DEPARTMENT OF WATER SUPPLY • COUNTY OF HAWAI'I
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TELEPHONE (808) 961-8050 • FAX (808) 961-8657

June 25, 2007

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

FINAL ENVIRONMENTAL ASSESSMENT/FINDING OF NO SIGNIFICANT IMPACT
KEŌPŪ-PU'UHONUA PRODUCTION WELL & RESERVOIR
NORTH KONA DISTRICT, COUNTY OF HAWAI'I

Dear Ms. Salmonson:

The County of Hawai'i Department of Water Supply (DWS) has reviewed the comments received during the public review period which began on February 8, 2007. Based on our review, we have affirmed our determination that this project will not have significant environmental effects. Consequently, we have issued a Finding of No Significant Impact (FONSI). Please publish this determination in the next available OEQC *Environmental Notice.*

We have enclosed a completed OEQC Publication Form, four copies of the Final Environmental Assessment (FEA), and the project summary on disk. If you have any questions or would like additional information, please call Planning Solutions, Inc., the consultant, at 808-550-4483 and speak with Mr. Perry White.

Sincerely,

Milton D. Pavao, P.E.
Manager

dld

Enclosures:

(1) Final EA/FONSI, 4 copies
(2) OEQC Publication form
(3) Electronic version of Project Summary on disk

... Water brings progress...

Final Environmental Assessment
& Finding of No Significant Impact

KEŌPŪ-PU'UHONUA PRODUCTION WELL AND RESERVOIR

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

PREPARED BY:
PLANNING SOLUTIONS

MAY 2007

PROJECT SUMMARY

Project:	**Keōpū-Pu'uhonua Production Well & Reservoir**
Applicant/Approving Agency	Department of Water Supply (DWS) County of Hawai'i Contact: Milton Pavao (808-961-8050) 345 Kekūanaō'a Street., Suite 20, Hilo, HI 96720
Location	North Kona District; Island of Hawai'i
Tax Map Key	7-5-001:115 (well & reservoir site) & 7-5-001:044 (underground electrical utility easement)
Parcel Area	1.922 acres & 222.368 acres
Project Site Area	1.88 acres
State Land Use District	Agriculture
County Zoning	Ag-5a
Proposed Action	The DWS proposes to convert an existing exploratory well on its Keōpū-Pu'uhonua site to a 650-gallon per minute capacity production well and to construct a 1.0 million gallon reservoir to provide storage. The permanent pump motor will draw electrical power from an underground power line that DWS will install along the existing access road. The facility includes a single-story, 900 square-foot control building and a SCADA communications antenna. Water from the well will augment water from the present water sources in the southern portion of the North Kona Water System.
Associated Actions Requiring Environmental Assessment	Proposed use of County & Federal funds & County land.
Consultation	DWS consulted the State Historic Preservation Division during preparation of this document. In addition, the parties listed in Table 7.2 were sent copies of the *Draft EA* for review and comment.
Required Permits and Approvals	• Plan Approval, Hawai'i County Planning Department • Construction Noise Variance, State Department of Health (possible) • Building Permit, Hawai'i County Department of Public Works • Pump Installation Permit, State Commission on Water Resource Management • Certification of Well for Drinking Water Use, State Department of Health
Determination	Finding of No Significant Impact
Consultant	Planning Solutions, Inc. 210 Ward Avenue, Suite 330 Honolulu, HI 96814 Contact: Perry White (808)-550-4483

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1.0 PURPOSE & NEED

1.1 INTRODUCTION

The proposed Keōpū-Pu'uhonua production well and reservoir site is located in the North Kona District of the Island of Hawai'i (TMK 7-5-001:115, see Figure 1.1). The site is owned and maintained by the County of Hawai'i Department of Water Supply (DWS). The previous owner of the site, Haseko Hawaii Inc., drilled an exploratory well at the site in 1992 (State Well No. 3957-01) and the subsequent owner (Keopuolani Estates Associates) dedicated the site to the DWS in 2000. Haseko (Hawaii, Inc.) performed the pump testing and water quality testing needed to confirm the suitability of the exploratory well for potable water supply in 1993. DWS is proposing to outfit the well with a 650 gallon per minute (gpm) pump and a 1.0 million gallon (MG) storage reservoir to supply additional potable water to its customers in the North Kona district. In order to provide electricity to the site, DWS will install underground electrical duct lines along an approximately 900-foot section of the existing access road to the site (TMK 7-5-001:044). DWS is presently seeking an easement over that property for access and utility purposes.

DWS may seek Federal funding for the project under the Drinking Water State Revolving Fund (DWSRF) program administered by the Safe Drinking Water Branch of the State Department of Health. This would constitute a Federal action. Consequently, this *Environmental Assessment* has been prepared under the dual legal authorities of Chapter 343, Hawai'i Revised Statutes/Hawai'i Administrative Rules §11-200 and the National Environmental Policy Act (NEPA). It incorporates the content required to comply with the Hawai'i DWSRF program (see Section 4.1.4 for details).

1.2 PURPOSE AND NEED FOR THE PROJECT

The purpose of the proposed well and reservoir is to supply the North Kona District of Hawai'i County with a new source of potable water and associated storage capacity. At about 10 million gallons per day (MGD), the North Kona water system has the highest metered water consumption of any DWS water system; it ranks second in the County in the number of connections at almost 9,000. The high rate of consumption in the North Kona water system is attributable to the extensive resort and residential areas that exist there.

The North Kona District's resident population has increased nearly five-fold during the last thirty years, rising from 4,832 persons in 1970 to 28,543 in the year 2000. As shown in Table 1.1, while the growth was greatest in relative terms (average annual percent change) early in this period, the rate of growth has been relatively constant in absolute numbers.

Table 1.1. Resident Population Change in North Kona District: 1970-2000

Date	Resident Population	Change	% change
April 1, 1970	4,832		
April 1, 1980	13,748	8,916	185%
April 1, 1990	22,284	8,536	62%
April 1, 2000	28,543	6,259	28%
Source: U.S. Census, (1970, 1980, 1990, and 2000).			

The County of Hawai'i predicts, under assumptions of moderate growth, that the resident population of the North Kona District will increase by another 13,000 people to a total of about 42,000 by 2020, an increase of about 45% (County of Hawai'i 2005, Series B Growth Scenario). In fiscal year 2003,

water usage in the North Kona system was about 9.8 million gallons per day (MGD). Based on the moderate growth scenario above, DWS' *20-Year Water Master Plan (R..W. Beck, Inc, June 2006)* projects that demand for water in North Kona will more than double by the year 2025 to 21.6 MGD.

Rapid growth requires careful planning to ensure that water demands, water quality, operational requirements, and ongoing maintenance needs are met. Currently, DWS relies on four drilled wells and one inclined shaft at Kahalu'u and one well each at Hōlualoa, Keahuolū, Honokōhau, Hualālai, and Kalaoa to supply the North Kona system (see Figure 1.2).[1] The Kahalu'u wells, particularly the inclined shaft, produce the majority of the water used in the system. In order to satisfy the rising demand, DWS has had to pump the shaft in excess of its appropriate maximum rate. DWS' *20-Year Water Master Plan* concludes that the Department needs to develop additional sources of supply so that it can reduce pressure on the shaft while still meeting the forecast demand for water. It has identified the proposed Keōpū-Pu'uhonua well as among the highest-priority projects.

DWS' *20-Year Water Master Plan* also identifies water storage needs for each of its systems by the year 2025. It bases the estimate of storage need on the maximum daily demand plus additional storage to provide emergency firewater reserves. The *20-Year Water Master Plan* lists a 1.0 mg reservoir at Keōpū-Pu'uhonua among the projects needed to meet projected water storage needs for the North Kona System.

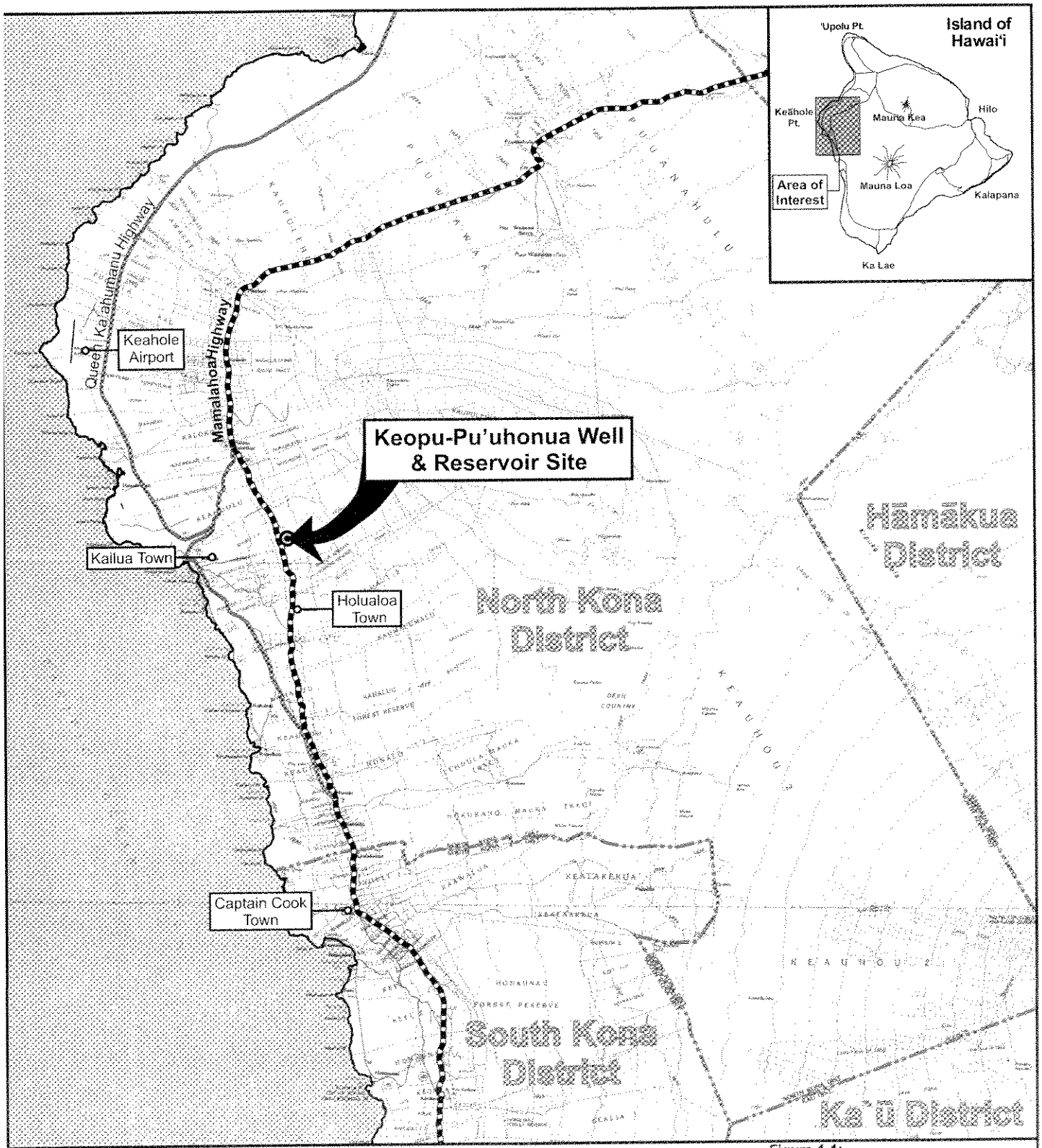
The Keōpū-Pu'uhonua site is particularly important to the North Kona Water system because its elevation and central location facilitate efficient water distribution both to the northern and southern parts of the service area. Locating a production well and reservoir there will help ensure that DWS continues to provide its customers in North Kona with adequate, high quality, and affordable water into the future.

1.3 ORGANIZATION OF THE ENVIRONMENTAL ASSESSMENT

This EA is divided into the following parts:

- Chapter 2 outlines the alternatives analyzed in this EA, as well as several other alternatives that were considered and rejected by DWS during earlier planning phases.
- Chapter 3 describes the proposed action of constructing and operating the well and reservoir in detail, providing specifications for its location, design, phasing, and operation.
- 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 project with relevant plans, policies, and controls at local, regional, state, and federal levels.
- Chapter 6 considers the overall impacts of the project by evaluating the proposed well with respect to each individual significance criterion.
- Chapters 7 and 8, respectively, list the parties consulted and the references cited during preparation of this EA.

[1] One additional deep water well at Wai'aha is under construction and is shown as a future well on the Figure.



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

Prepared By:
PLANNING SOLUTIONS

Source:
USGS 7.5' Quad Map: Kealakekua
State of Hawai'i GIS 1982-84

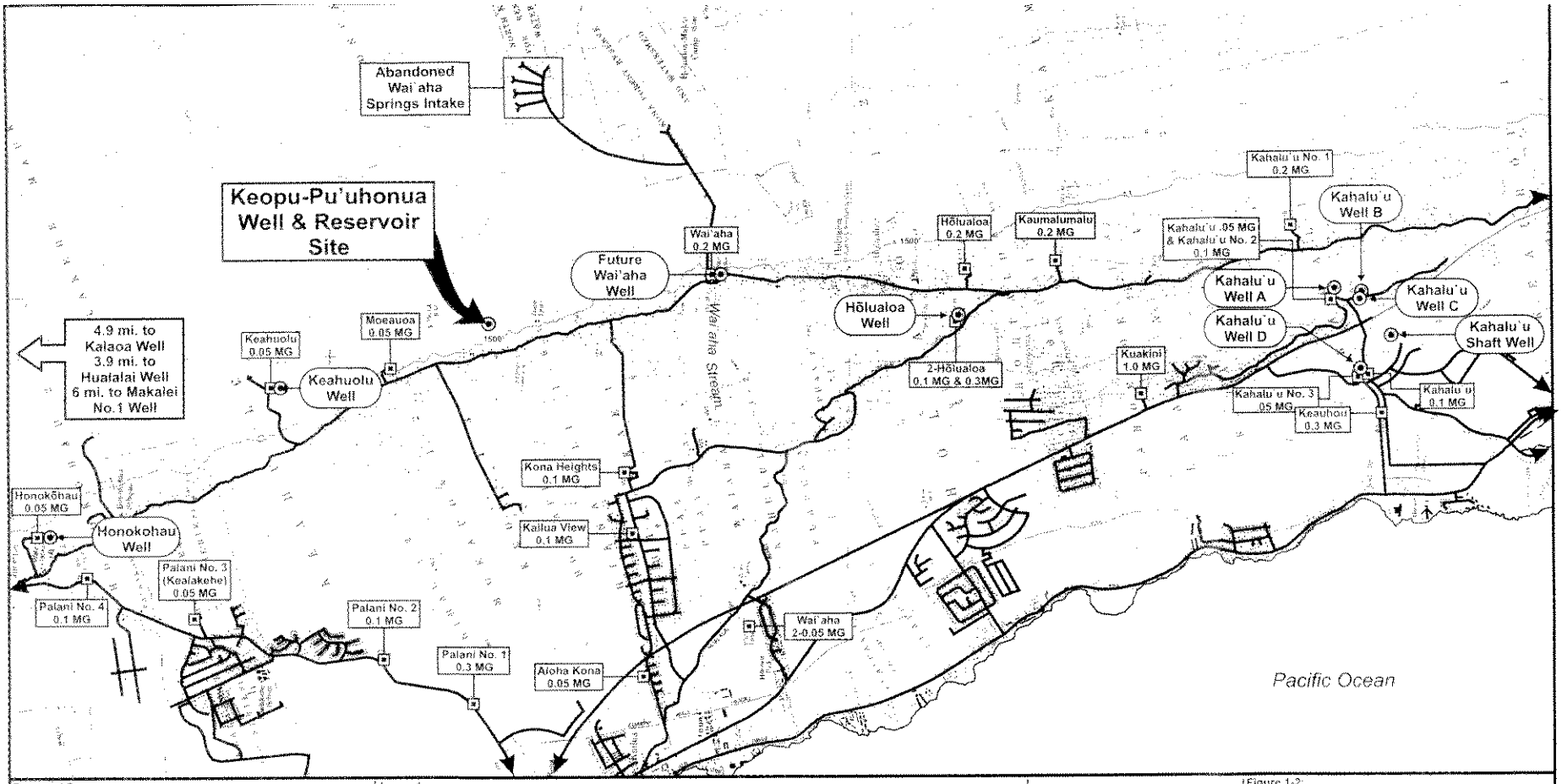
Legend:
Māmalahoa Highway
District Boundaries

0 2 4 8
Distance in Miles

Figure 1-1:

Location Map

Keopu-Pu'uhonua Production Well & Reservoir



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

Prepared By:
PLANNING SOLUTIONS

Source:
Department of Water Supply, County of Hawai'i
USGS 7.5' Quadrangle Maps: Kailua and Kealakekua 1982-84

Legend:
- Water Transmission/Distribution Line
- Well Name
- Reservoir Name and Capacity

Miles

Island of Hawai'i

Area of Interest

Figure 1-2:

Existing North Kona Water System

Keopu-Pu'uhonua Production Well & Reservoir

2.0 PROPOSED ACTION & ALTERNATIVES CONSIDERED

2.1 DESCRIPTION OF THE PROPOSED ACTION

2.1.1 OVERVIEW

DWS proposes to convert the existing exploratory well at the Keōpū-Pu'uhonua site into a production well and to construct a new water storage tank and related facilities. The project will involve demolition of the existing concrete pad surrounding the exploratory well, as well as clearing and grubbing of the remainder of the site. The new facility will include:

- A 900 square foot control building;
- A 1.0 million gallon (MG), reinforced concrete water storage tank;
- Chlorination equipment;
- A 650 gallon per minute (GPM), 400 horsepower (HP) submersible pump and motor;
- A six-foot chain link perimeter fence;
- A Supervisory Control and Data Acquisition (SCADA) system;
- An access drive; and
- An approximately 900-foot extension of underground electrical service along the access road.

A total of approximately 1.88 acres will be disturbed due to these activities. Section 2.1.2 describes the facilities as they would appear once fully developed. Section 2.1.3 describes the activities that would be undertaken during their construction.

2.1.2 DESIGN OF THE PROPOSED FACILITIES

Figure 2.1 depicts the existing facilities at the site; it also contains the demolition plan for the areas that will be cleared, grubbed, and graded. Figure 2.2 provides a site plan of the proposed well and reservoir. The following subsections describe other major components of the facility's design.

2.1.2.1 Well Pump & Equipment

The existing exploratory well casing is drilled to a depth of 112 feet below mean sea level (-112 MSL), or about 1,800 feet below finished grade. The upper 1,650 feet of the drilled hole is cased in solid steel; the remainder has a perforated casing. Table 2.1 presents the as-built dimensions of the existing exploratory well at the site.

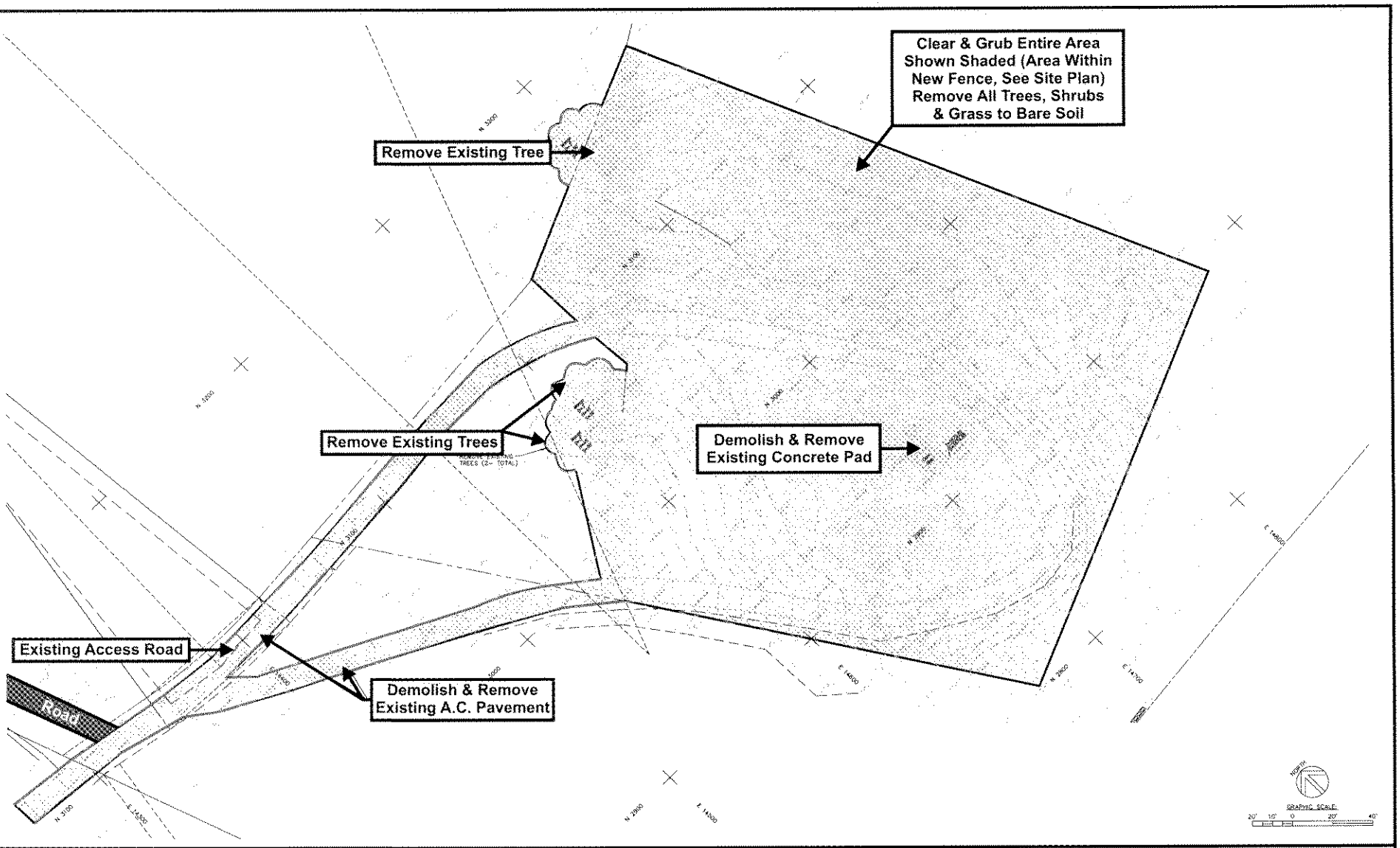
Plans for outfitting the well for production call for the use of a submersible deep well vertical turbine pump rated at 650 gallons per minute (GPM). The pump will be powered by a 400 HP electric motor; the motor will be controlled by a sensor measuring the water level in the new reservoir. Figure 2.3 contains a plan view and cross sections of the proposed well pump, and Figure 2.4 includes sections of the outfitted well shaft.

Table 2.1 As-Built Dimensions of Keōpū-Pu'uhonua Well (State #3957-01)

Description	*Dimension*
Basic Well Parameters	
Casing Diameter (inches)	14
Ground Elevation (feet MSL)	1,676
Total Well Depth (feet)	1,788
Elevation at Bottom (feet MSL)	-112
Solid Casing	
Length Below Ground (feet)	1,652
Elevation at Bottom (feet MSL)	24
Perforated Casing	
Length (feet)	50
Elevation at Bottom (feet MSL)	-26
Open Hole	
Diameter (inches)	20
Length (feet)	86
Static Water Level :	
Depth Below Ground (feet)	1,629
Elevation (feet MSL)	47
Source: Tom Nance Water Resource Engineering	

2.1.2.2 Control Building

The proposed design includes a single-story, naturally ventilated, 20-foot by 45-foot concrete block control building (Figure 2.5). That structure will house the motor control center, electrical control panel, SCADA remote system, alarm system, and chlorination system. A concrete walkway will be installed along one side of the building.



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

Prepared By:
PLANNING SOLUTIONS

Source:
Tom Nance Water Resource Engineering (TNWRE)
(Job No. 2004-839, Sheet C-4)

Figure 2-1:

Site Demolition Plan

Keopu-Pu'uhonua Production Well & Reservoir

Figure 2-1 Site Demolition Plan 2007-01-10.cdr

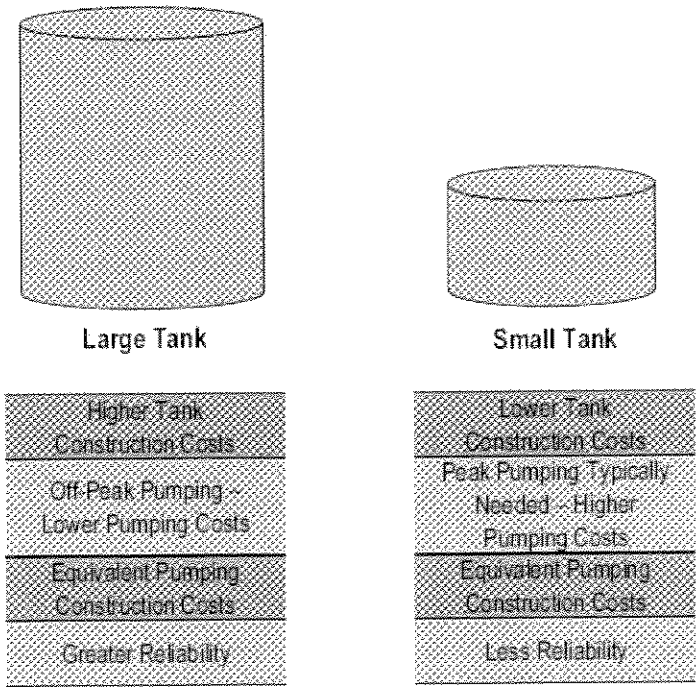
2.4.2 SMALLER RESERVOIR

This alternative would entail installing a smaller reservoir (i.e., less than 1.0 MG) at the Keōpū-Pu'uhonua site along with the proposed production well.

Currently, much of DWS' system relies on smaller reservoirs served by pump stations that often must pump for more than 16 hours per day to fill the reservoirs. This strategy reduces the construction cost of the reservoirs but has the following drawbacks:

- It leaves many DWS water systems with storage deficits and unable to meet DWS' storage criteria for operating and emergency firewater reserves.
- It forces DWS to incur higher pumping costs because it needs to operate well pumps during the hours of 7 AM to 9 PM, when electricity is priced at peak rates, rather than at off-peak periods.

Constructing larger reservoirs such as the one proposed potentially allows DWS to refill reservoirs only at night, thereby taking advantage of lower off-peak electricity prices. DWS' 2006 *20-Year Water Master Plan* includes a cost-benefit analysis of larger versus smaller reservoirs. The results indicate that the higher capital costs of putting in a larger reservoir are offset in the long term by decreased pumping costs, and have the added benefit of providing additional reliability to the system due to increased storage (see inset below). Consequently, DWS believes that the proposed 1.0 MG reservoir is the most economically viable alternative.



Source: DWS *20-Year Water Master Plan* (2006).

2.4.3 DIFFERENT SIZE WELL PUMP

As discussed in Section 2.1.2.1, the proposed well will be outfitted with a 650 gpm pump. DWS selected this pump size based on the results of the pump tests conducted on the existing exploratory well. According to the pump test report, 650 gpm is a sustainable well yield from the perspective of the individual well and the aquifer system.

Considering the magnitude of growth anticipated in the North Kona area and the high cost of establishing new water sources, DWS feels that it would not be responsible to install a smaller pump

- **Customer and Source Metering:** DWS has service meters for all of its customers and requires service meters for all new customers. DWS also has source meters for many of its supply sources. This ensures that all users bear the costs of their water use practices.
- **Meter Replacement and Repair:** DWS tests all meters before installation and tests them after installation whenever a customer requests that. The 2006 *20-Year Water Master Plan* makes increased funding for replacement of aged and failing meters a priority.
- **Non-Revenue Water Analysis:** Non-revenue water includes both accounted-for and unaccounted-for non-metered water (i.e., leaks, unauthorized water use, inaccurate metering, and inaccurate billing). DWS uses the non-revenue water estimates in deciding whether a leak detection program and other non-revenue monitoring activities are justified.
- **Leak Detection Program:** DWS has several systems that have significant water losses and unaccounted-for water through pipe leaks. DWS has recently begun a pilot leak-detection program in the Hilo water system. During phase 1 of the program, it installed 625 permaloggers to permanently monitor and detect major leaks within the distribution and transmission mains. As the permaloggers have identified major leaks DWS has repaired them. DWS estimates that this effort has reduced water use in the targeted areas by 15 to 35 percent. DWS expects that implementing this specific leak detection program throughout its other systems would achieve similar significant water use and energy savings.
- **Storage Tank Automatic Level Controls:** DWS maintains and operates automatic level-control valves on most of its storage facilities to prevent system losses to unnecessary overflows.

In addition to the supply-side measures described above, DWS also currently implements the following demand-side water conservation initiatives:

- **Plumbing Code Regulation:** Plumbing code efficiency standards set by the State and Federal governments require low-flow and energy-efficient appliances and plumbing fixtures. As a result, all new construction and redevelopment has lower water use rates than was heretofore the case. This will continue to provide reductions in per-customer water use.
- **Voluntary Water Reduction:** During times of drought or low water conditions, DWS issues conservation notices in local newspapers. DWS may institute special conservation measures and may restrict water use by any reasonable method of control to forestall water shortage and a consequent emergency. Water notices have primarily been required on the more arid west side of the island in the Kona-Kailua areas.
- **Public Outreach/Education Program:** A public outreach and education program is an important part of a conservation program. The objective is to inform, educate, and gain support from the public. DWS has several printed informational brochures on water conservation that are available to customers through district offices.
- **Xeriscape and Efficient Landscaping:** Significant permanent reductions in outdoor water use can be achieved through efficient landscaping. This is particularly beneficial in arid climates. It may include xeriscaping, which is the use of native, low water-use plants and vegetation for landscaping. Efficiencies can also be gained through improved irrigation practices. This demand-side conservation measure would be most beneficial on the west side of the island.

DWS factored the effects of these conservation initiatives on water use into the water use projections included in the *Water Master Plan*. DWS also outlined goals for continuing and improving these conservation efforts. While their successful implementation can in some cases prolong the need for new source development, overall the growth anticipated in North Kona is too large for existing sources to accommodate. As one of the higher priority source development projects, the Keōpū-Pu'uhonua Production Well is needed regardless of existing and future conservation efforts. Consequently, enhanced water conservation alone is not a viable alternative to the proposed action.

2.2 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 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", 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 production well and reservoir as currently designed. 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.

2.3 ALTERNATIVES ADDRESSED IN DETAIL IN THE EA

2.3.1 PROPOSED ACTION: PRODUCTION WELL & 1.0 MG RESERVOIR AT KEŌPŪ-PU'UHONUA

This alternative consists of the proposed action as described in detail in Section 2.1 above. DWS believes constructing the facility at the proposed site would best enable it to continue to provide adequate, reliable, and affordable drinking water to North Kona, and thus it represents their preferred course of action.

2.3.2 NO ACTION ALTERNATIVE

The "No Action" Alternative consists of continued reliance on the existing water sources and storage facilities for the North Kona system. According to the U.S. Census, the population of the North Kona District grew 28 per cent between 1990 and 2000 and the County forecasts that it will increase another 19% between 2000 and 2010 (see Section 1.1).

The "No Action" Alternative would force DWS to continue or increase withdrawals from existing sources, potentially impairing DWS' ability to provide adequate and reliable service to its customers in North Kona. Thus, DWS believes that "No Action" is not a viable alternative. It is included in this EA primarily to fulfill the legal requirements of NEPA, Chapter 343 Hawai'i Revised Statutes, and HAR §11-200. It also provides a baseline against which to measure the environmental and social impacts of the proposed action.

2.4 ALTERNATIVES ELIMINATED FROM DETAILED ANALYSIS

2.4.1 ENHANCED WATER CONSERVATION ALTERNATIVE

The County of Hawai'i has a number of measures in place to promote water conservation, and recognizes that encouraging conservation is a low-tech, cost-effective way to delay the need for costly new source development. Accordingly, DWS' 2006 *20-Year Water Master Plan* contains extensive information about DWS' water conservation program. It lists the following conservation measures that DWS has implemented:

As indicated in Table 2.2, the DWS expects that preparing the site, outfitting the well, and constructing the new on- and off-site facilities will take approximately a year. During that period, the contractor will finish-grade the site, install the well pump and controls, construct the access roads and underground piping and utilities, set up the SCADA system, and erect the reservoir and control building. The contractor will also install fencing, landscaping, and other minor site improvements during this period.

2.1.4 CONSTRUCTION SCHEDULE

The DWS schedule for the project (see Table 2.2) calls for the facility to be completed in June 2008.

Table 2.2. Preliminary Project Schedule

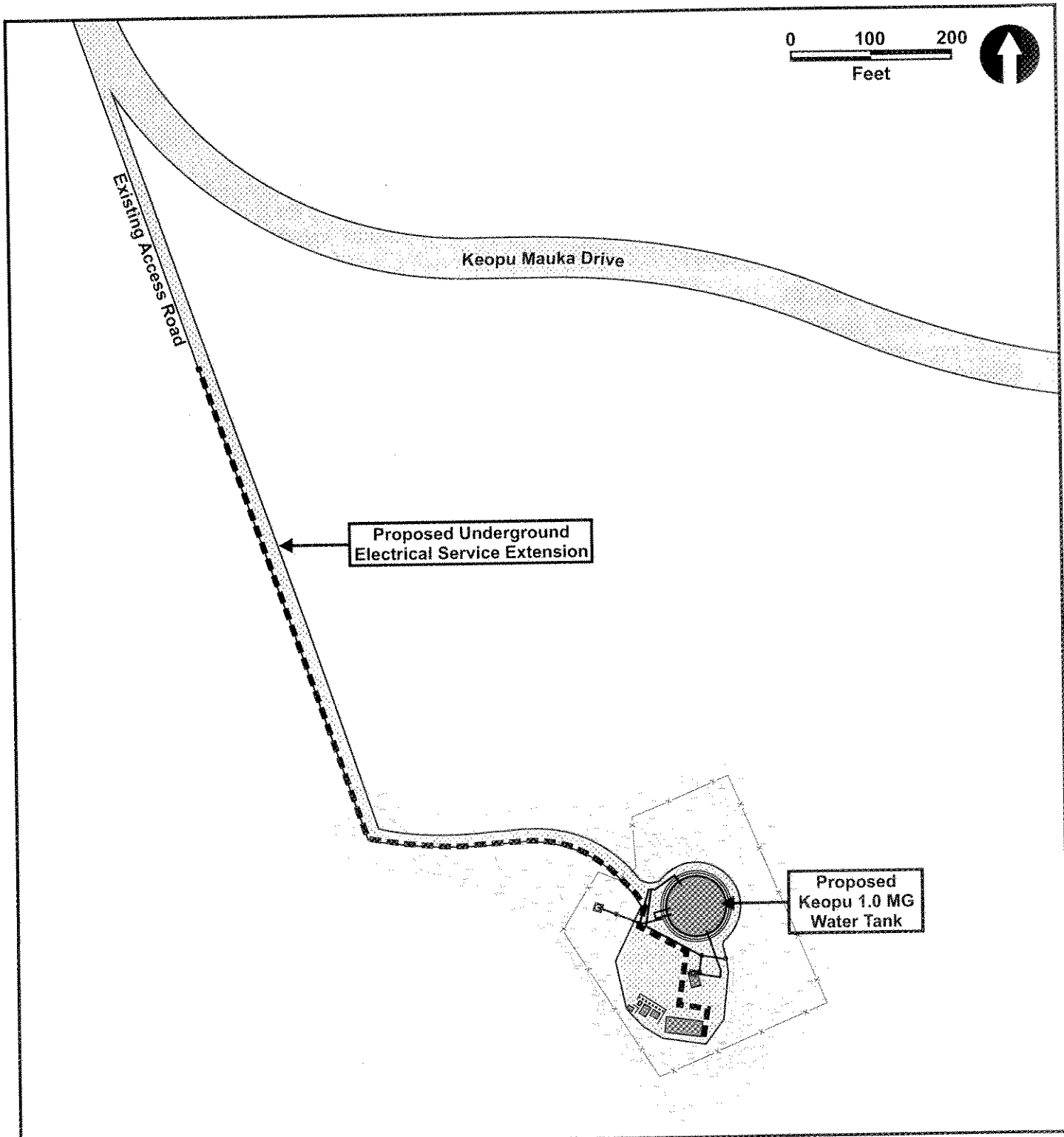
Task	*Approximate Duration*	*Estimated Completion Date*
Final Design	Underway	Feb 2007
Design Review	1 month	March 2007
Bid Solicitation	1 month	April 2007
Bid Evaluation, Contracting, Notice-to-Proceed	1 month	June 2007
Construction Period	12 months	June 2008
Source: Tom Nance Water Resource Engineering		

2.1.5 PROJECT COSTS

The County of Hawai'i Department of Water Supply has identified the project as DWS Job No. 2004-839. The project may be partially or wholly funded by 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 4.1.4 for further discussion). Table 2.3 presents the estimated costs of the project.

Table 2.3 Preliminary Project Costs (in 2006 dollars)

Item	*Estimated Cost*
Site Preparation	$503,000
Production Well Outfitting	615,000
Reservoir and Control Building	1,528,000
Access Road	144,000
Connection to existing water lines and valves	126,000
Mechanical Systems (Pumps & chlorination)	116,000
Electrical & Communications Systems (electrical, phone, controls)	791,000
Subtotal	$3,823,000
Contingency (20%)	$382,000
Total	**$4,205,000**
Source: Tom Nance Water Resource Engineering	



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

Prepared By:
PLANNING SOLUTIONS

Source:
Tom Nance Water Resource Engineering (TNWRE)
Job No. 2004-839

Figure 2-6:

Proposed Electrical Service Extension

Keopu-Pu'uhonua Production Well & Reservoir

Figure 2-6 Proposed Electrical Service Extension 2006-11-01.cdr

2.1.2.3 1.0 MG Reservoir

The proposed design calls for a standard DWS reinforced concrete tank with a capacity of 1.0 million gallons. The tank will have an approximately 90-foot diameter and 36-foot operating height. It will be designed to Seismic Zone 4 standards (see Section 3.10 for discussion).

2.1.2.4 SCADA System

DWS would install a Supervisory Control and Data Acquisition (SCADA) system to monitor and control system operation. The SCADA control facilities will be housed in the control building. The only exterior component will be a small communications antenna approximately two feet tall mounted to the top of the tank.

2.1.2.5 Seepage pit

An 8-foot internal diameter seepage pit will be constructed on the proposed well site. It is sized to accommodate overflow from the tank in the unlikely event that it occurs. It will also collect small amounts of stormwater from portions of the facility. After the well begins operation, it will discharge approximately 3,250 gallons of water into the seepage pit each time the pump is started. This discharge prevents particulate matter entrained during each well start-up from entering the water system. This arrangement helps assure that only high quality water reaches the Department of Water Supply's customers.

2.1.2.6 Electricity and Communications

Electrical Power. Electrical power will be utilized for lighting and general power in the control building and for the proposed well pump motor. DWS is proposing to extend the service line to the site as part of this proposal. The new electrical line will begin where the existing electrical service stops and run approximately 900 feet through underground conduits installed on the *mauka* side of the existing access road, as shown in Figure 2.6. Utility metering will conform to HELCO's standards and design requirements. Once constructed and approved by the utility, the electrical power lines will be owned and maintained be the Hawai'i Electric Light Company (HELCO).

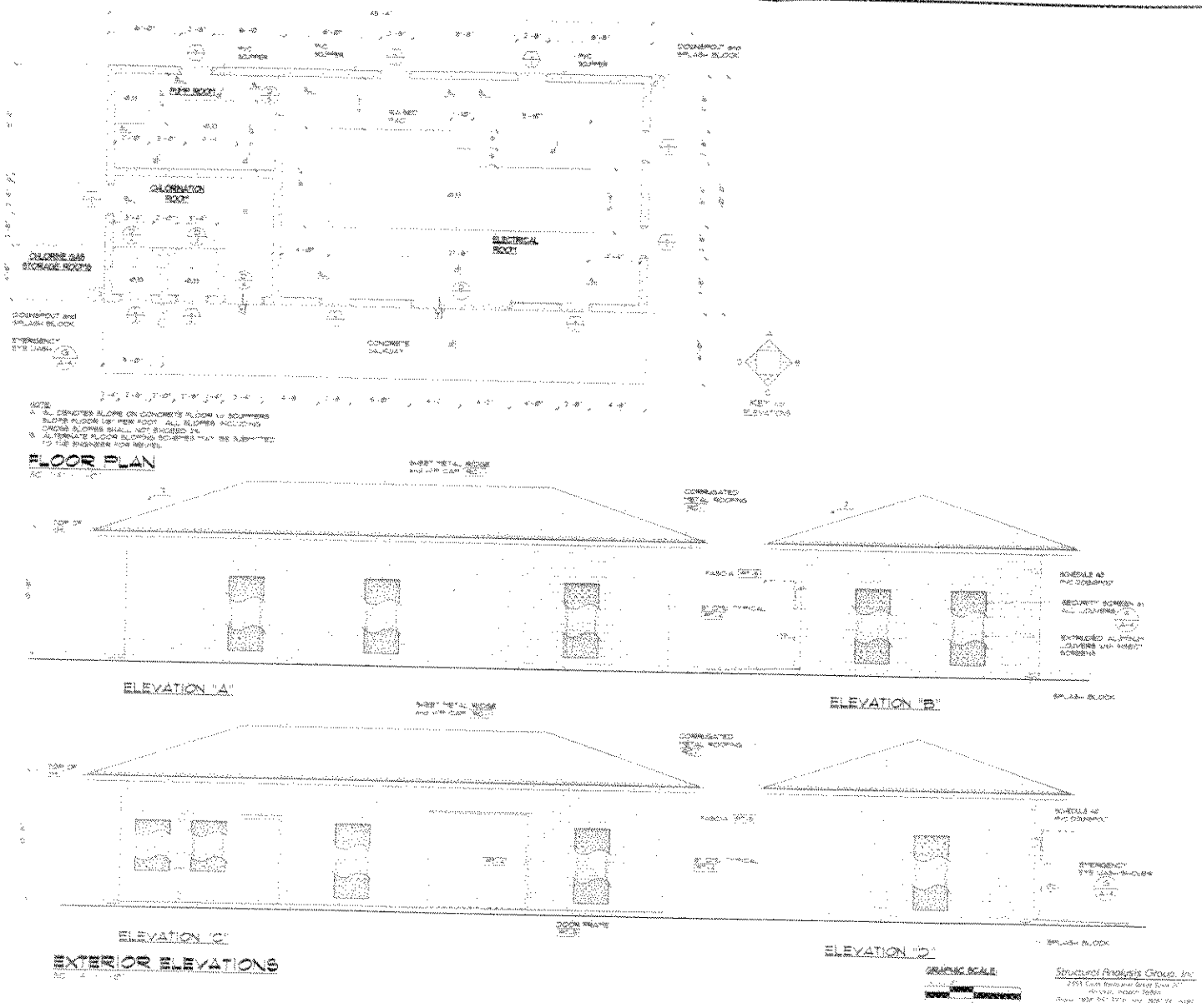
Communications. DWS plans to use radio and licensed DWS FCC frequencies for the SCADA telemetry communications. Telephone service by Hawaiian Telcom is being provided at this site for possible phone service and to provide direct backup communications for the pump station alarm system.

2.1.2.7 Site Access & Security

Access to the site is via Māmalahoa Highway and Keopu Mauka Drive, which runs through the future Royal Kamehameha Gardens Subdivision and connects with the well site access road. The subdivision developer installed the access road and waterlines underneath it and is expected to grant DWS an access and utility easement over its property in exchange for water service to the subdivision. As part of its work on the proposed project, the construction contractor will demolish on-site portions of the access road (see Figure 2.1) and replace it with the configuration shown on Figure 2.2. It will also erect a six-foot chain-link perimeter fence around the site. DWS will keep the gate at the entrance locked and install "no trespassing" signage.

2.1.3 CONSTRUCTION ACTIVITIES

Water from the existing exploratory well at the site was tested in January 1993 and found to meet all applicable standards for potable water (see Appendix A). DWS will incorporate this information into the engineering report that it will submit to the State Department of Health Safe Drinking Water Branch (SDWB). The engineering report will address all the requirements set forth in Hawai'i Administrative Rules §11-20-29. Before placing the well into service as part of the North Kona system, DWS will obtain approval from the SDWB, as required by these regulations.



Prepared For:

Department of Water Supply, County of Hawai'i

Prepared By:

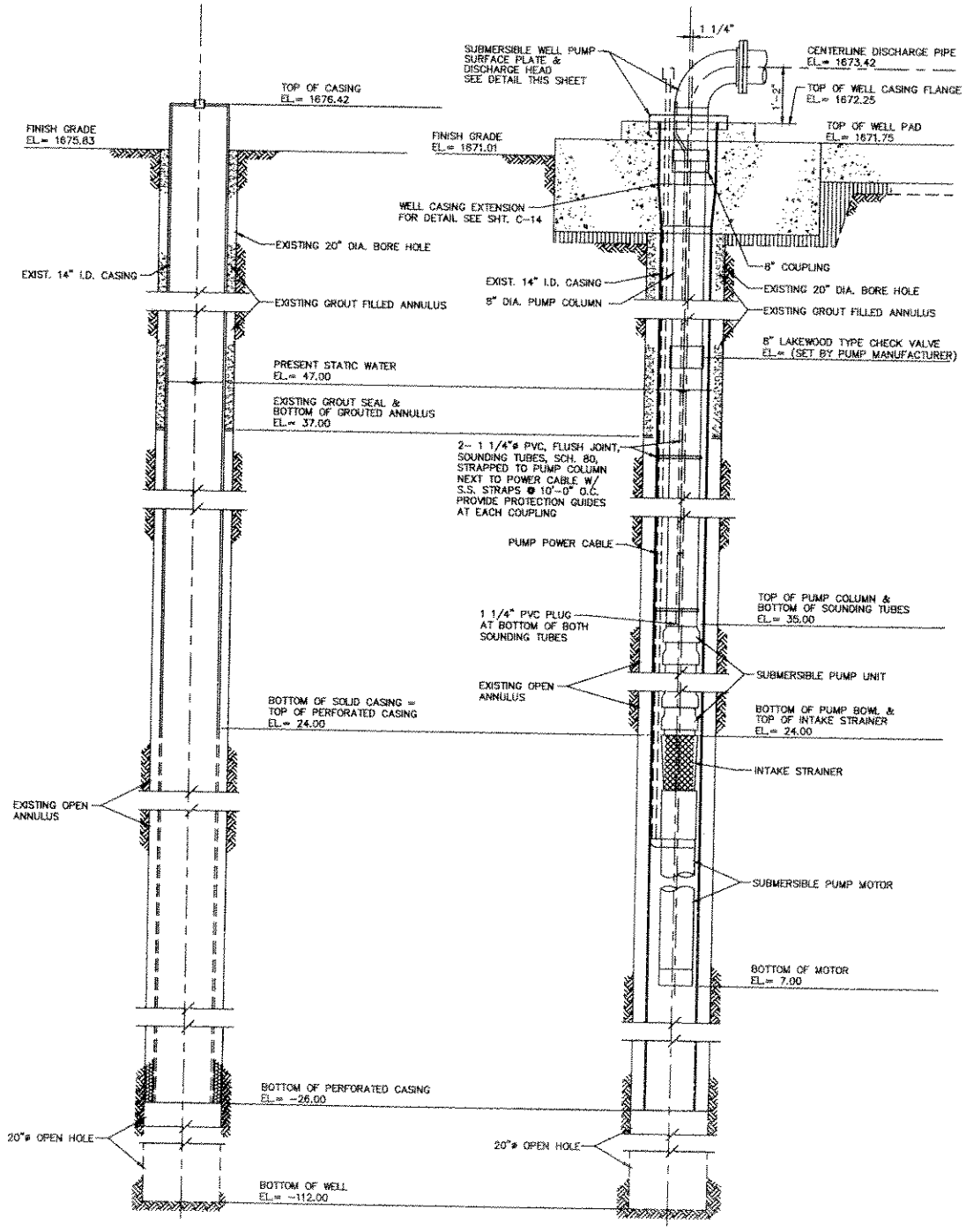
Source:

Tom Nance Water Resource Engineering (TNWRE)
Job No. 2004-839, Sheet A-2

Figure 2-5:

Control Building Plan & Elevations

Keopu-Pu'uhonua Production Well & Reservoir



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

Prepared By:
PLANNING SOLUTIONS

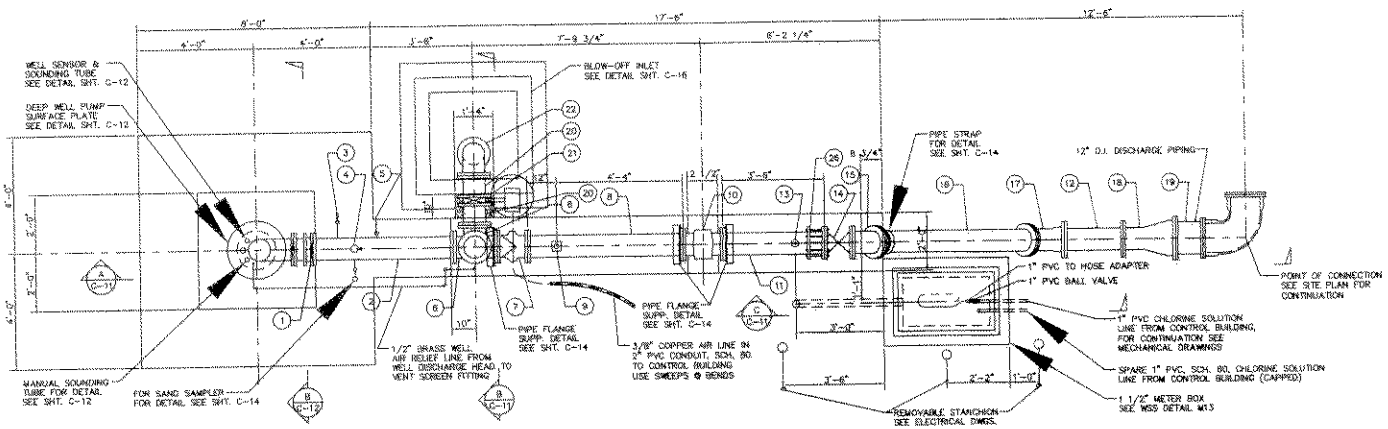
Source:
Tom Nance Water Resource Engineering (TNWRE)
Job No. 2004-839, Sheet C-6

Figure 2-4:

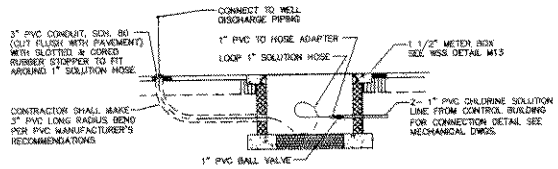
Well Shaft Sections

Keopu-Pu'uhonua Production Well & Reservoir

Figure 2-4 Well Shaft Sections 2006-11-01.cdr

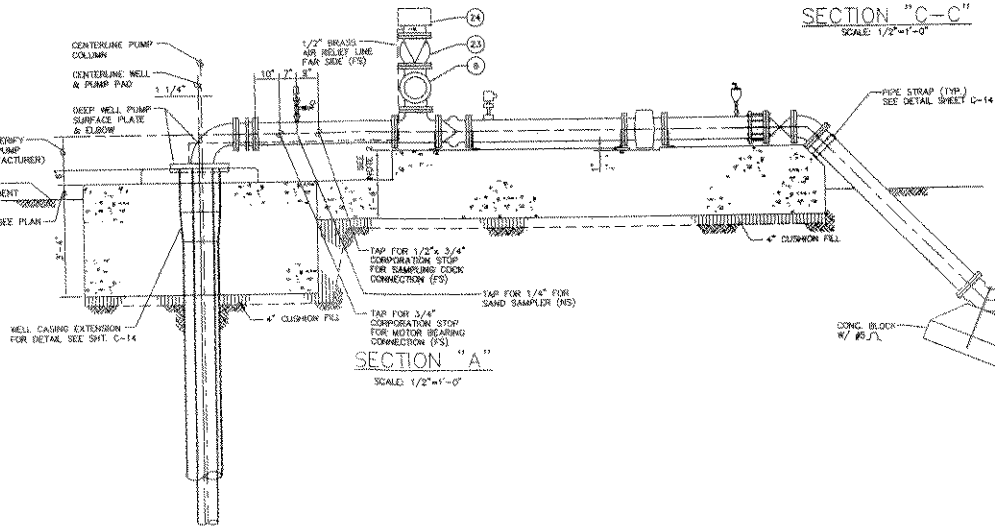


PLAN
SCALE: 1/2"=1'-0"



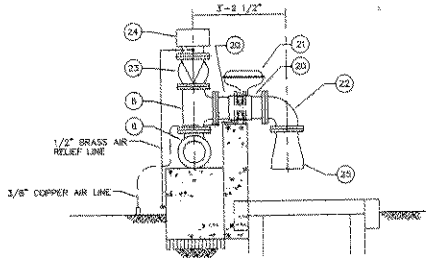
SECTION "C-C"
SCALE: 1/2"=1'-0"

NOTE:
1. FOR STRUCTURAL REINFORCING SEE SHT. C-13
2. CONTRACTOR TO ADJUST DIMENSION TO MATCH PUMP DISCHARGE ELBOW



SECTION "A"
SCALE: 1/2"=1'-0"

NOTE:
ALL FLANGES SHALL BE FACED AND DRILLED IN ACCORDANCE WITH ANSI B-16.1 CLASS 125



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

Legend:

1. 8" Dismantling Joint, Romac Model No. DJ400
2. 8" D.I Pipe, FE, 4'-8" Long
3. Test Gauge Connection, See Detail Sheet C-14
4. Pressure Switch Und, See Detail Sheet C-14
5. Sampling Cock, See Detail Sheet C-14
6. 8" D.I. Tee, FE
7. 8" Center-Guided Check Valve, FE
8. 8" D.I. Pipe, FE, 5'-4" Long, w/Double Strapped Service Saddle
9. 1 ½" Flow Switch, See Specs.
10. 8" Electromagnetic Meter, FE, w/ Flow Transmitter (See Sec. 334.10)
11. 8" Pipe, FE, 3'-6" Long
12. 8" D.I. Nipple, PE, Length to Fit
13. 1" Air Release Valve, Pressure Gauge: 0-30 PSI, See Detail Sheet C-14
14. 8" Gate Valve, FE, (OS&Y)
15. 8" 1/8 D.I. Bend, FE (Class 250)
16. 8" D.I. Pipe, FExPE, Length to Fit
17. 8" 1/8 D.I. Bend, MJ w/ Mega-Lug Retainer Glands
18. 8"x12" D.I. Increaser, MJ
19. 12" Nipple, PE, Length to Fit
20. 6" D.I. Pipe, FE, 0'-9" Long
21. 3" Rubberseat Butterfly Valve (Water), FE, w/Diaphragm Valve Actuator
22. 8" 1/4 D.I. Bend, FE
23. 8" Pump Vacuum Release Valve, FE
24. 3" Vent Screen & Fitting, See Detail Sheet C-14
25. 3" Tideflex Check Valve, Series 35, FE
26. 8" Flanged Coupling Adapter

Prepared For:

Department of Water Supply
County of Hawai'i

Prepared By:

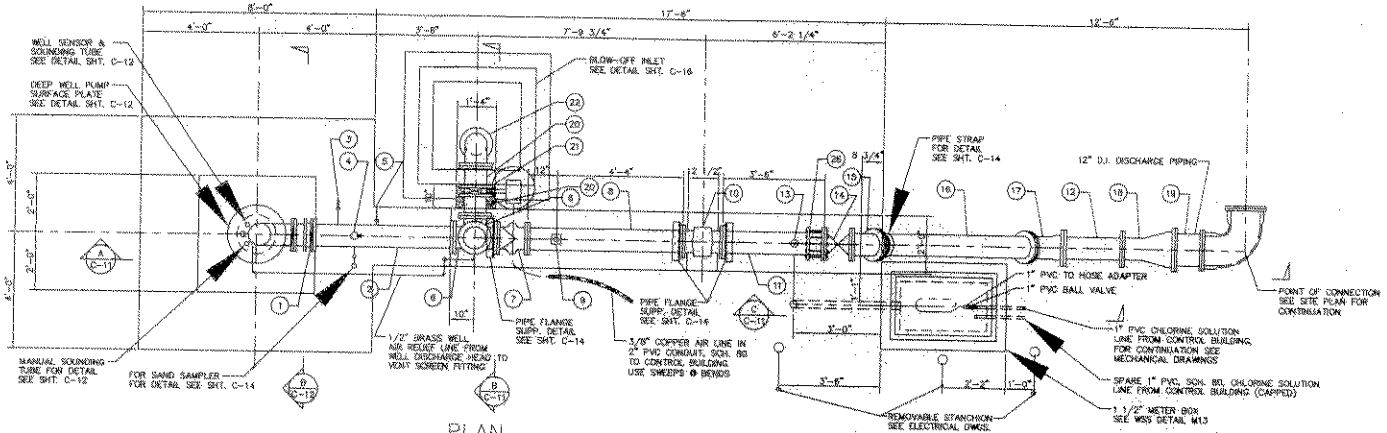
PLANNING SOLUTIONS

Source:

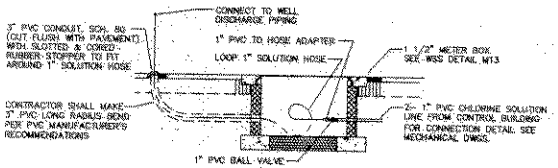
TNWRE

Figure 2-3:

Well Pump Plan & Sections

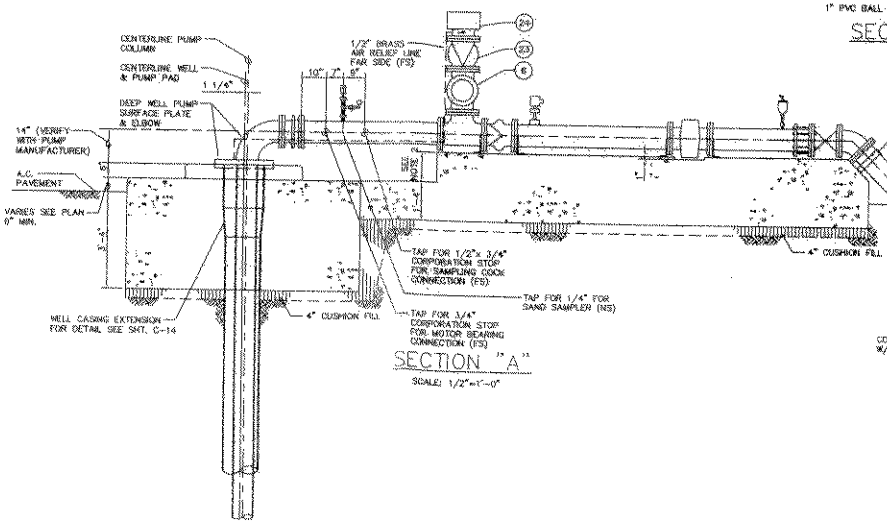


PLAN
SCALE: 1/2"=1'-0"



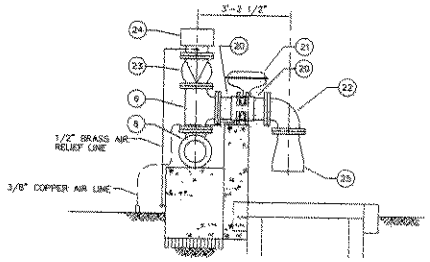
SECTION "C-C"
SCALE: 1/2"=1'-0"

NOTE:
1. FOR STRUCTURAL REINFORCING SEE SHT. C-13
2. CONTRACTOR TO ADJUST DIMENSION TO MATCH PUMP DISCHARGE ELBOW



SECTION "A"
SCALE: 1/2"=1'-0"

NOTE:
ALL FLANGES SHALL BE FACED AND DRILLED IN ACCORDANCE WITH ANSI B-16.1 CLASS 125



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

Legend:
1. 8" Dismantling Joint, Ronac Model No. DJ400
2. 8" D.I Pipe, FE, 4'-8" Long
3. Test Gauge Connection, See Detail Sheet C-14
4. Pressure Switch Unit, See Detail Sheet C-14
5. Sampling Cock, See Detail Sheet C-14
6. 8" D.I. Tee, FE
7. 8" Center-Guided Check Valve, FE
8. 8" D.I. Pipe, FE, 5'-4" Long, w/Double Strapped Service Saddle
9. 1 ½" Flow Switch, See Specs.
10. 8" Electromagnetic Meter, FE, w/ Flow Transmitter (See Sec. 304.10)
11. 8" Pipe, FE, 3'-6" Long
12. 8" D.I. Nipple, PE, Length to Fit
13. 1" Air Release Valve, Pressure Gauge, 0-30 PSI, See Detail Sheet C-14
14. 8" Gate Valve, FE, (OS&Y)
15. 8" 1/8 C.I. Bend, FE (Class 250)
16. 8" D.I. Pipe, FExPE, Length to Fit
17. 8" 1/8 D.I. Bend, MJ w/... Mega-Lug Retainer Glands
18. 8"x12" D.I. Increaser, MJ
19. 12" Nipple, PE, Length to Fit
20. 8" D.I. Pipe, FE, 9'-3" Long
21. 8" Rubberseat Butterfly Valve (Wafer), FE, w/Diaphragm Valve Actuator
22. 8" 1/4 C.I. Bend, FE
23. 8" Pump Vacuum Release Valve, FE
24. 8" Vent Screen & Fitting, See Detail Sheet C-14
25. 8" Tideflex Check Valve, Series 35, FE
26. 8" Flanged Coupling Adapter

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

Prepared By:
PLUMBING SOLUTIONS

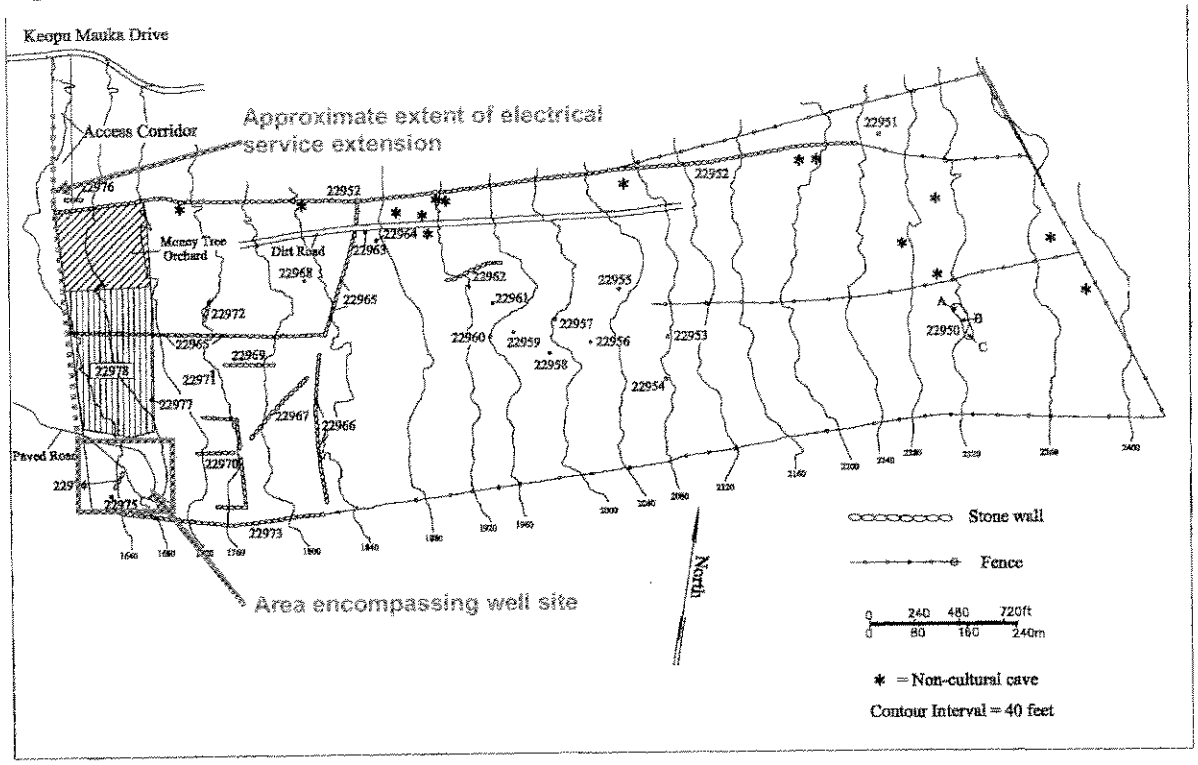
Source:
TNWRE

Figure 2-3:

Well Pump Plan & Sections

Keopu-Pu'uhonua Production Well & Reservoir

Figure 3.4. Archaeological Sites Identified in the Project Area



Source: Haun & Henry (2002a).

As shown in the Figure, Sites 22973, 22974, 22975, and 22978 are nearest to the proposed well site. Each of these is described below.

Site 22973. Site 22973 is a stone wall located along the southern well site boundary. This wall forms the southern boundary of a large rectangular enclosure with Site 22966 forming the inland, eastern boundary and the south wall of Site 22965 forming the northern boundary. The height of Site 22973 and its method of construction suggest that the wall likely functioned to restrict the movement of cattle.

Site 22974. Site 22974 is a disturbed linear wall located near the middle of the proposed well site. The wall measures 28 meters in length, originating about 5 meters southwest of the existing paved access road, and continuing to the south-southwest. The majority of the wall was disturbed by bulldozer activity associated with the construction of the access road and exploratory well, but a relatively intact section exists at the southern end. No cultural remains are present. The height of the intact section and its method of construction suggest that this wall functioned as a livestock control feature.

Site 22975. Site 22975 is a stone mound located about 10 meters south-southwest of the southern end of the Site 22974 wall. The mound, which is oval in shape, is 3.3 meters long (north-south), 2.9 meters wide, and 0.5 to 0.7 meters high; no cultural remains are present. Site 22975 is interpreted as an agricultural clearing pile based on its informal construction and lack of portable remains.

Site 22978. Site 22978 is a complex of 59 features located north of the proposed well site at elevations ranging from 1,620 to 1,720 feet above sea level. The features within this complex consist of 26 terraces, 17 walls, 15 mounds and 1 stone-lined path. No cultural remains are present on the surface of any of the features. The Site 22978 agricultural complex was probably initially used by the

1400s and apparently continued in use until at least the early 1800s based on its association with a ranch wall and an historic trail segment. The site consists of a grid of small fields formed by a series of inland-seaward oriented walls with subdividing walls and terraces. Nineteen bounded fields exist, ranging from 0.05 to 0.52 acres in area with an average of 0.17 acres. At least twenty other fields are present, but all lack one boundary because the area surrounding the site has been historically modified for pasture improvement and agriculture. Cattle ranching was established in the area by the mid-1800s and continues today as evidenced by ranch walls, paddocks, and a wooden water tank.

Conclusions. Haun & Henry (2002a) assessed all 29 sites identified in their survey as significant under Criterion "d" of the *Rules Governing Procedures for Historic Preservation Review* (DLNR 1998: Chap 275), meaning that the sites yield information important for research on prehistory or history. In addition, the study assessed the Site 22978 agricultural complex as significant under Criterion "c": *"Embodying the distinctive characteristics of a type, period, or method of construction; representing the work of a master; or possessing high artistic value."* Site 22978 is considered a well-preserved example of an agricultural field complex in the *'āpa'a* zone of the Kona Field System.

SHPD concurred with Haun's 2002 findings that Sites 22973, 22974, and 22975 have all been adequately documented by the inventory survey and no further work is needed. Portions around the edges of the Site 22978 complex were subsequently subject to SHPD-approved data recovery: first in 2003 and later in 2005 for the construction of the existing access road and waterline. The remaining area of Site 22978 is covered by a preservation plan (see Figure 3.5).

3.9.1.4 Cultural Resources and Traditional Cultural Uses

The proposed well and reservoir site has been extensively modified and disturbed during historic times. Modern development present on the site includes the exploratory well pad and asphaltic concrete access road, both of which required grading. The existing vegetation is further evidence of recent disturbance, and in that regard distinguishes the area from portions of the adjacent parcel where remnants of the Kona field system are evident. Furthermore, the archaeological field inspection conducted of the area yielded no physical evidence that any potentially significant cultural resources might be present on the project site. Finally, there is no indication that the area that would be disturbed by the proposed project has the kinds of resources necessary to or currently being used by Native Hawaiian cultural practitioners exercising traditional and customary access and use rights or by individuals of any other cultural affiliation for any traditional cultural purposes.

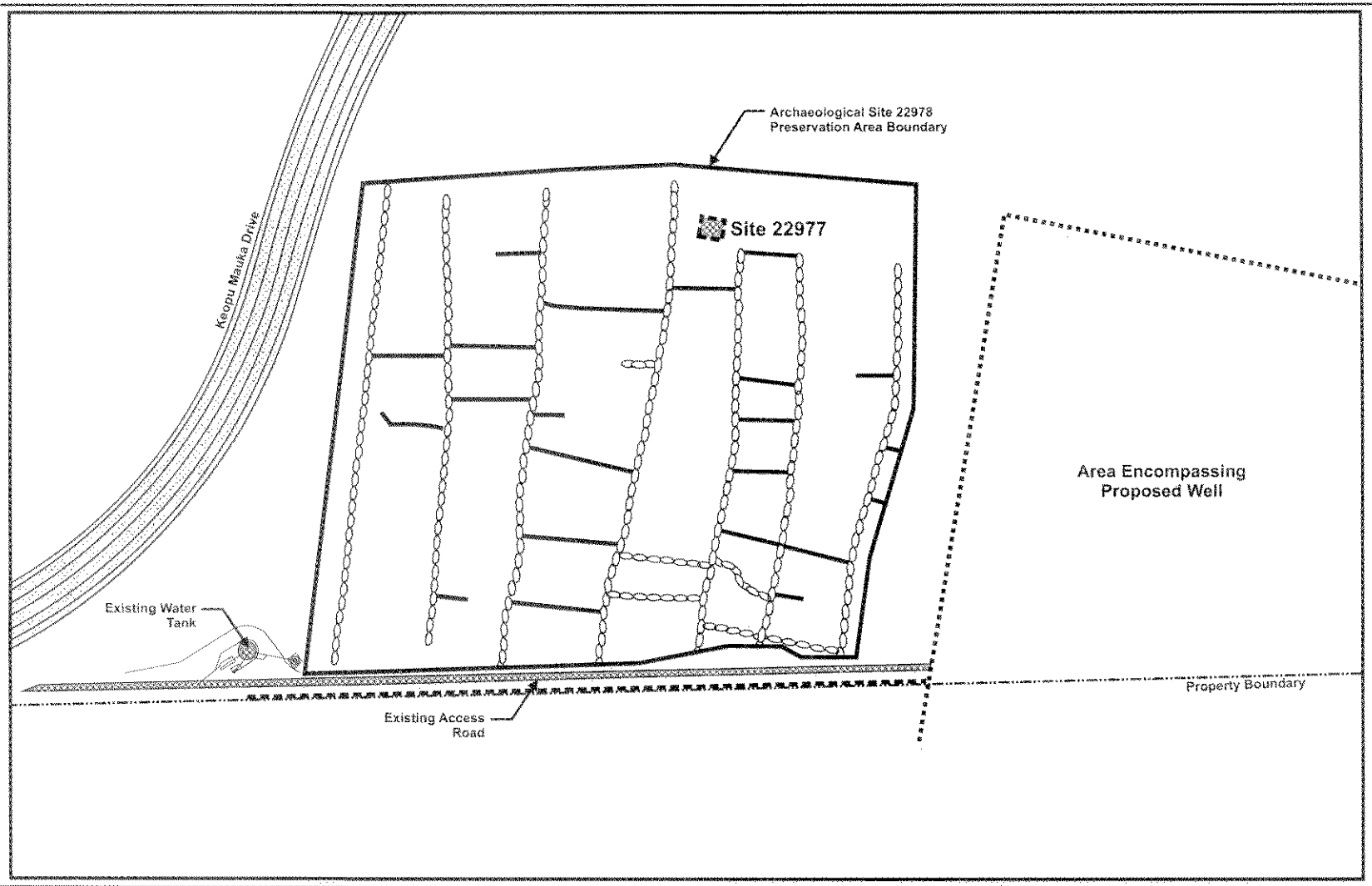
3.9.2 PROBABLE IMPACTS & MITIGATION MEASURES

Alan Haun of Haun & Associates reviewed the plans for the Keōpū-Pu'uhonua well and reservoir project and concluded that the proposed well, reservoir, and underground electrical line will not affect any of the sites protected by the Site 22978 preservation plan (see Figure 3.5). Adequate data recovery has already been performed on the other three sites near the proposed well (22973, 22974, and 22975) and SHPD determined that no further preservation is needed.

Haun & Associates sent a letter to SHPD seeking their concurrence with its assessment. Based on the previous archaeological surveys and data recovery work, SHPD indicated in a letter dated May 4, 2007 that they believe "no historic properties will be affected" by the Keōpū-Pu'uhonua well and reservoir project. Appendix B includes a copy of the SHPD correspondence.

The DWS construction contract for work on the parcel will stipulate that, should any new 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.

Based on the lack of any evidence that the proposed well and reservoir site is used for traditional cultural purposes and the absence of unique biological or archaeological resources at the site, the project is not anticipated to have direct adverse effects on cultural uses. Neither will it impair or limit the ability of native Hawaiian practitioners and others to access cultural resources in adjacent areas.



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

Prepared By:
PLANNING SOLUTIONS

Source:
Haun & Associates (2006)

Note: Drawing not shown to scale.

- - - - Approximate Location of the Electrical Service Extension

Figure 3-5:

Site 22978 Preservation Area

Keopu-Pu'uhonua Production Well & Reservoir

Figure 3-5 Site 22978 Preservation Area 2007-01-16.cdr

3.10 NATURAL HAZARD RISKS

3.10.1 EXISTING CONDITIONS

3.10.1.1 Volcanic Hazards

Hualālai last erupted between 1800 and 1801. Flows originated at the northwestern ridge of the mountain at elevations of about 6,000 feet (the Ka'ūpūlehu flow) and 1,500 feet (the Hu'ehu'e flow). Both of these flows traveled down slope to the west and north. The Ka'ūpūlehu flow entered the ocean just to the west of Kīholo Bay, while the Hu'ehu'e flow entered the ocean just north of Keāhole Point (McDonald, Abbott, and Peterson 1983; Moore et al. 1987). Of these two historic flows, the Hu'ehu'e flow came closest to the Keōpū-Pu'uhonua site, but was still more than five miles away.

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. All of Hualālai is in Zone 4. About 5 percent of the land surface in areas classified as Zone 4 has been covered by lava since 1800, and 15 percent has been covered by lava in the last 750 years. Hualālai's flanks do not have a distinctly lower hazard than its rift zones because the distance from the vents to the coast is short and the slopes are steep. Hualālai erupts less often than Kīlauea and Mauna Loa, but flows typically cover large areas. Other direct hazards from eruptions, such as tephra fallout and ground cracking and settling, tend to be greatest in the areas of highest hazard from lava flows.

3.10.1.2 Seismic Hazards

Defining hazard zones for the effects of earthquakes is more difficult than for eruptions and has not been attempted in any great detail for the Island of Hawai'i. For the most part, earthquakes on Hawai'i are concentrated beneath Kīlauea and Mauna Loa, and particularly beneath the south flanks of both volcanoes and in the Ka'ōiki region between them. The likelihood of a damaging earthquake on Kīlauea or Mauna Loa probably increases with long-lived activity of the rift zones, but its precise time and magnitude are impossible to predict. Large earthquakes unrelated to volcanic activity also occur at irregular intervals on the Island (USGS 1997). For the purposes of structural design, most of the Island of Hawai'i, including the Keōpū-Pu'uhonua site, is classified as Seismic Zone 3 by the Uniform Building Code adopted by the County of Hawai'i in 1993 (USGS 1994).

3.10.1.3 Flood and Tsunami Hazards

The proposed well site is not located within a designated Flood Hazard Safety Area (FHSA) nor within a Tsunami Evacuation area (State of Hawai'i 2002).

3.10.2 PROBABLE IMPACTS

3.10.2.1 Lava Flows

As mentioned, the U.S. Geological Survey (1987) has designated the area in which the project site is located as Volcanic Lava Flow Hazard Level 4, which is midway along its risk scale. The estimated probability that property in this zone will be covered by fresh lava within the next 200 years is less than 5 percent; the estimated probability of it being overrun within the next 1,000 years is less than 15 percent. Because the remainder of the western flank of Hualālai is in the same risk zone, it is not possible to relocate the well to a safer location where it could draw water from the same aquifer.

3.10.2.2 Earthquakes

The Island of Hawai'i experiences thousands of earthquakes each year, but the vast majority are so small that they can only be detected by instruments. Strong earthquakes endanger people and property by shaking structures and by causing ground cracks, ground settling, and landslides. The size of an earthquake is commonly expressed by its magnitude on the Richter scale; an increase of

than the 650-gpm model proposed. Doing so could result in the need to develop additional water sources in a relatively short period. It is in the interest of DWS and its customers to keep water supply costs at a reasonable level by maximizing the sustainable output of each source.

2.4.4 OTHER SOURCE-DEVELOPMENT ALTERNATIVES

Because of the substantial groundwater flux through the region, it is likely that wells drilled in other locations at similar high elevations would also be productive. While DWS could probably develop a production well elsewhere in the North Kona District, the proposed Keōpū-Pu'uhonua Production Well and Reservoir project has several characteristics that make it unlikely that a different location would be superior from an economic, environmental, or operational viewpoint. These include:

- The proposed location is an existing DWS facility that has a proven exploratory well in place. Other possible well locations would require the acquisition of property and exploration of a new well in addition to the development of the production and storage facilities that are part of the proposed action. The duplication of these existing assets would unnecessarily increase the project cost and would add the risk of drilling an unsuccessful exploratory well.
- The proposed well's strategic location near the center and top of the North Kona water system would provide additional flexibility and reliability to the water distribution system. Most other locations are more poorly placed than the proposed site.
- The proposed site's close proximity to the existing water transmission and distribution system avoids the need for significant new waterline construction. The majority of other locations are not as well situated in this regard.

A detailed analysis of potential environmental impacts from development of alternative water sources was beyond the scope of this assessment. However, in view of the absence of adverse effects documented above and in Chapter 3, it seems unlikely that other well locations might be better from an environmental standpoint.

2.4.5 DELAYED ACTION

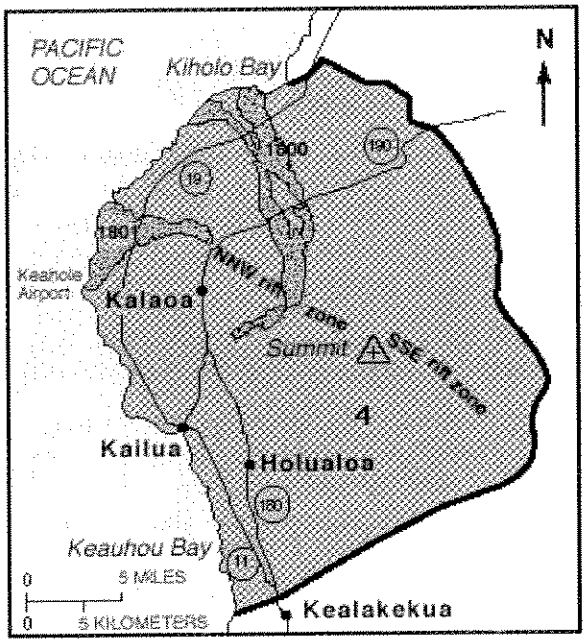
For reasons documented above and in the Department's *20-Year Water Master Plan* and because of the long lead-time necessary to develop a production well (see Table 2.2), it is undesirable to delay development of the proposed well and reservoir. There are no existing activities or conditions at the site or in the project area that would make delaying the project desirable or that would allow delay to reduce the impacts associated with it appreciably. In fact, delaying the project may increase the impacts of its construction due to the fact that the surrounding area is undergoing residential development. If DWS delays construction until nearby residential development is completed, there would be greater potential impacts to those residents as a result of construction noise and traffic. DWS wants to act quickly to minimize construction-related impacts and ensure that it maintains reliable service to its customers in North Kona. Therefore, it does not consider delayed action a viable alternative.

3.0 EXISTING ENVIRONMENT & PROBABLE IMPACTS

3.1 GEOLOGY

3.1.1 EXISTING CONDITIONS

The Keōpū-Pu'uhonua Production Well and Reservoir site is situated at an elevation of about 1,700 feet above mean sea level (MSL) on the southwestern flank of Hualālai. Most of the surface area of this volcano is composed of geologically young but prehistoric lava flows. Geologists believe the volcano emerged above sea level some 300,000 years ago, while the oldest rocks found on the surface are about 128,000 years old. Over the last 3,000 years, Hualālai has erupted near its summit, along the northwest and south-southeast rift zones, and from vents on the north flank of the volcano. Other major eruptions occurred about 300 and 700 years ago. Major flows since 1800 are shown in gray and are dated on the sketch to the right. A large flow from the 700-year-old eruption forms the north side of Keauhou Bay, south of Kailua. Twenty-five percent of the volcano is covered by flows less than 1,000 years old. No commercially useful minerals are known to be present (McDonald, Abbott, and Peterson 1983; Moore et al. 1987).



3.1.2 PROBABLE IMPACTS

The project site does not contain any significant geological features or landmarks. The proposed project would not substantially change exposure to geological hazards or bar the use of significant geological resources (such as minerals) if they are discovered.

3.2 TOPOGRAPHY AND SOILS

3.2.1 EXISTING CONDITIONS

The Keōpū-Pu'uhonua site slopes from east to west, with an elevation of about 1,700 feet MSL on the eastern boundary and about 1,640 at the westernmost edge (see Figure 2.1). The average slope from top to bottom across the site is about 14%.

The soil at the proposed well site is classified as Honua'ulu extremely stony silty clay loam, 12 to 20 percent slopes (HVD) (Foote et al., 1973). This soil type overlies fragmented a'a lava at depths of about 36-40 inches; stones cover only a small percent of the ground surface. Soil permeability is rapid, runoff is slow, and the erosion hazard is slight. This soil type is used mostly for coffee cultivation and pasture. The site and adjacent properties are not designated as Agricultural Lands of Special Interest to the State of Hawai'i.

3.2.2 PROBABLE IMPACTS

Construction of the proposed facility will require clearing, grubbing, and grading over an area of 1.88 acres to accommodate the proposed well, access road, reservoir, and associated structures. The contractor will re-vegetate the portions of the site not used for structures or pavement. These

localized modifications will affect the ground contours on the site itself but will not substantially change the overall topography of the surrounding area. Because the soil type at the project site has limited agricultural applications and the site has not been used for agriculture in recent years, the project will not significantly affect agricultural activities. Neither will it interfere with existing or future agricultural use of the surrounding areas.

3.3 HYDROLOGY

3.3.1 EXISTING CONDITIONS

3.3.1.1 Surface Water

Stormwater runoff has eroded short, shallow gullies into the surface of the Hualālai volcano. Despite relatively high rainfall in the area, these watercourses are not well developed due to the high permeability of the surface lava flows. The most prominent stream in the area is Wai'aha Stream near Hōlualoa, which flows only intermittently according to data from U.S. Geological Survey Gaging Station 16759300.

A small gulch passes approximately 200 feet south of the proposed well and reservoir site at its closest point. The gulch carries water only during and immediately after intense rainfall.

Presently, most of the storm water originating on the proposed site either percolates into the ground through the thick vegetation and permeable soil or sheet flows down the existing access road to the south and west, eventually entering a grove of bamboo. The bamboo forest has rocky, well-drained soils that help runoff entering the area to percolate into the ground relatively quickly.

3.3.1.2 Groundwater

The Keōpū-Pu'uhonua site is in the Keauhou Aquifer System of the Hualālai Sector (see Figure 3.1). The State of Hawai'i Commission on Water Resource Management (CWRM) has determined that the Keauhou System has a Sustainable Yield of 38 million gallons per day (MGD), while the entire Hualālai Sector Sustainable Yield is 56 MGD (CWRM 1995).

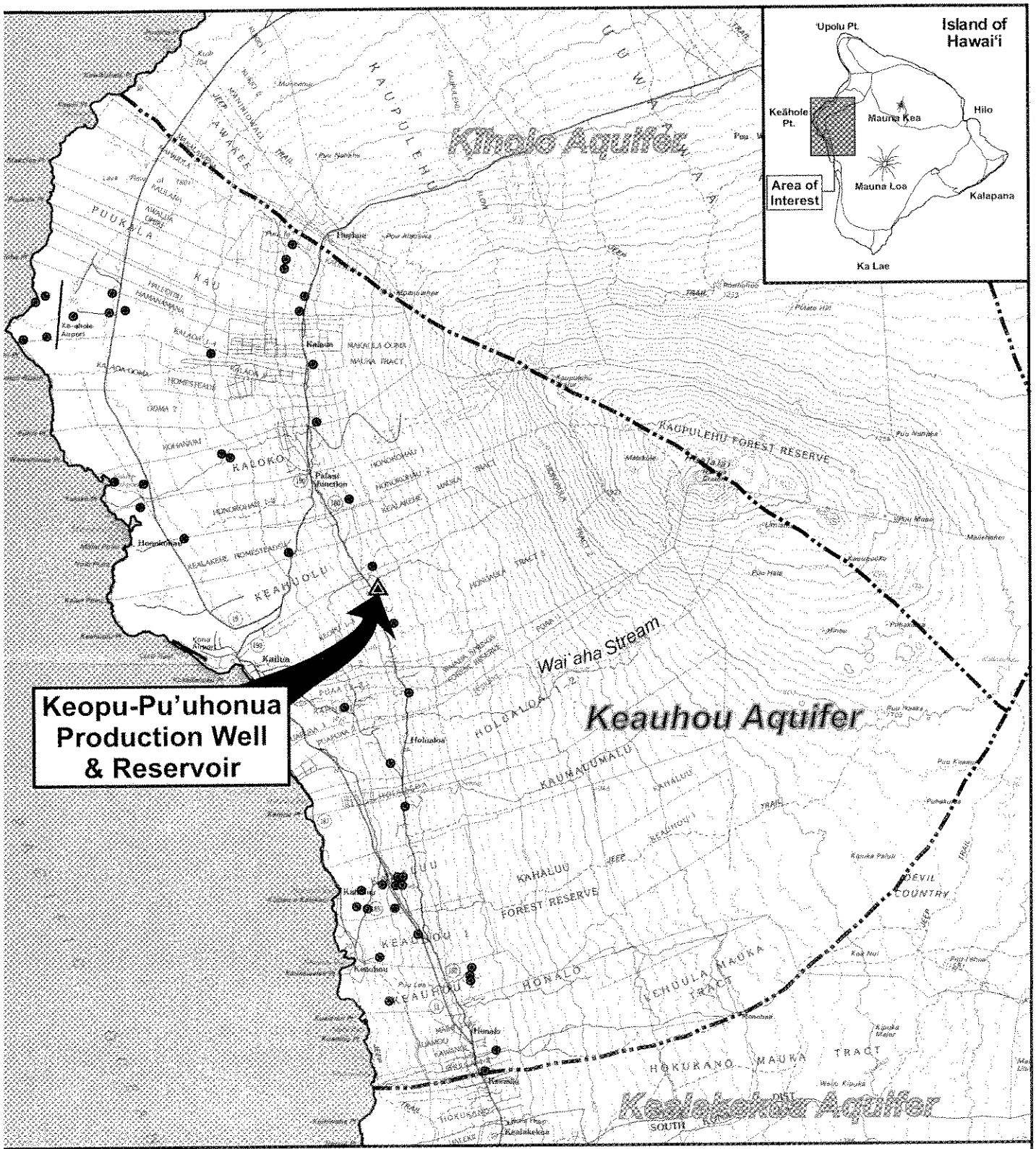
The Keōpū-Pu'uhonua well (State Well No 3957-01) penetrates high-level groundwater, the top of which is about 47 feet above sea level. As such, it is not subject to salinity intrusion and the water the well produces is extremely fresh. High-level groundwater in North Kona was first discovered in 1990 inland of Keauhou; it is now known to extend from Kalaoa on the north to Kealakekua on the south, a distance of about 19 miles. The exact nature of the geologic structure (or structures) which creates the high-level groundwater is unknown.

3.3.2 PROBABLE IMPACTS

3.3.2.1 Surface Water

Construction Phase. The contractor will use best management practices as necessary during construction to prevent contaminants such as sediment, petroleum products, and debris from leaving the site via stormwater runoff. It will attempt to schedule work for periods of minimal rainfall, and will place permanent erosion control measures on lands denuded of vegetation as quickly as possible. Since the disturbed area is expected to be over an acre, the contractor will obtain NPDES Construction Stormwater General permit coverage for these construction activities from the State of Hawai'i Department of Health.[2] During the pump installation phase of the project, the contractor will direct the discharge from testing into the new seepage pit.

[2] 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)



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

Prepared By:
PLANNING SOLUTIONS

Source:
State of Hawai'i GIS
USGS 7.5' Quad Map; *Kealakekua* 1982-84

Legend:
- Existing Well Location
- Aquifer Boundaries

0 1 2 3 4 5
Distance in Miles

Figure 3-1:

Keauhou Aquifer System

Keopu-Pu'uhonua Production Well & Reservoir

Figure 3-1 Keauhou Aquifer System 2008-11-01.cdr

Because the nearest natural drainageway is more than 200 feet away from the site and separated from it by a swath of bamboo forest with highly permeable soils, it is very unlikely that any runoff from the well and reservoir site presently reaches it. This would not change during construction and operation of the project. Regardless, the BMPs that the contractor will implement during construction will ensure that runoff leaving the property conforms to State water quality standards.

Operational Phase. Once construction is completed, the majority of the ground surface at the well and reservoir site will be permeable (i.e., covered with gravel or vegetation). However, the access driveway and the central portion of the site housing the reservoir, well pump, and control building will be paved with impermeable asphalt concrete.

A concrete swale and drainage system will be installed to collect runoff from paved areas and divert it through underground drain lines into a new seepage pit at the lower end of the site. The project engineer estimates that a rainfall event with a ten-year occurrence interval (3.2 inches per hour) will generate peak runoff of 3.77 cfs from the entire site. The new drainage system will capture approximately two thirds of this (2.44 cfs) and divert it into the new seepage pit. Because this slightly exceeds the 2.0 cfs capacity of the pit, about one-fifth (0.44 cfs) will overflow the seepage pit and continue into the adjacent gully. Runoff from the portion of the site that is not served by that drainage system (estimated at 1.33 cfs) will continue to leave the area via overland flow. Together, the overflow from the seepage pit and the uncaptured overland flow from a 10-year event will total an estimated 1.77 cfs. This is just over half (54 percent) of the 3.28 CFS which the engineer estimates leaves the site during the same storm event at present. ,Consequently, the proposed project will substantially decrease the volume of stormwater runoff flowing off the site onto adjacent parcels.

The reservoir site does not contain any hazardous materials, and much of the runoff that is not immediately absorbed into the ground would be from paved or graveled surfaces that would contribute little to no suspended sediment. There will be virtually no vehicle-traffic or other activity that could add oil, grease, or other common roadway pollutants to the paved areas. Hence, while the quantity of runoff from the reservoir site will be slightly greater than at present once the proposed improvements are completed, the quality will not significantly change.

The gulch to the south of the project site contains water only during and immediately following periods of intense rainfall. Further, the water that the well would draw from is more than 1,500 feet below ground surface. Consequently, withdrawal of the groundwater for the proposed well will not affect surface water flows.

3.3.2.2 Groundwater

Waimea Water Services Inc. (WWS) conducted a series of pump tests of the well in January 1993 on behalf of Haseko Hawaii, Inc., the previous owner of the Keōpū-Pu'uhonua well site. The results of a step-drawdown test conducted on the morning of January 21, 1993, show that at the proposed pumping rate of 650 gpm, the drawdown would be just under 6 feet (see Table 3.1). After a 24-hour rest period, WWS ran a 96-hour constant-rate pump test between January 22 and January 26, 1993. The average pumping rate during this 5-day test was 738 GPM, equivalent to 1.06 MGD.

Table 3.1 Results of Step-Drawdown Testing [January 21, 1993]

Pumping Rate (GPM)	*Drawdown (feet)*
210	1.5
440	3.0
560	4.4
600	4.8
740	7.8
810	8.3
Source: Waimea Water Services, Inc. (1993)	

Based on these results, it appears that the planned pumping rate of 0.94 MGD (650 GPM) is sustainable from the viewpoint of the individual well. As noted in Section 3.3.1.2, CWRM has set the sustainable yield for the Keauhou Aquifer System at 38 MGD. Present total withdrawals of potable water from this aquifer system are on the order of CWRM records indicate that current water use within the Keauhou Aquifer System is approximately 13 MGD, of which 10 MGD is potable and 3 MGD is non-potable and brackish irrigation water (Hawai'i, State of, Use Commission (August 1, 2005). Since the combined pumpage of 13 MGD is only 34 percent of the aquifer system's 38 MGD sustainable yield, the use of the Keōpū-Pu'uhonua Production Well appears to be sustainable on an overall aquifer basis as well.

3.4 POTENTIAL FOR WELL CONTAMINATION

For reasons outlined below, there is a low probability that water from the proposed Keōpū-Pu'uhonua Production Well and Reservoir Project is, or would become, contaminated.

- The area surrounding the proposed well site is mostly undeveloped. An abandoned money tree orchard and agricultural field complex exist along the *mauka* side of the existing access road, indicating past agricultural use. Both of these areas are overgrown with trees and thick vegetation, indicating that no agricultural chemicals that could affect groundwater have been used there in recent years.
- There are only two recorded instances of contamination among the wells of the Hualālai Aquifer System. Small levels of isophorone, a constituent of solvents, herbicides, and pesticides, were detected in 1998 in Kahalu'u Well B and in 2000 in Hualālai Well (DOH 2006a). In both instances, the levels detected were less than 0.02% of the contamination level considered dangerous to humans.
- As required by the State Department of Health to obtain certification before putting the well into service, in January 1993 Waimea Water Services completed extensive testing of the well water and found no evidence of contamination. The results of these tests, which will be repeated before the well is placed in service, show that the well water meets all State and Federal regulatory requirements for potable water.
- According to the County of Hawai'i Department of Environmental Management, Solid Waste Division, the nearest landfill to the project site is in Pu'uanahulu, which is approximately 20 miles north of the well site.
- The nearest solid-waste transfer station is in Kailua, several miles down gradient from the site.
- The nearest existing cesspool is over 1,000 feet down-gradient from the proposed well site. The developer for Royal Kamehameha Gardens has confirmed that the owners of residential lots nearest

the well site will be required to provide and install a specific type of individual wastewater treatment system that the State Department of Health has approved for use within a 1000-ft radius of a well.

- Based on the State Department of Health Office of Hazard Evaluation and Emergency Response report covering the area (DOH 2006b), no identified site of concern to the State Department of Health is located near the Keōpū-Pu'uhonua well site. The nearest listed sites are all in the Kailua-Kona area, several miles away.

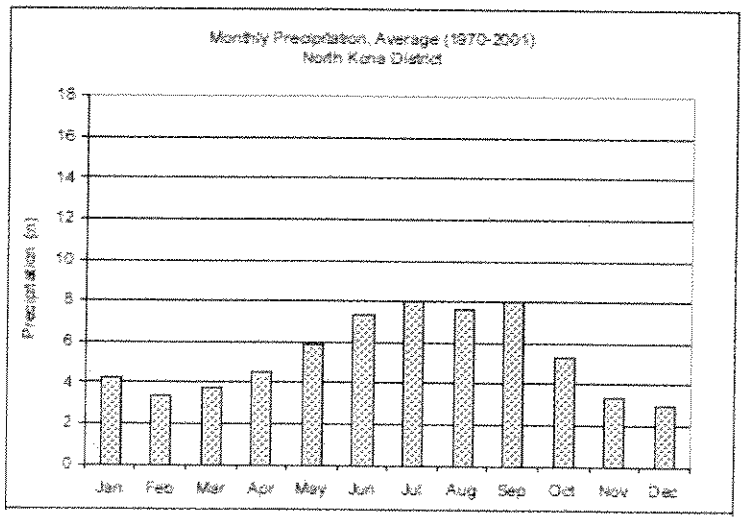
3.5 CLIMATE AND AIR QUALITY

3.5.1 EXISTING CONDITIONS

Temperatures in the area are very moderate. Daily low temperatures are typically 58-59° F between December and March and 63-64° between June and November. Normal daily high temperatures are 76-77° between December and May and 79-80° between August and November.

No site-specific wind data are available from the well location. However, DWS' Keōpū-Pu'uhonua Well site and Kona in general are protected from the normal northeasterly trade winds by the Hualālai, Mauna Loa, and Mauna Kea volcanoes. Consequently, winds are typically light, averaging less than 5 miles per hour (mph). The wind direction varies diurnally. Winds move gently down slope and to the northwest during nighttime hours at speeds averaging 1-2 mph. During midday, they are usually upslope to the east-northeast at speeds averaging 8-9 miles per hour. Kona storms, which usually occur in the winter, bring stronger southerly winds to the site (Juvik, Juvik & Paradise 1998).

The rain gauging station at Lanihau, located an elevation of 1,530 feet MSL about 1.5 miles north of the DWS' Keōpū-Pu'uhonua property, provides a good indication of rainfall at the project site. The median annual precipitation at Lanihau between 1971 and 2000 was 53.5 inches (NOAA 2002). June was the wettest month during this period, with an average monthly rainfall of 6.78 inches. The average monthly rainfall in November, the driest month, was 2.8 inches. This is roughly consistent with seasonal rainfall patterns throughout the North Kona District, as shown in the graph below. In general, rain occurs in the afternoon in concert with the normal diurnal onshore winds.



Source: DWS 20-Year Water Master Plan (2006).

Passing traffic on Māmalahoa Highway and Keopu Mauka Drive is the only source of anthropogenic air emissions near the project site. The northeasterly trade winds carry emissions from Kilauea volcano around the southern side of the island to the well site and can occasionally impair air quality.

3.5.2 PROBABLE IMPACTS

3.5.2.1 Construction Phase

As mentioned, grading and excavation of the proposed well site and underground electrical route will disturb a little over an acre of land. No more than a few pieces of construction equipment would operate on the site at any one time. Moreover, work would be limited to period of a several months. The site's relatively high rainfall, generally moderate wind speeds, and distance from most sensitive receptors means that fugitive dust is unlikely to be a problem during construction. The contractor will ensure that the work conforms with the State Department of Health's guidelines for controlling fugitive dust as outlined in Hawai'i Administrative Rules §11-60.1. Consequently, pollutant emissions from construction equipment do not have the potential to affect the local or regional air quality substantially.

3.5.2.2 Operational Phase

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. The electrical power consumed in the operation of the well and controls will require power generation (and, therefore, fuel consumption and gaseous emissions) by the Hawai'i Electric Light Company. This will occur only insofar as pumping from the proposed well is not offset by reduced pumping elsewhere in DWS system. In any event, forecast electrical power use by the proposed well represents such a small portion of total electrical power use on the island that its operation would have no discernible effect on power plant emissions.

3.6 TERRESTRIAL FLORA AND FAUNA

3.6.1 EXISTING CONDITIONS

3.6.1.1 Flora

The well and reservoir site has been partially graded in the past and contains a paved roadway that circles the majority of the site. The vegetation within the well and reservoir site consists of an eclectic mix of fruit trees, ornamental trees, shrubs, grasses and weedy species. The more abundant species present include, mango (*Mangifera indica*), papaya (*Carica papaya*), common guava (*Psidium guajava*), strawberry guava (*Psidium cattleianum*), African tulip (*Spathodea campanulata*), silk oak (*Grevillea robusta*), ironwood (*Casuarina equisetifolia*), eucalyptus (*Eucalyptus sp.*), Octopus tree (*Sheffelera actinophylla*), Christmas berry (*Shinus terebinthifolia*), saltbush (*Pluchea carolinesis*), lantana (*Lantana camara*), common bamboo (*Bambusa vulgaris*), kahili ginger (*Hedychium gardnerianum*), castor bean (*Ricinus communis*), koa haole (*Leucaena leucocephala*), and a mix of grasses including, Elephant grass (*Pennisetum purpureum*), Guinea grass (*Panicum maximum*), dropseed grass (*Sporobolus indicus*), molasses grass (*Melinus minutiflora*), and Natal redtop (*Rhynchelytrum repens*), along with numerous other weedy species typical of ruderal areas in the relatively wet areas at this elevation in the North Kona District (Rana Productions 2006). The vegetation is similar along the existing access road, with common and strawberry guava dominating the *mauka* side of the road, and Guinea grass, ginger and castor bean on the *makai* side of the road where the proposed electrical line would be installed.

The habitat present on the well and reservoir site, as well as along the existing access road, is highly disturbed second-growth vegetation almost totally alien in its makeup. The few native species seen are all common species usually associated with ruderal areas at this altitude and location in North Kona. None are endangered, threatened, or species of concern identified by State or federal law (Rana Productions 2006). Photographs of the proposed well site and existing access road are provided in Figure 3.2 and Figure 3.3.

1. Existing exploratory well at Keopu. Note the Mango trees in the background.

2. View across proposed reservoir site.

3. Existing well shaft at Keopu site.

4. View towards existing natural berm at eastern end of site.

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

Prepared By:
PLANNING SOLUTIONS

Source:
Planning Solutions, Inc. (November 11th, 2006)

Key to Photo Locations:

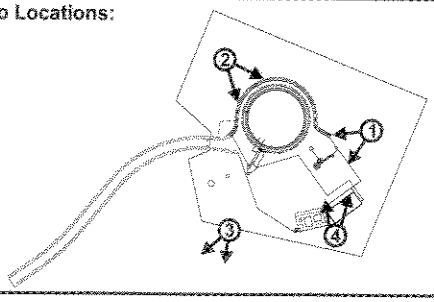
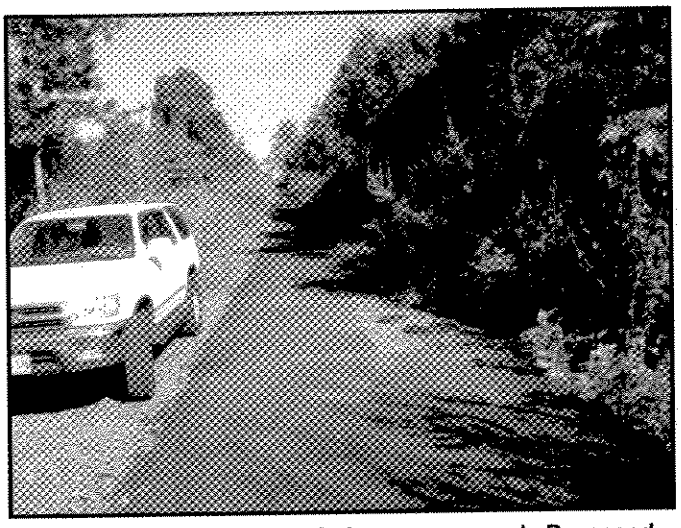


Figure 3-2:

Existing Well & Reservoir Site Conditions

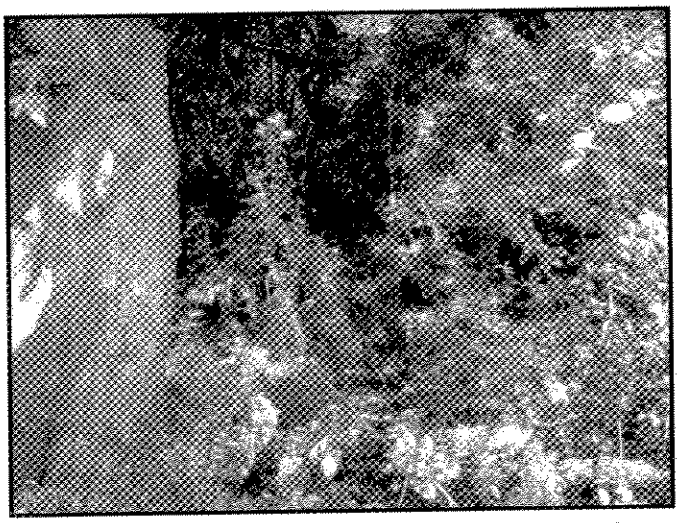
Keopu-Pu'uhonua Production Well & Reservoir

Figure 3-2 Views of the Existing Site 20070413.dgn



1. Looking north down existing access road. Proposed electrical extension will be placed on the *makai* (left) side of the road.

2. View west down the existing driveway toward bamboo forest.



3. Construction fencing along the northern property boundary (archaeological preserve).

4. Looking south down the access road towards the well site.

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

Prepared By:
PLANNING SOLUTIONS

Source:
Planning Solutions, Inc. (November 11th, 2006)

Key to Photo Locations:

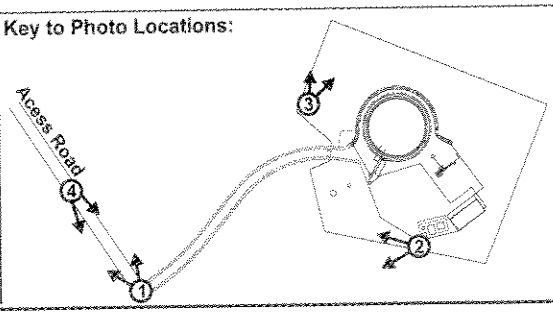


Figure 3-3:

Existing Access Road & Project Area Conditions

Keopu-Pu'uhonua Production Well & Reservoir

Figure 3-3 Existing Access Road & Project Area Conditions 2007-01-12.cdr

3.6.1.2 Mammals

Only one mammalian species, Indian mongoose (*Herpestes a. auropunctatus*), was detected on the proposed well and reservoir site (Rana Productions 2006). Dogs (*Canis f. familiaris*) were heard barking from farms and house lots to the north, east, and west of the site. Finally, numerous pig (*Sus. s. scrofa*) trails, rooting sites, and signs were observed within the site, especially in the bamboo grove located on its southwest corner. It is likely that rats, mice, and feral cats are present as well.

The endangered Hawaiian hoary bat (*Lasiurus cinereus semotus*), was not detected during the course of the survey. Although not detected, it is possible that this species does occasionally use resources on and above the proposed well and reservoir site, as they are regularly seen in areas *mauka* of Māmalahoa Highway.

3.6.1.3 Birds

Almost 100 individual birds of 10 different species were recorded during two avian point counts at the well and reservoir site during November 2006 (Rana Productions 2006, see Table 3.2). An additional species, Wild Turkey (*Meliagris gallopavo*), was not seen or heard, however, scat and feathers of this species were seen in several locations within the site.

Table 3.2. Avian Species at Proposed Well & Reservoir Site

Common Name	Scientific Name	ST	RA
	GALLIFORMES		
	PHASIANIDAE - Pheasants & Partridges		
	Phasianinae - Pheasants & Allies		
Red Junglefowl	*Gallus gallus*	D	2.50
	Meleagridinae - Turkeys		
Wild Turkey	*Meleagris gallopavo*	A	S
	COLUMBIFORMES		
	COLUMBIDAE – Pigeons & Doves		
Spotted Dove	*Streptopelia chinensis*	A	3.50
Zebra Dove	*Geopelia striata*	A	4.00
	PASSERIFORMES		
	TIMALIIDAE – Babblers		
Hwamei	*Garrulax canorus*	A	4.00
Red-billed Leiothrix	*Leiothrix lutea*	A	4.50
	ZOSTEROPIDAE – White-eyes		
Japanese White-eye	*Zosterops japonicus*	A	10.50
	STURNIDAE – Starlings		
Common Myna	*Acridotheres tristis*	A	5.50
	CARDINALIDAE – Cardinals Saltators & Allies		
Northern Cardinal	*Cardinalis cardinalis*	A	2.50
	FRINGILLIDAE – Fringilline and Carduline Finches & Allies		
	Carduelinae – Carduline Finches		
House Finch	*Carpodacus mexicanus*	A	5.00
Yellow-fronted Canary	*Serinus mozambicus*		7.50

Notes:
ST = Status
D = Domesticated Species – Not currently considered established in the wild on Hawai'i
A = Alien Species – Species introduced to Hawai'i by humans
RA = Relative Abundance – Number of birds detected divided by the number of count stations (2)
S = Sign – tracks, scat and feathers

Source: Rana Productions (2006).

All 11 bird species detected are alien to the Hawaiian Islands. No avian 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 during the course of the survey, and the disturbed nature of the habitat present on the site makes it generally unattractive to native avian species. The only notable exceptions are the two large mango trees present near the center of the well site, which may occasionally attract Hawaiian Hawk (*Buteo solitatius*), an endangered endemic raptor.

Although not detected at the site, it is possible that small numbers of the endangered Hawaiian Petrel (*Pterodroma sandwichensis*) and the threatened Newell's Shearwater (*Puffinus auricularis newelli*) fly over the site between the months of May and November. Both of these species are susceptible to collision with manmade structures and can be disoriented by artificial lighting.

3.6.2 PROBABLE IMPACTS & MITIGATION MEASURES

3.6.2.1 Flora

Construction of the proposed facilities will affect approximately one acre of land. The plants that are present in the affected area are primarily introduced and invasive species. The affected area is not habitat for any rare, threatened or endangered species. Consequently, the proposed action will not have any substantial direct impacts on terrestrial flora or fauna.

3.6.2.2 Mammals

All mammals observed on the proposed well and reservoir site are introduced species. No Hawaiian hoary bats were detected, although they may occasionally utilize the site and surrounding areas. Female bats are especially vulnerable to disturbance while they are lactating and caring for their young. To reduce the potential for interactions between clearing and grubbing activity and Hawaiian hoary bats, the contractor will schedule clearing and grubbing outside the May through late July period that bats are caring for young.

3.6.2.3 Birds

As discussed above, all of the avian species detected at the proposed well and reservoir site were common non-native species and the habitat at the site is not particularly valuable for any rare, threatened, or endangered species. There is an extremely small chance that the endangered Hawaiian Hawk may occasionally nest in one of the large mango trees on site. Scheduling construction activity outside of the hawk nesting season (which occurs from February to July) will eliminate any threat that the proposed action will result in deleterious impacts to this species.[3]

There is no suitable nesting habitat within or close to the proposed project site for the Newell's Shearwater or Hawaiian Petrel. The exterior lighting planned for the facility is shielded so that it points downward, and it will only be used in case of emergency. Finally, the vegetation surrounding the proposed well and reservoir site is sufficiently tall to prevent birds from flying low enough to collide with any of the proposed structures.

3.7 AQUATIC RESOURCES

3.7.1 EXISTING CONDITIONS

As noted in Section 3.3.1.1, the gulch that exists near the project site only carries water during and immediately after periods of heavy rainfall. During an inspection of the site on November 14, 2006,

[3] A visual and audio playback survey for this species would be conducted by a qualified ornithologist on the site if clearing and grubbing is expected to occur between February and July. This is to ensure that the construction activities will not disturb nesting Hawaiian Hawks. If nesting activity is detected, consultation with the U. S. Fish & Wildlife Service will be required prior to conducting further clearing activity within 500 meters of the nest tree. The currently approved protocols for conducting such a survey are based on those developed by John Klavitter during his multi-year island wide survey of Hawaiian Hawks.

the gulch was dry and there was no evidence that small pools or other aquatic habitat is ever present. There are no known wetlands, irrigation ditches, or other water bodies nearby with the potential to host significant aquatic communities.

3.7.2 PROBABLE IMPACTS

As noted above, the gulch near the well site does not host substantial aquatic communities. As noted in Section 3.3.2, the typically dry gulch is over 200 feet from the site and will not be affected by the well and reservoir's construction and operation. For these reasons, the project does not have the potential to affect freshwater aquatic resources substantially. Groundwater withdrawal from the well would slightly reduce groundwater discharge into the ocean, but the fact that the change would be distributed over a broad area combined with the active mixing that occurs in the ocean will prevent any substantial effect.

3.8 NOISE

3.8.1 EXISTING CONDITIONS

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. Sounds at frequencies above 10,000 Hz are much more difficult to hear, as are sounds at frequencies below about 100 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. One weighing procedure that attempts this is called "A-weighting". The U.S. Environmental Protection Agency (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. The variables used in this report to indicate sound levels all use A-weighting to describe different features of sound collected over a fixed measurement interval. During the measurement interval, sound levels are recorded continuously and the signal is integrated over shorter intervals to permit statistical analysis. The instrument used for the data collected at the Keōpū-Pu'uhonua Well site[4] was set to collect data for 10-minute intervals and to integrate the data within this interval every second. The data were used to determine the baseline levels shown in Table 3.3 for four parameters:

- 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.
- Maximum Sound Level (Lmax). This is the maximum sound level (1-second integrated value) recorded during the measurement interval.
- Minimum Sound Level (Lmin). This is the minimum sound level (1-second integrated value) recorded during the measurement interval.
- Maximum Peak Level (MaxP). This is the instantaneous maximum sound level measured during the measurement interval.

[4] A Brüel & Kjær Integrating meter, Type 2239A.

Table 3.3. Baseline Sound Level at Keōpū-Pu'uhonua Well Site on November 14. 2006

Station Description	*Leq*	*MaxP*	*MinL*	*MaxL*
Southern end of site near proposed control building	46.4	86.7	32.2	63.9
Notes: A-Weighted, 10-minute interval; 1-sec. integration; 30-100 dBA scale; 11/14/06				
Source: Planning Solutions, Inc.				

Existing noise sources at the proposed well and reservoir site include birds, insects, wind in the foliage, aircraft passing overhead, and muffled traffic sounds from Keopu Mauka Drive and Māmalahoa Highway.

3.8.2 PROBABLE IMPACTS & MITIGATION MEASURES

3.8.2.1 Environmental Noise Guidelines, Standards, and Criteria

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) equipment related to agricultural, construction, and industrial activities. Those limits, applicable at the property boundary of the parcels containing the affected land use, are shown in Table 3.4. 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 all times.

3.8.2.2 Construction Phase Impacts

Demolition and construction will involve the operation of diesel-powered equipment for a period of up to 12 months. Noise from loudest un-muffled equipment of this sort can be as high as 80 to 85 dBA measured at a distance of 50 feet. Currently, the nearest residence is more than 1,000 feet from the reservoir site and the proposed electrical extension. Low-density residential development will eventually occur within the Royal Kamehameha Gardens subdivision, but construction of the well and reservoir project is scheduled to be completed well before the homes are occupied.

Depending upon the construction equipment that is used, demolition and construction activities associated with the proposed project could exceed the 70 dBA daytime property line noise limit for agricultural areas (as the location is zoned). Because of this, a construction noise permit may be needed from the State Department of Health.

HAR §11-46-7 gives the Director of Health the authority to issue permits that allow the limits shown in the table to be exceeded so long as:

- the best available control technology is used;
- the granting of the permit is in the public interest;
- the services or activities for which the permit is sought are temporary and cannot be delayed, postponed, or rescheduled to a time period in which they are permitted;
- additional time is needed to alter or modify the activity or operation to comply with the regulation;
- the applicant has disclosed any possible impact from noises created by any proposed nighttime activity which may affect the immediate surrounding; and
- The applicant plans to notify the people in the surrounding area of planned nighttime activity.

The regulations prohibit issuance of a construction noise permit for construction activities which:

- emit noise in excess of the maximum permissible sound levels for the hours before 7:00 a.m. and after 6:00 p.m. of the same day, Monday through Friday;

- emit noise in excess of the maximum permissible sound levels for hours before 9:00 a.m. and after 6:00 p.m. on Saturday; and
- emit noise in excess of the maximum permissible sound levels on Sundays and on holidays.

HAR §11-46-8 also provides for variances in situations where it is not possible to meet all of the conditions required for permits. At present it is anticipated that development of the Keōpū-Pu'uhonua Well and reservoir would qualify for a noise permit if required; hence, it is not anticipated that a variance will be needed.

Table 3.4. Maximum Permissible Sounds Levels in dBA (HAR §11-46).

Zoning Districts	*Daytime (7 a.m. to 10 p.m.)*	*Nighttime (10 p.m. to 7a.m.)*
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

3.8.2.3 Operational Phase Noise Impacts

A submersible pump and motor will be used, limiting aboveground noise to the hum of the transformer. This is below the most stringent noise limit in HAR §11-46 (45 dBA) and would not be detectable from the nearest dwelling that will be constructed as part of the Royal Kamehameha Gardens development.

3.9 ARCHAEOLOGICAL, HISTORIC AND CULTURAL FEATURES

3.9.1 EXISTING CONDITIONS

3.9.1.1 Historical Context

The project site is situated within the *ahupua'a* of Honua'ula, which is literally translated as "red dirt" (Pukui et al. 1974). Researchers have noted that the *ahupua'a* is rarely mentioned in historic accounts (Rosendahl 1991; Henry, Wolforth and Rosendahl 1996).

Maly (1996) conducted historical documentary research for a parcel in the nearby *ahupua'a* of Hienaloli. One reference cited by Maly mentions Honua'ula as one of the *ahupua'a* from Lanihau to Puapua'a that provided the food and natural resources to support a 13th century high chief named Pili-a-Ka'aiea (Pili). Maly translated portions of *Ka 'ao Ho 'oniva Pu 'uwai No Ka-Miki* (The Heart Stirring Story of Ka-Miki) a legendary account of two supernatural brothers, Ka-Miki and Maka-'iole), who traveled around the island of Hawai'i. The account was published in serial form between 1914 and 1917 in a Hawaiian newspaper, *Ka Hoku o Hawai'i*. According to Maly, the account was recorded by Hawaiian historians John Wise and J.W.I. Kihe. Based on Maly's translation and study of the account:

> *The story is set in about the 13th century, in the time of Pili-a-Ka'aiea (Pili), sovereign chief of all Kona, the narrative identifies the lands between Lanihau (Kailua) and Puapua'a as an integral component of Pili's royal domain. Pili was a great advocate of contests in debating, fighting, and contests of physical strength, and Hinakahua at Puapua'a was the site of the chief's longhouses and contest field, which supported these activities. While Pili was at Hinakahua he was supported by the agricultural and natural resources of the surrounding ahupua'a, including Kahului, Wai'aha, Pua 'a, Auhaukea'e, Hinaloli (Hienaloli), Honua'ula, Keopu, Moeauoa, and Lanihau. Pill's royal compound was at Niumalu, his canoe fleets were harbored at Oneo, and his wealth-houses (where tribute was kept until it was needed) were situated at Ahu'ena (Lanihau).*

Early events documented in the Kona regional traditional history are associated with 'Umi-a-Liloa. Hawai'i was first unified under the rule of 'Umi-a-Liloa and Kona was selected as a dwelling place of chiefs (Kamakau 1961). The area lies within the realm of the traditional Hawaiian political authority that was centered in the Kailua-Keauhou area from at least the 15th century to the reign of Kamehameha I. With the arrival of Kamehameha I and his court in Kona, the area between Kamakahonu (on the north side of the present-day Kailua pier) and Puapua'a became an extended royal center, a hub of activity that focused on the support of the king and his large court. According to Kamakau:

> *...at Kamakahonu could be seen at night the sparkle of lights reflected in the sea like diamonds, from the homes of the chiefs from Kahelo [in Puapua'aiki] to Lanihau. The number of chiefs and lesser chiefs reached into the thousands.*

The earliest detailed historic account of the area south of Kailua Town including Honua'ula comes from English missionary William Ellis, who traveled around the Big Island in 1822:

> *Leaving Kairua [Kailua], we passed through the villages thickly scattered along the shore to the southward. The country around looked unusually green and cheerful, owing to the frequent rains, which for some months have fallen on this side of the island. Even the barren*

lava, over which we traveled, seemed to veil its sterility beneath frequent tufts often waving grass, or spreading shrubs and flowers.

The sides of the hills, laid out for a considerable extent in gardens and fields, and generally cultivated with potatoes, and other vegetables, were beautiful.

The number of heiaus, and depositories of the dead, which we passed, convinced us that this part of the island must formerly have been populous. The latter were built with fragments of lava, laid up evenly on the outside, generally about eight feet long, from four to six broad, and about four feet high. Some appeared very ancient, others had evidently been standing but a few years.

Native Hawaiian historic accounts and the observations of early foreign visitors such as Ellis describe the extensive cultivated slopes that included Honua'ula. The cultivated lands, today known as the Kona Field System, were in intensive use during late prehistoric to early historic times.

The Kona Sugar Company was established in 1898 and it was incorporated the following year (Conde and Best 1973). In 1901, the West Hawaii Railway Company began constructing a railroad to transport sugar cane to the Kailua Sugar Company Mill situated in Wai'aha. The railroad extended to Honua'ula at its northern end, suggesting sugar cane cultivation may have extended into the ahupua'a. However, the decline in sugar removed the economic basis for the railroad, and by the end of 1926 it had ceased operation.

Commercial coffee cultivation in the Hawaiian Islands began in the in the 1830s, but fluctuating world coffee prices, labor shortages, pest and disease infestations, and drought made the industry uneconomic, and most of the larger coffee operations were in serious decline. By 1860, the only large coffee farms remaining were in the Kona and Hamakua regions of the Big Island, and by the 1880s Kona coffee production was limited almost entirely to local consumption.

Beginning in 1885, Japanese immigrants who came to Big Island sugar plantations on 3-year labor contracts began to find their way to Kona coffee plantations to work as pickers. In 1899, when world coffee prices declined sharply while world sugar prices soared, most investors began to shift their money from coffee to sugar production, but Kona's steep terrain and scarce water made large-scale sugar cultivation in Kona impossible. Consequently, the larger coffee farmers who had dominated the early production in Kona began to subdivide their coffee plantations into 5 to 15 acre parcels for lease to tenant farmers, primarily first generation (issei) Japanese immigrant family ventures. The change occurred so swiftly that by 1910, Japanese farmers comprised 80% of Kona's coffee farmers and family ventures were responsible for most coffee production, a transformation that saved the Kona coffee industry.

Cattle ranching and coffee cultivation became the dominant forms of land use in the mid-1900s. According to Mr. Mitchell Fujisaka, who was one of the equipment operators, extensive mechanical clearing was conducted in the project area for pasture improvement in the mid-1960s (Haun & Associates 2001). In recent years, the project area was used for grazing horses and cultivation of money trees and coffee. Presently, the area is slated for development as part of the Royal Kamehameha Gardens subdivision.

3.9.1.2 Prehistoric Land Use & Settlement

The project area lies within the *'āpa'a* (dry) zone of the Kona Field System, SIHP Site 6601 (Cordy 1995; Newman 1970; Schilt 1984). The Kona Field System extends north to Kā'u ahupua'a, south to Hōnaunau, and from the coastline to the forested upper slopes of Hualālai. The characteristics and general locations of the system's four elevation zones are summarized below (see Newman 1970; Kelly 1983).

- The *kula* (open field, pasture) zone extends from sea level to 500-foot elevation.[5] This lower elevation zone traditionally was used for habitation and cultivation of sweet potatoes, paper mulberry (*wauke*), and gourds. Historic cultigens included melons, beans, cabbage, coffee, onions, oranges, corn, pumpkins, cotton, tobacco, pineapple, and Irish potatoes (Schilt 1984). Agricultural features, including clearing mounds, planting mounds, planting depressions, modified outcrops, and planting terraces, are common in this zone (Hammett and Clark 1980; Hammett and Folk 1980; Schilt 1984). Habitations are scattered throughout the *kula* zone, but they are concentrated along its shoreline portion (Cordy 1995). The shoreline portion, extending approximately 200 m inland, was the focus of permanent habitation and activities such as burial, canoe storage, ritual, and marine exploitation. Royal centers and chiefly residences were also situated near the shoreline. These complexes included residences for high status individuals and their supporters and attendants, *heiau*, places of refuge, *hōlua* slides, and other structures.
- The *kalu'ulu* zone extends from the top of the *kula* zone to an elevation of about 1,000 feet. This zone was used for cultivating sweet potatoes, paper mulberry, and especially breadfruit. Archaeologically, this zone is not distinguishable from the adjacent *'āpa'a* zone (Cordy 1995).
- The *'āpa'a* zone of the Kona Field System is situated between the top of the *kalu'ulu* zone and an elevation of about 2,500 feet. It was traditionally used for dry land cultivation of taro, sugar cane, sweet potato, and *ti*. Historically, the *kalu'ulu* and *'āpa'a* zones were also used for the same crops as the *kula* zone (Schilt 1984). Permanent habitations were present in the *'āpa'a* zone, but were infrequent (Cordy 1995, Burtchard 1995). Early historic chroniclers observed dwellings in this zone, but most were probably for temporary use in conjunction with agriculture, bird hunting, and collecting of plant resources. Burials and ritual sites are rare in the upper elevation zones (Kawachi 1989). *Kua* are prominent agricultural features of the *kalu'ulu* and *'āpa'a* zones (Cordy 1995; Newman 1970). These are broad, linear piles of rocks, which also served as field boundaries, built from stones cleared from the adjacent slopes. *Kua'iwi* are oriented inland-seaward often interconnected with perpendicular, soil-retaining walls and terraces forming a rectangular grid pattern of fields. *Kua'iwi* also served to control rainfall runoff (Kirch 1985). These formal fields contrast with more informal garden areas characterized by scattered agricultural features in very rocky areas, such as younger lava flows, and much of the *kula* zone.
- The *'ama'u* (fern) zone of the Kona Field System extends from 2,500 foot to 4,000 foot elevation. The zone was associated with banana and plantain cultivation. The archaeological traits of the zone have not been well defined, but temporary habitations were probably present associated with agriculture and exploitation of forest resources (Allen 1984).

Schilt (1984) used information gathered from the Kuakini Highway Realignment Corridor survey research to propose a five-phase chronology of settlement and field system development. The chronology, which is listed in Table 3.5, focuses on the *kula* zone, but includes developments occurring in the inland zones of the Kona Field System.

[5] Cordy (1995) has suggested that the upper limit of this zone may be higher, between 600- and 700 foot elevation.

Table 3.5. Kona Field System Settlement & Land Use Chronology

Pioneer Settlement *c. A.D. 1050-1400*	Very limited, sporadic use of lowland slopes and cave shelters just above the Kailua Bay area. Probably contemporaneous with pioneer settlements along the coast. Development of one or more of the *mauka* sub-zones of the Kona Field System may have commenced in the later portion of this phase.
Garden Developments *c. AD. 1400-1600/1650*	Initial use of the *kula* sub-zone for small gardens and of the caves for temporary shelter. Erosional deposition, resulting from development of the upland sub-zones, began to bury an old ground surface and gradually created deepening soil deposits on *kula* land.
Refuge, Habitation, Intensive & Extensive Gardening *c. AD1600/1650-1779*	Extensive development of at least the *mauka* portion of the *kula* subzone, for sweet potatoes, *wauke*, and probably also gourds. This development was accompanied rarely by permanent habitation and more often by temporary and seasonal habitations among the *kula* gardens. Animal enclosures, probably for pigs, may date to this phase. The upland zones were under complete development by this time. Suitable caves were modified for refuge during times of warfare or social conflict. Caves located in the midst of garden features were intensively used for temporary shelter and work spaces.
Historic Habitation & Gardening *c. A.D. 1779-1850*	The cultivation of *kula* lands gradually decreased in extent and intensity, nevertheless remaining important to a decreasing population. Permanent habitations on the *kula* during this phase occurred primarily on the *makai* side of the Great Wall of Kuakini. In 1848, Hawaiians were claiming an undetermined portion of *kula* lands, but none of these *kula* claims were honored by the Board of Land Commissioners (Kelly 1983). Some *kula* lands were being converted to grazing beginning in the 1840s.
Historic Ranching *c. A.D. 1850-present*	Land-use shifted completely to grazing, following the awards of *kula* lands to chiefs, missionaries, and others (Kelly 1983). Isolated permanent habitations on upland slopes of the *kula* were oriented to ranching. Today ranching is not as extensive as it once was. Kailua in recent years has been developed as a tourist and urban hub for leeward Hawai'i Island (Schilt 1984:284).
Source: Haun & Henry 2002a.	

3.9.1.3 Archaeological Research

Haun & Henry (2002a) conducted an Archaeological Inventory Survey of the proposed well site (TMK 7-5-001:115) and of the adjacent parcel (TMK 7-5-001:44). The survey was approved by the State Historic Preservation Division (SHPD) in July 2002. The archaeological survey identified 29 sites with 89 features (see Figure 3.4). The sites consist of 27 single-feature sites and two complexes of features. The features include terraces, walls, mounds, enclosures, and one each of the following: platform, alignment, berm, cave, modified outcrop, modified depression, path and water tank. These features performed various functions, including agriculture, livestock control, permanent habitation, temporary habitation, burial, storage, and transportation.

one whole number on the Richter scale represents a tenfold increase in the amplitude of the seismograph recording.

As can be seen by the U.S. Geological Survey's plot of the location and size of the larger earthquakes that occurred on the Island of Hawai'i between 1962 and 1985 (Figure 3.6), the majority of the earthquakes are centered near Kīlauea, but no part of the island is completely free of them. Figure 3.7, another U.S. Geological Survey drawing, shows the generalized locations of damaging earthquakes of magnitude 6 or greater that have occurred since 1868 on the Island. Information on those events is presented in Table 3.6. All structures associated with the proposed project will be built to comply with the Uniform Building Codes for Seismic Zone 3.

Figure 3.6 Recent Earthquakes on and Near the Island of Hawai'i, 1962-1985.

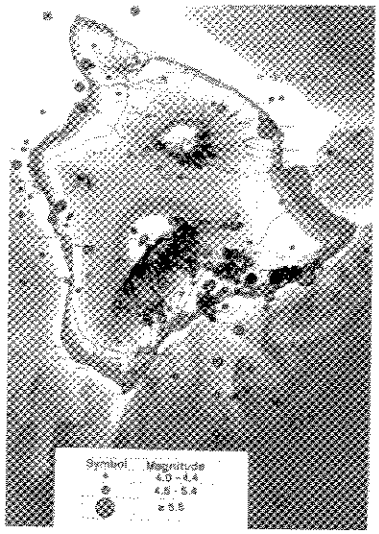
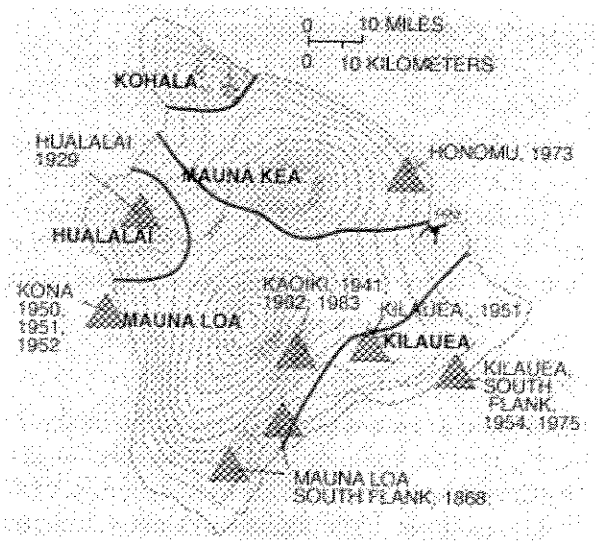


Figure 3.7 Generalized Locations of Damaging Earthquakes of Magnitude 6 or Greater Since 1868 on the Island of Hawai'i.



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

Table 3.6 Damaging Earthquakes of Magnitude 6 or Greater Since 1868 on the Island of Hawai'i.

Year	Date	Region	Magnitude	Depth (Miles)
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	Kīlauea	6.3	20
1951	Aug. 21	Kona	6.9	5
1952	May 23	Kona	6.0	5
1954	Mar. 30	Kīlauea south flank	6.5	5
1962	June 27	Ka'oiki	6.1	6
1973	Apr. 26	Honomu	6.2	25
1975	Nov. 29	Kīlauea south flank	7.2	6
1983	Nov. 16	Ka'oiki	6.6	7
1989	June 25	Kīlauea south flank	6.1	9
2006[1]	Oct. 15	Kona	6.7	24

[1] USGS Earthquake Hazards Program website: http://earthquake.usgs.gov/eqcenter/ (2006).

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

3.10.2.3 Flooding from Streams or Tsunami

As discussed above, DWS' Keōpū-Pu'uhonua property is not subject to flooding or tsunami. Neither will it increase runoff in a way that might increase hazards on other properties. Hence, there is no natural hazard risk from that source.

3.11 SCENIC AND RECREATIONAL RESOURCES

3.11.1 EXISTING CONDITIONS

The facility is located over 1,000 feet from Keopu Mauka Drive along a private access road and will not be visible to traffic along that thoroughfare. Because of the thick vegetation and tree cover surrounding the site, none of the facilities will be visible from Māmalahoa Highway. The facility is shielded from areas to the east by a large vegetated berm, and the areas north and south of the site are archaeological and forest reserves, respectively. No unique or outstanding viewpoints exist at the site.

3.11.2 PROBABLE IMPACTS & MITIGATION MEASURES

As noted above, trees and topographic features will screen most of the facilities to be constructed from the highway below and the residences in Royal Kamehameha Gardens. No established scenic viewpoints will be affected by the project. For these reasons, the project will not have any substantial impacts on scenic and aesthetic resources. The project will not affect recreational activities in the area.

3.12 TRANSPORTATION

3.12.1 EXISTING CONDITIONS

Access to the project site is via the Māmalahoa Highway and Keopu Mauka Drive. Māmalahoa Highway is the main road encircling the Island of Hawai'i; in the project area, it is a two-lane highway. Keopu Mauka Drive is a relatively new road serving the Royal Kamehameha Gardens subdivision, which is presently under construction. Currently, only a handful of residences exist along Keopu Mauka Drive and its offshoot roadways. Consequently, there is very little residential traffic; most traffic consists of construction vehicles traveling to and from the subdivision. The existing access roadway to the well site was created specifically for DWS use and will experience little to no traffic other than occasional DWS employees and maintenance crews.

3.12.2 PROBABLE IMPACTS & MITIGATION MEASURES

Adequate space exists alongside the roadway and on the existing access driveway to allow construction vehicles to park without interfering with the active traffic lanes. The only possible exception to this is brief intervals when large construction equipment and material for the tanks and other structures are moved onto and off the site. The well will not require manned operation, but only occasional monitoring and maintenance. Service vehicles will park in designated on-site areas and will not interfere with traffic. For these reasons, the construction and operation of the facility will not lead to substantial impacts on area roadways.

3.13 LAND USE & ECONOMIC AND CULTURAL ENVIRONMENT

3.13.1 EXISTING CONDITIONS

The parcel on which the proposed facilities would be developed was dedicated to DWS in 2000; it is not presently used for any productive purpose. The parcel and surrounding area are within the State Agricultural Land Use District, as is approximately 43 percent of all the land in the North Kona District; nearly all the remainder (over half the total) is in the Conservation District (DWS *20-Year Water Plan* 2006).

The parcels neighboring the proposed well and reservoir site to the north and east are part of the future Royal Kamehameha Garden subdivision. A portion of the land immediately to the north has been set aside as an archaeological preserve; residential development is ongoing to the east. A private residence exists approximately 1,000 feet to the west of the property line, and the land to the south is owned by the State of Hawai'i.

The area on and around the site has been disturbed by commercial agriculture and historic/modern ranching activity. An abandoned money tree nursery (*Dracaena* sp.) is located near the intersection of Keopu Mauka drive and the existing access road to the well site. Numerous recently created piles of soil and stone exist throughout the project area; these were probably made by bulldozers.

The well and reservoir site is located in Census Tract 215.02. The 2000 population of this census tract was 3,688 persons. The median household income for that year was $46,100, slightly lower than the statewide median household income of $49,820. Unemployment was low in the civilian labor force at only 1.9% compared to a state average of 6.3%.

Tourism is a major component of the economy in North Kona. Currently, there are about 4,100 visitor units in the area; these account for over 45 per cent of total hotel rooms on the island. The visitor industry in North Kona is expected to continue growing at a moderate rate (Hawai'i County General Plan 2005).

Most of the Big Island's coffee production is in the North and South Kona Districts, which have been producing coffee since the 1800s. The number of acres on which coffee is being cultivated has

declined slightly during the first half of the decade (from about 6,400 in the 1999-2000 season to about 5,800 during the 2004-2005 season), but the dollar value has remained the same (about $20 million per year). Besides coffee, agricultural enterprises include cattle ranching and the growing of fruits, macadamia nuts, and vegetables, particularly tomatoes (Hawai'i County General Plan 2005).

Other industries in North Kona include timber extraction, fishing (particularly big game recreational fishing), quarrying operations, and industrial activities. The latter include a wide range of manufacturing, service, wholesale and retail activities that are concentrated in the Old Kailua Industrial Area and the Kaloko Industrial Area.

3.13.2 PROBABLE IMPACTS

An exploratory well has existed at the site since 1992, and the property was dedicated to DWS in 2000. Consequently, the proposed facilities do not constitute a significant change in the existing use and ownership of the site. The areas surrounding the site were under agricultural use until relatively recent times and are now slated for residential development as part of the Royal Kamehameha Gardens subdivision.

The proposed well and reservoir will increase DWS' total source and storage capacity in the North Kona District. This will allow the Department to meet the additional demand created by population growth that is occurring in accordance with approved County plans. 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.

4.0 RELATIONSHIPS TO RELEVANT PLANS, POLICIES & CONTROLS

4.1 COUNTY AND STATE REGULATIONS

4.1.1 COUNTY OF HAWAI'I GENERAL PLAN

4.1.1.1 Applicable Goals, Policies, and Recommended Actions

The Department of Water Supply operates and maintains over twenty separate water systems in the County of Hawai'i, including the North Kona System. The 2005 *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 *2005 General Plan* identifies the following County policies with regards to public water systems that are relevant to the proposed project:

(a) Water system improvements shall correlate with the County's desired land use development pattern.

(b) All water systems shall be designed and built to Department of Water Supply standards.

(c) Improve and replace inadequate systems.

(d) Water sources shall be adequately protected to prevent depletion and contamination from natural and man-made occurrences or events.

(e) Water system improvements should be first installed 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.

(f) A coordinated effort by County, State and private interests shall be developed to identify sources of additional water supply and be implemented to ensure the development of sufficient quantities of water for existing and future needs of high growth areas and agricultural production.

(g) The fire prevention systems shall be coordinated with water distribution systems in order to ensure water supplies for fire protection purposes.

(j) Cooperate with appropriate State and Federal agencies and the private sector to develop, improve and expand agricultural water systems in appropriate areas on the island.

(k) Promote the use of ground water sources to meet State Department of Health water quality standards.

(m) Seek State and Federal funds to assist in financing projects to bring the County into compliance with the Safe Drinking Water Act.

The *2005 Hawai'i County General Plan* identifies a number of actions to implement these policies in the North Kona District. Specifically, it directs DWS to:

- Continue to pursue groundwater source investigation, exploration and development in areas as needed to provide for anticipated growth.
- Construct reservoirs as needed.
- Explore and develop a well in Wai'aha.

4.1.1.2 Conformance With the 2005 *Hawai'i County General Plan*

DWS constructed the existing exploratory well at the Keōpū-Pu'uhonua site in accordance with the *General Plan* policy for North Kona that encourages groundwater source investigation for this fast-growing area of the island. The production well and reservoir that is part of the proposed action is responsive to the same directive.

The proposed project meets all applicable design standards. It will allow DWS to continue to meet the needs of the people of North Kona in a cost-effective manner while complying with the State Department of Health requirements for reliability and quality of potable water sources. The well will allow DWS to reduce withdrawals from existing well sources that might otherwise be overused. The proposed well and ancillary facilities are located on a site that is already part of the DWS system; they fit into their surroundings; and they will be largely hidden from public view. The facilities are allowable under existing State and County zoning and development regulations. Operation of the well would not produce substantial air or noise emissions that would disturb existing uses on adjacent properties.

4.1.2 COUNTY OF HAWAI'I ZONING ORDINANCE

The County zoning in the project area is Agriculture (Ag-5a), as is the majority of the zoned land in the North Kona District. The Hawai'i County Code (2000 Edition), Section 25-4-11(b) states:

> *Any substation used by a public utility for the purpose of furnishing telephone, gas, electricity, water, radio, or television shall be a permitted use in any district provided that the use is not hazardous or dangerous to the surrounding area and the director has issued plan approval for such use.*

The proposed well and reservoir would be a public utility that would furnish water for the North Kona community and would thus qualify as a permitted use under this regulation. DWS will submit an *Application for Plan Approval* to the Hawai'i County Department of Planning to obtain the necessary director's approval for the project once the Chapter 343 process is completed.

4.1.3 STATE OF HAWAI'I LAND USE

As discussed in Section 3.13, the site is in the State Agriculture District. HRS Chapter 205 §205-4.5 (7) lists public utility facilities such as those that are proposed as permissible uses within the State Agricultural District.

4.1.4 STATE DRINKING WATER STATE REVOLVING FUND (DWSRF)

This project may be 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 intent of the DWSRF is to help water system operators construct the infrastructure needed to maintain or improve compliance with the SDWA. This document includes all of the environmental information required for compliance with the DWSRF program.

4.2 CROSS-CUTTING FEDERAL AUTHORITIES

4.2.1 ARCHEOLOGICAL AND HISTORIC PRESERVATION ACTS

The results of investigations conducted during preparation of this document indicate that the proposed Keōpū-Pu'uhonua Well and Reservoir Project is consistent with the Archeological and Historic Preservation Act (16 U.S.C. § 469a-1) and the National Historic Preservation Act (16 U.S.C. § 470(f)). It is also consistent with all applicable State historic preservation requirements, including

Hawai'i Revised Statutes Chapter 6E - Historic Preservation and Hawaii Administrative Rules §13-198 and §13-300 (see Appendix A).

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

As discussed in Section 3.5, air quality at the Keōpū-Pu'uhonua 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.

Grading and excavation will disturb a little more than an acre of land during construction of the project. This and the relatively wet climate mean that fugitive dust will not be a problem during construction so long as the contractor follows the dust control measures that the County will require in its construction documents.

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. The electrical power consumed in the operation of the well and reservoir will require additional power generation (and, therefore, fuel consumption and gaseous emissions) by the Hawaii Electric Light Company. Some of this will probably be offset by decreased electrical use at other DWS facilities. The increase represents such a small portion of total power use that its effect not be significant in and of itself.

4.2.3 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.

4.2.4 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. It also includes 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 Keōpū-Pu'uhonua Well and Reservoir project is located approximately 2.5 miles from the coast. It is not located within the County of Hawai'i's Special Management Area and 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.

4.2.5 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, which outlines procedures for federal agencies to follow when taking actions that may jeopardize listed species, allows exceptions and exemptions.

Sections 3.6 and 3.7 discuss 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.

4.2.6 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 3.13, the Census Tract in which the proposed well is located exhibits a median household income that is only slightly less than the statewide average, and an unemployment rate that is significantly lower. The project area is not considered a low-income area. The purpose of the proposed well is to continue to provide residents of North Kona 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 Keōpū-Pu'uhonua Well and Reservoir complies with this Executive Order.

4.2.7 FLOODPLAIN MANAGEMENT (42 U.S.C. § 4321)

Based on the Flood Insurance Rate Map for the area, the site proposed for the Keōpū-Pu'uhonua Well and Reservoir 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.

4.2.8 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 impacts to any water body and or to fish or wildlife resources.

4.2.9 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.
- 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 3.13, the Keōpū-Pu'uhonua Well and Reservoir site is within a designated agricultural area. The surrounding lands and portions of the site were previously used for agricultural activities. However, neither the proposed well site nor the immediately adjacent properties are recognized as prime or unique agricultural lands on the 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 protected by the provisions of the FPPA.

4.2.10 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, the U.S. Environmental Protection Agency (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 in Section 1.2, the proposed Keōpū-Pu'uhonua Well and Reservoir project is intended to permit the North Kona Water System to continue to comply with the standards mandated pursuant to the Act by providing a source of high-quality freshwater for the system. Before connecting the new Keōpū-Pu'uhonua 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 Keōpū-Pu'uhonua Well project is located.

4.2.11 PROTECTION OF WETLANDS (42 U.S.C. § 4321)

As noted in Section 3.3, 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.

4.2.12 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.*

As discussed in Section 3.3.1, no perennial streams or major fresh water bodies exist near the proposed project site. As such, development of the Keōpū-Pu'uhonua well and reservoir 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.

5.0 DETERMINATION

5.1 SIGNIFICANCE CRITERIA

Hawai'i Administrative Rules (HAR) §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. HAR §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. HAR §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. *Detrimentally 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.*

5.2 FINDINGS

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

5.2.1 IRREVOCABLE LOSS OR DESTRUCTION OF VALUABLE RESOURCE

The proposed project would be constructed on previously disturbed land at an existing Department of Water Supply facility. It does not involve the loss of any significant cultural or natural resources.

5.2.2 CURTAILS BENEFICIAL USES

Construction and operation will not curtail beneficial uses of the site. The water that the DWS proposes to withdraw is a small fraction of the developable yield of the aquifer, 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 Keōpū-Pu'uhonua site for North Kona customers of DWS.

5.2.3 CONFLICTS WITH LONG-TERM ENVIRONMENTAL POLICIES OR GOALS

The proposed project is consistent with the *County of Hawai'i's General Plan* 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 (see Section 4.1).

5.2.4 SUBSTANTIALLY AFFECTS ECONOMIC OR SOCIAL WELFARE

The proposed well is intended to provide a continuing supply of water to existing residents of North Kona and to accommodate the likely growth provided for in the *County of Hawai'i General Plan*. It will not have a substantial adverse effect on economic or social welfare; it will benefit the region's residents and businesses by allowing DWS to assure its customers an adequate supply of high-quality potable water.

5.2.5 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. Construction noise has the potential to exceed noise standards at the property line, but the potential adverse effects of this will be mitigated by the noise abatement and attenuation measures that the County will require of the construction contractor.

5.2.6 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 will only support development already envisioned by the *County of Hawai'i General Plan*.

5.2.7 SUBSTANTIALLY DEGRADE ENVIRONMENTAL QUALITY

As discussed in detail in Chapter 3, the proposed project will not have substantial long-term environmental effects.

5.2.8 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.

5.2.9 AFFECTS ON RARE, THREATENED, OR ENDANGERED SPECIES

The proposed project will be constructed on an already developed site. It will not utilize a resource needed for the protection of rare, threatened, or endangered species.

5.2.10 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. The project does have the potential to increase noise levels during the construction phase. Adequate mitigation measures will be taken to limit these to reasonable levels.

5.2.11 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 not any more subject to lava flows than any

other prospective well site in the region. The structures built as part of the well and reservoir development will be constructed consistent with the Hawai'i Uniform Building Code for Earthquake Zone 3.

5.2.12 AFFECTS SCENIC VISTAS AND VIEWPLANES

The proposed well and reservoir site is camouflaged from adjacent areas by vegetation and a tall forest canopy. The proposed new facilities are not within a designated scenic area. They will not significantly alter the visual character of the site (which has been previously disturbed) or change views across it.

5.2.13 REQUIRES SUBSTANTIAL ENERGY CONSUMPTION

Operation of the new well will require a small amount of electrical energy. The increase would be partially offset by a decrease in the electrical energy that is now used to pump water from existing sources.

5.3 DETERMINATION

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

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7.0 PARTIES CONSULTED

7.1 DRAFT EA DISTRIBUTION

Copies of the *Draft EA* were mailed to the recipients listed in Table 7.2 below. Notice of the *Draft EA* appeared in the February 8, 2007 *Environmental Notice* published by the State Office of Environmental Quality Control.

Table 7.1 Draft EA Distribution List

Federal Agencies	
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
District Chief, Geological Survey, Department of the Interior	
State Agencies	
Office of Environmental Quality Control (4 copies)	Department of Business and Economic Development & Tourism, Planning Office
Department of Hawaiian Home Lands	Department of Health, Clean Water Branch
Office of Hawaiian Affairs	Department of Health, Environmental Planning Office
Department of Accounting and General Services	Department of Health, Safe Drinking Water Branch
Department of Agriculture	Department of Land and Natural Resources (5 copies)
Commission on Water Resource Management	DLNR Historic Preservation Division
Department of Transportation	Environmental Center, University of Hawai'i
	Water Resources Center, University of Hawai'i
County of Hawai'i	
Planning Department	Fire Department
Department of Public Works	Police Department
Department of Parks and Recreation	Department of Environmental Management, Solid Waste Division
Utilities	
Hawaiian Electric Light Company	Hawaiian Telcom
Libraries and Depositories	
Hawai'i State Library Hawai'i Documents Center	Kailua-Kona Regional Library
University of Hawai'i, Hilo Campus Library	Holualoa Public Library

Copies of the DEA were also sent to the landowners that abut the proposed well site and the existing access road nearest to the proposed electrical extension. Table 7.3 lists the names and Tax Map Key numbers of these neighbors.

Table 7.2 Neighboring Landowners Sent Copies of the Draft Environmental Assessment

Landowner Name	*Property Tax Map Key(s)*
Sunra Kona Coffee LLC	7-5-001:044
Komo Brothers Partners	7-5-001:001
State of Hawai'i DLNR	7-5-013:022
EES Johnson Trust	7-5-001:052
Classic Pacific Investments LLC	7-5-001:045
Suzanne Farrow/Ian O'Brien	7-5-001:118

Source: Planning Solutions, Inc. and County of Hawai'i Dept. of Water Supply, Engineering Division

7.2 COMMENTS & RESPONSES ON THE DRAFT EA

The comment period for the Draft EA ended on March 12, 2007. Table 7.3 below lists the parties that submitted written comments on the project. Their comments and DWS's responses to them are reproduced at the end of this section.

Table 7.3 Written Comments on the Draft EA

No.	*Name & Title of Commenter*	*Organization*
1	Christopher Yuen, Director	Hawai'i County Planning Department
2	Lawrence K. Mahuna, Chief	Hawai'i County Police Department
3	Barbara Bell, Director	Hawai'i County Dept of Environmental Management
4	Genevieve Salmonson, Director	State Office of Environmental Quality Control
5	Ernest Lau, Public Works Administrator	State Department of Accounting & General Services
6	c/o Russell Y. Tsuji, Administrator	Engineering Division, State Dept of Land & Natural Resources
7	Barry Fukunaga, Interim Director	State Department of Transportation
8	Kelvin H. Sunada, Manager	Environmental Planning Office, State Dept of Health
9	Russell Y. Tsuji, Administrator	Land Division, State Dept of Land & Natural Resources
10	Clyde W. Nāmu'o, Administrator	State Office of Hawaiian Affairs
11	Alec Wong, P.E., Chief	Clean Water Branch, State Department of Health
12	George P. Young, Chief	Regulatory Branch, Department of the Army

Source: Compiled by Planning Solutions, Inc. (2007).

Harry Kim
Mayor

#1

Christopher J. Yuen
Director
Brad Kurokawa, ASLA
LEED® AP
Deputy Director

County of Hawaii
PLANNING DEPARTMENT
101 Pauahi Street, Suite 3 • Hilo, Hawaii 96720-3043
(808) 961-8288 • FAX (808) 961-8742

February 20, 2007

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

Dear Mr. White:

SUBJECT: Keōpū-Pu'uhonua Production Well and Reservoir
Draft Environmental Assessment/Anticipated
Findings of No Significant Impact
TMK: 7-5-1:115 and 44, North Kona, Island of Hawai'i

Thank you for the opportunity to review the Draft Environmental Assessment/ Anticipated Findings of No Significant Impact for the proposed Keōpū-Pu'uhonua Production Well and Reservoir.

The relevant land use plans and policies have been adequately addressed in the Draft EA document. However, on Page 4-4 relating to 4.2.4 Coastal Zone Management, please include a paragraph that the project area is not located within the Special Management Area of the County of Hawai'i.

Should you have any questions, please feel free to contact Alice Kawaha of this department at 961-8288, Ext. 203.

Sincerely,

CHRISTOPHER J. YUEN
Planning Director

AK:cd
p:\wpwin60\alicewin\LWhite DEAKeopu-PuuhonuaWell

xc: Mr. Milton D. Pavao, Manager, Department of Water Supply

Hawai'i County is an Equal Opportunity Provider and Employer

PLANNING SOLUTIONS

February 22, 2007
2006-0013-001

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

Subject: Keōpū-Pu'uhonua Production Well & Reservoir
Draft Environmental Assessment, North Kona, Hawai'i

Dear Mr. Yuen:

Thank you for your February 20, 2007 letter commenting on the Hawai'i County Department of Water Supply's *Draft Environmental Assessment (DEA): Keōpū-Pu'uhonua Production Well and Reservoir Project.* We appreciate the time you and your staff spent reviewing the document and preparing written comments.

Your comments are reproduced below for your convenience, followed by our response.

Comment 1:

The relevant land use plans and policies have been adequately addressed in the Draft EA document. However, on Page 4-4 relating to 4.2.4 Coastal Zone Management, please include a paragraph that the project area is not located within the Special Management Area of the County of Hawai'i.

Response: Thank you very much for confirming that the *Draft EA* adequately addresses the relevant land use plans and policies. In response to your suggestion, the second paragraph on Page 4-4 has been modified to read as follows in the *Final EA*:

The proposed Keōpū-Pu'uhonua Well and Reservoir project is located approximately 2.5 miles from the coast. It is not located within the County of Hawai'i's Special Management Area and does not involve the placement, erection, or removal of materials near the coastline.

If you have any further questions concerning the project, please call me at (808) 550-4483.

Sincerely,

Perry J. White

cc: Mr. Keith Okamoto, Department of Water Supply
Office of Environmental Quality Control
Mr. Greg Fukumitsu, TNWRE

Ward Plaza, Suite 330 • 210 Ward Avenue • Honolulu, Hawaii 96814-4012
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Harry Kim
Mayor

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Lawrence K. Mahuna
Police Chief

Harry S. Kubojiri
Deputy Police Chief

County of Hawaii

POLICE DEPARTMENT

349 Kapiolani Street • Hilo, Hawaii 96720-3998
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February 22, 2007

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

Dear Mr. White:

SUBJECT: Keopu-Puuhonua Production Well and Reservoir
Draft Environmental Assessment/Anticipated Finding of No Significant Impact

Staff has reviewed the above-referenced draft environmental assessment and has no comments or objections to offer at this time.

Should you have any questions, please feel free to contact Captain Paul Kealoha, Commander of the Kona District, at 326-4646, ext. 249.

Sincerely,

LAWRENCE K. MAHUNA
POLICE CHIEF

DEREK D. PACHECO
ASSISTANT CHIEF
AREA II OPERATIONS

PK:dmv

"Hawai'i County is an Equal Opportunity Provider and Employer"

PLANNING SOLUTIONS

February 27, 2007
2006-0013-001

Mr. Lawrence K. Mahuna, Chief
Police Department
County of Hawai'i
349 Kapiolani Street
Hilo, HI 96720-3998

Subject: Keōpū-Pu'uhonua Production Well & Reservoir
Draft Environmental Assessment, North Kona, Hawai'i

Dear Chief Mahuna:

Thank you for your February 22, 2007 letter commenting on the Hawai'i County Department of Water Supply's *Draft Environmental Assessment (DEA): Keōpū-Pu'uhonua Production Well and Reservoir Project.* We appreciate the time you and your staff spent reviewing the document and preparing your letter.

We understand that your Department has no comments or objections to offer on the project at this time. If in the future you would like additional information concerning the project, please call me at (808) 550-4483.

Sincerely,

Perry J. White

cc: Mr. Keith Okamoto, Department of Water Supply
Office of Environmental Quality Control
Mr. Greg Fukumitsu, TNWRE

Ward Plaza, Suite 330 • 210 Ward Avenue • Honolulu, Hawaii 96814-4012
Phone: 808 550-4483 • Fax: 808 550-4549 • www.psi-hi.com

copy: DWS

#3

Harry Kim
Mayor

Barbara Bell
Director

Nelson Ho
Deputy Director

County of Hawaii
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

25 Aupuni Street, Room 210 • Hilo, Hawai'i 96720-4252
(808) 961-8083 • Fax (808) 961-8086
email: cohdem@co.hawaii.hi.us

February 28, 2007

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

Re: Keopu-Pu'uhonua Production Well and Reservoir
Draft EA/Anticipated FONSI

Dear Mr. White,

Thank you for allowing us the opportunity to review the subject Draft EA. We have no comments to offer.

Barbara Bell
DIRECTOR

Hawai'i County is an equal opportunity provider and employer.

PLANNING SOLUTIONS

March 9, 2007
2006-0013-001

Ms. Barbara Bell, Director
Department of Environmental Management
County of Hawai'i
25 Aupuni Street
Hilo, HI 96720-4252

Subject: Keōpū-Pu'uhonua Production Well & Reservoir
Draft Environmental Assessment, North Kona, Hawai'i

Dear Ms. Bell:

Thank you for your February 28, 2007 letter commenting on the Hawai'i County Department of Water Supply's *Draft Environmental Assessment (DEA): Keōpū-Pu'uhonua Production Well and Reservoir Project.* We appreciate the time you and your staff spent reviewing the document and providing written comments.

We understand that your Department has no comments or objections to offer on the project at this time. If in the future you would like additional information concerning the project, please call me at (808) 550-4483.

Sincerely,

Perry J. White

cc: Mr. Keith Okamoto, Department of Water Supply
Office of Environmental Quality Control
Mr. Greg Fukumitsu, TNWRE

Ward Plaza, Suite 330 • 210 Ward Avenue • Honolulu, Hawaii 96814-4012
Phone: 808 550-4483 • Fax: 808 550-4549 • www.psi-hi.com

LINDA LINGLE
GOVERNOR OF HAWAI'I

#4

GENEVIEVE SALMONSON
DIRECTOR

STATE OF HAWAI'I
DEPARTMENT OF HEALTH
OFFICE OF ENVIRONMENTAL QUALITY CONTROL

235 SOUTH BERETANIA STREET
LEIOPAPA A KAMEHAMEHA, SUITE 702
HONOLULU, HAWAI'I 96813
Telephone (808) 586-4185
Facsimile (808) 586-4186
Electronic Mail: OEQC@doh.hawaii.gov

March 02, 2007

Mr. Milton D. Pavao, P.E., Manager
Department of Water Supply
County of Hawai'i
345 Kekuanaoa Street, Suite 20
Hilo, Hawai'i 96720

Mr. Perry White
Planning Solutions, Inc.
210 Ward Avenue, Suite 330
Honolulu, Hawai'i 96814

Dear Messrs. Pavao and White:

The Office of Environmental Quality Control has reviewed the draft environmental assessment for the proposed Keopu Puuhonua Production Well and Reservoir, Tax Map Key Number (3rd) 7-5-001:115 and 7-5-001:044, in the judicial district of North Kona, submitted to the Office of Environmental Quality Control. The environmental assessment is well-written and the Office of Environmental Quality Control has no comments to offer at this time.

Thank you for the opportunity to comment. If there are any questions, please call Mr. Leslie Segundo, Environmental Health Specialist, at (808) 586-4185.

Sincerely,

Genevieve Salmonson

GENEVIEVE SALMONSON
Director of Environmental Quality Control

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

March 9, 2007
2006-0013-001

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

Subject: Keōpū-Pu'uhonua Production Well & Reservoir
Draft Environmental Assessment, North Kona, Hawai'i

Dear Ms. Salmonson;

Thank you for your March 2, 2007 letter commenting on the Hawai'i County Department of Water Supply's *Draft Environmental Assessment (DEA): Keōpū-Pu'uhonua Production Well and Reservoir Project*. We appreciate the time you and your staff spent reviewing the document and providing written comments.

We understand that your Office has no comments or objections to offer on the project at this time. If in the future you would like additional information concerning the project, please call me at (808) 550-4483.

Sincerely,

Perry J. White

cc: Mr. Keith Okamoto, Department of Water Supply
Office of Environmental Quality Control
Mr. Greg Fukumitsu, TNWRE

Ward Plaza, Suite 330 • 210 Ward Avenue • Honolulu, Hawaii 96814-4012
Phone: 808 550-4483 • Fax: 808 550-4549 • www.psi-hi.com

LINDA LINGLE
GOVERNOR

RUSS K. SAITO
COMPTROLLER

#5

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

(P)1049.7

MAR - 6 2007

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

Dear Mr. White:

Subject: Keopu - Pu'uhonua Production Well & Reservoir
Draft Environmental Assessment 7-5-001:115 & 7-5-001:044,
North Kona District, Island of Hawaii

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

If there are any questions regarding the above, please have your staff call Mr. David DePonte of the Planning Branch at 586-0492.

Sincerely,

ERNEST Y. W. LAU
Public Works Administrator

DD:vca
c: Ms. Genevieve Salmonson, OEQC
Mr. Milton Pavao, Department of Water Supply
Mr. Glenn Okada, DAGS Hawaii District Office

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

March 13, 2007
2006-0013-001

Mr. Ernest Y. W. Lau, Public Works Administrator
Department of Accounting and General Services
State of Hawai'i
P.O. Box 119
Honolulu, HI 96810

Subject: Keōpū-Pu'uhonua Production Well & Reservoir
Draft Environmental Assessment, North Kona, Hawai'i

Dear Mr. Lau:

Thank you for your March 2, 2007 letter commenting on the Hawai'i County Department of Water Supply's *Draft Environmental Assessment (DEA): Keōpū-Pu'uhonua Production Well and Reservoir Project.* We appreciate the time you and your staff spent reviewing the document and providing written comments.

We understand that your Department has no comments or objections to offer on the project at this time. If in the future you would like additional information concerning the project, please call me at (808) 550-4483.

Sincerely,

Perry J. White

cc: Mr. Keith Okamoto, Department of Water Supply
Office of Environmental Quality Control
Mr. Greg Fukumitsu, TNWRE

Ward Plaza, Suite 330 • 210 Ward Avenue • Honolulu, Hawaii 96814-4012
Phone: 808 550-4483 • Fax: 808 550-4549 • www.psi-hi.com

LINDA LINGLE
GOVERNOR OF HAWAII

#6

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

ROBERT K. MASUDA
DEPUTY DIRECTOR

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

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

March 2, 2007

Planning Solutions
Ward Plaza Suite 330
210 Ward Avenue
Honolulu, Hawaii 96814

Attention: Mr. Perry J. White

Gentlemen:

Subject: Draft Environmental Assessment for Keopu-Pu'uhonua production Well and Reservoir, North Kona, Hawaii, Tax Map Key: (3) 7-5-1:115 and 7-5-1:44

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

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

Sincerely,

Russell Y. Tsuji
Administrator

LINDA LINGLE
GOVERNOR OF HAWAII

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

ROBERT K. MASUDA
DEPUTY DIRECTOR

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

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

February 15, 2007

RECEIVED
LAND DIVISION
2007 FEB 23 A 9:35

MEMORANDUM

TO: **DLNR Agencies:**
__Div. of Aquatic Resources
__Div. of Boating & Ocean Recreation
x Engineering Division
__Div. of Forestry & Wildlife
__Div. of State Parks
x Div. of Water Resource Management
__Office of Conservation & Coastal Lands
x Land Division – Hawaii District

FROM: Russell Y. Tsuji
SUBJECT: Draft Environmental Assessment for Keopu-Pu'uhonua Production Well and Reservoir
LOCATION: North Kona, Hawaii, TMK: (3) 7-5-1:115 and 7-5-1:44
APPLICANT: Planning Solutions, Inc. on behalf of Department of Water Supply

Transmitted for your review and comment on the above referenced document. We would appreciate your comments on this document. Please submit any comments by February 27, 2007.

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

Attachments

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

Signed:
Date: 2/21/07

DEPARTMENT OF LAND AND NATURAL RESOURCES
ENGINEERING DIVISION

LD/RYT
REF: DEAKEOPUPUUHONUWELL
Hawaii.349

COMMENTS

( ) We confirm that the project site, according to the Flood Insurance Rate Map (FIRM), is located in Flood Zone ____.

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

( ) Please note that the correct Flood Zone Designation for the project site according to the Flood Insurance Rate Map (FIRM) is ____.

( ) Please note that the project must comply with the rules and regulations of the National Flood Insurance Program (NFIP) presented in Title 44 of the Code of Federal Regulations (44CFR), whenever development within a Special Flood Hazard Area is undertaken. If there are any questions, please contact the State NFIP Coordinator, Ms. Carol Tyau-Beam, of the Department of Land and Natural Resources, Engineering Division at (808) 587-0267.

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

( ) Mr. Robert Sumimoto at (808) 523-4254 or Mr. Mario Siu Li at (808) 523-4247 of the City and County of Honolulu, Department of Planning and Permitting.
( ) Mr. Kelly Gomes at (808) 961-8327 (Hilo) or Mr. Kiran Emler at (808) 327-3530 (Kona) of the County of Hawaii, Department of Public Works.
( ) Mr. Francis Cerizo at (808) 270-7771 of the County of Maui, Department of Planning.
( ) Mr. Mario Antonio at (808) 241-6620 of the County of Kauai, Department of Public Works.

( ) The applicant should include project water demands and infrastructure required to meet water demands. Please note that the implementation of any State-sponsored projects requiring water service from the Honolulu Board of Water Supply system must first obtain water allocation credits from the Engineering Division before it can receive a building permit and/or water meter.

( ) The applicant should provide the water demands and calculations to the Engineering Division so it can be included in the State Water Projects Plan Update.

( ) Additional Comments:

( ) Other: .....

Should you have any questions, please call Ms. Alyson Yim of the Planning Branch at 587-0259.

Signed: _____
ERIC T. HIRANO, CHIEF ENGINEER

Date: 2/21/07

PLANNING SOLUTIONS

March 13, 2007
2006-0013-001

Mr. Russell Y. Tsuji, Administrator
Department of Land and Natural Resources
Land Division
State of Hawai'i
P.O. Box 621
Honolulu, HI 96809

Subject: Keōpū-Pu'uhonua Production Well & Reservoir
Draft Environmental Assessment, North Kona, Hawai'i

Dear Mr. Tsuji:

Thank you for your March 2, 2007 letter commenting on the Hawai'i County Department of Water Supply's *Draft Environmental Assessment (DEA): Keōpū-Pu'uhonua Production Well and Reservoir Project.* We appreciate the time you and other Department of Land and Natural Resources staff spent reviewing the document and providing written comments.

A response to the Engineering Division's comment is provided below. The comment is reproduced for your convenience in italics before the response.

Comment 1 (Engineering Division):

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

Response:

Thank you for noting that the project site is within Flood Zone X (i.e., an area that has been determined to be outside the 100- and 500-year floodplains) as shown on the Flood Insurance Rate Map (FIRM) for the area. We will add this information to Section 3.1.1.1 in the Final EA.

If you have any further questions or comments, please call me at (808) 550-4483.

Sincerely,

Perry J. White

cc: Mr. Keith Okamoto, Department of Water Supply
Office of Environmental Quality Control
Mr. Greg Fukumitsu, TNWRE

Ward Plaza, Suite 330 • 210 Ward Avenue • Honolulu, Hawaii 96814-4012
Phone: 808 550-4483 • Fax: 808 550-4549 • www.psi-hi.com

LINDA LINGLE
GOVERNOR

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

#7

BARRY FUKUNAGA
INTERIM DIRECTOR

Deputy Directors
FRANCIS PAUL KEENO
BRENNON T. MORIOKA
BRIAN H. SEKIGUCHI

IN REPLY REFER TO:

STP 8.2419

March 5, 2007

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

Dear Mr. White:

Subject: Keopu-Puuhonua Production Well and Reservoir
Draft Environmental Assessment (Draft EA)

Thank you for your transmittal requesting our review of the subject project being planned by the County of Hawaii Department of Water Supply.

The proposed road will access Mamalahoa Highway on the section of highway under Hawaii County's jurisdiction. As described in the Draft EA, we concur the proposed production well and reservoir project will not have a significant impact on our State transportation facilities in the area.

We appreciate the opportunity to provide our comments.

Very truly yours,

BARRY FUKUNAGA
Interim Director of Transportation

PLANNING SOLUTIONS

March 13, 2007
2006-0013-001

Mr. Barry Fukunaga, Interim Director of Transportation
Department of Transportation
State of Hawai'i
869 Punchbowl Street
Honolulu, HI 96813-5097

Subject: Keōpū-Pu'uhonua Production Well & Reservoir
Draft Environmental Assessment, North Kona, Hawai'i

Dear Mr. Fukunaga:

Thank you for your March 2, 2007 letter commenting on the Hawai'i County Department of Water Supply's *Draft Environmental Assessment (DEA): Keōpū-Pu'uhonua Production Well and Reservoir Project*. We appreciate the time you and your staff spent reviewing the document and providing written comments.

We understand that your Department has no objections to offer on the project at this time. If in the future you would like additional information concerning the project or would like to discuss it further, please call me at (808) 550-4483.

Sincerely,

Perry J. White

cc: Mr. Keith Okamoto, Department of Water Supply
Office of Environmental Quality Control
Mr. Greg Fukumitsu, TNWRE

Ward Plaza, Suite 330 • 210 Ward Avenue • Honolulu, Hawaii 96814-4012
Phone: 808 550-4483 • Fax: 808 550-4549 • www.psi-hi.com

LINDA LINGLE
GOVERNOR OF HAWAII

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

#8

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

In reply, please refer to:
EPO-7-031

March 5, 2007

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

Dear Mr. White:

SUBJECT: Draft Environmental Assessment for Keopu-Puuhonua Production Well and Reservoir, North Kona, Island of Hawaii, Hawaii
TMK: (3) 7-5-001: 115

Thank you for allowing us to review and comment on the subject documents. The documents were routed to the various branches of the Environmental Health Administration. We have the following Clean Water Branch comments.

Clean Water Branch

The Department of Health (DOH), Clean Water Branch (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/indiv-index.html.

   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, 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]

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 (808) 586-4309.

We strongly recommend that you review all of the Standard Comments on our website: www.state.hi.us/health/environmental/env-planning/landuse/landuse.html. Any comments specifically applicable to this application should be adhered to.

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

Sincerely,

KELVIN H. SUNADA, MANAGER
Environmental Planning Office

c: EPO
CWB
EH-Hawaii

PLANNING SOLUTIONS

March 23, 2007
2006-0013-001

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

Subject: Keōpū-Pu'uhonua Production Well & Reservoir
Draft Environmental Assessment, North Kona, Hawai'i

Dear Mr. Sunada:

Thank you for your March 2, 2007 letter commenting on the Hawai'i County Department of Water Supply's *Draft Environmental Assessment* (*DEA*): *Keōpū-Pu'uhonua Production Well and Reservoir Project.* We appreciate the time you and your staff spent reviewing the document and providing written comments.

We understand the requirement for an NPDES construction permit, and this is noted in section 3.3.2.1 of the *DEA*. We do not anticipate any of the other discharges mentioned in your letter. Nonetheless, the County of Hawai'i Department of Water Supply will provide a copy of your letter to the construction contractor and make it responsible for obtaining any additional permits that are needed.

We have provided copies of the *DEA* to the U.S. Army Corps of Engineers and to the Historic Preservation Division of the State of Hawai'i Department of Land and Natural Resources. However, we do not expect that these agencies will impose any additional approval requirements or restrictions.

If in the future you would like additional information concerning the project, please call me at (808) 550-4483.

Sincerely,

Perry J. White

cc: Mr. Keith Okamoto, Department of Water Supply
Office of Environmental Quality Control
Mr. Greg Fukumitsu, TNWRE

Ward Plaza, Suite 330 • 210 Ward Avenue • Honolulu, Hawaii 96814-4012
Phone: 808 550-4483 • Fax: 808 550-4549 • www.psi-hi.com

LINDA LINGLE
GOVERNOR OF HAWAII

#9

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

ROBERT K. MASUDA
DEPUTY DIRECTOR

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

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

March 9, 2007

Planning Solutions
Ward Plaza Suite 330
210 Ward Avenue
Honolulu, Hawaii 96814

Attention: Mr. Perry J. White

Gentlemen:

Subject: Draft Environmental Assessment for Keopu-Pu'uhonua production Well and Reservoir, North Kona, Hawaii, Tax Map Key: (3) 7-5-1:115 and 7-5-1:44

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

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

Sincerely,

Russell Y. Tsuji
Administrator

LINDA LINGLE
GOVERNOR OF HAWAII

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

ROBERT K. MASUDA
DEPUTY DIRECTOR

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

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

February 15, 2007

MEMORANDUM

TO: **DLNR Agencies:**
__Div. of Aquatic Resources
__Div. of Boating & Ocean Recreation
_x_ Engineering Division
__Div. of Forestry & Wildlife
__Div. of State Parks
_x_ Div. of Water Resource Management
__Office of Conservation & Coastal Lands
_x_ Land Division – Hawaii District

FROM: Russell Y. Tsuji
SUBJECT: Draft Environmental Assessment for Keopu-Pu'uhonua Production Well and Reservoir
LOCATION: North Kona, Hawaii, TMK: (3) 7-5-1:115 and 7-5-1:44
APPLICANT: Planning Solutions, Inc. on behalf of Department of Water Supply

Transmitted for your review and comment on the above referenced document. We would appreciate your comments on this document. Please submit any comments by February 27, 2007.

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

Attachments

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

Signed:
Date: 3/1/07

PLANNING SOLUTIONS

March 23, 2007
2006-0013-001

Mr. Russell Y. Tsuji, Administrator
Department of Land and Natural Resources
Land Division
State of Hawai'i
P.O. Box 621
Honolulu, HI 96809

Subject: Keōpū-Pu'uhonua Production Well & Reservoir
Draft Environmental Assessment, North Kona, Hawai'i

Dear Mr. Tsuji:

Thank you for your March 9, 2007 letter forwarding comments from your Land Division Hawaii Office on the Hawai'i County Department of Water Supply's *Draft Environmental Assessment (DEA): Keōpū-Pu'uhonua Production Well and Reservoir Project.* We appreciate the time you and your staff spent reviewing the document.

We understand the Land Division has no comments to offer on the project at this time. If you have any further questions, please call me at (808) 550-4483.

Sincerely,

Perry J. White

cc: Mr. Keith Okamoto, Department of Water Supply
Office of Environmental Quality Control
Mr. Greg Fukumitsu, TNWRE

Ward Plaza, Suite 330 • 210 Ward Avenue • Honolulu, Hawaii 96814-4012
Phone: 808 550-4483 • Fax: 808 550-4549 • www.psi-hi.com

PHONE (808) 594-1888 FAX (808) 594-1865

STATE OF HAWAI'I
OFFICE OF HAWAIIAN AFFAIRS
711 KAPI'OLANI BOULEVARD, SUITE 500
HONOLULU, HAWAI'I 96813

#10

(10)

HRD06/2906

March 6, 2007

Perry White
Planning Solutions
210 Ward Avenue, Suite 300
Honolulu, HI 96814-4012

RE: Draft Environmental Assessment for the Proposed Keōpū-Pu'uhonua Well and Reservoir, North Kona, Hawai'i Island, TMK 7-5-001: 115.

Dear Mr. White,

The Office of Hawaiian Affairs (OHA) is in receipt of your February 13, 2007 submission and offers the following comments:

Our staff requests that, due to the abundance of known historic properties within the proposed project area, that a qualified archeological monitor be present during all ground altering activities on the subject parcel. We also ask that the applicant contact Ruby McDonald of OHA's Kailua-Kona office as she may have additional concerns pertinent to the proposed action. Thank you for your continued correspondence.

OHA asks that, in accordance with Section 6E-46.6, Hawaii Revised Statutes and Chapter 13-300, Hawaii Administrative Rules, if the project moves forward, and if any significant cultural deposits or human skeletal remains are encountered, work shall stop in the immediate vicinity and the State Historic Preservation Division (SHPD/DLNR) shall be contacted.

Thank you for the opportunity to comment. If you have further questions or concerns, please contact Jesse Yorck, Native Rights Policy Advocate, at (808) 594-0239 or jessey@oha.org.

Aloha,

Clyde W. Nāmu'o
Administrator

C: Ruby McDonald
OHA Community Affairs Coordinator (Kailua-Kona)
75-5706 Hanama Pl., Suite 107
Kailua-Kona, HI 96740

PLANNING SOLUTIONS

May 8, 2007
2006-0013-001

Mr. Clyde Nāmu'o, Administrator
Office of Hawaiian Affairs
State of Hawai'i
711 Kapi'olani Boulevard, Suite 500
Honolulu, HI 96813

Subject: Keōpū-Pu'uhonua Production Well & Reservoir
Draft Environmental Assessment, North Kona, Hawai'i

Dear Mr. Nāmu'o:

Thank you for your March 6, 2007 letter (your reference HRD06/2906) commenting on the Hawai'i County Department of Water Supply's *Draft Environmental Assessment (DEA): Keōpū-Pu'uhonua Production Well and Reservoir Project.* 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:

Our staff requests that, due to the abundance of known historic properties within the proposed project area, that a qualified archeological monitor be present during all ground altering activities on the subject parcel. We also ask that the applicant contact Ruby McDonald of OHA's Kailua-Kona office as she may have additional concerns pertinent to the proposed action. Thank you for your continued correspondence.

Response: At your suggestion, our archaeological consultant, Alan Haun of Haun & Associates, contacted Ms. Ruby McDonald of OHA's Kailua Kona office. Ms. McDonald acknowledged the findings of the archaeological surveys conducted in the project area, which indicate that the chances of encountering additional archaeological sites or cultural resources are very slim. Nonetheless, Ms. McDonald expressed a preference for having an archaeological monitor present during construction.

The State Historic Preservation Division reviewed the project and supporting archaeological documentation and determined that the project would have no effect on historic properties. A copy of the determination letter is attached.

The Department of Water Supply will specify in the construction contract that orange construction fencing be placed along the boundaries of the archaeological preserve that is adjacent to the reservoir site prior to commencing construction. It will also require the contractor to brief all construction workers on the presence of the preserve and the need to be particularly vigilant in looking out for buried remains during the course of clearing, grubbing, and grading work for the proposed project. However, in light of SHPD's findings, DWS does not plan to hire an archaeological monitor to be present on site during construction.

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Comment 2:

OHA asks that, in accordance with Section 6E-46.6, Hawaii Revised Statutes and Chapter 13-300, Hawaii Administrative Rules, if the project moves forward, and if any significant cultural deposits or human skeletal remains are encountered, work shall stop in the immediate vicinity and the State Historic Preservation Division (SHPD/DLNR) shall be contacted.

Response: The Department of Water Supply has informed us that if the proposed project moves forward and any significant cultural deposits or human skeletal remains are encountered, it will immediately halt work in the immediate vicinity and contact the State Historic Preservation Division (SHPD/DLNR) in accordance with Section 6E-46.6, Hawaii Revised Statutes and Chapter 13-300, Hawai'i Administrative Rules. Provisions concerning this will be incorporated into the construction contract to ensure that all are aware of the requirement.

Thank you again for your comments. If you have any further questions concerning the project, please call me at (808) 550-4483.

Sincerely,

Perry J. White

Attachment:
(1) Copy of SHPD Determination Letter

cc: Mr. Keith Okamoto, Department of Water Supply (via e-mail)
Office of Environmental Quality Control (via e-mail)
Mr. Greg Fukumitsu, TNWRE (via e-mail)
Mr. Alan Haun, Haun & Associates (via e-mail)

LINDA LINGLE
GOVERNOR OF HAWAII

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

ROBERT K. MASUDA
FIRST DEPUTY

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

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

STATE HISTORIC PRESERVATION DIVISION
601 KAMOKILA BOULEVARD, ROOM 555
KAPOLEI, HAWAII 96707

May 4, 2007

Dr. Alan Haun, Ph.D.
Haun and Associates
HCR 1 Box 4780
Keaau, Hawai'i 96749

LOG NO: 2007.0107
DOC NO: 0704MK34
Archaeology

Dear Dr. Haun:

SUBJECT: **Chapter 6E-42 Historic Preservation Review – [County/DWS]**
Request for a Determination of No Effect for the DWS Keopu-Puuhonua Well and Reservoir Project
Keopu and Honuaula Ahupuaa, North Kona District, Island of Hawaii
TMK (3) 7-5-011:115, 044

Thank you for the opportunity to provide comments on the above County of Hawaii Department of Water Supply request for the subject well and reservoir project.

We concur that no historic properties will be affected by this undertaking because:

- ☐ Intensive cultivation has altered the land
- ☐ Residential development/urbanization has altered the land
- ☐ Previous grubbing/grading has altered the land
- ☐ An accepted archaeological inventory survey (AIS) found no historic properties
- ☒ SHPD previously reviewed this project and mitigation has been completed
- ☒ Other: *The archaeological inventory survey of the above parcels included the well and reservoir site, conducted by Haun and Associated in 2002 has been approved by this office (LOG NO. 30381/ DOC NO: 0207RC30). Four sites were identified and consisted of ranch walls, a mound, and the southern edge of a large agricultural complex. SIHP 22978 (the agricultural complex) has been slated for a combination of data recovery and preservation. Portions of SIHP 22978 have been subjected to data recovery in 2003 under an approved data recovery plan (LOG NO: 2003.0434/ DOC NO: 0306MK02) and the report documenting the results has been reviewed and accepted (LOG NO: 2005.1285/ DOC NO: 0506MK11). Additional data recovery was conducted in consultation with SHPD (DOC NO: 0504MK49) along the seaward edge of the complex, on land that will be conveyed to the County for waterline and access road. The additional data recovery was reviewed and accepted by this office (LOG NO: 2006.2396/ DOC NO: 0607JT47). A buffer zone is in place protecting the southern side of this site. The western boundary of SIHP 22978 follows the edge of a water line and access road. We believe that no historic properties will be affected by the proposed undertaking*

Post-it® Fax Note 7671	Date	# of pages ▸ 2
To Melissa White	From Kawika	
Co./Dept.	Co. SHPD	
Phone #	Phone # 243-1285	
Fax # 550-4549	Fax #	

Dr. Alan Haun
Page 2

In the event that historic resources, including but not limited to artifacts, lava tubes, blisters or caves, or human skeletal remains, are identified during routine construction activities, all work needs to cease in the immediate vicinity of the find, the find needs to be protected from additional disturbance, and the State Historic Preservation Division, needs to be contacted immediately at (808) 243-5169.

Aloha,

Melanie Chinen, Administrator
State Historic Preservation Division

MK:kf

c: Chris Yuen, Planning Director, County of Hawaii FAX 961-8742 (Hilo) and 327-3563 (Kona)
Milton Pavao, Dept. of Water Supply, FAX 961-8657
Bruce McClure, Dept. of Public Works, FAX 961-8321

MAY - 4 2007

LINDA LINGLE
GOVERNOR OF HAWAII

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

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

In reply, please refer to:
EMD / CWB

#11

03036PKP.07

March 9, 2007

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

Dear Mr. White:

Subject: Draft Environmental Assessment
Keopu-Puuhonua Production Well and Reservoir

The Department of Health (DOH), Clean Water Branch (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/indiv-index.html.

   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, 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. Storm water associated with construction activities, including clearing, grading, and excavation, that result in the disturbance of equal to or greater than one (1) acre of total land area. The total land area includes a contiguous area where multiple separate and distinct construction activities may be taking place at different times on different schedules under a larger common plan of development or sale. **An NPDES permit is required before the 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]

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 the Engineering Section, CWB, at 586-4309.

Sincerely,

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

KP:np

PLANNING SOLUTIONS

April 12, 2007
2006-0013-001

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

Subject: Keōpū-Pu'uhonua Production Well & Reservoir
Draft Environmental Assessment, North Kona, Hawai'i

Dear Mr. Wong:

Thank you for your March 9, 2007 letter commenting on the Hawai'i County Department of Water Supply's *Draft Environmental Assessment (DEA): Keōpū-Pu'uhonua Production Well and Reservoir Project*. 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 [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.*

Response: No discharges into navigable waters are anticipated as part of the proposed project. The U.S. Army Corps of Engineers (COE) submitted a letter dated April 3, 2007 commenting on the *Draft Environmental Assessment*. It indicated that the COE has determined that a Department of the Army permit for Section 404 activities of the Clean Water Act will not be required for the proposed production well and reservoir project. The COE's letter will be reproduced 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.

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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.

Response: The contractor will apply for NPDES General Permit Coverage for construction-related stormwater discharges, since the project site is over an acre. The Notice of Intent (NOI) Form C will be submitted to your Department at least 30 days prior to commencing construction.

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), 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: On December 8, 2006, the archaeological consultant for the project wrote to the State Historic Preservation Division (SHPD) concerning the proposed project. Its letter cited the SHPD-approved preservation plan for the area and requested a determination of no effect on historic properties for the subject project (see Appendix A of the *Draft EA*). SHPD has not yet responded to this request. DWS will send SHPD a copy of the NOI-C for construction of the project when it submits the application to the Department of Health.

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 contractor's application for NPDES General Permit coverage will demonstrate that all construction-related discharges are compliant with HAR 11-54.

If you have any further questions, please call me at (808) 550-4483.

Sincerely,

Perry J. White

cc: Mr. Keith Okamoto, Department of Water Supply
Office of Environmental Quality Control
Mr. Greg Fukumitsu, TNWRE

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

#12

REPLY TO ATTENTION OF

April 3, 2007

Regulatory Branch

File Number POH-2007-59

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

Dear Mr. White:

This responds to your request for written comments on draft Environmental Assessment (dEA) addresses activities proposed for the Keopu-Puuhonua Production Well and Reservoir Project, North Kona, Hawaii Island (TMK 7-5-001: por. 44 and 115).

Our records and the dEA indicate that waters of the United States, as represented by perennial or intermittent streams and wetlands do not occur within the preferred project site. It also appears that other special aquatic sites such as anchialine ponds are not present.

The dEA states that there is no potential for navigable waters of the U.S. to be impacted by construction of project structures and the use of a single access road to Keopu Mauka Drive. Therefore, it is determined that a DA permit for Section 404 activities of the Clean Water Act will not be required for the proposed production well and reservoir project.

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 or need additional information. Please refer to the file number above in any future correspondence with us.

Sincerely,

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

PLANNING
SOLUTIONS

April 9, 2007
2006-0013-001

Mr. George P. Young, P.E., Chief
Regulatory Branch
Department of the Army
U.S. Army Engineer District, Honolulu
Fort Shafter, HI 96858-5440

Subject: Keōpū-Pu'uhonua Production Well & Reservoir (File No. POH-2007-059)
Draft Environmental Assessment, North Kona, Hawai'i

Dear Mr. Young:

Thank you for your April 3, 2007 letter (File No. POH-2007-059) commenting on the Hawai'i County Department of Water Supply's *Draft Environmental Assessment (DEA): Keōpū-Pu'uhonua Production Well and Reservoir Project.* 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:

Our records and the DEA indicate that waters of the United States, as represented by perennial or intermittent streams and wetlands do not occur within the preferred project site. It also appears that other special aquatic sites such as anchialine ponds are not present.

Response: Thank you for confirming that waters of the United States and other special aquatic sites are not present within the area affected by the proposed project. This is consistent with our assessment.

Comment 2:

The DEA states that there is no potential for navigable waters of the U.S. to be impacted by construction of project structures and the use of a single access road to Keopu Mauka Drive. Therefore, it is determined that a DA permit for Section 404 activities of the Clean Water Act will not be required for the proposed production well and reservoir project.

Response: Thank you very much for confirming that a DA permit for activities regulated under Section 404 of the Clean Water Act will not be required for the proposed project.

If you have any further questions concerning the project, please call me at (808) 550-4483.

Sincerely,

Perry J. White

cc: Mr. Keith Okamoto, Department of Water Supply
Office of Environmental Quality Control
Mr. Greg Fukumitsu, TNWRE

Ward Plaza, Suite 320 • 219 Ward Avenue • Honolulu, Hawaii 96814-4012
Phone: 808 550-4483 • Fax: 808 550-4549 • www.psi-hi.com

APPENDIX A. WATER QUALITY DATA FROM KEŌPŪ-PU'UHONUA EXPLORATORY WELL

waimea water services inc.

To: Bill Sewake
Dept. of Water
County of Hawaii

Fr: John Stubbart

Re: Keopu Well Report

Date: 2 April 93

On behalf of the developers of the Keopu Well (No. 3957-01), Haseko Hawaii, we are transmitting a copy of the final well report for your review and use. Contained in the report is information on the pumping test and water quality.

If you would like to discuss the contents of the report with Steve Bowles or myself, please do not hesitate to contact us for a meeting.

cc: Haseko Hawaii

RECEIVED APR 0 5 1993

P.O. Box 326 • Kamuela, Hawaii 96743 • (808) 885-5941 • FAX (808) 885-7851

Bill Stevens

KEOPU WELL

State Well No. 3957-01

AS BUILT
January 1993

Prepared by

WAIMEA WATER SERVICES INC.

and

ISLAND RESOURCES LTD.

KEOPU WELL

State Well No. 3957-01

TABLE OF CONTENTS

KEOPU WELL

State Well No. 3957-01

DRILLING AND TESTING

This well is intended to pump at a rate of up to 720,000 gallons per day (gpd) for purposes of potable water use. The well was designed and budgeted to be drilled to below sea level. Based on the water data from other wells drilled in the area, (Bowles 1983 to 1990), it was determined that potable quality water was available at this site.

A well Construction/Pump Installation Permit was issued effective December, 5, 1990. Site grubbing activities started initially on 4 Dec 91. The notice to proceed was given on 10 April 92. The conductor pipe was set 12 June 92. A paved road was installed to the well site as part of the mobilization. Well drilling (the 12 inch pilot hole) commenced 2 July 1992 by KKRC Water Source Development, J V. Water was first struck at a depth of about 1635 feet (+ 40 foot head).

The 12 inch bore was video taped on 6 Aug 92 and a pump test was run on 4 Aug 92. A measurable drawdown of 1.5 feet was detected at 210 gpm during the 8 hour test. Water quality was sampled during the test. The following data was recorded:

* Conductivity	160 to 170	EC (start to end readings)
* Chloride	10 to 15	mg/l

Based on the evidence provided by the open bore pumping test, water quality, rock cuttings, video taping, and the 40 foot water level measurements, a conclusion was reached that the bore had tapped an aquifer containing high level water. It is clear that a hydrogeologic boundary lies makai of the well site. The yield and water quality during the preliminary test were satisfactory and it was decided to continue with the well project with design modifications on the setting of the casing, adding 20 feet of screen to the end of the casing, and provide a gravel pack around the screen.

The well was reamed to a diameter of 20 inches, cased and grouted by 21 Dec 92. The As-Built dimensions of the well are shown in Figure 1. It was decided, based on test results of the 12 inch bore, to perform a long term pumping test at 700 gpm (gallons per minute).

A series of pumping tests were run between 21 Jan 93 to 26 Jan 93. On 21 Jan 93, the specific capacity tests were conducted. The results of these tests are shown in Figure 2. At the design rate of 500 gpm the drawdown will be about 4 feet. Following a 24 hour rest period, the pump was restarted and an aquifer test was conducted at an average rate of 738 gpm. The test was started at 10:30 am on 22 Jan 93 and stopped at 10:30 am on 26 Jan 93 for a total pumping time of 96 hours. A recovery period of 48 hours was monitored. As shown in Figure 2, the drawdown in the well was immediate and there was no measured continued drawdown or recovery trend observed. The pumping well was monitored on two separate air lines, each accurately measured to 0.1 psi or 0.23 feet of water.

On 26 Jan 93 a sample of water was collected by Aecos Laboratory for analysis. The results of the analysis are listed in Figure 3. All analysis are performed to comply with the Safe Drinking Water Act and the State of Hawaii Dept. of Health. The water quality meets all requirements.

Based on the results of the pumping tests and the water quality, the well can be pumped indefinitely at a pumping rate of 500 as planned.

Upon casing, a series of tests were run to evaluate the plumbness and alignment. These tests, as called for in the specifications, consisted of running a 40 foot long pump dummy system and a wireline cage. The plot of the results of the caging are shown in Figure 4. The well survey results indicated that the deviations appeared to have long radiuses and should have no impact on the pump installation or performance. The 40 foot dummy had a 13.5" O.D., which passed freely upon and up the well.

The contracted drillers Well Completion Report is attached as Figure 5. This report was sent to the State as required.

Reference - Waimea Water Services Records, Reports, Correspondence, and Permit.

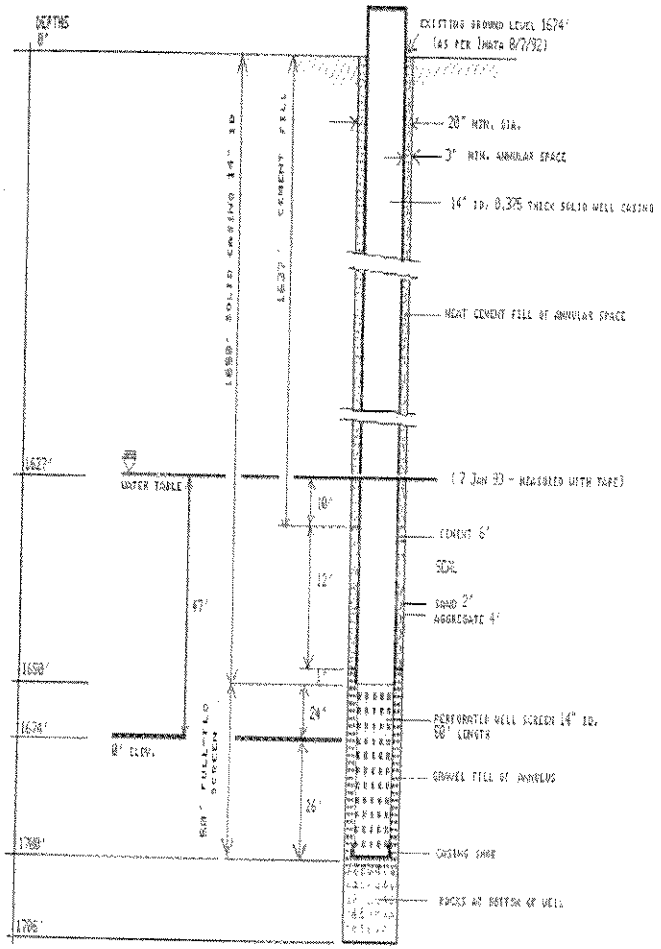
Bowles, S.P., Island Resources

KKRC Water Development J.V. Records

HYDROGEOLOGIC SECTION AND WELL SECTION

FIGURE 1

waimea water services inc.



WELL SECTION

KEOPU WELL

No. 3957-01

NOT TO SCALE

2/1/93

WAIMEA WATER SERVICES INC.

P.O. Box 326 • Kamuela, Hawaii 96743 • (808) 885-5941 • Fax (808) 885-7851

PUMP TEST DATA AND GRAPHS

FIGURE 2

KEOPU WELL
PRELIMINARY SPECIFIC CAPACITY TEST
1/21/93

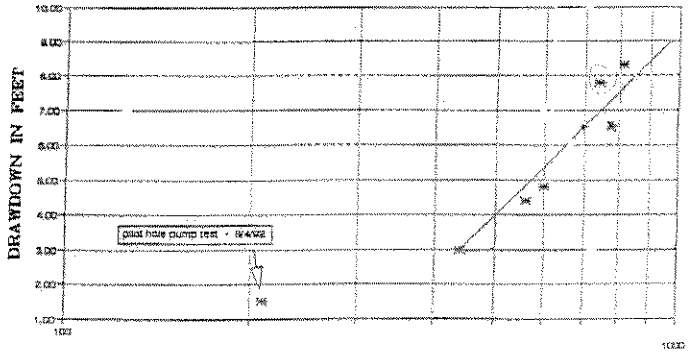
ITEM	ELEVATION IN FEET
WATER LEVEL	+ 48
BOTTOM OF WELL SCREEN	- 33
PUMP INTAKE	- 49'
AIR LINE 1	- 34'
AIR LINE 2	- 44'

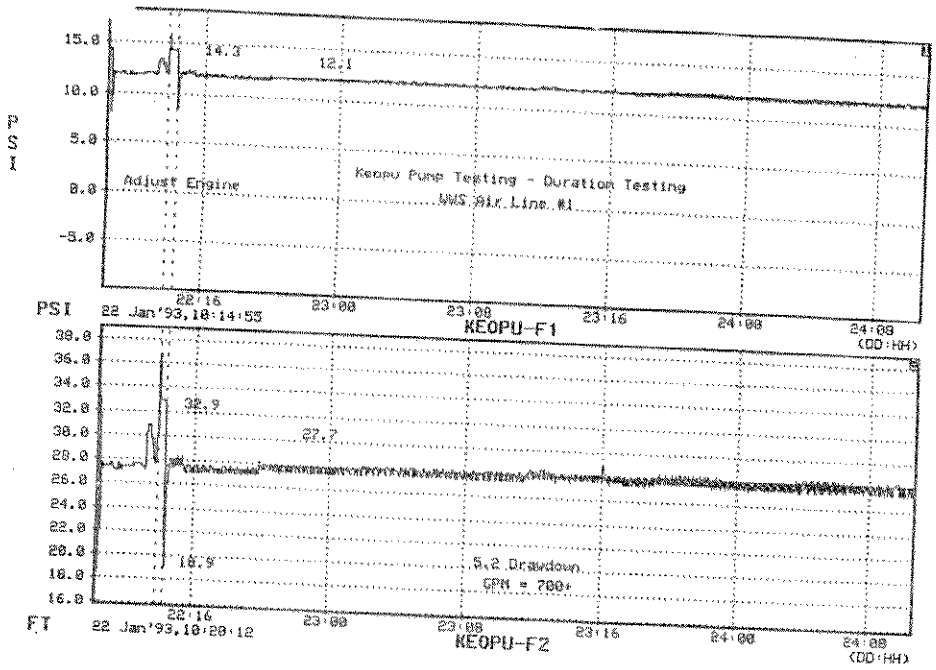
TEST DATA OF 1/21/93

	Q (FLOW)	PSI	D.D. PSI	D.D. FEET	SPECIFIC CAPACITY GPM/FT/DD
0.	0	18	0	0	
1.*	210			1.5	140
2.	440	16.7	1.3	3.0	147
3.	560	16.1	1.9	4.4	127
4.	600	15.9	2.1	4.8	125
5.	740	14.6	3.4	7.8	95
6.	810	14.4	3.6	8.3	98

* Pilot hole pump test (8/4/93).

KEOPU WELL SPECIFIC CAPACITY
AIR LINE 2 1/21/93

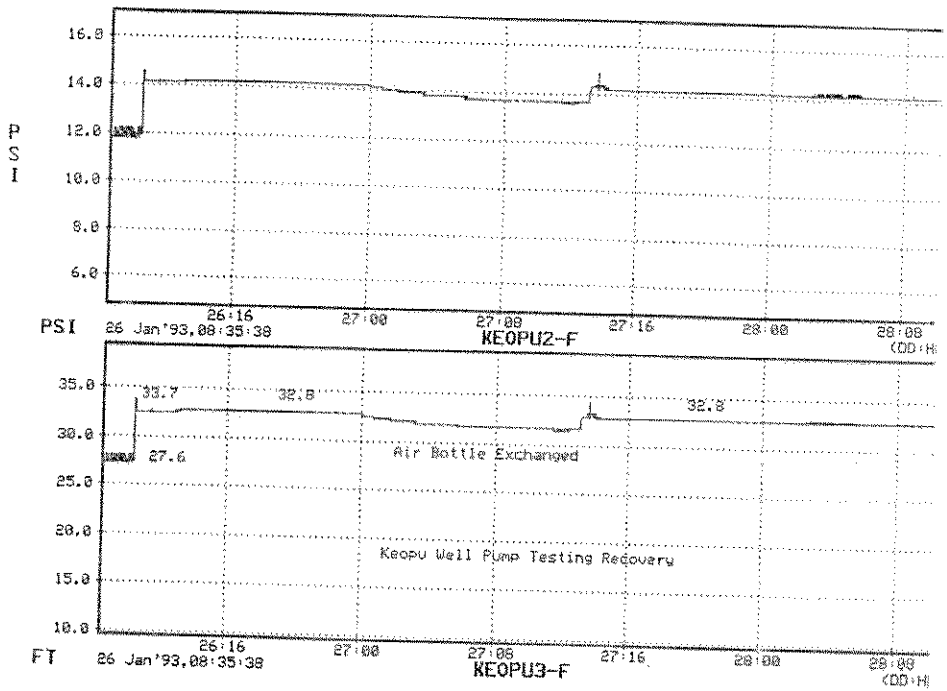




Key:

Graph 1 Trace 1	KEOPU-F1.DTA	Adaptive	Line	24 Jan 1993
Graph 2 Trace 1	KEOPU-F2.DTA	Adaptive	Line	24 Jan 1993

KEOPU WELL
PUMPING TEST GRAPHS



Key:

Graph 1 Trace 1	KEOPU2-F.DTA	Adaptive	Line	28 Jan 1993
Graph 2 Trace 1	KEOPU3-F.DTA	Adaptive	Line	28 Jan 1993

RECOVERY INFORMATION
KEOPU WELL PUMP TESTING

WATER QUALITY DATA

FIGURE 3

AECOS
970 N. Kalaheo Avenue, Suite C311 • Kailua, Hawaii 96734
Telephone: (808) 254-5884

JOB: 457
DATE: 03/01/93
PAGE: 1 OF 2

TO: AECOS Laboratory of Hawaii ATTN: Karen Klein

SAMPLE SITE: Keopu Well
DATE SAMPLED: 01/26/93
TIME SAMPLED: 10:15
SAMPLED BY: Karen Klein

RECEIPT DATE: 01/26/93
LOG: 6368

LABORATORY ANALYSIS REPORT

	Amount Detected	Detection Limit	Date Analyst
Arsenic (mg/l)	BDL	0.005	2/04 mka
Barium (mg/l)	BDL	0.05	1/27 mka
Cadmium (mg/l)	BDL	0.002	1/27 mka
Chromium (mg/l)	BDL	0.005	2/01 mka
Lead (mg/l)	BDL	0.005	2/03 mka
Mercury (mg/l)	BDL	0.0004	2/04 mka
Selenium (mg/l)	BDL	0.01	1/28 mka
Copper (mg/l)	BDL	0.02	2/10 mka
Iron (mg/l)	0.291	0.1	2/12 ds
Manganese (mg/l)	BDL	0.5	2/26 ds
Zinc (mg/l)	BDL	0.01	2/16 ds
Calcium (mg/l)	13.8	0.01	2/17 ds
Magnesium (mg/l)	5.05	0.002	2/16 ds
Fluoride (mg/l)	0.32	0.1	1/28 klm
Nitrate (mg N/l)	1.03	0.03	1/27 klm
Nitrite (mg N/l)	0.001	0.001	1/27 klm
Turbidity (NTU)	0.55	0.1	1/27 klm
Gross Alpha (pCi/l)	BDL	0.4	2/17 AL
Gross Beta (pCi/l)	BDL	0.6	2/17 AL
Asbestos	BDL		2/17 AL

BDL = Below Detection Limit
* See attached lists.

	Amount Detected	Detection Limit	Date Analyst
Carbamates (EPA 531.1) (ug/l)	BDL	*	2/17 AL
EDB/DBCP (EPA 504) (ug/l)	BDL	*	2/17 AL
Organochlorine Pesticides & PCB's (EPA 505) (ug/l)	BDL	*	2/17 AL
Chlorophenoxy Acids Herbicides (EPA 515.1) (ug/l)	BDL	*	2/17 AL
Trihalomethanes	BDL	*	2/17 AL
EPA (502.2) (ug/l)	BDL	*	2/17 AL
Alkalinity (mg CaCO3/l)	54	5	1/27 jr
Total Hardness (mg CaCO3/l)	55.2	0.5	2/16 klm
Chloride (mg/l)	5.2	5	1/27 jr
Color (APCU)	BDL	10	1/27 klm
Total Dissolved Solids (mg/l)	133	10	1/24 jr
Corrosivity	-1.55 @ 25 C	<0=corrosive >0=noncorrosive	2/17 ds
Foaming Agents (mg LAS/l)	BDL	0.025	1/27 ds
pH	6.97	0.1	1/26 sm
Sulfate (mg/l)	9.91	2	2/10 klm
Conductivity (umhos/cm)	138	1	1/26 sm

BDL = Below Detection Limit
* See attached lists.

EPA Method 531.1	Detection Limit (ug/l)
Aldicarb	3.0
Aldicarb Sulfone	5.0
Aldicarb Sulfoxide	8.0
Baygon	5.0
Carbaryl	5.0
Carbofuran	5.0
Methiocarb	8.0
Methomyl	5.0
Oxamyl	5.0
3-Hydroxycarbofuran	5.0

EPA Method 504	
EDB	0.02
DBCP	0.01

EPA Method 505	Detection Limit (ug/l)
Alachlor	0.225
Aldrin	0.007
Atrazine	2.4
alpha-Chlordane	0.006
gamma-Chlordane	0.012
Chlordane	0.14
Dieldrin	0.012
Endrin	0.063
Heptachlor	0.003
Heptachlor Epoxide	0.004
Hexachlorobenzene	0.002
Hexachlorocyclopentadiene	0.13
Lindane	0.003
Methoxychlor	0.96
cis-Nonachlor	0.027
trans-Nonachlor	0.011
Simazine	6.8
Toxaphene	1.0
Aroclor 1016	0.08
Aroclor 1221	15.0
Aroclor 1232	0.48
Aroclor 1242	0.31
Aroclor 1248	0.102
Aroclor 1254	0.102
Aroclor 1260	0.189

EPA Method 515	
Dinoseb	0.2
2,4-D	0.2
Dalapon	1.3
2,4-DB	0.8
DCPA	0.02
Dicamba	0.081
2,4,5-T	0.08
2,4,5-TP (Silvex)	0.075

EPA METHOD 502.2	Detection Limits (ug/l)
Benzene	0.5
Bromobenzene	0.5
Bromochloromethane	0.5
Bromodichloromethane	0.5
Bromoform	0.5
Bromomethane	0.5
n-Butylbenzene	0.5
sec-Butylbenzene	0.5
tert-Butylbenzene	0.5
Carbon tetrachloride	0.5
Chlorobenzene	0.5
Chloroethane	0.5
Cloroform	0.5
Chloromethane	0.5
2-Chlorotoluene	0.5
4-Chlorotoluene	0.5
Dibromochloromethane	0.5
1,2-Dibromo-3-chloropropane	0.5
1,2-Dibromoethane	0.5
Dibromomethane	0.5
1,2-Dichlorobenzene	0.5
1,3-Dichlorobenzene	0.5
1,4-Dichlorobenzene	0.5
Dichlorodifluoromethane	0.5
1,1-Dichloroethane	0.5
1,2-Dichloroethane	0.5
1,1-Dichloroethene	0.5
cis-1,2-Dichloroethene	0.5
trans-1,2-Dichloroethene	0.5
cis-1,3-Dichloropropene	0.5
trans-1,3-Dichloropropene	0.5
1,2-Dichloropropane	0.5
1,3-Dichloropropane	0.5
2,2-Dichloropropane	0.5
1,1-Dichloropropene	0.5
1,3-Dichloropropene, Total	0.5
Ethylbenzene	0.5
Hexachlorobutadiene	0.5
Isopropylbenzene	0.5
p-Isopropyltoluene	0.5
Methylene chloride	0.5
Naphthalene	0.5
n-Propylbenzene	0.5
Styrene	0.5

EPA Method 502.2 (Cont.)	Detection Limits (ug/l)
1,1,1,2-Tetrachloroethane	0.5
1,1,2,2-Tetracholroethane	0.5
Tetrachloroethene	0.5
Toluene	0.5
1,2,3-Trichlorobenzene	0.5
1,2,4-Trichlorobenzene	0.5
1,1,1-Trichloroethane	0.5
1,1,2-Trichloroethane	0.5
Trichloroethene	0.5
Trichlorofluoromethane	0.5
1,2,3-Trichloropropane	0.5
1,2,4-Trimethylbenzene	0.5
1,3,5-Trimethylbenzene	0.5
Vinyl chloride	0.5
p-Xylene	0.5
m-Xylene	0.5
o-Xylene	0.5

ALIGNMENT CHARTS

FIGURE 4

waimea water services inc.

To: Craig Tachibana

Fr: John Stubbart

Re: Keopu Well
Alignment Test Results

Date: 24 Dec 92

Enclosed are the Keopu well alignment results from the test performed with a cage on 22 Dec 92. The data is contained on four sheets.

Also attached is a graph of the North and East drift and a graph of each the north and east drift and an estimation of the well line from top to bottom.

Based on this information, deviations appear to have long radiuses over the 1700 feet of the well and should have no impact on the well pump installation or performance. Such long radius deviations are common in these types of holes.

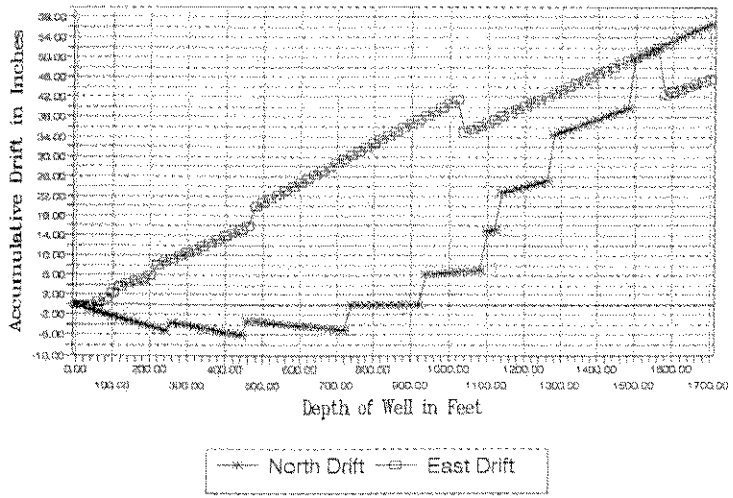
A 40' dummy was run down the well and transversed the well with no problems noted.

The pump is expected to be installed during the week of 4 Jan 93.

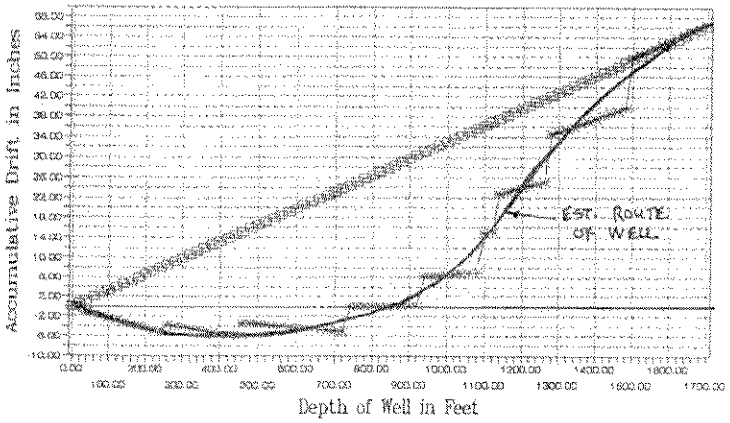
cc: Akinaka and Assoc.

P.O. Box 326 [illegible] (808) 885-[illegible]

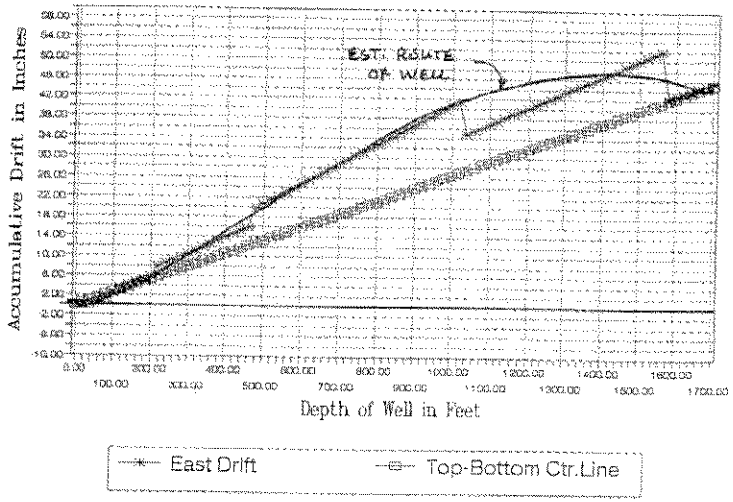
Keopu Well
Alignment Survey 22 Dec 92



Keopu Well
Alignment Survey 22 Dec 92



Keopu Well
Alignment Survey 22 Dec 92



KEOPU WELL ALIGNMENT DATA PRINTED 24-Dec-92

KEOPU WEL
22 DEC 92

DRIFT = DEFLECTION * (HEIGHT + DEPTH)
HEIGHT

CASING TO PULLY 18.83'
CASING = 14" I.D.
PLUMMET = 13.5" O.D.

	NORTH					EAST				
MEASURE FEET	DRIFT INCHES	DRIFT DIFF. INCHES	TOP-BOT DEFLECT CTR.LN.	DIFF. DEFLECT. INCHES	VARIANCE DEFLECT INCHES	DRIFT INCHES	DRIFT DIFF. INCHES	TOP-BOT DEFLECT CTR.LN.	DIFF. DEFLECT INCHES	VARIAN DEFLE INCH
0.00	7.00	0.00	0.00	0.00	0.00	7.00	0.00	0.00	0.00	0.
20.00	6.87	-0.27	0.66	-0.93	-0.93	7.00	0.00	0.53	-0.53	-0.
40.00	6.62	-1.19	1.32	-2.51	-1.58	7.00	0.00	1.06	-1.06	-0.
60.00	6.62	-1.59	1.98	-3.57	-1.06	7.12	0.50	1.59	-1.09	-0.
80.00	6.62	-1.99	2.64	-4.63	-1.06	7.25	1.31	2.12	-0.81	0.
100.00	6.62	-2.40	3.30	-5.70	-1.06	7.37	2.33	2.65	-0.32	0.
120.00	6.62	-2.80	3.96	-6.76	-1.06	7.50	3.69	3.18	0.51	0.
140.00	6.62	-3.21	4.62	-7.83	-1.06	7.50	4.22	3.71	0.51	0.
160.00	6.62	-3.61	5.28	-8.89	-1.06	7.50	4.75	4.24	0.51	0.
180.00	6.62	-4.01	5.94	-9.95	-1.06	7.50	5.28	4.77	0.51	0.
200.00	6.62	-4.42	6.60	-11.02	-1.06	7.50	5.81	5.30	0.51	0.
220.00	6.62	-4.82	7.26	-12.08	-1.06	7.62	7.86	5.83	2.03	1.
240.00	6.62	-5.22	7.92	-13.14	-1.06	7.62	8.52	6.36	2.16	0.
260.00	6.75	-3.70	8.58	-12.28	0.86	7.62	9.18	6.89	2.29	0.
280.00	6.75	-3.97	9.24	-13.21	-0.93	7.62	9.84	7.42	2.42	0.
300.00	6.75	-4.23	9.90	-14.13	-0.93	7.62	10.50	7.95	2.55	0.
320.00	6.75	-4.50	10.56	-15.06	-0.93	7.62	11.16	8.48	2.68	0.
340.00	6.75	-4.76	11.22	-15.98	-0.93	7.62	11.81	9.01	2.80	0.
360.00	6.75	-5.03	11.88	-16.91	-0.93	7.62	12.47	9.54	2.93	0.
380.00	6.75	-5.30	12.54	-17.84	-0.93	7.62	13.13	10.07	3.06	0.
400.00	6.75	-5.56	13.20	-18.76	-0.93	7.62	13.79	10.60	3.19	0.
420.00	6.75	-5.83	13.86	-19.69	-0.93	7.62	14.45	11.13	3.32	0.
440.00	6.75	-6.09	14.52	-20.61	-0.93	7.62	15.11	11.66	3.45	0.
460.00	6.87	-3.31	15.18	-18.49	2.13	7.62	15.77	12.19	3.58	0.
480.00	6.87	-3.44	15.84	-19.28	-0.80	7.75	19.87	12.72	7.15	3.

KEOPU WELL ALIGNMENT DATA PRINTED 24-Dec-92

KEOPU WEL
22 DEC 92

DRIFT = DEFLECTION * (HEIGHT + DEPTH)
HEIGHT

CASING TO PULLY 18.83'
CASING = 14" I.D.
PLUMMET = 13.5" O.D.

	NORTH					EAST				
MEASURE FEET	DRIFT INCHES	DRIFT DIFF. INCHES	TOP-BOT DEFLECT CTR.LN.	DIFF. DEFLECT. INCHES	VARIANCE DEFLECT INCHES	DRIFT INCHES	DRIFT DIFF. INCHES	TOP-BOT DEFLECT CTR.LN.	DIFF. DEFLECT INCHES	VARIANC DEFLEC INCH
500.00	6.87	-3.58	16.50	-20.08	-0.80	7.75	20.67	13.25	7.42	0.2
520.00	6.87	-3.72	17.16	-20.88	-0.80	7.75	21.46	13.78	7.68	0.2
540.00	6.87	-3.86	17.82	-21.68	-0.80	7.75	22.26	14.31	7.95	0.2
560.00	6.87	-4.00	18.48	-22.48	-0.80	7.75	23.05	14.84	8.21	0.2
580.00	6.87	-4.13	19.14	-23.27	-0.80	7.75	23.85	15.37	8.48	0.2
600.00	6.87	-4.27	19.80	-24.07	-0.80	7.75	24.65	15.90	8.75	0.2
620.00	6.87	-4.41	20.46	-24.87	-0.80	7.75	25.44	16.43	9.01	0.2
640.00	6.87	-4.55	21.12	-25.67	-0.80	7.75	26.24	16.96	9.28	0.2
660.00	6.87	-4.69	21.78	-26.47	-0.80	7.75	27.04	17.49	9.55	0.2
680.00	6.87	-4.82	22.44	-27.26	-0.80	7.75	27.83	18.02	9.81	0.2
700.00	6.87	-4.96	23.10	-28.06	-0.80	7.75	28.63	18.55	10.08	0.2
720.00	6.87	-5.10	23.76	-28.86	-0.80	7.75	29.43	19.08	10.35	0.2
740.00	7.00	0.00	24.42	-24.42	4.44	7.75	30.22	19.61	10.61	0.2
760.00	7.00	0.00	25.08	-25.08	-0.66	7.75	31.02	20.14	10.88	0.2
780.00	7.00	0.00	25.74	-25.74	-0.66	7.75	31.82	20.67	11.15	0.2
800.00	7.00	0.00	26.40	-26.40	-0.66	7.75	32.61	21.20	11.41	0.2
820.00	7.00	0.00	27.06	-27.06	-0.66	7.75	33.41	21.73	11.68	0.2
840.00	7.00	0.00	27.72	-27.72	-0.66	7.75	34.21	22.26	11.95	0.2
860.00	7.00	0.00	28.38	-28.38	-0.66	7.75	35.00	22.79	12.21	0.2
880.00	7.00	0.00	29.04	-29.04	-0.66	7.75	35.80	23.32	12.48	0.2
900.00	7.00	0.00	29.70	-29.70	-0.66	7.75	36.60	23.85	12.75	0.2
920.00	7.00	0.00	30.36	-30.36	-0.66	7.75	37.39	24.38	13.01	0.2
940.00	7.12	6.11	31.02	-24.91	5.45	7.75	38.19	24.91	13.28	0.2
960.00	7.12	6.24	31.68	-25.44	-0.53	7.75	38.99	25.44	13.55	0.2
980.00	7.12	6.37	32.34	-25.97	-0.53	7.75	39.78	25.97	13.81	0.2

KEOPU WELL ALIGNMENT DATA PRINTED 24-Dec-92

KEOPU WEL
22 DEC 92

DRIFT = DEFLECTION * (HEIGHT + DEPTH)
HEIGHT

CASING TO PULLY 18.83'
CASING = 14" I.D.
PLUMMET = 13.5" O.D.

MEASURE	NORTH					EAST				
FEET	DRIFT INCHES	DRIFT DIFF. INCHES	TOP-BOT DEFLECT CTR.LN.	DIFF. DEFLECT. INCHES	VARIANCE DEFLECT INCHES	DRIFT INCHES	DRIFT DIFF. INCHES	TOP-BOT DEFLECT CTR.LN.	DIFF. DEFLECT INCHES	VARIAN DEFLE INCH
1000.00	7.12	6.49	33.00	-26.51	-0.53	7.75	40.58	26.50	14.08	0.2
1020.00	7.12	6.62	33.66	-27.04	-0.53	7.75	41.38	27.03	14.35	0.2
1040.00	7.12	6.75	34.32	-27.57	-0.53	7.62	34.86	27.56	7.30	-7.0
1060.00	7.12	6.88	34.98	-28.10	-0.53	7.62	35.52	28.09	7.43	0.1
1080.00	7.12	7.00	35.64	-28.64	-0.53	7.62	36.18	28.62	7.56	0.1
1100.00	7.25	14.85	36.30	-21.45	7.19	7.62	36.84	29.15	7.69	0.1
1120.00	7.25	15.12	36.96	-21.84	-0.39	7.62	37.50	29.68	7.82	0.1
1140.00	7.37	22.77	37.62	-14.85	6.99	7.62	38.16	30.21	7.95	0.1
1160.00	7.37	23.16	38.28	-15.12	-0.27	7.62	38.81	30.74	8.07	0.1
1180.00	7.37	23.56	38.94	-15.38	-0.27	7.62	39.47	31.27	8.20	0.1
1200.00	7.37	23.95	39.60	-15.65	-0.27	7.62	40.13	31.80	8.33	0.1
1220.00	7.37	24.34	40.26	-15.92	-0.27	7.62	40.79	32.33	8.46	0.1
1240.00	7.37	24.74	40.92	-16.18	-0.27	7.62	41.45	32.86	8.59	0.1
1260.00	7.37	25.13	41.58	-16.45	-0.27	7.62	42.11	33.39	8.72	0.1
1280.00	7.50	34.49	42.24	-7.75	8.70	7.62	42.77	33.92	8.85	0.1
1300.00	7.50	35.02	42.90	-7.88	-0.13	7.62	43.42	34.45	8.97	0.1
1320.00	7.50	35.55	43.56	-8.01	-0.13	7.62	44.08	34.98	9.10	0.1
1340.00	7.50	36.08	44.22	-8.14	-0.13	7.62	44.74	35.51	9.23	0.1
1360.00	7.50	36.61	44.88	-8.27	-0.13	7.62	45.40	36.04	9.36	0.1
1380.00	7.50	37.14	45.54	-8.40	-0.13	7.62	46.06	36.57	9.49	0.1
1400.00	7.50	37.67	46.20	-8.53	-0.13	7.62	46.72	37.10	9.62	0.1
1420.00	7.50	38.21	46.86	-8.65	-0.13	7.62	47.38	37.63	9.75	0.1
1440.00	7.50	38.74	47.52	-8.78	-0.13	7.62	48.03	38.16	9.87	0.1
1460.00	7.50	39.27	48.18	-8.91	-0.13	7.62	48.69	38.69	10.00	0.1
1480.00	7.50	39.80	48.84	-9.04	-0.13	7.62	49.35	39.22	10.13	0.1

KEOPU WELL ALIGNMENT DATA PRINTED 24-Dec-92

KEOPU WEL
22 DEC 92

DRIFT = DEFLECTION * (HEIGHT + DEPTH)
HEIGHT

CASING TO PULLY 18.83'
CASING = 14" I.D.
PLUMMET = 13.5" O.D.

MEASURE	NORTH					EAST				
FEET	DRIFT INCHES	DRIFT DIFF. INCHES	TOP-BOT DEFLECT CTR.LN.	DIFF. DEFLECT. INCHES	VARIANCE DEFLECT INCHES	DRIFT INCHES	DRIFT DIFF. INCHES	TOP-BOT DEFLECT CTR.LN.	DIFF. DEFLECT INCHES	VARIAN DEFLE INCH
1500.00	7.62	50.01	49.50	0.51	9.55	7.62	50.01	39.75	10.26	0.
1520.00	7.62	50.67	50.16	0.51	-0.00	7.62	50.67	40.28	10.39	0.
1540.00	7.62	51.33	50.82	0.51	-0.00	7.62	51.33	40.81	10.52	0.
1560.00	7.62	51.98	51.48	0.50	-0.00	7.62	51.98	41.34	10.64	0.
1580.00	7.62	52.64	52.14	0.50	-0.00	7.50	42.45	41.87	0.58	-10.
1600.00	7.62	53.30	52.80	0.50	-0.00	7.50	42.99	42.40	0.59	0.
1620.00	7.62	53.96	53.46	0.50	-0.00	7.50	43.52	42.93	0.59	0.
1640.00	7.62	54.62	54.12	0.50	-0.00	7.50	44.05	43.46	0.59	0.
1660.00	7.62	55.28	54.78	0.50	-0.00	7.50	44.58	43.99	0.59	0.
1680.00	7.62	55.94	55.44	0.50	-0.00	7.50	45.11	44.52	0.59	0.
1700.00	7.62	56.59	56.10	0.49	-0.00	7.50	45.64	45.05	0.59	0.

WELL COMPLETION FORM

FIGURE 5

COMMISSION ON WATER RESOURCE MANAGEMENT
Department of Land and Natural Resources
Division of Water Resource Management

WELL COMPLETION REPORT

INSTRUCTIONS: Please print or type and submit completed report within 30 days of well completion to the Division of Water & Land Development, P.O. Box 373, Honolulu, HI 96809. An as-built drawing of the well and c[illegible]ical analysis, if available, should also be submitted. If necessary, phone 548-7541, Hydrology, Geology S[illegible]on for assistance.

A. STATE WELL NO. 3957-01 WELL NAME Keopu/Puuhonua Well 1 ISLAND Hawaii
B. LOCATION Keopu Mauka, North Kona TAX MAP KEY 7-5-01:01
C. WELL OWNER Haseko (Hawaii) Inc.
D. DRILLING OR PUMP INSTALLATION CONTRACTOR KKRC WATER SOURCE DEVELOPMENT, J.V.
E. TYPE OF RIG Wilson DRILLER William Cates
F. DATE OF WELL COMPLETION 1-26-93 DATE OF PUMP INSTALLATION N/A
G. GROUND ELEVATION (msl) 1674 ft.
Top of Drilling Platform (msl) 1685 ft.
Height of drilling platform above ground surface 11 ft.
Bench mark and method used to determine ground elevation Survey by Inata.
H. TOTAL DEPTH OF WELL BELOW GROUND 1706
I. HOLE SIZE: 20 inch dia. from GL ft. to 1706 ft. below ground
[blank] inch dia. from [blank] ft. to [blank] ft. below ground
[blank] inch dia. from [blank] ft. to [blank] ft. below ground
J. CASING INSTALLED:
14 in. I.D. x .375 in. wall solid section to 1650 ft. below ground
14 in. I.D. x .375 in. wall perforated section to 1700 ft. below ground
Type of perforation 1/4" w x 1 1/2" x 120 slots/ft.
K. ANNULUS:
Grouted from GL ft. to 1637 ft. below ground
Gravel packed from 1637 ft. to 1700 ft. below ground
L. PERMANENT PUMP INSTALLATION:
Pump type, make, serial No. N/A Capacity [blank] gpm
Motor type, H.P., voltage, r.p.m. [blank]
Depth of pump intake setting [blank] ft. below [blank] which elevation is [blank] ft.
Depth at bottom of strainer [blank] ft. below [blank] which elevation is [blank] ft.
M. PROPOSED USE Potable
N. STATIC WATER LEVEL 1627 ft. below ground. Date and time of measurement 1-7-93 12:00pm
O. INITIAL CHLORIDE 10 ppm. Date and time of sampling 1-26-93 10:00am
P. PUMPING TESTS: Reference point (R.P.) used ground which elevation is 1674 ft.

Date	1-22-93					Date					
Start water level	1627	ft. below R. P.				Start water level		ft. below R. P.			
End water level	1627	ft. below R. P.				End water level		ft. below R. P.			
Depth of well	1706	ft. below R. P.				Depth of well		ft. below R. P.			
Exposed Time (hours)		Rate (gpm)	Draw-down (ft.)	Cl- (ppm)	Temp. °F	Elapsed Time (hours)		Rate (gpm)	Draw-down (ft.)	Cl- (ppm)	Temp. °F
0	to 1	738	6.23	10	70		to				
1	to 95	738	6.46	10	70		to				
	to						to				
	to						to				
	to						to				
	to						to				

Q. DRILLER'S LOG:

Depth, ft.	Rock Description & Remarks	Water Level ft.	Depth, ft.	Rock Description & Remarks	Water Level ft.
0 to 148	Hard/medium		to		
149 to 262	Hard/medium		to		
2[illegible] to 306	Medium/soft		to		
3[illegible] to 510	Medium/hard		to		
511 to 520	Ratty - Hard & broken		to		
521 to 907	Hard/soft spots		to		
908 to 1190	Soft & consolidated		to		
1191 to 1528	Soft w/hard spots		to		
1527 to 1706	Soft	1627'	to		
to			to		
to			to		

REMARKS: [blank]

Submitted by (print) KKRC WATER SOURCE DEVELOPMENT, J.V. Title Partner
Signature [signature] C. Dale Strowmatt Date 5/7/93

APPENDIX B. SHPD CORRESPONDENCE

Haun & Associates

Archaeological, Cultural, and Historical Resource Management Services
HCR 1 Box 4730, Keaau, Hawaii 96749 Phone: 982-7755 Fax: 982-6343

December 8, 2006

Project 496

Ms. Melanie Chinen, Administrator
State Historic Preservation Division
Department of Land and Natural Resources
601 Kamokila Boulevard, Room 555
Kapolei, Hawaii 96707

Subject: Request for Determination of No Effect
DWS Keopu-Pu'uhonua Well and Reservoir Project
Lands of Keopu and Honuaula, North Kona District
Island of Hawaii (TMK [3] 7-5-011:115, 044)

Dear Ms. Chinen:

At the request of Planning Solutions, Inc. on behalf of the County of Hawaii Department of Water Supply, we are requesting a determination of no effect on historic properties for the subject well and reservoir project. The project is situated within TMK: (3) 7-5-011:115 and a portion of TMK 7-5-001:044 situated in the Lands of Keopu and Honuaula, North Kona District, Island of Hawaii. The well and reservoir site are situated within the former parcel and a buried electrical line will extend across the seaward end of the later parcel (*Figures 1* and *2*).

Both parcels were entirely surveyed by Haun and Associates in 2002 (Haun and Henry 2002a). The inventory survey was approved by SHPD in July 2002 (Log No: 30381, Doc No: 0207RC30). Four sites were identified in the vicinity of Parcel 115: two ranch walls (Sites 22973 and 22974), a mound (Site 22975) and the southern edge of a large agricultural complex (Site 22978). Sites 22973, 22974, and 22975 were all adequately documented by the inventory survey and a recommendation for no further work or preservation for the sites was approved by SHPD. Site 22978 was recommended for a combination of data recovery and preservation.

The Site 22978 spans the seaward portion of Parcel 44. Two ranch walls (Sites 22952 and 22965) extended through the seaward portion of Parcel 44. Another ranch wall segment (Site 22976) extended through an access road corridor in Keopu Ahupua'a that was also covered by the original inventory survey. Sites 22952, 22965, and 22976 were all adequately documented by the inventory survey and a recommendation for no further work or preservation for these sites was approved by SHPD.

Portions of Site 22978 were subjected to data recovery in 2003. These portions include features south of Feature G and north of the Site 22965 wall that bisects the north portion of the complex (*Figure 3*). The data recovery plan (Haun and Henry 2002b) was

approved by SHPD in March 2003 (Log No: 2003.0434, Doc No: 306MM02) and the data recovery report (Haun et al. 2003) was approved by SHPD in June 2005 (Log No: 2005.1285, Doc No: 0506MM11).

Subsequently, additional data recovery was conducted in consultation with SHPD (Log No:2005, Doc No: 0504MM49) along the seaward edge of the Site 22978 complex in 2005 for a water line and access road. This corridor will be conveyed to the County of Hawaii. The additional data recovery report (Haun et al. 2005) was approved by SHPD in July 2006 (Log No: 2006.2396, Doc No: 0607JT47). The subject project electrical service extension will be installed on the seaward side of the access road.

The remaining portions of Site 22978 will be treated in accordance with a preservation plan (Haun and Henry 2002c) approved by SHPD (Log No: 2003.0435; Doc No: 306MM03) as follows:

1. The site will be plotted accurately on grading plans and construction plans prior to the initiation of any grading, grubbing, and/or construction activities;

2. A buffer zone of 16 ft shall be identified southern side of the site. The western boundary of Site 22978 follows the edge of a water line and access road (*Figure 4*). These boundaries will be delineated with orange plastic fencing. An archaeologist will verify that the fencing is correctly in place prior to any land alteration. The verification will be documented in a letter to DLNR-SHPD; and:

3. Construction supervisors will be explicitly notified as to the nature and location of the site, the significance of the buffer zones, and the meaning of the buffer zone markings.

The work associated with the proposed Keopu-Pu`uhonua Well and Reservoir Project will occur outside of the designated Site 22978 preservation area and will not affect any sites that are protected by the preservation plan. Based on the results of the inventory survey and subsequent data recovery work, all sites outside of the preservation plan area have been adequately documented and require no further preservation. Thus, we request a determination of no effect of historic properties for the subject project.

If you have any questions or comments, please contact me at 982-7755.

Sincerely,

Alan E. Haun, Ph.D.
Principal Investigator

cc: Melissa Kirkendall
Planning Solutions, Inc.

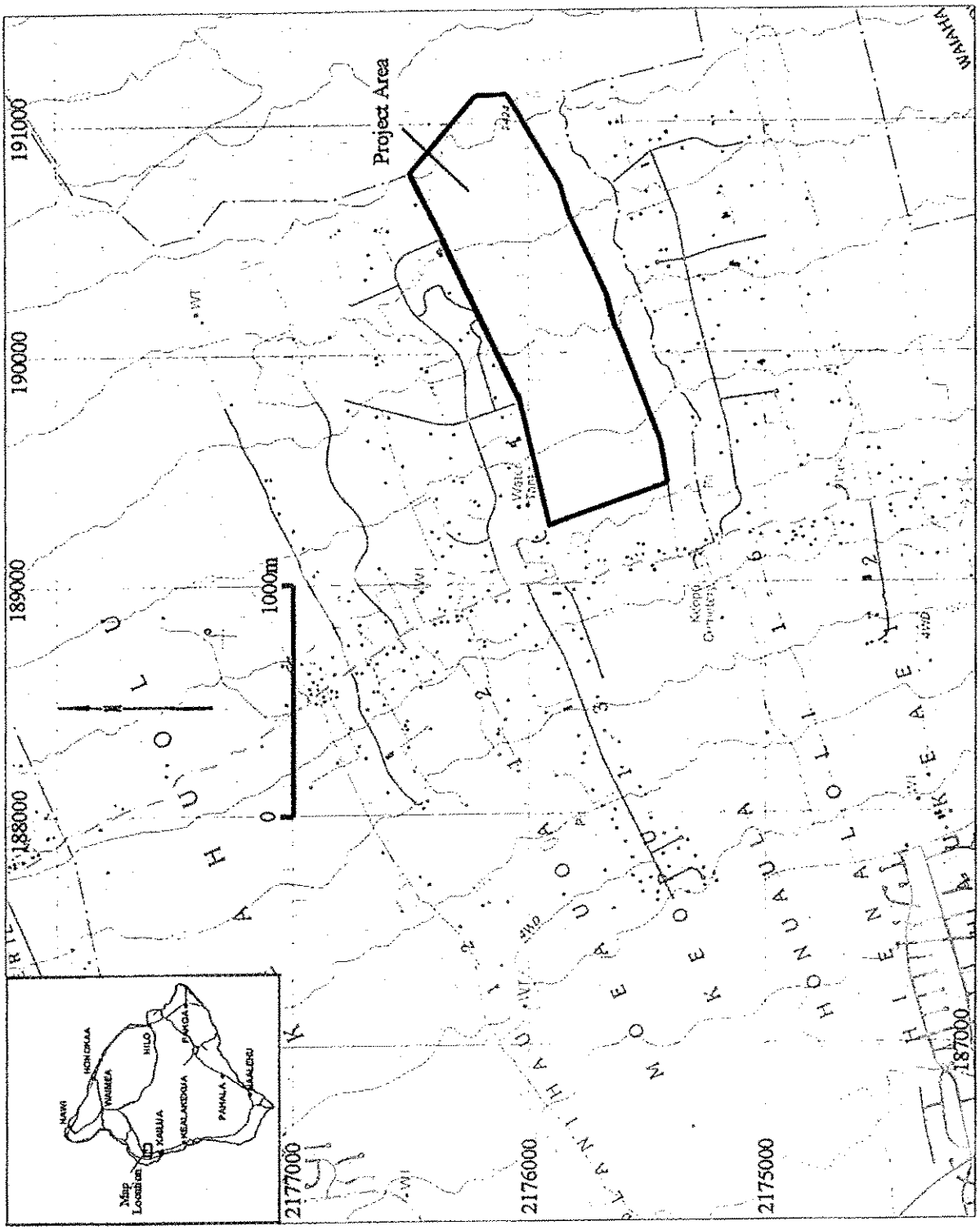
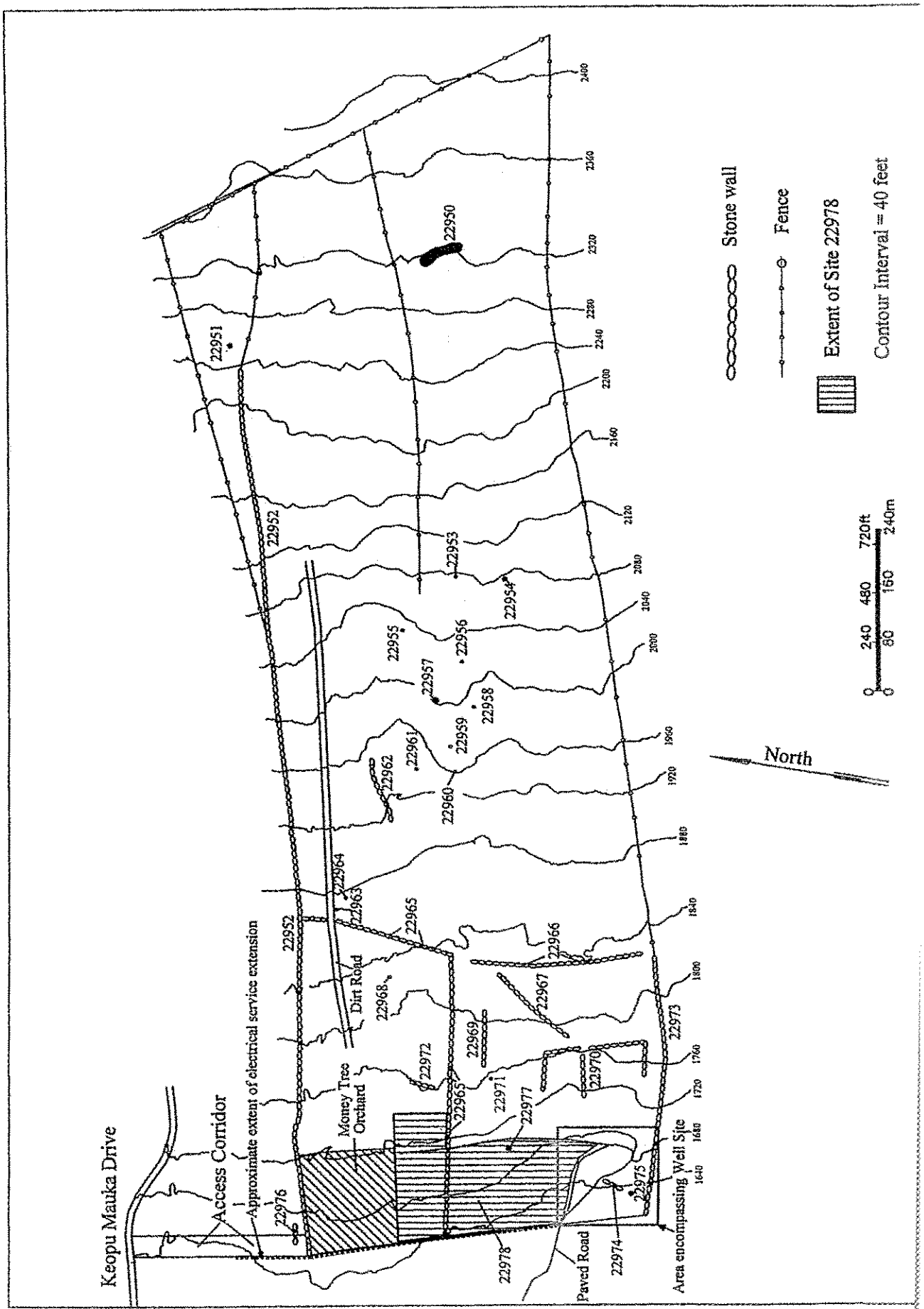


Figure 1. Portion of 1996 USGS Kailua Quadrangle Showing Project Area


Keopu Mauka Drive
Access Corridor
Approximate extent of electrical service extension
Money Tree Orchard
Dirt Road
Paved Road
Area encompassing Well Site
22950
22951
22952
22953
22954
22955
22956
22957
22958
22959
22960
22961
22962
22963
22964
22965
22966
22967
22968
22969
22970
22971
22972
22973
22974
22975
22976
22977
22978
Stone wall
Fence
Extent of Site 22978
Contour Interval = 40 feet
0 240 480 720ft
0 80 160 240m
North

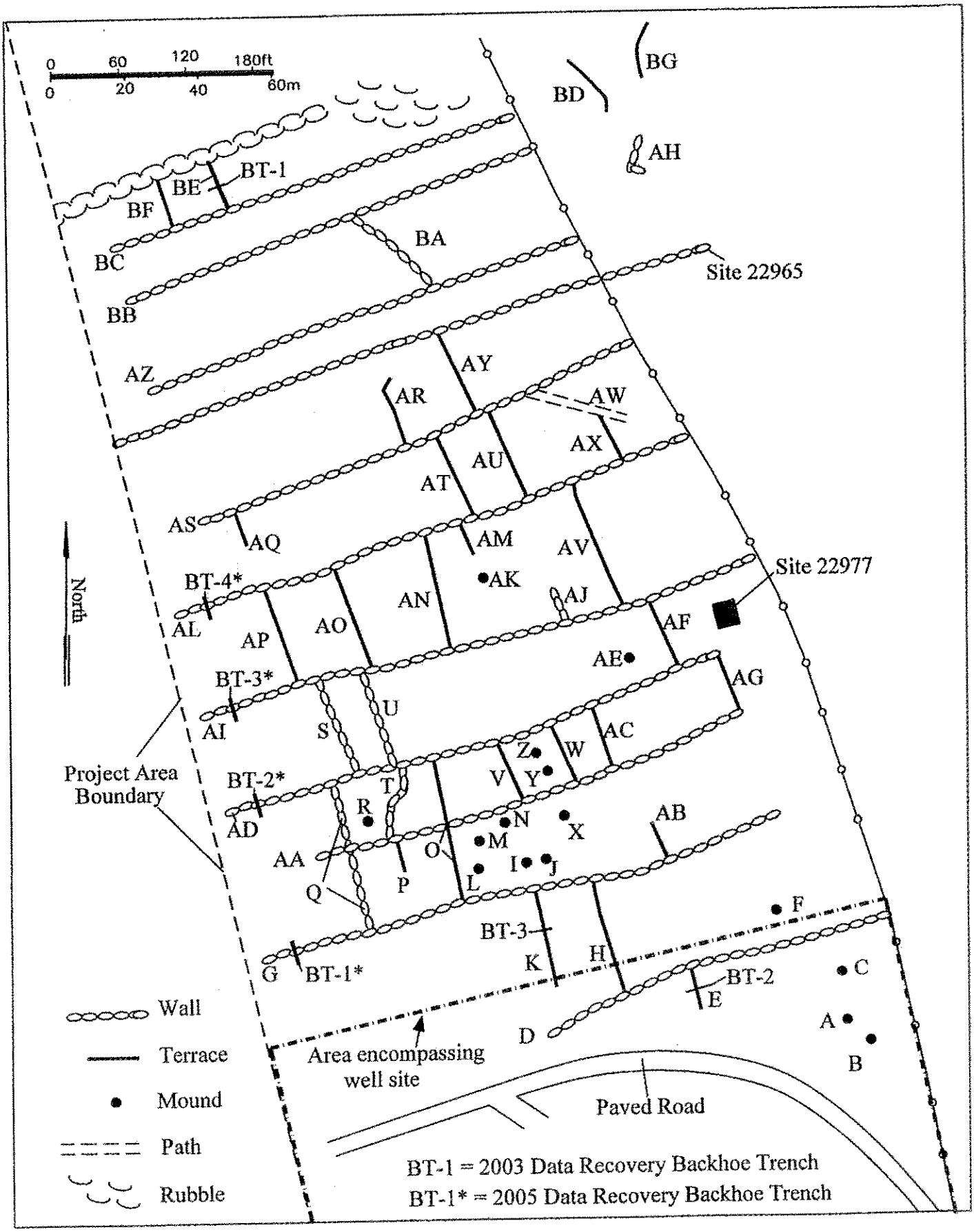


Figure 3. Site 22978 Plan Map

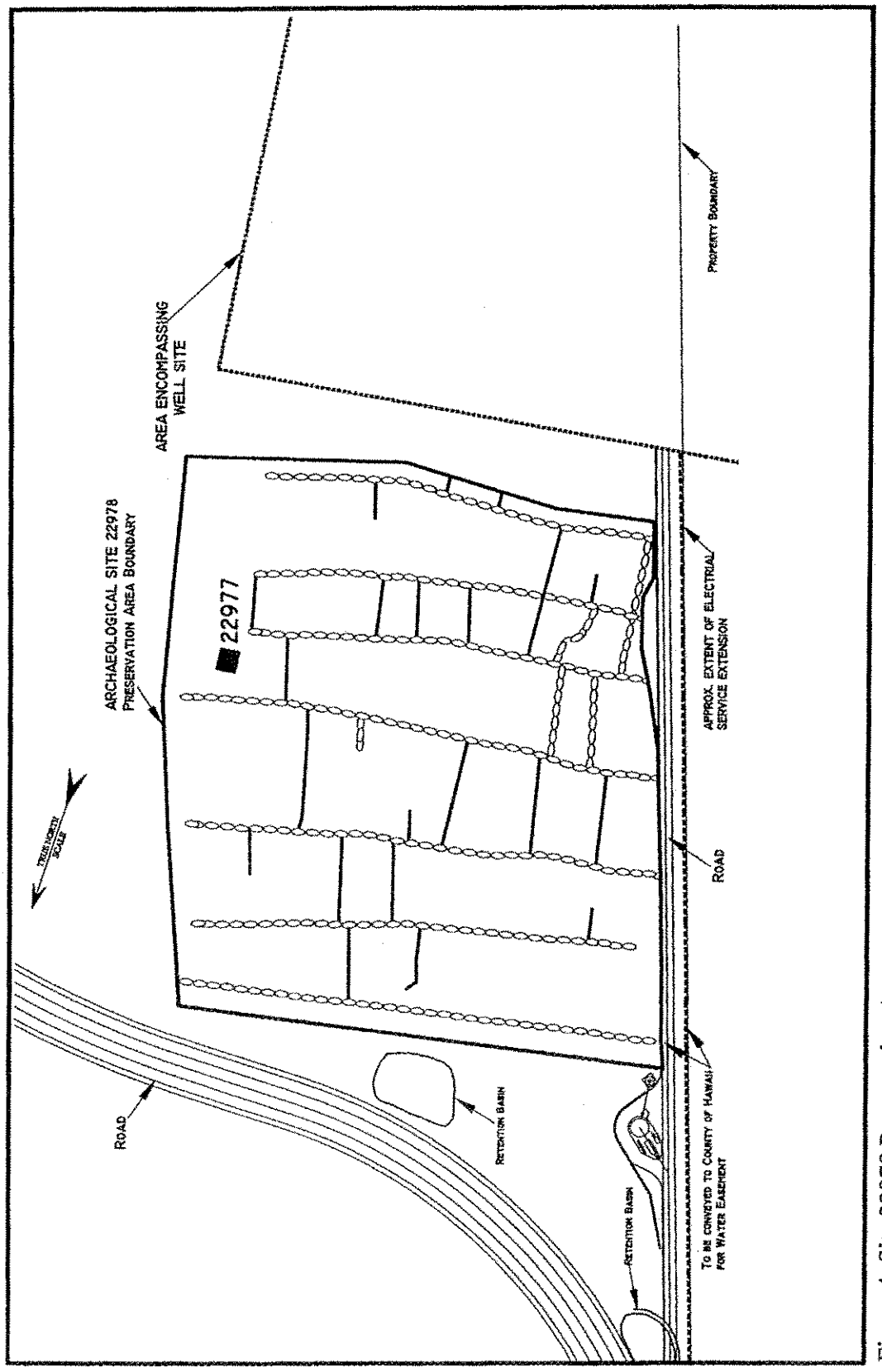


Figure 4. Site 22978 Preservation Area

References Cited

Haun, A.E. and J.D. Henry
2002a Archaeological Inventory Survey TMK: 7-5-001: 44, 115 Honuaula, North Kona District, Island of Hawai'i. Prepared by Haun & Associates (Report 085-032302) for John Price & Associates, Inc. Las Vegas, NV.

Haun A.E., and J.D. Henry
2002b Archaeological Data Recovery Sites 22950, 22953, 22954, 22955, 22960, 22968, and 22978. Land of Honuaula, North Kona District, Island of Hawai'i (TMK: 7-5-001: 44). Prepared by Haun & Associates (Report 217-100902) for Sunra Coffee LLC, Kailua-Kona, HI.

Haun A.E., and J.D. Henry
2002c Archaeological Site Preservation Plan, Site 22978. Land of Honuaula, North Kona District, Island of Hawai'i (TMK: 7-5-001: 44). Prepared by Haun & Associates (Report 219-100802) for Sunra Coffee LLC, Kailua-Kona, HI.

Haun A.E., J.D. Henry, and D.M Berrigan
2003 Archaeological Data Recovery Sites 22950, 22953, 22954, 22955, 22960, 22968, and 22978 Land of Honuaula, North Kona District, Island of Hawai'i (TMK: 7-5-001: 44). Prepared by Haun & Associates (Report 217-111003) for Sunra Coffee LLC, Kailua-Kona, HI.

Haun A.E., J.D. Henry, and D.M Berrigan
2005 Addendum: Archaeological Data Recovery Site 22978 Land of Honuaula, North Kona District, Island of Hawai'i (TMK: 7-5-001: 44). Prepared by Haun & Associates (Report 432-080405) for Sunra Coffee LLC, Kailua-Kona, HI.

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

STATE HISTORIC PRESERVATION DIVISION
601 KAMOKILA BOULEVARD, ROOM 555
KAPOLEI, HAWAII 96707

May 4, 2007

Dr. Alan Haun, Ph.D.
Haun and Associates
HCR 1 Box 4730
Keaau, Hawai'i 96749

LOG NO: 2007.0107
DOC NO: 0704MK34
Archaeology

Dear Dr. Haun:

SUBJECT: **Chapter 6E-42 Historic Preservation Review – [County/DWS]**
Request for a Determination of No Effect for the DWS Keopu-Puuhonua Well and Reservoir Project
Keopu and Honuaula Ahupuaa, North Kona District, Island of Hawaii
TMK (3) 7-5-011:115, 044

Thank you for the opportunity to provide comments on the above County of Hawaii Department of Water Supply request for the subject well and reservoir project.

We concur that no historic properties will be affected by this undertaking because:

- ☐ Intensive cultivation has altered the land
- ☐ Residential development/urbanization has altered the land
- ☐ Previous grubbing/grading has altered the land
- ☐ An accepted archaeological inventory survey (AIS) found no historic properties
- ☒ SHPD previously reviewed this project and mitigation has been completed
- ☒ Other: *The archaeological inventory survey of the above parcels included the well and reservoir site, conducted by Haun and Associated in 2002 has been approved by this office (LOG NO. 30381/ DOC NO: 0207RC30). Four sites were identified and consisted of ranch walls, a mound, and the southern edge of a large agricultural complex. SIHP 22978 (the agricultural complex) has been slated for a combination of data recovery and preservation. Portions of SIHP 22978 have been subjected to data recovery in 2003 under an approved data recovery plan (LOG NO: 2003.0434/ DOC NO: 0306MK02) and the report documenting the results has been reviewed and accepted (LOG NO: 2005.1285/ DOC NO: 0506MK11). Additional data recovery was conducted in consultation with SHPD (DOC NO: 0504MK49) along the seaward edge of the complex, on land that will be conveyed to the County for waterline and access road. The additional data recovery was reviewed and accepted by this office (LOG NO: 2006.2396/ DOC NO: 0607JT47). A buffer zone is in place protecting the southern side of this site. The western boundary of SIHP 22978 follows the edge of a water line and access road. We believe that no historic properties will be affected by the proposed undertaking.*

Post-it® Fax Note 7671	Date	# of pages ▶ 2
To Melissa White	From Kawika	
Co./Dept.	Co. SHPD	
Phone #	Phone # 243-1285	
Fax # 550-4549	Fax #	

In the event that historic resources, including but not limited to artifacts, lava tubes, blisters or caves, or human skeletal remains, are identified during routine construction activities, all work needs to cease in the immediate vicinity of the find, the find needs to be protected from additional disturbance, and the State Historic Preservation Division, needs to be contacted immediately at (808) 243-5169.

Aloha,

Melanie Chinen, Administrator
State Historic Preservation Division

MK:kf

c: Chris Yuen, Planning Director, County of Hawaii FAX 961-8742 (Hilo) and 327-3563 (Kona)
Milton Pavao, Dept. of Water Supply, FAX 961-8657
Bruce McClure, Dept. of Public Works, FAX 961-8321

MAY - 4 2007