPWEM, County of Maui  
Michael Foley, Director, Dept of Planning, 250 S. High Street, Wailuku, HI 96793  
Maui Cultural Resources Commission, Dept. of Plng, 250 S. High Street, Wailuku, HI 96793

JAN - 5 2006

# **APPENDIX D.**

## **Archaeological Monitoring Plan**

**An Archaeological Monitoring Plan for the proposed  
Waiale Surface Treatment Plant Project,  
Wailuku *Ahupua'a*, Wailuku District,  
Maui Island  
(TMK: (2) 3-8-46: 020)**

**Prepared for:**

**The State Historic Preservation Division**

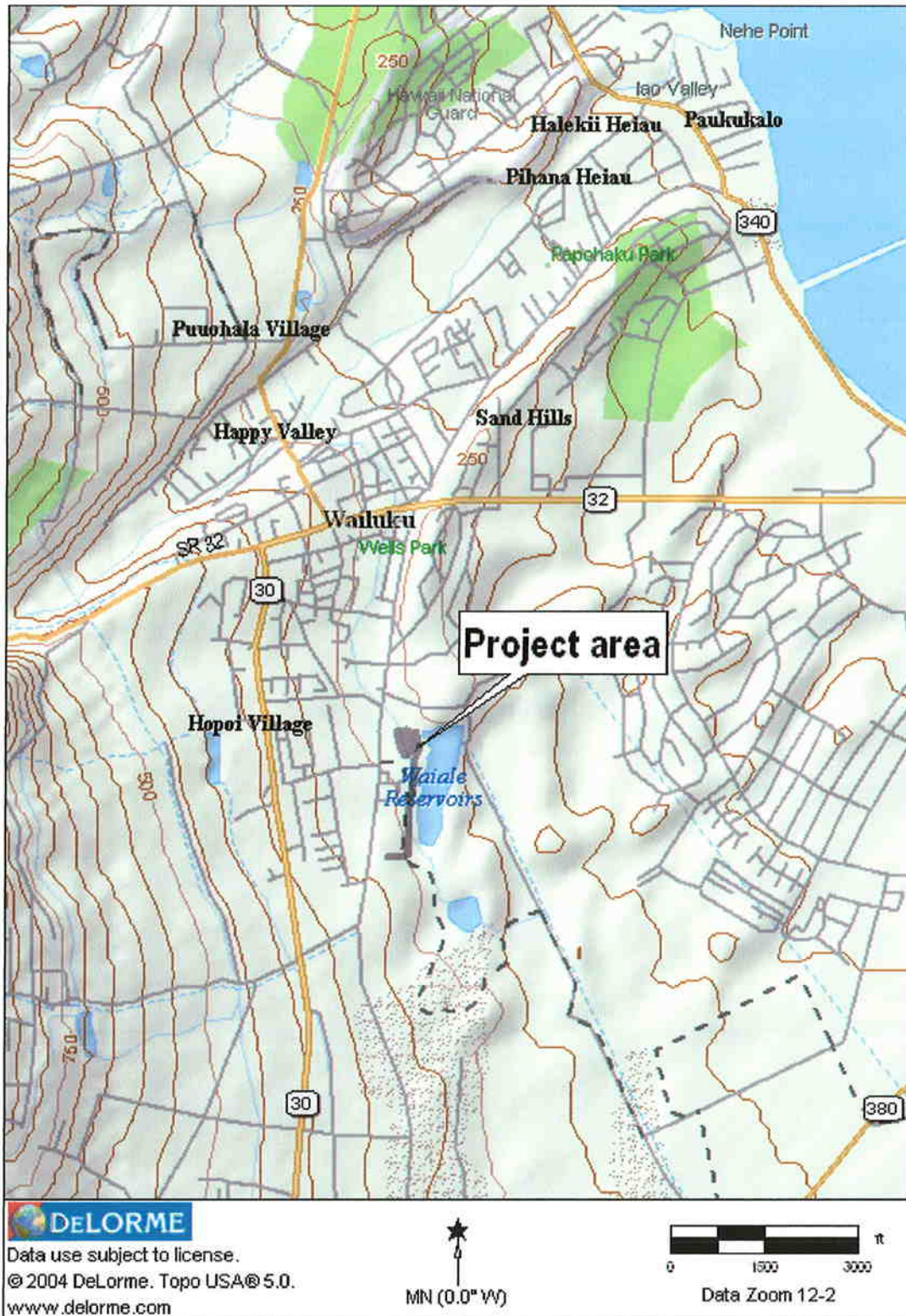
**On behalf of:**

**Austin, Tsutsumi & Associates, Inc.  
501 Sumner Street, Suite 521  
Honolulu, Hawai'i, 96817**

**Prepared by:**

**Xamanek Researches LLC  
Pukalani, Maui  
Erik Fredericksen**

*22 May 2006*



**Figure 1: Location of the Waiale Surface Water Treatment Plant facility project area.**



## **INTRODUCTION**

Mr. Ivan Nakatsuka, Chief Environmental Engineer with Austin Tsutsumi & Associates, Inc (ATA) contacted Xamanek Researches, LLC in early 2005 regarding the proposed Waiale Surface Water Treatment Facility project. Project plans called for the construction of a surface water treatment facility on a c. 2.25 acre parcel of land and the placement of c. 1,600 lineal feet of new 12-inch diameter line that would connect this facility to an existing County of Maui (COM) Department of Water Supply 3 million gallon water tank (TMK (2) 3-8-46: 020). We contacted Melissa Kirkendall, State Historic Preservation (SHPD) Maui staff archaeologist about the project. Given that the proposed project was located in a portion of the extensive Pu'uone Sand Dune complex, we were informed that an archaeological inventory/assessment survey would be required. Our assessment survey was carried out on an intermittent basis between February and April of 2005. While there were no significant cultural materials located during our survey, archaeological monitoring was nonetheless recommended, because the proposed project lies in the Pu'uone Sand Dune complex (SHPD DOC NO: 0512MK50). This region of Maui is noted for containing isolated and clustered human burials.

We were subsequently contacted regarding the monitoring program for the proposed water treatment facility project. Mr. Ivan Nakatsuka requested that we prepare the necessary monitoring plan for the project. Our proposal was subsequently accepted, and we were given the notice to proceed with the preparation of the plan. The proposed project will include grubbing and grading and excavation activities for the construction of the water treatment facility as well as grubbing and excavation activities for the installation of c. 1,600 ft (500 m) of 12-inch diameter water line within the subject parcel (see Figures 1-3). The following archaeological monitoring plan addresses State Historic Preservation Division requirements for this proposed project.

## THE STUDY AREA

The project area lies near (east of) Waiale Road in Wailuku on the windward side of the isthmus of Maui. Sand deposits are present in this region, which is part of the large Pu'uone dune system. The general area contains a mix of businesses and residential areas, as well as COM facilities, including the Maui Community Correctional Center, the Ka Hale A Ke Ola Homeless Resource Center, and the Hale Makana O Waiale. These facilities essentially border the western portion of the project area.<sup>1</sup> The Upper Waiale Reservoir 73 lies east of and adjacent to a portion of the project area. Observed vegetation in the vicinity of the project area includes alien weeds and grasses, along with various introduced trees, including *kiawe* (*Prosopis pallida*). It is estimated that this portion of the island receives between 20 and 30 inches of annual rainfall.

As noted previously, Xamanek Researches, LLC conducted an archaeological assessment survey for the Waiale Surface Water Treatment Plant facility project. There was no evidence of an intact cultural deposit encountered during subsurface testing on the project area. Test results indicate that the upper c. 50-70 cm of much of the study area has been impacted by previous activities associated with non-permitted dumping, the construction of a HC & S Co. access road, and the previous development of a County of Maui (COM) water tank.<sup>2</sup> Stratigraphy observed in all but Backhoe Trenches 1, 3 and 4 indicates that intact sand dune deposits are present in sampled portions of the study area. Information obtained from the archaeological assessment survey indicates that exposed sand dune deposits exist in the existing HC & S Co. access road and on the sand dune where the COM water tank is located.<sup>3</sup> Disturbed zones with intact subsurface deposits of dune sand were also noted in tests conducted for the proposed water treatment facility. Soil cores indicate that sand dune deposits are relatively thick in sampled areas.

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<sup>1</sup> A portion of Site 50-50-04-1508, Spreckels Ditch, separates the project area from these County of Maui facilities.

<sup>2</sup> This water tank has a 3 million gallon capacity.

<sup>3</sup> The proposed water line will traverse much of this access road.

## ARCHAEOLOGICAL MONITORING PLAN

### Scope of monitoring

The scope of this monitoring plan includes having an archaeological monitor present during all grubbing, grading and subsurface earthmoving activities within the project area. Actual on-site time and specific actions to be followed in the event of inadvertent discoveries will be discussed and agreed upon by the general contractor and Xamanek Researches, LLC at a pre-construction meeting held for this purpose. Additional meetings may be called, if either the monitoring archaeologist or the general contractor believes that other relevant information should be disseminated.

There is a possibility that significant material culture remains may be inadvertently disturbed during proposed and/or future earthmoving activities in this portion of Wailuku, Maui. Possible significant cultural materials could include subsurface habitation deposits, human burials and/or human skeletal remains. While the likelihood that subsurface cultural deposits may be located somewhere in the study area is somewhat unlikely, it is important to note that human burials and previously disturbed human remains have been located in portions of the large Pu'uone dune complex, including the nearby Hale Makana O Waiale COM facility.

### Monitoring methodology

There is a possibility that significant material culture remains (especially human burials and/or human skeletal remains) may be inadvertently disturbed during earthmoving activities in this portion of Wailuku, Maui. Consequently, close cooperation between the monitoring archaeologist and construction personnel will be essential. Topics for discussion shall include, but not necessarily be limited to the following:

- 1) The contractor shall be responsible for ensuring that the archaeological consultant is aware of all pertinent construction schedules and that the archaeological monitor is present for all subsurface excavation activities on this parcel.
- 2) Both the archaeological consultant and the contractor are responsible for ensuring that on-site work is halted in an area of significant findings and to protect any such find from any further damage (i.e., construction fencing, protective covering, etc.). The State Historic Preservation Division will recommend appropriate mitigation actions. The SHPD Burial Sites Program,

the SHPD Maui office, and the Maui/Lana`i Islands Burial Council (MLIBC) shall be consulted in the event that human remains are found. (Change work order)

- 3) In the event of the discovery of human remains, work shall cease in the immediate find area. The monitoring archaeologist will be responsible for notifying the SHPD Maui office and the Historic Preservation Division Burials Sites Program, which, in consultation with the Maui/Lana`i Islands Burial Council, shall determine the appropriate mitigation measures. This notification will include accurate information regarding the context and composition of the find. (Change work order)
- 4) Xamanek Researches, LLC will work in compliance with Hawai`i Revised Statutes Chapter 6E (procedures Relating to Inadvertent Discoveries).
- 5) The monitoring archaeologist will have the authority to closedown construction activities in areas where potentially significant discoveries have been made until they have been properly evaluated. Normally, construction activities may continue in unaffected portions of the project area. (Change work order)
- 6) Field procedures to be followed for documentation of discovered cultural features or human skeletal remains: a) standard field methods including recordation of profiles showing stratigraphy, cultural layers, etc.; b) mapping and photographing of finds other than human remains; c) and excavation of cultural materials and/or exposed features.
- 7) The SHPD Maui archaeologist shall be notified and consulted with regarding treatment of identified features such as cultural layers, artifact or midden concentrations, structural remains, etc., considered to be of significance under S13-279-2 (definitions).
- 8) The contractor should take into account the necessity for machine excavation at a speed slow enough to allow for reasonable visual inspection of the work. The monitoring archaeologist must make a “best effort” to search for significant material culture remains (i.e. artifacts, features, midden, skeletal remains, etc.). Machine excavation speed will need to be slowed in an area where significant material culture remains have been identified. (Change work order)
- 9) Significant archaeological discoveries, if they occur, shall be protected and identified by construction “caution” tape, fencing, or other reasonable means, until the SHPD Maui office and the archaeological consultant decide appropriate mitigation actions. All recovered material culture remains—with the possible exception of charcoal samples for radiometric analysis—will remain on Maui. Standard laboratory methods shall be utilized by Xamanek

Researches in the event that significant cultural materials are recovered during monitoring and/or mitigation work. Cultural materials will be curated by the consultant on the island of Maui (change work order)

- 10) One monitor in most instances will carry out the necessary fieldwork. Tasks will include observation of grubbing and earth-moving activities. However, the SHPD concurs with the MLIBC and requires that one archaeological monitor be assigned to each piece of major earth-moving equipment in sand dune areas, or other culturally sensitive locales. (Change work order if more than one piece of machinery is to be utilized)
- 11) In the event of night work, the general contractor shall supply adequate lighting for the onsite monitor. The monitor shall determine if the lighting is adequate for his/her needs.
- 12) Chapter 6E-11 (a) specifies the following “It shall be unlawful for any person or corporate, to take, appropriate, excavate, injure, destroy, or alter any historic property or aviation artifact located on the private lands of any owner thereof without the owner’s written permission being first obtained. It shall be unlawful for any person, natural or corporate, to take, appropriate, excavate, injure, destroy, or alter any historic property located upon lands owned or controlled by the State or any of its political subdivisions, except as permitted by the department.”

Field methods utilized during the monitoring program shall include photographic recordation (where appropriate), artifact excavation (recovery and recordation), profile documentation of cultural layers and stratigraphy, excavation and recordation of exposed features, and mapping of all pertinent features on an appropriate site map. A daily log (field notes) of activities and findings will also be kept. Gathered information shall be utilized in the preparation of the monitoring report to be submitted to the SHPD.

In the event human skeletal remains are inadvertently disturbed, the SHPD Maui office, the SHPD Burial Sites Program and the Maui/Lana`i Islands Burial Council shall be notified, and appropriate mitigation actions determined (photographs of human skeletal remains will not be taken).

A supervisory archaeologist may periodically visit the monitoring site as often as is necessitated by the nature of the construction activities and archaeological findings. If significant discoveries are made, appropriate mitigation measures will be discussed with the SHPD Maui office.

Any cultural materials, other than human remains recovered from the monitoring project, will be curated by the archaeological consultant on Maui, until analysis is completed. The cultural materials will be then turned over to the appropriate parties. Long-term curation arrangements of such materials will be approved by the SHPD.

When fieldwork for this required archaeological monitoring project is completed, a draft monitoring report will be prepared. This draft report shall be submitted to the State Historic Preservation Division within 180 days of the completion of fieldwork, for comment and approval. Approved changes and corrections will result in the final monitoring report for proposed Waiale Surface Water Treatment Plant facility in Wailuku, Maui.







## **APPENDIX D-1.**

**Letter from State Historic  
Preservation Division, Dated  
July 21, 2006**

LINDA LINGLE  
GOVERNOR OF HAWAII



STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES

STATE HISTORIC PRESERVATION DIVISION  
601 KAMOKILA BOULEVARD, ROOM 555  
KAPOLEI, HAWAII 96707

PETER T. YOUNG  
CHAIRPERSON  
BOARD OF LAND AND NATURAL RESOURCES  
COMMISSION ON WATER RESOURCE MANAGEMENT

ROBERT K. MARUDA  
DEPUTY DIRECTOR - LAND

DEAN KAKANO  
ACTING DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES  
BOATING AND OCEAN RECREATION  
BUREAU OF CONVEYANCES  
COMMISSION OF WATER RESOURCE MANAGEMENT  
CONSERVATION AND COASTAL LANDS  
CONSERVATION AND RESOURCES IMPROVEMENT  
DIVISION  
FORESTRY AND WILDLIFE  
HISTORIC PRESERVATION  
KAROO LAKE ISLAND RESERVE COMMISSION  
LAND  
STATE PARKS

July 21, 2006

Mr. Erik Fredericksen  
Xamanek Researches  
P.O. Box 880131  
Pukalani, Hawai'i 96788

LOG NO: 2006.2313  
DOC NO: 0607MK05  
Archaeology

Dear Mr. Fredericksen:

**SUBJECT: Chapter 6E-42 Historic Preservation Review –  
Archaeological Monitoring Plan for the  
Proposed Waiale Surface Treatment Plant Project  
Wailuku Ahupua'a, Wailuku District, Island of Maui  
TMK: (2) 3-8-046:020**

Thank you for the opportunity to review this plan which was received by our staff on June 9, 2006 (Fredericksen 2006, *An Archaeological Monitoring Plan for the Proposed Waiale Surface Treatment Plant Project, Wailuku Ahupua'a, Wailuku District, Maui Island [TMK (2) 3-8-46:020]*...Xamanek Researches LLC, ms). We have previously provided comments on the archaeological assessment (LOG NO: 2005.2708/DOC 0512MK50) in which we concurred with the mitigation for precautionary archaeological monitoring. No historic properties were identified during the archaeological assessment.

The plan conforms to Hawaii Administrative Rules Chapter 13-279 which govern standards for monitoring; the subject plan includes the following provisions. Machine excavation will occur at a very slow, controlled speed, especially in areas where cultural material is identified. An archaeologist will be on site on a full-time basis, one per piece of heavy equipment, and will have the authority to halt excavation in the event that cultural materials are identified. Consultation with Maui SHPD will occur in this event, to determine acceptable course of action. If human burials are identified, work will cease, the SHPD Burial Sites Program, Maui SHPD, O'ahu SHPD and the Maui/Lana'i Islands Burial Council will be notified, and compliance with procedures outlined in HRS 6E-43 will be followed. Coordination meetings with the construction crew will be held prior to project initiation. The plan further indicates that an acceptable report will be submitted to this office within 180 days of project completion.

Please notify our Maui and O'ahu offices, via facsimile, at onset and completion of the project and monitoring program.

**Mr. Erik Fredericksen**  
**Page 2**

The plan is acceptable. We believe there will be "no historic properties affected" with the implementation of this monitoring plan. If you have any questions, please contact Dr. Melissa Kirkendall at 243-5169.

Aloha,



Melanie Chinen, Administrator  
State Historic Preservation Division

MK:kf

c: Bert Ratte, DPWEM, County of Maui  
Michael Foley, Director, Dept. of Planning, 250 S. High Street, Wailuku, HI 96793  
Maui Cultural Resources Commission, Dept. of Planning, 250 S. High St., Wailuku, HI 96793

# **APPENDIX E.**

## **Cultural Impact Assessment Report**

**A Cultural Impact Assessment for the proposed  
Waiale Surface Treatment Plant Project,  
Wailuku *Ahupua'a*, Wailuku District,  
Maui Island  
(TMK: (2) 3-8-46: 020)**

**Prepared for:**

**The State Historic Preservation Division**

**On behalf of:**

**Austin, Tsutsumi & Associates, Inc.  
501 Sumner Street, Suite 521  
Honolulu, Hawai'i, 96817**

**Prepared by:**

**Xamanek Researches LLC  
Pukalani, Maui  
Erik Fredericksen**

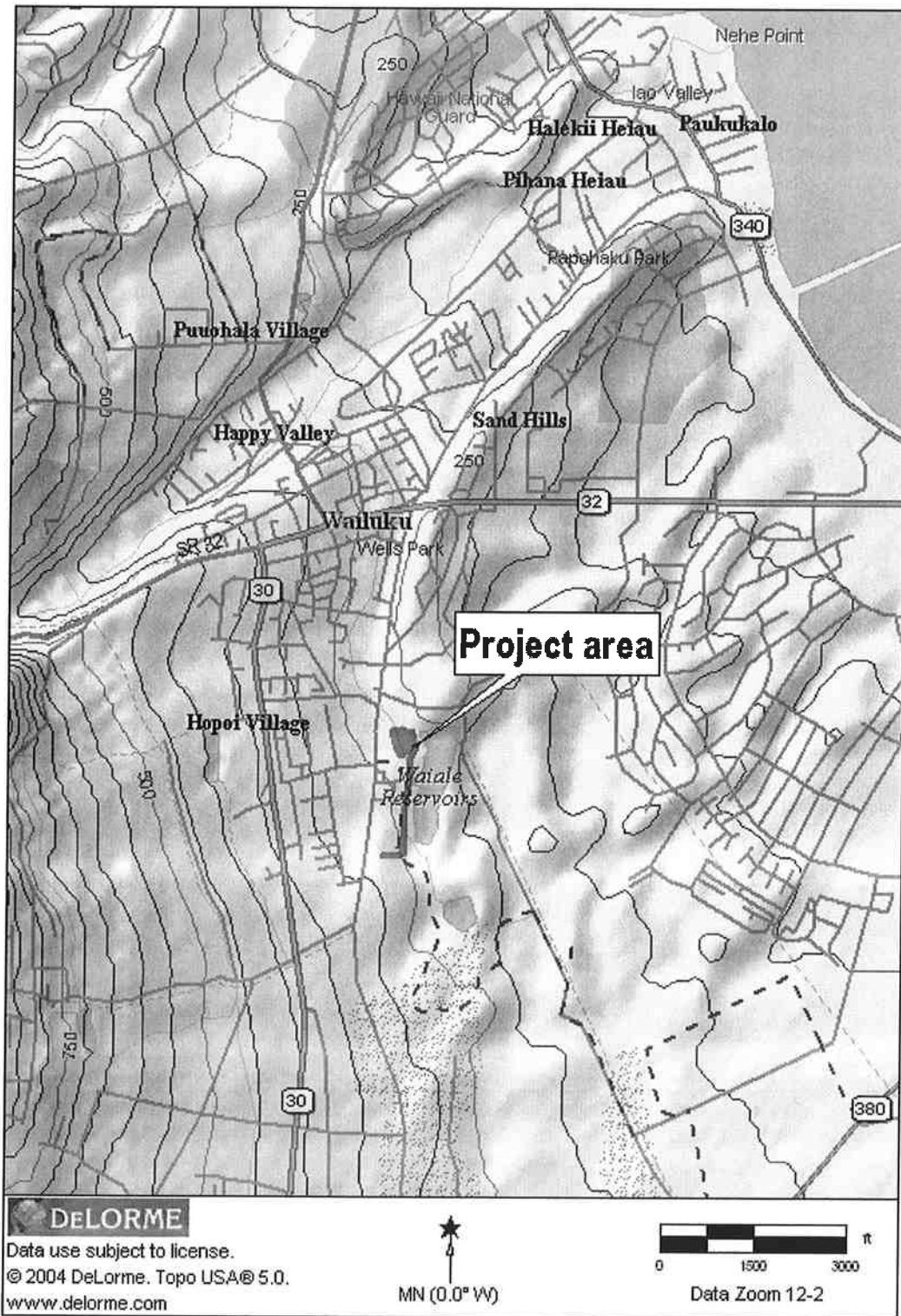
***16 July 2006***

## ABSTRACT

Xamanek Researches, LLC carried out an archaeological assessment survey for the proposed Waiale Surface Water Treatment Facility project in 2005. The study area is located in a portion of the Pu'uone Sand Dune complex in Wailuku ahupua'a, Wailuku District (TMK: (2) 3-8-46: 020). While there were no significant cultural materials located during our survey, archaeological monitoring was nonetheless recommended, because the proposed project lies in a sand dune area (SHPD DOC NO: 0512MK50). This region of Maui is noted for containing isolated and clustered human burials.

We were subsequently contacted regarding the monitoring program for the proposed water treatment facility project and we were requested to prepare the necessary monitoring plan for the project. The proposed project will include grubbing and grading and excavation activities for the construction of the water treatment facility as well as grubbing and excavation activities for the installation of c. 1,600 ft (500 m) of 12-inch diameter water line within the subject parcel. This monitoring plan is currently under review by the SHPD.

It was also brought to our attention that a Cultural Impact Assessment was necessary for the proposed project as well. Both the Office of Hawaiian Affairs (Maui office) and the State Historic Preservation Division (Maui office) were contacted about the CIA. Mr. Leslie Kuloloio, Maui/Lana'i Islands Burial Council Member of many years, conducted a field visit with Erik Fredericksen of Xamanek Researches, LLC. Given the location of the project area, Mr. Kuloloio's concern was that the proposed construction project needed to be monitored. He felt that this mitigation was necessary, because unmarked Native Hawaiian burials have been located in the general area. Mr. Kuloloio was unaware of any other traditional practices that may have occurred in the project area.



**Figure 1: Location of the Waiale Surface Water Treatment Plant facility project area.**







## INTRODUCTION

Mr. Ivan Nakatsuka, Chief Environmental Engineer with Austin Tsutsumi & Associates, Inc (ATA) originally contacted Xamanek Researches, LLC in early 2005 regarding the proposed Waiale Surface Water Treatment Facility project (Figures 1-3). Project plans called for the construction of a surface water treatment facility on a c. 2.25 acre parcel of land and the placement of c. 1,600 lineal feet of new 12-inch diameter line that would connect this facility to an existing County of Maui (COM) Department of Water Supply 3 million gallon water tank (TMK (2) 3-8-46: 020). We contacted Melissa Kirkendall, State Historic Preservation (SHPD) Maui staff archaeologist about the project. Given that the proposed project was located in a portion of the extensive Pu'uone Sand Dune complex, we were informed that an archaeological inventory/assessment survey would be required. Xamanek Researches, LLC carried out the assessment survey on an intermittent basis between February and April of 2005 (Fredericksen, October 2005). While there were no significant cultural materials located during our survey, archaeological monitoring was nonetheless recommended, because the proposed project lies in the Pu'uone Sand Dune complex (SHPD DOC NO: 0512MK50). This region of Maui is noted for containing isolated and clustered human burials.

We were subsequently contacted regarding the monitoring program for the proposed water treatment facility project and we were requested to prepare the necessary monitoring plan for the project. Our proposal was subsequently accepted, and we were given the notice to proceed with the preparation of the plan. The proposed project will include grubbing and grading and excavation activities for the construction of the water treatment facility as well as grubbing and excavation activities for the installation of c. 1,600 ft (500 m) of 12-inch diameter water line within the subject parcel (see Figures 1-3). This monitoring plan is currently under review by the SHPD.

It was also brought to our attention that a Cultural Impact Assessment was necessary for the proposed project, because an Environmental Assessment was required for the water treatment facility. The following Cultural Impact Assessment report has been prepared for the proposed project.

## THE STUDY AREA

The project area lies near (east of) Waiale Road in Wailuku on the windward side of the isthmus of Maui. Sand deposits are present in this region, which is part of the large Pu'uone dune system. The general area contains a mix of businesses and residential areas, as well as COM facilities, including the Maui Community Correctional Center, the Ka Hale A Ke Ola Homeless Resource Center, and the Hale Makana O Waiale. These facilities essentially border the western portion of the project area.<sup>1</sup> The Upper Waiale Reservoir 73 lies east of and adjacent to a portion of the project area. Observed vegetation in the vicinity of the project area includes alien weeds and grasses, along with various introduced trees, including *kiawe* (*Prosopis pallida*). It is estimated that this portion of the island receives between 20 and 30 inches of annual rainfall.

As noted previously, Xamanek Researches, LLC conducted an archaeological assessment survey for the Waiale Surface Water Treatment Plant facility project. There was no evidence of an intact cultural deposit encountered during subsurface testing on the project area. Test results indicate that the upper c. 50-70 cm of much of the study area has been impacted by previous activities associated with non-permitted dumping, the construction of an existing HC & S Co. access road, and the previous development of a County of Maui (COM) water tank.<sup>2</sup> Stratigraphy observed in all but Backhoe Trenches 1, 3 and 4 indicates that intact sand dune deposits are present in sampled portions of the study area. Information obtained from the archaeological assessment survey indicates that exposed sand dune deposits exist in the existing HC & S Co. access road and on the sand dune where the COM water tank is located.<sup>3</sup> Disturbed zones with intact subsurface deposits of dune sand were also noted in tests conducted for the proposed water treatment facility. Soil cores indicate that sand dune deposits are relatively thick in sampled portions of the project area.

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<sup>1</sup> A portion of Site 50-50-04-1508, Spreckels Ditch, separates the project area from these County of Maui facilities.

<sup>2</sup> This water tank has a 3 million gallon capacity.

<sup>3</sup> The proposed water line will traverse much of this access road.

## Present Usage

At the time of the Cultural Impact Assessment study, the project area was utilized for a variety of purposes. The proposed water treatment facility appears to have been primarily utilized as an informal dump. Abandoned vehicles, industrial machinery, commercial agricultural items, construction spoil, road debris, and piles of backdirt were noted on portions of the project area. An HC & S Co. access road is presently maintained and contains an access gate. The dune area near the COM water tank appears to have been impacted by previous construction activities, although the area along the nearby boundary with the assisted housing facility to the north yielded relatively intact sand dune deposits.<sup>4</sup>

## BACKGROUND RESEARCH

### Precontact Period

The *ahupua'a* of Wailuku is a large land unit stretching around Kahului Bay from Paukukalo to Kaukaulua. It includes Iao Valley and the northern half of the Kahului Isthmus. This single land division comprises nearly half of the District of Wailuku, and is noted as a place where chiefs were buried and wars were fought. The word itself can be translated as "water of destruction" (Pukui, et. al., 1974, p. 225), and the name Wailuku refers to the battles which took place in the area.

Iao Valley and the two associated dunes on the north and south sides of the river constituted the core area of Wailuku. This was the central place of religious and political power on Maui, which culminated during the time of Pi'ilani (c. 1600 AD). In the late precontact period warfare increased as the chiefs from Maui, Oahu and Hawaii vied for political and military dominance. High Chief Pi'ilani unified the districts of Maui by warfare, but after his death, his sons fought with one another—each to establish political control. Eventually Kiha-a-Pi'ilani became victorious, establishing his political dominance (Speakman, 1978, pp. 9-13). Each succeeding generation of chiefs had to struggle through warfare to secure their positions of political preeminence.

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<sup>4</sup> This area will be impacted by the planned installation of a water line, which will feed water into the existing County of Maui one million gallon water tank.

During the reign of the last powerful paramount chief or king, Kahekili (who ruled from 1765 to 1790), Wailuku again became the site of intense warfare. Kahekili's royal residence, Kalanihale, was located in Wailuku.<sup>5</sup> In the mid-1770s it was marched upon by a Big Island chief named Kalani`opu`u and his *alapa* (the name given to his warriors). News of his coming preceded him, and Kahekili hid his warriors in the sand dunes above Haleki`i *heiau* to surprise the invading troops. Kalani`opu`u's army was pushed to the sea and slaughtered (Speakman, pp. 16-17).

By 1786, Kahekili controlled Maui, Moloka`i, Lana`i, and Oahu as well. This undisputed political control lasted for only 4 years, however. In 1790, Kamehameha the Great made his move on Kahekili's domain, an action, which ended in the battle of Kepaniwai<sup>6</sup> and the defeat of the Maui ruler. The word Kahului can be translated as "the winning", and the Bay takes this name because Kamehameha gathered his warriors there prior to fighting the battle in Iao Valley (Pukui, et. al., 1974).

### Early Post-Contact Period

The reign of Kamehameha was intertwined with the increasing presence of foreigners (*haoles*). The arrival of Captain Cook offshore at Kahului Bay in 1778 began the steady flow of outside influences, which would forever alter the indigenous population and environment. One of the first of these influences came with missionaries, whose charge it was to save heathen souls. The first missionaries arrived in Wailuku in 1832, and the traditional religion began to wane under their influence. A girls' seminary (Central Female Boarding School) was established by Rev. Jonathan Green in 1836, where young Hawaiian women were taught the language and customs of the foreigners, as well as their religion.

Another influence to bring change was foreign commercialism, and it came initially in the form of sugar production. The first sugar cane crops grown in the *ahupua`a* were harvested and processed in 1828. Kamehameha III, with the help of two Chinese technicians, established a water-powered mill in Wailuku. This was known as Hungtai Sugar Works, and its location was fairly close to the later location of the Wailuku Sugar Mill, which was established in 1862. Hungtai Sugar Works continued to operate until the opening of the new mill.

The population of the *ahupua`a* of Wailuku in the 1831-32 census was listed as 2,256, with most of it being in the northern portion, presumably in Iao Valley (Cordy, 1978, p. 59).

On the southern and eastern side of the Iao Valley dunes (Pu`uone Dunes), commercial activity took the form of cattle ranching. This sizable area was used for pasturage. By as early as 1845, large herds of cattle were roaming the Kahului Isthmus

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<sup>5</sup> The location is said to be somewhere near the intersection of High Street and the road leading into Iao Valley in Wailuku town.

<sup>6</sup> Kepaniwai means literally "water dam" in reference to Iao Stream, because the stream was choked with human bodies after the slaughter there (Pukui, et. al., 1974, p. 109).

(cattle had been introduced on the Big Island by Vancouver in 1793). The Maui cattle were under royal *kapu* so could not be molested. They were so destructive to the environment that Native Hawaiian landowners protested, but to no avail (Barrere, 1975, p. 52). In addition to the commercial raising of cattle, there were also brief attempts at the production of cotton in the 1830s. This endeavor met with little commercial success however<sup>7</sup>, and further adversely impacted the landscape.

### Post-1850s Period

After the Mahele in 1848, much of the *ahupua`a* was designated as Crown Land, to be used in support of the royal "state and dignity". In 1872 Kamehameha V died, and his sister Princess Ruth Ke'elikolani inherited the land. She was designated as the owner of the *Ka'a* lands of Wailuku, the southern portion of the *ahupua'a*. The *ili* of *Owa* comprised of 743.40 acres, LCA 420) was granted to Kuihelani, a steward to Kamehameha I. A much smaller northern section (the *ili* of *Kalua*-LCA 7713, Apana 23-391 acres) was awarded to Princess Ruth's half-sister, Victoria Kamamalu. In 1882, Princess Ruth sold one-half of the Crown Lands of Hawaii to sugar producer, Claus Spreckels, in order to settle her debts with him. Spreckels already held a lease for 16,000 acres of Wailuku *ahupua`a*, dating from 1878. Worried about what Spreckels might do with half of the Crown Lands, King Kalakaua gave him Land Grant 3343, a 24,000 acre portion of the southeastern section of Wailuku *ahupua`a*, in return for the surrender of his claim (Adler, 1966, pp. 262-264).

The Reciprocity Treaty of 1876 with the United States had given a boost to the sugar industry by increasing prices. The dry eastern part of the *ahupua`a* would be attractive as potential sugar land if water could be brought to it. In 1880, Spreckels began construction of what was called "Spreckels' Ditch", located *makai* of the Hamakua Ditch, built earlier by Alexander and Baldwin to water their Maui Agricultural Company's fields. The "Spreckels' Ditch" brought Haleakala water to the arid Kahului isthmus. The ditch was 30 miles long, and delivered about 60 million gallons of water a day, and cost \$500,000. Spreckels also built another ditch, the Waihe'e ditch in 1882, which tapped the water resources from the West Maui Mountains, thus bringing water to both sides of the Wailuku Commons isthmus area (Adler, 1966, pp. 48-49). These endeavors enabled him, in 1882, to found Hawaiian Commercial and Sugar Company. He continued involvement in that company until 1898, when control was wrested from his hands. The parent company still bears the name of Alexander and Baldwin, the principal participants in the transfer of corporate control. The production of sugar cane continues to be an

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<sup>7</sup>The Anglican Church felt that "the Hawaiian people, freed from their service to and dependence on the chiefs should be self-supporting and thought that the encouragement of the manufacture of cloth from the superior cotton which grew luxuriantly in the islands would be a means to that end. They therefore suggested that a manufacturer be sent with sufficient machinery to get the project started. They felt that the people would continue to work with the encouragement and cooperation of the chiefs." (Lemmon et. al., 1973, p. 2.B.3). To this end they sent Miss Lydia Brown in 1835 with " 'a quantity of domestic spinning apparatus' (presumably spinning wheels and a loom)" (Ibid.), and "charged with the responsibility of teaching the Hawaiian girls the arts of carding, spinning, weaving and knitting locally grown cotton and wool." (Ibid.) As each class grew proficient enough to teach others, a new class was formed (Ibid., 2.B.4).

activity in the isthmus area to this day, although some portions operated by C. Brewer and Company have shifted to pineapple production.

The environmental conditions in the lower Iao Valley, which in precontact times were ideal for agricultural support of a large population, were a wide valley floor, rich alluvial soils, and a constant water supply from Iao Stream. These combined with the access to Kahului Harbor, rich in marine resources, made this area the prime precontact location on West Maui for a political and religious center. The lower portion of Iao Valley contained some of the most productive taro land on the island, and the abundance of Land Commission Awards in the lower valley attest to this. There are 66 LCA's, primarily taro patch *kuleana*, and 39 *po'alima* located between the old Wailuku Mill site and Paukukalo, on the southern side of Iao stream. In addition, Kamehameha IV made 13 awards directly to individual chiefs.<sup>8</sup>

Lower Main Street was built along the route of an old government road, which very likely followed the course of existing transportation routes from the ocean to the inland portions of Iao Valley. Nearly all of the LCAs in this area have borders aligned with the road, indicating it was an important transportation corridor at the time the *kuleana* were granted. This corridor follows the natural boundary between the sand dune and the alluvial deposits of the valley.<sup>9</sup> The Kahului Railroad paralleled Lower Main Street and Waiale Road and was one of the earliest known projects that impacted the Pu'uone dune itself.

The route of the railroad from Kahului Harbor to Wailuku Sugar Mill is shown on both the 1954 USGS map, and the 1937 Towill Map. The remnants of this old railroad bed can still be noted along Lower Main and Waiale Road. Railroad construction was begun in the late 1870s and continued for nearly 2 decades, as routes were added and service expanded. The railroad continued operations until after World War II. Then slowly, demands began to change, and segments of the system were phased out. An article in **The Maui News** of October 15, 1957 bore the headline "Iron Horses Bow Out As Wailuku Sugar Company Discontinues Use of Railroad". The railroad continued to serve other areas until 1966, when it ceased operation.

The commercial and residential growth along Lower Main Street and Waiale Road is related, no doubt, to the growth of the railroad. After the railroad's closure, development on the southern side of both streets began, and generally the dune was cut down to street level in the developed portions. At the time of this construction and development, little or no attention was paid to archaeological sites impacted by such construction. If Hawaiian or other human burials were encountered, the skeletal remains were simply turned over to the local mortuary for disposal.

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<sup>8</sup> This is in contrast to the area south and east of Lower Iao Valley, in which the study parcel lies. Here there were 2 LCAs awarded—one to Victoria Kamamalu (7713), and one to Kuihelani (420). The largest portion is Grant 3343 to Claus Spreckels.

<sup>9</sup> It is noteworthy that all LCAs along Lower Main Street and Waiale Road lie on the western side of these roads, which were generally located near the boundary of the Pu'uone dune system and the rich alluvial fan of Iao Valley.

In the central Maui area to the south and east, residential development did not occur until after World War II. During the war, portions of the Pu'uone dune area were used by the military. There was a large Marine Base in the area occupied by Maui Community College and the Maui Arts and Cultural Center. After the war, several housing developments were built in the Kahului and Wailuku area.

Alexander and Baldwin, Inc. began planning the Maui Lani Development in the 1970s and 1980s, a project which encompasses more than 1000 acres. It includes 634.2 acres for residential use; c. 200 acres for recreational use, including an 18-hole golf course; 68 acres for public/quasi-public use; 21.7 acres for commercial use; and 67.8 acres for circulation and open space. The Maui Lani Development project borders the Waiale Reservoirs, the larger of which lies adjacent to and east of the present study area.

## CULTURAL IMPACT ASSESSMENT

The purpose of this Cultural Impact Assessment (CIA) study is to assess potential impacts of the proposed Waiale Surface Treatment Plant Project on traditional cultural practices in the study area. We requested assistance from two State agencies: the Maui Office of Hawaiian Affairs (OHA), and the State Historic Preservation Division. Ms. Thelma Shimaoka, Community Resource Specialist with the Maui OHA office and Mr. Hinano Rodrigues, Cultural Historian with the SHPD Maui office were both contacted near the end of May 2006 regarding any of the following components of the CIA:

- Information on cultural sites that may potentially be impacted by the proposed water treatment plant facility;
- Knowledge of any traditional gathering activities in the general project area (past/present);
- Traditional uses within the project area;
- Referrals of community elders who may be willing to share their cultural knowledge of the study area and the surrounding environs.

### **Project visit with Mr. Leslie Kuloloio, Maui/Lana'i Islands Burial Council Member**

While there was no information available at either agency, both Ms. Shimaoka of the OHA office, and Mr. Rodrigues of the SHPD Maui office recommended that we



contact Mr. Leslie Kuloloio, Maui Lana'i Islands Burial Council (MLIBC) member, regarding the project area. The author phoned Mr. Kuloloio and he graciously agreed to visit the project area. Mr. Kuloloio lives near the study area and has been extensively involved as a member of the MLIBC for many years. In addition, he has been a long-time advocate for the protection of Native Hawaiian burials, as well as significant Hawaiian sites and places.

Mr. Kuloloio and I visited the project area on 12 July 2006. Mr. Kuloloio was first shown the location and scope of the proposed surface water treatment plant on maps (see Figures 2 and 3, this report). Mr. Kuloloio was also informed that we had previously carried out an archaeological assessment survey of the proposed treatment facility location and the proposed corridor for the water line. While we did not locate any significant remains during the course of our survey, archaeological monitoring had, nevertheless, been recommended because of the presence of intact sand dune deposits in the study area. Finally, it was noted that a monitoring plan for the proposed project had recently been prepared and was currently under SHPD review.

Given the location of the proposed project in the Pu'uone dune system, away from and east of Waiale Road, Mr. Kuloloio shared the opinion that the area would likely have been too dry in precontact times for any extended usage by Hawaiians.<sup>10</sup> He was unaware of any traditional cultural practices, with the exception of past burial practices, which may have formerly occurred in this portion of the island. He was not aware of any modern traditional uses in this area. He went on to note the proximity of the large Upper Waiale Reservoir<sup>11</sup>, which was likely constructed around the beginning of the 1900s, had undoubtedly impacted the surrounding area. In addition, Mr. Kuloloio pointed out that the proposed water treatment facility appears to be on or near the former site of Apana's Surplus.<sup>12</sup>

While the general area has been impacted by various uses in the past, Mr. Kuloloio nevertheless did express concern that Native Hawaiian human burials could possibly be contained in untested portions of the project area, which crosses a partly intact section of the Pu'uone sand dune complex.<sup>13</sup> Given that isolated and scattered Native Hawaiian burials have been found in the general area, he was satisfied that

---

<sup>10</sup> This observation has been borne out by numbers of archaeological studies in the general area. Various studies have demonstrated that the dune areas in close proximity to Lower Main Street and northwestern Waiale Road near the former meanders of Iao Stream contain precontact Hawaiian habitation sites, often with associated human burials. Studies in the more easterly sections of the dune area have indicated that the more isolated and arid interior sand dunes were commonly used for burial, rather than habitation purposes.

<sup>11</sup> This large reservoir was likely constructed in the early 1900s, in conjunction with the development of Spreckels Ditch, which empties into the reservoir.

<sup>12</sup> The author visited this facility many times in my youth with my parents—Walter and Demaris Fredericksen—in search of various World War II surplus items for use on our sail boat, the Xamanek.

<sup>13</sup> Human burials and previously disturbed human remains have been located in portions of the large Pu'uone dune complex, including the essentially adjacent Ka Hale A Ke Ola Homeless Resource Center and Hale Makana O Waiale County of Maui facilities, which are separated from portions of the study area by Site 1508, Spreckels Ditch.

archaeological monitoring would be scheduled for the proposed surface water treatment facility. He felt that this precautionary action was warranted and that monitoring would help ensure that Native Hawaiian burials were not negatively impacted by actions of the proposed project.

## SUMMARY

The proposed Waiale Surface Water Treatment Facility project will impact partly intact portions of the Pu'uone sand dune complex. The study area has been previously subjected to an archaeological assessment survey, which did not encounter any significant material culture remains. The State Historic Preservation Division has previously reviewed and accepted our archaeological assessment survey report. Given that intact sand dune deposits were identified during the survey, the SHPD has recommended that precautionary archaeological monitoring take place. This monitoring plan is currently under review by SHPD. Mr. Leslie Kuloloio, Maui/Lana'i Islands Burial Council member, visited the project area with the author. Mr. Kuloloio was not aware of any traditional uses for the general project area, with the exception of the traditional interment of Native Hawaiian burials. Mr. Kuloloio felt that precautionary archaeological monitoring was justified for this project, given the possibility that unmarked Native Hawaiian burials may be contained in untested portions of the study area.

**Project Photographs (taken on 12 July 2006)**



**Photograph 1: View to the northeast across cemetery; project area at right in trees in background. [Spreckels Ditch, Site 1508, is located behind the hibiscus hedge in the center of photograph.]**



**Photograph 2: View to the southeast across cemetery; project area at center in trees in background. [Maui Community Corrections Center at right]**



**Photograph 3: View to the northeast of County of Maui DWS water tank (visible in center left in trees in background).**

# **APPENDIX F.**

## **Preliminary Drainage Report**

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# DRAINAGE REPORT FOR WAIALE WATER TREATMENT FACILITY WAILUKU, MAUI, HAWAII

Revised January 24, 2008  
December 29, 2005

Prepared for:

Alexander & Baldwin, Inc.



*Austin, Tsutsumi & Associates, Inc.*

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Honolulu • Wailuku, Hawaii

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**DRAINAGE REPORT FOR  
WAIALE WATER TREATMENT FACILITY  
Wailuku, Maui, Hawaii**

Prepared for

**Alexander & Baldwin, Inc.**

Prepared by

**Austin, Tsutsumi & Associates, Inc.**

Civil Engineers • Surveyors  
Honolulu • Wailuku, Hawaii

Revised January 14, 2008  
December 29, 2005

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## **EXHIBITS**

- Exhibit 1      Location Map
- Exhibit 2      Topographic Map
- Exhibit 3      TMK Map
- Exhibit 4      WTF Site Plan
- Exhibit 5      WTF Site Grading Plan
- Exhibit 6      Flood Map
- Exhibit 7      WTF Site Erosion Control Plan

## **APPENDICES**

- A      WTF Site Storm Water Calculations

**DRAINAGE REPORT**  
**FOR**  
**WAIALE WATER TREATMENT FACILITY**  
**Wailuku, Maui, Hawaii**

**I. INTRODUCTION**

The purpose of this report is to evaluate the existing site drainage conditions and to develop a grading and drainage plan for the proposed project.

**II. PROPOSED PROJECT**

**A. Location**

The Waiale Reservoir property is a 76.932-acre parcel (TMK: 3-8-046:020) within which are the Upper Waiale Reservoir (Reservoir 73) and the Lower Waiale Reservoir (Reservoir 74). The Waiale Water Treatment Facility (WTF) will be located on the mauka side of the Upper Waiale Reservoir between this reservoir and the Spreckles Ditch, at an approximate elevation of 224 feet msl. Primary access to the site will be from the Kuikahi Drive Extension within the 3,000 feet long and 12-foot wide gravel roadway. A much shorter access from Waiinu Road through a parcel currently being leased to T.J. Gomes Trucking Company, Inc. (TMK: 3-8-046:031) is being negotiated with the parcel owner.

## **B. Project Description**

### **1. General**

Alexander & Baldwin (A&B) contracted Austin, Tsutsumi & Associates, Inc. (ATA) to design a WTF for production of potable water. Finished water will be conveyed via a 30-inch finished water line approximately 3,000 feet in length, within a widened existing gravel roadway which terminates at a connection to an existing 16-inch waterline within the Kuikahi Drive Extension. The WTF would be located within the property of A&B's Waiale Reservoir.

Grading of approximately the last 800 feet of the existing gravel roadway to the Kuikahi Drive Extension will be completed by others, and is expected to occur before the construction of the 30-inch finished water line. The project involves grading of approximately 3.9 acres of land at the WTF site.

### **2. WTF Site**

The major structures within the 2.5- acre fenced WTF site will be as follows:

- A 220 feet x 90 feet x 29 feet high Treatment Plant Building with interior rooms constructed of concrete masonry units (CMU). All of the microfiltration units, flocculation tanks and most of the major equipment and office/laboratory facility would be within this building. The Treatment Plant Building would be a rigid-frame structure with metal siding.
- A 28 feet x 17 feet x 14 feet high Chlorinator Building, with CMU walls and concrete roof, to house the chlorination system.
- Dual sludge lagoons for gravity solids-liquid separation of backwash water from the microfiltration units.
- A chlorine contact tank and contiguous finished water clearwell.

### **III. EXISTING CONDITIONS**

#### **A. Topography and Soil Conditions**

The U.S. Soil Conservation Service's Soil Survey of the Islands of Kauai, Oahu, Molokai, Maui and Lanai, Soil Survey Map of Maui indicates that the soil classification for the WTF site is PZUE – Puuone sand – 7 to 30 percent slopes and IaA – lao silty clay, 0 to 3 percent slopes.

The Puuone Series consists of somewhat excessively drained soils on low uplands on the island of Maui. These soils developed in material derived from coral and seashells. These soils are used for pasture and home sites. The natural vegetation consists of bermudagrass, kiawe, and lantana.

The lao Series consists of well-drained soils on valley fill and alluvial fans. These soils developed in alluvium derived from basic igneous rock. These soils are used for sugarcane. Small acreages are used for pasture and homesites. The natural vegetation consists of bermudagrass, feather fingergrass, koa haole, lantana, and Natal redtop.

#### **B. Climate**

Records from the nearest precipitation and temperature climatological station – located at the Kahului WSO Air Port 398 – indicate that the average annual rainfall varies between 6 and 23 inches per year. The average annual temperature at the station is approximately 76 degrees Fahrenheit, with the high and low temperatures near 94 degrees and 54 degrees, respectively.

#### **C. Drainage**

The 76.932 acre parcel (TMK 3-8-046:020) is located at the toe of the Wailuku Heights. Mountainous terrain exists to the west of the project area. Generally, the existing topography directs the storm water runoff from the mountains to the west, easterly, into the Waiale Reservoir.

The WTF site is bordered on its north and east sides by the Upper Waiale Reservoir. In general, storm runoff from the site flows from the northern

boundary of the site to the southern boundary where it discharges directly into the Upper Waiale Reservoir. There is no existing drainage system within the project area. Based on hydraulic calculations of the undeveloped site, the existing storm runoff is 4.58 cubic feet per second (cfs), for a 50-year, 1-hour storm.

**D. Flood Zone**

The subject property is located within Zone "C", areas of minimal flooding. No floodway or flood hazard permits will be required.

**E. Topography**

The ground slope at the WTF site is approximately two percent. The WTF will be located on land covered by low-lying trees and brush. North of the WTF is the Spreckles Ditch and to the south is the Upper Waiale Reservoir.

**IV. GRADING AND DRAINAGE**

**A. Grading Plan**

The WTF project encompasses grading work within and around the fenced WTF Site.

**1. WTF Site Grading**

The proposed grading plan for the WTF site will require both cut and fill at various locations around the site to level the existing mounds and low points to the finish grade of approximately 224 feet msl. The majority of the northern end of the site will be filled, while there will be excavations on the southern portion of the site. The maximum fill depth will be approximately 9 feet. The maximum cut and fill slopes will be 2H:1V (horizontal to vertical).

The total graded area will be approximately 3.9 acres. The northern boundary of the WTF site will be graded to allow storm runoff to sheet flow into the Upper Waiale Reservoir. The southern boundary of

the WTF site will also be graded at a 2H:1V (horizontal to vertical) maximum slope.

The dirt road fronting the western boundary of the WTF site will be graded, and a 12-foot wide gravel roadway will be constructed to provide an access road to the WTF. This road will have a maximum cut of 3 feet and have a road slope of about 0.5 percent.

## **B. Erosion Control Plan**

Erosion control measures will be incorporated during the construction period to minimize soil loss and erosion hazards. In addition to the permanent swales, silt fences will be positioned around the boundaries of the graded areas to detain sediment-laden runoff and prevent it from reaching off-site areas. Periodic water spraying of loose soil will be required for dust control. All slopes and swales within the graded areas will be grassed and the exposed areas within the WTF fenced site will be covered with gravel. During construction, temporary vehicle wheel wash areas will be incorporated, using access gravel strips to reduce tracking of on-site soil off-site.

## **C. Drainage Plan**

### **1. WTF Site Drainage**

The WTF is situated in an area where the existing drainage north of the project site flows along the access road adjacent to the western boundary of the WTF and across and out of the southern boundary, discharging into the Upper Waiale Reservoir. A drainage system within the site will be constructed to collect runoff to be discharged into the Upper Waiale Reservoir.

Based on the proposed finish grades, a gentle slope will be constructed along the northern boundary of the WTF site. The concept is to allow storm runoff to sheet flow into the Upper Waiale Reservoir.

The Upper Waiale Reservoir is located directly adjacent to the WTF site with no existing, or potential for future, development between the reservoir and site. All storm water runoff from the WTF site will

continue to be discharged directly into the Upper Waiale Reservoir, including any additional flow due to the development of the WTF site. (See exhibit 5.) Therefore, the Upper Waiale Reservoir will, in essence, serve as the retention basin that would otherwise have to be constructed to retain the additional runoff from the WTF site.

**D. Hydrology**

The Rational Method as described in the "Rules for the Design of Storm Drainage Facilities in the County of Maui" (hereafter referred to as the Storm Water Manual), November 1995, by the County of Maui was used to compute the storm water runoff quantity. Runoff calculations were based on a 50-year, 1-hour storm recurrence interval. The rainfall intensity for a 1-hour, 50-year storm is 2.5 inches.

Factors used in the calculation of the existing WTF Site runoff were as follows:

<b>WTF Site Existing Storm Water Runoff Calculations</b>	
Factors	Values
Runoff Coefficient, C	0.3
I (intensity of 50-year, 1-hour rainfall, inches)	2.5
Time of Concentration, min.	21
I (rainfall intensity, in/hr.)	3.9
Area, acres	3.9
Discharge, cfs	4.58

\*See Appendix A for Calculations

<b>WTF Site Proposed Storm Water Runoff Calculations</b>		
	Factors	Values
Area 1	Runoff Coefficient, C	0.35
	I (intensity of 50-year, 1-hour rainfall, inches)	2.5
	Time of Concentration, min.	6
	I (rainfall intensity, in/hr.)	6.4
	Area, acres	0.24
	Discharge, cfs	0.53
Area 2	Runoff Coefficient, C	0.95
	I (intensity of 50-year, 1-hour rainfall, inches)	2.5
	Time of Concentration, min.	6
	I (rainfall intensity, in/hr.)	6.4
	Area, acres	0.62
	Discharge, cfs	3.75



<b>WTF Site Proposed Storm Water Runoff Calculations</b>		
	<b>Factors</b>	<b>Values</b>
Area 3	Runoff Coefficient, C	0.95
	I (intensity of 50-year, 1-hour rainfall, inches)	2.5
	Time of Concentration, min.	6
	I (rainfall intensity, in/hr.)	6.4
	Area, acres	0.59
	Discharge, cfs	3.56
Area 4	Runoff Coefficient, C	0.95
	I (intensity of 50-year, 1-hour rainfall, inches)	2.5
	Time of Concentration, min.	6
	I (rainfall intensity, in/hr.)	6.4
	Area, acres	0.33
	Discharge, cfs	2.0
Area 5	Runoff Coefficient, C	0.51
	I (intensity of 50-year, 1-hour rainfall, inches)	2.5
	Time of Concentration, min.	18
	I (rainfall intensity, in/hr.)	4.5
	Area, acres	1.86
	Discharge, cfs	4.27

\*See Appendix A for Calculations

In general, the existing and proposed drainage areas should be the same. However, since rainwater entering the proposed sludge lagoon will remain in the lagoon, the surface area of the sludge lagoon (0.29 acre) was not included in the drainage area for the proposed condition.

The storm runoff calculated for the existing on-site condition was approximately 4.58 cubic feet per second (cfs). Projected runoff for the improved site condition was calculated to be 14.11 cfs.

## **V. CONCLUSION**

The proposed grading and drainage design for this project should not produce negative impacts to adjacent and downstream properties owners. This is primarily due to not having any existing, or potential future developments, between the areas to be graded and the existing Upper Waiale Reservoir. Therefore, any additional runoff will flow directly in the reservoir without first traversing through private properties.

Although the result of this project will create an additional storm water discharge of 9.5 cfs, this is only a small percent increase when compared to the total discharge from the Waiale Water shed. All the storm water runoff will be either collected in swales, allowed to sheet flow, or be collected in a drainage system and be piped into the upper reservoir. No negative impacts would exist to any downstream property owners as the areas to be graded for this project are right up against the reservoirs, where the runoff can be held. Therefore, the Waiale Reservoir will, in essence, serve as the retention basin that would otherwise have to be constructed to retain the additional runoff from the graded areas.

Soil loss will be minimized during the construction period by the implementation of appropriate erosion control measures. Dust will also be minimized during construction by the implementation of water sprinkling. Drainage improvements will conform to the County Standards and will be coordinated with the Department of Public Works, County of Maui.

## REFERENCES

1. American Society of Civil Engineers and the Water Environment Federation, Design and Construction of Urban Stormwater Management Systems, 1992.
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4. State of Hawaii, Department of Taxation, Tax Map, 2<sup>nd</sup> Division 3-8-46, First American Real Estate Solutions, 2001.
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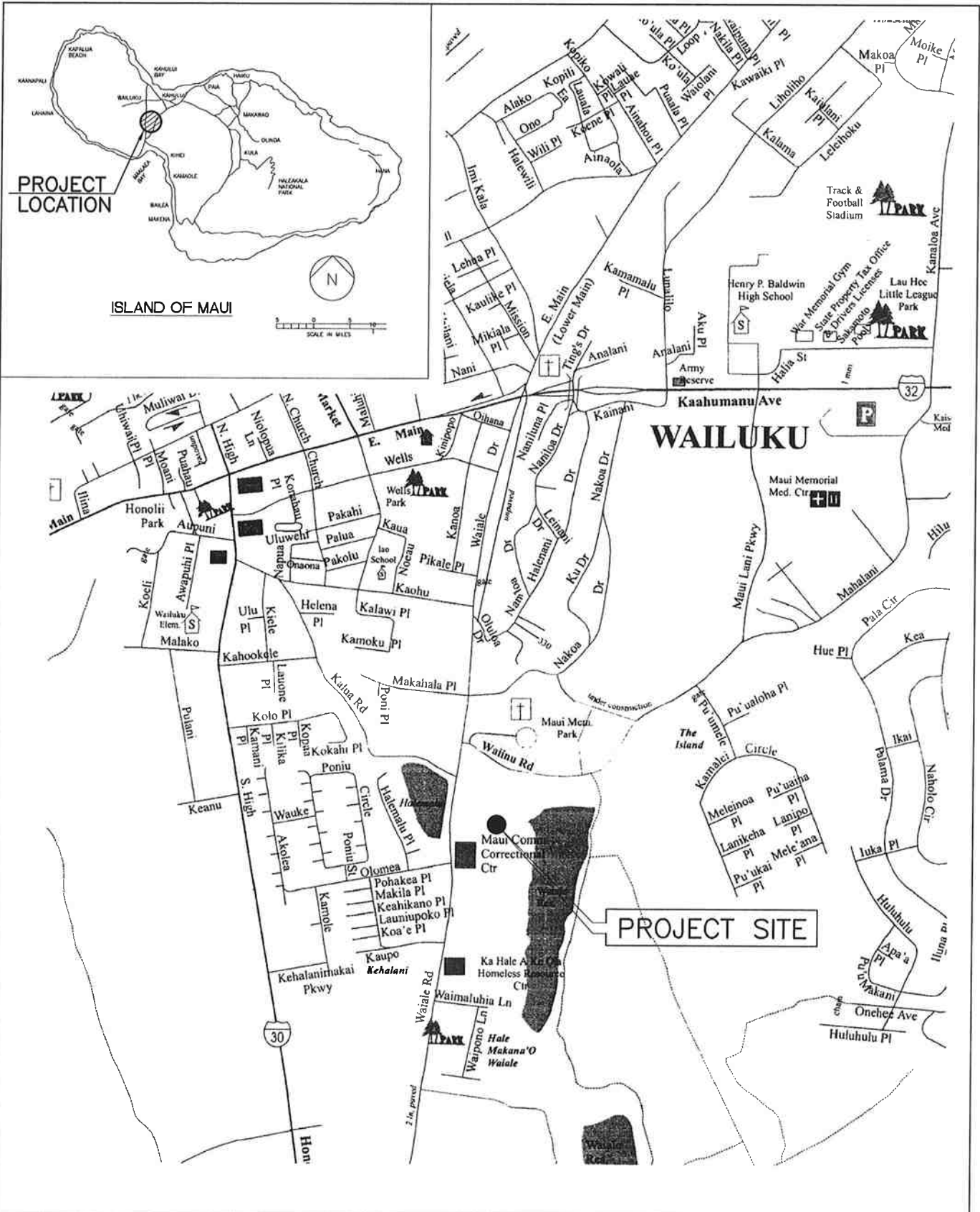
AUSTIN, TSUTSUMI & ASSOCIATES,  
INC.

CIVIL ENGINEERS • SURVEYORS

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# EXHIBITS

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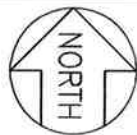
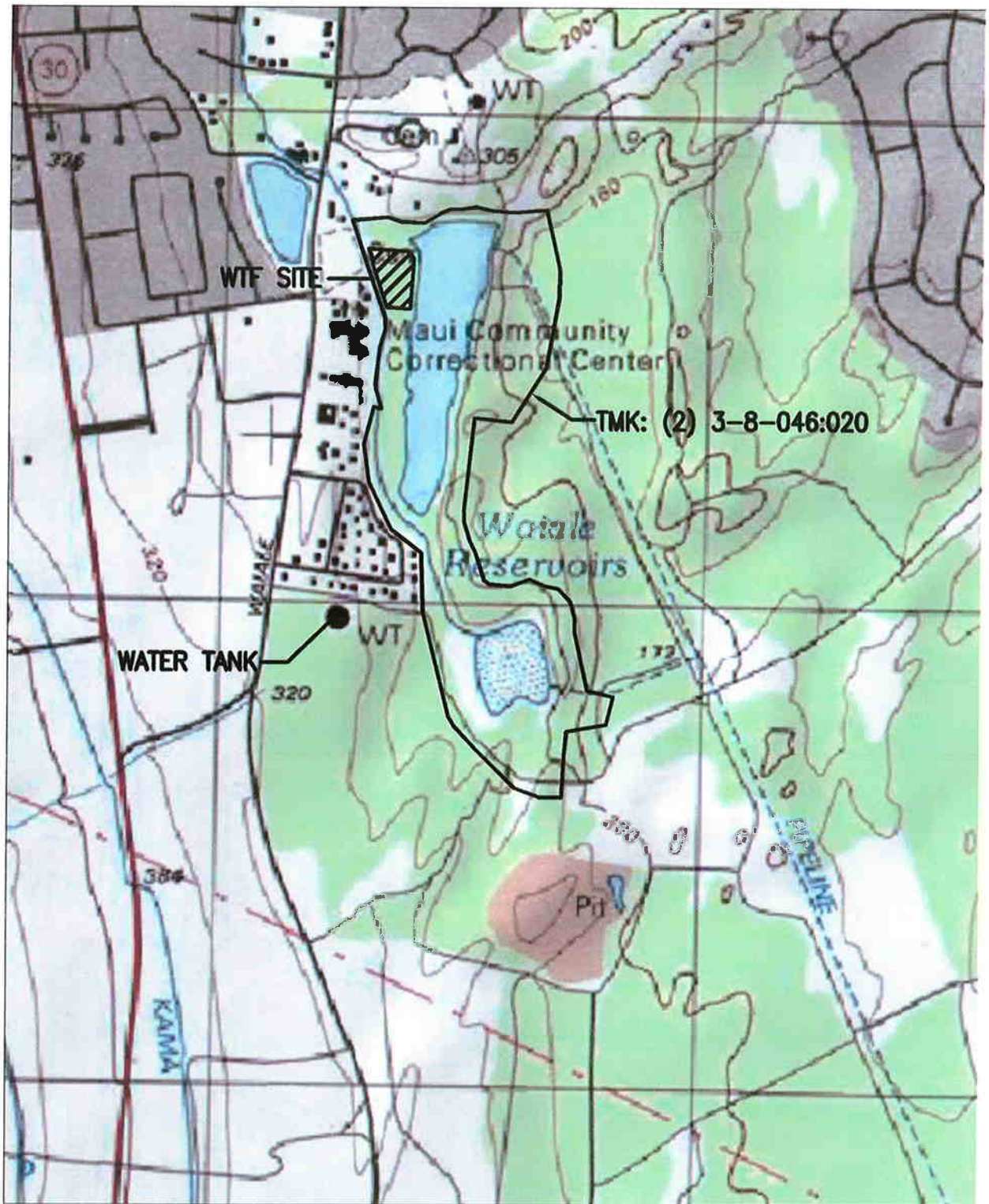
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 DRAINAGE REPORT FOR WAIALE  
 WATER TREATMENT FACILITY  
 WAILUKU, MAUI, HAWAII

**AUSTIN, TSUTSUMI & ASSOCIATES, INC.**  
 ENGINEERS • SURVEYORS HONOLULU • WAILUKU, HAWAII

EXHIBIT

**LOCATION MAP**

**1**



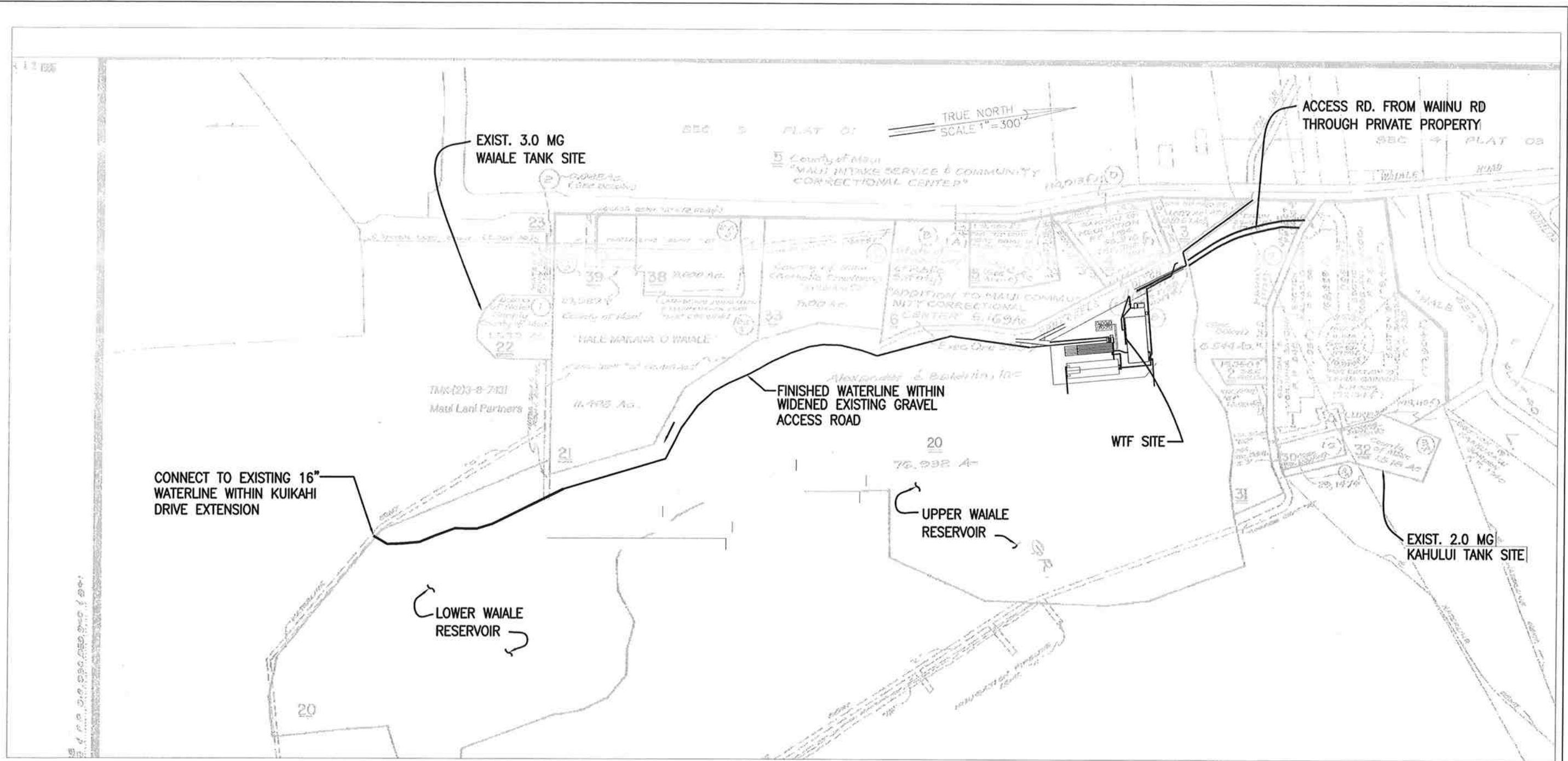
APPROXIMATE SCALE: 1"=1000'

**ALEXANDER AND BALDWIN, INC.**  
**DRAINAGE REPORT FOR WAIALE**  
**WATER TREATMENT FACILITY**  
 WAILUKU, MAUI, HAWAII

**ATA AUSTIN, TSUTSUMI & ASSOCIATES, INC.**  
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**TOPOGRAPHIC MAP**



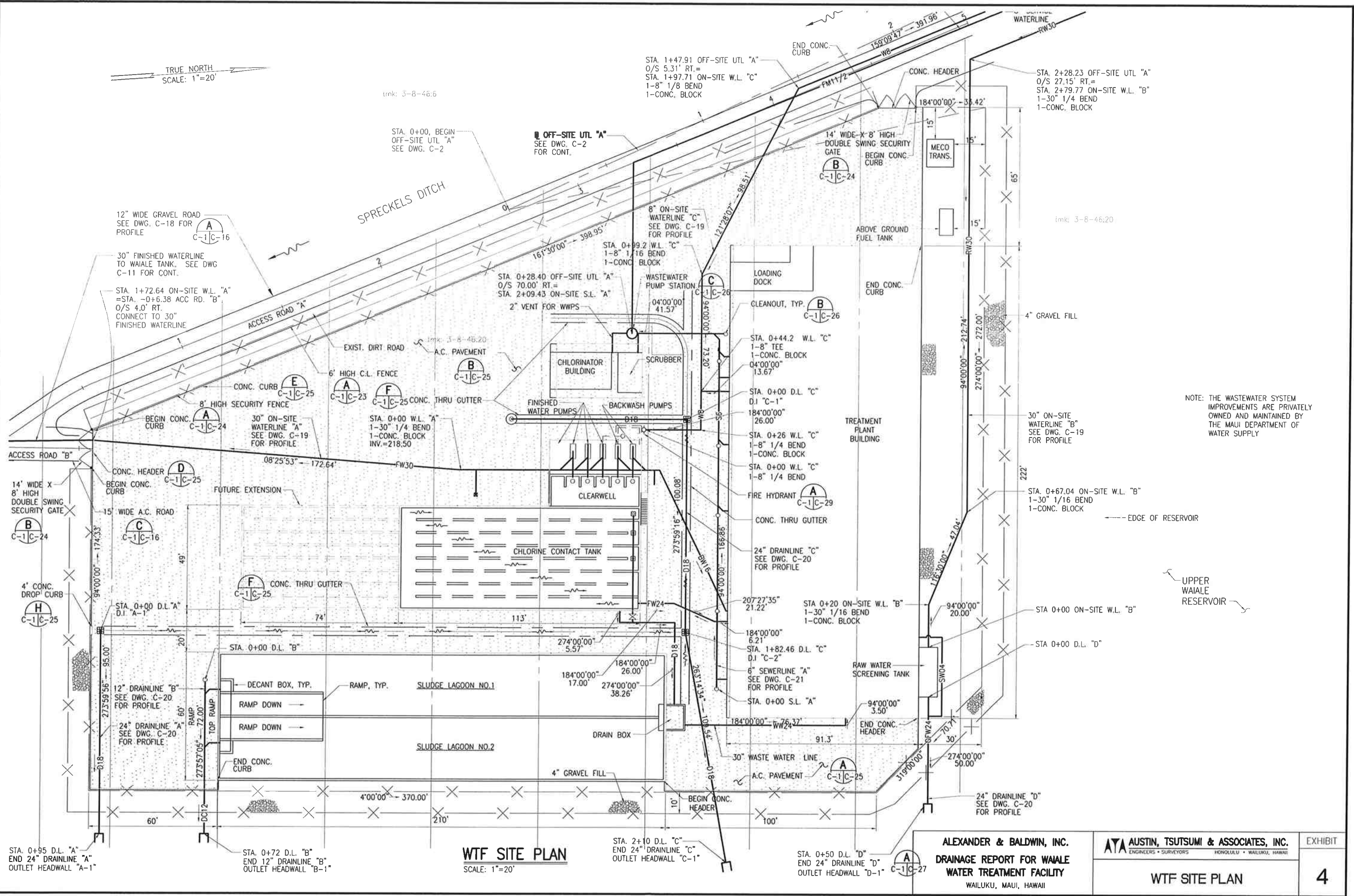


<u>30, 31</u> Maui Memorial Park Inc. - 1/2 Alvin Charlotte Nakamura Trust - 1/2-1/2	<u>34</u> Filipino Assemblies of the First Born Inc.
<u>1</u> Maui Memorial Park, Inc. 981,276 sq	<u>12</u> State of Hawaii
<u>2</u> Maui Electric Co., Ltd.	<u>14</u> State of Hawaii WAILUKU HEALTH CENTER
<u>3</u> Memorial Home Clearing Trust (Hawaii Mortuaries, Ltd.) Co.	<u>19</u> County of Maui
<u>4</u> Maui Memorial Park, Inc.	<u>23</u> County of Maui
<u>29</u> County of Maui (Pan Pacific Medical Development, Inc.) Co.	<u>24</u> County of Maui

TMK: (2) 3-8-46	
ALEXANDER & BALDWIN, INC. DRAINAGE REPORT FOR WAIALE WATER TREATMENT FACILITY WAILUKU, MAUI, HAWAII	<b>ATA</b> AUSTIN, TSUTSUMI & ASSOCIATES, INC. <small>ENGINEERS • SURVEYORS HONOLULU • WAILUKU, HAWAII</small>
TMK MAP	EXHIBIT <b>3</b>

TRUE NORTH  
SCALE: 1"=20'

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**WTF SITE PLAN**  
SCALE: 1"=20'

**ALEXANDER & BALDWIN, INC.**  
DRAINAGE REPORT FOR WAIALE  
WATER TREATMENT FACILITY  
WAILUKU, MAUI, HAWAII

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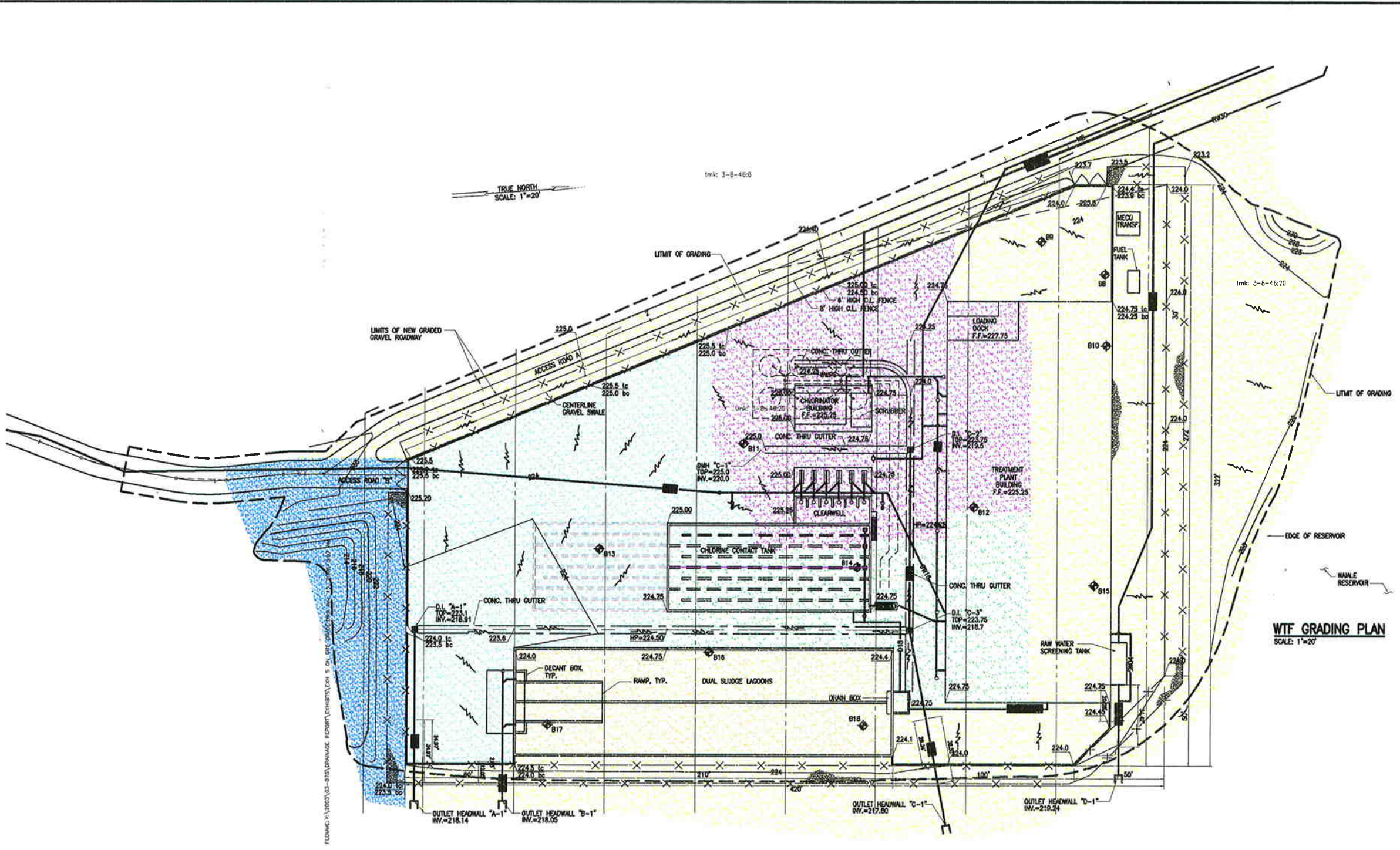
WTF SITE PLAN

EXHIBIT

4

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WTF GRADING PLAN  
SCALE: 1"=20'

LEGEND

	AREA 1		AREA 5
	AREA 2		AREA 6
	AREA 3	377.0'	FINISH GRADE
	AREA 4	× 377.0	EXISTING GRADE

ON-SITE GRADING PLAN  
SCALE: 1" = 60'

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DRAINAGE REPORT FOR WAIALE  
WATER TREATMENT FACILITY  
WAILUKU, MAUI, HAWAII

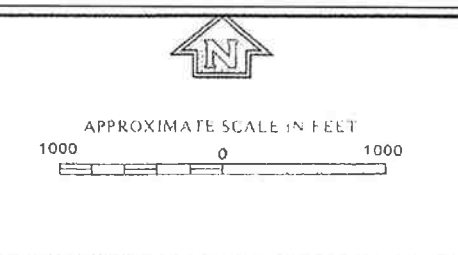
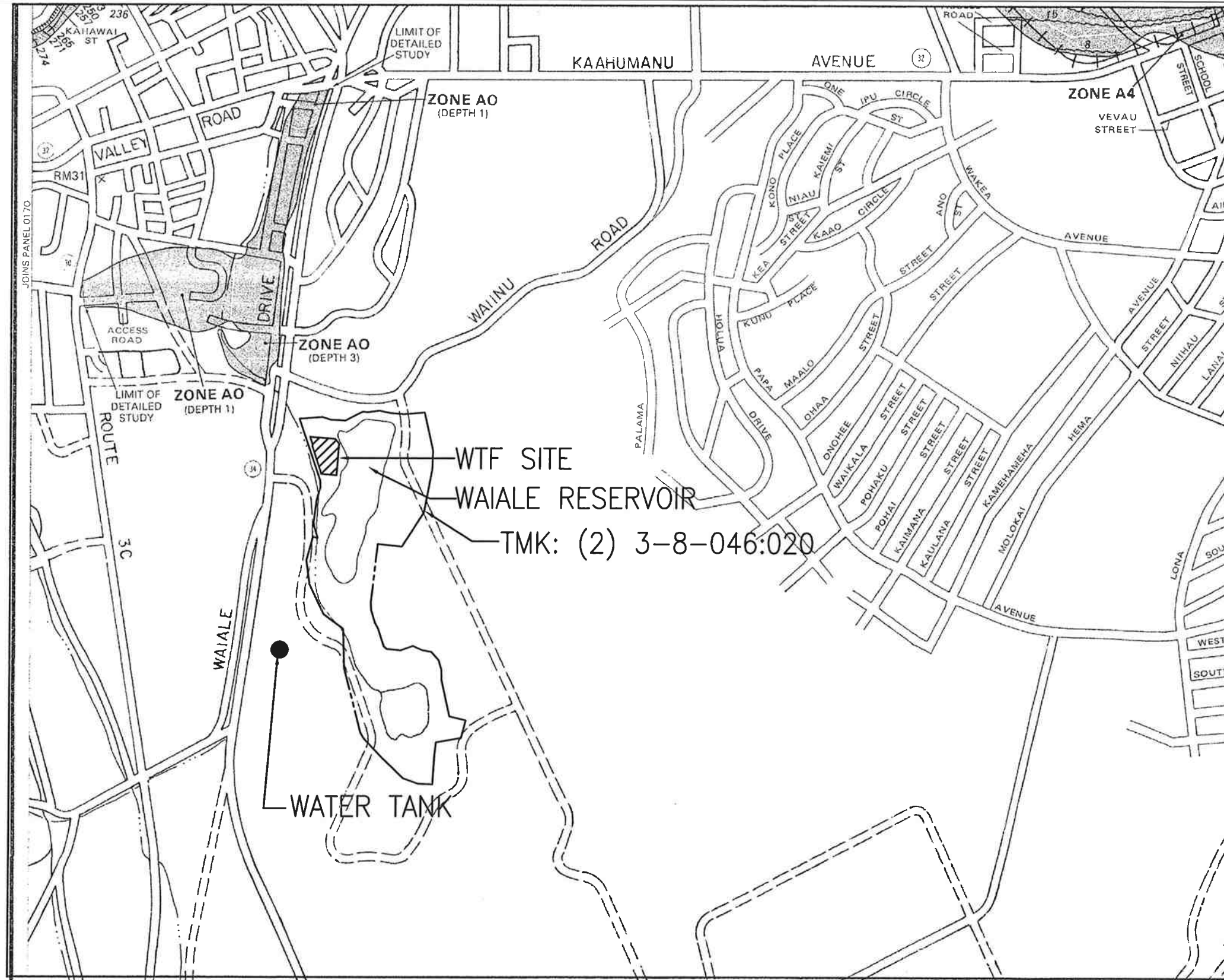
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WTF SITE GRADING PLAN

EXHIBIT  
**5**

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NATIONAL FLOOD INSURANCE PROGRAM

**FIRM**  
FLOOD INSURANCE RATE MAP

MAUI COUNTY, HAWAII

PANEL 190 OF 400  
(SEE MAP INDEX FOR PANELS NOT PRINTED)

COMMUNITY-PANEL NUMBER  
150003 0190 D

MAP REVISED:  
MARCH 16, 1995



Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at [www.msc.fema.gov](http://www.msc.fema.gov)

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FLOOD MAP

EXHIBIT

6

**EROSION CONTROL MEASURES**

**MINIMUM BEST MANAGEMENT PRACTICES**

**DRAINAGE.** HANDLE TO CONTROL EROSION, PREVENT DAMAGE TO DOWNSTREAM PROPERTIES AND RETURN TO THE NATURAL DRAINAGE COURSE IN A MANNER WHICH MINIMIZES SEDIMENTATION OR OTHER POLLUTION TO THE MAXIMUM EXTENT PRACTICABLE.

**DUST CONTROL.** CONTROL DUST EMISSIONS TO THE MAXIMUM EXTENT PRACTICABLE THROUGH BMP'S SUCH AS WATER SPRINKLING, DUST FENCES, LIMITING AREA OF DISTURBANCE AND TIMELY GRASSING OF FINISHED AREAS.

**VEGETATION.** RETAIN NATURAL VEGETATION, SPECIALLY GRASSES, WHEREVER FEASIBLE. AVOID STORAGE OR GRUBBED MATERIAL NEAR WATERCOURSES.

**EROSION CONTROL.** STABILIZE ALL DISTURBED AREAS WITH EROSION CONTROL MEASURES SUCH AS VEGETATION, RUNOFF DIVERSION, CHECK DAMS, MULCHING, BLANKETS, BONDED FIBER MATRICES, AND VEHICLE WHEEL WASH FACILITIES.

**SEDIMENT CONTROL.** CAPTURE SEDIMENT TRANSPORTED IN RUNOFF TO MINIMIZE THE SEDIMENT FROM LEAVING THE SITE WITH METHODS SUCH AS SEDIMENT BASIN, SEDIMENT TRAPS, SILT FENCES, SAND BAGS, AND VEGETATED FILTER STRIPS.

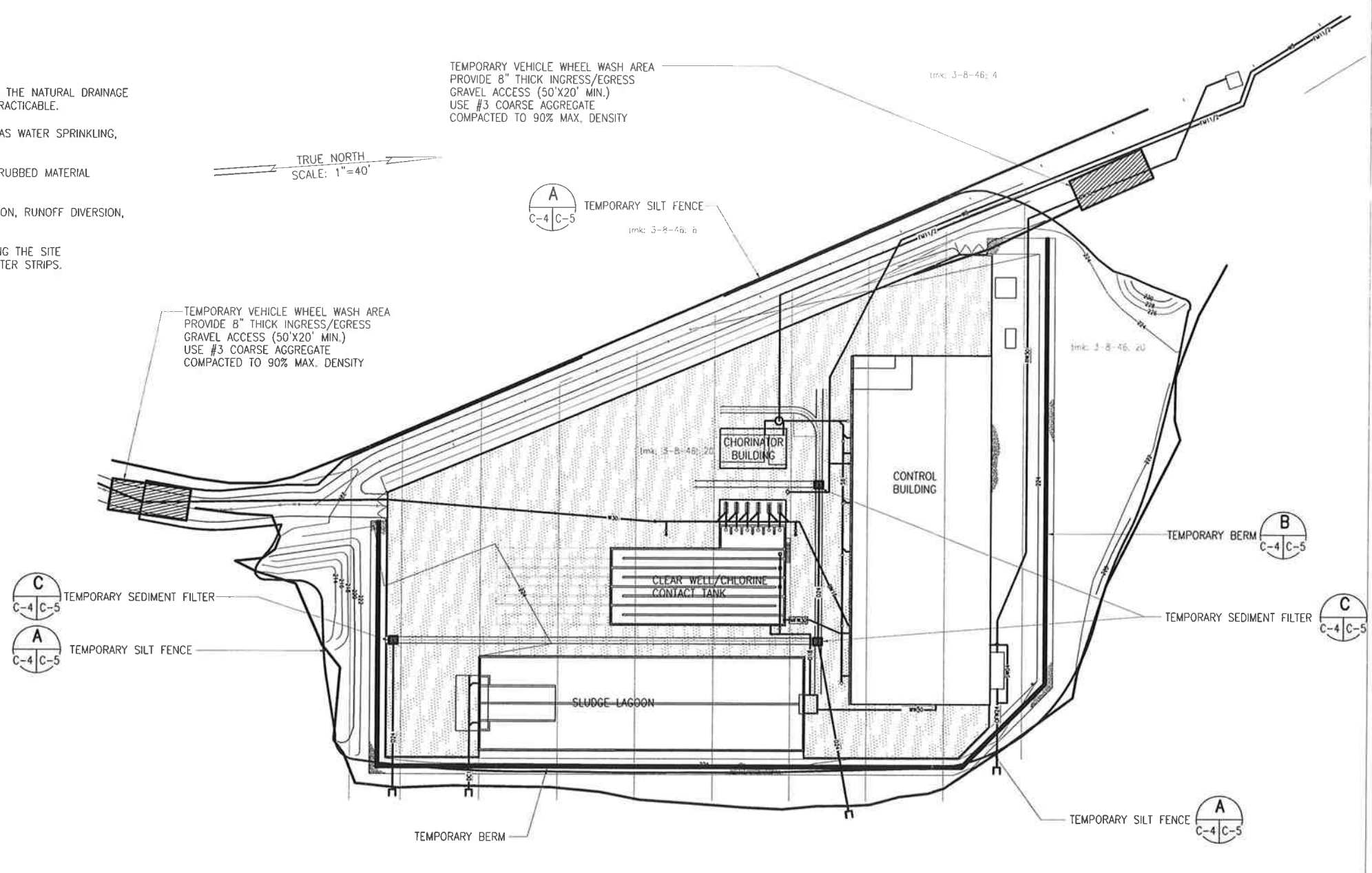
**MATERIAL AND WASTE MANAGEMENT.** PROPERLY STORE TOXIC MATERIAL AND PREVENT THE DISCHARGE OF POLLUTANTS ASSOCIATED WITH CONSTRUCTION MATERIALS.

**TIMING OF CONTROL MEASURE IMPLEMENTATION.** TIMING OF CONTROL MEASURES SHALL BE IN ACCORDANCE WITH THE APPROVED EROSION CONTROL PLAN. DISTURBED AREAS OF CONSTRUCTION SITES THAT WILL NOT BE REDISTURBED FOR TWENTY-ONE DAYS OF MORE WILL BE STABILIZED (GRASSED OR GRAVELED) BY NO LATER THAN THE FOURTEENTH DAY AFTER THE LAST DISTURBANCE.

**MATTING.** INSTALL EROSION CONTROL MATTING FOR ALL SLOPES GREATER THAN 3H:1V.

**ADDITIONAL BEST MANAGEMENT PRACTICES (BMP'S):**

1. GRAVEL CONSTRUCTION ENTRANCE FOR EACH INGRESS AND EGRESS.
2. PERIMETER RUNOFF CONTROL.
3. MEASURES TO CONTROL EROSION AND OTHER POLLUTANTS SHALL BE IN PLACE BEFORE ANY EARTH MOVING PHASE OF THE GRADING IS INITIATED.
4. CONTRACTOR SHALL CONSTRUCT PROCESS WATER BASIN TO HAVE PROCESS WATER SUCH AS CHLORINATED WATER, HYDROSTATIC TESTING WATER, WASHWATER AFTER CLEANING CONCRETE TRUCKS, ETC. BE CONTAINED WITHIN THE BASIN AND PERCOLATE INTO THE SOIL.
5. CONTRACTOR AND/OR OWNER SHALL COMPLY WITH CHAPTER 11-55, WATER POLLUTION CONTROL, HAWAII ADMINISTRATION RULES, DEPT. OF HEALTH WHICH REQUIRES AN NPDES PERMIT FOR CERTAIN CONSTRUCTION ACTIVITY.
6. CONTRACTOR SHALL OBTAIN APPROVAL OF A GRADING PHASING PLAN BY THE DEPARTMENT OF PUBLIC WORKS & ENVIRONMENTAL MANAGEMENT PRIOR TO CONSTRUCTION.



**WTF EROSION CONTROL PLAN**  
SCALE 1"=80'

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<b>ALEXANDER &amp; BALDWIN, INC.</b> DRAINAGE REPORT FOR WAIALE WATER TREATMENT FACILITY WAILUKU, MAUI, HAWAII	<b>ATA AUSTIN, TSUTSUMI &amp; ASSOCIATES, INC.</b> ENGINEERS • SURVEYORS HONOLULU • WAILUKU, HAWAII	EXHIBIT
	<b>WTF SITE EROSION CONTROL PLAN</b>	7



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# APPENDICES

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## **APPENDIX A**

### **WTF SITE STORM WATER CALCULATIONS**

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## WTF SITE HYDROLOGY

Graded Area (A) = 3.9 acres (less than 100 acres, Rational Method)

Recurrence Interval (T) = 50 Year-1 Hour-Rainfall

50 Year-1 Hour-Rainfall – 2.5 in.

Runoff Coefficient

Existing Condition – Unimproved areas

C (Existing, on-Site) = 0.30

Proposed Condition – Built-up area

Total Area = 3.9 acres (less 0.29 acres of sludge lagoon)

Area 1 (dark blue) = 0.24 acres

Heavy Soil/Steep – C = 0.35

Area 2 (light blue) = 0.62 acres

Roof/Pavement (100% of total area) – C = 0.95

Area 3 (purple) = 0.59 acres

Pavement/Roof (100% of total area) – C = 0.95

Area 4 (green) = 0.33 acres

Pavement/Roof (100% of total area) – C = 0.95

Area 5 (yellow) = 1.86 acres

Heavy Soil/Steep (70% of total area) – C = 0.35

Gravel (18% of total area) – C = 0.85

Pavement/Roof (12% of total area) – C = 0.95

$$\text{Weighted C for Area 5} = 0.7 (0.35) + 0.18 (0.85) + 0.12(0.95) \\ = 0.51$$

Area 6 (orange) = 0.29 acres (Not a drainage area, Sludge Lagoon)

Length of Longest Travel Time / Time of Concentration (Tc) / Intensity (i) /  $Q=C \times I \times A$

Existing:

725-feet                      Average Slope = 1.7%

Tc = 21 min.                      I = 3.9 in/hr

$Q = C \times I \times A$

$$Q = (0.3)(3.9)(3.9) = 4.58 \text{ cfs}$$

Proposed:

Area 1

90-feet                      Average Slope = 12%

Tc = 6 min.                      I = 6.4 in/hr

$Q = C \times I \times A$

$$Q = (0.35)(6.4)(0.24) = 0.53 \text{ cfs}$$

Area 2

230-feet                      Average Slope = 0.8 %

Tc = 6.0 min.                      I = 6.4 in/hr

$Q = C \times I \times A$

$$Q = (0.95)(6.4)(0.62) = 3.75 \text{ cfs}$$

Area 3

120-feet                      Average Slope = 0.4%

$$T_c = 6 \text{ min.} \quad I = 6.4 \text{ in/hr}$$

$$Q = C \times I \times A$$

$$Q = (0.95)(6.4)(0.59) = 3.56 \text{ cfs}$$

#### Area 4

$$135\text{-feet} \quad \text{Average Slope} = 0.56\%$$

$$T_c = 6 \text{ min.} \quad I = 6.4 \text{ in/hr}$$

$$Q = C \times I \times A$$

$$Q = (0.95)(6.4)(0.33) = 2.0 \text{ cfs}$$

#### Area 5

$$700\text{-feet} \quad \text{Average Slope} = 0.4\%$$

$$T_c = 18 \text{ min.} \quad I = 4.5 \text{ in/hr}$$

$$Q = C \times I \times A$$

$$Q = (0.51)(4.5)(1.86) = 4.27 \text{ cfs}$$

$$Q(\text{Proposed}) = Q(\text{Area 1}) + Q(\text{Area 2}) + Q(\text{Area 3}) + Q(\text{Area 4}) + Q(\text{Area 5}) + Q(\text{Area 6})$$

$$= 0.53 + 3.75 + 3.56 + 2.0 + 4.27$$

$$= 14.11 \text{ cfs}$$