

DEPARTMENT OF WATER SUPPLY • COUNTY OF HAWAII

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February 3, 2006

Ms. Genevieve Salmonson, Director  
State of Hawai'i  
Office of Environmental Quality Control  
235 South Beretania Street, Suite 702  
Honolulu, HI 96813

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OFFICE OF ENVIRONMENTAL  
QUALITY CONTROL

**FINAL ENVIRONMENTAL ASSESSMENT/FINDING OF  
NO SIGNIFICANT IMPACT (FONSI)  
AHUALOA PRODUCTION WELL AND RESERVOIR  
HAMAKUA, COUNTY OF HAWAII  
TAX MAP KEY 4-6-011:042**

The County of Hawai'i, Department of Water Supply, has reviewed the comments received on its Ahualoa Production Well and Reservoir project during the 30-day public comment period, which began on December 23, 2005. The agency has determined that this project will not have significant environmental effects and has issued a FONSI. Please publish this notice in the February 23, 2006, edition of the OEQC *Environmental Notice*.

We have enclosed a completed OEQC Publication Form, four copies of the final EA, and the project summary on compact disk. Please call the project consultants Mr. Charles Morgan or Ms. Melissa White at (808) 550-4483 if you have any questions.

Sincerely yours,

Milton D. Pavao, P.E.  
Manager

FM:sco

Enc. - Draft EA (4 copies)  
OEQC Publication Form  
Electronic Version of Project Summary on Disk

... *Water brings progress...*

2006-02-23-HA-FEA AHUALOA PRODUCTION WELL &  
RESERVOIR

FEB 23 2006

*Final Environmental Assessment  
& Finding of No Significant Impact*

**ĀHUALOA PRODUCTION WELL &  
RESERVOIR**

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PREPARED FOR:  
**Department of Water Supply  
County of Hawai'i**

PREPARED BY:  
 **PLANNING  
SOLUTIONS**

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**FEBRUARY 2006**

## PROJECT SUMMARY

<b>Project:</b>	<b>Āhualoa Production Well &amp; Reservoir</b>
<b>Applicant/Approving Agency</b>	Department of Water Supply (DWS), County of Hawai'i Contact: Milton Pavao (808-961-8050) 345 Kekūanaō'a Street., Suite 20, Hilo, HI 96720
<b>Location</b>	Hāmākua District; Island of Hawai'i
<b>Tax Map Key</b>	4-6-11:042
<b>Parcel Area</b>	18.044 acres
<b>Project Site Area</b>	Approximately 1.59 acres
<b>State Land Use District</b>	Agriculture
<b>County Zoning</b>	Agriculture, minimum 40-acre building site area (Ag-40a)
<b>Proposed Action</b>	DWS proposes to drill, test, and, if successful complete a new municipal water supply well on a site approximately 4 miles <i>mauka</i> of the community of Honoka'a. A single-story, 877 square-foot control building is planned to house the motor control center, chlorination system, toilet-pump room, and other electrical equipment needed to start and stop the well pump. Water would be stored in a new 1.0 MG reinforced concrete storage tank. Water from the well would replace the present surface water source (Kohākōhau Stream) serving the Āhualoa/Hāmākua water area and would supplement the potable water supply for the Honoka'a area.
<b>Actions Requiring Assessment</b>	Proposed use of County land and Federal funds.
<b>Consultation</b>	County of Hawai'i Planning Department
<b>Required Permits and Approvals</b>	<ul style="list-style-type: none"> <li>• Plan Approval, Hawai'i County Planning Department</li> <li>• NPDES Construction Permit, State Dept. of Health</li> <li>• Building Permit, Hawai'i County</li> <li>• Pump Installation Permit, State Commission on Water Resource Management</li> <li>• Certification of Well for Drinking Water Use, State Department of Health</li> </ul>
<b>Determination</b>	Finding of No Significant Impact
<b>Consultant</b>	Planning Solutions, Inc. 210 Ward Avenue, Suite 330, Honolulu, HI 96814 Contact: Perry White (808)-550-4483

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## 1.0 NEED FOR THE PROPOSED ACTION

### 1.1 INTRODUCTION

The Hawai'i County Department of Water Supply (DWS) is responsible for the development, operation, and maintenance of the municipal water systems throughout the Island of Hawai'i. The DWS maintains 23 water systems on the island, which primarily draw potable water from drilled well and spring sources. Under recently implemented Federal and State regulations, potable water from surface water sources (e.g., streams, lakes, etc.) is subject to more stringent water treatment requirements than ever before.<sup>1</sup> Such sources now require enhanced treatment measures under the Surface Water Treatment Rule (SWTR), which can be expensive and labor intensive to install and maintain, and hence can drive up the cost of potable water for DWS customers. Consequently, the County of Hawai'i has made it their policy to promote shifts to purely groundwater sources for DWS' potable water systems (County of Hawai'i 2001).

The proposed action analyzed in this Environmental Assessment (EA) is the exploration for and construction of a new well, construction of a 1.0 million gallon (MG) storage reservoir, and associated control and monitoring equipment. The project is located in Hawai'i's Hāmākua District, approximately 4 miles west of the community of Honoka'a (see Figure 1-1). The new well's intended function is twofold: 1) to replace Kohākōhau Stream, a surface water source, as the primary potable water source for the Āhualoa/Hāmākua area (see Figure 1-2); and 2) to supplement and provide a backup potable water source for the Honoka'a system, which is currently served by the Haina Well. This will help to reduce the dependency on surface water sources that are subject to the SWTR and will increase the availability of clean, affordable drinking water for DWS customers in these two service areas.

#### 1.1.1 OBJECTIVES OF THE PROPOSED ACTION

DWS' overall goals for the proposed project include the following:

- Reduce the dependency on potable water sources which will be subject to the enhanced treatment requirements mandated by the SWTR by exploring for and developing a well in an area with known groundwater resources.
- Continue to provide DWS customers in the Āhualoa/Hāmākua and Honoka'a areas with an adequate supply of affordable potable water to support current and future projected water use.
- Continue to comply with all applicable County, State and Federal regulations regarding safe drinking water and treatment in the most cost-effective way possible.

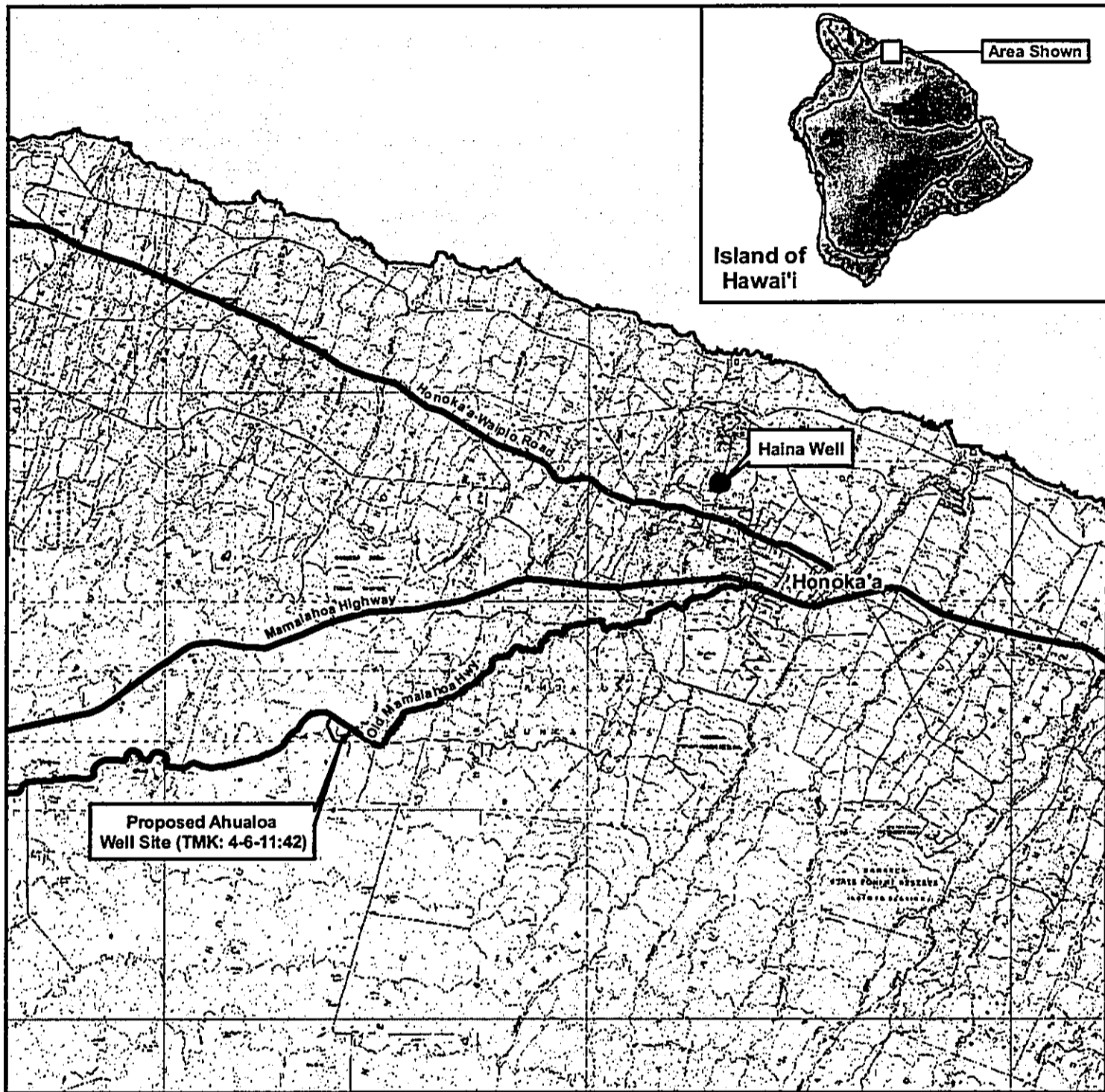
#### 1.1.2 ORGANIZATION OF THE ENVIRONMENTAL ASSESSMENT

This EA is divided into the following parts:

- The remainder of Chapter 1 describes the need for the proposed well. It explains how the evaluation of the existing potable water system in the region has prompted DWS to develop an additional well source to serve its Āhualoa/Hāmākua and Honoka'a customers.
- Chapter 2 outlines the alternatives analyzed in this EA, as well as several other alternatives that DWS considered and rejected during earlier planning phases.
- Chapter 3 describes the proposed action of constructing and operating the well in detail, providing specifications for its location, design, phasing, and operation.


<sup>1</sup> *Federal Register*, Volume 67, page 1812; January 14, 2002; *Federal Register*, Volume 68, No. 154, page 47640; August 11, 2003.





Prepared For:  
 Dept. of Water Supply  
 County of Hawai'i

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Prepared By:  

**PLANNING  
 SOLUTIONS**

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Sources:  
 -TNWRE, Inc.  
 -USGS 7.5' Topo, Kukuihaele  
 Honoka'a  
 -State of Hawai'i GIS

Legend:

0 1 2  
 Miles




Figure 1-1:

**Location Map**

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Āhualoa Production Well  
 & Reservoir Project

Figure 1-1: Location Map 2005-10-04.mxd

- Chapter 4 describes the existing environment and analyzes the potential for impacts on environmental, cultural, and socioeconomic resources caused by the proposed project and alternatives. It also outlines strategies for minimizing and mitigating unavoidable adverse effects.
- Chapter 5 discusses the consistency of the proposed well with relevant plans, policies, and controls at local, regional, State, and Federal levels.
- Chapter 6 provides justification for DWS' issuance of a Finding of No Significant Impact (FONSI) by considering each individual significance criterion with respect to the proposed well.
- Chapters 7 and 8 list the parties consulted and the references cited during preparation of this EA.

## 1.2 NEED FOR AN ADDITIONAL WELL

### 1.2.1 LIMITATIONS OF EXISTING POTABLE WATER SYSTEMS

The proposed well would benefit two of DWS's existing service areas: the Āhualoa/Hāmākua area, located in the *mauka* area between Honoka'a town and Waimea, and the Honoka'a town area. The limitations of the existing potable water systems that make the proposed well necessary are described in the following sections.

#### 1.2.1.1 Āhualoa/Hāmākua System

As noted above, the Āhualoa/Hāmākua area's water comes primarily from Kohākōhau Stream, located in Waimea town (see Figure 1-2). The stream is a surface water source and is therefore subject to stringent and costly treatment requirements (see Section 1.2.3). The stream is currently the main potable water source for Waimea town as well. Water from the stream is treated and fed via gravity through an 8-inch water line from Waimea to the Āhualoa/Hāmākua area, a distance of approximately five miles. The existing treatment system for the stream source is compliant with current regulations. However, the treatment plant has limited capacity and would require a costly upgrade in the near future in order to continue serving both Waimea and the Āhualoa/Hāmākua area. Rather than invest in upgrading the treatment plant, DWS wants to reduce and eventually eliminate dependencies on the stream source by switching to groundwater wells in both Waimea town and Āhualoa/Hāmākua. The Āhualoa/Hāmākua area is also connected to the Honoka'a area via existing water lines (see Figure 1-3), and water is occasionally pumped up to it from the Haina well in Honoka'a town. However, because of the energy required to lift water to these higher-elevation areas, this is only done in rare circumstances.

#### 1.2.1.2 Honoka'a System

The Haina well is the primary water source serving DWS's Honoka'a service area, and its pump has a maximum capacity of 400 gpm (gallons per minute). Currently, the Haina well pumps 0.413 MGD (million gallons per day) on an average day, which represents 72% of the well's maximum pumping capacity. On a maximum water-use day (i.e., 1.5 times the use of an average day), the well pumps 0.576 MGD, or 100% of its capacity. DWS personnel have observed with increasing frequency instances when the well is operating for at least 24 hours at a time at average daily usage rates. According to DWS, well pumps are designed to operate for 16 hours a day at average usage rates. Therefore, they are concerned that the Haina well pump is being overworked. This increases the possibility of well pump failure, which would severely compromise the water supply for the Honoka'a system. There is currently no backup source for this system other than the Kohākōhau Stream surface water source in Waimea (see above) and the small, existing treatment plant could not produce enough water to sustain the demands of its existing service area in addition to the demands of Honoka'a town for long.

The State, with the assistance of DWS, is proposing to add a new well to the area (the Honoka'a Well, shown on Figure 1-3) by 2006. This will relieve the pressure on the Haina Well to some extent. However, the pump tests of the new well revealed it to have less capacity than the Haina Well (375

gpm at most). Thus, it does not qualify as an adequate backup source according to County regulations.<sup>2</sup> The proposed Āhualoa well will be designed at a capacity of 775 gpm, which is the combined capacity of the Haina and Honoka'a wells. It would therefore qualify as a backup source for both wells, while also relieving pressure on them by allowing to them operate at well under their maximum capacities.

## 1.2.2 CURRENT AND PROJECTED POTABLE WATER CONSUMPTION

DWS also analyzed the current and anticipated demand for potable water in determining the need for a new well source. Water use in the two service areas is described below.

### 1.2.2.1 Āhualoa/Hāmākua System

Current potable water usage in the Āhualoa/Hāmākua area is approximately 0.25 million gallons per day. Residents of the Department of Hawaiian Homelands' Āhualoa Homesteads comprise the majority of the system's water users. Some growth is anticipated to occur in this area. However, water use is expected to remain well below 1.0 MGD, so the new well will be adequate to serve this system's needs. The new well will primarily benefit this system by replacing its current surface water source with high quality, affordable groundwater.

### 1.2.2.2 Honoka'a Area

As noted above, current water usage in the Honoka'a area ranges from 0.413 to 0.576 MGD, the latter representing the maximum capacity of the Haina well. Thus, Honoka'a's potable water system is already being overworked in order to meet current demand. DWS estimates the system's potable water demand could increase to approximately 1.0 MGD in the next 10-20 years as the area's population increases.

The combined capacities of the existing Haina Well and the State's Honoka'a well slated for operation in 2006 is 0.744 MGD.<sup>3</sup> DWS Standards require that the largest capacity well in a system be considered a standby source only. This provides a safeguard in case one well fails. Neither the Haina well nor the proposed Honoka'a well have the capacity to meet current system demands, and as the area grows the situation will worsen. The proposed Āhualoa well is expected to have a maximum capacity of 1.116 MGD (or 0.744 MGD if operated for 16 hours per day). Thus, the three well sources together should provide adequate potable water supply for the Honoka'a system well into the future without overworking the pumps.

## 1.2.3 COMPLIANCE WITH FEDERAL AND STATE DRINKING WATER STANDARDS

The Federal Safe Drinking Water Act (42 U.S.C. § 300h-3(e)) requires that all public water systems meet stringent water quality standards. These standards cover a long list of potential chemical, radiological and biological contaminants. The standards distinguish between surface water and groundwater sources, with the testing and monitoring requirements for surface water sources being far greater than those for groundwater sources.

Kohākōhau Stream is a surface water source, which means water from the stream must meet the enhanced treatment requirements of the Surface Water Treatment Rule (SWTR). As noted above, the existing treatment system for the stream source is compliant with these standards. However, the treatment plant's capacity is limited, and upgrading it would be very costly. Thus, DWS plans to reduce and eventually eliminate the use of surface water sources such as Kohākōhau Stream for potable water. Construction of the proposed well is consistent with this goal.

<sup>2</sup> Water System Standards 2002, Division 100 Planning, Section 111 – Water Requirements, Subsection 111.08 Total Pumping Capacity.

<sup>3</sup> This assumes that both well pumps are operated for 16 hours a day, the average number of operating hours per day that they are designed to withstand. They would produce 1.116 MGD if operated at maximum capacity 24 hours per day.

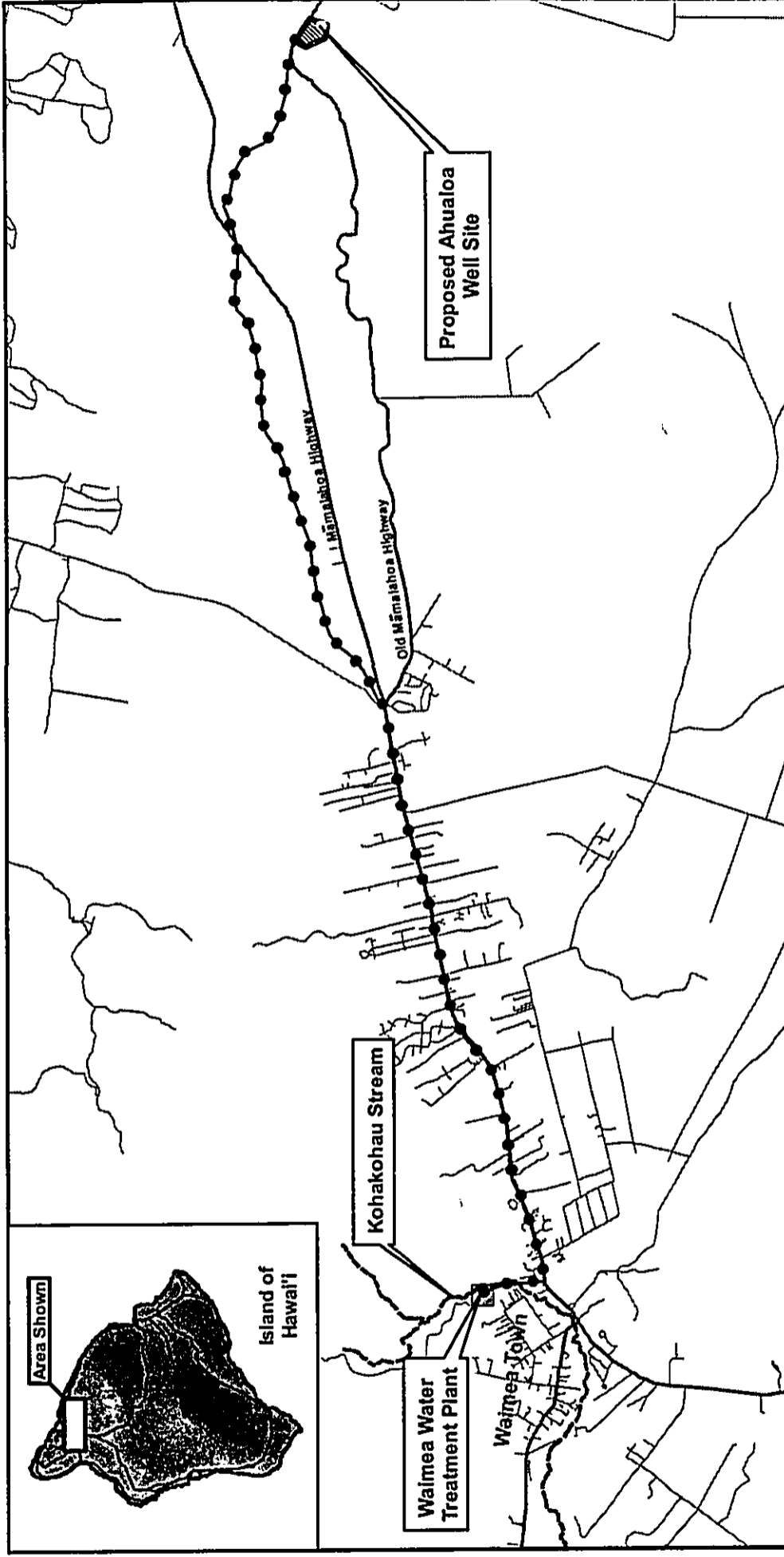



Figure 1-2:  
**Existing Potable  
 Water System  
 Serving  
 Āhualoa-Hāmākua**  
 Āhualoa Production Well  
 & Reservoir Project

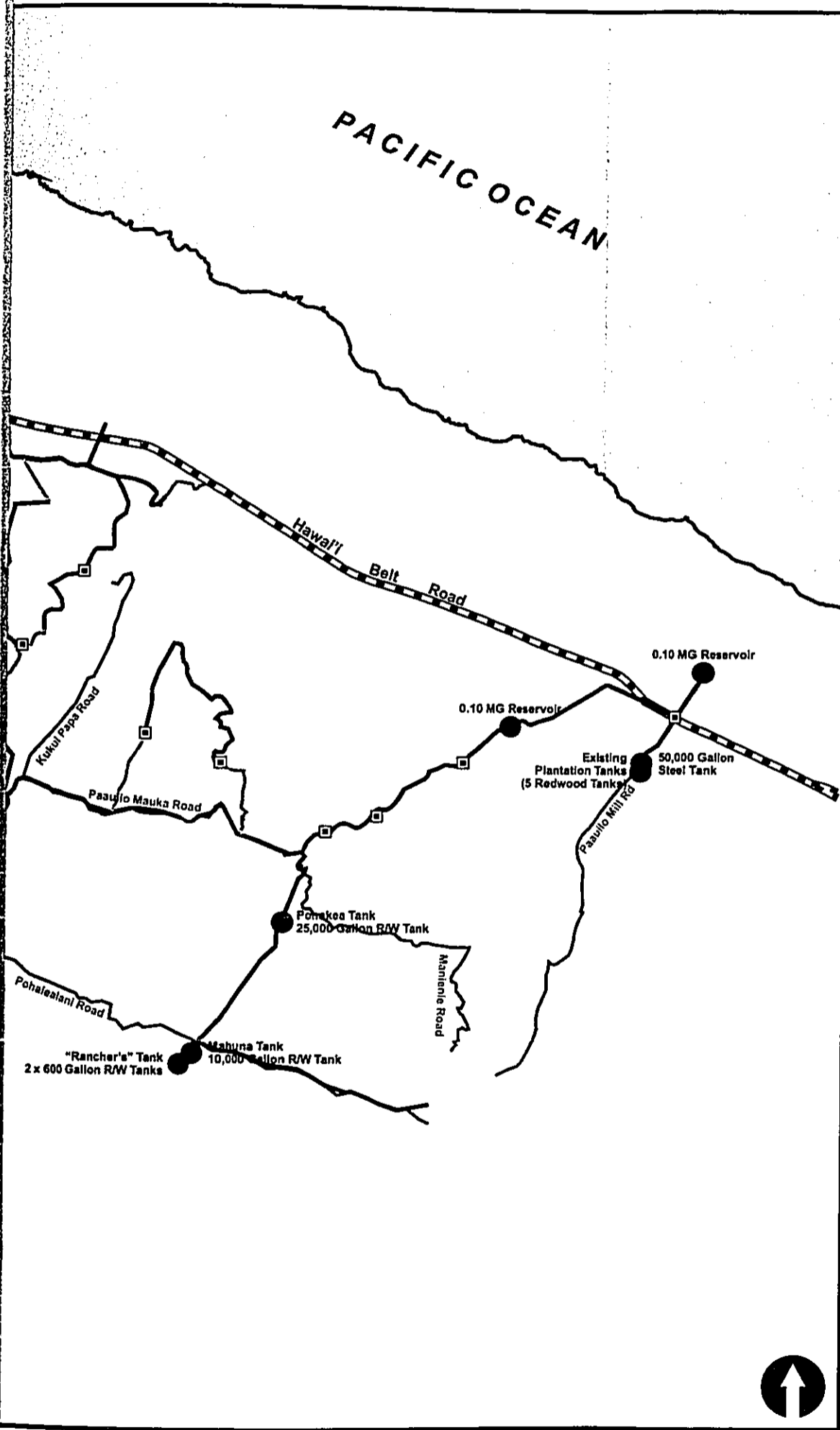
Prepared For:  
 Dept. of Water Supply  
 County of Hawai'i

Prepared By:  
 PLANNING  
 SOLUTIONS

Sources:  
 -State of Hawai'i GIS  
 -TNWRE, Inc.

Legend:  
 ●— Existing Water Line to Ahualoa  
 — Highways  
 — Roadways

0 0.5 1 2  
 Miles



**Legend:**

- Existing 1 1/2" Water Lines
- Existing 2" Water Lines
- Existing 2 1/4" Water Lines
- Existing 3" Water Lines
- Existing 4" Water Lines
- Existing 6" Water Lines
- Existing 8" Water Lines
- Existing 12" Water Lines
- ▲ Existing Wells
- Existing Pressure Reduction Valves
- ⊙ Existing Booster Pumps
- Existing Reservoirs

**Prepared For:**

Tom Nance Water Resource Engineers, Inc.

**Prepared By:**



**Source:**

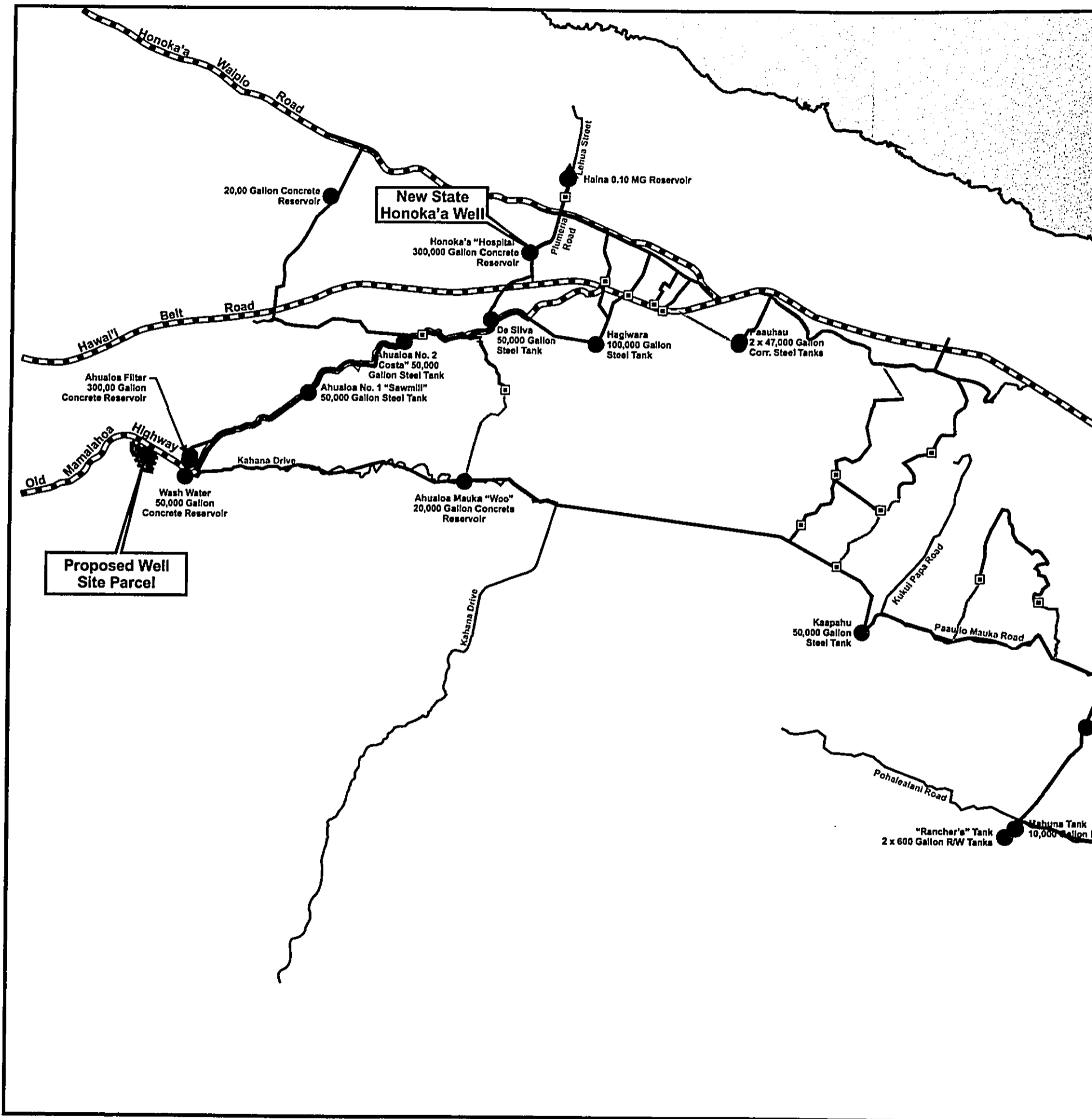
Fukunaga & Associates, Inc.

**Figure 1-3:**

**Existing Water System Serving Honoka'a**

Āhualoa Production Well & Reservoir Project

Figure 1-3 Existing Water System Serving Honoka'a 2005-09-28.cdr



**Proposed Well Site Parcel**

**New State Honoka'a Well**

20,00 Gallon Concrete Reservoir

Honoka'a "Hospital" 300,000 Gallon Concrete Reservoir

Halna 0.10 MG Reservoir

Ahualoa Filter 300,000 Gallon Concrete Reservoir

Wash Water 50,000 Gallon Concrete Reservoir

Ahualoa No. 1 "Sawmill" 50,000 Gallon Steel Tank

Ahualoa No. 2 "Costa" 50,000 Gallon Steel Tank

Ahualoa Mauka "Woo" 20,000 Gallon Concrete Reservoir

De Silva 50,000 Gallon Steel Tank

Hagiwara 100,000 Gallon Steel Tank

Peauhau 2 x 47,000 Gallon Corr. Steel Tanks

Kaapahu 50,000 Gallon Steel Tank

"Rancher's" Tank 2 x 600 Gallon R/W Tanks

Mahuna Tank 10,000 Gallon

Honoka'a Waipio Road

Hawaii Belt Road

Old Manalaha Highway

Kahana Drive

Kahana Drive

Lehua Street

Piheneria Road

Kukuji Papa Road

Paauilo Mauka Road

Pohalealani Road

## 2.0 ALTERNATIVES CONSIDERED

### 2.1 FRAMEWORK FOR CONSIDERATION OF ALTERNATIVES

Title 11, Chapter 200 of the Hawai'i Administrative Rules (HAR §11-200) contains the Department of Health's Environmental Impact Statement Rules. HAR §11-200-5 deals with "agency actions" such as the one that DWS is proposing. It requires that, for all agency actions that are not exempt (as defined in HAR §11-200-8) the agency must consider environmental factors and available alternatives and disclose these in an environmental assessment or environmental impact statement. HAR §11-200-9 requires the proposing agency to analyze alternatives, in addition to the proposed action in the environmental assessment. HAR §11-200-10 establishes the required contents of environmental assessments. Among the requirements listed, HAR §11-200-10 (6) calls for an identification and summary of impacts and alternatives considered (emphasis added).

In accordance with these requirements, DWS considered a number of alternatives before determining that the proposed project is the best course of action. These included "No Action", upgrading existing well pumps, enhanced water conservation, development of new surface or well sources at other locations, and delayed action. DWS concluded that only two of these alternatives, merit consideration in the impact analysis portion of this EA. They are "No Action" (as required by Chapter 343), and the proposed action of constructing the new well as currently designed. The other alternatives failed to achieve the project objectives outlined in Section 1.1.1 above. The following two subsections describe the alternatives considered in preparation of this EA and the criteria DWS used to decide whether to include them in the impact analysis presented in Chapter 4.

### 2.2 ALTERNATIVES ADDRESSED IN DETAIL IN THE EA

#### 2.2.1 PROPOSED ACTION: CONSTRUCT NEW EXPLORATORY & PRODUCTION WELL AT ĀHUALOA

The proposed action stems from DWS's need to continue to provide safe, reliable, and affordable drinking water to serve their Āhualoa/Hāmākua and Honoka'a areas. DWS has concluded that developing a new well source is the most cost-effective means of accomplishing this objective and the others outlined in Section 1.1.1. DWS selected the proposed project site for several reasons, including:

- The site is easily accessible by an established road, thereby avoiding the need for significant off-site roadway improvements.
- The proposed site's close proximity to the existing water transmission and distribution system avoids the need for new water line construction.
- The site is located upgrade from the areas it is intended to serve. This will allow the proposed well to deliver water to its service areas in an energy efficient manner rather than pumping it uphill.
- A USGS test well drilled nearby (approximately 0.2 miles from the proposed well site) encountered perched groundwater, suggesting that it is also likely to be encountered during the Āhualoa well's exploration drilling.<sup>4</sup>
- The proposed site is already assigned to the County through Executive Order from the State, isolated from sensitive land uses, and has been heavily disturbed in the past. Thus the potential for significant adverse environmental effects resulting from the well's construction and operation is minimal.

<sup>4</sup> If a perched groundwater source is not encountered, DWS is confident that an acceptable water source will be accessible closer to sea level and will drill deeper as needed to reach it.

DWS believes that constructing the well at the proposed site would best allow them to meet all of their stated objectives and thus represents its preferred course of action.

### 2.2.2 NO ACTION ALTERNATIVE

The "No Action" Alternative consists of: 1) the continued reliance on the existing stream source to provide the Āhualoa/Hāmākua area's potable water; and 2) continued dependence on the Haina Well and the new Honoka'a well to provide potable water for the Honoka'a area. The former is acceptable under current drinking water standards, but it is not consistent with DWS policy of shifting from surface water to groundwater sources. The latter is unacceptable because it would leave the Honoka'a area without an adequate backup source as required by County DWS Standards. By developing a new well source, DWS will be able to comply with County policies and regulations while still providing an affordable and adequate water supply to meet its customers' needs. "No Action" would not meet the project objectives and is not, therefore, a viable alternative. It is included in this EA primarily to fulfill the legal requirements of NEPA, Chapter 343 and HAR §11-200. It also provides a baseline against which to measure the environmental impacts of the proposed action.

## 2.3 ALTERNATIVES ELIMINATED FROM DETAILED ANALYSIS

### 2.3.1 SOURCE REDUCTION

This alternative would entail abandoning the existing stream source providing water for the Āhualoa/Hāmākua area without constructing the Āhualoa well to replace it. This would eliminate the system's reliance on the stream source, but it would leave the Āhualoa/Hāmākua area entirely dependent upon the Haina well and the future Honoka'a well. As discussed in Section 1.2.2, these two well sources alone would not be able to provide water for both service areas under DWS standards. Moreover, if this alternative were implemented, water from the lower elevation wells would have to be constantly pumped several miles up into the mountains to reach the *mauka* residents there, requiring significant amounts of energy.

### 2.3.2 UPGRADING EXISTING WELL PUMPS

DWS looked into whether the areas' needs could be met by installing larger capacity pumps at the Haina Well, the new Honoka'a Well, or both, instead of drilling the proposed Āhualoa well. Upgrading the Honoka'a well was shown to be out of the question, since the pump tests revealed a lower capacity than expected. Similarly, the Haina well is not outfitted with a large enough well casing to allow for a significant pump upgrade. In addition, upgrading the lower elevation wells would require upgrading the existing booster pump stations to deliver water to the *mauka* areas. Not only would upgrading the booster pump stations be costly, but pumping uphill from the lower elevation wells would require far more energy than pumping from a deep well at a higher elevation and feeding the system via gravity. Thus, DWS did not pursue this alternative further.

### 2.3.3 ENHANCED WATER CONSERVATION

The primary purpose of the proposed new well is not to accommodate an increase in demand, although its capacity will be large enough to accommodate some of the anticipated growth in the area. Rather, it is intended to: 1) reduce the risk of water shortage in the Honoka'a area by supplementing the water supply and providing an adequate backup source to the Haina and Honoka'a wells, and 2) replace the existing surface water source serving the Āhualoa/Hāmākua area, in accordance with the County's policy of shifting to groundwater sources.

Because the existing system is working at capacity, during drought conditions DWS has had to request extensive water conservation measures of its customers in the project area, including



limitations on washing, bathing, sanitation, and irrigation.<sup>5</sup> It is very unlikely that further conservation measures could decrease the demands sufficiently to eliminate the need for the project.

#### 2.3.4 DEVELOPMENT OF OTHER GROUNDWATER SOURCES

As discussed in Chapter 4, perched groundwater is thought to be available extensively in the region. Thus, from a hydrologic perspective, alternative well sites are feasible. However, none offer the advantages of the selected site as described in Section 2.2.1 above.

#### 2.3.5 DELAYED ACTION

The long lead-time necessary to drill, test and develop a production well and the immediacy of the Honoka'a area's need for a backup source make expedient action on DWS's part important. Delaying development of the well could negatively affect DWS and potentially their customers in the Honoka'a area if demand exceeds the current water supply or if the Haina well fails due to overuse. Further, replacement of the Kohākōhau Stream source serving the Āhualoa/Hāmākua area with a groundwater source will eliminate virtually any potential that may currently exist for the introduction of surface-water contaminants into the system. DWS wants to act expeditiously to ensure the delivery of safe and reliable drinking water to its customers in Āhualoa/Hāmākua and Honoka'a.

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<sup>5</sup> For example, see notices in the March 6 and 8, 2005 editions of the *Hawai'i Tribune Herald* and *West Hawai'i Today*.

### 3.0 PROJECT DESCRIPTION

#### 3.1 LOCATION AND EXISTING USE OF THE PROPOSED SITE

The proposed Āhualoa well site is in the Hāmākua District of the Island of Hawai'i. The site is located within TMK 4-6-11:042, approximately 4 miles west of the community of Honoka'a on Old Māmalahoa Highway (see Figure 3-1). The proposed well site is on a portion of a former quarry site assigned to the County of Hawai'i through Executive Order. There are no existing facilities present at the proposed well site, and the remainder of the quarry site is overgrown with grass and vegetation (photographs of the site are included in Figure 3-2). Its present use is limited to the occasional disposal of small amounts of green waste by the County Department of Public Works (DPW). Two DWS storage tanks exist approximately 1,000 feet east of the proposed well site; these represent the *mauka* terminus of the Āhualoa/Hāmākua water system (see Figure 1-2). The immediately adjacent properties are used for cattle grazing.

#### 3.2 DESCRIPTION OF THE PROPOSED ACTION

##### 3.2.1 OVERVIEW

The proposed action consists of two phases.

- Phase 1 involves drilling, casing, and pump testing an exploratory well on the vacant site.
- Phase 2 (which would be undertaken only if pump tests confirm that the exploratory well's yield and water quality are adequate), involves outfitting the well for production and constructing a new 1.0 MG reservoir and related control facilities. The DWS will install a remote Supervisory Control and Data Acquisition (SCADA) unit as part of the control building. This SCADA system will be connected to the existing DWS system located at the Waimea Baseyard.

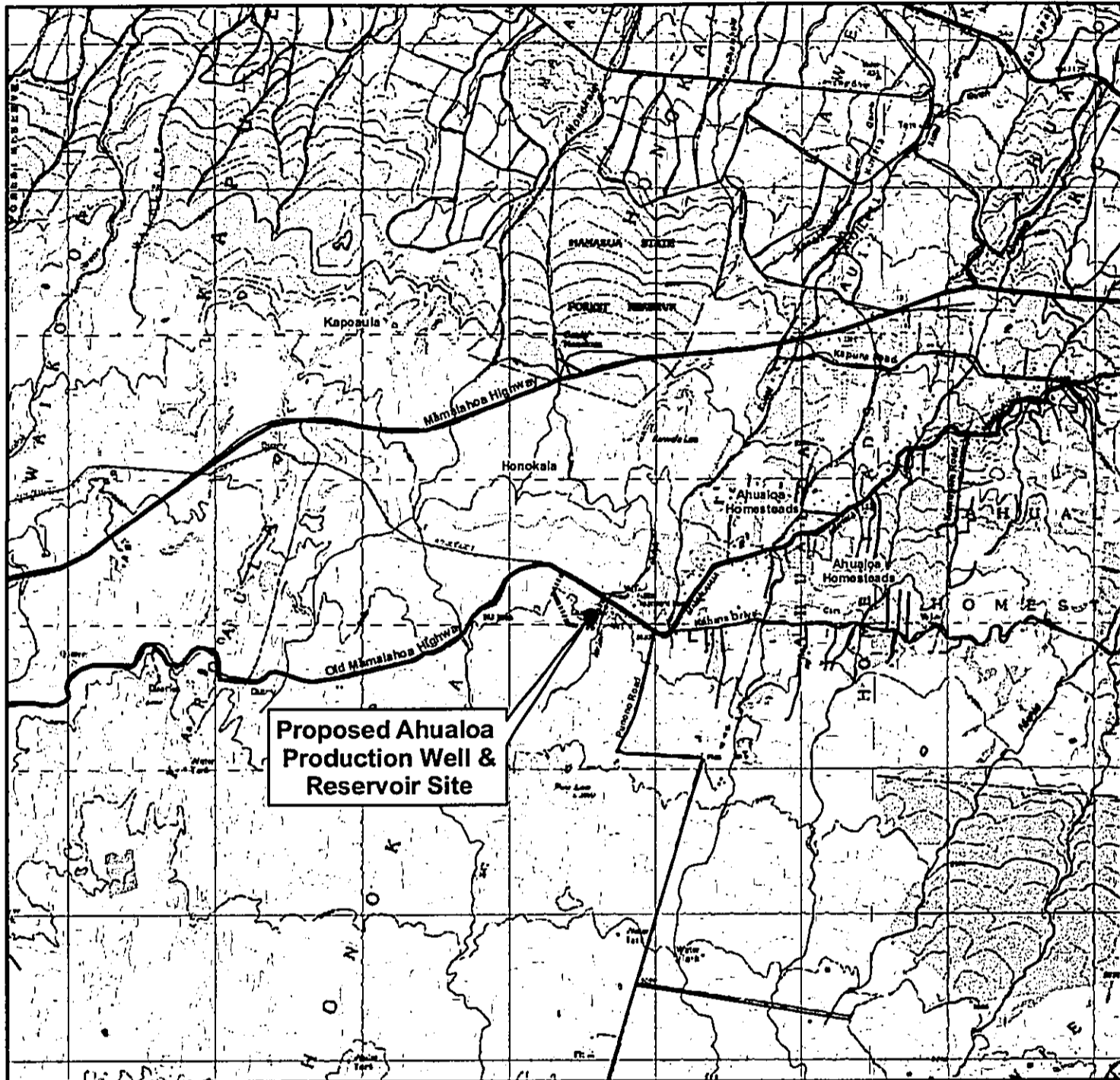
Section 3.2.2 describes the facilities as they would appear once fully developed. Section 3.2.3 describes the activities that would be undertaken during their construction.

##### 3.2.2 DESIGN OF THE PROPOSED FACILITIES

Figure 3-3 provides a site plan of the proposed well and reservoir. Figure 3-4 contains a cross-section of the drilled well and Figure 3-5 provides plan views of the proposed well pump. Figure 3-6 depicts the proposed control building. Major components of the proposed design are described below.


###### 3.2.2.1 Drill Depth and Well Casing

Groundwater is believed to stand about 1,200 feet or more above sea level at the proposed well site, based on the results from a US Geological Survey test well drilled about 0.2 miles from the site. DWS expects to complete the new well to a depth of 1,750 feet below ground surface or about 800 feet above sea level. The borehole would be 27" inches in diameter. DWS's preliminary plans call for it to install a 20" inner diameter inch solid steel casing in the upper 1,400 feet of the drilled hole; it will install approximately 300 feet of perforated casing below that. The well may also have a 19-inch diameter open hole below the bottom of the casing if necessary to achieve the desired yield. The 20-inch well casing diameter is necessary to accommodate the pump's motor, column pipe, and sounding tubes. It also provides sufficient space for the DWS to replace the pump with a larger 4-pole submersible pump and motor should it ever wish to do so.



**Prepared For:**  
 Department of Water Supply  
 County of Hawai'i




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**Prepared By:**  
 **PLANNING SOLUTIONS**


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**Sources:**  
 -State of Hawai'i GIS  
 -TNWRE, Inc.  
 -USGS 7.5' Topo: Kukuihaele, Honoka'a

**Legend:**

-  Waterways
-  Roadways
-  Highways

0      0.5      1  
 Miles



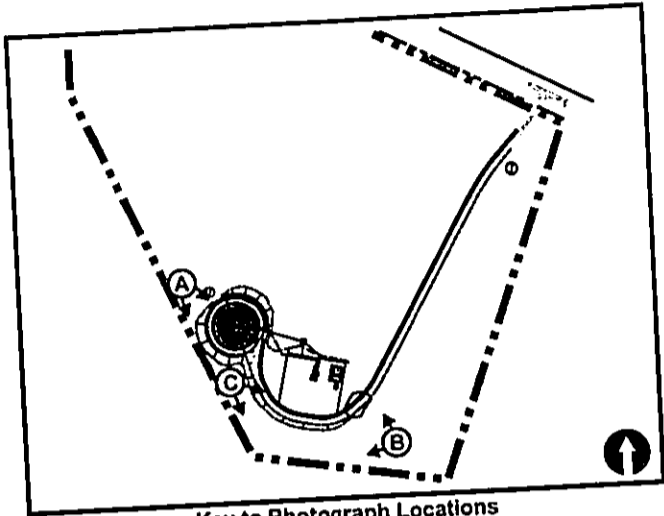
**Figure 3-1:**

**Vicinity Map**

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Āhualoa Production Well  
 & Reservoir Project

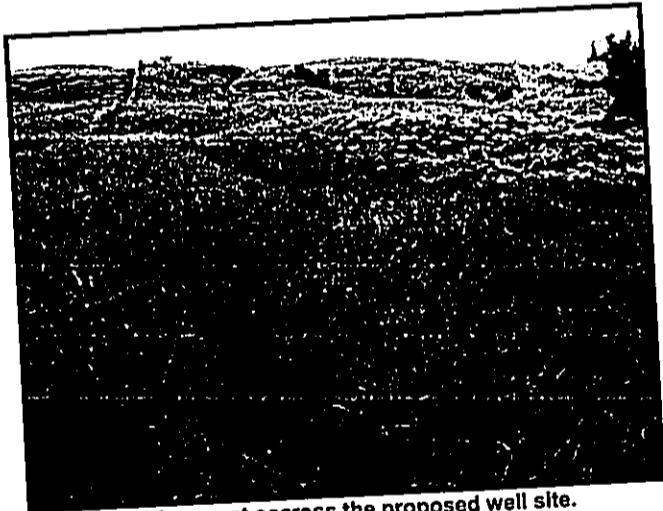
Figure 3-1 Vicinity Map, 2005-10-M.mxd



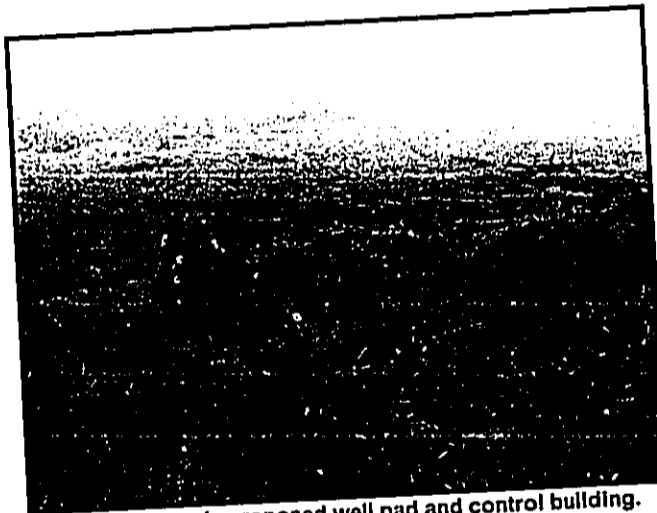
Key to Photograph Locations



A. Approximate site of proposed 1.0 MG reservoir.




B. View west across the proposed well site.



C. View towards proposed well pad and control building.

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SOLUTIONS

Source:  
Planning Solutions, Inc.

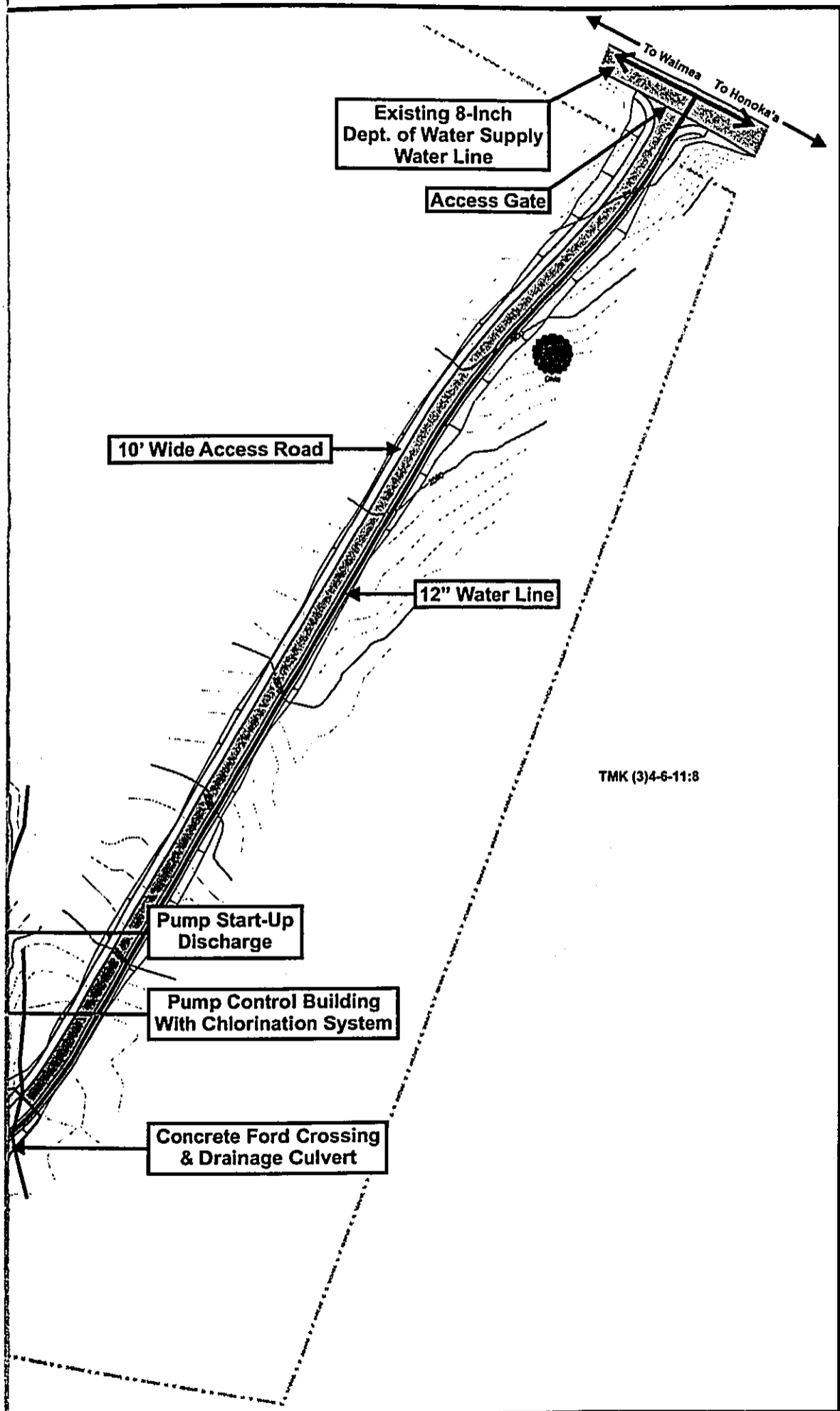
Legend:

Figure 3-2:

## Views of the Project Site

Āhualoa Production Well  
& Reservoir Project

Figure 3-2, View of the Project Site, 2005-10-14 CD



NOTE: Contours shown in 2 foot intervals.

Prepared For:

Tom Nance Water Resource Engineering (TNWRE)

Prepared By:



Source:

Tom Nance Water Resource Engineering (TNWRE)

Figure 3-3:

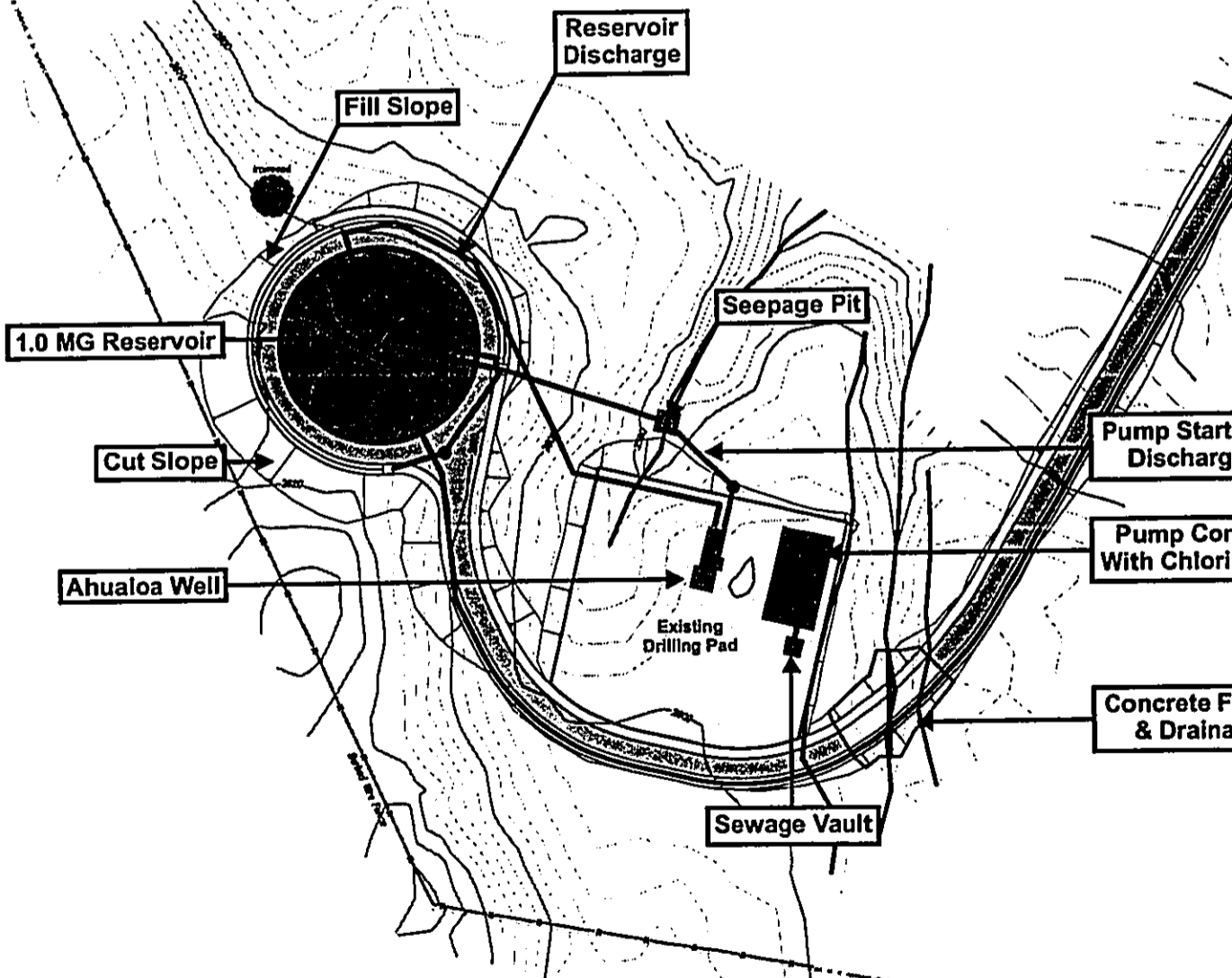
## Site Plan

Āhualoa Production Well & Reservoir Project

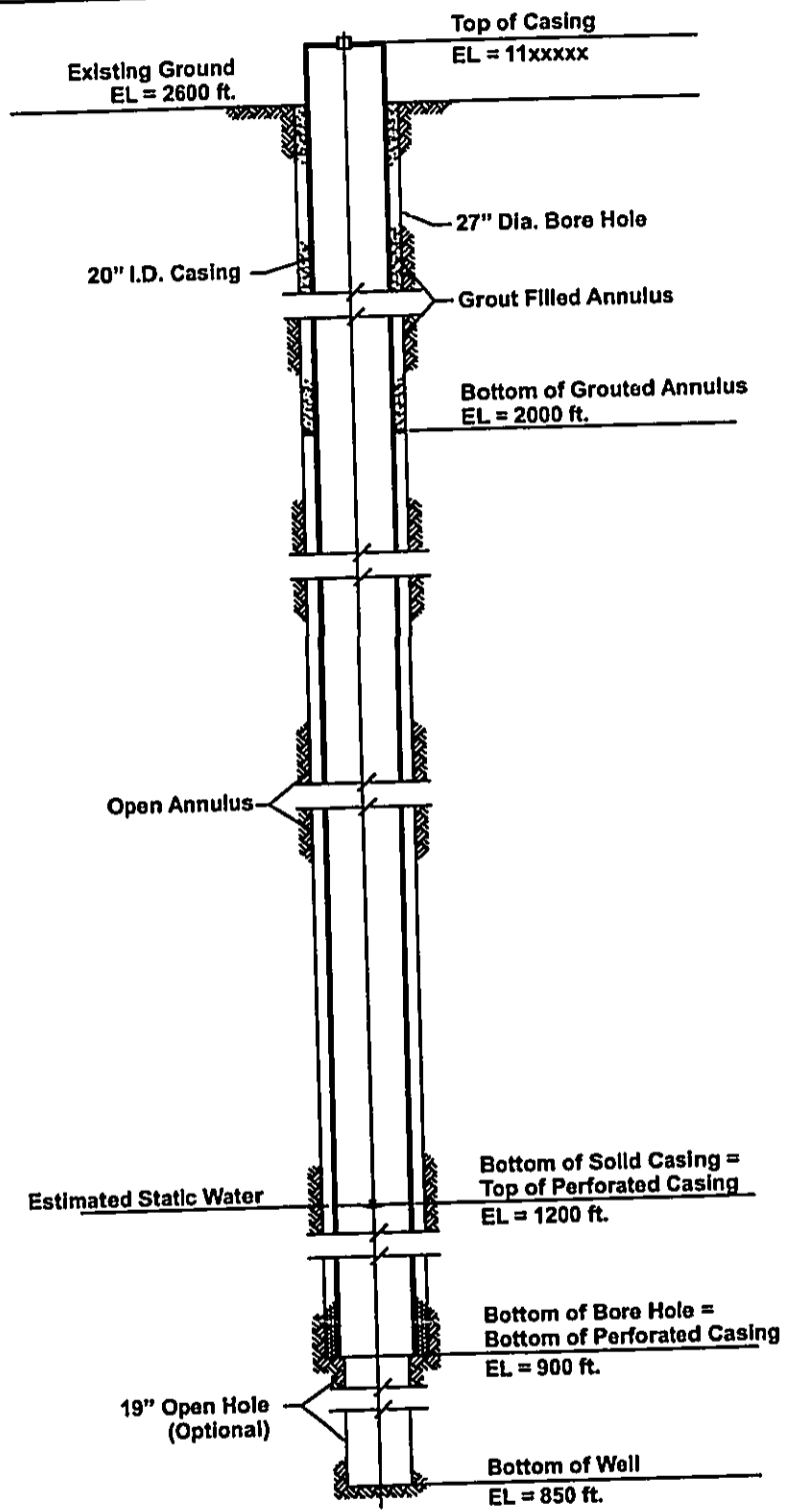
Figure 3-3 Site Plan 2003-11-18.cdr

County of Hawai'i  
Quarry Site  
TMK (3)4-6-11:42

10' Wide Access




TMK (3)4-6-11:13



NOTE: Drawing is not shown to scale.

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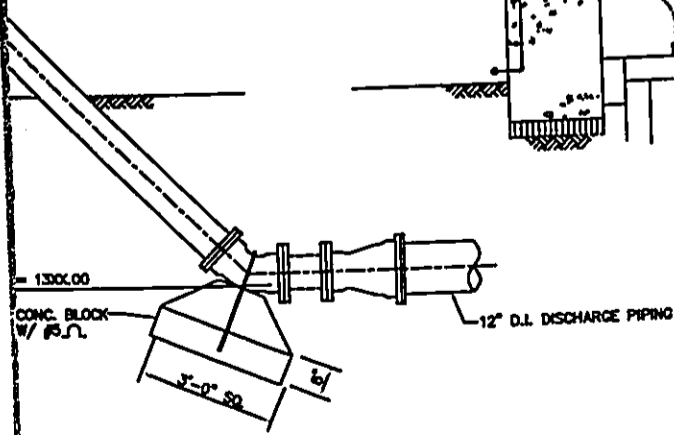
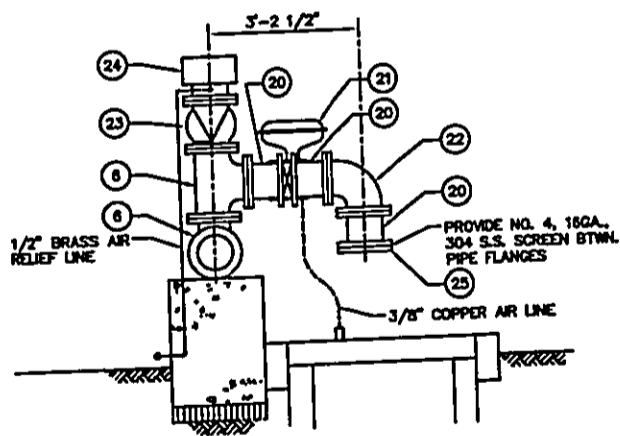
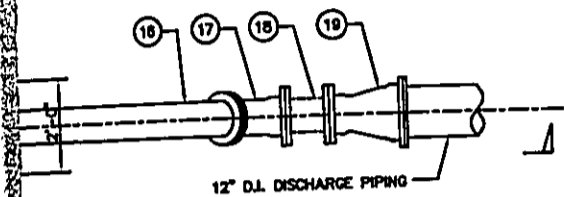
Source:  
 Tom Nance Water Resource  
 Engineering (TNWRE)

Figure 3-4:

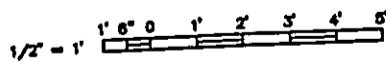
## Pump Section

Āhualoa Production Well  
 & Reservoir Project

Figure 3-4 Proposed Well Pump Section 2005-10-07.zxp



**SECTION "B"**  
SCALE: 1/2" = 1'-0"



**Legend:**

- ① 8" Dismantling Joint
- ② 8" D.I. Pipe, FE, 4'-8" Long
- ③ Test Gauge Connection
- ④ Pressure Switch Unit
- ⑤ Sampling Cock
- ⑥ 8" D.I. Tee, FE
- ⑦ 8" Center Guided Check Valve, FE
- ⑧ 8" D.I. Pipe, FE, 5'4" Long w/1 1/2" Boss
- ⑨ 1 1/2" Flow Switch
- ⑩ 8" Electromagnetic Meter, FE, w/ Flow Transmitter
- ⑪ 8" D.I. Pipe, FE, 2'0" Long
- ⑫ 8" D.I. Blind Flange
- ⑬ 3/4" ARV Unit
- ⑭ 8" Gate Valve, FE
- ⑮ 8" 1/8 D.I. Bend, FE
- ⑯ 8" D.I. Pipe, FExPE, Length to Fit
- ⑰ 8" 1/8 D.I. Bend, MJ
- ⑱ 8" D.I. Spool, Length to Fit
- ⑲ 8" x 12" D.I. Increaser, MJ
- ⑳ 8" D.I. Pipe, FE, 9" Long
- ㉑ 8" Rubber-Seated Butterfly Valve, FE, w. Diaphragm Valve Actuator
- ㉒ 8" 1/4 D.I. Bend, F.E.
- ㉓ 8" Pump Vacuum Release Valve, FE
- ㉔ 8" Vent Screen & Fitting
- ㉕ 8" D.I. Flange Adapter w/S.S. Screen

**Prepared For:**

Dept. of Water Supply  
County of Hawai'i

**Prepared By:**



**Source:**

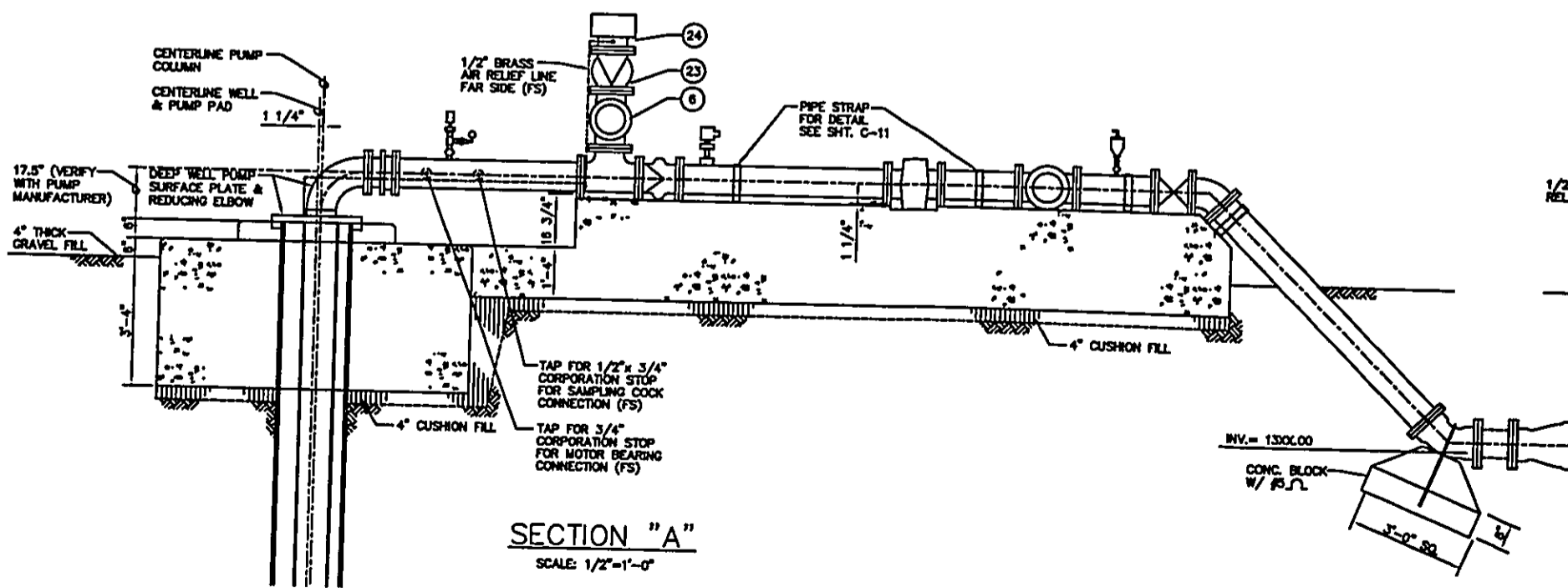
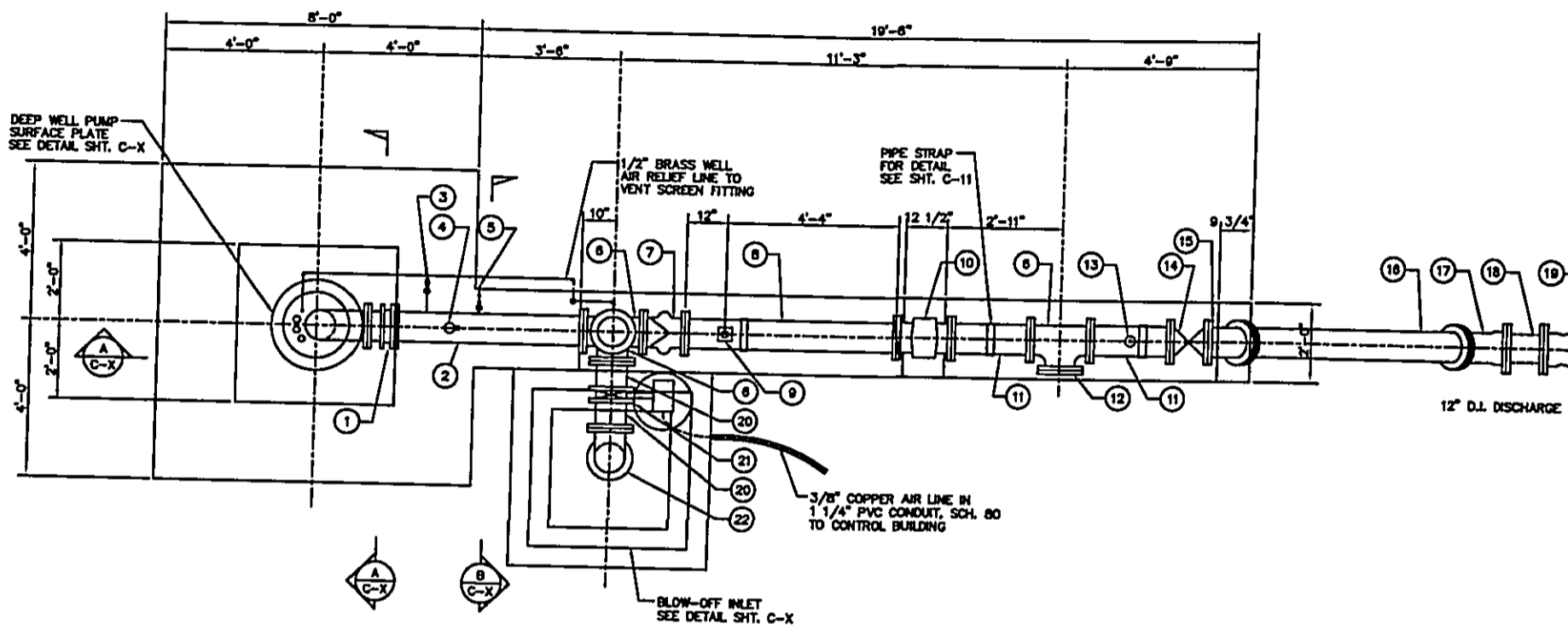
Tom Nance Water Resource  
Engineering (TNWRE)

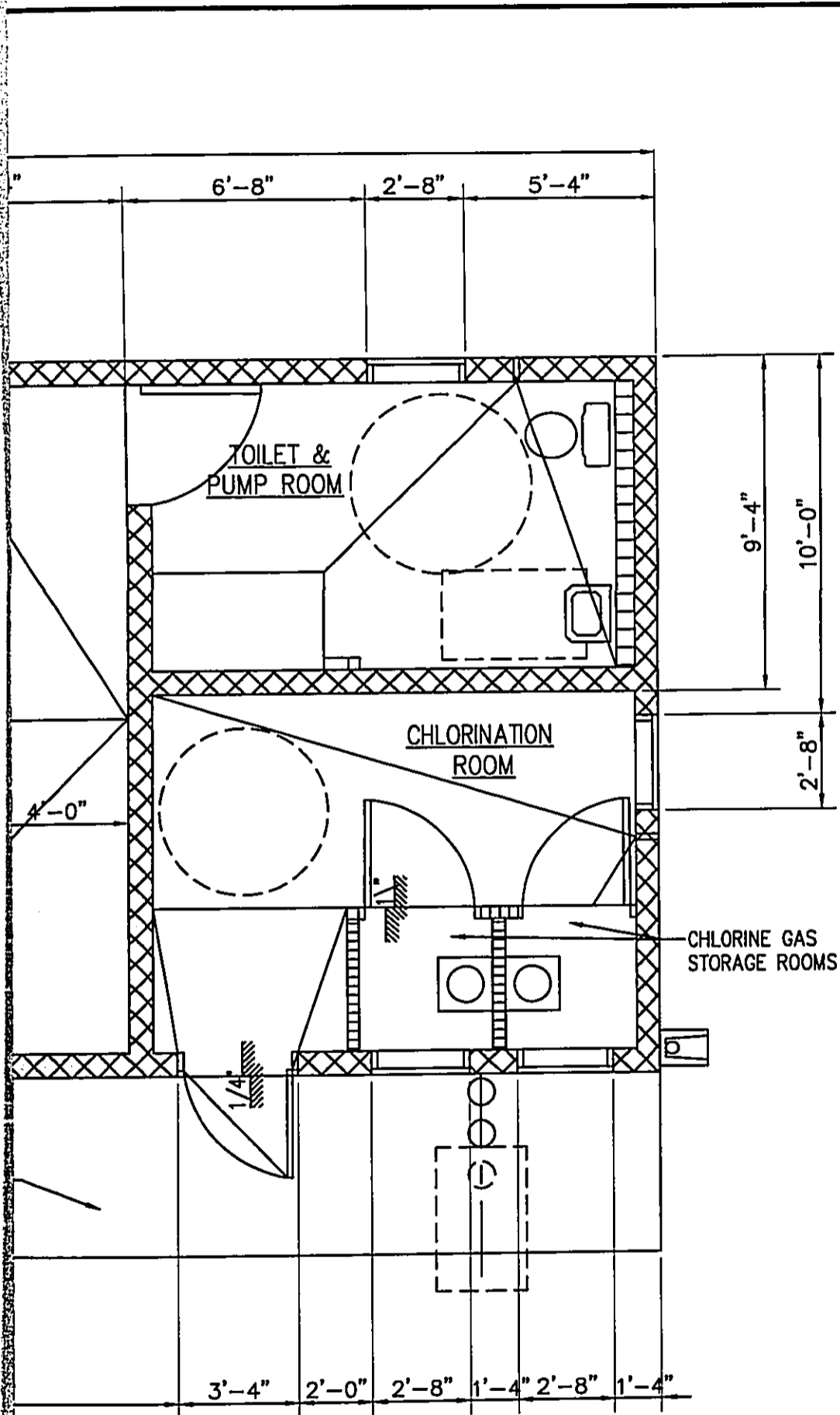
**Figure 3-5:**

**Well Pump  
Outfitting Plan  
& Sections**


Āhualoa Production Well  
& Reservoir Project







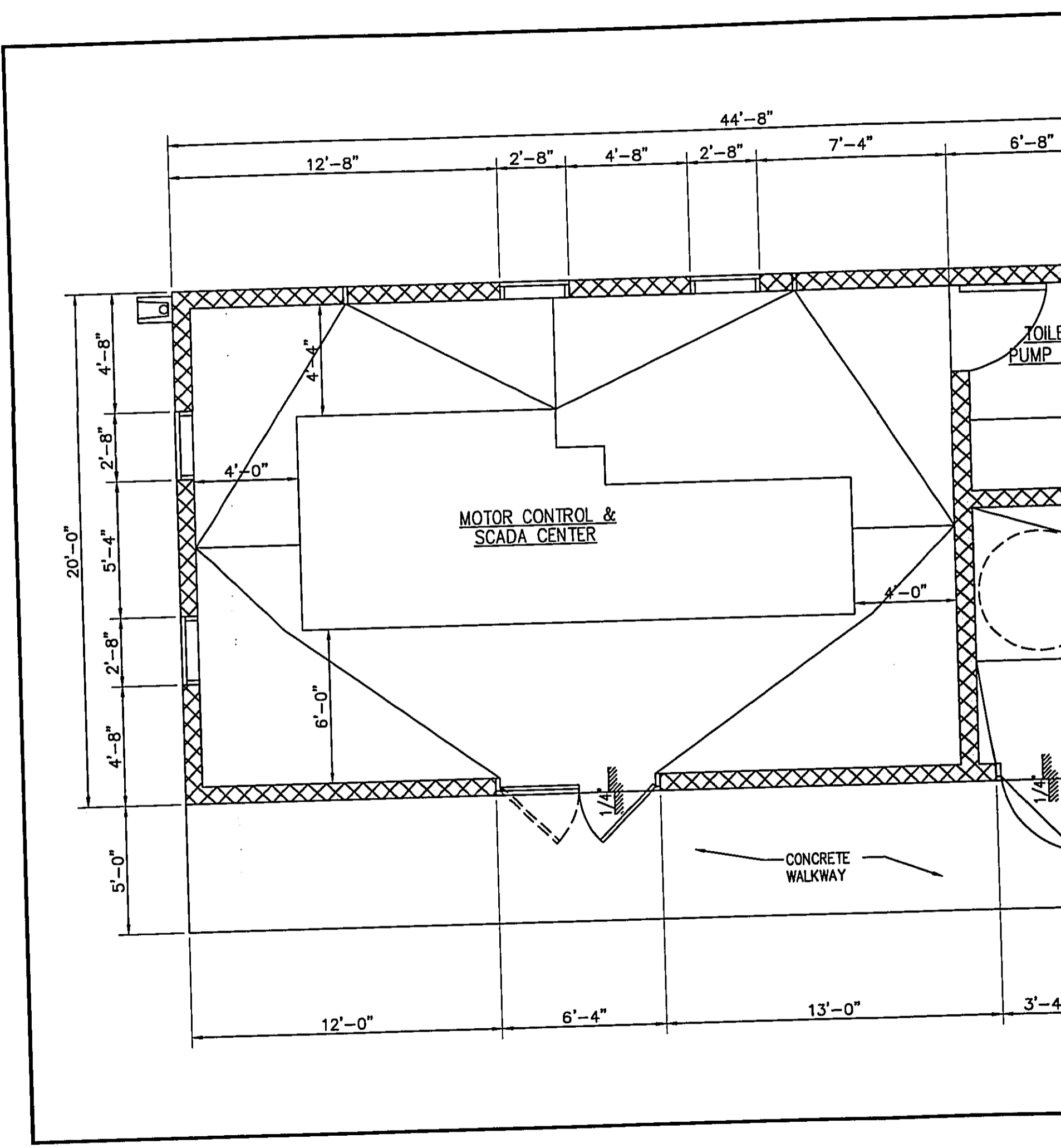
Prepared For:  
 Dept. of Water Supply  
 County of Hawai'i

Prepared By:  
 PLANNING  
 SOLUTIONS

Source:  
 Tom Nance Water Resource  
 Engineering (TNWRE)

Figure 3-6:  
**Control Building**

Āhualoa Production Well  
 & Reservoir Project



44'-8"

12'-8"

2'-8"

4'-8"

2'-8"

7'-4"

6'-8"

20'-0"

4'-8"

2'-8"

5'-4"

2'-8"

4'-8"

5'-0"

4'-0"

4'-4"

6'-0"

4'-0"

MOTOR CONTROL &  
SCADA CENTER

TOILET  
PUMP

CONCRETE  
WALKWAY

12'-0"

6'-4"

13'-0"

3'-4"

1/4"

1/4"

## PROJECT DESCRIPTION

**3.2.2.2 Well Pump**

Tentative plans call for the use of a water-lubricated submersible pump rated at 775 gallons per minute (GPM).<sup>6</sup> Based on the anticipated total dynamic pumping head of 1435 feet, it will be powered by a 400 HP electric motor. The pump capacity and motor size will be reviewed and, if necessary, adjusted once pump test results are available.

**3.2.2.3 Control Building**

The proposed design includes a single-story, naturally ventilated, concrete block structure with a footprint of 20 by 45 feet (Figure 3-5). It would house the motor control center, electrical control panel, SCADA remote system, alarm system, and chlorination system. A restroom for DWS staff will also be provided. Sanitary waste will be pumped into a concrete sewage vault. DWS personnel will periodically pump it out and transport it to an approved location.<sup>7</sup> A concrete walkway will be installed on one side.

**3.2.2.4 1.0 MG Reservoir**

The proposed design calls for a pre-stressed concrete tank meeting AWWA D110 standards with a capacity of 1.0 million gallons. The tank will have an inside diameter of 93 feet with a 20 foot operating height. It will be designed to meet seismic zone 4 standards (see Section 4.10.2).

**3.2.2.5 SCADA System**

DWS would install a Supervisory Control and Data Acquisition (SCADA) system to monitor and control the well pump operation. The SCADA facilities would be installed during Phase Two of this project.<sup>8</sup>

**3.2.2.6 Electricity and Communications**

**Electrical Power.** Electrical power will be utilized for lighting and general power in the control building and for the proposed 400 HP pump motor. A sensor that measures the water level in the new 1.0 MG concrete reservoir will control Start/Stop operation of the well pump. Electrical power will be delivered to the well site using overhead electrical lines owned and maintained by the Hawai'i Electric Light Company (HELCO). The existing main transmission system will have to be upgraded to three-phase power from their Honoka'a Substation to the well site to accommodate this motor pump load. Utility metering will conform to HELCO's standards and design requirements.

**Communications.** DWS plans to use radio and licensed DWS FCC frequencies for the SCADA telemetry communications if it is determined that the site is accessible by radio. If not, telephone service by Hawaiian Telecom is available at the nearby DWS tank site on Māmalahoa Highway. Telephone service would have to be extended approximately 1,000 feet from the tank site in order to serve the well site.

**3.2.2.7 Seepage pit**

One seepage pit will be constructed on the proposed well site (see Figure 3-3). It will be approximately 8 feet in diameter and 8 feet deep. It will initially be used to dispose of water from the pump test; once the well is operational, it will accommodate water from the pump startup and provide a drain for the 1.0 MG tank. It will also collect stormwater drainage from the site.

<sup>6</sup> The proposed well casing is large enough to accommodate up to a 1565 GPM pump. This will allow DWS to upgrade the pump in the future to accommodate increased water demands if the area grows.

<sup>7</sup> Cesspools are not permitted within 1,000 feet of a well, and that is why DWS is proposing the sewage vault option.

<sup>8</sup> The DWS is developing a SCADA system that will allow it to control key components of its facilities on the Big Island. The master base station for the local system is located at the Waimea Baseyard. Communication among sites will use radio telemetry, if possible; where this is infeasible, DWS will use telephone telemetry. All the SCADA improvements at the site would be inside the control building, with the exception of a small rooftop antenna.

### 3.2.3 WELL-DRILLING AND CONSTRUCTION ACTIVITIES

#### 3.2.3.1 Phase 1: Exploratory Well Drilling, Casing, and Pump Testing

The contractor will grade a 125 ft<sup>2</sup> level well drilling pad on the proposed site to provide a working area. Including the casing installation and pump testing, a construction period of up to 9 months is expected (see Table 3.1). Pump testing will be at rates of up to 800-1,200 gallons per minute and may last up to 3 or 4 consecutive days.

#### 3.2.3.2 Phase 2: Production Well Outfitting & Construction of Related Facilities

The research that has been conducted to date suggests that there are no sources of groundwater contamination that could affect the groundwater that the well would tap. DWS will analyze water collected during the pump testing of the exploratory well to ensure that the quality of water is satisfactory. It will incorporate this information into the engineering report that it will submit to the State Department of Health Safe Drinking Water Branch (SDWB). The report will address all the requirements set forth in Hawai'i Administrative Rules §11-20-29. Before the well is placed into service as a production well, DWS will obtain approval from the SDWB, as required by these regulations.

As indicated in Table 3.1, the DWS expects that drilling and testing the exploratory well will take approximately 9 months and outfitting the well and constructing the new on-site facilities will take approximately 18 months. During that period, the contractor will finish grade the site, install the access road and underground piping and utilities, install and set up the SCADA system, and erect the reservoir and control building. The contractor will also install fencing, landscaping, and other minor site improvements.

### 3.3 IMPLEMENTATION SCHEDULE

Table 3.1 outlines the DWS schedule for the project.

Table 3.1. Preliminary Project Schedule

<i>Task</i>	<i>Estimated Duration</i>
Final Design	1 month
Design Review	2 months
Bid Solicitation	2 months
Award and Notice to Proceed	1 month
Exploratory Well Construction and Testing	9 months
Design & Construction/ Outfitting of Production Well & Control Facilities (including SCADA)	18 months
Commence Operation	33 months from start

Source: Tom Nance Water Resource Engineering.

### 3.4 PROJECT COSTS

The County of Hawai'i Department of Water Supply has authorized and allocated funding for the first phase of the project. It is identified as DWS Job No. 2005-866, Āhualoa Well Development – Phase I. DWS may also apply for Federal funds through the State of Hawai'i's Drinking Water State Revolving Fund (DWSRF) program, which would constitute a Federal action and will require the project to meet all of the Hawai'i DWSRF program requirements (see Section 5.1.3 for further discussion).

The estimated construction cost for the initial phase consisting of drilling, casing, and pump testing the well is \$1,460,000. The subsequent construction to outfit the well, build a new 1.0 MG reinforced concrete tank, install the control building and related SCADA facilities, and pay HELCO and Hawaiian Telcom service charges are estimated to cost \$3,805,000. Table 3.2 summarizes these estimated costs.

Table 3.2. Preliminary Project Costs

<i>Item</i>	<i>Estimated Cost</i>
Well Drilling, Casing, and Pump Testing (Exploratory Phase)	\$1,460,000
Well Outfitting, Tank & Facility Construction (Development Phase)	\$3,245,000
Offsite SCADA Improvements (Development Phase)	\$30,000
HELCO & Hawaiian Telcom Service Charge Extension (Development Phase)	\$530,000
<b>Total Estimated Construction Cost</b>	<b>\$5,265,000</b>
<b>Estimated Design and Construction Administration Cost</b>	<b>\$527,000</b>
<b>Total Estimated Project Cost</b>	<b>\$5,792,000</b>
Source: Tom Nance Water Resource Engineering	

## 4.0 EXISTING ENVIRONMENT, POTENTIAL IMPACTS & MITIGATION MEASURES

This chapter describes existing conditions within the area affected by the project, discusses its potential impacts, and describes measures that the DWS will take to minimize and mitigate those impacts. No significant lasting or secondary environmental impacts are anticipated from the construction of the project. Overall, the well will provide long-term public benefits to the Āhualoa/Hāmākua and Honoka'a areas by ensuring that customers there receive affordable, high quality potable water.<sup>9</sup>

### 4.1 GEOLOGY, TOPOGRAPHY & SOILS

#### 4.1.1 EXISTING CONDITIONS

The proposed Āhualoa well site is on the northern flank of Mauna Kea. Mauna Kea's rocks overlap those of the older Kohala Mountain to the north. However, Mauna Kea had already reached its present size by 9,000 or more years ago. During the late stages of its volcanic development, Mauna Kea produced a cap of differentiated lavas that almost completely buried the original shield volcano above sea level. These lava types consist of an older Hāmākua Volcanic Series and a younger Laupāhoehoe Volcanic series (both of which are divided into upper and lower members). The geology at the project site is derived from the Laupāhoehoe lower member volcanic series, of which the youngest dated flow is about 4,400 years old (Macdonald et al. 1983).

As shown in Figure 3-1, topographic relief across the proposed Āhualoa well site is variable, ranging from almost level to hill slopes of more than 40%. The site elevation ranges from 2590 feet MSL at the northwest corner to 2620 at the southeast corner.

The U.S. Soil Conservation Service classifies the soil at the project site as Honoka'a silty clay loam, 10 to 20 percent slopes (HTD). This soil type exhibits rapid permeability, slow runoff, and a slight erosion hazard. It is used mostly for pasture and woodland. A strip of rough broken land (RB) lies just to the east of the proposed well site, along the existing gulch. The site is designated as "Other" on the Agricultural Lands of Interest to the State of Hawai'i (ALISH) map.

#### 4.1.2 POTENTIAL IMPACTS

Some grading and trenching will be necessary for construction of the well, access driveway, underground utilities, and associated facilities. However, it should not result in a significant change in topography since the portions of the site slated for the proposed structures are already nearly level. Once water and utility lines are installed, the trenches will be backfilled to grade. The proposed reservoir will be on a small hill above the proposed well and control building, but the topography is not steep enough to require substantial grading for the vehicle access path. DWS will obtain coverage under the State of Hawai'i NPDES General Permit program for the facility construction (HAR §11-55, Appendix C). This will require the use of Best Management Practices to minimize erosion of the area disturbed during construction and the installation of permanent erosion control structures to ensure the long-term minimization of erosion at the site. These measures will ensure that there will be no substantial impact on topography and soils from the project.

<sup>9</sup> Most of the discussion focuses on the environmental characteristics of the proposed well site and surrounding area. Where relevant, it expands to include a larger geographical area.

## 4.2 HYDROLOGY

### 4.2.1 EXISTING CONDITIONS

A natural drainageway exists just east of the parcel, the 'Ino'ino Gulch, which is classified by the U.S. Geological Survey as an "intermittent stream."<sup>10</sup> During a site visit on September 22, 2005, no flow was observed, despite recent rains. A small, steep ridge separates the gulch from the proposed well site. Other than that, no natural water features are located nearby. The site is heavily vegetated and has highly permeable soils, so surface runoff from upslope (south-southeast) of the site typically percolates into the ground before reaching any defined drainageway. During very heavy rains, on-site runoff likely enters the small, forested natural swale located near the eastern property boundary of the project site and continues flowing downhill toward the road. The forested ridge between the site and Ino'ino Gulch prevents runoff directly from the site from flowing into the gulch.

The project site is underlain by the Honoka'a aquifer, which is a subset of the East Mauna Kea aquifer system. According to the State Commission on Water Resource Management (CWRM), the Honoka'a aquifer's sustainable yield is 31 MGD, while the entire aquifer system's sustainable yield is 388 MGD. As noted in Section 3.2, perched groundwater may exist throughout the *mauka* areas near the project site, although if not encountered during the well exploration DWS will explore deeper.

Of the wells shown on Figure 4-1, the only two that are regularly used are the Haina (Well No. 6528-01) and Waimea CC (No. 6235-01) wells, the latter of which is used for irrigation.<sup>11</sup> The combined maximum pumping capacities of the two wells in regular use is 925 gpm, or 1.332 MGD. The new State Honoka'a well will add another 0.54 MGD, bringing the total to 1.872 MGD. If all of these wells were operating at maximum capacity, they would be utilizing approximately 6% of the Honoka'a aquifer's estimated sustainable yield.

### 4.2.2 POTENTIAL IMPACTS

#### 4.2.2.1 Construction Period.

Construction activities themselves will not substantially alter the quantity of stormwater runoff.<sup>12</sup> However, the grading will slightly alter the pattern (i.e., discharge points) of runoff, and the soil disturbance that will occur during construction will affect the quality of the stormwater runoff.

The contractor will use best management practices as necessary during construction of the well site to prevent eroded soil, construction debris, and other pollutants from leaving the site via runoff. Areas that have been grubbed and/or graded will be stabilized and vegetation will be replanted as quickly as possible to control erosion. Since the disturbed area is expected to more than an acre, NPDES Construction Stormwater general permit coverage<sup>13</sup> will be required for construction activities associated with the proposed well. During the pump installation phase of the project, the contractor will direct the discharge from testing into a seepage pit downslope (north) of the well pad that will be installed during construction work.

<sup>10</sup> USGS DLG Hydrology Line; State GIS Coverage: DLGHYDLN

<sup>11</sup> The Parker Ranch (No. 6239-02) well was dedicated to DWS by the ranch and is occasionally used as a backup source when the demand exceeds the capacity of the Waimea Water Treatment Plant. When in use, the well water is pumped up to the existing 4.0 MG reservoir at the treatment plant and is then distributed to the Waimea and Āhualoa-Hāmākua areas as needed.

<sup>12</sup> As new facilities with impermeable surfaces are developed they will gradually change the volume, but these are permanent changes and are discussed with the other operational period effects.

<sup>13</sup> National Pollutant Discharge Elimination System administered through the Clean Water Branch of the State Department of Health (Hawai'i Administrative Rules, 11-55, Appendix C).



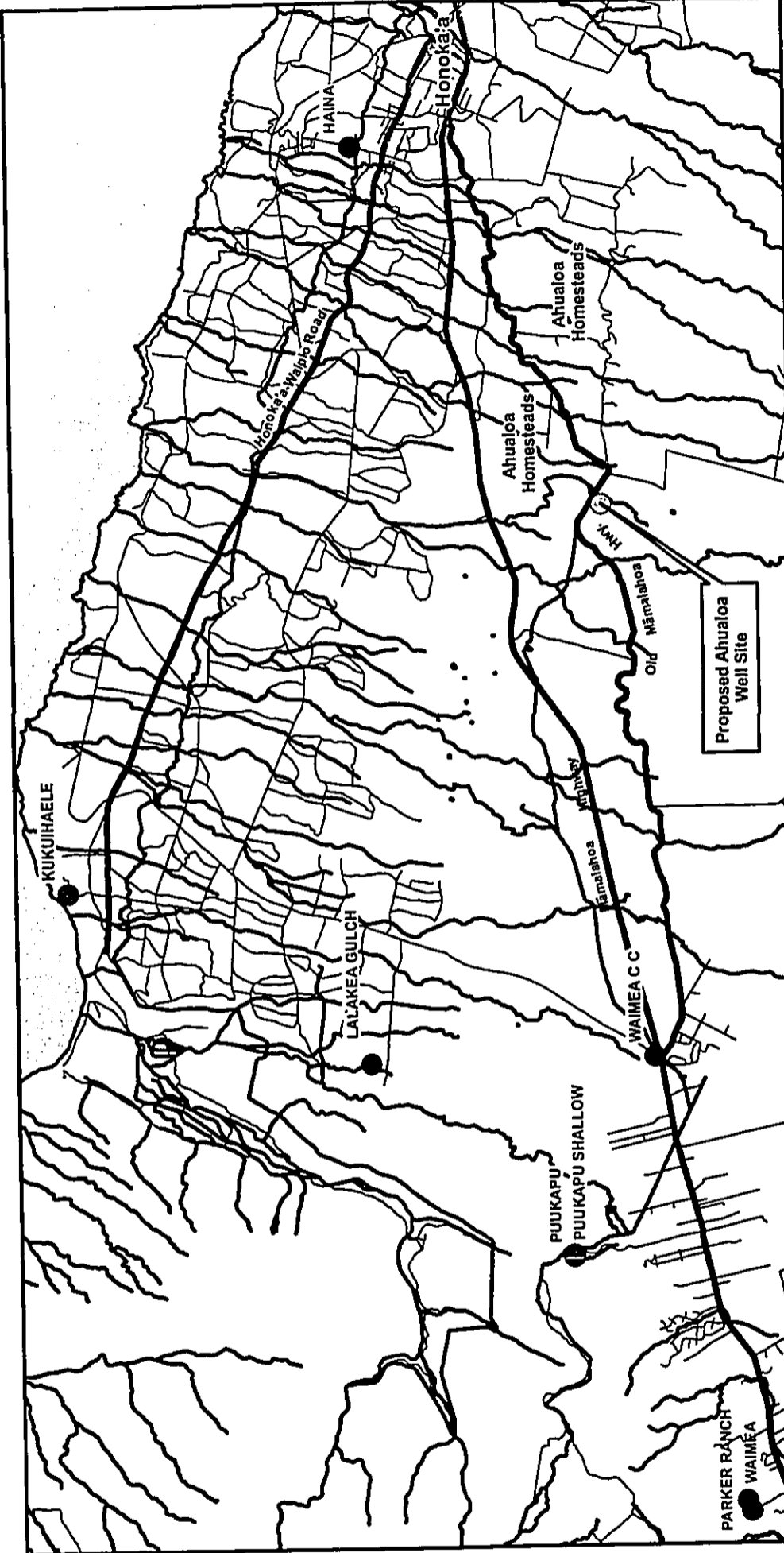


Figure 4-1:

## Wells In the Honoka'a Aquifer System

Āhualoa Production Well & Reservoir Project

Legend:

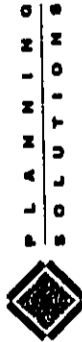
- Well Sites
- Streams
- Highways
- Roadways



Prepared For:

Department of Water Supply,  
County of Hawai'i

Prepared By:



Source:

—TNWRE, Inc.  
—State of Hawai'i GIS

#### 4.2.2.2 Operational Period.

Construction of the proposed facilities will increase the amount of impermeable surface on the project site and will, therefore, slightly increase the potential for stormwater runoff. As discussed in Section 3.2.2.7, the seepage pit will receive most or all of the additional storm water runoff resulting from the added impermeable area; however during heavy rainfall events some may escape into the small vegetated swale just east of the well.

After the well begins operation, it will discharge approximately 5,000 gallons of water into the drainage system each time the pump starts. This is done so that particulate matter entrained during each well start-up does not enter the water supply system. This arrangement helps assure that only high quality water reaches the Department of Water Supply's customers. Even though the particulate levels in the startup water are higher than is desirable for potable use, they are low compared to naturally occurring levels in surface runoff. The frequency of startups will change over time as water use from the system increases. Initially, engineers expect that the pump will cycle on and off approximately once a day. The seepage pit planned for just north of the well pad will be used to dispose of the water from pump startup, as well as tank overflow and hydrotest water.

At a pumping rate of 775 gpm, the well's maximum yield is 1.116 MGD. If the pump is upgraded to 1,565 gpm in the future, it could draw up to 2.253 MGD. Both of these numbers are small fractions of CWRM's estimated sustainable yield for the Honoka'a aquifer, and even in combination with the existing wells described above the total withdrawal from the aquifer would be well less than 20% of its estimated sustainable yield. Consequently, no significant effect on other groundwater use is anticipated. It is also worth noting that drawing water from the well instead of the Kohākōhau Stream would not affect groundwater contribution to streamflow nearer the coast.

### 4.3 GROUNDWATER CONTAMINATION

#### 4.3.1 EXISTING CONDITIONS

There is very little data on groundwater quality in the immediate vicinity of the project site. As noted above, a USGS test well that was drilled nearby encountered high-level groundwater, but no water quality data were collected before the well was decommissioned.

According to maps prepared by the State Department of Health (DOH 2005a), traces of chemical contaminants were detected in the Haina Well in Honoka'a town on three recent instances. The chemicals encountered (followed by the dates encountered and the concentrations detected) were: atrazine (10/26/04, 0.27 ppb); desethyl atrazine (12/08/03; 0.60 ppb); and hexazinone (12/8/03; 0.15 ppb). Traces of atrazine and desethyl atrazine were also detected at the Wai'uli'uli Spring near Waipio, which is also part of the Honoka'a aquifer system. All three of these contaminants are associated with herbicides used for agriculture. Atrazine levels recorded at both sources were below the maximum contamination level (MCL) of 0.30 ppb.<sup>14</sup> Hexazinone levels at the Haina Well were also well below the EPA-defined contamination level of 3,000 ppb.<sup>15</sup> Desethyl atrazine is a breakdown product of atrazine and there are no maximum contamination levels defined for it (DOH 2005a).

The areas adjacent to the site are used primarily for cattle grazing, which is not chemically intensive. The nearest residence (and therefore the nearest cesspool) is approximately 0.25 miles south of the

<sup>14</sup> Maximum Contaminant Level (MCL) is the highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCL Goals (i.e., the level of a contaminant in drinking water below which there is no known or expected risk to health) as feasible using the best available treatment technology and taking cost into consideration. MCLs are enforceable standards.

<sup>15</sup> Lifetime Health Advisory (LHA) – This 2004 EPA advisory describes a non-regulatory concentration of a drinking water contaminant at which health effects would not be anticipated to occur over a lifetime exposure of 70 years duration. The advisories are based on data describing noncarcinogenic risk from exposure. This is a non-regulatory standard.

site. The nearest up-gradient cesspool is significantly farther away, as most of the land uphill of the site is used for cattle grazing. The vertical separation between it and the formation from which the well would draw water would be at least several hundred feet. Moreover, there are no sites of interest to the State Department of Health Office of Hazard Evaluation and Emergency Response within several miles of the proposed well site (DOH 2005b).<sup>16</sup> Hence, the probability of groundwater contamination at the proposed well site is small.

#### 4.3.1.1 Potential Impacts

As described above in Section 3.2.2.1, the upper 1,400 feet of the well will be cased in solid steel, isolating it from surface water inputs. This, together with the absence of upgradient sources of pollution nearby make it unlikely that the well could be contaminated by existing sources of pollution. No hazardous materials will be used or generated during the drilling itself. DWS will, at the end of the pump test for its exploratory well, collect water samples and test these for the full suite of parameters for which drinking water standards exist to confirm the absence of contaminants that could make it unsuitable as a potable water source.

## 4.4 AIR QUALITY AND MICROCLIMATE

### 4.4.1 EXISTING CONDITIONS

Air quality data from the Hawai'i Department of Health's Air Quality Branch show that the project site (and indeed the *entire State of Hawai'i*) is well within air quality attainment standards for the state and the nation (DOH 2004). The occasional cars traveling along Old Māmalahoa Highway constitute the only source of anthropogenic air emissions near the project site. Sulfur dioxide concentrations occasionally spike due to "vog" or fog produced by active volcanoes, but none of the recorded levels at Hilo, which is much closer to the sources of volcanic emissions than the project site, exceeded State limits during 2004.

The National Climatic Data Center's station at the Lālamilo Field Office<sup>17</sup>, situated at approximately the same elevation (about 2,600 feet) as the project site, receives approximately 18 inches of rain per year. The Makahalau station nearer the project site but at a higher elevation (3,821 feet) receives about 25 inches per year. Thus, rainfall at the project site probably lies somewhere in between. At both stations, January is typically the wettest month and the summer months are the driest (NOAA 2002). Cloud drip is also an important source of moisture at higher elevations in the Hāmākua District, where the proposed well site is located.

Temperatures in the area are moderate. In higher elevation areas such as the proposed well site, average daily low temperatures are typically 58-64 degrees Fahrenheit, and the average daily high temperatures are 76-80 degrees year round. It is unlikely that temperatures at the well site ever reach 90 degrees.

No site-specific wind data are available from the well location. However, prevailing wind maps for the island suggest that the proposed Āhualoa well site is partially protected from the prevailing northeast trade winds. Wind direction at the site remains generally constant throughout the day, traveling upslope from the east-northeast at speeds of 0.5 to 1 meters per second (Juvik & Juvik 1998).

<sup>16</sup> TMK Map (3) 4-6-11 names the parcel just across Māmalahoa Highway from the well site (TMK 4-6-11:044) "Āhualoa Landfill Site." In researching potential well contamination issues, DWS contacted the County Finance Department and found that the site was once slated to be a landfill under Executive Order 2827, however Executive Order 3297 cancelled those plans in 1985. The site is currently under the jurisdiction of the State Department of Land and Natural Resources.

<sup>17</sup> Climatic data is from the National Climatic Data Center/NESDIS/NOAA Lalamilo Field Office 19, Station #515260.

#### 4.4.2 POTENTIAL AIR QUALITY IMPACTS

**Construction Period.** Construction of the proposed well and facilities will require grading and excavation, which have the potential to temporarily generate fugitive dust. The project site's moist climate and relative protection from strong trade winds reduce the potential for airborne dust during construction. Potential adverse effects will be further minimized by the dust control measures the contractor will implement in accordance with Hawai'i Administrative Rules Title 11, Chapter 59 and Chapter 60.

The operation of internal combustion engines that power the construction equipment will add small amounts of pollutants to the atmosphere during the few months that site work is underway. The amounts are small, however, and do not have the potential to affect the local or regional air quality substantially.

**Operational Period.** Normal operation of the proposed facilities will not produce on-site air emissions. Neither are the structures sufficiently large to alter airflow or other microclimatic conditions in the vicinity. The well pump and controls will require some electricity, however DWS anticipates that overall, energy use will decrease with the new well, as water will not need to be pumped uphill from Honoka'a or Waimea to higher elevation areas. In any case, the electrical energy that would be used by the pump and controls will represent a very small fraction of total electrical power use on the island, and the change in gaseous emissions from generating facilities would not have a substantial effect on ambient air quality.

### 4.5 HAZARDOUS MATERIALS

#### 4.5.1 EXISTING CONDITIONS

No structures using asbestos-containing materials, lead-based paint, or other hazardous materials exist on or near the site. As noted above, the site is used occasionally by the County Department of Public Works for disposal of small quantities of non-hazardous green waste, and it was previously used only as a County rock quarry.

#### 4.5.2 POTENTIAL IMPACTS

Construction and operation of the well, the 1.0 MG tank, and the supporting facilities will not use or generate any hazardous materials.

### 4.6 TERRESTRIAL FLORA AND FAUNA

#### 4.6.1 EXISTING CONDITIONS

##### 4.6.1.1 Vegetation

Rana Productions, Ltd. conducted a survey of botanical and faunal resources at the proposed well site on September 22 and 24, 2005, which is included as Appendix A. The study characterized the habitat present within the parcel containing the proposed well site as dominated by a community of non-native grasses with Henry's Crabgrass (*Digitaria ciliaris*) being the most abundant. There is a windbreak of ironwood (*Casuarina equisetifolia*) trees on the western edge of the parcel. There are numerous strawberry and common guava (*Psidium cattleianum*, *P. guajav*) bushes and trees and remnant pockets of 'Ō'hia (*Metrosideros polymorpha*) with mixed understory in the central part of the site, and a mixed 'Ō'hia forest with a ginger (*Hedychium* spp.) and fern understory on the eastern boundary of the parcel. No plant species currently listed as endangered, threatened or proposed for listing under either the Federal or the State of Hawai'i's endangered species programs was detected on the site (DLNR 1998, Federal Register 1999a, 1999b, 2001, 2002, 2004). Given the disturbed

nature of the habitat due to cattle grazing, there is no reason to believe that any rare or endangered species are present or that the area hosts biologically sensitive habitats or communities.

#### 4.6.1.2 Mammals

With the exception of the endangered Hawaiian hoary bat (*Lasiurus cinereus semotus*), or 'Ōpe'ape'a as it is known locally, all terrestrial mammals currently found on the Island of Hawai'i are alien species. The survey noted evidence of dogs (*Canis f. familiaris*), Indian mongoose (*Herpestes a. auropunctatus*), and feral pigs (*Sus s. scrofa*) at the site, all of which are introduced mammals considered deleterious to Hawaiian ecosystems. No rodents were detected during the course of the survey, however it is likely that roof rats (*Rattus r. rattus*), Norway rats (*Rattus norvegicus*), European house mice (*Mus domesticus*) and possibly Polynesian rats (*Rattus exulans hawaiiensis*) use resources within the general project area.

Although the survey did not detect the endangered Hawaiian hoary bat on the site, it is likely that bats occasionally forage within the general project area (Jacobs 1994, R. David unpublished field notes 1985-2005). Unlike nocturnally flying seabirds, which often collide with man-made structures, bats are uniquely adapted to avoid collision with obstacles, man-made or natural. They navigate and locate their prey primarily using ultrasonic echolocation, which is sensitive enough to allow them to locate and capture small, volant insects at night.

#### 4.6.1.3 Avian Fauna

An avian survey was also undertaken at the site (see Appendix A). All of the avian species recorded are considered alien to the Hawaiian Islands. The surveyor noted that avian diversity and densities were remarkably low at the site, with one species, the Japanese White-eye (*Zosterops japonicus*) accounting for 26% of the total number of birds recorded. No species currently listed as endangered, threatened or proposed for listing under either the Federal or the State of Hawai'i's endangered species programs was detected on the site (DLNR, 1998, Federal Register, 1999a, 1999b, 2001, 2002, 2004).

In general, the habitat currently found within the project area and within the alien-species dominated pasture land in the Hāmākua District is not conducive to supporting native forest birds, with the possible exception of Short-eared Owls (*Asio flammeus sandwichensis*), and Hawaiian Hawks (*Buteo solitarius*). It is also possible that small numbers of the endangered endemic Hawaiian Petrel (*Pterodroma sandwichensis*), and the threatened Newell's Shearwater (*Puffinus auricularis newelli*), over-fly the project area between the months of May and November on their way out to sea (Banko, 1980a, 1980b, Day et al., 2003a, Harrison, 1990). These seabirds are sensitive to upward-projecting light; it has been known to disorient them, causing them to fall to the ground or collide with manmade structures.

#### 4.6.2 POTENTIAL IMPACTS

The survey noted that much of the site has clearly been bulldozed, excavated and generally altered by anthropogenic efforts. There are several old, four-wheel drive roads traversing the site and the old quarry pit is still very evident in the northwest corner of the parcel. The habitat present within the subject property is highly degraded and dominated by alien species, with the exception of a few remaining patches of native 'Ō'hia forest. The survey concluded that further modification of the habitat is not expected to result in deleterious impacts to any avian, mammalian or botanical species currently listed as endangered, threatened or proposed for listing under either Federal or State of Hawai'i endangered species programs.

Construction of proposed well and associated facilities will occur in areas of the site that are disturbed and dominated by introduced grasses (see Figure 3-1 for photographs); the small but relatively high quality stands of 'Ō'hia located in the middle of the site and along the eastern boundary will not be displaced by the proposed facilities. Any exterior lighting planned for the facility will be shielded in

accordance with Hawai'i County Code §14-50 et seq.<sup>18</sup>; and this will help to minimize the possibility of disorienting Newell's Shearwaters and Hawaiian Petrels that may fly over the area. The project will likewise not affect important habitat for Hawaiian Hoary Bat nesting or foraging.

In summary, no substantial impacts to terrestrial flora and fauna are expected as a result of the proposed project.

#### 4.7 NOISE

##### 4.7.1 EXISTING CONDITIONS

Table 4.1 summarizes quantitative measurements taken on the site on September 22, 2005. The only discernable noise sources were insects, cattle, wind in the foliage, and the occasional passing car along Old Māmalahoa Highway.

##### 4.7.2 CONSTRUCTION PHASE NOISE IMPACTS

Occasional operation of diesel-powered equipment will occur on the site during the 27-month construction period. Noise from the loudest un-muffled equipment of this sort can be as high as 80 to 85 dBA measured at a distance of 50 feet. The nearest noise-sensitive site, a residence, is approximately 1/2 mile from the project site; natural noise attenuation will reduce peak construction noise levels to just over 50 dBA by the time it reaches that home. Noise levels on other, more distant properties would be lower. This noise would be present only for a short time during daytime hours.

Table 4.1. Baseline Sound Levels in dBA at Āhualoa Well Site: September 22, 2005.

<i>Station Description</i>	<i>Baseline Sound Levels in dBA<sup>1</sup></i>		
	<i>Leq<sup>2</sup></i>	<i>MaxP<sup>3</sup></i>	<i>MaxL<sup>5</sup></i>
Proposed Well Site	47.8	98.8	53.3
<sup>1</sup> A person's ability to hear a sound depends greatly on its frequency. Young, healthy people can hear frequencies as low as about 20 Hertz (Hz) and as high as about 20,000 Hz (one hertz is equivalent to one wave per second, or cycle, per second). People hear sounds best when the predominant sound energy is between 1,000 and 6,000 Hz. To measure sound on a scale that reflects the way people perceive it, more weight must be given to the frequencies that people hear more easily. The U.S. EPA recommends the A-weighting scale for environmental noise because it is convenient to use, accurate for most purposes, and is used extensively throughout the world.			
<sup>2</sup> Equivalent Sound Level (Leq). This variable is the root-mean square (RMS) average of the time-varying sound energy measured during the 10-minute measurement interval. Leq correlates reasonably well with the effects of noise on people, even for wide variations in environmental sound levels and time patterns.			
<sup>3</sup> Maximum Sound Level (Lmax). This is the maximum sound level (1-second integrated value) recorded during the measurement interval.			
<sup>4</sup> Maximum Peak Level (MaxP). This is the instantaneous maximum sound level measured during the measurement interval.			
Source: Planning Solutions, Inc. Sound levels were recorded continuously over a ten-minute period using a Brüel & Kjær Type 2239A Integrating meter. The meter was set to integrate data every second using the A-weighting scheme.			

Hawai'i Administrative Rules (HAR) §11-46 defines three classes of zoning districts and specifies corresponding maximum permissible sound levels due to (i) stationary noise sources and (ii)

<sup>18</sup> This regulation was enacted to lower the ambient glare caused by unshielded lighting to the astronomical observatories located on Mauna Kea.

equipment related to agricultural, construction, and industrial activities. These are reproduced in Table 4.2. The noise limit for "Class C Districts" [which §11-46-3(3) defines as "...all areas equivalent to lands zoned agriculture, country, industrial, or similar type."] is 70 dBA at any time. The limits are applicable at the property line.

Because construction noise will be below 70 dBA at the property line of the nearest residence, no noise permit will be needed for the construction work.

#### 4.7.3 OPERATIONAL PHASE NOISE IMPACTS

The well pump and motor are submersible and will produce very little noise. Noise from the proposed well will be very low or undetectable at the property line, and therefore the facility will be compliant with HAR §11-46.

**Table 4.2. Maximum Permissible Sound Levels in dBA (HAR §11-46)**

<i>Zoning Districts</i>	<i>Daytime (7 a.m. to 10 p.m.)</i>	<i>Nighttime (10 p.m. to 7 a.m.)</i>
Class A	55	45
Class B	60	50
Class C	70	70

Notes:

(a) The maximum permissible sound levels apply to any excessive noise source emanating within the specified zoning district, and at any point at or beyond (past) the property line.

(b) Noise levels may not exceed the maximum permissible sound levels for more than ten per cent of the time within any twenty-minute period, except by permit or variance issued under sections 11-46-7 and 11-46-8.

(c) For mixed zoning districts, the primary land use designation shall be used to determine the applicable zoning district class and the maximum permissible sound level.

(d) Measurements values are for "A" weighting network and "slow" meter response unless otherwise stated. Sound level meters and calibrators must conform to American National Standard, ANSI S1.4-1983, specifications. The maximum permissible sound level for impulsive noise is ten dBA above the maximum permissible sound levels shown and is measured using the "Fast" meter response.

(e) The limits do not apply to the operation of emergency generators, provided the best available control technology is implemented.

(f) For the purpose of the regulations, the following definitions apply:  
 "Construction activities" means any or all activities, including but not limited to those activities necessary or incidental to the erection, demolition, assembling, renovating, installing, or equipping of buildings, public or private highways, roadways, premises, and parks.  
 "Construction equipment" means any device designed and intended for use in construction, including but not limited to any air compressor, pile driver, bulldozer, pneumatic hammer, steam shovel, derrick, crane, tractor, grader, loader, power saw, pump, pneumatic drill, compactor, on-site vehicle, and power hand tool.  
 "Construction site" means any or all areas, necessary or incidental for the purpose of conducting construction activities.

(g) Class A zoning districts include all areas equivalent to lands zoned residential, conservation, preservation, public space, open space, or similar type.  
Class B zoning districts include all areas equivalent to lands zoned for multi-family dwellings, apartment, business, commercial, hotel, resort, or similar type.  
Class C zoning districts include all areas equivalent to lands zoned agriculture, country, industrial, or similar type.

Source: Hawai'i Administrative Rules, Title 11, Department of Health, Chapter 46, Community Noise Control

## 4.8 TRANSPORTATION

### 4.8.1 EXISTING CONDITIONS

Access to the site is via Old Māmalahoa Highway, a two-lane paved road that was formerly the main road between Honoka'a and Waimea. With the construction of the main Māmalahoa Highway, the Old Highway has experienced less use and is primarily used by residents living along it and heavy trucks traveling to and from an active quarry west of the proposed well site; most through traffic uses the main highway.

### 4.8.2 POTENTIAL IMPACTS

*Construction Period.* No off-site road improvements are planned as part of the well's construction. Construction vehicles have previously used the road in order to construct homes and DWS facilities located there without difficulty. Trucks and passenger cars will bring workers, equipment, and building materials to the site, slightly increasing traffic on Old Māmalahoa Highway. The number will be small, generally less than 10 to 20 vehicle-trips per day; that, together with the very low existing traffic volumes means that roadway capacity will be more than adequate to accommodate these movements. Heavy trucks may occasionally slow other vehicles traveling in the same direction, and there is limited room in some areas for vehicles traveling in opposite directions to pass one another. Consequently, the construction traffic will increase the required travel time. However, the short distance over which this will occur, the small number of vehicles that will be affected, and the limited duration of the construction work mean that the impact will be small. Site construction does not entail work in the existing road right-of-way, eliminating that as a potential source of adverse effects.

*Operational Period.* The well will not require manned operation, but only occasional monitoring and maintenance. Service vehicles will park in designated on-site stalls and will not interfere with traffic. Consequently, operation of the facility will have virtually no effect on traffic in the area.

## 4.9 ARCHAEOLOGICAL, HISTORIC AND CULTURAL FEATURES

### 4.9.1 EXISTING CONDITIONS

PHRI surveyed the proposed well site for historic and archaeological resources on September 22, 2005 and conducted research to determine whether any existing cultural uses exist on the site or in the immediate vicinity. No physical evidence of any prehistoric or early historic period occupation or use of the project area was encountered, nor was any evidence of any potentially significant cultural properties, features, natural resources, practices, or beliefs. The remnants of native Ō'hia forest suggested that the project area may at some time have been traversed by people in the process of obtaining various forest resources, however no physical remains of any such transitory occupation or exploitation were encountered. Furthermore, the few native plant resources (see Section 4.6.1.1) present within the project area are neither rare nor unique, and are common and readily available in relative abundance through much of the general vicinity of the Hāmākua District.

The project area has evidently been extensively modified and developed during historic times, as indicated by (a) the existing modified condition, (b) the present vegetation cover, and (c) the negative findings of the field inspection which yielded no physical evidence of the presence of any potentially significant cultural resources either within or related to the project site. Furthermore, there is no indication of any kind that the project area has resources necessary to or currently being used by either Native Hawaiian cultural practitioners exercising traditional and customary access and use rights for any purposes or by individuals of any other cultural affiliation for any traditional cultural purposes. The parcel is fenced and has been under County management for many years. PHRI's complete report is included as Appendix B.



#### 4.9.2 POTENTIAL IMPACTS

Based on the negative results of the archaeological field inspection and the absence of any evidence that the proposed well site is currently being used for traditional cultural purposes, it can be concluded that the construction and operation of the proposed Āhualoa Production Well and Reservoir should have no significant effects upon any archaeological or cultural resources.

Nonetheless, the DWS construction contract for work on the parcel will stipulate that should any artifact or burial site be encountered during construction, all activities would halt and SHPD would be notified. It will provide that work may be resumed only after consultation with the SHPD is completed and a monitoring program is in place.

#### 4.10 NATURAL HAZARDS VOLCANIC AND SEISMIC HAZARDS

##### 4.10.1 RISK FROM LAVA FLOWS

There are no Hawaiian traditions documenting eruptions of Mauna Kea, and it probably has not been active during the last 2,000 years, but it is unknown whether the volcano is extinct or only dormant. Occasional earthquakes originate beneath it, emphasizing the possibility that it may someday erupt again (Macdonald et al. 1983).

The U.S. Geological Survey has divided the island into zones based on the probability of coverage by future lava flows; Zone 1 represents the greatest hazard and Zone 9 the least. As shown in Figure 4-2, the proposed Āhualoa well site is in Zone 8, which signifies an area with a relatively low probability of lava flows (Juvik & Juvik 1998).

##### 4.10.2 RISK FROM EARTHQUAKES

The USGS has not defined hazard zones for the effects of earthquakes. Figure 4-3 and Table 4.3 describe the major earthquakes that have occurred there in historic times, none of which were centered near the project site.

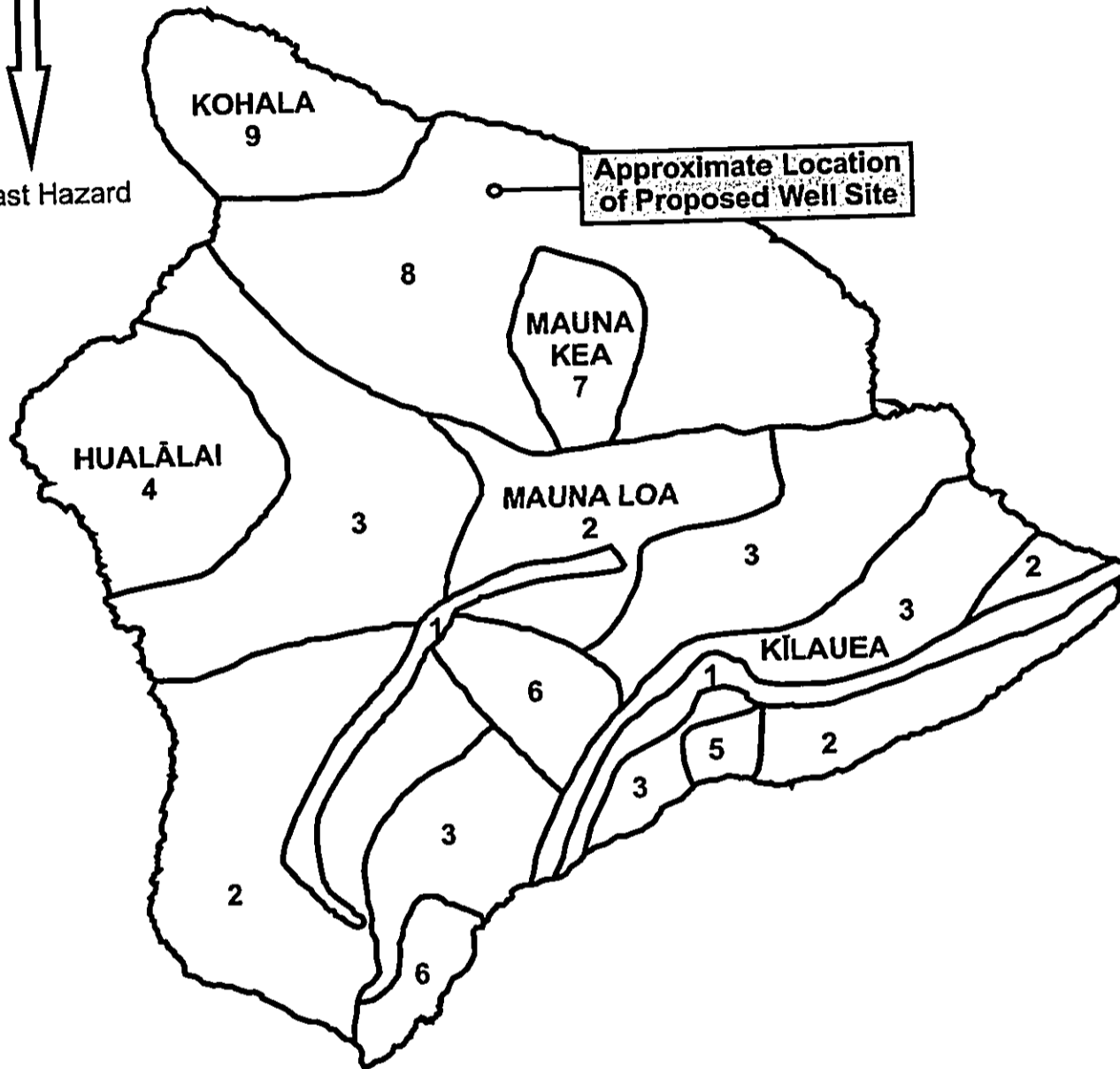
For the purposes of structural design, the entire Island of Hawai'i is classified as Zone 4 (10% chance of severe ground shaking in a 50-year interval) by the Uniform Building Code adopted by the County of Hawai'i in 1993 (USGS 1997). This is the highest risk category that is assigned. All structures associated with the proposed well will be built to comply with the Uniform Building Codes for Earthquake Zone 4.

##### 4.10.3 FLOOD AND TSUNAMI HAZARDS


The proposed well site is in an area designated as Zone X on the Flood Insurance Rate Map (FIRM) by the Federal Emergency Management Agency. Zone X signifies an area that has been determined to be outside the 500-year floodplain. The site is not located within a designated Flood Hazard Safety Area (FHSA). As discussed in Section 4.2, virtually no overland flow enters the site from surrounding areas. The nearby intermittent stream (the 'Ino'ino Gulch) is located in a well-defined drainageway at least 40 feet deep and is separated from the site by a steep ridge; consequently, the site is well protected from high stream flows and flash floods.

**Legend:**

- 1 Most Hazard
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9 Least Hazard



Prepared For:  
County of Hawai'i  
Department of Water Supply

Prepared By:  
 PLANNING  
SOLUTIONS

Source:  
--Dept. of Interior USGS  
--County of Hawai'i Office of Planning

**NOTE:** The island of Hawaii is divided into zones according to the degree of hazard from lava flows. Zone 1 is the area of the greatest hazard, Zone 9 of the least.

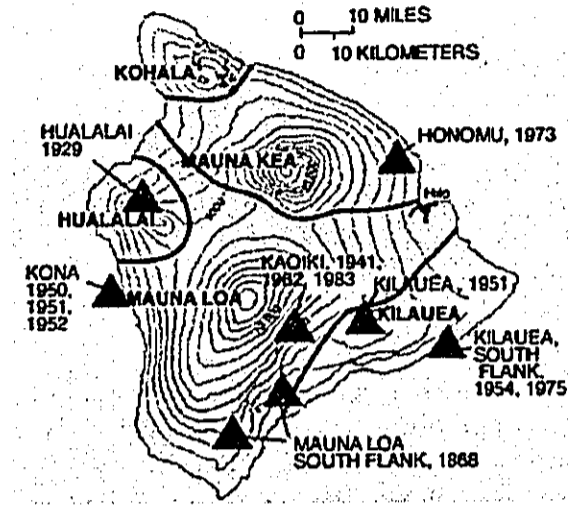
Figure 4-2:

### Lava Hazard Zones

Āhualoa Production Well  
& Reservoir Project

Figure 4-2 Lava Hazard Zones 2005-09-27.dwg

**Figure 4-3. Generalized Locations of Damaging Earthquakes of Magnitude 6 or Greater Since 1868 on the Island of Hawai'i**



Source: Volcanic and Seismic Hazards on the Island of Hawai'i. Updated July 18, 1997

**Table 4.3. Damaging Earthquakes of Magnitude 6 or Greater Since 1868 on the Island of Hawai'i**

<i>Year</i>	<i>Date</i>	<i>Location</i>	<i>Magnitude</i>	<i>Depth (Mi)</i>
1868	Mar. 28	Mauna Loa south flank	6.5-7.0*	No data
1868	Apr. 2	Mauna Loa south flank	7.5-8.1*	No data
1929	Oct. 5	Hualalai	6.5*	No data
1941	Sept. 25	Ka'oiki	6.0*	No data
1950	May 29	Mauna Loa southwest rift	6.2	No data
1951	Apr. 22	Kilauea	6.3	20
1951	Aug. 21	Kona	6.9	5
1952	May 23	Kona	6.0	5
1954	Mar. 30	Kilauea south flank	6.5	5
1962	June 27	Ka'oiki	6.1	6
1973	Apr. 26	Hono'u	6.2	25
1975	Nov. 29	Kilauea south flank	7.2	6
1983	Nov. 16	Ka'oiki	6.6	7
1989	June 25	Kilauea south flank	6.1	9

Note: The magnitudes marked by an (\*) are based on eyewitness accounts of the earthquakes' effects and on reports of damage.

Source: USGS 1997.

## 4.11 SCENIC AND AESTHETIC RESOURCES

### 4.11.1 EXISTING CONDITIONS

The parcel containing the proposed well site is overgrown with vegetation along the highway frontage to the north and along most of its western and eastern sides, so most of it is not visible to vehicles passing along Old Māmalahoa Highway. The southern boundary of the parcel, where the well facilities would be located is open grassland, as are the adjacent properties, so there is greater visibility. The well facilities will likely be visible from the nearest residence, which is about 0.25 miles away and visible during good weather conditions. No other residences are visible to the naked eye from the proposed well site.

### 4.11.2 POTENTIAL IMPACTS

As noted above, the facilities to be constructed should not be visible from the highway below; some of them will be visible to the nearest residence, but it is far enough away that the facilities should not detract from its expansive view across the grasslands. The tallest of the facilities planned is the 1.0 MG reservoir, which will have a 20 foot operating height and will be situated on a small hill. The small external antenna that will be installed on the roof of the control building as part of the SCADA system will not noticeably detract from views any more than the proposed reservoir and control facilities. For these reasons, the project will not have any substantial impacts on scenic and aesthetic resources.

## 4.12 EXISTING LAND USE & ECONOMIC AND CULTURAL ENVIRONMENT

### 4.12.1 EXISTING CONDITIONS

As noted above, the site is a former County of Hawai'i quarry site. The surrounding land is privately owned and is presently used for cattle grazing. The nearest dwelling is about a quarter of a mile to the south of the proposed well site. There are no other commercial or industrial activities in the immediate area.

The proposed well site is contained within Census Tract 219, which includes Honoka'a town and Āhualoa Homesteads (see Figure 4-4). The 2000 population of Census Tract 219 was 3,895 people. These constituted 1,316 households. The area reported a median household income of \$40,086 in 2000, which is a bit lower than the statewide median household income in 2000, which was \$49,820. Unemployment in that year was at 6.6% of the civilian labor force, which was comparable to the statewide average of 6.3%. The average commuting time of working residents was 32 minutes each way, suggesting that some probably commute to Hilo for work. Educational attainment in the project area was comparable to the State average in 2000, with approximately 18% of residents in Census Tract 219 holding at least a bachelor's degree compared to 17.8% of state residents.

More than 30% of employed residents were working in the "Arts, entertainment, recreation, accommodation and food services" sector, and another 11% were in retail, which is a reflection of the Hāmākua Coast's value as a tourist destination. About 6% of the working population were employed in agriculture and another 6% in construction. As noted above, the area is experiencing moderate growth, some of which has come about in the form of existing property owners subdividing their larger agricultural parcels for residential use.

### 4.12.2 POTENTIAL IMPACTS

As noted above, the site is mostly overgrown and has fallen largely out of use since the old quarry there was abandoned. The site is fenced off from the adjacent pasture land (except on the side facing

the road) to prevent cattle from entering the site and potentially falling into the quarry pit. Thus, there are no existing agricultural activities at the site that would be displaced by the proposed well.

The only current use of the parcel containing the well site is for the disposal of small amounts of green waste by the County. The proposed well represents a new use of the land. However, it is a use that is not incompatible with the surrounding rural landscape. Other DWS facilities already exist a short distance down the road. As discussed in other sections, the project will not create significant visual impacts, traffic, or noise, and is well away from sensitive land uses. The project will also not affect recreational activities in the area.

The proposed well and reservoir will increase DWS's total source and storage capacity for its customers in Āhualoa-Hāmākua and Honoka'a. This will allow the Department to meet current system demands and provide a reliable backup source for the Haina Well and the planned Honoka'a Well. It will also provide potable water to accommodate the population growth that is anticipated to occur in the area. Aside from the temporary construction employment and expenditures that it would create, the project will not in and of itself stimulate or otherwise promote population growth or economic activity.

#### 4.13 LAND OWNERSHIP

The parcel containing the proposed well site is already County-maintained. The land was granted to the County by the State through Executive Order 2554 for the purpose of the quarry. It is currently maintained by the *Department of Public Works*, and there are no existing plans to resume use of the site as a quarry. The County Department of Finance has stated that it has no objection to granting DWS a survey right-of-entry and construction right-of-entry for the drilling and testing of the exploratory well. Upon completing the well construction plans, DWS intends to obtain the construction right-of-entry needed to construct the exploratory well. If the well tests indicate that it will produce a sufficient yield, DWS will request the State Department of Land and Natural Resources to issue another executive order for the use of a portion of the site as a well (and future reservoir) site.

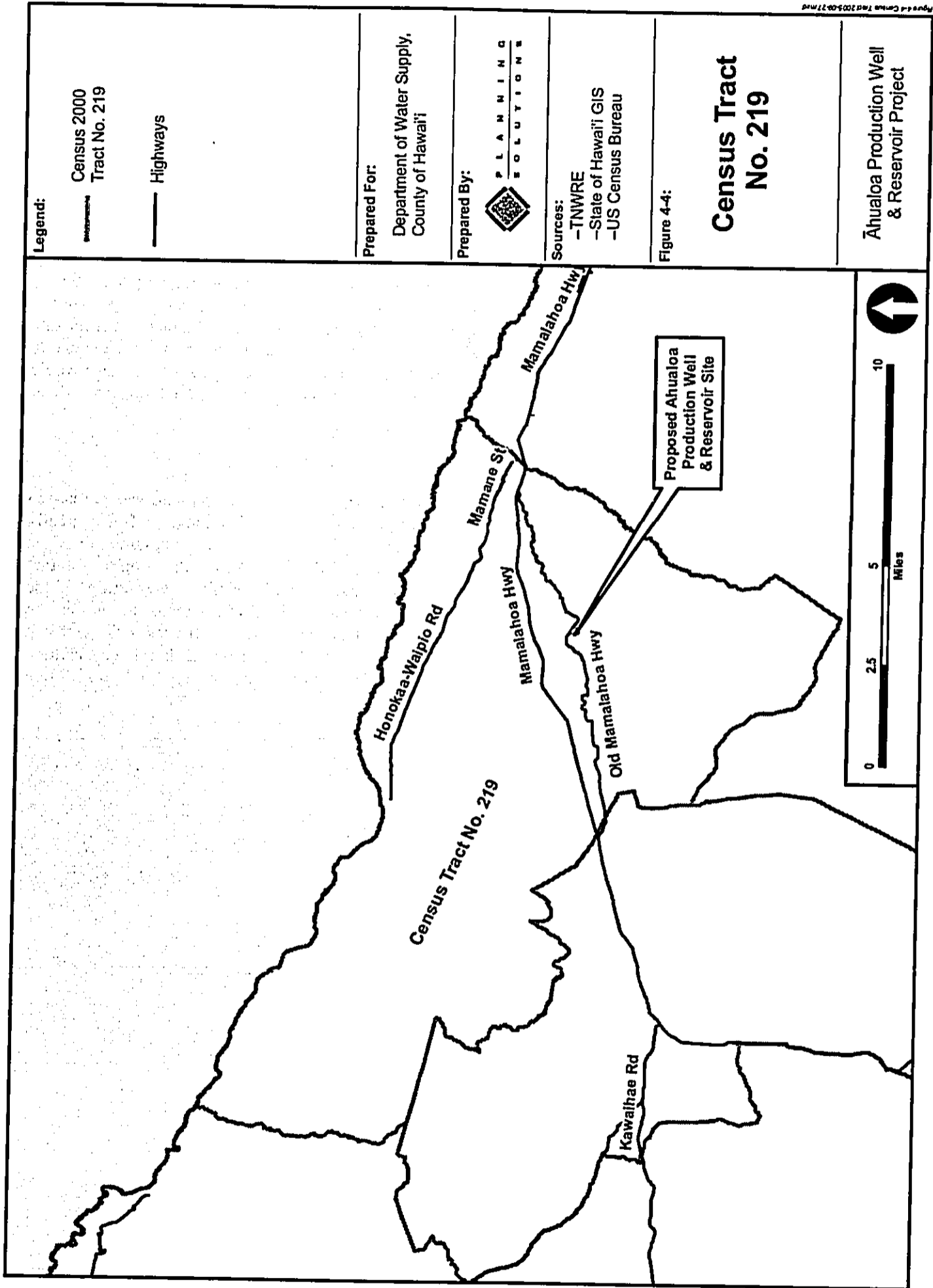


Figure 4-4: Ahualoa Production Well & Reservoir Project

U.S. GEOLOGICAL SURVEY WATER RESOURCES DIVISION

## 5.0 RELATIONSHIPS TO RELEVANT PLANS, POLICIES & CONTROLS

### 5.1 COUNTY AND STATE REGULATIONS

#### 5.1.1 COUNTY OF HAWAI'I GENERAL PLAN

##### 5.1.1.1 Applicable Goals, Policies, and Recommended Actions

The Department of Water Supply operates and maintains twenty-three separate water systems in the County of Hawai'i, including the ones in the Honoka'a and Āhualoa-Hāmākua areas. As discussed in Section 1.2, DWS has a policy of shifting potable water systems from surface water sources to groundwater sources. One of the reasons for this is the high costs associated with treating surface water sources such as the Kohākōhau Stream. The County of Hawai'i acknowledged these costs in the Revised General Plan of 2001:

*Surface water or a groundwater source under the influence of surface water is required to be treated and quality monitored to ensure compliance with the SDWA [Safe Drinking Water Act], whereas groundwater need only be chlorinated. As such, the maintenance of surface water systems are much more expensive and labor intensive.*

The General Plan further notes that:

*Surface water flows depend on weather conditions. During extremely dry weather conditions, the flow may drop below the required rate. During high rainfall periods the water may be turbid.*

The 2001 Draft Revision to the *Hawai'i County General Plan* contains goals and policies concerning the development and operation of essential water supply facilities. The *General Plan* recognizes that water supply facilities are needed to support the patterns of development which the *General Plan* seeks to achieve. It makes planning for the location of utility facilities such as wells, reservoirs, and pumping stations an integral part of the land planning process.

The *Draft 2001 General Plan* makes it the goal of the County to address the following water supply issues:

- Ensure that properly regulated, adequate, efficient and dependable public and private utility services are available to users.
- Maximize efficiency and economy in the provision of public utility services.
- Design public utility facilities that fit into their surroundings or are concealed from public view.

To achieve those goals, the *2001 Draft General Plan* makes it County policy to:

- Design public utility facilities so that they complement adjacent land uses and operate them so as to minimize pollution or disturbance.
- Encourage the use of properties or easements owned by public or private utility companies or agencies as supplemental open space and recreational areas.
- Provide utilities and service facilities that minimize total cost to the public and effectively service the needs of the community.
- Design utility facilities to minimize conflict with the natural environment and natural resources.
- Improve existing utility services to meet the needs of users.
- Develop capital improvement programs and plans for public utilities that are consistent with the General Plan.

PLANS, POLICIES, AND CONTROLS

- Correlate water system improvements with the County's desired land use development pattern.
- Design and build all water systems to Department of Water Supply standards.
- Improve and replace inadequate systems.
- Adequately protect water sources to prevent depletion and contamination from natural and manmade occurrences or events.
- Install water system improvements first in areas that have established needs and characteristics, such as occupied dwellings, agricultural operations and other uses, or in areas adjacent to them if there is need for urban expansion.
- Develop a coordinated effort by County, State and private interests to identify sources of additional water supply and implement it to ensure the development of sufficient quantities of water for existing and future needs of high growth areas and agricultural production.
- Promote the use of ground water sources to meet State Department of Health water quality standards.
- Seek State and Federal funds to assist in financing projects to bring the County into compliance with the Safe Drinking Water Act.

The *Draft 2001 Hawai'i County General Plan* identifies a number of actions to implement these policies in the Hāmākua District. Several of these are relevant to the proposed well project. Specifically, it directs DWS to:

- Improve existing storage, transmission and distribution facilities.
- Replace old, sub-standard, or deteriorating lines and storage facilities.
- Investigate groundwater sources in the Honoka'a and Kukuihaele areas.

**5.1.1.2 Conformance with the 2001 Hawai'i County General Plan**

The proposed Āhualoa Well and reservoir is consistent with the General Plan's policies of encouraging the use of ground water sources in order to facilitate compliance with DOH standards and seeking Federal funding in support of this objective. Moreover, the well, reservoir, and related facilities are compatible with surrounding land uses and compliant with all applicable design standards. As discussed in Chapter 4, the proposed project is not expected to adversely affect the physical or social environment, and its location upland of the areas it is intended to serve will facilitate the efficient delivery of clean groundwater. In sum, it will allow DWS to continue to meet the needs of the people of the Hāmākua District in a safe and cost-effective manner while complying with all applicable requirements for potable water sources.

**5.1.2 COUNTY OF HAWAI'I ZONING ORDINANCE**

The County zoning of the parcel containing the well site is Agriculture with a minimum site size of 40 acres (Ag-40a). Section 25-4-11 of the County of Hawai'i Zoning Code<sup>19</sup> states that "any substation used by a public utility for the purpose of furnishing telephone, gas, electricity, water, radio, or television" and "public uses, structures and buildings" are permitted uses within any district, provided that a plan approval is obtained. The proposed well project is both a public utility substation and a public use and structure, and thus is considered a permitted use in the Ag-40a District. DWS will submit an *Application for Plan Approval* to the County Department of Planning to obtain the necessary director's approval for the project. At about 18 acres, the parcel containing the proposed well site is well under the 40-acre minimum parcel size specified for the Ag-40a district. DWS is not proposing to subdivide it any further as part of the proposed well project.

<sup>19</sup> 1996, Ord. No. 96-160, sec. 2 (as ratified and amended in April 1999).



**5.1.3 DRINKING WATER STATE REVOLVING FUND (DWSRF)**

DWS may apply to have the project partially or wholly funded by Federal funds through the State of Hawai'i's Drinking Water State Revolving Fund (DWSRF) program. The U.S. Congress established the DWSRF program as a new section 1452 of the Safe Drinking Water Act (SDWA), 33 U.S.C. 300j-12, by the SDWA Amendments of 1996, Public Law 104-182. The DWSRF was established to help prevent contamination through source water protection and enhanced water system management. It emphasizes the needs of small water systems, such as Āhualoa-Hāmākua. The proposed project is consistent with the overall program intent to prevent potential contamination and with the program's emphasis on benefits to small water systems. This document includes all of the environmental information required for compliance with the DWSRF program.

**5.1.4 STATE OF HAWAI'I LAND USE**

The parcel containing the proposed well site is in the State Agriculture District. HRS Chapter 205 §205-4.5 (7) lists public utility facilities such as the proposed well as permissible uses within the State Agricultural District.

**5.2 CROSS-CUTTING FEDERAL ENVIRONMENTAL AUTHORITIES****5.2.1 ARCHEOLOGICAL AND HISTORIC PRESERVATION ACT (16 U.S.C. § 469A-1) & NATIONAL HISTORIC PRESERVATION ACT (16 U.S.C. § 470(F))**

The archaeological and cultural resource assessment conducted for the project indicates that no known archaeological or historic features exist at the site (see Appendix B). Similarly, there is no evidence that the site is used for cultural practices. DWS will instruct its contractors to halt activity and notify SHPD in the event that any artifact or burial site is encountered during construction.

**5.2.2 CLEAN AIR ACT (42 U.S.C. § 7506(C))**

As discussed in Section 4.4, air quality at the Āhualoa Well site is good. It is in an air quality attainment area as defined by the State of Hawai'i Department of Health in its EPA-approved air quality program (DOH 2004). Measures will be taken to control fugitive dust during construction in accordance with Hawai'i Administrative Rules Title 11, Chapters 59 and 60. Normal operation of the proposed facilities will not produce on-site air emissions, will not alter airflow in the vicinity, and will have no other measurable effect on the area's microclimate.

**5.2.3 COASTAL BARRIER RESOURCES ACT (16 U.S.C. § 3501)**

Coastal Barrier Resources Act (CBRA), Public Law 97-348 (96 Stat. 1653; 16 U.S.C. 3501 et seq.), enacted October 18, 1982, designated various undeveloped coastal barrier islands, depicted by specific maps, for inclusion in the Coastal Barrier Resources System (System). Areas so designated were made ineligible for direct or indirect Federal financial assistance that might support development, including flood insurance, except for emergency life-saving activities. Exceptions for certain activities, such as fish and wildlife research, are provided, and National Wildlife Refuges and other, otherwise protected areas are excluded from the System. The proposed project will not affect any areas protected by this Act.

**5.2.4 COASTAL ZONE MANAGEMENT ACT (16 U.S.C. § 1456(C) (1))**

Enacted as Chapter 205A, HRS, the Hawai'i Coastal Zone Management (CZM) Program was promulgated in 1977 in response to the Federal Coastal Zone Management Act of 1972. The CZM area encompasses the entire state, including all marine waters seaward to the extent of the state's police power and management authority, including the 12-mile U.S. territorial sea and all archipelagic waters.

The Hawai'i Coastal Zone Management Program focuses on ten policy objectives:

- **Recreational Resources.** To provide coastal recreational opportunities accessible to the public and protect coastal resources uniquely suited for recreational activities that cannot be provided elsewhere.
- **Historic Resources.** To 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.
- **Scenic and Open Space Resources.** To protect, preserve, and where desirable, restore or improve the quality of coastal scenic and open space resources.
- **Coastal Ecosystems.** To protect valuable coastal ecosystems, including reefs, from disruption and to minimize adverse impacts on all coastal ecosystems.
- **Economic Uses.** To provide public or private facilities and improvements important to the state's economy in suitable locations; and ensure that coastal dependent development such as harbors and ports, energy facilities, and visitor facilities, are located, designed, and constructed to minimize adverse impacts in the coastal zone area.
- **Coastal Hazards.** To reduce hazard to life and property from tsunami, storm waves, stream flooding, erosion, subsidence, and pollution.
- **Managing Development.** To improve the development review process, communication, and public participation in the management of coastal resources and hazards.
- **Public Participation.** To stimulate public awareness, education, and participation in coastal management; and maintain a public advisory body to identify coastal management problems and provide policy advice and assistance to the CZM program.
- **Beach Protection.** To protect beaches for public use and recreation; locate new structures inland from the shoreline setback to conserve open space and to minimize loss of improvements due to erosion.
- **Marine Resources.** To implement the state's ocean resources management plan.

Other key areas of the CZM program include: a permit system to control development within a Special Management Area (SMA) managed by the Counties and the Office of Planning; a Shoreline Setback Area which serves as a buffer against coastal hazards and erosion, and protects view-planes; and the Marine and Coastal Affairs. Finally, a Federal Consistency provision requires that Federal activities, permits and financial assistance be consistent with the Hawai'i CZM program.

The proposed Āhualoa Well project is located more than five miles from the coastline. It does not involve the placement, erection, or removal of materials near the coastline. As documented in this environmental assessment, the type and scale of the activities that it involves do not have the potential to affect coastal resources significantly. Finally, it is consistent with the CZM objectives that are relevant to a project of this sort.

#### **5.2.5 ENDANGERED SPECIES ACT (16 U.S.C. 1536(A)(2) AND (4))**

The Endangered Species Act (16 U.S.C. §§ 1531-1544, December 28, 1973, as amended 1976-1982, 1984 and 1988) provides broad protection for species of fish, wildlife, and plants that are listed as threatened or endangered in the U.S. or elsewhere. The Act mandates that Federal agencies seek to conserve endangered and threatened species and use their authorities in furtherance of the Act's purposes. It provides for listing species, as well as for recovery plans and the designation of critical habitat for listed species. The Act outlines procedures for Federal agencies to follow when taking actions that may jeopardize listed species, and contains exceptions and exemptions.

Section 4.6 of this EA discusses existing biota on and near the project site. The discussion documents the fact that there are no known rare or endangered species on or immediately adjacent to the project site, and that the project would not affect habitat necessary to their survival.

#### **5.2.6 ENVIRONMENTAL JUSTICE (EXECUTIVE ORDER 12898)**

The Environmental Justice Executive Order was issued in 1994 for the purpose of protecting low-income and minority residents of the United States from disproportionate exposure to environmental and health hazards. Section 1-101 of the Executive Order States:

*To the greatest extent practicable and permitted by law, and consistent with the principles set forth in the report on the National Performance Review, each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations in the United States and its territories and possessions, the District of Columbia, the Commonwealth of Puerto Rico, and the Commonwealth of the Mariana Islands.*

As discussed in Section 4.12, the Census Tract in which the proposed well is located had a 2000 median annual household income of \$40,086, somewhat lower than that for the entire State. The purpose of the proposed well is to continue to provide residents of the area with a clean and affordable source of drinking water that conforms to State and Federal standards. The project will not have adverse secondary environmental, economic, or social impacts, as discussed in detail in Chapter 4. Moreover, the State and Federal regulations regarding safe drinking water are applicable to all water systems in Hawai'i, irrespective of the economic or demographic characteristics of their residents. Thus, the proposed Āhualoa Well complies with this Executive Order.

#### **5.2.7 FLOODPLAIN MANAGEMENT (42 U.S.C. § 4321)**

The site proposed for the Āhualoa Well lies outside a defined floodplain. The project does not involve property acquisition, management, or construction within a 100-year flood plain (Zones A or V), and it does not involve a "critical action" within a 500-year flood plain. Consequently, it is consistent with applicable regulations and guidance relating to floodplain management.

#### **5.2.8 PROTECTION OF WETLANDS (42 U.S.C. § 4321)**

As noted in Section 4.2, there are no wetlands on or near the site. Neither are there food resources on the site that are important to wildlife that use wetlands elsewhere on the island. Copies of the *Draft EA* were sent to the administrator of the Pacific Island Eco-Region, U.S. Fish & Wildlife Service, and to the State Department of Land and Natural Resources Department of Aquatic Resources to ensure adequate consideration of this topic in the environmental review for this project.

#### **5.2.9 FARMLAND PROTECTION POLICY ACT (7 U.S.C. § 4202(8))**

The U.S. Congress adopted the Farmland Protection Policy Act (FPPA) (Public Law 97-98) on December 22, 1981). The U.S. Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS) has national leadership for administering the FPPA. The effective date of the FPPA rule (part 658 of Title 7 of the Code of Federal Regulations) is August 6, 1984.

The stated purposes of the FPPA are to:

- Minimize the extent to which Federal programs contribute to the unnecessary and irreversible conversion of farmland to nonagricultural uses.

## PLANS, POLICIES, AND CONTROLS

- Assure that Federal programs are administered in a manner that, to the extent practicable, will be compatible with State, unit of local government, and private programs and policies to protect farmland.

"Farmland", as used in the FPPA, includes prime farmland, unique farmland, and land of statewide or local importance. "Farmland" subject to FPPA requirements does not have to be currently used for cropland. As discussed in Section 4.12, the Āhualoa Well site is within a designated agricultural area. The surrounding lands are currently used for cattle grazing. However, the proposed well site has not been used for agricultural purposes for many years, and neither it nor the immediately adjacent properties are recognized as prime or unique agricultural lands on the most recent Agricultural Lands of Importance to the State of Hawai'i (ALISH) map (State of Hawai'i 2002). As such, the well site does not qualify as farmland under the provisions of the FPPA.

#### 5.2.10 FISH AND WILDLIFE COORDINATION ACT (16 U.S.C. § 662(A))

The Federal Fish and Wildlife Coordination Act, as amended, authorizes the Secretaries of Agriculture and Commerce to require consultation with the U.S. Fish and Wildlife Service and the fish and wildlife agencies of States where the "waters of any stream or other body of water are proposed or authorized, permitted or licensed to be impounded, diverted . . . or otherwise controlled or modified" by any agency under a Federal permit or license. Consultation is to be undertaken for the purpose of "preventing loss of and damage to wildlife resources."

As documented in this report, the proposed project will not result in the diversion of any water body and will not result in impacts on fish or wildlife resources. The U.S. Fish and Wildlife Service and the State Department of Land and Natural Resources were provided copies of the Draft EA.

#### 5.2.11 SAFE DRINKING WATER ACT (42 U.S.C. § 300H-3(E))

The Safe Drinking Water Act (SDWA) is the principal Federal law that ensures the quality of Americans' drinking water. Under SDWA, EPA sets standards for drinking water quality and oversees the states, localities, and water suppliers who implement those standards. The SDWA requires that all public water systems meet stringent water quality standards. These standards cover a long list of potential chemical, radiological and biological contaminants.

As discussed, one of the purposes of the proposed Āhualoa Well project is to permit continued compliance of their water system with the standards mandated pursuant to the Act, by replacing the existing surface water source with a source of high quality freshwater for the Āhualoa-Hāmākua area. Before connecting the new Āhualoa Production Well to its existing system, DWS will test water from it to ensure that the water is consistent with all State and Federal standards for potable water.

The Safe Drinking Water Act also provides the impetus behind the development of regulatory protection of principal or sole source aquifers. Part C of this Law pertains specifically to the protection of underground sources of drinking water, including the establishment of regulations on the injection of materials into subsurface aquifers in those areas of the United States where only one aquifer (principal or sole source aquifer) exists. Section 1424(e) of PL 93-523 states:

*(e) If the Administrator determines, on his own initiative or upon petition, that an area has an aquifer which is the sole or principal drinking water source for the area and which, if contaminated, would create a significant hazard to public health, he shall publish notice of the determination in the Federal Register. After the publication of any such notice, no commitment for Federal financial assistance (through a grant, contract, loan guarantee, or otherwise) may be entered into for any project which the Administrator determines may contaminate such aquifer through a recharge zone so as to create a significant hazard to public health, but a commitment for Federal financial assistance may, if authorized under another Provision of law, be entered into to plan or design the project to assure that it will not so contaminate the aquifer.*

As identified by the U.S. Environmental Protection Agency, Region IX Groundwater Office (<http://www.epa.gov/OGWDW/swp/ssa/reg9.html>), there are only two Sole Source Aquifers in Hawai'i. They are the Southern O'ahu Basal Aquifer on the Island of O'ahu and the Moloka'i Aquifer on the island of Moloka'i. There are no sole source aquifers on the Island of Hawai'i where the proposed Āhualoa Well project is located.

#### 5.2.12 WILD AND SCENIC RIVERS ACT (16 U.S.C. 1271-1287)

The purpose of this act, as stated in Section (b) of its preamble is as follows:

*It is hereby declared to be the policy of the United States that certain selected rivers of the Nation which, with their immediate environments, possess outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar values, shall be preserved in free-flowing condition, and that they and their immediate environments shall be protected for the benefit and enjoyment of present and future generations. The Congress declares that the established national policy of dam and other construction at appropriate sections of the rivers of the United States needs to be complemented by a policy that would preserve other selected rivers or sections thereof in their free-flowing condition to protect the water quality of such rivers and to fulfill other vital national conservation purposes.*

The only water body near the proposed well is the intermittent stream a short distance to the east in 'Ino'ino Gulch. It is not designated as a Wild and Scenic River, and Section 4.2.2 documents that the project should have no negative impact on it. As such, development of the Āhualoa well does not have the potential to affect the hydrology, water quality, or aquatic resources in any streams and therefore is consistent with the provisions of the Wild and Scenic Rivers Act.

## 6.0 DETERMINATION

### 6.1 SIGNIFICANCE CRITERIA

Hawai'i Administrative Rules §11-200-11.2 establishes procedures for determining if an environmental impact statement (EIS) should be prepared or if a finding of no significant impact is warranted. §11-200-11.2 (1) provides that proposing agencies should issue an environmental impact statement preparation notice (EISPN) for actions that it determines may have a significant effect on the environment. Hawai'i Administrative Rules §11-200-12 lists the following criteria to be used in making that determination:

*In most instances, an action shall be determined to have a significant effect on the environment if it:*

1. *Involves an irrevocable commitment to loss or destruction of any natural or cultural resource;*
2. *Curtails the range of beneficial uses of the environment;*
3. *Conflicts with the State's long-term environmental policies or goals as expressed in Chapter 344, HRS, and any revisions thereof and amendments thereto, court decisions, or executive orders;*
4. *Substantially affects the economic or social welfare of the community or State;*
5. *Substantially affects public health;*
6. *Involves substantial secondary impacts, such as population changes or effects on public facilities;*
7. *Involves a substantial degradation of environmental quality;*
8. *Is individually limited but cumulatively has considerable effect on the environment or involves a commitment for larger actions;*
9. *Substantially affects a rare, threatened, or endangered species, or its habitat;*
10. *Detrimentially affects air or water quality or ambient noise levels;*
11. *Affects or is likely to suffer damage by being located in an environmentally sensitive area such as a flood plain, tsunami zone, beach, erosion-prone area, geologically hazardous land, estuary, fresh water, or coastal waters;*
12. *Substantially affects scenic vistas and view planes identified in county or state plans or studies; or,*
13. *Requires substantial energy consumption.*

### 6.2 FINDINGS

The potential effects of the proposed project described earlier in this document were evaluated using these significance criteria. The findings with respect to each criterion are summarized below:

#### 6.2.1 IRREVOCABLE LOSS OR DESTRUCTION OF VALUABLE RESOURCE

The proposed project would be constructed on previously disturbed land that is under County jurisdiction. It does not involve the loss of any significant cultural or natural resources.

### **6.2.2 CURTAILS BENEFICIAL USES**

Construction and operation of the well would not curtail beneficial uses of the site. The water that the DWS proposed to withdraw is a small fraction of the developable yield of the aquifer (see Section 4.2.2), and its removal from the groundwater flow into the ocean will not have a measurable effect on ocean or groundwater quality. The project would significantly enhance the utility of the well site for the County and for customers of DWS.

### **6.2.3 CONFLICTS WITH LONG-TERM ENVIRONMENTAL POLICIES OR GOALS**

The proposed project is consistent with the County of Hawai'i's General Plan (see Section 5.1.1.2) and with the State's long-term environmental policies and goals as expressed in Chapter 344, Hawai'i Revised statutes and elsewhere in State law.

### **6.2.4 SUBSTANTIALLY AFFECTS ECONOMIC OR SOCIAL WELFARE**

The proposed well is intended to provide a continuing supply of water to existing residents of the Hāmākua District. It will not have a substantial adverse effect on economic or social welfare except insofar as it allows DWS to assure its customers that they are receiving the best quality water at the lowest cost, consistent with the maintenance of environmental quality.

### **6.2.5 PUBLIC HEALTH EFFECTS**

The proposed project will not adversely affect air or water quality. Neither will it generate solid waste or produce other emissions that will have a significant adverse effect on public health.

### **6.2.6 PRODUCE SUBSTANTIAL SECONDARY IMPACTS**

The proposed project will not produce significant secondary impacts. It is not designed to foster population growth or to promote economic development. Instead, it is intended to meet current potable water demands, allowing for moderate growth that is already projected.

### **6.2.7 SUBSTANTIALLY DEGRADE ENVIRONMENTAL QUALITY**

The proposed project will not have substantial long-term environmental effects. Noise from construction and demolition activities is the only impact of note, and it will be of limited duration. So long as adequate measures are taken to control the intensity of the construction noise and the time of day during which it will occur, any effects on nearby residents can be managed.

### **6.2.8 CUMULATIVE EFFECTS OR COMMITMENT TO A LARGER ACTION**

Development of the proposed well and reservoir is not a commitment to a larger action and is not intended to facilitate substantial population growth. It will provide enough potable water to accommodate moderate growth for the area and will act as the required backup source for the Haina and Honoka'a wells.

### **6.2.9 EFFECTS ON RARE, THREATENED, OR ENDANGERED SPECIES**

The proposed project will be constructed on disturbed land that is primarily colonized by invasive species. It will not utilize a resource needed for the protection of rare, threatened, or endangered species.

### **6.2.10 AFFECTS AIR OR WATER QUALITY OR AMBIENT NOISE LEVELS**

Construction and operation of the proposed well will not have a measurable effect on air or water quality. Neither will it have a long-term effect on noise levels, as discussed in Section 4.7.

**6.2.11 ENVIRONMENTALLY SENSITIVE AREAS**

There are no environmentally sensitive areas or resources near the proposed project. The Island of Hawai'i as a whole is subject to certain geologic hazards, such as earthquakes and lava flows. The project site is above the tsunami evacuation zone and is largely protected from lava flows. The structures built as part of the well and reservoir development will be consistent with the Hawai'i Uniform Building Code for Earthquake Zone 4.

**6.2.12 AFFECTS SCENIC VISTAS AND VIEWPLANES**

The proposed new facilities are not within a designated scenic area. They will not significantly detract from the visual character of the site or obstruct views from surrounding properties.

**6.2.13 REQUIRES SUBSTANTIAL ENERGY CONSUMPTION**

Operation of the new well and the SCADA system will require some energy; the amount will depend upon the final drilled depth of the well and its level of use. Compared to the energy required to pump water 5 miles uphill from Kohākōhau Stream to Āhualoa-Hāmākua area (or occasionally up from Honoka'a), however, the proposed well may have a net energy savings by serving areas that are down-gradient from it.

**6.3 ANTICIPATED DETERMINATION**

In view of the foregoing, DWS concludes that the proposed project will not have a significant adverse impact on the environment. Consequently, it is issuing a Finding of No Significant Impact for the proposed action.



## 7.0 CONSULTATION & DISTRIBUTION

### 7.1 PARTIES CONSULTED

In the development of this EA, DWS consulted with the County of Hawai'i Dept. of Finance and Department of Planning.

### 7.2 DRAFT EA DISTRIBUTION

DWS distributed the DEA to the individuals and organizations listed in Table 7.1 and requested their comments on the project. A copy of the distribution letter that was sent with the document is included here as Figure 7-1. The list of parties who submitted comments is included in Table 7.2. Their comment letters and the responses to them are reproduced at the end of this Chapter.

**Table 7.1. Draft EA Distribution List**

<b>Federal Agencies</b>	
Environmental Protection Agency, Pacific Islands Contact Office	District Engineer, U.S. Army Engineer District, Honolulu
U.S. Department of Agriculture, Natural Resources Conservation Service	U.S. Fish & Wildlife Service, Pacific Island Eco-Region
<b>State Agencies</b>	
Office of Environmental Quality Control	Department of Business and Economic Development & Tourism, Office of Planning
State Department of Defense	Department of Health, Environmental Planning Office
Department of Hawaiian Home Lands	Department of Health, Safe Drinking Water Branch
Office of Hawaiian Affairs	Department of Health, Clean Water Branch
State Department of Accounting and General Services	DLNR Historic Preservation Division
State Department of Agriculture	Department of Land and Natural Resources (DLNR) (5 copies)
<b>County of Hawai'i</b>	
Planning Department	Fire Department
Department of Parks and Recreation	Department of Environmental Management
Department of Public Works	
<b>Other Organizations</b>	
Water Resources Center, University of Hawai'i	Environmental Center, University of Hawai'i
<b>Libraries and Depositories</b>	
Hawai'i State Library Hawai'i Documents Center	Hilo Regional Public Library
University of Hawai'i, Hilo Campus Library	Honoka'a Public Library

**Figure 7-1. Draft EA Distribution Letter**

December 19, 2005

**Subject: Āhualoa Well and Reservoir Draft Environmental Assessment, Hāmākua District,  
Island of Hawai'i (TMK 4-6-011:042)**

Dear Participant:

A copy of the Draft Environmental Assessment (DEA) for the proposed Āhualoa Well and Reservoir project is enclosed. An announcement of its availability is scheduled to appear in the December 23, 2005 edition of The Environmental Notice published by the State Office of Environmental Quality Control.

The proposed action analyzed in this Environmental Assessment (EA) is the exploration for and construction of a new well, 1.0 million gallon (MG) storage reservoir, and associated control and monitoring equipment. The project is located approximately 4 miles west of the community of Honoka'a, in the Hāmākua District of the Island of Hawai'i. The new well and reservoir will: 1) replace Kohākōhau Stream, a surface water source, as the primary potable water source for the Āhualoa/Hāmākua area; and 2) supplement and provide a backup potable water source for the Honoka'a system. This will reduce the dependency on surface water sources that are subject to enhanced treatment requirements and will provide additional source capacity to the Honoka'a system, allowing DWS to continue to provide clean and affordable drinking water to its customers in these two service areas.

As indicated in the DEA, the Department of Water Supply has concluded that construction and operation of the well and reservoir would not have substantial adverse impacts on the environment. It proposes to mitigate short-term construction impacts by application of appropriate Best Management Practices. Consequently, it anticipates a Finding of No Significant Impact (FONSI) for the project.

We would appreciate it if you would review the DEA/Anticipated FONSI and write to us if you have any comments. The deadline for public comments on the DEA is January 23, 2006. If you have any questions or would like additional information before reaching a conclusion, please call Ms. Melissa White or me at (808) 550-4483.

Sincerely,



Perry J. White  
President

Attachment:

*(1) Draft Environmental Assessment, Āhualoa Production Well and Reservoir*

cc: Office of Environmental Quality Control (w/o Attachment)  
Mr. Tom Nance, TNWRE (w/o Attachment)  
Mr. Milton D. Pavao, Hawai'i County DWS (w/o Attachment)

Table 7.2. Written Comments Received on the Draft EA

No.	Name & Title of Commenter	Agency or Organizational Affiliation
1	George P. Young, P.E., Chief	Regulatory Branch, Department of the Army
2	Barbara Bell, Director	County of Hawai'i Department of Environmental Management
3	Glenn Okamoto, P.E., Civil Engineer	State of Hawai'i Department of Agriculture
4	Darryl Oliveira, Chief	County of Hawai'i Fire Department
5	Genevieve Salmonson, Director	State Office of Environmental Quality Control
6	Christopher Yuen, Planning Director	County of Hawai'i Planning Department
7	Denis Lau, P.E., Chief	Clean Water Branch, State Department of Health
8	Galen Kuba, Division Chief	Engineering Division, Hawai'i County Dept of Public Works
9	William Wong, P.E., Chief	Safe Drinking Water Branch, State Department of Health

Source: Compiled by Planning Solutions, Inc.



DEPARTMENT OF THE ARMY  
U. S. ARMY ENGINEER DISTRICT, HONOLULU  
FT. SHAFTER, HAWAII 96850-5440

#1

December 30, 2005

File Number: FOH-2005-672

REGALY TO  
ATTENTION OF

Regulatory Branch

Mr. Perry J. White  
President  
Planning Solutions  
210 Ward Avenue, Suite 330  
Honolulu, HI 96814-4012

Dear Mr. White:

This responds to your request for written comments for the draft Environmental Assessment (dEA) which addresses activities and impacts of the proposed Ahualoa Well and reservoir project, at Hamakua District, Hawaii Island (about 1.59 acres on a portion of TMK 4-6-11: 42).

Our records indicate that waters of the United States, as represented by 'Ino'ino Gulch, an intermittent stream, is adjacent to the proposed project area. It also appears that other special aquatic sites such as wetlands or springs are absent. The dEA states in appropriate sections that there is no potential for these waters of the U.S. to be impacted by construction of project structures and associated ground disturbing activities within the proposed improvement areas. Therefore, it is determined that a Department of Army (DA) permit for Section 404 activities of the Clean Water Act does not appear to be required for the proposed project.

Thank you for your consideration of potential impacts to the aquatic environment in the Ahualoa watershed. Please contact Mr. Farley Watanabe of my staff at 438-7701, or facsimile 438-4060, or Farley.K.Watanabe@usace.army.mil if you have any questions. Please cite the file number above in any future correspondence regarding this project.

Sincerely,

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



P L A N N I N G  
S O L U T I O N S

January 3, 2006  
2005-0006-001

Mr. George P. Young, P.E., Chief  
Regulatory Branch  
Department of the Army  
U.S. Army Engineer District, Honolulu  
Fort Shafter, HI 96850-5440

Subject: Draft Environmental Assessment: Ahualoa Production Well & Reservoir  
Hamakua District, Island of Hawaii (Portion of TMK 4-6-11:042)

Dear Mr. Young:

Thank you for your December 30, 2005 letter (Army File No. POH-2005-672) commenting on the County of Hawaii's Department of Water Supply's Draft Environmental Assessment (dEA): Ahualoa Production Well & Reservoir.

We appreciate the time you and your staff spent reviewing the document and confirming that the project does not require a Department of the Army permit.

Thank you once again for reviewing the project, and if you have any further questions, please call me at 530-4483.

Sincerely,

Perry J. White

cc: Mr. Milton Pavao, Department of Water Supply  
Office of Environmental Quality Control

Ward Plaza, Suite 330 • 210 Ward Avenue • Honolulu, Hawaii 96814-4012  
Phone: 808 530-4483 • Fax: 808 530-4549 • www.psi-hi.com

#2

Harry Klein  
Mayor



Barbara Bell  
Director  
Nisasa Ho  
Deputy Director

**County of Hawaii**  
**DEPARTMENT OF ENVIRONMENTAL MANAGEMENT**  
25 Aupuni Street, Room 210 • Hilo, Hawaii 96720-4252  
(808) 941-4483 • Fax (808) 941-4486

January 4, 2006

Mr. Perry J. White  
Planning Solutions  
Ward Plaza, Suite 330  
210 Ward Avenue  
Honolulu, HI 96817

Re: Ahualoa Well and Reservoir  
Draft Environmental Assessment, Hamakua District  
Island of Hawaii (TMK 4-6-011:042)

Dear Mr. White,

We have no comments at this time regarding the proposed project.

Thank you for allowing us the opportunity to offer input on this project and if we can be of further assistance, please don't hesitate to contact us.

Barbara Bell  
DIRECTOR

cc: OEQC  
Mr. Milton D. Pavao, DWS



**P L A N N I N G**  
**S O L U T I O N S**

Ms. Barbara Bell, Director  
Department of Environmental Management  
County of Hawaii  
25 Aupuni Street, Room 210  
Hilo, HI 96720-4252

Subject: Draft Environmental Assessment: Ahualoa Production Well & Reservoir  
Hamakua District, Island of Hawaii (Portion of TMK 4-6-11:042)

Dear Ms. Bell:

Thank you for your January 4, 2006 letter commenting on the County of Hawaii's Department of Water Supply's Draft Environmental Assessment (DEA), Ahualoa Production Well & Reservoir. We appreciate the time you and your staff spent reviewing the document.

We understand that you have no comments to offer regarding the project at this time. If you have any further questions, please feel free to call me at (808) 550-4483.

Sincerely,

Perry J. White

cc: Finn McCall, Department of Water Supply  
Office of Environmental Quality Control

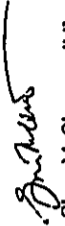
January 10, 2006  
2005-0006-001

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Phone: 808 550-4483 • Fax: 808 550-4549 • www.psi-hi.com

Mr. Perry White  
Page 2  
January 9, 2006

Thank you for giving us the opportunity to review the draft environmental assessment. We respectfully request to be kept on your list for future reviews. Should you have any questions, please do not hesitate to call me at 973-1123.

Sincerely,

  
Glenn M. Okamoto, P.E.  
Civil Engineer  
Agricultural Resource Management Division

SANDRA LEE KUNIMOTO  
Chairperson, Board of Agriculture  
DUANE K. OKAMOTO  
Deputy to the Chairperson

#3



State of Hawaii  
DEPARTMENT OF AGRICULTURE  
1428 South King Street  
Honolulu, Hawaii 96814-2512  
Phone (808) 973-4600 Fax (808) 973-9813  
January 9, 2006

Mr. Perry White, President  
Planning Solutions  
210 Ward Avenue, Suite 330  
Honolulu, HI 96814

Dear Mr. Perry:

Re: Ahualoa Well and Reservoir Draft Environmental Assessment, Hamakua District, Island of Hawaii (TMK 4-6-011:042)

The Department of Agriculture has completed its review of referenced project, dated December 2005. Although this project does not appear to impact any of our current agricultural operations, we offer the following non-agricultural related comments:

SECTION	COMMENT
3.2.2.7	1. Is the percolation rate sufficient to prevent water from ponding in the seepage pit? An 8' deep seepage pit could present a hazardous condition
4.2.2.2	1. How much water is anticipated to discharge into the vegetated swale? 2. Shouldn't the seepage pit be sized to prevent any additional discharge? 3. At what rate does the 5,000 gallons of water discharge when the pump is started? During high intensity rainfall periods, will the seepage pits be able to accommodate the additional water? 4. In the future, are the pumps anticipated to cycle on and off more or less than once per day? If more, will the seepage pit be able to accommodate the additional water?
4.10	1. Is the resident (located 0.25 miles away) aware of the proposed reservoir? Should any complaints regarding aesthetics of the reservoir arise, can the proposed site accommodate some type of tree shielding?
4.11.2	1. With no fencing along the road, what kind of measures will be implemented to prevent unauthorized personnel from accessing the proposed site? Does the existing fence need to be modified/replaced with barbed-wire?
Figure 3.3	1. What kind of measures will be implemented to prevent potential sewage overflow or chlorination spills from discharging into the adjacent drainage swale?

U.S. Department of Agriculture  
Agriculture  


U.S. DEPARTMENT OF AGRICULTURE



PLANNING  
SOLUTIONS

January 13, 2006  
2005-0006-001

Mr. Glenn M. Okamoto, P.E., Civil Engineer  
Agricultural Resource Management Division  
Department of Agriculture  
State of Hawai'i  
1428 South King Street  
Honolulu, HI 96814-2512

Subject: Draft Environmental Assessment: Ahualoa Production Well & Reservoir  
Hāmākua District, Island of Hawai'i (Portion of TMK 4-6-11:042)

Dear Mr. Okamoto:

Thank you for your January 9, 2006 letter commenting on the County of Hawai'i Department of Water Supply's *Draft Environmental Assessment (DEA)*, *Ahualoa Production Well & Reservoir*. We appreciate the time you spent reviewing the document and providing written comments.

We are pleased to hear that the project does not impact your department's current agricultural operations. Your non-agriculture related comments were thoughtful as well and were reviewed with your Chief Engineer Brian Kau and our client Greg Fukumitsu of Tom Nance Water Resource Engineering on January 13, 2006. They confirmed that the comments have been addressed to the Division's satisfaction and that no further written response is required on our part.

Should you have any further questions on the project, please call me at 550-4483.

Sincerely,

Perry White

cc: Finn McCall, Department of Water Supply  
Greg Fukumitsu, TNWRE  
Office of Environmental Quality Control

Ward Plaza, Suite 300 • 710 Waike Avenue • Honolulu, Hawaii 96814-4012  
Phone: 808 550-4483 • Fax: 808 550-4549 • www.psi-hl.com







STATE OF HAWAII  
OFFICE OF ENVIRONMENTAL QUALITY CONTROL  
210 WARD AVENUE, SUITE 330  
HONOLULU, HAWAII 96813  
January 20, 2006

GENEVIEVE SALMONSON  
DIRECTOR

# 5

Mr. Milton D. Pavao, P.E., Manager  
Department of Water Supply - County of Hawaii  
345 Kakuanoa Street, Suite 20  
Hilo, Hawaii 96720

Ms. Melissa White  
Planning Solutions, Inc.  
210 Ward Avenue, Suite 330  
Honolulu, Hawaii 96813

Dear Mr. Pavao and Ms. White:

The Office of Environmental Quality Control has reviewed the draft environmental assessment for the Ahualoa Production Well and Reservoir, Tax Map Key (3<sup>rd</sup>) 4-6-11, parcel 42, situated in the judicial district of South Hilo. We offer the following comment for your consideration and response.

**Project Phasing:** The Office understands that the draft environmental assessment covers two phases of the project, namely, (1) exploratory well drilling, casing and pump testing, and (2) production well outfitting and construction of related facilities. The Office prepared guidance (hereinafter, "Guidance") in May 1998, on assessing the impacts of water well development projects with the objectives of integrating the review of the environmental concerns with existing planning and regulatory processes. The Guidance sets forth recommended information to be included in the environmental assessment, namely, (1) orientation maps, (2) aquifer of hydrologic unit status, (3) contamination analysis and vulnerability assessment, (4) hydrologic impact analysis, (5) biological assessment, (6) archaeological and cultural impact assessment, (7) financial and institutional arrangements, (8) watershed and land use analysis, (9) alternative analysis, and (10) impacts of accessory facilities. The Guidance notes that environmental assessments for exploratory wells should not need to comply with all the above information requirements because some of the above information will not be available until the well is tested. For this reason, the Office recommends that a second environmental assessment with the pump test data and other information above be prepared after the exploratory well phase. Doing so will result in a more meaningful analysis of direct, indirect and cumulative impacts on the environment. The Guidance can be found at our Internet website: <http://www.state.hi.us/health/oeqc/index.htm>.

Thank you for the opportunity to comment. If there are any questions, or if you would like to discuss this matter further, please call Mr. Leslie Segundo, Environmental Health Specialist, at (808) 586-4185.

Sincerely,

*Genevieve Salmonson*  
GENEVIEVE SALMONSON  
Director



P L A N N I N G  
S O L U T I O N S

Ms. Genevieve Salmonson, Director  
Office of Environmental Quality Control  
Department of Health  
State of Hawaii  
235 South Beretania Street, Suite 702  
Honolulu, HI 96813

Subject: Draft Environmental Assessment: Ahualoa Production Well & Reservoir  
Hamakua District, Island of Hawaii (Portion of TMK 4-6-11:042)

Dear Ms. Salmonson:

Thank you for your January 20, 2006 letter commenting on the County of Hawaii's Department of Water Supply's Draft Environmental Assessment (DEA): Ahualoa Production Well & Reservoir. We appreciate the time you and your staff spent reviewing the document and providing written comments.

Thank you for referring us to the Guidelines for Assessing Water Well Development Projects published by your office. We consulted them during the preparation of the DEA. Your letter correctly notes that the DEA is intended to cover both the exploratory well phase and the production well development phase of the project, the latter being contingent upon finding the well water quality and supply to be adequate for potable use.

We understand that the Guidelines do not necessarily apply to environmental assessments for exploratory wells, however DWS feels that it is their responsibility to consider hydrologic, environmental, and cultural impacts thoroughly before conducting well exploration activities which, if successful, will lead to the development of production facilities. Consequently, the analyses included in the DEA for the project fully address each of the items listed in the Guidelines for Assessing Water Well Development Projects. For your convenience, we have reproduced the items listed in your letter below, followed by the Section number, Figure number, or Appendix of the DEA that addresses them:

Item	Section or Figure Where Addressed
1. Orientation Maps	Figures 1-1, 1-2, 1-3, 3-1, and 4-1
2. Aquifer or Hydrologic Unit Status	Sections 1.2, 4.2.1 and 4.2.2
3. Contamination Analysis & Vulnerability Assessment	Sections 4.2.3 and 4.4
4. Hydrologic Impact Analysis	Sections 4.2.1 and 4.2.2
5. Biological Assessment	Section 4.5 and Appendix A
6. Archaeological and Cultural Assessment	Section 4.8 and Appendix B
7. Financial and Institutional Arrangements	Sections 3.4, 4.12, and 5.1.3
8. Watershed and Land Use Analysis	Sections 1.2, 4.1.1, 4.12, and Chapter 5
9. Alternative Analysis	Chapter 2
10. Impacts of Accessory Facilities	Chapter 4

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Phone: 808-550-4483 • Fax: 808-552-4548 • www.psi-hi.com

January 26, 2006  
2005-0006-001

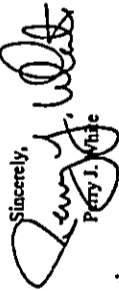
Page 2  
Ms. Genevieve Salmonson  
January 26, 2006

You are correct that information obtained from the pump test on water quality and yield are not yet available to include in the impact analysis. However, other wells in areas that are similarly situated have produced good yields of high quality water. Hence, the EA impact analysis was carried out on the assumption that the pump test water will be adequate for potable use and that the well will provide the maximum desired yield over time. The data collected during the pump test will allow this to be confirmed.

If either of these working hypotheses proves untrue, the DWS will either abandon its plans to develop the production well (if water quality proves problematic) or will develop the well with a lower pump capacity (if the yields proven by the pump test are lower than anticipated). If the pump test data show poor quality, the production well would not be developed and all impacts related to the operation of the well would be avoided. If the yield is less than anticipated, a smaller pump size would be used or the County would not authorize completion of the project. If the yields and water quality are as expected, then the impacts related to the development of the production well would be the same as those described in the present *Draft EA*.

Consequently, DWS believes that it is wise to address both phases of the project within the single environmental assessment.

If you have any further questions, please call me at 550-4483.

Sincerely,  
  
Perry J. White

cc: Mr. Finn McCall, Department of Water Supply

171 161 151 141 131 121 111 101 91 81 71 61 51 41 31 21 11

Harry Kim  
*Mayor*



#6

Christopher J. Yuen  
*Director*

Roy R. Takemoto  
*Deputy Director*

**County of Hawaii**

**PLANNING DEPARTMENT**  
101 Puuhale Street, Suite 3 • Hilo, Hawaii 96720-3043  
(808) 961-8288 • Fax (808) 961-8742

January 17, 2006

Mr. Perry J. White  
Planning Solutions  
Ward Plaza, Suite 330  
210 Ward Avenue  
Honolulu HI 96814-4012

Dear Mr. White:

**SUBJECT: Draft Environmental Assessment**  
**Applicant: Department of Water Supply**  
**Project: Ahualoa Production Well and Reservoir**  
**TMK: 4-6-11:Portion of 42**

This is to acknowledge receipt on December 20, 2006 of a copy of the Draft Environmental Assessment for the Ahualoa Production Well and Reservoir.

The proposed development is to drill, test and, if successful, construct a new municipal water supply well, 1.0 million gallon storage reservoir, and associated control and monitoring equipment. The new well and reservoir would replace Kohakohau Stream as the primary potable water source for the Ahualoa/Hamakua area and supplement and provide a backup potable water source for the Honokaa system.

We affirm that the subject parcel is designated Agricultural by the State Land Use Commission, is zoned Agricultural (A-40a) by the County and is not located in the County's Special Management Area.

For your information, the General Plan Land Use Pattern Allocation Guide (LUPAG) Map designates the parcel as Important Ag. Lands.

*Hawaii's County is an equal opportunity provider and employer.*

Mr. Perry J. White  
Planning Solutions  
Page 2  
January 17, 2006

Other than the foregoing, we have no further comments to offer.

If you have questions, please feel free to contact Esther Imamura or Larry Brown of our office at 961-8288.

Sincerely,

**CHRISTOPHER J. YUEN**  
Planning Director

ETJ:cd  
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P L A N N I N G  
S O L U T I O N S

January 26, 2006  
2005-0006-001

Mr. Christopher J. Yuen, Planning Director  
Planning Department  
County of Hawai'i  
101 Pauahi Street, Suite 3  
Hilo, HI 96720-3043

Subject: Draft Environmental Assessment: Ahuakoa Production Well & Reservoir  
Hāmākua District, Island of Hawai'i (Portion of TMK 4-6-11-042)

Dear Mr. Yuen:

Thank you for your January 17, 2006 letter commenting on the County of Hawai'i Department of Water Supply's *Draft Environmental Assessment: Ahuakoa Production Well & Reservoir*. We appreciate the time you and your staff spent reviewing the document and providing written comments.

We appreciate your confirming the zoning designation of the project site and noting that it lies outside of the County's Special Management Area. Thank you also for providing information concerning the project area's LUPAG designation as Important Agricultural Land. The proposed well and reservoir would occupy a small portion of the parcel and would not preclude the remainder of the parcel from being reverted to agricultural use in the future.

If you have any further questions concerning the project, please call me at 550-4483.

Sincerely,

Peggy J. White

cc: Finn McCall, Department of Water Supply  
Office of Environmental Quality Control

Ward Plaza, Suite 330 • 210 Ward Avenue • Honolulu, Hawaii 96814-4312  
Phone: 808 550-4483 • Fax: 808 550-4549 • www.psi-hi.com

10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31



STATE OF HAWAII  
DEPARTMENT OF HEALTH  
P.O. BOX 1378  
HONOLULU, HAWAII 96801-3378

#7

CHAROLEE FRANKS, M.D.  
DIRECTOR OF HEALTH

Health Services  
Division

01054PKP.06

January 24, 2006

Mr. Perry J. White  
President  
Planning Solutions  
210 Ward Avenue, Suite 330  
Honolulu, Hawaii 96814-4012

Dear Mr. White:

Subject: Ahualoa Well and Reservoir Draft Environmental Assessment

The Department of Health (DOH), Clean Water Branch (CWB), acknowledges receipt of the subject document, dated December 19, 2005. The CWB has reviewed the limited information contained in the subject document and offers the following comments:

1. The Army Corps of Engineers should be contacted at (808) 438-9258 for this project. Pursuant to Federal Water Pollution Control Act (commonly known as the "Clean Water Act" (CWA) Paragraph 401(a)(1), a Section 401 Water Quality Certification (WQC) is required for "[a]ny applicant for Federal license or permit to conduct any activity including, but not limited to, the construction or operation of facilities, which may result in any discharge into the navigable waters..." (emphasis added). The term "discharge" is defined in CWA, Subsections 502(16), 502(12), and 502(6); Title 40, Code of Federal Regulations (CFR), Section 122.2; and Hawaii Administrative Rules (HAR), Chapter 11-54.
2. In accordance with HAR, Sections 11-55-04 and 11-55-34.05, the Director of Health may require the submittal of an individual permit application or a Notice of Intent (NOI) for general permit coverage authorized under the National Pollutant Discharge Elimination System (NPDES).

- a. An application for an NPDES individual permit is to be submitted at least 180 days before the commencement of the respective activities. The NPDES application forms may also be picked up at our office or downloaded from our website at <http://www.hawaii.gov/health/environmental/water/cleanwater/forms/individ-index.html>.

Mr. Perry J. White  
January 24, 2006  
Page 2

- b. An NOI to be covered by an NPDES general permit is to be submitted at least 30 days before the commencement of the respective activity. A separate NOI is needed for coverages under each NPDES general permit. 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/gen-index.html>.

- i. Storm water associated with industrial activities, as defined in Title 40, CFR, Sections 122.26(b)(14)(i) through 122.26(b)(14)(ix) and 122.26(b)(14)(xi). [HAR, Chapter 11-55, Appendix B]
- ii. 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 commencement of the construction activities. [HAR, Chapter 11-55, Appendix C]
- iii. Discharges of treated effluent from leaking underground storage tank remedial activities. [HAR, Chapter 11-55, Appendix D]
- iv. Discharges of once through cooling water less than one (1) million gallons per day. [HAR, Chapter 11-55, Appendix E]
- v. Discharges of hydrotesting water. [HAR, Chapter 11-55, Appendix F]
- vi. Discharges of construction dewatering effluent. [HAR, Chapter 11-55, Appendix G]
- vii. Discharges of treated effluent from petroleum bulk stations and terminals. [HAR, Chapter 11-55, Appendix H]
- viii. Discharges of treated effluent from well drilling activities. [HAR, Chapter 11-55, Appendix I]
- ix. Discharges of treated effluent from recycled water distribution systems. [HAR, Chapter 11-55, Appendix J]
- x. Discharges of storm water from a small municipal separate storm sewer system. [HAR, Chapter 11-55, Appendix K]
- xi. Discharges of circulation water from decorative ponds or tanks. [HAR, Chapter 11-55, Appendix L]



**P L A N N I N G  
S O L U T I O N S**

February 1, 2006  
2003-0006-001

Mr. Denis R. Lau, P.E., Chief  
Clean Water Branch  
Department of Health  
State of Hawaii  
P.O. BOX 3378  
Honolulu, Hawaii 96801-3378

**Subject: Draft Environmental Assessment: Ahualoa Production Well & Reservoir  
Hauakua District, Island of Hawaii (Portion of TMK 4-6-11:042)**

Dear Mr. Lau:

Thank you for your January 24, 2006 letter [your reference EMD/CWB 01054PKP.06] commenting on the County of Hawaii's Department of Water Supply's *Draft Environmental Assessment (DEA): Ahualoa Production Well & Reservoir*. We appreciate the time you and your staff spent reviewing the document and providing written comments.

Item-by-item responses to your comments are provided below. The comments are reproduced for your convenience in italics before each response.

**Comment 1:**

*The Army Corps of Engineers should be contacted at (808) 438-9258 for this project. Pursuant to Federal Water Pollution Control Act (commonly known as the "Clean Water Act" (CWA) Paragraph 401(a)(1), a Section 401 Water Quality Certification (WQC) is required for "any applicant for Federal license or permit to conduct any activity including, but not limited to, the construction or operation of facilities, which may result in any discharge into the navigable waters." (emphasis added). The term "discharge" is defined in CWA, Subsections 502(16), 502(12), and 502(6); Title 40, Code of Federal Regulations (CFR), Section 122.2; and Hawaii Administrative Rules (HAR), Chapter 11-54.*

**Response:** The Army Corps of Engineers has been contacted and provided a copy of the DEA. Their written response states that the project will not require a Department of the Army permit. We are including a copy of their letter and our response in the Final EA for the project.

**Comment 2:**

*In accordance with HAR, Sections 11-55-04 and 11-55-34.05, the Director of Health may require the submittal of an individual permit application or a Notice of Intent (NOI) for general permit coverage authorized under the National Pollutant Discharge Elimination System (NPDES).*

**a. An application for an NPDES individual permit is to be submitted at least 180 days before the commencement of the respective activities. The NPDES application forms may also be picked up at our office or downloaded from our website at <http://www.hawaii.gov/health/environmental/water/cleanwater/forms/individ-index.html>.**

Ward Plaza, Suite 330 • 210 Ward Avenue • Honolulu, Hawaii 96814-4012  
Phone: 808 550-4483 • Fax: 808 550-4519 • [www.ps-hi.com](http://www.ps-hi.com)

Mr. Perry J. White  
January 24, 2006  
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3. In accordance with HAR, Section 11-55-38, the applicant for an NPDES permit is required to either submit a copy of the new 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 DOH that the project, activity, or site covered by the NOI or application has been or is being reviewed by SHPD. If applicable, please submit a copy of the request for review by SHPD or SHPD's determination letter for the project.

4. Any discharges related to project construction or operation activities, with or without a Section 401 WQC or NPDES permit coverage, shall comply with the applicable State Water Quality Standards as specified in HAR, Chapter 11-54.

The Hawaii Revised Statutes, Subsection 342D-50(a), requires that "[n]o person, including any public body, shall discharge any water pollutants into state waters, or cause or allow any water pollutant to enter state waters except in compliance with this chapter, rules adopted pursuant to this Chapter, or a permit or variance issued by the director."

If you have any questions, please contact Mr. Alec Wong, Supervisor of the Engineering Section, CWB, at 586-4309.

Sincerely,

DENIS R. LAU, P.E., CHIEF  
Clean Water Branch

KP:np

100 (03) 177 (04) 100 (04) 100 (05) 100 (06) 100 (07) 100 (08) 100 (09) 100 (10) 100 (11) 100 (12) 100 (13) 100 (14) 100 (15) 100 (16) 100 (17) 100 (18) 100 (19) 100 (20) 100 (21) 100 (22) 100 (23) 100 (24) 100 (25) 100 (26) 100 (27) 100 (28) 100 (29) 100 (30) 100 (31) 100 (32) 100 (33) 100 (34) 100 (35) 100 (36) 100 (37) 100 (38) 100 (39) 100 (40) 100 (41) 100 (42) 100 (43) 100 (44) 100 (45) 100 (46) 100 (47) 100 (48) 100 (49) 100 (50) 100 (51) 100 (52) 100 (53) 100 (54) 100 (55) 100 (56) 100 (57) 100 (58) 100 (59) 100 (60) 100 (61) 100 (62) 100 (63) 100 (64) 100 (65) 100 (66) 100 (67) 100 (68) 100 (69) 100 (70) 100 (71) 100 (72) 100 (73) 100 (74) 100 (75) 100 (76) 100 (77) 100 (78) 100 (79) 100 (80) 100 (81) 100 (82) 100 (83) 100 (84) 100 (85) 100 (86) 100 (87) 100 (88) 100 (89) 100 (90) 100 (91) 100 (92) 100 (93) 100 (94) 100 (95) 100 (96) 100 (97) 100 (98) 100 (99) 100 (100)

Page 2  
Mr. Denis R. Lau  
February 1, 2006

b. An NOI to be covered by an NPDES general permit is to be submitted at least 30 days before the commencement of the respective activity. A separate NOI is needed for coverage under each NPDES general permit. 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>
- i. Storm water associated with industrial activities, as defined in Title 40, C.F.R. Sections 122.26(b)(1-4)(i) through 122.26(b)(1-4)(iv). [HAR, Chapter 11-55, Appendix B]
  - ii. 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 commencement of the construction activities. [HAR, Chapter 11-55, Appendix C]
  - iii. Discharges of treated effluent from leaking underground storage tank remedial activities. [HAR, Chapter 11-55, Appendix D]
  - iv. Discharges of once through cooling water less than one (1) million gallons per day. [HAR, Chapter 11-55, Appendix E]
  - v. Discharges of hydrating water. [HAR, Chapter 11-55, Appendix F]
  - vi. Discharges of construction dewatering effluent. [HAR, Chapter 11-55, Appendix G]
  - vii. Discharges of treated effluent from petroleum bulk stations and terminals. [HAR, Chapter 11-55, Appendix H]
  - viii. Discharges of treated effluent from well drilling activities. [HAR, Chapter 11-55, Appendix I]
  - ix. Discharges of treated effluent from recycled water distribution systems. [HAR, Chapter 11-55, Appendix J]
  - x. Discharges of storm water from a small municipal separate storm sewer system. [HAR, Chapter 11-55, Appendix K]
  - xi. Discharges of circulation water from decorative ponds or tanks. [HAR, Chapter 11-55, Appendix L]

**Response:** Thank you for the comprehensive listing of the activities for which NPDES General Permit coverage is required. At present DWS expects coverage will be required only under item ii, construction activities, in the event that a production well is developed at the site. The well exploration phase would disturb well under one acre and would not result in a discharge to State waters or to a public wastewater system.

**Comment 3:**

In accordance with HAR, Section 11-55-38, the applicant for an NPDES permit is required to either submit a copy of the new NOI or NPDES permit application to the State Department of Land and Natural Resources, State Historic Preservation Division (SHPD).

Page 3  
Mr. Denis R. Lau  
February 1, 2006

or demonstrate to the satisfaction of the DOH that the project, activity, or site covered by the NOI or application has been or is being reviewed by SHPD. If applicable, please submit a copy of the request for review by SHPD or SHPD's determination letter for the project.

**Response:** A copy of the Draft EA has been sent to SHPD, and their comments (if any) will be reproduced in the Final EA. Copies of any NOI's submitted to the Clean Water Branch will also be sent to SHPD.

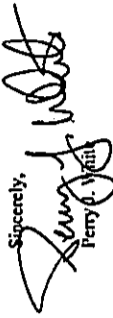
**Comment 4:**

Any discharges related to project construction or operation activities, with or without a Section 401 WQC or NPDES permit coverage, shall comply with the applicable State Water Quality Standards as specified in HAR, Chapter 11-54.

**Response:** The proposed project would not result in a non-stormwater discharge into State waters. As mentioned, DWS is seeking NPDES General Permit coverage for construction of the project and will comply with all applicable requirements. As such, the project complies with HAR 11-54.

Thank you again for your comments. If you have any further questions, please call me or Melissa White at 550-4483.

Sincerely,



Fynn McCall

cc: Fynn McCall, Department of Water Supply  
Office of Environmental Quality Control

LOCAL OFFICE  
OF THE STATE OF HAWAII



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

January 26, 2006

Mr. Perry J. White  
Planning Solutions  
Ward Plaza, Suite 330  
210 Ward Avenue  
Honolulu, Hawaii 96814

Dear Mr. White:

**SUBJECT: COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR  
AHUALOA WELL AND RESERVOIR, DECEMBER 2005**

We have reviewed the Draft Environmental Assessment (EA) for the  
Ahualoa Well and Reservoir, dated December 2005.

The Draft EA adequately addresses the environmental review items  
that are required for DWSRF projects. This includes an  
appropriate review of the Federal Cross Cutters, consultation  
with applicable agencies, and a notice in the document and  
announcement that federal monies may be used.

Please have a copy of the Final Environmental Assessment and  
findings and determination sent to this office when completed.

If you have any questions or comments, please contact  
Denise Manuel of the Safe Drinking Water Branch at 596-4258.

Sincerely,

*William Wong*

WILLIAM WONG, P.E., CHIEF  
Safe Drinking Water Branch  
Environmental Management Division

DM:cb

c: Milton Pavao, Hawaii Dept. of Water  
Wastewater Branch  
Environmental Planning Office

CHRISTOPHER L. FURUKAWA, M.D.  
DIRECTOR OF HEALTH

IN COMPLIANCE WITH THE  
FOIA



P L A N N I N G  
S O L U T I O N S

Mr. William Wong, P.E., Chief  
Safe Drinking Water Branch  
Environmental Management Division  
Department of Health  
State of Hawaii  
P.O. Box 3378  
Honolulu, HI 96801-3378

**Subject: Draft Environmental Assessment: Ahualoa Production Well & Reservoir  
Hamakua District, Island of Hawaii (Portion of TMK 4-6-11-042)**

Dear Mr. Wong:

Thank you for your January 26, 2006 letter commenting on the County of Hawaii's Department of  
Water Supply's *Draft Environmental Assessment (DEA): Ahualoa Production Well & Reservoir*. We  
appreciate the time you and your staff spent reviewing the document and providing written  
comments.

Thank you very much for confirming that the DEA adequately addresses the environmental review  
items that are required for funding under the Drinking Water State Revolving Fund (DWSRF). As  
you requested, we will send your office a copy of the *Final Environmental Assessment* and  
determination for the project. At present, DWS expects that notice of a Finding of No Significant  
Impact will appear in the February 23, 2006 edition of the *Environmental Notice* published by the  
State Office of Environmental Quality Control.

If you have any further questions, please call me at 550-4483.

Sincerely,

*Finn McCall*

Finn McCall, Department of Water Supply  
Office of Environmental Quality Control

Ward Plaza, Suite 330 • 210 Ward Avenue • Honolulu, Hawaii 96814-1012  
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February 3, 2006  
2005-0006-001



## 8.0 BIBLIOGRAPHY

- CWRM (State of Hawai'i Commission on Water Resource Management). (1995) *Ground Water Hydrologic Units*. In Water Data Section of CWRM web site. URL: <http://www.state.hi.us/dlnr/cwrms/data/maps.htm>
- County of Hawai'i (2001) *County Of Hawai'i General Plan Revision*. County of Hawai'i Planning Department, December 21, 2001.
- DBEDT (State of Hawai'i Department of Business, Economic Development, and Tourism) (2004) *2004 Data Book*. URL: [http://www3.hawaii.gov/DBEDT/index.cfm?section=READ\\_Databook1075](http://www3.hawaii.gov/DBEDT/index.cfm?section=READ_Databook1075)
- DOH (State of Hawai'i Department of Health) (2005a) *2004 Groundwater Contamination Maps for the State of Hawai'i*. Environmental Health Division, Safe Drinking Water Branch. URL: <http://www.hawaii.gov/health/environmental/water/sdwb/conmaps/pdf/conmaps04.pdf>
- DOH (State of Hawai'i Department of Health) (2005b). *Facilities, Sites, or Areas in which HEER has an Interest*. URL: <http://www.state.hi.us/health/environmental/hazard/pdf/heersitelist.xls>
- DOH (State of Hawai'i Department of Health), Air Quality Branch. (2004) *2004 Annual Summary: Hawai'i Air Quality Data*. URL: <http://www.hawaii.gov/health/environmental/air/cab/cabmaps/pdf/databook2004.pdf>
- DOH (State of Hawai'i Department of Health) (2000b) *Classification of Hawaii State Waters*. URL: <http://www.state.hi.us/health/eh/cwb/wqmaps/wqstand.htm>
- Department of Land and Natural Resources. (DLNR). 1998. *Indigenous Wildlife, Endangered and Threatened Wildlife and Plants, and Introduced Wild Birds*. Department of Land and Natural Resources. State of Hawaii. Administrative Rule §13-134-1 through §13-134-10, dated March 02, 1998.
- EPA (Environmental Protection Agency). (2004). 2004 Edition of the Drinking Water Standards and Health Advisories. URL: <http://www.epa.gov/waterscience/drinking/standards/dwstandards.pdf>
- Federal Register. (1999a). Department of the Interior, Fish and Wildlife Service, Endangered and Threatened Wildlife and Plants. 50CFR 17:11 and 17:12 – December 3, 1999
- \_\_\_\_\_. (1999b). Department of the Interior, Fish and Wildlife Service, 50 CFR 17. Endangered and Threatened Wildlife and Plants. Endangered and Threatened Wildlife and Plants; Review of Plant and Animal Taxa that are Candidates or Proposed for Listing as Endangered or Threatened; Annual Notice of Findings on Recycled Petitions, and Annual Description of Progress on Listing Actions. Federal Register, 64 No. 205 (Monday, October 25, 1999): 57534-57547.
- \_\_\_\_\_. (2001). Department of the Interior, Fish and Wildlife Service, 50 CFR 17. Endangered and Threatened Wildlife and Plants. Notice of Findings on Recycled Petitions. Federal Register, 66 No. 5 (Monday, January 8, 2001): 1295 – 1300.
- \_\_\_\_\_. (2002). Department of the Interior, Fish and Wildlife Service, 50 CFR 17. Endangered and Threatened Wildlife and Plants. Review of Species That Are Candidate or Proposed for Listing as Endangered or Threatened; Annual Notice of Findings on Recycled Petition; Annual Description of Progress on Listing Actions. Federal Register, 67 No. 114 (Thursday, June 13, 2002): 40657-40679.
- \_\_\_\_\_. (2004). Department of the Interior, Fish and Wildlife Service, 50 CFR 17. Endangered and Threatened Wildlife and Plants. Review of Species That Are Candidates or Proposed for Listing as Endangered or Threatened; Annual Notice of Findings on Resubmitted Petition; Annual Description of Progress on Listing Actions. Federal Register, 69 No. 86 (Tuesday, May 4, 2004): 24876-24904.

- Juvik, S.P., J.O. Juvik, and T.R. Paradise. (1998). *Atlas of Hawai'i, Third Edition*. University of Hawai'i Press, Honolulu, 333 p.
- Macdonald, G.A., A.T. Abbott, and F.L. Peterson. (1983). *Volcanoes in the Sea: The Geology of Hawai'i*. 2<sup>nd</sup> Edition. Honolulu: University Press, 517 p.
- NOAA (National Oceanic and Atmospheric Administration) (2002) *CLIMATOGRAPHY OF THE UNITED STATES NO. 81: Monthly Station Normals of Temperature, Precipitation, and Heating and Cooling, Degree Days 1971 - 2000*. 51 Hawai'i. 21 p.
- Sato, H.H., W. Ikeda, R. Paeth, R. Smythe, and M. Takehiro, Jr. (1973) *Soil Survey of the Island of Hawaii, State of Hawaii*. U.S. Dept. of Agriculture, Soil Conservation Service in cooperation with the University of Hawai'i Agricultural Experiment Station.
- State of Hawai'i (2001) *Hawaii Statewide GIS Program*. Office of Planning, Department of Business, Economic Development and Tourism. URL: <http://www.hawaii.gov/dbedt/gis/>
- USFWS (United States Fish and Wildlife Service) (2002) *Critical Habitat for 47 Plant Species from the Island of Hawaii*. URL: [http://pacificislands.fws.gov/CHRules/bigislandch\\_fs.pdf](http://pacificislands.fws.gov/CHRules/bigislandch_fs.pdf)
- USGS (United States Geological Survey) (1997). *Volcanic and Seismic Hazards on the Island of Hawai'i*. Compiled by USGS Staff Kathie Watson. URL: <http://pubs.usgs.gov/gip/hazards/earthquakes.html>
- USGS National Water Information System (2004). URL: <http://nwis.waterdata.usgs.gov/hi/nwis/si>

**APPENDIX A BOTANICAL AND FAUNAL RESOURCE  
SURVEY**

**Rana Productions, Ltd.**

**September 2005**

**A Survey of Botanical and Faunal Resources on the  
Proposed Āhualoa Well Project Site,  
TMK(3)4-6-11:42, Hāmākua District,  
Island of Hawai'i.**

**Prepared by:**

Reginald E. David  
Rana Productions, Ltd.  
P.O. Box 1371  
Kailua-Kona, Hawai'i 96745

**Prepared for:**

Planning Solutions, Inc.  
Suite 330 Ward Plaza  
210 Ward Street  
Honolulu, Hawaii 96814-4012

October 15, 2005

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### Introduction

This report summarizes the findings of a botanical and faunal survey conducted on a approximately 18.044-acre parcel of land identified as TMK (3)4-6-11:42 located adjacent to the Old Māmalahoa Highway some three-miles east of its intersection with Mud Lane The Hawai'i County Department of Water Supply (DWS) is proposing to develop a well, a one-million gallon above ground reservoir, and a 12' 6" wide access road and 12" water line connecting the reservoir to the existing DWS waterline located along the Old Māmalahoa Highway. Fieldwork was conducted on September 22<sup>nd</sup> and 24<sup>th</sup>, 2005.

The primary purpose of the survey was to determine if there were any botanical, avian or mammalian species currently listed as endangered, threatened or proposed for listing under either the federal or the State of Hawai'i's endangered species programs on, or are likely to occur within in the immediate vicinity of the proposed project site. Federal and State of Hawai'i listed species status follows species identified in the following referenced documents (DLNR, 1998, Federal Register, 1999a, 1999b, 2001, 2002, 2004).

Avian phylogenetic order and nomenclature follows *The American Ornithologists' Union Checklist of North American Birds 7<sup>th</sup> Edition* (American Ornithologists' Union, 1998), and the 42<sup>nd</sup> through the 46<sup>th</sup> supplements to *Check-list of North American Birds* (American Ornithologists' Union, 2000; Banks et al., 2002, 2003, 2004, 2005). Mammal scientific names follow *Mammals in Hawaii* (Tomich, 1986). Plant names follow *Manual of the Flowering Plants of Hawaii* (Wagner et al., 1990, Wagner and Herbst, 1999). Place names follow *Place Names of Hawaii* (Pukui et al., 1974).

Hawaiian and scientific names are italicized in the text. A glossary of technical terms and acronyms used in the document, which may be unfamiliar to the reader, are included at the end of the narrative text on (Page 12).

### General Site Description

The approximately 18.044-acre site is bound to the north by the Old Māmalahoa Highway, to the south and west by Department of Hawaiian Home Lands currently leased to Parker Ranch, and to the east by a rocky outcrop that separates the parcel from 'Ino'ino Gulch. The project site gently slopes from south to north, from an elevation of ~ 790-meters above mean sea level (ASL), at southern boundary, down to ~ 760-meters ASL, at the northern boundary of the property along the Old Māmalahoa Highway (USGS 1996). The project area is sited on a mix of moderately eroded 'a'a and pāhoehoe lava flows disgorged from Mauna Kea during the middle to late Pleistocene Age (Macdonald et al., 1983). The dominating geology is now one of volcanic derived soils with scattered outcrops of basaltic rock. Annual rainfall is on the order of 2030-millimeters (Tellaferro

1959). Cloud drip is an important source of moisture at this elevation in the Hāmākua District.

A large portion of the site is an abandoned quarry. Much of the site has clearly been bulldozed, excavated and generally altered by anthropogenic efforts. There are several old four-wheel drive roads traversing the site and the main quarry pit is still very evident in the north-west corner of the parcel. The habitat present within the study site is dominated by a community of non-native grasses with Henry's Crabgrass (*Digitaria ciliaris*) being the most abundant. There is a windbreak of ironwood (*Casuarina equisetifolia*) trees on the western edge of the site. There are numerous strawberry and common guava (*Psidium cattleianum*), (*P. guajava*) bushes and trees and remnant pockets of 'ō'hia (*Metrosideros polymorpha*) with mixed understorey in the central part of the site, and a mixed 'ō'hia forest with a ginger (*Hechechium spp.*) and fern understorey on the eastern boundary of the site.

### Mammalian Survey Methods

With the exception of the endangered Hawaiian hoary bat (*Lasiurus cinereus semotus*), or 'ōpe 'ōpe' as it is known locally, all terrestrial mammals currently found on the Island of Hawai'i are alien species. Most are ubiquitous. No trapping program was proposed or undertaken to quantify the use of the property by alien mammalian species. The survey of mammals was limited to visual and auditory detection, coupled with visual observation of scat, tracks, and other animal sign. A running tally was kept of all vertebrate species observed and heard within the project area.

### Avian Survey Methods

Following a reconnaissance visit to the site on September 22<sup>nd</sup>, 2005 we returned on the 24<sup>th</sup> to conduct the faunal surveys. Two avian count station was located within the site, one approximately 30-meters south of the Old Māmalahoa Highway along the existing path over which the well access road will be constructed. The second station was sited on the southern boundary of the site, to the west of the proposed reservoir site. Eight-minute point counts were made at each count station. Field observations were made with the aid of Leitz 10 X 42 binoculars and by listening for vocalizations. Counts were concentrated between 07:30 a.m. and 9:30 a.m., the peak of daily bird activity. Time not spent counting was used to search the project area for species and habitats that were not detected during count sessions.

### Botanical Survey Methods

A reconnaissance level, pedestrian botanical survey was conducted within the site, primarily to characterize the vegetation present and to determine whether a more

extensive botanical survey was warranted. A species list was kept of the plants observed while on the site.

#### Mammalian Survey Results

A total of three alien mammalian species were recorded during the course of this survey. Two dogs (*Canis familiaris*) were heard barking from outside the study area, additionally dog scat and sign were encountered along the northern boundary of the site immediately adjacent to the Old Māmalahoa Highway. One small Indian mongoose (*Herpestes a. auripunctatus*) was seen coming out of the trash pile located just north of the pole gate which is located west of the trail. We encountered scat and sign of feral pigs (*Sus s. scrofa*) along the 'Ino'ino Gulch wall on the eastern edge of the site. All of the alien mammalian species recorded during this survey are deleterious to avian and floristic components of the remaining native ecosystems present on the Island.

#### Avian Survey Results

A total of 35 individual birds of 8 different species, representing 7 separate families were recorded during the course of station counts (Table 1). All of the avian species recorded are considered to be alien to the Hawaiian Islands. No species currently listed as endangered, threatened or proposed for listing under either the federal or the State of Hawai'i's endangered species programs was detected on the site (DLNR, 1998, Federal Register, 1999a, 1999b, 2001, 2002, 2004).

Avian diversity and densities were remarkably low. One species, the Japanese White-eye (*Zosterops japonicus*) accounted for 26% of the total number of birds recorded during station counts. An average of 17.5 individual birds were detected per station count.

#### Botanical Survey Results

The reconnaissance level botanical inventory identified 41 separate plant species, of which two are considered to be endemic, two indigenous and one introduced to the Hawaiian Islands by the early Polynesian settlers. The remaining 36 species are generally considered to be naturalized alien species. (Table 2). No species currently listed as endangered, threatened or proposed for listing under either the federal or the State of Hawai'i's endangered species programs was detected on the site (DLNR, 1998, Federal Register, 1999a, 1999b, 2001, 2002, 2004).

#### Discussion

The findings of the mammalian survey are consistent with one survey conducted on lands immediately adjacent to the subject property (Guinther and David, 2005a) and several

Table 1

Avian Species Detected TMK: (3)4-6-11-42 Ahualoa Well Site		
Common Name	Scientific Name	ST RA

Ring-necked Pheasant	<i>Phasianus colchicus</i>	A 0.5
GALLIFORMES		
PHASIANIDAE - Pheasants & Partridges		
Phasianinae - Pheasants & Allies		
COLUMBIFORMES		
COLUMBIDAE - Pigeons & Doves		
Zebra Dove	<i>Geopelia striata</i>	A 3.5
Spotted Dove	<i>Streptopelia chinensis</i>	A 0.5
PASSERIFORMES		
ALAUDIDAE - Larks		
Sky Lark	<i>Alauda arvensis</i>	A 0.5
ZOSTEROPIDAE - White-Eyes		
Japanese White-eye	<i>Zosterops japonicus</i>	A 4.5
STURNIDAE - Starlings		
Common Myna	<i>Acridotheres tristis</i>	A 2.0
FRINGILLIDAE - Fringilline And Cardueline Finches & Allies		
House Finch	<i>Carduelinae - Cardueline Finches</i>	A 2.5
ESTRILDIDAE - Estrildid Finches		
Nutmeg Mannikin	<i>Estrildinae - Estrildine Finches</i>	A 3.5
<i>Lonchura punctulata</i>		

#### KEY TO TABLE 1

ST Status  
 A Alien Species - introduced to the Hawaiian Islands by humans  
 RA Relative Abundance - number of birds detected divided by the number of station counts (2)

Table 2

Plants Recorded on TMK: (3)4-6-11:42 Āhualoa Well Site		
Scientific Name	Common Name	ST

FERNS & FERN ALLIES

DICKSONIACEAE		
<i>Cibotium chamissoi</i> Kaulf.	hapu'u	E
GLEICHENIACEAE		
<i>Dicranopteris linearis</i> (Burm. f.) Underw	ulufe	I
NEPHROLEPIDACEAE		
<i>Nephrolepis multiflora</i> (Roxburgh) Jarrett ex Morton	common sword fern	N

FLOWERING PLANTS  
DICOTYLEDONES

APIACEAE		
<i>Centella asiatica</i> (L.) Urb	Asiatic pennywort	N
ASTERACEAE (COMPOSITAE)		
<i>Ageratum conyzoides</i> L.	maile hohono	N
<i>Ridens pilosa</i> L.	beggar's-tick	N
<i>Cirsium vulgare</i> (Savi) Ten.	bull thistle	N
<i>Hypochaeris radicata</i> L.	hairy cat's ear	N
<i>Pluchea carolinensis</i> Jacq. G Don	sourbush	N
<i>Senecio mikanioides</i> Otto ex Walp.	German ivy	N
<i>Sphagneticola trilobata</i> (L.) Pruski	wedelia	N
<i>Taraxacum officinale</i> W. W. Weber ex Wigg.	dandelion	N
CASUARINACEAE		
<i>Casuarina equisetifolia</i> L.	common ironwood	N
CHENOPODIACEAE		
<i>Chenopodium ambrosioides</i> L.	Mexican tea	N
CONVOLVULACEAE		
<i>Ipomoea cairica</i> (L.) Sweet	koali 'ai	I
FABACEAE		
<i>Desmodium cf. incanum</i> DC	Spanish clover	N
<i>Lotus subbiflorus</i> Lag.		N
<i>Melilotus alba</i> Medik.	white sweet clover	N
<i>Neonotonia wightii</i> (Wight & Arnott) Lackey		N
GERANIACEAE		
<i>Geranium homeanum</i> Turcz.		N

MALVACEAE		
<i>Sida rhombifolia</i> L.		N
MELASTOMATIDAE		
<i>Tibouchina herbacea</i> (DC) Cogn.	***	N
<i>Metrosideros polymorpha</i> Gaud.	ʻōʻhia	E
<i>Psidium cattleianum</i> Sabine	strawberry guava	N
<i>Psidium guajava</i> L.	common guava	N
PLANTAGINACEAE		
<i>Plantago major</i> L.	broad-leaved plantain	N
PRIMULACEAE		
<i>Anagallis arvensis</i> L.	scarlet pimpernel	N
ROSACEAE		
<i>Rubis rosifolius</i> Sm.	thimbleberry	N
RUBIACEAE		
<i>Richardia brasiliensis</i> Gomes		N

MONOCOTYLEDONES

JUNCACEAE		
<i>Juncus cf. tenuis</i> Willd.	***	N
MUSACEAE		
<i>Musa X paradisiaca</i> L.	banana	P
ORCHIDACEAE		
<i>Arundina graminifolia</i> (D. Don) Hochr.	bamboo orchid	N
POACEAE (GRAMINEAE)		
<i>Dactyloctenium aegyptium</i> L.	cockfoot	N
<i>Digitaria ciliaris</i> (Retz.) Koeler	Henry's crabgrass	N
<i>Melinis minutiflora</i> P. Beauv.	molasses grass	N
<i>Pennisetum clandestinum</i> Chiov.	Kikuyu grass	N
<i>Pennisetum purpurium</i> Schumach.	Elephant grass	N
<i>Sacciolepis indica</i> (L.) Chase	Glenwood grass	N
Sporobolus		
ZINGIBERACEAE		
<i>Hedyotium comararium</i> Koenig	white ginger	N
<i>Hedyotium flavescens</i> N. Carey ex. Roscoe	yellow ginger	N
<i>Hedyotium gardnerianum</i> Sheppard ex Ker-Gawl	kahili ginger	N

KEY TO TABLE 2

ST	Status
E	Endemic to the Hawaiian Islands
I	Indigenous to the Hawaiian Islands
N	Naturalized - An alien species now naturalized in the Hawaiian Islands
P	Polynesian - Introduced to the Hawaiian Islands by the early Polynesian settlers

other surveys conducted in alien pasture grass dominated lands the Hāmākua and South Kohala Districts within the recent past (David, 1999, 2000, 2004, 2005a). Although we did not detect the endangered Hawaiian hoary bat during the course of this survey, it is likely that bats forage within the general project area, at least occasionally, as they have been seen in the general project area (Jacobs 1994, R. David unpublished field notes 1985-2005).

It should be noted that current survey techniques available for gathering information on the distribution, abundance and usage of resources within a given area by Hawaiian hoary bats are inadequate and/or time and cost prohibitive. Data gathered by these methods only indicate whether bats are present or not in any given area. The two main methods currently being used to monitor lasiurine bats are; heterodyne echolocation detector surveys and mist netting. Scientists currently have no understanding of detection probabilities associated with either method (Carter et al., 2000). It may be impossible to standardize detection probabilities among surveyors, studies, or over time (O'Shea and Bogen, 2000). The inability to estimate detection probability, limits the usefulness of data collected using un-calibrated indices produced by either mist netting or echolocation surveys.

Unlike nocturnally flying seabirds, which often collide with man-made structures, bats are uniquely adapted to avoid collision with obstacles, man-made or natural. They navigate and locate their prey primarily by using ultrasonic echolocation, which is sensitive enough to allow them to locate and capture small volant insects at night.

Although no rodents were detected during the course of this survey, it is likely that roof rats (*Rattus r. rattus*), Norway rats (*Rattus norvegicus*), European house mice (*Mus domesticus*) and possibly Polynesian rats (*Rattus exulans hawaiiensis*) use resources within the general project area. Without conducting a trapping program, it is difficult to assess the population densities of these often hard-to-see mammals. All of these introduced rodents are deleterious to native ecosystems and the native faunal species that are dependant on them.

The remarkably low diversity and densities of avian species detected during this survey was in keeping with the results with several other relatively recent faunal surveys conducted in the Hāmākua and South Kohala and Districts (David, 1999, 2000, 2004, 2005a, Guinther and David, 2005). The habitat currently found within the project area and within the alien species dominated pasture land in the Hāmākua District is not conducive to supporting native forest birds, with the possible exception of Short-eared Owls (*Asio flammeus sandwicensis*), and Hawaiian Hawks (*Buteo solitarius*). Although not detected on this survey I have recorded both species on several occasions immediately adjacent to the subject property (Guinther and David, 2005, David, 2005b). Although not detected during this survey it is possible that small numbers of the endangered endemic Hawaiian Petrel (*Pterodroma sandwicensis*), and the threatened Newell's Shearwater

(*Puffinus auricularis newelli*), over-fly the project area between the months of May and November (Banko, 1980a, 1980b, Day et al., 2003a, Harrison, 1990).

Hawaiian Petrels were formerly common on the Island of Hawai'i (Wilson and Evans 1890-1899). This pelagic seabird reportedly nested in large numbers on the slopes of Mauna Loa and in the saddle area between Mauna Loa and Mauna Kea (Henshaw, 1902), as well as at the mid to high elevations of Mount Hualālai. It has, within recent historic times, been reduced to relict breeding colonies located at high elevations on Mauna Loa and, possibly, Mount Hualālai (Banko, 1980a, Banko et al., 2001, Cooper and David, 1995, Cooper et al., 1995, Day et al., 2003a, Harrison, 1990, Hue et al., 2001, Simons and Hodges, 1998).

Newell's Shearwaters were formerly common on the Island of Hawai'i (Wilson and Evans, 1890-1899). This species breeds on Kaua'i, Hawai'i and Moloka'i in extremely small numbers. Newell's Shearwater populations have dropped precipitously since the 1880s (Banko, 1980b, Day et al., 2003b). This pelagic species nests high in the mountains in burrows excavated under thick vegetation, especially 'uluhie fern.

The primary cause of mortality in both these species is thought to be predation by alien mammalian species at the nesting colonies (Ainley et al., 2001, Cooper and Day, 1995, 1998, Day and Cooper, 1997, Hue et al., 2001). Collision with man-made structures is considered to be the second most significant cause of mortality of these seabird species in Hawai'i. Nocturnally flying seabirds, especially fledglings on their way to sea in the summer and fall, can become disoriented by exterior lighting. When disoriented, seabirds often collide with manmade structures, and if they are not killed outright, the dazed or injured birds are easy targets of opportunity for feral mammals (Ainley et al., 1995, 1997, 2001, Cooper and Day, 1995, 1998, Day and Cooper, 1997). There is no suitable nesting habitat within or close to the subject property for either of these pelagic seabird species.

#### **Potential Impacts to Protected Vertebrate Species**

##### *Hawaiian Petrel and Newell's Shearwater*

The principal potential impact that the construction and operation of the proposed well and associated appurtenances poses to Hawaiian Petrels and Newell's Shearwaters is the increased threat that birds will be downed after becoming disoriented by exterior lighting that may be required in conjunction with the construction and operation of the well and reservoir.



### Conclusions

The habitat present within the subject property is highly degraded, and dominated by alien species. The further modification of this habitat is not expected to result in deleterious impacts to any avian, mammalian or botanical species currently listed as endangered, threatened or proposed for listing under either federal or State of Hawai'i endangered species programs.

There are small but relatively high quality stands of 'o'hia located in the middle of the site and along the eastern boundary, though not protected under endangered species statutes these areas are of biological interest, and ought to be conserved if practical.

### Recommendations

To reduce the potential for interactions between nocturnally flying Hawaiian Petrels and Newell's Shearwaters with external lights and man-made structures, it is recommended that any external lighting planned to be used during construction or being proposed as permanent street lights be shielded (Reed et al. 1985, Teifer et al., 1987). This mitigation would serve the dual purpose of minimizing the threat of disorientation and downing of Hawaiian Petrels and Newell's Shearwaters, while at the same time complying with the Hawaii County Code § 14 - 50 *et seq.* which requires the shielding of exterior lights, so as to lower the ambient glare caused by unshielded lighting to the astronomical observatories located on Mauna Kea.

The 'o'hia stands present on the site, especially those along the 'Ino'ino Guch wall should be conserved if practical.

### Glossary:

**Alien** - Introduced to Hawai'i by humans.  
**Commensal** - Animals that share humans food such as rats and mice.  
**Endangered** - Listed and protected under the ESA as an endangered species.  
**Endermic** - Native and unique to the Hawaiian Islands.  
**Indigenous** - Native to the Hawaiian Islands, but also found elsewhere naturally.  
**Naturalized** - An introduced alien species which has become self sustaining in the wild.  
**Nocturnal** - Night-time, after dark.  
**Threatened** - Listed and protected under the ESA as a threatened species.  
**Volant** - Flying, capable of flight - as in flying insect.

**ASL** - Above mean sea level.  
**DLNR** - Hawaii State Department of Land & Natural resources.  
**DWS** - Hawaii County Department of Water Supply.  
**ESA** - Federal Endangered Species Act of 1973, as amended.

**Literature Cited:**

- Ainley, D. G., R. Podolsky, L. DeForest, G. Spencer, and N. Nur. 1995. Kauai endangered seabird study. Volume 2: The ecology of Dark-rumped Petrels and Newell's Shearwaters. Final Report TR-105847-V2, Electric Power Research Institute, Palo Alto, California, by PRBO Stinson Beach, CA.
- \_\_\_\_\_. 1997. New Insights into the Status of the Hawaiian Petrel on Kauai. Colonial Waterbirds, 20 (1): 24-30
- \_\_\_\_\_. 2001. The Status and Population Trends of the Newell's Shearwater on Kauai: Insights from Modeling. In: Scott, J. M., S. Conant, and C. Van Riper III (editors) *Evolution, Ecology, Conservation, and Management of Hawaiian Birds: A Vanishing Avifauna*. Studies in Avian Biology No. 22. Cooper's Ornithological Society, Allen Press, Lawrence, Kansas. (Pg. 108-123)
- American Ornithologist's Union. 1998. *Check-list of North American Birds*. 7th edition. AOU, Washington D.C. 829pp.
- \_\_\_\_\_. 2000. Forty-second supplement to the American Ornithologist's Union *Check-list of North American Birds*. Auk 117:847-858.
- Banks, R. C., C. Cicero, J. L. Dunn, A. W. Kratter, P. C. Rasmussen, J. V. Remsen, Jr., J. D. Rising, and D. F. Stotz. 2002. Forty-third supplement to the American Ornithologist's Union *Check-list of North American Birds*. Auk 119:897-906.
- \_\_\_\_\_. 2003. Forty-fourth supplement to the American Ornithologist's Union *Check-list of North American Birds*. Auk 120:923-931.
- \_\_\_\_\_. 2004. Forty-fifth supplement to the American Ornithologist's Union *Check-list of North American Birds*. Auk 121:985-995.
- \_\_\_\_\_. 2005. Forty-sixth supplement to the American Ornithologist's Union *Check-list of North American Birds*. Auk 122:1026-1031.
- Carter, T. C., M. A. Menzel, and D. Saugy. 2000. Population Trends of Foliage-Roosting Bats in O'Shea, T. J. and M. A. Bogan (editors), Interim Report of the Workshop on Monitoring Trends in U. S. Bat Populations: Problems and Prospects. U. S. Geological Survey, Midcontinent Ecological Science Center, Fort Collins, Colorado, 124 pp. Also available on line from : <http://www.mrsc.usgs.gov/BPD/ireport.htm>
- Banko, W. E. 1980a. Population Histories- Species Accounts Seabirds: Hawaiian Dark-rumped Petrel ('Ua'u). Cooperative National Park Resources Studies Unit, University of Hawaii at Manoa, Department of Botany, Technical Report #5B.
- \_\_\_\_\_. 1980b. Population Histories- Species Accounts Seabirds: Newell's Shearwater ('A'o). Cooperative National Park Resources Studies Unit, University of Hawaii at Manoa, Department of Botany, Technical Report #5A.
- Banko, P. C., R. E. David, J. D. Jacobi, and W. E. Banko. 2001. Conservation Status and Recovery Strategies for Endemic Hawaiian Birds. In: Scott, J. M., S. Conant, and C. Van Riper III (editors) *Evolution, Ecology, Conservation, and Management of*

*Hawaiian Birds: A Vanishing Avifauna*. Studies in Avian Biology No. 22. Cooper's Ornithological Society, Allen Press, Lawrence, Kansas (Pg. 359-376).

- Cooper, B. A. and R. E. David. 1995. Radar and Visual Surveys of Seabirds in the HELCO SSP Unit 71, Puna, Hawaii, During July 1995. Prepared for R. M. Towill Corporation & Hawaii Electric Light Co.
- Cooper, B. A., R. E. David, and R. J. Blaha. 1995. Radar and Visual Surveys of Endangered Seabirds and Bats in the Pohakuloa Training Area, Hawaii'i, During Summer 1995. Prepared for R.M. Towill Corporation and the U.S. Army Corps of Engineers, Pacific Division (POD).
- Cooper, B. A. and R. H. Day. 1995. Kauai endangered seabird study. Volume 1: Interactions of Dark-rumped Petrels and Newell's Shearwaters with utility structures on Kauai, Hawaii: Final Report, TR-105847-V1, Electric Power Research Institute, Palo Alto, California.
- \_\_\_\_\_. 1998. Summer Behavior and Mortality of Dark-rumped Petrels and Newell's Shearwaters at Power Lines on Kauai. Colonial Waterbirds, 21 (1): 11-19.
- David, R. E. 1999. A Survey of Terrestrial Vertebrate Species Associated with the Waikoloa Maneuver Area, Phase II: Wai-koloa Village and Surrounding Areas, Island of Hawaii'i, Hawaii'i. Prepared for: Edward K. Noda & Associates & the U.S. Army Corps of Engineers, Pacific Ocean Division (POD).
- \_\_\_\_\_. 2000. A Survey of Terrestrial Vertebrate Species Associated with the Ordnance Avoidance and Environmental Survey of the Former Nansay Hawaii Lands at Ouli, DERP-FUDS Site No. H091H004301 and Puako, DERP-FUDS Site No. H091H004302, South Kohala, Hawaii'i. Prepared for: Donaldson Enterprises, Inc. & the U.S. Army Corps of Engineers, Pacific Ocean Division (POD).
- \_\_\_\_\_. 2004. A Survey of Terrestrial Vertebrate Species Associated with the Ordnance Avoidance and Environmental Survey of Sector 15 of the former Waikoloa Maneuver Area, Phase III, South Kohala and Hamakua Districts, Island of Hawaii'i. Prepared for: Donaldson Enterprises Inc. & the U.S. Army Corps of Engineers, Pacific Ocean Division (POD).
- \_\_\_\_\_. 2005a. A Survey of Avian and Terrestrial Mammalian Species for the Waimea Bypass Highway: Hawaii'i Belt Road, Mud Lane to Parker Ranch Race-track, South Kohala District, Island of Hawaii'i. Prepared for: Akinaka & Associates, Inc & State of Hawaii'i Department of Transportation, Highways Division (HDOT).
- \_\_\_\_\_. 2005b. Unpublished Field Notes - Island of Hawaii'i: 1985-2005.
- Day, R. H., and B. Cooper. 1997. Patterns of Movement of Dark-rumped Petrels and Newell's Shearwaters on Kauai. The Condor, 97: 1011-1027.
- Day, R. H., B. Cooper, and R. J. Blaha. 2003. Movement Patterns of Hawaiian Petrels and Newell's Shearwaters on the Island of Hawaii'i. Pacific Science, 57, 2:147-159.
- Day, R. H., B. Cooper, and T. C. Telfer. 2003. Decline of Townsend's (Newell's) Shearwaters (*Puffinus auricularis newelli*) on Kauai, Hawaii. The Auk 120: 669-679.

2: 193-200.  
Macedonalid, G. A., A. T. Abbott, and F. L. Peterson. 1983. *Volcanoes in the sea: The geology of Hawaii*. 2d. ed. Honolulu: University of Hawaii Press 517 pp.

O'Shea, T. J. and M. A. Bogan (editors). 2000. Interim Report of the Workshop on Monitoring Trends in U. S. Bat Populations: Problems and Prospects. U. S. Geological Survey, Midcontinent Ecological Science Center, Fort Collins, Colorado, 124 pp. Also available on line from : <http://www.mtsc.usgs.gov/BFD/itsreport.htm>

Pukui, M. K., S. H. Elbert, and E. T. Mookini. 1976. *Place Names of Hawaii*. University of Hawaii Press. Honolulu, Hawaii. 289 pp.

Reed, J. R., J. L. Sincoc, and J. P. Hailman. 1985. Light Attraction in Endangered Procellariiform Birds: Reduction by Shielding Upward Radiation. *Auk* 102: 377-383.

Simons, T. R., and C. N. Hodges. 1998. Dark-rumped Petrel (*Pterodroma phaeopygia*). In A. Poole and F. Gill (editors). *The Birds of North America*, No. 345. The Academy of Natural Sciences, Philadelphia, PA. And the American Ornithologists Union, Washington, D.C.

Telfer, T. C., J. L. Sincoc, G. V. Byrd, and J. R. Reed. 1987. Attraction of Hawaiian seabirds to lights: Conservation efforts and effects of moon phase. *Wildlife Society Bulletin* 15:406-413.

Telliadro, W. J. 1959. Rainfall of the Hawaiian Islands. State of Hawaii, Hawaii Water Authority, Honolulu, Hawaii. 394 pp.

Tomich, P.Q. 1986. *Mammals in Hawaii*. Bishop Museum Press. Honolulu, Hawaii. 37 pp.

USGS. 1996. *Kamuela Quadrangle, Hawaii, Hawaii Co.* 7.5 minute series (Topographic). Denver, Colorado.

Wagner, W.L., D.R. Herbst, and S.H. Sohmer. 1990. *Manual of the Flowering Plants of Hawaii*. University of Hawaii Press, Honolulu, Hawaii 1854 pp.

Wagner, W.L. and D.R. Herbst. 1999. *Supplement to the Manual of the Flowering Plants of Hawaii*, pp. 1855-1918. In: Wagner, W.L., D.R. Herbst, and S.H. Sohmer, *Manual of the flowering plants of Hawaii*. Revised edition. 2 vols. University of Hawaii Press and Bishop Museum Press, Honolulu.

Wilson, S. B., and A. H. Evans. 1890-1899. *Aves Hawaiiensis: The birds of the Sandwich Islands*. R. H. Porter, London.

Department of Land and Natural Resources (DLNR). 1998. *Indigenous Wildlife, Endangered and Threatened Wildlife and Plants, and Introduced Wild Birds*. Department of Land and Natural Resources, State of Hawaii. Administrative Rule §13-134-1 through §13-134-10, dated March 02, 1998.

Federal Register. 1999a. Department of the Interior, Fish and Wildlife Service, Endangered and Threatened Wildlife and Plants. 50CFR 17:11 and 17:12 - December 3, 1999

\_\_\_\_\_. 1999b. Department of the Interior, Fish and Wildlife Service, 50 CFR 17. Endangered and Threatened Wildlife and Plants. Endangered and Threatened Wildlife and Plants; Review of Plant and Animal Taxa that are Candidates or Proposed for Listing as Endangered or Threatened; Annual Notice of Findings on Recycled Petitions, and Annual Description of Progress on Listing Actions. *Federal Register*, 64 No. 205 (Monday, October 25, 1999): 57534-57547.

\_\_\_\_\_. Federal Register. 2001. Department of the Interior, Fish and Wildlife Service, 50 CFR 17. Endangered and Threatened Wildlife and Plants. Notice of Findings on Recycled Petitions. *Federal Register*, 66 No. 5 (Monday, January 8, 2001): 1295 - 1300.

\_\_\_\_\_. 2002. Department of the Interior, Fish and Wildlife Service, 50 CFR 17. Endangered and Threatened Wildlife and Plants. Review of Species That Are Candidates or Proposed for Listing as Endangered or Threatened; Annual Notice of Findings on Recycled Petitions; Annual Description of Progress on Listing Actions. *Federal Register*, 67 No. 114 (Thursday, June 13, 2002): 40657-40679.

\_\_\_\_\_. 2004. Department of the Interior, Fish and Wildlife Service, 50 CFR 17. Endangered and Threatened Wildlife and Plants. Review of Species That Are Candidates or Proposed for Listing as Endangered or Threatened; Annual Notice of Findings on Resubmitted Petitions; Annual Description of Progress on Listing Actions. *Federal Register*, 69 No. 86 (Tuesday, May 4, 2004): 24876-24904.

Guinther, E. B., and R. E. David. 2005. Biological resources survey and assessment for the Honoka'a Tract, parcels TMK: 4-6-11-03, 11, 12, & 13 near Honoka'a, Island of Hawaii. Prepared for State of Hawaii Department of Hawaiian Homes Lands (DHHL)

Harrison, C. S. 1990. *Seabirds of Hawaii: Natural History and Conservation*. Cornell University Press, Ithaca, N.Y. 249 pp.

Henshaw, H.W. 1902. *Complete list of birds of the Hawaiian Possessions with notes on their habits*. Thrum, Honolulu. 146 pp.

Hue, D., C. Gladden, J. Lippert, L. Schnell, J. MacIvor and J. Meisler. 2001. *Habitat Use and Limiting Factors in a Population of Hawaiian Dark-rumped Petrels on Mauna Loa, Hawaii*. In: Scott, J. M., S. Conant, and C. Van Riper III (editors) *Evolution, Ecology, Conservation, and Management of Hawaiian Birds: A Vanishing Avifauna*. Studies in Avian Biology No. 22. Cooper's Ornithological Society, Allen Press, Lawrence, Kansas (Pg. 234-242).

Jacobs, D.S. 1994. *Distribution and Abundance of the Endangered Hawaiian Hoary Bat, *Lasionycteris cinereus semotus*, on the Island of Hawaii*. Pacific Science, Vol. 48, no.

**APPENDIX B    ARCHAEOLOGICAL AND CULTURAL  
IMPACT ASSESSMENT**

**Paul H. Rosendahl, Inc.**

**September 2005**

# PHRI

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PHRI Report #584-101105

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## ARCHAEOLOGICAL AND CULTURAL IMPACT ASSESSMENT FOR ENVIRONMENTAL ASSESSMENT (EA)

### ĀHUALOA PRODUCTION WELL AND STORAGE TANK PROJECT

Land of Honokaa, Hāmākua District, Island of Hawai'i  
(TMK: (5) 4-6-11: Por. 49)

Prepared by  
Paul H. Rosendahl, Ph.D.  
for  
Planning Solutions, Inc.

#### Introduction

At the request of Mr. Charles L. Morgan of Planning Solutions, Inc. (PSI), and on behalf of their client, Tom Nance Water Resource Engineers (TNWRE), Paul H. Rosendahl, Ph.D., Inc. (PHRI) conducted an archaeological and cultural impact assessment for the Āhualoa Production Well and Storage Tank Project (TMK: (5) 4-6-11: Por. 49), which is located in the Land of Honokaa, Hāmākua District, on the windward side of the Island of Hawai'i. This assessment was conducted in connection with preparation of a *Chapter 345 (Haw. Rev. Stat.)* environmental assessment (EA) for development planning and subsequent permit applications that would be made to such agencies as the Hawaii County Planning Department and/or Hawaii County Department of Public Works, and/or the Hawaii State Department of Land and Natural Resources.

#### Assessment Purpose, Objectives, and General Scope of Work

##### Archaeological Assessment

The basic purpose of the archaeological assessment was to comply with all current historic preservation requirements of the Hawaii State Historic Preservation Division (SHIPD) and the Hawaii County Planning Department (HICPD). The specific objectives of the archaeological assessment survey were to determine the following: (a) the general nature, extent, and potential significance of any archaeological-historical remains that might be present; (b) the historic preservation implications of any such remains for the feasibility of any proposed future development; and (c) the general scope of work and level of effort for any subsequent archaeological-historic preservation work that might be appropriate and/or required.

#### Cultural Impact Assessment

The basic purpose of the cultural impact assessment study was to comply with the requirements of *Chapter 345 (Haw. Rev. Stat.)* as amended by H.B. No. 2895 H.D. 1 of the Hawaii State Legislature (2000) and approved by the Governor as *Act 50* on April 26, 2000, and which among other things requires that environmental assessments (EA) and environmental impact statements (EIS) identify and assess the potential effects of any proposed project upon the "cultural practices of the community and State...." *Chapter 345 (Haw. Rev. Stat.)* was amended by the State Legislature because of the perceived need to assure that the environmental review process explicitly addressed the potential effects of any proposed project upon "....Hawaii's culture, and traditional and customary rights." Guidelines previously prepared and adopted by the State Office of Environmental Quality Control (OEQC) (1997) provide compliance guidance. Both *Act 50* and the OEQC *Guidelines for Assessing Cultural Impacts* mandate consideration of all the different groups comprising the multi-ethnic community of Hawai'i. This inclusiveness, however, is generally understated, and the emphasis—as indicated by a background review of the cultural impact assessment issue (PHRI 1998-5-8), and the intent and evolution of both the legislative action and the guidelines—is clearly meant to be upon aspects of Native Hawaiian culture—particularly traditional and customary access and use rights.

The specific objectives of the cultural impact assessment were to determine the following: (a) if the project area is currently being accessed by native Hawaiian cultural practitioners, or individuals of any other cultural groups, for any traditional and customary cultural uses; (b) if the proposed project would have any adverse impacts upon any identified current native Hawaiian or other cultural group uses of the area; and (c) what measures might be proposed to mitigate any adverse impacts the proposed project might have upon the uses of the area by any identified current native Hawaiian or other cultural group.

The scope of work and methodology for the Āhualoa Production Well and Storage Tank Project cultural impact assessment is based on the general assumption that the level of study effort appropriate in any project-specific context should involve the consideration of several factors, the most relevant of which are the following: (a) the probable number and significance of known or suspected cultural properties, features, practices, or beliefs within or associated with the specific project area; (b) the potential number of individuals (potential informants) with cultural knowledge of the specific project area; (c) the availability of historical and cultural information on the specific project area or immediately adjacent lands; (d) the physical size, configuration, and natural and human modification history of the specific project area; and (e) the potential effects of the project on known or expected cultural properties, features, practices, or beliefs within or related to the specific project area.

Consideration of these factors within the specific nature and context of the proposed Āhualoa Production Well and Storage Tank Project indicated that the most appropriate level of study for an adequate assessment of potential cultural impacts would be a limited or abbreviated assessment study. Based on the location, small size, and the extensive recent historic period modification, development and utilization of the project site, this study assumes that (a) potential cultural impact assessment issues would be highly unlikely; (b) the negative results of the archaeological reconnaissance survey conducted for the project would confirm both the greatly altered physical nature of the project area and the absence of cultural resources within or related to the project area; and (c) in the unlikely instance that any legitimate cultural impact assessment issues should arise during the environmental review period, they could be addressed adequately within the framework of the regulatory review process (i.e., from Draft to Final Environmental Assessment).

#### General Scope of Work

Based on information provided by Mr. Morgan, preliminary review of available background information for the general vicinity of the project area, and familiarity with both the general project area and the current regulatory review requirements of the SHPD and the Hawaii County Planning Department, the following scope of work was determined to be appropriate for the archaeological and cultural impact assessment:

1. Conduct appropriate background review and research;
2. Mobilization—including all field work preparations, field crew travel time, and demobilization;
3. Conduct variable intensity, 100% coverage, pedestrian surface reconnaissance fieldwork only of the project area;
4. Conduct post-field analysis of field and other data;
5. Prepare a written assessment report—including description and evaluation of assessment findings, and a scope of work and cost estimate for any additional work that might be required by various regulatory agencies in connection with project planning and development; and
6. Coordinate and consult with client, client representatives, agency staff, etc. (as appropriate and/or required).

Based on available information on the general status and past land use history of the project area and its immediate vicinity, the likelihood of encountering potentially significant archaeological-historical resources seemed to be very low. Based on the information to be provided in the report on the assessment, it was believed likely that a formal determination of "no historic properties affected" for the project area in accordance with the general guidance provided by Chapter 15-284, Section 5(b) of the SHPD Rules and Regulations (HAR) (effective 12/11/05) could be requested of and received from SHPD for the project area. Such a determination should satisfy the historic preservation review requirements of the SHPD and the Hawaii County Planning Department. This preliminary evaluation was made with the qualification that it is always possible—no matter how unlikely, that potentially significant resources requiring subsequent additional work might be encountered during the assessment fieldwork.

#### Project Area Description

The Ahualoa Production Well and Storage Tank project area (TMK: (5) 4-6-11: Por. #2) is situated c. 4.5 miles from the coastline, c. 1.1 miles inland of and above the Hawaii Belt Road, and c. 700 ft inland of the old Mamalahoa Highway, along the section of road between Honoka'a Town and Ahualoa Village, in the Land of Honoka'a, Hamakua District, on the windward side of the Island of Hawaii (see Figure 1, at end). The project area totals c. 2.8 ac overall of open, undeveloped ranch land, and consists of two components: (a) an approximately 700-ft long and 20-ft wide access road corridor; extends inland of the old Mamalahoa Highway (0.25 ac), and (b) the approximately 150,000 sq ft well and storage tank site (c. 3.4 ac) (see Figure 2, at end).

The project area is located in the Hamakua District, on the lower northeastern windward slope of Mauna Kea, at an elevation of c. 2,000 ft (AMSL). The area is geologically dominated by the Pahala Ash capped, chiefly basaltic lava flows of the Hamakua volcanic series of volcanic rocks of Mauna Kea Volcano, which are overlain by the later andesitic and basaltic lava flows of the lower member of the Laupahoehoe volcanic series of volcanic rocks of Mauna Kea Volcano (Stearns and Macdonald 1946:159-7, 159-165). The physiographic type of landform is Wai'anae Slightly Dissected Upland, which is characterized by slopes cut by widely spaced erosional gullies (Armstrong 1989:37).

The project area terrain consists primarily of gently undulating tableland, and the surface has been cut by several quite shallow erosional gullies—dry at present, but which obviously carry periodic storm runoff. The soil within the general project area is included in the Akaka-Honokaa-Kaiwika association of deep, gently sloping to steep, moderately well drained and well drained soils (Sato et al. 1973:6). More specifically, soil in the project area consists of Honokaa silty clay loam (10-20% slopes), representing the Honokaa series of well drained silty clay loams that have formed in volcanic ash, are generally found on uplands from 1,000 ft to 2,000 ft, and are rapidly permeable, with slow run-off, and a slight erosion hazard. These soils are typically used for pasture, sugarcane, and woodland (Sato et al. 1973:6, 18-19). Annual rainfall is estimated to be c. 75 inches, and the mean annual temperature is approximately 72 degrees F. (Armstrong 1986:63-4).

Vegetation within the project area is rather limited, and consists mainly of a luxuriant low cover of grass of an undetermined species. Several scattered specimens of definitely identified indigenous or prehistorically introduced plants were observed—including primarily *Adiantum* (*Metrosideros collina* (Forst.) Gray subsp. *polymorpha* (Gaud.) Rock), *Apuia* (tree fern), *Cibotium* (*Adiantum* (Gaud.) Kirajima), and *ki* (ii; *Gonolobus terminalis* (L.) Kunth). Situated immediately adjacent to and east of the project area is a small remnant stand of open native forest, consisting predominately of *ohia* with an understory of *hupu*, which evidences the earlier precontact vegetation of the general area. The principal non-indigenous species noted within and/or immediately adjacent to the project area included *Passiflora* (strawberry guava), *Pisonia* (*Sabine*) and three different species or varieties of ornamental ginger. The general vicinity including the project area, has been historically utilized for ranching—i.e., for extensive grazing of cattle, and the slightly altered ground surface and terrain of the project area suggests that limited attempts have been made to create improved pasturage by mechanical means (grubbing and/or grading).

#### Field Inspection

A field inspection of the project area was carried out on September 22, 2005, by PHRI Principal Archaeologist Paul H. Rosendahl, Ph.D. Dr. Rosendahl conducted his field inspection at the same time and in the company of other project personnel—including Planners Mr. Charles Morgan and Ms. Melissa May of Planning Solutions, Inc. (Honolulu), and Biologist Dr. Reggie David of Rana Productions, Inc. (Kailua-Kona). Variable intensity surface coverage inspection fieldwork was conducted by means of pedestrian ground survey traverses. Vegetation cover was quite open, and ground visibility varied from generally fair to good.

#### Archaeological and Cultural Impact Assessment Results

No physical evidence of any prehistoric or early historic period occupation or use of the project area was encountered, nor was any evidence of any potentially significant cultural properties, features, natural resources, practices, or beliefs within the proposed Ahualoa Production Well and Storage Tank project area. While the general area of the inspection may at some time have been traversed by people in the process of obtaining various resources of the native forest, no physical remains of any such transitory occupation or exploitation were encountered. Furthermore, the few native natural resources (i.e., several plant species) present within the project area are neither rare nor unique, and are common and readily available in relative abundance through much of the general vicinity of the Hamakua District.

The project area appears to have been extensively modified and developed during historic times, as indicated by (a) the existing modified condition, (b) the present vegetation cover, and (c) the negative findings of the field inspection which yielded no physical evidence of the presence of any potentially significant cultural resources—properties, features, natural resources, practices, or beliefs—either within or related to the project site. Furthermore, there is no indication of any kind that the project area has resources necessary to or currently being used

by either Native Hawaiian cultural practitioners exercising traditional and customary access and use rights for any purposes or by individuals of any other cultural affiliation for any traditional cultural purposes.

#### Conclusion

Based on the negative results of the archaeological field inspection and the absence of any evidence that the proposed Ahualoa Production Well and Storage Tank project area is currently being used for legitimate traditional cultural purposes by either Native Hawaiian cultural practitioners or individuals of any other cultural affiliation, it can be concluded that the proposed Production Well and Storage Tank project area should have no significant effects—much less any adverse impacts—upon any cultural resources, and that therefore no mitigation measures of any kind are necessary or appropriate.

#### Request to SHPD for Determination of "No Historic Properties Affected"

Based on the negative results of the archaeological field inspection and the absence of any evidence that the proposed Ahualoa Production Well and Storage Tank project area is currently being used for legitimate traditional cultural purposes by either Native Hawaiian cultural practitioners or individuals of any other cultural affiliation, it is my professional opinion that (a) no significant historic sites are likely to be present within the subject project area—most likely because historic period modification and use of the area for cattle pasture, and (b) no further historic preservation or other cultural work of any kind is necessary. Furthermore, based on the negative results of the assessment fieldwork, it is believed appropriate to request that SHPD prepare and issue a written determination of "no historic properties affected", in accordance with the general guidance provided by Chapter 19-284: Section 5(b) of the SHPD Rules Pertaining to the Historic Preservation Review Process (*HAR*) (effective 12/11/03).

#### References Cited

- Armstrong, R. W. (ed.)  
1983 *Atlas of Hawaii*. Honolulu: University of Hawaii Press. (Second edition)
- OEQC (Office of Environmental Quality Control, State of Hawaii)  
1997 Guidelines for Assessing Cultural Impacts. Adopted by the Environmental Council; November 19, 1997.
- PHRI (Paul H. Rosendahl, Ph.D., Inc.)  
1998 Cultural Impact Assessment Study: Identification of Native Hawaiian Cultural Practices Associated with Wa'alaila Ridge. HIECO Kamolu-Pukele 198-KV Trans-mission Line Project, Lands of Manoa, Palolo, and Waikiki, Honolulu (Kona) District; Island of O'ahu. Technical Report for Environmental Impact Study. PHRI Report 1873-091498. Prepared for Hawaiian Electric Company, Inc. (November)
- Sato, H.H., W. Ikeda, R. Paeth, R. Smythe, and M. Takehiro, Jr.  
1973 Soil Survey of the Island of Hawaii, State of Hawaii. U.S. Department of Agriculture-Soil Conservation Service and the Univ. of Hawaii Agri. Experiment Station. Government Printing Office; Washington, D.C.
- Stearns, H.T., and G.A. MacDonald

