

Whitmore Exploratory Well

BOARD OF WATER SUPPLY

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July 23, 1997

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'97 JUL 25 P1:39

OFFICE OF ENVIRONMENTAL QUALITY CONTROL

Mr. Gary Gill, Director
Office of Environmental Quality Control
State of Hawaii
235 South Beretania Street, Suite 702
Honolulu, Hawaii 96813

Dear Mr. Gill:

Subject: Finding of No Significant Impact for the Board of Water Supply's Proposed Whitmore Exploratory Well, Whitmore, Wahiawa, Oahu, Hawaii, TMK: 7-1-009: 064

The Board of Water Supply has reviewed the comments received during the public comment period which began on January 8, 1997. We have determined that the environmental impacts of this project have been adequately addressed as discussed in the final environmental assessment (EA) and are therefore, issuing a finding of no significant impact. We request that our proposed exploratory well project be published as finding of no significant impact in the next Office of Environmental Quality Control (OEQC) Bulletin.

Attached are the completed OEQC bulletin publication form and four copies of the final EA for your review.

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

Very truly yours,


RAYMOND H. SATO
Manager and Chief Engineer

Attachments

cc: Bennett Mark, CH2M Hill

1997-08-08-0A-~~FEA~~-Whitmore Exploratory
Well

AUG 8 1997

FILE COPY

FINAL ENVIRONMENTAL ASSESSMENT

WHITMORE EXPLORATORY WELL

WHITMORE, WAHIAWA, OAHU, HAWAII
TAX MAP KEY: 7-1-09:64

PROPOSING AGENCY
CITY AND COUNTY OF HONOLULU
BOARD OF WATER SUPPLY



Submitted pursuant to Chapter 343, Hawaii Revised Statutes

JULY 1997

CIMHILL

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A	An Archaeological Assessment of the Exploratory Well Site at Whitmore Village, Wahiawa, Oahu, TMK 7-1-09:64, Cultural Surveys of Hawaii, December 1994.
B	Botanical Resources Assessment, Whitmore Exploratory Well, Wahiawa District, Island of Oahu, Char and Associates, December 1994.
C	Avifaunal and Feral Mammal Survey for a Board of Water Supply Exploratory Well Site at Whitmore Village, Oahu, Phillip L. Bruner, December 1994.
D	Agencies and Others Provided a Copy of the Draft Environmental Assessment
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Chapter 1 Executive Summary

1.1 Proposing Agency and Proposed Action

The City and County of Honolulu Board of Water Supply (BWS) proposes to drill and case an exploratory potable water well near the west side of Whitmore Village, along the north edge of Whitmore Avenue. The well site is proposed to be located on vacant land owned by the City and County of Honolulu Department of Parks and Recreation. The well is proposed to be located on a portion of the 2.644-acre site, will involve the installation of a temporary pump, pipelines, and electrical and mechanical control devices. If the well is integrated into the municipal water system, a permanent pump, control house, appurtenant piping, driveway, landscaping, irrigation system, and electrical systems will be installed on the site, and a transmission line will be installed to connect the well to the existing water main in Whitmore Avenue.

The exploratory well is proposed to be located at least 1,000 feet north of the banks of the north fork of Kaukonahua Stream-Wahiawa Reservoir. The well is expected to be capable of yielding up to 2.0 million gallons per day (mgd) of water that can be made available to the municipal water system.

The drilling and casing of this well is the first step of a process that the BWS utilizes to obtain hydro-geological data on the potential of new potable groundwater resources that could be used for municipal purposes. Following the drilling and casing of the exploratory well, test pumping of the well will be performed to determine if the quantity of the water from the exploratory well is adequate. If the quantity of the water proves to be unsuitable, the exploratory well will be sealed and/or capped. The quality of the water will also be tested. Besides the standard parameters, a check will be made on the presence of volatile organic compounds (VOC) in the well. In the event that VOCs are detected, the water could still be made suitable for municipal use. This could be accomplished with the installation of a granular activated carbon (GAC) treatment facility.

If the quantity of the water is sufficient, and if the quality of water is suitable or can be made adequate for municipal use with a GAC water treatment facility, the BWS's next step would be to integrate the well into the BWS's system as a production well. If the well is to be developed into a potable water production well, jurisdiction of the site will be transferred to the City and County of Honolulu BWS, and a subsequent amendment to the City and County of Honolulu Development Plan Public Facilities Map to include the project area as a "site determined water well programmed for production within 6 years" will be required. Water from this well, if it is converted to a production well, will be pumped into BWS's municipal system via pipelines to an existing 12-inch water main located under Whitmore Avenue.

This environmental assessment (EA) evaluates the impacts of the drilling, casing, and testing of this proposed exploratory well. The proposed action includes the temporary installation of a pump, piping, and appurtenances, and the temporary discharge of test water into the nearby gulch. This action also includes the monitoring of the nearest potable water wells to determine if these nearby wells are affected during the test pumping.

1.2 Purpose of this Environmental Assessment

This EA was prepared pursuant to Chapter 343, Hawaii Revised Statutes (HRS). Any project proposing the use of State of Hawaii or county lands or funds must comply with Chapter 343, HRS. Environmental compliance pursuant to Chapter 343, HRS, is required because the proposed exploratory well will be constructed with BWS funds on property owned by the City and County of Honolulu.

A final environmental assessment and an accompanying Negative Declaration by the BWS determining that the impacts of this project are not sufficient to require the preparation of an environmental impact statement (EIS) will satisfy the Chapter 343, HRS, requirements.

1.3 Subsequent Permits and Approvals Required

A well construction, pump installation and water use permit will be required from the Commission on Water Resource Management (CWRM).

A noise permit will be required from the State of Hawaii, Department of Health (DOH), Noise and Radiation Branch.

According to the City and County of Honolulu Planning Department, exploratory wells are considered minor and are not required to be shown on the Development Plan Public Facilities Map (DPPFM). If the well is developed into a potable water production well, a subsequent amendment to City and County of Honolulu DPPFM to include the project area as a "site determined well facility programmed for production within 6 years" will first be required since the well site is not shown on the Development Plan Public Facilities Map. A DPPFM amendment Application would require an application to the City and County of Honolulu Planning Department and approval by the City Council.

1.4 Benefits of this Project

The proposed well addition will furnish valuable data that will be added to Oahu's island-wide hydro-geological information base. This data will be valuable in estimating the quantity and quality of the potable groundwater resources available at this site, and in combination with data from other potable wells. The data will ultimately be valuable for determining total water resources available for the entire island.

If the hydro-geological data shows that potable groundwater sources can be developed successfully at this site, this well will be converted to a potable water well and integrated into BWS's potable water system. The development of additional potable water sources is necessary to accommodate the growing demand for potable water within the City and County of Honolulu.

1.5 Alternatives Considered

The no action alternative, the delayed action alternative, site alternatives, and source alternatives are discussed in this environmental assessment or were discussed in previous environmental analyses done by the BWS.

The no action alternative was not pursued because it would be contrary to the BWS's legal mandate to provide for the water needs of a growing population. This project is part of an overall potable groundwater development program intended to increase the water supply to

meet growing municipal water demands. If the BWS's water source development program is curtailed, the BWS would be hampered in providing adequately for the water needs of the future population of the island, which may result in restrictions in new development as well as regional water shortages.

The delayed action alternative was not pursued because this alternative would delay the BWS's implementation schedule, and would have substantially similar environmental outcomes as the no action alternative, and higher development costs because of inflation. Delay in the proposed well testing program would increase the risk that the growth in population will lead to water demands in excess of available supplies.

This environmental assessment analyzes one of two possible potable groundwater well site locations currently being evaluated by the BWS in the Wahiawa portion of the Central Sector. The other possible potable water well site location being considered is in Wahiawa town. The well site location in the Wahiawa town is considered by the BWS to be an additional site for potable water development rather than an alternative site. If the exploratory well site as proposed at the west side of Whitmore Village proves to be unfeasible, a future alternative location for an exploratory well site along the east edge of Whitmore Village along the north side of Whitmore Avenue may be possible. The area along the east edge of Whitmore Village does not contain any particular cultural/archaeological, botanical, or faunal characteristics that would be an impediment to the development of an exploratory water well or production well in this area. The land along the east edge of Whitmore Village is former agricultural land that has been extensively modified; this extensive modification has obliterated any sites of cultural or archaeological significance. The present vegetation along the east edge of Whitmore Village includes only the fallow remnants of previous cultivations, introduced, and alien species, and does not include any listed, proposed, or candidate threatened and endangered plant species. Like the other areas of Whitmore Village, no native, endangered, or threatened birds would be expected at this location along the east side of Whitmore Village. Although considered as a viable alternative, this alternative site was not pursued since the site is not owned by the City and County of Honolulu.

Alternative source development was analyzed by the BWS in its 1984 study, *Regional Environmental Impact Assessment for Development of Wells, Reservoirs, Transmission Lines and Appurtenances at Honolulu, Hawaii*, where potential potable water source alternatives other than groundwater were evaluated, including desalinization, the development of surface and brackish water sources, and the recycling of treated wastewater. Typically, these alternative sources have considerably higher costs and technical challenges. For instance, the use of surface water from Wahiawa Reservoir, which receives effluent from the City and County of Honolulu's sewage disposal plant, has a high potential for health and safety problems and would require costly water treatment works. The development of these alternatives was not considered as feasible as the development of groundwater resources.

1.6 Potential Impacts of this Project and Mitigation Measures

Construction work, primarily the drilling of the exploratory well, will cause minor short-term noise and air pollution impacts. Noise and air pollution impacts from this project will be noticeable at the adjacent residences located along Whitmore Avenue, but will be minimal at the nearest school, Helemano Elementary School, which is located about 1,500 feet away. All government rules and regulations concerning noise and air pollution will be followed during construction to minimize these minor short-term noise and air pollution impacts.

Contractors will comply with all of the conditions of the required noise permit. Mufflers will be required for all construction equipment. All noise-attenuating equipment will be maintained in proper operation condition and will be repaired or replaced as needed. Drilling operations will be restricted to the hours of 7:30 am to 3:30 pm on weekdays and will not include state holidays. In order to reduce noise levels from the temporary pumps, a surface pump will be installed with mutes, or a submersible pump (which is considerably quieter) will be used.

If the well is converted to a production well, noise levels from the permanent pump will be reduced to below regulatory levels by the use of a surface pump installed with mutes, or by the use of a submersible pump.

To mitigate the effects of the construction activities, dust control measures, such as water sprinkling and dust screens, may be implemented by the contractor as necessary to reduce dust levels that may affect nearby residents. Further, the contractor will properly maintain its internal combustion equipment to minimize exhaust emissions, and will comply with the Hawaii Department of Health Rules Title 11, Chapter 59 and 60 regarding Air Pollution Control.

Traffic impacts to Whitmore Avenue will be minimal. The contractor will schedule the movement of heavy trucks and vehicles to or from the site after 8:30 am and before 2:00 pm to avoid morning and afternoon peak traffic periods.

Water from the test pumping will be discharged into a gulch north of the Whitmore Village via a temporary drain line. The gulch leads into Poamoho Gulch and eventually into Poamoho Stream. It is expected that the water that will be discharged will be clean and therefore will not introduce any pollutants into the environment. Care will be taken in disposing of the test water to preclude the possibility of flushing debris or re-suspending sediments and other pollutants in the gulch.

If the test pumping results indicate that the quantity of the water from the exploratory well is unsatisfactory for municipal use, the exploratory well will be capped and/or sealed to prevent malicious or accidental contamination of the underlying groundwater aquifer. The presence of volatile organic compounds in the well is possible. If necessary, the quality of the water will be made adequate for municipal use with the installation of a granular activated carbon (GAC) water treatment facility on the site.

During the test pumping, the nearest potable groundwater wells will be monitored to determine if they are affected. There are no potable groundwater wells within one mile of the proposed Whitmore Exploratory Well site. The nearest wells are the BWS's Wahiawa Wells and Wahiawa II Well, and the well at the U.S. Navy Reservation. The resulting data from the monitoring of the nearby groundwater wells will be valuable to determine if the exploratory well can be converted to a production well and integrated into the existing municipal facilities.

The north fork of Kaukonahua Stream is also the north fork of Wahiawa Reservoir. Wahiawa Reservoir's north fork is located across Whitmore Avenue to the south beyond Whitmore Village. The reservoir is located at least 1,000 feet to the south of the proposed well site. There will not be any adverse impacts to Kaukonahua Stream or Wahiawa Reservoir in this vicinity because the water flowing into Kaukonahua Stream and Wahiawa Reservoir is supplied by high elevation (about 1,000 feet above mean sea level [msl]) surface water and will not be affected by the deep groundwater (approximately 700 below surface elevation, which is about 280 feet above msl) withdrawn by the well.

There is no potential for adverse impacts to significant wetlands since none exist in the Wahiawa Aquifer. The nearest wetlands occur at Pearl Harbor to the south and Haleiwa to the north, both about 9 miles away.

1.7 Determination

In accordance with Chapter 343, HRS, the BWS has determined that an EIS is not required for the Whitmore Exploratory Well construction and test pumping, which will include the temporary installation of a pump, pipelines, and electrical and mechanical control devices.

This determination has been made primarily because the impacts of this project are not significant enough to require the preparation of an EIS. Whatever minor adverse impacts that may result from this project may be minimized to insignificant levels by the application of the recommended mitigation measures. The BWS has concluded that this project has potentially significant benefits in terms of the potable water supplies that may be obtainable if the Whitmore Exploratory Well can be converted into a production well.

1.8 Agencies and Others Consulted in Making this Assessment

The following agencies were consulted during the preparation of the draft environmental assessment for this project:

State of Hawaii agencies

- Department of Agriculture
- Department of Land and Natural Resources
 - Historic Preservation Division
 - Commission on Water Resources Management
- Department of Health
 - Environmental Health Division
 - Office of Environmental Quality Control

City and County of Honolulu agencies

- Fire Department
- Planning Department
- Land Utilization Department
- Parks and Recreation

Twenty-one government agencies and three groups or other individuals were provided a copy of the draft environmental assessment for this project and requested to provide comments.

The following is a list of those agencies and others who were provided a copy of the draft environmental assessment.

Federal agencies

- U.S. Department of Agriculture, Soil Conservation Service
- U.S. Army Corps of Engineers, Pacific Ocean Division
- U.S. Navy, Naval Facilities, Engineering Command, Pacific Division
- U.S. Fish and Wildlife Service

State of Hawaii agencies

- Department of Agriculture
- Department of Business, Economic Development, and Tourism
- Department of Education
- Department of Land and Natural Resources
 - Forestry and Wildlife Division
 - Historic Preservation Division
 - Commission on Water Resources Management
- Department of Health
 - Environmental Management Division
 - Office of Environmental Quality Control
- Department of Transportation, Highways Division
- University of Hawaii
 - Environmental Center
 - Water Resources Research Center

City and County of Honolulu agencies

- Fire Department
- Planning Department
- Land Utilization Department
- Public Works Department
- Transportation Services Department
- Wastewater Management Department

Others

- City Council District I representative Rene Mansho
- Wahiawa Neighborhood Board No. 26, Chair Jack Kampfer
- Sierra Club, Hawaii Chapter

Chapter 2 Purpose and Need for the Proposed Action

2.1 Project's Purpose and Need

In 1990, the average water demand on the island of Oahu was 158 mgd of which 156 mgd was potable water. Actual BWS water usage in 1995 averaged 156 mgd, of which 154 mgd was potable water. The Commission on Water Resource Management (CWRM), Department of Land and Natural Resources (DLNR), in its 1992 review draft of the *Hawaii Water Plan, Oahu Water Management Plan (OWMP)*, projected that municipal water demand would be between 204 to 213 mgd by the year 2010, depending on whether the upper limit of the City and County of Honolulu's General Plan population projection for Oahu is attained. BWS historical data from 1970 to 1995 indicates an annual average increase of approximately 2.0 mgd/year for Oahu's municipal water system. Thus, additional water requirements for the year 2010 are projected to be between 50 and 59 mgd. To meet the growing island-wide demand for water, the BWS plans to develop new sources of potable groundwater on Oahu within Wahiawa, particularly in the Whitmore Village area (see Figure 2-1).

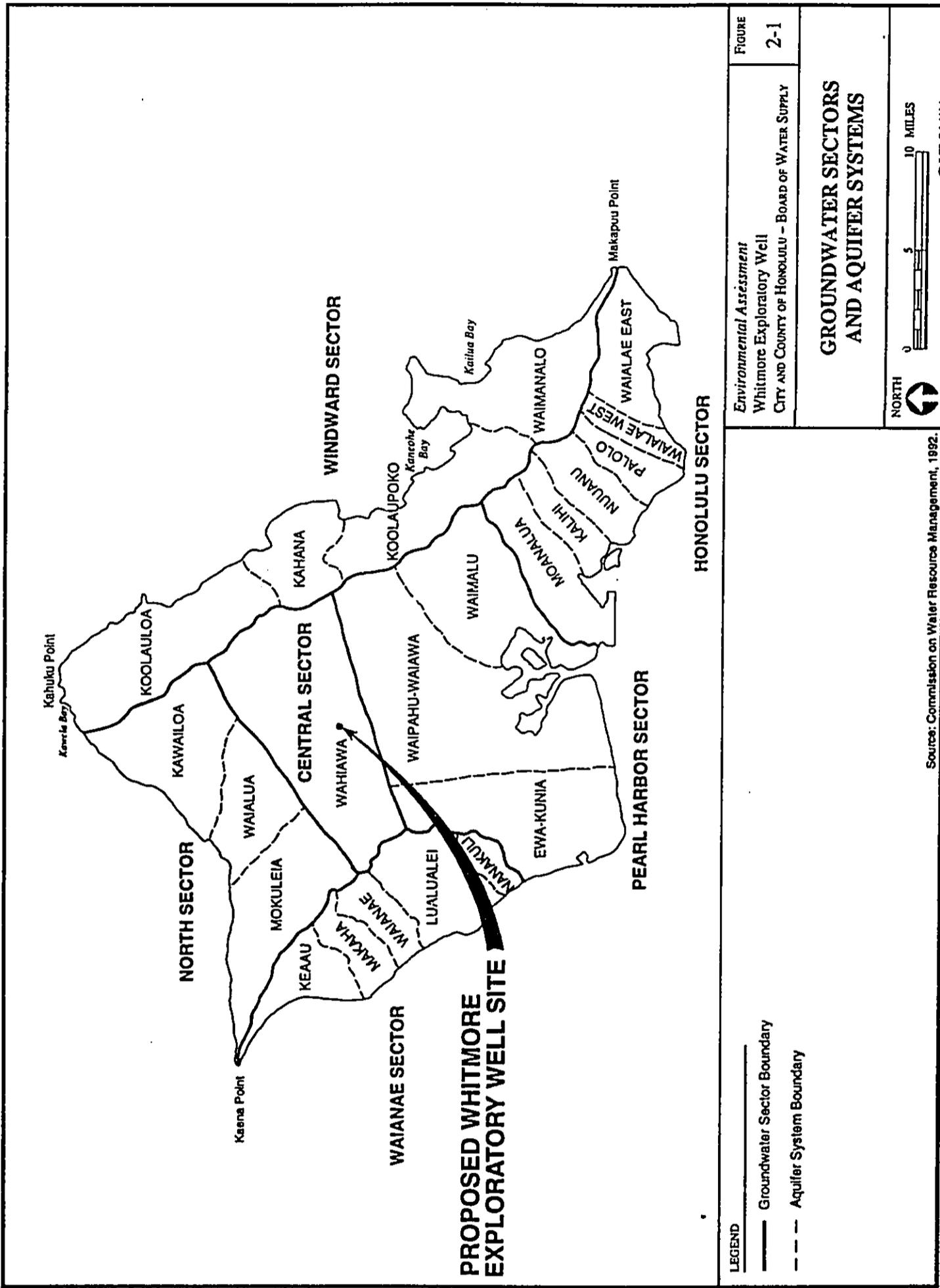
The Whitmore Exploratory Well is a proposed BWS well project within the Central Sector, Wahiawa Aquifer. If the tests for the quantity and quality of the groundwater from the well addition proves to be successful, the BWS intends to convert this well into a production well and integrate it into the BWS's Oahu potable water source, storage, and transmission system. The Whitmore Exploratory Well, if converted to a production well, is expected to yield up to 2 mgd of potable water for standby and future growth.

2.2 The State Water Code and the Commission on Water Resource Management

The State Water Code and the CWRM were established in 1987 by the Hawaii State Legislature in Section 174-C, HRS. The CWRM was established to handle the administration of the new State Water Code.

The State Water Code established a Hawaii Water Plan consisting of four parts:

- a water resource protection plan prepared by the CWRM
- water use and development plans prepared by each county
- a state water project plan prepared by state agencies
- a water quality plan prepared by the Department of Health



As part of the Hawaii Water Plan, a study was commissioned to determine the sustainable yields of surface and groundwater sources statewide.

Under the state water code, the CWRM creates management boundaries for water management areas. Water management areas were designated by the CWRM for those areas where the CWRM decided, after conducting scientific investigation and research, that management of groundwater or surface water, or both, was necessary because the water resources for that area were threatened by existing or proposed withdrawal or diversion of water.

In designating an area for groundwater use regulation, the CWRM must consider the following:

- (1) Whether an increase in water use of authorized planned use may cause the maximum rate of withdrawal from the groundwater source to reach 90 percent of the sustainable yield of the proposed water management area;*
- (2) There is an actual or threatened water quality degradation as determined by the Department of Health;*
- (3) Whether regulation is necessary to preserve the diminishing groundwater for future needs, as evidenced by excessively declining groundwater levels;*
- (4) Whether the rates, times, spacial patterns, or depths of existing withdrawals of groundwater are endangering the stability or optimum development of the groundwater body due to upconing or encroachment of salt water;*
- (5) Whether the chloride contents of existing wells are increasing to levels which materially reduce the value of their existing uses;*
- (6) Whether excessive preventable waste of water is occurring;*
- (7) Serious disputes respecting the use of the groundwater resources are occurring; or*
- (8) Whether water development projects that have received any federal, state, or county approval may result, in the opinion of the commission, in one of the above conditions.*

Notwithstanding an imminent designation of a water management area conditioned on a rise in the rate of groundwater withdrawal to a level of 90 percent of the area's sustainable yield, the CWRM, when such level reaches the 80 percent level of the sustainable yield, may invite the participation of water users in the affected area to an informational hearing for the purposes of assessing the groundwater situation and devising mitigative measures (Section 174C-44, HRS).

2.3 Groundwater Sectors and Aquifers

The CWRM has established, for planning and administration purposes, six groundwater sectors that encompass the entire island of Oahu (see Figure 2-1). These sectors are: Honolulu, Pearl Harbor, Waianae, Central, North, and Windward. Presently, all sectors except the Waianae Sector have been designated as groundwater management areas. The Windward Sector, which became a groundwater management area in March 1993, is the last

sector to be included as a groundwater management area (*personal communications with Lenore Nakama, CWRM, May 12, 1994*).

Each groundwater sector is divided into aquifers. The Central Sector is located on the central plain of Oahu, in the Schofield plateau between the Koolau Mountains to the northeast, and the Waianae Mountains to the southwest. The North Sector is located down gradient and to the northwest, and consists of the Mokuleia, Waialua, and Kawailoa aquifers. The Pearl Harbor Sector is located down gradient and to the south, and consists of the Ewa-Kunia, Waipahu-Waiawa, and Waimalu aquifers. The Central Sector consists of a single aquifer, the Wahiawa Aquifer.

From northwest to southeast, the Wahiawa Aquifer is about 3 to 7 miles wide, and from the southwest to the northeast is about 12 to 14 miles long. The Whitmore Exploratory Well is proposed to be located in Whitmore Village near the center of the Wahiawa Aquifer.

2.4 Sustainable Yield and Central Water Management Area—Wahiawa Aquifer

In order to evaluate the impacts of developing an additional permanent potable groundwater source on this site, it may be necessary to estimate the sustainable yield of the underlying aquifer system. Sustainable yield is the amount of groundwater that can be removed from an aquifer over a period of many years without developing serious adverse impacts to the aquifer.

Within the Hawaiian Islands, the sustainable yield of basal aquifers for each island is always less than the average annual rate of recharge to the groundwater aquifer, because a small amount of the fresh groundwater is not available for development because a portion of the "fresh" groundwater is lost by mixing with the underlying salt water. Estimating sustainable yield for the island of Oahu and for its individual aquifers is complex because the amount of fresh groundwater that is mixed with salt water is dependent upon the degree of aquifer confinement, lens thickness, the degree of agricultural and urban development, and numerous other factors that are not constant.

The highest estimated sustainable yield of 184 mgd occurs in the Pearl Harbor Water Management Area (WMA). The OWMP notes that the Central WMA's only aquifer, the Wahiawa Aquifer, has a total estimated sustainable yield of 23 mgd. The Pearl Harbor WMA is the most heavily utilized WMA for municipal water use. In 1990, 92.01 mgd, or nearly 60 percent of BWS's total usage of 156 mgd, was taken from the Pearl Harbor WMA. In comparison, the BWS's total usage from the Wahiawa Aquifer was about 3.65 mgd in 1990, or about 2 percent of BWS's total island-wide usage.

In 1990, the average water withdrawn from the Wahiawa Aquifer was 9.07 mgd, which is about 14 mgd lower than this aquifer's estimated sustainable yield of 23 mgd.

2.5 Potential Areas for Source Development

According to the OWMP report, there is potential for developing additional potable water sources in Wahiawa, North Shore, Windward, and Waianae areas. Of the remaining areas, the OWMP report states that virtually all of the prime groundwater sources in the Pearl Harbor and Honolulu aquifers have been developed and are under restricted allocations of the

CWRM, and that the development of new sources for future development in the Pearl Harbor and Honolulu aquifers will require efforts to reallocate existing potable water supplies.

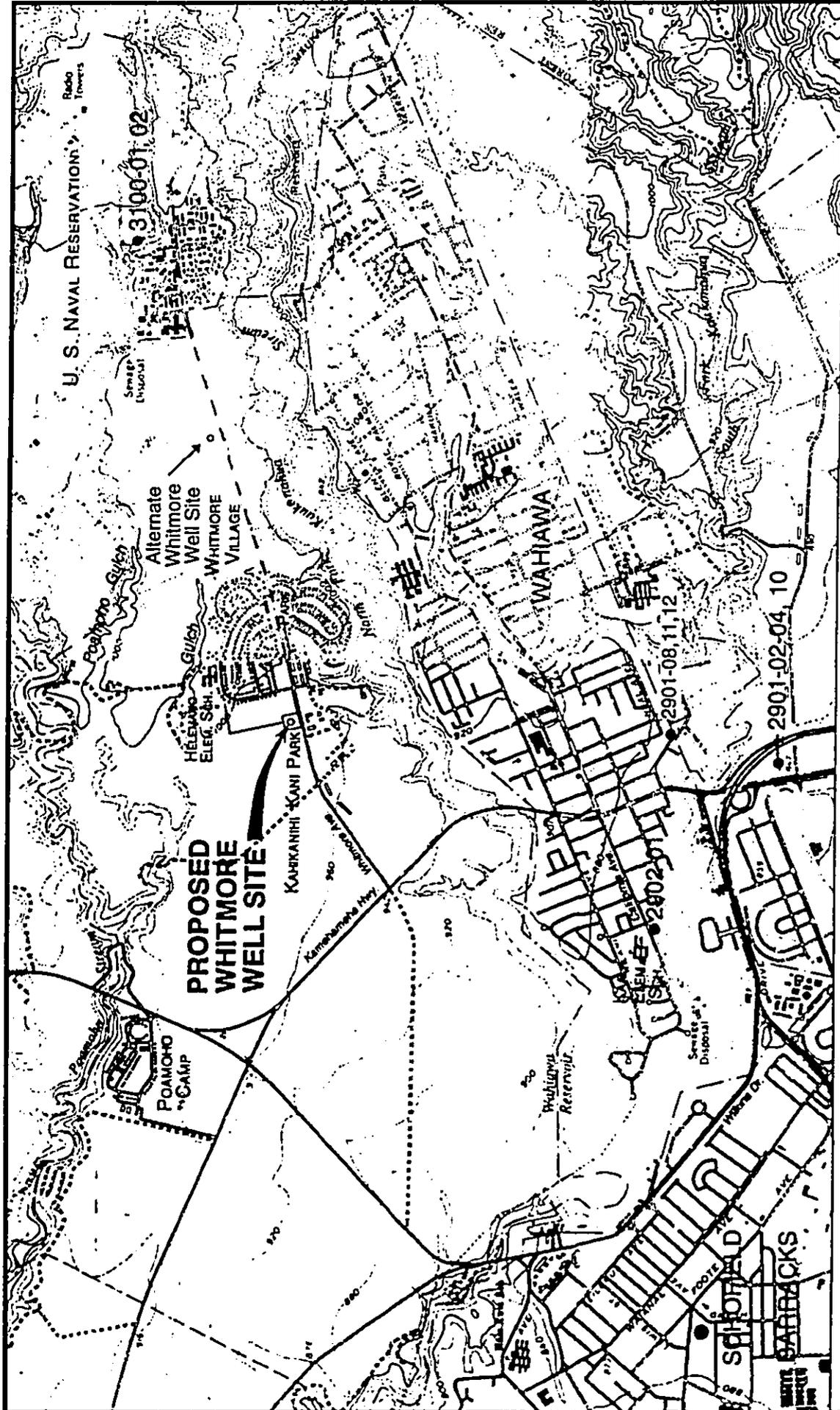
The impact of development of additional sources of potable groundwater in Honolulu was assessed in a separate study entitled *Regional Environmental Impact Assessment for Development of Wells, Reservoirs, Transmission Lines and Appurtenances at Honolulu, Hawaii*, which was prepared for the BWS and published in 1984. The BWS evaluated the development of additional sources of potable groundwater in Windward Oahu in a separate study entitled *Windward Oahu Regional Water System Improvements*, published in 1988.

The purpose of the proposed Whitmore Exploratory Well is to determine if the development of additional potable water sources in the Whitmore Village area of the Wahiawa Aquifer is feasible and for standby purposes if the single transmission line from Wahiawa is broken.

2.6 Existing Water Sources

According to OWMP, the Wahiawa Aquifer facilities consists of wells operated by BWS, the military, Waialua Sugar Company, and Del Monte Corporation (see Figure 2-2). The BWS operates Wahiawa Wells (Well Nos. 2901-08, 11, and 12) and Wahiawa II Well (Well No. 2902-01). The military operates the Schofield Shaft (Well Nos. 2901-02 to 04, and 10) and the wells in the Whitmore U.S. Naval Reservation (Well No. 3100-01 and 02). The Waialua Sugar Company operates three wells (Well Nos. 3102-01, 3203-01 and 02) and Del Monte Corporation operates one well (Well No. 3103-01) northwest of Poamoho Camp (over 1-1/2 miles northwest of the proposed Whitmore Exploratory Well, and not shown on Figure 2-2). Del Monte Corporation also operates two wells (Well Nos. 2803-05 and 07) west of Wheeler Air Force Base (over two miles southwest of the proposed Whitmore Well, and not shown on Figure 2-2).

Records for the Wahiawa Aquifer for 1990 indicate that the BWS withdrew a total of about 3.25 mgd from its three existing wells at its Wahiawa Well facility and about 0.40 mgd from its one existing well at the Wahiawa II Well facility, for a total of 3.65 mgd. Military users withdrew about 3.92 mgd, Waialua Sugar Company withdrew about 0.35 mgd, and Del Monte Corporation withdrew about 1.15 mgd. As of January 24, 1997, the CWRM has set the permitted water use for the Wahiawa Aquifer System to 20.954 mgd, about 2 mgd less than the estimated 23 mgd sustainable yield for this aquifer. In 1990, the actual usage for the Wahiawa Aquifer was a total of 9.07 mgd as compared to the permitted use of 20.954 mgd, which leaves about 11.9 mgd of unused permitted use. The CWRM is in the process of adjusting the remaining unused permitted use to reflect any non-use for a period of more than 4 years.



Well No.	Well Name
2901-02-04, 10	Schofield Shaft
2901-08, 09, 11	Wahiawa Wells
2902-01	Wahiawa II Well
3100-01, 02	U.S. Naval Reservation, Whitmore

Source: Oahu Water Management Plan, Commission on Water Resource Management, May 1992

Environmental Assessment
Whitmore Exploratory Well
CITY AND COUNTY OF HONOLULU - BOARD OF WATER SUPPLY

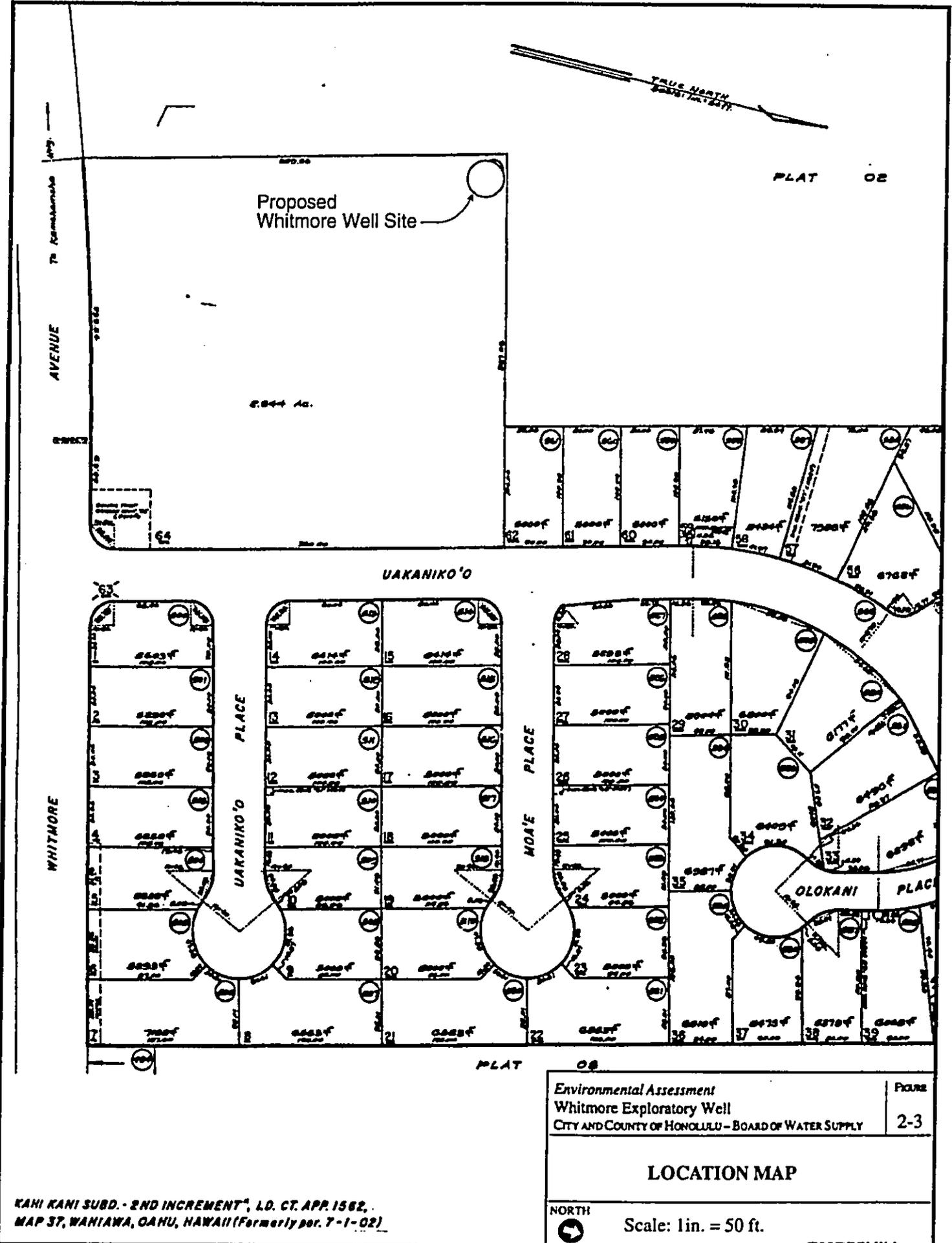
**PROPOSED WHITMORE
WELL SITE**

Figure 2-2

NORTH

0 2000 4000 FEET

CH2MHILL



KAHI KANI SUBD. - 2ND INCREMENT, L.O. CT. APP. 1982,
 MAP 37, WAHIAWA, OAHU, HAWAII (Formerly per. 7-1-02)

Environmental Assessment Whitmore Exploratory Well CITY AND COUNTY OF HONOLULU - BOARD OF WATER SUPPLY	FIGURE 2-3
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LOCATION MAP

NORTH
 Scale: 1 in. = 50 ft.

CH2MHILL

Chapter 3 Project Description

3.1 Location and Site Characteristics

The proposed project site is located at Whitmore Village on the high Schofield plateau in Central Oahu, between the Koolau Mountain Range to the northeast and the Waianae Mountain Range to the southwest. The site is located near the west end of Whitmore Village, in the area north of the Kaukonahua Stream's north fork, which is also the north fork of the Wahiawa Reservoir. Wahiawa Reservoir is a man-made irrigation water reservoir with a normal elevation of 842 above msl. The reservoir level is controlled by a spillway at the confluence of the north fork and south fork of Kaukonahua Stream.

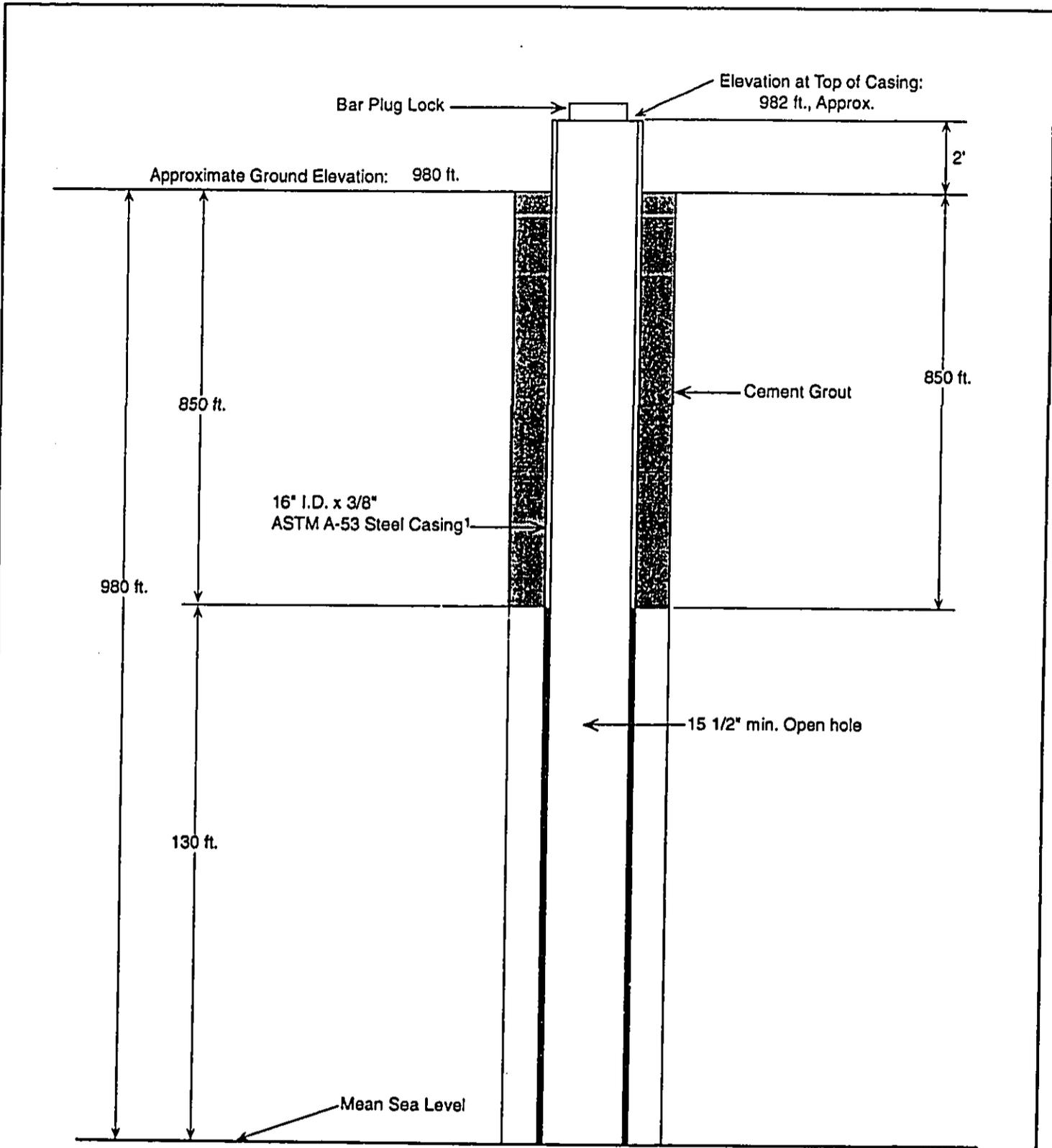
The proposed Whitmore Exploratory Well site is located within a parcel owned by the City and County of Honolulu Department of Parks and Recreation, along the north edge of Whitmore Avenue. A gulch that leads to Poamoho Gulch, and eventually into Poamoho Stream, is located about 2,000 feet north of the proposed Whitmore Exploratory Well site. The proposed well addition site is about 1,000 feet above msl, and is at least 1,000 feet upgradient and north of the bank of the Wahiawa Reservoir. The site is about 1,500 feet southwest of Helemano Elementary School. Residential homes are located adjacent to the proposed well site to the north and east. On the south side of Whitmore Avenue, across the street from the site, the land is vacant. Areas to the west of the site are agricultural. Access to the site is via Whitmore Avenue, which is a roadway under the jurisdiction of the State of Hawaii (see Figures 2-2 and 2-3).

3.2 Technical Characteristics

The Whitmore Exploratory Well site is proposed for a single well. The well is proposed to be located north of the edge of Whitmore Avenue. The well is proposed to be approximately 980 feet deep to about 0 feet above mean sea level and will attempt to extract potable water from the high level groundwater in the basalt (see Figure 3-1). The proposed Whitmore Exploratory Well, if converted to a production well is expected to be able to yield up to 2.0 mgd.

There are no potable water wells within 1 mile of the proposed Whitmore Exploratory Well site.

Within about 1-1/2 miles of the proposed Whitmore Exploratory Well, there are two existing BWS potable water well sites consisting of four wells, one well site operated by the U.S. Army consisting of four wells, and one U.S. Navy well site consisting of two wells. The existing BWS Wahiawa II Well (Well No. 2902-01) is located a little more than 1 mile to the southwest. The existing BWS Wahiawa Wells (Well Nos. 2901-08, 11, and 12) are located a



NOTES:

¹Solid Casing:
 Material: ASTM A-53 Steel
 Length: 850 ft.
 Inside Diameter: 16 in.
 Wall thickness: 3/8 in.

^{*}ASTM=American Society for Testing and Materials

Environmental Assessment
 Whitmore Exploratory Well
 CITY AND COUNTY OF HONOLULU - BOARD OF WATER SUPPLY

FIGURE
 3-1

WELL CROSS-SECTION

Not to scale

CH2M HILL

little more than 1 mile to the south. The U.S. Army's Schofield Shaft Wells (Well Nos. 2901-02 to 04, and 10) are located about 1-1/4 miles to the south. The U.S. Navy's Wells (Well Nos. 3100-01 and 02) are located about 1 mile to the northeast.

Records for the Wahiawa Aquifer for 1990 indicate that the BWS withdrew a total of about 3.25 mgd from its three existing wells at its Wahiawa Well facility and about 0.40 mgd from its one existing well at the Wahiawa II Well facility, for a total of 3.65 mgd. The U.S. Army withdrew about 3.92 mgd from its Schofield Shaft. DLNR records show that the U.S. Navy's Well No. 3100-01 has not been used since 1974, and OWMP records do not show any water being withdrawn from the U.S. Navy's Well No. 3100-02.

The oldest of the BWS wells are the three wells in the Wahiawa Wells facility, built from 1941 to 1962, at a ground elevation of 870 to 873 feet above msl, which had initial static heads varying from about 273 to 275 feet above msl. The Wahiawa II Well was built in 1974, at a ground elevation of 866 feet above msl, and had an initial static head of about 276 feet above msl. The U.S. Army's Schofield Shaft wells were built from 1936 to 1956 at ground elevations of about 287 and had initial static heads of about 284 feet above msl. The U.S. Navy's wells were built in 1941 to 1942 at a ground elevation of 1,145 feet above msl; initial static head for the U.S. Navy's Well No. 3100-02 was 288 feet above msl.

It is expected that the proposed Whitmore Exploratory Well will be successful in yielding the necessary quantity of potable groundwater that will be suitable for municipal use because it will be extracting water at a depth of 280 feet above msl, from high level dike-free water, where the BWS hydrologists have predicted that there may be adequate yields of potable groundwater available.

3.3 Construction and Well Testing

The proposed Whitmore Exploratory Well will be approximately 980 feet deep with the upper 850 feet consisting of a 16-inch diameter steel casing. The lower 130 feet of the well will consist of a 15-1/2-inch open hole. The ground elevation of the proposed Whitmore Exploratory Well will be about 980 feet above mean sea level (see Figure 3-1).

Drainage from the Whitmore Exploratory Well from testing or flushing will be conveyed through temporary pipes that will empty into the existing dry gulch to the north of Whitmore Village. The gulch leads into Poamoho gulch and eventually into Poamoho Stream. This temporary drainage system emptying into the gulch will be used to dispose of the water extracted during the yield draw down test and the long term constant rate pump test. Best Management Practices will be implemented during test pumping.

The yield draw down test will be conducted after the Whitmore Exploratory Well is drilled, and temporary diesel or electric pumps and pipelines are connected. The yield draw down test will be performed for the exploratory well at a rate of 700 to 1,400 gallons per minute. Following the yield draw down test, a long term constant rate pump test will be conducted for the well for a period of several days at the rate determined from the yield-draw down tests. Water table draw down rates will be measured and the quality of water will be tested.

Should the quantity of the potable water prove to be adequate for municipal use, the exploratory well will be temporarily capped. If the pump tests prove to be unsatisfactory, the well will be sealed and/or capped. When the yield draw down and the long term constant rate pump tests are completed, the temporary diesel or electric pumps, pipelines, and control structure will be removed from the site, and all surplus excavation material and construction

debris will be removed and disposed of off-site in compliance with applicable State and City and County regulations.

The presence of volatile organic compounds in the well is possible because of known presence in other wells. If necessary, if the well is converted to a production well, the quality of the water could be made suitable for municipal use with the installation of a GAC water treatment facility on the site. A GAC facility on site will require approximately an additional 1,000 square foot of area.

If the well quantity tests are satisfactory, and if the quality of water is suitable or can be made suitable for municipal use with a GAC facility, the well will be integrated into the existing island-wide municipal water system which will require installation of a new pipeline to connect to the existing 12-inch water main in Whitmore Avenue. Permanent pumps will be installed at the Whitmore Exploratory Well site along with the necessary pipelines, control house, driveway, landscaping, and irrigation system. Additional permanent electrical and mechanical control devices necessary for operation will also be installed. If necessary to make the quality of water suitable for municipal use, a permanent GAC facility will be installed on site.

3.4 Project Schedule, Cost, and Work Force

The construction and testing of the proposed Whitmore Exploratory Well is expected to take 8 months to complete. The capital cost for the exploratory portion of this project is estimated at \$770,000, and would involve a work crew consisting of no more than about 12 people at any one time.

Drilling will be completed in about 6 months. Installation of the casing will take about a week and another 2 to 3 weeks will be required to install the pump and run the test pumping. Demobilization may take up to 2 weeks. Total project duration for the construction and testing of the exploratory well is estimated to be about 8 months.

If the well tests are successful, the Whitmore Exploratory Well will be integrated into the existing municipal potable water system. Installation of the permanent pumps, pipelines, control house, necessary electrical and mechanical control devices, the landscaping and irrigation system, and if necessary the GAC facility, is expected to take up to an additional 18 months, at an additional cost of \$1,900,000 without the GAC facility and \$2,100,000 with the GAC facility.

Chapter 4
Environmental Setting, Potential Impacts, and Mitigation

4.1 Land Use and Ownership

4.1.1 Existing Environment

Land use in the vicinity of Whitmore Village is a mix of suburban and agricultural uses. Whitmore Village itself is a mix of predominantly single-family residences, apartments, and small commercial activities including a supermarket. Whitmore Village has one school, the Helemano Elementary School, and a park in the center of Whitmore Village on the south side of Whitmore Avenue. Whitmore Village is surrounded by agricultural land uses. The site is located along the north edge of Whitmore Avenue near the west edge of Whitmore Village. Single-family residences are located adjacent to the proposed well site. Helemano Elementary School is located about 1,500 feet to the northeast. Areas to the west of the Whitmore Village are agricultural. Access to the site is via Whitmore Avenue, which is the primary roadway through this area.

The 2.644-acre site proposed for the Whitmore Exploratory Well is identified by Tax Map Key parcel 7-1-09: por. 64, and is owned by City and County of Honolulu Department of Parks and Recreation. A sewer pump unit is located in a 50-foot by 50-foot easement area enclosed by a chain-link fence at the southeast portion of the site. The single-family residential lots located adjacent to the site are predominantly privately owned, although there are a number owned by Oceanic Properties. Helemano Elementary School is owned by the City and County of Honolulu. The 2.3-acre park in the center of Whitmore Village along the south edge of Whitmore Avenue is also owned by the City and County of Honolulu. About half of the commercial area is privately owned with the remaining portion owned by the State of Hawaii. The Hawaii Housing Authority's Lalawai Apartments, located between Whitmore Avenue and Helemano School, is on State of Hawaii land. Whitmore Avenue is under the jurisdiction of the State of Hawaii.

4.1.2 Project Impacts

Installation of the Whitmore Exploratory Well will not change any of the surrounding land uses and ownership patterns.

4.1.3 Mitigation Measures

No mitigation measures are proposed or required.

4.2 Topography, Climate and Rainfall

4.2.1 Existing Environment

The proposed BWS exploratory well site is within the Whitmore Village area, in the high Schofield plateau of Central Oahu, and in the area north of the north fork of the Kaukonahua Stream. Wahiawa Reservoir is a man-made reservoir with a normal elevation of 842 feet above msl that is controlled by a spillway at the confluence of the north fork and south fork of Kaukonahua Stream. The two tributaries of Kaukonahua Stream flow in a westward

direction from the Koolau Mountains along the north edge and south edge of Wahiawa, and join together at the west end of Wahiawa before flowing northwestward into Kaiaka Bay at Waialua. The proposed BWS site is located at least 1,000 feet north and upgradient of the banks of the north fork of Wahiawa Reservoir, at a ground elevation of about 1,000 feet above msl. There is a gulch north of Whitmore Village that leads into Poamoho Gulch and eventually into Poamoho Stream (see Figure 2-2).

Temperature ranges from 74 to 75 degrees Fahrenheit in March and from 79 to 80 degrees Fahrenheit in September. A northeasterly or windward trade wind is prevalent throughout most of the year. In Hawaii, the term "windward" generally refers to the normal direction of this prevailing trade wind, and not the direction of the wind at a specific time. The northeast or windward trade wind occurs with higher frequency in the summer, about 90 percent of the time, as compared to winter when the northeast trade wind occurs only about 50 percent of the time.

Rainfall averages about 250 inches per year near the upper reaches of the tributaries of Kaukonahua Stream near the upper ridges of the Koolau Mountain range (at an elevation of about 2,400 feet above msl). The rainfall at the elevations near the upper ridges of the Koolau Mountains is the result of mountain caused or "orographic" rains that form as the moist trade wind air moves in from the sea, predominantly from the northeast direction from the windward side of the island, first along the lower flat lands, and then up the steep windward slopes of the Koolau Mountains. Rainfall distribution on both windward and leeward sides of the Koolau Mountains, and on the Schofield plateau, closely follows the topographic contours, with higher rainfall at the upper slopes, and lower rainfall at lower elevations on the plateau. Rainfall in the area of the proposed BWS exploratory well site averages about 50 inches per year.

4.2.2 Project Impacts

Installation of the Whitmore Exploratory Well would not have any significant effect on the topography, climate, or rainfall in the area.

4.2.3 Mitigation Measures

No mitigation measures are proposed or required.

4.3 Geology and Hydrology

4.3.1 Geology

The island of Oahu is the result of the growth, connection, and erosion of two elongated shield volcanoes that are the foundation of the present Waianae and Koolau mountain ranges. The Waianae volcano, which is the older of the two volcanoes, formed the caldera that is now the Waianae mountain range. The Koolau volcano became active after the Waianae volcano had reached its maturity, and continued its activity long after the Waianae volcano ceased its activity. The Koolau volcano continued to build and fill in the region between the two volcanoes creating one island as lava flows continued westward creating the Schofield plateau and the leeward areas of what is now Honolulu.

Within the geological time known as the "great erosional period," the Koolau volcano was inactive for a long period of time, during which time erosion and the deposition of sediment continued to shape the deep valleys on the island of Oahu. Changes in sea level also shaped

the island of Oahu as evidenced by the marine and terrestrial sediments deposited on the coastal plains, especially around Pearl Harbor and Ewa. Reef limestone coral fossils are found miles inland from the present shoreline and conspicuous submarine benches are found offshore. After the long period of dormancy, eruptions broke out on the southern slopes of the Koolau range and at the heads of the deeply eroded valleys, with lava from these eruptions running down the valleys and spreading out.

Along the west edge of the Schofield Plateau near the east slopes of the Waianae mountain range, the deep subsurface geology is comprised of alternating layers of basalt and alluvium formed along the slopes of the older Waianae volcano. The deepest and thickest layer is Waianae basalt, which is a result of the oldest volcanic eruptions from the Waianae volcano. After the Waianae volcano had ceased its activity, this deepest and thickest layer of Waianae basalt was alternately overlaid by layers of chiefly older alluvium from the erosion of the Waianae mountain range, and by the layers of Koolau basalt from the continuing eruptions of the Koolau volcano that lapped up against the sides of the now silent alluvium covered Waianae volcano. The alternating layers of basalt and alluvium follow the original slope of the old Waianae volcano and extend eastward beneath the Schofield plateau, presumably underlying a portion of west Wahiawa town. An overlying layer of chiefly older alluvium extends eastward from the Waianae mountains across the Schofield plateau to about the east edge of Schofield Barracks, to about where the west boundary of Wahiawa town is now located. In the areas east of Schofield Barracks, which includes both Wahiawa and Whitmore Village, the geologic structure is Koolau basalt (Stearns and Vaksvik, 1935).

The soils at the surface of the proposed Whitmore Exploratory Well site is classified by the U.S. Soil Conservation Service as Wahiawa Silty Clay (WaA). Wahiawa Silty Clay is characterized as having moderate permeability, slow runoff, slight erosion hazard, and low shrink-swell potential. Wahiawa Silty Clay is typically found in areas with 0 to 2 percent slopes.

4.3.2 Groundwater Hydrology

The proposed BWS Whitmore Exploratory Well, located in the vicinity of Whitmore Village, is proposed to be drilled deep beneath the high Schofield plateau, within the Wahiawa Aquifer. Beneath the Schofield plateau, the Wahiawa Aquifer consists of a high-level groundwater body, occurring in the high yield, permeable basalts.

Northeast of the Schofield plateau, moderate yields of high-level groundwater occur in the marginally dike-intruded basalts in the northwest rift of the Koolau volcano. This high level groundwater moves southwestward from the dike-intruded basalts of the Koolau crest into the dike-free basalts at the lower elevations beneath the Schofield plateau in the Wahiawa Aquifer. From the north portion of the Wahiawa Aquifer, this high-level groundwater flows northwestward toward the Waialua Aquifer. From the south portion of the Wahiawa Aquifer groundwater flows southeastward toward the Waipahu-Waiawa Aquifer. In the Wahiawa Aquifer, the high-level groundwater level stands as much as 265 feet above msl. The northwestward and southeastward flow of this high-level groundwater toward the Waialua and Waipahu aquifers is believed to be constrained by two northeast-to-southwest trending geological features, one located more than 2 miles to the northwest of Wahiawa town and Whitmore Village and the other one located about 1 mile to the southeast of Wahiawa town. Geologic formation of dikes and other impermeable layers are presumed to have created this high-level groundwater body.

According to OWMP, the Wahiawa Aquifer facilities consists of wells operated by BWS, the military, Waialua Sugar Company, and Del Monte Corporation (see Figure 2-2). The BWS

operates Wahiawa Wells (Well Nos. 2901-08, 11, and 12) and Wahiawa II Well (Well No. 2902-01). The military operates the Schofield Shaft (Well Nos. 2901-02 to 04, and 10) and the wells in the U.S. Naval Reservation (Well No. 3100-01 and 02). The Waiialua Sugar Company operates three wells (Well Nos. 3102-01, 3203-01 and 02) and Del Monte Corporation operates one well (Well No. 3103-01) northwest of Poamoho Camp (over two miles northwest of the proposed Wahiawa Well II Addition, and not shown on Figure 2-2). Del Monte Corporation also operates two wells (Well Nos. 2803-05 and 07) west of Wheeler Air Force Base (about 1-1/2 miles southwest of the Wahiawa Well Addition, and not shown on Figure 2-2).

During the test pumping, the nearby potable groundwater wells will be monitored to determine if they are affected. There are no potable groundwater wells within one mile of the proposed Whitmore Exploratory Well site.

4.3.3 Surface Water Hydrology

The Wahiawa drainage basin flows into both the north fork and south fork of Kaukonahua Stream. The streams flow toward the west and converge at the west end of Wahiawa town to form Kaukonahua Stream, a perennial stream. Kaukonahua Stream continues to the northwest, eventually flowing into the sea at Waiialua. Wahiawa Reservoir, which receives effluent from the City and County of Honolulu's sewage disposal plant, is an unlined earthen irrigation water reservoir created at the confluence to the north and south forks of Kaukonahua Stream, and has a normal elevation of 842 feet above msl. The water level of the reservoir is controlled by a spillway leading into Kaukonahua Stream west of Wahiawa town. The north fork of the Kaukonahua Stream is also the north fork of Wahiawa Reservoir, and is the closest water body to the proposed BWS well site. The proposed BWS well site is located at least 1,000 feet upgradient and north of the bank of the Wahiawa Reservoir.

The U.S. Geological Survey maintains a stream flow gage in the south fork of Kaukonahua Stream (No. 208000) that is located about 3 miles upstream from the confluence of the north fork and south fork of Kaukonahua Stream at an elevation of 860.35 feet above msl. A stream flow gage in the north fork of Kaukonahua Stream (No. 200000) is located east of Whitmore Village and Wahiawa town at an elevation of 1,150 feet above msl. The average flow for the south fork of Kaukonahua Stream at Gaging Station No. 208000 was 21.2 cfs (13.7 mgd) for the period since 1957, and the average flow for the north fork of Kaukonahua Stream at Gaging Station No. 200000 was 16.3 cfs (10.5 mgd) for the period since 1913 (CWRM, 1990).

A gulch north of Whitmore Village leads into Poamoho Gulch and eventually into Poamoho Stream. Water from the test pumping will be discharged into the gulch north of Whitmore Village. It is expected that the water that will be discharged from the test pumping of the well will be clean and therefore will not introduce any pollutants into the gulch. Care will be taken in disposing of the test water to preclude the possibility of flushing debris or other pollutants into the gulch.

Wahiawa Reservoir has recreational resources due to fishing. There will not be any adverse impacts to Wahiawa Reservoir's fishing-related recreational resources in this vicinity, because no water will be discharged into the Wahiawa Reservoir.

The nearest wetlands occur at Pearl Harbor to the south and Haleiwa to the north, both about 9 miles away (U.S. Army, 1977). There is no potential for adverse impacts to significant wetlands since none exist in the Wahiawa Aquifer.

4.3.4 Project Impacts

No adverse impacts to the geological formations underlying the drilling site for the exploratory well or to the soils at the surface of the site are expected. Impacts to the groundwater and surface water flows of Kaukonahua Stream and Wahiawa Reservoir are expected to be insignificant. There will be no adverse impacts to the Wahiawa Reservoir and its recreational fishing resources since no water will be discharged into the reservoir.

4.3.5 Mitigation Measures

During the test pumping, care will be taken in disposing of the test water to preclude the possibility of flushing debris or re-suspending sediments and other pollutants into the gulch located north of Whitmore Village. Best Management Practices (BMP) will be implemented during construction and test pumping of the exploratory well to minimize potential pollution of receiving waters. Measures include swales, berms and sedimentation basins with oil absorptive material to ensure that sediment and petroleum products will be retained on-site and prevented from entering any receiving waters.

There will be no discharge into the municipal storm sewer system. The discharge of potable groundwater associated with test pumping operations is exempt from National Pollution Discharge Elimination System (NPDES) requirements.

During the test pumping, the nearby potable groundwater wells will be monitored to determine if they are affected. There are no potable groundwater wells within one mile of the proposed Whitmore Exploratory Well site.

If the pump test results indicate that the quantity of the water from the exploratory well is unsatisfactory, the Whitmore Exploratory Well will be capped and/or sealed to prevent malicious or accidental contamination of the underlying groundwater aquifer.

The presence of volatile organic compounds in the exploratory well is possible. If the exploratory well is converted into a production facility, the quality of the water could be made suitable for municipal use with the installation of a GAC water treatment facility on the site, if necessary.

Pumpage of this well will not affect stream flow in the north fork of Kaukonahua Stream or the water elevation in Wahiawa Reservoir because of the large elevation difference separating the stream and reservoir from the section of the well drawing water.

No other mitigation measures are proposed or required.

4.4 Natural Hazards

4.4.1 Flood Zones

The proposed Whitmore Exploratory Well site is located at an elevation of about 1,000 feet above msl in central Oahu. The site is located in the Flood Insurance Rate Map (FIRM) Zone D, in an area where flood hazards are undetermined. The nearest flood-prone areas are located at Kaiaka Bay, approximately 8 miles to the northwest, and at Waiawa and Waikele streams, located approximately 8 miles to the southeast.

4.4.2 Seismic Activity

Under the Uniform Building Code (UBC), the island of Oahu is designated as Seismic Zone 1, which in a scale from 1 to 4, is the zone with the lowest potential for ground motion created by seismic events. The UBC establishes minimum design criteria for structures to resist the effects of seismic ground motion, in accordance with the standards for the seismic zone in which the structure is to be built. In the interest of public health and safety, the BWS has adopted the standards for Seismic Zone 3 for all of its structures. All structures that will be built as part of this project will be designed and built in accordance with the UBC standards for Seismic Zone 3.

4.4.3 Project Impacts

The proposed project will not affect nor will be affected by flooding. Seismic risk at the project site is minimal. The proposed project will not affect seismic activity, and will not likely be affected by seismic activity.

4.4.4 Mitigation Measures

As a public health and safety measure, the BWS has adopted the standards for Seismic Zone 3 for the design and construction of all the structures that will be a part of this project.

No other mitigation measures are proposed or required.

4.5 Demographics

4.5.1 Population, Housing, and Employment

The project area where the exploratory well is proposed is located in Census Tract 91, which generally comprises the area north of the north fork of Kaukonahua Stream, east of Wilikina Drive, west of the Koolau Mountains crest, and south of Poamoho Stream. According to U.S. Census reports, the population for this tract increased 28.9 percent from 1980 to 1990 from 3,339 to 4,303. The number of housing units in this tract was reported to be 1,053 in 1991. Employment in this tract includes government services at the US Naval Reservation, and teaching and administration jobs at the Helemano Elementary School.

4.5.2 Project Impacts

The proposed Whitmore Exploratory Well project will involve a small amount of new construction work. However, this work will be temporary and will most likely be conducted by workers that reside outside of this census tract. Existing and future population, housing, and employment in this portion of Whitmore Village will not be affected by this project.

4.5.3 Mitigation Measures

No mitigation measures are proposed or required.

4.6 Roadways and Traffic

4.6.1 Roadways and Traffic

Whitmore Avenue is a main thoroughfare through Whitmore Village and is the only roadway access to the BWS site. Whitmore Avenue is a State of Hawaii roadway in the area where Whitmore Exploratory Well is being proposed. Whitmore Avenue is accessed from Kamehameha Highway and is the only access to Whitmore Village. According to the State of Hawaii Department of Transportation, average daily traffic leading into Whitmore Avenue in 1991 from Kamehameha Highway amounted to 9,319. Whitmore Avenue traffic consists of a mix of automobiles, trucks, and buses.

Traffic on Whitmore Avenue in the vicinity of the proposed Whitmore Exploratory Well site is a combination of residential and commuter trips from the predominantly single-family and apartment units in this area, Helemano Elementary School, and the work crews at the U.S. Naval Radio Station located to the east. Traffic on Whitmore Avenue is usually light, except during the morning or afternoon peak periods when increased traffic occurs because of commuter and school traffic.

4.6.2 Project Impacts

The project will create a slight and temporary rise in heavy truck traffic. No significant or long-term impacts to Whitmore Avenue are expected with this proposed project.

4.6.3 Mitigation Measures

To minimize traffic impacts and avoid conflicts with the traffic to the nearby Helemano Elementary School, the contractor will schedule heavy truck activity between the hours of 8:30 am to 2:00 pm Monday through Friday and will exclude state holidays.

4.7 Visual and Recreational Resources

4.7.1 Visual Resources and Recreational Resources

In the vicinity of the project area, there are distant views of the Koolau Mountains to the northeast and the Waianae Mountains to the southwest from pedestrians and vehicles on Whitmore Avenue. For the most part, views of the Wahiawa Reservoir from Whitmore Avenue are obscured by existing structures, or are nonexistent because the ground slopes down from Whitmore Avenue toward the Wahiawa Reservoir.

The proposed exploratory well site is to be located within the 2.644-acre site designated as the Kahikanihi Kani Park by the City and County of Honolulu Department of Parks and Recreation. The site has been graded and grassed, and is presently being used as a park.

The school grounds of Helemano Elementary School are located about 1,500 feet northeast of the proposed well site. A 2.3-acre park, located along the south edge of Whitmore Avenue, is located about 1/2 mile to the east of the proposed well site, and is the next closest recreational area to the site.

4.7.2 Project Impacts

The proposed Whitmore Exploratory Well will not be visible from the Helemano Elementary School grounds, because of the distance and the intervening single-family residences.

The 2.3-acre park is located on the opposite side of Whitmore Avenue from the proposed well site, this recreational area will not be affected by this proposed project in any way.

4.7.3 Mitigation Measures

The BWS will coordinate the siting of the facilities with the Department of Parks and Recreation in order to minimize the impacts to the Kahikanihi Kani Park as much as possible.

No other mitigation measures are proposed or required.

4.8 Cultural Resources

4.8.1 Cultural Resources

An archaeological assessment was conducted by Cultural Surveys of Hawaii on December 12, 1994. The results of the archaeological assessment are found in Appendix A of this report.

A review of the literature found that no archaeological investigations have been conducted that encompass the present project area. Surveys of the surrounding area from 1930 to 1994 reveal few precontact findings. There are no apparent remnants of any sites of archaeological or cultural significance at or in the proposed project area because the area has been totally altered by past and present land uses. The Wahiawa healing stones, which still exist, are located 1-1/2 miles away on California Avenue in Wahiawa town.

4.8.2 Project Impacts

The results of the field work show that this project area is devoid of archaeological potential. The proposal for additional development of this site will not impact any archaeological resources.

4.8.3 Mitigation Measures

No mitigation measures are proposed or required.

4.9 Biological Resources

4.9.1 Botanical Resources

A botanical reconnaissance survey was conducted by Char and Associates on December 13, 1994. The results of the botanical reconnaissance survey and related research are found in Appendix B of this report.

The proposed site is located on part of a landscaped parcel now used as a park. The vegetation, which is typical of a park, consists of a mowed, grassy lawn composed almost

exclusively of introduced or alien plants. A small monkeypod tree (*Samanea saman*) is located near the southeast corner of the site. One plant, the yellow woodsorrel (*Oxalis corniculata*), presumably of early Polynesian introduction, was also found on the 2.644-acre site.

None of the plants is a listed, proposed, or candidate threatened and endangered species; nor is any plant considered rare or vulnerable.

4.9.2 Faunal Resources

A faunal (bird and mammal) reconnaissance survey was conducted by Philip L. Bruner, Environmental Consultant, on December 6, 1994. The results of this bird and mammal reconnaissance survey and related research are found in Appendix C of this report.

No native, resident land birds or waterbirds were observed on the site. No seabirds or migratory shorebirds were observed; none would be expected at this location.

A total of nine species of exotic birds were recorded, including the house sparrow (*Passer domesticus*), java sparrow (*Padda oryzivora*), and common waxbill (*Estrilda astrild*). Other species of exotic birds probably also occur in this area. None of these exotic species are "endangered" or "threatened."

No feral mammals were seen on the survey. The non-native Small Indian Mongoose (*Herpestes auropunctatus*), along with rats, mice, and feral cats are likely to occur in nearby areas.

It is unlikely that the endemic and "endangered" Hawaiian Hoary Bat (*Lasiurus cinereus semotus*) would be found at this location.

4.9.3 Project Impacts

There are no sensitive native plants communities on the project site. The proposed project will not have any effect on any significant biological resources.

There were no sensitive bird or mammal resources observed on or nearby the project site. The proposed project should have no impact on any significant bird or mammal resources.

4.9.4 Mitigation Measures

For both botanical and faunal resources, no mitigation measures are proposed or required.

4.10 Air Quality and Noise

4.10.1 Air Quality and Noise

Air quality on Oahu is, in general, relatively clean and low in pollution, except where there are large numbers of motor vehicles or stationary sources. In the vicinity of the project site along Whitmore Avenue in Whitmore Village, pollution contributed from vehicles travelling on Kamehameha Highway is minimal because of the distance separating the highway from the project site and the predominance of the northeast trade winds. Air pollution resulting from vehicles on Whitmore Avenue in this vicinity is usually minimal, but will be slightly elevated during the morning and afternoon peak traffic periods when there is increased traffic into and out of Helemano Elementary School and because of increased commuter trips. However, with the absence of any major stationary sources of air pollution, the air quality in this portion of Whitmore Village near the project site is usually good.

Ambient noise at and around the project site is also usually low, and results mainly from vehicular movements on Whitmore Avenue and from the activities at nearby residences and apartments. Ambient noise levels are higher in the morning and afternoon peak traffic periods, due to the increased number of cars that travel to and from Helemano Elementary School, and the increased commuter traffic on Whitmore Avenue.

4.10.2 Project Impacts

Site clearing, grading, and construction will involve heavy vehicle and equipment operations that will create a small amount of fugitive dust and pollutant emissions. The fugitive dust and pollutant emissions will have minimal impacts upon the nearby school buildings and adjacent residents. There will be no long-term air quality impacts once construction is completed.

On the island of Oahu, community noise controls have been set for analyzing noise impacts pursuant to Hawaii Department of Health Rules, Title 11, Chapter 46. Allowable daytime and nighttime noise level standards for sensitive receptors in residential, preservation, hotel, apartment, and business districts have been set under these rules. The project site is located in an Ag-1, Restricted Agricultural zone, and is adjacent to an R-5, Residential zone. For residential zones, the maximum allowable daytime noise level from 7:00 am to 10:00 pm is 55 dBA and the maximum allowable nighttime noise level from 10:00 pm to 7:00 am is 45 dBA. For agricultural zones, the maximum allowable daytime noise level from 7:00 am to 10:00 pm is 70 dBA, and the maximum allowable nighttime noise level from 10:00 pm to 7:00 am is 70 dBA.

The project will have noise impacts on nearby residents. Heavy equipment, moving, construction, and the drilling of the exploratory well will cause noise that may be intrusive to the nearby residents. For the well drilling, if the cable tool drilling method is used, noise will result from the drill bit hitting rock, in a manner similar to a pile driver. Noise will also result from the operation of the diesel engine driving the drill.

A noise permit will be required from the Noise and Radiation Branch of the State of Hawaii Department of Health.

There will be no noise impacts after construction is completed.

4.10.3 Mitigation Measures

To mitigate the effects of site clearing, grading, and construction activities to the adjacent residences, dust control measures, such as water sprinkling and dust screens, will be implemented by the contractor to reduce dust levels, as necessary. Further, the contractor will properly maintain its internal combustion equipment to minimize exhaust emissions, and will comply with the Hawaii Department of Health Rules Title 11, Chapter 59 and 60 regarding Air Pollution Control.

Contractors will comply with all of the conditions of the required noise permit. Mufflers will be required for all construction equipment. All noise attenuating equipment will be maintained in proper operating condition and will be repaired or replaced as needed. For the drilling operation, drilling operations will be restricted to the hours of 7:30 am to 3:30 pm on weekdays, and will not include state holidays.

To reduce pump noise levels during the test pumping, a surface pump may be installed with mutes, or a submersible pump, which will reduce noise considerably, may be installed. If the test pumping is successful, and permanent pumps are installed, a surface pump with mutes may be installed, or a submersible pump may be installed to reduce noise levels to less than the regulatory limit.

Chapter 5
Relationship to Land Use Designations and Controls

5.1 State Land Use Designations and Controls

The subject property is located within the State Land Use Agricultural District. According to State law, Chapter 205, HRS, the land use controls in the Agricultural Districts on the island of Oahu are under the jurisdiction of the City and County of Honolulu.

A well construction pump installation and water use permits will be required from the CWRM.

A noise permit will be required from the State of Hawaii, Department of Health, Noise and Radiation Branch.

5.2 City and County of Honolulu
Land Use Designations and Controls

The subject parcel is shown as agricultural on the City and County of Honolulu's Development Plan Land Use Map and is shown as Ag-1, Restricted Agricultural on the City and County of Honolulu's Zoning Map. According to the City and County of Honolulu's Land Use Ordinance (LUO), the proposed project is considered a Utility Installation, Type A, and is a principal permitted use in the agricultural district.

The Development Plan Public Facilities Map (DPPFM) shows a fire station programmed for the commencement of land acquisition and/or construction in the "beyond 6 years" category near the center of Whitmore Village. Consultation with the Honolulu Fire Department has confirmed that there are no plans for a fire station in Whitmore Village in the "within 6 years" time frame. Thus, this project will not affect or be affected by any plans of the Honolulu Fire Department.

According to the City and County of Honolulu Planning Department, the construction of the exploratory well is considered minor and is not required to be shown on the DPPFM.

If the Whitmore Exploratory Well is converted to a production well, the well site will need to be identified on the appropriate DPPFM. Before funds can be committed for construction of a production well, the well site must be shown as a "site determined well facility programmed for construction within 6 years." A DPPFM amendment would require an application to the City and County of Honolulu Planning Department and approval by the City Council.

A building permit will be required from the City Building Department.

Chapter 6 Possible Alternatives

The no action alternative, the delayed action alternative, alternative sites, and alternative sources were considered either in this environmental assessment or in previous environmental analyses done by the BWS.

6.1 No Action Alternative

The no action alternative was not pursued because it would be contrary to the BWS's legal mandate to provide for the water needs of a growing population. This project is part of an overall potable groundwater development program intended to increase the water supply to meet growing municipal water demands. If their water source development program is curtailed, the BWS would be hampered in providing adequately for the water needs of the future population of the island, which may result in restrictions in new development as well as regional water shortages.

6.2 Delayed Action

The delayed action alternative was not pursued because this alternative would delay the BWS's implementation schedule, and would have substantially similar environmental outcomes as the no action alternative, and higher development costs because of inflation. Delay in the proposed well testing program would increase the risk that the growth in population will lead to water demands in excess of available supplies.

6.3 Alternative Sites

This environmental assessment analyzes one of two possible potable groundwater well site locations currently being evaluated by the BWS in the Wahiawa portion of the Central Sector. The other possible potable water well site location being considered is in Wahiawa town. The well site location in Wahiawa town is considered by the BWS to be an additional site for potable water development rather than an alternative site.

If the exploratory well site as proposed at the west side of Whitmore Village proves to be unfeasible, a future alternative location for an exploratory well site along the east edge of Whitmore Village along the north side of Whitmore Avenue may be possible. The area along the east edge of Whitmore Village does not contain any particular cultural/archaeological, botanical, or faunal characteristics that would be an impediment to the development of an exploratory water well or permanent production well in this area. The land along the east edge of Whitmore Village is former agricultural land that has been extensively modified; this extensive modification has obliterated any sites of cultural or archaeological significance. The present vegetation along the east edge of Whitmore Village includes only the fallow remnants of previous cultivations, introduced, and alien species, and does not include any listed, proposed, or candidate threatened and endangered plant species. Like the other areas of Whitmore Village, no native, endangered, or threatened birds would be expected at this location along the east side of Whitmore Village. This alternative site along the east edge of Whitmore Village, although considered as a viable alternative, was not pursued at this time since the site is not owned by the City and County of Honolulu.

6.4 Alternative Sources

Alternative source development was analyzed by the BWS in its 1984 study, *Regional Environmental Impact Assessment for Development of Wells, Reservoirs, Transmission Lines and Appurtenances at Honolulu, Hawaii*, where potential potable water source alternatives other than groundwater were evaluated, including desalination, the development of surface and brackish water sources, and the recycling of treated wastewater. Typically these alternative sources have considerably higher costs and technical challenges. For instance, the use of surface water from Wahiawa Reservoir, which receives effluent from the City's Wahiawa Sewage Treatment Plant, has a high potential for health and safety problems, and would require a costly water treatment works. The development of these alternatives was not considered as feasible as the development of groundwater resources.

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Botanical Resources
Archaeological and Cultural Resources

Chapter 8
Agencies Consulted in
Making this Assessment

The following agencies were consulted during the preparation of the draft environmental assessment for this project:

State of Hawaii agencies

- Department of Agriculture
- Department of Land and Natural Resources
 - Historic Preservation Division
 - Commission on Water Resources Management
- Department of Health
 - Environmental Management Division
 - Office of Environmental Quality Control

City and County of Honolulu agencies

- Fire Department
- Planning Department
- Land Utilization Department
- Parks and Recreation

Chapter 9 Works Cited

Bishop Museum. October 1978. *Sites of Oahu*. Prepared by Elspeth P. Sterling and Catherine C. Summers.

City and County of Honolulu, Board of Water Supply. July 1982. *Oahu Water Plan*.

———. August 1988. *Windward Oahu Regional Water System Improvements*. Final Environmental Impact Statement.

———. 1984. *Regional Environmental Impact Assessment for Development of Wells, Reservoirs, Transmission Lines and Appurtenances at Honolulu, Hawaii*.

City and County of Honolulu, Department of Land Utilization. 1987. *Coastal View Study*. Prepared by Michael S. Chu and Robert B. Jones.

International Conference of Building Officials. May 1, 1991. *Uniform Building Code*.

MacDonald, Gordon A., et al. 1990, 2nd edition. *Volcanoes in the Sea: The Geology of Hawaii*.

State of Hawaii, Department of Land and Natural Resources, Commission on Water Resource Management. 1990. *Hawaii Stream Assessment, A Preliminary Appraisal of Hawaii's Stream Resources*.

———. May 1992 Review Draft. *Hawaii Water Plan Oahu Water Management Plan*.

State of Hawaii, Department of Transportation, Highways Division. 1991. *Traffic Summary, Island of Oahu*.

Stearns, Harold T. and K.N. Vaksvik. 1935. Geology and groundwater resources of the island of Oahu, Hawaii. Hawaii Division of Hydrography, Bulletin 1.

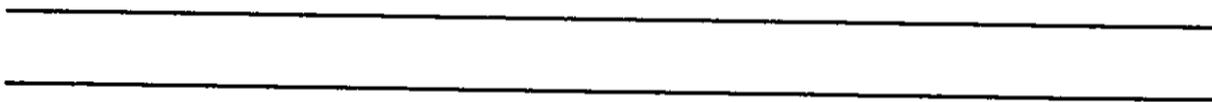
Timbol, Amadeo S. and John A. Maciolek. April 1978. *Stream Modification in Hawaii, Part A: Statewide Inventory of Streams, Habitat Factors and Associated Biota*.

U.S. Army, Engineer District, Honolulu. December 1977. *An Ornithological Survey of Hawaiian Wetlands*. Prepared by Ahuimanu Productions.

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

University of Hawaii, Department of Geography. 1983. *Atlas of Hawaii*.

Appendix A



**AN ARCHAEOLOGICAL ASSESSMENT OF
the Exploratory Well Site at
Whitmore Village, Wahiawa, O'ahu**

(TMK 7-1-09:64)

by

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and

Hallett H. Hammatt, Ph.D.

Prepared for

CH2M Hill

Cultural Surveys Hawaii
December 1994

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INTRODUCTION

The purpose of this report is to describe the results of an archaeological reconnaissance survey conducted at the exploratory well site at Whitmore Village, Wahiawa, Kona, Oahu (TMK 7-1-09:64). The Board of Water supply is proposing to develop a well facility at this site to include installation of one pump, appurtenant piping, access road, landscaping, irrigation system, transmission main, electrical equipment and appurtenances.

Property Description

The project area which consists of 2.644 acre parcel described by Tax Map Key 7-1-09:64 which has been acquired by the City and County of Honolulu Parks Department. The Project area is located along the northern side of Whitmore Ave. directly on the western side of Whitmore Village (Fig. 1,2, and 3). The project consists of level graded soil surface covered in short grass situated in the approximate center of Kahikanihi Kani Park. The area to the west of the project area is presently planted in pineapple. The area to the east and the north of the project area is delineated by the Whitmore Village housing development.

The entire property has apparently gone through a number of tillings and gradings due to it formerly being cultivated in sugarcane and pineapple.

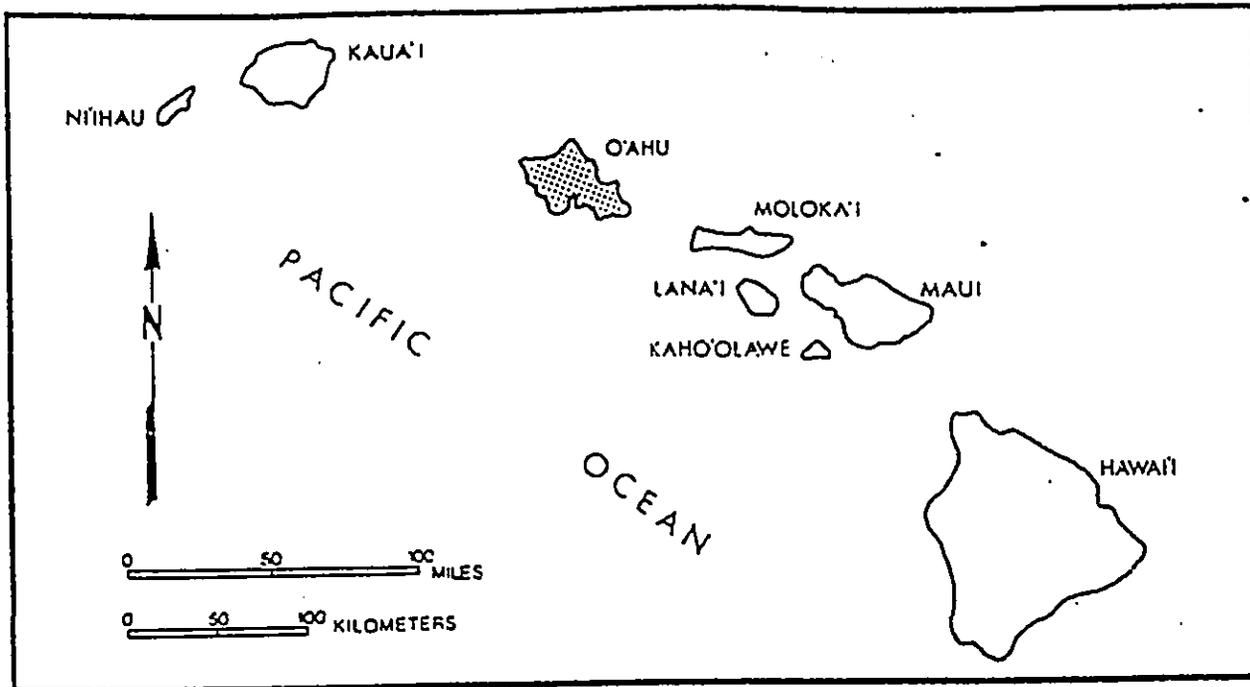


Fig. 1 State of Hawai'i

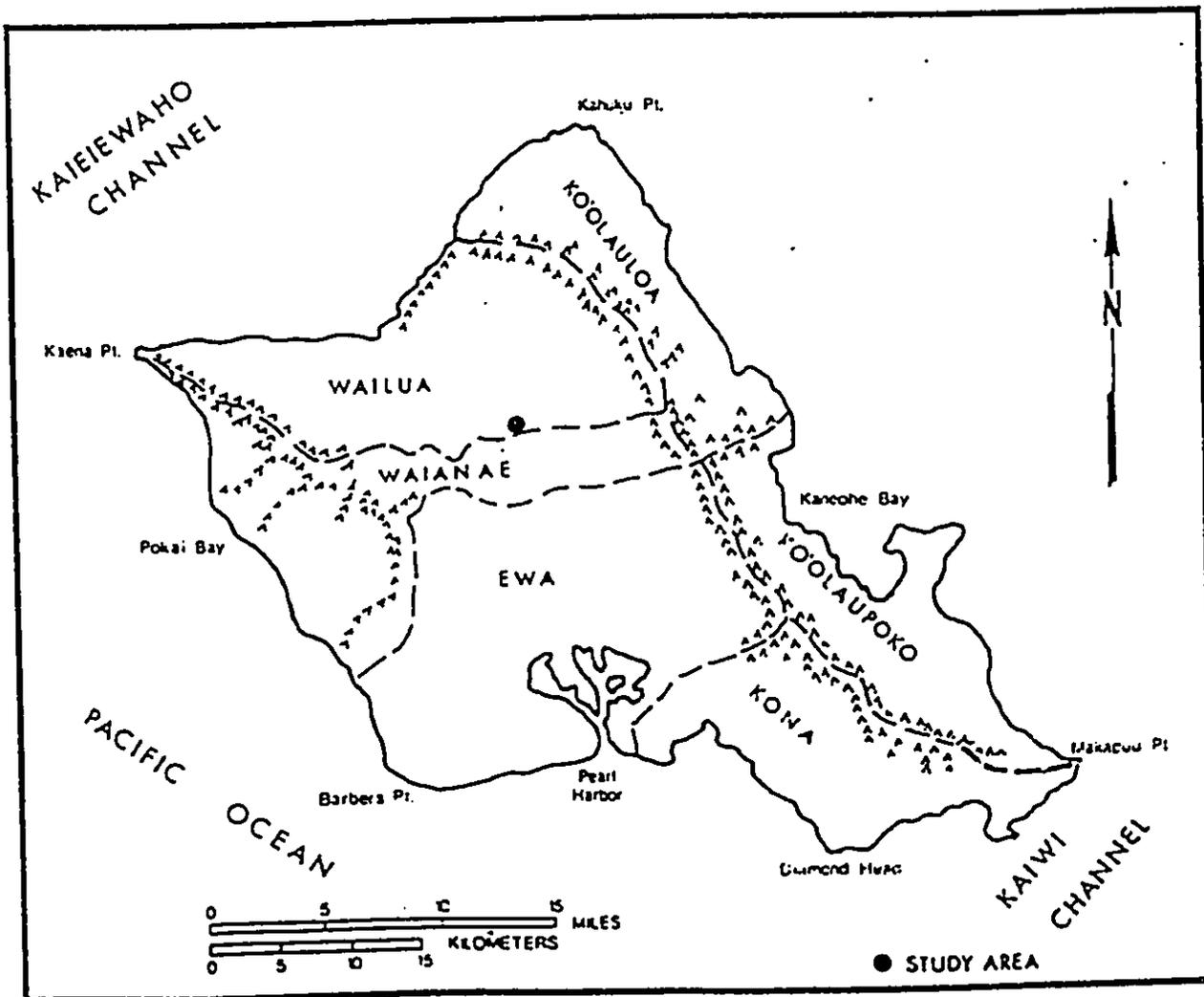
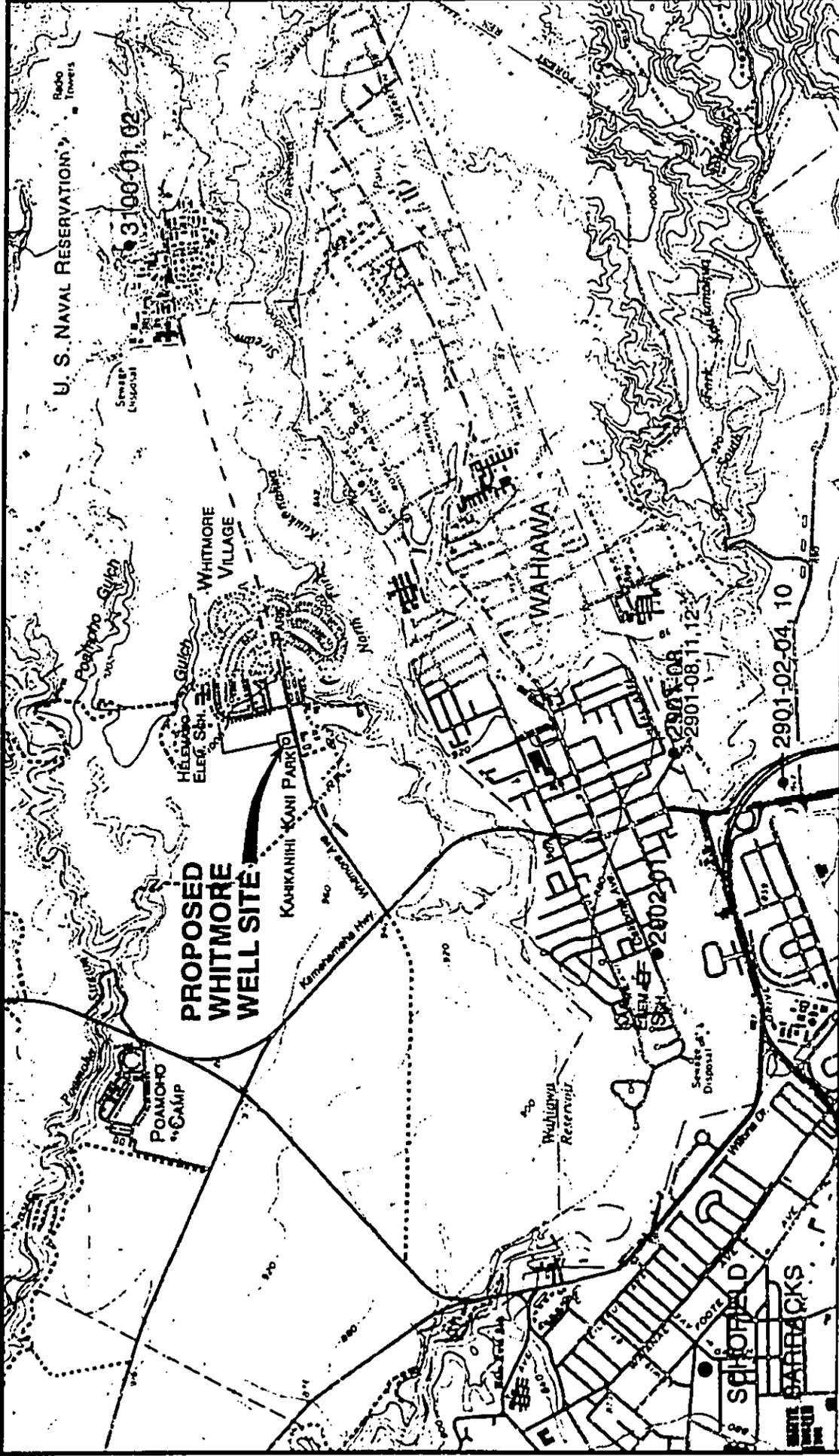


Fig. 2 O'ahu Island Location Map

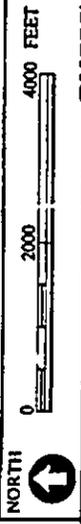


Well No.	Well Name
2901-02-04, 10	Schofield Shaft
2901-08, 09, 11	Waihiwa Wells
2902-01	Waihiwa II Well
3100-01, 02	U.S. Naval Reservation, Whitmore

Source: Oahu Water Management Plan, Commission on Water Resource Management, May 1992

Figure
3

OAHU WATER MANAGEMENT PLAN
MAP DISPLAYING PROJECT AREA



CH2MHILL

PREVIOUS ARCHAEOLOGY

No archaeological investigations have been conducted within the present project area.

McAllister Survey

Two sites in the vicinity of the project area were recorded by J. Gilbert McAllister in 1930 during his survey of the island of Oahu. One of the sites, Kukaniloko Birthstones are located approximately one mile to the west of the project area. McAllister (1933) stated the following in his book "Archaeology of Oahu":

Kukaniloko, located near Wahiawa, on the Waialua side of Kaukonahua Gulch, one of the two famous places in the Hawaiian islands for the birth of children of tapu chiefs.... Kukaniloko is said to have been established by Nankaoko and his wife, Kahihokalani, whose son, Kapawa, heads the list of the important *alii* born here.

There is now little to see at Kukaniloko. It is an inclosed area about one-half acre in size, with many large stones, some just visible, others protruding to a height of 3 to 4 feet, scattered about on a well-kept lawn. Tall trees border the site. To the old Hawaiians these stones were all named and represented *alii*, but now the only name remembered is Kahamaluihi, a flat stone near the center of the group. The old Hawaiians of today remember that in their childhood they were never allowed by their parents to approach even near the sacred birthplace, an indication of the great respect in which Kukaniloko was held, even a century after contact with Europeans and more than a half century after the coming of the missionaries.

McAllister (1933) also states the following about Hoolonopahu heiau:

Hoolonopahu was a heiau which functioned in connection with Kukaniloko. Here were kept the sacred drums of Opuku and Hawea which announced the birth of an *alii*. Nothing now remains of the temple. The land is planted in pineapples.

Apparently there are no remnants of Hoolonopahu heiau. Virtually all of the land surrounding the site area of Kukaniloko is comprised of pineapple fields.

Also within the vicinity of the project area, approximately 1.5 miles from the project area, in Wahiawa town are the Wahiawa healing stones. McAllister (1933) states the following about the healing stones:

In connection with Kukaniloko, Wahiawa healing stone" may be mentioned. About fifty years ago there was in the bed of Kaukonahua Gulch a large stone, almost 6 feet long, 2 feet wide and less than 1 foot thick. It is now said to have been Keanini-ula-o-ka-lani, considered as a milestone at the side of the old Hawaiian pathway. Thrum is not of this opinion. This stone was noticed by Mr. George Galbraith and moved to Kukaniloko, where it remained for many years. Galbraith had placed the stone in an upright position, which made it one of the most prominent of the group. Because of its unusual shape and position, the stone became noticed and was the recipient of much attention. Offerings of all sorts were placed before the stone, and it was soon discovered that it had unusual healing power. Large crowds of people were attracted to the site and soon the other more sacred stones of Kukaniloko were covered with the tallow from candles burnt as offerings to this prominent stone; decayed food and flowers lay about the once tapu ground; and the Daughters of Hawaii, who had taken over the care of Kukaniloko, decided that this stone, which had no connection with Kukaniloko, should be moved. It was therefore moved to Wahiawa, where it became a Mecca for people from islands as well as Oahu. Thousands gathered each day, either to witness the healing powers of this strange stone or to partake of its benefits. Chinese, Japanese, Filipino, Koreans, Portuguese, and Hawaiians all were among the daily pilgrims to this shrine, each worshipping their own way. The importance of the stone has now dwindled, and only a few persons visit the place to leave flowers or other offerings.

These stones are still present and are located along the northern side of California Ave. People still are placing offerings of fruit, incense, and flower on or near the stones which are situated in a small cement structure which encloses the stones and is sealable with a wrought iron gate.

Recent Investigations

A number of investigations have been conducted in the immediate vicinity of the project area. In 1983 Hommon and Ahlo conducted a survey of a 12 acre parcel on the east end of California Ave. (located to the south of the present project area). No sites were identified in their survey.

In 1992 Paul H. Rosendahl Inc. conducted an inventory survey of approximately 2000 acres of the Galbraith Trust Lands situated directly to the west of the present project area. Only two sites were identified during the survey, one of which is the Kukaniloko Birthstones (218) and the other consisted of a stacked rock wall at the base of

Poamoho Stream Gulch.

In 1994, BioSystems Analysis Inc. conducted an archaeological investigation for the U.S. Army Corps of Engineers at a portion of Schofield Barracks. They identified three historic structures but none of the structures were deemed significant. The project area was located to the west southwest of the present project area.

Based on the results of the archaeological investigations in the vicinity of the project area it is unlikely that any cultural deposits, sites, or remains older than fifty years would be encountered within the project area. When this is looked at in conjunction with the previous and present land use and land alterations the likelihood of encountering anything that is culturally significant is extremely slim.

ARCHAEOLOGICAL FINDINGS

Archaeological Fieldwork

Archaeological fieldwork was conducted on December 12, 1994. The project area was covered by foot by two archaeologist with 100% coverage of the area. It is highly probable that the well site itself was agricultural land before its development into Kahikanihi Kani Park.

Conclusions

It is clear from the results of the fieldwork, that this project area is devoid of archaeological potential. The proposal for additional development of this site, will not impact archaeological resources. For these reasons, no further archaeological investigation should be required for this project. If, however, in the unlikely event that archaeological remains are encountered during development of the exploratory well, work should cease and the State Historic Preservation Division of Department of Land and Natural Resources should be notified at 587-0047 to determine significance and treatment of the findings.

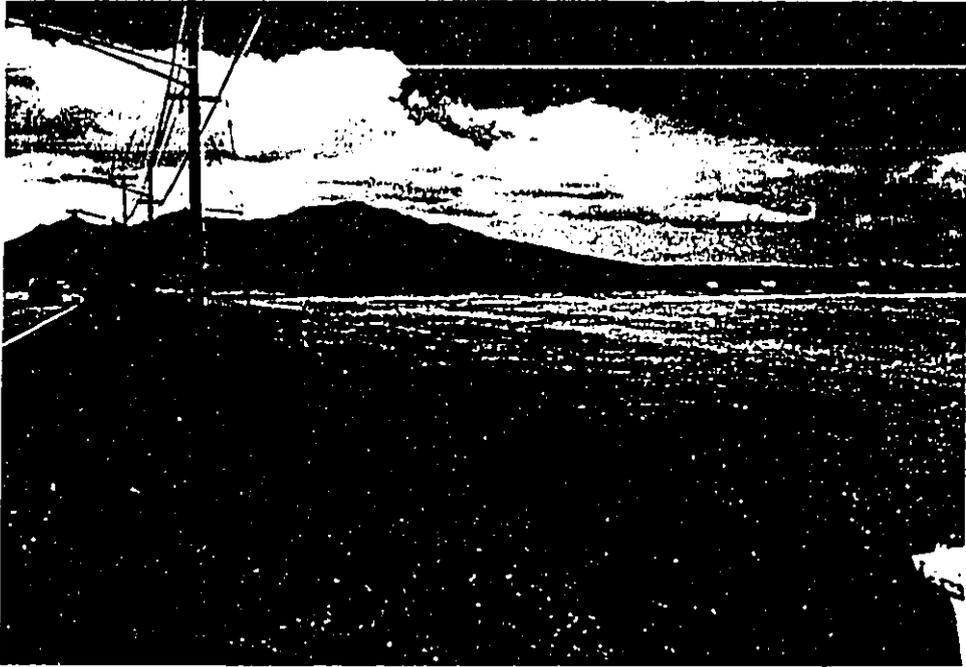


Figure 4 Portion of Project Area Fronting Whitmore Ave, View to West

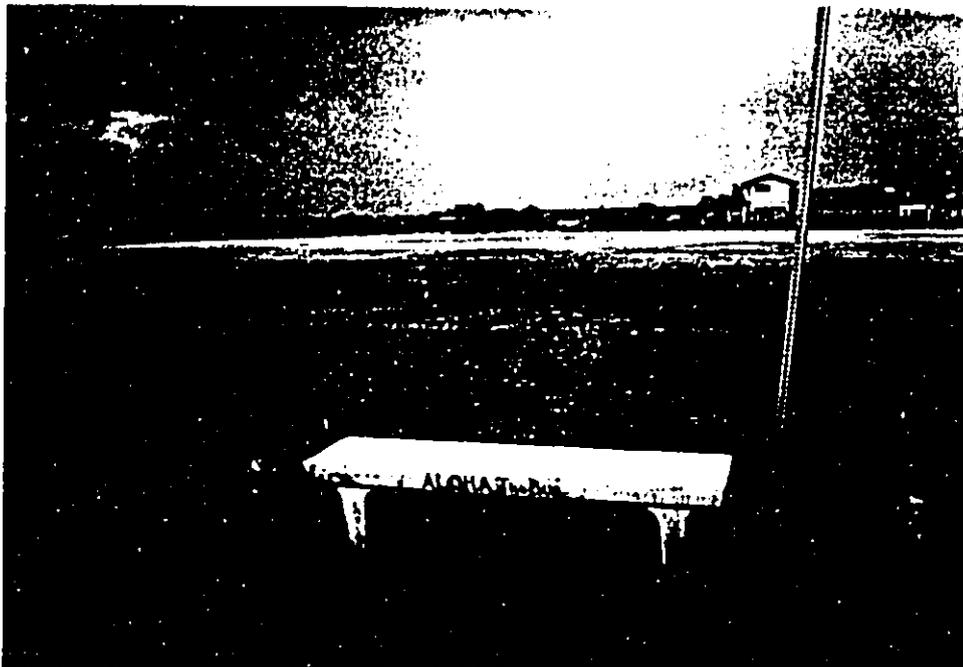


Figure 5 Portion of Project Area Showing Vegetation, View to North



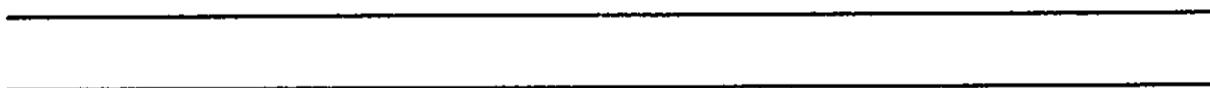
Figure 6 Portion of Project Area Displaying Housing Development along the Eastern portion of the Project Area. View to Northeast

REFERENCES

- Henry, Jack D. et. al. PHRI Inc.
1992 **Archaeological Inventory Survey Galbraith Trust Lands: Lands of Kamananui and Wahiawa, Waialua and Wahiawa Districts, Island of Oahu.** PHRI Report 1260-080192
- McAllister, J.G.
1933 *Archaeology of O'ahu*, Bishop Museum, Bulletin 104, Honolulu.
- Sterling, Elspeth P. and Catherine C. Summers (comp.)
1978 *Sites of O'ahu*, Dept. of Anthropology, B.P. Bishop Museum, Honolulu.
- Tomonari-Tuggle, M.J. and K. Bouthillier
1994 **Archaeology and History on the Central O'ahu Plateau: A Cultural Resources Assessment of Wheeler Army Airfield.** International Archaeological Research Institute, Inc.

NOTE: The area to the east of Whitmore Village and north of Whitmore Ave. was also inspected during this assessment. The area has recently been tilled and appears to have been recently planted in pineapple. Therefore the recommendations for this area is most probably be the same as the recommendations for the present project area. Photographs are available.

Appendix B



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BOTANICAL RESOURCES ASSESSMENT WHITMORE EXPLORATORY WELL WAHIAWA DISTRICT, ISLAND OF O'AHU

INTRODUCTION

The proposed Whitmore Exploratory Well site is located on the west side of Whitmore Village, adjacent to Whitmore Avenue, on TMK: 7-1-09: portion of 64. The site covers approximately 2.6 acres and has been acquired by the Parks Department, City and County of Honolulu.

At the request of CH2M Hill and the City and County Board of Water Supply (BWS), a survey to assess the botanical resources found on the proposed well site was conducted on 13 December 1994. The primary objectives of the study were to describe the vegetation on the Whitmore well site, search for threatened and endangered species as well as rare and vulnerable plants, and identify areas of potential environmental problems or concerns and propose appropriate mitigation measures.

A walk-through survey method was used. Notes were made on plant associations and distribution, substrate types, drainage, exposure, disturbance, etc. Plants were identified in the field; plants which could not be positively identified were collected for later determination in the herbarium (U.H., Manoa - HAW), and for comparison with the taxonomic literature. The plant names used in this report follow the most recent treatment of the Hawaiian

flora by Wagner et al. (1990).

The work planned for the Whitmore Well site includes installation of one pump, control building, piping, landscaping, transmission main, electrical equipment, and related appurtenances.

DESCRIPTION OF THE VEGETATION

The proposed well site will be located on a part of a parcel now landscaped and used as a park. The parcel was formerly used for pineapple cultivation. Bermuda grass or manienie (Cynodon dactylon) is the major lawn grass, but there are patches of Hilo grass (Paspalum conjugatum) scattered here and there. There are also a few small patches of some common lawn weeds which include creeping indigo (Indigofera spicata), sensitive plant or puahilahila (Mimosa pudica), hierba del cabello (Calyptocarpus vialis), hairy spurge (Chmaesyce hirta), Henry's crabgrass (Digitaria adscendens), and yellow woodsorrel (Oxalis corniculata).

One small tree of monkeypod (Samanea saman), about 7 ft. tall, is found along the Uakaniko'o Street side of the parcel. Also found on the Uakaniko'o Street and Whitmore Avenue corner, is a fenced area. A few clumps of a red-flowered Hibiscus cultivar and Guinea grass (Panicum maximum) grow around the outside of the fence. Inside the fence, there is a thin layer of gravel, but it is now mostly overgrown with Hilo grass and narrow-leaved plantain (Plantago lanceolata).

DISCUSSION AND RECOMMENDATIONS

The Whitmore Exploratory Well site will be located within a portion of Kahikanihi Kani Park, City and County of Honolulu property. The vegetation on the park consists of a mowed, grassy

lawn composed almost exclusively of introduced or alien plant species. Introduced or alien species are all those plants which were introduced into the Hawaiian Islands by humans, intentionally or accidentally, after Western contact, that is, Cook's discovery of the islands in 1778. The yellow woodsorrel or 'ihi 'ai is the only Polynesian introduced plant. No native plants (indigenous or endemic) were observed on the site during the field survey.

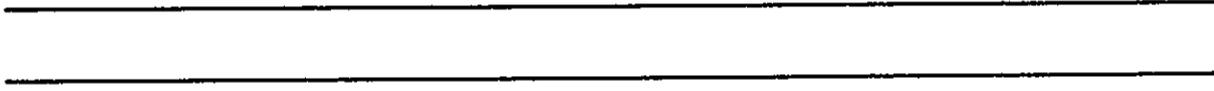
None of the plants found during the study is a listed, proposed, or candidate threatened and endangered species (U.S. Fish and Wildlife Service 1994a, 1994b). None of the plants is considered rare or vulnerable (Wagner *et al.* 1990). All of the plants can be found in similar environmental habitats throughout the Hawaiian Islands.

The proposed use of the site should not have a significant negative impact on the botanical resources as the vegetation is composed almost exclusively of introduced species. There is very little of botanical interest on the proposed Whitmore well site. Given the findings above, there are no reasons to impose any restrictions, impediments, or conditions to the use of the site for the proposed exploratory well. No recommendations are proposed at this time.

References

- U.S. Fish and Wildlife Service. 1994a. Endangered and threatened wildlife and plants. 50 CFR 17.11 & 17.12. August 20, 1994.
- _____. 1994b. Plants, Hawaiian Islands, Listed, proposed or candidate species under the U.S. Endangered Species Act, Updated: November 29, 1994. Unpublished list, Pacific Islands Office, Honolulu.
- Wagner, W.L., D.R. Herbst, and S.H. Sohmer. 1990. Manual of the flowering plants of Hawai'i. 2 vols. University of Hawai'i Press and B.P. Bishop Museum Press, Honolulu. B.P. Bishop Museum Special Publication No. 83.

Appendix C



AVIFAUNAL AND FERAL MAMMAL SURVEY FOR A BOARD OF WATER
SUPPLY EXPLORATORY WELL SITE AT WHITMORE VILLAGE, OAHU

Prepared for

CH2M Hill

by

Phillip L. Bruner
Assistant Professor of Biology
BYU-Hawaii
Environmental Consultant - faunal (Bird & Mammal) Surveys

9 December 1994

INTRODUCTION

The purpose of this report is to summarize the findings of a bird and mammal field survey of a proposed well site at Whitmore Village, Oahu conducted on 6 December 1994 (Fig. 1). Also included are references to pertinent literature.

The objectives of the field survey were to:

- 1- Record what bird and mammal species occur on and near the property, or may likely be found in this area given the type of habitats available.
- 2- Determine the presence or likely occurrence of any native fauna, particularly any that are considered "Endangered" or "Threatened".
- 3- Evaluate the importance of the property for native wildlife and note any special or unique resources.

GENERAL SITE DESCRIPTION

Figure One indicates the location of the proposed well site. This property is presently covered in grass. Pineapple fields and residential habitat adjoin the site.

Weather during the survey visit was overcast with light passing showers and winds from the east at 5 mph.

STUDY METHODS

Field observations were made with binoculars and by listening for vocalizations. A count was made of all birds seen or heard during the visit (Table 1). Published data of birds known from this region of the island were consulted in order to acquire a more complete picture of the possible species that might be expected (Pratt et al. 1987) and Hawaii Audubon Society 1993).

Scientific names used in this report follow those given in Hawaii's Birds (Hawaii Audubon Society 1993); Field guide to the birds of Hawaii and the Tropical Pacific (Pratt et al. 1987) and Mammal species of the World (Honacki et al. 1982).

RESULTS

Resident Endemic (Native) Land Birds and Waterbirds:

No native, resident land birds or waterbirds were observed on the survey. Given the location and habitat on this site it is unlikely that any native resident birds would occur on this property.

Seabirds and Migratory Shorebirds:

No seabirds were observed on the survey. This site is totally inappropriate for seabirds.

No migratory shorebirds were recorded on this survey. The lawn habitat could support Pacific Golden-Plover (Pluvialis fulva).

Surprisingly, none were recorded on this survey. This species nests in the arctic and winters on lawns and other open habitats in Hawaii (Johnson et al. 1981). It is possible that plover may have territories on this property but were off their territory during the time of the survey. Plover are not an "endangered" or "threatened" species.

Exotic (Introduced) Birds:

A total of nine species of exotic birds were recorded during the field survey (Table 1). Pratt et al. (1987) and Hawaii Audubon Society (1993) note that other species which might occur in this area include: Barn Owl (Tyto alba); Cattle Egret (Bubulcus ibis); Northern Cardinal (Cardinalis cardinalis); Red-vented Bulbul (Pycnonotus cafer) and Red-crested Cardinal (Paroaria coronata). No unusual species were recorded at this location.

Feral Mammals:

No feral mammals were found on the survey. The introduced Small Indian Mongoose (Herpestes auropunctatus) along with rats, mice and perhaps feral cats may occur on the site or on nearby lands.

Oahu records of the endemic and endangered Hawaiian Hoary Bat (Lasiurus cinereus semotus) are limited (Tomich 1986; Kepler and Scott 1990). It is unlikely any would be found at this location.

DISCUSSION AND CONCLUSIONS

This brief survey provides a limited view of the wildlife which utilize the area. The number and relative abundance of each species may vary throughout the year due to available food resources and reproductive success. Exotic species sometimes prosper only to later disappear or become a less significant part of the ecosystem (Williams 1987; Moulton et al. 1990). Long term studies can provide a more comprehensive view of the bird and mammal populations in a particular area. Nevertheless, some general conclusions related to birds and mammals at this site are provided. The following comments summarize the findings of this survey.

- 1- The entire site, as well as, nearby areas were investigated. All birds seen and heard were tallied. These data are summarized in Table 1.
- 2- No native birds were recorded on the survey. None would be expected at this site. No "endangered" or "threatened" species were found on the survey. The native migratory Pacific Golden-Plover may use this area. They are not "threatened" or "endangered".
- 3- This site is surrounded by residential and agricultural (pineapple) lands. I would not characterize this property as unique or special for native or non-native birds and mammals. Any development at this site should have no significant impact on the populations of birds and mammals on Oahu.

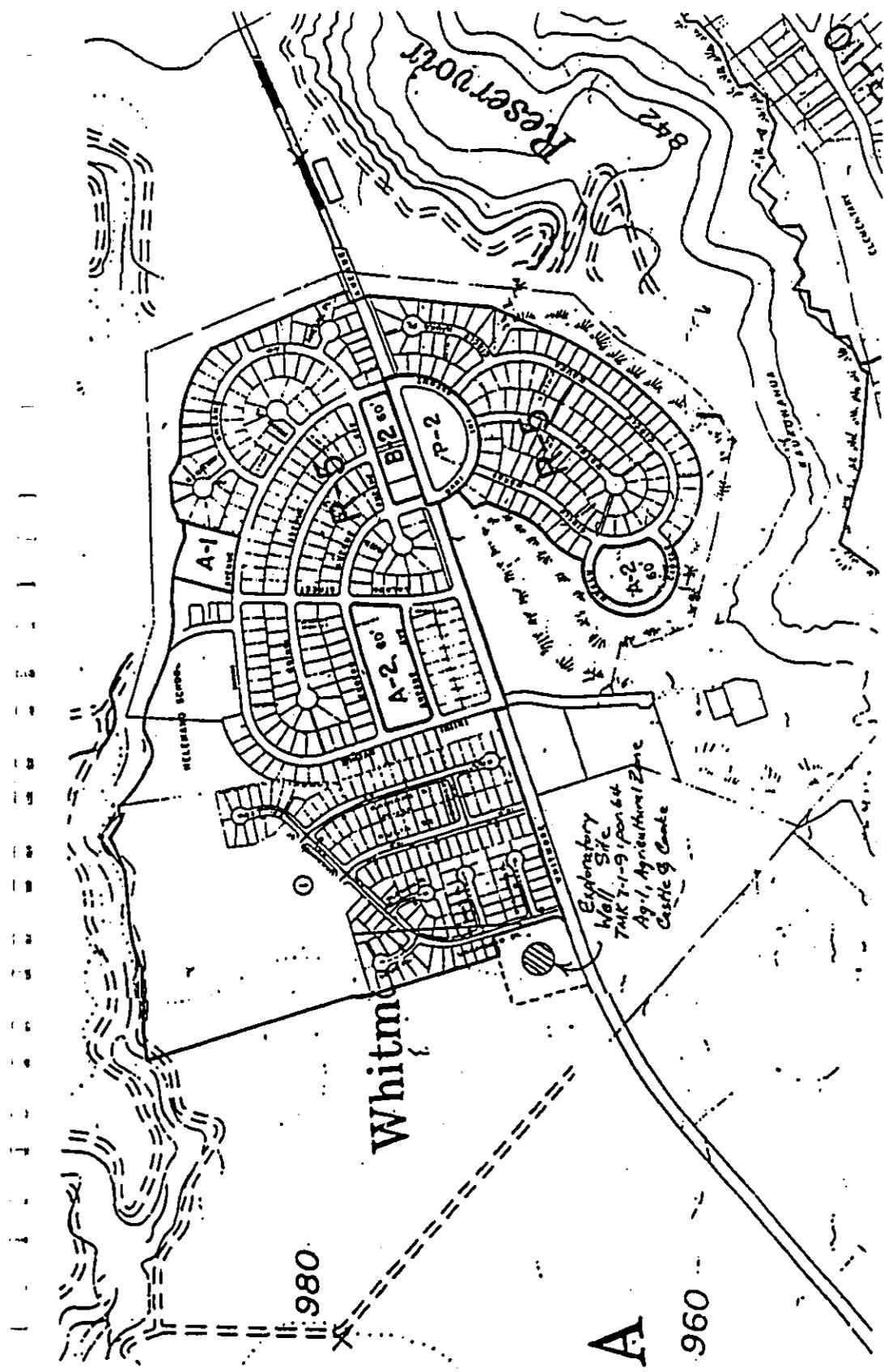


Fig. 1. Location of faunal (bird & mammal) field survey at Whitmore Village, Oahu.

TABLE 1

Introduced birds recorded at the proposed Whitmore Village well site on Oahu. These data provide only an estimate of relative abundance.

COMMON NAME	SCIENTIFIC NAME	TOTAL NUMBER RECORDED
Spotted Dove	<u>Streptopelia chinensis</u>	6
Zebra Dove	<u>Geopelia striata</u>	40
Common Myna	<u>Acridotheres tristis</u>	5
House Finch	<u>Carpodacus mexicanus</u>	18
House Sparrow	<u>Passer domesticus</u>	10
Nutmeg Mannikin	<u>Lonchura malabarica</u>	30
Chestnut Mannikin	<u>Lonchura malacca</u>	7
Java Sparrow	<u>Padda oryzivora</u>	50
Common Waxbill	<u>Estrilda astrild</u>	60

SOURCES CITED

- Hawaii Audubon Society. 1993. Hawaii's Birds. Fourth Edition. Hawaii Audubon Society, Honolulu.
- Honacki, J. H., K. E. Kinman and J. W. Koeppel ed. 1982. Mammal species of the World: A taxonomic and geographic reference. Allen Press, Inc. and the Association of Systematic Collections.
- Johnson, O. W., P. M. Johnson, and P. L. Bruner. 1981. Wintering behavior and site-faithfulness of Golden Plovers on Oahu. 'Elepaio 41(12):123-130.
- Kepler, C. B. and J. M. Scott. 1990. Notes on distribution and behavior of the endangered Hawaiian Hoary Bat (Lasiurus cinereus semotus) 1974-1983. 'Elepaio 50(7):59-64.
- Moulton, M. P., S. L. Pimm and n. W. Krissinger. 1990. Nutmeg Mannikin (Lonchura punctulata): a comparison of abundance in Oahu vs. Maui sugarcane fields: evidence for competitive exclusion? 'Elepaio 50(10):83-85.
- Pratt, H. D., P. L. Bruner and D. G. Berrett. 1987. A field guide to the birds of Hawaii and the Tropical Pacific. Princeton Univ. Press.
- Tomich, P. Q. 1986. Mammals in Hawaii. Bishop Museum Press.
- Williams, R. N. 1987. Alien birds on Oahu. 1944-1985. 'Elepaio 47(9):87-92.

Appendix D



Appendix D
Agencies and Others Provided a Copy of
the Draft Environmental Assessment

Twenty-one government agencies and three groups or other individuals were provided a copy of the draft environmental assessment for this project and requested to provide comments. The following is a list of those agencies and others who were provided a copy of the draft environmental assessment.

Federal agencies

- U.S. Department of Agriculture, Soil Conservation Service
- U.S. Army Corps of Engineers, Pacific Ocean Division
- U.S. Navy, Naval Facilities, Engineering Command, Pacific Division
- U.S. Fish and Wildlife Service

State of Hawaii agencies

- Department of Agriculture
- Department of Business, Economic Development, and Tourism
- Department of Education
- Department of Land and Natural Resources
 - Forestry and Wildlife Division
 - Historic Preservation Division
 - Commission on Water Resources Management
- Department of Health
 - Environmental Management Division
 - Office of Environmental Quality Control
- Department of Transportation, Highways Division
- University of Hawaii
 - Environmental Center
 - Water Resources Research Center

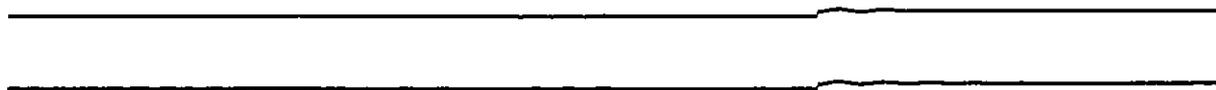
City and County of Honolulu agencies

- Fire Department
- Planning Department
- Land Utilization Department
- Public Works Department
- Transportation Services Department
- Wastewater Management Department

Others

- City Council District I representative Rene Mansho
- Wahiawa Neighborhood Board No. 26, Chair Jack Kampfer
- Sierra Club, Hawaii Chapter

Appendix E



Appendix E
Comments and Responses to the
Draft Environmental Assessment



United States
Department of
Agriculture

Natural
Resources
Conservation
Service

P.O. Box 50004
Honolulu, HI
96850

P-127/97

Our People... Our Islands... In Harmony

February 25, 1997

Mr. Scott Muraoka
City and County of Honolulu
Board of Water Supply
630 South Beretania Street
Honolulu, Hawaii 96843

Dear Mr. Muraoka:

Subject: Draft Environmental Assessment (DEA) - Whitmore Exploratory Well,
Whitmore, Waianua, Oahu, Hawaii

We have reviewed the above mentioned document and have no comments to offer at
this time.

Thank you for the opportunity to review this document.

Sincerely,

KENNETH M. KANESHIRO
State Conservationist

cc:
Mr. Mark Willey, CH2M Hill, 1585 Kapiolani Boulevard, Suite 1420,
Honolulu, HI 96814-6530

The Natural Resources Conservation Service works hand-in-hand with
the American people to conserve natural resources on private lands.

AN EQUAL OPPORTUNITY EMPLOYER

COPY

STREPT HAWKEL, Mayor
WALTER D. WATSON, JR., Chairman
MAURICE H. YAMAGUCHI, Vice Chairman
KAZU HAYASHIDA
MELESA Y. LUM
FORREST C. MURPHY
JONATHAN K. SHIMODA, PIO
BARBARA JOU STANTON
RAYMOND H. SATO
Manager and Chief Engineer



May 1, 1997

BOARD OF WATER SUPPLY

CITY AND COUNTY OF HONOLULU
630 SOUTH BERETANIA STREET
HONOLULU, HAWAII 96843
PHONE (808) 527-6100
FAX (808) 533-2714

Mr. Kenneth M. Kaneshiro
Natural Resources Conservation Service
United States Department of Agriculture
P. O. Box 50004
Honolulu, Hawaii 96850

Dear Mr. Kaneshiro:

Subject: Draft Environmental Assessment for the Board of Water Supply's Proposed
Whitmore Exploratory Well, Whitmore, Waianua, Oahu, TMK: 7-1-09: 64.

Thank you for reviewing the Draft Environmental Assessment for the proposed
Whitmore Exploratory Well project.

We acknowledge that you have no comments to offer at this time.

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

Very truly yours,

RAYMOND H. SATO
Manager and Chief Engineer

cc: Bennett Mark, CH2M Hill

MAILING BRANCH
MAY 28 2 07 PM '97

Pure Water... our greatest need - and it's unity



DEPARTMENT OF THE ARMY
PACIFIC OCEAN DIVISION, CORPS OF ENGINEERS
FORT SHAFTER, HAWAII 96858-5440

ATTENTION OF

February 13, 1997

P-110/97

Planning and Operations Division

FEB 25 2 46 PM '97

Mr. Scot Muraoka
City and County of Honolulu
Board of Water Supply
630 South Beretania Street
Honolulu, Hawaii 96843

Dear Mr. Muraoka:

Thank you for the opportunity to review and comment on the Draft Environmental Assessment (DEA) for the Whitmore Exploratory Well Project, Wahiawa, Oahu (TMK 7-1-9: 64). The following comments are provided pursuant to Corps of Engineers authorities to disseminate flood hazard information under the Flood Control Act of 1960 and to issue Department of the Army (DA) permits under the Clean Water Act; the Rivers and Harbors Act of 1899; and the Marine Protection, Research and Sanctuaries Act.

a. Based on the information provided in the DEA, a DA permit will not be required for the project. Please contact Mr. Benton Ching of my Regulatory Section at 438-9258 (extension 13) for further information and refer to file number 970000100.

b. The flood hazard information provided on page 4-6 of the DEA is correct.

Sincerely,

Paul Mizue, P.E.
Acting Chief, Planning
and Operations Division

Copy Furnished:

Mr. Mark Willey
CH2M HILL, Incorporated
1585 Kapiolani Boulevard, Suite 1420
Honolulu, Hawaii 96814-4530

BOARD OF WATER SUPPLY

CITY AND COUNTY OF HONOLULU
630 SOUTH BERETANIA STREET
HONOLULU, HAWAII 96843
PHONE (808) 527-6180
FAX (808) 533-2714



May 1, 1997

COPY

JEREMY HARRIS, Mayor
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MAURICE M. YAMASATO, Vice Chairman
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MELISSA J. LUM
FORREST C. MURPHY
JOHN HANKS, BISHOP, P.O.
BARBARA WILSON STANTON
RAYMOND H. SATO
Manager and Chief Engineer

Mr. Paul Mizue, P.E.
Department of the Army
Pacific Ocean Division, Corps of Engineers
Fort Shafter, Hawaii 96858-5440

Dear Mr. Mizue:

Subject: Draft Environmental Assessment for the Board of Water Supply's Proposed
Whitmore Exploratory Well, Wahiawa, Oahu, TMK: 7-1-9: 64

Thank you for reviewing the Draft Environmental Assessment for the proposed
Whitmore Exploratory Well project.

We acknowledge that a Department of the Army permit will not be required for the
proposed project.

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

Very truly yours,

RAYMOND H. SATO
Manager and Chief Engineer

cc: Bennett Mark, CH2M Hill



STATE OF HAWAII
DEPARTMENT OF EDUCATION
P. O. BOX 2360
HONOLULU, HAWAII 96804

HERMAN M. AIZAWA, Ph.D.
SUPERINTENDENT

RECEIVED
FEB 27 1997

CHAMBERLAIN - HNL

February 20, 1997

Mr. Scot Muraoka
Board of Water Supply
City and County of Honolulu
630 South Beretania Street
Honolulu, Hawaii 96813

Dear Mr. Muraoka:

Subject: Draft EA for Whitmore Exploratory Well
TRK 7-3-02184

The Department of Education has the following comments on the subject draft environmental assessment:

Helemano Elementary School releases students at 2:05 p.m. (1:15 p.m. on Wednesdays). Therefore, we request that the contractor schedule heavy truck activity between 8:30 a.m. and 2:00 p.m. rather than between 8:30 a.m. and 2:30 p.m.. This will help to reduce congestion and increase safety for pedestrians and cars during this peak time.

It is also our understanding that the contractor will undertake appropriate measures to mitigate noise and dust disturbances.

Thank you for the opportunity to comment. If you have any questions, please call Mr. Sanford Beppu of the Facilities Branch at 733-4862.

Sincerely,

Stanley T. Aida

Herman M. Aizawa, Ph.D.
Superintendent

HMA:hy/ds

cc: A. Suga, OBS
M. Willey, CH2M Hill
A. Hokama, CDO
R. Golden, CDO

AN AFFIRMATIVE ACTION AND EQUAL OPPORTUNITY EMPLOYER

BOARD OF WATER SUPPLY

CITY AND COUNTY OF HONOLULU
630 SOUTH BERETANIA STREET
HONOLULU, HAWAII 96813
PHONE (808) 527-8180
FAX (808) 533-2714



May 23, 1997

WATER SUPPLY

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WALTER O. WATSON, JR., Chairman
MAURICE H. YAMAGUCHI, Vice Chairman
KAZUHIKO ITO
ALESSA T. LUI
FORREST G. SHAW
DAVID M. SHIMADA, Ph.D.
SARAH K. STEWART
RAYMOND H. SATO
Manager and Chief Engineer

Mr. Herman M. Aizawa, Superintendent
Department of Education
State of Hawaii
P. O. Box 2360
Honolulu, Hawaii 96804

Dear Mr. Aizawa:

Subject: Draft Environmental Assessment for the Whitmore Exploratory Well, TRK: 7-1-009: 064

Thank you for reviewing the Draft Environmental Assessment (EA) for the Whitmore Exploratory Well. We have the following response to your concerns:

1. The Final EA will be revised to accommodate your request to limit heavy truck activities between 8:30 a.m. and 2:00 p.m. rather than between 8:30 a.m. and 2:30 p.m. We understand this will help to reduce congestion and increase pedestrian safety around Helemano Elementary School.
2. The Board of Water Supply requires all construction work to comply with noise and dust limits set forth by the Department of Health. The contractor will take the necessary measures to mitigate the noise and dust impacts.

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

Very truly yours,

Raymond H. Sato

RAYMOND H. SATO
Manager and Chief Engineer

cc: Bennett Mark, CH2M Hill

SELAJUNJI GAYTANO

RECEIVED
BO OF WATER SUPPLY
FEB 10 10 08 AM '97



STATE OF HAWAII
OFFICE OF ENVIRONMENTAL QUALITY CONTROL

235 SOUTH BERETANIA STREET
SUITE 702
HONOLULU, HAWAII 96813
TELEPHONE: (808) 527-4100
FACSIMILE: (808) 527-4100

February 7, 1996

The Honorable Raymond Sato, Manager and Chief Engineer
Board of Water Supply
City and County of Honolulu
630 South Seretania Street
Honolulu, Hawaii 96843

Dear Mr. Sato:

We submit for your response (required by Section 343-5(b), Hawaii Revised Statutes) the following comments on a December 1996, draft environmental assessment (DEA) prepared by CH2M Hill and entitled "Whitmore Exploratory Well, Whitmore, Wahiawa, Oahu, Hawaii, Tax Map May 7-1-09:64". The document was submitted by your December 10, 1996, letter to our office. Notice of availability of this draft environmental assessment was initially published in the January 8, 1997, edition of the *Environmental Notice*.

1. Please discuss if a separate environmental assessment will be prepared when the exploratory well is converted into a production well.

Please include a copy of this letter and your response in the final environmental assessment for this project. If there are any questions, please call Mr. Leslie Segundo, Environmental Health Specialist at 586-4185. Thank you.

Sincerely,

GARY GILL
Director

c: Mr. Barry Usagawa, Board of Water Supply
Mr. Robert Chuck, CH2M Hill

970414

GARY GILL
DIRECTOR

pe

FEB 11 10 56 AM '97

BOARD OF WATER SUPPLY

CITY AND COUNTY OF HONOLULU
630 SOUTH BERETANIA STREET
HONOLULU, HAWAII 96843
PHONE: (808) 527-4100
FAX: (808) 523-2714



May 23, 1997

Mr. Gary Gill, Director
Office of Environmental Quality Control
State of Hawaii
235 South Beretania Street, Suite 702
Honolulu, Hawaii 96813

Dear Mr. Gill:

Subject: Draft Environmental Assessment for the Board of Water Supply's Proposed Whitmore Exploratory Well, Whitmore, Wahiawa, Oahu. TDKs: 7-1-09:64

Thank you for reviewing the Draft Environmental Assessment (EA) for the proposed Whitmore Exploratory Well project.

A separate EA will be prepared if the exploratory wells are converted to production facility. Separate EA's for the exploratory and well station construction are normally conducted when new facilities are proposed such as the Whitmore Well. During the well drilling phase of a new project, the yield of the well is unknown, as well as land requirements, access and connecting pipelines. For additional wells to existing facilities, we feel separate EA's are not necessary, in most cases, because adjacent well data is known and will be similar. In addition, land, access and pipeline infrastructure are already existing and most renovation work would be exempt under Chapter 11-200 (8), HAR.

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

Very truly yours,

RAYMOND H. SATO
Manager and Chief Engineer

cc: Bennett Mark, CH2M Hill

COPY

SPERRY HARRIS, Mayor
WALTER O. WATSON, Jr., Chairman
MAURICE H. YAMASATO, Vice Chairman
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FORREST C. MURPHY
JONATHAN K. SHIMADA, PNO
BARBARA JON STANTON
RAYMOND H. SATO
Manager and Chief Engineer

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FOREST C. MURPHY
JOYDANKI S. MANA, PhD
BARBARA YON STANTON
RAYMOND H. SATO
Manager and Civil Engineer



BOARD OF WATER SUPPLY

CITY AND COUNTY OF HONOLULU
630 SOUTH BERETANIA STREET
HONOLULU, HAWAII 96813
PHONE (808) 527-6180
FAX (808) 532-2714

May 1, 1997

P-86/97



STATE OF HAWAII
OFFICE OF HAWAIIAN AFFAIRS
711 KAPOLANE BOULEVARD, SUITE 500
HONOLULU, HAWAII 96813-5249
PHONE (808) 584-1208
FAX (808) 584-1885

January 31, 1997

City & County of Honolulu
Board of Water Supply
Attn: Mr. Barry Usagawa
630 South Beretania Street
Honolulu, HI 96843

Dear Mr. Usagawa:

Thank you for the opportunity to review the Draft Environmental Assessment (DEA) for the Whitmore Exploratory Well, Whitmore, Waihiwa, Island of Oahu. The City & County of Honolulu proposes to drill and case an exploratory potable water well near the west side of Whitmore Village. If the quantity of the water proves to be suitable and the quality meets standards for municipal use, the well will be integrated into the Board of Water Supply's system.

The Office of Hawaiian Affairs has no objections at this time to the proposed well development. Based on information contained in the DEA, the project apparently bears no significant long-term adverse impacts on adjacent areas nor upon existing flora or fauna habitats. Furthermore, no known archaeological remains exist and the proposed well case will not significantly affect scenic resources. Please contact Lynn Lee, Acting Officer of the Land and Natural Resources Division, or Luis Manrique, should you have any questions on this matter.

Sincerely yours,
Martha Ross
Martha Ross
Deputy Administrator

Ms. Martha Ross, Deputy Administrator
Office of Hawaiian Affairs
State of Hawaii
711 Kapiolani Boulevard, Suite 500
Honolulu, Hawaii 96813-5249

Dear Mr. Ross:

Subject: Draft Environmental Assessment for the Whitmore Exploratory Well,
IMK: 7.1-009: 064

Thank you for reviewing the Draft Environmental Assessment for the Whitmore Exploratory Well.

We acknowledge that you have no objections to the proposed well development. There are no known archaeological remains due to the area's extensive agricultural activity.

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

Very truly yours,

Raymond H. Sato
RAYMOND H. SATO
Manager and Chief Engineer

cc: Bennett Mark, CH2M Hill

P-114/97



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT
110 SOUTH BERKELEY ST.
HONOLULU, HAWAII 96813
FEB - 8 1997

RECEIVED & FILED
MARCH 10 1997
DEPARTMENT OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT
110 SOUTH BERKELEY ST.
HONOLULU, HAWAII 96813

Mr. Scott Murooka
Honolulu Board of Water Supply
630 South Berkeley St.
Honolulu, HI 96813

Dear Mr. Murooka:

SUBJECT: Draft Environmental Assessment for the Whitemore Exploratory Well
Whitemore, Waialeale, Oahu, Hawaii, TMAC: 7-1-0934

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

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

- We recommend coordination with the county government to incorporate this project into the county's Water Use and Development Plan.
- We are concerned about the potential for ground or surface water degradation/contamination and recommend that approvals for this project be conditioned upon a review by the State Department of Health and the developer's acceptance of any resulting requirements related to water quality.
- A Well Construction Permit and a Pump Installation Permit from the CWRM would be required before ground water is developed as a source of supply for the project.
- The proposed water supply source for the project is located in a designated water management area, and a Water Use Permit from the CWRM would be required prior to use of this source.
- Groundwater withdrawal from this project may affect streamflows. This may require an instream flow standard amendment.
- We recommend that no development take place affecting highly erodible slopes which drain into streams within or adjacent to the project.
- If the proposed project diverts additional water from streams or if new or modified stream diversions are planned, the project may need to obtain a stream diversion works permit and petition to amend the instream flow standard for the affected stream(s).
- Based on the information provided, it appears that a Stream Channel Alteration Permit pursuant to Section 13-169-50, HAR will be required before the project can be implemented.

Mr. Scott Murooka
110 S. BERKELEY ST.
FEB - 8 1997

- Based on the information provided, it does not appear that a Stream Channel Alteration Permit pursuant to Section 13-169-50, HAR will be required before the project can be implemented.
- An amendment to the instream flow standard from the CWRM would be required before any streamwater is diverted.
- Any new development that is permitted along a stream that is not yet channelized should be based on the stream condition that no stream will be channelized to prevent flooding of the development. Development in the open floodplain should not be allowed; other economic uses of the floodplain should be encouraged.

OTHER:

The DEA correctly identifies the necessary well construction, pump installation, and water use permits that must be obtained from the Commission on Water Resource Management (Commission) prior to any withdrawal of ground water. In water management areas, the policy of the Commission is to require approval for a water use permit prior to well construction/pump installation permits unless the well construction is exploratory in nature; in this case, the Commission may approve an exploratory well construction permit prior to approval of the water use permit.

With regard to the current status of the ground water allocations in the Waialeale Aquifer System (discussed on page 2-7 of the DEA), at present, the total ground water allocation for the Waialeale Aquifer System, which sustainable yield is 23 mgd, is 23 mgd.

The DEA does not discuss the consistency of the proposed project with land use plans, which is a condition for a water use permit under §174C-19(a). Specifically, what water system will the Whitemore Well be incorporated into and what development plan (DP) area does that water system serve. Is the DP area served by the water system slated for additional growth according to the County General Plan and Development Plan?

We would also like to correct the last sentence in the first paragraph on page 2-4. The Whitemore Well, which effectively became a ground water management area in July 1992, is the last sector on Oahu to be included as a ground-water management area. (The Commission's action in March 1993 was to modify the boundaries of the Honolulu, Pearl Harbor, North, and Central Sectors, including the Ewa Caprock.)

The DEA indicates that there will not be any adverse impacts to Kaulaohahu Stream or Waialeale Reservoir. We acknowledge that surface waters are not likely to be adversely impacted because there is approximately 500 feet of saturated (vadose) zone between the ground and surface water. The Commission will require pump testing to ensure that surface waters are not impacted as a condition of the well construction permit.

If there are any questions, please contact Lenore Nakama at 587-0218.

Sincerely,

RAB M. LOUI
Deputy Director

BOARD OF WATER SUPPLY

CITY AND COUNTY OF HONOLULU
630 SOUTH BERTANHA STREET
HONOLULU, HAWAII 96813
PHONE (808) 537-4160
FAX (808) 533-2714



May 2, 1997



JEFFREY MARSH, Mayor
WALTER O. WATSON, JR., Chairman
MAURICE A. YAMAGUCHI, Vice Chairman
JACU MATIAS, M.D.
SELISKIY U. LIM
FORREST C. LAMONT
JOHN WICK, M.D.
BARBARA K. EMMERTON
ANDREW H. SATO
Manager and Chief Engineer

Ms. Rae M. Loui, Deputy Director
Commission on Water Resource Management
Department of Land and Natural Resources
State of Hawaii
P. O. Box 621
Honolulu, Hawaii 96809

Dear Ms. Loui:

Subject: Draft Environmental Assessment for the Board of Water Supply's Proposed
Exploratory Well, Whitmore, Mahiava, Oahu, TMSL 7-1-091-61

Thank you for reviewing the Draft Environmental Assessment for the proposed Whitmore
Exploratory Well project.

We provide the following responses to your concerns:

1. We acknowledge that a Well Construction Permit, Pump Installation Permit and
Water Use Permit are required for the project.
2. The project has been incorporated into the Board of Water Supply's 6-year
Capital Improvement Program (CIP) and the update of the County's Water Use
and Development Plan. The 6-year CIP is reviewed by the Planning Department
for consistency with the City's development plans. The Whitmore Village and
Mahiava areas are part of the Central Oahu Development Plan area which is a
designated growth area.
3. We acknowledge that the total groundwater allocation for the Mahiava Aquifer
system, which has a sustainable yield of 21 mgd, is presently 20,284 mgd.
There is significant amounts of non-used permitted use in the Mahiava
aquifer which could also be used to accommodate this well.
4. The proposed well project is intended to provide additional water supply for
agricultural growth in the area and serve as a backup source to the existing
Whitmore Village water system. The Whitmore Village presently relies on a
single creek on the western cresting the Mahiava reservoir from Mahiava.
A long term study on the reservoir cresting would be extremely difficult to
repair leaving the Whitmore Village area without water service for an
extended period of time. We are presently evaluating other alternatives to
resolve the system reliability issue.
5. We note your comments on the designation of the windward sector, as a
groundwater management area.
6. If the well is constructed, standard test pumping procedures will be
implemented.

If you have any questions, please contact Barry Usagawa at 537-5335.

Very truly yours,

Raymond Satou
RAYMOND M. SATO
Manager and Chief Engineer

cc: Bennett Mark, CDM Hill

WILLIAM A. GUTTING
Commissioner of Land



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
DIVISION OF FORESTRY AND WILDLIFE
1151 PUNCHBOWL STREET
HONOLULU, HAWAII 96813

January 31, 1997

Mr. Scot Murnoka
City and County of Honolulu
Board of Water Supply
630 Beretania Street
Honolulu, HI 96843

Dear Mr. Murnoka:

Subject: Draft Environmental Assessment (EA) for the Whitmore Exploratory Well
Whitmore, Wahiawa, Oahu, Hawaii, TMK: 7-1-09: 64

We have reviewed the subject matter and have determined that the proposed project will not affect our programs or projects in the area. Thank you for the opportunity to comment.

Very truly yours,

Michael G. Buck
Administrator

cc: Oahu Branch
Mark Whaley - CH2M HILL

MICHAEL S. WILSON
Commissioner

BOARD OF LAND AND NATURAL RESOURCES

REPORT

BOARD OF WATER SUPPLY

CITY AND COUNTY OF HONOLULU
630 SOUTH BERETANIA STREET
HONOLULU, HAWAII 96843
PHONE (808) 527-4190
FAX (808) 533-2714



May 1, 1997

Mr. Michael G. Buck, Administrator
Division of Forestry and Wildlife
Department of Land and Natural Resources
State of Hawaii
1151 Punchbowl Street
Honolulu, Hawaii 96813

Dear Mr. Buck:

Subject: Draft Environmental Assessment for the Board of Water Supply's Proposed
Whitmore Exploratory Well, Whitmore, Wahiawa, Oahu, TMK: 7-1-09: 64

Thank you for reviewing the Draft Environmental Assessment for the proposed Whitmore Exploratory Well Project.

We acknowledge that the proposed project will not affect any forestry and wildlife programs or projects in the area.

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

Very truly yours,

RAYMOND H. SATO
Manager and Chief Engineer

cc: Bennett Mark, CH2M Hill

COPY

SPENCY HARRIS, Mayor
WALTER O. WATSON, JR., Chairman
MAURICE H. YAMASATO, Vice Chairman
KAZUHIYASHIRO
MELISSA Y. LIAM
FOREST C. MURPHY
JONATHAN C. SHIMADA, P.E.
BARBARA LAM STANTON
RAYMOND H. SATO
Manager and Chief Engineer

MARKET & VILLAGES
DEPARTMENT OF LAND



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
STATE HISTORIC PRESERVATION DIVISION
33 SOUTH KING STREET, 6TH FLOOR
HONOLULU, HAWAII 96813

February 11, 1997

Scot Muraoka
City and County of Honolulu
Board of Water Supply
630 South Beretania Street
Honolulu, Hawaii 96813

Dear Mr. Muraoka:

SUBJECT: Historic Preservation Review Chapter 6E-8 - Draft Environmental Assessment (DEA) for the BWS Whitmore Exploratory Well
Wahiawa, Wahiawa, O'ahu
TMK: 7-1-09:64

LOG NO: 18894 ✓
DOC NO: 9702EJ10



MARKET & VILLAGES
DEPARTMENT OF LAND AND NATURAL RESOURCES
SERVICES
PLANNING
CURRENT DEVELOPMENT
AGRICULTURE DEVELOPMENT
PROGRAMS
ANALYTIC RESEARCH
AND CONSULTATION
RESOURCES MANAGEMENT
CONVEYANCES
PROPERTY AND TAXATION
HISTORIC PRESERVATION
DIVISION
STATE PARKS
WATER AND LAND DEVELOPMENT

BOARD OF WATER SUPPLY

CITY AND COUNTY OF HONOLULU
630 SOUTH BERETANIA STREET
HONOLULU, HAWAII 96813
PHONE (808) 527-6180
FAX (808) 533-2714



May 1, 1997

Mr. Don Hibbard, Administrator
State Historic Preservation Division
Department of Land and Natural Resources
State of Hawaii
33 South King Street, 6th Floor
Honolulu, Hawaii 96813

Dear Mr. Hibbard:

Subject: Draft Environmental Assessment for the Board of Water Supply's Proposed
Whitmore Exploratory Well, Whitmore, Wahiawa, Oahu, TMK: 7-1-09: 64.

Thank you for reviewing the Draft Environmental Assessment for the proposed Whitmore Exploratory Well Project.

We acknowledge that the proposed project will have "no effect" on any historic sites in the area due to the area's extensive agricultural activity.

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

Very truly yours,

RAYMOND H. SATO
Manager and Chief Engineer

cc: Bennett Mark, CH2M HILL

Aloha,

Don Hibbard, Administrator
Historic Preservation Division
EJ:jk

c: ✓ Mark Willey, CH2M HILL, 1585 Kapiolani Blvd., Ste 1420, Honolulu, Hawaii
96814-4530

COPY

JEREMY HARRIS, Mayor
WALTER L. WATSON, JR., Chairman
MAURICE H. YALOWITZ, Vice Chairman
KAZUHIYASHIRO
MELISSA J. UETA
FORREST C. MERRAY
JOHNATHAN K. BRIMMO, PRO
BARBARA KIM STANTON
RAYMOND H. SATO
Manager and Chief Engineer

EDUARDO J. CAYTEJANO
SECRETARY



STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
869 PUNCHBOWL STREET
HONOLULU, HAWAII 96813-5087

FEB - 7 1997

KADU HAYASHIDA
DIRECTOR

DEPUTY DIRECTOR
JERRY M. MATTHEWS
OLENN H. OKAMOTO

IN REPLY REFER TO
HWY-PS
2,3425

Mr. Scott Muraoka
City and County of Honolulu
Board of Water Supply
630 South Beretania Street
Honolulu, Hawaii 96843

Dear Mr. Muraoka:

Subject: Draft Environmental Assessment, Whitmore Exploratory Well,
Whitmore, Wahiawa, Oahu; TMK: 7-1-9: 64

Thank you for requesting our review of the draft environmental assessment for the proposed Whitmore exploratory well.

The proposed well and appurtenant facilities are not anticipated to impact Whitmore Avenue, our State facility.

Plans for construction work within the State right-of-way must be submitted for our review and approval.

Very truly yours,

HUGH HONO
Administrator
Highways Division

/c/ Mr. Mark Willey
CH2M Hill
1585 Kapiolani Boulevard, Suite 1420
Honolulu, Hawaii 96814-4530

BOARD OF WATER SUPPLY

CITY AND COUNTY OF HONOLULU
630 SOUTH BERETANIA STREET
HONOLULU, HAWAII 96843
PHONE (808) 527-8100
FAX (808) 523-2714



May 1, 1997

Mr. Hugh Y. Ono, Administrator
Highways Division
Department of Transportation
State of Hawaii
869 Punchbowl Street
Honolulu, Hawaii 96813-5097

Dear Mr. Ono:

Subject: Draft Environmental Assessment for the Board of Water Supply's Proposed
Whitmore Exploratory Well, Whitmore, Wahiawa, Oahu, TMK: 7-1-9: 64

Thank you for reviewing the Draft Environmental Assessment for the proposed Whitmore Exploratory Well Project.

We acknowledge that the proposed project is not anticipated to impact Whitmore Avenue.

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

Very truly yours,

RAYMOND H. SATO
Manager and Chief Engineer

/c/ Bennett Mark, CH2M Hill

COPY

JEREMY HARRIS, Mayor
WALTER O. WATSON, JR., Chairman
MAURICE H. YAMASATO, Vice Chairman
KADU HAYASHIDA
MELISSA Y. J. LUI
FOREST C. MURPHY
JONATHAN K. BEAMON, PIO
BARBARA ION STANTON
RAYMOND H. SATO
Manager and Chief Engineer

FEB 10 9 24 AM '97



University of Hawai'i at Mānoa

Environmental Center
A Unit of Water Resources Research Center
Crawford 317 • 2540 Campus Road • Honolulu, Hawai'i 96822
Telephone: (808) 836-7361 • Facsimile: (808) 836-3980

February 7, 1997
EA-0154

Mr. Barry Usagawa
City and County of Honolulu
Board of Water Supply
630 South Beretania Street
Honolulu, Hawaii 96843

Mr. Usagawa:

Draft Environmental Assessment (EA)
Whitmore Exploratory Well
Whitmore Village, Oahu

The City and County of Honolulu Board of Water Supply (BWS), proposes to drill, case, and pump test an exploratory potable water well located near the west side of Whitmore Village, along the north edge of Whitmore Avenue. The proposed well will be approximately 980 feet deep, and is anticipated to yield about 2.0 million gallons of potable water per day for the Whitmore Village area. The well will improve flows and pressures to the Whitmore area and will provide backup to the single pipeline crossing Lake Wilson from Waihara. The estimated cost of the proposed exploratory well project is \$770,000 and it is expected to last about eight months.

This review was completed with the assistance of Paul Derkowitz and Tom Hawley, Environmental Center.

Our reviewers questioned whether a separate EA will be prepared for the proposed project should the exploratory well be converted to a production well. While this used to be standard procedure, we have noticed that preparation of separate documents for the different stages of well development has decreased in recent years. Without additional documentation upon conversion to production, insufficient data are presented in the draft EA regarding water quality, water quantity, and sustainable yield. If the well is to be converted to a production well, a second EA must be prepared which discusses the criteria and standards used to determine production feasibility. Only at this point will the public be afforded adequate opportunity for review of the proposed project.

Mr. Barry Usagawa
February 7, 1997
Page 2

Our reviewers question the statement on page 1-3 of the draft EA, which states that "The development of additional potable water sources is necessary to accommodate the growing demand for potable water within the City and County of Honolulu." We wonder whether this is still the case, given that sugarcane irrigation has ceased and the state now has far more available water than it did a few years ago. The draft EA lacks current water use figures relative to current supplies, and our reviewers suggest that supplies might, in fact, greatly exceed current use. In general, this question reflects the use of what appears to be quite old data in the draft EA. Our reviewers suggest that information regarding the use of former AmFae and Waibole Ditch water, in addition to updated population growth figures, could clarify the issue of water use and demand.

On page 2-7 of the draft EA, permitted use of the Waihara Aquifer is listed at 22.53 million gallons per day (mgd), and sustainable yield at 23 mgd. We further note that the proposed project provides for a capacity of 2.0 mgd. Will permitted use exceed sustainable yield if the well goes into production? Or, conversely, will the Commission on Water Resource Management's downward adjustments for non-use compensate for the increase provided by the proposed Whitmore well? These issues need to be clarified in the final EA.

Finally, we question whether any community groups were consulted with regard to the cultural significance of the proposed site. Cultural surveying of any proposed project site goes beyond merely identifying archaeological sites. Hence, more complete data must be presented on this issue.

Thank you for the opportunity to comment.

Sincerely,

John T. Harrison
Environmental Coordinator

cc: OEQC
Roger Fujioka
CH2M Hill
Paul Derkowitz
Tom Hawley

JTH

BOARD OF WATER SUPPLY

CITY AND COUNTY OF HONOLULU
600 SOUTH BERTHMAN STREET
HONOLULU, HAWAII 96813
PHONE (808) 527-4180
FAX (808) 533-3714



May 28, 1997

Mr. John T. Harrison
Environmental Center
University of Hawaii at Manoa
Crawford 317
2550 Campus Road
Honolulu, Hawaii 96822

Dear Mr. Harrison:

Subject: Draft Environmental Assessment for the Board of Water Supply's Proposed Whitmore
Exploratory Well, Whitmore, Waialua, Oahu, TMS, 7-1-97-64

Thank you for reviewing the Draft Environmental Assessment (EA) for the proposed Whitmore
Exploratory Well project.

We provide the following response to your concerns:

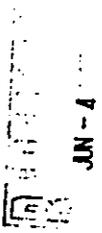
1. A separate EA will be prepared if the exploratory wells are converted to a production facility. Separate EA's for the exploratory and permanent well station construction are normally conducted when new facilities are proposed such as the Whitmore Well. During the well drilling phase of a new project, the productivity of the well is unknown as well as land requirements, access and connecting pipelines. However, for additional wells to existing facilities, we feel separate EA's are not necessary, in most cases, because adjacent well data is known and will be similar. In addition, land, access and pipeline infrastructure are already existing and most renovation work would be exempt under Chapter 11-200(8), HAR.
2. The proposed well project is intended to provide additional potable supply for the incremental growth of the area and to serve as a backup source to the existing Whitmore Village water system. The Waialua and Whitmore areas are part of the Central Oahu Development Plan District which is a designated growth area. The Whitmore Village presently relies on a single waterline crossing the Waialua Reservoir. Should a main break occur on this waterline, Whitmore Village would be left without water service for an extended period of time. We are also evaluating other alternatives to improve the reliability of the Whitmore Village water system.

The close of the plantations will free unused groundwater permitted use, if no longer needed in agriculture. However, because the plantations have their own surface and groundwater sources and are not served by the Board of Water Supply (BWS), the close does not increase the BWS source capacity. By freeing up unused permitted use, BWS can then construct new wells while retaining within the aquifer's sustainable yield.

Pure Water... our greatest need - use it wisely

COPY

JERRY HARRIS, Mayor
WALTER D. WATSON, JR., Chairman
MURIEL H. YAMASAKI, Vice Chairman
KAZUHIYASHIKI
MELISSA Y. LIU
FORREST G. MURPHY
JOHN W. K. BISHARA, PhD
BARBARA IRL STANTON
RAYMOND H. SATO
Manager and Chief Engineer



Mr. John T. Harrison
Page 2
May 28, 1997



The population growth figures are current; however, the water supply situation is still in a state of flux. The sustainable yield of the area's aquifers, subsequent to the close of the plantations, will be down adjusted and is still being evaluated by the Commission on Water Resource Management (CWRM). The amount of groundwater available to urban development in Central Oahu will be dependant on the adoption of permanent instream flow standards, on surface water and groundwater allocations to agriculture and the aquifer sustainable yield which CWRM eventually adopts.

3. The current permitted use for the Waialua Aquifer as of January 24, 1997, is 20,954 million gallons per day (mgd) with a sustainable yield of 23 mgd. The 1994 pumpage totalled only 9.7 mgd. There are significant amounts of unused permitted use in the Waialua aquifer due to the close of the plantations. The proposed well project's anticipated yield is 2.0 mgd, however, the approved permitted use will be contingent upon available sustainable yield of the aquifer.

4. We understand your comments regarding cultural significance. The proposed well site will occupy a small portion of the 2.644 acre site which is currently landscaped and used as a park. There are no known historic sites at the park because the area was commercially cultivated in agriculture. Most cultural impacts are associated with surface water impacts. Since surface water is not expected to be impacted by this project, cultural investigations beyond historic sites were not conducted.

Thank you again for providing comments on the draft EA. If you have any questions, please contact Barry Usagawa at 527-5235.

Very truly yours,

RAYMOND H. SATO
Manager and Chief Engineer

cc: Bennett Mark, CH2M Hill

Pure Water... our greatest need - use it wisely





HOUSE OF REPRESENTATIVES

STATE OF HAWAII
STATE CAPITOL
HONOLULU, HAWAII 96813

January 16, 1997

Mr. Barry Usagawa
City and County of Honolulu
Board of Water Supply
630 South Beretania Street
Honolulu, Hawaii 96843

Re: Whitmore Exploratory Well

Dear Mr. Usagawa:

With regard to the First Notice of a Draft Environmental Assessment for the Whitmore Exploratory Well (December 1996), with its proposal to drill, case, and pump test an exploratory potable water well near Whitmore Village in the District of Wahiawa, I am hereby voicing my concerns about the project.

While the well, if successfully integrated into the municipal water system, would provide backup to the single water line from Wahiawa and improve water flow and pressure in the Whitmore area, the proposed and subsequent withdrawal of up to 2.0 mgd by the Board of Water Supply would exceed the established sustainable yield for the Wahiawa Aquifer by 1.4 mgd. The addition of another exploratory well in Wahiawa town, as mentioned in the assessment, would no doubt raise that figure even higher. Should this project, along with all permittees using the Wahiawa Aquifer, withdraw the maximum amount of water authorized by the State Commission on Water Resource Management, it would exceed that "which can be accommodated with the available water source", pursuant to HAR §13-171-13.

Now if, pursuant to HAR §13-171-24-4, certain users permits relating to the Wahiawa aquifer are revoked or reduced because of non-use for a period of four years, that action would mitigate my concerns for now. However, to my knowledge, the Water Commission has not acted upon these permits.

COPY

Another of my concerns concerns the location of the well site in Kahi Kani Park. Accompanying maps in the environmental assessment place the location in the northwest corner of the 2.64 acre park, in close proximity to a neighborhood, and about 130 feet from the nearest house. Would it not be possible to relocate the well site about 250 feet to the southwest corner of the site? Such a move would at least partially alleviate any noise, fugitive dust and exhaust emissions from the site that would impact houses along Uakanika's Street.

Thank you for allowing me to express my concerns.

Sincerely yours,

REP. MARCUS OSHIRO
40th District (Wahiawa-Whitmore)
House Majority Floor Leader

MO:dk

cc: CH2M Hill, Consultants
State Office of Environmental Quality Control
Wahiawa Neighborhood Board
State Commission on Water Resource Management

COPY

JAN 23 1997

M HILL - HNL

COPY

JEREMY HARRIS Mayor
WALTER O. WATSON, JR. Chairman
LAURICE H. YAMASATO, Vice-Chairman
KAZUO HAYASHIDA
MELISSA Y. J. LIM
FORREST C. MURPHY
JOATHAN K. SHIMADA, P.O.
BARBARA TOM STANTON
RAYMOND H. SATO
Manager and Chief Engineer



July 9, 1997

BOARD OF WATER SUPPLY

CITY AND COUNTY OF HONOLULU
630 SOUTH BERTANA STREET
HONOLULU, HAWAII 96843
PHONE (808) 527-6100
FAX (808) 533-2714

The Honorable Marcus Oshiro
4th District (Waialae-Whitmore)
House of Representatives
State of Hawaii
State Capitol
Honolulu, Hawaii 96813

Dear Representative Oshiro:

Subject: Draft Environmental Assessment for the Board of Water Supply's Proposed
Whitmore Exploratory Well, Whitmore, Mahiwa, Oahu, TNS, 7-1-091, 44

Thank you for reviewing the Draft Environmental Assessment (EA) for the proposed
Whitmore Exploratory Well project.

We provide the following responses to your concerns:

1. The Final EA will be revised to indicate that the current permitted use for the Mahiwa Aquifer as of January 21, 1997, is 20,324 mgd with a sustainable yield of 23 mgd. The proposed project's anticipated yield of 2.0 mgd will remain within the sustainable yield of the aquifer.
2. The proposed well site was selected within the northwest corner of Kahi Zani Park to minimize impacts to the Department of Parks and Recreation's future plans to construct a playground and comfort station. The proposed site is located as far away from Whitmore Avenue and Hakanikoo Street as possible. In addition, the well's location was selected so that it would have the least impact on the future options of the Fire Department. The City's Development Plan Public Facilities Map shows a fire station is planned in the beyond six years category, near the center of Whitmore Village.
3. The contractor will be required to minimize any noise, dust and exhaust impacts that may inconvenience the adjacent homes along Hakanikoo Street. To mitigate the effects of site clearing, grading and construction activities, dust control measures such as water sprinkling and dust screens will be implemented by the contractor. In addition, the contractor must minimize exhaust emissions and noise in accordance with the State Department of Health rules, Title 11, Chapters 43, 49 and 60.

For your information, we are presently evaluating the feasibility of serving the Whitmore Village with a parallel main instead of the proposed well.

If you have any questions, please contact Barry Usagava at 537-5235.

Very truly yours,

Raymond H. Sato
RAYMOND H. SATO
Manager and Chief Engineer

cc: Bennett Mark, CH2M Hill

FIRE DEPARTMENT
CITY AND COUNTY OF HONOLULU
 3375 KOLEA STREET, SUITE 3431
 HONOLULU, HAWAII 96819-1949



AGENCY NAME
 ADDRESS

February 10, 1997

ANTHONY J. LOPEZ, JR.
 FIRE CHIEF



TO: SCOT MURAOKA, ENVIRONMENTAL UNIT
 BOARD OF WATER SUPPLY

FROM: ANTHONY J. LOPEZ, JR., FIRE CHIEF

SUBJECT: DRAFT ENVIRONMENTAL ASSESSMENT (EA) FOR THE
 WHITMORE EXPLORATORY WELL WHITMORE, WAHIAWA, OAHU,
 HAWAII. TMK: 7-1-09-64

We have reviewed the subject material provided and foresee no adverse impact in Fire Department facilities or services. Fire protection services provided from Wahiawa and Milliani engine companies with ladder service from Waiau are adequate.

Should you have any questions, please call Acting Assistant Chief Arthur Ugalde of our Administrative Services Bureau at 831-7774.

Anthony J. Lopez, Jr.
 ANTHONY J. LOPEZ, JR.
 Fire Chief

AJL/MPN:ny

cc: Mark Wiley, CH2M HILL, INC. w/EA report

COPY

JEREMY HUPPER, Mayor
 WALTER O. WATSON, JR., Chairman
 MAURICE H. YAMAGUCHI, Vice Chairman
 KAZUO HAYASHIDA
 MELISSA Y. LUM
 FORREST C. MURPHY
 JONATHAN K. SHIMADA, PhD
 BARBARA DOM STANTON
 RAYMOND H. SATO
 Manager and Chief Engineer



May 1, 1997

BOARD OF WATER SUPPLY

CITY AND COUNTY OF HONOLULU
 630 SOUTH BERETANA STREET
 HONOLULU, HAWAII 96843
 PHONE: (808) 527-6180
 FAX: (808) 533-2714

TO: ANTHONY J. LOPEZ, JR., FIRE CHIEF
 FIRE DEPARTMENT

FROM: *Raymond H. Sato*
 RAYMOND H. SATO, MANAGER AND CHIEF ENGINEER
 BOARD OF WATER SUPPLY

SUBJECT: DRAFT ENVIRONMENTAL ASSESSMENT FOR THE WHITMORE EXPLORATORY
 WELL, WHITMORE, WAHIAWA, OAHU, HAWAII. TMK: 7-1-09-64

Thank you for reviewing the Draft Environmental Assessment for the Whitmore Exploratory Well Project.

We acknowledge that you foresee no adverse impact in Fire Department facilities or services. We understand that fire protection services provided from the Wahiawa and Milliani engine companies with ladder service from Waiau are adequate.

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

cc: Bennett Mark, CH2M HILL

DEPARTMENT OF LAND UTILIZATION
CITY AND COUNTY OF HONOLULU
 810 SOUTH KING STREET, 7TH FLOOR • HONOLULU, HAWAII 96813
 PHONE: (808) 533-4514 • FAX: (808) 531-8745



JAN MAOE SULLIVAN
 ACTING DIRECTOR
 DEPARTMENT OF LAND UTILIZATION
 97-00630 (AC/SHC)

RECEIVED
 FEB 25 1997

February 24, 1997

CN2MHILL - HNL

MEMORANDUM

TO: RAYMOND H. SATO, MANAGER AND CHIEF ENGINEER
 BOARD OF WATER SUPPLY

ATTN: SCOT MURAOKA

FROM: JAN MAOE SULLIVAN, ACTING DIRECTOR
 DEPARTMENT OF LAND UTILIZATION

SUBJECT: DRAFT ENVIRONMENTAL ASSESSMENT (DEA) FOR
 THE WHITMORE EXPLORATORY WELL
 TAX MAP KEY: 7-1-09: 64

Thank you for allowing the Department of Land Utilization the opportunity to review and comment on the above-referenced DEA. We have examined the contents and have no comments at this time. Should you have any questions, please contact Art Challacombe of our staff at 523-4107.

[Signature]
 JAN MAOE SULLIVAN
 Acting Director of Land Utilization

JNS:em
 cc: Mark Willey, CH2M HILL
 97-00630.048

COPY

JEREMY HARRIS, Mayor
 WALTER O. WATSON, JR., Chairman
 LAWRENCE H. YAMASATO, Vice Chairman
 KAZUO HAYASHIDA
 MELISSA J. LIU
 FORREST C. MURPHY
 JONATHAN K. SHIMADA, PRO
 BARBARA MUI STANTON
 RAYMOND H. SATO
 Manager and Chief Engineer



BOARD OF WATER SUPPLY
 CITY AND COUNTY OF HONOLULU
 630 SOUTH BERETANIA STREET
 HONOLULU, HAWAII 96843
 PHONE: (808) 527-6180
 FAX: (808) 533-2714

May 1, 1997

TO: JAN SULLIVAN, DIRECTOR
 DEPARTMENT OF LAND UTILIZATION

FROM: *[Signature]*
 RAYMOND H. SATO, MANAGER AND CHIEF ENGINEER
 BOARD OF WATER SUPPLY

SUBJECT: DRAFT ENVIRONMENTAL ASSESSMENT FOR THE WHITMORE
 EXPLORATORY WELL, WHITMORE, WAHIAWA, OAHU, HAWAII,
 TMK: 7-1-009: 064

Thank you for reviewing the Draft Environmental Assessment for the Whitmore Exploratory Well Project.

We acknowledge that you have no comments to offer at this time.

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

cc: Bennett Mark, CH2M Hill

CITY AND COUNTY OF HONOLULU

PLANNING DEPARTMENT
300 SOUTH KING STREET
HONOLULU, HAWAII 96813



PATRICK T. ONISHI
CHIEF PLANNING OFFICER
DEPUTY CHIEF PLANNING OFFICER

GW 2/97-0720

RECEIVED

FEB 26 1997

CH2MHILL - HNL

February 21, 1997

Mr. Scott Muraoka
Board of Water Supply
City and County of Honolulu
630 South Beretania Street
Honolulu, Hawaii 96843

Dear Mr. Muraoka:

Draft Environmental Assessment (EA)
for the Whitmore Exploratory Well
Whitmore, Wahiawa, Oahu, Hawaii. JMK: J-1-09-64

We have reviewed the above-referenced Draft Environmental Assessment and offer the following comments.

1. The EA should be revised to clarify the likelihood of the presence of volatile organic compounds (VOC's): page 1-1 indicates it is highly unlikely, but pages 1-5 and 3-4 indicate it is likely.
2. The intended depth from which the proposed well will draw should be clarified: page 1-5 indicates draws will be from 700 feet below mean sea level (MSL), page 3-1 indicates they will be from MSL, and page 3-3 (and the OEQC Environmental Notice dated January 8, 1997) indicates they will be from 280 feet above MSL.
3. Current uses of the parcel on which the proposed well will be located should be clarified: page 3-1 indicates it is a vacant parcel owned by the Department of Parks and Recreation, whereas page 4-8 indicates it is used as Kahikanini Kani Park. Use of the site should be coordinated with the Department of Parks and Recreation.

Mr. Scott Muraoka
Board of Water Supply
February 20, 1997
Page 2

4. The subsurface geological characteristics of the site should be clarified: page 3-3 indicates it is dike-confined whereas page 4-4 indicates it is dike-free basalt.
5. We note that the size of the granular activated carbon (GAC) treatment facility (which may be necessary for the treatment of VOC's) is estimated on page 3-4, but no information is provided as to the expected size of the pumping station which may be constructed. Information regarding the size and siting of the pumping station and any appurtenant improvements will be critical to assessing the potential impact of the pumping station on continued recreational uses of the site.
6. Page 4-8 indicates that heavy truck activity will be scheduled between 8:30 AM and 2:30 PM Monday through Friday, to avoid traffic conflicts with Helemano Elementary School. Classes at the school end at 2:05 PM Mondays, Tuesdays, Thursdays and Fridays; and at 1:15 PM Wednesdays. Consideration should be given to adjusting the heavy truck activity schedule so that it will not conflict with the pedestrian and vehicular traffic associated with the end of the school's classroom day.

Thank you for the opportunity to review this Draft Environmental Assessment. Should you have any questions, please call Gordon Wood of the Planning Department staff at 527-6073.

Sincerely,

PATRICK T. ONISHI
Acting Chief Planning Officer

PTO:lh

c: Mark Willey, CH2M Hill

BOARD OF WATER SUPPLY

CITY AND COUNTY OF HONOLULU
630 SOUTH BERETANIA STREET
HONOLULU, HAWAII 96843
PHONE (808) 527-5180
FAX (808) 525-2714



July 9, 1997

COPY

SPRING HARBOR, MAUI
WALTER WATSON, JR., Chairman
MARIANNE TAMARATO, Vice Chairman
HAZUKIYASHIDA
MELISSA YU LIM
FOREST C. MURPHY
JOHNATHAN K. SHIMADA, PRO
BARBARA TOM STANTON
RAYMOND H. SAITO
Manager and Chief Engineer

TO: PATRICK T. OBIERI, CHIEF PLANNING OFFICER
PLANNING DEPARTMENT
FROM: *Raymond H. Saito*
RAYMOND H. SAITO, MANAGER AND CHIEF ENGINEER
BOARD OF WATER SUPPLY
SUBJECT: DRAFT ENVIRONMENTAL ASSESSMENT FOR THE BOARD OF WATER SUPPLY'S
PROPOSED WHITMORE EXPLORATORY WELL, WHITMORE, WAIHANA, OAHU, HAWAII,
TEL# 525-9321-914

Thank you for reviewing the Draft Environmental Assessment (EA) for the proposed
Whitmore Exploratory Well Project.

We have the following responses to your concerns:

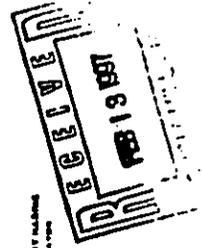
1. The Final EA will be revised to indicate that the presence of volatile organic compounds (VOC) is possible, but the existence or level of concentration is unknown at this time. Water quality tests for VOC's will be made on the extracted water when the well is test-pumped.
2. The reference to the intended depth from which the proposed well will draw will be clarified in the Final EA. The depth that groundwater will be pumped will be approximately 700 feet below ground elevation. Since the elevation of the wellhead is at approximately 980 feet above mean sea level, the depth that the proposed well is expected to pump groundwater is about 280 feet above mean sea level.
3. At the time the Draft EA was being prepared, the proposed well site was vacant, but designated as Kahikahaui Park. Presently, the Department of Parks and Recreation intends to utilize the site as a playground, with future plans for a concert station. The Board of Water Supply will coordinate its efforts for the proposed well with the Department of Parks and Recreation.
4. Chapter 3 of the Final EA will be revised to indicate that the pumped water is anticipated to be high-level dibe-free water.
5. The information on the size and location of the permanent pumping station would be dependent upon whether the quality and quantity of the water drawn from the exploratory well are adequate for municipal use. If the well is converted to a production facility, a separate EA will be prepared to address the pumping station and appurtenant improvements.
6. The Final EA will be revised to indicate that heavy truck activities will be limited between 8:30 a.m. and 2:00 p.m. to accommodate Helemano Elementary School.

If you have any questions, please contact Barry Usagaus at 527-5215.

cc: Bennett Mark, CHEN Hill

CITY AND COUNTY OF HONOLULU

DEPARTMENT OF PUBLIC WORKS
 430 SOUTH KING STREET 11TH FLOOR • HONOLULU, HAWAII 96813
 PHONE: (808) 522-4241 • FAX: (808) 527-8857



JONATHAN K. SHIMADA, PhD
 Acting Director and Chief Engineer
 RAYMOND H. SATO, Jr.
 Deputy Director
 ENV 87-022

February 7, 1997

MEMORANDUM
TO: RAYMOND SATO, MANAGER AND CHIEF ENGINEER
 BOARD OF WATER SUPPLY
ATTENTION: SCOT KURAOKA
FROM: JONATHAN K. SHIMADA, PhD
 ACTING DIRECTOR AND CHIEF ENGINEER
SUBJECT: DRAFT ENVIRONMENTAL ASSESSMENT (DEA)
 WHITMORE EXPLORATORY WELL
 TRK: 7-1-021-64

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

- Page 1-5, Section 1.6: Please discuss ownership of the gulch into which the discharge of effluent from construction and hydrotesting activities will be directed.
- Page 4-5, Section 4.3.5: The DEA should address best management practices (BMPs) to mitigate discharge of pollutants during construction.
- Effluent discharge permits from the State Department of Health and the City Department of Public Works may be required.

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

CC: CH2M HILL (Mark Willey)

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JEREMY HARRIS, City Engineer
 WALTERO WATSON, JR., Chairman
 MAURICE H. YAMASATO, Vice Chairman
 KAZUO HAYASHIDA
 HELESA T. LUI
 FORTUNE C. KIMURA
 JONATHAN K. SHIMADA, PhD
 BARBARA M. STANTON
 RAYMOND H. SATO
 Manager and Chief Engineer



July 9, 1997

BOARD OF WATER SUPPLY
 CITY AND COUNTY OF HONOLULU
 630 SOUTH BERETANA STREET
 HONOLULU, HAWAII 96843
 PHONE: (808) 527-6180
 FAX: (808) 523-2714

TO: JONATHAN K. SHIMADA, DIRECTOR AND CHIEF ENGINEER
 DEPARTMENT OF PUBLIC WORKS
FROM: RAYMOND H. SATO, MANAGER AND CHIEF ENGINEER
 BOARD OF WATER SUPPLY
SUBJECT: DRAFT ENVIRONMENTAL ASSESSMENT FOR THE BOARD OF WATER
 SUPPLY'S PROPOSED WHITMORE EXPLORATORY WELL, WHITMORE,
 WAHIAWA, OAHU, HAWAII. TRK: 7-1-009, 064

Thank you for reviewing the Draft Environmental Assessment for the proposed Whitmore Exploratory Well Project.

We have the following responses to your concerns:

- The gulch into which the effluent from construction and hydrotesting activities will be discharged into is owned by Castle and Cooke, Inc.
- During construction and test pumping of the exploratory well, we shall implement best management practices to minimize potential pollution of receiving waters. Measures include swales, berms and sedimentation basins with oil absorbent material to ensure that sediment and petroleum products will be retained on-site and prevented from entering any receiving waters.
- There will be no discharge into the municipal storm sewer system. In addition, the discharge of potable groundwater associated with well test pumping operations is exempt from National Pollutant Discharge Elimination System requirements.

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

Barrett Merritt, CH2M Hill

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JERRY HARRE, Mayor
WALTER O. WATSON, JR., Chairman
MAURICE H. YAMASATO, Vice Chairman
KAZU HAYASHIDA
MELISSA Y. LIUM
FORREST C. MURPHY
JONATHAN K. SHIMADA, PIO
BARBARA TOM STANTON
RAYMOND H. SATO
Manager and Chief Engineer



May 1, 1997

BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU
600 SOUTH BERETANIA STREET
HONOLULU, HAWAII 96843
PHONE (808) 527-6190
FAX (808) 533-2714

DEPARTMENT OF TRANSPORTATION SERVICES
CITY AND COUNTY OF HONOLULU
PACIFIC PINE PLAZA
1111 BISHOP LANE, SUITE 1120
HONOLULU, HAWAII 96813



CHERYL D. SOON
DIRECTOR
DEPARTMENT OF TRANSPORTATION SERVICES

FEBRUARY 24, 1997

TSP1/97-00470R

RECEIVED
FEB 27 1997

MEMORANDUM

TO: RAYMOND H. SATO, MANAGER AND CHIEF ENGINEER
BOARD OF WATER SUPPLY
CH2MHILL - HNL

ATTN: SCOT MURAOKA

FROM: CHERYL D. SOON, DIRECTOR

SUBJECT: WHITMORE EXPLORATORY WELL

In response to the January 29, 1997 letter from CH2M HILL, INC., the draft environmental assessment for the subject project was reviewed. The access to the project site is off of Whitmore Avenue, via Kamehameha Highway, both State facilities. We, therefore, have no objections or comments regarding the transportation or traffic impacts of this project.

Should you have any questions regarding this matter, please contact Faith Miyamoto of the Transportation System Planning Division at Local 6976.

Cheryl D. Soon
CHERYL D. SOON

cc: Mr. Mark Willey, CH2M Hill

TO: CHERYL D. SOON, DIRECTOR
DEPARTMENT OF TRANSPORTATION SERVICES
Cheryl D. Soon

FROM: RAYMOND H. SATO, MANAGER AND CHIEF ENGINEER
BOARD OF WATER SUPPLY

SUBJECT: DRAFT ENVIRONMENTAL ASSESSMENT FOR THE WHITMORE EXPLORATORY WELL, WHITMORE, WAHIAWA, OAHU, HAWAII. TRK-7-1-009: 064

Thank you for reviewing the Draft Environmental Assessment for the Whitmore Exploratory Well Project.

We acknowledge that you have no objection regarding the transportation or traffic impacts of the proposed project. We understand that access to the project site is off Whitmore Avenue, via Kamehameha Highway, which are both state facilities.

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

cc: Bennett Mark, CH2M Hill

DEPARTMENT OF WASTEWATER MANAGEMENT
CITY AND COUNTY OF HONOLULU P-112/97
610 SOUTH KING STREET, 5th FLOOR • HONOLULU, HAWAII 96813
PHONE: (808) 527-6000 • FAX: (808) 527-4075



CHRYSTLE SPRAGUE, P.E.
ACTING DIRECTOR
CIVIL & ENVIRONMENTAL ENGINEERING
DEPARTMENT OF WASTEWATER MANAGEMENT
In reply refer to:
WCC 97-22

February 19, 1997

MEMORANDUM

TO: MR. RAY SATO, MANAGER AND CHIEF ENGINEER
BOARD OF WATER SUPPLY

ATTN: MR. SCOTT MURAOKA

FROM: KENNETH E. SPRAGUE, ACTING DIRECTOR
DEPARTMENT OF WASTEWATER MANAGEMENT

SUBJECT: DRAFT ENVIRONMENTAL ASSESSMENT FOR
WHITMORE EXPLORATORY WELL
TMK-2-1-02-64

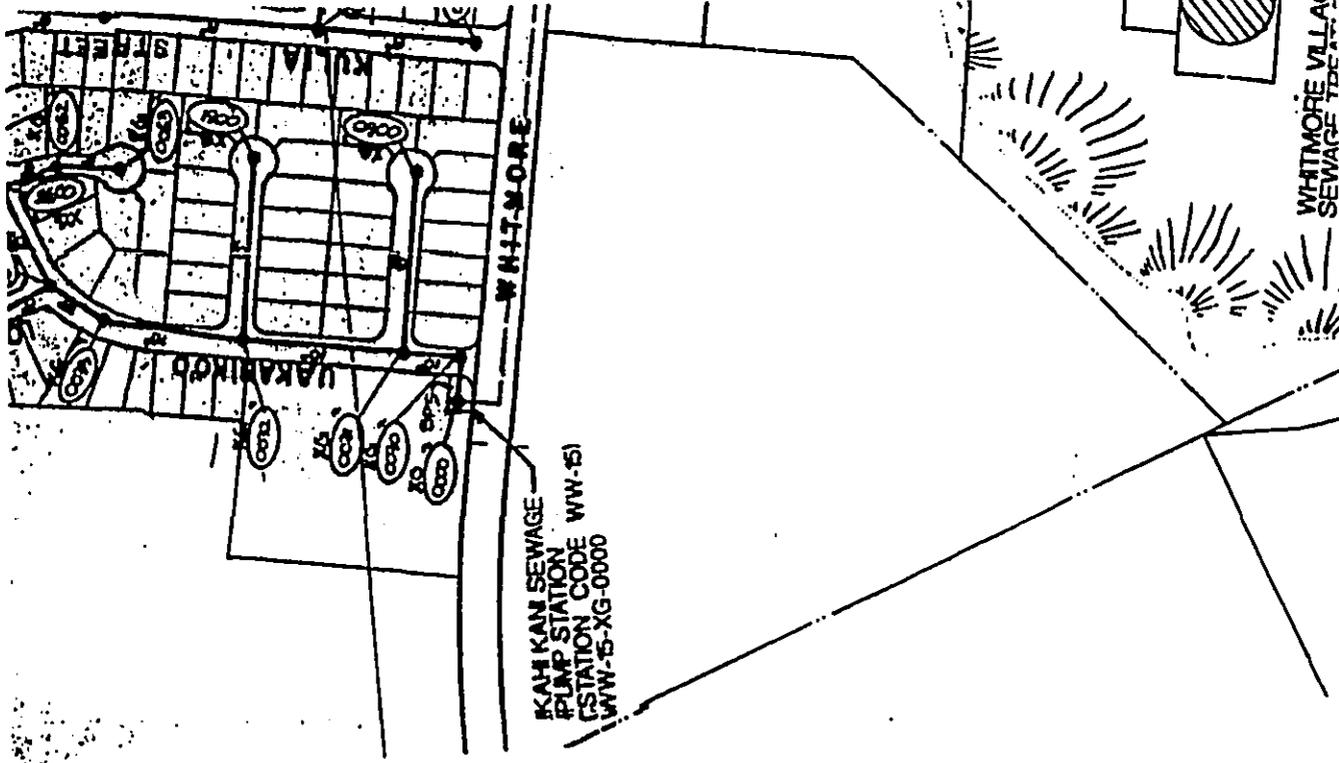
We have no objection to the proposed site for the Whitmore exploratory well. The nearest wastewater sewer lines are on Ulaniko'o Street and Whitmore Avenue. See attached map.

If you have any questions, please contact Ms. Tessa Ching of the Service Control Branch at 523-4956.

KENNETH E. SPRAGUE
Acting Director

Attachment

cc: Mark Willey, CH2M HILL



BOARD OF WATER SUPPLY

CITY AND COUNTY OF HONOLULU
630 SOUTH BERETANA STREET
HONOLULU, HAWAII 96843
PHONE (808) 537-8100
FAX (808) 533-2714



May 1, 1997

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JEREMY HARRIS, Mayor
WALTER O. WATSON, JR., Chairman
MAURICE K. YAMASATO, Vice Chairman
KAZUO HAYASHIDA
MELISSA Y. LIM
FORREST C. MURPHY
JONATHAN K. SHIMADA, PIO
BARBARA LOM STANTON
ANNOUNCING SATO
Manager and Chief Engineer

TO: KENNETH E. SPRAGUE, DIRECTOR
DEPARTMENT OF WASTEWATER MANAGEMENT
FROM: *Raymond H. Sato*
RAYMOND H. SATO, MANAGER AND CHIEF ENGINEER
BOARD OF WATER SUPPLY

SUBJECT: DRAFT ENVIRONMENTAL ASSESSMENT FOR THE WHITMORE
EXPLORATORY WELL, WHITMORE, WAHIAWA, OAHU, HAWAII,
TRK-7-1-009-064

Thank you for reviewing the Draft Environmental Assessment for the Whitmore Exploratory Well Project.

We acknowledge that you have no objections to the proposed site for the well and that the nearest wastewater sewer lines are on Uakimiko'o Street and Whitmore Avenue.

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

Bennett Mark, CH2M Hill