Palolo Wells Addition

BOARD OF WATER SUPPLY

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

July 25, 1997

RECEIVED
'97 JUL 28 P1:41
OFC. OF ENVIRONMENTAL QUALITY CONTROL

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

Dear Mr. Gill:

Subject: Finding of No Significant Impact for the Board of Water Supply's Proposed Palolo Well Addition, Palolo, Oahu, Hawaii, TMK: 3-4-24: 44

The Board of Water Supply has reviewed the comments received during the public comment period which began on March 8, 1996. 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 the proposed well project be published as finding of no significant impact in the next Office of Environmental Quality Control Bulletin (OEQC).

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: George A. L. Yuen and Associates, Inc.

1997-08-08-OA-FEA-Palolo Exploratory Well

ENVIRONMENTAL ASSESSMENT

PROPOSED PALOLO EXPLORATORY WELL

HONOLULU, OAHU, HAWAII

TMK 3 - 4 - 24 - :44

PREPARED FOR

HONOLULU BOARD OF WATER SUPPLY

HONOLULU, HAWAII

PREPARED BY

GEORGE A. L. YUEN & ASSOCIATES, INC.

100 NORTH BERETANIA STREET, SUITE 303

HONOLULU, HAWAII 96817

June, 1997

TABLE OF CONTENTS

LIST OF FIGURES

I. AUTHORITY

This environmental impact assessment is for the drilling, casing, and testing of a proposed exploratory well located in a 73,517 square feet lot, TMK 3-4-24:44, along Carlos Long Street, Oahu, Hawaii. The lot is owned by the Board of Water Supply (BWS), City and County of Honolulu. This assessment is prepared in accordance with Chapter 343, Hawaii Revised Statutes (HRS), Act 241, Session Laws of Hawaii (SLH) 1992, and Chapter 200 of Title 11, Department of Health (DOH) Administrative Rules.

II. PROPOSING AGENCY

The proposing agency for this project is the Honolulu Board of Water Supply, City and County of Honolulu.

III. DESCRIPTION OF THE PROJECT

The project involves the drilling of an exploratory well located within the boundaries of the Palolo 405' Reservoir and well site. The well is to serve as a backup to an existing 1.5 million gallon per day (mgd) well at the site which provides water to the upper Palolo Valley area. The elevation of the well will be approximately 387 feet above mean sea level (see Figure 1, Location Map). The well will probably be located somewhere between the two existing 0.5 million gallon (mg) reservoirs, each with a spillway elevation of 405 feet and a floor elevation of 387 feet. Figure 2 shows the site on the State Land Use Map. Figure 3

shows the site in relation to the mauka boundary of the Special Management Area (SMA). The map shows that the SMA boundary is some 13,000 feet makai of the well site.

The overall diameter of the well is 18 inches with a 14-inch casing and a 2-inch grout-filled annulus. The total depth of the well is about 575 feet with a casing length of about 425 feet leaving an uncased bore of about 150 feet. The diameter of the open bore is about 13 inches. Figure 4 is an approximate cross-sectional drawing of the proposed well. The well will be equipped with a 1,050 gallon per minute (gpm) pump capable of producing up to 1.5 mgd.

The time required to drill, install the casing, and test pump the well will be about six months. Estimated cost of the project is $320,000.

The existing access road off Carlos Long Street can be used for the project. A short section may have to be added to the present road for full access. This addition will be made permanent if pump test results are favorable and the well is put into service.

A permanent pump, pipelines, and electrical-mechanical control devices require an additional 12 months to install at an additional cost of $750,000.

IV. PERMITS AND APPROVALS REQUIRED

1. Well Construction Permit from the State Commission on Water Resource Management (CWRM).
2. Pump Installation Permit from CWRM.
3. Noise Permit from the Noise and Radiation Branch, State Department of Health (DOH).
4. Well Completion Report to CWRM.
5. Approval of an 11-20-29 engineering report by the Safe Drinking Branch, State DOH.
6. Discharge of effluent from well test pumping into the municipal storm sewer from the Department of Public Works.

V. PURPOSE OF THE PROJECT

The existing Palolo Well was built to serve the upper Palolo area and is currently supplementing the Kaimuki Wells Station high service pumps. Figure 5 is a schematic diagram of the Palolo High Service System showing the Palolo Well as part of the system. Without the proposed well serving as a backup, any stoppage of the existing well for routine maintenance or unexpected problems would severely curtail service of the water system served by the 405' and 605' reservoirs, including fire protection. In addition pumping data indicate that the Palolo Well has averaged about 20 hours per day on-line. This high usage necessitates a backup well for providing peak pumping capacity.

The Palolo Well Addition is a proposed BWS well project within the Palolo Aquifer System of the Honolulu Water Management Area. If quantitative and qualitative tests of groundwater from the well addition prove to be successful, the BWS intends to install a permanent pump and integrate it into the BWS's Oahu potable water source, storage and transmission system. The pump capacity is expected to be about 1.5 mgd.

VI. DESCRIPTION OF THE AFFECTED ENVIRONMENT.

The well site is on the property which the BWS's existing Palolo 405' station is located. This 73,517 square feet lot presently holds two reinforced-concrete reservoirs of one-half million gallons capacity each, the Palolo 605' Booster Pumps Station and the Palolo 405' Well (1847-01). The parcel is located on the corner of Palolo Avenue and Carlos Long Street, amid a well-established neighborhood of single family homes. Pukele Stream is about 200 feet east of the parcel but is not affected by well pumping.

The lot is completely fenced with chain-link wire fabric atop masonry walls. Access is via a gate on Carlos Long Street. The two reservoirs and the well occupy the graded portion of the lot. A lined drainage channel parallels Carlos Long Street about twenty feet from the fence line. All drainage from the station flow into this drainage channel which crosses Palolo Avenue via a culvert and drops into Pukele Stream. Figure 6 is a plot plan of the station and Figure 7 shows the Palolo 405' Station and water distribution bystem in the area.

Single family homes abut the north and east boundaries of the lot. Carlos Long Street forms the west boundary and Palolo Avenue is the south boundary. Figures 8 and 9 are photographs of the Palolo Station.

Temperatures in the area range from 65 degrees F to 85 degrees F. Average rainfall is about 65 inches per year.

VII. ARCHAEOLOGICAL CONSIDERATIONS.

The proposed well will be located on the site of an existing BWS facility. According to BWS records, grading of the site for the construction of two reservoirs, a well, and a booster station did not uncover anything of historical or archaeological significance. The State Division of Historical Preservation also has no record of the presence or uncovering of historical remains at the site. The Division is doubtful that the installation of another well at the site will result in the discovery of significant historical remains.

However, if well drilling or roadway construction should unearth any archaeological remains, construction will cease and the State Historical Preservation Division will be contacted immediately for further instructions or action.

VIII. FLORA - FAUNA

The proposed well is located with an area previously developed and landscaped by the BWS. Paper bark trees are planted along the northeasterly portion of the site. Formosan koa is planted along the boundary running parallel to Pukele Stream. A few kukui nut trees are along the boundary fronting Palolo Avenue. Oleander plants are evident along the north boundary of the site, and honeysuckle is used as ground cover under some of the trees. Cut slopes along the north-east border are covered with wedalia. Botanist

Winona Char of Char and Associates confirmed that none of the trees and plants mentioned is endangered.

According to Dr. Dan Polhemus of the Bishop Museum-Smithsonian Institute, it is very unlikely that any endangered animals are inhabiting the site. Animals such as geckos, rats, and mongooses have been seen but these are common to Hawaii. Toads have been sighted but frogs are rarely, if ever seen. Dr. Robert Pyle of the Bishop Museum believes that birds which may frequent the site are common in Hawaii, such as mynahs, sparrows, cardinals, bulbuls, white eyes, finches, and pigeons. None is endangered or native to the islands. Birds in the vicinity of the drilling operations may be disturbed but they will return after drilling stops.

IX.. FLOOD HAZARDS.

The City and County Flood Insurance Rate Map (FIRM) shows the Palolo Station to be located in Flood Zone "X". These are areas determined to be outside the 500-year flood plain. The grounds of the station have undergone extensive grading and are well maintained. There was no evidence of any ponding or water retention during a visit to the site following a week of rainy weather. The drainage channel on the Carlos Long Street boundary carries away any surface runoff quickly and safely.

X. EARTHQUAKE HAZARDS.

Under the Uniform Building Code (UBC), the island of Oahu is designated as Seismic Zone 1, which on a scale of 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 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.

XI. POTENTIAL ENVIRONMENTAL IMPACTS AND MITIGATIVE MEASURES.

Well Drilling

After suitable access to the well site is cleared, well drilling and other support equipment will be brought to the site. One of two existing well drilling methods may be used. Cable tool or percussion drilling is performed by repeatedly raising and dropping a heavy string of drilling tools into a bore-hole. The drill bit breaks or crushes rock into small fragments. The uncontaminated fragments are bailed from the bore-hole and collected in a pit or discharged on the surface.

The rotary method employs a rotating bit to cut and crush the rock formations into fragments. The cuttings are removed by continuous circulation of a drilling fluid as the bit penetrates the formation. The drilling fluid, bentonite, a fine clay material, carries the cuttings to the surface where it is collected in a mud tank. Drill cuttings are removed either by settling or by screening. The mud, cleared of drill cuttings, is recirculated. Drilling mud is not a hazardous material. Once the water table is reached, drilling mud is not used. Either air or an air-foam mixture is pumped down to the drill bit to carry the cuttings to the surface. No surface runoff of drilling mud will be permitted. When drilling is completed, the drilling mud will be removed from the site and disposed of in an approved manner.

During the well drilling operation, noise and dust are the only nuisances anticipated. They will be intermittent and will last only the duration of the drilling operation. Space, structures, and trees will attenuate the noise nuisance. The closest residences are some 200 feet away. The presence of two large reinforced-concrete reservoirs and intervening trees will further mute the noise. The contractor will be required to maintain all internal combustion equipment in excellent condition to minimize noise and the emission of noxious fumes. In addition, he is required to comply with Title 11, DOH, Chapters 59 and 60, Air Pollution Control. Dust can be controlled by sprinkling.

Pump Test

Two types of pump tests will be conducted after the completion of the drilling operation. The first pump test will be a step-drawdown or yield-drawdown test. This test involves pumping water from the well at incremental rates to determine the drawdown. This test may last 4 to 5 hours and will be performed between 9:00 A.M. and 2 P.M. on weekdays.

From the results of the step-drawdown test, a sustained pumping test rate is determined. In this five-day pumping test, the well will be pumped 5 hours on the first day and 8 hours per day for the next four days. This test is to determine the sustained pumping capacity of the well, monitor water quality and measure aquifer perameters by monitoring water levels at other wells in the vicinity.

During the pump test phase, noise, noxious emissions and

disposal of pump test water are the only nuisances. Noise will be attenuated by space, structures and trees. Pump test hours will limit the noise to the normal work-day hours. Noxious emissions will be controlled by requiring the contractor to maintain all internal combustion equipment in excellent condition and to comply with Title 11, DOH, Chapter 59 and 60, Air Pollution Control. Pump test water can be piped to the drainage channel on the west side of the parcel after passing through suitable filters to assure compliance with all National Pollution Discharge Elimination System (NPDES) requirements.

Drainage and Flooding

Drainage at the site should not pose problems. The parcel is on high.ground sloping away to the south and west. Rain water will drain off naturally toward the drainage channel. Test pump water can be piped to the drainage channel after passage through suitable filters and settling basins. The contractor must meet all National Pollution Discharge Elimination System (NPDES) requirements.

During the well drilling operations, the drilling contractor must meet all City and County requirements for disposing of any water entering the storm drain system including treatment and monitoring. This also applies to disposing of water from test pumping. In addition, the contractor must use the best management practices including settling basins, sand bags, berms and filters to assure that

the drainage of water from the operations will not degrade the receiving water below the standard set by the State DOH.

Traffic

Vehicular traffic at this site will be minimal. Palolo Avenue is one of two roads leading into Palolo Valley. There are no large shopping or tourist oriented destinations in the valley. The area is primarily occupied by single family homes. Vehicular traffic is mostly residential with occasional visitors. The well site is away from the road system. Once the construction equipment is on site, there should be no disturbance to vehicular traffic.

Hydrological Considerations

The proposed Palolo Exploratory Well is located in the Palolo Aquifer System, one of five comprising the Honolulu Aquifer Sector. Figure 10 is a map showing the limits of this system as determined by district water levels. The southeast boundary follows along the Maunalani Heights-Diamond Head Crater ridge line. The northeast boundary follows the axis of Manoa Valley down to the Honolulu Stadium Park.

In the Water Use Permit Index report of August 31, 1996, the CWRM has issued water use permits totalling 5.689 mgd for the Palolo Aquifer System. The breakdown is shown in Table I.

Table I
Palolo Aquifer System
Water Use Permits--August 31, 1996

Source (Well No.)	Permitted Use mgd	
Kaimuki Pump Station (1748-03...11)	4.000	
Love's Bakery (1749-18)	0.043	(Sealed)
Kokusai Kogyo Well (1749-19)	0.336	
Palolo Well (1847-01)	1.310	
TOTAL	5.689	

The Love's Bakery Well (1749-18) is no longer in use. Well 1749-19 is currently used by the Sheraton Hotels - Kyo-Ya for irrigation of various hotels. The permitted use for the Palolo Well Station will not be increased because the proposed well will be strictly for standby purposes. Therefore, there will be no additional withdrawal from the Palolo Aquifer System.

Table II shows the annual draft from the three sources still in use for the period 1991-1995.

Table II
Palolo Aquifer System Draft
1991-1995

Year	Kaimuki Pump	Palolo Well	Kokusai	Total
1991	4.77	1.35	0.33	6.45
1992	4.36	1.31	0.35	6.02
1993	3.79	1.35	0.35	5.49
1994	4.51	1.05	0.35	5.91
1995	4.49	1.21	0.36	6.06
5-Yr Mean	4.38	1.25	0.35	6.13

Note: Kaimuki and Palolo--Fiscal Yr.
Kokusai--Calender Yr.

Head and chloride concentration for the same five-year period are shown in Table III.

Table III
Palolo Aquifer System Chloride and Head
1991-1995

Year	Chlorides (mg/l) Kaimuki Pump	Palolo Well	Head (ft) Well 1749-22
1991	87	28	24.4
1992	80	26	24.2
1993	81	30	23.3
1994	78	30	24.2
1995	76	28	24.3

The proposed exploratory well will be located at the existing Palolo 405' Station grounds. Ground surface elevation is 385 feet above mean sea level (msl). The well will be drilled to a depth of 575 feet, nearly 200 feet below sea level. It is designed to tap into the same basal water body as the other three sources. Water quality is expected to be very similar to the existing well (1847-01).

The sustainable yield of the Palolo Aquifer System has been set at 5.0 mgd by CWRM. At steady state for this average pumping rate the head in the System should stabilize at about 22 feet. Head at Well 1749-22 has averaged slightly more than 24 feet since 1991.

Actual production from the Palolo System averaged 6.13 mgd over the five-year period between 1991 and 1995. In the most recent two-year period, 1994-1995, the average was 5.99 mgd. These values exceed the assigned sustainable yield of 5.5 mgd, yet head has not decayed to a new equilibrium. For 6 mgd, head should eventually stabilize at about 18 feet,

assuming recharge to the System was 7.68 mgd (U.S.G.S. water balance) and the original head was 38 feet.

The sustainable yield of 5.0 mgd was determined by combining a water balance equation with Darcy's law of groundwater flow. The validity of the yield value depends on the accuracy of the elements assigned to the water budget. Because these elements exclude precise quantification, sustainable yield is an approximation that can only be verified by operating experience and monitoring the responce of the basal lens. The BWS is continuing to evaluate deep monitor well data on the Palolo aquifer freshwater/saltwater transition zone to qualify the actual sustainable yield based on operational experience and responce of the basal lens. The BWS has recently reduced pumpage from the Kaimuki Station and Palolo Well such that the 12-month moving average is within the permitted use limits.

Pukele Stream is about 200 feet east of the existing station. The stream bed elevation is about 300 feet above msl at the Palolo Avenue crossing. The stream is one of two main tributaries to Palolo Stream--the other being Waiomao Stream. Pumping from the proposed well will not affect stream flow because the basal water level is more than 260 feet below the stream bed. The storm-drainage system in this area empties into the stream on State land about 300 feet downstream of Palolo Avenue. The stream itself is owned by the State.

XII. ALTERNATIVES TO PROPOSED PROJECT

Alternatives to the proposed project include:

1. Abandoning the proposed project;
2. Seeking other sources;
3. Resorting to alternative methods of water production.

Abandoning the project will force the BWS to increase on-line time for the existing Palolo Well. Any malfunctioning of the well pump may force the BWS to limit water service to surrounding areas and possibly to other areas directly or indirectly. This is contrary to the Board's long-range program of water development and service wherever possible.

Obtaining water from another source may not be feasible. The siting of the exploratory well is based on hydrologic studies of all available sources, an evaluation of all available sources, and an evaluation of the cost and effectiveness of the distribution system required.

Desalination and recovery of surface water are possible alternatives but their feasibility is still questionable because of high costs.

Alternatives such as the treatment of sewage effluent for irrigation and using the potable water now being used for irrigation for municipal use are possible except for the high

cost of treatment, cost of distributing the treated water to points of use, and the BWS's concern of the increase of dissolved solids in basal groundwater. These questions must be resolved before the use of treated sewage effluent can be a viable alternative for irrigation.

XIII. FINDINGS AND DETERMINATION

1. There are no known historic or archaeological sites in the area.
2. There are no known endangered species of flora or fauna in the area.
3. There are no significant environmental impacts resulting from the project.
4. Dust, noise, and minimal traffic problems may be expected, but they will be temporary and controllable.
5. Operation of the well would have no measureable negative impact on Pukele Stream of well in the general vicinity.
6. Connecting pipelines, motor controls, electrical and mechanical systems, mute, and pump appurtenances will be contained within the property. These activities are exempt from the environmental assessment process as determined in Chapter 1-200(8) HAR, EIS rules, as having minimal impact.

In summary, the proposed project will not affect any endangered species of flora or fauna since none is existent on the site. It will involve no irreversible commitment to loss or destruction of any natural or cultural resource, and it will result in no environmental degradation. There would be no serious or long-term detrimental effects on public health in regard to sanitation, air quality, water quality, ambient noise levels, dust, etc.

In view of the above, it is determined that the proposed

project will have no significant effect on the environment and that an Environmental Impact Statement is not required under Chapter 343, Hawaii Revised Statutes.

Due to the minimal anticipated impact of the well addition to an existing water facility, the BWS anticipates that another environmental assessment for the production facility will not be necessary. The exploratory well and permanent pump impacts have been therefore addressed in a consolidated environmental assessment.

XIV. REFERENCES

Uniform Building Code

City & County Flood Insurance Map

State Data Book, 1993-1994

State Water Protection Plan, 1992

Board of Water Supply Wells and Pump Records

University of Hawaii - Water Resources Research Center Report of Efficacy of Soil in Removing Pathogens and Viruses

APPENDICES

APPENDIX A

APPENDIX A. AGENCIES AND INDIVIDUALS CONSULTED IN THE PREPARATION OF THIS DRAFT

Dan Hibbard - Division of Historic Preservation

Elaine Jourdaine - Division of Historic Preservation

Scott Muraoka - Board of Water Supply

Barry Usagawa - Board of Water Supply

Winona Char - Winona Char and Associates

Dr. Dan Polhemus - Bishop Museum - Smithsonian Institute

Dr. Robert Pyle - Bishop Museum - Smithsonian Institute

Staff Member - Department of Land Utilization

Staff Member - Land Use Commission

Cliff Jamile - Board of Water Supply

Tracy Runnels - Roscoe-Moss, Hawaii, Inc.

Chester Lao - Board of Water Supply

APPENDIX B

APPENDIX B. INDIVIDUALS AND AGENCIES RECEIVING COPIES OF THE DRAFT ENVIRONMENTAL ASSESSMENT FOR COMMENTS

Eighteen governmental agencies and three other groups or individuals were provided a copy of the draft environmental assessment for this project and were requested to provide comments. The following is a list of those agencies and others that were requested to provide comments.

Federal Agencies

- U.S. Department of Agriculture, Soil Conservation Service
- U.S. Army Corps of Engineers, Pacific Ocean Division
- U.S. Fish and Wildlife Service
- U.S. Department of the Interior, U.S. Geological Survey, Water Resources Division

State of Hawaii Agencies

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

City and County of Honolulu Agencies

- Planning Department
- Land Utilization Department
- Public Works

Others

- District IV Council Member Duke Bainum, City Council
- Palolo Neighborhood Board
  Chairman, 3291 Uilani Place, Honolulu, 96826
- Sierra Club, Hawaii Chapter
- Office of Hawaiian Affairs

APPENDIX C

COPY

BOARD OF WATER SUPPLY

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

June 3, 1997

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 Proposed Palolo Exploratory Well, Palolo, Oahu, Hawaii, TMK: 3-4-024: 044

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

We acknowledge that you have no comments regarding 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: George Yuen and Associates, Inc.

United States
Department of
Agriculture

Natural
Resources
Conservation
Service

P.O. Box 50004
Honolulu, HI
96850

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

April 28, 1997

Mr. John Chang
George A.L. Yuen and Associates, Inc.
100 North Beretania Street, Suite 303
Honolulu, Hawaii 96817

Dear Mr. Chang:

Subject: Draft Environmental Assessment (DEA) - Proposed Palolo Exploratory Well, Honolulu, Oahu, Hawaii (TMK: 3-4-24:44)

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

BOARD OF WATER SUPPLY

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

June 3, 1997

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

Dear Mr. Mizue:

Subject: Draft Environmental Assessment for the Proposed Palolo Exploratory Well, Palolo, Oahu, Hawaii, TMK: 3-4-024: 044

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

We acknowledge that a Department of the Army permit will not be required for the proposed project and that you concur with the flood hazard information.

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

Very truly yours,

RAYMOND H. SATO
Manager and Chief Engineer

cc: George Yuen and Associates, Inc.

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

REPLY TO
ATTENTION OF

March 26, 1997

Planning and Operations Division

Mr. John Chang
George A.L. Yuen and Associates
100 North Beretania Street, Suite 303
Honolulu, Hawaii 96817

Dear Mr. Chang:

Thank you for the opportunity to review and comment on the Draft Environmental Assessment (DEA) for the Proposed Palolo Exploratory Well, Honolulu, Oahu (TMK 3-4-24: 44). The following comments are provided pursuant to U.S. Army 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. The information provided in the DEA does not identify any specific activities involving work in waters of the U.S.; therefore, a DA permit will not be required at this time (file number 970000147).

b. The flood hazard information provided on page 7 of the DEA is correct.

Sincerely,

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

BOARD OF WATER SUPPLY

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

COPY

June 3, 1997

Mr. Rick Egged, Director
Office of Planning
Department of Business,
Economic Development and Tourism
State of Hawaii
P. O. Box 2359
Honolulu, Hawaii 96804

Dear Mr. Egged:

Subject: Draft Environmental Assessment for the Proposed Palolo Exploratory Well, Palolo, Oahu, Hawaii, TMK: 3-4-024: 044

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

We acknowledge that you have no comments on the Draft EA.

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

Very truly yours,

FOR RAYMOND H. SATO
Manager and Chief Engineer

cc: George Yuen and Associates, Inc.

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

BENJAMIN J. CAYETANO
GOVERNOR
SEIJI F. NAYA
DIRECTOR
BRADLEY J. MOSSMAN
DEPUTY DIRECTOR
RICK EGGED
DIRECTOR, OFFICE OF PLANNING

DEPARTMENT OF BUSINESS, ECONOMIC DEVELOPMENT & TOURISM

OFFICE OF PLANNING

235 South Beretania Street, 6th Flr., Honolulu, Hawaii 96813
Mailing Address: P.O. Box 2359, Honolulu, Hawaii 96804

Tel.: (808) 587-2846
Fax: (808) 587-2824

Ref. No. P-6600

April 7, 1997

Mr. John Chang
George A.L. Yuen and Associates, Inc.
100 North Beretania Street, Suite 303
Honolulu, Hawaii 96817

Dear Mr. Chang:

Subject: Draft Environmental Assessment, Proposed Palolo Exploratory Well, Honolulu, Oahu, Hawaii (TMK: 3-4-24:44)

We have reviewed the above assessment and do not have any comments on the document.

If you have any questions, please contact Christina Meller of our Coastal Zone Management Program at 587-2845.

Sincerely,

Rick Egged
Director
Office of Planning

BOARD OF WATER SUPPLY

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

COPY

June 3, 1997

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

Dear Dr. Aizawa:

Subject: Draft Environmental Assessment for the Proposed Palolo Exploratory Well, Palolo, Oahu, Hawaii, TMK: 3-4-024: 044

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

We acknowledge that you have no comments on the Draft EA.

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

Very truly yours,

FOR RAYMOND ~~H.~~ SATO
Manager and Chief Engineer

cc: George Yuen and Associates, Inc.

BENJAMIN J. CAYETANO
GOVERNOR

HERMAN M. AIZAWA, Ph.D.
SUPERINTENDENT

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

OFFICE OF THE SUPERINTENDENT

March 27, 1997

Mr. John Chang
George A.L. Yuen and Associates, Inc.
100 North Beretania Street, Suite 303
Honolulu, Hawaii 96817

Dear Mr. Chang:

SUBJECT: Draft EA, Proposed Palolo Exploratory Well, TMK 3-4-24:44

The Department of Education has no comments on the subject draft environmental assessment.

Thank you for the opportunity to respond.

Sincerely,

Herman M. Aizawa, Ph.D.
Superintendent

HMA:jml

cc: J. Sosa, Honolulu District Office

BOARD OF WATER SUPPLY

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

COPY

June 4, 1997

Mr. William S. Devick, Acting Administrator
Division of Aquatic Resources
Department of Land and Natural Resources
State of Hawaii
1151 Punchbowl Street
Honolulu, Hawaii 96813

Dear Mr. Devick:

Subject: Draft Environmental Assessment for the Board of Water Supply's Proposed Palolo Exploratory Well, Palolo, Oahu, TMK: 3-4-24: 44

Thank you for your letter regarding the Draft Environmental Assessment for the Board of Water Supply's proposed Palolo Exploratory Well project.

We provide the following responses to your concerns:

1. We acknowledge that the proposed project is not expected to have significant adverse impacts on aquatic resource values in the area including your finding of the O'opu Nakea in the Pukele Stream. Standard test pumping procedures will be followed.

2. Best management practices will be implemented during construction and test pumping of the exploratory well to minimize potential pollution of receiving waters. The contractor will be required to undertake mitigative measures such as the use of filters, berms and oil absorptive material to ensure that sediment and petroleum products will be prevented from entering into the City's storm drain system and Pukele Stream.

3. It is expected that the bulk of the construction work on the site will be completed during periods of dry weather.

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

Very truly yours,

RAYMOND H. SATO
Manager and Chief Engineer

cc: George Yuen and Associates, Inc.

BENJAMIN J. CAYETANO
GOVERNOR OF HAWAII

P5

CHAIRPERSON
MICHAEL D. WILSON
BOARD OF LAND AND NATURAL RESOURCES

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AQUACULTURE DEVELOPMENT PROGRAM
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WATER AND LAND DEVELOPMENT

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

April 22, 1997

Mr. John Chang
George A.L. Yuen and Associates, Inc.
100 North Beretania Street, Suite 303
Honolulu, Hawaii 96817

Dear Mr. Chang:

As requested by Mr. George A.L. Yuen, enclosed are our comments on the Draft Environmental Assessment, Proposed Palolo Exploratory Well; Honolulu, Oahu, Hawaii (TMK: 3-4-24: 44).

Should there be any question, please call Aquatic Biologist Glenn R. Higashi of my staff.

Thank you for the opportunity to review and comment on this project.

Yours truly,

WILLIAM S. DEVICK, Acting Administrator
Division of Aquatic Resources

encl.

BOARD OF WATER SUPPLY

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

COPY

June 4, 1997

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

Dear Mr. Costales:

Subject: Draft Environmental Assessment for the Board of Water Supply's Proposed Palolo Exploratory Well, Palolo, Oahu, TMK: 3-4-24: 44

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

We provide the following responses to your concerns:

1. We acknowledge that the proposed project is not anticipated to impact native plant or wildlife resources.

2. Adverse impacts to the Pukele Stream or nearby wells are not expected. Standard test pumping procedures will be followed as confirmation. Best management practices will be implemented to minimize noise, dust and surface water impacts during construction. Disposal of the test water will be into the municipal separate storm sewer system.

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

Very truly yours,

RAYMOND H. SATO
Manager and Chief Engineer

cc: George Yuen and Associates, Inc.

BENJAMIN J. CAYETANO
GOVERNOR OF HAWAII

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

MICHAEL D. WILSON
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES

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LAND MANAGEMENT
STATE PARKS
WATER AND LAND DEVELOPMENT
WATER RESOURCE MANAGEMENT

Mr. John Chang
George A.L. Yuen and Associates, Inc.
100 North Beretania Street, Suite 303
Honolulu, HI 96817

Dear Mr. Chang:

Thank you for the opportunity to review the Draft Environmental Assessment for the proposed Palolo Exploratory Well (TMK: 3-4-24:44).

Since the project site is far removed from any of our jurisdictional management units and incorporates comments by botanical and wildlife consultants, we do not foresee impact to native plant or wildlife resources. We do recommend, however, that drill operation and pumping tests be carefully designed, executed, and monitored to avoid stream flow depletion and contamination.

If you have question(s) regarding our comment you can call me at 973-9787. Mahalo!

Sincerely,

Patrick G. Costales
Oahu Branch Manager

cc DOFAW Administrator
DOFAW Oahu Branch Staff
CWRM

BOARD OF WATER SUPPLY

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

June 4, 1997

COPY

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 Proposed Palolo Exploratory Well, Palolo, Oahu, Hawaii, TMK: 3-4-024: 044

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

We acknowledge that the proposed project will have "no effect" on historic sites since there are no known historic sites at the project location. The area has been graded and developed during the construction of the existing facility making it highly unlikely that historic sites will be found.

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

Very truly yours,

RAYMOND H. SATO
Manager and Chief Engineer

cc: George Yuen and Associates, Inc.

BENJAMIN J. CAYETANO
GOVERNOR OF HAWAII

STATE OF HAWAII

DEPARTMENT OF LAND AND NATURAL RESOURCES

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

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

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HISTORIC PRESERVATION DIVISION
LAND DIVISION
STATE PARKS
WATER AND LAND DEVELOPMENT

March 26, 1997

Mr. John Chang
George A. L. Yuen and Associates, Inc.
100 North Beretania Street, Suite 303
Honolulu, Hawaii 96817

LOG NO: 19201
DOC NO: 9703EJ19

Dear Mr. Chang:

SUBJECT: Chapter 6E-8 Historic Preservation Review Draft Environmental Assessment (DEA) Proposed Palolo Exploratory Well
Palolo, Kona, O'ahu
TMK: 3-4-24:44

Thank you for the opportunity to review the DEA for this project. The DEA correctly states that there are no known historic sites at the project location. The area has been graded and developed during the construction of the existing facility making it highly unlikely that historic sites will be found. Therefore, we believe that this project will have "no effect" on historic sites.

Aloha,

DON HIBBARD, Administrator
State Historic Preservation Division

EJ:amk

APR -2 1997

BOARD OF WATER SUPPLY

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

COPY

June 17, 1997

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 Palolo Exploratory Well, Palolo, Oahu, TMK: 3-4-24: 44

Thank you for reviewing the Draft Environmental Assessment (EA) for the Board of Water Supply's proposed Palolo Exploratory Well project.

We provide the following responses to your concerns:

1. The proposed project has been incorporated into the County's Water Use and Development Plan.

2. Standard test pumping procedures will be followed.

3. We acknowledge that a Well Construction Permit and Pump Installation Permit are required prior to placing the well in service. The proposed well, if successful, will only be used for peak pumping requirements to accommodate the instantaneous peak demands experienced in the morning and evening. As a result, we will not require additional permitted use because the 12-month moving average will not increase. If a water use permit is still required despite no additional consumptive use from the station, it will be submitted.

4. The Final EA will be revised to indicate that the sustainable yield of the Palolo Aquifer System is 5 mgd.

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

Very truly yours,

RAYMOND H. SATO
Manager and Chief Engineer

cc: George Yuen and Associates, Inc.

BENJAMIN J. CAYETANO
GOVERNOR OF HAWAII

P4

MICHAEL D. WILSON
CHAIRPERSON

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RAE M. LOUI, P.E.
DEPUTY

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT
P. O. BOX 621
HONOLULU, HAWAII 96809

APR 18 1997

Mr. John Chang
George A.L. Yuen and Associates, Inc.
100 North Beretania St., Ste. 303
Honolulu, HI 96817

SUBJECT: Draft Environmental Assessment, Proposed Palolo Exploratory Well, Honolulu, Oahu, Hawaii (TMK 3-4-24:44)

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.

[X] 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.

[X] 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.

[X] 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. No additional consumptive use.

[ ] Groundwater withdrawals 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 interim 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.

[ ] 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 express condition that no streams 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.

[X] OTHER:

The report states that the BWS intends to install a permanent pump and integrate it into the BWS' Oahu potable water system if quantitative and qualitative tests show the well to be successful (page 4). Because the source is located in a designated water management area, a water use permit would be required prior to approval of a pump installation permit pursuant to the Commission's August 31, 1992 policy.

Page 10 of the report discusses proposed pump tests procedures. The Commission recently adopted the Hawaii Well Construction & Pump Installation Standards (January 1997), which outlines the pump test procedures to be followed as a condition of the well construction permit.

Page 13 of the report lists allocations for the Palolo Aquifer System as of August 31, 1996. The list includes a 0.043 mgd allocation for Love's Bakery (1749-18), which was revoked on October 23, 1996 due to four (4) years of continuous nonuse.

The sustainable yield of the Palolo Aquifer System has been set at 5 mgd, not 5.5 mgd, as stated on page 14 of the report. The aquifer system is currently over-allocated.

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

Sincerely,

RAE M. LOUI
Deputy Director

DH:fc

BOARD OF WATER SUPPLY

CITY AND COUNTY OF HONOLULU
630 SOUTH BERETANIA STREET
HONOLULU, HAWAII 96843
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COPY

June 4, 1997

Bruce S. Anderson, Ph.D.
Deputy Director for Environmental Health
Department of Health
State of Hawaii
P. O. Box 3378
Honolulu, Hawaii 96801

Dear Dr. Anderson:

Subject: Draft Environmental Assessment for the Board of Water Supply's Proposed Palolo Exploratory Well

Thank you for your letter regarding the Draft Environmental Assessment for the proposed Palolo Exploratory Well project.

We provide the following responses to your concerns:

1. An engineering report will be submitted to the Director of Health if the exploratory well is productive and will be placed into service for peak pumping purposes.

2. The engineering report must identify all potential sources of contamination and evaluate alternative control measures which would be implemented to reduce or eliminate the potential for contamination, including treatment of the water source.

3. The water quality analyses will be performed by a laboratory certified in the State of Hawaii and be submitted as part of the report to demonstrate compliance with all drinking water standards.

4. The contractor will be required to minimize any construction noise impacts that may inconvenience the adjacent homes. In addition, the proposed project will comply with the provisions of the Hawaii Administrative Rules (HAR), Chapter 11-46, "Community Noise Control", and Title 11, Chapter 42, "Vehicular Noise Control for Oahu", to keep noise levels from exceeding allowable levels.

   Notification of the surrounding affected area prior to a construction activity is a standard procedure. We understand that the Department of Health may require the contractor to conduct an informational meeting with the surrounding community to discuss 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: George Yuen and Associates, Inc.

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

17

BENJAMIN J. CAYETANO
GOVERNOR OF HAWAII

LAWRENCE MIIKE
DIRECTOR OF HEALTH

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

In reply, please refer to:

April 22,. 1997

97-066/epo

Mr. John Chang
George A. L. Yuen & Associates, Inc.
100 North Beretania Street, Suite 303
Honolulu, Hawaii 96817

Dear Mr. Chang:

Subject: DRAFT ENVIRONMENTAL ASSESSMENT (DEA)
Project: Proposed Palolo Exploratory Well
Location: Honolulu, Oahu, Hawaii
TMK: 3-4-24: 44

Thank you for allowing us to review and comment on the subject project. We have the following comments to offer:

Safe Drinking Water Branch:

1. The DEA stated that this project will be developing one well for potable use. Hawaii Administrative Rules, Title 11, Chapter 20, *Rules Relating to Potable Water Systems*, Section 11-20-29 requires that all new sources of potable water serving a public water system be approved by the Director of Health prior to its use. Such an approval is based primarily upon the submission of a satisfactory engineering report which addresses the requirements set in Section 11-20-29.

2. The engineering report must identify all potential sources of contamination and evaluate alternative control measures which could be implemented to reduce or eliminate the potential for contamination, including treatment of the water source. In addition, water quality analyses, performed by a laboratory certified in the State of Hawaii, must be submitted as part of the report to demonstrate compliance with all drinking water standards. Additional tests may be required by the Director upon his review of the information submitted.

If you should have any questions regarding these comments, please contact Ms. Queenie Komori of the Safe Drinking Water Branch, Engineering Section, at 586-4258.

Noise Comments:

We have some concerns regarding the proposed exploratory well due to the potential noise impacts resulting from the construction of the project.

1. The applicant must review and ensure that the construction activities comply with the provisions of Hawaii Administrative Rules, Chapter 11-46, "Community Noise Control."

   a. It is stated in the DEA that either the cable tool/percussion drilling method or the rotary method will be used for well drilling. For activities resulting in adverse noise impacts, notification of the surrounding affected areas will be required. In addition, the Department may further require the contractor to conduct a public informational meeting in order to provide the surrounding community with information pertaining to the proposed noise-emitting activity.

   b. Based on the determination that potential adverse noise impacts from the construction activities may occur, the Department may require a submittal of plans, procedures and specifications for the abatement of noise emissions from specific construction equipment, which may include the best available control technology (BACT). In addition, information pertaining to other alternatives to replace the operation of the noise source may be required.

   c. The contractor must comply with the conditional use of the permit as specified in the regulations and the conditions issued with the permit as stated in Section 11-46-7(d)(4).

2. Heavy vehicles travelling to and from the project site must comply with the provisions of Hawaii Administrative Rules, Title 11, Chapter 42, "Vehicular Noise Control for Oahu."

Should there be any questions regarding this matter, please contact Mr. Jerry Haruno, Environmental Health Program Manager of the Noise, Radiation & Indoor Air Quality Branch at 586-4701.

Sincerely,

BRUCE S. ANDERSON, Ph.D.
Deputy Director for Environmental Health

c: SDWB
NR&IAQB

BOARD OF WATER SUPPLY

CITY AND COUNTY OF HONOLULU
30 SOUTH BERETANIA STREET
HONOLULU, HAWAII 96843
PHONE (808) 527-6180
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COPY

June 18, 1997

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

Dear Mr. Gill:

Subject: Draft Environmental Assessment for the Board of Water Supply's Proposed Palolo Exploratory Well, Palolo, Oahu, TMK: 3-4-24: 44

Thank you for reviewing the Draft Environmental Assessment (EA) for the Board of Water Supply's (BWS) proposed Palolo Exploratory Well project.

We provide the following responses to your concerns:

1. We appreciate your suggestions for alternatives to constructing the well. However, we find that the well is still necessary despite our water conservation efforts to accommodate high peak water demand periods.

   The BWS continues to promote water conservation to all of its customers and we have seen reductions in average water use. Conservation efforts include leak detection, installing low flow water fixtures, accelerating our pipeline replacement to minimize leaks and main breaks, public education and inverting residential water rates.

   There are very few agricultural users in the Palolo 405' system. However, rainfall catchment is utilized in the State agricultural lots in the upper Palolo Valley above the 600-foot elevation. Rainfall catchment systems for residential homes may reduce irrigation needs if there is sufficient rainfall, however, the installation of these systems are expensive and most homeowners would not install them.

   The most accessible nonpotable system in this area is the valley's streams but environmental regulation would probably not allow any streamflow reduction.

   While these conservation efforts reduce average day demand, the ability to accommodate peak demand is also a function of available pump capacity, storage and pipeline infrastructure in the valley.

2. The prevailing groundwater flow paths move toward the ocean from the high rainfall areas of the Koolaus. There are no regions of known contamination in the valley that would affect this well, as verified by the data on the adjacent Palolo Well. Contours of water levels can only be estimated from available wells in the vicinity, but range between 15 feet and 20 feet. Chloride contours vary depending on the selected depth.

3. Most of this information on hydrology-geology and contamination potential are standard sections in the engineering report pursuant to Chapter 11-20-29, which will be completed after the pump is installed. The engineering report is a necessary prerequisite for potable well certification and is available at the Safe Drinking Water Branch of the State Department of Health.

4. Impacts associated with the well's permanent production facilities should be minimal and are exempt under Chapter 11-200(8). There will be no additional accessory structures other than the well pump. In addition, there will be no pipelines installed outside of the Palolo Station grounds.

5. Appendix D in the Draft EA includes the mineral analysis of the existing Palolo Well (1847-01). Data for the new well should be similar since the wells are adjacent, at the same depth and will be drawing water from the same aquifer.

   The well will be converted into a production well for standby and peaking purposes if water withdrawal rates reach 1.5 mgd. If the wells are not successful, the BWS could use the well for monitoring purposes or seal the well.

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

Very truly yours,

RAYMOND H. SATO
Manager and Chief Engineer

cc: George Yuen and Associates, Inc.

BENJAMIN J. CAYETANO
GOVERNOR

971492

PE

GARY GILL
DIRECTOR

STATE OF HAWAII
OFFICE OF ENVIRONMENTAL QUALITY CONTROL

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

97 APR 24 AM 9:37

April 21, 1997

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

Dear Mr. Sato:

Subject: Draft Environmental for Proposed Palolo Exploratory Well, Oahu

Thank you for the opportunity to review the subject documents. We have the following comments.

1. The purpose of the proposed well is to serve as a backup to an existing 1.5 mgd well at the site which provides water to the upper Palolo Valley area. Please consider other alternatives including using existing wells within and outside the aquifer, rainfall catchment for agricultural purposes, water conservation and restriction, and existing potable and nonpotable water supplies.

2. Please show on maps and/or diagrams the prevailing groundwater flow paths and any points or regions of known contamination. Contours of water levels and chloride concentrations in the area of interest can also be helpful.

3. Please provide a description of impacts associated with the well's permanent production facilities including pumps, distribution pipelines, control devices, storage facilities, access roads and accessory structures.

4. The EA should include pump test data on water level, extraction rates, and water quality parameters. Similar data from nearby wells should also be included. The precise criteria used to determine if the well should be converted to production should be described. Any provisions for future use and monitoring of wells not placed into production should also be described.

5. A record of contamination problems in the aquifer due to saltwater intrusion, heavy metals, volatile and non-volatile organic compounds, biological agents, and radioactivity. If contamination exists, the sources and duration of the contamination should be listed. Water quality data from nearby wells should be presented as wells as any anticipated need for treatment or filtering systems. Any hazardous materials used and/or produced during drilling and treatment should be described. The method of handling these hazardous materials should also be disclosed.

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

Sincerely,

Gary Gill
Director

c: George Yuen & Associates

BOARD OF WATER SUPPLY

CITY AND COUNTY OF HONOLULU
30 SOUTH BERETANIA STREET
HONOLULU, HAWAII 96843
PHONE (808) 527-6180
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COPY

June 17, 1997

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

Dear Mr. Harrison:

Subject: Draft Environmental Assessment for the Board of Water Supply's Proposed Palolo Exploratory Well, Palolo, Oahu, TMK: 3-4-24: 44

Thank you for your letter regarding the Draft Environmental Assessment (EA) for the Board of Water Supply's (BWS) proposed Palolo Well Addition project.

We provide the following responses to your concerns:

1. We appreciate your constructive suggestions on water conservation measures as alternatives to constructing the well. However, we find that the well is still necessary despite our water conservation efforts to accommodate high peak water demand periods.

2. The BWS continues to promote water conservation to all of its customers and we have seen reductions in average water use. Conservation efforts include; leak detection, installing low flow water fixtures, accelerating our pipeline replacement program islandwide, public education, and inverting residential water rates. While conservation efforts reduce average day demand, the ability to accommodate peak demand is also a function of available pump capacity, storage and pipeline infrastructure.

3. We do not feel another EA is necessary for the production well addition to the existing well station. The exploratory and possible production phases of this project are minimal and predictable because the existing station well data provides sufficient hydro-geological information. The consolidated EA attempts to address both the exploratory well construction and the permanent pump impacts. The water quality data for the proposed well will be similar in quality to the existing well which is within close proximity. The mineral analyses of the existing well is included in Appendix D of the Draft EA. The piping controls and access is appurtenant and accessory to the existing well station which is exempt under Chapter 11-200(8). In this case, we are trying to extend limited public funds by consolidating the entire project into a single cumulative EA.

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

Very truly yours,

RAYMOND H. SATO
Manager and Chief Engineer

cc: George Yuen and Associates, Inc.

P-288/97

University of Hawai'i at Mānoa

Environmental Center
A Unit of Water Resources Research Center
Crawford 317 · 2550 Campus Road · Honolulu, Hawai'i 96822
Telephone: (808) 956-7361 · Facsimile: (808) 956-3980

April 22, 1997
EA: 00160

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

Mr. Usagawa:

Draft Environmental Assessment (EA)
Palolo Wells Addition
Honolulu, Oahu

The City and County of Honolulu, Board of Water Supply (BWS) propose to drill, case, and pump test an additional potable water well located within the existing BWS Palolo Wells facility along Carlos Long street. The well will serve as a backup well for the existing well at the site. If test pumping results are favorable, the BWS will incorporate the exploratory well into its permanent production facilities. There will be no increase in permitted water use because this well addition is solely for standby and peak pumping purposes to the existing well at the site.

This review was completed with the assistance of Dave Penn, Geography; and Malia Akutagawa and Tom Hawley, Environmental Center.

In general this draft EA is thorough, clearly organized, and presents relevant quantitative and qualitative data on the proposed project. We are pleased to see BWS environmental assessments improving over time, and we look forward to quality documentation of future water projects. While this document covers many important issues, our reviewers raised some questions regarding the rationale provided in the document for a new well in the Palolo area.

According to the draft EA, increased usage of the Palolo High Service System "necessitates a backup well for providing peak pumping capacity" (page 4). While adequate water service in the Palolo area is clearly necessary, we suggest that there are alternatives to the construction of an additional well. The most significant of these are water conservation efforts. Our reviewers suggest that improvements to the existing transmission and

Conservation efforts as noted is part of our continuing conservation program, however, we find that existing sources have a hard time keeping up to max daily demands, etc. JRM

distribution system, such as fixing leaks and making other repairs, could help conserve Palolo system water. Similarly, efforts to promote water conservation on the part of BWS customers in the Palolo area might also alleviate pressure on existing wells. We suggest that spending BWS money on conservation efforts such as these is preferable to the construction of an additional well.

Should the well be constructed, it is important for the BWS to prepare a separate environmental assessment should it be converted from a test well to a backup 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.

The State Office of Environmental Quality Control (OEQC) is in the process of developing a multi-point content protocol for environmental assessments concerning water well development projects. We have included a draft copy of this protocol for your reference. The Palolo Wells Addition EA already provides much of the data suggested in the checklist, and we applaud the BWS for preparing a thorough draft EA for the proposed project.

Thank you for the opportunity to comment.

Sincerely,

John T. Harrison
Environmental Coordinator

cc: OEQC
Roger Fujioka
George Yuen and Associates, Inc.
Dave Penn
Malia Akutagawa
Tom Hawley

enclosure

BOARD OF WATER SUPPLY

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

COPY

June 17, 1997

TO: PATRICK T. ONISHI, CHIEF PLANNING OFFICER
DEPARTMENT OF PLANNING

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

SUBJECT: DRAFT ENVIRONMENTAL ASSESSMENT FOR THE PROPOSED PALOLO EXPLORATORY WELL, PALOLO, OAHU, TMK: 3-4-24: 44

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

We provide the following responses to your concerns:

1. The two most widely practiced well drilling methods are discussed in Section XI of the Draft EA. Rotary drilling may be faster and is generally favored for deep wells. Percussion drilling is slower and is preferred for shallower wells. For the proposed Palolo Well, neither method has any distinct advantage. Both methods have been widely used on Oahu with excellent results. The contractor will be allowed to use either well drilling method.

2. The sustainable yield of the Palolo aquifer system is presently 5.0 mgd. Recent data show that groundwater pumpage from both public and private sources in the aquifer has decreased. The proposed well project will not increase the permitted use from the Palolo Aquifer System. The proposed well will be used for instantaneous peak demand and as a standby source to the existing Palolo Well.

3. Alternative methods of potable water production are much more costly than groundwater development. However, the Board of Water Supply (BWS) has investigated these alternatives in the Oahu Water Management Plan and other specific studies.

   a. Desalination: Desalination will be implemented as groundwater withdrawals approach sustainable yields. A site and technology study is currently under way. While the capital cost of a large scale desalination plant per gallon is equivalent to groundwater development in rural areas, the O&M costs at $3.00 per thousand gallons is 10 times the cost of pumping groundwater. O&M cost directly affects water rates, which we are trying to keep as low as possible.

   b. Surface Water: A 1996 Surface Water Study indicated that surface water development for potable use was not feasible, given the small, variable flows, environmental impact and the intense regulatory process involved with the instream flow standards and the monitoring requirements of the Safe Drinking Water Act.

c. Reclamation: The reuse of sewage effluent is a promising alternative resource that is being actively pursued by the City to replace potable use for irrigation and industrial process water and to relieve the development pressure for high quality groundwater supplies. Public health concerns and high costs for dual water system infrastructure limit the extent of reuse. The city is focussing on the Ewa Plains where dual water systems can be master planned in new developments rather than the more costly alternative to redevelop existing urban areas with dual systems. Additionally, the Honouliuli Wastewater Treatment plant effluent has chloride content very suitable for irrigation. Whereas the Sand Island plant chloride contact is much too high for irrigation use.

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

cc: George Yuen and Associates, Inc.

DEPARTMENT OF PLANNING
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET, 8TH FLOOR • HONOLULU, HAWAII 96813-3017
PHONE: (808) 523-4711 • FAX: (808) 523-4950

p 182

JEREMY HARRIS
MAYOR

PATRICK T. ONISHI
CHIEF PLANNING OFFICER

DONA L. HANAIKE
DEPUTY CHIEF PLANNING OFFICER

GW 3/97-0669

April 18, 1997

Mr. John Chang
George A.L. Yuen and Associates, Inc.
100 North Beretania Street, Suite 303
Honolulu, Hawaii 96813

Dear Mr. Chang:

Draft Environmental Assessment for the
Proposed Palolo Exploratory Well
TMK 3-4-24:44, Palolo, Honolulu, Hawaii

We have reviewed the subject DEA and offer the following comments.

It has been the practice of the Board of Water Supply to conduct separate environmental reviews for exploratory wells and production wells. We understand the BWS has decided to conduct this consolidated environmental assessment for both the exploratory well and the future production well which may be developed at this site. This decision is based upon an anticipation of minimal impacts of an additional well, to be developed as a backup well, at an existing water facility.

Section XI, which provides a discussion of drilling methods, should indicate which of the methods will be used for this project and/or what factors contribute to the choice of methods. A discussion on the advantages and disadvantages of the drilling methods (environmental and costs) would be helpful.

The tables on page 13 show that CWRM permitted uses within the Palolo Aquifer System were consistently exceeded during the period 1991 through 1995. The EA also discussed the chloride and head levels during this five-year period. The EA should discuss whether these are the long-term impacts of exceeding the sustainable yield of the Palolo Aquifer System.

Section XII provides a discussion of alternatives to this project. A further discussion is needed for the benefit of reviewers of this document on the high costs cited as a reason for rejecting desalination, recovery of surface water, and treatment of sewage effluent as alternates to this project. Information should be provided on those costs and a comparison with the long-term costs of continuing to rely upon groundwater sources.

Should you have any questions, please call Gordon Wood of the Planning Department staff at 527-6073.

Sincerely,

PATRICK T. ONISHI
Chief Planning Officer

PTO:lh

BOARD OF WATER SUPPLY

CITY AND COUNTY OF HONOLULU
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HONOLULU, HAWAII 96843
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COPY

June 3, 1997

TO: JAN SULLIVAN, DIRECTOR
DEPARTMENT OF LAND UTILIZATION

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

SUBJECT: DRAFT ENVIRONMENTAL ASSESSMENT FOR THE PROPOSED PALOLO EXPLORATORY WELL, TMK: 3-4-024: 044

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

We acknowledge that the proposed project is not within the Special Management Area.

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

cc: George Yuen and Associates, Inc.

DEPARTMENT OF LAND UTILIZATION
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET, 7TH FLOOR • HONOLULU, HAWAII 96813
PHONE: (808) 523-4414 • FAX: (808) 527-6743

JEREMY HARRIS
MAYOR

JAN NAOE SULLIVAN
DIRECTOR

LORETTA K.C. CHEE
DEPUTY DIRECTOR

97-01753(AC/SHC)
'97 EA Comments Zone 3

April 17, 1997

Mr. John Chang
George A. L. Yuen and Associates, Inc.
100 North Beretania Street, Suite 303
Honolulu, Hawaii 96817

Dear Mr. Chang:

Draft Environmental Assessment (DEA) For
Proposed Palolo Exploratory Well
Tax Map Key: 3-4-24: 44

Thank you for allowing the Department of Land Utilization the opportunity to review and comment on the above-referenced DEA. Based on our review, we have determined that the proposed project is not within the Special Management Area (SMA).

Should you have any questions, please contact Art Challacombe of our staff at 523-4107.

Very truly yours,

JAN NAOE SULLIVAN
Director of Land Utilization

JNS:am

g:9701753.ehc

BOARD OF WATER SUPPLY

CITY AND COUNTY OF HONOLULU
30 SOUTH BERETANIA STREET
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COPY

June 4, 1997

TO: JONATHAN K. SHIMADA, DIRECTOR AND CHIEF ENGINEER
DEPARTMENT OF PUBLIC WORKS

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

SUBJECT: DRAFT ENVIRONMENTAL ASSESSMENT FOR THE PROPOSED PALOLO EXPLORATORY WELL, TMK: 3-4-024: 044

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

We provide the following responses to your concerns:

1. The Final EA will be revised to indicate that Pukele Stream is under the ownership of the State.

2. The appropriate water pollution control permits will be obtained and Best Management Practices will be implemented prior to the discharge of pumping effluent.

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

cc: George Yuen and Associates, Inc.

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET
HONOLULU, HAWAII 96813

JEREMY HARRIS
MAYOR

JONATHAN K. SHIMADA, PHD
DIRECTOR AND CHIEF ENGINEER
ROLAND D. LIBBY, JR
DEPUTY DIRECTOR

ENV 97-051

April 3, 1997

Mr. George A.L. Yuen
President
George A.L. Yuen & Associates, Inc.
100 North Beretania Street, Suite 303
Honolulu, Hawaii 96817

Dear Mr. Yuen:

Subject: Draft Environmental Assessment (DEA)
Palolo Exploratory Well
TMK: 3-4-24: 44

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

1. The DEA should address the ownership of Pukele Stream which is a State receiving water.

2. An effluent discharge permit from the Department of Public Works is not required if there is no discharge to the City's separate storm sewer system.

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

Very truly yours,

JONATHAN K. SHIMADA, PhD
Director and Chief Engineer

COPY

BOARD OF WATER SUPPLY

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

June 4, 1997

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

Dear Ms. Ross:

Subject: Draft Environmental Assessment for the Board of Water Supply's Proposed Palolo Exploratory Well, Palolo, Oahu, TMK: 3-4-24: 44

Thank you for your letter regarding the Draft Environmental Assessment for the Board of Water Supply's proposed Palolo Exploratory Well project.

We provide the following responses to your concerns:

1. We acknowledge that you have no objections to the proposed well project. Adverse impacts on the nearby production well or the Palolo Aquifer System are not expected. Standard test pumping procedures will be followed to provide confirmation of no adverse effects.

2. The proposed well project is for peak pumping purposes only and will not increase the 12-month average pumping rate. Pumpage within the Palolo aquifer which includes public and private wells, have been reduced from the 1995 levels.

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

Very truly yours,

RAYMOND H. SATO
Manager and Chief Engineer

cc: George Yuen and Associates, Inc.

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

PHONE (808) 594-1888

FAX (808) 594-1865

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

April 07, 1997

Mr. John Chang
George A.L. Yuen and Associates, Inc.
100 North Beretania Street, Suite 303
Honolulu, HI 96817

Subject: Draft Environmental Assessment (DEA) for the Proposed Palolo Exploratory Well, Island of Oahu.

Dear Mr. Chang:

Thank you for the opportunity to review the Draft Environmental Assessment (DEA) for the Proposed Palolo Exploratory Well, Island of Oahu. The Board of Water Supply (BWS) of the City and County of Honolulu proposes to drill a exploratory well that will serve as a backup to an existing 1.5 mgd well.

The Office of Hawaiian Affairs (OHA) has no objections at this time to the proposed well project as it apparently bears no adverse impacts on nearby existing wells nor upon the Palolo Aquifer System. However, the data included in the DEA (pages 13 and 14) apparently indicate that BWS average water withdrawals for the period 1991-1995 (6.1 mgd) exceed the sustainable yield of the Palolo system (5.5 mgd). OHA is concerned that overpumping may eventually lead to either a loss in water quality or a decline in the volume rate of pumping.

Please contact Lynn Lee, Acting Officer of the Land and Natural Resources Division, or Luis A. Manrique, should you have any questions on this matter.

Sincerely yours,

Martha Ross

Martha Ross
Deputy Administrator, Programs

LM:lm

APPENDIX D

APPENDIX D - MINERAL ANALYSES

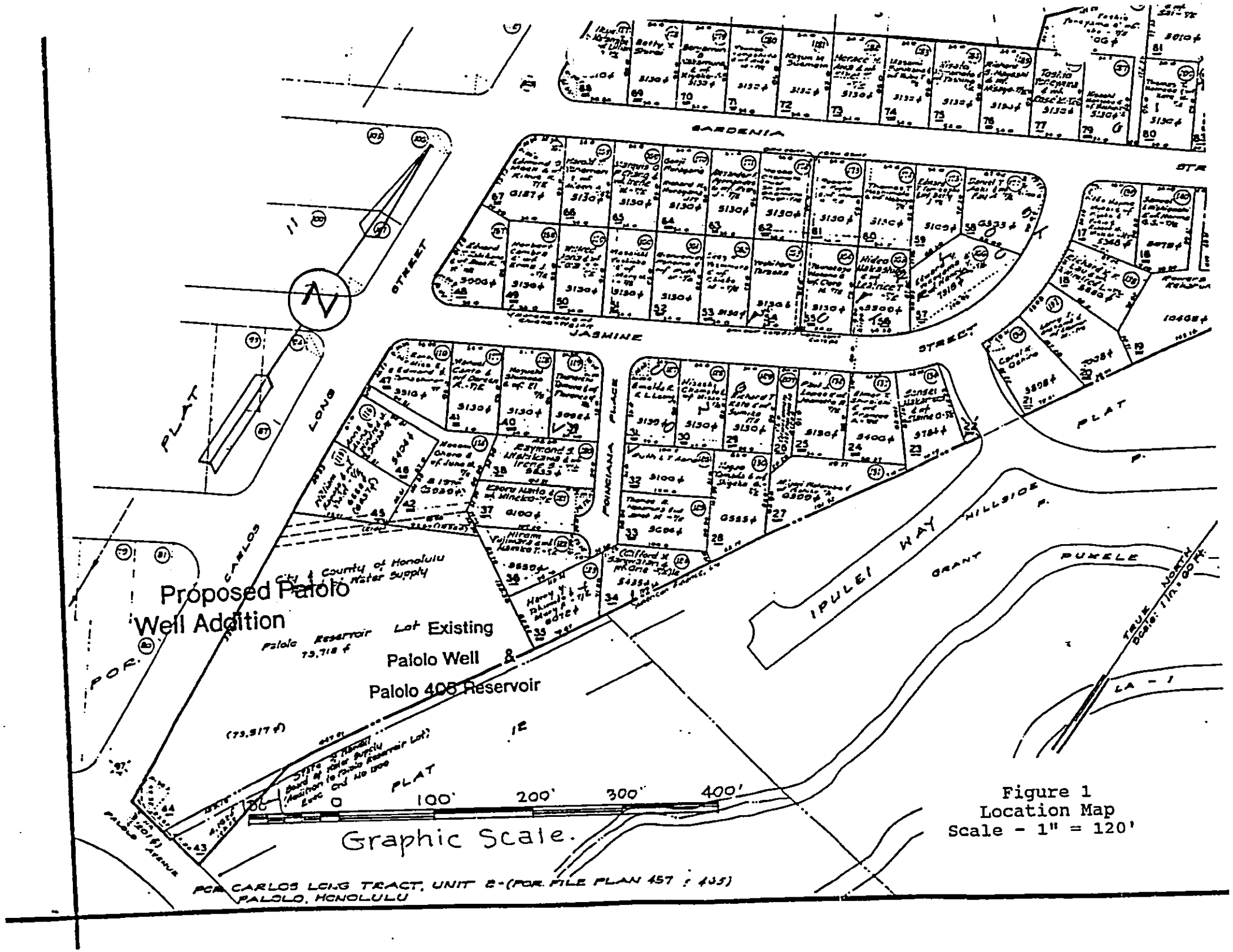
MINERAL ANALYSES

LOCATION	Palolo Well (1847-01)
Regional head, feet	24.55
Specific conductance micromhos @ 25°C	228
pH value	8.15
Turbidity	0
Color	0.3
IN PARTS PER MILLION	
Dissolved oxygen	8.60
Free carbon dioxide	0
Silica	34
Calcium	11
Magnesium	9.5
Sodium	21
Potassium	1.3
Bicarbonate	90
Sulfate	4.4
Chloride	23
Fluoride	0.05
Nitrate	2.1
Phosphate	0.15
Iron)	0.02
Manganese)	.02
Copper)	.02
Lead) Less than	.02
Arsenic)	.01
Selenium)	.01
Chromium[a])	.01
Total dissolved solids	197
Alkalinity	74
Total hardness	66
IN EQUIVALENTS PER MILLION	
Calcium (Ca)	0.549
Magnesium (Mg)	.781
Sodium (Na)	.895
Potassium (K)	.033
Bicarbonate (HCO_3)	1.475
Sulfate (SO_4)[b]	.092
Chloride (Cl)	.657
Nitrate (NO_3)	.034
TOTALS	4.516

a/ Hexavalent only.

b/ Includes fluoride and phosphate as PO_4.

FIGURES 1 THROUGH 10



FOR CARLOS LONG TRACT, UNIT 2-(FOR. FILE PLAN 457 ; 435)
PALOLO, HONOLULU

Figure 1
Location Map
Scale - 1" = 120'

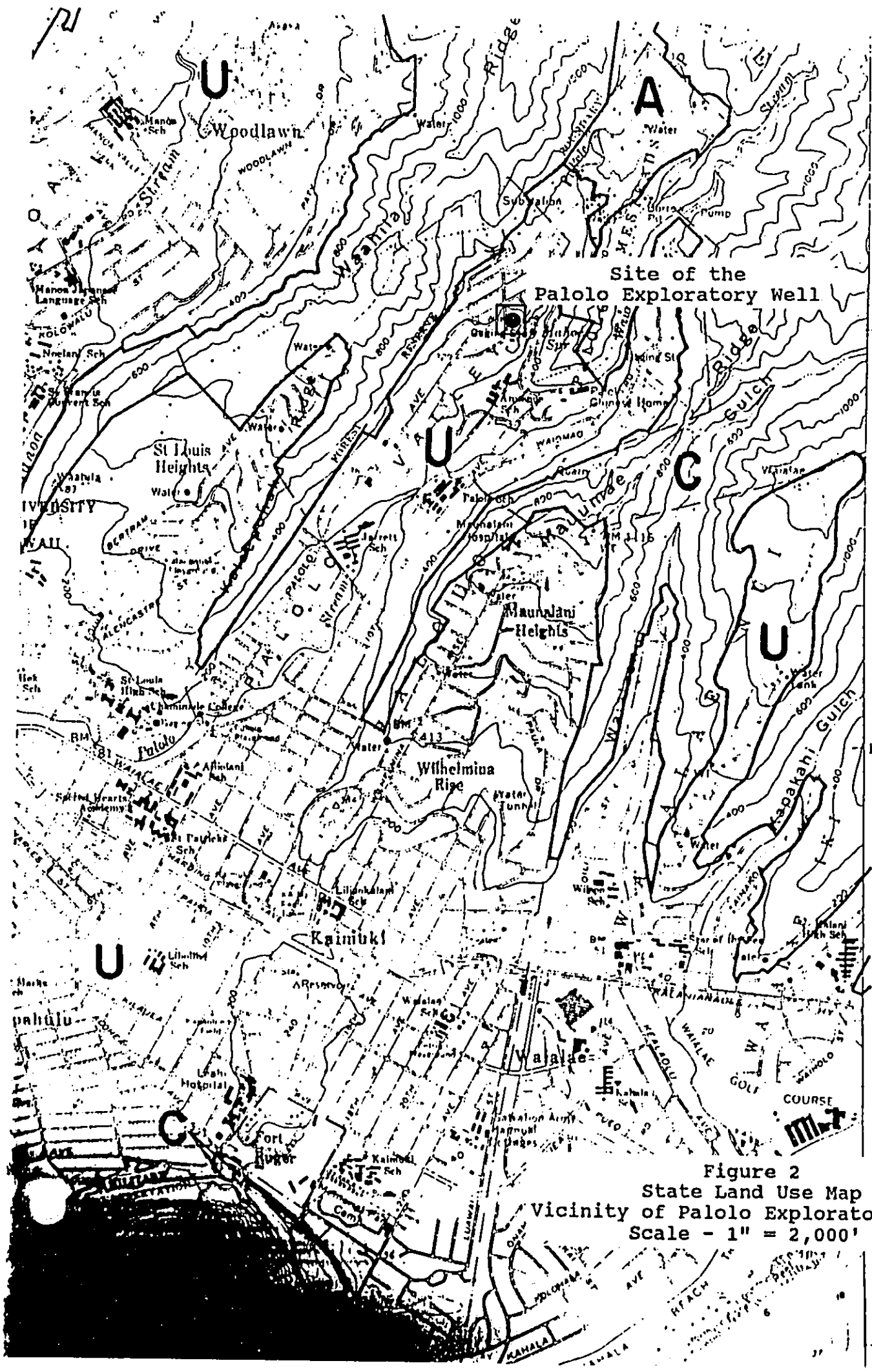
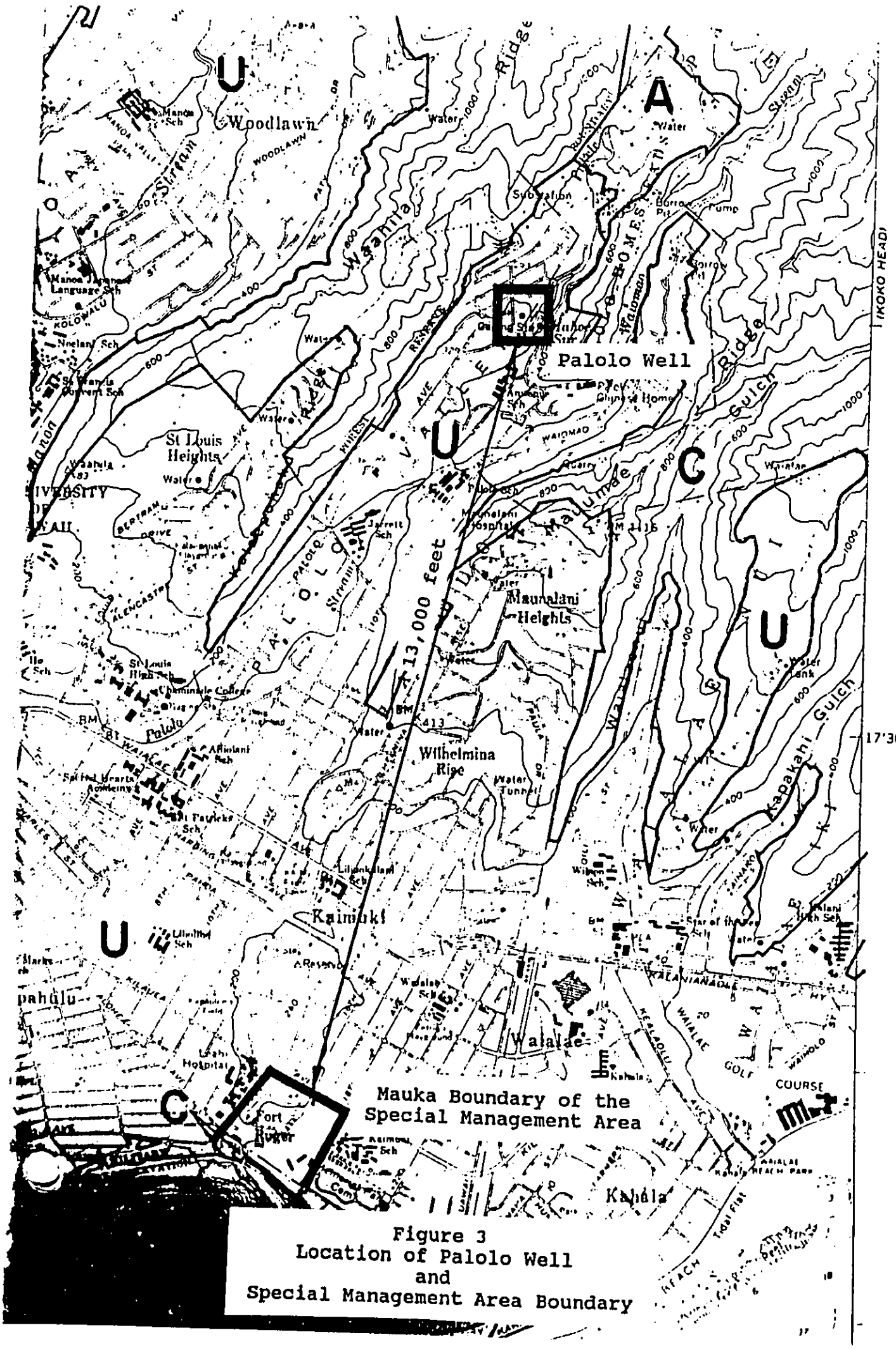


Figure 2
State Land Use Map
Vicinity of Palolo Exploratory Well
Scale - 1" = 2,000'



PALOLO STANDBY WELL

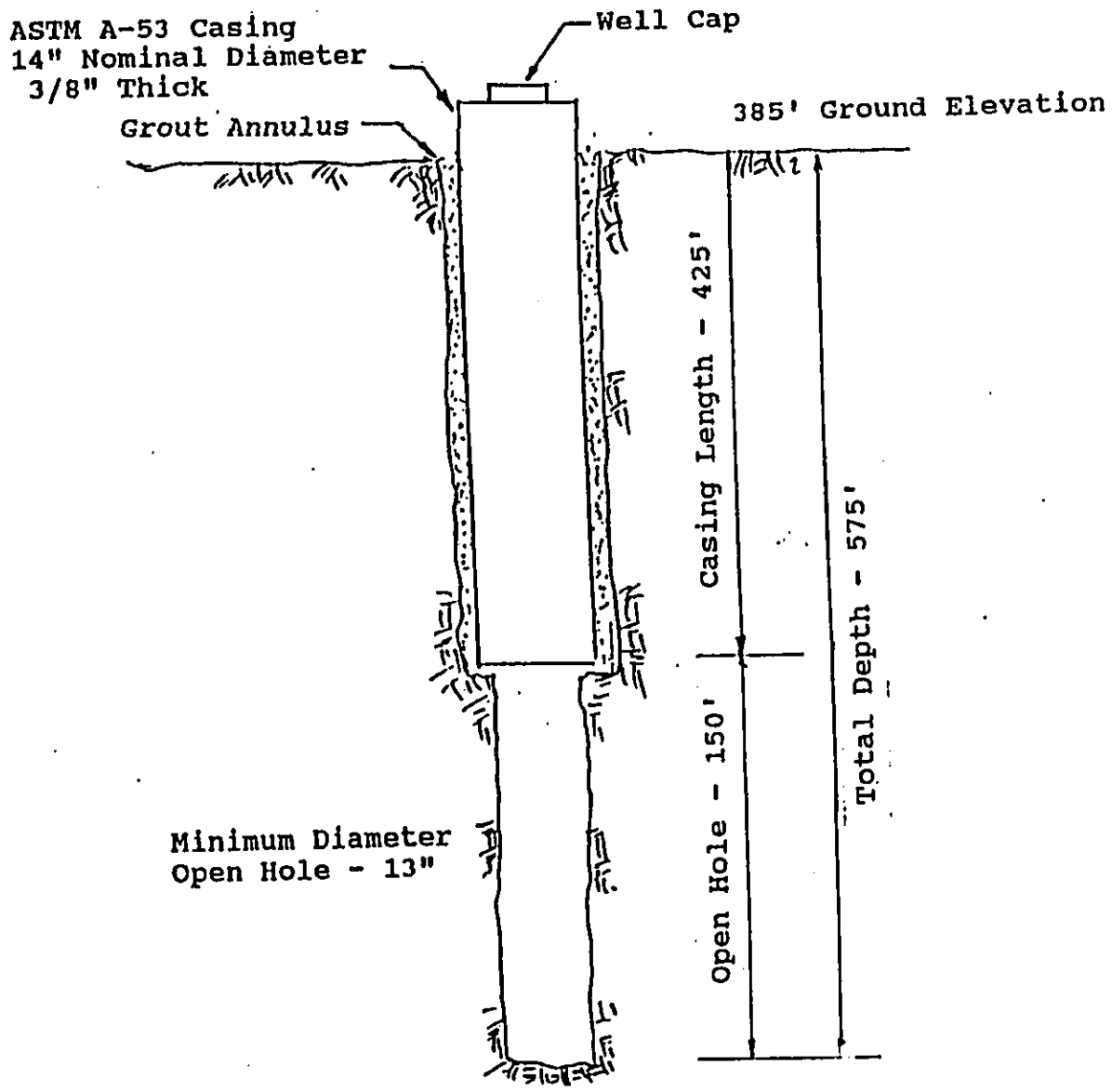


Figure 4
Well Cross Section
(Not to Scale)

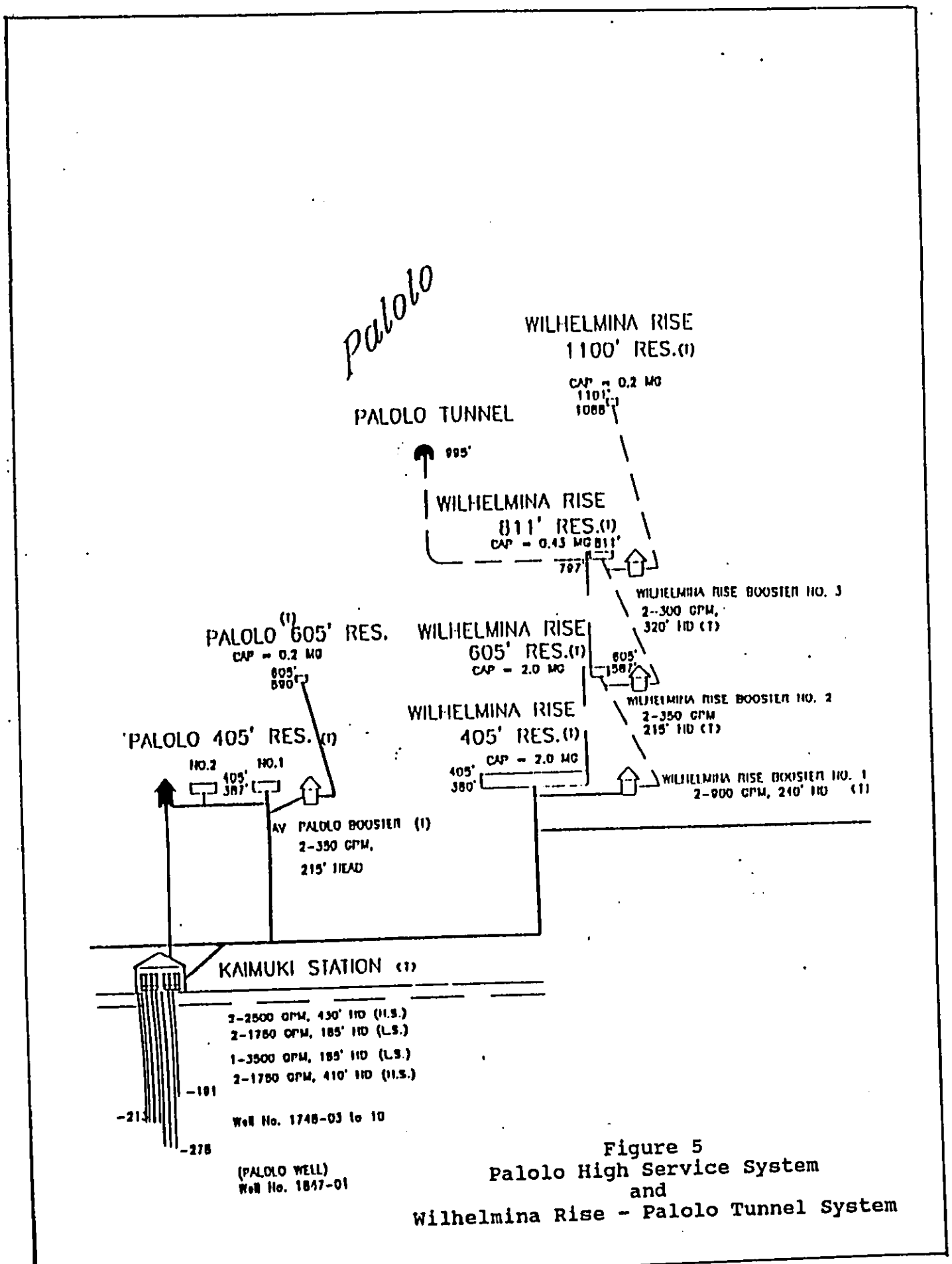
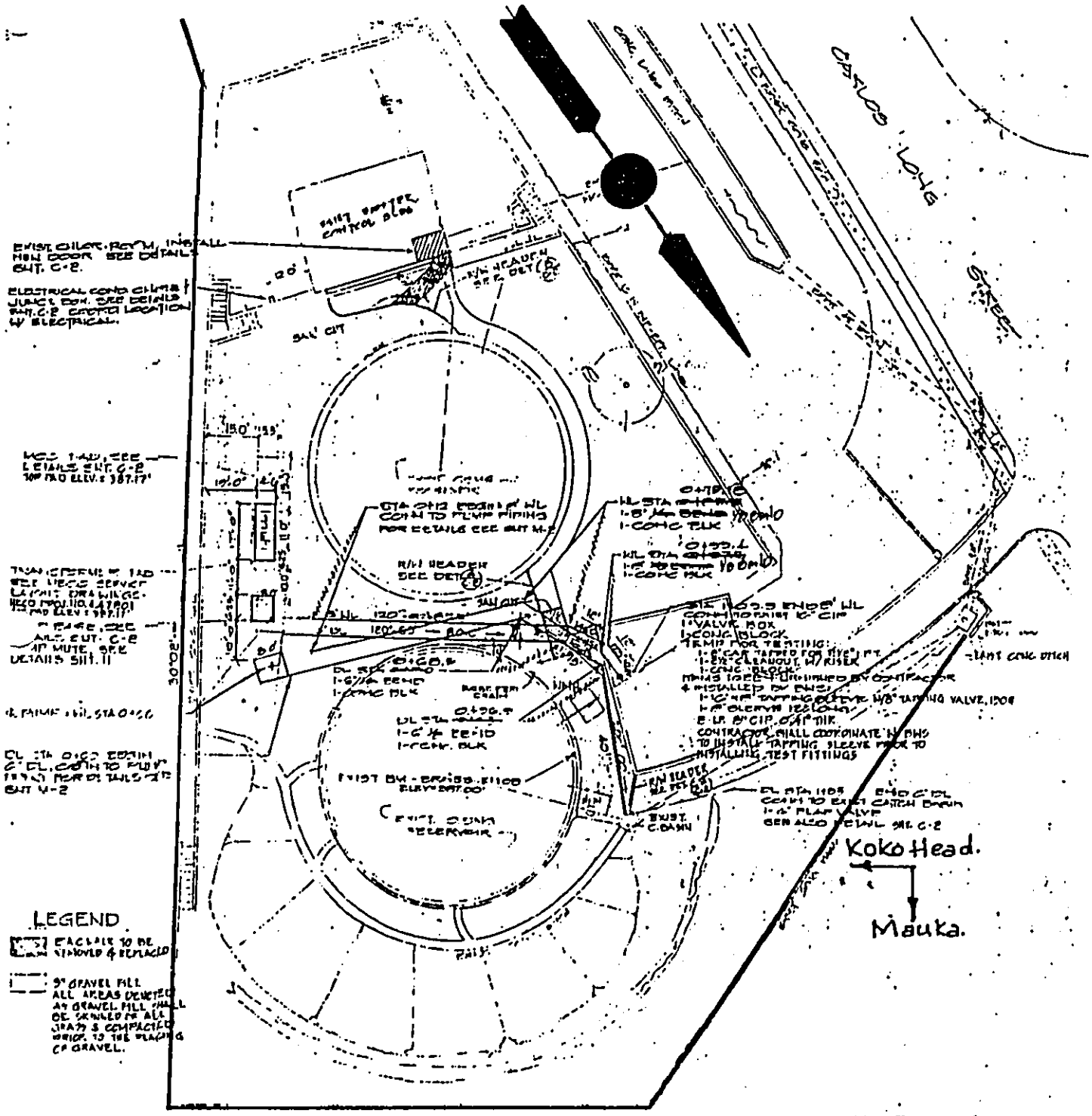


Figure 5
Palolo High Service System
and
Wilhelmina Rise - Palolo Tunnel System



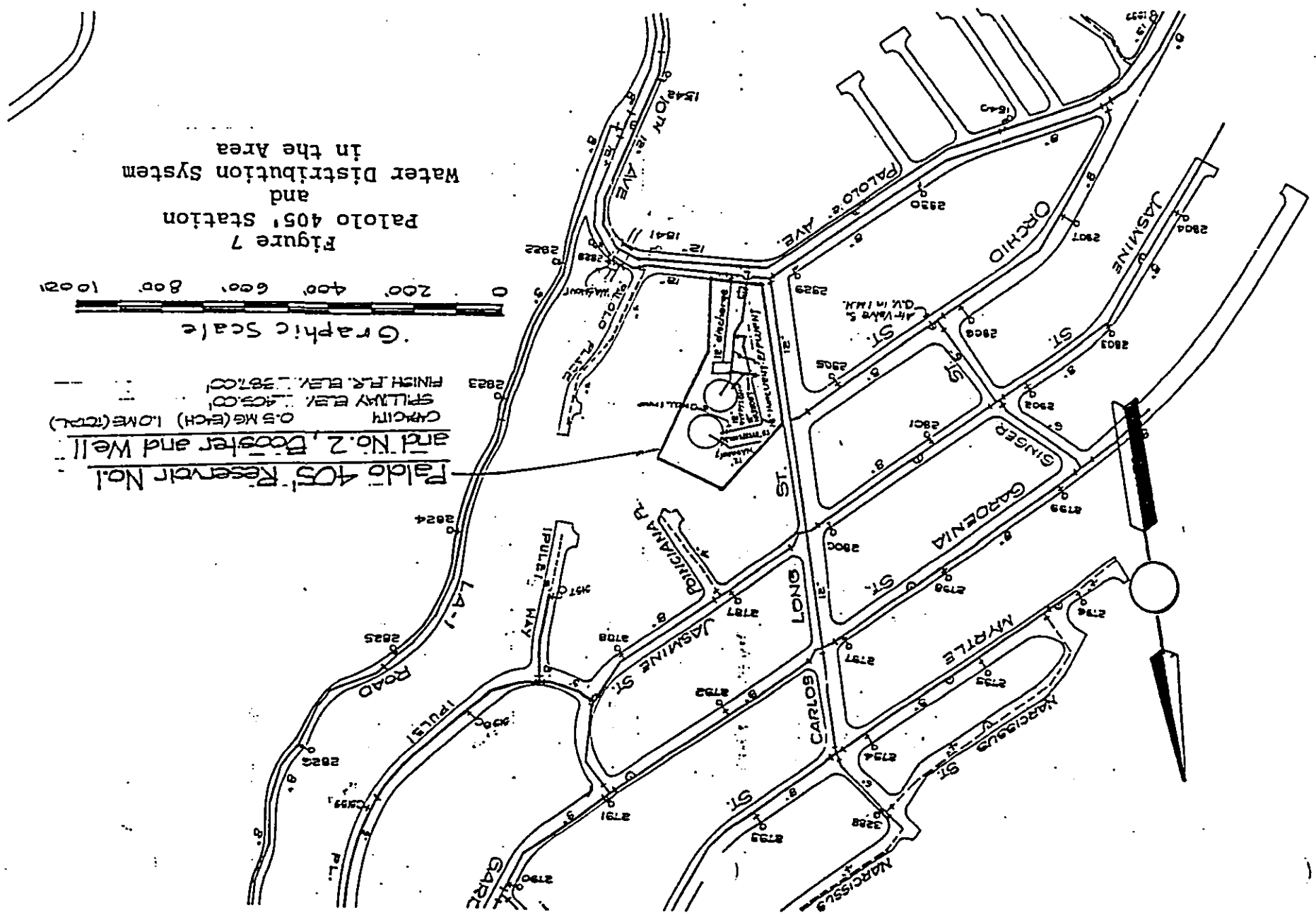
PLOT PLAN
Scale: 1"=40'

Figure 6
Palolo 405' Station
Plot Plan

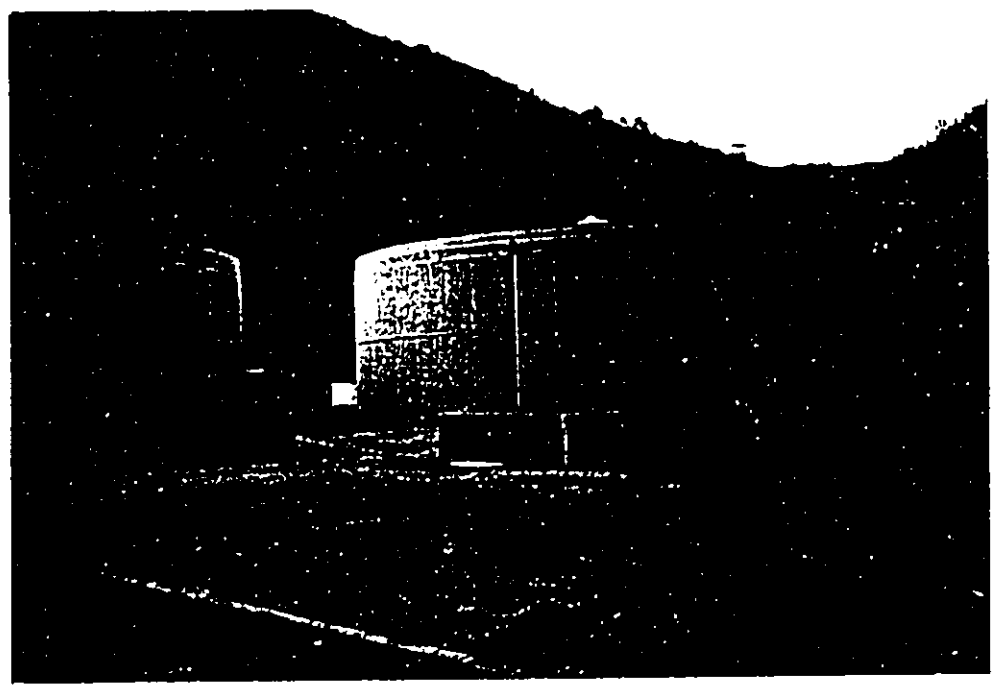
PALOLO 405' PES NO. 1 & NO. 2
Graphic Scale

0 50' 100' 150' 200'

Figure 7
Paloio 405' Station
and
Water Distribution System
in the Area

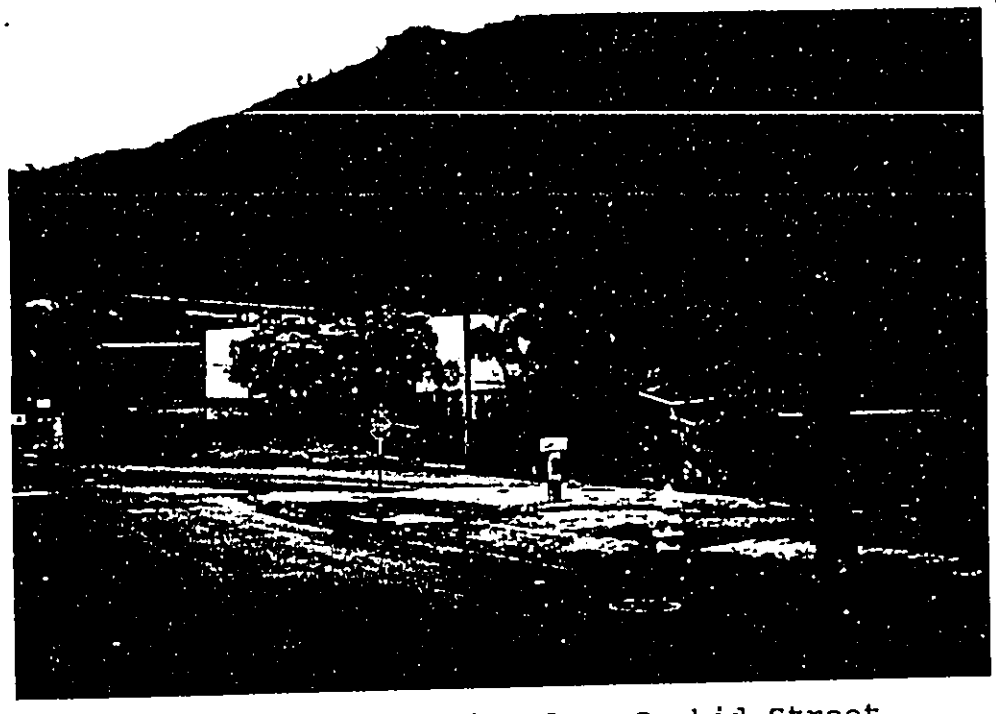


Palolo Well (1847-01). Reservoir at right edge of photograph. East boundary wall on left side of well.



View of the Palolo Station from the gate. Palolo Well is visible between the two reservoirs. Building at right edge of photograph is the booster pumping station.

Figure 8



View of the Palolo Station from Orchid Street looking east.

View of the Palolo Station from Palolo Avenue looking north.

Figure 9

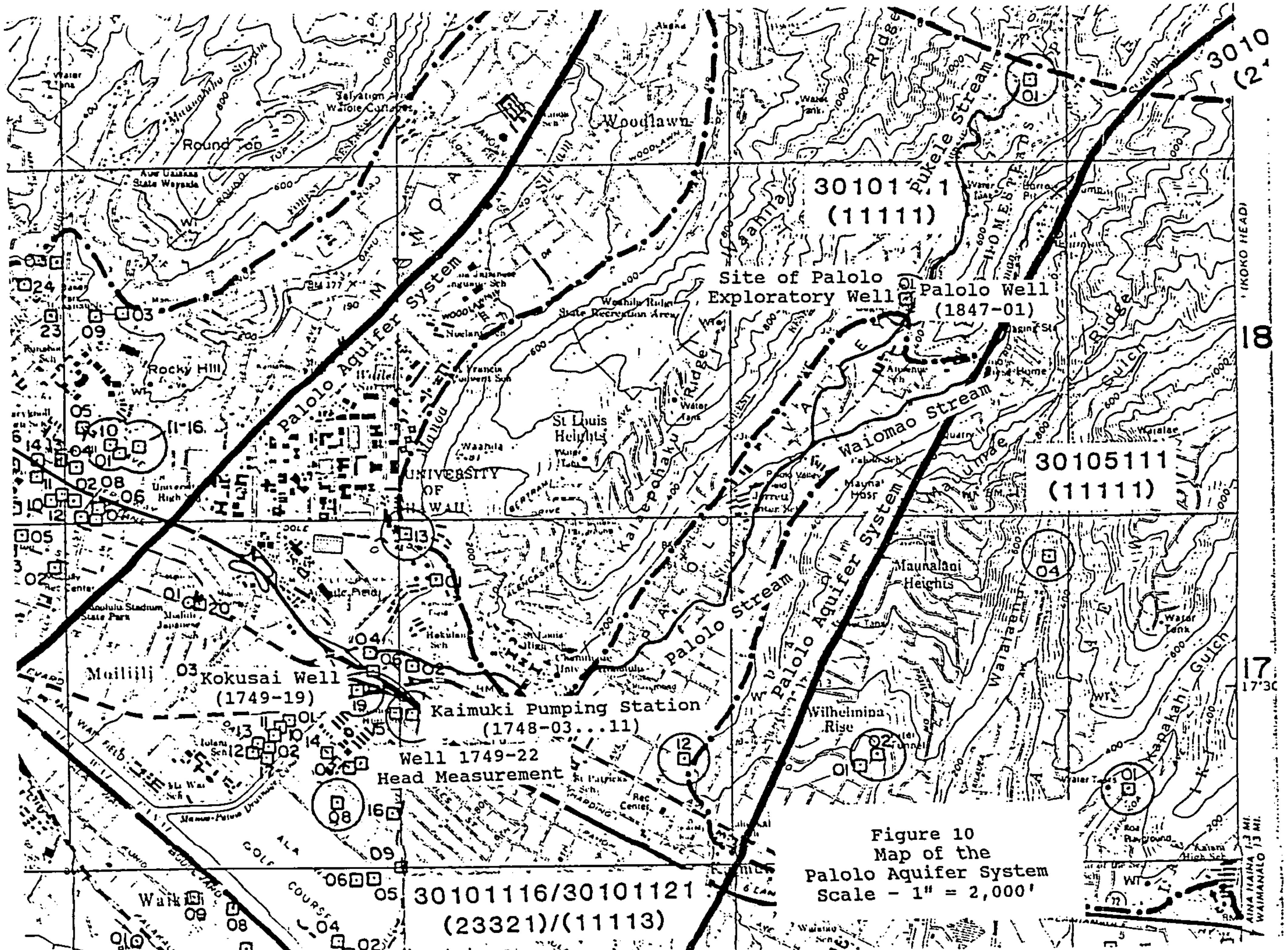


Figure 10
Map of the
Palolo Aquifer System
Scale - 1" = 2,000'