BARBERS POINT 215' NON-POTABLE RESERVOIR

Final Environmental Assessment

Prepared for:
City and County of Honolulu
Board of Water Supply

Prepared by:
PBR HAWAII & ASSOCIATES, INC.
July 2008

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LIST OF ABBREVIATIONS

Abbreviation	Definition
AG-2	General Agricultural
ALISH	Agricultural Lands of Importance to the State of Hawai‘i
BMP	Best Management Practices
BWS	City and County of Honolulu Board of Water Supply
DOH	State of Hawai‘i Department of Health
DPP	City and County of Honolulu Department of Planning and Permitting
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
FONSI	Finding of No Significant Impact
HAR	Hawai‘i Administrative Rules
HRS	Hawai‘i Revised Statues
LUC	Land Use Commission
LUO	Land Use Ordinance
MG	Million gallons
MGD	Million gallons per day
MSL	Mean sea level
NPDES	National Pollutant Discharge Elimination System
R-1	DOH Class 1 recycled water
SCADA	Supervisory Control And Data Acquisition
SMA	Special Management Area
TMK	Tax Map Key

1.0 INTRODUCTION

This Final Environmental Assessment is prepared pursuant to the requirements of Chapter 343, *Hawai'i Revised Statues*, and Chapter 200 of Title 11, Department of Health Hawai'i Administrative Rules, Environmental Impact Statement Rules.

1.1 PROJECT SUMMARY

Project Name:	Barbers Point 215' Non-potable Reservoir No. 2	
Applicant:	City and County of Honolulu Board of Water Supply	
Landowner:	Board of Water Supply	
Location:	Kapolei, O'ahu, Hawai'i	
Tax Map Key:	9-1-15: 23 (2.308 acres) 9-1-15: 05 (portion) (77.868 acres) 9-2-03: 02 (portion) (1201.179 acres)	
Existing Use:	City and County of Honolulu Board of Water Supply (BWS) 1.5 million gallon (MG) non-potable water reservoir	
Proposed Project:	Construction of a non-potable water reservoir to serve the BWS Honouliuli Recycled Water System and BWS Ko'Olina Non-potable Water System	
Project Area:	Approximately 2.3 acres	
Land Use Designations:	State Land Use:	Agricultural
	Zoning:	General Agriculture (AG-2)
	'Ewa Development Plan:	Golf Course
SMA:	The project site is not within the Special Management Area (SMA)	
Actions Requested:	Compliance with Chapter 343, *Hawai'i Revised Statutes*	
Approving Agency:	City and County of Honolulu Board of Water Supply	
Anticipated Determination:	Finding of No Significant Impact (FONSI)	

1.2 LOCATION

The project site is located in the Kapolei area of 'Ewa, O'ahu, Hawai'i (Figures 1 and 1a). The property lies in the foothills of the Wai'anae Mountain range just mauka of Farrington

Highway near the Kapolei Teleport and Hawaiian Waters Adventure Park. The site is accessed by a paved road that branches off from Farrington Highway.

1.3 LAND OWNERSHIP

The 2.308-acre project site is located on a parcel (TMK 9-1-15:23) owned by the Board of Water Supply (Figure 2). To accommodate the reservoir tank without increasing the structure's height, the Board of Water Supply may also be required to acquire and use a portion of the surrounding parcels (TMK: 9-1-15:05 (portion) and TMK: 9-2-03:02 (portion)). The 1,202-acre parcel north of the proposed project site is identified as TMK: 9-2-03:02 and is owned by Makaīwa Hills LLC. The 77-acre parcel south of the proposed project site is identified as TMK: 9-1-15:05 and is also owned by Makaīwa Hills LLC.

1.4 IDENTIFICATION OF THE APPLICANT

The City and County of Honolulu Board of Water Supply is the project applicant.

1.5 COMPLIANCE WITH STATE OF HAWAIʻI ENVIRONMENTAL LAWS

This document has been prepared in accordance with the provisions of Chapter 343, Hawaiʻi Revised Statutes (HRS) and Hawaiʻi Administrative Rules (HAR) Title 11, Department of Health, Chapter 200, Environmental Impact Rules. Section 343-5, HRS, establishes nine "triggers" that require either an environmental assessment or an environmental impact statement. Proposed use of State or County lands or funds is one of these "triggers." The Board of Water Supply proposes to build the reservoir on County land using County funds. As such, this EA is prepared in compliance with provisions of Chapter 343, HRS and HAR Title 11, Department of Health, Chapter 200, Environmental Impact Rules.

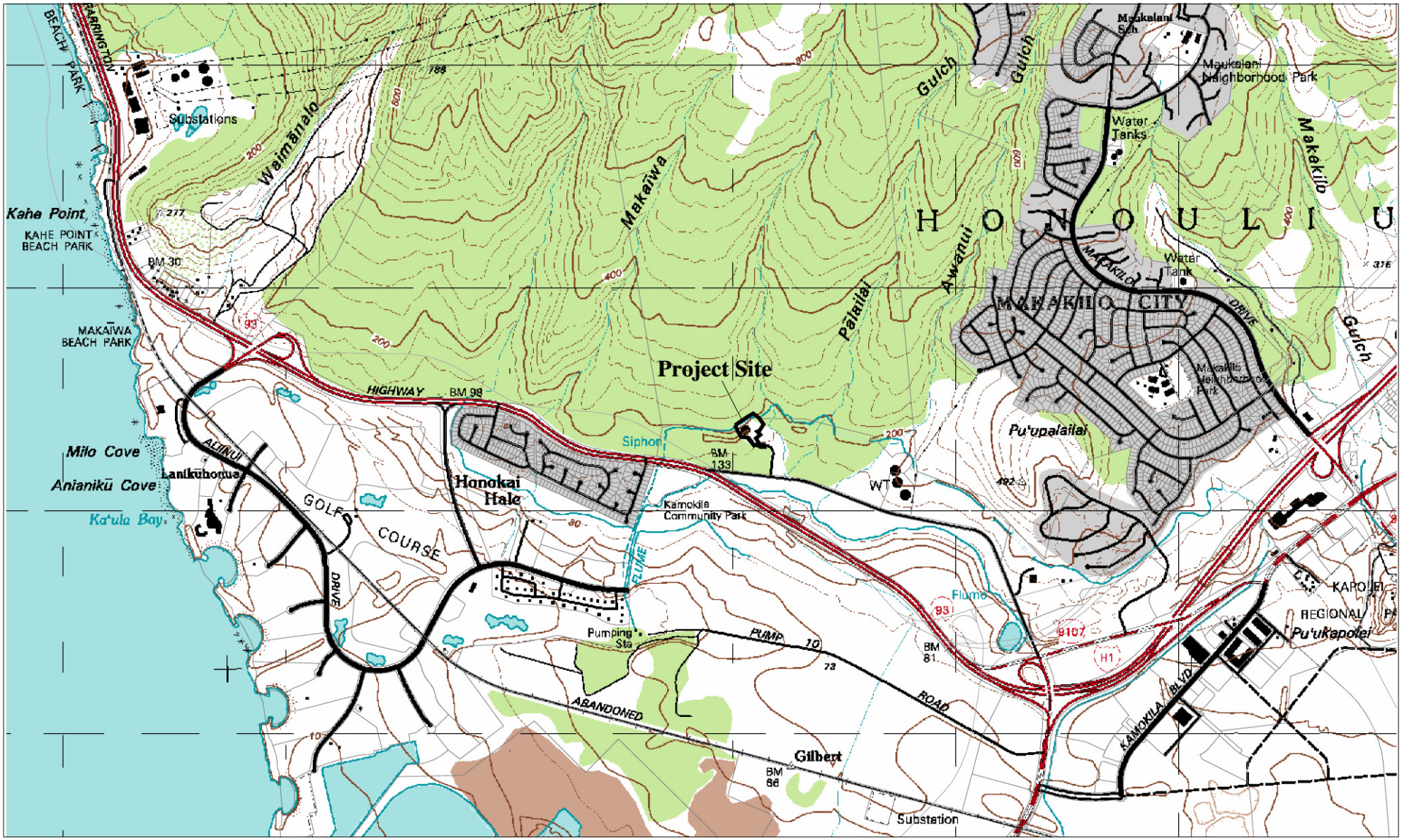
1.6 IDENTIFICATION OF THE APPROVING AGENCY

The City and County of Honolulu Board of Water Supply is the approving agency.

1.7 IDENTIFICATION OF AGENCIES, ORGANIZATIONS, AND INDIVIDUALS CONSULTED

City and County of Honolulu Agencies

Todd K. Apo, City Council Member
Department of Environmental Services
Department of Parks and Recreation
Board of Water Supply
Department of Facility Maintenance
Department of Transportation Services
Department of Design and Construction
Department of Planning and Permitting



Legend

Project Site

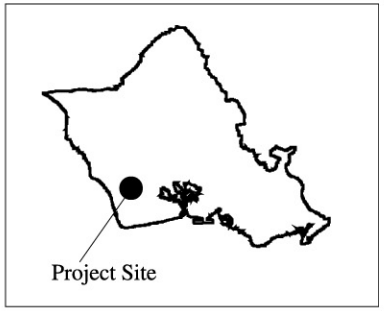


Figure 1
Location Map

Barbers Point
215' Non-potable Reservoir No. 2

Board of Water Supply
'Ewa, O'ahu

NORTH

LINEAR SCALE (FEET)
0 1,000 2,000

PBR HAWAII & ASSOCIATES, INC.

Source: U.S. Geological Survey
Disclaimer: This graphic is intended for general planning purposes only.

Legend

Project Site

Source: City and County of Honolulu (2000)
Disclaimer: This graphic is intended for general planning purposes only.

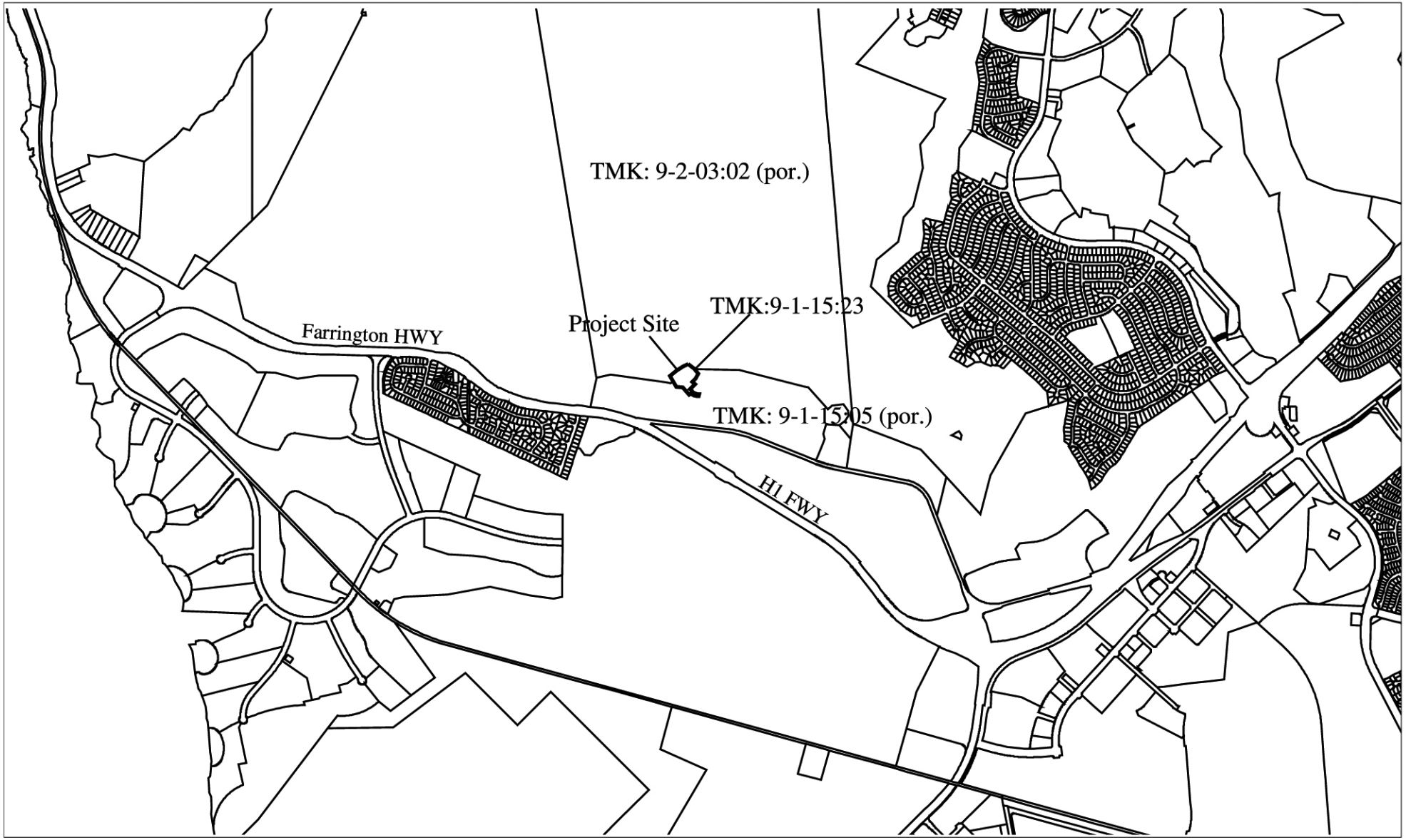
Figure 1a
Aerial Photograph
Barbers Point
215' Non-potable Reservoir No. 2

Board of Water Supply
'Ewa, O'ahu

NORTH

Not To Scale

PBR HAWAII & ASSOCIATES, INC.



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Project Site

Figure 2

Tax Map Key

Barbers Point
215' Non-potable Reservoir No. 2

Board of Water Supply

'Ewa, O'ahu

NORTH

LINEAR SCALE (FEET)

0 1,000 2,000

PBR HAWAII & ASSOCIATES, INC.

Source: Tax Map Key

Disclaimer: This graphic is intended for general planning purposes only.

Police Department
Fire Department

State of Hawai'i Agencies

Department of Business, Economic Development & Tourism
Land Use Commission
Office of Planning
Department of Health
Department of Health, Environmental Planning Office
Department of Land and Natural Resources
Department of Land and Natural Resources, State Historic Preservation Division
Department of Transportation
Department of Agriculture
Office of Environmental Quality Control
Department of Hawaiian Home Lands
Office of Hawaiian Affairs
University of Hawai'i Environmental Center

Federal Agencies

U.S. Army Corps of Engineers
U.S. Fish and Wildlife Service
U.S.D.A. Natural Resources Conservation Service

Other Agencies and Organizations

Makakilo/Kapolei/Honokai Hale Neighborhood Board
Makaīwa Hills, LLC
Hawaiian Electric Company
Hawaiian Telcom
Oceanic/Time Warner Cable

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2.0 PROJECT DESCRIPTION

2.1 BACKGROUND INFORMATION

2.1.1 Location

The Kapolei region is located in the southwest region of O'ahu in the 'Ewa District (Figures 1 and 1a). The 'Ewa Plain encompasses approximately 32,000 acres or about eight percent of the island of O'ahu.

Historically, the 'Ewa Plain, including the Kapolei area, was used for sugar cane cultivation. Economic growth in the 'Ewa region began the shift from agriculture to industry in the early 1960's with the opening of Campbell Industrial Park. Residential growth began a decade later with the development of Makakilo and 'Ewa Beach. The 'Ewa District has been designated as a location for a secondary urban center to be focused in the Kapolei area. The City of Kapolei and surrounding developments have been master-planned to provide for commercial, industrial, resort, recreational, and residential uses.

The 'Ewa District also continues to support diversified agriculture, mainly by independent growers, with over 3,000 acres of agricultural land protected by an urban growth boundary as designated in the 'Ewa Development Plan. The majority of land in the Kapolei area is owned by James Campbell Company LLC.

2.1.2 Description of the Reservoir Site

After evaluating three possible sites for the location of a new non-potable reservoir, the Board of Water Supply, with support from the Makakilo/Kapolei/Honokai Hale Neighborhood Board, selected the two-acre site adjacent to the existing Barbers Point 215' Non-potable Reservoir No. 1. The Barbers Point 215' Non-potable Reservoir No. 2 will be at elevation 215 feet (hence the name Barbers Point 215').

The site, including an existing reservoir, was constructed in 1989. The existing reservoir, which serves the Ko'Olina Non-potable Water System, is a 1.5 million gallon non-potable (brackish water), reinforced concrete tank, supplied by two brackish wells, well pumps, and a pump control station. Two well pumps supply approximately 2.0 MGD of non-potable water from about 150 feet below mean sea level (MSL) to provide irrigation water to the Ko'Olina golf course and resort area.

The site is currently accessed by a paved road that branches off of Farrington Highway. The existing access road is in good condition and features adequate security. The entrance to the access road on Old Farrington Highway has a padlocked vehicle gate. The reservoir site itself is secured with a chain-link fence topped with barbed wire and a padlocked chain-link gate for vehicular access. Minimal, if any, improvements to the access road are anticipated.

2.1.3 State Land Use District

The Barbers Point 215′ Non-potable Reservoir No. 2 will be located within the State Agricultural District (Figure 3). Depending on the final design and size of the new reservoir, the Board of Water Supply may also be required to acquire and use a portion of the surrounding parcels, which are located within the State Urban District. Reservoirs are permitted uses in both the Agricultural and Urban Districts.

2.1.4 ‘Ewa Development Plan

The ‘Ewa Development Plan designates the site of the Barbers Point 215′ Non-potable Reservoir No. 2 as Golf Course (Figure 4). In their pre-consultation letter the Department of Planning and Permitting (DPP) noted that the ‘Ewa Development Plan’s Urban Land Use Map applies a conceptual designation of “Golf Course” to the reservoir site. However, plans for the Makaīwa Hills project no longer include a golf course. Thus DPP plans to recommend changing this designation to “Agricultural and Preservation Area” during their ongoing ‘Ewa DP Five-Year Review process. Appendix E contains a copy of this letter.

2.1.5 City and County of Honolulu Zoning

The site of the proposed Barbers Point 215′ Non-potable Reservoir No. 2 is zoned AG-2, General Agriculture (Figure 5). Reservoirs are a permitted use in the Agricultural AG-2, General Agriculture zoning district.

2.1.6 Surrounding Land Uses

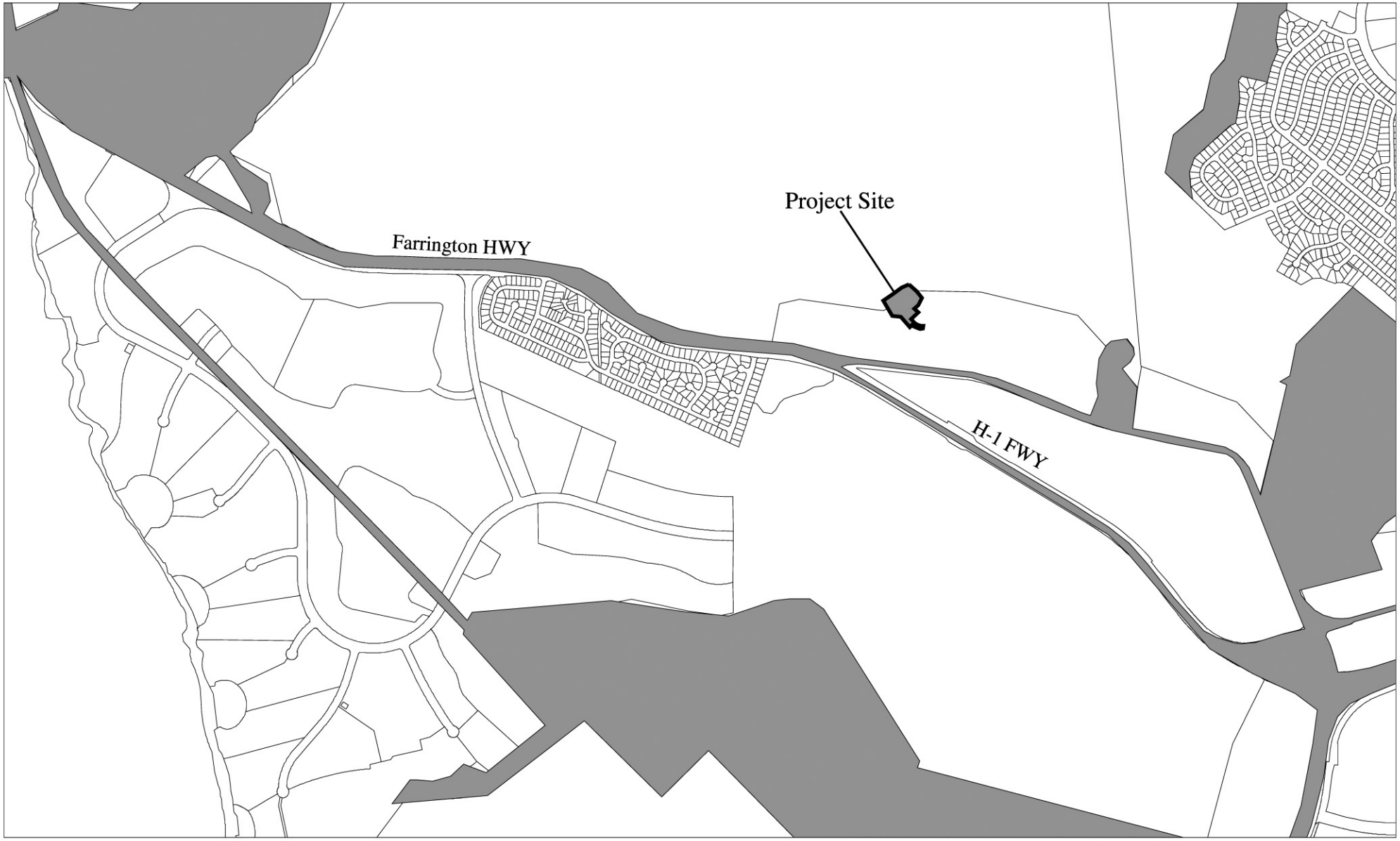
Undeveloped land surrounds the immediate perimeter of the site. Makaīwa Hills, LLC proposes to develop a new residential community on 1,781 acres of land surrounding the project site. This development, called Makaīwa Hills, will have 4,100 new single- and multi-family residential units at low and medium densities, a community commercial center, neighborhood retail center, recreational facilities (e.g., parks, trails, open spaces) a public elementary school, an amenity center, and associated infrastructure (e.g., new roadways, utilities, drainage, wastewater, and potable water distribution systems) (Group 70 International, Inc., 2007).

Honokai Hale is the nearest existing residential development, located approximately 0.25 miles to the west of the site. Three potable water reservoirs are located on TMK: 9-1-15: 17 approximately 2,200 feet to the east-southeast.

2.2 GENERAL DESCRIPTION OF THE BARBERS POINT 215′ NON-POTABLE RESERVOIR NO. 2

2.2.1 Purpose and Need of the Barbers Point 215′ Non-Potable Reservoir No. 2

O‘ahu’s population and economic growth are increasingly concentrated in leeward areas of the island, particularly the Kapolei region. To meet the current and future demand for water



Legend

- **Project Site**
- **Agricultural District**
- **Conservation District**
- **Urban District**

Source: State Land Use Commission (2007)
Disclaimer: This graphic is intended for general planning purposes only.

Figure 3
State Land Use Districts

Barbers Point
215' Non-potable Reservoir No. 2

Board of Water Supply
'Ewa, O'ahu

NORTH

LINEAR SCALE (FEET)
0 700 1,400

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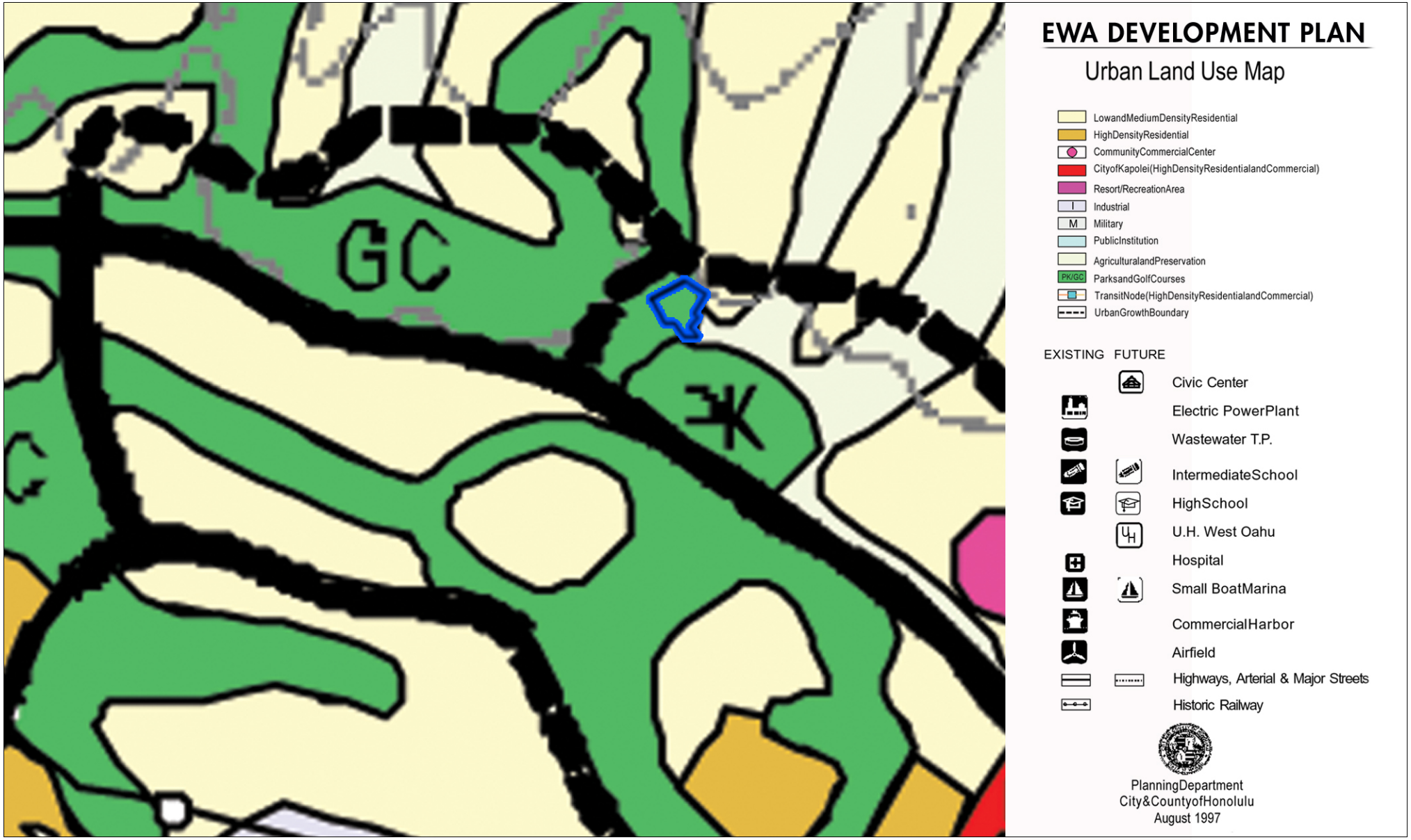
& ASSOCIATES, INC.



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Project Site

Source: City and County of Honolulu (1997)
Disclaimer: This graphic is intended for general planning purposes only.

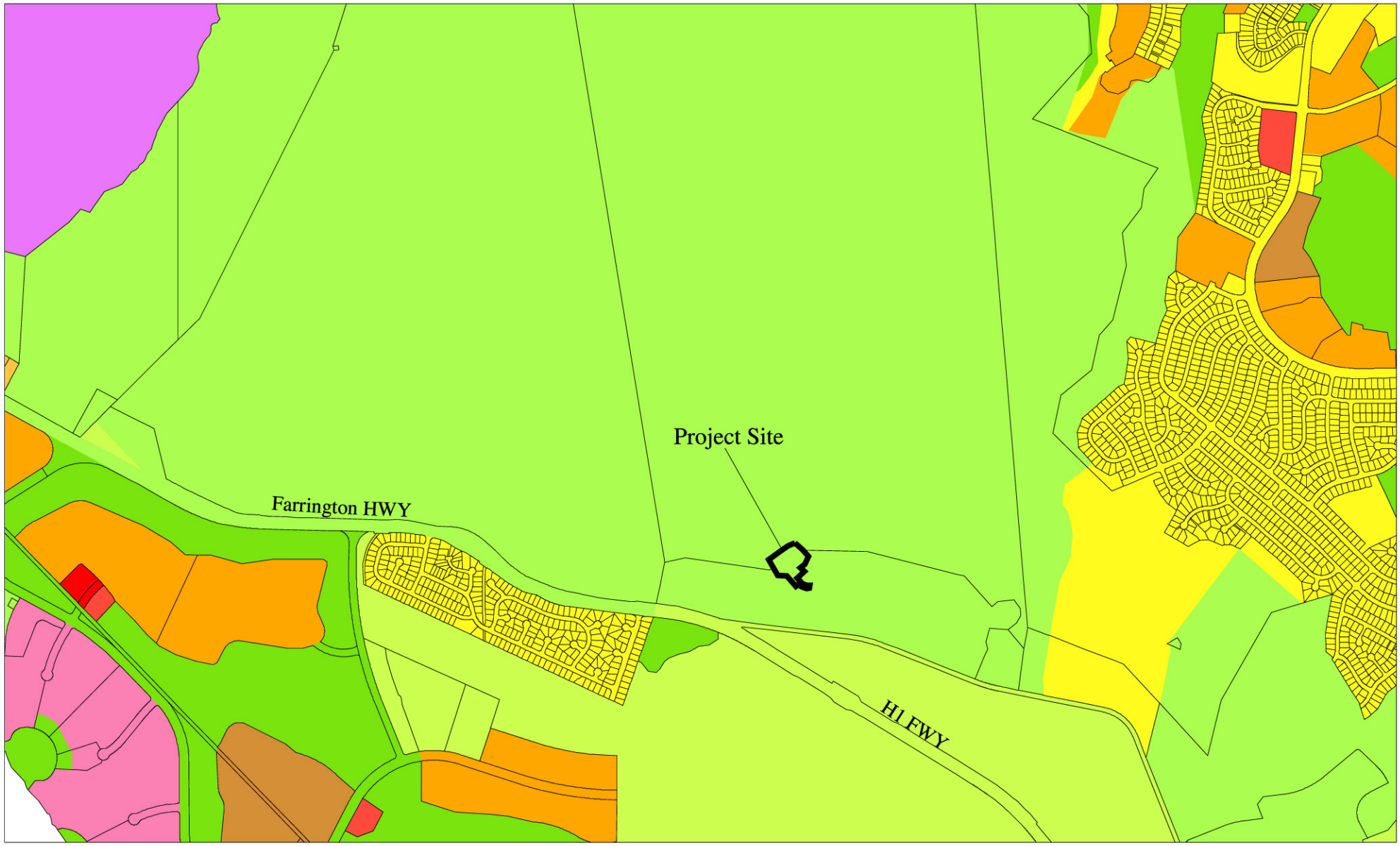
Figure 4
'Ewa Development Plan
Barbers Point
215' Non-potable Reservoir No. 2

Board of Water Supply
'Ewa, O'ahu

NORTH

Not To Scale

PBR HAWAII & ASSOCIATES, INC.



Legend

- **Project Site**
- **Apartment Low-density (A-1)**
- **Apartment Medium-density (A-2)**
- **Restricted Agriculture (AG-1)**
- **General Agriculture (AG-2)**
- **Neighborhood Business (B-1)**
- **Community Buisness (B-2)**
- **Residential (R-5)**
- **Resort**

Source: City and County of Honolulu (2005)
Disclaimer: This graphic is intended for general planning purposes only.

Figure 5
County Zoning

Barbers Point
215' Non-potable Reservoir No. 2

Board of Water Supply **'Ewa, O'ahu**

NORTH

LINEAR SCALE (FEET)
0 700 1,400

PBR HAWAII & ASSOCIATES, INC.

for residential, resort, commercial, and industrial developments, as well as agricultural operations, the Board of Water Supply is exploring new technologies to supplement groundwater resources, particularly desalination and water recycling.

Installation of the Barbers Point 215' Non-Potable Reservoir No. 2 will serve the Honouliuli Recycled Water System and the Ko'Olina Non-potable Water System. The reservoir will increase the storage capacity of these systems to meet existing and projected requirements and will enhance the Honolulu Board of Water Supply's capability to provide water service to the 'Ewa area. The new Barbers Point 215' Non-potable Reservoir No. 2 will be used to supply water for agricultural, industrial, and urban irrigation uses in the 'Ewa area. Expanded use of non-potable water resources for appropriate agricultural, industrial, and other urban uses will conserve and protect O'ahu's limited natural water resources. By utilizing non-potable water for appropriate uses, potable water resources can be conserved and used for public consumption.

2.2.2 Details of the 'Ewa Water Recycling Program

The Honouliuli Wastewater Treatment Plant. The recycled water for the 'Ewa Water Recycling Program comes from the Honouliuli Wastewater Treatment Plant, which is located on Geiger Road. The Honouliuli Wastewater Treatment Plant serves all residential, commercial, industrial, and agricultural areas in the western portion of the Mamala Bay sewer district (except for Pearl Harbor and Campbell Industrial Park). Currently, the Honouliuli Wastewater Treatment Plant has the capacity to treat 38 MGD of sewage. Treated effluent is either discharged through a 78-inch diameter deep ocean outfall or recycled (see "The Honouliuli Recycled Water System" discussion below). As the growth of the 'Ewa and Central Oahu districts continues, there are plans to expand the Honouliuli Wastewater Treatment Plant to an ultimate treatment capacity of 51 MGD by the year 2020 (R.M. Towill Corporation, 2004).

The Honouliuli Recycled Water System. The Honouliuli Water Recycling Facility currently has a capacity of 12 MGD and produces two grades of recycled water: R-1 water is used for irrigation and Reverse Osmosis water is used for industrial uses. Both types of recycled water begin with secondary treated effluent from the Honouliuli Wastewater Treatment Plant. The Honouliuli Water Recycling Facility is currently capable of producing up to 10 MGD of R-1 water, which is the highest level of treatment designated by the Hawai'i Department of Health. R-1 water is currently used throughout the State of Hawai'i for golf course irrigation, landscaping, and agriculture. Reverse Osmosis water is intended strictly for industrial uses such as boiler feed water, cooling tower make-up water, and process water for refineries. The facility currently has a Reverse Osmosis capacity of 2.0 MGD.

Existing Barbers Point 215' Non-potable Water System. The existing Barbers Point 215' Non-potable Reservoir No. 1 (formerly known as the West Beach Reservoir) is supplied by two onsite brackish wells and has a storage capacity of 1.5 MG. The system was dedicated to the BWS for operation and maintenance, but the water allocation is managed by the Ko'Olina Resort. The wells are identified as Well Number 2006-14 and Well Number 2006-15 and are

operated under Water Use Permit No. 82. The wells are part of the 'Ewa-Kunia Water Management Area. The permitted withdrawal rate is not to exceed 1.0 MGD, based on a twelve-month moving average. Each pump is capable of pumping about 1.0 MGD. The chloride levels in these wells typically range from about 325 to 350 mg/L.

The existing Barbers Point 215' Non-potable Reservoir No. 1 is connected to a transmission system that supports roadway and selected common area landscaping within the Ko'Olina resort area. A 24-inch transmission main conveys water from the reservoir to Farrington Highway. A 16-inch main then heads west along Farrington Highway. The main is further reduced in the Ko'Olina area to 16-inch and 12-inch mains, with 8-inch stub-outs at each of the connecting roads. The Ko'Olina Resort and golf course are currently being irrigated by this non-potable system.

Planned Non-potable Water System. The expansion of the non-potable R-1 water system is anticipated to occur in three phases. At ultimate development of the non-potable R-1 water system, the total potential demand for R-1 water is projected to be approximately 19 MGD, as indicated in Table 1.

Barbers Point 215' Non-potable Reservoir No. 2. The proposed Barbers Point 215' Non-potable Reservoir No. 2 will be used to store R-1 water from the Honouliuli Water Recycling Facility. The BWS is considering reservoir sizes ranging from 1.5 to 6 MG; however, the final storage capacity has not been determined. The existing reservoir (Barbers Point 215' Non-potable Reservoir No. 1) on the site, which currently stores non-potable (brackish) water from two deepwater wells, is also proposed to be used to store water from the Honouliuli Water Recycling Facility. The pumps for the brackish wells will then be turned off with this source retained for emergency purposes. The existing transmission line from the reservoir site (which currently supplies brackish water to the Ko'Olina Resort area) will then be used to supply R-1 water to the Ko'Olina Resort area. A new feeder line will be provided on the site to connect the new reservoir (Barbers Point 215' Non-potable Reservoir No. 2) to the existing transmission line. The transmission line from the Honouliuli Water Recycling Facility to the reservoir site is currently being upgraded on the Old Farrington Highway separately from this project.

2.3 PROJECT COST AND TIMETABLE

The estimated construction costs for the reservoir will be dependent on reservoir size. The schedule is dependent on the demand for non-potable storage in the region. The BWS is considering funding the reservoir through the Capital Improvements Program monies of the Board of Water Supply; however the reservoir may be constructed by private developers dependent on developer's non-potable demands.

Table 1. Existing and Potential R-1 Water Use

	Average Day Demand	Peak Night Demand

	(MGD)	(MGD)
Existing Users		
Golf Courses		
Barbers Point	0.6000	1.2000
Coral Creek	0.4000	0.4000
‘Ewa Villages	0.7500	0.7500
Hawai‘i Prince	0.5000	0.5000
Kapolei	0.4000	0.4000
New ‘Ewa Beach	0.6000	0.6000
West Loch	0.7500	0.7500
Fort Weaver Road Irrigation	0.0100	0.0300
Total Existing R1 System	**4.0100**	**4.6300**
Phase 1 Additional Users (2005-2010)		
Golf Courses		
Haseko	0.6000	0.6000
City of Kapolei	0.5000	1.5000
City of Kapolei-Additional	0.4400	1.3200
Geiger Park	0.0270	0.0810
One‘ula Beach Park	0.1000	0.3000
‘Ewa Marina District Park	0.0800	0.2400
UH West O‘ahu (East Kapolei)	0.5000	1.5000
DHHL East Kapolei I, Phase 1	0.1000	0.3000
DHHL East Kapolei I, Phase 2	0.2000	0.6000
North South Road Irrigation	0.0300	0.0900
Gentry Middle School	0.0200	0.0600
Gentry Kapolei Parkway Park	0.0270	0.0810
Total Demand Going Online in Phase 1	**2.6240**	**6.6720**

Table 1. Existing and Potential R-1 Water Use (continued)

	Average Day Demand (MGD)	Peak Night Demand (MGD)
Phase 2 Additional Users (2010-2015)		
Golf Courses		
Koʻolina Golf Course	0.6936	0.6936
Schools		
ʻIlima Intermediate	0.0282	0.0846
James Campbell High School	0.0609	0.1827
Pōhākea Elementary School	0.0168	0.0504
ʻEwa Elementary	0.0231	0.0693
ʻEwa Beach Community Park	0.0537	0.1612
ʻEwa Beach Elementary School	0.0159	0.0477
Haseko Property Development	0.3180	0.9540
Island Ready Mix	0.0800	0.2400
Kaʻimiloa Elementary School	0.0234	0.0702
Kalaeloa Regional Park	2.4480	7.3440
Kapolei Business Park	2.3400	7.0200
Kapolei Property Development	1.2963	3.8889
Parks	0.0628	0.1885
Puʻuloa Neighborhood Park	0.0177	0.0531
Villages of Kapolei-Additional		
Non-potable Reservoir Site	0.0220	0.0660
Kapolei Day Care Center	0.0020	0.0060
Community Park	0.0490	0.1469
Commercial Center	0.0550	0.1650
Village 7 Neighborhood Park	0.0245	0.0734
Village 6 Elderly Housing	0.0268	0.0804
BPT Access Road Buffer Zone	0.0238	0.0714
Total Demand Going Online in Phase 2	**7.6815**	**21.6573**
Phase 3 Additional Users (2015-beyond)		
Navy Blast Zone Area	2.6125	2.6125
Hoʻopili	2.1100	6.3300
Total Demand Going Online in Phase 3	**4.7225**	**8.9425**
TOTAL DEMAND	**19.0380**	**41.9018**

3.0 DESCRIPTION OF THE AFFECTED ENVIRONMENT, POTENTIAL IMPACTS OF THE PROPOSED ACTION, AND MITIGATION MEASURES

The environment surrounding the proposed Barbers Point 215' Non-potable Reservoir No.2 site includes the physical or natural environment and the human or social environment. This section describes the existing physical conditions, potential impacts to the environment, and proposed mitigation measures.

3.1 PHYSICAL CHARACTERISTICS

3.1.2 Climate

The proposed Barbers Point 215' Non-potable Reservoir No. 2 will be located on the leeward side of Oʻahu. With the exception of a few months in the winter, the climate in the area is characterized by prevailing trade winds. The general climate on the leeward site of Oʻahu is sunny, dry, and relatively uniform throughout the year. Average annual daily minimum and maximum temperatures in the Kapolei area are 65°F and 84°F, respectively. The mean annual precipitation in Kapolei is approximately 25 inches. Most of this rainfall occurs during the winter months.

Potential Impacts and Mitigation Measures

The proposed reservoir is not expected to have an effect on the climatic conditions and no mitigation measures are warranted or planned.

3.1.1 Topography and Geology

Oʻahu, the third largest island in the State, covers an area 44 miles long and 30 miles wide. The total land area of Oʻahu is 604 square miles. The ʻEwa Plain is bordered by the Koʻolau Range on the east and the Waiʻanae range to the west. The geology of the ʻEwa area was formed by a combination of volcanic activity and the emergence of reefs along the southern edge of Oʻahu. During the volcanic activity along the Koʻolau volcanic range, a series of lava flows, cinder cones and tuff cones were formed. These are known as the Honolulu Volcanic Series. The ʻEwa Plain is underlain by a broad elevated coral reef, partly covered by alluvium carried out from the mountains.

The existing topography of the proposed site is relatively flat due to previous grading for construction of the existing on-site reservoir. The site elevations range from 228 feet above MSL along the northern boundary, to 180 feet above MSL at the southern boundary. There is an existing pad on the site that could potentially accommodate a smaller reservoir. Along the mauka edge of the property, the proposed site is bounded by a steep rocky face.

Potential Impacts and Mitigation Measures

The final grade of the site will be approximately similar to existing grades. Depending on reservoir capacity, excavation of the mauka slope may be necessary because the existing pad may be too small to accommodate a larger reservoir without creating a very tall structure. The final grading design for the site will be based on soil data and recommendations for grading and maximum slopes.

A soil investigation and report was performed before the existing reservoir on site (Barbers Point 215′ Non-potable Reservoir No. 1) was built (CW Associates Inc., 1986). Based this investigation, the rock formations underlying the site should provide an adequate foundation for the proposed Barbers Point 215' Non-potable Reservoir No. 2. If necessary, further geotechnical investigation may be done during the final design of the new reservoir.

Any excess material excavated during construction activities will be removed to ensure proper drainage. Furthermore, existing drainage areas shall not be impacted or reduced. Proper grading will alleviate negative environmental consequences such as flooding and soil instability.

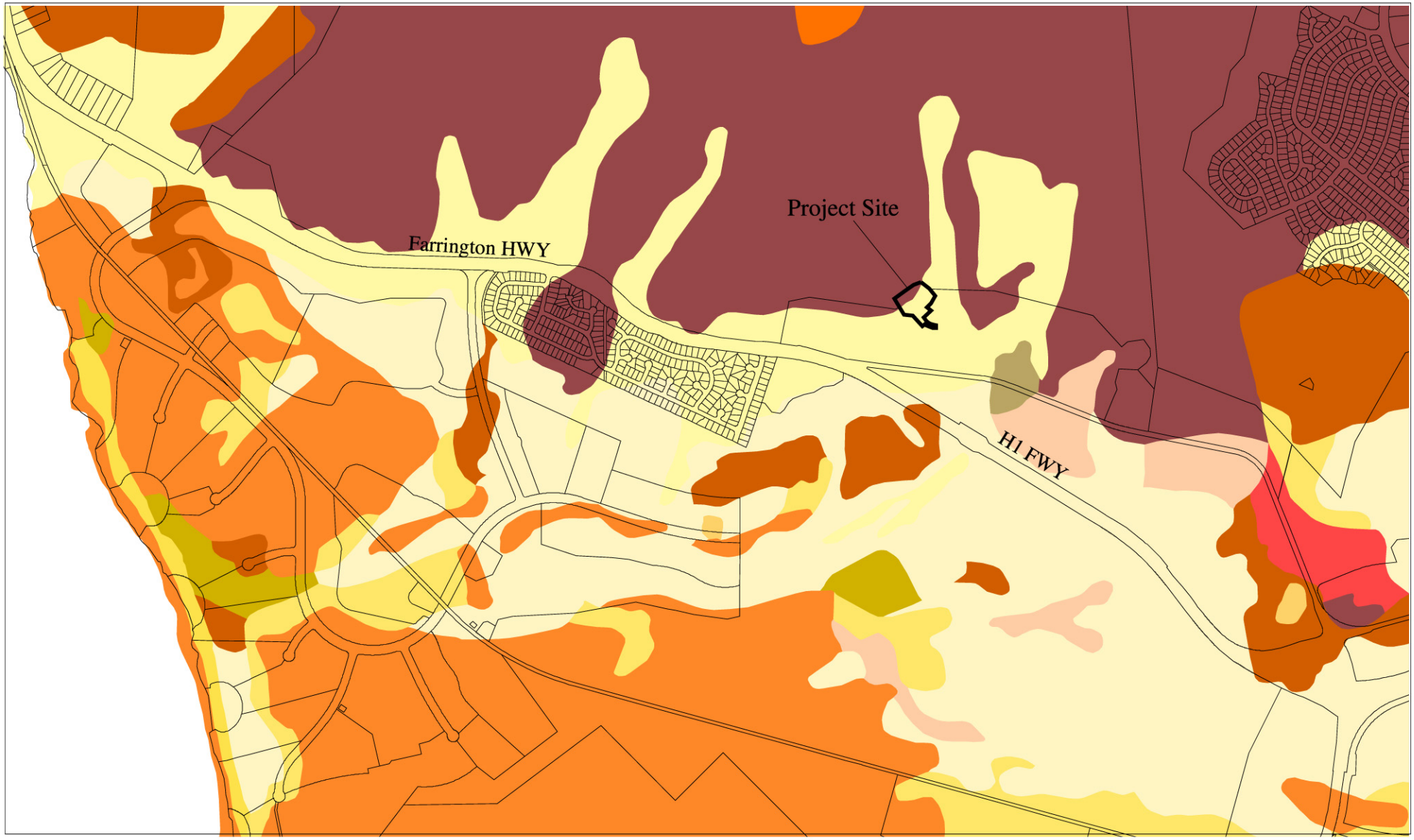
Erosion due to site preparation and reservoir construction is anticipated to be minimal. All construction activities will comply with all applicable Federal, State, and County regulations and rules for erosion control. Best Management Practices, such as the installation of silt fences at the base of all slopes and the immediate vegetation of all graded areas will be utilized. It is not anticipated that the construction activities will have an adverse effect on adjacent properties and resources.

The reservoir site and lands immediately down slope are uninhabited and will remain vacant for the foreseeable future. In addition, the new reservoir will not provide for human habitation of the site. Therefore, any potential rockfall hazards in the vicinity of the reservoir site do not pose a significant risk to human activity. However, rockfall mitigation, such as a wire/cable mesh, may be installed along the cut slopes located behind the existing and new reservoir to reduce the potential for rockfall occurrences as a result of soil erosion and/or settlement.

3.1.3 Soils

There have been three soil suitability studies prepared for Hawaiʻi whose principal focus have been to describe the physical attributes of land and the relative productivity of different land types for agricultural production. These are: 1) the U.S. Department of Agriculture Soil Conservation Service Soil Survey; 2) Land Study Bureau Detailed Land Classification; and 3) the Agricultural Lands of Importance to the State of Hawaiʻi (ALISH).

Soil Conservation Survey. According to the *U.S. Department of Agriculture Soil Conservation Service, Soil Survey of Islands of Kauaʻi, Oʻahu, Maui, Molokaʻi, and Lānaʻi, State of Hawaiʻi* (1972), the soils on the proposed Barbers Point 215' Non-potable Reservoir site are classified as Lualualei Extremely Stony Clay and Stony Steep Land (Figure 6).



Legend

- **Project Site**
- **Lualualei Extremely Stony Clay**
- **Stony Steep Land**

Figure 6
Detailed Soil Types

Barbers Point
215' Non-potable Reservoir No. 2

Board of Water Supply
NORTH

LINEAR SCALE (FEET)
0 700 1,400

'Ewa, O'ahu

PBR HAWAII
& ASSOCIATES, INC.

Source: U.S Natural Resources Conversation Service (1997)
Disclaimer: This graphic is intended for general planning purposes only.

Legend

- Project Site
- Prime Agricultural Land
- Unique Agricultural Land
- Other Agricultural Land
- Not Classified

Source: U.S. Deptartment of Agriculture (1977)

Disclaimer: This graphic is intended for general planning purposes only.

Figure 8

Agricultural Lands of Importance to the State of Hawaii (ALISH)

Barbers Point

215' Non-potable Reservoir No. 2

Board of Water Supply

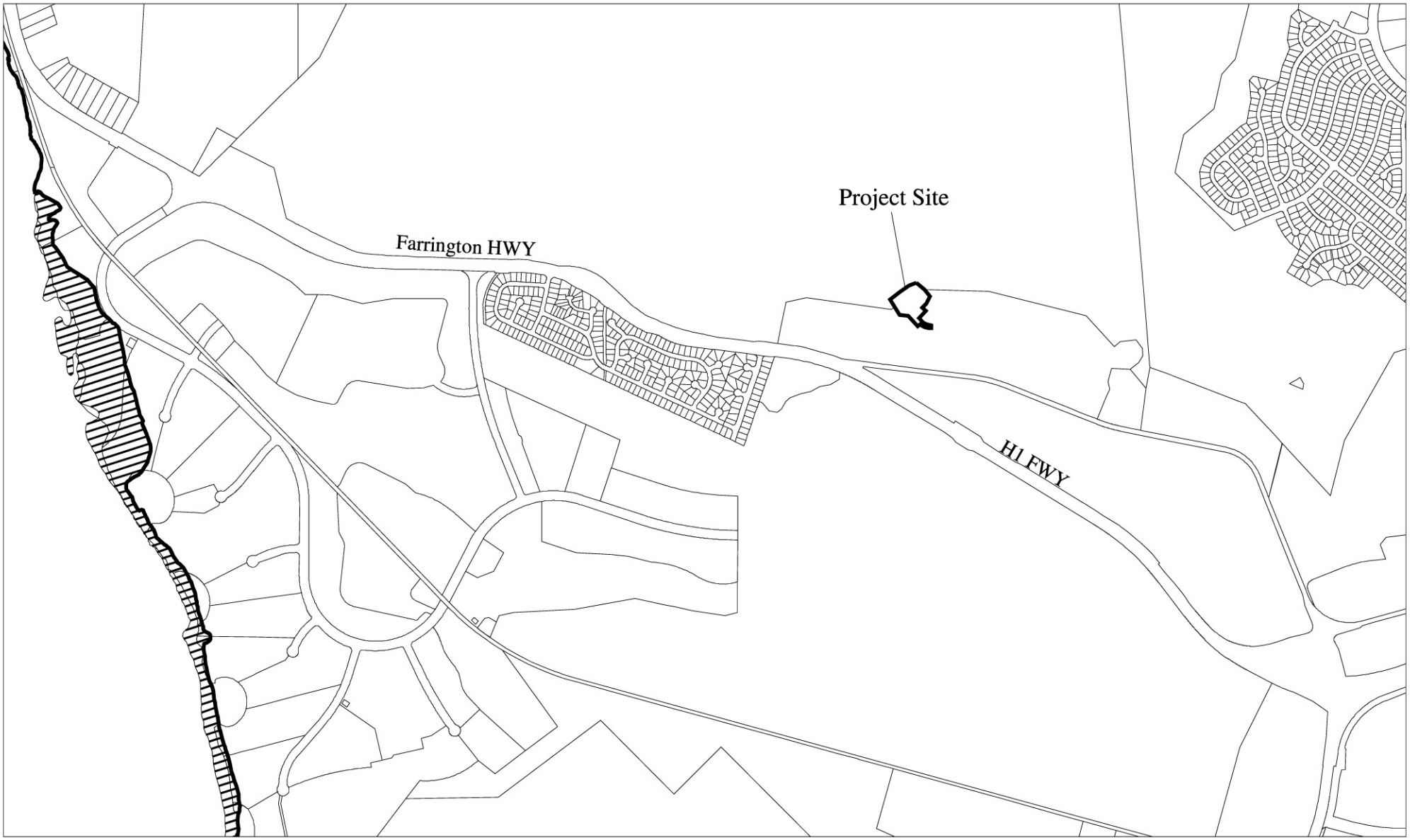
NORTH

LINEAR SCALE (FEET)

0 700 1,400

'Ewa, O'ahu

PBR HAWAII & ASSOCIATES, INC.



Legend

- **Project Site**
- **Zone D - Areas in which flood hazards are undetermined**
- **Zone AE- Special flood hazard areas inundated by 100-year flood. Base Flood elevations determined**

Source: Federal Emergency Management Agency Flood Insurance Rate Map (15003C0310F, 2004)

Disclaimer: This graphic is intended for general planning purposes only.

Figure 9
Flood Insurance Rate Map

Barbers Point
215' Non-potable Reservoir No. 2

Board of Water Supply

NORTH

LINEAR SCALE (FEET)
0 700 1,400

'Ewa, O'ahu

PBR HAWAII & ASSOCIATES, INC.

The Lualualei Extremely Stony Clay (LPE) type soil occurs throughout the majority of the western side of the site. Although slopes for Lualualei Extremely Stony Clay range from 3 to 35 percent, in most places the soil is moderately sloping to steep. This soil has many stones on the surface and in the profile, making it impractical to cultivate it unless the stones are removed. Runoff is medium to rapid, and the erosion hazard is moderate to severe.

The Stony Steep Land (rSY) type soil occurs along the northwestern border of the site. Stony Steep Land consists of a mass of boulders and stones deposited by water and gravity on side slopes of drainageways. The slope ranges from 40-70 percent. Stones and boulders cover 50 to 90 percent of the surface. There is a small amount of soil among the stones that provides a foothold for plants. Rock outcrops occur in many places.

Detailed Land Classification. This classification system applies a five-class productivity rating to soils using the letters A, B, C, D and E -- with A representing the class of highest productivity and E the lowest. The University of Hawai'i's Land Study Bureau *Detailed Land Classification - Island of O'ahu*, has not classified the potential reservoir site (Figure 7).

Agricultural Lands of Importance to the State of Hawai'i. The State Department of Agriculture's *Agricultural Lands of Importance to the State of Hawai'i (ALISH)* system of defining soil agricultural suitability has not classified the potential reservoir site according to its rating system (Figure 8).

Potential Impacts and Mitigation Measures

The reservoir site (TMK 9-1-15:23) is within the State Agricultural District and is zoned AG-2 (General Agricultural). Reservoirs are permitted uses in both the State Agricultural District and the AG-2 zone.

The use of the site for a second reservoir will have no impact on the agricultural use of the property as there are no current agricultural uses on the site. In addition, the potential agricultural use of the site is limited because of the small property size (2.308-acres) rocky topography, and dry climate. Further, the surrounding properties are within the State Urban District. Therefore, the use of the site for a second reservoir will not have an impact on agricultural activities and it is not likely the site would be used for future agricultural uses.

A soil investigation and report was performed before the existing reservoir on site (the existing Barbers Point 215' Non-potable Reservoir No. 1) was built (CW Associates Inc., 1986). Based this investigation, the rock formations underlying the site should provide an adequate foundation for the proposed Barbers Point 215' Non-potable Reservoir No. 2. If necessary, further geotechnical investigation may be done during the final design of the new reservoir.

Impacts to the soils of the site are not expected to be significant, but could include the potential for soil erosion and the generation of dust during construction. Clearing and grubbing activities may temporarily disturb the soil retention values of the existing vegetation

and expose soils to erosion forces. Some wind erosion of soils could occur without a proper watering and re-vegetation program. Heavy rainfall could also cause erosion of soils within disturbed areas of land.

All construction activities will comply with all applicable Federal, State, and County regulations and rules for erosion control. All construction activities will also comply with the provisions of Chapter 11-60.1, Hawai'i Administrative Rules, Section 11-60.1-33, Fugitive Dust.

3.1.4 Natural Hazards

Natural hazards impacting the Hawaiian Islands include hurricanes, tsunamis, volcanic eruptions, earthquakes, rockfalls, and flooding.

Devastating hurricanes have impacted Hawai'i twice since 1980: Hurricane 'Iwa in 1982 and Hurricane 'Iniki in 1992. While it is difficult to predict these natural occurrences, it is reasonable to assume that future events could be likely given the recent record.

Tsunamis are large, rapidly moving ocean waves triggered by a major disturbance of the ocean floor, which is usually caused by an earthquake but sometimes can be produced by a submarine landslide or a volcanic eruption. About 50 tsunamis have been reported in the Hawaiian Islands since the early 1800s. Seven caused major damage, and two of these were locally generated. The reservoir site is not within the Civil Defense Tsunami Evacuation Zone.

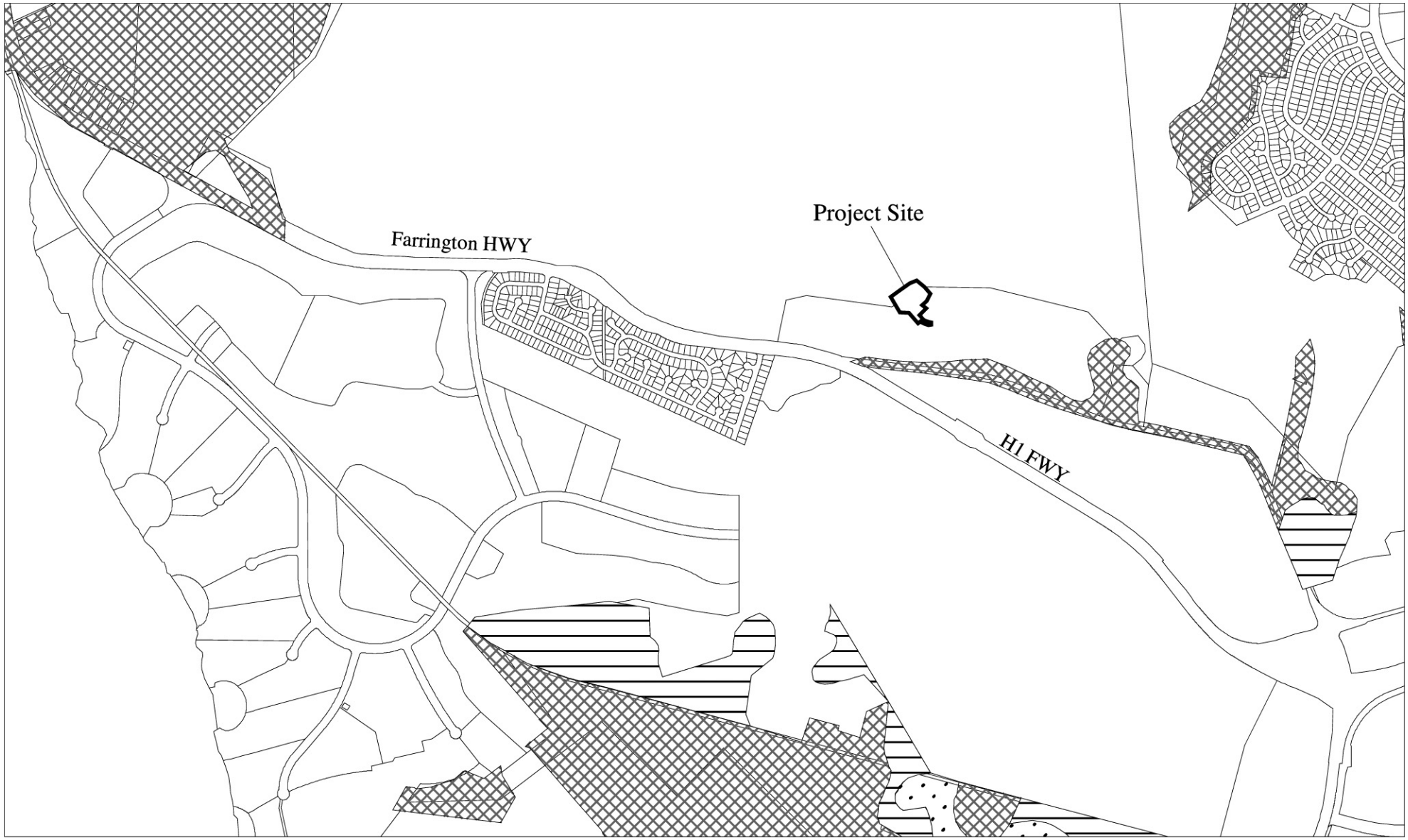
Volcanic hazards on Oahu are considered minimal due to the extinct status of the volcanoes comprising the island.

In Hawai'i, most earthquakes are linked to volcanic activity. Each year thousands of earthquakes occur in Hawai'i, the vast majority of them are so small and detectable only with highly-sensitive instruments. However, moderate and disastrous earthquakes have been known to occur.

Rockfalls could be triggered by intense or prolonged rainfall, earthquakes, increase in an incline of a slope, or applying excess weight to the top of a slope.

Flood hazard areas are depicted in the Flood Insurance Rate Map (FIRM) prepared by the Federal Emergency Management Agency (FEMA), National Flood Insurance Program. The FIRM map for the Kapolei area (Map No. 15003CO310F) indicates that the proposed site for the Barbers Point 215' Non-potable Reservoir No. 2 is located with Zone D, which is defined as an area in which flood hazards are undetermined (Figure 9). The Flood Insurance Program does not have any regulations for developments within Flood Zone D (DLNR Engineering Division Comment).

Potential Impacts and Mitigation Measures



Legend

- Project Site
- Not Classified
- A - Very Good
- B - Good
- D - Poor
- E - Very Poor
- C - Fair

Source: Land Study Bureau (1967)
Disclaimer: This graphic is intended for general planning purposes only.

Figure 7
Detailed Land Classification

Barbers Point
215' Non-potable Reservoir No. 2

Board of Water Supply
'Ewa, O'ahu

NORTH

LINEAR SCALE (FEET)
0 700 1,400

PBR HAWAII
& ASSOCIATES, INC.

The new reservoir is not anticipated to exacerbate any hazard conditions.

The potential impact of destructive winds, torrential rainfall of tropical hurricanes, earthquakes, and flooding on the reservoir structure and any other on-site buildings will be mitigated by sound engineering and construction practices.

The reservoir site and lands immediately down slope are uninhabited and will remain vacant for the foreseeable future. In addition, the new reservoir will not provide for human habitation of the site. Therefore, any potential rockfall hazards in the vicinity of the reservoir site do not pose a significant risk to human activity. However, rockfall mitigation, such as a wire/cable mesh, may be installed along the cut slopes located behind the existing and new reservoir to reduce the potential for rockfall occurrences as a result of soil erosion and/or settlement.

3.1.5 Flora

Char and Associates conducted a botanical survey of the site and surrounding parcels. Appendix A contains the complete survey report.

No threatened or endangered species were found during the survey. In addition, the site does not contain any outstanding vegetative features and all of the plants can be found in similar lowland, dry habitats throughout the islands.

The new reservoir will be located next to an existing reservoir. This area is disturbed and gravel-covered with scattered patches of weedy species. The rest of the new reservoir site is located on a flat, buffelgrass-covered area; kiawe trees and koa haole shrubs border the site where the site abuts a gulch. The vegetation on the site is dominated by introduced species such as buffelgrass (*Cenchrus ciliaris*), swollen fingergrass (*Chloris barbata*), creeping indigo (*Indigofera hendecaphylla*), kiawe (*Prosopis pallida*), koa haole (*Leucaena leucocephala*), Guinea grass (*Panicum maximum*), Natal redtop grass (*Melinis repens*), etc.

A few native species can be found on or adjacent to the site. ʻUhaloa (*Waltheria indica*) and hoary abutilon (*Abutilon incanum*) occur on the site, while ʻilima (*Sida fallax*), alena (*Boerhavia repens*), and pili grass (*Heteropogon contortus*) are found on the rocky hillside above the project site. One plant of the Hawaiian cotton or maʻo (*Gossypium tomentosum*) is found by the entrance gate to the existing reservoir outside of the site. All of these plants, with the exception of the maʻo, are indigenous (i.e., they are native to the islands and elsewhere). The maʻo is endemic; that is, it is native only to the Hawaiian Islands. The maʻo is considered a low priority species of concern.

Potential Impacts and Mitigation Measures

No threatened or endangered species were found during the survey. Clearing of existing vegetation on the site and on surrounding parcels will not impact the vegetation in the area.

It is anticipated that species of flora that presently inhabit the area will return after construction. It is not anticipated that new species of flora will migrate to the area. The day to day operation of the reservoir is not anticipated to adversely the local flora. Given these findings, the new non-potable reservoir is not expected to have a significant negative impact on the botanical resources. There are no botanical reasons to impose any restrictions, conditions, or impediments to the proposed use of the site.

3.1.6 Fauna

Phil Bruner conducted a faunal survey of the site and nearby lands. Appendix B contains the complete survey report.

No threatened or endangered species were found during the survey. No native birds or migratory birds were recorded during the survey.

A total of 13 species of non-native (introduced) birds were tallied during the survey. None of the introduced birds found during the survey are listed as threatened or endangered. Introduced birds recorded during the field survey included: Ring-necked Pheasant (*Phasianus colchicus*), Spotted Dove (*Streptopelia chinensis*), Zebra Dove (*Geopelia striata*), Red-vented Bulbul (*Pycnonotus cafer*), Common Myna (*Acridotheres tristis*), Japanese White-eye (*Zosterops japonicus*), Northern Mockingbird (*Mimus polyglottos*), Northern Cardinal (*Cardinalis cardinalis*), Red-crested Cardinal (*Paroaria coronata*), House Finch (*Carpodacus mexicanus*), House Sparrow (*Passer domesticus*), Common Waxbill (*Estrilda astrild*), and Nutmeg Mannikin (*Lonchura punctulata*). The birds recorded were those typically found in this region of O'ahu. Other introduced species that potentially could occur on or near the site include: Barn Owl (*Tyto alba*), Cattle Egret (*Bulbucus ibis*), Red Avadavat (*Amandava amandava*), and Java Sparrow (*Padda oryzivora*).

Two small feral pigs (*Sus scrofa*) were seen in an area of high grass along the eastern portion of the area surveyed. In addition, three Small Indian Mongoose (*Herpestes auropunctatus*) and two feral cats (*Felis catus*) were also observed during the survey. Scats of dogs (*Canis familiaris*) were present throughout the survey. Rats and mice were not found, but are likely to occur in this area.

Potential Impacts and Mitigation Measures

No threatened or endangered species were found during the survey. It is anticipated that animals that presently inhabit the area will return after construction. Because of the small scope of the project, it is not anticipated to have an impact on the relative abundance of birds and mammals in this region of O'ahu. Day to day operation of the reservoir is not anticipated to adversely affect the local fauna. Therefore, no mitigation measures are proposed.

3.2 HUMAN ENVIRONMENT

3.2.1 Archaeological and Historic Resources

Scientific Consultant Services (SCS), Inc. conducted an Archaeological Inventory Survey of the project site and surround parcels and found no human remains and/or burial features, no evidence of traditional Native Hawaiian activities, and four historical features related to 19th or 20th century commercial agricultural and ranching activities (Appendix C).

The first historical feature (Feature 1) was a water flume or *ʻauwai papa*, that traverses the project area in a northeast-to-southwest orientation, and continues across the gulch to the northeast. The second historical feature (Feature 2) is a dry-stacked, core-filled rock wall, roughly 30 meters long, oriented in an east-west direction. The third historical feature (Feature 3) consists of two bridge supports on either side of the gulch in the eastern portion of the project area. The fourth historical feature (Feature 4) is a series of short, low rock walls and other informally stacked rocks located on a 30-35° slope at the northeast terminus of the vertical outcrop traversing the project area. This feature is consistent with the remains of a short-term, informal shelter constructed by workers from 19th or 20th century ranching and/or farming operations. The hypothesis is that Feature 4 was a kind of informal "break area" for laborers while they completed the nearby water flume (Feature 1) and the rock walls (Feature 2).

Potential Impacts and Mitigation Measures

The archaeological survey report concludes that no further archaeological work is required. However, archaeological monitoring should be provided for any work related to transmission lines that involves subsurface excavation.

The Board of Water Supply and its contractors will comply with all State and County laws and rules regarding the preservation of archaeological and historic sites. Should historic remains such as artifacts, burials, concentrations of shell or charcoal be encountered during the construction activities, work will cease immediately in the immediate vicinity of the find and the find will be protected from further damage. The contractor shall immediately contact the State Historic Preservation Division, which will assess the significance of the find and recommend appropriate mitigation measures, if necessary.

3.2.2 Cultural Resources

The Barbers Point area has long been associated with the military, serving as home to the United States Naval Air Station. Long before the military occupied this portion of land, it was recognized by the Hawaiians by its original name of Kalaeloa (lit., the long point). The area that is being studied is considered to be within the district of Kalaeloa; however, oral traditions refer to this area as Pūkaua which is at the base of Puʻu Makakilo. In recent times, land divisions have been expanded and renamed, and areas such as Pūkaua are not as well-recognized, making Barbers Point the name for a number of smaller place names. Barbers Point or Kalaeloa has a history of hosting sailors from various countries, and more recently during the twentieth century, the United States Armed Forces.

During the late 1700's Captain Henry Barber, for whom Barbers Point was named, frequently visited Oʻahu and docked at Kalaeloa. In 1795, Captain Barber had his first friendly encounter with Kamehameha I. The following excerpt is from *Sites of Oʻahu* (Sterling and Summers, 1978):

> *In October 1795 Captain Henry Barber made one of several trips to Oʻahu. At this time Kamehameha I was on Oʻahu and he and Captain Barber became very friendly. When Barber departed he gave Kamehameha gifts. He intended giving him a keg of brandy but after thinking it over decided to that to give the heathen king a whole keg of brandy which he wouldn't appreciate was a great waste. He therefore had the keg half drained and filled up with water and sent this watered brandy to the king.*
>
> *On leaving Oʻahu he ran aground at Kaleloa and when the natives saw the ship's plight they swarmed out to it taking everything they could lay their hands on. In the meantime, Kamehameha had left for Kona and Barber seeking his help to recover the stolen goods went to Kona to see him. There he was treated cordially and a large feast was prepared. When the awa was passed around Barber was surprised that his awa cup held nothing but watered awa, thus did Kamehameha remind Barber that he was not a fool. In spite of Barber's treatment of Kamehameha the king sent him back with kapu sticks and orders that the Hawaiians must return all which had been stolen. When the Hawaiians saw that Barber came with authority they immediately returned all that had been taken.*

The following Hawaiian historians and culture preservationists were asked if they were aware of any current cultural practices in the area of Barbers Point reservoir site: Momi Kamahele, Shad Kāne, and Poni Kamauʻu. Ms. Kamahele deferred comment and provided names of other noted sources. Shad Kāne and Poni Kamauʻu provided the following comments about the project site.

Shad Kāne (2003) stated the following:

> *I realized that you were referring to the area referred to in oral traditions as "Pūkaua". There are oral traditions that refer to this place. There are also numerous ancient rock walls that appear to have been altered during the cattle era. There are also two burial sites that I am aware of in close proximity to the water tank. The construction needs to stay within the previous disturbed area or footprint and (development) should be okay.*

Pūkaua has two definitions, the first refers to a war leader, general, or champion. The other definition of pūkaua is artillery. The following is excerpt from the *Honolulu Advertiser* recorded in *Sites of Oʻahu*:

> *History recalls that on one of his visits to Hawaii Capt. Barber and his good ship Arthur became shipwrecked on reed near Pearl Harbor. His crew of 22 men was saved, six were drowned. Hawaiian hospitality overwhelmed them and some time was*

> *spent there. Later King Kamehameha salvaged a dozen brass cannon from the wreck of the Arthur and mounted them. Capt. Barber arriving unexpectedly two years later, had two kegs of gunpowder for the cannon. A sharp bargain was driven by the Hawaiian king and the swap was made. Barber admitted he was worsted in the trade.*
>
> *Honolulu Advertiser, Feb 18, 1939*

An article speaking of the same incident was written later that year and similar accounts are retold with a slight variation:

> *At the end of 1802 he sailed for China and again called at Honolulu. He took the opportunity to visit Kamehameha at Lahaina on Maui, and saw that that king had a battery of ten guns placed for the defense of his new palace with its brick walls and glazed windows. Barber learned that these had been recovered from the wreck of the brig Arthur near Barber's Point, and he asked the King to return them, but Kamehameha refused.*
>
> *The king's divers had brought the guns up from the bottom with great difficulty and the king had them for six years. He wouldn't be convinced that the original owner who had left them derelict, had any right to them. Possession was nine parts of the law.*
>
> *Nor would he listen to Barber's suggestion that his possession of the guns entitled the captain to "most-favored individual" treatment. He wanted gunpowder that Barber had on the Unicorn, however, for his planned expedition against Kauai and Niihau, and refused to exchange provisions for anything but powder. Barber had to accept; Kamehameha got the powder and kept the cannon, and Barber got only the supplies.*
>
> *Laselle Gilman*
> *Honolulu Advertiser, July 2, 1939*

When asked about the area of study, Poni Kamauʻu (2003), a recognized historian, shared experiences about the area of Pūkaua. According to Mr. Kamauʻu, many burial sites exist in the area of Pūkaua as well as areas that have already been developed such as Koʻ Olina and Kapolei. He recalls hearing of one or two of the existing water tanks being built over a Hawaiian burial site. Most of Kalaeloa and Kapolei are prime spots for the Hawaiian spirits to "lele" or leap to the next world, which may explain why so many burial sites can be found on this side of the island. A few Hawaiians today still go out to the leeward coast to speak to their kūpuna (elders).

Kamukila Campbell, the wife of Mr. James Campbell told Mr. Kamauʻu many stories about the valley that the site is located within. Mrs. Campbell informed Mr. Kamauʻu of the many kiʻi pōhaku (petroglyphs) that point the way to the kilo (stargazing sites, also a reader of omens). The kilo site provides a way for the people on earth to communicate with the heaven and the sky above. When the *kilo* stones are aligned properly, four winds are said to

appear over the kilo site. As Mr. Kamauʻu stood at the kilo site, he realized the alignment of the stones acted as a compass. Interestingly, Mr. Kamauʻu experienced the same type of kilo practice in Kawaihae on the Big Island of Hawaiʻi.

Makakilo has been a common place for Hawaiian astronomy, hence, the name Makakilo (the observing eyes). Coincidentally, Makakilo is also known to be closely watched and guarded by the eyes of a demigod that takes the form of a pueo (owl).

Along the highway from Pūkaua through Nānākuli, Mr. Kamauʻu recounts a story of a white dog with reddish eyes (said to be Poki, the pet dog of Pele), whose size is comparable to an automobile. In times of danger, Poki would block the road to restrict people from entering the danger zone. When Pele's sister, Kapo would visit Oʻahu, this white dog would take the form of clouds and represent her lei, which is how Kapolei acquired its name.

Written in the mid 1960's, a woman by the name of Hōkūlani Meatoga wrote a song for Caroline Kekoa speaking about the hospitality of the Kekoa family as well as the beauty of Makakilo and its neighboring districts. She also makes reference to Barbers Point and its reputation of hosting sailors:

Aloha kuʻu home aʻo Makakilo
Aia i ka nani aʻo Makakilo

Kaulana kou inoa aʻo Barber's Point
Home hoʻokipa mau ia no ka selamoku

Hoʻihoʻi ke aloha aʻo Makakilo
Home hoʻokipa mau ia no ka malihini

Huli aku mākou iā kou nani
A ʻike i ka nani o ke kuahiwi

Haʻina ʻia mai ana ka puana
Hoʻihoʻi ke aloha aʻo Makakilo

Loved is my home at Makakilo
There in the beauty of Makakilo

Famous is your name, Barber's Point,
The home that always welcomes sailors.

Let love return to Makakilo,
The home that always welcomes the visitor.

We turn towards your loveliness
And see the beauty of the mountains.

The story is told
Let love return to Makakilo.

Potential Impacts and Mitigation Measures

The Kalaeloa area is very rich in natural resources and was once very populated. Many walkways which provided access to Nānākuli and Waiʻanae are still clearly visible. Kalaeloa, or Barbers Point is a sacred area and culturally important to Native Hawaiians. It is considered an ideal place for the spirits to transition from one life to the next.

During a site visit, Mr. Kāne pointed out that the rocks that are situated above, which may also be cut away to create a larger pad depending on the final design and size of the new reservoir, should be monitored carefully or avoided if possible. The positioning of the boulders indicate a possibility of a "cave", in which remains are often stored.

In light of both Mr. Shad Kāne and Poni Kamauʻu's comments, an archaeological survey of the site and surrounding area was conducted (see Section 3.2.1). No burials were found during the survey. To ensure that any ancient burial sites that may be discovered during construction are left undisturbed, the Board of Water Supply and its contractors will comply with all State and County laws and rules regarding the preservation of archaeological and historic sites. Should historic remains such as artifacts, burials, concentrations of shell or charcoal be encountered during the construction activities, work will cease immediately in the immediate vicinity of the find and the find will be protected from further damage. The contractor shall immediately contact the State Historic Preservation Division, which will assess the significance of the find and recommend appropriate mitigation measures, if necessary.

3.2.3 Traffic and Circulation

The site is currently accessed by a paved access road that branches off from Farrington Highway. No road improvements, except for in the direct vicinity of the new reservoir, will be required.

Potential Impacts and Mitigation Measures

In their pre-consultation letter, the State Department of Transportation stated: "The project is not anticipated to significantly impact our State transportation facilities." Appendix E contains a copy of this pre-consultation comment letter.

During the construction period, transporting equipment and material, as well as hauling away excess dirt or fill material, may cause some temporary inconveniences on Farrington Highway. Best Management Practices will be utilized to mitigate tracking of mud/dirt onto City or State streets. A traffic control plan will be prepared during the design phase of the project to minimize disruptions and inconveniences to the public using Farrington Highway.

This temporary impact, although not significant, will be properly mitigated by limiting the hauling and transportation of construction equipment and materials to off-peak traffic hours, as well as using flagmen to ensure smooth traffic flow along Farrington Highway.

3.2.4 Air Quality

The 'Ewa Plains area is not exposed to adverse air quality conditions. There are no point sources of airborne emissions in the immediate vicinity of the project site. The vehicular traffic on Farrington Highway and the H-1 Freeway is the primary source of indirect emissions in the area. The air quality in the area is generally good and is considered to be well within the State and Federal Ambient Air Quality Standards.

Potential Impacts and Mitigation Measures

It is anticipated that no State or Federal air quality standards will be violated during or after the construction of the Barbers Point 215' Non-potable Reservoir No. 2. The only anticipated issues related to air quality would be during the actual construction of the reservoir; however, construction activities, such as site clearing and grading, would be temporary. Long-term negative impacts related to air quality are not expected.

An effective dust control plan will be implemented as necessary. All construction activities will comply with the provisions of Chapter 11-60.1, Hawaii Administrative Rules, Section 11-60.1-33, Fugitive Dust. Measures to control dust during various phases of construction include:

- Providing an adequate water source at the site prior to start-up of construction activities.
- Irrigating the construction site during periods of drought or high winds.
- Landscaping and rapid covering of bare areas, including slopes, starting from the initial grading phase.
- Disturbing only the areas of construction that are in the immediate zone of construction to limit the amount of time that the areas will be subject to erosion.
- Providing adequate dust control measures during weekends, after hours, and before daily start-up of construction activities.
- Installing silt screening in the areas of disturbance.

3.2.5 Noise

Since the reservoir site is in an open area, there are no significant fixed noise generators in the vicinity. Background noise in the area can be primarily attributed to vehicular traffic from the H-1 and Farrington Highway.

Potential Impacts and Mitigation Measures

Potential impacts to the acoustic environment of the site and neighboring properties will primarily relate to construction activity noise, which will be temporary and confined to the

period of construction.

All construction activities will comply with the Administrative Rules of the Department of Health (DOH), Chapter 11-46, Community Noise Control. Proper mitigating measures will be employed to minimize construction-related noise and comply with all Federal and State noise control regulations. Increased noise activity due to construction will be limited to daytime hours and persist only during the construction period. When construction noise exceeds, or is expected to exceed, the DOH's allowable limits, a permit will be obtained from the DOH. Specific permit restrictions for construction activities are:

- No permit shall allow any construction activities that emit noise in excess of the maximum permissible sound levels before 7:00 a.m. and after 6:00 p.m. of the same day, Monday through Friday.
- No permit shall allow any construction activities that emit noise in excess of the maximum permissible sound levels before 9:00 a.m. and after 6:00 p.m. on Saturday.
- No permit shall allow any construction activities that would emit noise in excess of the maximum permissible sound levels on Sundays and holidays.

The use of pile drivers, hoe rams, jack hammers 25 lbs. or larger, and high-pressure sprayers are not expected to be needed, but if required, will be restricted to 8:00 a.m. to 5:30 p.m., Monday through Friday. Construction equipment and on-site vehicles or devices requiring an exhaust of gas or air must be equipped with mufflers. In addition, construction vehicles must satisfy the DOH's vehicle noise requirements.

3.2.6 Visual Resources

The Barbers Point 215′ Non-potable Reservoir No. 2 site is visible from Farrington Highway and the H-1 Freeway. A sheer, rocky face approximately 30 feet high borders the northern edge of the site, obscuring any significant mauka views of the Wai'anae Mountain Range from the site. The mauka view plane is also characterized by dry scrub vegetation and sparsely distributed trees.

Potential Impacts and Mitigation Measures

The Barbers Point 215′ Non-potable Reservoir No. 2 will not affect any scenic vistas and view planes identified in County or State plans or studies. There will be a minimal affect on the visual characteristics in the vicinity of the reservoir site. The visual impact from the Barbers Point 215′ Non-potable Reservoir No. 2 will be minimized by the existing topography and vegetation in the area as well as design considerations. The finished floor elevation of the new reservoir will be slightly above grade and the reservoir structure will rise up to approximately 22 feet above this finished floor elevation. To construct a new reservoir on the existing pad without creating a tall structure that is highly visible from nearby roadways, the Board of Water Supply is considering a wider reservoir structure, which may involve cutting into the steep, rocky face along the northern edge of the site. This design would result in a far less visible structure than if BWS were to construct a taller tank on the existing pad. Computer-generated renderings showing the potential visual impact of the new reservoir are

presented in Figure 10.

The new reservoir will be painted a light-brown or tan color as appropriate. Trees such as Geranium-leaf Aralia—which can grow up to 20 feet—could be used to shield the view of both reservoirs from Farrington Highway. A small berm with an approximate height of four feet bordering the eastern and southern boundary of the site would also mitigate the visual impact.

3.2.7 Social and Economic Impacts

3.2.7.1 Kapolei Community Profile

Historically, the ʻEwa Plain has been a primary location for the island's agricultural resources. However, with the exit of the sugar industry, the region has emerged as the focus for new residential, commercial, and industrial development, with an emphasis on creating a master-planned urban community in which residents can live, work, attend school, and play.

Kapolei has increased its population by more than 60 percent to 69,000 people since 1990, according to the 2000 U.S. Census. The residential population is expected to increase another 40 percent to nearly 97,000 by 2010 (City and County of Honolulu Department of Planning and Permitting, 2002). Communities in the Kapolei region include, Coconut Plantation, ʻEwa by Gentry, ʻIwalani, Kai Lani, Kapolei Knolls, Kumulani, Ocean Pointe, and the Villages of Kapolei, including Department of Hawaiian Homelands developments.

Potential Impacts and Mitigation Measures

The Barbers Point 215' Non-potable Reservoir No. 2 is expected to benefit the community by ensuring an adequate and reliable supply of water resources necessary for the continued growth and expansion of Kapolei as Oʻahu's second urban center. The Barbers Point 215' Non-potable Reservoir No. 2 is not expected to have any long term adverse effects on the social characteristics of the communities within the Kapolei area.

3.2.7.2 Economic Impacts

Since the exit of sugar from the ʻEwa Plain, the region's economy has shifted from agriculture to residential and commercial uses. To protect certain agricultural lands for continued use by independent farmers, portions of the ʻEwa Plain have been set aside for diversified agricultural use.

The City of Kapolei and surrounding communities have been the focus of economic activity on the ʻEwa Plain. The Kapolei region now encompasses: 1) the state's largest industrial park, 2) the state's second-busiest commercial harbor, 3) a business park, 4) a vacation resort area, 5) residential areas, and 6) extensive telecommunications infrastructure. In the greater Kapolei region, nearly 500 businesses provide nearly 15,000 jobs, a 31 percent increase since 1990. There are approximately 140 businesses accounting for 5,000 jobs within the City of

1a. View of the existing reservoir from near Honokai Hale.

1b. View of the existing and proposed reservoir from near Honokai Hale.

1c. View of the existing and proposed reservoir with landscaped berm from near Honokai Hale.

2a. View of the existing reservoir from H1 Freeway.

2b. View of the existing and proposed reservoir from H1 Freeway.

2c. View of the existing and proposed reservoir with landscaped berm from H1 Freeway.

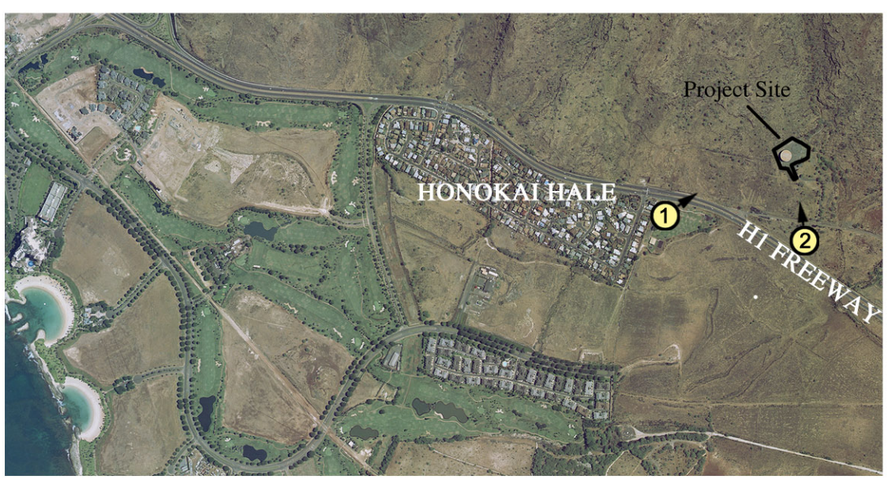


Figure 10
Visual Impacts
Barbers Point
215' Non-potable Reservoir No. 2
Board of Water Supply
'Ewa, O'ahu

PBR HAWAII
& ASSOCIATES, INC.

Kapolei.

Potential Impacts and Mitigation Measures

The construction of the new reservoir is anticipated to positively impact the economy of the ʻEwa region and the State. Ensuring an adequate and reliable supply of water resources is critical to the Kapolei region. Recycled non-potable water serves the water needs of a wide range of businesses, including golf course and landscaping irrigation, industrial cleaning, and the production of steam used in oil processing. Reclaimed water is actually more valuable to agricultural operations than potable water because of its higher nutrient content.

Expansion of the Honouliuli Recycled Water System and increased use of non-potable water for appropriate industrial and irrigation activities will provide economic benefits for ʻEwa residents by reducing the need to drill costly new water wells and keeping potable water rates affordable. Sale of non-potable water to private users also generates income for the Board of Water Supply.

The construction of the new reservoir will provide short term benefits through increased employment opportunities in the construction industry. It will also benefit material suppliers, both in retail and service sectors.

3.2.8 Infrastructure

3.2.8.1 Non-potable Water System

The Honouliuli Recycled Water System. The Honouliuli Water Recycling Facility currently has a capacity of 12 MGD and produces two grades of recycled water: R-1 water is used for irrigation and Reverse Osmosis is used for industrial uses. Both types of recycled water begin with secondary treated effluent from the Honouliuli Wastewater Treatment Plant. The Honouliuli Water Recycling Facility is currently capable of producing up to 10 MGD of R-1 water, which is the highest level of treatment designated by the Hawaiʻi Department of Health. R-1 water is currently used throughout the State of Hawaiʻi for golf course irrigation, landscaping, and agriculture. Reverse Osmosis water is intended strictly for industrial uses such as boiler feed water, cooling tower make-up water, and process water for refineries. The facility currently has a Reverse Osmosis capacity of 2.0 MGD.

Existing Barbers Point 215ʼ Non-potable Water System. The existing Barbers Point 215ʼ Non-potable Reservoir No. 1 (formerly known as the West Beach Reservoir) is supplied by two onsite brackish wells and has a storage capacity of 1.5 MG. The system was dedicated to the BWS for operation and maintenance, and the water allocation is managed by the Koʻ Olina Resort. The wells are identified as Well Number 2006-14 and Well Number 2006-15 and are operated under Water Use Permit No. 82. The wells are part of the ʻEwa-Kunia Water Management Area. The permitted withdrawal rate is not to exceed 1.0 MGD, based on a twelve-month moving average. Each pump is capable of pumping about 1.0 MGD. The chloride levels in these wells typically range from about 325 to 350 mg/L.

The existing Barbers Point 215′ Non-potable Reservoir No. 1 is connected to a transmission system that supports roadway and selected common area landscaping within the Ko‘Olina resort area. A 24-inch transmission main conveys water from the reservoir to Farrington Highway. A 16-inch main then heads west along Farrington Highway. The main is further reduced in the Ko‘Olina area to 16-inch and 12-inch mains, with 8-inch stub-outs at each of the connecting roads. The Ko‘Olina Resort and golf course are currently being irrigated by this non-potable system.

Potential Impacts and Mitigation Measures

When completed, the new reservoir will increase the storage capacity of the Honouliuli Recycled Water System to meet existing and projected requirements and will enhance the Honolulu Board of Water Supply's capability to provide water service to the ‘Ewa area. The new Barbers Point 215' Non-potable Reservoir No. 2 will be used to supply water for agricultural, industrial, and urban irrigation uses. By utilizing non-potable water for appropriate uses, potable water resources can be conserved and used for public consumption.

3.2.8.2 Wastewater Facilities

The Honouliuli Wastewater Treatment Plant, run by the City and County of Honolulu, provides wastewater treatment for the ‘Ewa district. The service area of the plant encompasses a total area of approximately 76,000 acres and ranges from Red Hill along its eastern boundary up to Mililani on its northern boundary, and extends to Makakilo, Honokai Hale, and Ko‘Olina on its western boundary. All residential, commercial, industrial, and agricultural areas within these boundaries are included in the service area except for Pearl Harbor and Campbell Industrial Park.

Recycled water for the ‘Ewa Water Recycling Program comes from the Honouliuli Wastewater Treatment Plant. Currently, the Honouliuli Wastewater Treatment Plant has the capacity to treat 38 MGD of sewage. Treated effluent is either discharged through a 78-inch diameter deep ocean outfall or recycled at the Honouliuli Water Recycling Facility. As the growth of the ‘Ewa and Central Oahu districts continues, there are plans to expand the Honouliuli Wastewater Treatment Plant to an ultimate treatment capacity of 51 MGD by the year 2020 (R.M. Towill Corporation, 2004).

The reservoir site is not serviced by the ‘Ewa sewer system and has no permanent on-site structures that produce wastewater.

Potential Impacts and Mitigation Measures

The new reservoir will provide greater storage of recycled water from the Honouliuli Wastewater Recycling Facility, which is supplied by the Honouliuli Wastewater Treatment Plant.

3.2.8.3 Drainage Facilities

According to the Flood Insurance Rate Maps (FIRM) date September 28, 1990, the site is located within Zone D (Flood Hazard Undetermined). The nearest natural drainage is Pālailai Gulch. During construction of the existing non-potable reservoir, an abandoned irrigation ditch that passed through the site was removed and backfilled.

Two swales rim the mauka portion of the site at the bottom and the top of the cut slopes. The swales direct flows to the makai edge of the site. The access road is bordered by swales directing drainage flows toward Farrington Highway.

The existing reservoir includes a 16-inch overflow and 16-inch washout drain line that combine to an 18-inch drain line directed to an offsite intermittent stream (tributary to Pālailai Gulch). A 10-foot easement in favor of the BWS is provided for this offsite drain line. Pump No. 2 has a 6-inch flow control line that discharges into this drain system.

Pump No. 1 has a 6-inch flow control line that discharges to the swale on the east side of the access road, which leads to the swale along Farrington Highway, which discharges to Pālailai Gulch.

Potential Impacts and Mitigation Measures

The new reservoir will tie into the existing drainage system. The existing drainage system is adequate to facilitate disposal of both on-site and off-site storm runoff as well as overflow and washout from normal reservoir operations. The existing drainage system to Pālailai Gulch will be modified to accommodate the new reservoir. The existing drain line alignment will be relocated and extended along the southern perimeter of the new reservoir. This relocated and extended drain line will connect to the drain line which is tributary to Pālailai Gulch. The existing drain line was designed and intended to accommodate flows from the existing reservoir and a potential future reservoir.

Depending on the size of the new reservoir, the existing drain line may need to be enlarged. The estimated runoff to be generated by the Barbers Point 215′ Non-potable Reservoir No. 2 is 1.35 cubic feet per second (cfs). The adequate size of the drain line, approximate length of the necessary flow easement for discharge of storm runoff, and reservoir blow off/over flow waters shall be determined during the design process.

The placement of the new reservoir will likely require revisions to the alignment of piping systems connected to the existing reservoir: 1) overflow and washout drain lines; 2) transmission lines to Ko′Olina; and 3) feed lines from the well pumps. To accommodate the new reservoir the non-potable water and drain pipe alignments and stubouts will be relocated.

BWS will: 1) minimize discharges to state waters to the maximum extent practicable; 2) implement or supplement BMPs as needed to improve the quality of discharges to state

waters; 3) reduce the risk of discharges to state waters; and 4) reduce contamination of R-1 water after is it produced. An NPDES General Permit authorizing Occasional or Unintentional Discharges from Recycled Water Systems will be necessary as per the requirements of Chapter 11-55, Appendix J, Hawai'i Administrative Rules. Additionally, an NPDES General Permit authorizing discharges of hydrotesting waters will be required. Depending on the size of the new reservoir, an NPDES General Permit for discharges composed entirely of storm water runoff associated with construction activities may be required.

3.2.8.4 Electrical and Communication Utilities

The reservoir site has electrical and telephone service for its Supervisory Control and Data Acquisition (SCADA) system and for the reservoir pumps.

Potential Impacts and Mitigation Measures

Depending on the size of the new reservoir, new electrical lines and/or rerouting of existing lines may be required and shall be determined during the design process. However, the new reservoir project is not anticipated to have any impact on electrical or communication utilities.

3.2.9 Solid Waste Disposal

Solid waste collection is provided by the City and County of Honolulu on a twice weekly basis. Refuse is collected and transported to the H-POWER plant or Waimānalo Gulch Landfill for final disposal.

Potential Impacts and Mitigation Measures

The need for refuse collection and solid waste disposal services during construction will be handled by a private refuse collection company. There is no anticipated long-term impact on solid waste disposal services from the construction of the new reservoir. Once the construction of the reservoir is completed, solid waste is not expected to be generated.

3.2.10 Public Services

3.2.10.1 Schools

There are a number of schools in the Kapolei area. These include, Barbers Point Elementary School, Kapolei Elementary, Middle, and High Schools, Kapolei Seagull School, Makakilo Elementary School, and Mauka Lani Elementary School.

Potential Impacts and Mitigation Measures

The new reservoir is not anticipated to increase the need for or have any impact on schools in

the Kapolei area.

3.2.10.2 Recreation Facilities

The nearest recreation facilities to the reservoir site are located within the adjacent residential communities. Parks within the Makakilo and Kapolei areas include, Kamokila Park, Mauka Lani Community Park, Mauka Lani Neighborhood Park, Makakilo Park, and Kapolei Regional Park.

The ʻEwa Plains area is also home to many golf courses. There are eight courses in the Kapolei area - Barbers Point, Coral Creek, ʻEwa Villages (municipal), Hawaʻi Prince, Kapolei, Koʻ Olina, New ʻEwa Beach, and West Loch (municipal). The nearest golf course, Koʻ Olina, is approximately 1.4 miles from the site.

Potential Impacts and Mitigation Measures

The new reservoir is expected to have a positive impact on recreation facilities in the Kapolei area by increasing the storage capacity and reliability of non-potable water resources used for irrigation of landscaped areas and golf courses.

In their pre-consultation letter the City and County of Honolulu Department of Parks and Recreation stated, in part: "…the proposed project will not impact any program or facility of the department…" Appendix E contains a copy of this letter.

3.2.10.3 Police and Fire Protection

The nearest police station to the reservoir site is in Kapolei, located approximately 1.5 miles away. Fire protection for the area is supplied by stations located in Kapolei and Makakilo, located approximately two miles and four miles away, respectively.

Potential Impacts and Mitigation Measures

After construction, the Barbers Point 215' Non-Potable Reservoir No. 2 is not expected to increase the need for police or fire protection services. In their pre-consultation letter the Police Department stated: "This project should have no significant impact on the facilities or operation of the Honolulu Police Department." Appendix E contains a copy of this letter.

The reservoir will be constructed in conformance with the 1997 Uniform Fire Code. In their comment letter on the Draft EA, the Honolulu Fire Department stated that fire apparatus access must be maintained throughout the construction site and access to fire hydrants must be maintained. The Honolulu Fire Department will be notified regarding any interruption of the existing fire hydrant system. Appendix F contains a copy of the Honolulu Fire Department's letter.

3.2.10.4 Health Care Services

There are many medical facilities throughout the City and County of Honolulu. Health care on O'ahu is provided by various general hospitals. Health care facilities for in-patient medical care include 29 hospitals of various types, including acute and long-term facilities, 16 skilled nursing facilities and intermediate care facilities, and 261 care homes. Eight acute care hospitals are operated directly by the state government and one by the federal government; 12 are nonprofit community hospitals. There are 7,651 beds available for general, acute, and other care services. Most other medical institutions are privately owned.

The major medical facility in the vicinity of the reservoir site is the Saint Francis West Medical Center, located between Waipahu and 'Ewa. Other facilities in the area include Kahi Mohala Behavioral Healthcare Facility near the Saint Francis West Medical Center, the 'Ewa Hospital located in 'Ewa, and the Kaiser Pūnāwai Clinic in Waipahu.

Potential Impacts and Mitigation Measures

The new reservoir is not expected to increase the need for health care services.

4.0 LAND USE CONFORMANCE

4.1 STATE OF HAWAIʻI

4.1.1 State Land Use Law (Chapter 205, Hawaiʻi Revised Statutes)

The State Land Use Law (Chapter 205, Hawaiʻi Revised Statutes), establishes the State Land Use Commission (LUC) and gives this body the authority to designate all lands in the State into one of four districts: Urban, Rural, Agricultural, or Conservation. The majority of the site for the Barbers Point 215' Non-potable Reservoir No. 2 is located within the State Agricultural District (Figure 3). If necessary to accommodate the larger reservoir without increasing its height, the BWS may be required to extend the site into a portion of the surrounding parcels which are within the Urban District. Reservoirs are permitted uses within both the Agricultural and Urban Districts.

4.2 CITY AND COUNTY OF HONOLULU

Relevant land use plans of the City and County of Honolulu that pertain to the proposed reservoir include the General Plan and the ʻEwa Development Plan.

4.2.1 General Plan

As required by the City Charter, the General Plan for the City and County of Honolulu serves two purposes. The first is a statement of the long-range social, economic, environmental, and design objectives for the general welfare and prosperity of the people of Oʻahu. Second, the General Plan is a statement of broad policies that facilitate the attainment of the objectives of the plan.

The new reservoir is in accordance with the following General Plan policies:

> Policy II. Economic Activity
> Objective C, Policy 8: *Encourage the more efficient use of non-potable water for agricultural use.*
>
> Policy V. Transportation and Utilities
> Objective B, Policy 1: *Develop and maintain an adequate supply of water for residents and visitors.*
>
> Objective B, Policy 2: *Develop and maintain an adequate supply of water for agricultural and industrial needs.*
>
> Objective B, Policy 3: *Encourage the development of new technology which will reduce the cost of providing water and the cost of waste disposal.*

Objective B, Policy 6: *Support programs to recover resources from solid-waste and recycled wastewater.*

Discussion: The new reservoir conforms to many objectives of the General Plan. In particular, the construction of the reservoir will implement the General Plan objectives related to the provision of public utilities. The Barbers Point 215' Non-potable Reservoir No. 2 will expand the storage capacity of the Board of Water Supply's existing recycled water system and help to ensure an adequate supply of non-potable water for agricultural, industrial, and urban irrigation uses. Construction of the reservoir also meets the objectives of developing new technology to reduce the cost of providing water and to support programs to recycle wastewater. Improvement and expansion of these technologies and programs addresses the objective to develop and maintain an adequate supply of water for residents and visitors. By expanding the use of non-potable water for appropriate agricultural, industrial, and urban irrigation uses, the Board of Water Supply will be better able to ensure an adequate supply of potable water.

4.2.2 'Ewa Development Plan

The City and County Sustainable Communities and Development Plans (SCPs and DPs) represent eight geographic regions that include all areas of O'ahu. The site for the Barbers Point 215' Non-potable Reservoir No. 2 is located in the area designated as 'Ewa. The corresponding plan for this area is the 'Ewa Development Plan. Pertinent sections applicable to the new reservoir include the following:

Section 2. THE VISION FOR 'EWA'S FUTURE

2.2 KEY ELEMENTS OF THE VISION

2.2.8. CONSERVATION OF NATURAL RESOURCES

'Ewa Natural Resources, including potable water, coastal water quality, and wetlands and other wildlife habitat, will be conserved by:

X *Developing a dual water distribution system with potable water for drinking and other clean water uses and non-potable water for irrigation and industrial use;*

Section 4. PUBLIC FACILITIES AND INFRASTRUCTURE POLICIES AND PRINCIPLES

4.2 WATER ALLOCATION AND SYSTEM DEVELOPMENT

4.2.1 GENERAL POLICIES

X ***Use of Non-potable Water.*** *An adequate supply of non-potable water should be developed for irrigation and other suitable uses on the 'Ewa*

Plain in order to conserve the supply of potable water and to take advantage of dual water systems constructed by 'Ewa developers.

Section 5. IMPLEMENTATION

5.1 PHASING AND DEVELOPMENT

5.1.2 PUBLIC FACILITY INVESTMENT PRIORITIES

Significant Capital Projects of the highest priority for the 'Ewa Development Plan *are:*

X *New potable and non-potable water sources.*

X *Expanded wastewater treatment plant capacity, and reclamation of effluent from the Honouliuli Wastewater Plant for non-potable water uses.*

Discussion: In the 'Ewa Development Plan, the Board of Water Supply estimates the long-term demand for non-potable water for existing and new urban irrigation and other urban purposes to be approximately 26 MGD. Agricultural demand for non-potable water for agricultural land in 'Ewa protected from development by the Urban Growth Boundary of the 'Ewa Development Plan could be as much as 10 MGD.

To meet this demand, the 'Ewa Development Plan places a priority on expanding the existing recycled water system and developing a greater supply of non-potable water. The new reservoir is in accord with this priority. The Barbers Point 215' Non-potable Reservoir No. 2 will expand the storage capacity of the Board of Water Supply's Honouliuli Recycled Water System and help to ensure an adequate supply of non-potable water for agricultural, industrial, and urban irrigation uses.

By expanding the use of non-potable water for appropriate agricultural, urban irrigation, and industrial uses, the Board of Water Supply will also meet the conservation objectives and policies established in the 'Ewa Development Plan to conserve potable water resources by: 1) developing a dual water system, 2) using non-potable water for irrigation and other industrial uses, and 3) reserving potable water for drinking and other clean water needs.

In their pre-consultation letter, the Department of Planning and Permitting (DPP) noted that the 'Ewa Development Plan's Urban Land Use Map applies a conceptual designation of "Golf Course" to the reservoir site. However, plans for the Makaīwa Hills project no longer include a golf course. Thus, DPP plans to recommend changing this designation to "Agricultural and Preservation Area" during their ongoing 'Ewa DP Five-Year Review process. Appendix E contains a copy of this pre-consultation comment letter.

DPP also notes that the reservoir will need to be reflected on the 'Ewa Public Infrastructure Map as a new "water reservoir" project. As necessary an application for revisions to the Public Infrastructure Maps will be submitted to the DPP to reflect the new reservoir.

4.2.3 Land Use Ordinance

The Land Use Ordinance (LUO) is the City and County of Honolulu's zoning ordinance. Besides zoning regulations, the LUO contains ordinances regulating the use of land and regulations intended to ensure that adequate controls and review mechanisms are in place for proposed land uses.

The Barbers Point 215' Non-potable Reservoir No. 2 site is in an area zoned General Agricultural District (AG-2) (Figure 5). The purpose of the General Agricultural District is to conserve and protect agricultural activities on smaller parcels of land.

Discussion: The Barbers Point 215' Non-potable Reservoir project is classified as Public Uses and Structures, which is considered a permissible use of AG-2 land. Although the site is zoned for agriculture, it is not suited for agricultural uses because of the slope and the rocky condition of the soil.

4.2.4 County Special Management Area

The Barbers Point 215′ Non-potable Reservoir No. 2 site is not within the City and County of Honolulu's Special Management Area (SMA).

4.3 APPROVALS AND PERMITS

Table 2 provides an approximate list of approvals and permits required for the implementation of the new reservoir.

Table 2. Anticipated Required Permits and Approvals

Permit	Approving Agencies	Approximate Processing Time
NPDES: Hydrotesting Permit	Department of Health, Clean Water Branch State of Hawai'i	60-90 days
NPDES: Storm Water Runoff Associated with Construction Activity Permit	Department of Health, Clean Water Branch State of Hawai'i	60-90 days
NPDES: Occasional or Unintentional Discharges from Recycled Water Systems Permit	Department of Health, Clean Water Branch State of Hawai'i	60-90 days
Community Noise Permit	Department of Health State of Hawai'i	
Building Permit	Department of Planning and Permitting City and County of Honolulu	30-45 days
Grubbing, Grading, and Stockpiling Permit	Department of Planning and Permitting City and County of Honolulu	
Traffic Control Plan	Department of Planning and Permitting City and County of Honolulu	
Revision of the Public Infrastructure Maps	Department of Planning and Permitting City and County of Honolulu	
Conditional Use Permit for "joint development"[1]	Department of Planning and Permitting City and County of Honolulu	45 days

1 Only required if the project site includes TMK 9-1-15: 05 (portion) and/or TMK 9-2-03: 2 (portion).

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5.0 ALTERNATIVES

In compliance with the provisions of Title 11, Department of Health, Chapter 200, Environmental Impact Statement Rules, Section 11-200-17(f), an environmental assessment must discuss potential alternatives to the proposed action.

5.1 NO ACTION

The no action alternative means that a new non-potable water reservoir will not be constructed. As the population and concentration of new industries in the area increases, the existing water storage capacity will become inadequate and unreliable for residential uses, fire protection, urban irrigation, other urban uses, and agricultural uses. Groundwater resources (including non-potable, brackish water) and potable water will likely continue to be utilized for non-potable water appropriate uses. This alternative is unacceptable, since water supply and conservation issues will not be resolved.

5.2 DELAYED ACTION ALTERNATIVE

The delayed action alternative means that the water reservoir construction would take place at some time in the future. This alternative will postpone the resolution of water storage concerns in the area, creating potential water supply shortages due to inadequate supply. Furthermore, the delay of the water reservoir construction will also result in higher construction costs in the future due to inflation.

5.3 ALTERNATIVE SITES

The Board of Water Supply initially identified three potential locations for the Barbers Point Non-potable Reservoir No. 2. Alternative Site 2 was eliminated based on the minimum criteria (discussed below). Of the two remaining sites, Alternative Site 1 was found to meet all evaluation criteria and had a clear advantage over Alternative Site 3 because of its location adjacent to an existing reservoir. In general, use of Alternative Site 3 would result in higher costs, higher maintenance requirements and greater disruptive drainage and grading impacts to the area.

5.3.1 Alternative Site Evaluation Criteria

The following minimum criteria were established to screen alternative sites prior to the feasibility analysis:

- The location must have sufficient elevation to service the Barbers Point non-potable water system.
- The location must have adequate area to accommodate construction of the new reservoir and support facilities.
- The location must be accessible for operational personnel and equipment.

- Geology at the location must be adequate to support the loads imposed by the reservoir.
- Drainage at the location must be able to handle storm runoff and controlled discharge of reservoir flows without adverse impacts on property and the environment.
- The cost of the new reservoir must be justifiable by its benefit to the BWS recycled water program.

In addition, 10 evaluation categories were created to compare the site alternatives that meet the minimum criteria above. The sites were then evaluated based on these factors to determine their relative feasibility for the proposed project. A brief description of each criterion is presented as follows:

- **Zoning** - The appropriate uses of the site based on County zoning and State land use designation. If zoning changes, variances, or waivers on use restrictions are required, the project could incur additional costs, or the reservoir's operability might be impaired.
- **Geology and Soils** - The ability of the site's geological substrata to provide a stable foundation for the reservoir and the water it will contain.
- **Size** - The available area at the site to accommodate a new reservoir and ancillary facilities, including perimeter and access roads.
- **Grading Requirements and Special Construction Needs** - The existing topography at the site and grading requirements to allow integration of the new reservoir with the existing non-potable water system without excessive excavation or earth movement to the extent that construction costs and/or requirements for special constructions are greatly affected. Special construction needs refer to retaining walls, berms, and any other features or a natural drainage pathway in the area.
- **Accessibility** - The presence or absence of existing access roads to the new reservoir site; their conditions, i.e. paved or unimproved and length.
- **System Integration** - The ability to integrate the proposed reservoir into the existing water system with special emphasis on hydraulics and alignments of influent, effluent, and/or transmission lines.
- **Construction Cost** - The total construction cost estimate of the new reservoir, access road, and ancillary features.
- **Permitting** - The effort required to obtain all applicable permits for construction and operation of the new reservoir.
- **Environmental Factors** - The potential impacts of the new reservoir on the following categories:
  - Archaeological/Historic Resources
  - Flora and Fauna
  - Air and Water Quality
  - Noise
  - Traffic

- Visual Impacts
- Loss of Agricultural Land

5.3.2 Alternative Sites Summary

Upon a preliminary review of the design criteria, it was clear that Alternative Site 1 is not only capable of meeting these criteria, but Alternative Site 1 also has a clear advantage over Alternative Site 3 based on the current use of the site for an existing non-potable reservoir. As part of the construction of Barbers Point Non-potable Reservoir No. 1, Alternative Site 1 was graded to accommodate a future reservoir. Alternative Site 1 also offers the least cost for integration of the new reservoir into the non-potable water system, particularly because the site has existing infrastructure that would need to be constructed at Alternative Site 3. This includes existing grading and infrastructure such as an access road, pump housing, pumps, and transmission mains.

Based on the minimum criteria, Alternative Site 2 was eliminated due to the significant distance from the existing non-potable water system and the prohibitive cost associated with connecting a reservoir from that site to the existing system. Furthermore, Alternative Site 2 may be more appropriate as a site for a future reservoir serving the users in the eastern portion of the 'Ewa Water Recycling Program.

The three alternative sites were presented to the Makakilo/Kapolei/Honokai Hale Neighborhood Board on February 26, 2003 and April 30, 2003. Based on the comparative estimated costs and other factors, the Neighborhood Board unanimously supported Alternative Site 1, under the condition that a cultural assessment of the site be performed. A cultural assessment of the site was performed, the results of which are included in Section 3.2.2 of this environmental assessment.

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6.0 FINDINGS, SUPPORTING REASONS, AND DETERMINATION

To determine whether the Barbers Point 215′ Non-potable Reservoir No. 2 may have a significant impact on the environment, all phases and expected consequences, both primary and secondary, and the cumulative as well as short- and long-term effects have been evaluated. Based on the studies performed and research evaluated, a Finding of No Significant Impact (FONSI) is anticipated as summarized in this section.

6.1 PROBABLE IMPACT, INCLUDING CUMULATIVE IMPACTS

Construction of the new reservoir, which will serve the Honouliuli Recycled Water System and the Ko'Olina Non-potable Water System, will increase the storage capacity and enhance the Honolulu Board of Water Supply's capability to provide water service to the 'Ewa area. Expanded use of non-potable water resources for appropriate agricultural, industrial, and other urban uses will conserve and protect O'ahu's limited natural water resources.

6.2 PROBABLE ADVERSE ENVIRONMENTAL IMPACTS THAT CAN BE AVOIDED

Chapter 3 of this EA elaborates on probable environmental impacts associated with the Barbers Point 215′ Non-potable Reservoir No. 2 and provides proposed mitigation measures. Significant adverse environmental impacts have been avoided.

6.3 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

The Barbers Point 215′ Non-potable Reservoir No. 2 involves irreversible and irretrievable uses of energy, labor, materials, and capital funds by the City and County of Honolulu Board of Water Supply. Construction of the reservoir will increase the storage capacity of the Honouliuli Recycled Water System and increase water supply reliability within the 'Ewa region. Therefore, the use of resources for the construction of the reservoir is justified.

6.4 SIGNIFICANCE CRITERIA

According to the Department of Health Rules (11-200-12), an applicant must determine whether an action may have a significant impact on the environment, its expected consequences, its cumulative impact with other projects, and its short and long-term effects. In making the determination, the Rules establish "Significance Criteria" to be used as a basis for identifying whether significant environmental impacts will occur. According to the Rules, an action shall be determined to have a significant impact on the environment if it meets any one of the following criteria:

1. Involves an irrevocable commitment to loss or destruction of any natural or cultural resources;

The new reservoir will be located on a site that has been determined to have no outstanding vegetative features and no threatened or endangered species. The Hawaiian historians and culture preservationists interviewed regarding the cultural resources of the area recommended that rocks situated above the site, which indicate the possibility of a cave containing human remains, be monitored carefully or avoided if possible during the construction phase. An archaeological survey did not identify any archaeological or historic sites that would be affected by the proposed reservoir.

2. Curtails the range of beneficial uses of the environment;

The new Barbers Point 215′ Non-potable Reservoir No. 2 will not curtail the range of beneficial uses of the environment. The new non-potable reservoir helps to preserve Oahu's potable water resources, allows for the recycling of water, and serves the water needs of a wide range of users.

3. Conflicts with the State's long-term environmental policies or goals and guidelines as expressed in Chapter 344, HRS; and any revisions thereof and amendments thereto, court decisions, or executive orders;

The Environmental Policies established in Chapter 344, HRS and the National Environmental Policy Act espouse conservation of natural resources and enhancement of the quality of life. The new Barbers Point 215' Non-potable Reservoir No. 2 will not significantly impact natural resources due to the relatively small amount of land being used. Additionally, by improving water storage capacity and expanding the use of non-potable water, it will promote general welfare, improve reliability and availability of water in the area, and will enhance the Honolulu Board of Water Supply's capability to provide water service to the 'Ewa region.

4. Substantially affects the economic or social welfare of the community or state;

The new reservoir will positively affect the social welfare of the community and state. The reservoir will provide a valuable resource for future economic and social use by ensuring the water resources necessary for the continued growth and expansion of Kapolei.

5. Substantially affects public health;

The new Barbers Point 215' Non-potable Reservoir No. 2 will improve the reliability of the existing water system and will help to ensure an adequate supply of water for agricultural, industrial, and urban irrigation uses. By utilizing non-potable water for appropriate uses, potable water resources can be conserved and used for public consumption.

6. Involves substantial secondary impacts, such as population changes or effects on public facilities;

The new Barbers Point 215' Non-potable Reservoir No. 2 does not involve substantial secondary impacts. The new reservoir is necessary to increase the storage capacity of the Honouliuli Recycled Water System, which will help to meet the current and future demand non-potable water in the 'Ewa region.

7. Involves a substantial degradation of environmental quality;

The new reservoir will not involve a degradation of environmental quality because mitigation measures, as discussed in this environmental assessment, will prevent significant negative impacts and there are no threatened or endangered species on the site. The reservoir will not result in concentrations of air or water pollutants exceeding State or Federal standards.

8. Is individually limited but cumulatively has considerable effect on the environment, or involves a commitment for larger actions;

The new reservoir is supplemental to the existing public water supply system and does not imply a commitment to further upgrades or additions to the system. The new reservoir will provide a reliable, safe, and efficient non-potable water supply system for the community.

9. Substantially affects a rare, threatened or endangered species;

No threatened or endangered species were found during the Botanical and Avifaunal and Feral Mammal Field Surveys. The Botanical Survey concluded that the new non-potable reservoir is not expected to have a significant negative impact on botanical resources. The Avifaunal and Feral Mammal Field Survey noted because of the small scope of the project, it is not anticipated to have an impact on the relative abundance of birds and mammals in this region of O'ahu.

10. Detrimentally affects air or water quality or ambient noise levels;

There are no significant long term air quality, water quality, or ambient noise impacts anticipated. Short term impacts from construction activity include increased noise levels, dust, and exhaust from construction machinery. Implementation of proper mitigation measures and BMPs such as watering of the site and mufflers for heavy machinery would ensure all compliance requirements. The project will comply with all requirements for construction activities established by City, State, and Federal agencies.

11. Affects or is likely to suffer damage by being located in an environmentally sensitive area, such as a flood plain, tsunami zone, beach, erosion-prone area, geologically hazardous land, estuary, freshwater, or coastal waters;

The new Barbers Point 215′ Non-potable Reservoir No. 2 will not be located in an environmentally sensitive area. As discussed in Chapter 3, the reservoir site is not expected to significantly impact the environment. A soil investigation was conducted before the existing reservoir was built and it was found that the rock formations underlying the site should provide an adequate foundation for both reservoirs.

The reservoir site and lands immediately down slope are uninhabited and will remain vacant for the foreseeable future. In addition, the new reservoir will not provide for human habitation of the site. Therefore, any potential rockfall hazards in the vicinity of the reservoir site do not pose a significant risk to human activity. However, rockfall mitigation, such as a wire/cable mesh, may be installed along the cut slopes located behind the existing and new reservoir to reduce the potential for rockfall occurrences as a result of soil erosion and/or settlement.

12. Substantially affects scenic vistas and view planes identified in county or state plans or studies;

The Barbers Point 215′ Non-potable Reservoir No. 2 will not affect any scenic vistas and view planes identified in county or state plans or studies. There will be a minimal affect on the visual characteristics in the vicinity of the reservoir site. The reservoir will be designed with a wide base to make it lower and flatter and minimize the visual impact. In addition, to mitigate the impact on visual resources of the area, the new reservoir will be painted a light-brown or tan color as appropriate. Trees could be planted on the side of the reservoir facing Farrington Highway. These trees would help screen the reservoir from view. Creating a small berm with an approximate height of four feet bordering the eastern and southern boundary of the site would also mitigate the visual impact.

13. Requires substantial energy consumption.

Construction of the reservoir will not require substantial energy consumption. Electrical energy will be used minimally during construction. Following construction, the operation of the reservoir will require minimal electricity for its Supervisory Control and Data Acquisition system and pumps.

6.5 DETERMINATION

On the basis of the above criteria and the discussion of impacts and mitigation measures contained in this document, it is determined that the Barbers Point 215' Non-potable Reservoir No. 2 will not have significant impacts on the environment. Pursuant to Chapter

343, Hawai'i Revised Statutes, the Approving Agency, the City and County of Honolulu Board of Water Supply, has determined and issued a Finding of No Significant Impact (FONSI).

6.6 REASONS SUPPORTING THE DETERMINATION

The nature and scale of the new reservoir are such that the Approving Agency, the City and County of Honolulu Board of Water Supply, has determined that new reservoir will not have significant environmental impacts. Potential impacts, if any, can be mitigated or minimized through site planning and engineering design, implementation of careful construction methods, and compliance with all governmental requirements, including those of the State Department of Health, the City and County of Honolulu's Department of Design and Construction, and the City and County of Honolulu's Department of Planning and Permitting.

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8.0 PRE-CONSULTATION COMMENT LETTERS

Pre-consultation letters were sent to the following agencies, organizations, and individuals. Where indicated, the agency, organization, or individual submitted comments. All pre-consultation comment letters along with responses are provided in Appendix E.

AGENCY	PRE-CONSULTATION LETTER MAIL DATE	COMMENT DATE
FEDERAL AGENCIES		
U.S. Army Corps of Engineers	7/31/2007	
U.S. Fish and Wildlife Service	7/31/2007	8/31/2007
U.S.D.A. Natural Resources Conservation Service	7/31/2007	8/6/2007
STATE		
Department of Agriculture	7/31/2007	
Department of Business, Economic Development & Tourism	7/31/2007	
Department of Hawaiian Home Lands	7/31/2007	
Land Use Commission	7/31/2007	
Office of Planning	7/31/2007	
Department of Health	7/31/2007	
Department of Health, Environmental Planning Office	7/31/2007	
Department of Land & Natural Resources (DLNR)	7/31/2007	8-21-2007/8-31-2007
DLNR–State Historic Preservation Division	7/31/2007	
Department of Transportation	7/31/2007	8/20/2007
Office of Environmental Quality Control	7/31/2007	
Office of Hawaiian Affairs	7/31/2007	8/22/2007
University of Hawai'i Environmental Center	7/31/2007	
CITY AND COUNTY OF HONOLULU		
Board of Water Supply	7/31/2007	
Todd K. Apo, City Council Member	7/31/2007	
Department of Design and Construction	7/31/2007	8/21/2007
Department of Environmental Services	7/31/2007	
Department of Facility Maintenance	7/31/2007	8/10/2007
Department of Parks and Recreation	7/31/2007	8/13/2007
Department of Planning and Permitting	7/31/2007	8/27/2007
Department of Transportation Services	7/31/2007	8/27/2007
Police Department	7/31/2007	8/9/2007
Fire Department	7/31/2007	8/22/2007
Private Companies, Organizations, and Individuals		
Makakilo/Kapolei/Honokai Hale Neighborhood Board	7/31/2007	
Makaīwa Hills, LLC	7/31/2007	

AGENCY	PRE-CONSULTATION LETTER MAIL DATE	COMMENT DATE
Hawaiian Electric Company	7/31/2007	
Hawaiian Telcom	7/31/2007	
Oceanic/Time Warner Cable	7/31/2007	

9.0 DRAFT ENVIRONMENTAL ASSESSMENT COMMENT AND RESPONSE LETTERS

The Draft Environmental Assessment (EA) was sent to the following agencies, organizations, and individuals. The public comment period on the Draft EA was from December 8, 2007 to January 7, 2008. Where indicated, the agency, organization, or individual submitted comments. All comment letters along with responses are provided in Appendix F.

Agency	Draft EA Mail Date	Comment Received
FEDERAL		
U.S. Army Engineer District	11/29/2007	
U.S. Fish and Wildlife Service Pacific Islands Office	11/29/2007	
USDA-Natural Resources Conservation Service	11/29/2007	12/20/2007
STATE		
Department of Agriculture	11/29/2007	
DBEDT Office of Planning	11/29/2007	
Department of Hawaiian Home Lands	11/29/2007	
Department of Health - Environmental Planning Office	11/29/2007	1/11/2008
Department of Land and Natural Resources	11/29/2007	1/3/2008
Department of Land and Natural Resources-CWRM	11/29/2007	1/14/2008
DLNR State Historic Preservation Division	11/29/2007	
Office of Environmental Quality Control	11/29/2007	
Office of Hawaiian Affairs	11/29/2007	12/19/2007
State Department of Transportation	11/29/2007	
COUNTY		
Board of Water Supply	11/29/2007	
City Councilman Mr. Todd Apo	11/29/2007	
Department of Design & Construction	11/29/2007	12/20/2007
Department of Environmental Services	11/29/2007	
Department of Facility Maintenance	11/29/2007	1/11/2008
Department of Planning & Permitting	11/29/2007	1/2/2008
Department of Transportation Services	11/29/2007	12/28/2007
Police Department	11/29/2007	
Fire Department	11/29/2007	12/28/2007
Private Companies, Organizations, and Individuals		
Makaiwa Hills, LLC	12/14/2007	1/7/2008
Makakilo/Kapolei Neighborhood Board No. 34	11/29/2007	
Kapolei Public Library	11/29/2007	

APPENDIX A

Floral Survey

CHAR & ASSOCIATES
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July 2003

BOTANICAL RESOURCES ASSESSMENT STUDY
BARBER'S POINT 215' NONPOTABLE RESERVOIR, NO. 2
'EWA DISTRICT, O'AHU

INTRODUCTION

The proposed Board of Water Supply's nonpotable reservoir is located at the 215-foot elevation in the Barber's Point/Makakilo area on O'ahu. A paved access road to the reservoir site is also proposed. A portion of the new reservoir will be sited on an already graded, level, gravel-covered area next to an existing reservoir. The remainder of the proposed reservoir site will extend beyond the existing reservoir fence and onto a relatively flat area covered by dense buffelgrass. The lands adjacent to the existing reservoir are used for grazing cattle and horses.

Field studies to assess the botanical resources on the new reservoir site were conducted on 20 June 2003 by two botanists. The primary objectives of the field studies were to:

1) provide a general description of the vegetation on the project site;
2) search for threatened and endangered species as well as species of concern; and
3) identify areas of potential environmental problems or concerns and propose appropriate mitigation measures.

In the field, notes were made on plant associations and distribution, substrate types, disturbances, topography, drainage, etc. The project engineers, planner, Board of Water Supply representative, and archaeological subconsultants accompanied us in the field.

RESULTS

The plant names used in this report follow Wagner et al. (1990) and Wagner and Herbst (1999). The few recent name changes are those reported in the Hawaii Biological Survey series (Evenhuis and Eldredge, editors, 1999-2002).

Vegetation on the disturbed, gravel-covered area next to the existing reservoir is patchy and weedy. Clumps of swollen fingergrass (Chloris barbata) and Natal redtop grass (Melinis repens), 1 to 2 feet tall, and low mats of creeping indigo (Indigofera hendecaphylla) are common to locally abundant. Other plants which occur here in smaller numbers include buffelgrass (Cenchrus ciliaris), Spanish needle (Bidens pilosa), coatbuttons (Tridax procumbens), fuzzy rattlepod (Crotalaria incana), false mallow (Malvastrum coromandelianum), cowpea (Macroptilium latyroides), etc. A few shrubs of koa haole (Leucaena leucocephala), sourbush (Pluchea carolinensis), klu (Acacia farnesiana), and hairy abutilon (Abutilon grandifolium), 1 to 5 feet tall, are found on this area. Small trees of kiawe (Prosopis pallida) and 'opiuma (Pithecellobium dulce) border the edge of this disturbed area. Two native species found here are 'uhaloa (Waltheria indica) and hoary abutilon (Abutilon incanum).

The relatively flat area outside of the chainlink fence was bulldozed at one time. It supports dense clumps of buffelgrass, but in places with thin, stony soils Natal redtop grass, pitted beardgrass (Bothriochloa pertusa), and lovegrass (Eragrostis amabilis) are abundant. Scattered throughout this grassy area are plants of lion's ear (Leonotis nepetifolia), 'uhaloa, hoary abutilon, hairy honohono (Commelina benghalensis), wild cucumber (Cucumis dipsaceus), bristly foxtail (Setaria verticillata), and Spanish needle. The grassy area abuts a shallow gulch. Kiawe trees, 20 to 30 feet tall, and koa haole shrubs line the gulch. Ground cover consists of robust clumps of Guinea grass (Panicum maximum).

Plant cover, especially Guinea grass, is lush and green where a culvert directs runoff into the gulch.

The existing reservoir and the proposed reservoir abut a hillside. This boulder-strewn hillside supports buffelgrass with scattered stands of kiawe trees. Besides 'uhaloa and hoary abutilon, three other native species were observed here; they are 'ilima (Sida fallax), alena (Boerhavia repens), and pili grass (Heteropogon contortus).

One plant of the Hawaiian cotton or ma'o (Gossypium tomentosum) is found at the gated entrance to the existing reservoir. The ma'o is considered a species of concern (U.S. Fish and Wildlife Service 1999a). Species of concern generally means that there is a need for more biological and/or taxonomic information regarding whether a species might need conservation actions in the future. The ma'o, however, is a low priority species of concern as ma'o can be found on all of the main Hawaiian Islands except Hawai'i; it occurs primarily on arid, rocky or clay coastal plains (Wagner et al. 1990). The ma'o will not be affected by the proposed project.

DISCUSSION

A portion of the proposed new reservoir will be located next to an existing reservoir site. This area is disturbed and gravel-covered with scattered patches of weedy species. The rest of the new reservoir site is located on a flat, buffelgrass-covered area; kiawe trees and koa haole shrubs border the site where it abuts a gulch. The vegetation on the project site is dominated by introduced species such as buffelgrass, swollen fingergrass, creeping indigo, kiawe, koa haole, Guinea grass, Natal redtop grass, etc. Introduced species are all those plants which were brought to the Hawaiian Islands by humans, intentionally or accidentally, after Western contact, that is, Cook's arrival in the islands in 1778.

A few native species can be found on or adjacent to the project site. 'Uhaloa

and hoary abutilon occur on the site, while 'ilima, alena, and pili grass are found on the rocky hillside above the project site. One plant of the Hawaiian cotton or ma'o is found by the entrance gate to the existing reservoir outside of the project site. All of the plants with the exception of the ma'o are indigenous, that is, they are native to the islands and elsewhere. The ma'o is endemic, that is, it is native only to the Hawaiian Islands; the ma'o is considered a low priority species of concern. None of the plants found during the field studies is a threatened or endangered species protected by the endangered species' laws (U.S. Fish and Wildlife Service 1999b; Wagner et al. 1999). All of the plants can be found in similar lowland, dry habitats throughout the islands.

Given these findings, the proposed nonpotable reservoir project is not expected to have a significant negative impact on the botanical resources. There are no botanical reasons to impose any restrictions, conditions, or impediments to the proposed use of the site.

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APPENDIX B

Faunal Survey

AVIFAUNAL AND FERAL MAMMAL FIELD SURVEY OF THE BARBERS POINT 215' NON POTABLE RESERVOIR SITE AT MAKAKILO, OAHU

Prepared for :

PBR Hawaii and The Limtiaco Consulting Group

Prepared by:

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25 July 2003

INTRODUCTION

The purpose of this report is to provide the findings of a two day (16, 22 July 2003) field survey of lands involved with the proposed Barber's Point 215' Nonpotable Reservoir site at Makakilo, Oahu (Fig. 1). References to pertinent published and unpublished sources are also given in this report in order to provide a broader perspective of the species known from this region and in this type of habitat on Oahu. The goals of the field survey were:

1- To document the species of birds and mammals on or near this property.

2- To obtain data on the relative abundance of birds at this location

SITE DESCRIPTION

This property is composed primarily of dry grass and patches of introduced trees and brush. A dry streambed occurs near the eastern portion of the site. Makakilo residential property is upslope. The general appearance of this property is dry parkland (grass and scattered trees).

METHODS OF SURVEY

The site and nearby lands were surveyed on foot on two separate days (16, 22 July 2003). Data were obtained during early morning and late afternoon periods when birds are most active. Counts of all species seen or heard were kept in order to estimate a relative abundance for each species. Data on mammals were obtained by visual sightings

and tracks/scats. No trapping of mammals was conducted. The length and nature of this survey did not warrant trapping.

Weather during the survey period ranged from clear to cloudy with easterly winds at 10-15 mph. These conditions made for good visual and auditory detection of birds.

Scientific and common names used in this report follow Pyle (2002) and Honacki et al. (1982).

RESULTS

Native Birds:

No native birds were recorded on the survey. The only likely species that might occur on occasion in this area is the Short-eared Owl or Pueo (*Asio flammeus sandwichensis*). Pueo are listed by the State of Hawaii as endangered on the island of Oahu. They forage in a variety of habitats including grasslands, agricultural fields, and forests (Pratt et al. 1987, Hawaii Audubon Society 1997).

Migratory Birds:

No migratory birds were recorded on the survey. At this time of the year these birds are on their arctic breeding grounds. The only migratory bird that might be seen along the road leading into the property is the Pacific Golden-Plover (*Pluvialis fulva*). The bird is called Kolea in Hawaiian. It is the most abundant migrant to Hawaii. They

winter here between August and late April. Extensive long-term studies have documented many details of their life history (Johnson et al. 1981, 1989, 1993, 2001). Kolea are not listed as threatened or endangered.

Introduced Birds:

A total of 13 species of non-native (introduced) birds were tallied on the survey. Table One gives the names of these species and their relative abundance. The birds recorded were those typically found in this region of Oahu (Bruner 1989, 1990a, 1990b, 1991, 2000; Hawaii Audubon Society 1997). Other introduced species that potentially could occur on or near this site include: Barn Owl (*Tyto alba*), Cattle Egret (*Bulbucus ibis*), Red Avadavat (*Amandava amandava*) and Java Sparrow (*Padda oryzivora*) (Hawaii Audubon Society 1997). None of the introduced birds found on the survey are listed as threatened or endangered.

Mammals:

Two small feral pigs (*Sus scrofa*) were seen in an area of high grass along the eastern portion of the area surveyed. In addition, three Small Indian Mongoose (*Herpestes auropunctatus*) and two feral cats (*Felis catus*) were also observed during the survey. Scats of dogs (*Canis familiaris*) were present throughout the property. On day two of the survey two dogs were seen walking with their owner along the road leading into the site. The endangered Hawaiian Hoary Bat (*Lasiurus cinereus semotus*) was not

recorded on the survey. This species is rarely seen on Oahu but is more common on Kauai and the Big Island (Tomich 1986, Kepler and Scott 1990). They roost solitarily in trees and forage for insects in a wide variety of native and non-native habitats including urban areas. Rata and mice were not found but likely occur in this area.

SUMMARY AND CONCLUSIONS

The field survey examined the entire site and nearby lands. The expected array of introduced birds and mammals were recorded. The relative abundance of these species was likewise comparable to what would be expected in similar habitats elsewhere in this region of Oahu. The absence of the migratory Pacific Golden-Plover was due to the time of year this survey was conducted. Plover are on their arctic breeding grounds from the end of April to early August. The endangered Hawaiian Owl (Pueo) was not seen but could forage in this area (Bruner, pers. obser.). Due to its rarity on Oahu the Hawaiian Hoary Bat was not seen. However, they could forage and roost in this area since they utilize a broad array of habitats.

The proposed project is small enough in scope that it will have no significant impact on the relative abundance of birds and mammals in this region of Oahu.

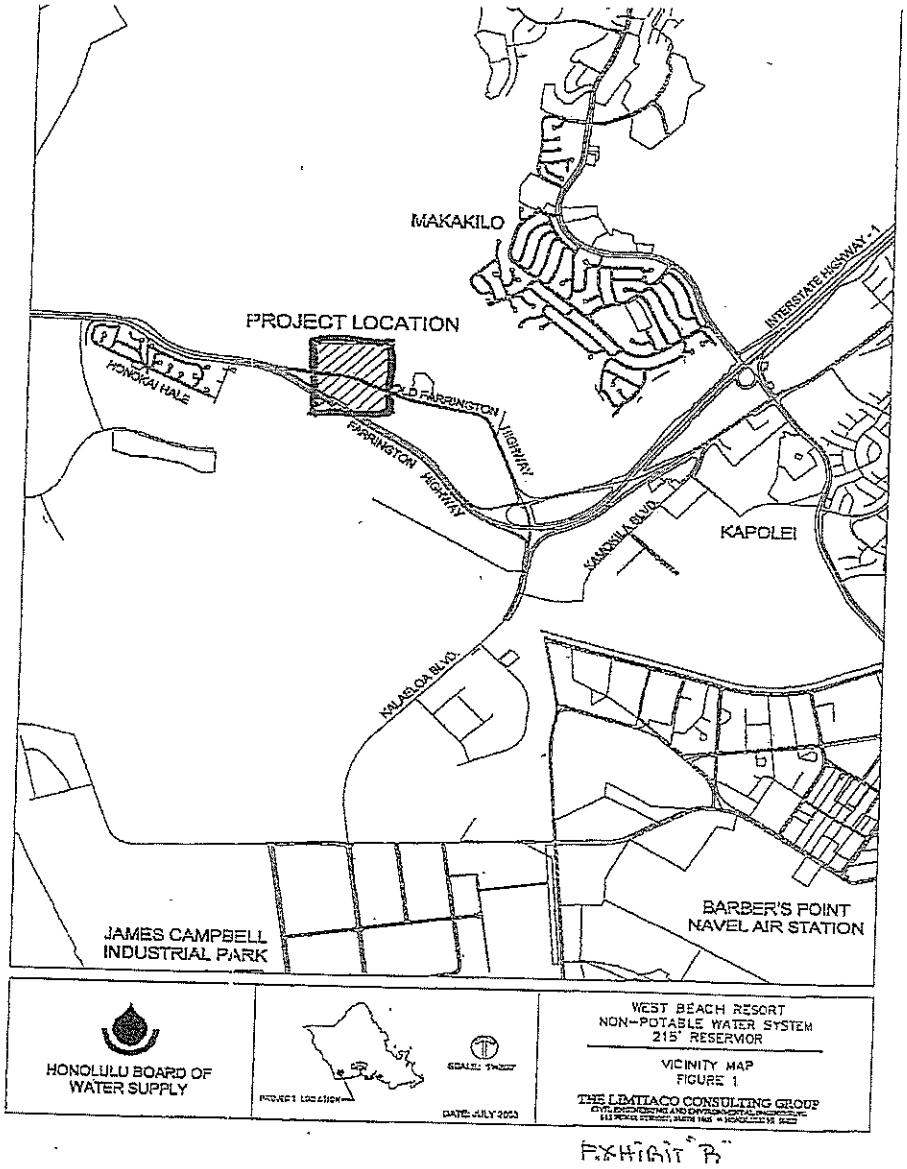

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Fig. 1. Location of faunal survey.

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A = abundant (25+ birds per survey day)
C = common (10-24 birds per survey day)
U = uncommon (1-9 birds per survey day)

Common Name	Scientific Name	Relative Abundance
Ring-necked Pheasant	*Phasianus colchicus*	U
Spotted Dove	*Streptopelia chinensis*	A
Zebra Dove	*Geopelia striata*	A
Red-vented Bulbul	*Pycnonotus cafer*	C
Common Myna	*Acridotheres tristis*	C
Japanese White-eye	*Zosterops japonicus*	A
Northern Mockingbird	*Mimus polyglottos*	U
Northern Cardinal	*Cardinalis cardinalis*	U
Red-crested Cardinal	*Paroaria coronata*	C
House Finch	*Carpodacus mexicanus*	U
House Sparrow	*Passer domesticus*	U
Common Waxbill	*Estrilda astrild*	A
Nutmeg Mannikin	*Lonchura punctulata*	U

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AVIFAUNAL AND FERAL MAMMAL FIELD SURVEY OF THE BARBERS POINT 215' NON POTABLE RESERVOIR SITE AT MAKAKILO, OAHU

Prepared for :

PBR Hawaii and The Limtiaco Consulting Group

Prepared by:

Phillip L. Bruner
Environmental Consultant
Faunal (bird and mammal) Surveys
 # 1775 BYU-H
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25 July 2003

INTRODUCTION

The purpose of this report is to provide the findings of a two day (16, 22 July 2003) field survey of lands involved with the proposed Barber's Point 215' Nonpotable Reservoir site at Makakilo, Oahu (Fig. 1). References to pertinent published and unpublished sources are also given in this report in order to provide a broader perspective of the species known from this region and in this type of habitat on Oahu. The goals of the field survey were:

1- To document the species of birds and mammals on or near this property.

2- To obtain data on the relative abundance of birds at this location

SITE DESCRIPTION

This property is composed primarily of dry grass and patches of introduced trees and brush. A dry streambed occurs near the eastern portion of the site. Makakilo residential property is upslope. The general appearance of this property is dry parkland (grass and scattered trees).

METHODS OF SURVEY

The site and nearby lands were surveyed on foot on two separate days (16, 22 July 2003). Data were obtained during early morning and late afternoon periods when birds are most active. Counts of all species seen or heard were kept in order to estimate a relative abundance for each species. Data on mammals were obtained by visual sightings

and tracks/scats. No trapping of mammals was conducted. The length and nature of this survey did not warrant trapping.

Weather during the survey period ranged from clear to cloudy with easterly winds at 10-15 mph. These conditions made for good visual and auditory detection of birds.

Scientific and common names used in this report follow Pyle (2002) and Honacki et al. (1982).

RESULTS

Native Birds:

No native birds were recorded on the survey. The only likely species that might occur on occasion in this area is the Short-eared Owl or Pueo (*Asio flammeus sandwichensis*). Pueo are listed by the State of Hawaii as endangered on the island of Oahu. They forage in a variety of habitats including grasslands, agricultural fields, and forests (Pratt et al. 1987, Hawaii Audubon Society 1997).

Migratory Birds:

No migratory birds were recorded on the survey. At this time of the year these birds are on their arctic breeding grounds. The only migratory bird that might be seen along the road leading into the property is the Pacific Golden-Plover (*Pluvialis fulva*). The bird is called Kolea in Hawaiian. It is the most abundant migrant to Hawaii. They

winter here between August and late April. Extensive long-term studies have documented many details of their life history (Johnson et al. 1981, 1989, 1993, 2001). Kolea are not listed as threatened or endangered.

Introduced Birds:

A total of 13 species of non-native (introduced) birds were tallied on the survey. Table One gives the names of these species and their relative abundance. The birds recorded were those typically found in this region of Oahu (Bruner 1989, 1990a, 1990b, 1991, 2000; Hawaii Audubon Society 1997). Other introduced species that potentially could occur on or near this site include: Barn Owl (*Tyto alba*), Cattle Egret (*Bulbucus ibis*), Red Avadavat (*Amandava amandava*) and Java Sparrow (*Padda oryzivora*) (Hawaii Audubon Society 1997). None of the introduced birds found on the survey are listed as threatened or endangered.

Mammals:

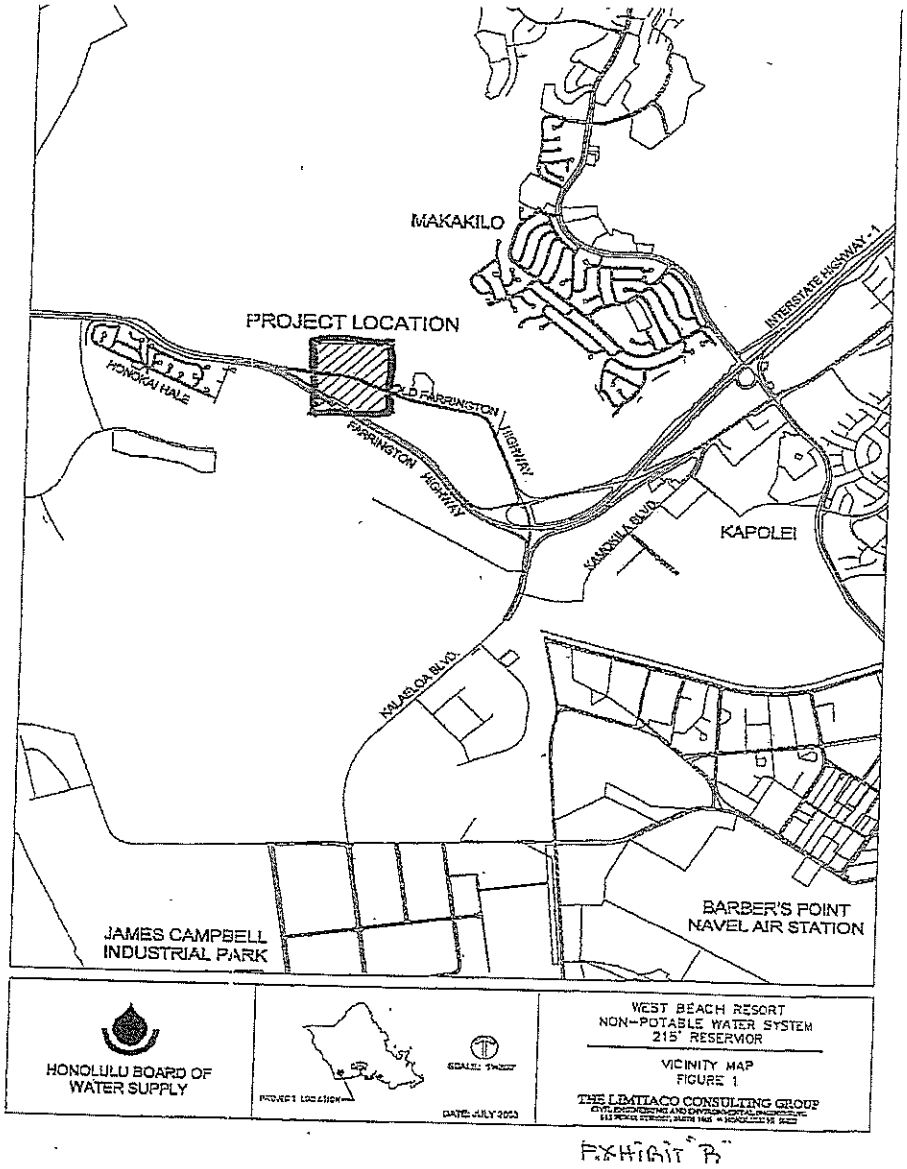
Two small feral pigs (*Sus scrofa*) were seen in an area of high grass along the eastern portion of the area surveyed. In addition, three Small Indian Mongoose (*Herpestes auropunctatus*) and two feral cats (*Felis catus*) were also observed during the survey. Scats of dogs (*Canis familiaris*) were present throughout the property. On day two of the survey two dogs were seen walking with their owner along the road leading into the site. The endangered Hawaiian Hoary Bat (*Lasiurus cinereus semotus*) was not

recorded on the survey. This species is rarely seen on Oahu but is more common on Kauai and the Big Island (Tomich 1986, Kepler and Scott 1990). They roost solitarily in trees and forage for insects in a wide variety of native and non-native habitats including urban areas. Rata and mice were not found but likely occur in this area.

SUMMARY AND CONCLUSIONS

The field survey examined the entire site and nearby lands. The expected array of introduced birds and mammals were recorded. The relative abundance of these species was likewise comparable to what would be expected in similar habitats elsewhere in this region of Oahu. The absence of the migratory Pacific Golden-Plover was due to the time of year this survey was conducted. Plover are on their arctic breeding grounds from the end of April to early August. The endangered Hawaiian Owl (Pueo) was not seen but could forage in this area (Bruner, pers. obser.). Due to its rarity on Oahu the Hawaiian Hoary Bat was not seen. However, they could forage and roost in this area since they utilize a broad array of habitats.

The proposed project is small enough in scope that it will have no significant impact on the relative abundance of birds and mammals in this region of Oahu.



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Common Myna	*Acridotheres tristis*	C
Japanese White-eye	*Zosterops japonicus*	A
Northern Mockingbird	*Mimus polyglottos*	U
Northern Cardinal	*Cardinalis cardinalis*	U
Red-crested Cardinal	*Paroaria coronata*	C
House Finch	*Carpodacus mexicanus*	U
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APPENDIX C

Archaeological Survey

SCS Project 369-2

ARCHAEOLOGICAL INVENTORY SURVEY OF 2 ACRES OF LAND LOCATED IN THE *AHUPUA`A* OF HONO`ULI`ULI, DISTRICT OF `EWA, O`AHU ISLAND, HAWAI`I

[TMK: 9-1-015: PORTION OF 005 AND TMK: 9-2-03: PORTION OF 002]

Prepared by:
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February 2004

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ABSTRACT

Scientific Consultant Services (SCS), Inc. conducted Archaeological Inventory Survey near Kapolei and Barbers Point in the *ahupua`a* of Hono`uli`uli, district of `Ewa, O`ahu Island, Hawai`i [TMK: 9-1-015: portion of 005 and TMK: 9-2-03: portion of 002]. The survey covered an area of approximately 2 acres. The work precedes construction of a new water tank by the Honolulu Board of Water Supply next to an existing water tank and facility. Results of this Inventory Survey are as follows. First, no human remains and/or burial features were encountered in the project area. Second, four historical features consistent with 19th or 20th century commercial agricultural and ranching activities were recorded. One of these features (a portion of flume) is a component of the previously identified State Site No. 50-80-12-4341. A stone ranch wall is designated State Site No. 50-80-12-6654. A pair of concrete/cement bridge supports is designated State Site No. 50-80-12-6655. A small area of low rock walls and rock stacking is designated State Site No. 50-80-12-6656. Testing (excavation) of this latter site yielded two small fragments of 19th or 20th century ceramics. No evidence of traditional Native Hawaiian activities was identified within the project area. The identified sites are no longer considered significant under Criterion D. Work on the new water tank can proceed without endangering any significant cultural resources.

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INTRODUCTION

Scientific Consultant Services (SCS), Inc. conducted an Archaeological Inventory Survey of approximately two acres of land near Kapolei and Barbers Point in the *ahupua`a* of Hono`uli`uli, district of `Ewa, O`ahu Island, Hawai`i [TMK: 9-1-015: portion of 005 and TMK: 9-2-03: portion of 002] (Figures 1 and 2). Fieldwork was conducted over a three-day period in July, 2003, by Christopher Monahan, Ph.D., Principal Investigator.

This work precedes construction of a new water tank ('Barbers Point Non-Potable Reservoir No. 2') by the Honolulu Board of Water Supply (BWS) next to an existing water tank and facility (Figure 3). The existing BWS facility is an 'easement' located within land owned by the James Campbell Trust Estate (TMK: 9-1-015: portion of 005), and the present construction plan will require expanding the easement a short distance to the north and to the east, possibly extending into TMK: 9-2-03: portion of 002. Part of this expansion will involve removal (blasting) of a short section of vertical rock outcrop as well as mechanical grading and leveling of a small area (see Figure 3). Accordingly, SCS was contracted to conduct an Inventory Survey covering both the area directly impacted by these activities (hereafter the 'impact area') as well as the buffer zone surrounding the impact area (hereafter the 'project area'). The primary objectives of this Inventory Survey were as follows:

(1) Inspect the vertical rock outcrop traversing the project area, looking specifically for possible burial features and/or human remains.

(2) Survey the entire project area for archaeological and historical sites or features.

(3) Test (excavate) any potentially significant sites or features encountered in survey.

Results of this study are as follows. First, no human remains and/or burial features were encountered along the vertical rock outcrop traversing the project area. Second, four historical features consistent with 19th or 20th century commercial agricultural and ranching activities were identified and documented (Figure 4). One of these features, a water flume, is a component of the previously identified State Site No. 50-80-12-4341 (Hammatt *et al.* 1991). The three other features have been assigned new site numbers: (1) a stone ranch wall, designated State Site No. 50-80-12-6654; (2) a pair of concrete/cement bridge supports, designated State Site No. 50-80-12-6655; and (3) a small area of low rock walls and rock stacking, designated State Site No. 50-80-12-6656. The small area of low rock walls and rock stacking was tested (excavated) and found to contain two small fragments of 19th or 20th century ceramics. Finally, no evidence of traditional Native Hawaiian activities was identified within the project area. A previous study by Hammatt *et al.* (1991) in the present project area is discussed below.

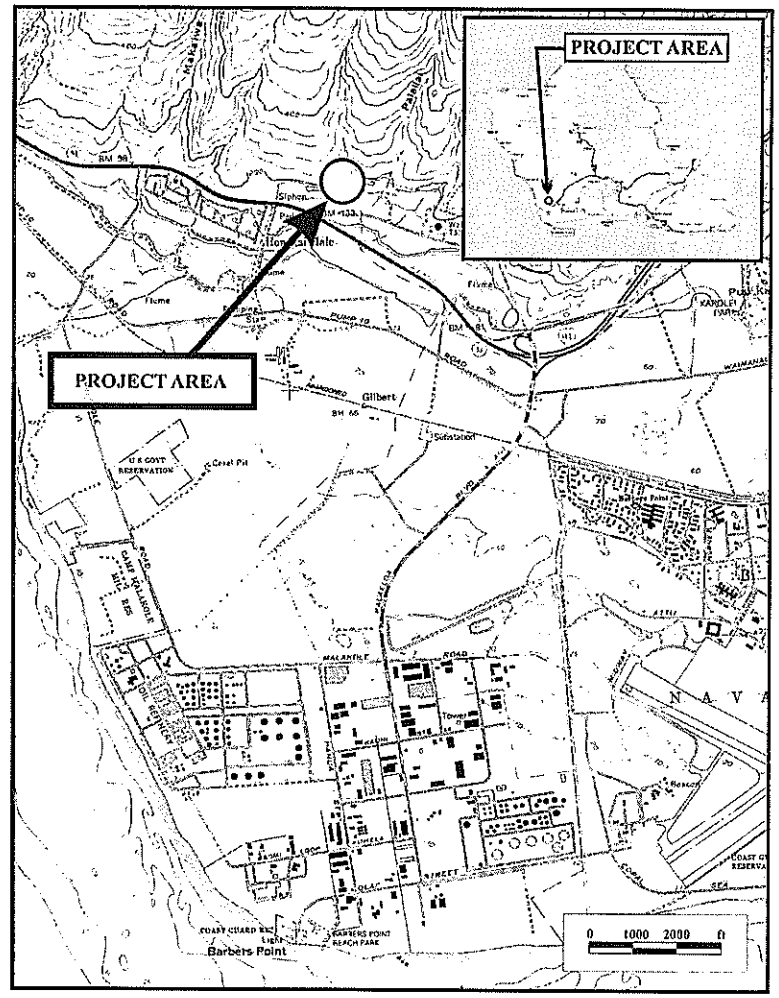
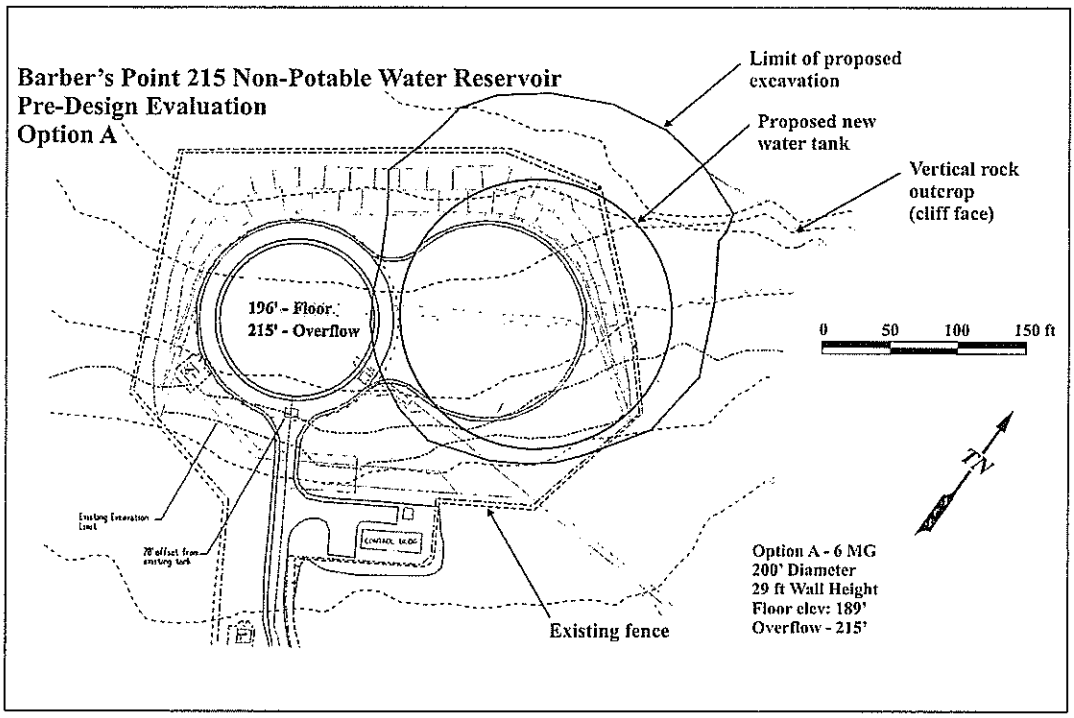


Figure 1: USGS Map (Ewa Quadrangle) of Project Area.



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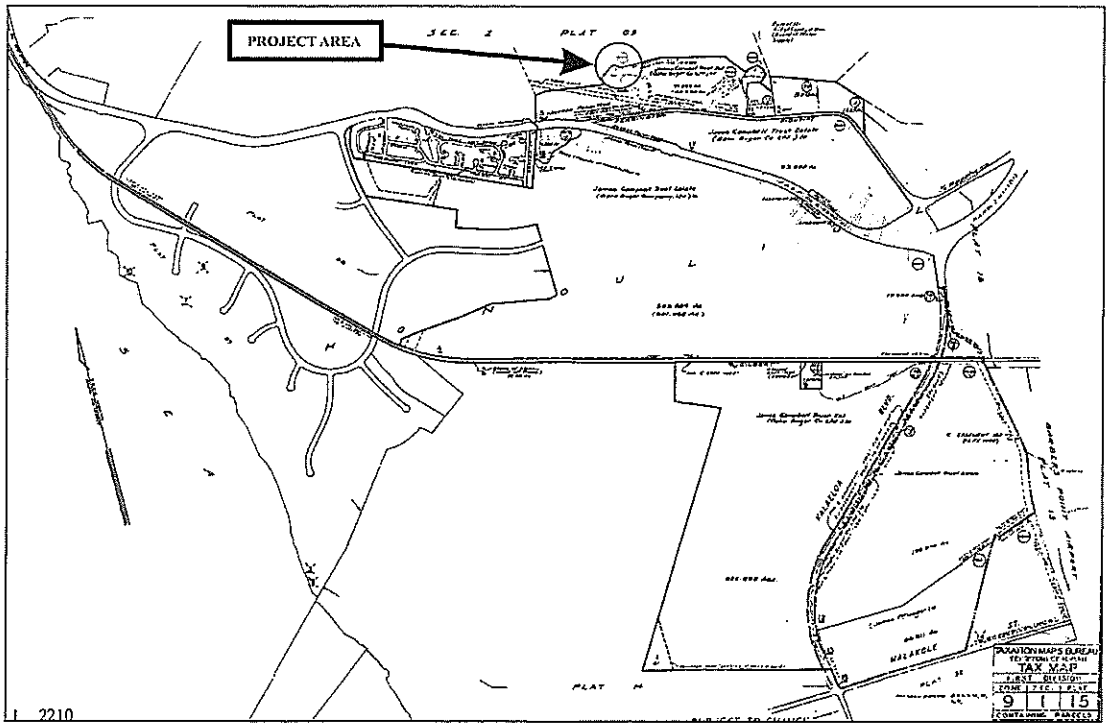

Figure 2: TMK Map of Project Area. Note, Project Area Includes Portions of Both TMK: 9-1-015: portion of 005 and TMK: 9-2-03: portion of 002..

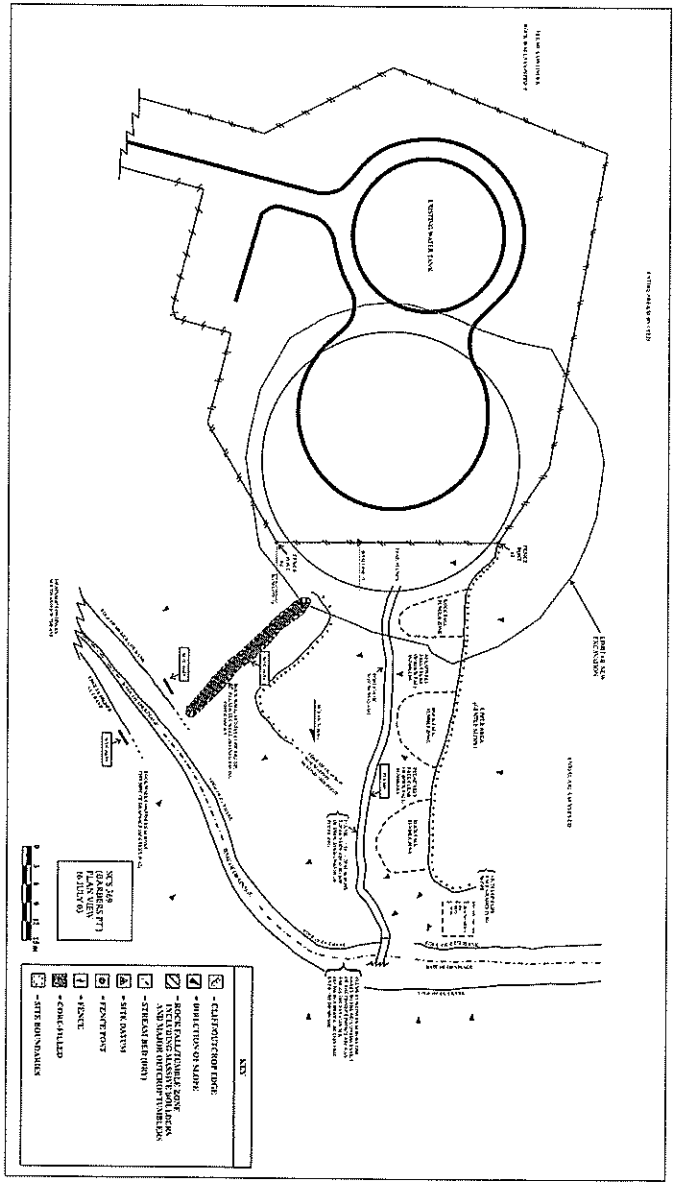

Figure 4: Project Area at Barbers Point Reservoir Showing Existing Facilities, Planned Expansion, and Archaeological Features Identified in Inventory Survey

ENVIRONMENTAL SETTING

The project area is located approximately 70 m above mean sea level, three miles north of the coast at Barbers Point, and one and one-half miles east of the coast near Kahe Point (see Figure 1). Farrington Highway and the H-1 Interstate are located several hundred meters south of the project area. Kapolei is roughly one and one-half miles to the east. Makakilo City is one mile to the northeast. As stated above, the existing BWS site is an 'easement' within James Campbell Trust Estate land (TMK: 9-1-015: portion of 005). The project area also includes part of TMK: 9-2-03: portion of 002 immediately adjacent and north of the existing BWS easement (see Figures 2 and 3).

Geologically, the project area is located at the southern terminus of the Makakilo Uplands, a piedmont (transitional) zone of alluvial and colluvial deposits between the volcanic Wai`anae Range to the north and the `Ewa (coral) Plain to the south. The gently-sloping landscape is dissected by drainages and gulches oriented roughly north-to-south. The project area, itself, is adjacent to an unnamed gulch between Palailai Gulch, to the east, and Makaiwa Gulch, to the west (see Figure 1).

Soils in the project area, defined as "extremely stony clays" and "stony steep land," are part of the Lualualei Series (Foote *et al.* 1972). These are well-drained, but very rocky, soils formed on talus slopes, and usually found in relatively dry ecological zones. Large rocky outcrops are common throughout this area, and cultivation is usually impractical unless the stones are removed.

Annual rainfall is approximately 20 in (Armstrong 1983). Vegetation is dominated by *kiawe*, lowland shrubs, and grasses. Plant species include the following: *kiawe* (*Prosopis pallieda*), *haole koa* (*Leucaena leucocephala*), *'uhaloa* (*Waltheria americana*), false mallow (*Malvastrum coromandelianum*), sweet acacia (*Acacia farnesiana*), and *ilima* (*Sida fallax*). Various grasses and small (unidentified) weedy plants complete the floral inventory.

HISTORICAL BACKGROUND

As stated above, the project area is located in a kind of transitional zone between the Wai`anae mountain range to the north and the `Ewa coral plain to the south. In general, this entire region, and particularly the `Ewa district west of Pearl Harbor, has traditionally been described in historical documents as a rather marginal place for human occupation. Captain Vancouver (1798:217) described southwestern O`ahu in 1792 as follows:

> From these shores we were visited by some of the natives, in the most wretched canoes I had yet seen amongst the South-Sea islands; they correspond however with the appearance of the country, which from the commencement of the high land westward of Opooroah [Pu'uloa], was composed of one very barren rocky waste, nearly destitute of verdure, cultivation or inhabitants, with little variation all the way to the west point of the island.

Later missionaries and other explorers describe the region in similarly bleak tones (*e.g.*, Chamberlain 1957; Hall 1839; Wilkes 1845), and the reputation—partly deserved and partly not—has persisted into recent times (Davis 1990). Without a doubt, the area is, and has been for some time, a relatively hot and dry place, and the lack of water for cultivation/agriculture has probably always limited the intensity of human settlement. However, archaeological studies (see PREVIOUS ARCHAEOLOGICAL RESEARCH) have increasingly called in to question the "cultural backwater" interpretation of the area, which was probably more dynamic and productive than previously appreciated.

It seems likely that pre-Contact Native Hawaiians in and around Barbers Point were primarily dependant on ocean resources, supplemented, to a lesser extent, by small-scale (relatively limited) cultivation (Kelly 1979).

The sandalwood trade, which peaked between 1815 and 1830, was the first widespread commercial activity to impact the project area. Hawaiian chiefs began to trade local sandalwood for exotic goods from Asia, and vast tracts of the `Ewa plain and lower hills and ridges to the north were burned in order to find all remaining sandalwood (St. John 1947).

At the time of the Great Māhele (1848), the entire 43,250 acres of the Hono`uli`uli *ahupua`a* were originally deeded to M.W. Kekauonohi, a chiefess (one of Liholiho's five wives), great-granddaughter of Kekaulike (King of Maui), and granddaughter of Kamehameha I. Upon her death (1851), these lands were passed on to Levi Haalelea. Documents associated with these transactions indicate that taro was cultivated in some places, but the records are not specific as to precisely where in this large *ahupua`a* this took place. After Haalelea's death, the land passed to his wife, Anadelia Amoe, who rented it to cattle ranchers starting in 1871. These ranchers thus introduced grazing in areas too high, rocky, and/or dry for agriculture, including landscapes very similar to the present project area. Amoe eventually deeded the land to her brother-in-law, John C. Coney, who sold it to James Campbell in 1877 (Kalima and Smith 2000).

Campbell (1826-1900), a Scottish-Irish, emigrated to the Hawaiian Islands after working on whaling vessels. He started in the sugar business on Maui (in 1860 or 1861), eventually moving to Honolulu in 1877 and buying up the Hono`uli`uli *ahupua`a*, a total of some 43,640 acres (which had apparently increased by 400 acres from the original deed to Kekauonohi). This land, which includes the two parcels covered in this study, was considered to be commercially worthless at the time. By 1879, however, Campbell had an artesian well drilled near his ranch house in Hono`uli`uli—the first of its kind in Hawai`i—and the sugar industry entered a new phase of commercial expansion in the region. Over the next several decades, upwards of 70 deep wells were operating and supplying the region with over 100 million gallons of water per day (Wilcox 1996; Dorrance and Morgan 2000). The full story of the `Ewa sugar industry is beyond the scope of this report. It involves numerous other prominent individuals and changes of ownership and operation (see Kalima and Smith 2000; Pagliaro 1987). Suffice it to say that sugar was produced into relatively recent times (1970s), and the area—especially the uplands north of Barbers Point, which have never been extensively settled even in modern times—is criss-crossed with water flumes, ditches, and rock walls from these activities.

PREVIOUS ARCHAEOLOGICAL RESEARCH

Davis (1990:39) lists a total of 32 separate archaeological studies of southwestern O`ahu between 1907 and 1986, the vast majority taking place since the 1970s. Most of these 32 studies are "surface reconnaissance" or "surface survey", meaning no excavation was carried out, but at least a dozen involved some subsurface testing (excavation). Nearly all of the attention has been focused on the `Ewa plain and coastal settings, rather than the upland areas, which have practically been ignored thus far by archaeologists.

Davis (2000) presents the following general picture of human settlement in the Barbers Point area, especially on the `Ewa coastal plain. The earliest occupation dates to *c.* A.D. 200, with ample evidence of relatively small camps and temporary sites along the coastal beaches and around small scattered wetlands inland. These settlers were primarily fishers and bird-hunters, and the "settlement period" lasted from *c.* A.D. 200 to *c.* A.D. 1100-1200. After *c.* A.D. 1100-1200, the density of human settlement appears to increase with more sites presumably reflecting greater local populations. These sites, however, are still relatively undifferentiated with no evidence of different functions or activities taking place at different places. Finally, from about the end of the 16th century on, the region witnessed further population increases and, for the first time, the emergence of special-function sites such as "men's houses" and religious shrines, in addition to habitation sites.

Davis (1990) investigated a portion of the uplands immediately west of the present project area, and reports at least eleven archaeological sites related to pre-contact Native Hawaiians. These include temporary habitation sites—including rockshelter occupations, religious shrines—including a *ko`a* (fishing shrine), and a petroglyph (rock engraving) site. The most significant of these is Site Complex 2893, a temporary habitation site reoccupied on numerous occasions over a period of some 250 years. Radiocarbon dates from excavated matrix at this site complex suggest occupation between A.D. 1396 and 1671. Excavations here revealed a hearth, midden deposits containing marine shells, and several hundred traditional artifacts used in fishing activities or in maintaining fishing gear. The rocky cliff faces at the site preserve dozens of petroglyphs, or rock engravings, of human forms, animals, and other signs and symbols. All indications are that this site was occupied on a temporary basis by fishermen repairing their gear, rather than by entire families in long-term settlements.

Hammatt *et al.* (1991) conducted an archaeological site inventory survey of approximately 1,915 acres of the proposed Makaiwa Hills development project (TMK: 9-1-15: 5, 11, 17; 9-1-16: Portion 9; 9-2-03: Portion 2), an area that includes, and completely subsumes, the present project area. Hammatt *et al.* (1991) identified 34 sites, including temporary and permanent habitation structures, agricultural features (terraces and mounds), rock shelters, a possible rock shelter quarry, petroglyphs, *ahu* (*i.e.*, stone markers), and various other structures associated with sugarcane cultivation and cattle ranching. Most of these sites were located some distance from the present project area. The only site located within the present project area was an historic flume designated State Site No. 4341. A rockshelter complex, interpreted as representing a traditional permanent habitation, was recorded approximately 200 meters north-northwest of the present project area. Other nearby sites included: a modern era enclosure (Site 4329) some 350 meters west of the present project area; a platform associated with sugarcane cultivation (Site 4330) some 400 meters east of the present project area.

Two reconnaissance-level studies (Spear 1996; Magnuson 1999) located at elevations similar to, and lower than, the present project area documented no traditional Native Hawaiian sites. Spear (1996) assessed several hundred acres (TMK: 9-1-16) just northeast of Kapolei town center, from the H-1 highway down (*makai*) to the Barbers Point Airport. The upper portions include landforms and elevations similar to the present project area. The entire area was observed to have been in sugarcane cultivation, resulting in no significant cultural finds. Magnusun (1999) conducted a reconnaissance of a narrow corridor associated with the expansion of Farrington Highway, just northwest of `Ewa town center. Upper portions of the project area studied by Magnusun reach 160 to 175 ft above mean annual sea level, slightly lower than the

present project area. Several historic sites dating from the early 20th century, including bridges and railroad features (which may date to the late 19th century), were identified.

Two studies (Hammatt and Chiogioji 1997; Tulchin *et al.* 2001) located at similar elevations to the present project area also documented no significant cultural finds. Hammatt and Chiogioji (1997) conducted an Archaeological Reconnaissance Survey of a 4.5 km (14,730 ft) long corridor just east northeast of the present project area. The entire area was observed to have been in sugarcane cultivation, resulting in no significant cultural finds. Tulchin *et al.* (2001) conducted an Archaeological Inventory Survey of an approximately 1.0-acre area just above the H-1 highway near `Ewa. One historic stone wall (State Site 50-80-08-6370) was recorded.

Two studies (Dega *et al.* 1998; Hammatt and Shideler 1999) located at elevations similar to, and higher than, the present project area complete this brief review of nearby archaeological projects. Dega *et al.* (1998) conducted an Archaeological Inventory Survey of approximately 1,000 acres just northeast of Makakilo City (TMK: 9-2-02: 01, 03, and 05). No traditional sites were documented during the survey. Two separate irrigation systems (*i.e.*, large-scale flume networks) dating from the late 19th century to the early 20th century were identified. Elements of the previously-identified Waiahole Ditch System (50-80-09-2268) and the newly designated Site 5593, including flumes, aqueducts, ditches, pumps, and other irrigation features, were recorded. Hammatt and Shideler (1999) conducted an Archaeological Inventory Survey of approximately 122.75 acres, and noted the presence of a petroglyph site (4110) at elevations similar to the present project area. Other than this, no significant cultural finds were located in the lower portion of the project area described by Hammatt and Shideler (1999).

EXPECTED FINDINGS

Given several factors—previous archaeological findings in the area, geographic location and resources in the project area specifically, and historical land use patterns in the region—expected findings of this Inventory Survey were as follows:

(1) There was a low probability of finding evidence of permanent, Native Hawaiian habitation sites since the stony soils in the project area are relatively poor for cultivation purposes. If detected, traditional occupation was expected to be temporary, rather than permanent, and located near the protective rocky outcrop.

(2) There was a possibility of finding burials in the vertical faces of the rocky outcrop traversing the project area, in keeping with some traditional Native Hawaiian burial practices (Kirch 1985), as well as petroglyphs.

(3) There was a relatively high probability of finding landscape features and/or artifacts related to historical commercial farming (*e.g.*, sugar) and/or ranching activities.

METHODOLOGY

Archaeological Inventory Survey was conducted over the course of three days in July, 2003. All aspects of the work were photographed. There were three main field activities:

(1) *Create a detailed site map* -- A 1:500 scale map of the project area was generated using the existing fence northeast of the existing water tank as a site datum. The map was designed to show the "footprint" of the existing structures and facilities in relation to the planned impact of the new construction and to other natural and cultural features identified in this survey.

(2) *Conduct a pedestrian survey of the impact area* – Two SCS archaeologists systematically walked the entire project area (see Figure 3) in order to identify and document any and all historical and/or archaeological features of the landscape.

(3) *Test (excavate) any potentially significant sites or features encountered in survey* – Two test units, each measuring 50-x-50-cm square, were excavated at a series of low rock walls and stacked stones, possibly related to traditional Native Hawaiian activities. Each unit was excavated by natural stratigraphic layers, rather than by artificial levels, and all excavated sediments were screened using 1/4 in metal mesh. Both test units were photographed before and after excavation, and stratigraphic profiles were drawn in accordance with standard archaeological procedure. Soil and sediments were described in accordance with standard archaeological procedure (U.S. Dept. of Agriculture Soil Survey Staff 1951, 1962; Munsell 1951).

Laboratory work, conducted at SCS facilities in Honolulu, consisted of digital drafting of maps and sketches, digitizing of all photographs and maps for archival purposes, and identification/interpretation of excavated ceramic artifacts. All documentation pertaining to this project is curated at SCS, Honolulu.

RESULTS

Results of the Inventory Survey can be summarized as follows. First, no human remains and/or burial features were encountered along the vertical rock outcrop traversing the project area. Second, four historical features consistent with 19th or 20th century commercial agricultural and ranching activities were identified and documented (see Figure 4). One of these features, a water flume, is a component of the previously identified State Site No. 50-80-12-4341 (Hammatt

et al. 1991). The three other features have been assigned new site numbers: (1) a stone ranch wall, designated State Site No. 50-80-12-6654; (2) a pair of concrete/cement bridge supports, designated State Site No. 50-80-12-6655; and (3) a small area of low rock walls and rock stacking, designated State Site No. 50-80-12-6656. The small area of low rock walls and rock stacking was tested (excavated) and found to contain two small fragments of 19th or 20th century ceramics. Finally, no evidence of traditional Native Hawaiian activities was identified within the project area.

WATER FLUME (ASSOCIATED WITH SITE -4341)

The most prominent feature on the landscape is a historic era water flume that traverses the project area in a northeast-to-southwest orientation, and continues across the gulch to the northeast as far as the eye can see (see Figure 4). To the southwest, the flume is truncated by the existing BWS tank and facilities, and continues on the far side of the existing fenced area. The flume is part of an area-wide flume system, previously designated State Site No. 50-80-12-4341 (Hammatt *et al.* 1991).

The flume, which is roughly 1-m high, is hand-constructed using locally available basalt cobbles and boulders stacked and held together with a mortar/cement matrix (Figures 5 and 6). In several places along its length, the flume incorporates very large angular boulders representing rock fall from the adjacent outcrop. The interior of the flume is lined with a thick coating of mortar/cement, and there is evidence of at least one episode of repair (see Figure 6). With the exception of fairly widespread exfoliation of the mortar/cement, the feature exhibits good structural integrity. A cross-sectional view of the feature reveals walls that taper from the base to the top (Figure 7). The water channel, itself, is roughly 1 m across and 75 cm deep, and would have flowed from northeast to southwest.

SITE -6654

Site -6654 is a dry-stacked, core-filled rock wall, roughly 30-m long, oriented in an east-to-west direction (see Figure 4). The wall is approximately 1-m high, with 5 to 7 stacked courses, and 2 m wide. With the exception of one or two small sections of collapse, it exhibits good structural integrity and is complete and intact on both ends and around its perimeter (Figures 8 and 9). Some of the rocks from the interior (fill) of the wall are freshly-broken (not weathered) suggesting that cobbles have been added to the feature in the relatively recent past. The wall stops at the edge of the gulch. Another wall of similar dimensions and construction is located across the gulch, *outside of the project area,* to the east.

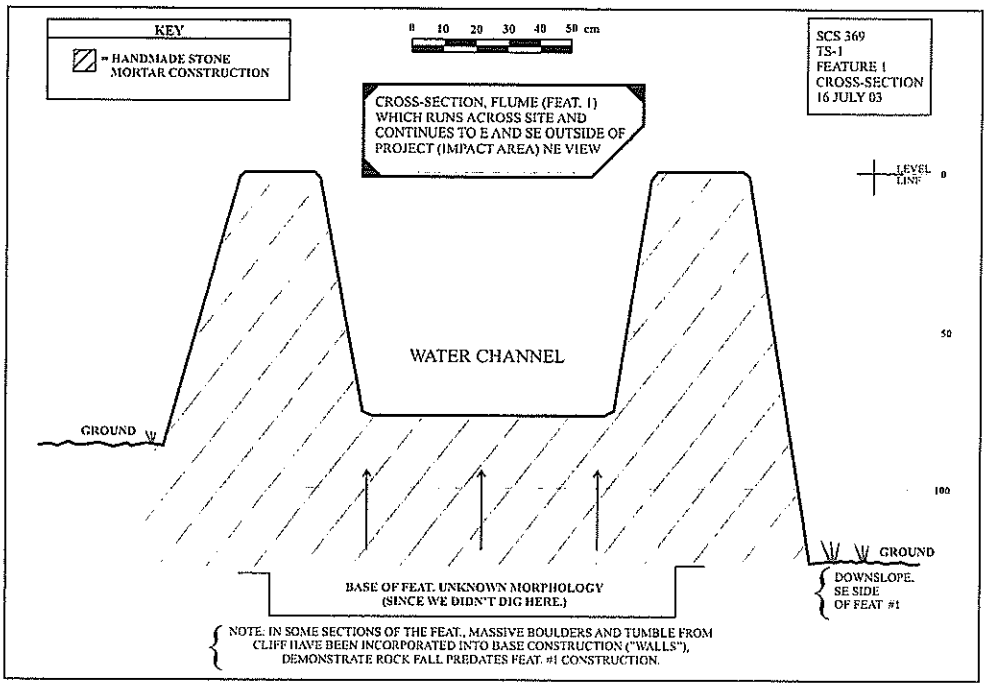

Figure 7: Cross-sectional Drawing of Flume.

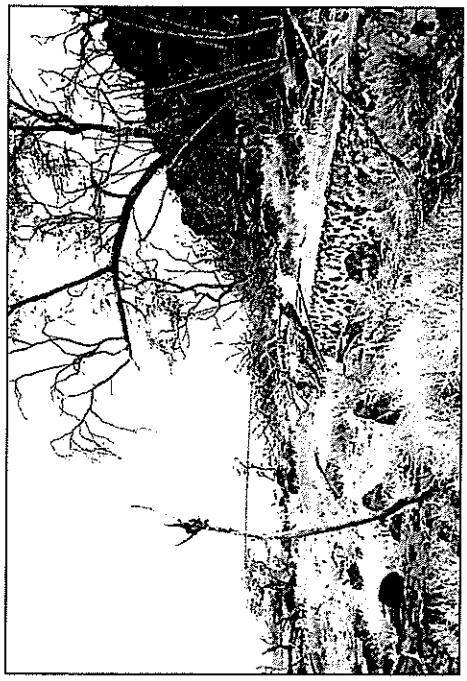

Figure 5: Water Flume and Existing Water Tank (Left Background), Facing Southwest. Note, Rock Outcrop to the Right.

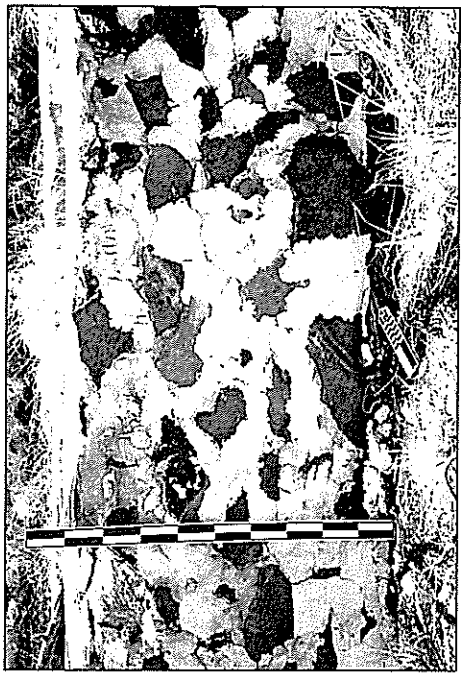

Figure 6: Detail of Flume Construction, Facing Northwest. Note, Names (*Tony* and *Martin*) Inscribed in Repair-Work Mortar.

Figure 8: Eastern End of Rock Wall (Site -6654), Facing Southwest. Note, Existing Water Tank (Right Background).

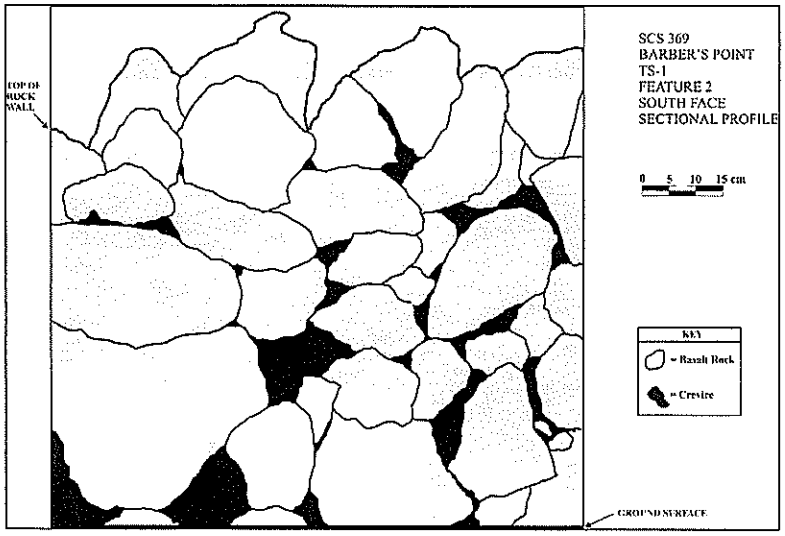

Figure 9: Profile Drawing of Site -6654 (Rock Wall) Section.

Other similar wall structures are located in the immediate vicinity, but *outside of the project area*, to the east and to the south. Survey on the far (southwest) side of the existing BWS facilities, also *outside of the project area*, reveals a number of similar core-filled rock walls. Hammatt *et al.* (1991) did not identify any rock walls within the present project area or in the near-vicinity of the project area.

SITE -6655

Site -6655 consists of two bridge supports on either side of the gulch in the eastern portion of the project area (see Figure 4). Each bridge support is constructed of concrete/cement with two embedded, ferrous metal bolts that would have functioned to anchor the spanning materials (Figure 10). Each support is approximately 4-m long and trapezoidal in cross-section.

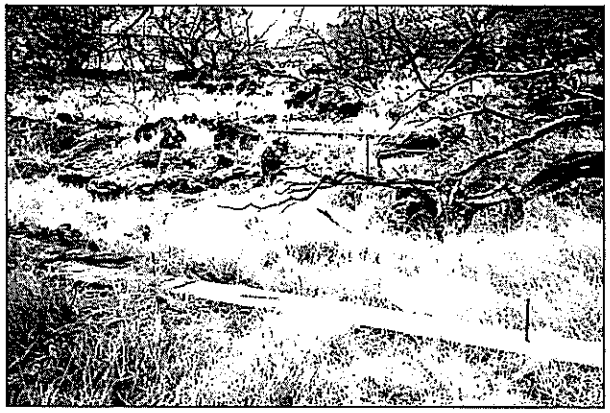

Figure 10: Site -6655 (Concrete Bridge Supports), Facing West. Note, Existing Water Tank (Upper Left).

This site has been assigned a separate site number because it may be functionally associated with either Site -4341 or Site -6654.

SITE -6656

Site -665 is a series of short, low rock walls and other informally stacked rocks located on a 30-35° slope at the northeast terminus of the vertical outcrop traversing the project area (Figure 11, and see Figure 4). A large *kiawe* tree is located at the top (westernmost) portion of the feature, which encompasses an area of approximately 5 m by 10 m. The overall structural

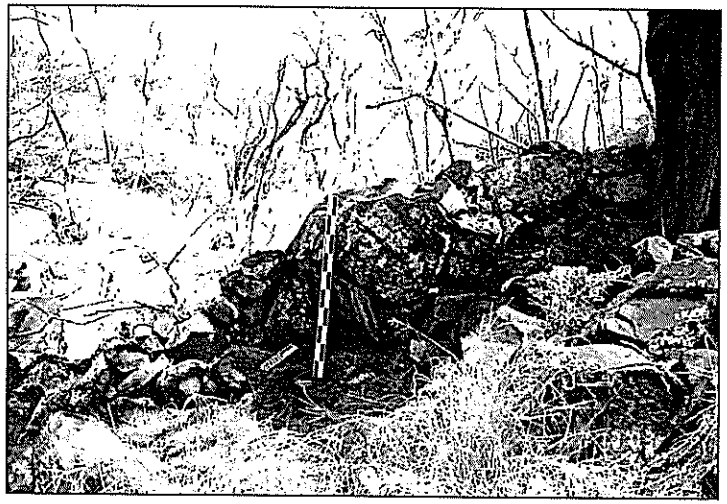

Figure 11: Site -6656 (Low Rock Walls and Rock Stacking), Facing Southeast. Note, Water Flume (Site -4341, Lower Left).

integrity of the feature is fair-to-poor, as many sections have suffered episodes of collapse and down slope movement. Despite these difficulties, parts of the feature are relatively intact and it is possible to make some general observations about its form and construction.

At least three short sections of dry-stacked rocks, 3 to 5 courses high, are preserved (Figure 12). The walls, which are 30 to 75 cm in height, were built atop and abutting several massive boulders and smaller rock fall from the cliff face (Figure 13). In addition to these intact wall sections, there are several other degraded and/or collapsed sections that may have originally been well-defined walls. These also appear to have been built against and atop massive boulders and other rock fall, as well as the large *kiawe* tree at the top of the slope.

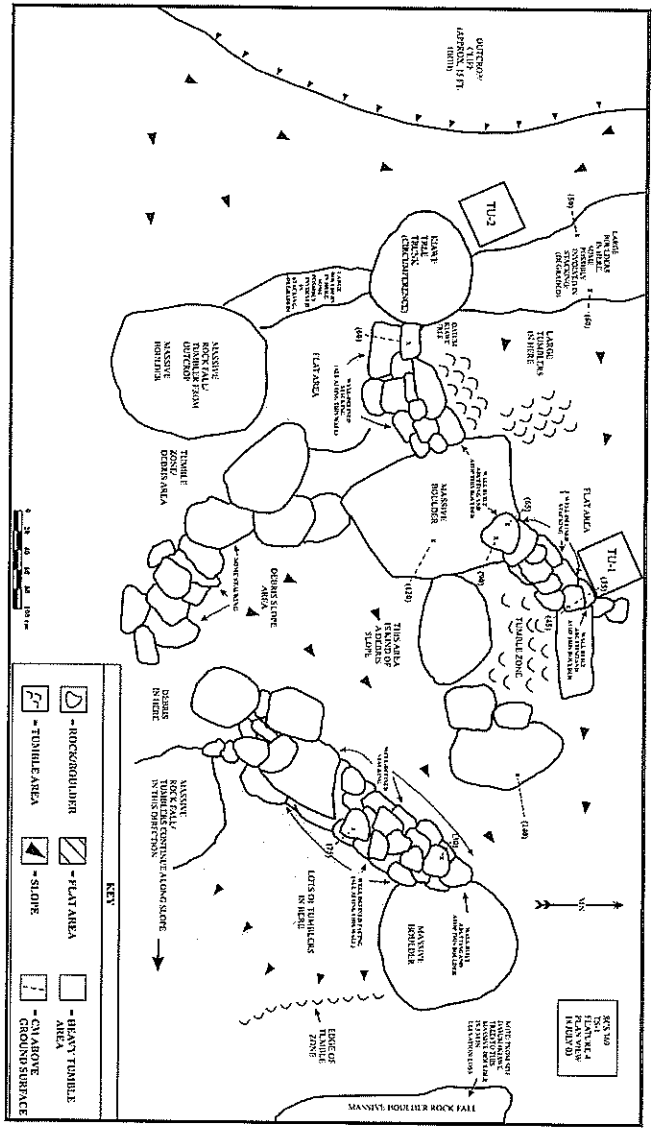

Figure 12: Plan View Map of Site -6656, Showing Location of Low Rock Walls, Test Units, and Other Key Features

Figure 13: Site -6656, Showing Two Sections of Intact Rock Wall, One to the Right of the Scale Bar, One in the Background (Upper Center), Facing Northwest.

Given its location on a relatively steep slope, the feature does not appear to represent any kind of permanent habitation structure nor does it resemble a pen or stockyard for domestic animals. Rather, the working hypothesis, subsequently tested by limited excavation, was that this feature represents some kind of shelter or temporary camp site, a place to rest and to get protection from the elements. This site has been assigned a separate site number because it may be functionally associated with either Site -4341 or Site -6654.

Subsurface testing

Two 50 cm by 50 cm test units were excavated to 75 cm below surface in small, flat areas next to stacked rock sections (see Figure 12). Both units revealed similar soil-stratigraphic profiles (Figures 14 and 15), which can be summarized as follows:

Layer I: Dark brown (7.5YR 3/3), silty fine sand, abundant small roots, flecks of charcoal, includes the present ground surface, approximately 5 cm thick, artifacts recovered in this layer (test unit 2).

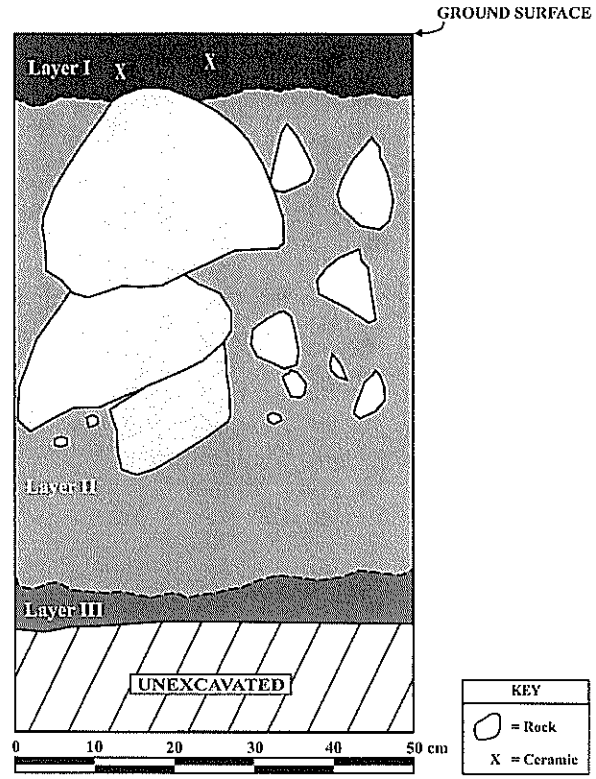

Figure 14: Soil-Stratigraphic Profile, Test Unit 1 (See Figure 13 for location), a 50 cm by 50 cm Square Excavated to 75 cmbs (Site -6656).

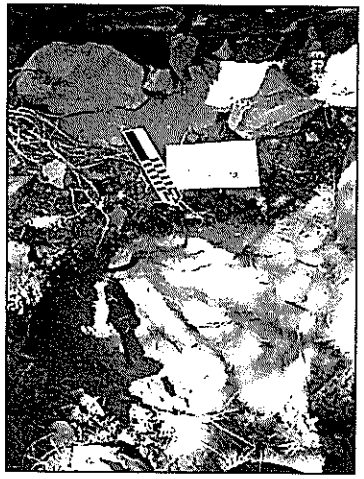

Figure 15: Test Unit 2 (See Figure 13 for Location), a 50 by 50 cm Square, After Excavation to 75 cmbs (Site -6656).

Layer II: Yellowish brown (10YR 5/4), silt, extremely abundant angular- and subangular-cobbles and other smaller and larger clasts, approximately 60-70 cm thick.

Layer III: Reddish brown (2.5YR 4/4), silty clay, fewer rocks than overlying layer, continues to unknown depth.

Test unit 1 was sterile, *i.e.*, completely devoid of cultural material. Test unit 2 (Layer I) yielded two refitting fragments of a ceramic cup with a white and blue glazed finish (Figure 16). This ceramic style is consistent with a 19th or 20th century date for this feature. No evidence of traditional Native Hawaiian occupation was recovered.

DISCUSSION AND CONCLUSION

The most interesting find of this Inventory Survey was the small area of low rock walls and rock stacking, designated State Site No. 50-80-12-6656. Given its location on the landscape and the artifacts recovered in subsurface testing, Site -6656 is consistent with the remains of a short-term, informal shelter constructed by workers from the 19th or 20th century ranching and/or farming operations. Both the nearby water flume (part of Site -4341) and the rock wall (Site -

6654) must have required a considerable number of man-hours to complete. The area is relatively hot and dry, with little or no protection from the sun. The working hypothesis is that Site -6656 represents a kind of informal 'break area' for laborers. No traditional cultural artifacts were observed at the surface or recovered in excavation at this site.

The water flume, designated as part of the previously designated State Site No. 50-80-12-4341, appears on USGS maps and extends over a very large area. As summarized by Hammatt *et al.* (1991), the flume was previously recorded by PHRI (Haun 1986), who declined to assign it a state site number because it was probably less than 50 years old. "However, because of uncertainty concerning the earliest construction of the site and common knowledge that sugarcane cultivation had occurred within the vicinity before modern times, it has been given a state site number." (Hammatt *et al.* 1991:97)

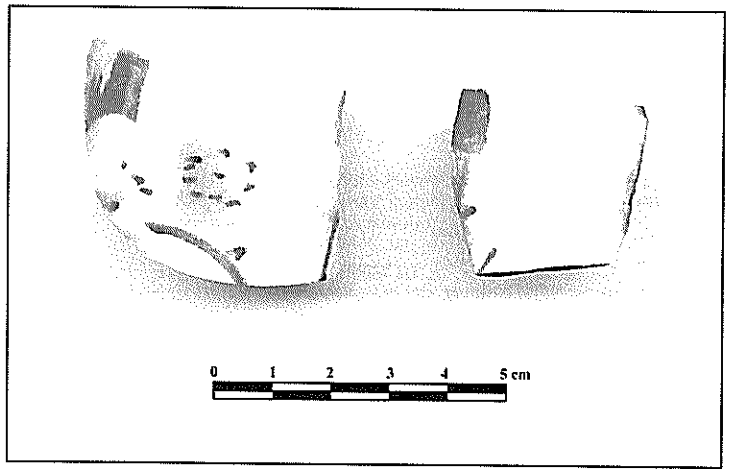

Figure 16: Refitting Ceramics from Test Unit 2 (Site -6656), Excavated from Layer I (0-5 cmbs).

SIGNIFICANCE ASSESSMENTS

The sites identified in this Inventory Survey (State Site Nos. 50-80-12–6654, -6655, and -6656) and the portion of flume system associated with previously identified State Site No. 50-80-12-4341 are significant under Criterion D, which highlights their potential to yield information pertaining to the history and prehistory of O`ahu, as well as the state of Hawai`i as a whole.

RECOMMENDATIONS

No further work is recommended at Site Nos. 50-80-12-6654, -6655, and -6656 because documentation, analysis, and classification of the artifacts have been completed. Likewise, no further work is recommended at the portion of previously identified Site -4341. Based on the results of the Archaeological Inventory Survey, it is unlikely that additional research would contribute significantly to furthering our understanding of Hawaiian prehistory or history.

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APPENDIX D

Preliminary Engineering Study

Preliminary Engineering Study
Barbers Point 215' Nonpotable Reservoir No. 2

Ewa, Oahu, Hawaii

Final Submittal

Prepared for

HONOLULU BOARD OF WATER SUPPLY

Prepared by

THE LIMTIACO CONSULTING GROUP

IAN Y. ARAKAKI
LICENSED PROFESSIONAL ENGINEER
NO. 10291-C
HAWAII USA

October 2006

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

4/30/10

Signature

License Expiration Date

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LIST OF ABBREVIATIONS

Abbreviation	Definition
AG-2	General Agricultural District
AS1	Alternative Site 1
AS2	Alternative Site 2
AS3	Alternative Site 3
ATC	Alternative Tank Configuration
BMP	Best Management Practices
BWS	Honolulu Board of Water Supply
CCH	City and County of Honolulu
DOH	Hawaii Department of Health
DPP	City and County of Honolulu, Department of Planning and Permitting
ENV	City and County of Honolulu, Department of Environmental Services
EWRF	Ewa Water Recycling Facility
GIS	Geographic Information Systems
GPM	Gallons per minute
HAR	Hawaii Administrative Rules
HWWTP	Honouliuli Wastewater Treatment Plant
MG	Million gallons
MGD	Million gallons per day
MSL	Mean sea level
NPDES	National Pollutant Discharge Elimination System
NOI	Notice of Intent
PSI	Per square inch
R1	DOH Class 1 recycled water
RO	Reverse osmosis
SCADA	Supervisory Control And Data Acquisition
TDS	Total Dissolved Solids
TMK	Tax Map Key
UHWOC	University of Hawaii West Oahu Campus
WWB	Wastewater Branch

Chapter 1 Introduction

This report is a preliminary engineering study for the Honolulu Board of Water Supply's (BWS) proposed nonpotable water reservoir at the 215-foot elevation to serve recycled water users in the western portion of the Ewa Plain. The preferred site accommodates an existing BWS reservoir, called the "Barbers Point 215' Nonpotable Reservoir No. 1." The project herein will be referred to as the "Barbers Point 215' Nonpotable Reservoir No. 2." This nomenclature is not intended to disregard the alternative sites to be considered in this study report.

1.1 *Project Description*

1.1.1 Background Information

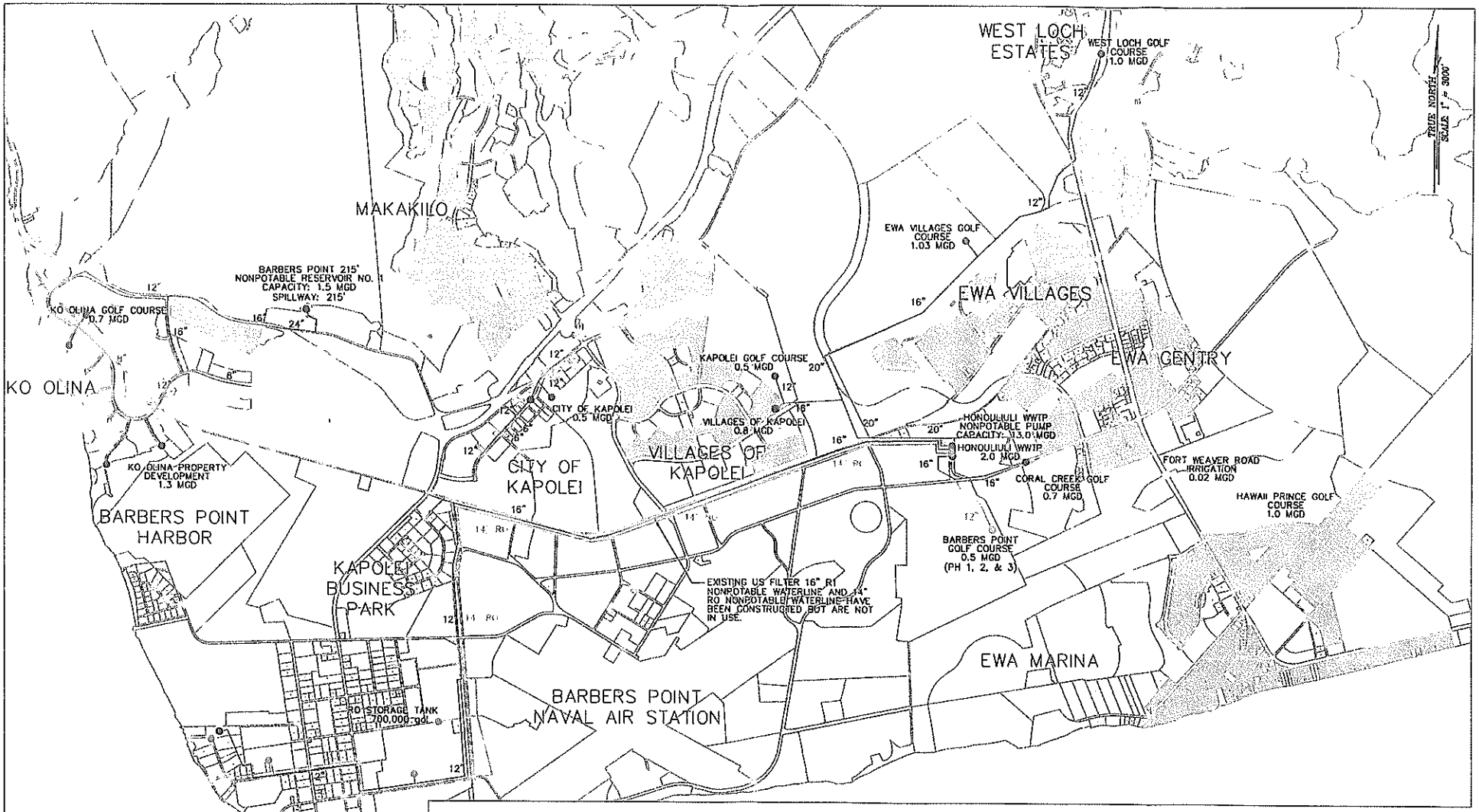
The Ewa Plain is located in the southwest region of the Island of Oahu and encompasses approximately 32,000 acres or about 8 percent of the entire island. Kapolei, located in the Ewa Plain (see **Figure 1-1**), is a fast-growing area consisting of commercial, industrial, resort, recreational, and residential uses.

Historically, the Ewa Plain was used for sugar cane cultivation until the development of the Campbell Industrial Park in the early 1960s. The majority of the land in the Kapolei area was owned by the James Campbell Trust Estate. Residential growth began in the 1970s with the development of the Makakilo and Ewa Beach communities. Since then, the Ewa District has been designated as a secondary urban center to be focused around the City of Kapolei.

Due to the planned growth of the secondary urban center, an increase in usage of both potable and nonpotable water is anticipated. The Department of Land and Natural Resources, Commission on Water Resource Management has been limiting the number of new well permits and renewal applications for existing wells because of the sustainable yield decline of the Ewa caprock aquifer. Therefore, to meet the growing demand, the City and County of Honolulu (CCH) and the BWS have jointly pursued a water recycling program in the Ewa Plain. This program will also comply with a Hawaii Department of Health (DOH) consent order and United States Environmental Protection Agency 309 Consent Decree provisions, that requires the City to spend at least $20 million to develop an effluent reuse system.

1.1.2 Existing Barbers Point 215' Nonpotable Water System

The existing Barbers Point 215' Nonpotable Reservoir No. 1 (formerly known as the West Beach Reservoir) is supplied by two onsite brackish wells and has a storage capacity of 1.5 million gallons (MG). The reservoir is connected to a transmission system, which provides irrigation water for the Ko Olina golf course as well as roadway and selected common area landscaping within the Ko Olina resort area (R.M. Towill Corporation, 2004). This preliminary engineering report will evaluate the proposed addition of a second reservoir to store DOH Class 1 recycled water (R1) water for use in the Ko Olina area and beyond as part of the phased expansion of the BWS's water recycling program.



BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU

LEGEND:

- EXISTING US FILTER RO
- EXISTING US FILTER R1
- EXISTING NONPOTABLE WATERLINE
- EXISTING NONPOTABLE WATERLINE (ABANDONED POTABLE WATERLINE)
- PROPOSED NONPOTABLE WATERLINE–PHASE 1 (ALREADY CONSTRUCTED)

Project Site

Date: October 2006

PRELIMINARY ENGINEERING STUDY
BARBERS POINT 215' NONPOTABLE RESERVOIR NO.2

EXISTING NONPOTABLE WATER SYSTEM

FIGURE 1-1

LIMTIACO CONSULTING GROUP
CIVIL ENGINEERING AND ENVIRONMENTAL ENGINEERING
650 IWILEI RD, SUITE 209•HONOLULU HI 96817

1.1.3 Ewa Water Recycling Program

The Honouliuli Wastewater Treatment Plant (HWWTP), located on Geiger Road (see **Figure 1-1**), serves all residential, commercial, industrial, and agricultural areas in the western portion of the Mamala Bay sewer district (except for Pearl Harbor and Campbell Industrial Park). Currently, the HWWTP has the capacity to treat 38 million gallons per day (MGD) and discharges its effluent through a 78-inch diameter deep ocean outfall. As the growth of the Ewa and Central Oahu districts continues, there are plans to expand the HWWTP to an ultimate treatment capacity of 51 MGD by the year 2020 (R.M. Towill Corporation, 2004).

In 1996, the CCH partnered with US Filter for the design and construction of a 13 MGD secondary treatment facility and the Ewa Water Recycling Facility (EWRF) at the HWWTP site. The HWWTP is currently providing secondary treatment for 13 MGD of primary treated effluent that can be used for reverse osmosis (RO) and R1 water production. 1 MGD of RO water has been designated for industrial use, 2 MGD of R1 water has been designated for in-plant use at the HWWTP, and 10 MGD of R1 water has been designated for users in the Ewa Plain. In practice, however, about 1 MGD of the 13 MGD has been wasted as filter backwash or RO reject.

The BWS has plans to add recycled water facilities in 3 phases: Phase 1 (2005-2010), Phase 2 (2010-2015), and Phase 3 (2015 and beyond). An additional 8 MGD of capacity will be implemented in the near future (R.M. Towill Corporation, 2004). This will require capacity upgrades for both the HWWTP's secondary treatment and the EWRF's filtration and disinfection facilities. The treatment expansions will be accompanied by extensions of the distribution system to new users, which will include users that are currently pumping brackish caprock water for nonpotable uses.

1.2 *Scope and Purpose*

The purpose of this study is to evaluate the feasibility of constructing up to a 6-MG nonpotable water reservoir with a spillway elevation at 215 feet above mean sea level (MSL) as part of the Ewa region's distribution system for recycled water. The BWS will consider a smaller storage volume if it is operationally appropriate or more feasible than a 6-MG tank. In addition to the site of the Barbers Point 215' Nonpotable Reservoir No. 1, the BWS selected two alternative locations for this study. The suitability of each site will be assessed based on the following criteria:

- Land Requirements
- Accessibility
- Grading Requirements and Special Construction Needs
- Geology and Soil Profile
- Drainage of Storm Water and Reservoir Discharges
- Integration with Transmission and Distribution Facilities
- Aesthetics
- Permitting Issues
- Environmental Factors (archeological, botanical, etc.)
- Construction Costs

- Public Input

Under a separate project, the BWS will plan, design, and construct a transmission main that will connect the Barbers Point 215' reservoirs to the Ewa R1 water distribution system. This preliminary engineering study will focus on the requirements for the proposed 6-MG reservoir and will not evaluate sizing, alignment, or other design or construction requirements for the proposed transmission main.

Chapter 2 Ewa Nonpotable Water Master Plan

This chapter introduces the existing and future plans of the nonpotable water system in the Ewa area, based on the *Draft Ewa Non-Potable Water Master Plan* (R.M. Towill Corporation, 2004).

2.1 *Existing Nonpotable Water System*

In addition to the existing Barbers Point 215' nonpotable water system and the existing recycled water system, there are two nonpotable water systems supplied by the Ewa caprock aquifer that currently service the Ewa Plain. **Figure 1-1** in the previous chapter shows a map of these systems, which are described herein.

2.1.1 Existing Barbers Point 215' Nonpotable Water System

The existing Barbers Point 215' Nonpotable Reservoir No. 1 (formerly known as the West Beach Reservoir) is supplied by two onsite brackish wells and has a storage capacity of 1.5 MG. The system was dedicated to the BWS for operation and maintenance, but the water allocation is managed by Ko Olina. The wells are identified as Well Nos. 2006-14 and 2006-15 and are operated under Water Use Permit No. 82. The wells are part of the "Ewa-Kunia" Water Management Area. The permitted withdrawal rate is not to exceed 1.0 MGD, based on a 5-month moving average. Each pump is capable of pumping about 1.0 MGD. The chloride levels in these wells typically range from about 325 to 350 mg/L.

The reservoir is connected to a transmission system, which supports roadway and selected common area landscaping within the Ko Olina resort area. A 24-inch transmission main conveys water from the reservoir to Farrington Highway. A 16-inch main then heads west along Farrington Highway. The main is further reduced in the Ko Olina area, to 16-inch and 12-inch mains, with 8-inch stub-outs at each of the connecting roads. The Ko Olina Resort and golf course and the Ko Olina Property Development are currently being irrigated by this nonpotable system.

2.1.2 Villages of Kapolei

The Villages of Kapolei are currently supplied with nonpotable water from two brackish wells that feed two 1.0-MG reservoirs. The 12-inch, 14-inch, and 16-inch diameter transmission mains convey water from the reservoirs in the northerly direction along the Navy boundary line. The 12-inch and 14-inch lines continue in the westerly direction along Kapolei Parkway before being reduced to 8 inches. The nonpotable reservoirs provide brackish water for irrigation of existing and future developments in the area on an interim basis. The reservoirs and transmission mains have been designed to accommodate recycled water in the future.

2.1.3 City of Kapolei

The City of Kapolei nonpotable water system is partially completed. Interim transmission mains along Kamokila Boulevard have been constructed with lateral connections along portions of Haumea, Wakea, and Manawai Streets. Two caprock wells have been drilled in the City of Kapolei and are being used as the interim source for the nonpotable distribution system. The wells are located near the intersection of Kapolei Parkway and Kamokila Boulevard.

2.2 *Planned Nonpotable Water System*

The expansion of the nonpotable R1 water system is anticipated to occur in three phases, as presented in **Table 2-1**. At ultimate development, the total potential demand for R1 water is projected to be approximately 23 MGD (City and County of Honolulu, Board of Water Supply, 2005). Existing average and peak use rates are based on actual data from April 2004 to March 2005 (12-month average use) and July 2004 (peak use).

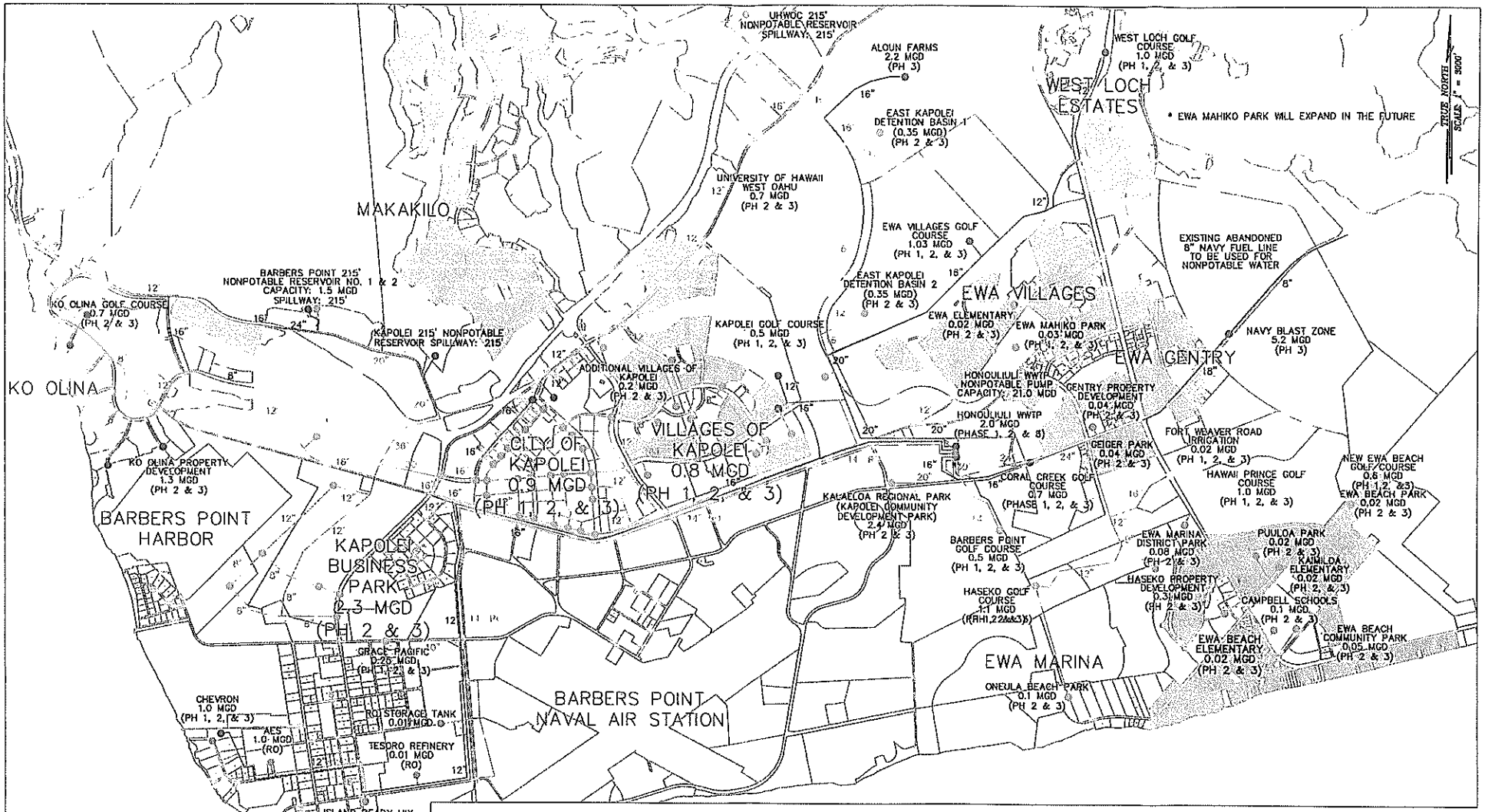
The facilities and distribution system layout of the planned R1 water system is presented in **Figure 2-1** (adopted from R.M. Towill Corporation, 2004). The actual growth of the R1 treatment and distribution system will be based on future user demands and the available system capacity.

2.3 *RO System*

The EWRF has a separate treatment and distribution system for its RO water that employs microfiltration and RO membranes to produce about 1.5 MGD of high-quality recycled water for industrial use at the James Campbell Industrial Park. There are no defined plans to expand the RO system, although the system has the capacity to incorporate a future Hawaiian Electric Company power plant in the Campbell Industrial Park. The RO system is completely isolated from and will have no bearing on the Barbers Point 215' nonpotable water system.

Table 2-1 Existing and Potential R1 Water Use

Existing Users	12-month Average Use (MGD)	Peak Use (MGD)
East System		
City Users		
West Loch Golf Course	0.581	1.248
Ewa Villages Golf Course	0.717	1.580
Honouliuli RW Plant	3.543	4.028
Hawaii Prince Golf Course	0.761	1.580
Kapolei Golf Course	0.643	1.142
Fort Weaver Road Irrigation	0.008	0.014
West System		
Coral Creek Golf Course	0.602	1.391
Existing System Total	**6.855**	**10.984**
Phase 1 Additional Users (2005-2010)	**12-month Average Use (MGD)**	**Peak Use (MGD)**
New Ewa Beach Golf Course	0.6	0.9
Barbers Point Golf Course	0.6	1.8
Ocean Pointe Golf Course	0.6	0.9
City of Kapolei	0.25	0.75
Phase 1 Cumulative Total	**8.905**	**15.334**
Phase 2 Users (2010-2015)	**12-month Average Use (MGD)**	**Peak Use (MGD)**
Ko Olina Golf Course	0.6936	1.0404
Campbell Schools		
Ilima Intermediate School	0.0282	0.0846
Campbell High School	0.0609	0.1827
Pohakea Elementary School	0.0168	0.0504
City of Kapolei - Additional	0.378	1.134
East Kapolei Detention Basin	0.7	1.4
Ewa Beach Community Park	0.0537	0.1611
Ewa Beach Elementary School	0.0159	0.0477
Ewa Beach Park	0.0199	0.0597
Ewa Elementary	0.0231	0.0693
Ewa Marina District Park	0.0816	0.2448
Geiger Park	0.0408	0.1224
Haseko Property Development	0.318	0.954
Island Ready Mix	0.08	0.24
Kaimiloa Elementary School	0.0234	0.0702
Kalaeloa Regional Park (Kapolei Community Development Park)	2.448	7.344
Kapolei Business Park	2.34	7.02
Ko Olina Property Development	1.2963	3.8889
Oneula Beach Park	0.1224	0.3672
Parks	0.0628	0.1884
Puuloa Neighborhood Park	0.0177	0.0531
UH West Oahu Campus (East Kapolei)	0.7344	2.2032
Phase 2 Cumulative Total	**18.461**	**42.260**
Phase 3 Additional Users (2015-beyond)	**12-month Average Use (MGD)**	**Peak Use (MGD)**
Aloun Farms (Campbell Estates East Kapolei)	2.2032	4.4064
Navy Blast Zone	2.6125	5.225
Phase 3 Cumulative Total	**23.276**	**51.891**


UHWOC 215' NONPOTABLE RESERVOIR SPILLWAY: 215'
ALOUN FARMS 2.2 MGD (PH 3)
WEST LOCH GOLF COURSE 1.0 MGD (PH 1, 2, & 3)
WEST LOCH ESTATES
* EWA MAHIKO PARK WILL EXPAND IN THE FUTURE
TRUE NORTH
SCALE 1" = 3000'
EAST KAPOLEI DETENTION BASIN 1 (0.35 MGD) (PH 2 & 3)
UNIVERSITY OF HAWAII WEST OAHU 0.7 MGD (PH 2 & 3)
MAKAKILO
EWA VILLAGES GOLF COURSE 1.03 MGD (PH 1, 2, & 3)
EXISTING ABANDONED 8" NAVY FUEL LINE TO BE USED FOR NONPOTABLE WATER
BARBERS POINT 215' NONPOTABLE RESERVOIR NO. 1 & 2 CAPACITY: 1.5 MGD SPILLWAY: 215'
KO OLINA GOLF COURSE 0.7 MGD (PH 2 & 3)
EAST KAPOLEI DETENTION BASIN 2 (0.35 MGD) (PH 2 & 3)
EWA VILLAGES
KAPOLEI 215' NONPOTABLE RESERVOIR SPILLWAY: 215'
KAPOLEI GOLF COURSE 0.5 MGD (PH 1, 2, & 3)
EWA ELEMENTARY 0.02 MGD (PH 2 & 3)
EWA MAHIKO PARK 0.03 MGD (PH 1, 2, & 3)
NAVY BLAST ZONE 5.2 MGD (PH 3)
EWA GENTRY
KO OLINA
ADDITIONAL VILLAGES OF KAPOLEI 0.2 MGD (PH 2 & 3)
HONOLULUI WWTP NONPOTABLE PUMP CAPACITY: 21.0 MGD
GENTRY PROPERTY DEVELOPMENT 0.04 MGD (PH 2 & 3)
HONOLULUI WWTP 2.0 MGD (PHASE 1, 2, & 3)
CITY OF KAPOLEI 0.9 MGD (PH 1, 2, & 3)
VILLAGES OF KAPOLEI 0.8 MGD (PH 1, 2, & 3)
FORT WEAVER ROAD IRRIGATION 0.02 MGD (PH 1, 2, & 3)
GEIGER PARK 0.04 MGD (PH 2 & 3)
KO OLINA PROPERTY DEVELOPMENT 1.3 MGD (PH 2 & 3)
CORAL CREEK GOLF COURSE 0.7 MGD (PHASE 1, 2, & 3)
HAWAII PRINCE GOLF COURSE 1.0 MGD (PH 1, 2, & 3)
NEW EWA BEACH GOLF COURSE 0.6 MGD (PH 1,2, &3)
EWA BEACH PARK 0.02 MGD (PH 2 & 3)
BARBERS POINT HARBOR
KALAELOA REGIONAL PARK (KAPOLEI COMMUNITY DEVELOPMENT PARK) 2.4 MGD (PH 2 & 3)
KAPOLEI BUSINESS PARK 2.3 MGD (PH 2 & 3)
BARBERS POINT GOLF COURSE 0.5 MGD (PH 1, 2, & 3)
EWA MARINA DISTRICT PARK 0.08 MGD (PH 2 & 3)
PUULOA PARK 0.02 MGD (PH 2 & 3)
KAWILDA ELEMENTARY 0.02 MGD (PH 2 & 3)
HASEKO PROPERTY DEVELOPMENT 0.3 MGD (PH 2 & 3)
HASEKO GOLF COURSE 1.1 MGD (PHH 2,2&3)
CAMPBELL SCHOOLS 0.1 MGD (PH 2 & 3)
GRACE PACIFIC 0.26 MGD (PH 1, 2, & 3)
EWA BEACH ELEMENTARY 0.02 MGD (PH 2 & 3)
EWA BEACH COMMUNITY PARK 0.05 MGD (PH 2 & 3)
EWA MARINA
CHEVRON 1.0 MGD (PH 1, 2, & 3)
ONEULA BEACH PARK 0.1 MGD (PH 2 & 3)
BARBERS POINT NAVAL AIR STATION
RO STORAGE TANK 0.017 MGD
AES 1.0 MGD (RO)
TESORO REFINERY 0.01 MGD (RO)
ISLAND READY MIX 0.08 MGD (PH 2 & 3)
BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU
LEGEND:
EXISTING US FILTER RO
EXISTING US FILTER R1
EXISTING NONPOTABLE WATERLINE
EXISTING NONPOTABLE WATERLINE (ABANDONED POTABLE WATERLINE)
PROPOSED NONPOTABLE WATERLINE–PHASE 1
PROPOSED NONPOTABLE WATERLINE–PHASE 2
PROPOSED NONPOTABLE WATERLINE–PHASE 3
Project Site
Date: October 2006
PRELIMINARY ENGINEERING STUDY
BARBERS POINT 215' NONPOTABLE RESERVOIR NO.2
PLANNED NONPOTABLE WATER SYSTEM
FIGURE 2-1
LIMTIACO CONSULTING GROUP
CIVIL ENGINEERING AND ENVIRONMENTAL ENGINEERING
650 IWILEI RD, SUITE 208•HONOLULU HI 96817

Chapter 3 Feasibility of Project Site and Alternatives

This chapter will evaluate the feasibility of the proposed Barbers Point Nonpotable Reservoir No. 2. First, three locations, which were identified by the BWS as candidate sites, will be screened and evaluated. Second, design concepts and alternatives for the proposed reservoir will be developed for the preferred site(s). The development of these concepts will provide insight as to which design alternatives are available to the BWS for this project and which alternatives should not be considered further.

3.1 *Site Evaluation Criteria*

The following minimum criteria were established to screen alternative sites:

- The proposed location must have sufficient elevation and be located in an appropriate area to be operationally effective and service the existing Barbers Point 215' nonpotable water system and the western portion of the Ewa Plains, including the City of Kapolei.
- The proposed location should have adequate area to accommodate construction of a reservoir with a volume as high as 6 MG and support facilities.
- The proposed reservoir site must be accessible for operational personnel and equipment.
- Geology at the proposed location must be adequate to support the loads imposed by the reservoir.
- Drainage at the proposed location must be able to handle storm runoff and controlled discharge of reservoir flows without adverse impacts on property and the environment.
- The cost of the proposed project is justifiable by its benefit to the BWS recycled water program.

In addition, 10 evaluation categories were created to compare the site alternatives that meet the minimum criteria above. The sites were then evaluated based on these factors to determine their relative feasibility for the proposed project. A brief description of each criterion is presented as follows:

- **Zoning** – Refers to the appropriate uses of the site based on County zoning and State land use designation. If zoning changes, variances, or waivers on use restrictions are required, the project could incur additional costs, or the reservoir's operability might be impaired.
- **Geology and Soils** – Refers to the ability of the site's geological substrata to provide a stable foundation for the reservoir and the water it will contain.
- **Size** – Refers to the available acreage at the site to accommodate up to a 6-MG reservoir and ancillary facilities, including perimeter and access roads.
- **Grading Requirements and Special Construction Needs** – Refers to the existing topography at the site and grading requirements to allow integration of the proposed reservoir with the existing 215' nonpotable water system without excessive excavation or earth movement to the extent that construction costs and/or requirements for special constructions are greatly affected. Special construction needs refer to retaining walls, berms, and any other special features.

- **Drainage** – Refers to the potential of the site to allow discharge of on-site drainage waters and/or reservoir discharges into either an existing storm drainage system or a natural drainage pathway in the area.
- **Accessibility** – Refers to the presence or absence of existing access roads to the proposed reservoir site, their conditions, i.e. paved or unimproved, and length.
- **System Integration** – Refers to the ability to integrate the proposed reservoir into the existing water system with special emphasis on hydraulics and alignments of influent, effluent, and/or transmission lines.
- **Construction Cost** – Refers to the total construction cost estimate of the proposed reservoir, access road, transmission lines, and ancillary facilities.
- **Permitting** – Refers to the effort required to obtain all applicable permits for construction and operation of the proposed reservoir.
- **Environmental Factors** – Refers to impacts of the proposed reservoir on the following categories:
  - Archaeological/Historic Resources
  - Flora and Fauna
  - Air and Water Quality
  - Noise
  - Traffic
  - Visual Impacts
  - Loss of Agricultural Land

3.2 *Screening of Alternative Sites*

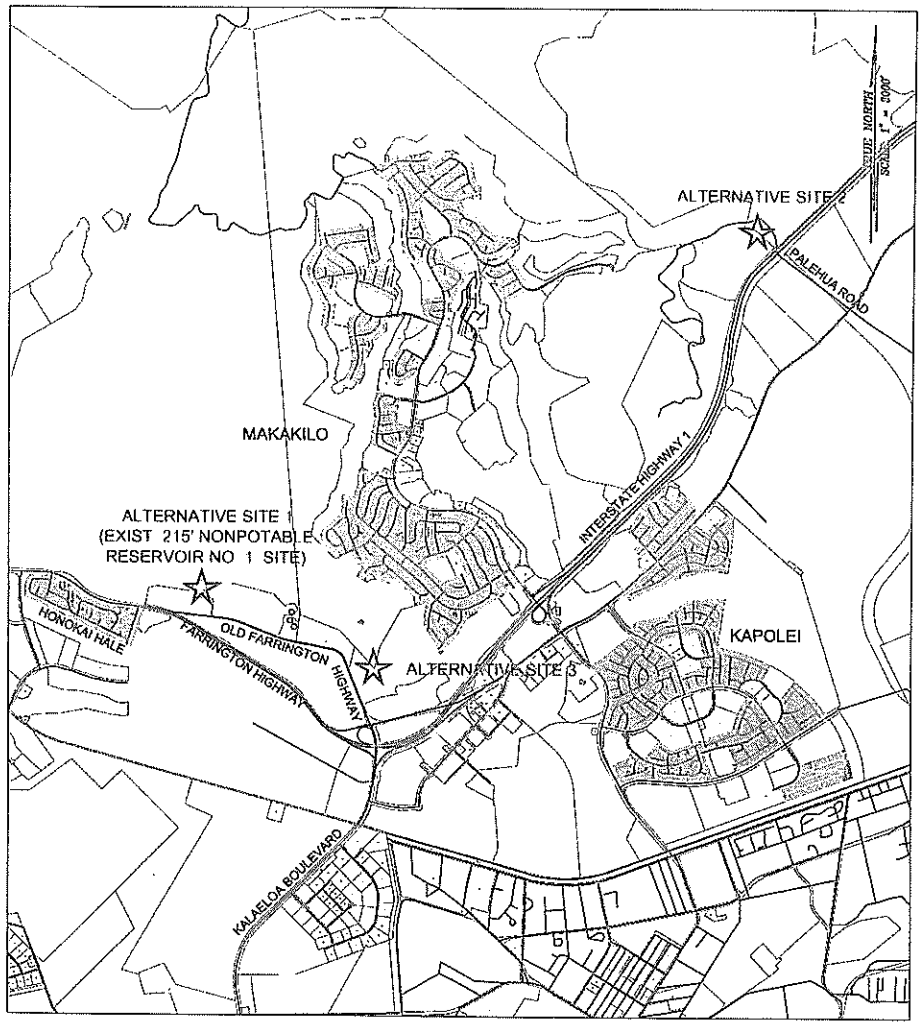
The three candidate locations for the project are numbered Alternative Site 1 (AS1), Alternative Site 2 (AS2), and Alternative Site 3 (AS3), and can be seen in **Figure 3-1**. AS1 is the site of the existing Barbers Point 215' Nonpotable Reservoir No. 1, about 600 feet mauka of Old Farrington Highway, and near Honokai Hale. AS2 is located mauka of the H1 freeway and North-South Road at the former proposed site of the University of Hawaii West Oahu campus (UHWOC). AS3 is also located on Old Farrington Highway, about 4500 feet east-southeast of AS1. In the *Ewa Non-Potable Water Master Plan* (R.M. Towill Corporation, 2004) and in **Figure 2-1**, AS1, AS2, and AS3 are respectively known as the Barbers Point 215' Nonpotable Reservoirs No. 1 and 2, the UHWOC 215' Nonpotable Reservoir, and the Kapolei 215' Nonpotable Reservoir. Photographs of the three sites are presented in **Appendix 1**.

3.2.1 Alternative Site 2

Based on the minimum criteria, AS2 was eliminated due to its significant distance from the existing Barbers Point 215' non-potable water system and the prohibitive cost associated with integrating a reservoir from that distance to the existing system. Moreover, AS2 is proposed as a potential site for a future R1 water reservoir serving the eastern portion of the Ewa Plains.

3.2.2 Alternative Site 1 vs. Alternative Site 3

Table 3-1 presents a decision matrix for the basic comparison of AS1 and AS3. It is clear that AS1 is not only capable of meeting these criteria, but AS1 also has a clear advantage over AS3 – that is, it would occupy an existing reservoir site that was built to accommodate an additional tank. During construction of the Barbers Point Nonpotable Reservoir No. 1, AS1 was graded and a concrete pad was built to accommodate a future 1.5-MG reservoir.



BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU

Date: October 2006

PRELIMINARY ENGINEERING STUDY
BARBERS POINT 215' NONPOTABLE
RESERVOIR NO.2

MAP OF ALTERNATIVE SITES

FIGURE 3-1

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Table 3-1 Decision Matrix for Comparison of Alternative Sites 1 and 3

Criteria	*Alternative Site 1*	*Alternative Site 3*
Zoning	+ Ag-2	+/– Ag-2/R-5
Geology and Soils	+	N/A
Size	o Some land acquisition and earthwork required	– Significant land acquisition and earthwork required
Grading Requirements and Special Construction Needs	+ Site previously graded for future reservoir	– Extensive site development required
Drainage	+ Existing drainage to Palailai Gulch	– No storm drains or natural watercourses nearby
Accessibility	+ Existing access road and perimeter security	– Old Farrington Highway nearby; access and perimeter road required
System Integration	+ Tandem operation at one site	– Two 215' nonpotable sites; difficult to integrate
Construction Cost Estimate	o	–
Permitting	o	o
Environmental Factors	o	o
Overall	+	–

Key: + (relatively advantageous), – (relatively disadvantageous), o (neutral or similar), N/A (not available)

The BWS's project team presented the proposed project and its three alternative sites to the Makakilo/Kapolei/Honokai Hale Neighborhood Board at its February and April 2003 meetings (see meeting minutes in **Appendix 3**). The presentations to the Neighborhood Board included a preliminary comparison of costs and other parameters. This preliminary comparison has been updated and included in **Appendix 3**. Based on its advantages and photographic renderings of the proposed 6-MG reservoir (see **Appendix 2**), AS1 was supported unanimously at the meeting on April 30, 2003, under the condition that a cultural assessment of the selected site be performed. The Environmental Assessment for this project will detail the results of the cultural assessment of the project at AS1.

Based on the public's support, the relative costs, and other advantages, AS1 is the recommended site for this project, and AS3 is eliminated from further consideration. Furthermore, the BWS prefers that the new reservoir be clustered with the existing reservoir, minimizing the distance between the two, so they can be integrated and operated in tandem.

3.3 *Description of the Proposed Reservoir Site*

AS1, the site of the existing Barbers Point 215' Nonpotable Reservoir No. 1, is the recommended site for this project.

3.3.1 General

The BWS, with the backing of the Makakilo/Kapolei/Honokai Hale Neighborhood Board, has selected AS1 as the site for the Barbers Point Nonpotable Reservoir No. 2. The site is a 2.308-acre lot identified as Tax Map Key (TMK) Number 9-1-015:023, Lot 4025, as shown in **Figure 3-2**. The site is owned by the BWS and is occupied by the Barbers Point Nonpotable Reservoir No. 1. According to the City and County of Honolulu, Department of Planning and Permitting's (DPP's) online Geographic Information Systems (GIS) maps in 2005, the assessed land value of the parcel was $535,500.

The site is located roughly 600 feet mauka of the Old Farrington Highway between Makakilo and Makaiwa Hills. Honokai Hale is the nearest residential development, located approximately a quarter of a mile to the west of the site. Three BWS potable water reservoirs – Barbers Point 215' Reservoirs No. 1, 2, and 3 – are located approximately 2200 feet to the east-southeast. Their capacities are 4 MG, 5 MG, and 3 MG, respectively. Undeveloped land immediately surrounds the perimeter of the site. A paved access road connects the site to the Old Farrington Highway. Photos from various vantage points can be seen in **Appendices 1 and 2**.

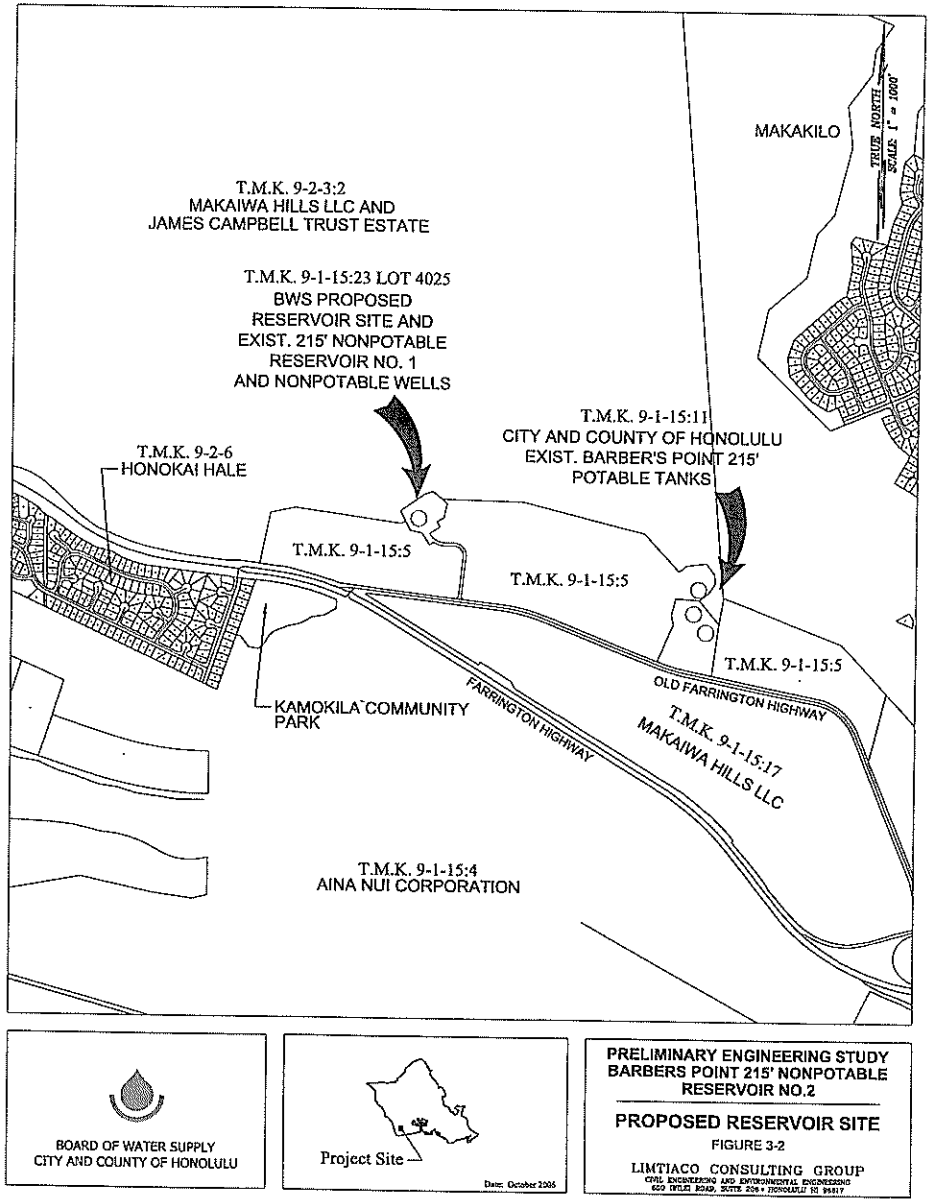
The site, including the existing nonpotable reservoir, was constructed in 1989. A plan view of the site is presented in **Figure 3-3**. The existing reservoir is a 1.5-MG reinforced concrete tank. Two deepwells, pumps, and a control station supply brackish water to the tank. A 24-inch-diameter transmission main was laid from the site to provide irrigation water to the West Beach (now Ko Olina) golf course and resort area. Each pump has the capacity to supply approximately 1.0 MGD of nonpotable water from about 150 feet below MSL. Two secured access gates allow BWS personnel access for maintenance, while restricting public vehicular and pedestrian access.

Elevations of the proposed site range from approximately 228 feet above MSL at the northern boundary to approximately 180 feet above MSL at the southern boundary, not including the access road.

3.3.2 Zoning

The State land use designation of the proposed site is Agricultural. The parcel also falls within one of the State's Enterprise Zones. Its City zoning classification is Ag-2 (General Agricultural District). It is not necessary to change the zoning designations in order to construct a second nonpotable reservoir on this site. Furthermore, the parcel is mauka of the Shoreline Management Area, and no Special District or historical registry restrictions would apply to this project.

The setback requirement for Ag-2 is 15 feet for front yards and 10 feet for side and rear yards. The front yard requirement is met by the existing access road, and the side/rear yard requirement will be met by the need for a perimeter road and the cut slope around the reservoir. The maximum height of a structure may be increased from 15 to 25 feet, if any portion of the structure above 15 feet is set back one foot from the buildable boundary (i.e. the standard setback) for every two feet of additional height above 15 feet.



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CITY AND COUNTY OF HONOLULU

Date: October 2006

PRELIMINARY ENGINEERING STUDY
BARBERS POINT 215' NONPOTABLE
RESERVOIR NO.2

PROPOSED RESERVOIR SITE

FIGURE 3-2

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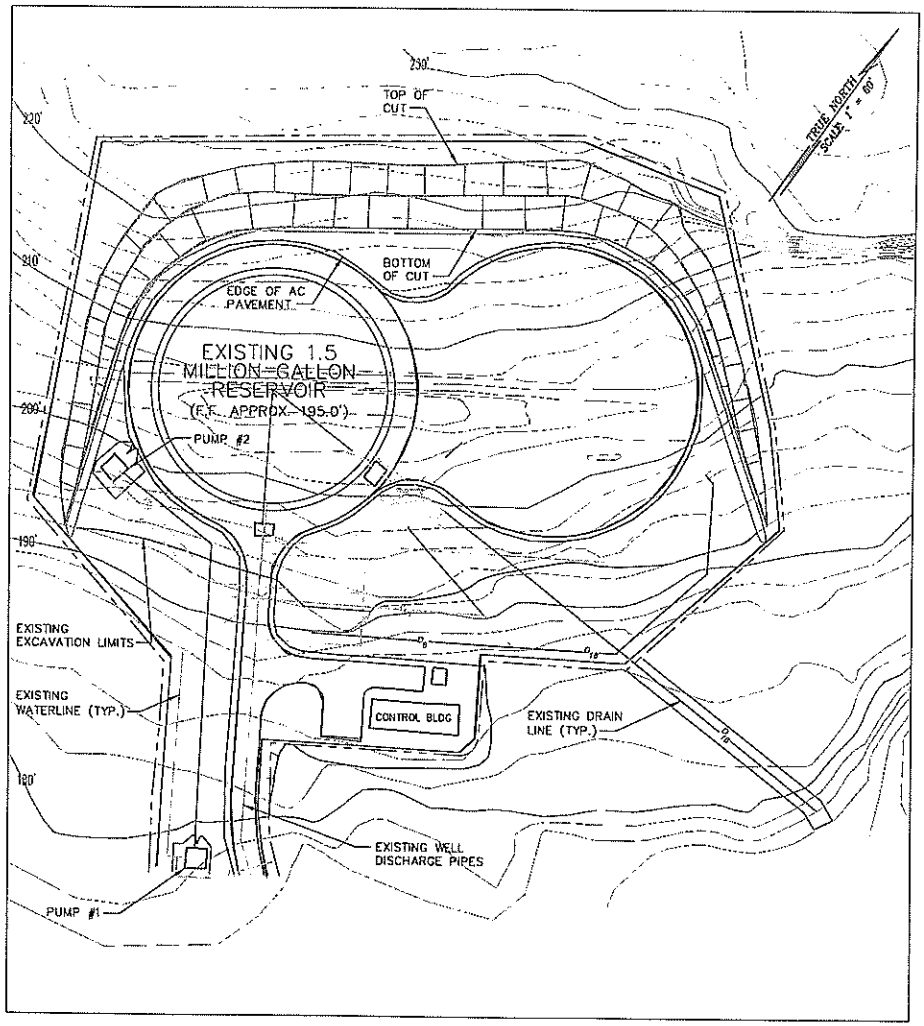

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PRELIMINARY ENGINEERING STUDY
BARBERS POINT 215' NONPOTABLE RESERVOIR NO.2

EXISTING SITE CONDITIONS

FIGURE 3-3

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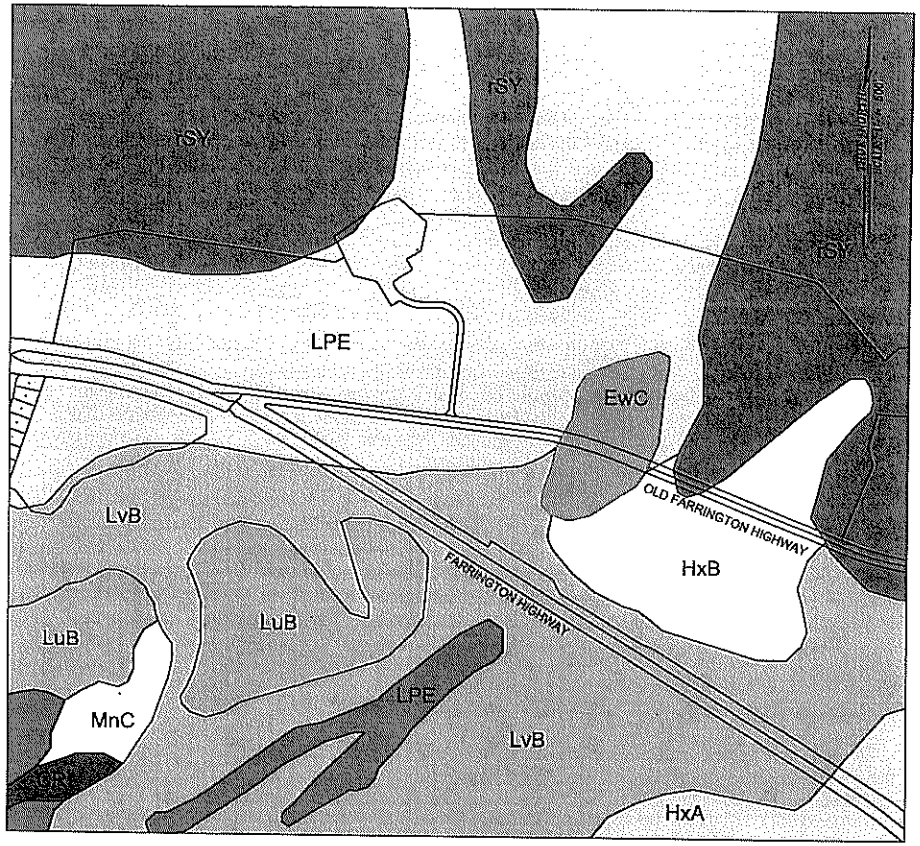
3.3.3 Geology and Soils

A geotechnical investigation was not completed for this preliminary engineering study. Existing geotechnical data were reviewed and found to be appropriate for this stage of the project. It is recommended that a geotechnical investigation, including soil borings and analysis, be performed during the design phase to confirm the assumptions used in this report.

A soil investigation and report was performed for the existing nonpotable reservoir's site (CW Associates Inc., 1986), which includes the area reserved for a future 1.5-MG reservoir. Four borings were taken at the site. A site map and boring logs are provided in **Appendix 4**. The borings extended from ground surface (Elev. 197' to 217' above MSL, prior to grading of the existing site) to about Elev. 182' to 192' above MSL. Based on the previous soil investigation, the rock formations underlying the site should provide an adequate foundation for a proposed 6-MG reservoir. For this preliminary engineering study, the general recommendations regarding structural design, site grading, and perimeter road of CW Associates Inc. (1986) will be used as guidance.

Figure 3-4 presents the generalized soil types found in the vicinity of the proposed project site from the *Soil Survey of Islands of Kauai, Oahu, Maui, Molokai, and Lanai, State of Hawaii* (U.S. Department of Agriculture, Soil Conservation Service, 1972).

The island of Oahu is categorized in the *Uniform Building Code* (International Code Council, 1997) as Seismic Zone 2A. To be conservative, the BWS prefers the use of Zone 3 for the structural design of its facilities.



LEGEND:

SYMBOL	NAME
CR	CORAL OUTCROP
EwC	EWA STONY SILTY CLAY, 6 TO 12 PERCENT SLOPES
HxA	HONOULIULI CLAY, 0 TO 2 PERCENT SLOPES
HxB	HONOULIULI CLAY, 2 TO 6 PERCENT SLOPES
LPE	LUALUALEI EXTREMELY STONY CLAY, 3 TO 35 PERCENT SLOPES
LuB	LUALUALEI CLAY, 2 TO 6 PERCENT SLOPES
LvB	LUALUALEI STONY CLAY, 0 TO 2 PERCENT SLOPES
MnC	MAMALA STONY SILTY CLAY LOAM, 0 TO 12 PERCENT SLOPES
rSY	STONY STEEP LAND

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PRELIMINARY ENGINEERING STUDY
BARBERS POINT 215' NONPOTABLE RESERVOIR NO.2

SOIL TYPES AT THE PROPOSED RESERVOIR SITE

FIGURE 3-4

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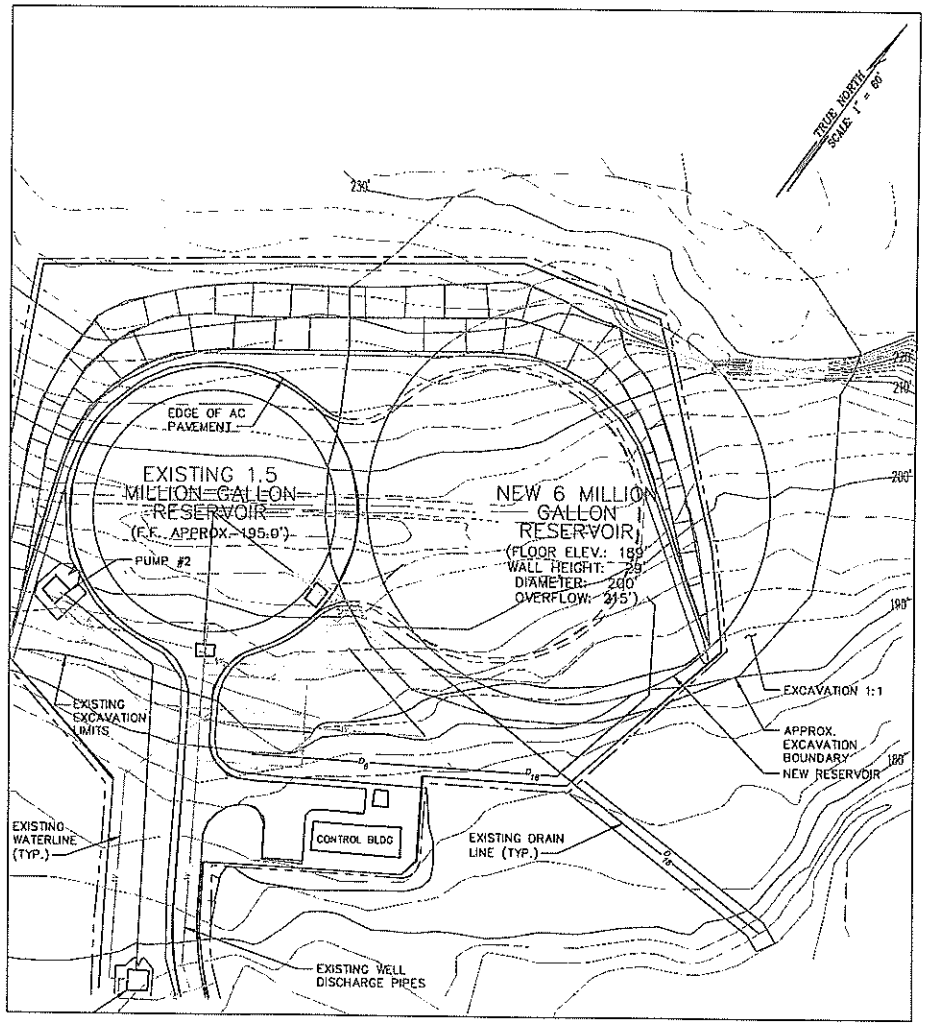

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PRELIMINARY ENGINEERING STUDY
BARBERS POINT 215' NONPOTABLE RESERVOIR NO.2

ALTERNATIVE TANK CONFIGURATION #1

FIGURE 4-1

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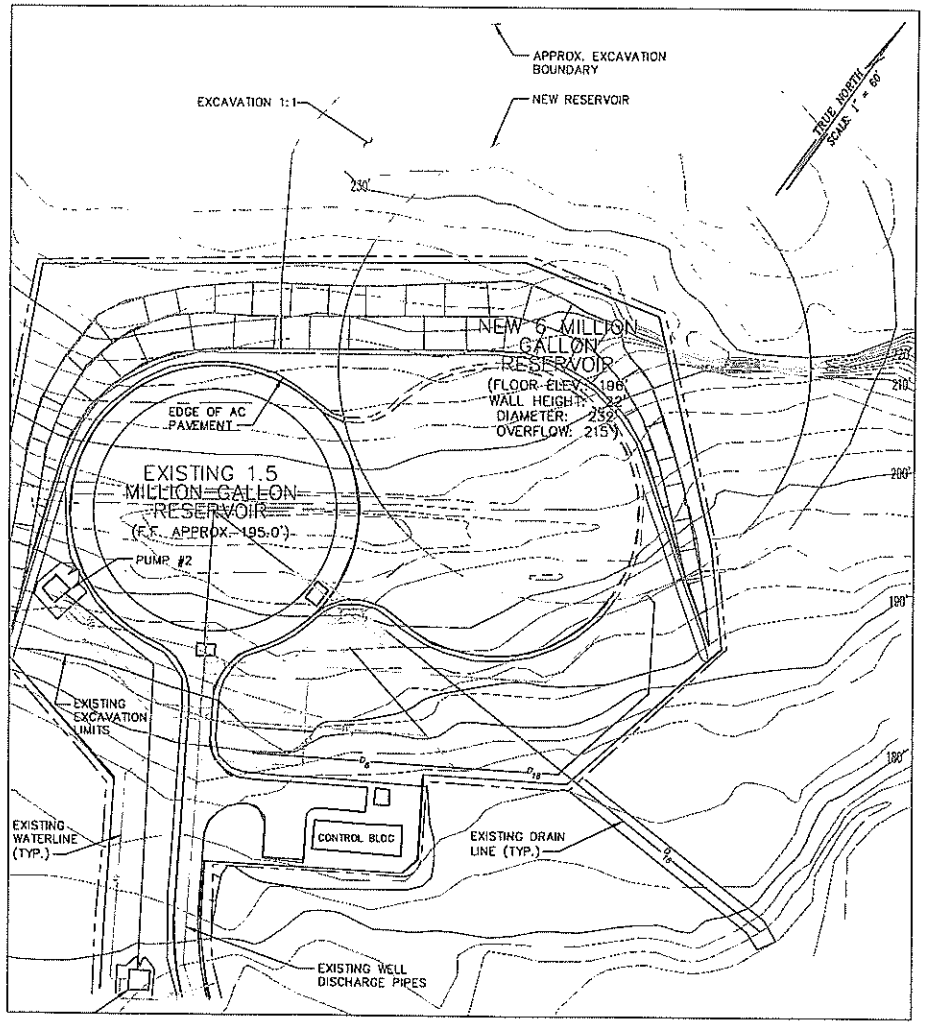

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PRELIMINARY ENGINEERING STUDY
BARBERS POINT 215' NONPOTABLE RESERVOIR NO.2

ALTERNATIVE TANK CONFIGURATION #2

FIGURE 4-2

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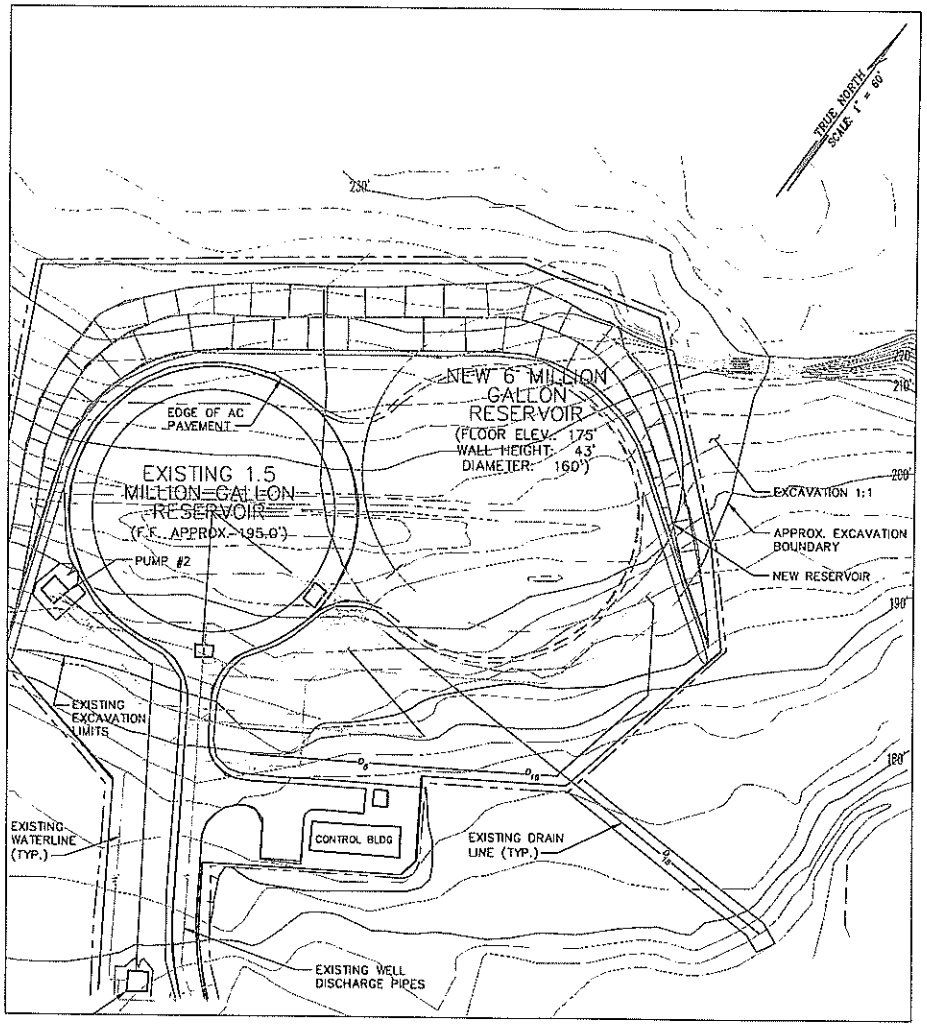

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PRELIMINARY ENGINEERING STUDY
BARBERS POINT 215' NONPOTABLE RESERVOIR NO.2

ALTERNATIVE TANK CONFIGURATION #3

FIGURE 4-3

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4.2.1 Conventional Cast-in-Place Reinforced Concrete

Design considerations and features for conventional cast-in-place reinforced concrete tanks are as follows:

- Design per *ACI 350, Code Requirements for Environmental Engineering Concrete Structures and Commentary* (American Concrete Institute, 2001).
- Common design. Most contractors are experienced with this type of construction. Economical for small, circular tanks, with wall heights under 22 feet.
- Tendencies include cracking at top and bottom of wall, due to continuity of rebar and concrete, during initial shrinkage drying, during initial fill, and after a seismic event.
- Survives seismic events well with some leakage. Usually repairable with epoxy injection, and patching.
- Exterior appearance of overall wall may suffer because of tendency for wall cracking, particularly at the base and top.
- Tension cracking in concrete is required for rebar to perform its function; however, cracks will eventually lead to overall deterioration and necessary repairs as tank ages.
- OPTION: Free top slab is slightly more expensive than fixed; however, top-of-wall cracking is minimized.
- OPTION: Design wall base connection similar to a pre-stress tank design. Include free-base expansion joint with seismic cabling to reduce base-of-wall cracking. Account for overturning and shear forces induced by seismic event. The cost of this base design results in minor additional construction cost, but provides superior seismic performance and life-expectancy.

4.2.2 Pre-stressed Reinforced Concrete with Free Top and Base

Design considerations and features for pre-stressed reinforced concrete tanks are as follows:

- Design per *AWWA D110 Wire- and Strand-Wound, Circular, Prestressed Concrete Water Tanks* (American Water Works Association, 1995).
- Common design. Number of contractors who have done successful projects in Hawaii may be limited. Particularly economical for circular tanks with wall heights as high as 50 feet. More economical with respect to conventional cast-in-place walls, as wall height increases.
- Life expectancy projected at 75 years. Superior with respect to life-cycle economics.
- Superior corrosion resistance to cast-in-place because of no wall cracking.
- Pre-stressing and post-tensioning of walls results in zero net-tension. Walls designed to be free of cracking.
- Wall top and base designed for full radial movement.
- Incorporate high-quality, polyvinyl chloride water stops in walls, wall-to-footing joints, and floor joints to prevent leakage and possible corrosion. This approach is similarly necessary with the above-described conventional concrete design approaches.
- Incorporate galvanized pre-stressing strand to provide corrosion protection. An investigation of existing pre-stressed tanks over the past three decades reveals no incidents of corrosion of galvanized strand.

Table 4-1 Comparison of Tank Construction Materials

Tank Material	*Advantages*	*Disadvantages*
Steel	• Zero leakage tolerance if maintained. • Less construction time on site. • More tolerant to uneven settlement of foundation if pipes detailed correctly. • Leakage detection underdrain system not required. • Low risk of contents loss after a seismic event. • 50-year design life. • Easy to attach baffles and diffusers.	• May require cathodic protection. • Requires initial coatings. • Requires periodic maintenance, paint touch-up and future sand blasting and repainting. • Painting subject to weather delay. • No earth touching walls. Cannot bury. • Tank bottom and top moves with temperature changes. • Flexible roof - difficult to attach equipment. • May need total replacement after seismic event due to structure distortion. • Aging at 50 years.
Pre-stressed Concrete	• Minimal maintenance. • 75-year minimum life. • Wall in compression vertically and horizontally—no cracking or leakage. • Can be buried. • Roof suitable for multiple use, equipment or other structures. • Flexible wall top and base are tolerant of seismic loads. • Easy to attach baffles and diffusers. • Usually easily repairable, minor, non-leakage, post seismic event damage.	• Construction period slightly longer than steel. • First costs may be higher, especially for smaller tanks. • Can get construction-initiated minor leakage at base floor joints that are detectable and repairable with leakage detection UD system. • Subsurface prep required to mitigate differential settlement on soft soils. Not an issue on rock. • Underdrain leakage detection system recommended.
Conventional Cast-In-Place Concrete	• Minimal maintenance. • 50-year life. • Dimensional flexibility-length versus width. (Circular, Rectangular) • Can be buried. • Roof suitable for multiple use, equipment or other structures. • Easy to attach baffles and diffusers. • Usually repairable post seismic event at cost effective price.	• More construction time. • More difficult to control cracking due to shrinkage and temperature changes. • Aging at or before 50 years and may need upgrade or replacement • Leakage after seismic event more probable. • Can mitigate at roof through moving joint but not at floor. • Can get minor leakage at walls and base slabs over time and post seismic event. • Underdrain leakage detection system recommended but not usually implemented.

- Construction costs for this type of tank will typically match or beat conventional cast-in-place concrete when wall height is 28 feet or greater.

4.2.3 Material Selection

The pre-stressed reinforced concrete tanks can be initially cost-competitive with conventional reinforced concrete construction, and should have superior life-cycle costs. To simplify comparisons of other project options, pre-stressed reinforced concrete construction will be used as the basis for forthcoming cost comparisons. Either style of concrete tank, however, should suffice for this project. Final determination of the type of concrete construction will be during the design phase.

4.3 *Comparative Construction Costs*

The three Alternative Tank Configurations (ATCs) were developed to form the basis for the cost comparison of a 6-MG reservoir. The purpose of this cost analysis is to produce a first-order comparison of the cost impacts of sizing and placement of a 6-MG reservoir at the proposed site.

The comparative cost estimates for the construction of a 6-MG, strand-wrapped pre-stressed concrete tank in the various ATCs are shown in **Table 4-2**. The costs for tank painting, land acquisition, and site improvements such as modifications to the existing reservoir and piping are considered similar for each ATC and therefore negligible for the purposes of this comparison. The estimated excavation volumes and costs assume a 1:1 cut slope for the proposed site and excavation costs of $60 per cubic yard. The actual slope in rock can be ¾:1 (H:V), and in topsoil can be 2:1.

Table 4-2 Comparative Budgetary Cost Estimates for ATCs 1, 2, and 3

ATC	*Diameter*	*Wall Height*	*Water Height*	*Tank Cost*	*Estimated Excavation*	*Excavation Cost*	*Total Cost*
1	200 ft	29 ft	26 ft	$5.41 M	11,000 cy	$0.66 M	$6.07 M
2	232 ft	22 ft	19 ft	$5.68 M	50,000 cy	$3.00 M	$8.68 M
3	160 ft	43 ft	40 ft	$5.54 M	20,000 cy	$1.20 M	$6.74 M

As evidenced in **Table 4-2**, the costs are similar among the various configurations for a 6-MG tank. The amount of earthwork, however, can vary significantly and can have a strong influence on the overall cost of the project. Because the site was developed to accommodate two 1.5-MG tanks only, ATC #2 would incur the largest excavation cost because it would require the deepest penetration into the existing cut slope. Based on these cost estimates, it would appear that a tank with dimensions comparable to ATC #1 would be optimal for the site.

4.4 *Operation and Maintenance Considerations*

Under normal conditions, the two nonpotable water reservoirs will be operated in tandem, which means that both tanks will be hydraulically connected and share water surface elevations. If one tank needs to be shut down for maintenance, the second tank can continue to service the system.

The three 6-MG ATCs share spillway elevations all share the same spillway elevation as the existing reservoir, but have different floor elevations. BWS Operations staff previously indicated that the deeper reservoir is worth considering, as long as system pressure requirements are met and equipment accessibility (for example, with a cherry picker) is provided. Although a deeper 6-MG tank is more economical, the BWS presently requires that the two tanks' bottoms to be at the same elevation due to the difficulty of operating two reservoirs of varying depths in the same system. Thus, the only 6-MG configuration that can be considered is a 226-ft diameter, 20-ft water height, similar to ATC #2.

4.5 *Reclaimed Water Use in the Service Area*

Table 4-1 presented the existing and projected reclaimed water use in the Ewa Plains. The ultimate demand is projected at about 23 MGD. Because the sizing of reservoirs is based on 1.0 times the average daily use, about 23 MG of storage is required systemwide. There currently is 11.5 MG of combined storage at the Barber Point Nonpotable Reservoir No. 1 (1.5 MG), EWRF (5 MG), and existing golf courses (5 MG). Future golf courses should provide an additional 4 MG of storage. This leaves about 7.5 MG of required additional storage systemwide. The BWS's two preferred sites for additional storage reservoirs are AS1 and AS2.

About 5.0 MGD of the average day's R1 demand will be in the western region (roughly Kapolei and westward) of the Ewa Plains. These users are:

- City of Kapolei (0.63 MGD)
- Ko Olina Golf Course (0.69 MGD)
- Island Ready Mix (0.08 MGD)
- Kapolei Business Park (2.34 MGD)
- Ko Olina Property Development (1.30 MGD)

For this western region to be completely self-sufficient with respect to elevated storage capacity, the Barbers Point Nonpotable Reservoirs No. 1 and 2 would need to have a combined capacity of 5.0 MG, so Reservoir No.2 would require 3.5 MG of storage. A 6-MG storage tank would be oversized for the service area, and a smaller tank size should be considered. In the following chapter, a 3-MG tank and a 1.5-MG tank will be considered. The final sizing of the reservoir should not only consider the currently projected service area demands, but also refined estimates of future demands, financing capability, and other economic considerations as well.

Chapter 5 Feasibility of a 3-MG and 1.5-MG Reservoir

The previous chapter identified that a 6-MG tank would be excessive in volume and cost, and that 3.5 MG of storage is the maximum required of the Barbers Point Nonpotable Reservoir No. 2. If future R1 demands are less than anticipated, or if demands do not wholly require elevated storage, then a volume less than 3.5 MG is required. In this chapter, a 3-MG reservoir at AS1 will be evaluated. A 1.5-MG reservoir will also be presented for comparison, in the event that demands are reduced considerably from the projected values.

5.1 *Tank Configuration*

Based on the previous discussion, the floor and spillway elevations must match those of the existing tank. The 3.0-MG tank will be sized at 173 feet in diameter, 20 feet in water height, and 23 feet in wall height; the diameter of the tank accounts for volume of water displaced by the interior columns and floor slope. A site plan and a cross section of this tank configuration are presented in **Figure 5-1** and **Figure 5-2**.

A 1.5-MG tank will be sized at 113 feet in diameter, 20 feet in water height, and 23 feet in wall height. It is assumed that the 1.5-MG tank will be constructed similar to the existing tank. Thus, there will be sixteen interior columns, 2 feet by 2 feet each. The water displaced by the columns is about 10,000 gallons, so the actual volume will be about 1.49 MG. For discussion purposes, this report will refer to this tank by its nominal 1.5-MG volume. A site plan and a cross section of this tank configuration are presented in **Figure 5-3** and **Figure 5-4**.

5.2 *Tank Construction*

Similar to the previous chapter, cost estimates for the 3-MG and 1.5-MG tanks will be based upon construction using strand-wrapped, pre-stressed reinforced concrete.

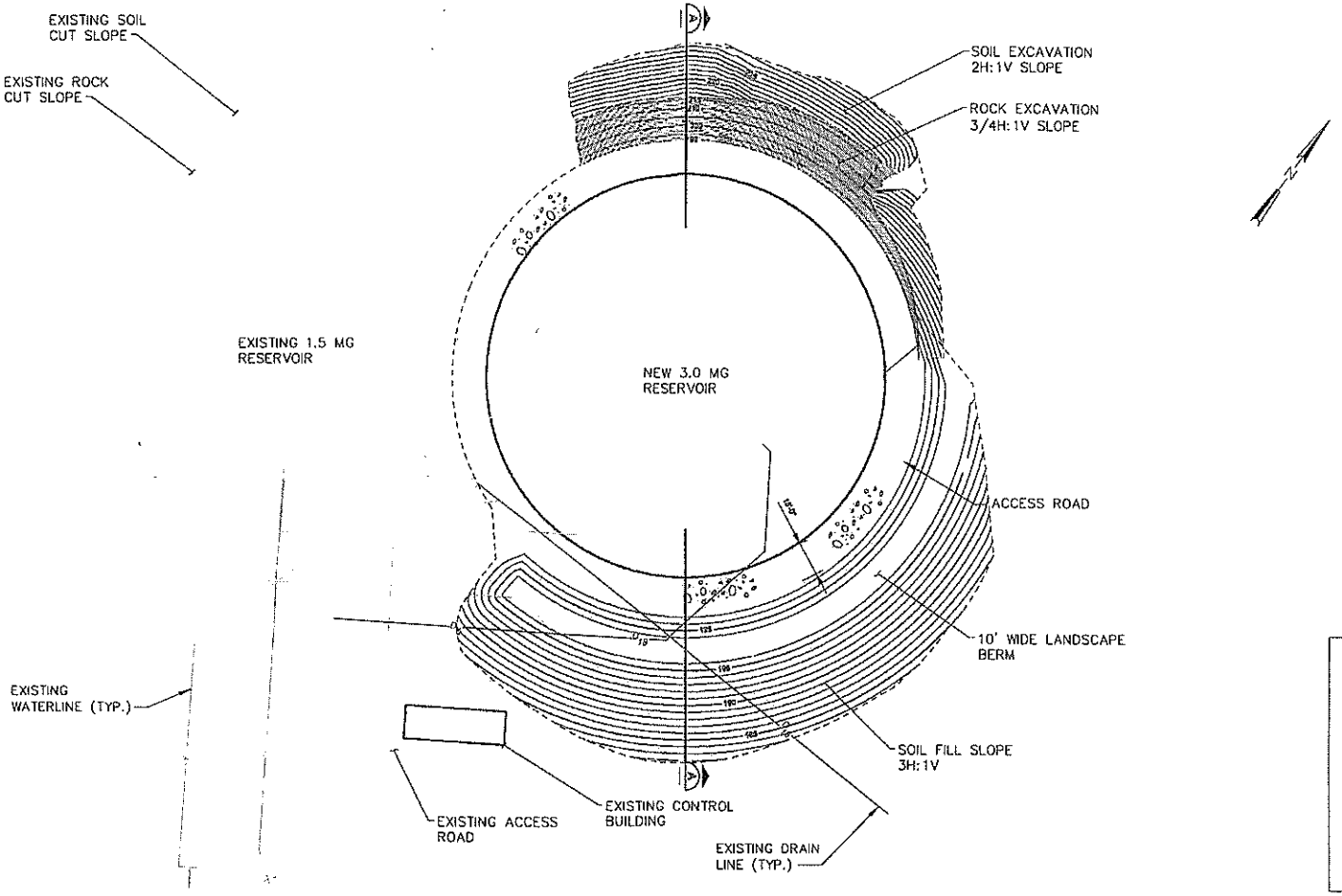
5.3 *Considerations for Design, Construction, and Operation*

The discussion in this section describes special considerations for the design, construction, and operation of the 3-MG and 1.5-MG tanks. Differences between the two tanks will be pointed out, where applicable.

5.3.1 Grading Requirements and Special Construction Needs

During the design phase of this project, soil borings and a geotechnical study should be conducted to confirm the tank's ideal configuration, location, and construction methods. In this report, estimated excavations assume a 1:1 cut slope for the proposed site. The actual slope in rock can be ¾:1 (H:V), and in topsoil can be 2:1. Rockfall mitigation, such as a wire/cable mesh, may be installed along the cut slopes located behind the existing and new tanks to reduce the potential for rockfall occurrences as a result of soil erosion and/or settlement.

A landscaped berm bordering the south and east sides of the new tank should be incorporated into the design to minimize the visual impact.



EARTHWORK QUANTITIES

ROCK EXCAVATION		
CUT	8700	CY
SOIL		
CUT	4400	CY
FILL	1000	CY
NET	3400	CY (CUT)
GRANULAR FILL		
FILL	9900	CY
LANDSCAPE BERM		
FILL	3000	CY

BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU

LEGEND:
EXISTING NONPOTABLE WATERLINE
EXISTING DRAINLINE

SCALE: 1" = 50'

Date: October 2006

PRELIMINARY ENGINEERING STUDY
BARBERS POINT 215' NONPOTABLE RESERVOIR NO.2

3.0 MG RESERVOIR SITE PLAN

FIGURE 5-1

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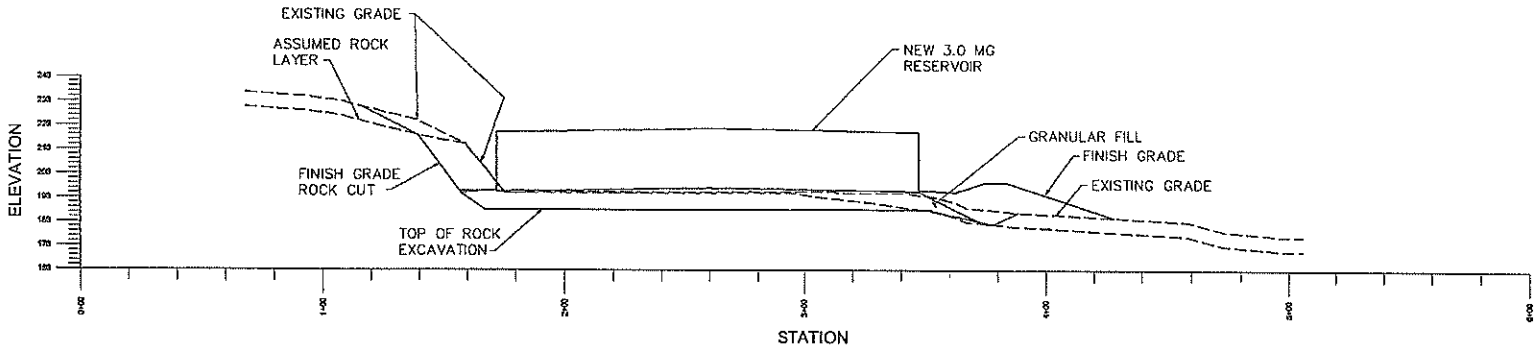

SITE SECTION A
1" = 50'

BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU

Date: October 2005

PRELIMINARY ENGINEERING STUDY
BARBERS POINT 215' NONPOTABLE RESERVOIR NO.2

3.0 MG RESERVOIR
CROSS SECTION
FIGURE 5-2

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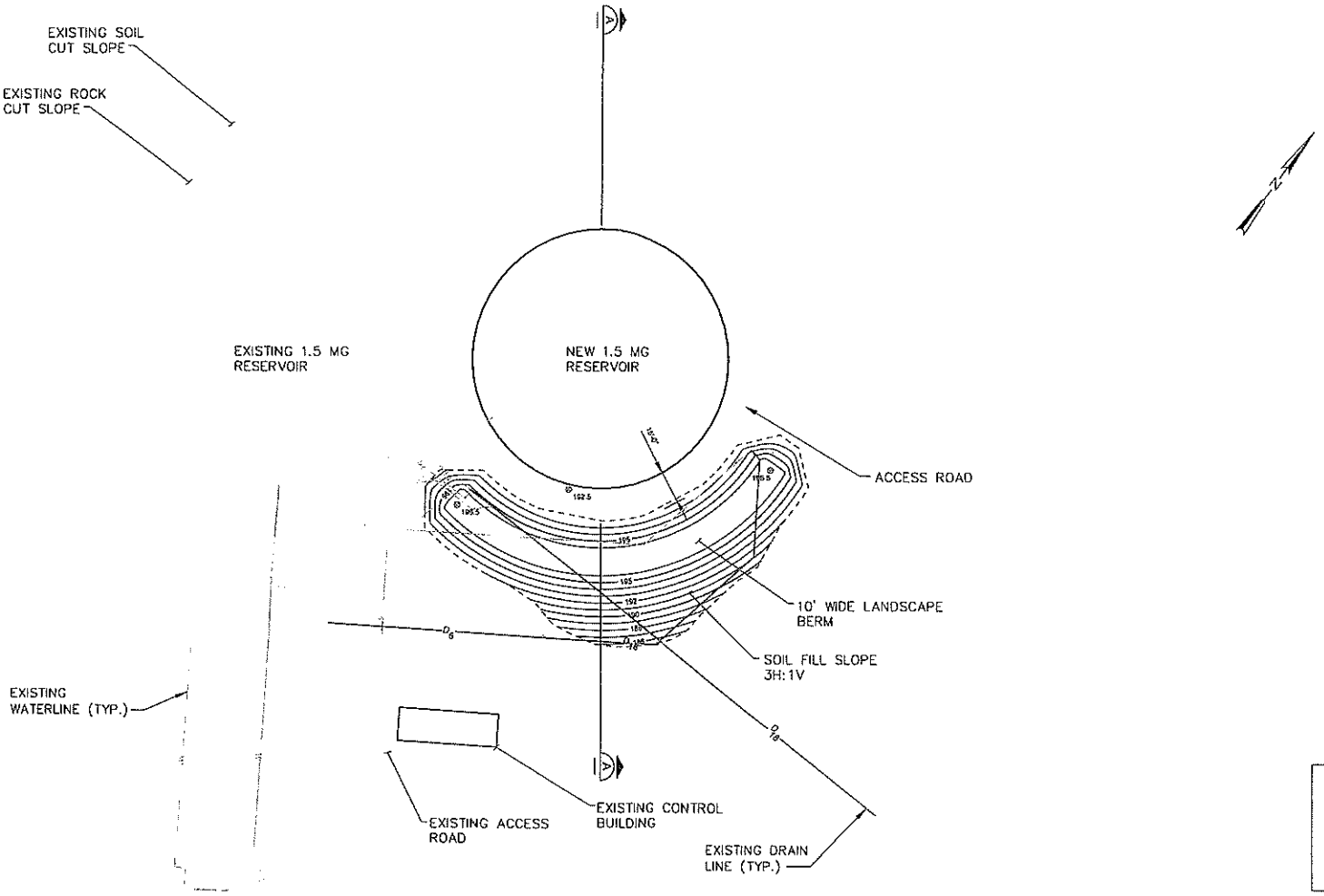

EARTHWORK QUANTITIES

GRANULAR FILL
FILL 750 CY

LANDSCAPE BERM
FILL 800 CY

BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU

LEGEND:
- EXISTING NONPOTABLE WATERLINE
- EXISTING DRAINLINE

SCALE: 1" = 50'

Date: October 2006

PRELIMINARY ENGINEERING STUDY
BARBERS POINT 215' NONPOTABLE RESERVOIR NO.2

1.5 MG RESERVOIR SITE PLAN

FIGURE 5-3

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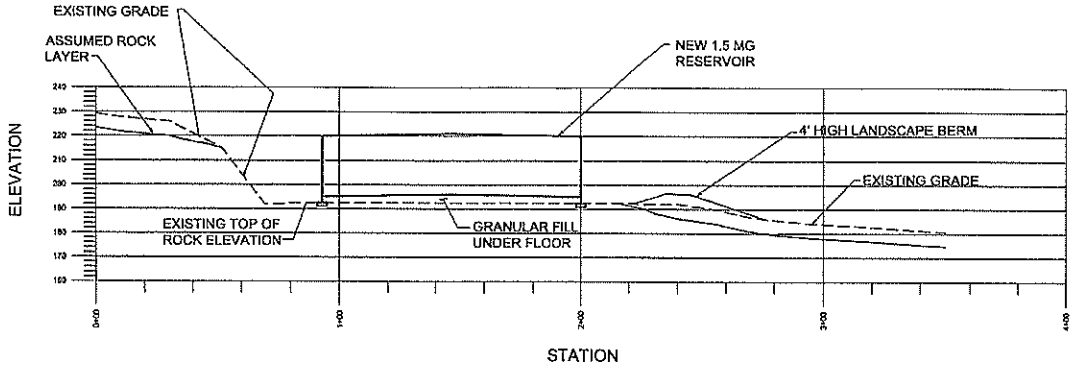

SITE SECTION (A)
1" = 50'

BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU

Date: October 2006

PRELIMINARY ENGINEERING STUDY
BARBERS POINT 215' NONPOTABLE RESERVOIR NO.2

1.5 MG RESERVOIR
CROSS SECTION
FIGURE 5-4

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5.3.2 System Integration

The following are the basic operational requirements for the proposed Barbers Point Nonpotable Reservoir No. 2:

- The new nonpotable reservoir will be supplied with R1 water from the EWRF in Honouliuli. The BWS will design and build new transmission piping to the proposed site under a separate project.
- The existing nonpotable reservoir will also be connected to the R1 water system and its brackish water supply will be relegated to supplemental duty for dry-weather, high-demand periods.
- The two reservoirs will be operated in tandem, and the existing transmission main to the Ko Olina resort will continue to service that area. If one tank needs to be shut down for maintenance, the second tank can continue to service the system.

Per consultation with DOH, there is no State regulation or guideline that requires a BWS operator to be certified as a wastewater operator to conduct operation and maintenance activities on an R1 reservoir.

5.3.3 Site Piping Modifications

The placement of a new 3-MG reservoir will likely require revisions to the alignment of piping systems connected to the existing reservoir: 1) overflow and washout drain lines, 2) transmission lines to Ko Olina, and 3) feed lines from the well pumps. The nonpotable water and drain pipe alignments and stubouts intended for the future 1.5-MG tank need to be relocated to accommodate the 3-MG tank. Piping realignment for the 1.5-MG tank alternative is anticipated to be minimal.

Per consultation with DOH, cross connections between the brackish water system and the R1 system should include a reduced-pressure-principle backflow preventer to keep R1 from entering the wells. An air gap tank and pumps could also be used in lieu of the backflow preventer. The well pumps also have check valves, which should further protect the well. Strictly speaking, however, the cross connection policies are intended to protect potable water supplies.

5.3.4 System Pressure

The recycled water guidelines (State of Hawaii, May 15, 2002) state that it is "desirable" to have potable water mainline service pressure maintained at 10 pounds per square inch (PSI) greater than the recycled water service pressure. Because no potable water service exists at the proposed reservoir site, this requirement would not apply directly to the project. Because the nearby potable water system – the Barbers Point 215' (Potable) Reservoirs No. 1, 2, and 3 – is serving the same general area with the same spillway elevation, it is possible that there are areas with parallel or intersecting transmission mains with less than a 10 PSI differential. This matter should be investigated further, but is outside of the scope of this report.

The BWS's regional nonpotable water master plan (R.M. Towill Corporation, 2004) is being developed with the aid of a computer model of its phased system expansions. Distribution facilities were sized to provide a target minimum pressure of 40 PSI at the peak hourly flow.

Deviations were assumed to be allowed based on the non-essential nature of the nonpotable water system in comparison to the potable water system.

5.3.5 Water Quality

Early on in the BWS's water recycling program in Ewa, one of the golf courses, which stored R1 water in an open water feature, experienced algal growth. This episode can be attributed to the high nutrient content in the R1 effluent and the low turnover in the pond. The condition has since been corrected by increasing the turnover of the storage pond. The lesson to be learned from this episode is that R1 reservoirs in Ewa should be covered to limit the potential for algal growth and that turnover of the reservoirs' contents should be maximized to the extent possible.

In the first years of operation, when the systemwide use of R1 water may not have reached its full potential, the hydraulic retention time of the two Barbers Point reservoirs will be relatively high. In this situation, some water quality concerns may arise. A primary concern would be the regrowth of bacteria and other organisms that could affect the concentration of pathogens at the use area or that could cause plugging of strainers and other irrigation fixtures. At present, there is neither a regulatory standard for water quality nor a requirement for monitoring of R1 effluent beyond the bounds of the treatment facility.

In general, the sizing of reservoirs for the Ewa water recycling program is based on the average daily R1 water use rates (R.M. Towill Corporation, 2004). Because of the limited use of nonpotable water in the immediate service area of the Barbers Point 215' system, the construction of Reservoir No. 2 may not commence until the user demands in the greater western portion of the Ewa Plains begin to approach the BWS's expectations.

Other approaches to maintaining water quality in the distribution system are: 1) residual chlorination with injection at the EWRF, 2) residual chlorination with injection at the reservoir, and 3) implementing nutrient removal at the HWWTP. A new chlorination facility for the Barbers Point 215' Nonpotable Reservoirs might be problematic because of the manpower required for regular deliveries of liquid sodium hypochlorite, maintenance of the chlorination system, and environmental and public safety concerns associated with a remote, unmanned chlorination system. Furthermore, it is not a regulatory requirement, the tanks are covered, and no water quality issue in the service area has been identified. If a need arises, a centrally located chlorination system at the EWRF appears to be the better approach, especially since the open storage systems at the golf courses are in the eastern portion of the system. The practicable solutions to improve water quality would likely be implemented at the EWRF, and thus are not within the scope of this project.

Currently, the BWS's maintenance program requires the reservoir to be drained and manually cleaned. This R1 reservoir should be maintained in the same manner, by being drained of any chlorinated R1 water through offsite reuse. It is not anticipated that a dechlorination facility will be needed for the proposed project.

5.3.6 Control System

Control and Supervisory Control and Data Acquisition (SCADA) system modifications for the existing system are anticipated. The major control system modifications are discussed herein.

First, the brackish water well pumps will be relegated to supplemental duty in favor of the new R1 water supply. Automatic control of the well pumps should be revised appropriately. The well pumps should be maintained properly to ensure their ability to return to service. If the well pumps are inactive for long periods of time, the quality of the brackish water may not be adequate initially, and, therefore, may need to be flushed and tested before being restored to duty.

Second, because the two tanks may be operated independently of one another during maintenance activities, the proposed reservoir will require additional level monitoring and alarms. The SCADA infrastructure and local controls for the existing reservoir would need to be modified appropriately.

Third, the R1 pumps at the EWRF and any valves along the transmission line supplying the reservoirs would have to be operated either manually or automatically based on inputs from the Barbers Point 215' level indicators. The EWRF pumps should shut off automatically if a high-level alarm is triggered.

5.3.7 Drainage of Storm Water and Reservoir Discharges

5.3.7.1 Existing Site and Reservoir Drainage

According to the *Flood Insurance Rate Map* (Federal Emergency Management Agency, 1990), the site of the Barbers Point 215' Nonpotable Reservoir is located within Zone D ("Flood Hazard Undetermined"). The nearest natural drainage is a tributary to the Palailai Gulch. An intermittent watercourse, Palailai Gulch flows during storm periods into another intermittent watercourse, Awanui Gulch, which then makes its way to the Ewa Plains near Barbers Point. At a discontinued gauging station (USGS Station No. 16212400), located at approximately 140 feet above MSL, the total drainage area of the Awanui-Palailai gulch system encompasses 1.16 square miles.

Two swales rim the mauka portion of the site. At the top of the cut slope, a grassed cut-off swale prevents runoff from above the property from entering the site. At the bottom of the cut slope, a concrete swale directs runoff from behind the reservoir toward the lower front end of the site. The access road is bordered by asphalt swales directing drainage flows toward Farrington Highway. During construction of the existing nonpotable reservoir, the section of an abandoned irrigation ditch that passed through the site was removed and backfilled at the property line.

The existing reservoir includes a 16-inch overflow and 16-inch washout drain line, which combine into an 18-inch drain line directed to an offsite intermittent stream (an unnamed tributary to Palailai Gulch). A 10-foot easement in favor of the BWS is provided for this offsite drain line. Pump No. 2 has a 6-inch flow control line that also discharges to this drain system. Pump No. 1 has a 6-inch flow control line that discharges to the swale on the east side of the access road, which leads to the swale along Farrington Highway, discharging to Palailai Gulch. Water quality data for the brackish water supplied at this site is presented in **Table 5-1**.

The BWS previously held a permit, issued by the City and County of Honolulu, Department of Environmental Services (ENV), to discharge dechlorinated water to the municipal storm sewer

during maintenance of its reservoirs. This permit was effective until September 8, 2004, and covered a number of reservoirs, including the Barbers Point Nonpotable Reservoir No. 1. One other nonpotable water reservoir, the 1-MG, spring-fed Halawa 245' Reservoir, was covered under the permit. The BWS no longer possesses this particular permit and currently does not utilize chlorination methods in order to perform maintenance of its reservoirs. Instead, the reservoirs are now drained in order to perform maintenance cleaning. The BWS is currently in the process of updating its reservoir maintenance permit, which is awaiting ENV's approval.

As part of the permit application, the BWS stated that its general maintenance operations would discharge 1,000 gallons per minute (GPM) to the storm sewer via the overflow and onsite drainage lines for an estimated duration of five days during daylight hours. The application also included the BWS's Best Management Practices (BMPs) to meet State water quality standards, which is presented in **Appendix 5**.

5.3.7.2 Proposed Drainage Modifications

The proposed Barbers Point 215' Nonpotable Reservoir No. 2 will store R1 water from the EWRF. Furthermore, Reservoir No. 1 will also store R1 water and its brackish water pumps will be maintained for supplemental use. It is recommended that the new R1 system be covered similarly to the existing general reservoir maintenance permit.

5.3.7.3 Water Quality

The anticipated quality of the R1 water is shown in **Table 5-1**. The data for the HWWTP secondary effluent is also provided in **Table 5-1** as possible surrogates for some of the constituents that are not regularly tested in the R1 water. In general, the salt concentrations through the EWRF's granular-media filtration and UV disinfection processes should not change. Therefore, the total dissolved solids (TDS), chloride, conductivity, and components of soluble salts in the secondary effluent and R1 water should be relatively unchanged. Because of the filtration process entails the addition of chemical filtration aids and the removal of particulate matter, the other water quality measures for secondary effluent should not be relied upon as proxies for the quality of the R1 water.

From **Table 5-1** it can be seen that the salt content of the EWRF's R1 water is comparable to, if not slightly lower than, the brackish water currently being stored in Reservoir No. 1. The salt content in the R1 water is partially attributed to the infiltration of brackish groundwater into the sewers of the Honouliuli wastewater service area. Thus, depending on the City's ability to maintain the integrity of its collection facilities and to repair pipe defects, the salt levels in the R1 water may change in the future. Another noteworthy observation is that the nitrate level in the brackish water may be elevated, possibly due to the infiltration of fertilizers from past agricultural activities in the area.

Table 5-1 Water Quality Data

Constituent	Barbers Point Nonpotable Wells 1&2	Ewa Water Recycling Facility R1 Water [c]	Honouliuli WWTP Secondary Effluent [c]
pH	7.23 [a]		7.42
Chloride, mg/L	340 [a]		313
Alkalinity, mg/L as $CaCO_3$	154 [a]		114 [d]
Total Hardness, mg/L as $CaCO_3$	388 [a]		198 [d]
BOD_5, mg/L		10.3	13.7
TSS, mg/L		<1.2	7.1
TDS, mg/L	926 [b]		803
Settleable Matter, mg/L		<0.1	
DO, mg/L		6.20	
Fecal Coliforms, #/100 mL		<1.69	
Conductivity, µmhos/cm	1488 [b]	1439	
Turbidity, NTU	0.2 [b]	1.56	3.13
Color	0.55 [b]		
Silica, mg/L	67 [b]		62.2
Calcium, mg/L	55 [b]		27.4
Magnesium, mg/L	65.5 [b]		31.4
Sodium, mg/L	131 [b]		196
Potassium, mg/L	8.4 [b]		14.2
Carbonate, mg/L			5.1
Bicarbonate, mg/L	191 [b]		134
Sulfate, mg/L	56.5 [b]		63.6
Fluoride, mg/L	0.1 [b]		0.15
Ammonia, mg/L			5.18
Nitrate, mg/L	14 [b]		6.18
Phosphate, mg/L	0.175 [b]		
Iron, mg/L	<0.015 [b]		
Manganese, mg/L	<0.01 [b]		
Copper, mg/L	<0.01 [b]		
Lead, mg/L	<0.01 [b]		
Arsenic, mg/L	<0.01 [b]		
Selenium, mg/L	<0.01 [b]		
Chromium VI, mg/L	<0.01 [b]		
Barium, mg/L			0.006
Strontium, mg/L			0.27

Sources:
(a) – BWS FY 2002-2003 Annual Report, average of 2 wells
(b) – Preliminary data provided by BWS, source unknown, average of 2 wells
(c) – EWRF monthly water quality monitoring report, May-August 2003, average of monthly averages
(d) – Calculated from (c).

Appendix 7 of this report) has the following reporting requirements for R1 water spills from the reservoir to the ground:

- For spill volumes greater than 1,000 gallons, the BWS shall report by phone to the DOH Wastewater Branch (WWB) by the end of the next workday. Warning signs must be posted in the vicinity of the spill, and a spill record must be created.
- For spills between 50 and 1,000 gallons, the BWS shall post warning signs in the vicinity of the spill and create a spill record.
- Spill records should include the date, time, location, quantity, cause, and corrective action taken.
- The BWS shall include spill records for all spills greater than 50 gallons in an annual report to the WWB.
- Records should be kept on-site (eg, in the control building at the Barbers Point 215' Nonpotable Reservoirs) and available for inspection and copying for at least 5 years.
- There is no requirement for a press release or bacterial monitoring if the spill is demonstrated to be R1 water and if BMPs were implemented.

5.3.7.5 Risk Communication

The BWS has an established policy regarding the communication protocol in response to the release of recycled water to the environment. This policy is detailed in the *Water Recycling Program Incident Communication Manual* (City and County of Honolulu, Board of Water Supply, 2002).

5.3.8 Accessibility

Access to the proposed site would be via the existing access road, which is in good condition and features adequate security and drainage. The entrance to the access road on Old Farrington Highway has a padlocked vehicle gate. The reservoir site itself is secured with a chain-link fence topped with barbed wire and a padlocked chain-link gate for vehicular access. When these gates are opened, an alarm is transmitted via the SCADA system. Improvements to the access road are anticipated to be minor, if any.

5.3.9 Permits

As previously described, an NPDES permit is required for planned and unplanned R1 spills, reservoir overflows, and tank dewatering to the nearby waterway, a tributary of the Palailai Gulch. Construction plans should also be reviewed by the DOH to ensure conformance with the recycled water guidelines (State of Hawaii, May 15, 2002).

Construction of the proposed reservoir will also require the following permits and approvals:

- Grubbing, Grading, and Stockpiling Permit, issued by the DPP. This permit is required prior to the commencement of any earthwork. A Temporary Erosion Control Plan is to be submitted with the application, as required by the DPP, since the area under consideration is greater than one acre. DPP also requires that a drainage report be prepared for this project.

- Building Permit, issued by DPP. This permit is required prior to any electrical or plumbing work related to construction of the proposed reservoir.

5.3.10 Land Acquisition

The existing site covers 2.308 acres, and was previously graded for a future 1.5-MG reservoir. To accommodate a 3-MG reservoir and berm, the site boundary will need to be expanded by approximately ¾ of an acre. This will require the BWS to purchase or lease a portion of the adjoining properties from Makaiwa Hills LLC.

The parcel immediately mauka is identified as TMK 9-2-003:002. According to the DPP's online GIS maps in October 2006, the parcel is owned by Makaiwa Hills LLC (71%) and James Campbell Trust Estate (29%), and is leased to Kamaaina Care Inc. It is a 1201.179-acre parcel with an assessed land value of $1,042,500, or $868 per acre. Zoning for the parcel is similar to the existing reservoir site.

The parcel immediately makai is identified as TMK 9-1-015:005. According to the DPP's online GIS maps in October 2006, this parcel is owned by Makaiwa Hills LLC. It is a 73.381-acre parcel with an assessed land value of $5,064,000, or $69,010 per acre. Zoning for the parcel is similar to the existing reservoir site. The majority of the land to be acquired lies in this parcel.

Land acquisition is not factored into any of the costs in this report, as this is a matter to be negotiated with the Makaiwa Hills LLC. No land acquisition is anticipated for the 1.5-MG tank alternative.

5.3.11 Environmental Impacts

In accordance with Hawaii Revised Statutes Chapter 343, a Draft Environmental Assessment will be prepared in conjunction with this report. It will evaluate the environmental and socioeconomic impacts of the proposed Barbers Point Nonpotable Reservoir No.2 in further detail. A preliminary summary of impacts and mitigation measures is provided below.

5.3.11.1 Cultural Resources

The area surrounding the proposed reservoir site was very rich in natural resources and was once very populated. Many walkways, which provided access to Nanakuli and Waianae, are still clearly visible. Kalaeloa, or Barbers Point, is a very sacred area and culturally important to Native Hawaiians. It is considered an ideal place for the spirits to transition from one life to the next. Based on consultations with Hawaiian historians and cultural preservationists, it is possible that human remains are buried in the vicinity of the project site. Therefore, an archaeological survey was conducted.

5.3.11.2 Archaeological and Historic Resources

Archaeological consultants have indicated that the construction of a 6-MG reservoir (the largest reservoir investigated) is not expected to have any adverse impacts on historical or archaeological resources. However, archaeological monitoring will be provided for any work that involves subsurface excavation. In addition, all construction plans will include the following language as normally recommended by the State Historic Preservation Division:

"Should historic remains such as artifacts, burials, concentrations of shell or charcoal be encountered during the construction activities, work shall cease immediately in the immediate vicinity of the find, and the find shall be protected from further damage. The contractor shall immediately contact the State Historic Preservation Division at 692-8015, which will assess the significance of the find and recommend appropriate mitigation measures, if necessary."

5.3.11.3 Flora and Fauna

Botanical and faunal surveys were conducted at the project site. There are no outstanding vegetative features, and there are no threatened or endangered plant or animal species on the site. It is anticipated that any plant or animal species that presently inhabit the site will return after construction. The proposed project is not expected to have a significant negative impact on the botanical resources or relative abundance of birds and mammals in this region of Oahu. Therefore, no mitigative measures are proposed.

5.3.11.4 Air and Water Quality

There are no wetlands, perennial streams, or other sensitive riparian habitats in the vicinity of the project site. As is the case with the existing reservoir, the gulch adjacent to the site could be used periodically to drain R1 water at a maximum rate of 1,000 GPM for maintenance of the proposed reservoir. A new permit will be secured to conduct such activities prior to construction. Storm drainage of the site will also flow into this gulch.

Construction-related activities such as excavation, grading, and operation of construction equipment and motor vehicles may affect ambient air quality in the short-term. All construction activities will be required to comply with the provisions of HAR 11-60.1, "Air Pollution Control," regarding fugitive dust. The contractor will be responsible for employing erosion and dust-control measures. No adverse impact is anticipated following completion of construction.

5.3.11.5 Noise

In the short term, construction activity, including vehicle operation, blasting, and the use of impact tools, will unavoidably increase the ambient noise levels. Construction noise levels will comply with the DOH noise control requirements, or a noise variance will be sought. Contractors will implement mitigative measures to the extent practicable. After construction, the day-to-day operation of the reservoir is not anticipated to generate significant noise levels.

5.3.11.6 Traffic

The site is currently accessed by a paved access road that branches off from Farrington Highway. No road improvements, except for the perimeter road immediately surrounding the new reservoir, will be required. During the construction period, transporting equipment and material to the site, as well as hauling away excess dirt or fill material, may cause temporary inconveniences on Farrington Highway. A traffic control plan will be prepared during the design phase of the project to minimize disruptions and inconveniences to the public using Farrington Highway. BMPs will be utilized to mitigate tracking of mud and dirt onto public streets.

5.3.11.7 Aesthetics

The center of the existing reservoir is approximately 600 feet from Old Farrington Highway, 800 feet from the H1 Freeway, 1000 feet from Kamokila Community Park, and 1400 feet from the nearest residence at Honokai Hale. The reservoir site is visible from a few common public sightlines. This study focused on the proposed project's effect on view planes from the nearby Kamokila Community Park at Honokai Hale and from the H1 interstate freeway. Old Farrington Highway, which parallels the H1 and is not heavily traveled, is the public road that fronts the site's access road.

The visual impact of the new reservoir, as well as the existing reservoir, will be mitigated by painting both reservoirs and by using berms and landscaping. A light-brown or tan paint color may be appropriate, BWS's standard color schemes notwithstanding. Trees such as Geranium-leafed Aralia or Wiliwili – both of which can grow up to a 20-foot height – could be used to shield the view of the tanks from Farrington Highway. A small berm with an approximate slope of 2:1 at a height of four feet bordering the eastern and southern boundary of the site would also mitigate the visual impact. Although not its intent, this berm will also serve as a flood buffer for downstream properties in the event of a catastrophic structural failure of the reservoir. Flooding was a concern raised by a member of the Neighborhood Board.

Computer-generated renderings showing the potential visual impact of the 3-MG reservoirs are presented in **Appendix 2**. On April 30, 2003, following a presentation by the BWS's project team of these renderings, the Makakilo/Kapolei/Honokai Hale Neighborhood Board unanimously approved of the proposed site of the Barbers Point 215' Nonpotable Reservoir No. 2. Meeting minutes from the Neighborhood Board are provided in **Appendix 3**.

The 1.5-MG tank would have less of a visual impact because no excavation into the existing hillside will be required, and the tank will have a smaller diameter than a 3-MG tank.

5.3.11.8 Loss of Agricultural Land

A new 3-MG reservoir would require the acquisition of land beyond the existing site boundary. An expansion of the existing site should encompass about ¾ of an acre of arid, rocky, sloping, and uneven terrain. The agricultural land use and value is limited to grazing, if anything. The City's recycled water program, particularly the distribution of R1 water, is intended to provide nonpotable water for agricultural and landscape irrigation – activities that have been hampered by the decline of the quantity and quality of the Ewa caprock aquifer and the import of water from Windward Oahu. Thus, the benefit of the proposed reservoir to the nonpotable water users is anticipated to outweigh the minimal loss of agricultural land.

The 1.5-MG tank will not require acquisition of adjacent agricultural land.

5.3.12 Estimated Construction Cost

The estimated construction cost for the 3-MG tank is based on the layout provided in **Figure 5-1**. The total estimated cost for the construction of the reservoir, including upgrades to existing infrastructure, landscaping, and painting of the existing reservoir is approximately $6.93 million (including a 20% contingency). This cost estimate was based on the following assumptions:

Table 5-2 Estimated Construction Cost for Recommended 3-MG Tank

Item	*Quantity*	*Units*	*Unit Price*	*Cost*
SITE WORK				
Excavation & Mass Grading	13,100	CY	$60	$786,000
Backfill & Berm	13,900	CY	$42	$583,800
Clearing & Grubbing	1	AC	$3,960	$3,960
6' High Fence w/ Barbed Wire	2,000	LF	$40	$80,000
Rockfall Mitigation (Wire/Cable Mesh)	10,480	SF	$10	$104,800
18" Drain Line Relocation	180	LF	$210	$37,800
Drain Lateral	50	LF	$210	$10,500
Drain Manhole Relocation	3	EA	$7,920	$23,760
Inlet	3	EA	$2,640	$7,920
18" Influent Line in Place	300	LF	$330	$99,000
18" Effluent Line in Place	150	LF	$330	$49,500
Upgrade Existing Infrastructure	1	Site	$66,000	$66,000
Access/Fire Road	570	LF	$270	$153,900
Landscaping	1	LS	$120,000	$120,000
RESERVOIR				
3-MG Pre-stressed Concrete Tank	1	LS	$3,180,000	$3,180,000
Mechanical Equipment	1	LS	$79,200	$79,200
Electrical	1	LS	$66,000	$66,000
Paint Reservoir, incl. Existing	54,200	SF	$6	$325,200
SUBTOTAL				$5,777,340
CONTINGENCY (20%)				$1,155,468
GRAND TOTAL				$6,932,808

Table 5-3 Estimated Construction Cost for 1.5-MG Tank

Item	*Quantity*	*Units*	*Unit Price*	*Cost*
SITE WORK				
Excavation & Mass Grading	0	CY	$60	$0
Backfill & Berm	1,550	CY	$42	$65,100
Clearing & Grubbing	1	AC	$3,960	$3,960
6' High Fence w/ Barbed Wire	0	LF	$40	$0
Rockfall Mitigation (Wire/Cable Mesh)	8,750	SF	$10	$87,500
18" Drain Line Relocation	0	LF	$210	$0
Drain Lateral	50	LF	$210	$10,500
Drain Manhole Relocation	0	EA	$7,920	$0
Inlet	0	EA	$2,640	$0
16" Influent Line in Place	150	LF	$250	$37,500
16" Effluent Line in Place	150	LF	$250	$37,500
Upgrade Existing Infrastructure	1	Site	$40,000	$40,000
Access/Fire Road	0	LF	$270	$0
Landscaping	1	LS	$120,000	$120,000
RESERVOIR				
1.5-MG Pre-stressed Concrete Tank	1	LS	$2,220,000	$2,220,000
Mechanical Equipment	1	LS	$55,000	$55,000
Electrical	1	LS	$45,000	$45,000
Paint Reservoir, incl. Existing	36,400	SF	$6	$218,400
SUBTOTAL				$2,940,460
CONTINGENCY (20%)				$588,092
GRAND TOTAL				$3,528,552

Chapter 6 Summary and Conclusions

This preliminary engineering study recommends that the site of the existing Barbers Point 215' Nonpotable Reservoir No. 1 be expanded to accommodate a 3-MG Barbers Point Nonpotable Reservoir No. 2. As future R1 demands and pressure requirements become better known, the capacity of the tank can be adjusted during the design phase. Based on the information presented in this report, the volume of the new tank could range from 1.5 MG to 3.5 MG. A 6-MG tank could also be built, which would contribute to systemwide storage requirements. Functionally, however, the site would be more effective and efficient by serving only the region of the Ewa Plains from Kapolei westward. Hence, a second reservoir for the eastern region should be studied and implemented; the former UH West Oahu Campus site (AS2) has been suggested.

The Barbers Point 215' Nonpotable Reservoir site is a 2.308-acre lot identified as TMK 9-1-015:023, Lot 4025. The site was previously graded, and the existing infrastructure was built to accommodate a future 1.5-MG reservoir to be operated in tandem with the existing reservoir. Two alternate sites were suggested for this study, but both would require extensive site development and would not be operationally compatible with the existing reservoir. The Makakilo/Kapolei/Honokai Hale Neighborhood Board approved of the site selection at its April 2003 monthly meeting.

Approximately ¾ of an acre of the adjoining parcels – identified as TMK 9-2-003:002 and 9-1-015:005, both owned by the Makaiwa Hills LLC – will need to be acquired by the BWS to accommodate a new 3-MG reservoir and a landscaped berm. No activity seems to be occurring on the land that will need to be acquired. The project area is currently zoned as Ag-2. Construction of the reservoir and expanding the existing site boundaries are permitted without any zone changes. For a new 1.5-MG reservoir, acquisition of adjacent land is not anticipated to be needed.

The drainage and overflow of the new reservoir will adjoin with the existing reservoir's discharge to Palailai Gulch. The DOH issues a General Permit for the occasional or unintentional discharge of R1 water to State waters. Furthermore, the BWS's general permit with the ENV for reservoir discharge to the stormwater system should be amended to include the new reservoir. A Grubbing, Grading, and Stockpiling Permit and a Building Permit, both issued by the DPP, are required prior to earthwork. Submittals required to support these permit applications include a Temporary Erosion Control Plan and a Drainage Report.

The summary of the recommended design features for the Barbers Point 215' Nonpotable Reservoir No. 2 is as follows:

- The storage capacity for R1 water will be 3 MG.
- Strand-wrapped, pre-stressed concrete tank with 173-foot diameter, 23-foot-high wall.
- Spillway elevation at 215 feet above MSL; floor elevation at 195 feet above MSL.
- To mitigate the visual impact of the new reservoir, a combination of tank painting, landscaping with 20-ft tall trees, and a 4-foot-high berm bordering the eastern and southern edges of the property should be used.

- The new reservoir will be operated in tandem with the existing 1.5-MG Barbers Point 215' Nonpotable Reservoir No. 1. Isolation valves between the waterlines connecting the two reservoirs are required to enable maintenance on either of the reservoirs.
- Level monitoring and alarm signals from both tanks will be transmitted via the SCADA system to control the pumps at the EWRF.
- The existing brackish water well pumps will be maintained for supplemental duty.

The recommended budget for construction of this project is estimated at $6.93 million, not including land acquisition or offsite transmission and distribution pipelines. If projected nonpotable demands decrease, a smaller tank should be considered. The budget estimate for a smaller, 1.5-MG reservoir is approximately $3.53 million.

Chapter 7 References

American Concrete Institute, *ACI 350, Code Requirements for Environmental Engineering Concrete Structures and Commentary*, 2001.

American Water Works Association, *AWWA D110 Wire- and Strand-Wound, Circular, Prestressed Concrete Water Tanks*, 1995.

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International Code Council, *Uniform Building Code*, 1997.

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R.M. Towill Corporation, *Draft Ewa Non-Potable Water Master Plan, Ewa, Oahu, Hawaii*, October 2004.

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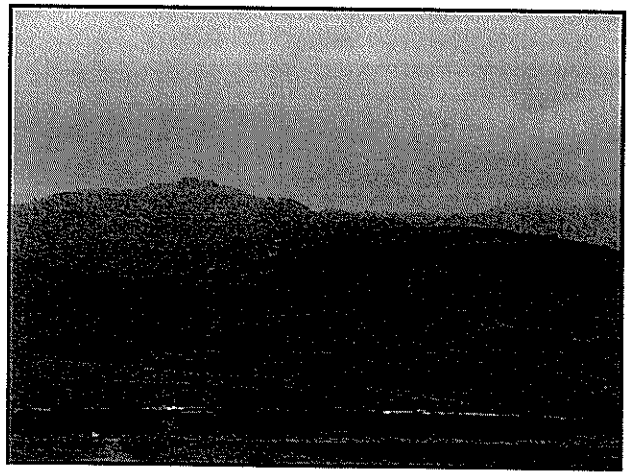
State of Hawaii, *NPDES General Permit Authorizing Occasional or Unintentional Discharges from Recycled Water Systems*, Hawaii Administrative Rules, Chapter 11-55, Appendix J, September 2002.

U.S. Department of Agriculture, Soil Conservation Service, *Soil Survey of Islands of Kauai, Oahu, Maui, Molokai, and Lanai, State of Hawaii*, August 1972.

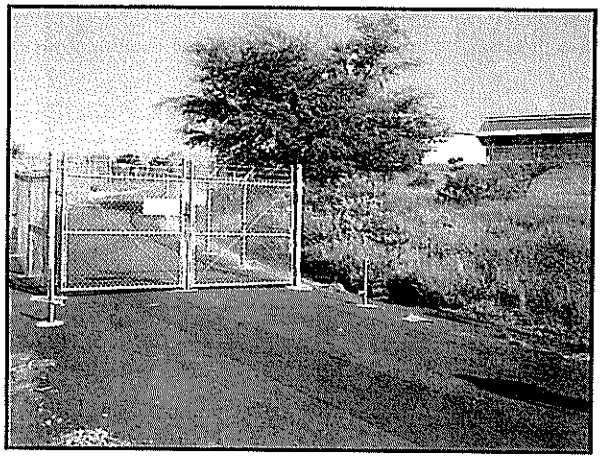
APPENDIX 1

Photographs of Alternative Sites

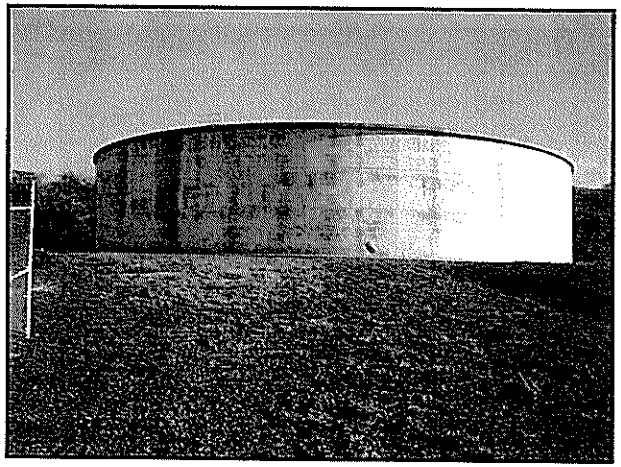
Alternative Site #1 and Existing Barbers Point Nonpotable Reservoir from Interstate H1



Alternative Site #2 from Farrington Highway and North-South Road



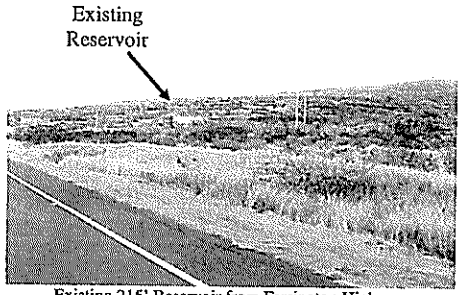
Alternative Site #1 – Second Access Gate



Alternative Site #1 – Existing 1.5-MG Nonpotable Reservoir

APPENDIX 2

Computer-generated Photographic Renderings
of the Proposed Reservoirs at Alternative Site 1



Existing 215' Reservoir from Farrington Highway

Illustration of Existing and Proposed 1.5-MG Reservoir from Farrington Highway

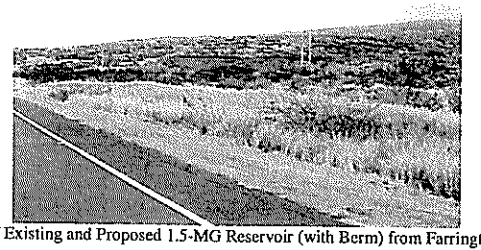
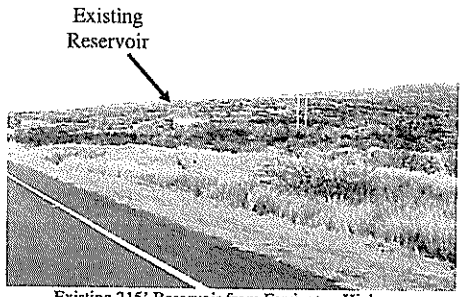


Illustration of Existing and Proposed 1.5-MG Reservoir (with Berm) from Farrington Highway



Existing 215' Reservoir from Farrington Highway

Illustration of Existing and Proposed 3-MG Reservoir from Farrington Highway

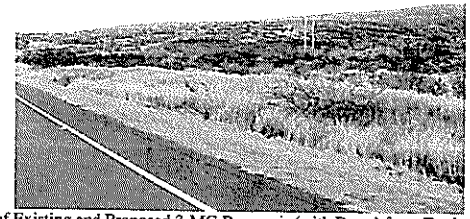
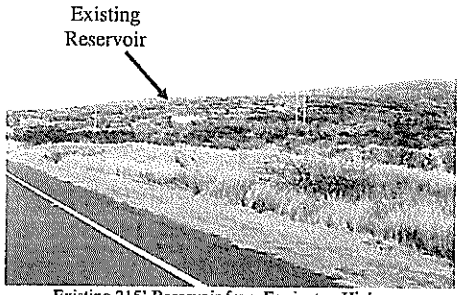


Illustration of Existing and Proposed 3-MG Reservoir (with Berm) from Farrington Highway



Existing 215' Reservoir from Farrington Highway

Illustration of Existing and Proposed 6-MG Reservoir from Farrington Highway

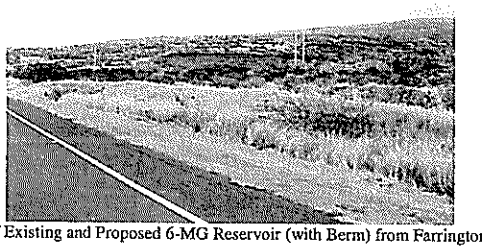


Illustration of Existing and Proposed 6-MG Reservoir (with Berm) from Farrington Highway

APPENDIX 3

Preliminary Site Comparison and
Makakilo/Kapolei/Honokai Hale Neighborhood Board No. 34,
Meeting Minutes: February 26, 2003, and April 30, 2003

Preliminary Site Comparison
6-MG Barbers Point Nonpotable Reservoir No. 2

	Alternative Site 1	Estimated Construction Cost	Alternative Site 3	Estimated Construction Cost
Basic Parameters				
Adequate Elevation	Yes		Yes	
Land Acquisition	1 acre	$ 70,000	6 acres	$ 420,000
2nd Reservoir for Maintenance	Yes		No	
Reservoir 6.0 MGD		$ 6,070,000		$ 6,070,000
Civil Improvements				
Access & Fire Road		$ 150,000		$ 600,000
Security System	Existing			$ 72,000
Drainage	Some	$ 72,000		$ 120,000
Electrical	Some	$ 60,000		$ 120,000
Backup Well Pumps	Yes		No	
Control Housing	Yes			$ 90,000
Landscaping		$ 120,000		$ 240,000
Earthwork & Grading		$ 1,200,000		$ 2,400,000
On-Site Piping		$ 180,000		$ 600,000
TOTAL		**$ 7,922,000**		**$ 10,732,000**

10/24/2006

MAKAKILO/KAPOLEI/HONOKAI HALE NEIGHBORHOOD BOARD

REGULAR MEETING MINUTES

WEDNESDAY, FEBRUARY 26, 2003

CAMPBELL ESTATE, LAULIMA ROOM

CALL TO ORDER: Chair Yamamoto called the meeting to order at 7:32 p.m., with a quorum of eight members present. Chair Yamamoto asked the Board and community to join him in a moment of silence for the seven heroes of the space shuttle Columbia.

MEMBERS PRESENT: Brent Buckley, Dave Gilbert, Michael Golojuch, Shad Kane, Martha Makaiwi, Jane Ross, Maeda Timson, and George Yamamoto.

MEMBER ABSENT: Kioni Dudley.

GUESTS: Tesha Malama, Ali Cudzilo, Patty Teruya (Councilmember Gabbard's Office staff); Councilmember Mike Gabbard, Lolita Takeda (Kapolei Schools), Henry Eng (Campbell Estate), Cynthia Rezentes; Captain Van Tomokijo and Firefighter Mark Adams (Honolulu Fire Department – HFD), Ron Ho (Campbell Industrial Park); Gary Oliva and Aaron Fujinaka (HECO), Cheryl Soon (Mayor's Representative); Major William Char, Lt. Frank Pugliese, Charles Chong and Rafael Hood (Honolulu Police Department – HPD); Tom Schnell (PBR Hawaii), Mindy Norris (LOTMA), Marcia Young; Shirley Kinoshita, Daniel Chang, Roberta Chang, Patrick Saby, Su Baker, Karen and Gary Hockett, Steve Proctor, Chris and Susan Johnson (Makakilo Baptist Church); Lee Sichter (Belt Collins), Puni Chee (Councilmember Garcia's Office staff), Councilmember Nestor Garcia, Michael Golojuch Jr.; Lorna Heller and George Kuo (Board of Water Supply – BWS); John Katahira and Ian Arakaki (Limtiaco Consultants), John Inimane (Senator Kanno's Office staff), Commissioner Roy Wickramaratna (Neighborhood Commissioner), Jill Stensrud (Department of Health), H. Young, Gregor Thomson (Chevron), Ken Williams (Ko Olina), and Charles Herrmann Jr. (Neighborhood Commission Office staff).

BOARD MEMBERS ROLL CALL: The Neighborhood Assistant called the roll. There were eight members present at this time.

MONTHLY REPORTS, PART I

Honolulu Police Department - HPD: Lt. Frank Pugliese distributed copies of the monthly written report and reported the following: 1) The statistics for the month of January included: 3 robberies, 10 burglaries, 29 thefts, 15 unauthorized entry into motor vehicles, 16 auto thefts 14 CPD, 37 persons, 48 motor vehicle collisions, 3 DUI's, 7 drug offenses, and 147 other offenses. There were 1,433 written reports resulting in 485 arrests (404 adults and 81 juveniles). 2) In 2002, O'ahu had 68 fatalities

3) Responding to a resident, Captain Tomokijo said that there is currently no recycling program for expired fire extinguishers.

COMMITTEE REPORTS

Environment/Health: Chair Kane reported that on February 22, 2003 the statue of Kapo (Pele's older sister) was unveiled at the corners of Kamehameha Highway and Kamokila Boulevard. The City and Campbell Estate sponsored the event. George Kuo, Martin Pahinui, and Aaron Mahi provided entertainment.

Education: Chair Gilbert reported that on February 21, 2003 the Kapolei Library volunteer team met to get the library running, starting in March it should be open for two mornings and one afternoon each week.

Transportation/Safety: Chair Golojuch reported that on February 27, 2003 OMPO would meet to discuss the proposed Transportation Improvement Projects (TIP) for 2004-2006. Golojuch added that the completion of the Kapolei Parkway and the Makakilo Drive H1 extension have been added to the TIP list. Responding to Golojuch, Eng said that Campbell Estate is still working with Department of Transportation Services on the concern for pedestrians crossing the highway to get to buses. Eng said that he believes that when the new transit center is opened in late spring that the problem should end.

Planning/Zoning/Development: Chair Buckley reported that on March 5, 2003 the City Council hearing regarding Waimanalo Gulch landfill expansion would be held at Honolulu Hale.

Questions, answers and comments followed:

Timson said that because this is the final EIS, the Board should submit written testimony on the issue.

Timson moved and Ross seconded the motion to place the Waimanalo Gulch Landfill proposed expansion be added to the agenda. Motion carried unanimously, 8-0-0.

Chair Yamamoto said the item would be placed under Unfinished Business for discussion and possible action.

APPROVAL OF REGULAR MEETING MINUTES FOR WEDNESDAY, JANUARY 29, 2003: The following additions/corrections were made to the minutes:

1) Page 3, under Community Concerns and Announcements, item 3, Ross expressed concern that by stating there was no second that it made her look stupid. She requested changing the minutes to read: "Chair Yamamoto stated that the order of the agenda was up to the Chair to decide, so the matter was dropped and that he would take the issue under advisement."

2) Page 6, second line of the landfill motion, adds: and that the Chair sends a letter to the appropriate City agencies.

Ross moved and Makaiwi seconded the motion to accept the minutes as amended. Motion carries unanimously, 8-0-0.

TREASURER'S REPORT: Gilbert reported that the operating account balance as of January 31, 2003 is $748.16. The publicity account remains at $2,128.00 and refreshment account remain the same at $120.00.

COMMUNITY CONCERNS AND ANNOUNCEMENTS

brief presentation on the proposed non-potable reservoir stating that currently the BWS is conducting an engineering study and preparing for the Supplemental Environmental Impact Statement. She said that the reservoir would serve the Honouliuli Recycled Water Plant and the Ko Olina non-potable water system. She displayed several pictures of the proposed sites. Arakaki, project manager, continued, several things are taken into consideration in the site selection criteria, cost of construction, feasibility, and the Board and community input. The first site is located above the Honokai Hale area where the BWS already has an existing non-potable reservoir. The second site is located close to Makakilo where there is currently no infrastructure, which would greatly increase the costs. He displayed the sites on the aerial photos and said that as the project proceeds updates will be provided to the Board.

Questions, answers, and comments followed:

1) Responding to Ross, Arakaki said that the new reservoir would be called Barbers Point Reservoir No. 2 because the existing reservoir at the same site is already called the Barbers Point Reservoir No. 1. The current system serves from Fort Barrett Road through Campbell Industrial Park, reservoir 1 currently holds 1.5 million gallons and reservoir 2 would hold 6 million gallons of recycled water.

2) Responding to Ross, Arakaki said should anything catastrophic happen to the reservoir that drainage is already in place. Ross was concerned that the water is channeled away from the Honokai Hale homes.

3) Responding to Kane, Kuo said that the water for the reservoir would come from the Honouliuli Recycling Plant and that as the system is enlarged it is designed to service all common areas.

4) Responding to Gilbert, Kuo said that the recycled water is also being used to water golf courses.

5) Responding to Golojuch, Kuo said that the second site is above the Grace Pacific quarry. Golojuch expressed concern that the site is in the vicinity of the proposed North-South Road.

6) Responding to Golojuch, Kuo said that the sites do not change BWS's plans to not supply recycled water above the H-1 freeway.

7) Responding to Ross, Kuo said that the reservoirs are monitored electronically daily and that the structure is inspected annually.

Honouliuli 228 Reservoir: This 6 million gallon potable water reservoir is proposed to be located about a mile past Kunia Road by the electric transformer. There is currently another 6 million reservoir located at the site. The project is in the design phase and construction will be included in this fiscal year's budget.

Questions, answers, and comments followed:

Responding to Gilbert, Kuo said that the landfill should not be affected if there should be a catastrophic event that damages the non-potable reservoir at the first proposed site.

MONTHLY REPORTS

Senator Brian Kanno: John Inimine distributed copies and read from the Senator's monthly report and was available for questions.

Mayor's Representative: Cheryl Soon reported the following: This community should be well represented at OMPO, both Councilmembers Garcia and Gabbard are members and Garcia will be the next Chair of OMPO. The Mayor will be on the Dan Boylan show on Friday, February 28, 2003

for the sunset event.

3) Gilbert said that he thought that the Council had proposed a resolution placing a moratorium on all traffic calming projects and asked for follow-up on the concern.

Campbell Industrial Park: Ron Ho distributed copies of the monthly emission incident report for January 2003 and stated the following: 1) The total number of calls received during the January reporting period was 25. Of these, 21 continued on to listen to various menu options, 12 continued to obtain information and 9 registered a complaint/concern. 2) The majority of incidents happened at the Hawaiian Electric Company (HECO) facility. Aaron Kujinaka, HECO manager, apologized to the community for the problems and said that they are doing their best to make sure they don't happen again.

No other representative were present to give reports.

UNFINISHED BUSINESS

Waimanalo Gulch Landfill Proposed Expansion: Timson moved and Golojuch seconded that the Board support the positions of the Waianae Coast Neighborhood Board No. 24 regarding having a community member appointed to the Blue Ribbon Siting Committee and that the City not be allowed to dump additional waste on to the front of the landfill. The Board supports writing a letter to the proper authorities regarding the final supplemental EIS stating that the Board opposes the proposed five year expansion and approved that it be extension be approved for no longer than two years. Motion carried unanimously, 8-0-0.

ADJOURNMENT: Without objection, Chair Yamamoto adjourned the meeting at 9:30 p.m.

Submitted by:

Charles Herrmann Jr.

Neighborhood Assistant

Wednesday, March 19, 2003

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MAKAKILO/KAPOLEI/HONOKAI HALE NEIGHBORHOOD BOARD

REGULAR MEETING MINUTES

WEDNESDAY, APRIL 30, 2003

CAMPBELL ESTATE, LAULIMA ROOM

CALL TO ORDER: Chair Yamamoto called the meeting to order at 7:34 p.m., with a quorum of eight members present.

MEMBERS PRESENT: Brent Buckley (late), Kioni Dudley, Dave Gilbert, Michael Golojuch, Shad Kane, Martha Makaiwi, Jane Ross, Maeda Timson, and George Yamamoto.

MEMBERS ABSENT: None.

GUESTS: Gary Oliva (HECO), Warren Wegesend, Malcolm Tom (City Deputy Managing Director), Bette Kalohi, Leslie Bise (State Department of Defense – DOD), James Nakatani (Congressman Case's Office staff), Puni Chee (Councilmember Garcia's Office staff), Gregor Thomson (Chevron), Herman Young; George Kuo and Lorna Heller (Board of Water Supply – BWS); Captain Matt Takashige (Honolulu Fire Department – HFD); John Katahira and Ian Arakaki (TLCG), Jill Stensrud (Department of Health – Clean Air Branch), Commissioner Roy Wickramaratna (Neighborhood Commission), Georgette Stevens, Michael Golojuch Jr., Henry Eng (Campbell Estate), Ron Ho (Department of Health), Lolita Takeda, Mark & Brenda Fields, Peter & Tricia Anderson, Mindy Norris (LOTMA), David Pagan, Linda Young, Aaron Fujinaka (HECO), Ali Cudzilo (Councilmember Gabbard's Office staff), Cheryl Soon (Mayor's Representative), Sen. Brian Kanno, Bob Farrell, Ivonne Cardenas, Rep. Mark Moses, Colonel Albert Riggle (USAF), Lt. Clyde Philips (Honolulu Police Department – HPD), and Charles Herrmann Jr. (Neighborhood Commission Office staff)

BOARD MEMBERS' ROLL CALL: The Neighborhood Assistant called roll, there were eight members present at this time.

CERTIFICATE OF RECOGNITION: Chair Yamamoto thanked Col. Riggle for endless community support and dedication to the community, a lei was presented to him. Several Board members thanked Col. Riggle and praised his work strengthening the relationship between the community and the military. Chair Yamamoto read the certificate and presented it to Col. Riggle and again thanked him for his dedication and commitment. The entire Board expressed wishes of good luck to the Colonel at his next duty station.

MONTHLY REPORTS, PART 1:

Honolulu Police Department – HPD – Lt. Clyde Philips distributed copies of the monthly

MAKILO/KAPOLEI/HONOKAI HALE

NEIGHBORHOOD BOARD NO. 34

REGULAR MEETING MINUTES

WEDNESDAY, APRIL 30, 2003

PAGE 2

Honolulu Fire Department – HFD – Captain Matt Takashige reported the following: The statistics for the month of March 2003 included: 5 structure, 7 brush and 3 rubbish fires, 52 medical, 3 search/rescue, and 22 miscellaneous emergency responses. Fire Safety Tip: When cooking, roll up your long sleeves. Long sleeves are a hazard, as they may get caught on a pot handle or brush against a flame.

COMMITTEE REPORTS

Education – Chair Gilbert reported the following: The Kapolei Library is currently open on Mondays and Wednesdays from 9:00 a.m. – 2:00 p.m., and on Thursdays from 2:00 – 6:00 p.m. The speakers for the May committee meeting will be the principals from Kapolei High and Middle Schools. They will answer any questions that you may have about the schools and programs. Hopefully, the four elementary school principals will be able to attend the June committee meeting and share the same type of information.

Questions, answers and comments followed: 1) Responding to a resident, Gilbert said that he did not know the exact amount of the $42 million appropriated for school repairs would be going to area schools. Kanno stated that the majority of the funding would go to the older schools. The same resident asked if anyone knew the number of area students that attend the Campbell High School. Rep. Moses said that only some area seniors are students at Campbell High. He added that only a small amount of the $42 million would go to area schools because most of the schools are new. The community will receive some funding help with their schools.

Transportation/Safety – Chair Golojuch had nothing to report but was available for questions.

Questions, answers and comments followed: Responding to a resident's concern with the condition of Makakilo Drive, Chair Golojuch said that funding had been approved to resurface the roadway and would probably be released in the third or fourth quarter of this fiscal year after the sewer project is complete. Residents also expressed concern that the road in front of the water park, the old Farrington Highway, is in extremely bad shape and needs to be resurfaced.

No other committees had reports to be given.

APPROVAL OF THE REGULAR MEETING MINUTES OF WEDNESDAY, MARCH 25, 2003: **Dudley moved and Gilbert seconded that the Board accept the minutes as written. Motion carried 7-1-0.** Timson expressed concern that she could not have the item deferred until later in the meeting when some information that was presented to the Board could be clarified. She said that in the minutes, information on one project was presented totally differently during two different reports and she needed to clarify which one reported it correctly. Therefore she voted against the motion.

TREASURER'S REPORT: No report was available from the Neighborhood Commission.

COMMUNITY CONCERNS AND ANNOUNCEMENTS:

servicing the Villages of Kapolei.

Timson left at 8:18 p.m., to testify at the budget hearing at Honolulu Hale, eight members present.

Resolution to Restore Funding for the Neighborhood Commission Office and Neighborhood Boards – Copies of a draft resolution were distributed to Board members. **Golojuch moved and Gilbert seconded the motion to support the resolution. Motion carried by unanimous consent 8-0-0.** Gilbert said that this type of funding cut is "penny wise and pound foolish" it would cost hundreds of thousands to do what the Commission and Boards do if the Council had to fund someone else for doing their work.

City Budget – Malcolm Tom, City Deputy Managing Director, distributed copies of information relating to the Mayor's proposed budget and reported the following: Tom stated that Gilbert had said it best when he said that the Council is being "penny wise and pound foolish" with the budget. The City administration is trying to expand community outreach programs and the Council wants to cut $30,000 from the Neighborhood Commission and Neighborhood Boards, which reach the most individual residents. The Office of Economic Development requested $800,000 the Council wants to cut them to $200,000 at a time when we need to create new jobs and invest in our future. The Council believes that it is not the job of the City to stimulate the economy. If the proposed cuts to the Mayor's budget pass, the City will not have funds to pay for spare parts of our vehicles or pay our electric bill. Tom said that not all Councilmembers are happy with the proposed budget cuts and he hopes they will be able to convince the others to not support them. Originally the departments requested $928 million, the Mayor trimmed their requests to $822 million before he submitted the budget to the Council. The City is faced with a $22.7 million fixed cost increase to fiscal cost, $14.9 million for the retirement system, $6.4

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million for the health fund, and $1.4 million for worker's compensation. The Mayor's budget proposes a modest increase in improved residential property taxes (up 2.7%), decreases the apartment rates (down 4.5%), and has created a new more equitable system for all property tax payers. Residential and apartment rates will be at $3.75; commercial, industrial, agricultural, conservation, and hotel/resort rates will classified as non-residential classes and be at $10.63; unimproved residential rate will be $5.35 (all rates are per $1000.00). The Mayor's capital budget is $288 million ($167 million less than last year) and includes: a) $85.5 million for highway and street improvements, b) $73 million for wastewater improvements, c) $40 million for road resurfacing, d) $14 million for ADA curbs, e) $5 million for bikeway improvements, f) $15 million for public safety, g) $13 million for new buses and handivans, h) $6 million for homeless facility. The new refuse/curbside recycling service will be conducted starting on your first refuse pick-up date with regular household refuse being taken, the next day you would use the same container and put your green waste out for pick-up. The next week you would put out your household refuse on the first day and your glass and plastic recyclables on the next day. For an additional $8.00 per month you can get a second household pick-up and for an additional $70.00 you could receive an additional container.

Questions, answers and comments followed:

1) Responding to Dudley, Tom said that the Mayor had submitted a balanced budget and that

that at the next meeting. Tom requested a copy of the information. Ross added that the plasma arc technology process creates usable by-products.

12) Responding to Ross, Tom said that the property tax rates would be the same for both homeowners and apartment owners.

13) Dudley said that the Mayor had been extremely fair with the budget and that he is on to something good with the recycling program and the sustainable communities program.

Dudley moved and Golojuch seconded the motion that the Board adopt a resolution to support the proposed by the administration of the mayor, with the provision that the refuse/recycling program be restudied to make it truly workable. Motion carried, 7-0-1. Ayes: Buckley, Dudley, Golojuch, Kane, Makaiwi, Ross, and Yamamoto. Abstained: Gilbert.

Discussion continued: 14) Gilbert said that he abstained because the data needs to be reviewed. Buckley said that he disagreed with Gilbert and that the Board did not have the time or energy to completely go over the budget and that the Board has debated the issues before. He added that the City has done a good job with the budget. Kane said the Board is only advisory and that they should be talking to their Councilmembers because they had the final vote. Tom thanked the Board and community for their excellent questions and support of the Mayor's budget.

Collector Roadway Symbol for Kamokila Boulevard Extension on the Public Infrastructure Map for the Ewa Development Plan – The proposed project would provide road connection and access to the City of Kapolei and the Kalaeloa special area. The plan is to design and construct a new .2-mile roadway extension of the Kamokila Boulevard from the intersection of Kamokila Boulevard and Kapolei Parkway to Franklin D. Roosevelt Avenue. The proposed project would be wide enough to accommodate between 2 to 4 lanes, pavement and striping, bike lanes and sidewalks. The project would cost approximately $1,000,000, ($200,000 for design and engineering and $800,000 for construction).

Questions, answers and comments followed: Buckley expressed concern that they would not have problems with the Navy owning any of the land. He was told that there is no land ownership by the Navy involved in the project but there is a railroad crossing to address.

Golojuch moved and Gilbert seconded the motion that the Board support adding the proposed symbol for the publicly funded "major collector roadway" to the Ewa Public Infrastructure Map. Motion carried unanimously, 8-0-0.

Follow-up Report on the Chevron Turnaround – Gregor Thomson reported that the project is going along fine and they should be back on line by the end of next week.

Follow-up Report on the BP 215 Non-Potable Reservoir #2 – George Kuo introduced John Katahira and Ian Arakaki to do the presentation. They said that a third proposed site had been added to the previous presentation and that it would be located next to the Hawaiian Water's Adventure Park. The site 2 (located by Kunia Road) has been considered too far from the service area to be useful. The BWS is concentrating on site 1(located above Honokai Hale) because it already has existing infrastructure and that greatly reduces the cost of building the reservoir. The new reservoir would be four-times as large as the existing one. They also said that in response to the concerns expressed at the last meeting they had decided to paint the reservoirs brown to better match the surroundings and that a berm would be added with landscaping to enhance the view plain. The berm and the natural slope of the land should help in an emergency if the tank broke, it would help direct the water away from the residents of Honokai Hale.

MAKAKILO/KAPOLEI/HONOKAI HALE

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3) Responding to Golojuch, Sen. Kanno said that the textbooks' fee bill had passed but the money does not have to go back to purchasing books. This is one of the ways the Legislature is empowering school principals, they will have the choice of enacting the fee and what it gets used for.

4) Buckley stated that the Board has continuously asked that the infrastructure be completed before projects are done, but in many cases the developer made deals with the City Council years ago and the infrastructure was not included in the deal.

MAKAKILO/KAPOLEI/HONOKAI HALE

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5) Responding to Gilbert, Sen. Kanno said that the library check-off box bill had been enacted and that he supported the bill. He added that the funding for libraries was so tight this year that the fighting for funds for the Kapolei Library pitted this community against the rest of the island.

Representative Mark Moses – Rep. Moses distributed copies of his monthly written report and was available for questions.

Questions, answers and comments followed:

1) Responding to Gilbert, Rep. Moses said that he shares Gilbert's concerns with the long-term care bill and that the Governor is very unhappy with the bill. She would like more community input and she may veto it. He continued that the bill really does not provide long-term care as it only pays for 365 days of at home care at the rate of $70.00 per day.

2) Responding to a resident, Rep. Moses said that $75 million came from special funds to balance the budget. The Dwelling Unit Revolving Fund was raided of $15 million.

3) M. Golojuch Jr., asked how many bills Rep. Moses had introduced, Rep. Moses started to list the bill and M. Golojuch Jr., interrupted that he had heard differently that Rep. Moses had not introduced all of the bills he was listing.

4) Responding to a resident, Rep. Moses said that a copy of the complete budget is available online, the resident said she had called the Chief Clerks office and they did not have copies available.

5) Buckley said that he thanked both Rep. Moses and Sen. Kanno for working to make the community better.

Representative Michael Kahikina – Chair Yamamoto acknowledged the receipt of the Representative's monthly written report.

Mayor's Representative – C. Soon said that she had nothing to report tonight but was available for questions.

and do a follow-up report on the issue. Another resident said that part of the problem with the bill is that electric scooter are included in the same class of vehicles.

3) Responding to Ross, Chee said that the Council hopes to have a new site selected for a landfill site by the end of the year. They approved that members of the proposed Landfill Blue Ribbon Site Selection Committee should come from the community.

Board of Education – Carol Gabbard - Ali Cudzilo distributed copies of her monthly written report and apologized that she could not attend tonight's meeting.

Campbell Industrial Park – Ron Ho distributed copies of the monthly written report and reported the following: The total number of calls received during the period were 11. Of these, 4 obtained additional information and 7 registered a complaint/concern.

Hawaii Community Development Authority – Sen. Kanno said that the Governor appointed Maeda Timson and Elevlyn Susa to the authority.

UNFINISHED BUSINESS:

Refreshments for the May 2003 Meeting – Golojuch moved and Gilbert seconded the motion that the Board support spending the refreshment funds for refreshments at the May 2003 regular meeting. Motion carried unanimously, 8-0-0.

O'lelo Scheduling of Neighborhood Board Meetings – Bob Farrell said that currently the Board meeting are being shown one month late. Next year if the new Board still wants to tape the meetings he will submit the paperwork for approval of a series and the program will be shown in the same month as it is taped and on a regular schedule.

ADJOURNMENT: Chair Yamamoto adjourned the meeting at 10:34 p.m., without objection.

Submitted by,

Charles Herrmann Jr.

Neighborhood Assistant

Tuesday, May 27, 2003

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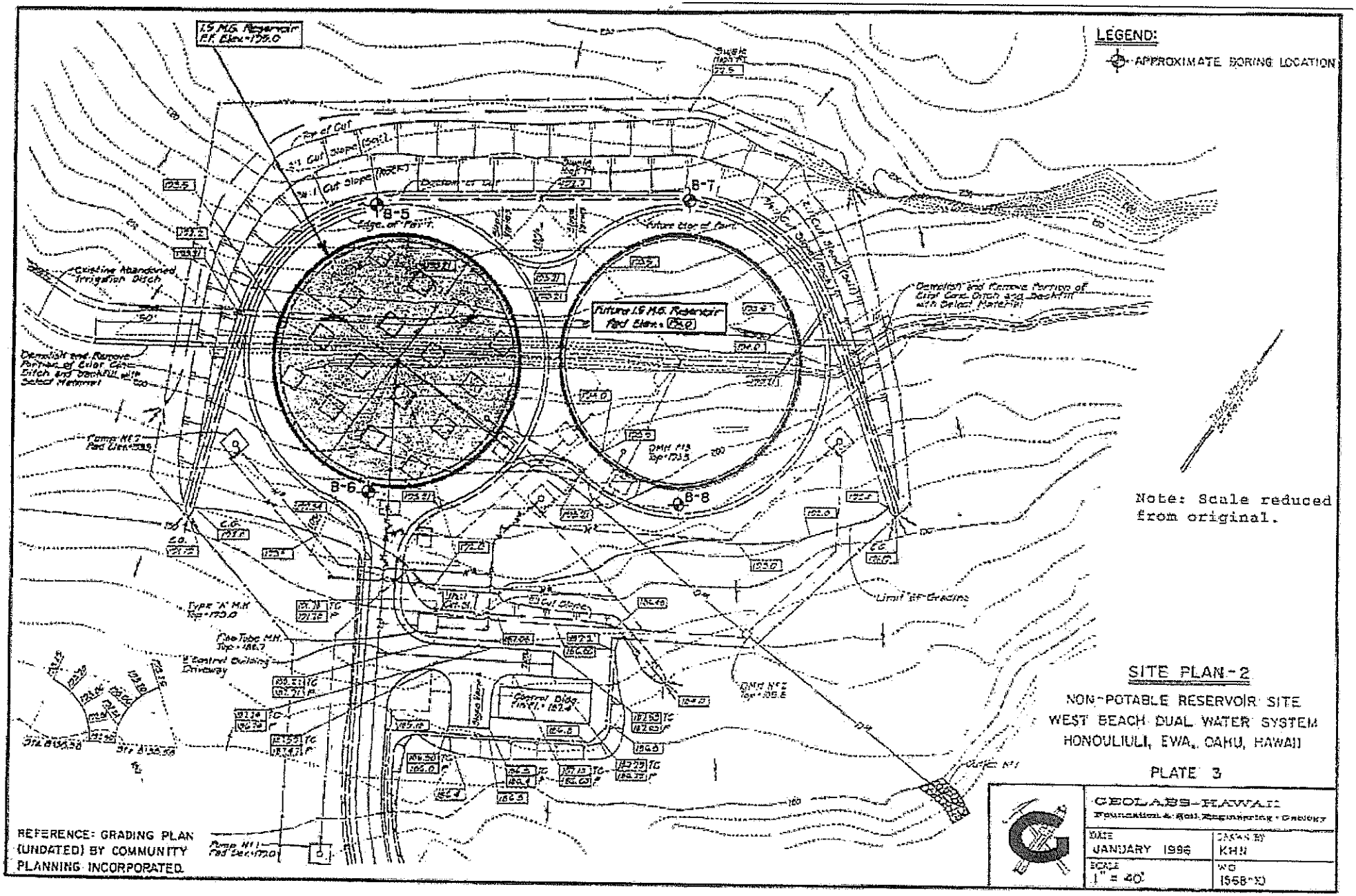
APPENDIX 4

Site Map and Boring Logs from
Soil Engineering Investigation, Proposed 3.0-MG Potable Reservoirs and 1.5-MG Non-potable Reservoirs, West Beach Dual Water System, Honouliuli, Ewa, Oahu, Hawaii,
C.W. Associates Inc. dba Geolabs-Hawaii, January 3, 1986



REFERENCE: GRADING PLAN (UNDATED) BY COMMUNITY PLANNING INCORPORATED.

SITE PLAN-2

NON-POTABLE RESERVOIR SITE
WEST BEACH DUAL WATER SYSTEM
HONOULIULI, EWA, OAHU, HAWAII

PLATE 3

GEOLABS-HAWAII
Foundation & Soil Engineering • Geology

DATE JANUARY 1996	DRAWN BY KHN
SCALE 1" = 40'	WO 1568-10

BORING 5

Sample
Dry density (pcf)
Blows per foot
50 40 30 20 10 0

Depth (feet)
Graph

Surface elevation 217'±**

SOIL DESCRIPTION | USC

RUN #1
REC=100%
RQD= 79%

RUN #2
REC=100%
RQD= 77%

RUN #3
REC=100%
RQD= 74%

RUN #4
REC=67%
RQD=17%

RUN #5
REC=86%
RQD= 0%

RUN #6
REC=60%
RQD= 0%

RUN #7
REC=80%
RQD=67%

5 10 15 20 25 30

SOIL DESCRIPTION	USC
DARK GRAY CLAY WITH COBBLES OR BOULDER, STIFF	CH
GRAY BROWN WEATHERED BASALT	
GRAY BROWN HIGHLY WEATHERED BASALT	
BLUE GRAY BASALT, HARD, MASSIVE	
GRAY BROWN HIGHLY WEATHERED CLINKER ROCK	
BLUE GRAY BASALT, HARD, MASSIVE	

BORING TERMINATED AT 30.0 FEET ON DECEMBER 19, 1985
GROUNDWATER NOT ENCOUNTERED

** ELEVATION ESTIMATED FROM PRELIMINARY GRADING PLAN BY AKINAKA & ASSOCIATES, UNDATED

LEGEND

- Moisture content
- I 2.0" O.D. split-spoon sample
- II Undisturbed ring sample
- III Disturbed ring sample
- IV Core sample
- P Sampler pushed

Plastic limit
Liquid limit
Natural water content

Driving energy: 140 lb.wt., 30" drop

LOG OF BORING

GEOLABS-HAWAII
Foundation Engineering • Soil Engineering • Geology

W.O. 1568-10 DECEMBER 1985

PLATE A-5.1

BORING 6

Sample
Dry density (pcf)
Blows per foot
50 40 30 20 10 0

Depth (feet)
Graph

Surface elevation 197'±ES

SOIL DESCRIPTION	USC
GRAY CLAY WITH COBBLE	CH
REDDISH BROWN AND GRAY WEATHERED BASALT, MEDIUM	
GRAY, FAIRLY BLOCKY BASALT WITH LARGE VESICLES AND CLAYEY SEAMS ALONG FRACTURES, HARD	
GRAY BROWN WEATHERED BASALT, MEDIUM	
LIGHT GRAY AND BROWN HIGHLY WEATHERED CLINKER ROCK, SOFT	

RUN #1
REC=100%
RQD= 30%

RUN #2
REC=100%
RQD=100%

RUN #3
REC=90%
RQD=60%

RUN #4
REC=80%
RQD=15%

5
10
15

BORING TERMINATED AT 15.0 FEET ON DECEMBER 19, 1985

GROUNDWATER NOT ENCOUNTERED

LEGEND

- Moisture content
- I 2.0" O.D. split-spoon sample
- II Undisturbed ring sample
- III Disturbed ring sample
- IV Core sample
- P Sampler pushed

Plastic limit
Liquid limit
Natural water content

Driving energy: 140 lb.wt., 30" drop

LOG OF BORING

GEOLABS-HAWAII
Foundation Engineering • Soil Engineering • Geology

W.O. 1568-10 DECEMBER 1985

PLATE A-6.1

BORING 7

Sample
Dry density (pcf)
Blows per foot
50 40 30 20 10 0

Depth (feet)
Graph

Surface elevation 217'±xx

SOIL DESCRIPTION | USC

RUN #1
REC=100%
RQD= 58%

RUN #2
REC=100%
RQD= 83%

RUN #3
REC=100%
RQD=100%

RUN #4
REC=100%
RQD= 75%

RUN #5
REC=100%
RQD= 80%

5
10
15
20
25

DARK GRAY CLAY — CH

BLUE GRAY BASALT, HARD, MASSIVE

GRAY WEATHERED BASALT, VESICULAR, HARD

BLUE GRAY BASALT, HARD, MASSIVE

BORING TERMINATED AT 25.0 FEET ON DECEMBER 23, 1985

GROUNDWATER NOT ENCOUNTERED

LEGEND

- Moisture content
- I 2.0" O.D. split-spoon sample
- II Undisturbed ring sample
- III Disturbed ring sample
- IV Core sample
- P Sampler pushed

Plastic limit
Liquid limit
Natural water content

Driving energy: 140 lb.wt., 30" drop

LOG OF BORING

GEOLABS-HAWAII
Foundation Engineering • Soil Engineering • Geology

W.O. 1568-10 DECEMBER 1985

PLATE A-7.1

BORING 8

Sample
Dry density (pcf)
Blows per foot
50 40 30 20 10 0

Depth (feet)
Graph

Surface elevation 198'±

SOIL DESCRIPTION	USC
DARK GRAY CLAY WITH COBBLES	CH
BLUE GRAY BASALT, HARD, MASSIVE	
GRAY WEATHERED CLINKER ROCK	
BLUE GRAY BASALT, HARD, MASSIVE	
BORING TERMINATED AT 15.0 FEET ON DECEMBER 20, 1985	
GROUNDWATER NOT ENCOUNTERED	

RUN #1
REC=100%
RQD= 79%

RUN #2
REC=100%
RQD= 67%

RUN #3
REC=100%
RQD= 75%

5
10
15

LEGEND

- Moisture content
- I 2.0" O.D. split-spoon sample
- II Undisturbed ring sample
- III Disturbed ring sample
- IV Core sample
- P Sampler pushed

Plastic limit
Liquid limit
Natural water content

Driving energy: 140 lb.wt., 30" drop

LOG OF BORING

GEOLABS-HAWAII
Foundation Engineering • Soil Engineering • Geology

W.O 1568-10 DECEMBER 1985

APPENDIX 5

Best Management Practices (BMPs) for Board of Water Supply reservoirs

BOARD OF WATER SUPPLY RESERVOIRS MAINTENANCE AND REPAIR

BEST MANAGEMENT PRACTICES TO MEET STATE WATER QUALITY STANDARDS:

INITIAL TREATMENT: The discharge water will be taken from the reservoirs through the treatment system to the discharge point. Initial flushing should be filtered using a filtering system consisting of layers of woven mirafi fibers prior to discharge into receiving waters to remove sediment within the reservoir during the repairs. Contractors should take necessary precautions to keep the reservoir as clean as possible to minimize flushing and disinfection.

FLUSHING/CHLORINATION PROCEDURES: Consist of 5 turnovers: 1) Initial Flush 2) Inject Chlorine 3) Flush Solution and Sample 4) Inject Chlorine Again 5) Flush Solution and Sample. Process is repeated if sample fails Safe Drinking Water Act lab test.

DECHLORINATION PROCEDURES: Disinfection waters must be dechlorinated to acceptable levels prior to discharge into receiving waters. Sodium Thiosulfate (Dechlor) in solution will be injected into the discharge system and within the reservoir following the disinfection process.

MAINTENANCE PROCEDURES FOR TREATMENT SYSTEMS: Constant monitoring of dechlorination system to insure proper proportions of Sodium Thiosulfate to Chlorine. Daily and/or periodic removal of entrapped particles and solids in the dechlorinating equipment and filtering system. Monitoring of pressurized system of water truck. If physical changes are observed, discharges shall be terminated until appropriate treatment systems are in place.

MONITORING PROCEDURES FOR HYDROTESTING EFFLUENT: Conduct frequent visual inspections during effluent discharges to insure no change in turbidity, color and odor. If physical changes are observed, discharges shall be terminated until appropriate treatment systems are in place. Representative effluent samples for chlorine shall be collected prior to entering receiving waters or Municipal Separate Storm Sewer System (MS4). Samples will be taken at discharge point into storm drains. The chlorine residuals will be measured by standard DPD kits and Color Comparators. The dechlorinated water initial turbidity and chlorine content shall approach zero.

METHOD OF DISCHARGE: The dechlorinated water will be pumped through the existing overflow line or on-site drainage line into the MS4. Discharges will only occur during dry periods to prevent the drain system from overflowing.

APPENDIX 6

Hawaii Administrative Rules, Title 11, Chapter 55, Appendix J
NPDES General Permit Authorizing Occasional or Unintentional Discharges from Recycled Water Systems, September 2002

CHAPTER 11-55 APPENDIX J

NPDES GENERAL PERMIT
AUTHORIZING OCCASIONAL OR UNINTENTIONAL DISCHARGES
FROM RECYCLED WATER SYSTEMS

September 2002

1. Coverage under this General Permit

   (a) This general permit covers occasional or unintentional discharges composed entirely of:

      (1) R-1 water, or

      (2) R-1 water with any combination of stormwater or potable water or water used primarily for irrigation,

   where the R-1 water is supplied from a treatment works and is conveyed or used by a recycled water system.

   (b) This general permit covers all areas of the State except for discharges in or to state waters classified by the department as "class 1, inland waters," "class AA, marine waters," and areas restricted in accordance with the State's "No Discharge" policy in chapter 11-54 entitled "Water Quality Standards."

2. Limitations on Coverage under this General Permit

   (a) This general permit does not cover the following:

      (1) Recycled water system discharges into a sanitary sewer system;

      (2) Recycled water system discharges which initially enter separate storm water drainage systems, unless a permit, license, or equivalent written approval

(1) Five years after the effective date of this general permit;

(2) When the notice of general permit coverage specifies; or

(3) When amendments to section 11-55-34.02(b)(9) are adopted,

whichever is earliest, unless the notice of general permit coverage is administratively extended under section 11-55-34.09(d).

4. Notice of Intent (NOI) Requirements

(a) The owner or its duly authorized representative shall submit a complete notice of intent no later than thirty days before the proposed starting date of the discharge or thirty days before the expiration date of the applicable notice of general permit coverage.

(b) The owner or its duly authorized representative shall include the following information in the notice of intent:

(1) Information required in section 34 of appendix A of chapter 11-55;

(2) Activity for which the recycled water is to be used and the amount in gallons per day of recycled water to be used or conveyed;

(3) Name of the owner or operator of treatment works producing or supplying the R-1 water, if different from the permittee;

(4) Copy of the agreement(s) relating to R-1 water use between the permittee and the owner or operator of treatment works

after the quarters ending March, June, September, and December.

(b) If the discharge is not of R-1 quality, best management practices approved by the director were not being implemented, or water quality is adversely affected, then the permittee shall immediately notify the director of any discharge to state waters, corrective measures taken, and shall report in writing all of a month's discharges and corrective measures within five days after that month.

(c) The permittee shall make oral reports by telephone to the Wastewater Branch at (808) 586-4294 during regular office hours which are Monday through Friday (excluding holidays) from 7:45 a.m. until 4:15 p.m. or the Hawaii State Hospital Operator at (808) 247-2191 outside of regular office hours.

10. Submittal Requirements

(a) The owner or its duly authorized representative shall submit signed copies of monitoring and all other reports required by this general permit to the director at the following address or as otherwise specified:

Director of Health
Wastewater Branch
Environmental Management Division
State Department of Health
P.O. Box 3378
Honolulu, HI 96801-3378

(b) The owner or its duly authorized representative shall include the following certification statement and signature on each submittal in accordance with section 11-55-07(b):

13. Falsifying Report

Knowingly making any false statement on any report required by this general permit may result in the imposition of criminal penalties as provided for in Section 309 of the Act and in section 342D-35, HRS.

APPENDIX 7

Guidelines for the Treatment and Use of Recycled Water (May 15, 2002), *Appendix I Responses for Wastewater Spills, Overflows, and Discharges ("Spills")*, Revised March 2002.

APPENDIX I

RESPONSES FOR WASTEWATER SPILLS, OVERFLOWS, AND DISCHARGES ("SPILLS")

(Revised March 2002)

Table of contents

1. Points of contact
2. Spills into state waters, excluding R-1 water from recycled water systems
3. Spills into state waters of R-1 water from recycled water system
4. Spills to ground only - with public access
5. Spills to ground only - with no public access
6. Spills to ground only - R-1 water only
7. Press release
8. Monitoring of state water
9. Reporting
10. Modifications by the director

1. Points of contact

Agency	Phone	Fax
Clean Water Branch (CWB)	586-4309	586-4352
Wastewater Branch (WWB)	586-4294	586-4352
Environmental Health Programs (EHP)		
Hawaii District Health Office	974-6006	974-6000
Kauai District Health Office	241-3323	241-3566
Maui District Health Office	984-8234	984-8222
State Hospital Operator (SHO)	247-2191	
Communications Office		586-4444

2. Spills from any facility into state waters, excluding R-1 water from recycled water systems

a. Applicability. Any wastewater spill which enters into state waters from a public or private wastewater

for any significant duration. Disinfection is not required if the owner/agent demonstrates that the spill was R-2 water and that BMPs as approved by the director were implemented.

e. Warning signs. The owner/agent shall immediately post warning signs in the vicinity of the spill area.

f. Clean up. All spill sites shall be cleared of all debris and standing wastewater, and disinfected pursuant to section 4.d.

In areas containing standing wastewater which cannot be removed, the owner/agent shall limit public access by having barricades or other means.

g. Reporting. The owner/agent of a public wastewater system shall report to the WWB as follows:
(1) For spills of a thousand gallons or more, the owner/agent shall report to the WWB under section 9.a.
(2) For spills less than a thousand gallons, immediate notice and reporting are not required. A tabulated summary of all spills less than a thousand gallons each shall be submitted to the WWB on a quarterly basis in accordance with section 9.b.
(3) Exfiltration. Reporting of leaks or breaks in pipelines discovered during inflow/infiltration repair work is not required. These situations are considered exfiltration.

5. Spills to ground only - with no public access

a. Applicability. All wastewater spills from any public or private wastewater system that does not enter state waters and are in areas inaccessible to the public.
(1) The public and inaccessibility are described in section 4.a.
(2) Exclusion. Spills of R-1 water provided the owner/agent demonstrates the spill was of R-1 water and that BMPs as approved by the director were implemented.

b. Immediate notice to DOH. If a spill of a thousand gallons or more, and for spills occurring more than twice within a 12 month period within the confines or fence line of a wastewater system, the owner/agent

7. **Press release**

The press release shall describe the location of the spill, the amount of wastewater released, what caused the spill, and what is being done to correct the situation. Also, include a contact person and telephone number (including an after hours/weekend contact). At a minimum, the press release shall be faxed or telephoned to the following:

a. Associated Press (for radio dissemination) Phone: 536-5510;
b. Major statewide and island newspapers;
c. Major television news stations;
d. Department of Health, Communications Office, Oahu (Fax: 586-4444);
e. CWB if into state waters, otherwise WWB; and
f. For neighbor island spills, also include faxing the press release to the respective island DHOs.

8. **Monitoring of state waters**

Monitoring shall begin as soon as possible and be conducted in the receiving water area affected by the spill. Bacterial monitoring is not required if the owner/agent demonstrates that the spill was of R-1 water and that BMPs as approved by the director were implemented.

For spills entering fresh or brackish waters, the bacterial monitoring shall consist of sampling for the following indicator organisms:

a. Fecal coliform; and
b. Clostridium perfringens.

For spills entering marine waters, the bacterial monitoring shall consist of sampling for the following indicator organisms:

a. Enterococci; and
b. Clostridium perfringens.

Results of the bacterial monitoring shall be submitted to the director in care of the CWB immediately. Monitoring shall continue until notification to stop is received from the director. With the approval of the director, on a case-by-case situation, some protocol requirements such as sampling or sign posting may be waived. The director shall

Situation	Immediate Notification to	Press Release[1] or	Disinfect**	Warning Signs*	Clean Up[2]	Monitor*	Follow Up Written Report to
Into State Waters - All Wastewater Systems (Section 2)	CWB or EHP (SOSC/SHO)	yes	yes	yes	no	yes	CWB
Not Into State Waters w/Public Access - Public Wastewater Systems (Section 3)*	WWB or EHP (SOSC/SHO)[1]	yes	yes	yes	yes	no	WWB*&[1]
Not Into State Waters w/Public Access - Private Wastewater Systems (Section 4)*	WWB or EHP (SOSC/SHO)[1]	yes	yes	yes	yes	no	WWB*&[1]
Not Into State Waters w/o Public Access - All Wastewater Systems (Section 5)	WWB[1]	no	yes	yes	yes	no	WWB*&[1]

*Except for proven R-1 water and BMP Compliance
**Except for proven R-2 water and BMP Compliance
[1]If spill greater than or equal to 1,000 gallons or spill may threaten public health
[2]Or barricade if clean up not possible

APPENDIX E

Pre-Consultation Comment and Response Letters

DEPARTMENT OF PARKS AND RECREATION
CITY AND COUNTY OF HONOLULU
KAPOLEI HALE • 1000 ULUOHIA STREET, SUITE 309 • KAPOLEI, HAWAII 96707
TELEPHONE: (808) 692-5561 • FAX: (808) 692-5131 • INTERNET: www.honolulu.gov

MUFI HANNEMANN
MAYOR

LESTER K.C. CHANG
DIRECTOR

DANA TAKAHARA-DIAS
DEPUTY DIRECTOR

August 13, 2007

Mr. Tom Schnell, AICP, Senior Associate
PBR Hawaii & Associates
1001 Bishop Street, ASB Tower, Suite 650
Honolulu, Hawaii 96813

Dear Mr. Schnell:

Subject: Pre-Consultation for the Barbers Point 215' Non-Potable Reservoir No. 2, Kapolei, Island of Oahu Draft Environmental Assessment

Thank you for the opportunity to comment at the Pre-Consultation stage of the subject Draft Environmental Assessment.

The Department of Parks and Recreation has no comment and as the proposed project will not impact any program or facility of the department you are invited to remove us as a consulted party to the balance of the EIS process.

Should you have and questions, please contact Mr. John Reid, Planner, at 768-3017.

Sincerely,

LESTER K. C. CHANG
Director

LKCC:mk
(220448)

PBR HAWAII
& ASSOCIATES, INC.

W. FRANK BRANDT, FASLA
Chairman

THOMAS S. WITTEN, ASLA
President

R. STAN DUNCAN, ASLA
Executive Vice-President

RUSSELL Y. J. CHUNG, FASLA
Executive Vice-President

VINCENT SHIGEKUNI
Vice-President

GRANT T. MURAKAMI, AICP
Principal

TOM SCHNELL, AICP
Senior Associate

RAYMOND T. HIGA, ASLA
Senior Associate

KEVIN K. NISHIKAWA, ASLA
Associate

KIMI MIKAMI YUEN, LEED® AP
Associate

SCOTT ALIKA ABRIGO
Associate

SCOTT MURAKAMI, ASLA
Associate

November 28, 2007

Mr. Lester K.C. Chang, Director
Department of Parks & Recreation
1000 Uluohia Street, Suite 309
Kapolei, Hawaii 96707

SUBJECT: PRE-CONSULTATION FOR THE BARBERS POINT 215' NON-POTABLE RESERVOIR NO. 2, KAPOLEI, ISLAND OF O'AHU DRAFT ENVIRONMENTAL ASSESSMENT

Dear Mr. Chang,

Thank you for your letter dated August 13, 2007. We acknowledge that:

- The Department of Parks and Recreation has no comment.
- The proposed project will not impact and program or facility of the Department of Parks and Recreation.
- The Department of Parks and Recreation wishes to be removed as a consulted party to the balance of the EIS process.

Thank you for your participation in the preparation of the upcoming Environmental Assessment.

Sincerely,

Tom Schnell, AICP
Senior Associate, PBR HAWAII

Cc: Ian Arakaki, The Limtiaco Consulting Group
Lorna Heller, Board of Water Supply

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HONOLULU OFFICE
1001 Bishop Street
ASB Tower, Suite 650
Honolulu, Hawai'i 96813-3484
Tel: (808) 521-5631
Fax: (808) 523-1402
E-mail: sysadmin@pbrhawaii.com

HILO OFFICE
101 Aupuni Street
Hilo Lagoon Center, Suite 310
Hilo, Hawai'i 96720-4262
Tel: (808) 961-3333
Fax: (808) 961-4989

WAILUKU OFFICE
1787 Wili Pa Loop, Suite 4
Wailuku, Hawai'i 96793-1271
Tel: (808) 242-2878

DEPARTMENT OF FACILITY MAINTENANCE

CITY AND COUNTY OF HONOLULU

1000 Uluohia Street, Suite 215, Kapolei, Hawaii 96707
Phone: (808) 692-5054 • Fax: (808) 692-5857
Website: www.honolulu.gov

RECEIVED
AUG 13 2007
PBR HAWAII

MUFI HANNEMANN
MAYOR

LAVERNE HIGA, P.E.
DIRECTOR AND CHIEF ENGINEER

GEORGE "KEOKI" MIYAMOTO
DEPUTY DIRECTOR

IN REPLY REFER TO:
DRM 07-734

August 10, 2007

Mr. Tom Schnell, AICP, Senior Associate
PBR Hawaii
1001 Bishop Street, Suite 650
Honolulu, Hawaii 96813-3484

Dear Mr. Schnell:

Subject: Pre-Consultation for the Barbers Point 215' Non-potable Reservoir No. 2, Kapolei Draft Environmental Assessment

Thank you for giving us the opportunity to comment on the subject Pre-Consultation Draft Environmental Assessment, we have no comments to offer at this time. Please keep us informed as to your progress with this project.

Should you have any questions, please contact Larry Leopardi, Chief of the Division of Road Maintenance, at 768-3600.

Sincerely,

Laverne Higa

Laverne Higa, P.E.
Director and Chief Engineer

PBR HAWAII
& ASSOCIATES, INC.

W. FRANK BRANDT, FASLA
Chairman

THOMAS S. WITTEN, ASLA
President

R. STAN DUNCAN, ASLA
Executive Vice-President

RUSSELL Y. J. CHUNG, FASLA
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Senior Associate

RAYMOND T. HIGA, ASLA
Senior Associate

KEVIN K. NISHIKAWA, ASLA
Associate

KIMI MIKAMI YUEN, LEED® AP
Associate

SCOTT ALIKA ABRIGO
Associate

SCOTT MURAKAMI, ASLA
Associate

November 28, 2007

Ms. Laverne Higa, P.E., Director
Department of Facility Maintenance
1000 Uluohia Street, Suite 215
Kapolei, Hawaii 96707

SUBJECT: PRE-CONSULTATION FOR THE BARBERS POINT 215' NON-POTABLE RESERVOIR NO. 2, KAPOLEI, ISLAND OF O'AHU DRAFT ENVIRONMENTAL ASSESSMENT

Dear Ms. Higa,

Thank you for your letter dated August 10, 2007. We acknowledge that the Department of Facility Maintenance has no comments to offer at this time.

Thank you for your participation in the preparation of the upcoming Environmental Assessment.

Sincerely,

Tom Schnell, AICP
Senior Associate, PBR HAWAII

Cc: Ian Arakaki, The Limtiaco Consulting Group
Lorna Heller, Board of Water Supply

HONOLULU OFFICE
1001 Bishop Street
ASB Tower, Suite 650
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Fax: (808) 961-4989

WAILUKU OFFICE
1787 Wili Pa Loop, Suite 4
Wailuku, Hawai'i 96793-1271
Tel: (808) 242-2878

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DEPARTMENT OF TRANSPORTATION SERVICES
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET, 3RD FLOOR
HONOLULU, HAWAII 96813
Phone: (808) 768-8305 • Fax: (808) 523-4730 • Internet: www.honolulu.gov

AUG 3 1 2007
PBR HAWAII

MUFI HANNEMANN
MAYOR

MELVIN N. KAKU
DIRECTOR

RICHARD F. TORRES
DEPUTY DIRECTOR

TP8/07-220465R

August 27, 2007

Mr. Tom Schnell, AICP
Senior Associate, PBR HAWAII
1001 Bishop Street
ASB Tower, Suite 650
Honolulu, Hawaii 96813-3484

Dear Mr. Schnell:

Subject: Barbers Point 215' Non-Potable Reservoir No. 2

Thank you for your July 31, 2007 letter, requesting our pre-consultation comments on the subject project.

The only comment we have is that the State of Hawaii Department of Transportation should be consulted because it appears that the access road for the project intersects Farrington Highway (a State highway).

We look forward to reviewing the draft EA. Should you have any questions regarding this matter, please contact Ms. Faith Miyamoto of the Transportation Planning Division at 768-8350.

Sincerely,

MELVIN N. KAKU
Director

PBR HAWAII
& ASSOCIATES, INC.

W. FRANK BRANDT, FASLA
Chairman

THOMAS S. WITTEN, ASLA
President

R. STAN DUNCAN, ASLA
Executive Vice-President

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Vice-President

GRANT T. MURAKAMI, AICP
Principal

TOM SCHNELL, AICP
Senior Associate

RAYMOND T. HIGA, ASLA
Senior Associate

KEVIN K. NISHIKAWA, ASLA
Associate

KIMI MIKAMI YUEN, LEED®AP
Associate

SCOTT ALIKA ABRIGO
Associate

SCOTT MURAKAMI, ASLA
Associate

November 28, 2007

Mr. Melvin N. Kaku, Director
Department of Transportation Services
650 South King Street, 3rd Floor
Honolulu, Hawaii 96813

SUBJECT: PRE-CONSULTATION FOR THE BARBERS POINT 215' NON-POTABLE RESERVOIR NO. 2, KAPOLEI, ISLAND OF O'AHU DRAFT ENVIRONMENTAL ASSESSMENT

Dear Mr. Kaku,

Thank you for your letter dated August 27, 2007. We acknowledge that the Department of Transportation recommends consulting the State Department of Transportation. The State Department of Transportation was also sent a pre-consultation letter and replied that the project is not anticipated to significantly impact State transportation facilities.

Thank you for your participation in the preparation of the upcoming Environmental Assessment.

Sincerely,

Tom Schnell, AICP
Senior Associate, PBR HAWAII

Cc: Ian Arakaki, The Limtiaco Consulting Group
Lorna Heller, Board of Water Supply

HONOLULU OFFICE
1001 Bishop Street
ASB Tower, Suite 650
Honolulu, Hawai'i 96813-3484
Tel: (808) 521-5631
Fax: (808) 523-1402
E-mail: sysadmin@pbrhawaii.com

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Hilo, Hawai'i 96720-4262
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Fax: (808) 961-4989

WAILUKU OFFICE
1787 Wili Pa Loop, Suite 4
Wailuku, Hawai'i 96793-1271
Tel: (808) 242-2878

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DEPARTMENT OF DESIGN AND CONSTRUCTION
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET, 11TH FLOOR
HONOLULU, HAWAII 96813
Phone: (808) 768-8480 • Fax: (808) 523-4567
Web site: www.honolulu.gov

MUFI HANNEMANN
MAYOR

EUGENE C. LEE, P.E.
DIRECTOR

CRAIG I. NISHIMURA, P.E.
DEPUTY DIRECTOR

August 21, 2007

Mr. Tom Schnell, AICP
PBR Hawaii & Associates, Inc.
1001 Bishop Street
ASB Tower, Suite 650
Honolulu, Hawaii 96813-3484

Dear Mr. Schnell:

Subject: Pre-Consultation for the Barbers Point 215' Non-Potable Reservoir No. 2, Kapolei, Island of Oahu Draft Environmental Assessment

Thank you for giving us the opportunity to comment on the above Draft Environmental Assessment.

The Department of Design and Construction does not have any comments to offer at this time.

Very truly yours,

Eugene C. Lee, P.E.
Director

ECL:lt (220384)

PBR HAWAII
& ASSOCIATES, INC.

W. FRANK BRANDT, FASLA
Chairman

THOMAS S. WITTEN, ASLA
President

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Executive Vice-President

RUSSELL Y. J. CHUNG, FASLA
Executive Vice-President

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Vice-President

GRANT T. MURAKAMI, AICP
Principal

TOM SCHNELL, AICP
Senior Associate

RAYMOND T. HIGA, ASLA
Senior Associate

KEVIN K. NISHIKAWA, ASLA
Associate

KIMI MIKAMI YUEN, LEED® AP
Associate

SCOTT ALIKA ABRIGO
Associate

SCOTT MURAKAMI, ASLA
Associate

November 28, 2007

Mr. Eugene C. Lee, Director
Department of Design & Construction
650 South King Street
Honolulu, Hawaii 96813

SUBJECT: PRE-CONSULTATION FOR THE BARBERS POINT 215' NON-POTABLE RESERVOIR NO. 2, KAPOLEI, ISLAND OF O'AHU DRAFT ENVIRONMENTAL ASSESSMENT

Dear Mr. Lee,

Thank you for your letter dated August 21, 2007. We acknowledge that the Department of Design and Construction has no comments to offer at this time.

Thank you for your participation in the preparation of the upcoming Environmental Assessment.

Sincerely,

Tom Schnell, AICP
Senior Associate, PBR HAWAII

Cc: Ian Arakaki, The Limtiaco Consulting Group
Lorna Heller, Board of Water Supply

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DEPARTMENT OF PLANNING AND PERMITTING
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET, 7TH FLOOR • HONOLULU, HAWAII 96813
TELEPHONE: (808) 768-8000 • FAX: (808) 527-6743
INTERNET: www.honolulu.gov • DEPT. WEB SITE: www.honoluludpp.org

MUFI HANNEMANN
MAYOR

HENRY ENG, FAICP
DIRECTOR

DAVID K. TANOUE
DEPUTY DIRECTOR

2007/ELOG-2145 (MW)

August 27, 2007

Mr. Tom Schnell, AICP
PBR Hawaii & Associates, Inc.
ASB Tower, Suite 650
1001 Bishop Street
Honolulu, Hawaii 96813-3484

Dear Mr. Schnell:

Subject: Pre-consultation for the Draft EA on the Board of Water Supply's Proposed Barbers Point 215' Non-Potable Reservoir No. 2

In response to your request for comments dated July 31, 2007, regarding the preparation of a Draft Environmental Assessment (DEA) for this project, we have the following comments:

1. The DEA trigger should be identified, along with all potential environmental impacts and any proposed mitigation measures.

2. The DEA should discuss how the proposed project is consistent with the State Land Use classification, with the City and County's General Plan and Ewa Development Plan, and with the surrounding zoning.

3. The DEA should include a complete listing of all permits and approvals to be requested. (See 5.b. below.)

4. If the project does decide to use a portion of the surrounding parcels, then a Conditional Use Permit for "joint development" would be required unless any such portions are subdivided and consolidated into the project site.

5. Your discussion of State and City policies should mention the following:

   a. The Ewa Development Plan's Urban Land Use Map applies a conceptual designation of "Golf Course" to the project site. However, plans for the Makaiwa Hills project no longer include a golf course. Thus, we plan to

   recommend changing this designation to "Agricultural and Preservation Area" during our ongoing Ewa DP Five-Year Review process.

   b. Your project will need to be reflected on the Ewa Public Infrastructure Map as a new "water reservoir" project.

   c. The project site is zoned AG-2 General Agricultural District. The use being proposed falls under the category of "public uses and structures", which are allowed as a principal use in all zoning districts.

We look forward to reviewing and commenting on the DEA. Should you have any questions, please contact Mike Watkins of our staff at 768-8044.

Very truly yours,

Henry Eng, FAICP, Director
Department of Planning and Permitting

HE:mo

cc: Office of Environmental Quality Control

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PBR HAWAII
& ASSOCIATES, INC.

W. FRANK BRANDT, FASLA
Chairman

THOMAS S. WITTEN, ASLA
President

R. STAN DUNCAN, ASLA
Executive Vice-President

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TOM SCHNELL, AICP
Senior Associate

RAYMOND T. HIGA, ASLA
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Associate

SCOTT ALIKA ABRIGO
Associate

SCOTT MURAKAMI, ASLA
Associate

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Wailuku, Hawaii 96793-1271
Tel: (808) 242-2878

November 28, 2007

Mr. Henry Eng, Director
Department of Planning & Permitting
650 South King Street
Honolulu, Hawaii 96813

SUBJECT: PRE-CONSULTATION FOR THE BARBERS POINT 215' NON-POTABLE RESERVOIR NO. 2, KAPOLEI, ISLAND OF O'AHU DRAFT ENVIRONMENTAL ASSESSMENT

Dear Mr. Eng,

Thank you for your letter dated August 27, 2007. We offer the following responses to your comments:

1. The Draft Environmental Assessment (DEA) trigger is the use of State or County lands or funds. In the DEA, this will indicated along with all potential environmental impacts and any proposed mitigation measures.

2. The DEA will discuss how the proposed project is consistent with the State Land Use classification, City and County's General Plan, Ewa Development Plan, and surrounding zoning.

3. The DEA will include a complete listing of all permits and approvals to be requested.

4. We acknowledge that if the project requires the use of a portion of the surrounding parcels, a Conditional Use Permit for "joint development" will be required. This will be noted in the DEA.

5. The DEA will include the following information where applicable:
   a. DPP will recommend changing the project site's designation of "Golf Course" on the Ewa Development Plan's Urban Land Use Map to "Agricultural and Preservation Area" during the ongoing Ewa DP Five-Year Review process.
   b. We note that the reservoir will need to be reflected on the Ewa Public Infrastructure Map as a new "water reservoir" project. As necessary an application for revisions to the Public Infrastructure Maps will be submitted to the DPP to reflect this new water reservoir.
   c. The project site is zoned AG-2 General Agricultural District. Reservoirs, as "public uses and structures" are permitted in all zoning districts.

Thank you for your participation in the preparation of the upcoming Environmental Assessment.

Sincerely,

Tom Schnell, AICP
Senior Associate, PBR HAWAII

Cc: Ian Arakaki, The Limtiaco Consulting Group
Lorna Heller, Board of Water Supply

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POLICE DEPARTMENT
CITY AND COUNTY OF HONOLULU

RECEIVED
AUG 13 2007
PBR HAWAII

BS-DK

August 9, 2007

Mr. Tom Schnell, AICP
PBR Hawaii & Associates, Inc.
ASB Tower, Suite 650
1001 Bishop Street
Honolulu, Hawaii 96813-3484

Dear Mr. Schnell:

This is in response to your letter of July 31, 2007, requesting comments on a Pre-Consultation, Draft Environmental Assessment, for the Barbers Point 215' Non-Potable Reservoir No. 2 project in Kapolei.

This project should have no significant impact on the facilities or operations of the Honolulu Police Department.

If there are any questions, please call Major Michael Moses of District 8 at 692-4253 or Mr. Brandon Stone of the Executive Office at 529-3644.

Sincerely,

BOISSE P. CORREA
Chief of Police

By
JOHN P. KERR
Assistant Chief of Police
Support Services Bureau

Serving and Protecting With Aloha

PBR HAWAII
& ASSOCIATES, INC.

W. FRANK BRANDT, FASLA
Chairman

THOMAS S. WITTEN, ASLA
President

R. STAN DUNCAN, ASLA
Executive Vice-President

RUSSELL Y. J. CHUNG, FASLA
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Senior Associate

KEVIN K. NISHIKAWA, ASLA
Associate

KIMI MIKAMI YUEN, LEED®AP
Associate

SCOTT ALIKA ABRIGO
Associate

SCOTT MURAKAMI, ASLA
Associate

November 28, 2007

Mr. Boisse P. Correa, Police Chief
Police Department
801 South Beretania Street
Honolulu, Hawaii 96813

SUBJECT: PRE-CONSULTATION FOR THE BARBERS POINT 215' NON-POTABLE RESERVOIR NO. 2, KAPOLEI, ISLAND OF O'AHU DRAFT ENVIRONMENTAL ASSESSMENT

Dear Chief Correa,

Thank you for your letter dated August 9, 2007. We acknowledge your comment that this project should have no significant impact on the facilities or operation of the Honolulu Police Department.

Thank you for your participation in the preparation of the upcoming Environmental Assessment.

Sincerely,

Tom Schnell, AICP
Senior Associate, PBR HAWAII

Cc: Ian Arakaki, The Limtiaco Consulting Group
Lorna Heller, Board of Water Supply

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Wailuku, Hawaii 96793-1271
Tel: (808) 242-2878

HONOLULU FIRE DEPARTMENT
CITY AND COUNTY OF HONOLULU
636 South Street
Honolulu, Hawaii 96813-5007
Phone: 808-723-7139 Fax: 808-723-7111 Internet: www.honolulu.gov/hfd

MUFI HANNEMANN
MAYOR

KENNETH G. SILVA
FIRE CHIEF

ALVIN K. TOMITA
DEPUTY FIRE CHIEF

August 22, 2007

Mr. Tom Schnell, AICP
Senior Associate
PBR HAWAII & Associates, Inc.
1001 Bishop Street
Suite 650, ASB Tower
Honolulu, Hawaii 96813-3484

Dear Mr. Schnell:

Subject: Preconsultation Draft Environmental Assessment
Barbers Point Reservoir No. 2
Tax Map Key: 9-1-015: 023

In response to your letter dated July 31, 2007, regarding the above-mentioned subject, the Honolulu Fire Department (HFD) requires that the following be complied with:

1. Provide a fire apparatus access road for every facility, building, or portion of a building hereafter constructed or moved into or within the jurisdiction when any portion of the facility or any portion of an exterior wall of the first story of the building is located more than 150 feet (45 720 mm) from a fire apparatus access road as measured by an approved route around the exterior of the building or facility. (1997 Uniform Fire Code, Section 902.2.1.)

2. Provide a water supply, approved by the county, capable of supplying required fire flow for fire protection to all premises upon which facilities or buildings, or portions thereof, are hereafter constructed or moved into or within the county.

   On-site fire hydrants and mains capable of supplying the required fire flow shall be provided when any portion of the facility or building is in excess of the 150 feet (45 720 mm) from a water supply on a fire apparatus access road, as measured by an approved route around the exterior of the facility or building. (1997 Uniform Fire Code, Section 903.2, as amended.)

3. Submit civil drawings to the HFD for review and approval.

Should you have any questions, please call Battalion Chief Lloyd Rogers of our Fire Prevention Bureau at 723-7151.

Sincerely,

ALVIN K. TOMITA
Acting Fire Chief

AKT/SY:bh

PBR HAWAII
& ASSOCIATES, INC.

W. FRANK BRANDT, FASLA
Chairman

THOMAS S. WITTEN, ASLA
President

R. STAN DUNCAN, ASLA
Executive Vice-President

RUSSELL Y. J. CHUNG, FASLA
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RAYMOND T. HIGA, ASLA
Senior Associate

KEVIN K. NISHIKAWA, ASLA
Associate

KIMI MIKAMI YUEN, LEED® AP
Associate

SCOTT ALIKA ABRIGO
Associate

SCOTT MURAKAMI, ASLA
Associate

November 28, 2007

Mr. Kenneth G. Silva, Fire Chief
Fire Department
636 South Street
Honolulu, Hawaii 96813

SUBJECT: PRE-CONSULTATION FOR THE BARBERS POINT 215' NON-POTABLE RESERVOIR NO. 2, KAPOLEI, ISLAND OF O'AHU DRAFT ENVIRONMENTAL ASSESSMENT

Dear Chief Silva,

Thank you for your letter dated August 22, 2007. We offer the following responses to your comments:

1. The reservoir will be constructed in conformance with the 1997 Uniform Fire Code.

2. The reservoir will be constructed in conformance with the 1997 Uniform Fire Code.

3. Civil drawing will be submitted to the HFD for review and approval.

Thank you for your participation in the preparation of the upcoming Environmental Assessment.

Sincerely,

Tom Schnell, AICP
Senior Associate, PBR HAWAII

Cc: Ian Arakaki, The Limtiaco Consulting Group
Lorna Heller, Board of Water Supply

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Wailuku, Hawai'i 96793-1271
Tel: (808) 242-2878

LINDA LINGLE
GOVERNOR OF HAWAII

LAURA H. THIELEN
INTERIM CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

August 21, 2007

PBR Hawaii & Associates, Inc.
1001 Bishop Street
ASB Tower Suite 650
Honolulu, Hawaii 96813

Attention: Mr. Tom Schnell

Gentlemen:

Subject: Pre-Consultation for Environmental Assessment for BWS Barbers Point 215 Non-potable Reservoir No. 2, Kapolei, Oahu, Tax Map Key: (1) 9-1-15:23, portion of 5 and 9-2-3:portion of 5

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

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

Sincerely,

Charlene E. Unoki
for Russell Y. Tsuji
Administrator

LINDA LINGLE
GOVERNOR OF HAWAII

ALLAN A. SMITH
INTERIM CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

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STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

August 2, 2007

MEMORANDUM

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

FROM: Russell Y. Tsuji
SUBJECT: Pre-Consultation for Draft Environmental Assessment
LOCATION: Barbers Point, Oahu, Tax Map Key: (1) 9-1-15:23, portion of 5 and 9-2-3:portion of 5
APPLICANT: PBR Hawaii & Associates, Inc. on behalf of the Board of Water Supply

Transmitted for your review and comment on the above referenced document. We would appreciate your comments on this document. Please submit any comments by August 20, 2007.

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

Attachments

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

Signed: Eric T. Hirano
Date: 8/15/07

DEPARTMENT OF LAND AND NATURAL RESOURCES
ENGINEERING DIVISION

LD/RYT
Ref.: PreConDEAPotableResBWS
Oahu.553

COMMENTS

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

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

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

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

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

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

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

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

( ) Additional Comments: _____

( ) Other: _____

Should you have any questions, please call Ms. Suzie Agraan of the Planning Branch at 587-0258.

Signed: _____
ERIC T. HIRANO, CHIEF ENGINEER
Date: 8/15/07

LINDA LINGLE
GOVERNOR OF HAWAII

ALLAN A. SMITH
INTERIM CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

August 2, 2007

MEMORANDUM

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

To: ~~FROM:~~ Russell Y. Tsuji
SUBJECT: Pre-Consultation for Draft Environmental Assessment
LOCATION: Barbers Point, Oahu, Tax Map Key: (1) 9-1-15:23, portion of 5 and 9-2-3:portion of 5
APPLICANT: PBR Hawaii & Associates, Inc. on behalf of the Board of Water Supply

Transmitted for your review and comment on the above referenced document. We would appreciate your comments on this document. Please submit any comments by August 20, 2007.

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

Attachments

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

Signed: _____
Date: 8/7/06

LINDA LINGLE
GOVERNOR OF HAWAII

LAURA H. THIELEN
INTERIM CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

August 31, 2007

PBR Hawaii & Associates, Inc.
1001 Bishop Street
ASB Tower Suite 650
Honolulu, Hawaii 96813

Attention: Mr. Tom Schnell

Gentlemen:

Subject: Pre-Consultation for Environmental Assessment for BWS Barbers Point 215 Non-potable Reservoir No. 2, Kapolei, Oahu, Tax Map Key: (1) 9-1-15:23, portion of 5 and 9-2-3:portion of 5

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

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

Sincerely,

Russell Y. Tsuji
Administrator

LINDA LINGLE
GOVERNOR OF HAWAII

ALLAN A. SMITH
INTERIM CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

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COMMISSION ON WATER RESOURCE MANAGEMENT

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

August 2, 2007

MEMORANDUM

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

FROM: Russell Y. Tsuji
SUBJECT: Pre-Consultation for Draft Environmental Assessment
LOCATION: Barbers Point, Oahu, Tax Map Key: (1) 9-1-15:23, portion of 5 and 9-2-3:portion of 5
APPLICANT: PBR Hawaii & Associates, Inc. on behalf of the Board of Water Supply

Transmitted for your review and comment on the above referenced document. We would appreciate your comments on this document. Please submit any comments by August 20, 2007.

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

Attachments

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

Signed: W. Paul Conry
Date: 8/24/07

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GOVERNOR OF HAWAII

LAURA H. THIELEN
INTERIM CHAIRPERSON

MEREDITH J. CHING
JAMES A. FRAZIER
NEAL S. FUJIWARA
CHIYOME L. FUKINO, M.D.
DONNA FAY K. KIYOSAKI, P.E.
LAWRENCE H. MIIKE, M.D., J.D.

KEN C. KAWAHARA, P.E.
DEPUTY DIRECTOR

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

August 29, 2007

REF: Pre-consultation DEA Barbers Pt Nonpotablel Reservoir.dr

TO: Russell Tsuji, Administrator
Land Division

FROM: Ken C. Kawahara, P.E., Deputy Director
Commission on Water Resource Management

SUBJECT: Pre-consultation for Draft Environmental Assessment, Barbers Pt.,
TMK (1) 9-1-15:23, portion 5 and 9-2-3: portion 5

FILE NO.:

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2007 AUG 31 A

Thank you for the opportunity to review the subject document. The Commission on Water Resource Management (CWRM) is the agency responsible for administering the State Water Code (Code). Under the Code, all waters of the State are held in trust for the benefit of the citizens of the State, therefore, all water use is subject to legally protected water rights. CWRM strongly promotes the efficient use of Hawaii's water resources through conservation measures and appropriate resource management. For more information, please refer to the State Water Code, Chapter 174C, Hawaii Revised Statutes, and Hawaii Administrative Rules, Chapters 13-167 to 13-171. These documents are available via the Internet at *http://www.hawaii.gov/dlnr/cwrm*.

Our comments related to water resources are checked off below.

☒ 1. We recommend coordination with the county to incorporate this project into the county's Water Use and Development Plan. Please contact the respective Planning Department and/or Department of Water Supply for further information.

☐ 2. We recommend coordination with the Engineering Division of the State Department of Land and Natural Resources to incorporate this project into the State Water Projects Plan.

☐ 3. There may be 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.

Permits required by CWRM: Additional information and forms are available at *www.hawaii.gov/dlnr/cwrm/forms.htm*.

☐ 4. The proposed water supply source for the project is located in a designated ground-water management area, and a Water Use Permit is required prior to use of ground water.

☐ 5. A Well Construction Permit(s) is (are) required before the commencement of any well construction work.

☐ 6. A Pump Installation Permit(s) is (are) required before ground water is developed as a source of supply for the project.

☐ 7. There is (are) well(s) located on or adjacent to this project. If wells are not planned to be used and will be affected by any new construction, they must be properly abandoned and sealed. A permit for well abandonment must be obtained.

☐ 8. Ground-water withdrawals from this project may affect streamflows, which may require an instream flow standard amendment.

☐ 9. A Stream Channel Alteration Permit(s) is (are) required before any alteration can be made to the bed and/or banks of a stream channel.

☐ 10. A Stream Diversion Works Permit(s) is (are) required before any stream diversion works is constructed or altered.

☐ 11. A Petition to Amend the Interim Instream Flow Standard is required for any new or expanded diversion(s) of surface water.

☐ 12. The planned source of water for this project has not been identified in this report. Therefore, we cannot determine what permits or petitions are required from our office, or whether there are potential impacts to water resources.

☐ 13. We recommend that the report identify feasible alternative non-potable water resources, including reclaimed wastewater.

☒ OTHER:

This project should be reflected in the County Water Use and Development Plan (WUDP) as it proposes replacement of existing brackish well water with reclaimed water for nonpotable uses. If the proposed project results in an increase in system capacity that can be used to meet existing or future demands, this should also be acknowledged in the WUDP.

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

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November 28, 2007

Mr. Russell Y. Tsuji, Administrator
Land Division
Department of Land and Natural Resources
P.O. Box 621
Honolulu, Hawaii 96809

SUBJECT: PRE-CONSULTATION FOR THE BARBERS POINT 215' NON-POTABLE RESERVOIR NO. 2, KAPOLEI, ISLAND OF O'AHU DRAFT ENVIRONMENTAL ASSESSMENT

Dear Mr. Tsuji,

Thank you for your letters dated August 21, 2007 and August 31, 2007. We offer the following responses to your comments:

Engineering Division
Thank you for the information that the project site is located in Flood Zone D.

Land Division—Oahu District
We acknowledge that you have no objections to the project.

Commission on Water Resource Management
The Barbers Point 215' Non-potable Reservoir No. 2 is proposed by the Board of Water Supply and will be incorporated into the County's Water Use and Development Plan.

Thank you for your participation in the preparation of the upcoming Environmental Assessment.

Sincerely,

Tom Schnell, AICP
Senior Associate, PBR HAWAII

Cc: Ian Arakaki, The Limtiaco Consulting Group
Lorna Heller, Board of Water Supply

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LINDA LINGLE
GOVERNOR

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

BARRY FUKUNAGA
DIRECTOR

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

IN REPLY REFER TO:

STP 8.2590

August 20, 2007

Mr. Tom Schnell, AICP
Senior Associate
PBR Hawaii & Associates, Inc.
1001 Bishop Street
ASB Tower, Suite 650
Honolulu, Hawaii 96813-3484

Dear Mr. Schnell:

Subject: Barbers Point 215' Non-Potable Reservoir No. 2
Draft Environmental Assessment (DEA), Pre-Consultation
TMK: 9-1-15: 23

Thank you for your notification of the subject project by the City & County Honolulu Board of Water Supply.

The project is not anticipated to significantly impact our State transportation facilities.

We appreciate the opportunity to provide comments.

Very truly yours,

BARRY FUKUNAGA
Director of Transportation

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& ASSOCIATES, INC.

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Associate

KIMI MIKAMI YUEN, LEED® AP
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SCOTT ALIKA ABRIGO
Associate

SCOTT MURAKAMI, ASLA
Associate

November 28, 2007

Mr. Barry Fukunaga, Interim Director
State Department of Transportation
869 Punchbowl Street
Honolulu, Hawaii 96813

SUBJECT: PRE-CONSULTATION FOR THE BARBERS POINT 215' NON-POTABLE RESERVOIR NO. 2, KAPOLEI, ISLAND OF O'AHU DRAFT ENVIRONMENTAL ASSESSMENT

Dear Mr. Fukunaga,

Thank you for your letter dated August 20, 2007. We acknowledge your comment that "The project is not anticipated to significantly impact our State transportation facilities."

Thank you for your participation in the preparation of the upcoming Environmental Assessment.

Sincerely,

Tom Schnell, AICP
Senior Associate, PBR HAWAII

Cc: Ian Arakaki, The Limtiaco Consulting Group
Lorna Heller, Board of Water Supply

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

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AUG 28 2007
PBR HAWAII

HRD07/3166

August 22, 2007

Tom Schnell, AICP
Senior Associate, PBR HAWAII
1001 Bishop Street
Abs Tower, Suite 650
Honolulu, Hawai'i 96813-3484

RE: Pre-Consultation Request for a 215' Proposed Reservoir No.2, Kapolei, O'ahu, TMK 9-1-15:23.

Dear Mr.Schnell,

The Office of Hawaiian Affairs (OHA) is in receipt of your request for written comments regarding the applicant's pre-consultation request for a 215 foot proposed reservoir in Kapolei on O'ahu. OHA has the following comments.

Kalaeloa is the modern name given to the former Barbers Point Naval Air Station after the military base was closed in 1999 and subsequently transferred to the State of Hawai'i. OHA notes that in the invitation for comments 'Barbers Point' is the place name for which the proposed reservoir is to be located. As this place name is inaccurate, OHA requests that the modern Hawaiian place name of Kalaeloa be used for this location.

Addressing the proposed project itself, OHA notes that the size of the reservoir and the footprint of the project are not determined yet. The invitation to comment states that the capacity of the reservoir may range from 1.5 to 6 million gallons and that portions of two other TMK parcels may need to be used. This range in project size makes it difficult to make substantive comments. Therefore, OHA looks forward to receiving the draft environmental assessment for this project in order to better address our beneficiaries' concerns.

Similarly, it is unclear from the information provided why this project is necessary. Under the State water code, all waters in the state are held in trust for the benefit of the citizens of the state; therefore, all water use is subject to legally protected water rights. Water uses must be directed toward attaining maximum reasonable-beneficial use of

water, conservation and development of the waters of the state, control of water for public purposes such as navigation and flood control, and adequate water quality.[1]

The invitation to comment states that the current reservoir stores brackish water from two deepwater wells. The proposal wants to valve off these two deepwater wells for "emergency purpose" and then store water from the Honouliuli Water Recycling Facility in the current reservoir as well as up to 6 million gallons of Honouliuli recycled water in the second, proposed reservoir. The reason for proposing this is unclear. There are no proposed uses listed or even figures of gallons per day given for current uses. With the information provided at this stage, it is not possible to determine if this proposed reservoir would be a maximum reasonable-beneficial current use of a valuable public trust resource or a way to store water for future development.

OHA appreciates being brought into this Pre-Consultation Request and looks forward to further commenting on this project once more information is provided. If you have any further questions or concerns please contact Grant Arnold at (808) 594-0263 or granta@oha.org.

Sincerely,

Clyde W. Nāmu'o
Administrator

[1] Hawai'i Revised Statutes § 174C-31(g)(5).

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November 28, 2007

Mr. Clyde W. Namu`o, Administrator
Office of Hawaiian Affairs
711 Kapiolani Blvd., Suite 500
Honolulu, Hawaii 96813

SUBJECT: PRE-CONSULTATION FOR THE BARBERS POINT 215' NON-POTABLE RESERVOIR NO. 2, KAPOLEI, ISLAND OF O'AHU DRAFT ENVIRONMENTAL ASSESSMENT

Dear Mr. Namu`o,

Thank you for your letter dated August 22, 2007. We offer the following responses to your comments:

The draft environmental assessment (DEA) will contain a discussion regarding the place names of Barbers Point and Kalaeloa. The project area is considered to be within the district of Kalaeloa, however, oral traditions refer to the specific area as Pūkaua which is at the base of Pu'u Makakilo.

The name Barbers Point is an existing internal operations facility service area name used by the Board of Water Supply for all reservoirs and facilities in this area. The Board of Water Supply will retain the project area name as Barbers Point to maintain consistency and avoid confusion.

The final size of the proposed reservoir has not yet been determined; however the DEA will discuss potential impacts and suggest mitigation measures based on the largest proposed reservoir capacity. We will provide a copy of the DEA to your office during the public comment period.

The DEA will also discuss the need for, and purpose of, the reservoir.

Thank you for your participation in the preparation of the upcoming Environmental Assessment.

Sincerely,

Tom Schnell, AICP
Senior Associate, PBR HAWAII

Cc: Ian Arakaki, The Limtiaco Consulting Group
Lorna Heller, Board of Water Supply

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United States Department of the Interior

FISH AND WILDLIFE SERVICE
Pacific Islands Fish and Wildlife Office
300 Ala Moana Boulevard, Room 3-122, Box 50088
Honolulu, Hawaii 96850

AUG 31 2007

In Reply Refer To:
2007-TA-0241

Mr. Tom Schnell, AICP
Senior Associate
PBR Hawaii and Associates, Incorporated
1001 Bishop Street
ASB Tower, Suite 650
Honolulu, Hawaii 96813-3484

Subject: Information for Preparation of an for Draft Environmental Assessment for the Barbers Point 215-Foot Non-potable Reservoir Number 2 in Kapolei on the Island of Oahu [TMK (1) 9-1-015:023 and 005 and TMK (1) 9-2-003:005]

Dear Mr. Schnell:

Thank you for your letter dated July 31, 2007, requesting information for the preparation of a draft Environmental Assessment (EA) for the proposed construction of a non-potable Reservoir at Barbers Point. The Reservoir will be used to store R1 water (Hawaii State Department of Health Class 1 recycled water) from the Honouliuli Water Recycling Facility.

To assist you we have reviewed the information you provided and pertinent information in our files, including data compiled by the Hawaii Biodiversity and Mapping Program and the Hawaii GAP Program. Land cover information indicates that the project area is classified as kiawe forest with haole koa shrubland and mixed high and low intensity development. The federally endangered Hawaiian stilt (*Himantopus mexicanus knudseni*) and Hawaiian hoary bat (*Lasirus cinereus semotus*) have been observed near the proposed project. The federally endangered plants Ewa hinahina (*Achyranthes splendens* var. *rotundata*), kooloaula (*Abutilon menziesii*) and akoko (*Chamaesysce skottsbergii* var. *skottsbergii*) occur in similar habitats in this area.

We recommend a knowledgeable biologist survey the site to determine if the stilt, bat and/or listed plant species occur within or adjacent to the project footprint. If listed species are present, the draft EA should address all potential direct and indirect impacts that may result from the proposed project to these species. Information obtained from the surveys should be provided to our office along with your determination of the effects of the project on the listed species.

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We hope this information assists you in developing a comprehensive and thorough draft EA. If you have questions, please contact Aaron Nadig, Fish and Wildlife Biologist (phone: 808-792-9466; fax: 808-792-9581).

Sincerely,

Patrick Leonard
Field Supervisor

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SCOTT MURAKAMI, ASLA
Associate

November 28, 2007

Mr. Patrick Leonard, Field Supervisor
U.S. Fish and Wildlife Service Pacific Islands Office
300 Ala Moana Blvd.; Rm. 3-122, Box 50088
Honolulu, Hawaii 96850

SUBJECT: PRE-CONSULTATION FOR THE BARBERS POINT 215' NON-POTABLE RESERVOIR NO. 2, KAPOLEI, ISLAND OF O'AHU DRAFT ENVIRONMENTAL ASSESSMENT

Dear Mr. Leonard,

Thank you for your letter dated August 31, 2007. A botanical survey and faunal survey of the project site has been prepared and will be included in the Draft Environmental Assessment for your office to review. The Hawaiian stilt, Hawaiian hoary bat, and Ewa hinahina plant were not observed during the surveys.

Thank you for your participation in the preparation of the upcoming Environmental Assessment.

Sincerely,

Tom Schnell, AICP
Senior Associate, PBR HAWAII

Cc: Ian Arakaki, The Limtiaco Consulting Group
Lorna Heller, Board of Water Supply

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United States Department of Agriculture

NRCS
Natural Resources Conservation Service
P.O. Box 50004 Rm. 4-118
Honolulu, HI 96850
808-541-2600

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PBR HAWAII

August 6, 2007

Mr. Tom Schnell, AICP
Senior Associate, PBR HAWAII
1001 Bishop Street
ASB Tower, Suite 650
Honolulu, Hawaii 96813

Subject: Draft Environmental Assessment for the Barbers Point 215' Non-Potable Reservoir No.2

Dear Mr. Tom Schell,

This does not have a negative impact on any projects in the area, and the use of recycled water will be beneficial to the resorts.

Thank you for the opportunity to comment.

Sincerely,

LAWRENCE T. YAMAMOTO, acting for
Director
Pacific Islands Area

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SCOTT ALIKA ABRIGO
Associate

SCOTT MURAKAMI, ASLA
Associate

November 28, 2007

Mr. Lawrence Yamamoto, Director
USDA-Natural Resources Conservation Service
P.O. Box 50004
Honolulu, Hawaii 96850

SUBJECT: PRE-CONSULTATION FOR THE BARBERS POINT 215' NON-POTABLE RESERVOIR NO. 2, KAPOLEI, ISLAND OF O'AHU DRAFT ENVIRONMENTAL ASSESSMENT

Dear Mr. Yamamoto,

Thank you for your letter dated August 6, 2007. We acknowledge your comments that the project will not have a negative impact on any projects in the area and the use of recycled water will be beneficial to the resorts.

Thank you for your participation in the preparation of the upcoming Environmental Assessment.

Sincerely,

Tom Schnell, AICP
Senior Associate, PBR HAWAII

Cc: Ian Arakaki, The Limtiaco Consulting Group
Lorna Heller, Board of Water Supply

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APPENDIX F

Draft EA Comment and
Response Letters

United States Department of Agriculture

NRCS

Natural Resources Conservation Service
P.O. Box 50004 Rm. 4-118
Honolulu, HI 96850
808-541-2600

December 20, 2007

Tom Schnell
PBR HAWAII
1001 Bishop Street, ASB Tower, Suite 650
Honolulu. Hawaii 96813

Dear Mr. Schnell,

We have reviewed the Draft Environmental Assessment for the Barbers Point 215' Non-potable Reservoir No. 2, TMK: 9-1-15:23 and 05 (por.), 9-2-3:02(por.) for Oahu, Hawaii. We have no comments regarding this project.

Thank you for the opportunity to comment.

Sincerely,

LAWRENCE T. YAMAMOTO
Director
Pacific Islands Area

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PBR HAWAII
& ASSOCIATES, INC.

PARTNERS
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VINCENT SHIGEKUNI
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GRANT T. MURAKAMI, AICP
Principal

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June 23, 2008

Mr. Lawrence T. Yamamoto
Director, Pacific Islands Area
United States Department of Agriculture
Natural Resources Conservation Service
P.O. Box 50004 Rm. 3-118
Honolulu, Hawai'i, 96850

SUBJECT: BARBERS POINT 215' NON-POTABLE RESERVOIR NO. 2, KAPOLEI, DRAFT ENVIRONMENTAL ASSESSMENT

Dear Mr. Yamamoto:

Thank you for your letter dated December 20, 2007 regarding the Barbers Point 215' Reservoir No. 2 Draft Environmental Assessment (EA).

We acknowledge that Natural Resources Conservation Service has no comments regarding this project.

Thank you for reviewing the Draft EA. Your letter will be included in the Final EA.

Sincerely,

PBR HAWAII

Tom Schnell, AICP
Senior Associate

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LINDA LINGLE
GOVERNOR OF HAWAII

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

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

In reply, please refer to:
EPO-07-226

January 7, 2008

Mr. Tom Schnell
PBR HAWAII
1001 Bishop Street
ASB Tower, Suite 650
Honolulu, Hawaii 96813

Dear Mr. Schnell:

SUBJECT: Draft Environmental Assessment for Barbers Point 215' Non-Potable Reservoir No. 2, Kapolei, Oahu, Hawaii
TMK: (1) 9-1-015: 23 and 005 (portion)
(1) 9-2-003: 002 (portion)

Thank you for allowing us to review and comment on the project. The document was routed to the various branches of the Department of Health (DOH) Environmental Health Administration. We have the following Wastewater Branch and General comments.

Wastewater Branch

The project which proposes the construction of a non-potable water reservoir to serve the BWA Honouliuli Recycled Water System and WBS Ko 'Olina Non-potable Water System.

The project is located in the Critical Wastewater Disposal Area (CWDA) where no new cesspools will be allowed. The majority of the proposed development lies in the No Pass Zone where subdivisions are not approved unless connection to the County sewer system is possible. There are two (2) cesspool locations for the TMK: (1) 9-2-003: 002 which is attached for your information.

However, as no domestic wastewater will be generated at the Barber's Point 215' Non-Potable Reservoir No. 2 and any wastewater generated is connected to the Honouliuli Wastewater Treatment Plant, we have no objections to the project. We encourage the developer to work with the Honolulu Board of Water Supply to utilize R-1 water for irrigation and other non-potable water purposes in open space and landscaping areas.

All wastewater plans must meet Department's Rules, HAR Chapter 11-62, "Wastewater Systems." We do reserve the right to review the detailed wastewater plans for conformance to applicable rules. If you have any questions, please contact the Planning & Design Section of the Wastewater Branch at 586-4294.

General

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

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

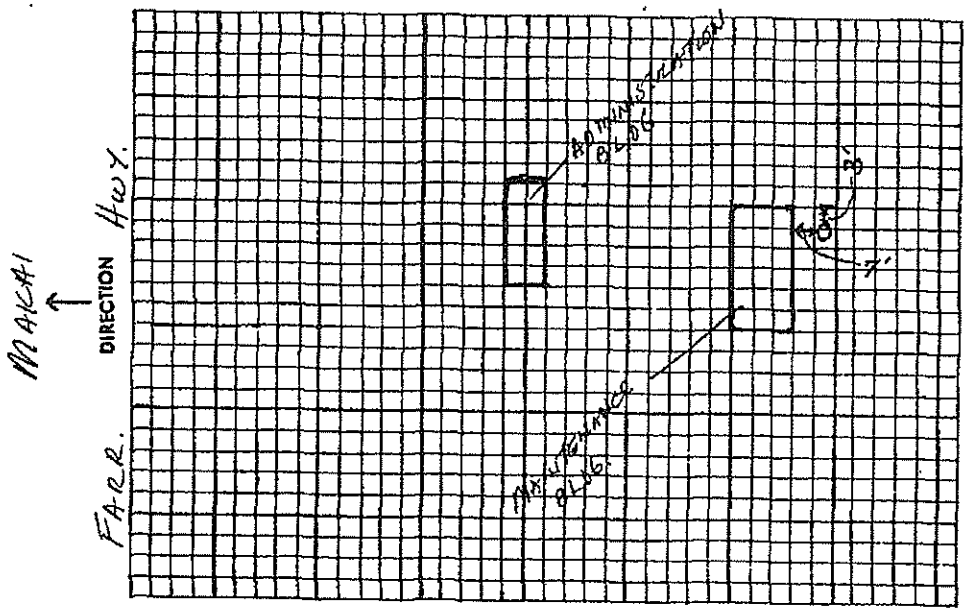
Sincerely,

KELVIN H. SUNADA, MANAGER
Environmental Planning Office

c: EPO
WWB

Attachments: Cesspool Survey Forms

MAKAHA
DIRECTION



REMARKS

4/3/90: CESSPOOL SERVICING MAINTENANCE BLDG. LOCATED 7' FROM BLDG. AND 3' FROM MAKAHA SIDE LINE OF MAINTENANCE BLDG.

SAN FORM 40

STATE OF HAWAII
DEPARTMENT OF HEALTH

APR 5 8 20 PM

SANITATION BRANCH
ENVIRONMENTAL PROTECTION AND HEALTH SERVICES DIVISION

BELOW W/C LINE

CESSPOOL SURVEY

Property Owner DEPT. OF PUBLIC WORKS, CITY & COUNTY OF HONOLULU Address 92-468 FARRINGTON HWY. EWA OAHU (WAIMANALO GULCH SANITARY LANDFILL)

Tax Map Key 9-2-3: 2, 13 & 40 Lot No (CESSPOOL FOR MAINTENANCE BLDG.)

Island OAHU City HON District EWA BEACH

Builder or Contractor DEPT. OF PUBLIC WORKS Intended For INDUSTRIAL

Primary ✓ Secondary Other

Distance From Building 7' Boundary 3' FROM MAKAHA SIDE OF MAINTENANCE BLDG. Stream, Well, Body of Water, Etc NONE

Diameter (Clear) Ft 6' Depth-Ft 14' Capacity (Gal) 2961

No Ft Down to Water Table 0 Ground Slope LEVEL

Soil Profile (Starting from Surface) 3' ADOBE, 11' RIVERBED MATERIALS

Type of Wall or Curb HOLLOW TILE Reinforced Concrete Cover YES

Distance from Finished Ground to Top of Cover (Ft) 1'

Date Certificate Issued 4/3/90

Date Approved 4/3/90 19 R. Akamichi
Sanitarian

DIRECTION

REMARKS

DIRECTION

SAN. FORM 40

BUS.

STATE OF HAWAII
DEPARTMENT OF HEALTH

MAR 28 1988

SANITATION BRANCH
ENVIRONMENTAL PROTECTION AND HEALTH
SERVICES DIVISION

Co

CESSPOOL SURVEY

Property Owner DEPT. OF PUBLIC WORKS, CITY & COUNTY OF HONOLULU Address EWA, OAHU (WAIMANALO GULCH SANITARY LANDFILL)

Tax Map Key 9-2-3:2, 13 & 40 Lot No (CESSPOOLS FOR ADMINISTRATION BLDG.)

Island OAHU City HON. District EWA BEACH

Builder or Contractor HAITSUKA BROS. Intended For INDUSTRIAL

Primary ✓ Secondary Other

Distance From Building BOTH 10' FROM BLDGS. Boundary SEE ATTACHED PLANS. Stream, Well, Body of Water, Etc. 0

Diameter (Clear) Ft. BOTH 8' Depth-Ft BOTH 21' Capacity (Gal) BOTH 7896

No Ft. Down to Water Table 0 Ground Slope LEVEL

Soil Profile (Starting from Surface) 7' LOOSE CORAL AND ROCKS, 1' ADOBE & ROCKS, 13' RIVER BED MATERIALS.

BACKFILLED WITH CRUSHED ROCKS

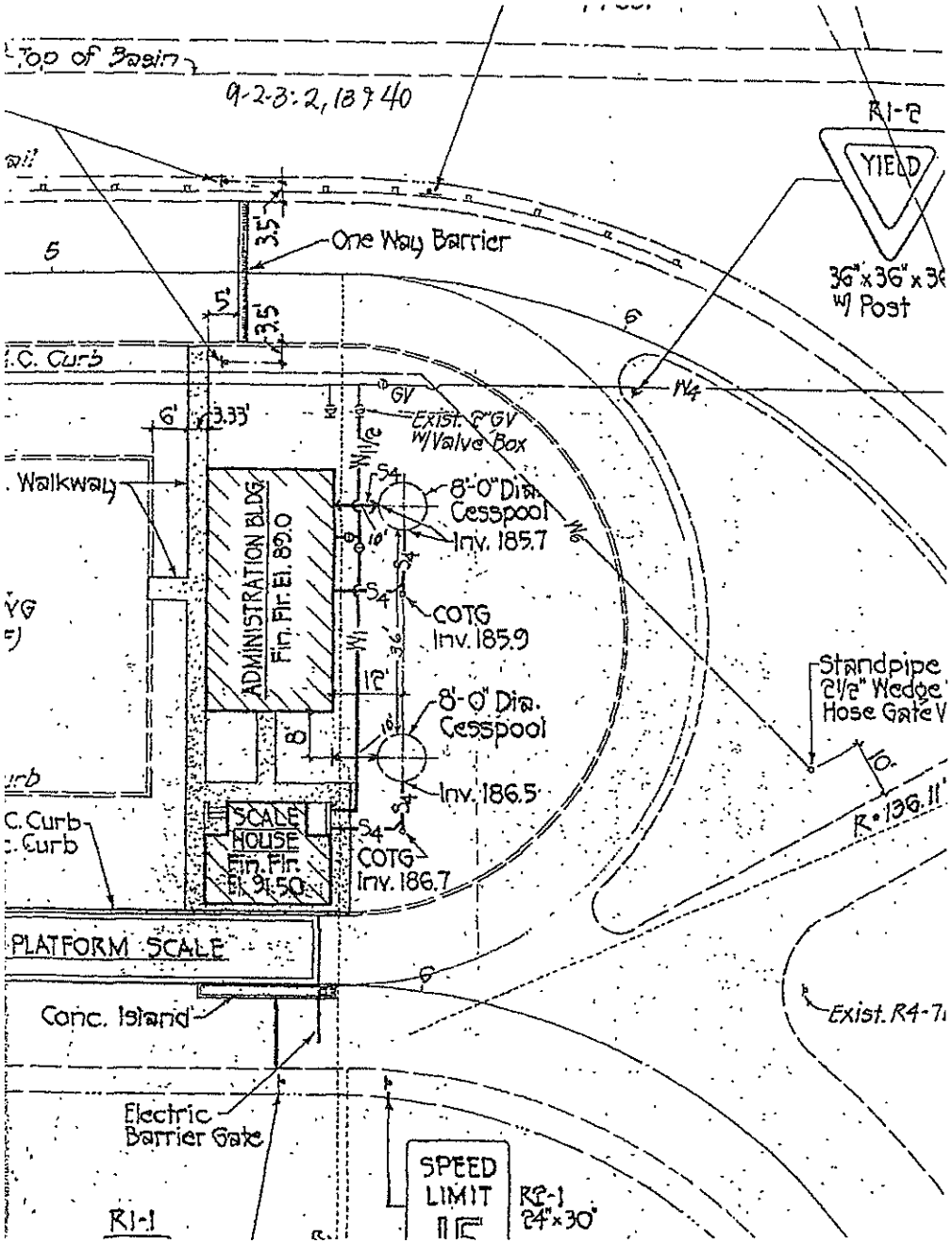
Type of Wall or Curb CONCRETE RINGS Reinforced Concrete Cover YES

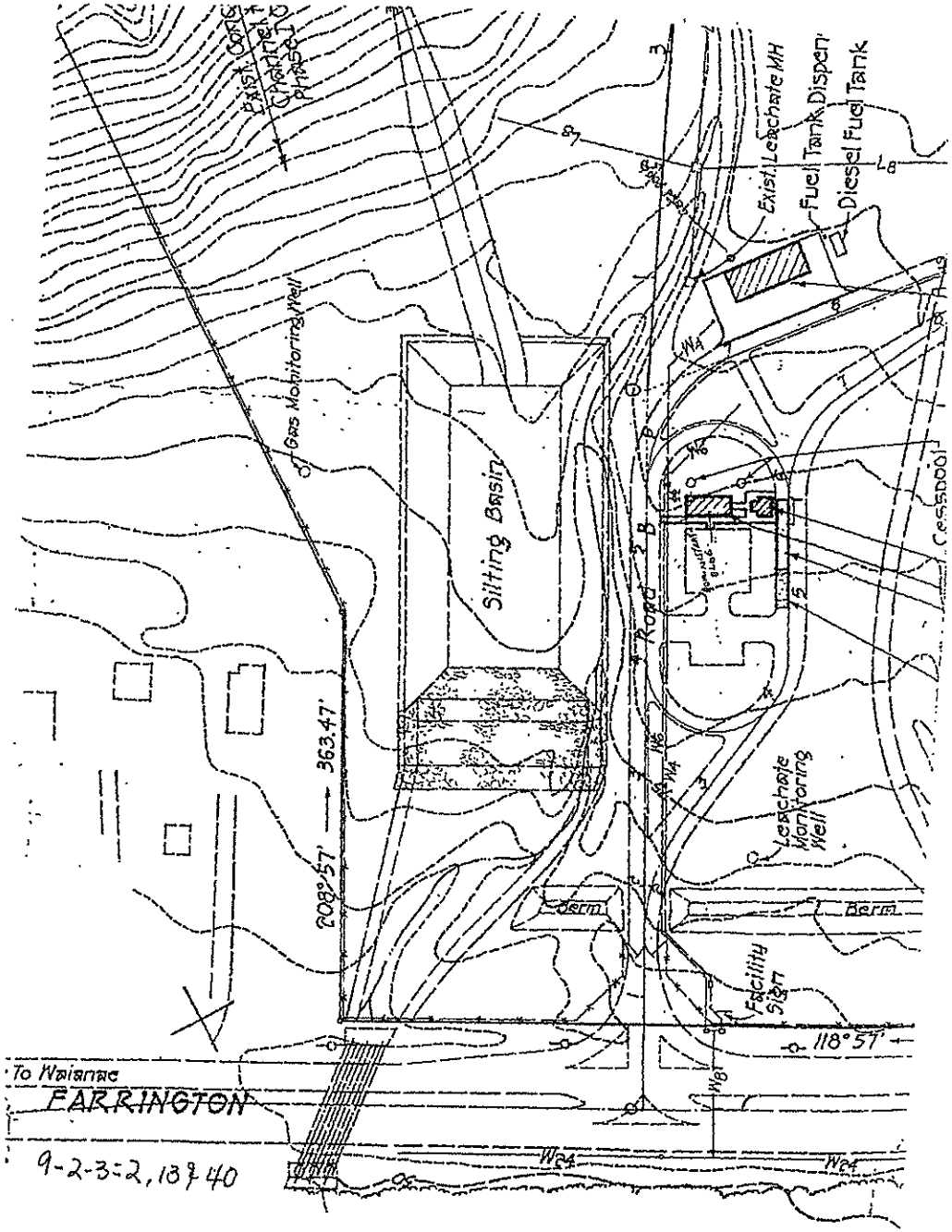
Distance from Finished Ground to Top of Cover (Ft) 1'

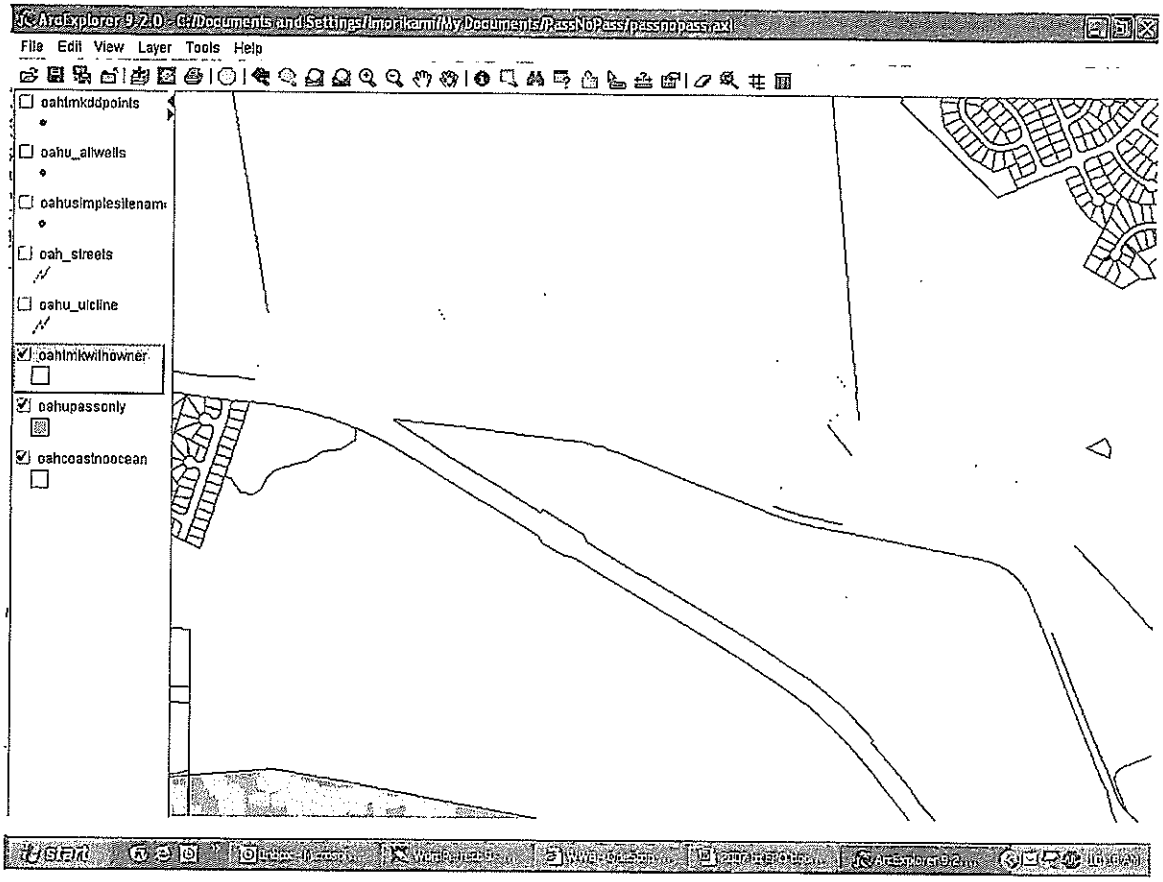
Date Certificate Issued 3/18/88

Date Approved 3/18/88 19 R Shemichi

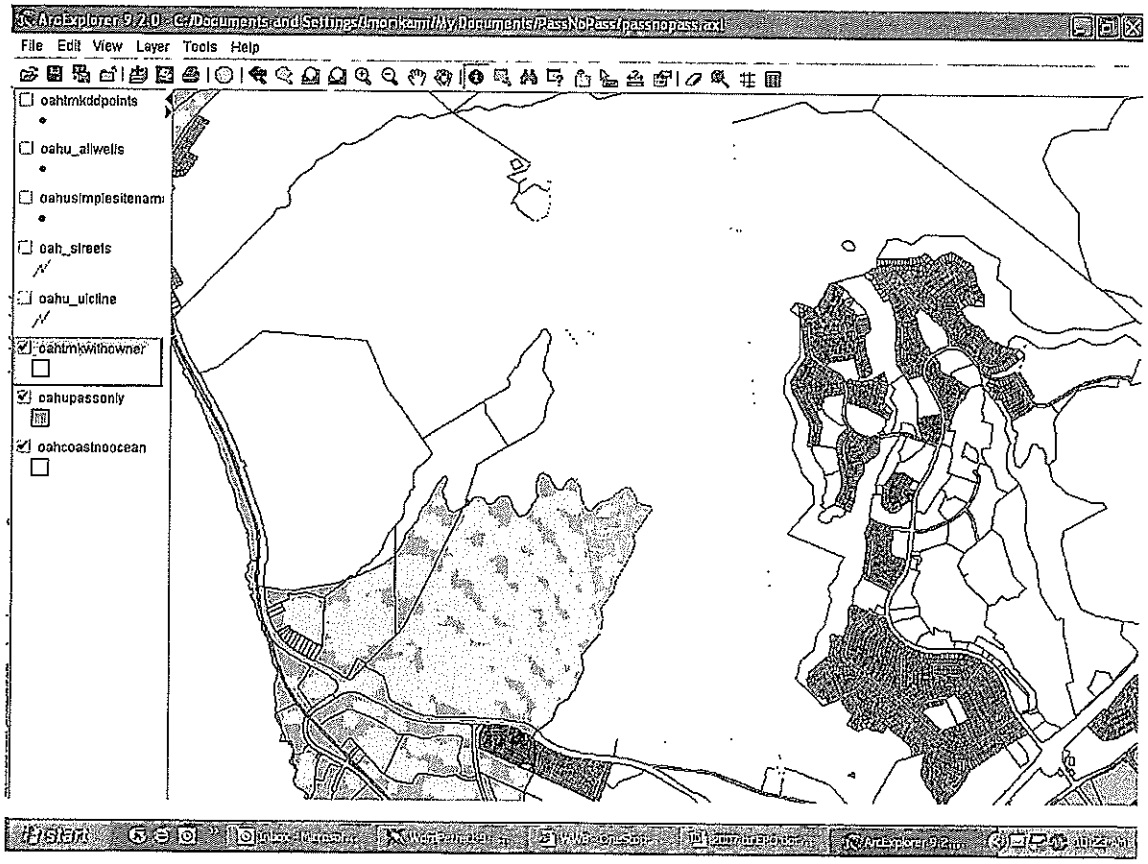
Sanitarian


Top of Basin
9-2-3:2, 18 & 40
R1-2
YIELD
36"x36"x36
w/ Post
One Way Barrier
3.5'
3.5'
5'
6'
3.33'
C. Curb
Walkway
Exist. 2" GV
w/ Valve Box
ADMINISTRATION BLDG.
Fin. Flr. El. 89.0
8'-0" Dia.
Cesspool
Inv. 185.7
COTG
Inv. 185.9
8'-0" Dia.
Cesspool
Inv. 186.5
SCALE
HOUSE
Fin. Flr.
El. 91.50
COTG
Inv. 186.7
Standpipe
2 1/2" Wedge
Hose Gate V
R=136.11'
C. Curb
C. Curb
PLATFORM SCALE
Conc. Island
Exist. R4-7
Electric
Barrier Gate
SPEED
LIMIT
R2-1
24"x30"
R1-1


Exist. Leachate MH
Fuel Tank
Dispen
Diesel Fuel Tank
Gas Monitoring Well
Settling Basin
Road
Cesspool
363.47'
209°57'
Leachate
Monitoring
Well
Berm
Berm
Facility
Sign
118°57'
To Waianae
FARRINGTON
9-2-3:2, 18 & 40



(1) 9-1-015: 005 1001 Kamokila Blvd, Kapolei 79.906 acres



(1) 9-2-003: 002 1001 Kamokila Blvd Kapolei, 1199.56 acres

PBR HAWAII
& ASSOCIATES, INC.

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Senior Associate

RAYMOND T. HIGA, ASLA
Senior Associate

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Associate

KIMI MIKAMI YUEN, LEED®AP
Associate

SCOTT ALIKA ABRIGO
Associate

SCOTT MURAKAMI, ASLA, LEED®AP
Associate

DACHENG DONG, LEED®AP
Associate

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Fax: (808) 961-4989

WAILUKU OFFICE
1787 Wili Pā Loop, Suite 4
Wailuku, Hawai'i 96793-1271
Tel: (808) 242-2878

June 23, 2008

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

SUBJECT: BARBERS POINT 215' NON-POTABLE RESERVOIR NO. 2, KAPOLEI, DRAFT ENVIRONMENTAL ASSESSMENT

Dear Mr. Sunada:

Thank you for your letter (EPO-07-226) dated January 7, 2008 regarding the Barbers Point 215' Reservoir No. 2 Draft Environmental Assessment (EA). We have reviewed your letter and offer the following responses to your comments:

Wastewater Branch

1. We acknowledge that the project is located in the Critical Wastewater Disposal Area where no new cesspools will be allowed. Please note that there are no cesspools proposed as part of the Barbers Point 215' Non-potable Reservoir No. 2.

2. We acknowledge that you have no objection to the Barbers Point 215' Non-potable Reservoir No. 2, as no wastewater will be generated.

3. The project will store recycled water for irrigation, landscaping, and other non-potable water purposes. The Draft EA contains a discussion of the project's contribution to supplying recycled water for irrigation and other non-potable water uses.

4. Regarding your comment pertaining to compliance with DOH's Administrative Rules, Chapter 11-62, "Wastewater Systems." Please note that the Barbers Point 215' Non-potable Reservoir No. 2 does not propose any new wastewater systems.

Thank you for reviewing the Draft EA. Your letter will be included in the Final EA.

Sincerely,

PBR HAWAII

Tom Schnell, AICP
Senior Associate

O:\Job22\2207.01 Barber's Point Reservoir\DEA\Comment Letters & Responses\Responses

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

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JAN 11 2008
PBR HAWAII

Mr. Tom Schnell
PBR Hawaii
1001 Bishop Street
ASB Tower, Suite 650
Honolulu, Hawaii 96813

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JAN 10 2008
MAILED FROM ZIP CODE 96813

LINDA LINGLE
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LAURA H. THIELEN
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

RECEIVED
LAND DIVISION
2007 DEC 11 P 3:33
DEPT. OF LAND & NATURAL RESOURCES
STATE OF HAWAII

December 4, 2007

MEMORANDUM

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

FROM: Morris M. Atta
SUBJECT: Draft Environmental Assessment for Barbers Point 215' Non-potable Reservoir No. 2
LOCATION: Kapolei, Oahu, TMK: (1) 9-1-15:23, portion 5; 9-2-3:portion 2
APPLICANT: PBR Hawaii & Associates on behalf of Board of Water Supply

Transmitted for your review and comment on the above referenced document. We would appreciate your comments on this document. Please submit any comments by December 31, 2007.

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

'07 DEC 05 PM02:14 ENGINEERING

Attachments

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

Signed:
Date: 12/11/07

DEPARTMENT OF LAND AND NATURAL RESOURCES
ENGINEERING DIVISION

LD/MorrisAtta
RE:DEABarbersPoint215'NonPotableReservoir
Oahu.588

COMMENTS

( ) We confirm that the project site, according to the Flood Insurance Rate Map (FIRM), is located in Zone ___.
( ) Please take note that the project site, according to the Flood Insurance Rate Map (FIRM), is located in Zone D, areas in which flood hazards are undetermined.
( ) Please note that the correct Flood Zone Designation for the project site according to the Flood Insurance Rate Map (FIRM) is ___.
( ) Please note that the project must comply with the rules and regulations of the National Flood Insurance Program (NFIP) presented in Title 44 of the Code of Federal Regulations (44CFR), whenever development within a Special Flood Hazard Area is undertaken. If there are any questions, please contact the State NFIP Coordinator, Ms. Carol Tyau-Beam, of the Department of Land and Natural Resources, Engineering Division at (808) 587-0267.

Please be advised that 44CFR indicates the minimum standards set forth by the NFIP. Your Community's local flood ordinance may prove to be more restrictive and thus take precedence over the minimum NFIP standards. If there are questions regarding the local flood ordinances, please contact the applicable County NFIP Coordinators below:
( ) Mr. Robert Sumimoto at (808) 523-4254 or Mr. Mario Siu Li at (808) 523-4247 of the City and County of Honolulu, Department of Planning and Permitting.
( ) Mr. Kelly Gomes at (808) 961-8327 (Hilo) or Mr. Kiran Emler at (808) 327-3530 (Kona) of the County of Hawaii, Department of Public Works.
( ) Mr. Francis Cerizo at (808) 270-7771 of the County of Maui, Department of Planning.
( ) Mr. Mario Antonio at (808) 241-6620 of the County of Kauai, Department of Public Works.

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

( ) Additional comments: _____

(X) **Other: Our comments dated August 15, 2007 to the Pre-Consultation for Draft Environmental Assessment for the subject project, still apply.**

Should you have any questions, please call Ms. Suzie Agraan of the Planning Branch at 587-0258.

Signed:
ERIC T. HIRANO, CHIEF ENGINEER
Date: 12/11/07

LINDA LINGLE
GOVERNOR OF HAWAII

LAURA H. THIELEN
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

STATE OF HAWAII
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LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

RECEIVED
LAND DIVISION
2007 DEC -7 P 3:40
DEPT. OF LAND & NATURAL RESOURCES
STATE OF HAWAII

December 4, 2007

MEMORANDUM

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

FROM: Morris M. Atta
SUBJECT: Draft Environmental Assessment for Barbers Point 215' Non-potable Reservoir No. 2
LOCATION: Kapolei, Oahu, TMK: (1) 9-1-15:23, portion 5; 9-2-3:portion 2
APPLICANT: PBR Hawaii & Associates on behalf of Board of Water Supply

Transmitted for your review and comment on the above referenced document. We would appreciate your comments on this document. Please submit any comments by December 31, 2007.

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

Attachments

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

Signed:
Date:
PAUL J. CONRY, ADMINISTRATOR
DIVISION OF FORESTRY AND WILDLIFE
DEC - 6 2007

PBR HAWAII
& ASSOCIATES, INC.

PARTNERS
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Associate
DACHENG DONG, LEED®AP
Associate

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Fax: (808) 523-1402
E-mail: sysadmin@pbrhawaii.com

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Hilo Lagoon Center, Suite 310
Hilo, Hawai'i 96720-4262
Tel: (808) 961-3333
Fax: (808) 961-4989

WAILUKU OFFICE
1787 Wili Pā Loop, Suite 4
Wailuku, Hawai'i 96793-1271
Tel: (808) 242-2878

June 23, 2008

Mr. Morris M. Atta, Administrator
Department of Land and Natural Resources
State of Hawai'i
P.O. Box 621
Honolulu, Hawai'i 96809

SUBJECT: BARBERS POINT 215' NON-POTABLE RESERVOIR NO. 2, DRAFT ENVIRONMENTAL ASSESSMENT

Dear Mr. Morris,

Thank you for your letter dated January 3, 2008. We understand that the Draft EA was distributed to the following divisions:

- Engineering Division (see responses to comments below)
- Division of Forestry and Wildlife (no objections)

In response to the Engineering Division comments:

We acknowledge that the project is located in Flood Zone D and the Flood Insurance Program does not have any regulations for developments within this flood zone.

In response to the Division of Forestry and Wildlife comments:

We acknowledge that the Division of Forestry and Wildlife has no objections.

Thank you for reviewing the Draft EA. Your comments will be included in the Final EA.

Sincerely,

PBR HAWAII

Tom Schnell, AICP
Senior Associate

O:\Job22\2207.01 Barber's Point Reservoir\DEA\Comment Letters & Responses\Responses

LINDA LINGLE
GOVERNOR OF HAWAII

LAURA H. THIELEN
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

January 11, 2008

RECEIVED
JAN 14 2008
PBR HAWAII

PBR Hawaii
1001 Bishop Street
ASB Tower Suite 650
Honolulu, Hawaii 96813

Attention: Mr. Tom Schnell

Gentlemen:

Subject: Draft Environmental Assessment for Barbers point 215' Non-potable Reservoir No. 2

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

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

Sincerely,

Charlene E. Unoki
for Morris M. Atta
Administrator

LINDA LINGLE
GOVERNOR OF HAWAII

LAURA H. THIELEN
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

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07 DEC 5 A7:49
COMMISSION ON WATER RESOURCE MANAGEMENT

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

December 4, 2007

MEMORANDUM

From:

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

To:

FROM: Morris M. Atta Charlene
SUBJECT: Draft Environmental Assessment for Barbers Point 215' Non-potable Reservoir No. 2
LOCATION: Kapolei, Oahu, TMK: (1) 9-1-15:23, portion 5; 9-2-3:portion 2
APPLICANT: PBR Hawaii & Associates on behalf of Board of Water Supply

Transmitted for your review and comment on the above referenced document. We would appreciate your comments on this document. Please submit any comments by December 31, 2007.

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

Attachments

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

Signed:
Date: 1/7/08

LINDA LINGLE
GOVERNOR OF HAWAII

LAURA H. THIELEN
CHAIRPERSON

MEREDITH J. CHING
JAMES A. FRAZIER
NEAL S. FUJIWARA
CHIYOME L. FUKINO, M.D.
DONNA FAY K. KIYOSAKI, P.E.
LAWRENCE H. MIIKE, M.D., J.D.

KEN C. KAWAHARA, P.E.
DEPUTY DIRECTOR

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

January 9, 2008

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LAND DIVISION
2008 JAN 9 P 3:48
DEPT OF LAND & NATURAL RESOURCES STATE OF HAWAII

REF:

TO: Morris Atta, Acting Administrator
Land Division

FROM: Ken C. Kawahara, P.E., Deputy Director
Commission on Water Resource Management

SUBJECT: Draft EA for Barber's Point 215' Non-Potable reservoir

FILE NO.:

Thank you for the opportunity to review the subject document. The Commission on Water Resource Management (CWRM) is the agency responsible for administering the State Water Code (Code). Under the Code, all waters of the State are held in trust for the benefit of the citizens of the State, therefore, all water use is subject to legally protected water rights. CWRM strongly promotes the efficient use of Hawaii's water resources through conservation measures and appropriate resource management. For more information, please refer to the State Water Code, Chapter 174C, Hawaii Revised Statutes, and Hawaii Administrative Rules, Chapters 13-167 to 13-171. These documents are available via the Internet at *http://www.hawaii.gov/dlnr/cwrm*.

Our comments related to water resources are checked off below.

☐ 1. We recommend coordination with the county to incorporate this project into the county's Water Use and Development Plan. Please contact the respective Planning Department and/or Department of Water Supply for further information.

☐ 2. We recommend coordination with the Engineering Division of the State Department of Land and Natural Resources to incorporate this project into the State Water Projects Plan.

☐ 3. There may be 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.

Permits required by CWRM: Additional information and forms are available at *www.hawaii.gov/dlnr/cwrm/forms.htm*.

☐ 4. The proposed water supply source for the project is located in a designated ground-water management area, and a Water Use Permit is required prior to use of ground water.

☐ 5. A Well Construction Permit(s) is (are) required before the commencement of any well construction work.

☐ 6. A Pump Installation Permit(s) is (are) required before ground water is developed as a source of supply for the project.

☐ 7. There is (are) well(s) located on or adjacent to this project. If wells are not planned to be used and will be affected by any new construction, they must be properly abandoned and sealed. A permit for well abandonment must be obtained.

☐ 8. Ground-water withdrawals from this project may affect streamflows, which may require an instream flow standard amendment.

☐ 9. A Stream Channel Alteration Permit(s) is (are) required before any alteration can be made to the bed and/or banks of a stream channel.

☐ 10. A Stream Diversion Works Permit(s) is (are) required before any stream diversion works is constructed or altered.

☐ 11. A Petition to Amend the Interim Instream Flow Standard is required for any new or expanded diversion(s) of surface water.

☐ 12. The planned source of water for this project has not been identified in this report. Therefore, we cannot determine what permits or petitions are required from our office, or whether there are potential impacts to water resources.

☐ 13. We recommend that the report identify feasible alternative non-potable water resources, including reclaimed wastewater.

☒ OTHER:
On page 8 in the first paragraph, a reference is made to a 5-month moving average. This should be a 12 month moving average.

If there are any questions, please contact Ryan Imata at 587-0255.

AFTER 10 DAYS, RETURN TO
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION
P.O. BOX 621
HONOLULU, HAWAII 96809

HONOLULU HI 968
11 JAN 2008
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0004227494 JAN 11 2008
MAILED FROM ZIPCODE 96813

PBR Hawaii
1001 Bishop Street
ASB Tower Suite 650
Honolulu, HI 96813

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JAN 14 2008
PBR HAWAII

PBR HAWAII
& ASSOCIATES, INC.

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President

R. STAN DUNCAN, ASLA
Executive Vice-President

RUSSELL Y. J. CHUNG, FASLA
Executive Vice-President

VINCENT SHIGEKUNI
Vice-President

GRANT T. MURAKAMI, AICP
Principal

CHAIRMAN EMERITUS

W. FRANK BRANDT, FASLA
Chairman Emiritus

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RAYMOND T. HIGA, ASLA
Senior Associate

KEVIN K. NISHIKAWA, ASLA
Associate

KIMI MIKAMI YUEN, LEED®AP
Associate

SCOTT ALIKA ABRIGO
Associate

SCOTT MURAKAMI, ASLA, LEED®AP
Associate

DACHENG DONG, LEED®AP
Associate

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Fax: (808) 523-1402
E-mail: sysadmin@pbrhawaii.com

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June 23, 2008

Mr. Morris M. Atta, Administrator
Department of Land and Natural Resources
State of Hawai'i
P.O. Box 621
Honolulu, Hawai'i 96809

SUBJECT: BARBERS POINT 215' NON-POTABLE RESERVOIR NO. 2, DRAFT ENVIRONMENTAL ASSESSMENT

Dear Mr. Morris,

Thank you for your letter dated January 11, 2008 regarding the Barbers Point 215' Reservoir No. 2 Draft Environmental Assessment (EA). We offer the following response to the Commission on Water Resource Management.

On page 8 of the Draft EA in the first paragraph, we acknowledge the permitted withdrawal rate is not to exceed 1.0 MGD based on a twelve-month moving average, not a five-month moving average. The final EA will reflect this change.

Thank you for reviewing the Draft EA. Your comments will be included in the Final EA.

Sincerely,

PBR HAWAII

Tom Schnell, AICP
Senior Associate

O:\Job22\2207.01 Barber's Point Reservoir\DEA\Comment Letters & Responses\Responses

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STATE OF HAWAI'I
OFFICE OF HAWAIIAN AFFAIRS
711 KAPI'OLANI BOULEVARD, SUITE 500
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HRD07/3209

December 19, 2007

Vincent Shigekuni, Vice President
PBR Hawaii & Associates, Inc.
1001 Bishop Street,
ABS Tower, Suite 650
Honolulu, Hawai'i 96813-3484

RE: Kalaeloa (Barbers Point) Non-Potable Reservoir No. 2, Kapolei, O'ahu, TMKs: 9-1-15: 23, 05 and 9-2-3: 02.

Dear Mr. Shigekuni,

The Office of Hawaiian Affairs (OHA) is in receipt of the above referenced request for comments concerning a Draft Environmental Assessment (DEA) for the proposed Kalaeloa 215' non-potable Reservoir No. 2 in Kapolei on O'ahu. We offer the following comments:

OHA understands that an existing 1.5 million gallon non-potable reservoir is located on the project site and that this water is used for the Ko 'Ōlina golf course and resort. OHA is concerned that page one of the DEA lists "Golf Course" as the proposed plan, yet page six states that there are no longer plans for a golf course. OHA seeks clarification on this point.

OHA also notes that section 2.1.6 states that undeveloped lands surround the site and that, "Makaïwa Hills, LLC proposed to develop a new residential community on 1,781 acres of land surrounding the project site." OHA sees that the applicant for the No.2 Reservoir is the City and County of Honolulu Board of Water Supply. This causes OHA to wonder who the intended beneficiary of the proposed reservoir is, and to take this opportunity to remind the Board of their public trust duties. OHA also stresses that this project and its DEA should stand alone and not be a segmented part of a larger project.

Section 2.2.1 of the DEA states that, "Reservoir No. 2 will be used to supply water for agricultural, industrial, and urban irrigation uses in the 'Ewa area." Since the land around the proposed project area is vacant and the resort already has water being provided to it from an existing reservoir in the same location, OHA inquires as to the agricultural, industrial, and urban irrigation uses that already exist in the 'Ewa area that demonstrate the necessity of the proposed project.

As we stated in our pre-consultation letter on August 22, 2007, specific proposed uses accompanied by data such as figures of gallons per day for current use in the area need to be given. Otherwise, it is not possible to evaluate the reasonable-beneficial use of public trust resources created by this proposed project. Neither the applicant's November 28, 2007 response to OHA's pre-consultation comments or this DEA contains this required information. Table 1 attempts to describe Existing and Potential R-1 Water Use. Under Existing Users, the table lists seven golf courses and one irrigation use for a total of eight existing users in the project area.

OHA finds it shocking that nearly all of the existing users in this area are golf courses. In fact, according to Table 1, 99.75 percent of existing users for R-1 water are golf courses. Additionally, Phase 1 Additional Users (2005-2010) and Phase 2 Additional Users (2010-2015) of Table 1 list two other golf course users. According to Table 1, a total of 5.2936 million gallons per day (MGD) will be used for golf courses by 2015. Schools will use only .6883 MGD by the same time and even public parks will use less water than golf courses.

In stating the supporting reasons for the project, the applicant states in section 6.1 that, "Construction of the new reservoir, which will serve the Honouliuli Recycled Water System and the Ko 'Ōlina Non-potable Water System, will increase the storage capacity and enhance the Honolulu Board of Water Supply's capability to provide water service to the 'Ewa area." As overwhelmingly demonstrated in Table 1, the highest use of R-1 water in this area is for golf courses. As such, OHA heavily presses the point that, should this proposed project come to fruition, none of the water from Reservoir No. 2 be used for golf courses as it is not a reasonable-beneficial use of this increasingly scarce public resource.

OHA further comments that Table 1 is generally useless. Phase 1 Additional Users (2005-2010) and Phase 2 Additional Users (2010-2015) of Table 1

would have been especially valid if used three years ago, but as we approach 2008, most of these listed users exist now. As such, they should be listed under the Existing and Potential R-1 Water Use section of Table 1. Additionally, some of the 'users' listed in Table 1 are undefined. For example, in addition to naming nine specific parks by name, the table also lists "Parks" and "Community Park". OHA directs the applicant to list the users by name or disclose where this information came from.

When the above mentioned things are done, the difference between actual existing users in the project area and projected demands can be estimated. Otherwise, (and as OHA commented on August 22, 2007) with no way to assess current use juxtaposed to the proposed use, there is no accurate or real way to determine the impacts of the proposed project, or even the need for it as required by Hawai'i Revised Statutes §174C-31(g)(5). As such, OHA again asks for clarification concerning current water use in the area and analysis as to the very need for the project itself.

As OHA noted in our pre-consultation letter on August 22, 2007, both the size of the reservoir itself and the footprint of the project are undetermined. Page eight of the DEA states that, "the final storage capacity has not been determined." The applicant is proposing a wide range of sizes; between 1.5 and 6 million gallons. The 4.5 million gallon difference is such that, in a DEA, a more accurate estimate must be accounted for in order to facilitate proper analysis which will generate the informed decision-making process that should occur. Further, the applicant states that they "may also be required to acquire and use a portion of the surrounding parcels." This absence of such basic information as project size and location makes it impossible for agencies to reasonably comment.

OHA stresses that the fundamental purpose behind the environmental review process is to ensure that environmental impacts are scrutinized by the public and government officials before actions are carried out, so that the applicant can incorporate the wisdom gained into the action. It is not possible for the applicant to gain the benefit from the very persons they sought out if the information that is provided falls short. This is the case with this DEA. Our agency is unsure of the project size or exact location, and is wholly ignorant of the water use in the project area or what the applicant will do with the water they intend to store. It is our conclusion that not even the applicant knows, as they cannot even state how much water they propose

to use, or how much project will cost, or how long it may take to build, or how to fund the project or who may build it. (See DEA, section 2.3)

Because the DEA does not state these things, other impacts cannot be assessed either. Page 27 of the DEA states that, "Depending on the size of the new reservoir, the existing drain line may need to be enlarged." Therefore, the amount of runoff generated by the proposed project is indeterminable, as is the necessary flow easement for discharge of storm runoff. The DEA actually states here that these things will, "be determined during the design process." OHA points out that the design process should have been completed long before the applicant has reached the DEA stage of environmental review. To be working on such basic elements of a project while asking others to review it is unfair and wasteful, even for the applicant themselves.

OHA expresses further concern that the existing Reservoir No. 1 is managed by the Ko 'Olina Resort. (Page 7 of DEA) OHA asks the City and County of Honolulu Board of Water Supply if such private management of a public trust resource is a common occurrence. We also inquire as to the management of the proposed Reservoir No. 2.

OHA also notes that section 2.2.2 of the DEA states that, "...there are plans to expand the Honouliuli Wastewater Treatment Plant to an ultimate treatment capacity of 51 MGD (million gallons per day) by the year 2020." OHA queries as to whether these plans will meet the Environmental Protection Agency standards for wastewater. OHA also requests a copy of the applicant's Best Management Practices regarding discharges to state waters and contamination of R-1 water as mentioned in section 3.2.8.3 of the DEA.

OHA appreciates that an effort was made to assess the impact on cultural resources, as required under Hawaii Revised Statutes, chapter 343. OHA notes that there are archaeological sites nearby the property as well as reports of Hawaiian burial sites in the project area. We do, therefore, hold you to your assurances that if iwi kūpuna or other cultural deposits are uncovered, work will stop and the applicant will contact the State Historic Preservation Division immediately. We also note that the applicant intends to have archaeological monitoring during subsurface excavation.

Additionally, OHA would also like to suggest that the project area be landscaped with native or indigenous species. OHA notes that the DEA states that a few native species can be found on or adjacent to the site and, as such, we direct that they be preserved. Any invasive species should also be removed. Any trees used as view shields should also be natives. Doing so would not only serve as practical water-saving landscaping practices, but also serve to further the traditional Hawaiian concept of mālama 'āina and create a more Hawaiian sense of place.

Due to the failure of the applicant to provide information in this DEA, OHA looks forward to receiving an environmental impact statement for this project. OHA finds it impossible that a finding of no significant impact can be in any way generated from this document.

Further, OHA commends to the Office of Environmental Quality Control that this DEA is not only wholly inadequate, it is not acceptable as an environmental review document. Moreover, OHA's confidence in this document continues to be weakened by the fact that the applicant and the accepting agency are one and the same.

If you have any further questions or concerns, please contact Grant Arnold at (808) 594-0263 or granta@oha.org.

Sincerely,

Clyde W. Nāmu'o
Administrator

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June 23, 2008

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SUBJECT: BARBERS POINT 215' NON-POTABLE RESERVOIR NO. 2, DRAFT ENVIRONMENTAL ASSESSMENT

Dear Mr. Nāmu`o,

Mahalo for your letter dated December 19, 2007. We offer the following responses to your comments:

Comment 1: Page one lists "Golf Course" as the proposed plan. Page six states that there are no longer plans for a golf course.

Response: The legally controlling version of the 'Ewa Development Plan sets aside the area for a golf course. The reference to the golf course Land Use Designation at page one is consistent with the most current Land Use Designation on the 'Ewa Development Plan.

In an attempt to have the Draft EA reflect the most recent information, reference to the disparity between the 'Ewa Development Plan and the Makaīwa Hills plans are explained in the Draft EA Section 2.1.4 as follows:

> The 'Ewa Development Plan designates the site of the Barbers Point 215' Non-potable Reservoir No. 2 for use as a Golf Course (Figure 4). In their pre-consultation letter, the Department of Planning and Permitting (DPP) noted the 'Ewa Development Plan's Urban Land Use Map applies a conceptual designation of "Golf Course" to the reservoir site. However, plans for the Makaīwa Hills project no longer include a golf course. Thus DPP plans to recommend changing this designation to "Agricultural and Preservation Area" during their ongoing 'Ewa DP Five-Year Review process.

We believe the text in the Draft EA is self-explanatory with regard to reconciling disparities between the identified usages for the area, and therefore requires no further modifications.

Comment 2: Who is the intended beneficiary of the proposed reservoir? This project and its Draft EA should stand alone and not be a segmented part of a larger project.

Response: Section 2.2.1 explains that the reservoir will serve the Honouliuli Recycled Water System and the Ko 'Ōlina Non-potable Water System to meet existing and projected requirements to provide water service to the 'Ewa area. BWS did not initiate plans for this reservoir with a specific beneficiary in mind. Rather, BWS' intent is to service the overall demand for R-1 water on the 'Ewa plain below the 200' elevation level. However, to describe how existing and potential demand for the project was calculated, the Draft EA included a list of users (Table 1 Existing and Potential R-1 Water Use on pages 9 and 10). The existing users include golf courses and Fort Weaver Road. The additional potential users range from the City of Kapolei, DPR, DHHL, industrial users, commercial centers, golf courses, right of ways, and schools.

The entire scope of the project encompasses only the construction of the reservoir. No other project is defined as dependent on the R-1 water, nor is committed to any specific development.

Furthermore, BWS accepted and filed a FEA for the 'Ewa Nonpotable Water Master Plan disclosing the non-potable water system, potential users, benefits, impacts and mitigation. The proposed reservoir is an important part of this system.

Comment 3: Referring to Section 2.2.1: since the land surrounding the proposed project area is vacant and the resort already has water provided, what are the agricultural, industrial, and urban irrigation uses that already exist in the 'Ewa area that demonstrate the necessity of the proposed project?

Response: BWS is attempting to reduce the amount of brackish or potable water drawn aquifers by expanding capacity to accommodate R-1 water. Although resort areas and golf courses already have water provided, replacing their current usage of brackish water with R-1 water will help alleviate stress on the aquifer. In addition, the reservoir will fill operational needs to improve system distribution flows and pressures.

Beyond existing resort areas, the Draft EA included a list of other existing and potential users of the proposed reservoir (Table 1 Existing and Potential R-1 Water Use on pages 9 and 10). Existing users include various golf courses and Fort Weaver Road. The additional potential users range from the City of Kapolei, DPR, DHHL, industrial users, commercial centers, golf courses, right of ways, and schools. R-1 water from the planned reservoir system could also support agricultural activities on the 'Ewa Plain.

Comment 4: Specific proposed uses accompanied by data such as figures of gallons per day for current use in the area need to be given. Otherwise, it is not possible to evaluate the reasonable-beneficial use of public trust resources created by this proposed project.

Response: The level of specificity regarding uses and volume is not within the scope nor required in the Draft EA for a project of this nature, rather projected demand based upon reasonable assumptions is reasonable and included in the disclosure document. Information regarding average daily demand for R-1 water is provided in Table 1, Existing and Potential R-1 Water Use.

As naturally occurring ground and surface water are an increasingly scarce resource held in the public trust, activities initiated to reduce the amount drawn from our aquifers and streams should be viewed as consistent with BWS' duty, and its overall effort to promote sustainability. Expanding the capacity of the R-1 water system in Kapolei allows for a reduction in the amount of potable water needed to sustain uses on the 'Ewa plain. BWS ultimately seeks to provide recycled water service to the entire 'Ewa Plain. However, some brackish systems will remain interspersed in the interim.

Recycled water does not fall under the regulatory purview of the Commission on Water Resource Management due to its manufactured nature.

The expansion of the non-potable R-1 water system will allow water to be reused in contrast to the discharging of effluent via a deep ocean outfall.

Comment 5: OHA finds in shocking that nearly all of the existing users in the area are golf courses; 99.75 percent of existing users for R-1 water are golf courses and two additional golf courses are considered. According to Table 1, a total of 5.2936 million gallons per day will be used for golf courses by 2015, schools will use only .6883 mgd, and public parks even less water than golf courses.

Response: Not only are schools and parks beneficiaries of future R-1 water, DHHL residential areas, UH West Oahu, The City of Kapolei, and various industrial companies will have access to R-1 water. Although we understand OHA's averseness to golf course development, golf courses are permitted type of land uses in this area, and BWS must also account for R-1 water demand derived as a result of these activities. Other alternate demands for water, like agricultural use, could also benefit from the additional R-1 capacity.

Also, the existing users of Reservoir No. 1 water are not the primary focus of this EA, as the issue centers on an additional reservoir to improve pump operations, distribution, and anticipated future demand.

As mentioned above, the proposed reservoir will accommodate recycled R-1 water in contrast to well-pumped brackish water currently held in Reservoir No.1. Furthermore, the ultimate scenario under this plan involves no brackish water held at Reservoir No. 1. However, as mentioned above, brackish water systems will remain interspersed during the interim period of transition.

Comment 6: The highest use of R-1 water in this area is for golf courses. Should this proposed project come to fruition, none of the water from Reservoir No. 2 be used for golf courses as it is not a reasonable-beneficial use of this increasingly scarce public resource.

Response: As mentioned above, potable water throughout the state is growing increasingly scarce. Activities initiated to reduce the amount drawn from our aquifers and streams should be viewed as consistent with BWS' public trust duty. Expanding the capacity of the R-1 water system in Kapolei allows for a reduction in the amount of potable water needed to sustain uses on the 'Ewa plain. The expansion of the non-potable R-1 water system will allow water to be reused in contrast to the discharging of effluent via a deep ocean outfall. Golf courses are a reasonable use for manufactured R-1 water.

The increased R-1 water capacity would also free-up additional volume in the brackish water irrigation system. The recycled R-1 water would instead replace well-pumped brackish water currently used to irrigate the 'Ewa area whether it is to be used for golf courses, community parks, schools, or right-of-ways.

Comment 7: Table 1 is generally useless. Phase 1 Additional Users (2005-2010 and Phase 2 Additional Users (2010-2013) of Table 1 would have been valid three years ago, but as we approach 2008, most of these listed users exist now and should be listed under the Existing and Potential R-1 Water Use Section.

Response: Table 1 identifies current and potential uses for R-1 water in the area. However, the table should not be interpreted as a commitment by BWS to provide service to specific projects. Rather, the table illustrates existing and anticipated R-1 demand for the entire 'Ewa area. BWS anticipates the eventual uses for R-1 may not be as exactly as those illustrated in the table, and deviation largely depends on the timing of development approval and construction.

Comment 7.1: Some of the users on Table 1 are undefined. OHA directs the applicant to list the users by name.

Response: As noted in our response to Comment 7, Table 1 illustrates existing and anticipated R-1 demand. It is a forecast based on best available data. However, this data is subject to change due to varying economic factors. The level of specificity you seek with regard to users, types of uses, and location of water use is outside the required scope of this EA.

Comment 8: There is no accurate method to determine the impacts or need of the proposed project as required by the Hawai'i Revised Statutes §174C-31(g)(5). As such, OHA again asks for clarification concerning the current water use in the area and the analysis as to the very need for the project itself.

Response: As mentioned above, the proposed reservoir is for operational purposes and does not create a new supply.

Table 1 is an adequate measure of the current water usage of Reservoir No. 1 for this Draft EA. The purpose and need for the project are listed under Section 2.2.1: To meet the current and future demand for water for residential, resort, commercial, and industrial developments, as well as agricultural operations.

Beyond the data justifying R-1 demand, the reach toward greater sustainability of our resources also should be taken into account when determining the need for a project. Adjusting some potable water uses to instead consume R-1 ultimately decreases the strain on the aquifers holding our public trust water resources.

Comment 9: the final storage capacity of the reservoir has not been determined and the applicant may also need to acquire and use a portion of the surrounding parcels. This absence of such basic information makes it impossible for agencies to reasonably comment.

Response: We disagree that the EA lacks sufficient information for agencies to comment. An appropriate level of detail has been provided to assess the potential environmental impact of a non-potable reservoir at the project location. Final storage capacity is incumbent on many factors indeterminable at this point in time, including costs and possible land acquisition. BWS proposes to construct a storage tank that could reasonably accommodate foreseeable demands for R-1 water in the area, and will not unreasonably exceed these outlined projections as enumerated in this EA.

Comment 10: Various comments to Draft EA Section 2.3

10.1. What is the project size?

Response: Approximately 2.3 acres

10.2. What is the exact location?

Response: Kapolei, O'ahu. TMK 9-1-15: 05 (portion), 23 and 9-2-03:02 (portion). Also see Figures 1, 1a, and 2.

10.3. What will the applicant do with the water they intend to store?

Response: Section 2.2.1 states the intent of the reservoir:

> Installation of the Barbers Point 215' Non-Potable Reservoir No. 2 will serve the Honouliuli Recycled Water System and the Ko 'Ōlina Non-potable Water System. The reservoir will increase the storage capacity of these systems to meet existing and projected requirements and will enhance the Honolulu Board of Water Supply's capability to provide water service to the 'Ewa area. The new Barbers Point 215' Non-potable Reservoir No. 2 will be used to supply water for agricultural, industrial, and urban irrigation uses in the 'Ewa area.

10.5. How much water they propose to use?

Response: Projected uses for existing and proposed users are listed in Table 1.

10.6. How much will the project cost?

Response: Project cost will ultimately depend on the final design of the reservoir

10.7. How long will it take to build?

Response: Full build-out is incumbent on water demand in the region.

10.8. How to fund the project?

Response: Funding will either be derived through BWS' Capital Improvements Program, or private-public partnerships.

10.9. Who will build it?

Response: The Board of Water Supply is the authority managing the project. The Board of Water Supply Will either build the reservoir or seek private-public partnerships.

Comment 11: The amount of runoff generated by the proposed project is indeterminable as is the necessary flow easement for discharge of storm runoff. The Draft EA states that these things will be determined during the design process, which should have been completed before the Draft EA stage of environmental review.

Response: As outlined in section 3.2.8.3 Drainage Facilities: The existing drainage system (Pālailai Gulch and drain lines to connect to the Gulch) is adequate to facilitate disposal of both on-site and off-site storm runoff as well as overflow and washout from normal reservoir operations. Estimated runoff generated by Reservoir No. 2 is estimated to be 1.35 cubic feet per second. As stated in the Draft EA, actual runoff and subsequent mitigation plans will be finalized upon completion of the design process. The detailed designs will identify the actual amount of hardened surface area upon which actual run-off can be calculated, and mitigation plans can proceed.

Comment 12: The existing Reservoir No. 1 is managed by the Ko 'Ōlina Resort. OHA asks the BWS is such private management of a public trust resource is a common occurrence. If so, who will manage Reservoir No. 2?

Response: Under Section 2.2.2 of the Draft EA it is explained that Ko 'Ōlina Resort manages the water allocation, and BWS owns, operates, and maintains the system. Water Use Permit No. 82 denotes BWS as the registered owner of the system. Private management of groundwater resources drawn from the public trust is not uncommon. There are numerous wells across the state that have received approvals from the Commission on Water Resource Management to construct and operate wells separate from county waterworks systems. OHA should also note a distinct difference between the characteristics of the water held in Reservoir No. 1 before and after the proposed action. As stated on Page 8 of the Draft EA:

> The pumps for the brackish wells will then be turned off with this source retained for emergency purposes. The existing transmission line from the reservoir site (which currently supplies brackish water to the Ko 'Ōlina Resort area) will then be used to supply R-1 water to the Ko 'Ōlina Resort area [in the long term].

Although BWS aims to provide total non-potable distribution with R-1 water service, brackish water will remain as an interim use until full transition.

Comment 13A: The Draft EA Section 2.2.2 states that there are plans to expand the Honouliuli Wastewater Treatment Plant to a capacity of 51 mgd by the year 2020. Will these plans meet EPA standards for wastewater?

Response: Issues related to the expansion of the Honouliuli Wastewater Treatment Plant are outside the scope of this EA. Obviously no expansion at the facility could proceed without regulatory approvals and permits, including those mandated by the EPA. However, BWS cannot officially remark on a project proposed by another governmental agency.

BWS does not operate nor hold responsibility for public wastewater facilities in Honolulu, including the Honouliuli Wastewater Treatment Plan. Jurisdiction over these facilities falls under the City's Department of Environmental Services.

Reuse falls under the regulatory authority of the State Department of Health (DOH). BWS is a permitted purveyor of recycled water and all users must comply with the DOH reuse guidelines.

Comment 13B: OHA requests a copy of the applicant's BMP regarding discharges to state waters and contamination of R-1 water mentioned in section 3.2.8.3 of the Draft EA

Response: For clarification, BWS' best management practices (BMPs) aimed at reducing the risk of contaminated storm water runoff and discharges should not be confused with those promulgated by the Department of Environmental Services for effluent discharges associated with the Honouliuli Wastewater Treatment Plant. Specific BMPs related to the operation of the Honouliuli Wastewater Treatment Plant and its proposed expansion, are not within the scope of this EA. We suggest you contact the Department of Environmental Services regarding BMPs related to the operation of the Honouliuli Wastewater Treatment Plant. Specification of any BMPs related to the proposed reservoir will occur after the completion of specific engineering and design plans and as part of applying for an NPDES permit (if necessary).

Comment 14: OHA appreciates the cultural impact assessment, and holds the applicant to assurances that if any cultural deposits are found work will stop immediately and SHPD will be contacted immediately. Additionally, OHA would like to suggest that the project area be landscaped with native of indigenous species. OHA directs that any native species found be preserved and any invasive species should be removed.

Response: Thank you for your concurrence with our cultural impact assessment. As stated in the Draft EA, The City and County of Honolulu Board of Water Supply, and its contractors will comply with all State and County laws and rules regarding the preservation of archaeological and historic sites, which includes Section 6E-46.6 HRS and Chapter 13-300 HAR. Should any significant cultural deposits or human skeletal remains be encountered during the construction activities, work will cease immediately in the immediate vicinity of the find and the find will be protected from further damage. The contractor shall immediately contact the State Historic Preservation Division.

As noted in Section 3.2.6 Visual Resources, low growing trees such as the Geranium-leaf Aralia could be planted to shield the view of both reservoirs from Farrington Highway. We will take into consideration OHA's recommendation to use native or indigenous plants.

Comment 15: Due to the failure of the applicant to provide information in this DEA, OHA looks forward to receiving an environmental impact statement for this project. OHA finds it impossible that a finding of no significant can be in any way generated from this document.

Response: We respectfully disagree with your assertion that the DEA lacks adequate information. The proposed reservoir is neither attached nor ancillary to any other development project. Rather, it is a project outlined in the 'Ewa Non-potable Water Master Plan and disclosed by the BWS in a previously filed FEA.

We also disagree with your assertion that an environmental impact statement is required for this project. Pursuant to Section 11-200-12, Hawai'i Administrative Rules, the Department of Health sets forth criteria to determine whether a particular project creates a significant impact on the environment. Environmental impact statements are only required in situations where a significant impact to the environment is clearly identified. In accordance with the rule, we have engaged in a deliberative process determining whether construction of the reservoir does create a significant impact. Our findings are set forth in Chapter 6 of the DEA, starting on page 41. Notably, of the thirteen (13) criteria evaluated, none revealed any significant impact leading to our conclusion of no significant impact to the environment.

Comment 16: Further, OHA commends (sic) to the Office of Environmental Quality Control that this DEA is not only wholly inadequate, it is not acceptable as an environmental review document. Moreover, OHA's confidence in this document continues to be weakened by the fact that the applicant and the accepting agency are one and the same.

Response: We strongly disagree with OHA's assertion that the DEA is "wholly inadequate." We believe that the document clearly discloses and evaluates the information as required by law given the scope of the project. We would also like to remind OHA that Section 343-5(b), HRS provides for the acceptance of an environmental disclosure document by an agency proposing the action.

Thank you for reviewing the Draft EA for the Barbers Point 215' Non-potable Reservoir No. 2. Your comments will be included in the Final EA. If you have any questions please contact Mike Dahilig with PBR Hawaii & Associates at 521-5631.

Sincerely,

Tom Schnell, AICP
Senior Associate, PBR HAWAII

Cc: Ian Arakaki, The Limtiaco Consulting Group
Lorna Heller, Board of Water Supply

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December 20, 2007

Mr. Tom Schnell
PBR Hawaii & Associates, Inc.
1001 Bishop Street
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Honolulu, Hawaii 96813-3484

Dear Mr. Schnell:

Subject: Draft Environmental Assessment
Barbers Point 215' Non-potable Reservoir No. 2
Kapolei, Oahu, Ewa
TMK: 9-1-15:23 and 05 (por.), 9-2-3:02 (por.)

Thank you for giving us the opportunity to comment on the above Draft Environmental Assessment.

The Department of Design and Construction does not have any comments to offer at this time.

Very truly yours,

Eugene C. Lee, P.E.
Director

ECL:lt (238645))

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& ASSOCIATES, INC.

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June 23, 2008

Mr. Eugene C. Lee, P.E.
Director
Department of Design and Construction
City and County of Honolulu
650 South King Street, 11th Floor
Honolulu, Hawai'i, 96813

SUBJECT: BARBERS POINT 215' NON-POTABLE RESERVOIR NO. 2, DRAFT ENVIRONMENTAL ASSESSMENT

Dear Mr. Lee:

Thank you for your letter dated December 20, 2007 regarding the Barbers Point 215' Reservoir No. 2 Draft Environmental Assessment (EA).

We acknowledge that the Department of Design and Construction does not have any comments to offer at this time.

Thank you for reviewing the Draft EA. Your letter will be included in the Final EA.

Sincerely,

PBR HAWAII

Tom Schnell, AICP
Senior Associate

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DEPARTMENT OF FACILITY MAINTENANCE

CITY AND COUNTY OF HONOLULU

1000 Uluohia Street, Suite 215, Kapolei, Hawaii 96707
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MAYOR

CRAIG I. NISHIMURA, P.E.
ACTING DIRECTOR AND CHIEF ENGINEER

GEORGE "KEOKI" MIYAMOTO
DEPUTY DIRECTOR

IN REPLY REFER TO:
DRM 08 -11

January 9, 2008

Mr. Tom Schnell
PBR Hawaii
1001 Bishop Street, ABS Tower, Suite 650
Honolulu, Hawaii 96813

Dear Mr. Schnell:

Subject: Draft Environmental Assessment (DEA)
Barbers Point 215' Non-Potable Reservoir No. 2, Kapolei

Thank you for the opportunity to review and comment on the DEA dated November 2007 for the Barbers Point 215' Non-Potable Reservoir No. 2.

We have no comments to offer. The improvements proposed in the DEA will have negligible impact on our facilities and operations.

Should you have any questions, please call Charles Pignataro of the Division of Road Maintenance, at 768-3697.

Sincerely,

CRAIG I. NISHIMURA, P.E.
Acting Director and Chief Engineer

c: Office of Environmental Quality Control
Board of Water Supply

City & County of Honolulu
Department of Facility Maintenance
Kapolei Hale
1000 Uluohia Street, Ste. 215
Kapolei, Hawaii 96707-2025

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Mr. Tom Schnell
PBR Hawaii
1001 Bishop Street, ABS Tower
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Honolulu, HI 96813

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June 23, 2008

Mr. Craig I. Nishimura, P.E.
Director and Chief Engineer
Department of Facility Maintenance
City and County of Honolulu
1000 Uluohia Street, Suite 215
Kapolei, Hawai'i, 96707

SUBJECT: BARBERS POINT 215' NON-POTABLE RESERVOIR NO. 2, KAPOLEI, DRAFT ENVIRONMENTAL ASSESSMENT

Dear Mr. Nishimura:

Thank you for your letter dated January 9, 2008 regarding the Barbers Point 215' Reservoir No. 2 Draft Environmental Assessment (EA).

We acknowledge that Department of Facility Maintenance (DFM) has no comments to offer regarding this project and the improvements proposed in the Draft EA will have negligible impact on DFM facilities and maintenance.

Thank you for reviewing the Draft EA. Your letter will be included in the Final EA.

Sincerely,

PBR HAWAII

Tom Schnell, AICP
Senior Associate

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DEPARTMENT OF PLANNING AND PERMITTING
CITY AND COUNTY OF HONOLULU
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MUFI HANNEMANN
MAYOR

HENRY ENG, FAICP
DIRECTOR

DAVID K. TANOUE
DEPUTY DIRECTOR

2007/ELOG-3395 (mw)

January 2, 2008

Mr. Tom Schnell
PBR Hawaii
ASB Tower, Suite 650
1001 Bishop Street
Honolulu, Hawaii 96813

Dear Mr. Schnell,

Subject: Draft EA for the Barbers Point 215'
Non-Potable Reservoir No. 2, Ewa

In response to your November 30, 2007 request for comments on this project's Draft EA, we have the following comments:

1. Potential rockfall hazards should be discussed in both Section 3.1.4 (Natural Hazards) and Section 6.4 (Significance Criteria), Item 11.
2. In Section 4.2.3 (Land Use Ordinance), the correct project classification is "Public uses and structures", not "Type-A utility." This is because it will be a City-owned facility that provides a government service. Also, "Public uses and structures" are a permitted use in all zoning districts.
3. In Table 2 on page 35, the approximate processing time needed to obtain a Grubbing, Grading, and Stockpiling Permit should be omitted.
4. The Preliminary Engineering Study which is included as Appendix D appears to be missing the engineer's stamp, signature, authentication statement, and expiration date of the engineer's license.

Should you have any questions, please call either Don Fujii (on comments 1, 3, or 4) of our staff at 768-8107 or Elizabeth Chinn (on comment 2) at 768-8021.

Very truly yours,

for Henry Eng, FAICP, Director
Department of Planning and Permitting

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& ASSOCIATES, INC.

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June 23, 2008

Mr. Henry Eng, FAICP, Director
Department of Planning and Permitting
City and County of Honolulu
650 South King Street, 7th Floor
Honolulu, Hawaii 96813

SUBJECT: BARBERS POINT 215' NON-POTABLE RESERVOIR NO. 2, DRAFT ENVIRONMENTAL ASSESSMENT

Dear Mr. Eng,

Thank you for your letter dated January 2, 2008 regarding the Barbers Point 215' Non-potable Reservoir No. 2 Draft Environmental Assessment (Draft EA). We offer the following responses to your comments:

Comment 1: Potential rockfall hazards should be discussed in both Section 3.1.4 (Natural Hazards) and Section 6.4 (Significance Criteria), Item 11.

Response: The reservoir site and lands immediately down slope are uninhabited and will remain vacant for the foreseeable future. In addition, the new reservoir will not provide for human habitation of the site. Therefore, any potential rockfall hazards in the vicinity of the reservoir site do not pose a significant risk to human activity

A geotechnical investigation was not completed for the Preliminary Engineering Study included in the Draft Environmental Assessment as Appendix D. However, existing geotechnical data were reviewed and found appropriate for this stage of the project.

Based on calculations using existing soils information, the actual slope in rock can be ¾:1 (H:V), and in top soil 2:1 can be used. However for the Preliminary Engineering Study, a slope of 1:1 was used in rock for the preliminary design. The project engineer recommends that a geotechnical investigation, including soil borings and analysis, be performed during the design phase.

Rockfall mitigation, such as a wire/cable mesh, may be installed along the cut slopes located behind the existing and new tanks to reduce the potential for rockfall occurrences as a result of soil erosion and/or settlement.

The Final EA will include discussion of rockfall hazards as appropriate in both Section 3.1.4 (Natural Hazards and Section 6.4 Significance Criteria), Item 11.

Comment 2: In Section 4.2.3 (Land Use Ordinance), the correct project classification is "Public uses and structures", not "Type-A utility." This is because it will be a City-owned facility that provides a government service. Also, "Public uses and structures" are a permitted use in all zoning districts.

Response: Thank you for providing this correction and clarification. In the Final EA the language in the discussion under Section 4.2.3 will be changed to read as follows:

> *The Barbers Point 215' Non-potable Reservoir project is a City-owned facility providing a government service. Therefore, under the Land Use Ordinance, it is considered a "Public use and structure" for classification purposes. Public uses and structures are permitted in all zoning districts.*

Comment 3: In Table 2 on page 35, the approximate processing time needed to obtain a Grubbing, Grading, and Stockpiling Permit should be omitted.

Response: In the Final EA Table 2 will be revised to reflect a deletion of the permit processing time for Grubbing, Grading and Stockpiling.

Comment 4: The Preliminary Engineering Study which included as Appendix D appears to be missing the engineer's stamp,signature, authentication statement, and expiration date of the engineer's license.

Response: The Preliminary Engineering Study included in the Final EA will include the engineer's stamp, signature, authentication statement, and expiration date of the engineer's license.

Thank you for reviewing the Draft EA. Your comments will be included in the Final EA.

Sincerely,

PBR HAWAII

Tom Schnell, AICP
Senior Associate, PBR HAWAII

Cc: Ian Arakaki, The Limtiaco Consulting Group
Lorna Heller, Board of Water Supply

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DEPARTMENT OF TRANSPORTATION SERVICES
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MAYOR

WAYNE Y. YOSHIOKA
ACTING DIRECTOR

RICHARD F. TORRES
DEPUTY DIRECTOR

TP12/07-239002R

December 28, 2007

Mr. Tom Schnell
PBR Hawaii
1001 Bishop Street
ASB Tower, Suite 650
Honolulu, Hawaii 96813

Dear Mr. Schnell:

Subject: Barbers Point 215' Non-Potable Reservoir No. 2

Thank you for your November 30, 2007 letter, requesting our review of and comments on the draft environmental assessment for the subject project.

We have no comments to offer on the document.

Should you have any questions regarding this matter, please contact Ms. Faith Miyamoto at 768-8350.

Very truly yours,

WAYNE Y. YOSHIOKA
Acting Director

cc: Office of Environmental Quality Control

Ms. Lorna Heller
Board of Water Supply

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June 23, 2008

Mr. Wayne Y. Yoshioka
Director
Department of Transportation Services
City and County of Honolulu
650 South King Street, 3rd Floor
Honolulu, Hawai'i, 96813

SUBJECT: BARBERS POINT 215' NON-POTABLE RESERVOIR NO. 2, DRAFT ENVIRONMENTAL ASSESSMENT

Dear Mr. Yoshioka:

Thank you for your letter dated December 28, 2007 regarding the Barbers Point 215' Non-potable Reservoir No. 2 Draft Environmental Assessment (EA).

We acknowledge that the Department of Transportation Services has no comments to offer on the document.

Thank you for reviewing the Draft EA. Your letter will be included in the Final EA.

Sincerely,

PBR HAWAII

Tom Schnell, AICP
Senior Associate

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HONOLULU FIRE DEPARTMENT

CITY AND COUNTY OF HONOLULU

636 South Street
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MAYOR

KENNETH G. SILVA
FIRE CHIEF

ALVIN K. TOMITA
DEPUTY FIRE CHIEF

December 28, 2007

Mr. Tom Schnell
PBR Hawaii
1001 Bishop Street
ASB Tower, Suite 650
Honolulu, Hawaii 96813

Dear Mr. Schnell:

Subject: Draft Environmental Assessment
Barbers Point 215' Non-potable Reservoir No. 2
Tax Map Keys: 9-1-015: 023 and portion 005; 9-2-003: portion 002

In response to your letter dated November 30, 2007, regarding the above-mentioned subject, the Honolulu Fire Department (HFD) reviewed the materials provided and requires that the following be complied with for the duration of the project:

1. Maintain fire apparatus access throughout the construction site.

2. Maintain access to fire hydrants. Please notify the Fire Communication Center at 523-4411 regarding any interruption of the existing fire hydrant system.

Should you have any questions, please call Acting Battalion Chief William H. Melemai III of our Fire Prevention Bureau at 723-7151.

Sincerely,

KENNETH G. SILVA
Fire Chief

KGS/SK:bh

cc: Lorna Heller, Board of Water Supply
Office of Environmental Quality Control

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& ASSOCIATES, INC.

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June 23, 2008

Mr. Kenneth G. Silva
Fire Chief
Honolulu Fire Department
City and County of Honolulu
636 South Street
Honolulu, Hawai'i, 96813

SUBJECT: BARBERS POINT 215' NON-POTABLE RESERVOIR NO. 2, KAPOLEI, DRAFT ENVIRONMENTAL ASSESSMENT

Dear Chief Silva:

Thank you for your letter dated December 28, 2007 regarding the Barbers Point 215' Reservoir No. 2 Draft Environmental Assessment (EA). We offer the following responses:

1. Fire apparatus access will be maintained throughout the construction site.

2. Fire hydrant access will be maintained. Notification will be made to the Fire Communication Center at 523-4411 regarding any interruption of the existing fire hydrant system.

Thank you for reviewing the Draft EA. Your letter and the above information will be will be included in the Final EA.

Sincerely,

PBR HAWAII

Tom Schnell, AICP
Senior Associate

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MAKAIWA HILLS LLC

James Campbell Building, Suite 250
1001 Kamokila Boulevard
Kapolei, Hawaii 96707
Tel 808 674-3541 / Fax 808 674-3111

January 7, 2008

Mr. Tom Schnell
PBR Hawaii
1001 Bishop Street, ASB Tower, Suite 650
Honolulu, Hawaii 96813

Dear Mr. Schnell:

Subject: Comments on Draft Environmental Assessment for the Construction of Barbers Point 215 Non-Potable Reservoir No. 2

On December 3, 2007, Makaiwa Hills LLC ("MH LLC") received a copy of the Barbers Point 215 Non-Potable Reservoir No. 2 Draft Environmental Assessment dated November 2007 (hereinafter referred to as the "Draft EA"). As outlined in the Draft EA, the City and County of Honolulu Board of Water Supply ("BWS") is planning to construct a non potable water reservoir on a 2.308-acre project site currently owned by the BWS and identified by tax map key number 9-1-15:23 ("Project Site").

Based on the representations in the Draft EA, the BWS may need to obtain additional land from surrounding property owners. Specifically, the Draft EA provides, that in order "[t]o accommodate the reservoir tank without increasing the structure's height, the Board of Water Supply may also be required to acquire and use a portion of the surrounding parcels (TMK: 9-1-15:05(portion) and TMK: 9-2-03:02(portion))." Both parcels identified by BWS are owned by MH LLC and are part of the planned Makaiwa Hills residential community. MH LLC is currently rezoning both parcels to a mix of residential and commercial zoning designations. Please keep MH LLC informed as BWS continues planning for the construction of its new non-potable reservoir in Makaiwa Hills.

Thank you for the opportunity to comment on the Draft EA.

Sincerely,

David W. Rae
Senior Vice-President

26034500\K10017

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& ASSOCIATES, INC.

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June 23, 2008

Mr. David W. Rae
Senior Vice-President
Makaiwa Hills LLC
1001 Kamokila Boulevard
Kapolei, Hawai'i, 96707

SUBJECT: BARBERS POINT 215' NON-POTABLE RESERVOIR NO. 2, KAPOLEI, DRAFT ENVIRONMENTAL ASSESSMENT

Dear Mr. Rae:

Thank you for your letter dated January 7, 2008 regarding the Barbers Point 215' Reservoir No. 2 Draft Environmental Assessment (EA).

Makaiwa Hills LLC will continue to be informed as the Board of Water Supply continues planning for the construction of its new non-potable reservoir in Makaiwa Hills.

Thank you for reviewing the Draft EA. Your letter will be included in the Final EA.

Sincerely,

PBR HAWAII

Tom Schnell, AICP
Senior Associate

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