BOARD OF WATER SUPPLY

CITY AND COUNTY OF HONOLULU

630 SOUTH BERETANIA STREET

HONOLULU, HAWAII 96843

April 4, 1994

Mr. Brian J.J. Choy, Director
Office of Environmental Quality Control
State of Hawaii
220 South King Street, Fourth Floor
Honolulu, Hawaii 96813

Dear Mr. Choy:

Subject: Final Environmental Assessment (EA) for the Waimanalo Exploratory Well III at Waimanalo, Oahu, TMK: 4-1-08: 05

We request the subject final EA be published in the April 23, 1994 OEQC Bulletin as a Negative Declaration. Please find the completed OEQC Bulletin Publication Form and four (4) copies of the document attached for your use.

If you have any question, please contact Barry Usagawa at 527-5235.

Very truly yours,

KAZU HAYASHIDA
Manager and Chief Engineer

Attachment

1994-04-23-OA-FEA-Waimanalo Exploratory Well III

ENVIRONMENTAL ASSESSMENT

FOR AN EXPLORATORY WELL AND ACCESS ROAD

AT WAIMANALO, OAHU

Proposing Agency

HONOLULU BOARD OF WATER SUPPLY
City and County of Honolulu
630 South Beretania Street
Honolulu, Hawaii 96843

Contact

Barry Usagawa, 527-5235

Prepared by:

MAGUIRE GROUP INC.
1600 Kapiolani Boulevard, Suite 601
Honolulu, Hawaii 96814

March 1994

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1.3 AGENCIES CONSULTED IN MAKING THE ASSESSMENT

Office of Environmental Quality Control

Department of Land & Natural Resources

1.4 PROJECT OBJECTIVES AND BACKGROUND

In the fiscal year ending June 30, 1991, the Honolulu Board of Water Supply (BWS) system served a population of over 830,000. Average daily water demand on the island during this period was 156 million gallons (mg). According to BWS projections, average daily water demand in the year 2010 will be 191 mg, an increase of 23 percent.

To meet growing demands for water, BWS has initiated a comprehensive groundwater development program. As part of this program, BWS proposes to drill an exploratory well in Waimanalo to determine the yield and quality of water supplies which may be withdrawn from this location.

1.5 PROJECT AND SITE DESCRIPTION

The proposed exploratory well will be located in Waimanalo on State land handled by DLNR and leased to Meadow Gold Dairies. The site is located at the foot of the northeastern face of the Ko'olau range near the northern boundary of the Waimanalo Forest Reserve.

Access to the well site is available via unimproved agricultural roads through the Meadow Gold Dairies property and pastures. The project will involve extending an agricultural road about 250 feet to obtain access to the site and clearing a work area for test drilling. A hole about 12 inches in diameter will then be drilled to a depth of about 500 feet. Once the drilling is completed, a 12 inch diameter steel casing will be grouted into place in the hole about 350 feet down and a pump will be installed. A series of pumping tests will be conducted to determine the potential sustained yield and quality of water from the aquifer. Water from the pumping tests will be routed overland and discharged to either the Maunawili or the Kailua ditch.

Upon completion of the testing, the well driller will remove the pump, cap the well, and clean the area. The total project will require an estimated six to seven months to complete.

1.6 POTENTIAL IMPACTS, MITIGATION MEASURES, AND ALTERNATIVES

No significant adverse impacts are expected during the drilling and pump testing. Short-term impacts during construction of the well and testing will include localized soil disturbance and increases in noise resulting from site access and the operation of drilling equipment. No permanent impacts are anticipated. Mitigation measures will be carried out to minimize soil erosion and short-term impacts of equipment noise.

Alternatives to the project have been considered, and are: no action, development of alternative sources, and delaying the project. None of these alternatives would enable the Board of Water Supply to successfully achieve its stated objectives. Additionally developing sources at other sites should be considered.

1.7 GOVERNMENTAL PERMITS AND APPROVALS

The following permits and approvals will be required:

Well Construction Permit and Water Use Permit - Department of Land and Natural Resources

Grading Permit - Department of Public Works

CHAPTER 2
PROJECT DESCRIPTION

2.1 PROJECT SITE

The site for the proposed exploratory well is near the base of the northeast face of the Koolau Range between the pastures of the Meadow Gold Dairies and the Waimanalo Forest Reserve. Figure 3 is a regional map indicating the general location of the proposed well. Located at an elevation of about 240', the site slopes steeply to the north, toward the pastures of the dairy. It is accessible via the agricultural roads of the dairy and an unimproved road leading into the forest above (south of) the pasture. Figure 4 provides photographs of the site location.

The well site [TMK 4-1-08:5] is owned by the State and leased to Meadow Gold Dairies. It is designated on the City and County of Honolulu Development Plan Land Use Map as AGRICULTURE, land dedicated to agricultural use. The City lists the planned use of the site as agricultural although a subdivision (92-188) was proposed for part of the tract in 1992. The part of the tract to be occupied by the well site is presently forested land between a powerline easement and the upper edge of a field presently in use for grazing horses.

2.2 PROJECT FEATURES

The following table describes the features of this exploratory well site.

Item	Waimanalo Exploratory Well
Tax Map Key (TMK)	4-1-08:5
Total parcel area (acres)	142.41 Acres
Flood Insurance Rate Map (FIRM)	Flood Zone D Areas of undetermined, but possible, flood hazard

Project Features (cont'd)

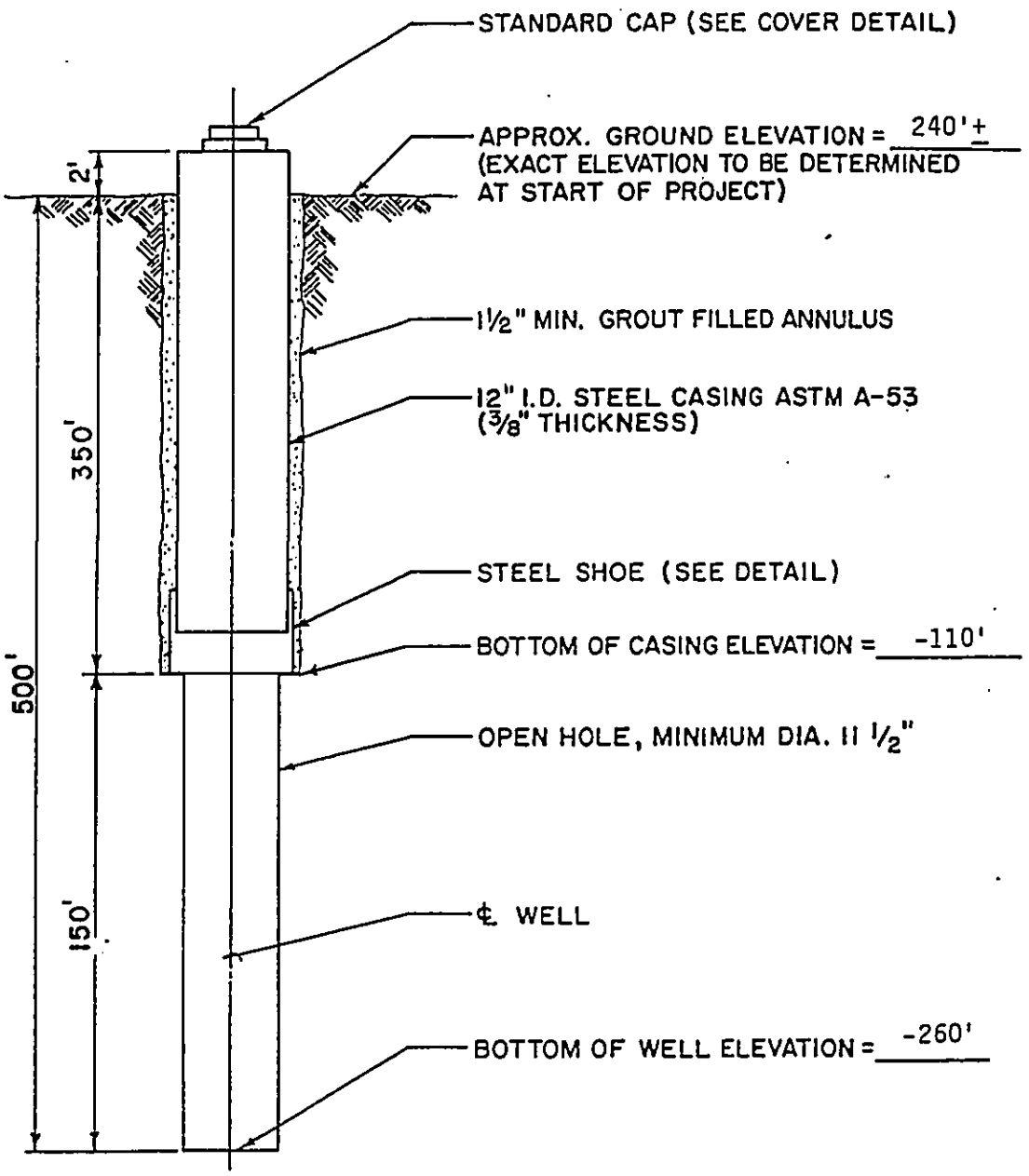
Item	Waimanalo Exploratory Well
State Land Use District	Agricultural
State Water Management Area	Windward Water Mgmt. Area
City & County of Honolulu Development Plan	Agriculture
City & County of Honolulu Zoning	AG-2
Estimated yield of production well	0.5 MGD
Type of Aquifer	Ko'olau Dike System (Perched)
Land Owner	State - handled by DLNR and leased to Meadow Gold Dairies
Nearest Access	Unimproved Agricultural Roads

2.3 PROPOSED FACILITIES AND ACTIVITIES

The project will involve installation of an access road, a test well, pumping and testing equipment. The access road will be installed by using a bulldozer to extend the existing forest road an additional 250' southward.

An area of about 5,500 square feet will be cleared and graded at the project site to accommodate well drilling and support equipment and necessary supplies. All excess material from the clearing and grading of the project site will be disposed at an approved location. Once the area has been cleared, a temporary fence may be erected to secure the project site.

Clearing and grading and test pumping operations will be restricted to hours from 7:30 a.m. to 3:30 p.m. on weekdays to minimize disturbance. No activities will occur on the project during weekends and holidays.



WELL DETAIL

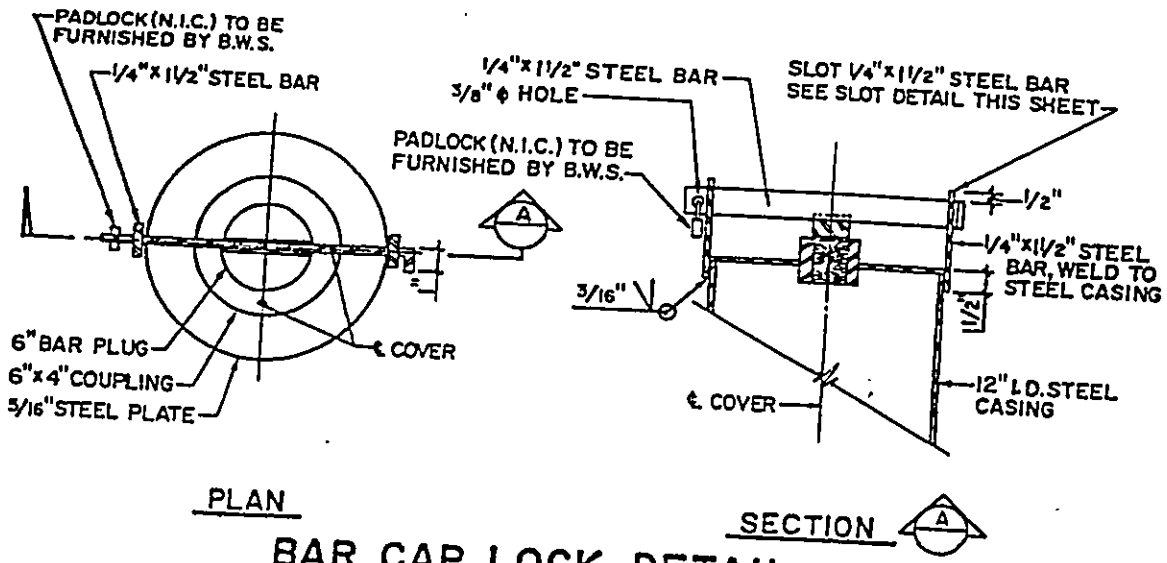
NOT TO SCALE

BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU

WELL DETAIL (1)

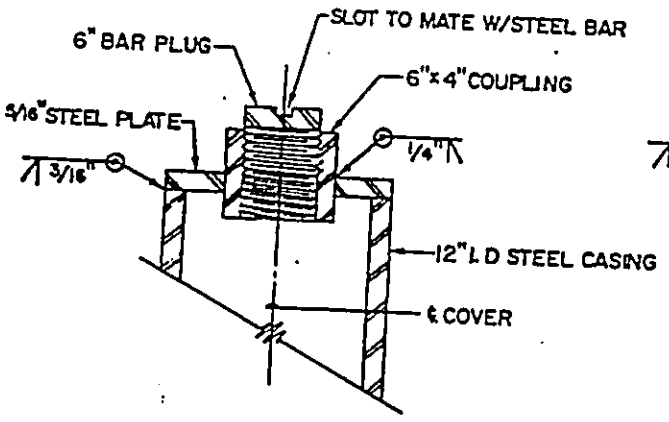
APPROVED:
CHIEF, PLANNING AND ENGINEERING DIVISION — DATE 6/12/92

FIGURE NO. 1

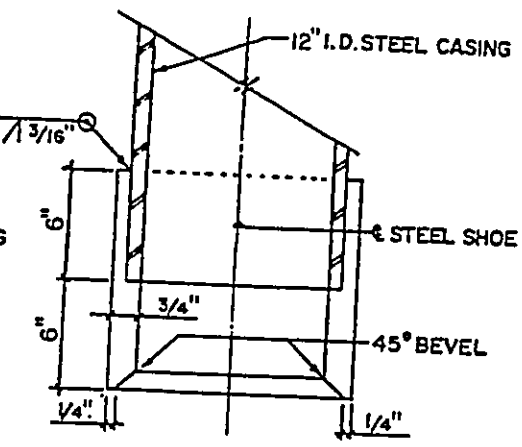


BAR CAP LOCK DETAIL

NOT TO SCALE

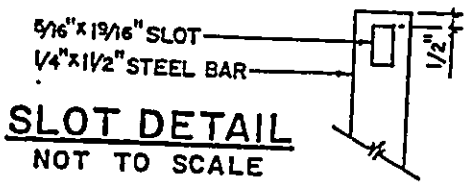


COVER DETAIL



STEEL SHOE DETAIL

NOT TO SCALE



SLOT DETAIL

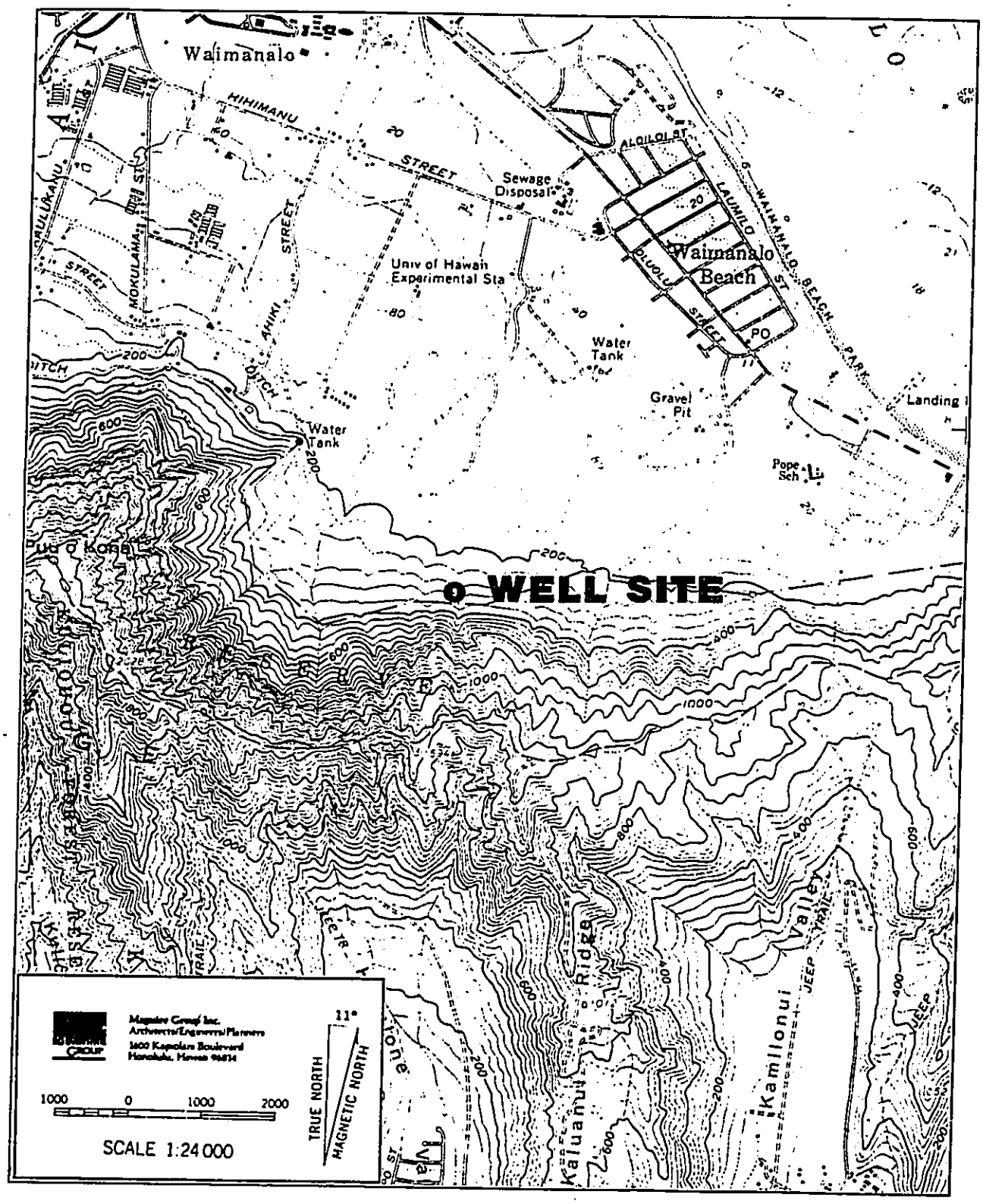
NOT TO SCALE

BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU

BAR CAP LOCK DETAIL

APPROVED:
CHIEF, PLANNING AND ENGINEERING DIVISION
5/12/92
DATE

FIGURE NO. 2



Location of the Proposed Waimanalo III Test Well

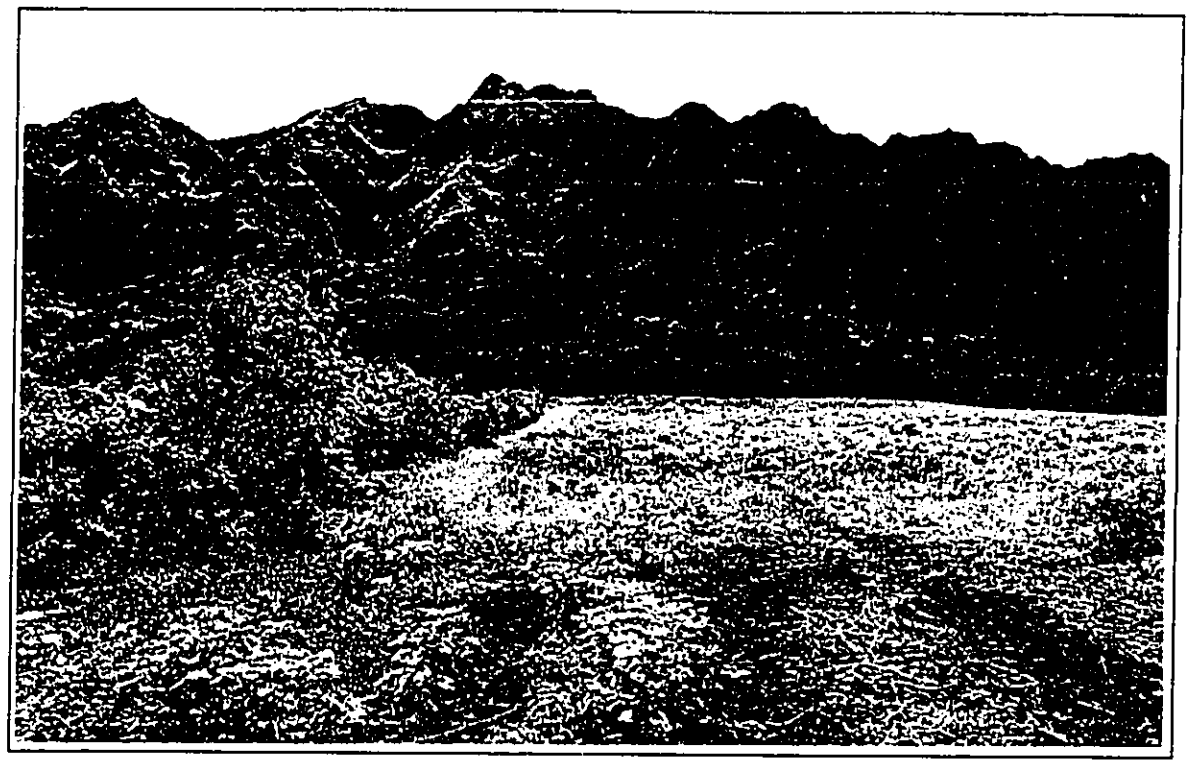


Photo 1: View Looking Southward toward Waimanalo III Site

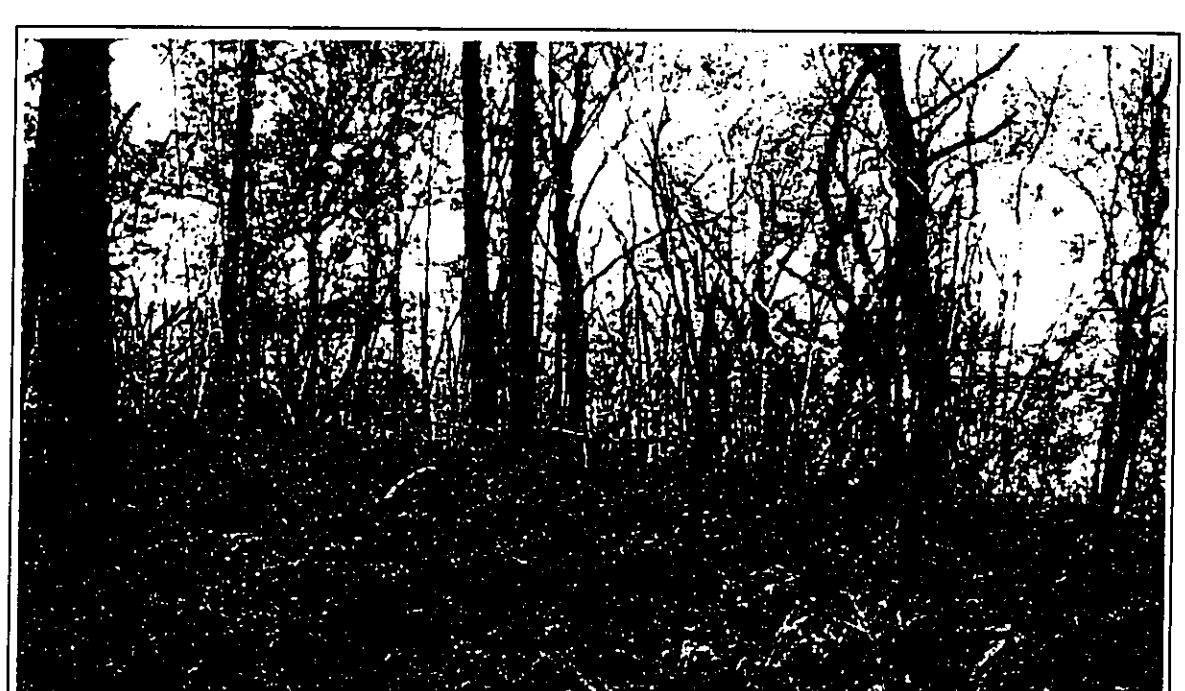


Photo 2: Proposed Location of Waimanalo III Test Well

Once the site has been cleared and secured, a truck or trailer-mounted well drilling rig and other support equipment will be brought to the project site for the exploratory drilling operation. The truck engine or a self-contained engine will be used to provide power for the well drilling rig. A single well hole about 12 inches in diameter will be drilled at the project site to reach the groundwater source.

One of two existing types of drilling methods, either cable tool or rotary, will be used. The cable tool drilling method is performed by repeatedly raising and dropping a heavy drill bit until the desired depth has been reached.

All waste material from the cable tool drilling operation is bailed from the hole and collected in a pit constructed on the project site or discharged on the surface. In either case, the waste material will be disposed of in an approved manner. The waste material generated from this drilling method does not contain any contaminants. Depending on the depth and geologic formations encountered, the well drilling may require up to a maximum of six months to complete.

If the rotary method is used, a drill bit rotating at moderate speed will bore the well while drilling fluid is pumped down the drill stem to the bit at the bottom of the hole. The drilling fluid, bentonite, a fine clay material, is then forced back up the hole carrying drill cuttings to the surface where they are removed from the drilling mud by a screen. The mud is then collected in a mud tank mounted on the site of the drilling rig. The collected mud is recirculated from the mud tank and is not considered a hazardous material. No surface runoff of the drilling mud will be permitted. When the drilling is complete, the drilling mud will be taken away from the project site and disposed in an approved manner. Some drilling contractors use air and foam to lift cuttings rather than drilling mud for the entire operation.

Once the water table is reached, instead of drilling fluid, an air compressor will be used to pump air or an air foam mixture down to the drill bit. This will ensure that drilling mud does not enter the aquifer. This rotary drill method of drilling may require three to four weeks to complete.

Once the drilling is completed, a 12" diameter steel casing will be grouted into place within the bore hole to a depth of at least 50 feet below the water table. A test pump will be installed in the well. The pump will be used to withdraw water from the well to test water quality and potential yield. Two pumping tests will be conducted. The first will be a short-term test conducted over a 5 hour period to evaluate yield and drawdown. The second will be a long-term test involving continuous pumping over a five day period. When the test pumping has been concluded, the drilling contractor will remove the pump and discharge line, cap the well, remove all equipment and miscellaneous materials, and clean the work area.

If the results show that development of the water source penetrated by the well is feasible, the Board of Water Supply expects to convert the test hole for long-term production. This will require installation of a permanent pump, control station and pipelines. Production well development will be subject to the environmental review process as stipulated in Chapter 343, Hawaii Revised Statutes, and Chapter 200 of the State Department of Health Regulations.

2.4 PUMP TEST

Two types of pump tests will be conducted after the drilling operation is completed. The initial test, a step-drawdown or yield-drawdown test, involves pumping water from the well at various pumping rates to estimate the specific capacity (number of gallons withdrawn per foot of drawdown) of the well. The drawdown will be measured for each pumping rate. Once the drawdown has stabilized, the pumping rate will be changed and a new drawdown measured. A step-drawdown test may last up to five hours, and will be performed from about 9:00 a.m. to 2:00 p.m. on a weekday.

After the step-drawdown test has been completed, a five-day sustained pumping test will be undertaken. The well will be pumped 5 hours the first day, and 8 hours per day for the next four days. This test is designed to determine the sustainable capacity of the well, and monitor water quality. (The sustainable capacity of a well is the rate at which the well can

be continuously pumped without adversely affecting nearby existing wells or water quality.) Water pumped during the pump test will be collected and tested for organic compounds as required by the U.S. Environmental Protection Agency (EPA); heavy metals, minerals, hazardous materials, coliform and standard plate count for bacteria. The tests are performed by the BWS and, in some cases, by the State of Hawaii Department of Health.

Upon completion of the five-day pumping test, the well driller will then remove the pump, cap the well, and clean the area, removing all excess materials and wastewater withdrawn during test pumping. The well will be capped after testing to prevent misuse of the well such as for disposal of hazardous wastes, sewage, or household garbage. According to the U.S. Environmental Protection Agency Underground Injection Control Section, unplugged or improperly abandoned water wells can easily become receptacles for the disposal of waste which may contaminate the groundwater aquifer.

2.5 PROJECT SCHEDULE AND COST

The project schedule will depend upon approval of required permits and other necessary licenses. For planning purposes, the BWS estimates the exploratory well drilling will occur within the Fiscal Year 1993-94.

The project will cost an estimated $430,000. Funds for the project are available in the BWS budget for the fiscal year ending June 30, 1993.

2.6 NEED FOR THE PROJECT

The Board of Water Supply currently serves a population of more than 830,000 persons (Board of Water Supply 1982). Island-wide average daily water demand was about 156 million gallons per day (mgd). The Windward District, extending from Hauula to Waimanalo served approximately 125,000 to 130,000 residents in 1990. Water demand in the district is presently about 20 mgd. Windward sources will be used to meet Windward demands first before being diverted to the Honolulu district which accommodates half of

its demand from sources within the district, while the remainder imported from the Pearl Harbor District and the Windward District. Pumpage from the Pearl Harbor aquifer cannot be further increased without risking serious encroachment of sea water into the basal water lens. The Department of Land and Natural Resources, Commission on Water Resource Management, currently limits the Honolulu District's total allowed draft from the Pearl Harbor aquifer to 38.14 mgd. The Commission on Water Resource Management recently designated the windward district a Water Management Area. All water withdrawals within this area are controlled by the Commission.

The demand for the Windward District is projected to remain relatively constant, however, demand for water in the Honolulu District is projected to continue to increase to 92 mgd by the year 2010. During this period, island wide water demand is projected to rise by nearly 23 percent. To meet growing demand, the Board of Water Supply is seeking to identify, test, and develop new groundwater sources. Some of these new sources will be used to meet demand in the districts within which the sources are developed, some will be transferred to meet the growing demand in Honolulu. If the Waimanalo III source is determined to be feasible for development, an estimated 0.5 mgd may be added to the BWS system.

The BWS has considered a number of alternatives for production of potable water. Water conservation programs are already in place to try and reduce per capita water demand. Alternatives to expanded use of groundwater sources include desalination, development of surface systems, use of brackish sources with dilution, and recycling of treated wastewater. At present, each of these alternatives is presently considered unacceptable for technical, health, and/or cost reasons.

CHAPTER 3
EXISTING CONDITIONS

3.1 PHYSICAL ENVIRONMENT

3.1.1 Geology

Windward Oahu is located on the northside of the Ko'olau Volcano. Profound erosion by Windward Streams and marine influences have removed the formations leeward of the caldera to the Pali. Eventual linkage of their headwalls joined to form the steep cliffs which are now characteristic of the windward side of the Ko'olau range. During this same period, alluvial and marine sediments accumulated in the valleys as sea level rose and fell during glacial and inter-glacial periods.

A major feature of the Ko'olau range is an extensive dike system which formed in the rift zone. The dikes were formed when molten rock flowed into fissures in the volcano and then cooled and solidified. Because these flows solidified under pressure, they formed rock which is much denser and much less permeable than the older, surrounding lava flows. Rainfall not lost to evapotranspiration or surface runoff infiltrates into the highly porous Ko'olau basalt and is stored as groundwater between the relatively impermeable dikes.

3.1.2 Hydrology

The proposed well location has been selected so to tap into the water bearing basalts of the Koolau dike complex. It is located mauka of the Kailua and Maunawili ditch, between two small intermittent streams which originate high in the Waimanalo Forest Reserve. The ditches are man-made drainage channels used to carry water for irrigation of the surrounding agricultural lands. The ditch water originates from water tunnels in Maunawili Valley to the north. Water flows by gravity through a system of flumes, ditches and tunnels to Waimanalo. The ditches are usually dry except when water is required for irrigation.

The streams are narrow drainageways which flow intermittently, carrying runoff northward through the agricultural fields and across Waimanalo Beach to Waimanalo Bay. They are fed principally by runoff although some of their flow may originate from dike leakage or marginal dike zone overflow.

3.1.3 Topography

The proposed well site is located at an elevation of about 240' above sea level. It is located near the base of the nearly vertical northeast face of the Ko'olau range on land which slopes steeply toward the north.

3.1.4 Climate

Average monthly temperature in the vicinity of the proposed well site is approximately 75°. It ranges from 72° in January to 78.5° in August (State of Hawaii Data Book, 1987). Exposed to the prevailing northeast tradewinds off the ocean, the windward coast of Oahu experiences very little variation in temperature between day and night. Rainfall in the area originates when tradewinds are intercepted and forced upward by the peaks of the Ko'olau range, dropping their moisture as they rise and cool. The proposed well site is in an area which receives a mean annual rainfall of about 75" (Atlas of Hawaii, 1973).

3.1.5 Soil

Soils in the vicinity of the proposed well site are classified by the U.S. Department of Agriculture Soil Conservation Service (SCS) as belonging to the Rock land-Stony steep land association (SCS 1972). These are steep to precipitous, well-drained to excessively drained, rocky and stony soils. More specifically, the soils at the proposed site are classified as Kaena very stony clay.

The Kaena soils consist of very deep, poorly drained soils on alluvial fans and talus slopes. These soils developed in alluvium and colluvium from basic igneous material. The SCS

describes a representative profile as follows:

> "The surface layer is very dark gray clay about 10 inches thick. The next layer, 36 to more than 48 inches thick, is dark gray and dark grayish-brown clay that has prismatic structure. It is underlain by highly weathered gravel. The soil is very sticky and very plastic and it is mottled. It is slightly acid to neutral. ...there are many stones on the surface and throughout the profile. Runoff is medium to rapid, and the erosion hazard is moderate to severe."

Given the site slope and character of the vegetative cover at the well site, the erosion potential at the site is moderate. The soil capability classification is VIs. Class VI soils have severe limitations that make the generally unsuited to cultivation. Subclass VIs soils have very severe limitations because of stoniness or texture.

The proposed well site is on land which is not in agricultural use and is not suited to agricultural use. The U.S. Department of Agriculture Soil Conservation Service and the Hawaii Department of Agriculture do not classify Kaena soils as agricultural land (Dept. of Agriculture, 1977) of importance. The areas directly downgradient, through which access to the site would be obtained, are not classified as "prime" agricultural land by the Soil Conservation Service, but are classified as agricultural lands of importance to the state of Hawaii by the State Department of Agriculture.

3.1.6 Natural Hazards

According to the National Flood Insurance Program Flood Insurance Rate Map, the proposed well site is in zone D, an area in which flood hazards are undetermined (FEMA, 1987). This generally indicates that the risk of flooding within the area is not significant enough to warrant detailed study by FEMA. Given the site elevation and relationship to the stream, the risk of flooding of the site is negligible.

Earthquake risk in the vicinity is also minimal. The island of Oahu is classified as a Seismic Zone 1 area, in which damage would be minor in the event of an earthquake (Uniform Building Code, 1988).

3.1.7 Flora and Fauna

A biological assessment of the project area was performed in October of 1992 by the B.P. Bishop Museum biological staff. Their report on the site is appended to this Environmental Assessment. The dominant vegetation on the site is the forest cover, with an understory and groundcover consisting of those species listed in Table 1. Table 1 provides the scientific names of the plants found on the site, following the taxonomy and nomenclature of St. John (1973) and Wagner, Herbst and Sohmer (1990). The scientific name is followed by the Hawaiian name and/or the most widely used common name for the subject species. An asterisk before the plant name indicates that the plant was introduced to the Hawaiian Islands either by the aborigines or since Cook's arrival in the islands. As can be seen from Table 1, the vegetation on the site is composed predominantly of alien species.

None of the species found on this site are listed or proposed for listing on the federal list of threatened or endangered species (USFWS, 1990) and none are considered threatened, endangered or rare species at the state level (State of Hawaii, 1990).

TABLE 1

SPECIES IDENTIFIED ON THE WAIMANALO III SITE

Eucalyptus

Levcaena Levcephala

Rivina humilis

Koa Haole

3.1.8 Archaeological Resources

An archaeological inspection of the proposed well site was conducted in October of 1992 by archaeological staff of the B.P. Bishop Museum. Although that pedestrian survey could not have detected subsurface remains, it was felt that an inventory level survey was not warranted, since grading would be limited to previously disturbed areas immediately adjacent to and at the project site. The archaeologists report is appended to this

Environmental Assessment. Findings of the archaeologist generally indicate the possibility of archaeological remains being present. We therefore plan to have an archaeologist present to monitor all site work.

3.2 Socio-economic Environment

Located high above Waimanalo, with extensive agricultural fields between it and the nearest residences, the proposed well site is not in the immediate vicinity of any particular residential, commercial or industrial development. Its impact is expected to be regional in nature. The population on the island of Oahu has been steadily increasing. The Windward district is one of the locations within which marginal growth has been forecasted to occur. City, County and State population projections indicate that the Windward district population will reach 126,013 by the year 2000, with a predicted daily water usage of 20.20 million gallons. The proposed Waimanalo III test well is one of several sources of water proposed for development to meet the needs of expanding population within the Windward Water District.

CHAPTER 4
POTENTIAL IMPACTS AND MITIGATION MEASURES

4.1 TEMPORARY IMPACTS

The development of a test well at the Waimanalo III site will result in short-term impacts on the environment in the immediate vicinity of the project area. No significant adverse impacts are expected during the drilling and pump testing. Short-term impacts during construction of the well and testing will include localized soil disturbance causing fugitive dust and temporary increases in noise resulting from the operation of drilling equipment.

Localized soil disturbance will result from extension of the access road and from clearing and grading of the vicinity of the well head to provide a work area for installation of the well and pumping equipment. It is anticipated that the affected area will be relatively small, about 15'x 200' (3,000 sq. ft.) for the road and about 50'x 50' (2500 sq. ft.) for the work area. Because of the potential for soil erosion once the vegetation is removed from the Kaena soils, every effort will be made to minimize the amount of soil disturbance. A silt fence and erosion barriers will be used to minimize erosion during the clearing of the road and work area. A grading permit showing erosion control measures will be filed with the City Dept. of Public Works by the contractor. The site will be revegetated with grass species as soon as possible after completion of the installation and testing work.

Noise will be produced by the drilling equipment and by the operation of the test pump. This minor increase in noise levels will not result in any significant adverse impacts because of the distance between the well location and populated areas. All operations will be restricted to daylight hours.

4.2 IMPACTS ON STREAM FLOW AND STREAM ENVIRONMENT

The well testing will require that water be withdrawn from the aquifer penetrated by the well. This water will be discharged to the ground and will flow to the Maunawili ditch

resulting in a temporary increase in flow to adjacent fields. The increase in flow is expected to be within the range of peak flows normally experienced within the ditch system and will not result in any flooding or adverse impacts in downstream areas. Because of the extreme permeability of downgradient soils, it is expected that much of the water will be absorbed by the ground downgradient, recharging the basal lens of water in the Waimanalo area. Water from test pumping will be dissipated through baffles to minimize erosion and excessive turbidity.

4.3 IMPACTS ON AGRICULTURAL SOILS

As noted in Chapter 3, the proposed well site is located in an area which is not used for agriculture and is not suitable for agricultural use because of the steep grade. Access to the site will be obtained across agricultural lands of importance to the State of Hawaii, but will be confined to access roads which are already in existence across that land. The proposed action will have no impact on the agricultural capability of the Waimanalo area.

4.4 IMPACT ON ARCHAEOLOGICAL RESOURCES

As noted in Chapter 3, archaeological review has indicated the possibility of archaeological remains being present. We therefore plan to have an archaeologist present to monitor all site work.

4.5 IMPACTS ON SOCIO-ECONOMICS

The Board of Water Supply will be working closely with the State Department of Land and Natural Resources to address concerns regarding BWS source developments on State Lands. Water rights and water allocation issues should be addressed but in avenues beyond the scope of this exploratory well environmental assessment.

CHAPTER 5
ALTERNATIVES

5.1 NO ACTION

The no action alternative would not meet the objectives of the Board of Water Supply for this project. This project is part of an overall groundwater development program intended to increase the municipal water supply to meet growing demand. If the Board's new water sources program is curtailed, it would not be able to provide adequately for the water needs of the population of the island in the future, which may result in restrictions in new development as well as regional water shortages.

5.2 ALTERNATIVE SOURCES

The Board of Water Supply has considered a variety of other alternatives to the development of new groundwater sources. Alternatives considered include direct use of stream flow, blending and use of brackish water resources, demineralization of brackish water sources, desalinization of sea water and direct reuse of treated wastewater. None of these alternatives at this time offers the potential to economically or cost-effectively produce water supplies of the quality which can be obtained through the proposed program.

5.3 DELAYED PROJECT

Delay in the proposed well testing program would increase the risk that population growth will lead to increasing water demands in excess of the available supplies. Delay of the project will not materially alter the environmental impacts of the project and has the potential to increase project costs.

5.4 ALTERNATIVE WELL SITES

In addition to evaluating alternative water sources, the Board of Water Supply has plans to test a number of other potential sites for development of groundwater resources. These alternative sites also offer opportunities as groundwater supply sources, but are to be considered in addition to, rather than as alternatives to, the proposed well testing program. The Waimanalo III test location has been selected by the Board of Water Supply because it offers the potential to supply a significant quantity of high quality water which may not be obtainable at alternative sites. Developing and testing a well at the Waimanalo III site is the most reasonable alternative given the relative remoteness of the site and the insignificant impacts associated with its development.

CHAPTER 6
DETERMINATION

In accordance with Chapter 343, Hawaii Revised Statutes, it has been determined that an Environmental Impact Statement is not required for the proposed Waimanalo III exploratory well and test pumping. This determination has been made based primarily on the short duration of the project and its minimal impacts on the environment. The project will result in some negative impacts, but these can be minimized or alleviated by the suggested mitigation measures. The identified impacts have been determined to be less significant in comparison to the potential benefits to be provided by the water supplies which may be obtainable from the Waimanalo III well.

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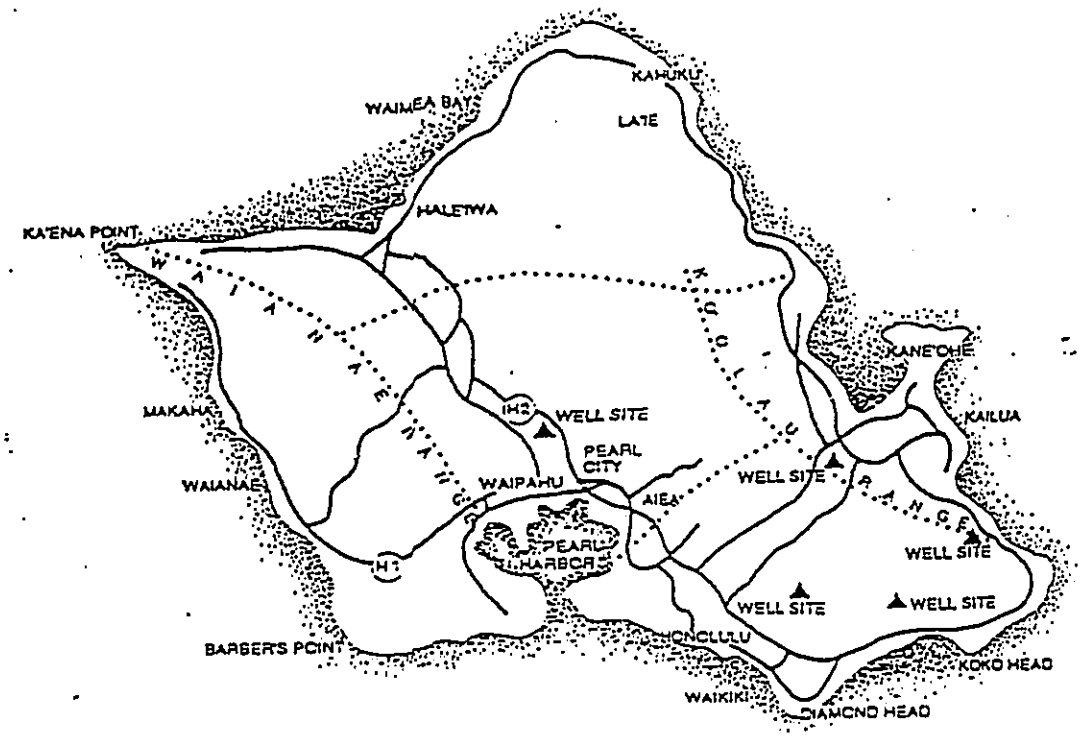
ARCHAEOLOGICAL REPORT

AN ARCHAEOLOGICAL RECONNAISSANCE OF FIVE BOARD OF WATER SUPPLY WELLS ON O'AHU, HAWAI'I



Prepared by

Boyd Dixon, Ph.D.
Supervising Archaeologist

Prepared for

Maguire Group, Inc.
Architects/Engineers/Planners
1600 Kapi'olani Blvd.
Honolulu, HI 96814

October 27, 1992

Revised
October 15, 1993

Public Archaeology Section
Applied Research Group
Bishop Museum
Honolulu, Hawai'i

Project #503
MS #102792

AN ARCHAEOLOGICAL RECONNAISSANCE OF FIVE BOARD OF WATER SUPPLY WELLS ON O'AHU, HAWAI'I

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Anthropology Department
Bishop Museum
Honolulu, Hawaii

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ABSTRACT

During October 1992, the Applied Research Group of the Bishop Museum conducted an Archaeological Reconnaissance as part of an Environmental Impact Assessment for five (5) exploratory water wells proposed by the Board of Water Supply for the City and County of Honolulu, under contract to the Maguire Group, Inc. Four of these locations-- Waipahu, Kāne'ohe, Waimānalo, and Mānoa failed to yield any cultural remains on the surface. The fifth location, in Kūpaua Valley, contained the remains of a culturally-modified bedrock terrace and one polished stone adze, on the surface, near the proposed well site on the east bank. Survey of the access road along the west bank also encountered possibly-modified bedrock terracing above the stream bed.

ACKNOWLEDGMENTS

The author would like to thank Mr. Ken Rappolt of the Maguire Group for the cooperation and patience he has shown in dealing with the sometimes alien profession of archaeology. In particular, his willingness to accompany Bishop Museum staff on a preliminary tour of the five water well locations greatly facilitated our work in the field from a logistical standpoint.

Within the Applied Research Group at the Bishop Museum, fieldwork was shared equally by Steve Clark, Maurice Major, and Angela Steiner-Horton, who also assisted with the cataloging of documents, photos, and artifacts. Hemantha Jayatilleke prepared the illustrations for this report, while Lana Pigao, Jinni Mitchell, and Chris Alper produced the final draft report. Peggy Chee and Marie Paresa coordinated our field needs, while Alan Haines was a rock of support in much more than just contracts.

INTRODUCTION

Under contract to the Maguire Group, Inc., the Applied Research Group of Bishop Museum conducted an archaeological reconnaissance of five exploratory water well locations on the island of O'ahu during October 1992. All were surveyed as part of an Environmental Impact Assessment being submitted by the City and County of Honolulu Board of Water Supply in accordance with the State of Hawaii, Title 11, Department of Health, Chapter 200, Environmental Impact Statement Rules. Any subsequent implementation of the exploratory well plans should ensure compliance with State Historic Preservation Division draft guidelines which may require additional research at these properties.

PROJECT LOCATIONS

The five exploratory water well locations are scattered around the island of O'ahu (Figure 1), situated above the 200 ft above mean sea level (famsl) elevation at the base of the Ko'olau mountain range to access known aquifers, in most cases already providing drinking water for local populations.

Waimānalo Well III

This well is located at approximately 240 famsl on Waimanalo State Forest Reserve land (TMK 4-1-11) in the *ahupua'a* (traditional land division) of Waimanalo, Koo'lau Poko District (Figure 2). Access to the project area crosses State land currently leased to Meadow Gold Dairies via trails starting at the end of Kulawai Street *mauka* from the beach park in Waimanalo. The well site and access road are on land presently forested with *Eucalyptus* as the dominant genus, although a nearby powerline has encouraged the invasion of a dense weedy understory.

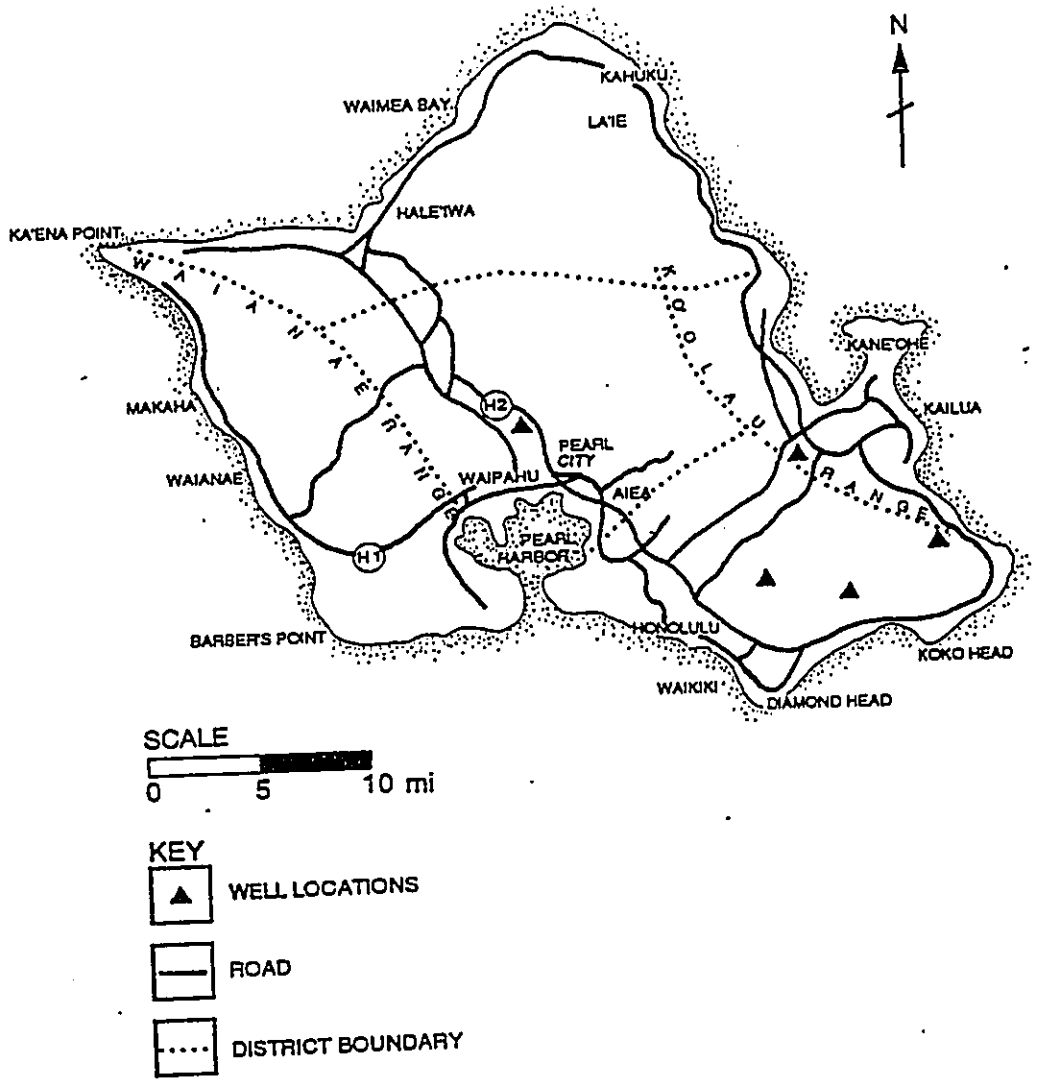

Figure 1. Location of the Five Water Wells on the Island of O'ahu.

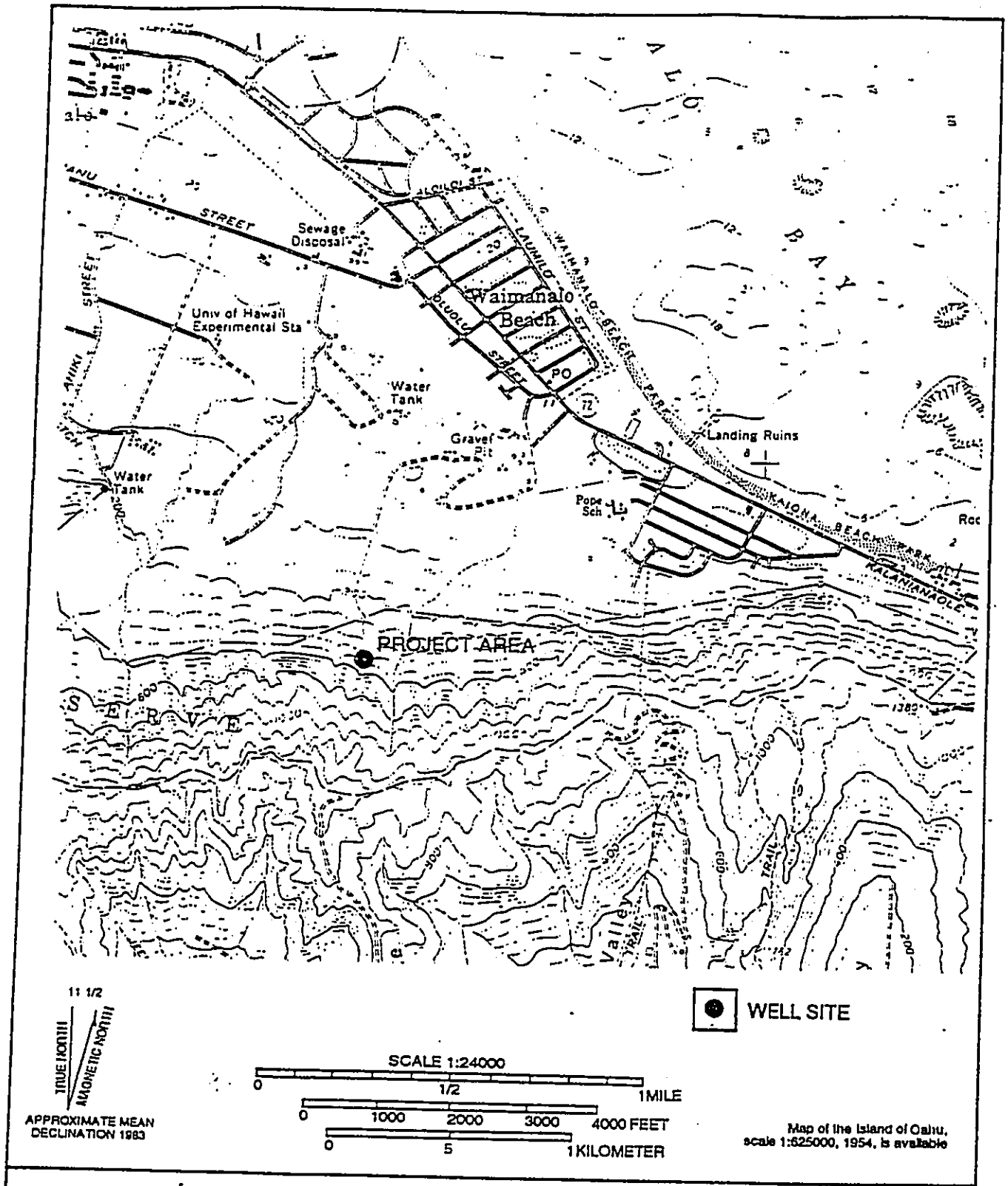

Figure 2. Location of the Waimānalo Well III.

Waipahu Well III

This well is located at approximately 280 famsl on Castle and Cooke, Ltd. land (TMK 9-4-5:74) in the *ahupua'a* of Waipio, 'Ewa District (Figure 3). Access to the well site, located in a fallow pineapple field, is provided by Kamehameha Highway, which runs immediately adjacent (east) to the project area.

Kuou Well III

This well is located at approximately 280 famsl within Ho'omaluhia Park (TMK 4-5-41) in the *ahupua'a* of Kāne'ohe, Ko'olau Poko District (Figure 4). Access to the well site is provided by a trail from the main park road, which is situated just *makai* of the H-3 Highway right-of-way and fenceline. The area is currently planted with banana trees that appears to have been there for some time.

Mānoa Well

This well is located at approximately 200 famsl within Mānoa Valley Park on City and County of Honolulu land (TMK 2-9-36) in the *ahupua'a* of Mānoa, Kona District (Figure 5). Access off Mānoa Road is provided on the lawn between the tennis courts *mauka* of Mānoa School and a small gulley bordering residential housing. The proposed location of the well is currently covered in low grasses.

Kūpaua Wells

These two alternate wells are located at approximately 300 famsl on land owned by Hawaiian Trust Co. Ltd. and the Hawaiian Humane Society (TMK 3-7-04:01) in the *ahupua'a* of Niu, Kona District (Figure 6). Access today is by a trail along the east bank of Kūpaua Stream although the route of a proposed access road up the opposite stream bank was surveyed in October. Two exploratory well locations were also surveyed, one on both sides of the stream. The entire project area is wooded with secondary regrowth of *koa haole, kiawe,* and various tall grasses although banyan, mango, and *wiliwili* trees were also observed.

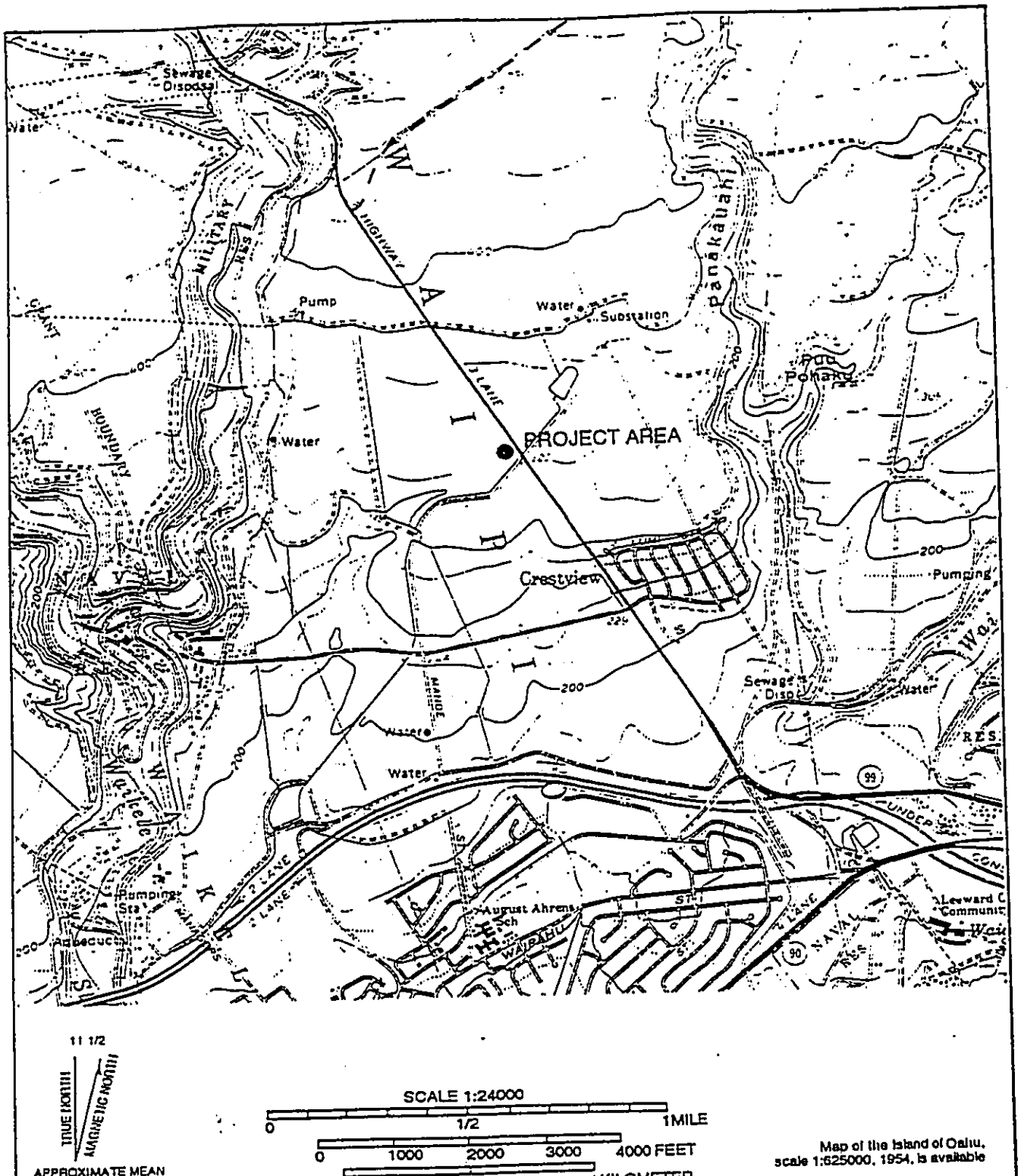

Figure 3. Location of the Waipahu Well III.

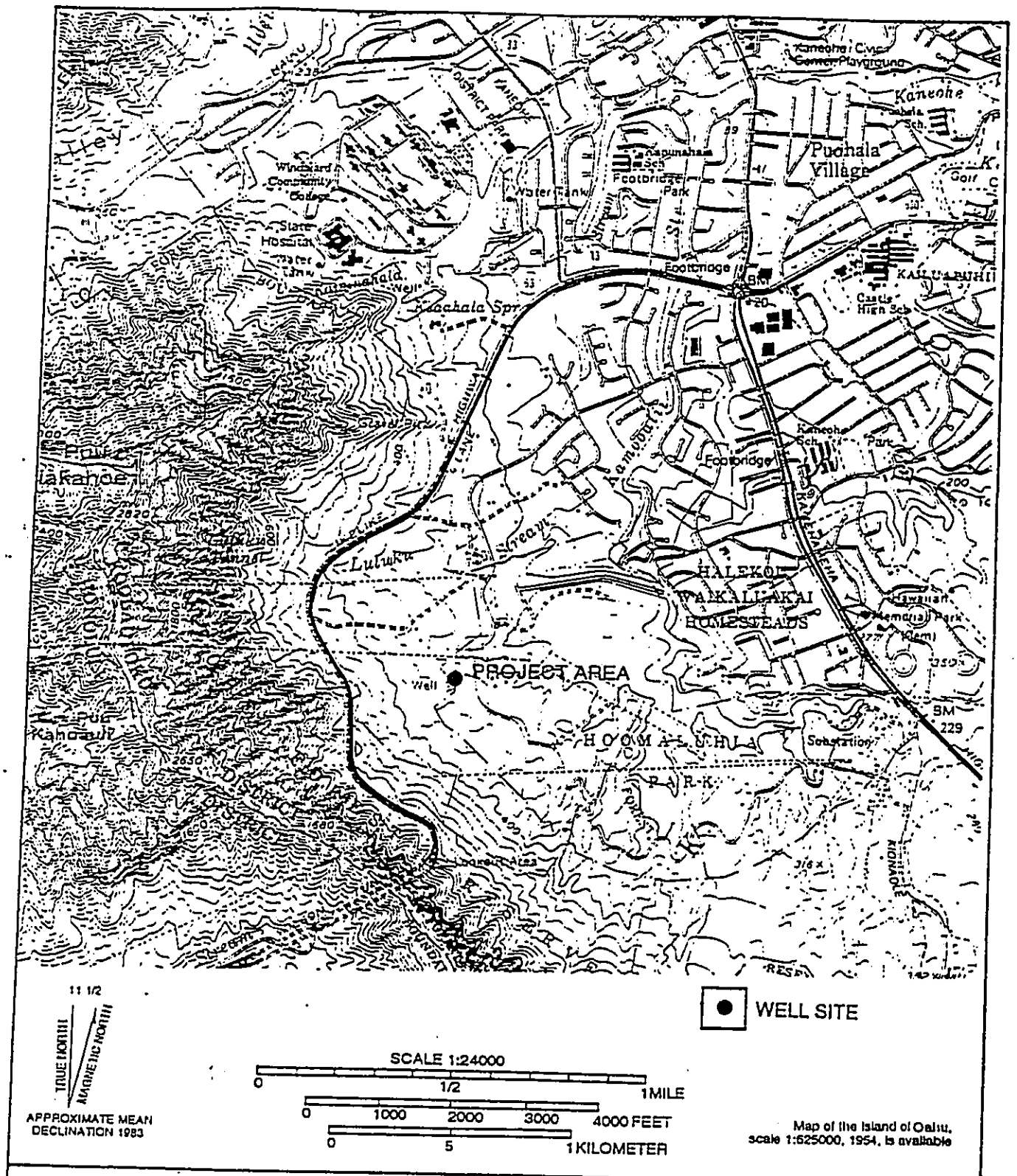

Figure 4. Location of the Kuou Well III.

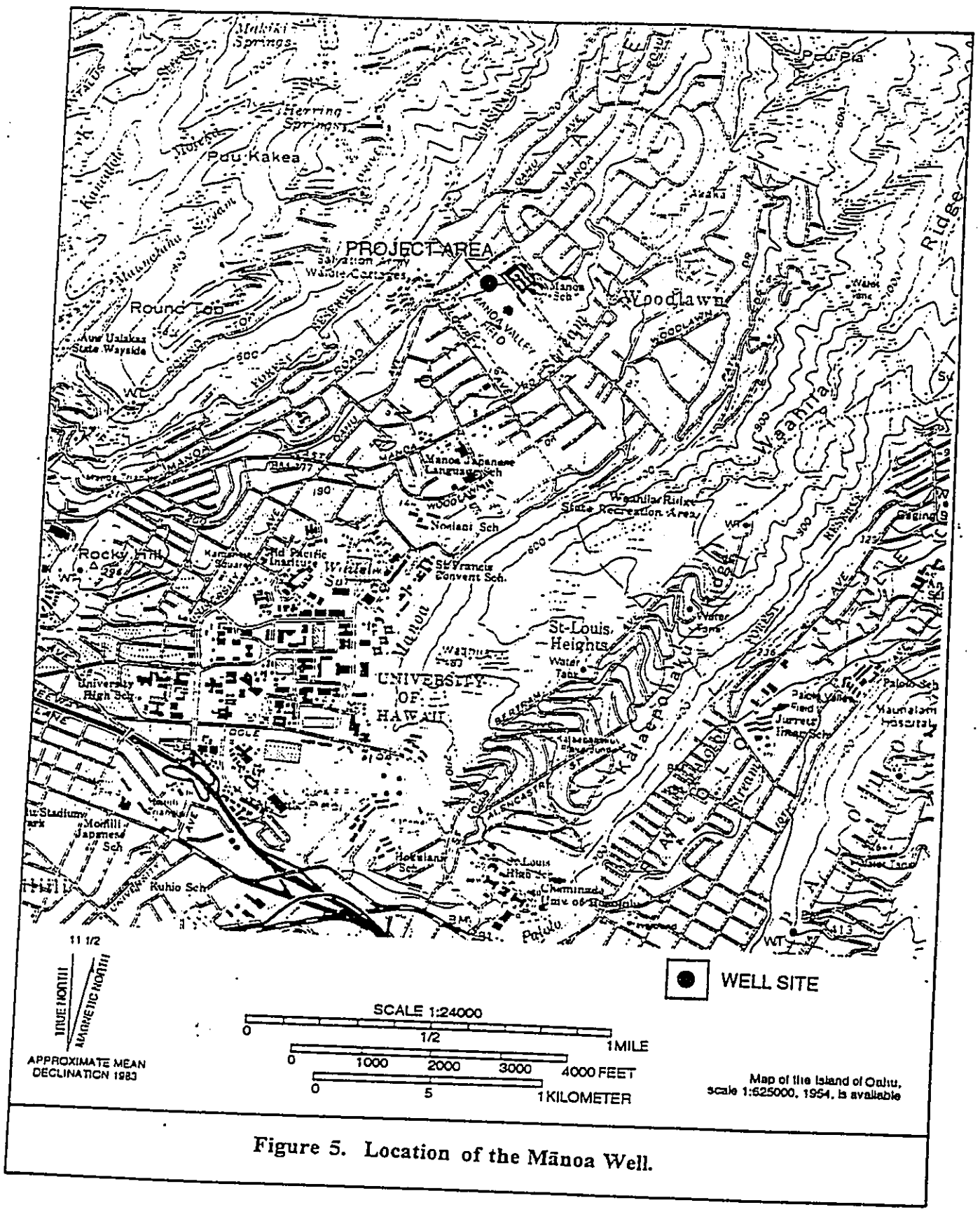

Figure 5. Location of the Mānoa Well.

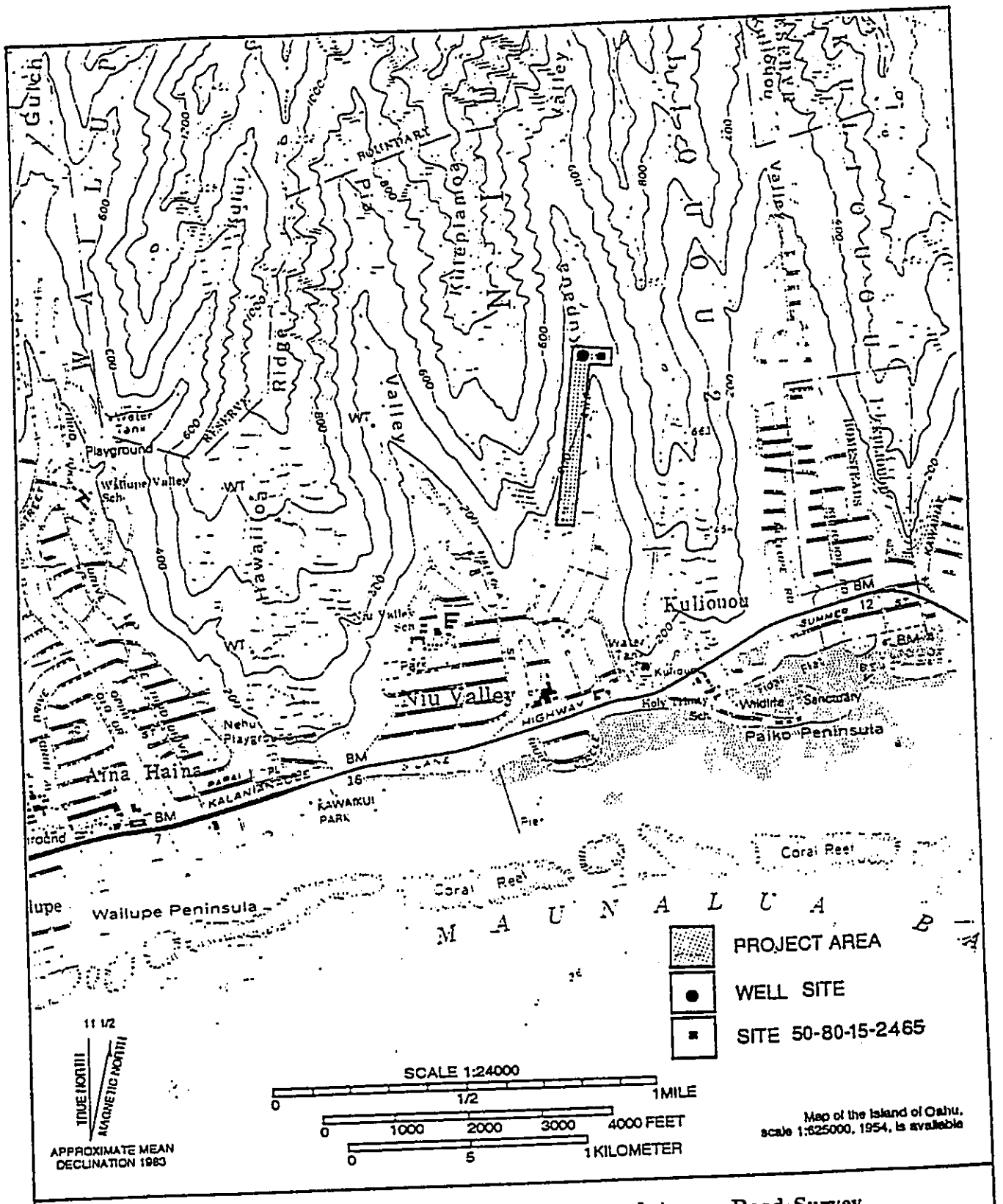

Figure 6. Location of the Kūpaua Wells and Access Road Survey.

PREVIOUS ARCHAEOLOGY

A thorough review of the previous archaeology for each *ahupua'a* containing a proposed exploratory water well location is not required for an Environmental Assessment reconnaissance prior to an Inventory level-survey (SHPD 1989). Nevertheless, a cursory search of traditional sources in the archaeological literature on the island of O'ahu (McAllister 1933; Sterling and Summers 1978; James 1992) was conducted in advance of the field survey of all five proposed well locations. In no instance was a known archaeological site located within the immediate vicinity of these project areas, although none of these areas has ever been subject to a systematic archaeological survey, according to a search of Bishop Museum Anthropology Department files. Future research in any of the five well sites should include a review of State Historic Preservation Division files as well.

Archaeological remains expected for the five areas varied with the setting, influenced as much by environmental factors as by proximity to larger coastal population centers in pre- and early post-Contact periods. On the slopes behind Waimānalo, terracing of the windward soils might be expected, as was the case *mauka* of the Kuou Well III site along Luluku Stream in Kāne'ohe (Allen 1987). In Waipahu, just above the 'Ewa Plain, leeward agricultural utilization of the slopes might have produced minimal modification of the landscape similar to that encountered *makai* of the project area (Davis 1988). But a recent survey just *mauka* of the well location revealed severe disturbances due to Historical Period agriculture (Goodman and Nees 1991). The upper valley of Mānoa was famed for its taro ponds and Historical Period royal residences (Sterling and Summers 1978:281-290; McAllister 1933:78-80) while the lower Niu Valley supported a more leeward agricultural regime (Handy 1940:155) with a *heiau* (temple) situated at the foot of the middle ridge between both streams (McMahon 1988:3).

FIELD METHODS

Methods employed during the archaeological reconnaissance varied with the degree of impact already found at each proposed water well location, but were restricted to pedestrian survey with no subsurface testing. At the Waipahu III and Mānoa well sites, only a cursory examination by the author was required, due to the extreme destruction of the previous landscape by agricultural and residential activities respectively. At the Kuou, Waimānalo, and Kūpaua well sites and access roads, a field crew of four ARG archaeologists conducted a pedestrian survey at 10-m-wide intervals across the entire length of the project areas. Bedrock outcrops were inspected for cultural modification and eroded gulleys, and surfaces were inspected to look for cultural materials.

RECONNAISSANCE RESULTS

Archaeological reconnaissance of the five exploratory water well locations on the island of O'ahu revealed four of these to have been impacted sufficiently in the Historic to recent past to effectively erase any traces of Native Hawaiian utilization of the landscape on the surface. Inspection of the exposed surfaces, moreover, failed to yield any evidence of subsurface features or activity areas. It therefore seems likely that these four well locations (Waimānalo III, Waipahu III, Kuou III, and Mānoa) were never subject to any intensive habitation or agricultural use that would have produced obvious archaeological residues, probably due to the somewhat peripheral setting of these locations in relation to water resources and traditional or historic population centers.

This assessment does not negate the possibility of subsurface remains (i.e. firepits, *imu*, or human burials) being present at all these locales, however. Downslope erosion in the case of Waimānalo and Kūpaua, agricultural soil modification at the Waipahu and Kuo locations, and urban landscaping in Mānoa may well have buried pre-Contact period deposits once visible.

KŪPAUA WELL ACCESS ROAD

Surface reconnaissance of the proposed access road alignment to the well site on the west bank of the Kūpaua Stream was conducted with four ARG archaeologists traversing dense underbrush over extremely rough exposed bedrock in many places. While these field methods were found adequate to cover the first four well locations, it was felt that a more intensive form of surface survey with clearing of vegetation and subsurface testing would be necessary along this access road to ascertain the true nature of several possibly modified bedrock outcrops encountered during the pedestrian reconnaissance.

Especially in the lower reaches of the project area just above the spillway (Figure 7), large boulder alignments paralleling the stream bed were found to contain many smaller cobbles creating a somewhat clear area immediately behind these probably natural terraces. The actual location of the proposed exploratory well on the west bank of the stream, however, appears to be free of this type of modification.

Given the setting of these potential features immediately above a permanent stream bed less than 1 km *mauka* of a substantial Native Hawaiian fishpond and *heiau* (McAllister 1933:70), the likelihood that the landscape was utilized in the past is quite high. The identification of more convincing cultural remains on the other side of the stream during this surface reconnaissance demonstrates the validity of this hypothesis.

STATE SITE 50-80-15-2465

This site consists of at least one modified cobble terrace wall located on the east bank of the Kūpaua Stream approximately 5 m *makai* of an alternate well location proposed to avoid crossing the stream drainage (Figure 7). The terrace itself is roughly 10 m long, and only stands some 30 cm tall, being a modification of a natural alignment of bedrock, probably to impede soil loss from downslope erosion.

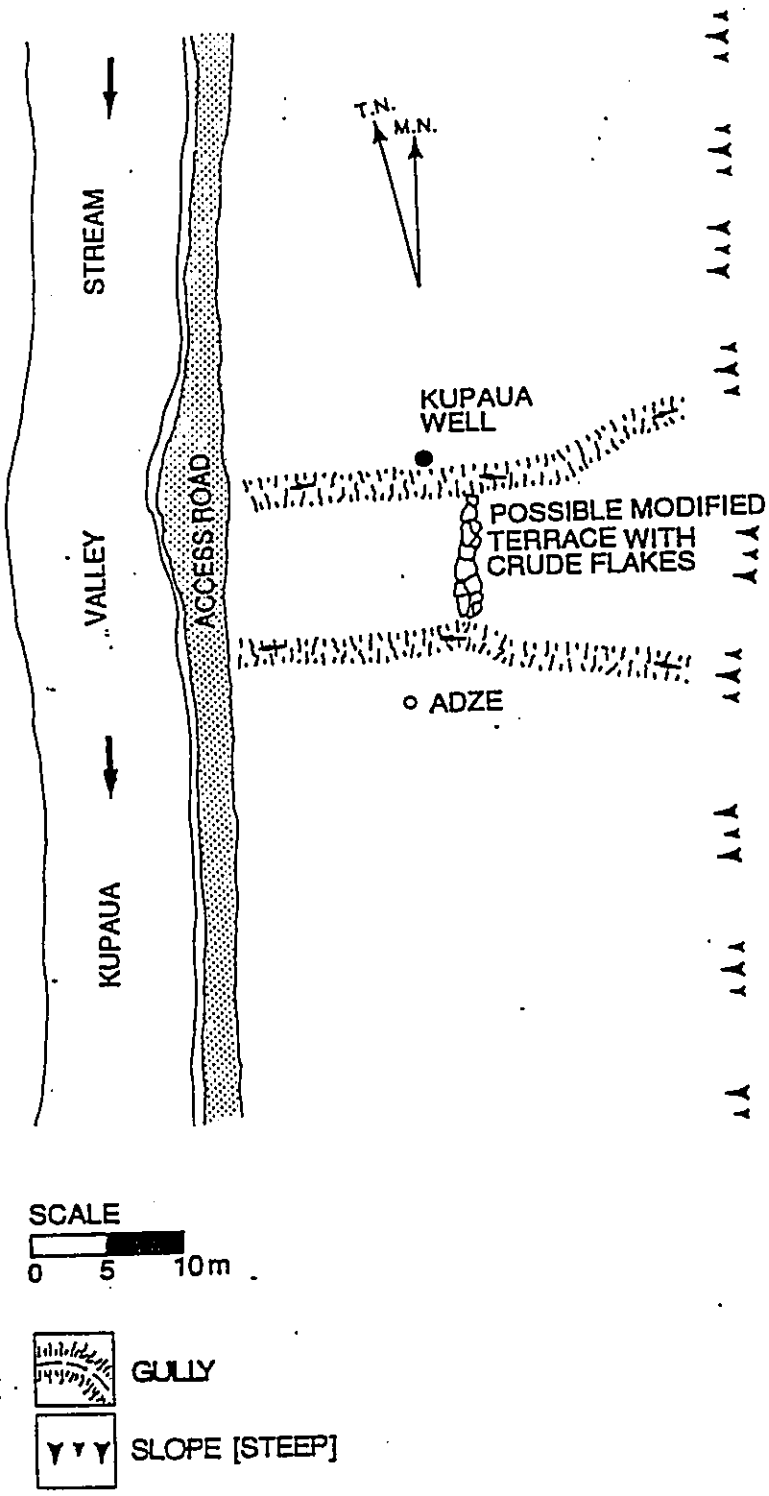

Figure 7. Sketch Map of State Site 50-80-15-2465.

Several large primary flakes of reasonable quality basalt are also located within and around the feature, although a cursory inspection of the surface (admittedly overgrown and covered with sheetwashed soil) failed to yield any smaller flakes to indicate traditional tool manufacture. This possibility was strengthened, however, by the recovery of a small polished stone adze (Figure 8) on the surface approximately 5 m *makai* of the terrace wall (Figure 7).

The issue of whether this artifact represents local use of a raw material resource would have to be resolved by basalt sourcing analysis, although the nature of the Kūpaua Valley lithic material has yet to be established (Kevin Johnson, personal communication 1992). Regardless of these analyses, however, the presence of a small polished adze, more commonly associated with wood-working, rather than forest clearing, is interesting, given its association with probable agricultural terracing. It appears likely therefore, that evidence of domestic habitation may be present in the vicinity, but more likely further up the slopes above seasonal flash floods for which the Niu Valley is known today.

CONCLUSIONS

Archaeological reconnaissance of five proposed exploratory water well locations on the island of O'ahu found four of these to contain no evidence of previous cultural remains or activities. The Waipahu III well site has been completely impacted by pineapple road construction and mechanized agriculture, as is the case for the Kuou III well site which is under banana production. The Mānoa well site, in turn, has been completely modified by landscaping associated with the construction of tennis courts adjacent to the Mānoa Elementary School. The Waimānalo III well site, on the other hand, has not been impacted by urban or commercial agricultural development, but does appear to have deforested and partially graded, both by historic ranching and more recent powerline construction.

The fifth location in the Kūpaua Valley, however, did contain artifactual and architectural evidence to suggest Native Hawaiian utilization of the area in the pre-

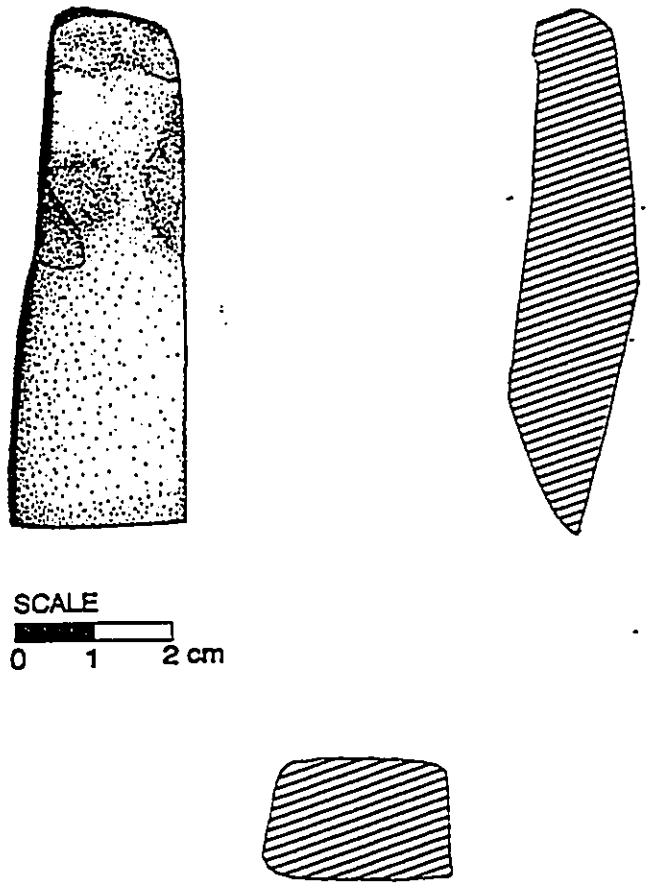

Figure 8. Stone Adze Recovered from State Site 50-80-15-2465.

or early post-Contact era. Recommended efforts to assess the nature of this occupation in Kūpaua Valley and the potential for subsurface deposits at the other four locations, are outlined below.

RECOMMENDATIONS

Given the absence of cultural remains in four of the proposed water well locations and access roads, it is recommended that an archaeological monitor be present during construction at the Waimānalo Well III, Waipahu Well III, Kuou Well III, and the Mānoa Well, if surface disturbances are minimal. This assessment can also be recommended for the well site located on the west bank of the Kūpaua Stream, if access is provided from the east bank.

The presence of positively identified cultural remains at the location of the proposed Kūpaua Well on the east bank of the stream, however, make archaeological Site 50-80-15-2465 potentially eligible to the National Register of Historic Places under Criterion D, due to its potential contribution to knowledge of past history and lifeways. The same assessment may also be the case for possible agricultural terracing located along the access road to the Kūpaua well location on the west bank of the stream. It is therefore recommended that two courses of action be undertaken to avoid negative impact to these cultural resources:

1 Access the west bank exploratory well location from across the stream bed, via the existing jeep trail.

2 Perform an Archaeological Inventory level survey of the west bank access road corridor before the route is more firmly established, to ascertain the true nature of the possible cultural remains located during the reconnaissance survey.

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BOTANIST'S REPORT

by

Dr. Loyal A. Mehrhoff
Department of Botany
Bishop Museum

Detailed Observations of Vegetation

Summary. Construction of water wells and attendant road systems does not appear to impact on any endangered or rare plant populations. The Hawaii Heritage Program's data base on the location of rare or endangered plants was searched in order to determine historical distributions of rare species. Only the Kupaua and Waimanalo Well Sites were located near know locations of rare plants. Field surveys of all sites were conducted to determine the present status of vegetation at the sites. None of the five proposed well sites have intact or high quality native ecosystems. In fact, the vegetation at four of the sites is composed entirely of alien plants. Only the Kupaua Well site has any native vegetation and this is composed entirely of scattered individual plants. Of the five native species found at this site, only two are endemic and neither of these are considered rare or endangered.

1. **Proposed Manoa Well [TMK 2-9-36]** is located entirely on a grassy lawn in a residential area of Manoa Valley. THERE ARE NO NATIVE PLANT COMMUNITIES WHICH COULD BE NEGATIVELY IMPACTED BY WELL CONSTRUCTION.

2. **Proposed Waimanalo Well III [TMK 4-1-11]** is located in a forest of alien weed trees. The dominant species are *Eucalyptus* sp., *Leucaena leucephala*, and *Rivina humilis*. Two species or rare plants are known from the vicinity or this well site; *Nesoluma polynesicum* and *Vigna o-wahuensis*. Neither species was observed in the area. THERE ARE NO NATIVE PLANT COMMUNITIES WHICH COULD BE NEGATIVELY IMPACTED BY WELL CONSTRUCTION.

3. **Proposed Waipahu Well III** is located in an existing agricultural field. No native plants were observed and there are no rare plants known from the area. THERE ARE NO NATIVE PLANT COMMUNITIES WHICH COULD BE NEGATIVELY IMPACTED BY WELL CONSTRUCTION.

4. **Proposed Kuou Well III [TMK 4-5-41]** is located in an existing banana plantation. No native plants were observed and there are no rare plants known from the area. THERE ARE NO NATIVE PLANT COMMUNITIES WHICH COULD BE NEGATIVELY IMPACTED BY WELL CONSTRUCTION.

5. **Proposed Kupaua Well [TMK 3-7-04:01]** is located in Niu Valley above existing residential areas. Niu Valley is one of the most famous collecting localities on Oahu. Many of the early Hawaiian botanists visited this valley so there is a good record of the vegetation present in the 1800's. The Hawaii Heritage Program data base has records from Niu Valley for 14 rare plants; *Bonamia menziesii, Cyanea grimesiana* ssp. *grimesiana, Eurya sandwicensis, Ctenitis squamigera, Tetraplasandra gymnocarpa, Delissea subcordata, Exocarpos gaudichaudii, Chamaesyce celastroides* var. *kaenana, Joinvillea ascendens* ssp. *ascendens, Lobelia monostachya, Phyllostegia parviflora* var. *parviflora, Rollandia lanceolata* ssp. *calycina, Melicope saint-johnii,* and *Schiedea nuttallii*. However, the current vegetation has only a few native plants, with the site dominated by alien weeds such as; *Leucaena leucephala, Schinus terebinthifolius, Asystasia gangetica,* and *Panicum maximum*. Four native species were observed; *Dodonaea viscosa* (a few scattered plants), *Sida fallax* (a small area with 20 to 30 plants), *Lipochaeta lobata* ssp. *lobata* (25 to 50 plants at the base of the cliffs), and *Erythrina sandwicensis* (several plants along the existing road on the east side of the creek). None of these species is considered rare or endangered and only the *Erythrina sandwicensis* should have special consideration (destruction of individual trees should be avoided). IT DOES NOT APPEAR THAT WELL CONSTRUCTION WOULD NEGATIVELY IMPACTED ON EITHER RARE PLANTS OR NATIVE PLANT COMMUNITIES.

AGENCIES' REVIEWS & RESPONSES

Agencies' Reviews and Responses

(1)	*(Agency)* State of Hawaii Office of Environmental Quality Control	August 12, 1993
	(Response) Board of Water Supply Office of Environmental Quality Control Brian J. J. Choy, Director	September 13, 1993
(2)	*(Agency)* City and County of Honolulu Dept. of Public Works	August 13, 1993
	(Response) Board of Water Supply City and County of Honolulu Dept. of Public Works C. Michael Street, Director & Chief	September 10, 1993
(3)	*(Agency)* City & County of Honolulu Planning Dept.	August 27, 1993
	(Response) Board of Water Supply Planning Dept. Robin Foster, Chief Planning Officer	September 22, 1993
(4)	*(Agency)* State of Hawaii Dept. of Health	August 27, 1993
	(Response) Board of Water Supply State of Hawaii, Dept. of Health John C. Lewin, M.D., Director	September 22, 1993
(5)	*(Agency)* State of Hawaii Dept. of Land & Natural Resources State Historic Preservation Division Don Hibbard, Administrator	September 16, 1993
(6)	*(Agency)* State of Hawaii Dept. of Land & Natural Resources Keith W. Ahue, Chairperson	September 23, 1993
	(Response) Board of Water Supply Dept. of Land & Natural Resources Keith W. Ahue, Chairperson	January 24, 1994

Agencies' Reviews and Responses
(cont'd)

(7)	*(Agency)* University of Hawaii at Manoa Water Resources Research Center	September 21, 1993
	(Response) Board of Water Supply UH Water Resources Research Center Jacquelin N. Miller	January 24, 1994
(8)	*(Agency)* U.S. Dept. of Agriculture Soil Conservation Service	October 22, 1993
	(Response) Board of Water Supply Soil Conservation Service Nathaniel R. Conner, State Conservationist	November 19, 1993
(9)	*(Agency)* State of Hawaii Dept. of Land & Natural Resources	November 23, 1993
	(Response) Board of Water Supply Dept. of Land & Natural Resources Keith W. Ahue, Chairperson	December 13, 1993

Aug 13 11 37 AM '93

JOHN WAIHEE
GOVERNOR

BRIAN J. J. CHOY
Director

STATE OF HAWAII
OFFICE OF ENVIRONMENTAL QUALITY CONTROL
220 SOUTH KING STREET
FOURTH FLOOR
HONOLULU, HAWAII 96813
TELEPHONE (808) 586-4185

932:79

Dep PG

AUG 16 1993

August 12, 1993

Mr. Kazu Hayashida
Manager and Chief Engineer
Board of Water Supply
City and County of Honolulu
630 South Beretania Street
Honolulu, Hawaii 96843

Attention: Mr. Roy Doi

Dear Mr Hayashida:

Subject: Draft Environmental Assessment for the Proposed Waimanalo Exploratory Well Project, TMK: 4-1-08:05, Waimanalo, Oahu

Thank you for the opportunity to review and comment on the subject document. We have the following comment.

In the assessment process, the proposing agency must consult with other agencies having jurisdiction or expertise as well as citizen groups and individuals. Therefore, we recommend that you consult with the parties listed below:

1. State of Hawaii, Department of Land and Natural Resources, Commission on Water Resources Management;

2. State of Hawaii, Department of Health, Environmental Management Division;

3. City and County of Honolulu, Department of Public Works; and

4. Meadow Gold Dairies.

If you have any questions, please call Jeyan Thirugnanam at 586-4185. Thank you.

Sincerely,

Brian J. J. Choy

Brian J. J. Choy
Director

BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU

COPY

September 13, 1993

Mr. Brian J. J. Choy
Director
Office of Environmental Quality Control
State of Hawaii
220 South King Street
Fourth Floor
Honolulu, Hawaii 96813

Dear Mr. Choy:

Subject: Your Letter of August 12, 1993 on the Draft Environmental Assessment (DEA) for the Waimanalo III Exploratory Well Project, Waimanalo, Oahu, TMK: 4-1-08: 05

Thank you for reviewing and commenting on the DEA for the proposed project.

We are consulting with the parties listed in your letter.

If you have any questions, please contact Roy Doi at 527-5235.

Very truly yours,

KAZU HAYASHIDA
Manager and Chief Engineer

cc: Maguire Group, Inc.

RMA:rk
cc: K. Hayashida
R. Doi

93-2279

932310

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813

RECEIVED
BOARD OF WATER SUPPLY
AUG 16 11 26 AM '93

AUG 16 1993

FRANK F. FASI
MAYOR

C. MICHAEL STREET
DIRECTOR AND CHIEF ENGINEER

KENNETH E. SPRAGUE
DEPUTY DIRECTOR

ENV 93-175

August 13, 1993

MEMORANDUM

TO: MR. KAZU HAYASHIDA, MANAGER AND CHIEF ENGINEER
BOARD OF WATER SUPPLY

FROM: C. MICHAEL STREET, DIRECTOR AND CHIEF ENGINEER

SUBJECT: DRAFT ENVIRONMENAL ASSESSMENT (DEA)
WAIMANALO EXPLORATORY WELL PROJECT
TMK:4-1-08:05

We have reviewed the subject DEA and have the following comments:

1. Since the water from test pumping is considered non-storm water, we suggest you contact the State Department of Health to see whether a storm water NPDES permit is required.

2. We also suggest a copy of the subject DEA be forwarded to the Department of Wastewater Management for their review and comment.

Should you have any questions, please contact Mr. Alex Ho, Environmental Engineer, at 523-4150.

for C. MICHAEL STREET
Director and Chief Engineer

BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU

COPY

September 10, 1993

TO: C. MICHAEL STREET, DIRECTOR AND CHIEF ENGINEER
DEPARTMENT OF PUBLIC WORKS

FROM: KAZU HAYASHIDA, MANAGER AND CHIEF ENGINEER
BOARD OF WATER SUPPLY

SUBJECT: YOUR MEMORANDUM DATED AUGUST 13, 1993 ON THE DRAFT ENVIRONMENTAL ASSESSMENT (DEA) FOR THE WAIMANALO III EXPLORATORY WELL PROJECT, TMK: 4-1-08: 05, WAIMANALO, OAHU

Thank you for your comments on the subject DEA.

We have consulted with the State Department of Health (DOH) on obtaining a National Pollutant Discharge Elimination System (NPDES) permit for the project. DOH has determined that the discharge of potable groundwater associated with well test pumping operations is exempt from NPDES requirements. The flows will be dissipated to reduce velocities to prevent scouring.

We have also consulted with the Department of Wastewater Management and have determined that the well project will have no adverse effect on the sewer system because of the well's remoteness.

If you have any questions, please contact Roy Doi at 527-5235.

cc: Maguire Group, Inc.

PLANNING DEPARTMENT

CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813

932493

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FE

FRANK F. FASI
MAYOR

ROBIN FOSTER
CHIEF PLANNING OFFICER

ROLAND D. LIBBY, JR.
DEPUTY CHIEF PLANNING OFFICER

MM 8/93-1927

August 27, 1993

MEMORANDUM

TO: KAZU HAYASHIDA, MANAGER AND CHIEF ENGINEER
BOARD OF WATER SUPPLY

FROM: ROBIN FOSTER, CHIEF PLANNING OFFICER
PLANNING DEPARTMENT

SUBJECT: DRAFT ENVIRONMENTAL ASSESSMENT (EA) FOR THE PROPOSED WAIMANALO EXPLORATORY WELL PROJECT, TAX MAP KEY: 4-1-08: 05, WAIMANALO, OAHU

We have reviewed the subject Draft EA for the Waimanalo Exploratory Well and have the following comments to offer:

1. The Project Description on page 4 states that the Development Plan Land Use Map designation for the site is AG-1. This should be corrected to indicate that the Development Plan designation is Agriculture and that the zoning is AG-2 General Agriculture District.

2. The Development Plan Public Facilities Map shows no improvements for the subject site. This does not preclude implementation of the proposed exploratory well. However, an amendment to the Public Facilities Map to add a well site would be necessary in order to establish a permanent and operational well site.

Thank you for the opportunity to comment. Should you have any questions, please contact Mel Murakami of our staff at 527-6020.

ROBIN FOSTER
Chief Planning Officer

RF:js

BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU

COPY

September 22, 1993

TO: ROBIN FOSTER, CHIEF PLANNING OFFICER
PLANNING DEPARTMENT

FROM: KAZU HAYASHIDA, MANAGER AND CHIEF ENGINEER
BOARD OF WATER SUPPLY Raymond D Lee

SUBJECT: YOUR MEMORANDUM OF AUGUST 27, 1993 ON THE DRAFT ENVIRONMENTAL ASSESSMENT (DEA) FOR THE WAIMANALO III EXPLORATORY WELL PROJECT, WAIMANALO, OAHU, TMK: 4-1-08: 05

Thank you for reviewing the DEA for our proposed project. We have the following responses to your comments:

P.4

1. The document will be amended to indicate the Development Plan Land Use Map designation is Agriculture and the zoning is AG-2, General Agriculture District.

2. A determination on whether to convert the exploratory well into a production facility will be made once the pumping tests have been completed. Should we decide to construct a production station, we will file for an amendment to the Development Plan Public Facilities Map indicating a well is planned for the site.

If you have any questions, please contact Roy Doi at 527-5235.

cc: Maguire Group, Inc.

932494

JOHN WAIHEE
GOVERNOR OF HAWAII

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

JOHN C. LEWIN, M.D.
DIRECTOR OF HEALTH

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In reply, please refer to:

August 27, 1993

93-243/epo

Mr. Kazu Hayashida
Manager and Chief Engineer
Board of Water Supply
City & County of Honolulu
630 Beretania Street
Honolulu, Hawaii 96843

Dear Mr. Hayashida:

Subject: Draft Environmental Assessment for the Proposed Waimanalo Exploratory Well Project
Waimanalo, Oahu
TMK: 4-1-08: 05

Thank you for allowing us to review and comment on the subject project. We do not have any comments to offer at this time.

Very truly yours,

JOHN C. LEWIN, M.D.
Director of Health

BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU

COPY

September 22, 1993

Dr. John C. Lewin, M.D.
Director of Health
Department of Health
State of Hawaii
P. O. Box 3378
Honolulu, Hawaii 96801

Dear Dr. Lewin:

Subject: Your Letter of August 27, 1993 (93-243/epo) on the Draft Environmental Assessment (DEA) for the Waimanalo III Exploratory Well, Waimanalo, Oahu, TMK: 4-1-08: 05

Thank you for reviewing the DEA for our proposed project. We note you have no comments to offer at this time.

Very truly yours,

Raymond D Soto

For KAZU HAYASHIDA
Manager and Chief Engineer

cc: Maguire Group, Inc.

RMA:js
cc: K. Hayashida
R. Doi

93-2494

JOHN WAIHEE
GOVERNOR OF HAWAII

Sep 20 11 53 AM

STATE OF HAWAII

DEPARTMENT OF LAND AND NATURAL RESOURCES

STATE HISTORIC PRESERVATION DIVISION
33 SOUTH KING STREET, 6TH FLOOR
HONOLULU, HAWAII 96813

KEITH AHUE, CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCE

DEPUTIES

JOHN P. KEPPELER II
DONA L. HANAIKE

AQUACULTURE DEVELOPMENT PROGRAM
AQUATIC RESOURCES
CONSERVATION AND ENVIRONMENTAL AFFAIRS
CONSERVATION AND RESOURCES ENFORCEMENT
CONVEYANCES
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION DIVISION
LAND MANAGEMENT
STATE PARKS
WATER AND LAND DEVELOPMENT

September 16, 1993

Status (RD)

NOV 10 1993
DEC 15 1993

Kazu Hayashida
Manager and Chief Engineer
Board of Water Supply
City and County of Honolulu
630 South Beretania Street
Honolulu, Hawaii 96843

LOG NO: 9173
DOC NO: 9309TD16

Dup Rec

SEP 20 1993 PE

Dear Mr. Hayashida:

SUBJECT: **Draft Environmental Assessment (EA) for the Proposed Waimanalo Exploratory Well Project**
Waimanalo, Ko`olaupoko, O`ahu
TMK: 4-1-8: 5

Thank you for the opportunity to review this EA. The archaeological reconnaissance survey report appended to this EA states that no historic sites were found at this project location. However, this report does not meet minimum standards for an archaeological inventory survey, so we cannot conclude that survey intensity was sufficient to find all historic sites, and cannot concur that there are no sites at the project location. It might be the case that past land uses would have destroyed historic sites that might once have existed here, but we can find no mention of these in the EA or the archaeological reconnaissance survey report.

We will need more information before we can proceed with HRS Chapter 6E review for this project. This information can be either documentation of past land uses that would have destroyed historic sites, or an inventory level survey report.

If you have any questions please call Tom Dye at 587-0014.

Sincerely,

DON HIBBARD, Administrator
State Historic Preservation Division

TD:jt

JOHN WAIHEE
GOVERNOR OF HAWAII

932789

KEITH W. AHUE, CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES

DEPUTIES
JOHN P. KEPPELER, II
DONA L. HANAIKE

AQUACULTURE DEVELOPMENT PROGRAM
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STATE PARKS
WATER AND LAND DEVELOPMENT

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

P. O. BOX 621
HONOLULU, HAWAII 96809

REF:OCEA:SKK

File No.: 94-090
DOC. ID.: 3498

SEP 23 1993

PE

The Honorable Kazu Hayashida
Manager and Chief Engineer
Board of Water Supply
City and County of Honolulu
630 South Beretania St.
Honolulu, Hawaii 96813

Dear Mr. Hayashida:

Subject: Draft Environmental Assessment (DEA) for the Proposed Waimanalo Exploratory Well Project, Waimanalo, Oahu, TMK: 4-1-08: 5

We have reviewed the DEA information for the proposed exploratory well project transmitted by your letter dated August 9, 1993, and have the following comments:

Historic Preservation Division

The Historic Preservation Division (HPD) comments that the archaeological reconnaissance survey report appended to this EA states that there were no historic sites found at this project location. However, this report does not meet minimum standards for an archaeological inventory survey, so HPD cannot conclude that survey intensity was sufficient to find all historic sites, and cannot concur that there are no sites at the project location. It might be the case that past land uses would have destroyed historic sites that might once have existed here, but HPD can find no mention of these in the DEA or the archaeological reconnaissance survey report.

HPD will need more information before they can proceed with Chapter 6E, HRS review for this project. This information can be either documentation of past land uses that would have destroyed historic sites, or an inventory level survey report.

Division of Aquatic Resources

The Division of Aquatic Resources (DAR) comments that there are no significant native aquatic species populations in surface waters in the vicinity of the well, and there is no discernible likelihood of any degradation of biologically valuable aquatic habitat from an operational well. Discharge of the test pumping water is well planned. DAR has no objections from the aquatic biological resources standpoint.

Commission on Water Resource Management

The Commission on Water Resource Management's (CWRM) staff comments that a Well Construction Permit and a Water Use Permit will be required for the proposed project as mentioned in the DEA. CWRM has not yet received any such applications.

We have no other comments to offer at this time. Thank you for the opportunity to comment on this matter.

Please feel free to call Steve Tagawa at our Office of Conservation and Environmental Affairs, at 587-0377, should you have any questions.

Very truly yours,

KEITH W. AHUE

BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU

COPY

January 24, 1994

Mr. Keith W. Ahue, Chairperson
Board of Land and Natural Resources
State of Hawaii
P. O. Box 621
Honolulu, Hawaii 96809

Dear Mr. Ahue:

Subject: Your Letter of September 23, 1993 on the Draft Environmental Assessment (DEA) for the Waimanalo III Exploratory Well, Waimanalo, Oahu, TMK: 4-1-08: 5

Thank you for reviewing the DEA for our proposed project. We have the following responses to your comments:

Historic Preservation Division

We agree the pedestrian survey for the site could not have detected subsurface remains. However, we felt an inventory level survey may not be warranted since grading would be limited to previously disturbed areas immediately adjacent to and at the project site.

We do recognize the possibility of archaeological remains being present. Therefore, we plan to have an archaeologist present to monitor all site work. This proposal has been discussed with the Historic Preservation Division and we understand that it is an acceptable alternative to an inventory level survey or documentation of past land uses. The DEA will be revised to reflect this as a mitigative measure.

Division of Aquatic Resources

We note they have no objections to the proposed project.

BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU

COPY

Commission on Water Resource Management

The well construction permit and water use permit applications were submitted on October 29, 1992. A copy is attached for your information.

If you have any questions, please contact Barry Usagawa at 527-5235.

Very truly yours,

KAZU HAYASHIDA
Manager and Chief Engineer

Attachment

cc: Don Hibbard, State Historic Preservation Division
Maguire Group, Inc.

P-465/93

University of Hawaii at Manoa

Environmental Center
A Unit of Water Resources Research Center
Crawford 317 • 2550 Campus Road • Honolulu, Hawaii 96822
Telephone: (808) 956-7361

September 21, 1993
EA:00030

Honolulu Board of Water Supply
City and County of Honolulu
Attention: Roy Doi
630 South Beretania Street
Honolulu, Hawaii 96843

Dear Mr. Doi:

Environmental Assessment (EA)
Waimanalo Exploratory Well and Access Road
Waimanalo, Oahu

The Board of Water Supply proposes to drill an exploratory well in Waimanalo to determine the yield and quality of water supplies which may be withdrawn from this location. The proposed exploratory well will be located at the foot of the northeastern face of the Ko'olau range near the northern boundary of the Waimanalo Forest Reserve. The project will involve extending an agricultural road about 250 feet to obtain access to the site and clearing a work area for test drilling. A hole about 12 inches in diameter will be drilled to a depth of about 500 feet. Once the drilling is completed, a 12 inch diameter steel casing will be grouted into place in the hole about 350 feet down and a pump will be installed. It is further proposed that the water from the pumping tests will be routed overland and discharged to either the Maunawili or the Kailua ditch.

The Environmental Center has reviewed the proposed action with the assistance of Paul Ekern, Emeritus, Agronomy and Soils/Water Resources Research Center; Bion Griffin, Anthropology; and Carolyn McCool of the Environmental Center.

In general, most of the potential impacts associated with this project have been adequately discussed and evaluated in this assessment. However, we are concerned that subsurface archaeological resources may be present. These subsurface remains could not be detected by the pedestrian (walk-through) surveys carried out as described in the EA. Due to the likelihood of archaeological resources at the project site, will an on site monitor be present during construction or excavation? If not, our reviewers strongly urge that such an archaeological monitor be on site during any excavations.

We appreciate the opportunity to provide comments and look forward to your response.

Sincerely,

Jacquelin N. Miller
Associate Environmental Coordinator

cc: OEQC
Roger Fujioka
Paul Ekern
Bion Griffin
Carolyn McCool

BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU

COPY

January 24, 1994

Ms. Jacquelin N. Miller
Associate Environmental Coordinator
Environmental Center
University of Hawaii at Manoa
2550 Campus Road, Crawford 317
Honolulu, Hawaii 96822

Dear Ms. Miller:

Subject: Your Letter of September 21, 1993 on the Draft Environmental Assessment (DEA) for the Waimanalo III Exploratory Well, Waimanalo, Oahu, TMK: 4-1-08: 5

Thank you for reviewing the DEA for our proposed project. We have the following response to your comments:

We agree the pedestrian survey for the site could not have detected subsurface remains. However, we felt an inventory level survey may not be warranted since grading would be limited to previously disturbed areas immediately adjacent to and at the project site.

We do recognize the possibility of archaeological remains being present. Therefore, we plan to have an archaeologist present to monitor all site work. This proposal is acceptable to the Department of Land and Natural Resources' Historic Preservation Division. The DEA will be revised to reflect this as a mitigative measure.

If you have any questions, please contact Barry Usagawa at 527-5235.

Very truly yours,

KAZU HAYASHIDA
Manager and Chief Engineer

cc: Maguire Group, Inc.

United States
Department of
Agriculture

Soil
Conservation
Service

P. O. Box 50004
Honolulu, HI
96850-0001

October 22, 1993

Mr. Kazu Hayashida, Manager
BOARD OF WATER SUPPLY
City and County of Honolulu
630 South Beretania
Honolulu, Hawaii 96850

Dear Mr. Hayashida:

Subject: Draft Environmental Assessment for the Proposed Waimanalo Exploratory Well Project, TMK: 4-1-08:05, Waimanalo, Oahu

We have reviewed the Draft Environmental Assessment for the proposed exploratory well project at Waimanalo. We have no major resource concerns about this project. However since the community continues to be aggressively concerned with water quality issues. We highly recommend that appropriate erosion control measures be installed and maintained during the construction of the assess road and well site. It is also important that these measures be maintained throughout exploratory operations by the contactor and monitored by the Board of Water Supply.

Thank you for the opportunity to provide comment on this proposal. Should you have any questions please contact Mr. Michael C. Tulang at (808) 541-2606 or Mr. Michael Bajingting at (808) 541-2665.

Sincerely,

NATHANIEL R. CONNER
Acting State Conservationist

cc: Michael Bajingting, Dist. Cons., Honolulu Field Office.

BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU

COPY

November 19, 1993

Mr. Nathaniel R. Conner
State Conservationist
Soil Conservation Service
U. S. Department of Agriculture
P. O. Box 50004
Honolulu, Hawaii 96850-0001

Dear Mr. Conner:

Subject: Your Letter of October 22, 1993 on the Draft Environmental Assessment (DEA) for the Proposed Waimanalo Exploratory Well Project, Waimanalo, Oahu, Hawaii, TMK: 4-1-08: 5

Thank you for reviewing the DEA for our proposed project. We have the following responses to your comments:

1. We note that you have no major resource concerns regarding the project.

2. Erosion control measures, such as swales and berms, will be undertaken to mitigate any soil erosion impacts associated with the clearing of the access road and work site, and drilling and pumping tests of the well. The contractor will be required to obtain a grading permit from the City Department of Public Works that shows these measures. In addition, a Best Management Practices Plan will be implemented to minimize any scouring effects during the pumping tests.

   We will have a construction inspector assigned to the job to verify that proper procedures are followed during all phases of the project.

If you have any questions, please contact Barry Usagawa at 527-5235.

Very truly yours,

KAZU HAYASHIDA
Manager and Chief Engineer

cc: Maguire Group, Inc.

GOVERNOR OF HAWAII

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BOARD OF LAND AND NATURAL RESOURCES

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JOHN P. KEPPELER, II
DONA L. HANAIKE

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

P. O. BOX 621
HONOLULU, HAWAII 96809

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STATE PARKS
WATER AND LAND DEVELOPMENT

REF:OCEA:RMB

NOV 23 1993

File No.: 94-090a
DOC. ID.: 3748

PE

The Honorable Kazu Hayashida
Manager and Chief Engineer
Board of Water Supply
City and County of Honolulu
630 South Beretania St.
Honolulu, Hawaii 96813

Dear Mr. Hayashida:

Subject: Draft Environmental Assessment (DEA) for the Proposed Waimanalo Exploratory Well Project, Waimanalo, Oahu, TMK: 4-1-08: 5

The following are additional comments for the proposed exploratory well project which supplement those forwarded in our previous letter dated September 23, 1993:

Division of Water and Land Development

The Division of Water and Land Development (DOWALD) comments that they have no objections to this Board of Water Supply exploratory well which is located on State land. Should the well be successful and be developed as a source of water, the State should retain a share of the water developed based on land ownership.

We have no other comments to offer at this time. Thank you for the opportunity to comment on this matter.

Please feel free to call Steve Tagawa at our Office of Conservation and Environmental Affairs, at 587-0377, should you have any questions.

Very truly yours,

KEITH W. AHUE

BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU

COPY

December 13, 1993

Mr. Keith W. Ahue, Chairperson
Department of Land and Natural Resources
State of Hawaii
P. O. Box 621
Honolulu, Hawaii 96809

Dear Mr. Ahue:

Subject: Your Letter of November 23, 1993 Regarding the Draft Environmental Assessment (DEA) for the Proposed Waimanalo Exploratory Well Project, Waimanalo, Oahu, Hawaii, TMK: 4-1-08: 5

Thank you for reviewing and responding to our DEA for the proposed Waimanalo Exploratory Well project. We acknowledge you have no objections to our well project.

We will discuss land acquisition requirements with the State if development of the exploratory well is feasible. Your comment regarding the State's retention of a portion of the water developed based on land ownership will be taken under advisement.

If you have any questions, please contact Barry Usagawa at 527-5235.

Very truly yours,

Raymond H Sato
For KAZU HAYASHIDA
Manager and Chief Engineer

SM/BU:do
cc: K. Hayashida
Land
B. Usagawa

93-3452