

Windward Exploratory Well

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STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES

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ENVIRONMENTAL  
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TO: Honorable Gary Gill, Director  
Office of Environmental Quality Control

FROM: *Jr* Micheal D. Wilson, Chairperson *Micheal D. Wilson*

SUBJECT Finding of No Significant Impact (FONSI) for Job No. 17-OW-J,  
Windward Exploratory Well, TMK 4-5-23:02, Kaneohe, Oahu, Hawaii

The Department of Land and Natural Resources, State of Hawaii, has reviewed the comments received during the 30-day public comment period which ended on September 23, 1998. The Department has determined that this project will not have significant environmental effect and has issued a finding of no significant impact. Please publish this notice in the next OEQC Bulletin.

We have enclosed a completed OEQC Bulletin Publication Form and four (4) copies of the Final Environmental Assessment. If there are any questions on this matter, please contact Mr. Andrew Monden, Chief Engineer, at extension 70230.

Enclosure

150



Sato & Associates, Inc.

Consulting Engineers

DEC 8 1998

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1998-12-08-OA-~~FEA~~-Windward Exploratory  
Well

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FINAL  
ENVIRONMENTAL ASSESSMENT  
&  
FINDING OF NO SIGNIFICANT IMPACT  
WINDWARD EXPLORATORY WELL

**FINAL  
ENVIRONMENTAL ASSESSMENT  
&  
FINDING OF NO SIGNIFICANT IMPACT  
WINDWARD EXPLORATORY WELL**

Prepared for:

Department of Land & Natural Resources  
State of Hawaii

Prepared by:

SATO & ASSOCIATES, INC.  
2046 S. King Street  
Honolulu, HI 96826

October 1998

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## I. Executive Summary

The Department of Land and Natural Resources (DLNR) of the State of Hawaii is proposing to drill, case and test an exploratory well on a portion of the grounds of Kaneohe State Hospital. The land is owned by the State of Hawaii and identified by TMK: 4-5-23:por 02. The proposed action is consistent with the State Water Code and the Commission on Water Resource Management (CWRM) and helps to implement the Oahu Water Management Plan (May 23, 1997 Draft). If tests are successful, the well could potentially provide another 0.5 to 1.0 million gallons per day (GPD) of high quality drinking water that could be considered for use by the Board of Water Supply (BWS).

The proposed exploratory well will be located approximately 300 feet mauka of the State Hospital's administration building (now vacant). The well site is at a ground elevation of 400 feet above mean sea level, approximately 1,500 feet from a probable connection with an existing BWS 16" pipeline. The nearest surface water to the site is the Kapunahala Stream, located approximately 1,000 feet to the south. Kealahala Road and the internal roadways of the State Hospital provide access to the project site. Once within the hospital's grounds, access to the well site is via an unimproved access road that leads to the hospital's water tank. (See Figures 1 & 2).

The exploratory well is proposed to be a single bore drilled to a maximum depth of approximately 800 feet below ground surface. A 12-inch diameter casing will extend for the first 300 feet. The lower 500 feet will be uncased. Following drilling and casing, a yield draw down test will be performed at a rate of 500 to 1000 gallons per minute (GPM). Upon completion of the yield draw down test, a long term constant rate pumping test will be conducted for a minimum period of five days at a rate determined and calculated based on results of the yield draw down test. The long term constant rate pumping test will monitor water table draw down and water quality. In addition, instream flow rates at nearby Kapunahala Stream will be monitored to determine potential impacts resulting from water withdrawal from this well site.

If the results of the pump tests indicate that the water quality and quantity are within acceptable parameters, the well will be targeted for conversion to production status. If the results of the pump tests are unacceptable, the drill hole will be permanently capped and sealed or considered for use as a monitoring well.

This Final EA (FEA) and Finding of No Significant Impact (FONSI) has been completed in compliance with the Hawaii environmental review process and Chapter 343 of the Hawaii Revised Statutes, Act 241 and Chapter 200 of Title 11, Department of Health Administrative Rules. Environmental impacts directly associated with the drilling, casing, and testing of the exploratory well, including the temporary installation of pumps, pipes, and appurtenances were assessed. Based on the environmental consequences associated with the proposed action assessment and comments received on the Draft EA, a Finding of No Significant Impact (FONSI) is issued.



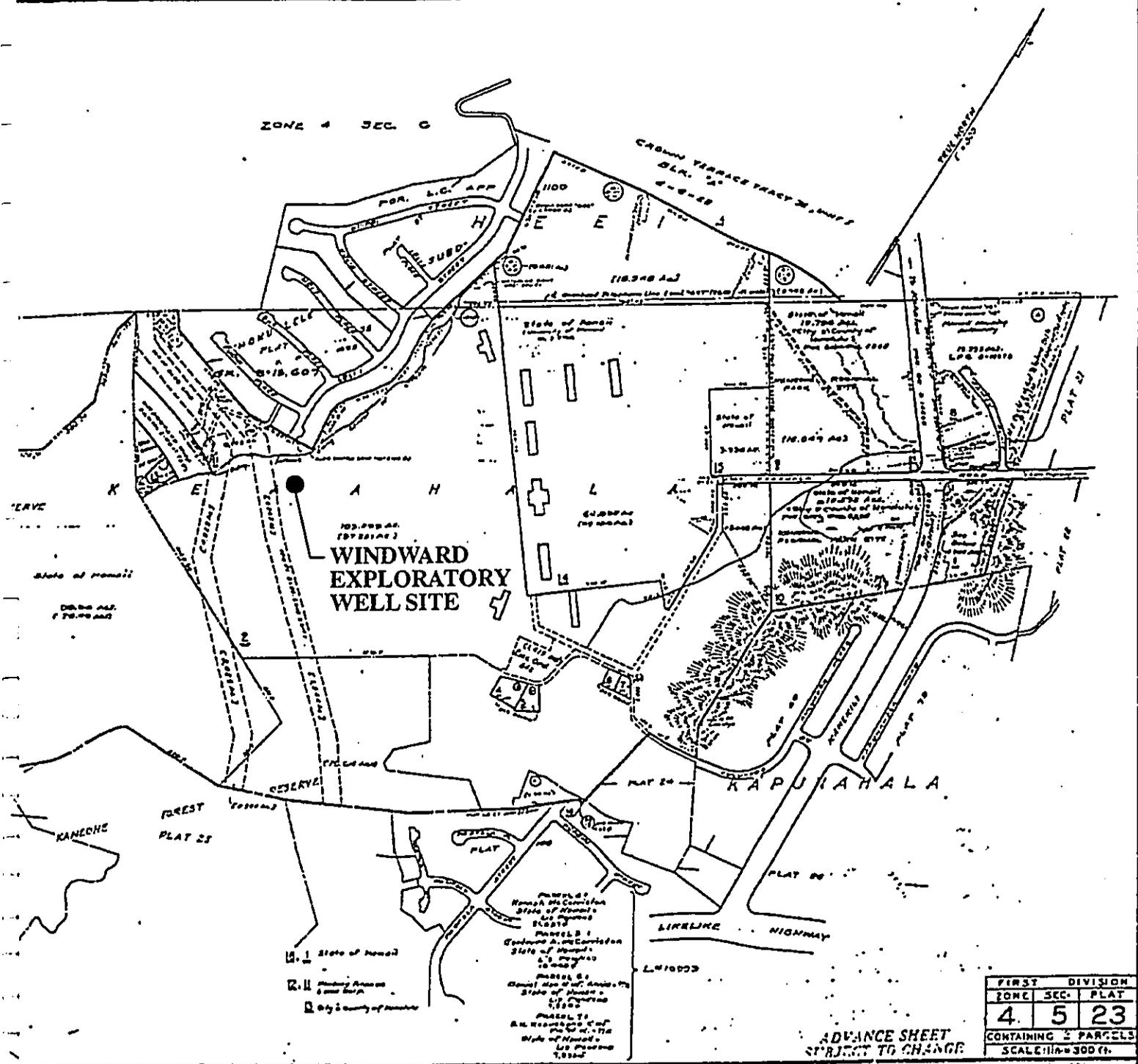


Figure 2  
TAX MAP  
WINDWARD EXPLORATORY WELL

## II. Summary Information

Pursuant to Chapter 343, Hawaii Revised Statutes (HRS) for Environmental Assessments:

Proposing Agency:	Department of Land and Natural Resources
Accepting Agency:	Department of Land and Natural Resources
Project Name:	Windward Exploratory Well
Project Description:	Project involves drilling, casing and testing an exploratory well.
Determination:	Finding of No Significant Impact (FONSI)
Project Location:	Kaneohe, Oahu Grounds of the Kaneohe State Hospital
Tax Map Key:	4-5-23:02 por
Landowner:	State of Hawaii
State Land Use Designation:	Urban
Development Plan Land Use Map:	Public & Quasi-Public Facility
Development Plan Public Facilities Map:	Not indicated
Zoning:	Ag-2
Existing Use:	Kaneohe State Hospital

### III. List of Individuals, Community Groups and Agencies Consulted

The following agencies were contacted for pre-assessment consultation during the preparation of the draft EA.

#### State Agencies

- Department of Land and Natural Resources, Commission on Water Resource Management
- Department of Land and Natural Resources, State Historic Preservation Division
- Department of Land and Natural Resources, Land Management Engineering Branch
- Department of Health, Environmental Management Division
- Department of Health, Hawaii State Hospital
- Department of Hawaiian Home Lands
- Office of Hawaiian Affairs

#### City and County of Honolulu

- Board of Water Supply
- Department of General Planning
- Department of Land Utilization
- Department of Public Works

#### Others

- Kaneohe Neighborhood Board No. 30

#### IV. Permits Required

Exploratory wells are considered a minor action and are not required to be shown on the Development Plan Public Facilities Map. If the exploratory well leads to full production status, the City's Development Plan Facilities Map must be amended and approved by the City Council, an action that will take place during the preparation of a separate EA for the production well.

An exploratory well requires a Well Construction Permit from the Commission on Water Resource Management (CWRM). This permit allows for digging, casing and test pumping on an exploratory basis. If the exploratory well proves successful, a permanent Pump Installation Permit and Water Use Permit are required from CWRM.

If withdrawn water is discharged into state waters through the county storm sewer system, an NPDES permit is required. If well effluent is disposed of by other means, such as through the use of sprinklers for irrigation or dust control, then NPDES can be avoided.

**Table IV-1: Permits Required  
Windward Exploratory Well**

Agency	Permit	Comments
Commission on Water Resources	Well Construction Permit	required for exploratory work and test pumping
Commission on Water Resources	Pump Installation Permit	
State of Hawaii Department of Health, Clean Water Branch	National Pollution Discharge Elimination System Permit	required if there is discharge of effluent into the State's waters via the sewer system

## V. Project Description

### A. Background: Proposing Agency and Action

The State of Hawaii, Department of Land and Natural Resources (DLNR), proposes to drill and case an exploratory well on a portion of the grounds of the Kaneohe State Hospital on land owned by the State of Hawaii. The well will be drilled to obtain hydrogeological data on the potential for new groundwater resources in accordance with the provisions of the Oahu Water Management Plan, May 23, 1997 Draft. Test pumping of the exploratory well will be performed to determine if the quantity and quality of water is suitable for development. If tests indicate acceptable conditions, the well will be converted into a potable groundwater production pump that could provide a source of potable water for the BWS.

The Oahu Water Management Plan was mandated by the State Water Code, Chapter 174C, HRS, to insure:

- The optimum utilization of the existing water supply in order to minimize the need for the development of additional potable groundwater sources,
- The preservation of the aquifers for the benefit of future generations, in perpetuity, by proper management of Oahu's groundwater sources,
- The timely development of additional potable groundwater sources and alternative sources to provide for additional consumer demand, and
- That growth in consumer demand will be compatible with available water supply.

According to the Oahu Water Management Plan, the 1990 municipal water demand of approximately 156 million gallons per day for the Island of Oahu is projected to rise to 215 millions gallons per day by the Year 2020.

### B. Project Location

The site of the exploratory well is on a portion of a 103.2-acre parcel of land identified as Tax Map Key (TMK) 4-5-23:02 por. The proposed exploratory well will be located approximately 300 feet mauka of the main State Hospital building and accessed by an unimproved access road. The well site is at a ground elevation of 400 feet above mean sea level and generally slopes towards the northeast. This location is located approximately 1,500 feet from a probable connection with an existing BWS 16" pipeline. The nearest surface water to the proposed site is the Kapunahala Stream located approximately 1,000 feet to the south. The Kapunahala Stream empties into Kaneohe Bay of the Pacific Ocean, approximately 2 miles to the northeast. Access to the project site is via Keaahala Road and the internal roadways of the State Hospital. Keaahala Road leads to Kahekili Highway, approximately one half mile to the northeast.

Figures 1 and 2 in the Executive Summary describe the location of the exploratory well.

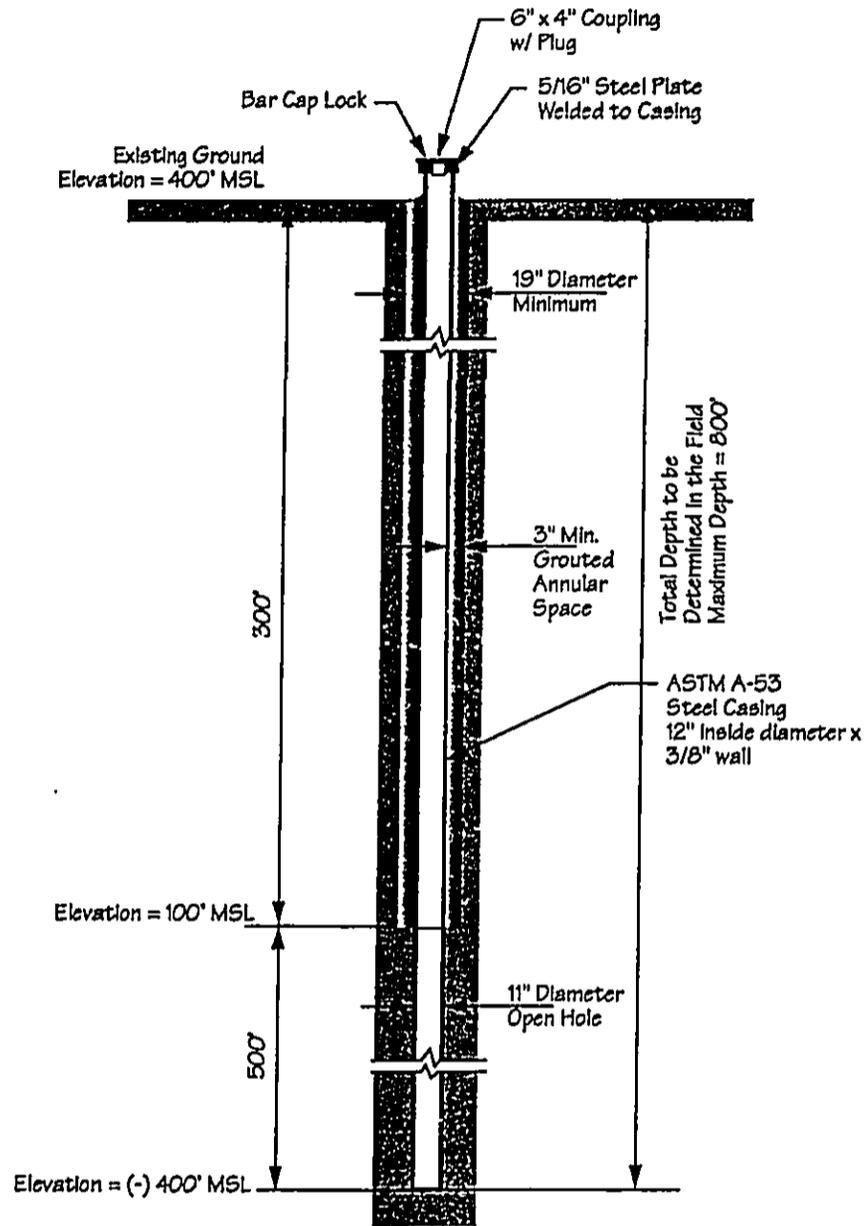
### C. Technical Characteristics

The exploratory well is proposed to be a single bore drilled to a maximum depth of approximately 800 feet below ground surface. A 12-inch diameter casing will extend for the first 300 feet. The lower 500 feet will be uncased. Figure 3 provides a cross-section diagram of the proposed exploratory well.

Following drilling and casing, temporary pipelines and a diesel or gasoline powered pump will be installed. A yield draw down test will be conducted once the well is drilled and cased. The yield draw down test will be performed on the well at a rate of 500 to 1000 gallons per minute (gpm). Following the yield draw down test, a long term constant rate pumping test will be conducted for a minimum period of five days at a rate determined and calculated based on results of the yield draw down test. The long term constant rate pumping test will monitor water table draw down and water quality. Water withdrawn from the exploratory well will be discharged into the hospital's storm drain system. Instream flow rates at nearby Kapunahala Stream will be monitored to determine potential impacts that may be attributed to water withdrawal from the exploratory well.

The exploratory well site will be cleared to provide access for drilling operations and storage of the materials and equipment necessary to complete the project. Upon completion of the pump tests, all equipment, material, construction surplus, stockpiled and grubbed material, and other debris generated during the course of this project will be removed from the site.

If the results of the pump tests indicate that the water quality and quantity are within acceptable parameters, the well will be targeted for conversion to production status. If the results of the pump tests indicate unacceptable conditions, the drill hole will be permanently capped and sealed or considered for use as a monitoring well.



Not To Scale

Figure 3  
CROSS SECTION  
WINDWARD EXPLORATORY WELL

**D. Estimated Project Schedule and Cost**

The exploratory well project is anticipated to take approximately seven months from project mobilization to completion. The targeted start date is December 1998 pending approval of the Final EA and FONSI and completion of engineering drawings.

The proposed project schedule is described in the following table:

**Table V-1: Estimated Project Schedule**

Activity	Estimated Duration
Mobilization and Drilling	4 months
Installation of Casing and Grouting	2 weeks
Pump Installation	3 weeks
Well Testing	3 weeks
Demobilization	3 weeks

The exploratory well is projected to cost approximately \$380,000 and is being funded by DLNR.

## **VI. Description of the Affected Environment, Potential Impacts and Mitigation Measures**

### **A. Land Use and Ownership**

The proposed exploratory well site will encompass approximately 2,000 square feet within a parcel of land identified as TMK 4-5-23:02 por. The land is owned by the State of Hawaii and is occupied by the Kaneohe State Hospital. The proposed exploratory well site is located on the mauka portion of the hospital grounds at the foot of the Waiahole Forest Reserve. The site is vacant and undeveloped and approximately 300 feet mauka of the main building. Across a ravine to the west of the well site is an existing, privately developed residential subdivision called the Hoku Lele Subdivision. The closest residence is roughly 300 feet away.

Existing land use controls governing the use of the site are as follows:

- State Land Use Commission: Urban classification, .
- Development Plan Land Use Map: Public & Quasi-Public Facility.
- Development Plan Public Facilities Map: indicates the H-3 Freeway. A well site designation would need to be added to this map if the well is put into production. .
- County Zoning: Ag-2, General Agricultural District. A water well is a principal permitted use under the definition of a Utility installation, Type A.

#### *Project Impacts*

Drilling the Windward Exploratory Well is an exploratory action that is a permissible use or activity under existing land use controls. It is also a permissible use or activity for all land use zones including the adjacent residential zone. This action is not expected to result in any significant impact to surrounding land uses.

#### *Mitigation Measures*

No mitigation measures are proposed nor required.

### **B. Topography and Climate**

The elevation of the subject site is approximately 400 feet above mean sea level. Located at the foot of the Waiahole Forest Reserve, the site is situated on a relatively flat terrace adjacent to an unimproved access road that leads to the hospital's water tank. The nearest surface water to the proposed site is the Kapunahala Stream located approximately 1,000 feet to the south. The Kapunahala Stream empties into Kaneohe Bay, approximately 2 miles to the northeast.

Monthly temperature in the vicinity of the proposed project site ranges from 72 degrees in January to 78.5 degrees in August. Average monthly temperature in the vicinity is 75 degrees Fahrenheit. The average annual rainfall at the site is approximately 75 inches (Park Engineering, November 1997). Wind direction at the project site is primarily from the northeast.

*Project Impacts*

Drilling the Windward Exploratory Well is not expected to result in any significant short or long term impacts to the existing topography or climate.

*Mitigation Measures*

No mitigation measures are proposed nor required..

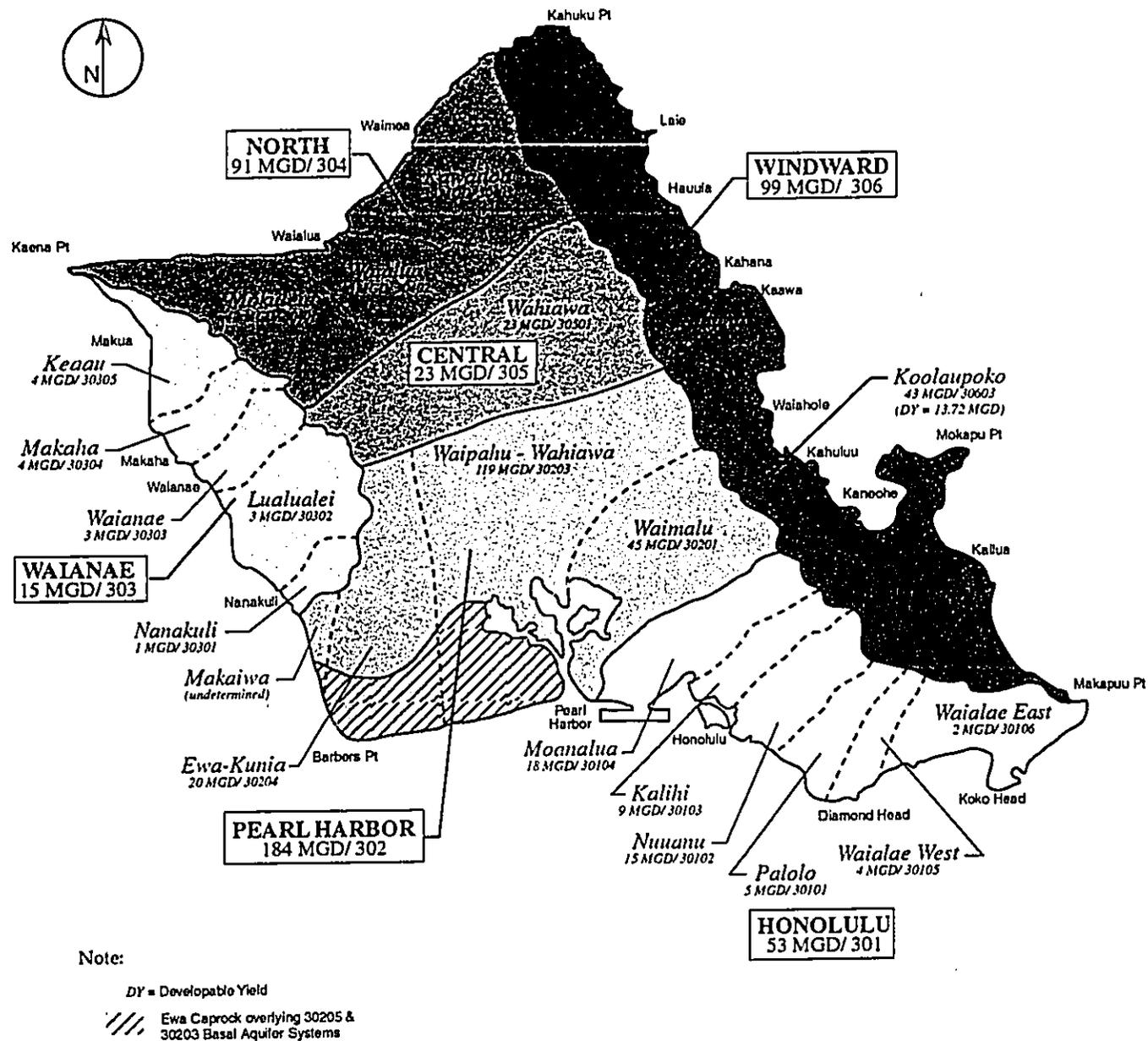
**C. Site Geology**

According to the United States Department of Agriculture Soil Conservation Service Soil Survey, the soil at the site is classified as Lolekaa silty clay, 3 to 8 percent slopes (LoB). The soil is part of the Lolekaa Series, which are well-drained soils on fans and terraces found on the windward side of the island of Oahu. These soils, developed in old, gravelly colluvium and alluvium, are gently sloping to very steep, and found in elevations ranging from nearly sea level to 500 feet above mean sea level. In a representative profile, the surface layer is dark-brown silty clay about 10 inches thick, with subsoil of 46 to more than 70 inches thick. Permeability is moderately rapid, runoff is slow, and the erosion hazard is slight. The available water capacity is about 1.3 inches per foot of soil.

**D. Aquifer and Hydrologic Unit Status**

The site is underlain by the Koolaupoko aquifer system, which is part of the Windward Aquifer Sector (System Identifier 30603). This system is identified as an unconfined, high-level dike aquifer. The aquifer is considered as an irreplaceable drinking water source containing fresh (<250 mg/l Cl<sup>-</sup>) water with a high vulnerability to contamination, (Mink and Lau, 1990). The regional groundwater flows in a northeasterly direction toward the Pacific Ocean. See Figure 4, Hydrologic Unit Status of Oahu.

According to the Oahu Water Management Plan, (pgs. 3-10 & 3-11) the total sustainable yield of the Koolaupoko aquifer is 43 million gallons per day (mgd). The CWRM has allocated a total water use of 10.312 mgd within the Koolaupoko Aquifer System. The total water use is based on 18 approved water use permits issued to 7 applicants. Of the 7, the Honolulu BWS has the largest allocation of water use, totaling 9.943 mgd. Approximately one fourth or 10.312 mgd of the Koolaupoko Aquifer system's 43-mgd sustainable use is available for future development and allocation.



**TOTAL - 465 MGD**

**Hydrologic Units  
Sustainable Yield/ Aquifer Code**

Figure 4  
**HYDROLOGIC UNITS OF OAHU  
WINDWARD EXPLORATORY WELL**

Twenty-three wells exist within the surrounding vicinity of the proposed site (See Table VI-1). Five of these wells, all within a 2.5-mile radius of the proposed site, have water use permits and produce potable water. These include Koolau GC 1 Well (2347-02) with a permitted use of .150 mgd, Kuou I #1 Well and Kuou II Well (2348-02 and 2348-05). These two wells located south southeast of the proposed site have a combined permitted use of 2,969.245 mgd and are owned by the Honolulu BWS. Hawaii State Hospital Well (2448-01) has a small permitted use of .088 mgd and Iolekaa Well, north of the proposed well site (2549-01), has a permitted use of .153 mgd. Heads within these five wells range from 277 to 321 feet above sea level. See Figure 5. Existing Wells.

Table VI-1. Existing Well Record

Well Name	State Well No.	Owner /User	Year Drilled	Elev. (ft)	Casing Dia (in)	Casing Depth (ft)	Well Depth (ft)	High Level Head (ft)	Basal Head (ft)	Pump Capacity (mgd)	Permitted Use (mgd)
Kamooalii II	2247-01	BWS	1985	358	--	--	525	--	171	--	--
Kamooalii I	2248-01	BWS	1985	467	14	615	737	--	299.2	--	--
Kaneohe	2347-01	Ruis J.	1944	260	8	--	110	--	--	--	--
Koolau GC 1	2347-02	Koolau Mgt	1988	234	8	38	130	--	200.5	.504	.150
Koolau GC 2	2347-03	Koolau Mgt	1988	246	10	40	130	--	219	.504	--
Kuou TH	2348-01	BWS	1954	290	2	85	273	295.3	298.6	--	--
Kuou I #1	2348-02	BWS	1955	274	16	366	418	276.9	310.4	--	2.969
Kuou I #2	2348-03	BWS	1955	293	16	113	280	288.2	289.9	3.024	--
Kuou TH	2348-04	BWS	1955	309	3	85	182	300.5	308.9	--	--
Kuou II	2348-05	BWS	1986	342	12	428	550	--	257.5	1.008	.245
Kuou III	2348-06	BWS	1995	329	12	230	566	--	254.85	--	--
Kaneohe	2447-01	U.S. Army	1946	40	10	--	240	--	--	--	--
Bayview Irrig 1	2447-02	Pacific Atlas	1995	13	6	10	50	--	4.43	--	--
Bayview Irrig 2	2447-03	Pacific Atlas	--	14	6	10	50	--	5.11	--	--
Bayview Irrig 3	2447-04	Pacific Atlas	--	15	6	10	50	--	8.48	--	--
Bayview Irrig 4	2447-05	Pacific Atlas	1996	11	6	10	50	--	8.37	--	--
Bayview Irrig 5	2447-06	Pacific Atlas	1996	22	6	20	60	--	5.33	--	--
Hawaii State Hosp	2448-01	State DOH	1946	252	12	148	249	--	248.8	.648	.088
Kaneohe	2448-02	Our Lady Beth	1961	216	6	102	180	--	211.6	--	--
Kaneohe	2449-01	C&C Hon	1945	238	6	79	92	--	170	--	--
Kaneohe	2548-01	C&C Hon	1945	179	6	178	178	--	124.7	--	--
Kaneohe	2548-02	C&C Hon	1945	113	6	--	113	--	--	--	--
Iolekaa	2549-01	BWS	1966	485	12	307	423	320.8	--	.302	.153

Source: Water Resource Associates, 1998



A hydrologic study of ground water and surface water conditions by George A.L. Yuen and Associates, 1990, found that the Koolaupoko aquifer is considered to have a direct relationship between surface water and ground water conditions in the upper elevations. At mid-elevations, surface water may be hydraulically separated from the basal and dike basal aquifers by layers of thick sediments. Lower elevation stream flows may or may not be affected by basal ground water withdrawals.

Essentially, the ground water and surface water relationship in the Koolaupoko aquifer will vary between different streams based on long term well production experience and therefore, any significant effects of ground water withdrawal on surface water should be evaluated on a case-by-case basis.

The scope of the project will include tests to monitor any effects on the stream flow of Kapunahala Stream.

#### *Project Impacts*

The proposed action is exploratory in nature and designed to determine if potable water can be withdrawn from this source without negatively impacting the underlying aquifer as well as nearby streams. If tests prove that an adequate supply and quality of water is available and stream flow rates at the nearby Kapunahala Stream are not affected, the proposed action would provide water to meet future island-wide demand.

#### *Mitigation Measures*

No mitigation measures are proposed nor required because of the exploratory nature of the proposed action. If negative impacts occur, i.e., instream flow rates are affected to some degree, additional studies would be warranted to determine what the acceptable instream flow rate level should be, particularly because only interim instream flow standards have been adopted (p. 3-13, OWMP).

#### **E. Contamination Analysis**

The project site is located approximately 300 feet mauka of the main State Hospital building. The November 11, 1994 Region IX Notification List Database, obtained from the Hawaii State Department of Health's (HDOH), Solid and Hazardous Waste Branch identifies the Hawaii State Hospital, located at 45-710 Kealahala Road, Kaneohe, Hawaii, as a registered 'Small Quantity Generator' of hazardous waste. The Environmental Protection Agency (EPA) identification number for this facility is listed as HID982013476.

According to the HDOH Hazard Evaluation and Emergency Response (HEER) Branch, there are no records of releases since 1988. Furthermore, the project site is not included in the Site List or Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS). The Site List includes all facilities, sites, or areas in which the HEER office has investigated or may investigate. The CERCLIS list includes potential hazardous waste sites that are undergoing or have been evaluated. No records related to the project site were found.

Records of wells near and around the facility were reviewed with representatives of the HDOH Safe Drinking Water Branch (SDWB) on June 29, 1998. The review did not suggest the presence of contamination in the subject aquifer.

A search of the HDOH Underground Storage Tank Section's Underground Storage Tank and Leaking Underground Storage Tank (UST/LUST) Database did not indicate the presence of USTs or LUSTs at or around the project site that would negatively impact underground water quality.

#### *Project Impacts*

Existing records pertaining to the project site and the subject aquifer do not indicate a contamination problem. Additionally, the proposed project is not expected to result in adverse impacts to municipal potable water sources.

#### *Mitigation Measures*

No mitigation measures are proposed nor required.

### **F. Socio-Economic Characteristics**

The proposed action is exploratory work that will have temporary socio-economic benefits in the form of construction industry employment. The estimated \$380,000 project cost will create an estimated 2 to 3 full time equivalent positions for the anticipated 7-month project duration. Should testing of the exploratory well prove successful and the well is put into production, the long-term socio-economic impacts would potentially provide 0.5 to 1.0 million gallons per day of potable water. This additional source of water would be considered for use by the BWS as part of their municipal water system.

#### *Project Impacts*

In addition to the infusion of capital into the local economy and the creation of construction jobs, the proposed action will be part of a larger, long-term program aimed at ensuring that adequate water is available to meet future demand. In keeping

with the City's General Plan which directs urban development to the Ewa Plains and Central Oahu, the proposed action is not anticipated to cause any change to the existing Windward community.

*Mitigation Measures*

No mitigation measures are proposed nor required.

**G. Natural Hazards**

The Flood Insurance Rate Map indicates that the project site is located within Zone 'X'. Areas within Zone 'X' are determined to be outside the 500-year flood plain. (Source: Flood Insurance Rate Map, September 3, 1980). The parcel generally slopes towards the northeast and is not within any drainage course or ravine.

The island of Oahu has been designated a Seismic Zone 1 in the Uniform Building Code (UBC). The UBC seismic zone scale is rated from Zone 1 through Zone 4 with 1 as the lowest level for potential seismic induced ground movement. No permanent structures will be built as part of this exploratory work.

*Project Impacts*

The potential for flooding or seismic activity is not anticipated to impact the proposed action.

*Mitigation Measures*

No mitigation measures are proposed nor required for flooding or seismic hazards.

**H. Roadways and Traffic**

The primary point of access to the project site is via Kahekili Highway and Keaahala Road. Keaahala Road bisects the Kaneohe Regional Park and leads to the grounds of the Kaneohe State Hospital. Once on the hospital grounds, the internal roadway system provides access to the project site. The intersection of Keaahala Road and Kahekili Highway is signalized with dedicated left turn pockets.

*Project Impacts*

The proposed exploratory action will generate construction-related traffic for the duration of the project. Traffic will be nominal consisting of a medium-duty pickup truck and drilling rig in tow and a front-end loader for clearing the site. Once the drilling operation starts, daily traffic would consist of 2 to 3 vehicles per day. The

existing roadways can accommodate project-related traffic. No traffic impacts are anticipated.

*Mitigation Measures*

No mitigation measures are proposed nor required for roadways or traffic.

**I. Visual and Recreational Resources**

The exploratory well site is located on the slopes of an undeveloped area on the grounds of the State Hospital. Construction activity will take place within an area surrounded by mature trees and fairly dense undergrowth. It is unlikely that construction activity will be visible from various vantage points of the hospital grounds, the lower Windward Community College Campus and some nearby residences in the adjacent residential subdivision. The Kaneohe Regional Park is located about a quarter mile to the north of the project site.

*Project Impacts*

As this activity is neither visibly obtrusive nor permanent, no short term impacts to visible resources are anticipated.

*Mitigation Measures*

No mitigation measures are proposed nor recommended for the proposed exploratory action.

**J. Cultural Resources**

According to records of the State Department of Land and Natural Resources, Historic Preservation Division, there are no known historic sites at the project location. Archaeological surveys conducted in the 1970s and 1980s located a single site about 100 meters northwest of the existing water tank. The site was comprised of six stacked rock mounds constructed and utilized in the early to mid-1900s. No other archaeological sites were identified in the area. (Source: letter from State Historic Preservation Division, dated December 3, 1997).

The project site is adjacent to the H-3 Freeway corridor. During the planning and evaluation stages of the freeway, cultural resources were not identified in the vicinity of the project site.

*Project Impacts*

Based on the review of the State Historic Preservation Division, the proposed action will not impact any known archaeological or historic site of significance. Further, no known cultural resource issue has been identified for the project site.

*Mitigation Measures:*

No mitigation measures are proposed. In the unlikely event that historic sites, including human burials, are uncovered during construction of the exploratory well activities, all work will stop and the State Historic Preservation Division will be notified (Tel: 587-0047) in accordance with the procedures established by the Historic Preservation Division.

An opportunity to determine if any cultural resource of significance is attributed to the site will be available during the Draft EA review process. Copies of the Draft EA will be distributed to the State Department of Hawaiian Home Lands and the Office of Hawaiian Affairs.

**K. Biological Resources**

The United States Department of the Interior, Fish and Wildlife Service, Pacific Islands Ecoregion (Service) indicated that there are no federally endangered, threatened, or candidate species directly within the project site. The Service also indicated that because the project will be located within a previously disturbed area, significant adverse impacts to fish and wildlife resources are not anticipated.

The project site is immediately makai of the H-3 Freeway. During the planning and evaluation stages of the H-3 Freeway, the presence of native vegetation or endangered species of plants in the vicinity of the project site was not indicated.

*Project Impacts:*

The proposed exploratory action is not expected to cause a significant impact to biological resources as no federally endangered, threatened, or candidate species of fish or wildlife are known to exist within the project site. Because the area has been previously disturbed, significant impacts to botanical resources are not anticipated as well.

*Mitigation Measures:*

No mitigation measures are proposed nor recommended for biological resources.

#### L. Air Quality and Noise

The proposed exploratory work will involve the use of heavy machinery and equipment powered by gasoline or diesel fuel and operated during normal daylight work hours. A limited amount of site clearing and grading will temporarily create fugitive dust and exhaust emissions from construction equipment. The project site is immediately adjacent to the recently opened H-3 Freeway and traffic using the freeway has changed the once pristine ambient air quality in the immediate vicinity of the project site.

The exploratory well will require heavy machinery and equipment for the duration of the project. Noise generated by construction activity will be related to the limited amount of clearing and grading of the site and drilling operations. Construction activities will elevate audible noise levels in the immediate area of the well site for approximately one month. The closest residence of the nearby Hokulele Subdivision is approximately 300 feet away. The main building of the State Hospital is located approximately 300 feet away, however, this building is currently unoccupied. Administrative functions occur in the adjacent building complex to the east, approximately 650 feet away.

##### *Project Impacts:*

Air quality will be degraded only to a minimal degree as a result of the proposed action and is not expected to exceed National and State Ambient Air Quality Standards. Prevailing trades from the northeast will carry exhaust emissions away from the hospital building and nearby residential areas.

Audible construction noise will probably be unavoidable during the project construction period. Construction noise from the operation of diesel equipment generates typical levels of noise in relation to distance. The project site is located approximately 300 feet from the nearest residence and 650 feet from the nearest occupied hospital building. At these distances, the anticipated noise levels from diesel equipment would range from 75 to 62 dB, levels which exceed the allowable daytime standards of 55 dB set by DOH Rules, Title 11, Chapter 43. However, the construction noise levels anticipated are not expected to be in the "public health and welfare" category due to the temporary nature of the work and administrative controls available.

##### *Mitigation Measures*

To mitigate construction noise, the use of properly muffled construction equipment should be required on the job site. Further, construction activity should be limited to noise limits and curfew times in accordance with the State Department of Health noise regulations.

Air quality mitigation measures should be employed to control fugitive dust by minimizing brush clearing and watering. Exhaust emissions from construction equipment will be short term and are not expected to be significant.

## VII. Alternatives Considered

The Windward Exploratory Well project will be conducted to determine if a reliable source of potable water is available at this location. If tests prove that the quantity and quality of water is available, water from the well will be used to meet projected water demands in accordance with the water development strategies of the Oahu Water Management Plan. Alternatives to the proposed project include 1) no action, 2) alternative site, and 3) alternative source. The following is a discussion of the alternatives considered and the recommended course of action.

### No Action

The no action alternative would be counterproductive to the objectives of the Oahu Water Management Plan, DLNR and the BWS. Drilling the exploratory well is an integral part of the overall program to meet future water demand. Not proceeding with the proposed action could lead to inadequate sources, excessive withdrawal beyond the sustainable yields from other aquifers, and disruptions to basic domestic water services.

### Alternative Site

Hydrologic analysis suggest that a well drilled in the general vicinity of the proposed action would generate sufficient capacity for sustainable potable water production without negatively impacting the sustainable yield of the underlying aquifer or stream flows at Kapunahala Stream.

Alternative sites were considered in addition to the proposed site. Site selection criteria included a need to be connected to BWS's lower water service system, below an elevation of approximately 470 feet. Two other sites were considered: Site #2 at elevation 350 feet located near the northern corner of the main building; and Site #3 at elevation 300 feet, located on a narrow ridge approximately 450 feet makai of the proposed site.

These two alternative sites were dismissed in favor of the proposed site because they were in locations with higher visibility and constrained by steep slopes and existing roadways. Furthermore, the selected site has the following advantages over the other sites. The site:

- is located in a visibly unobtrusive area of the hospital grounds;
- has adequate work space;
- has good proximity for a possible future connection to an existing BWS 16 inch pipeline;
- is geologically acceptable for the project; and
- is located at an acceptable elevation (below the existing water tank).

### **Alternative Sources**

According to the Oahu Water Management Plan, (p. 5-12), strategies to meet the short-term (10-year) demand for potable water are to pursue the most readily available and economically feasible sources of water. Ground water remains the most economically feasible source of new potable supply even though potential sources with untapped sustainable yields are at more distant, less productive and costly locations. Nonetheless, other alternatives to the proposed action include:

#### **Surface Water**

Currently, safe drinking water regulations require monitoring, treatment and disinfection of all surface waters utilized for potable water. The operation and maintenance cost necessary to run a surface water development facility is significantly higher than groundwater sources.

#### **Desalination**

According to the Oahu Management Plan, an Ewa demonstration desalination plant which began operations in 1991 is producing approximately 0.5 million gallons per day of potable water from brackish water sources. However, while capital costs associated with a large scale desalination facility is comparable to developing groundwater in rural areas, the operation and maintenance of this type of facility is approximately ten times the cost of pumping groundwater.

#### **Wastewater Effluent Reuse**

The reuse of sewage effluent for irrigation and industrial usage would reduce the quantity of potable water used for non-potable purposes. Additionally, this alternative provides a viable means of disposing of wastewater effluent. However, several factors limit the feasibility of this alternative, including public health concerns and the high cost associated with the installation of the necessary infrastructure.

#### **Water Conservation**

Water conservation programs initiated by BWS in 1991, achieved an approximate 7% reduction in per capita water use by 1995. While continued conservation strategies would have a positive effect of lowering projected demands for water supply, the timely development of high quality groundwater sources or other alternatives should not be neglected because water demand fluctuates between high and low use periods. Adequate reserve supplies will be necessary to provide water during peak demand periods of the dry summer months despite the best water conservation efforts.

**Recommended Action**

Among the alternatives considered, the proposed action is recommended because it is an integral part of the overall water resource development and management program of the State and BWS.

### **VIII. Determination, Findings, and Reason Supporting Determination**

In accordance with the provisions of Chapter 343, Hawaii Revised Statutes, and the significance criteria on Section 11-200-12 of Title 11, Chapter 200, this EA has determined that the Windward Exploratory Well project will have no significant adverse impact on the environment. The proposed action is exploratory by nature. Should tests indicate adverse effects to stream flows or the sustainable yield of the aquifer, the well will not be put into production.

Significant criteria supporting the anticipation of a Finding of No Significant Impact (FONSI) are presented below:

*The project will not involve an irrevocable commitment to loss or destruction of any natural or cultural resource.*

The proposed action is intended to determine if water, a natural resource, could be obtained from this source and used to meet future water demands. The exploratory action will be conducted in a manner that avoids detrimental environmental effects. If water is found, the withdrawn water will be disposed in accordance with DOH regulations. Should testing procedures indicate an adverse effect on the interim instream flow standards, the well will not be placed into production pending further studies or the establishment of permanent instream flow standards for the streams in the area.

The site has been previously disturbed and it is unlikely that significant cultural resources are evident in the area. The State Department of Land and Natural Resources, Historic Preservation Division, has indicated that there are no known historic sites at the project location.

*The project will not curtail the range of beneficial use of the environment.*

The proposed site for the exploratory well is in an undeveloped portion of the grounds of the State Hospital. The land further mauka consists of hillside terrain traversed by the H-3 Freeway. An exploratory well as well as a permanent well are classified as a Utility under the City and County Land Use Ordinance and are principal permitted uses according to the zoning for this property. Locating the exploratory well in this corner of the hospital grounds will not compromise the existing or future use of the property.

*The project will not conflict with the State's long-term environmental policies or goals and guidelines as expressed in Chapter 343, HRS, and any revisions thereof and amendments thereto, court decisions, or executive orders.*

The proposed project is consistent with the environmental policies, goals, and guidelines defined in Chapter 343, HRS. This exploratory work is consistent with long range plans to meet future water demands for the island.

***The project will not substantially affect the economic or social welfare of the community or State.***

The proposed project is part of the overall plan for providing an adequate long-term water supply for the community and State. The rural character of the Windward community is not expected to undergo major transformation as a result of the proposed action in the short-term nor in the long-term if the well is put into production. Available regional infrastructure in the Windward area will allow excess water to be transmitted to other parts of the island, thereby allowing development to concentrate in the Ewa and Central Oahu areas in accordance with the City's General Plan. How long term use of the water is distributed will be up to policy makers of the Water Commission and BWS.

***The project will not substantially affect public health.***

The proposed project will be performed in accordance with all federal, state, and local regulations to ensure the protection of human health and the environment. Potential impacts on public health are considered insignificant and temporary. Any impacts from the project, which affects public health, will be mitigated by measures defined in this report.

***The project will not involve substantial secondary impacts, such as population change or effects on public facilities.***

The proposed action is part of a program designed to ensure that high quality drinking water is available to meet the water demand of all people in the State. The provision of an adequate supply of water is not expected to cause substantial secondary impacts, such as population changes or effects on public facilities.

***The project will not involve a substantial degradation of environmental quality.***

The proposed action is exploratory. It will not involve a substantial degradation of environmental quality. The work to be performed is temporary, lasting approximately 7 months, and will be conducted in accordance with guidelines provided by the State Commission on Water Resource Management and the Department of Health. The subject site is not environmentally pristine and does not have any biological resources of significance.

*Is individually limited, but cumulatively has considerable effect upon the environment or involves a commitment for larger actions.*

This exploratory well is just one component of the larger Statewide plan to sensitively manage our water resources. The action will have a positive cumulative effect on the environment as water resource development will be conducted in an organized and rational manner with precautions in place to protect groundwater aquifers and stream flow conditions. The action, in itself, will not lead to a commitment for larger actions, as it is only one part of the larger picture.

*This project will not affect any rare, threatened, or endangered species, or its habitat.*

The proposed project site has been previously disturbed, is adjacent to the H-3 Freeway corridor and does not contain any endangered flora or fauna species.

*This project will not detrimentally affect air or water quality or ambient noise levels.*

The potential impacts on air, water, and noise levels will be insignificant and limited to the short duration of the project. Any potential impacts from the project will be mitigated by measures defined in this report.

*This project will not affect nor is it likely to suffer damage by being located in an environmentally sensitive area.*

The proposed project site is not located in an environmentally sensitive area.

*This project will not substantially affect scenic vistas and viewplanes identified in county or State plans or studies.*

The exploratory well site is not located in any scenic vistas or viewplanes identified by county or State plans or studies. The exploratory well will be located in a visually unobtrusive area of the hospital grounds and screened from view by the existing vegetation in the area.

*This project will not require substantial energy consumption.*

Energy, in the form of gasoline, diesel fuel and electricity will be consumed during construction and test pumping activities. However, the amount of energy expended is not considered substantial.

## **IX. Comments and Responses to the Draft Environmental Assessment**

Notice of availability of the Draft EA was published in the Office of Environmental Quality Control Bulletin on August 23, 1998. There were no comments during the 30 day review period except for the attached letter from OEQC. Responses to the comments raised are attached.

BENJAMIN J. CAYETANO  
GOVERNOR



GARY GILL  
DIRECTOR

STATE OF HAWAII  
OFFICE OF ENVIRONMENTAL QUALITY CONTROL

236 SOUTH BERETANIA STREET  
SUITE 702  
HONOLULU, HAWAII 96813  
TELEPHONE (808) 586-4185  
FACSIMILE (808) 586-4186

September 21, 1998

Mr. Hiram Young  
State of Hawai'i Department of Land and Natural Resources  
1151 Punchbowl Street, Room 221  
Honolulu, Hawai'i 96813

CLIFFORD ARAKAWA &  
ASSOCIATES, INC.

SEP 23 2 11:13

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Dear Mr. Young:

Having reviewed the draft environmental assessment (DEA) entitled "*Windward Exploratory Well*", TMK 4-5-23: portion 2, Ko'olaupoko, O'ahu, we submit the following comments for your response.

I. DISCUSSION OF THE WELL'S EFFECTS ON LANDOWNERS AND WATER USERS

Please discuss the well's impact on other water sources (such as springs, streams and other wells), surrounding land owners, and water users including farmers and kuleana residents in the region.

II. FINANCIAL AND INSTITUTIONAL ARRANGEMENTS

In certain instances, a well is developed by private financing, the transfer of public lands to government or private developers, or in return for a water allocation credit to supply an urban development. Please discuss any institutional, financial or land use arrangements or commitments related to developing the well and delivering water to end users. These arrangements may include: co-funding of state or county water system development, an executive order or other set-aside of state lands, and purchase of land or easements by public entities.

III. CRITERIA FOR DETERMINING IF A WELL SHOULD BE PLACED INTO PRODUCTION ?

Please list the precise criteria for determining whether the well should be placed into production.

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

Sincerely,

A handwritten signature in black ink, appearing to read "Gary Gill".

GARY GILL  
Director

c: Mr. Clifford Arakawa, Sato and Associates, Inc.  
2046 South King Street, Honolulu, Hawai'i 96816

BENJAMIN J. CAYETANO  
GOVERNOR OF HAWAII



STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES

P. O. BOX 621  
HONOLULU, HAWAII 96809

OCT 16 1998

MICHAEL D. WILSON, CHAIRPERSON  
BOARD OF LAND AND NATURAL RESOURCES

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PLANNING BRANCH  
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STATE PARKS  
WATER RESOURCE MANAGEMENT

LD:Eng/ssk

TO: Honorable Gary Gill, Director  
Office of Environmental Quality Control

FROM: Michael D. Wilson, Chairperson 

SUBJECT: Windward Exploratory Well Draft Environmental Assessment,  
TMK: 4-5-23:por 2

1. Discussion of the Well's Effects on Landowners and Water Users.

*Please discuss the Well's impact on other water sources (such as springs, streams, and other wells) surrounding landowners and water users, including farmers and kuleana residents in the region.*

The well's impact on other water sources will be monitored, as required by the Commission on Water Resources Management. Because the proposed action is exploratory in nature, potential impacts, if any, that can be attributed to the proposed well on other water sources surrounding landowners and water users in the region will be assessed. This will be achieved by monitoring the water level in a nearby well before, during, and after pump testing the exploratory well. If tests prove that the well can be placed into production, a separate EA will be prepared to further assess the potential impacts of this well on other water sources in the region.

2. Financial and Institutional Arrangements.

*In certain instances, a well is developed by private financing, the transfer of public lands to government or private developers, or in return for a water allocation credit to supply an urban development. Please discuss any institutional, financial, or land use arrangements or commitments related to developing the well and delivering water to end-users. These arrangements may include: co-funding of State or County water system development, an executive order or other set-aside of State lands, and purchase of land or easements by public entities.*

Hon. Gary Gill

Page 2

OCT 16 1998

The exploratory well will be drilled on State-owned land with State Department of Land and Natural Resources (DLNR) funds. No financial or institutional arrangements have been made with regard to placing the well into production or delivering water to end-users at this time. As noted, the well is exploratory and must first be proved to be a viable source.

**3. Criteria for Determining If a Well Should Be Placed Into Production.**

*Please list the precise criteria for determining whether the well should be placed into production.*

The well will be tested on the basis of the following criteria:

- hydrogeologic field conditions
- aquifer characteristics
- yield
- drawdown
- water quality
- potential impacts, if any, on existing water sources

If a decision is made to place the well into production, the results of the exploratory test will be discussed in a separate EA that will focus on potential environmental impacts associated with the production well.

Thank you again for your comments. Please feel free to contact Mr. Andrew Monden, Chief Engineer, if you have any questions.

c: Sato & Associates

## X. References

"Aquifer Identification and Classification for Oahu: Groundwater Protection Strategy for Hawaii." Mink, John F. and Stephen L. Lau, February 1990.

"Environmental Assessment, Proposed Exploratory Wells-Waipahu Wells IV, Waipahu, Oahu, Hawaii." City and County of Honolulu, Board of Water Supply and George A.L. Yuen & Associates, Inc., March 1997.

"Final Environmental Assessment, for Kuou Well III." City and County of Honolulu, Board of Water Supply and Park Engineering, November 1997.

"Final Environmental Assessment, Manana Exploratory Wells, Manana Honolulu, Oahu, Hawaii." City and County of Honolulu, Board of Water Supply and R.M. Towill Corporation, February 1998.

"Kaneohe Quadrangle, 7.5 Minute Series (Topographic Map)." U.S. Department of Interior Geological Survey, 1983.

"Oahu Water Management Plan." Commission on Water Resource Management, Department of Land and Natural Resources, State of Hawaii, Review Draft, May 23, 1997.

"Soil Survey of the Islands of Kauai, Oahu, Maui, Molokai, and Lanai, State of Hawaii." United States Department of Agriculture, Soil Conservation Service in cooperation with the University of Hawaii, Agricultural Experiment Station, August 1972.

"Volcanoes and the Sea." Macdonald, G.A., A.T. Abbot, and F.L. Peterson, University of Hawaii Press, 1983.

BENJAMIN J. CAYetano  
GOVERNOR OF HAWAII



STATE OF HAWAII

DEPARTMENT OF LAND AND NATURAL RESOURCES

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

MICHAEL D. WILSON, CHAIRPERSON  
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LAND MANAGEMENT  
STATE PARKS  
WATER AND LAND DEVELOPMENT

December 3, 1997

Ms. Loren G. S. Lau  
Project Manager  
Sato & Associates, Inc.  
2046 S. King Street  
Honolulu, Hawaii 96826

LOG NO: 20631 ✓  
DOC NO: 9711EJ16

Dear Mr. Lau:

SUBJECT: Chapter 6E-8 Historic Preservation Review for Drilling of  
an Exploratory Well, Job. No. 17-OW-J, near the Kaneohe  
State Hospital  
Kaneohe, Ko'olaupoko, O'ahu  
TMK: 4-5-23:02

Thank you for the opportunity to provide information regarding archaeological and historical sites in the vicinity of the exploratory well. A review of our records shows that there are no known historic sites at the project location. Archaeological surveys conducted in the 1970s and 1980s in conjunction with the H-3 interstate route located a single site about 100 meters NW of the existing water tank. This site, comprised of six stacked rock mounds, was interpreted to have been constructed during land clearing activities for cattle pasturing and used until the early to mid 1900s. No other archeological sites were identified in this area. Therefore, we believe that this project will have "no effect" on significant historic sites.

In the unlikely event that historic sites, including human burials, are uncovered during routine construction activities, all work in the vicinity must stop and the State Historic Preservation Division must be contacted at 587-0047.

If you have any questions please call Elaine Jourdane at 587-0014.

Aloha,

  
DON HIBBARD, Administrator  
State Historic Preservation Division

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SATO & ASSOC., INC.



United States Department of the Interior

FISH AND WILDLIFE SERVICE  
PACIFIC ISLANDS ECOREGION  
300 ALA MOANA BOULEVARD, ROOM 3108  
BOX 50088  
HONOLULU, HAWAII 96850  
PHONE: (808) 541-3441 FAX: (808) 541-3470

NOV 21 1997

In Reply Refer To: JJS

Loren G.S. Lau  
Sato & Associates, Inc.  
2046 S. King Street  
Honolulu, HI 96826

Re: Species List Technical Assistance; Proposed Exploratory Well, Kaneohe, Oahu.

Dear Mr. Lau:

The U.S. Fish and Wildlife Service (Service) has reviewed the information provided in your letter of November 12, 1997. The proposed project by Sato and Associates, Inc. involves the preparation of a draft environmental assessment for the proposed drilling of an exploratory well near the State Hospital in Kaneohe, Oahu. The project sponsor is the State Department of Land and Natural Resources.

The Service has reviewed the provided information as well as other information contained in our files, including maps prepared by The Nature Conservancy's Hawaii Natural Heritage Program. To the best of our knowledge, there are no federally endangered, threatened, or candidate species directly within the project site. Because the project will be located within a previously disturbed area, the Service does not anticipate significant adverse impacts to fish and wildlife resources.

If you have any questions or comments please contact Fish and Wildlife Biologist John Schmerfeld at (808) 541-3441.

Sincerely,

*Keren W. Kasa*  
for Brooks Harper  
Field Supervisor  
Ecological Services

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NOV 21 1997

SATO & ASSOC., INC.

**END**

CERTIFICATION

I HEREBY CERTIFY THAT THE MICROPHOTOGRAPH APPEARING IN THIS REEL OF  
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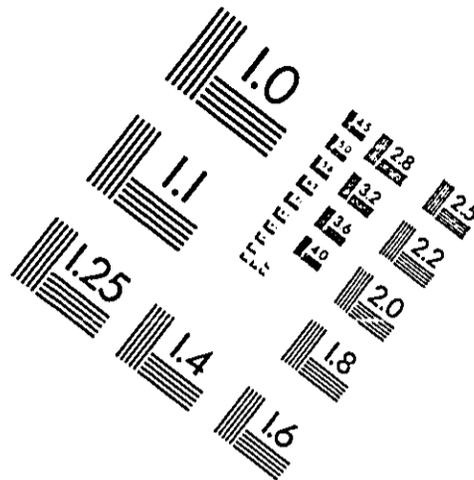
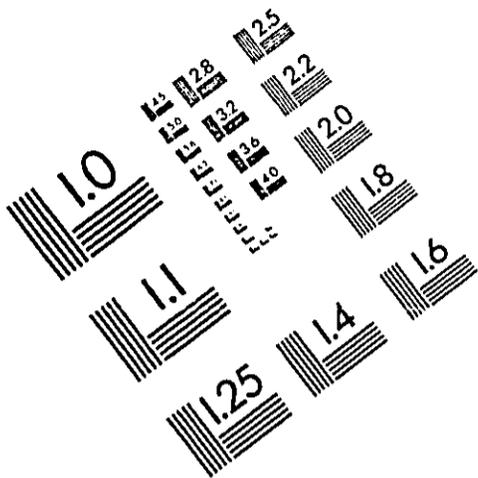
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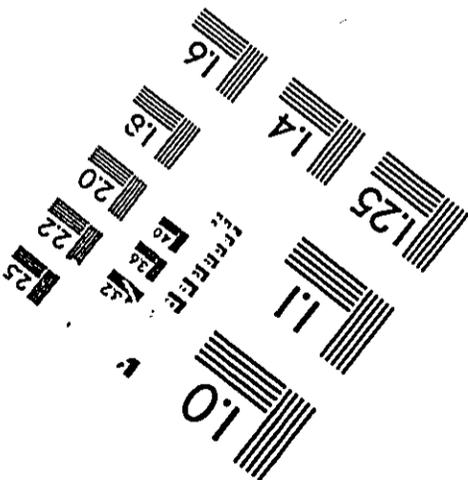
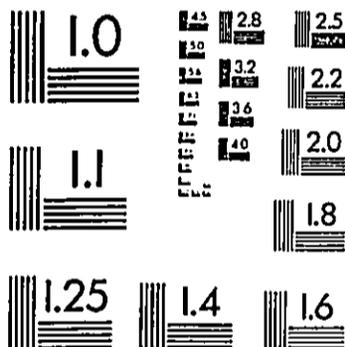
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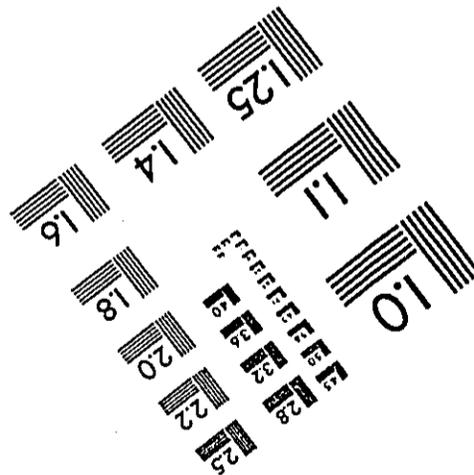
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