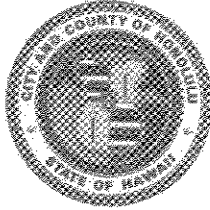


DEPARTMENT OF LAND UTILIZATION
CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813 • (808) 523-4432



EILEEN R. ANDERSON
MAYOR

MICHAEL M. McELROY
DIRECTOR

ROBERT B. JONES
DEPUTY DIRECTOR

March 2, 1984

LUT/84-240(LM)

Ms. Letitia N. Uyehara, Interim Director
Office of Environmental Quality Control
State of Hawaii
550 Halekauwila Street, Room 301
Honolulu, Hawaii 96813

Dear Ms. Uyehara:

Revised Environmental Impact Statement (EIS)
Waimanalo Wastewater Facilities
City & County of Honolulu, Department of Public Works
Waimanalo, Koolaupoko, Oahu, Hawaii
Tax Map Key 4-1

We are notifying you that the above is an acceptable EIS document, pursuant to Chapter 343, HRS, and the Environmental Commission - EIS Regulations.

The major unresolved issues are the proposed effluent irrigation system and the proposed composting facility. The only area of major concern is the effluent irrigation system. The applicant addresses this concern adequately in the EIS.

Other approvals will be required in order to implement the proposed project. These are listed in Section E of the attached Acceptance Report.

If there are any questions, please contact Lorene Maki of our staff at 527-5349.

Very truly yours,

A handwritten signature in black ink, appearing to read "Michael M. McElroy".

MICHAEL M. McELROY
Director of Land Utilization

MMM:sI

cc: DPW, Wastewater Div.

1984 3-2-84

DEPARTMENT OF LAND UTILIZATION (DLU)
LUI/84-240(LM)
March 2, 1984

ACCEPTANCE REPORT: CHAPTER 343, HRS
ENVIRONMENTAL IMPACT STATEMENT (EIS)
WAIMANALO WASTEWATER FACILITIES
CITY AND COUNTY OF HONOLULU
DEPARTMENT OF PUBLIC WORKS (DPW)
WAIMANALO, KOOLAUPOKO, OAHU, HAWAII
TAX MAP KEY: 4-1

A. Background

The EIS was prepared for the DPW by Wilson Okamoto and Associates, Inc. The DPW proposes to improve the wastewater facility system in the Waimanalo District, at Koolau-poko, Oahu, Hawaii. It is identified as Tax Map Key 4-1. This document describes the anticipated environmental impacts of implementing the proposed projects. See Exhibit A.

The overall objectives of the proposed Waimanalo Wastewater facilities are:

1. To eliminate public health problems associated with the Waimanalo Sewage Treatment Plant (STP) and individual on-site treatment facilities;
2. To improve existing plant operations in a cost-effective and environmentally compatible manner; and
3. To fulfill the wastewater facility requirements of Waimanalo through the year 2005.

The Waimanalo STP, located mauka of Kalaniana'ole Highway, presently serves approximately one-third of the district's population. The remaining two-thirds are served by on-site treatment facilities, which consist chiefly of cesspools.

Originally designed for an average flow of 1.1 million gallons per day (mgd), actual plant capacity is limited by the activated sludge process to 0.7 mgd. Currently, the plant is operating at an average rate of 0.2 mgd, which, in terms of effluent quality, is considered to be its maximum performance level. The effluent quality is consistently lower than the EPA standards for secondary treatment.

A major problem at the plant is the inadequate performance of the three existing injection wells used for effluent disposal. The structural condition of the wells has deteriorated. This is compounded by the fact that the wells cannot be properly maintained due to lack of equipment. The wells were rehabilitated in May - June 1982. No information on the wells' effectiveness subsequent to this action was available for inclusion in the EIS. An attempt was made to encase one of the wells, but this resulted in its complete cave-in.

Waimanalo has had a significant number of cesspool failures. Problem areas include the Waimanalo Beach lots, the Department of Hawaiian Home Lands (DHHL) subdivision mauka of the beach lots, DHHL "dry sewer" area, Flamingo Street, and scattered farm lots in the upper Waimanalo Valley. "Dry sewer" refers to areas which have installed sewer lines, but have not been connected to the STP for effluent disposal. See Exhibit B.

Defective cesspools may create public health hazards, generate odors, and contaminate groundwater supplies, if they are not pumped to restore operating efficiency. The proposed project would sewer all the abovementioned problem areas except the agricultural areas, such as Flamingo Street and the farm lots in the valley. These areas will continue to utilize cesspools. Also, the Makai Range Pier and Sea Life Park will continue to use their existing aerobic units for sewage disposal.

Primarily, improvements are proposed to be constructed at the existing Waimanalo STP, and within or adjacent to existing road rights-of-way. A nominal amount of additional land may be required for the proposed lift station in the vicinity of the Bell Street and Kalaniana'ole Highway intersection.

The proposed infrastructure modifications at the plant consist of the replacement of existing equipment with ten or less years of remaining life, a septic receiving tank, air-lift return sludge pumps, sand filter, equalization basin, flotation thickener, backwash tank conversion, a minimum of 3 new injection wells, and a compost facility.

Proposed improvements to the sewer system are the Makapuu Interceptor Sewer Sections 1 and 2, an interceptor sewer line, and the Bell Street sewage lift station and force main. A portion of the Bell Street force main and the sewage lift station will be within the Special Management Area.

The State Land Use designations in the Waimanalo district are Urban, Agriculture, and Conservation. The Waimanalo STP is within the Urban District. The other proposed infrastructure improvements, which include the interceptor sections and force main, are located within the Agriculture and Urban Districts.

The City and County of Honolulu's Development Plan for Koolau-poko designates the plant as a Public Facility. The other improvements will be installed in or along areas designated residential, commercial, parks and recreation, and agriculture. The corresponding Public Facilities Map indicates the Makapuu Interceptor Sections 1 and 2 in the 2 - 5 year category for funding. Presently, the zoning is not consistent with the approved Development Plan. Changes to the zoning maps have been proposed, but are not yet adopted. Current zoning for the STP is R-5 Residential. It is proposed to be rezoned to the AG-1 Agricultural District. Existing zoning for the rest of the proposed improvements are R-3, R-4 and R-5 Residential, and B-2 Business Districts. Some of these areas may also be rezoned.

The plant is located within Flood Zone A0, an area of shallow flooding with an average depth of 1 foot. It will be subject to the requirements in the Comprehensive Zoning Code Flood Hazard Districts under the Flood Fringe district.

The total cost for the proposed wastewater facilities is estimated to be \$6.5 million in 1982 dollars. These costs will be apportioned among the Federal, State, and City governments and affected property owners. No time frames for the infrastructure modifications and improvements have been established.

B. Procedures

1. An EIS Preparation Notice was published in the "Environmental Quality Commission (EQC) Bulletin" of November 23, 1982 under the Register of Chapter 343, HRS Documents. This was distributed to all interested Federal, State, and City and County agencies, and one private utility company.

2. The deadline for public review was set for December 23, 1982. Comments from consulted parties were received until January 10, 1983. During this period, twenty-two (22) parties submitted written comments, to which the applicant responded in writing.
3. The Draft EIS was received by the DLU on June 6, 1983, and a notice appeared in the June 8, 1983 "EQC Bulletin." The deadline for public review was set for July 8, 1983. However, comments were accepted until July 15, 1983. A list of reviewers is attached.
4. Twenty-eight (28) parties replied to the Draft EIS. The applicant made point-by-point responses to all substantive comments by August 10, 1983.
5. DLU received the Revised EIS on January 23, 1984. A notice was published in the "OEQC Bulletin" on February 3, 1984.

C. Area of Concern

Only one issue regarding the proposed project was identified by commenting parties as an area of concern.

Effluent Irrigation System

Both the U.S. Fish and Wildlife Service and the State DLNR were concerned that the treated effluent proposed to be used to irrigate agriculture lands may wash or leach into streams and aquatic habitats.

D. Unresolved Issues

The Revised EIS identifies two unresolved issues - the proposed effluent irrigation system and the proposed composting facility. The effluent irrigation system is proposed as part of the Waimanalo Watershed Plan and Waimanalo Agriculture Park Plan, although the implementation of these projects is uncertain at this time. If implemented, effluent disposal by injection wells will serve as the standby method.

The proposed composting facility must be studied to determine the feasibility of marketing the compost as a soil conditioner. If determined to be unfeasible, the sludge will be disposed of by landfilling.

E. Issues to be Subsequently Addressed by Other Approvals.

1. Coastal Zone Management Certification from the State Department of Planning and Economic Development;
2. A Notice of Intent to Drill Approval from the State DLNR;
3. Historic Sites clearance from the DLNR, Historic Preservation Office;
4. Permit for construction within State rights-of-way from the Department of Transportation;
5. Approval for a waste disposal facility from the Board of Water Supply;
6. Special Management Area Use Permit from DLU;
7. Flood Hazard District Development Approval from DLU; and
8. Construction Permits (Building, Grading, Grubbing, Stockpiling) from the DPW and Building Department.

F. RESPONSE

The applicant made adequate point-by-point responses to all comments which were included in the Revised EIS.

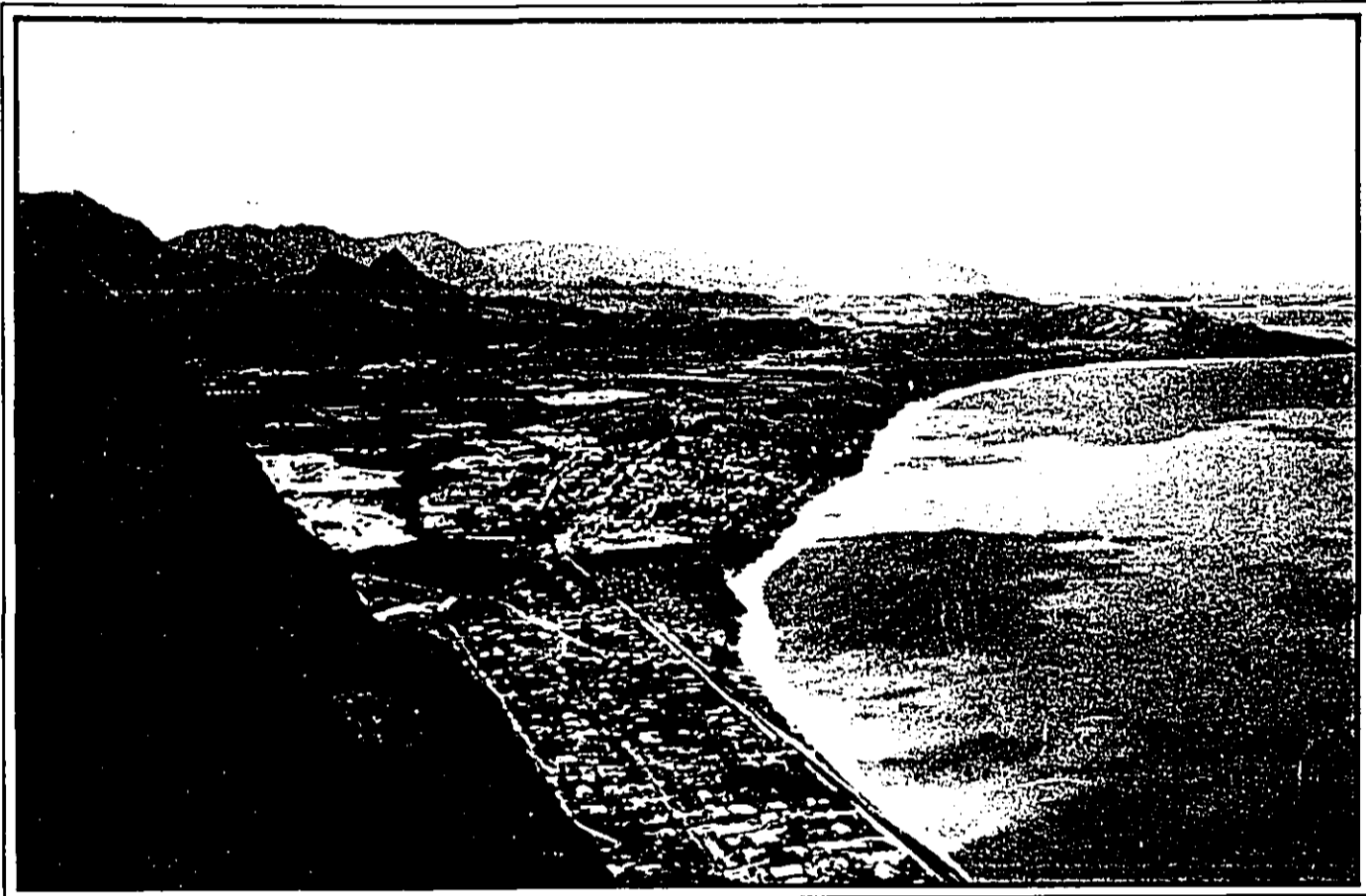
G. DETERMINATION

The Revised EIS is determined to be acceptable under the procedures established by Chapter 343, HRS, and the OEQC-EIS Regulations. This determination does not imply a favorable recommendation on the applicant's request for any subsequent approvals which are required.

APPROVED



MICHAEL M. McELROY
Director of Land Utilization



WAIMANALO WASTEWATER FACILITIES ENVIRONMENTAL IMPACT STATEMENT

OA
318

DIVISION OF WASTEWATER MANAGEMENT
DEPARTMENT OF PUBLIC WORKS • CITY AND COUNTY OF HONOLULU
PREPARED BY : WILSON OKAMOTO & ASSOCIATES, INC.

REVISED ENVIRONMENTAL IMPACT STATEMENT

WAIMANALO WASTEWATER FACILITIES

(TMK: 4-1)

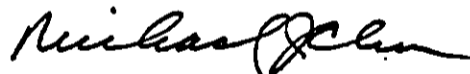
Koolaupoko, Oahu, Hawaii

This Environmental Document is Submitted
Pursuant to Chapter 343, Hawaii Revised Statutes

Proposing Agency:
Division of Wastewater Management
Department of Public Works
City and County of Honolulu

Accepting Authority:
Governor, State of Hawaii
and
Department of Land Utilization
City and County of Honolulu

Responsible
Official:



Date: 1/4/84

MICHAEL J. CHUN
Director and Chief Engineer

Prepared by:
WILSON OKAMOTO & ASSOCIATES, INC.

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FOREWORD

This Revised Environmental Impact Statement (EIS) has been prepared for the City and County of Honolulu, Department of Public Works, Division of Wastewater Management to disclose information about the proposed Waimanalo wastewater facilities. The preparation of this document is pursuant to Chapter 343, Hawaii Revised Statutes, and the Environmental Quality Commission Rules and Regulations.

The Environmental Impact Statement Preparation Notice appeared in the EQC Bulletins dated November 23, 1982 and December 8, 1982. The deadline for requests to be a consulted party was December 23, 1982.

The Draft EIS was filed with the Office of Environmental Quality Control on June 8, 1983, and the public review period ended on July 8, 1983.

SUMMARY

The Waimanalo community is currently served by the Waimanalo Sewage Treatment Plant (STP) and individual on-site treatment facilities (e.g., cesspools). The Waimanalo STP services approximately one-third of the Waimanalo community. A major problem at the plant is the limited capacity of the injection well system used to dispose of treated plant effluent. Cesspools are used by the remaining two-thirds of the Waimanalo population. Over the years, a high number of cesspool failures has been documented.

The overall objectives of the proposed Waimanalo wastewater facilities are:

- o to eliminate public health problems associated with the Waimanalo STP and individual on-site treatment facilities;
- o to improve existing plant operations in a cost-effective and environmentally compatible manner; and
- o to fulfill the wastewater facility requirements of Waimanalo through the year 2005.

The proposed Waimanalo wastewater facilities will include:

1. Waimanalo Sewage System

a. Sewer System

- o Makapuu Interceptor Sewer Sections 1 and 2
- o Bell Street Sewage Lift Station and Force Main
- o Unsewered Subareas 1 to 6 (648 housing units)
- o Existing DHHL Dry-Sewered Area (276 housing units)
- o Future DHHL Development (367 housing units)

b. Treatment System

- o Replacement of existing equipment with ten or less years of remaining life
- o Septage receiving tank
- o Air-lift return sludge pumps

- o Sand filter
- o Equalization basin
- o Flotation thickener
- o Backwash tank conversion

c. Effluent Disposal

- o New injection wells
- o Irrigation reuse (dependent upon implementation of Waimanalo Watershed Plan and Waimanalo Agricultural Park)

d. Sludge Disposal

- o Composting (dependent upon market feasibility study)
- o Land disposal

2. On-site Treatment Facilities

a. Cesspools (agricultural areas of Waimanalo)

b. Aerobic Units (Makai Range Pier and Sea Life Park)

POTENTIAL IMPACTS AND MITIGATION MEASURES

SHORT-TERM PRIMARY IMPACTS:

Short-term primary impacts will be generated by construction of the proposed wastewater facilities. Typically, construction activities will affect air quality, erosion potential, traffic, noise levels, safety, access, aesthetics, and resource areas. These impacts will be mitigated through the strict adherence to governmental regulations and the implementation of appropriate control measures.

Since construction activities will be primarily located at the existing STP site, and within or adjacent to existing road rights-of-way, the expected short-term environmental impacts should not be significant. Generally, construction-related impacts will be temporary and confined to the immediate area surrounding the construction site.

LONG-TERM PRIMARY IMPACTS:

Waimanalo Sewage System

Sewer System. Impacts related to the operation and maintenance of the proposed sewer system are expected to be minimal since the sewer lines will be buried and located within existing urban areas. Expansion of the sewer system to residential areas presently experiencing cesspool problems will

have a significant beneficial impact. There will also be financial impacts upon property owners within designated Sewer Improvement Districts.

Treatment System. Overall, the proposed treatment modifications and improvements are expected to have a beneficial environmental impact due to improved plant operations and the higher quality of effluent produced. Since these modifications and improvements will be contained within the existing STP site, other environmental impacts are not expected to be significant.

Effluent Disposal - Injection Wells. Generally, the impacts of the proposed injection wells are not anticipated to be significant. The new set of wells will be able to adequately handle the projected effluent flow, and thus, will eliminate the overflow problems associated with the existing wells.

Effluent Disposal - Irrigation Reuse. The overall environmental impact of using treated effluent for irrigation is not expected to be adverse if applicable governmental regulations are followed. In the event any serious problems arise, effluent irrigation can be discontinued and the injection wells used as the sole means of effluent disposal.

Sludge Disposal - Composting. The proposed central composting facility is not expected to result in significant adverse impacts since it will be located within the existing Waimanalo STP site. Because the composting process will produce a pasteurized product, the use of this compost material will not pose any environmental problems. Environmental and public health hazards will be significantly reduced by strict adherence to pertinent governmental regulations and implementation of additional precautionary measures as required during compost application. Composting may contribute to the protection of important agricultural lands if the compost is used for agricultural purposes.

Sludge Disposal - Land Disposal. There appears to be no serious environmental problems associated with the existing method of sludge disposal at the Kapaa Sanitary Landfill. Continued disposal of sludge at Kapaa is not expected to pose any future environmental problems. The amount of sludge to be produced at the Waimanalo STP will only constitute a small proportion of the total volume of solid waste at the landfill so the environmental impact will not be significant.

On-Site Treatment Facilities

Cesspool failures in the unsewered areas will continue to pose a public health hazard and odor nuisance. Another adverse impact is the potential contamination of a Board of

Water Supply well. There also will be an economic impact upon individual cesspool owners and the City and County of Honolulu associated with cesspool pumping.

SECONDARY IMPACTS:

Secondary impacts associated with the proposed wastewater facilities are not expected to be significant. The proposed facilities will not stimulate growth itself, but is intended to be supportive of the growth determined by the Oahu General Plan and Koolaupoko Development Plan.

ALTERNATIVES

The following alternatives were developed and evaluated for the Waimanalo STP.

Treatment System:

- o No Action
- o Energy Reduction Options

Effluent Disposal:

- o No Action
- o Ocean Outfall Disposal
- o Surface Water Disposal
- o Leach Field
- o Evaporation Ponds

Sludge Disposal:

- o Incineration
- o Ocean Disposal

Unsewered Area:

- o On-site Treatment Facilities (No Action)
- o Optimum Operation of Existing and New Cesspools
- o Alternative On-site Treatment Systems
- o Expansion of the Sewer System

11 10 9 8 7 6 5 4 3 2 1

1.
INTRODUCTION

CHAPTER 1

INTRODUCTION

1.1 PURPOSE OF THE EIS

This Environmental Impact Statement (EIS) is an informational document which discloses the environmental and socioeconomic effects of the proposed Waimanalo wastewater facilities. Mitigation measures to minimize potential adverse impacts, and alternatives are identified.

1.2 OBJECTIVES

The Waimanalo community is currently served by the Waimanalo Sewage Treatment Plant (STP) and individual on-site treatment facilities (e.g., cesspools). The Waimanalo STP services approximately one-third of the Waimanalo community. A major problem at the plant is the limited capacity of the injection well system used to dispose of treated plant effluent. Cesspools are used by the remaining two-thirds of the Waimanalo population. Over the years, a high number of cesspool failures has been documented.

The overall objectives of the proposed Waimanalo wastewater facilities are:

- o to eliminate existing public health problems associated with the Waimanalo STP and individual on-site treatment facilities;
- o to improve existing plant operations in a cost effective and environmentally compatible manner; and
- o to fulfill the wastewater facility requirements of Waimanalo through the year 2005.

1.3 PLANNING AREA

Waimanalo is situated in the southernmost portion of the judicial district of Koolaupoko on the windward side of Oahu. As shown in Figure 1, the Waimanalo planning area is bounded by Keolu Hills on the north, Waimanalo Bay on the east, Makapuu Point on the south, and the Koolau Mountain Range ridgeline on the west. There are approximately 7,000 acres within the planning area.

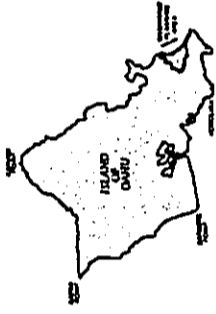
The planning area comprises a portion of the Waimanalo/Hawaii Kai Sewerage District designated in the 1971 Water Quality Program for Oahu with Special Emphasis on Waste

Planning Area 1

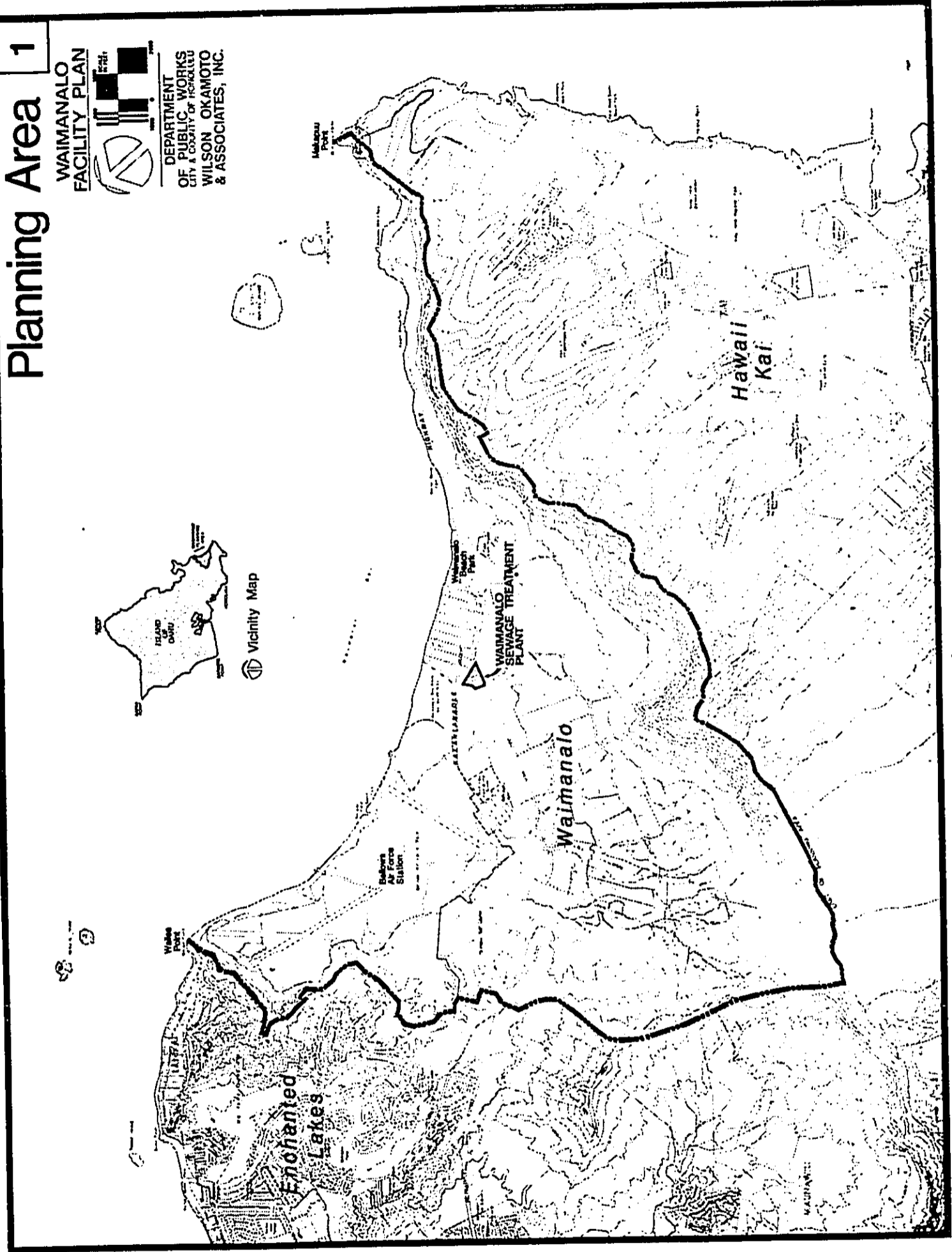
WAIMANALO
FACILITY PLAN



DEPARTMENT
OF PUBLIC WORKS
CITY & COUNTY OF HONOLULU
WILSON OKAMOTO
& ASSOCIATES, INC.



Vicinity Map



Disposal prepared by Engineering-Science, Inc.; Sunn, Low, Tom & Hara, Inc.; and Dillingham Environmental Co. The Waimanalo/Hawaii Kai Sewerage District is one of seven sewerage districts established for the entire Island of Oahu, as shown in Figure 2. The Koolau Mountain Range separates the Waimanalo area from the Hawaii Kai portion of the sewerage district. This geographic barrier requires that an independent wastewater system be situated in each subarea.

1.4 PROJECT BACKGROUND

1.4.1 Facility Planning Process

The proposed wastewater facilities were developed during the facility planning process established by the Federal Construction Grants Program. This Program consists of a three-step process adopted in 1972 by the Clean Water Act (PL 92-500).

The Facility Plan is the first step (Step 1) in the process, followed by detailed design (Step 2), and then by construction (Step 3). A fundamental purpose of this process is to assure that federally funded facilities are environmentally sound and cost effective.

The Construction Grants Program provides federal assistance for eligible sewage treatment works. The U.S. Environmental Protection Agency (EPA) has made a grant to the City and County of Honolulu for 75 percent of the cost of preparing the Waimanalo Facility Plan. The remaining 25 percent will be provided by the State Department of Hawaiian Home Lands (DHHL).

Facility planning involves the preparation of plans and studies to demonstrate the need for the proposed facilities. Technical, economic, environmental, institutional, and social considerations are included in the systematic evaluation of feasible alternatives to arrive at the selected plan. The process involved in preparing a Facility Plan is outlined in Table 1-1. Upon completion of Step 1, the City and County of Honolulu may proceed to Steps 2 and 3, depending upon the availability of funds.

1.4.2 Public Participation Program

The public participation program for the Waimanalo Facility Plan was designed to disseminate information and receive input from an informed public. The program included three public meetings and a public hearing, the use of a mailing list for correspondence with interested parties, distribution of informational material, and availability of reference documents for public review.

Oahu Sewerage Districts 2

WAIMANALO
FACILITY PLAN
DEPARTMENT
OF PUBLIC WORKS
WILSON, OKAMOTO
& ASSOCIATES, INC.

* From the Water Quality Program
for Oahu with Emphasis on
Waste Disposal. July 1971.

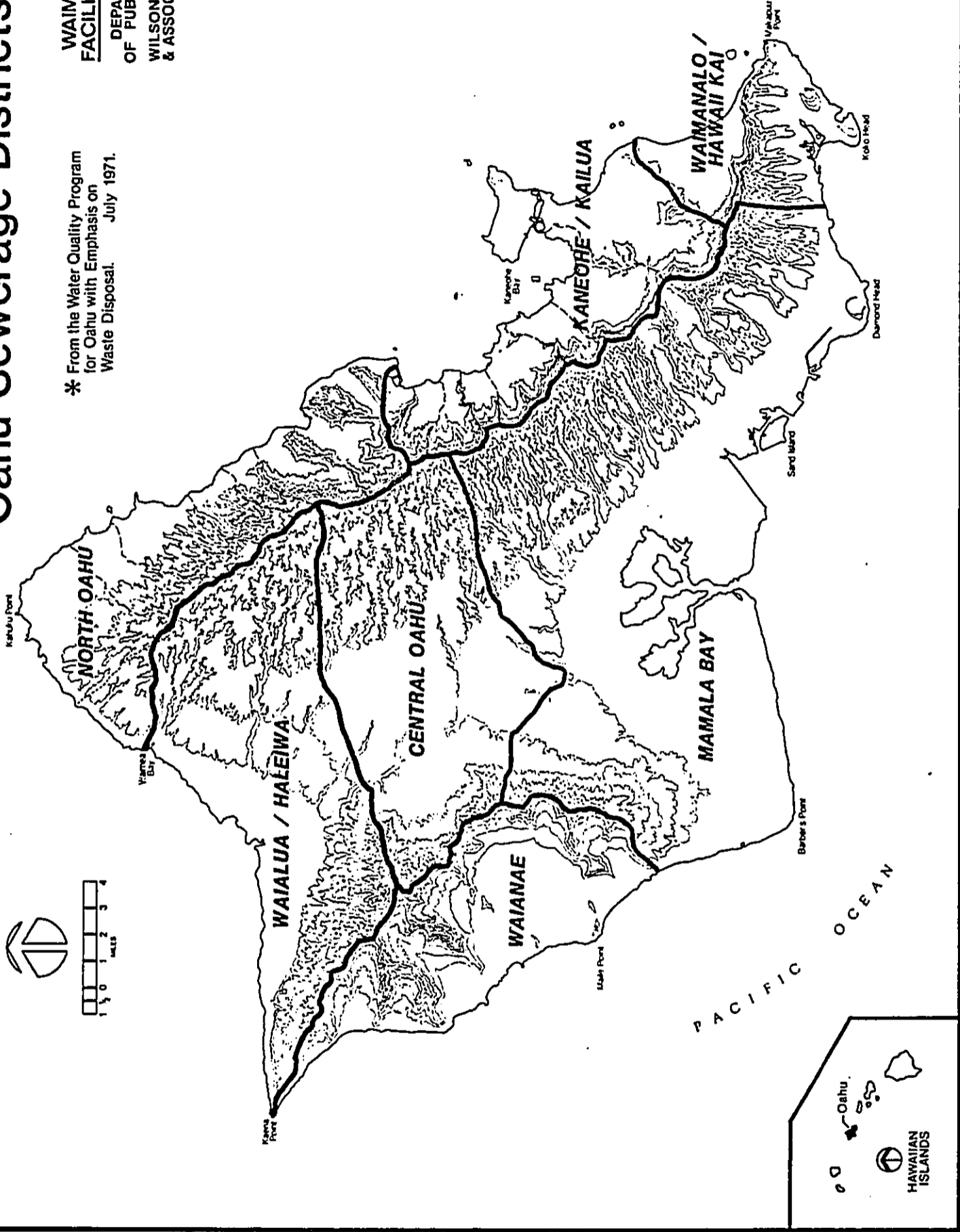
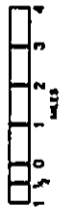


TABLE 1-1

FACILITY PLANNING PROCESS

- A. Identification of Effluent Limitations
- B. Assessment of Current Situation
 - 1. Existing Environment of the Planning Area
 - 2. Existing Wastewater Flows and Treatment Systems
 - 3. Infiltration and Inflow
 - a. State Certification
 - b. Infiltration and Inflow Analysis
 - c. Sewer System Evaluation Survey and Rehabilitation
 - d. Sewer Maintenance Program and Sewer Use Ordinance
 - 4. Performance of Existing Systems
- C. Assessment of Future Situation
 - 1. Demographic, Economic, and Land Use Projections
 - 2. Forecasts of Flows and Wasteloads
 - 3. Flow and Waste Reduction
 - 4. Future Environment Without the Project
- D. Development of Alternatives
 - 1. Optimum Operation of Existing Facilities
 - 2. Regionalization, Individual Systems and Small Wastewater Systems
 - 3. Evaluation of Systems
 - a. Best Practicable Waste Treatment Technology
 - b. Innovation and Alternative Technology
 - c. Evaluation of Sewer Alignments
 - d. Ultimate Disposal of Residuals
 - e. Combined Sewer Overflows and Stormwater Discharges
 - f. Municipal/Industrial Treatment
 - g. Phased Construction
 - h. Multiple Purpose Projects
- E. Evaluation of Alternatives
 - 1. Evaluation of Monetary Costs
 - a. Sunk Costs
 - b. Present Worth and Equivalent Uniform Annual Costs
 - c. Cost Escalation Factors for Energy Use
 - d. Innovative and Alternative Cost Preference
 - e. Multiple Purpose Projects
 - 2. Financial Impact Evaluation
 - 3. Environmental Evaluation
 - 4. Evaluation of Reliability
 - 5. Evaluation of Energy Requirements
 - 6. Evaluation of Implementability
 - 7. Evaluation of Recreational Opportunities
 - 8. Comparison of Alternatives
 - 9. Views of the Public and Concerned Interests
- F. Selection of Plan
 - 1. Justification for Plan Selection
 - 2. Description of Selected Plan
 - 3. Design of Selected Plan
 - 4. Cost Estimates for Selected Plan
 - 6. Environmental Impacts of Selected Plan
 - a. Description of Impacts
 - b. Mitigating Adverse Impacts
- G. Analysis of Implementation Arrangements
 - 1. Institutional Responsibilities
 - 2. Civil Rights Compliance
 - 3. Site Availability
 - 4. Operation and Maintenance Requirements
 - 5. Pretreatment Program
 - 6. Implementation Steps

Source: U.S. Environmental Protection Agency. Facilities Planning 1981: Municipal Wastewater Treatment. March 1981.

Under the EPA's Construction Grants Program for municipal sewage treatment works, the facilities planning process must provide for, encourage, and assist public participation. The public was provided information and opportunities for involvement in the following areas:

(1) the assessment of local water quality problems and needs;

(2) the identification and evaluation of various sites for wastewater treatment facilities and of alternative treatment technologies and systems including those which recycle and reuse wastewater (including sludge), use land treatment, reduce wastewater volume, and encourage multiple use of facilities;

(3) the evaluation of social, economic, and environmental impacts; and

(4) the resolution of other significant facilities planning issues and decisions.

A two-tier public participation program has been established by the EPA for municipal wastewater management, because wastewater facilities may vary in complexity and impact upon the community. The "Basic Public Participation Program" is intended for less complex projects, which anticipate only moderate community impacts. The "Full-Scale Public Participation Program" applies to more complex projects which anticipate potentially significant community impacts. The Waimanalo Facility Plan has been designated to comply with the Basic Program.

The Basic Program requires a series of three public information meetings and a public hearing during the facility planning process. The first public meeting is held at the initiation of the planning process to notify the public about the nature and scope of the proposed plan. The first meeting for the Waimanalo Facility Plan was held on June 2, 1980. The second public meeting is held early in the planning process while existing and future situations are assessed, and alternatives are identified and screened, but before alternatives are selected for evaluation. This second meeting was held on March 16, 1982. The third meeting is held when alternatives are largely developed, but before an alternative or plan is selected. This third meeting was held on January 18, 1983. After an alternative is selected and while it is being further developed, a public hearing is held before it is adopted in final form. The public hearing for the Waimanalo Facility Plan was held on June 15, 1983.

EPA requires a response to questions and comments voiced by the public during this process. "Responsiveness summaries" have been prepared for the second and third public meetings, and the public hearing. These reports summarize major items of concern brought out for discussion, and responses to these concerns from the City and County of Honolulu Department of Public Works. Further, all persons attending the public hearing received (by request) a summary of questions and concerns that were raised, which included the City's responses. Individuals who offered comments personally, received letters which specifically addressed their concerns, along with the summary of questions and responses.

A mailing list of interested persons, organizations, and public agencies was compiled early in the planning process, and periodically updated. These parties were notified and consulted throughout preparation of the Facility Plan and Environmental Impact Statement. Additionally, informational material was disseminated at the public gatherings and reference materials were made available for review.

CHAPTER 2

PROJECT DESCRIPTION

2.1 EXISTING WASTEWATER FACILITIES

2.1.1 Waimanalo Sewage System

2.1.1.1 Sewer System

The sewage treatment plant presently serves 828 housing units in Waimanalo. This represents approximately 3,400 residents or one-third of the 1980 Waimanalo population. The entire service area is situated northwest of the treatment facility within four separate developments: State Core Development, Banyan Tree Development, Waimanalo Village, and Hale Aupuni Subdivision. The service area also includes Waimanalo Elementary and Intermediate School, Waimanalo State Recreation Area, and some commercial development. Existing sewer areas in Waimanalo are shown in Figure 3.

Sewage generated from these areas is conveyed along Kalaniana'ole Highway to the Waimanalo STP. The existing trunkline varies from 12 to 24 inches in diameter. There is also a 12-inch force main and pump station along the highway.

A portion of the existing State Department of Hawaiian Home Lands (DHHL) developed area has a "dry" sewer system presently in place. The sewer lines are installed, but cannot be utilized until these lines are connected to the Waimanalo Sewage Treatment Plant.

2.1.1.2 Treatment and Disposal

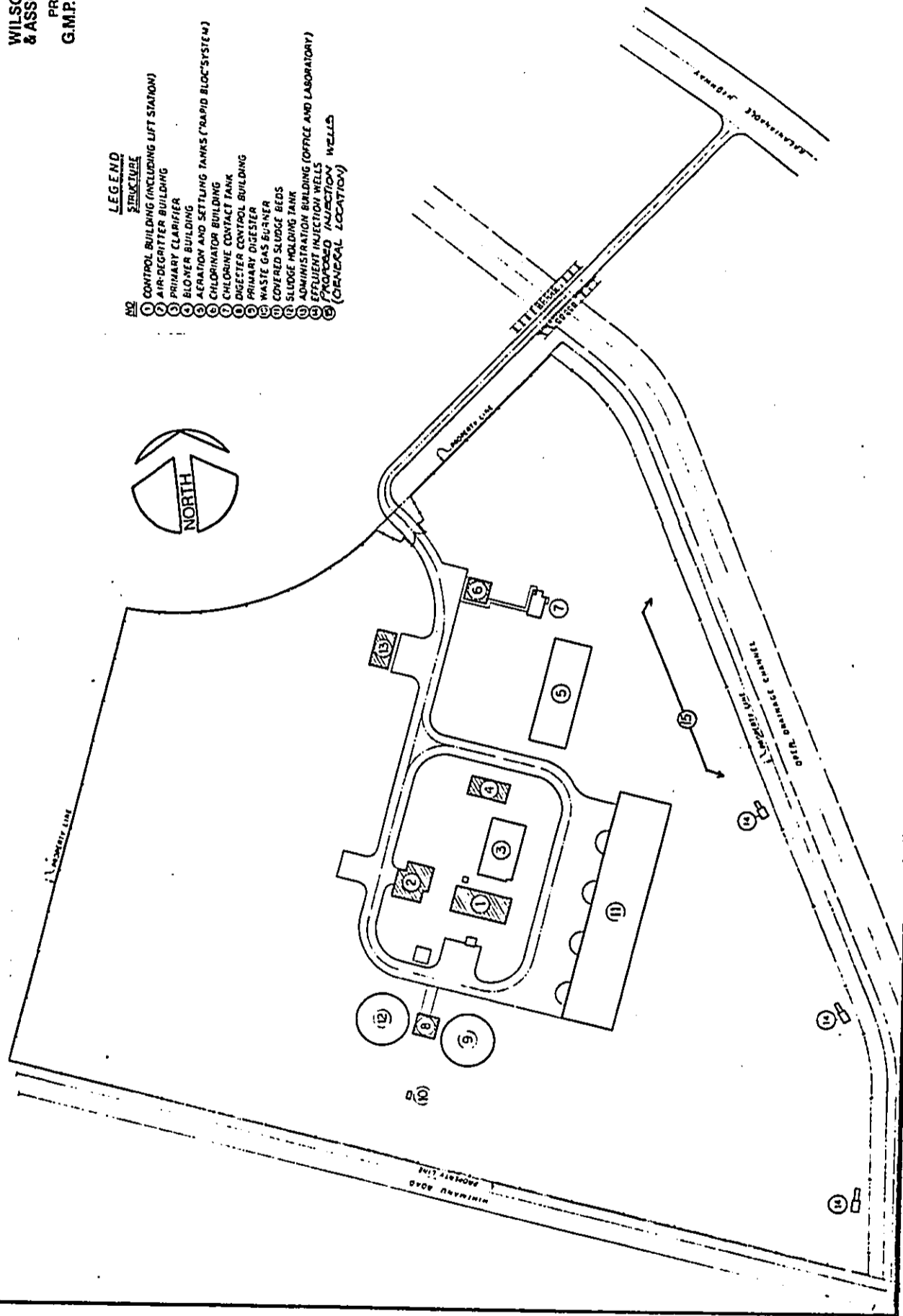
The Waimanalo STP was constructed by the State of Hawaii to service the State Core Development. It was put into operation in 1972. The City and County of Honolulu subsequently assumed control of the plant and its operation.

The 11.2-acre plant site is situated mauka of Kalaniana'ole Highway in the vicinity of the "Village Market" in the pine grove. A layout of the plant site is provided in Figure 4.

The Waimanalo STP provides secondary treatment of sewage using the "Rapid Bloc" activated sludge process. A schematic flow diagram of the treatment and disposal process is shown in Figure 5. Components of this process are described in Table 2-1.

Existing Waimanalo Sewage Treatment Plant Site Layout 4

WAIMANALO
FACILITY PLAN
DEPARTMENT
OF PUBLIC WORKS
WILSON OKAMOTO
& ASSOCIATES, INC.
PREPARED BY:
G.M.P. Associates, Inc.



- LEGEND**
- STRUCTURE**
- 1 CONTROL BUILDING (INCLUDING LIFT STATION)
 - 2 AIR-DECANTER BUILDING
 - 3 PRIMARY CLARIFIER
 - 4 BLOWER BUILDING
 - 5 AERATION AND SETTLING TANKS (RAPID FLOCC SYSTEM)
 - 6 CHLORINATOR BUILDING
 - 7 CHEMICAL CONTACT TANK
 - 8 DIGESTER CONTROL BUILDING
 - 9 PRIMARY DIGESTER
 - 10 WASTE GAS BURNER
 - 11 COVERED SLUDGE BEDS
 - 12 SLUDGE HOLDING TANK
 - 13 ADMINISTRATION BUILDING (OFFICE AND LABORATORY)
- EFFLUENT INJECTION WELLS**
- 14 EFFLUENT INJECTION WELL
 - 15 EFFLUENT INJECTION WELL
 - 16 EFFLUENT INJECTION WELL
- (CHEMICAL LOCATION)**

Waimanalo STP Schematic Flow Diagram

5

WAIMANALO
FACILITY PLAN
DEPARTMENT
OF PUBLIC WORKS
WILSON OKAMOTO
& ASSOCIATES, INC.
PREPARED BY
G.M.P. Associates, Inc.

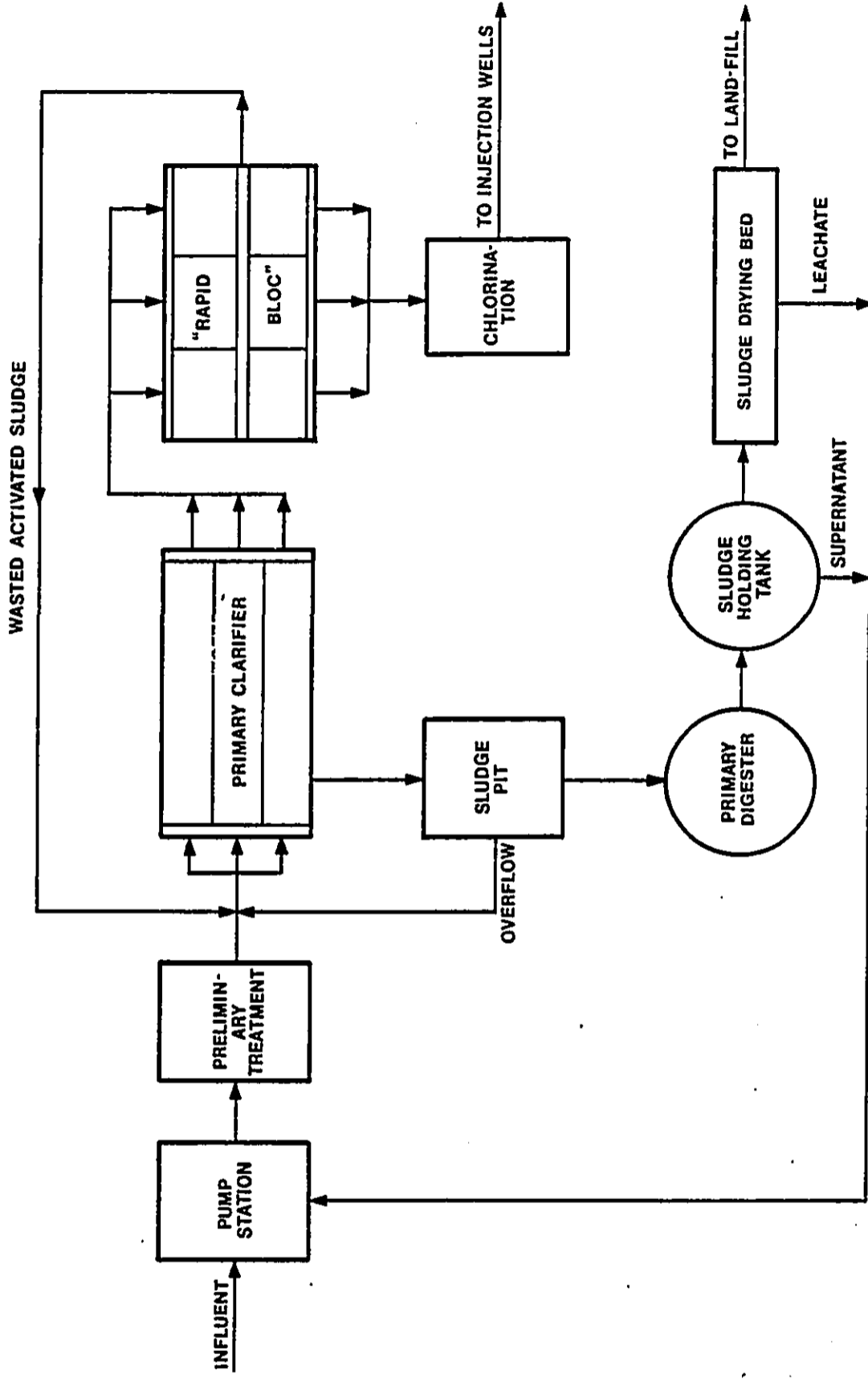


TABLE 2-1

WAIMANALO SEWAGE TREATMENT PLANT
LIQUIDS AND SOLIDS HANDLING PROCESS

<u>COMPONENT</u>	<u>DESCRIPTION</u>
Pump Station	Pumps raw sewage, supernatant from sludge holding tank, and leachate from sludge drying beds to the Air Degritter Building for pretreatment.
LIQUIDS HANDLING PROCESS:	
Preliminary Treatment	<ul style="list-style-type: none"> o Air Degritter - removes grit and other readily settleable materials. o Comminutor - grinds solids into smaller, more uniform pieces. Degritted sewage can be bypassed around the comminutor to a bar screen where larger-sized objects are removed from the sewage.
Primary Clarifier	Removes settleable material, including waste activated sludge recirculated from the "Rapid Bloc" system.
"Rapid Bloc" System	<ul style="list-style-type: none"> o Complete Mix Aeration Tank - allows micro-organisms to aerobically digest suspended organic material. o Final Clarifier - settles out micro-organisms.
Chlorination	Disinfects plant effluent prior to disposal in on-site injection wells.
Injection wells	Allows plant effluent to permeate through a subsurface stratum.
SOLIDS HANDLING PROCESS:	
Sludge Pit	Receives the settleable solids from the primary clarifier.
Primary Digester	Micro-organisms anaerobically digest the gas-mixed sludge.
Sludge Holding Tank	Provides settling of the digested sludge producing a thickened sludge and supernatant.
Sludge Drying Bed	Dewateres the digested sludge on sand beds.
Landfill	Dewatered sludge is trucked to the Kapaa Sanitary Landfill site.

2.1.2 On-site Treatment Facilities

All known on-site treatment facilities in the Waimanalo area are cesspools, with the exceptions noted below. Approximately two-thirds of the Waimanalo population are served by cesspools.

The number of existing cesspools within the planning area was approximated as the number of housing units not connected to the Waimanalo Sewage Treatment Plant. Each unsewered housing unit was assumed to have an individual cesspool. Based on the most current existing land use map prepared by the City and County of Honolulu Department of General Planning (December 1979), there are approximately 1,360 cesspools in Waimanalo.

Other types of on-site systems operating within the Waimanalo planning area include small-scale aerobic units. These units are presently used at Sea Life Park and Makai Range Pier. Treated effluent from Sea Life Park is discharged with untreated salt water into injection wells situated on the park site. A leach field located mauka of Kalaniana'ole Highway is used to dispose of the effluent from Makai Range Pier.

2.2 PERFORMANCE OF THE EXISTING FACILITIES

2.2.1 Waimanalo Sewage Treatment Plant

The plant was originally designed for an average flow of 1.1 million gallons per day (mgd). Presently, the actual plant capacity is limited by the activated sludge process at 0.7 mgd. An average wastewater flow of 0.2 mgd is currently received at the Waimanalo STP. This uses approximately 35 percent of the existing capacity of the plant.

The treatment plant is considered to be operating at its maximum performance level in terms of effluent quality. Effluent concentrations of suspended solids and five-day biochemical oxygen demand are consistently lower than the EPA standards for secondary treatment.

The major problem at the Waimanalo STP is the inadequate performance of the three existing injection wells used for effluent disposal. In recent years, it has become increasingly difficult to maintain the injection capacity of these wells. As a result, the wells have periodically overflowed.

The reduction in well capacity is primarily due to two problems. First, the structural condition of the wells has deteriorated, as evidenced by material from the upper layers

being deposited into the lower part of the well. Second, necessary well maintenance cannot be performed due to the lack of proper equipment to routinely back-flush the wells.

In response to these problems, the existing injection wells were rehabilitated from May to July, 1982. This involved back-flushing each well and removing accumulated materials from the bottom of the wells. At this time, it is difficult to determine the degree to which these rehabilitation efforts increased the capacity of the wells. An attempt was also made to encase one of the wells (No. 9A). This procedure failed and precipitated a complete cave-in of the well. A maintenance program and another injection well to replace the caved-in well have been proposed by the State Department of Land and Natural Resources. Detailed information about these proposals is not presently available according to the Department since the plans are still in preliminary stages of development.

2.2.2 On-site Treatment Facilities


There has been a significant number of cesspool failures reported in Waimanalo. Based on the City and County of Honolulu cesspool pumpage data from July 1975 to June 1981, about 34 percent of the existing 1,360 cesspools in Waimanalo were found to be defective. A defective cesspool is defined as one that requires at least one pumping during its existence (208 Water Quality Management Plan for the City and County of Honolulu). It should be noted that the actual cesspool failure rate may be higher because these records only document those cesspools that were pumped by the City. Private companies can also be contracted for cesspool pumping and the City does not document the services rendered by such companies.

General areas of significant cesspool failures are identified in Figure 6. Problem areas include cesspools which have been pumped by the City more than five times per year, on the average. Residential areas which have experienced a large number of cesspool failures include the Waimanalo Beach Lots, DHHL subdivision mauka of the Beach Lots, and DHHL "dry, sewered" area. In the agricultural area, failures have occurred in the vicinity of Flamingo Street and scattered farm lots in the upper valley.

Defective cesspools overflow and/or back up household plumbing creating a public health hazard. Pumping is required to remove the accumulated sewage in the cesspool and restore operation of the system. Among the potential problems associated with cesspool failures are public health hazards and nuisances (e.g., odor generation).

Cesspool Problem Areas 6

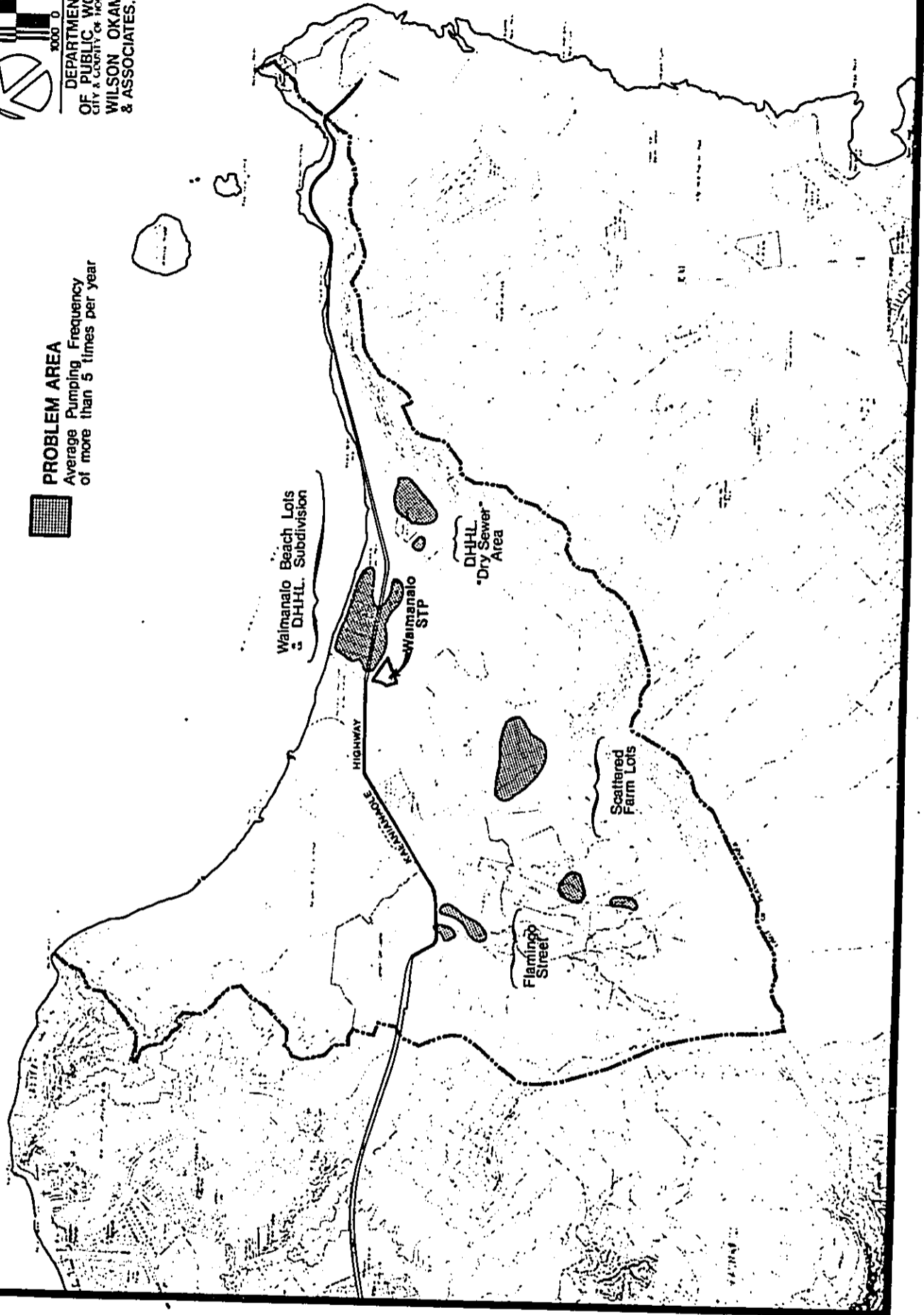
WAIMANALO
FACILITY PLAN



DEPARTMENT
OF PUBLIC WORKS
CITY & COUNTY OF HONOLULU

WILSON OKAMOTO
& ASSOCIATES, INC.

 **PROBLEM AREA**
Average Pumping Frequency
of more than 5 times per year



It appears that cesspool failures are primarily attributable to poor soil conditions. The permeability of soils in the upper regions of Waimanalo is generally low. Along the coastal areas, there are fine sands which are easily clogged by the solid materials contained in sewage.

The performance of the aerobic units at Makai Range Pier and Sea Life Park could not be assessed because monitoring data is presently not available.

2.3 PROPOSED ACTION

2.3.1 Waimanalo Sewage System

2.3.1.1 Sewer System

The proposed sewer system will be expanded toward Makapuu, as shown in Figure 7. The proposed sewered area includes existing residences which have experienced cesspool failure problems or are likely to develop problems, and future developments. Existing commercial developments within the area, Waimanalo and Kaiona Beach Parks, and Blanche Pope Elementary School will also be sewered.

An additional 1,300 housing units will be sewered by the year 2005. With these additions, the total sewer system will include 2,120 housing units or about 8,730 people. A list of the proposed areas to be sewered is presented in Table 2-2. Approximately three-fourths of the existing defective cesspools identified in Waimanalo (see Section 2.2.2) will be connected to the proposed sewer system.

Expansion of the sewer system will include the Makapuu Interceptor (see Figure 7) and other sewerlines. The proposed system also will require a force main and low capacity sewage lift station to service the low-lying area located toward Makapuu (see Figure 7, Areas 5 and 6).

The proposed sewer system improvements will be installed within existing road rights-of-way or easements. A nominal amount of additional land may be required for the lift station in the vicinity of the Bell Street and Kalaniana'ole Highway intersection.

Proposed Sewered Subareas

- MAKAPUU INTERCEPTOR SEWER, SECTION 1
- MAKAPUU INTERCEPTOR SEWER, SECTION 2
- INTERCEPTOR SEWER
- ◊◊◊◊◊ BELL STREET FORCE MAIN

WAIMANALO FACILITY PLAN



DEPARTMENT OF PUBLIC WORKS CITY & COUNTY OF HONOLULU
WILSON OKAMOTO & ASSOCIATES, INC.

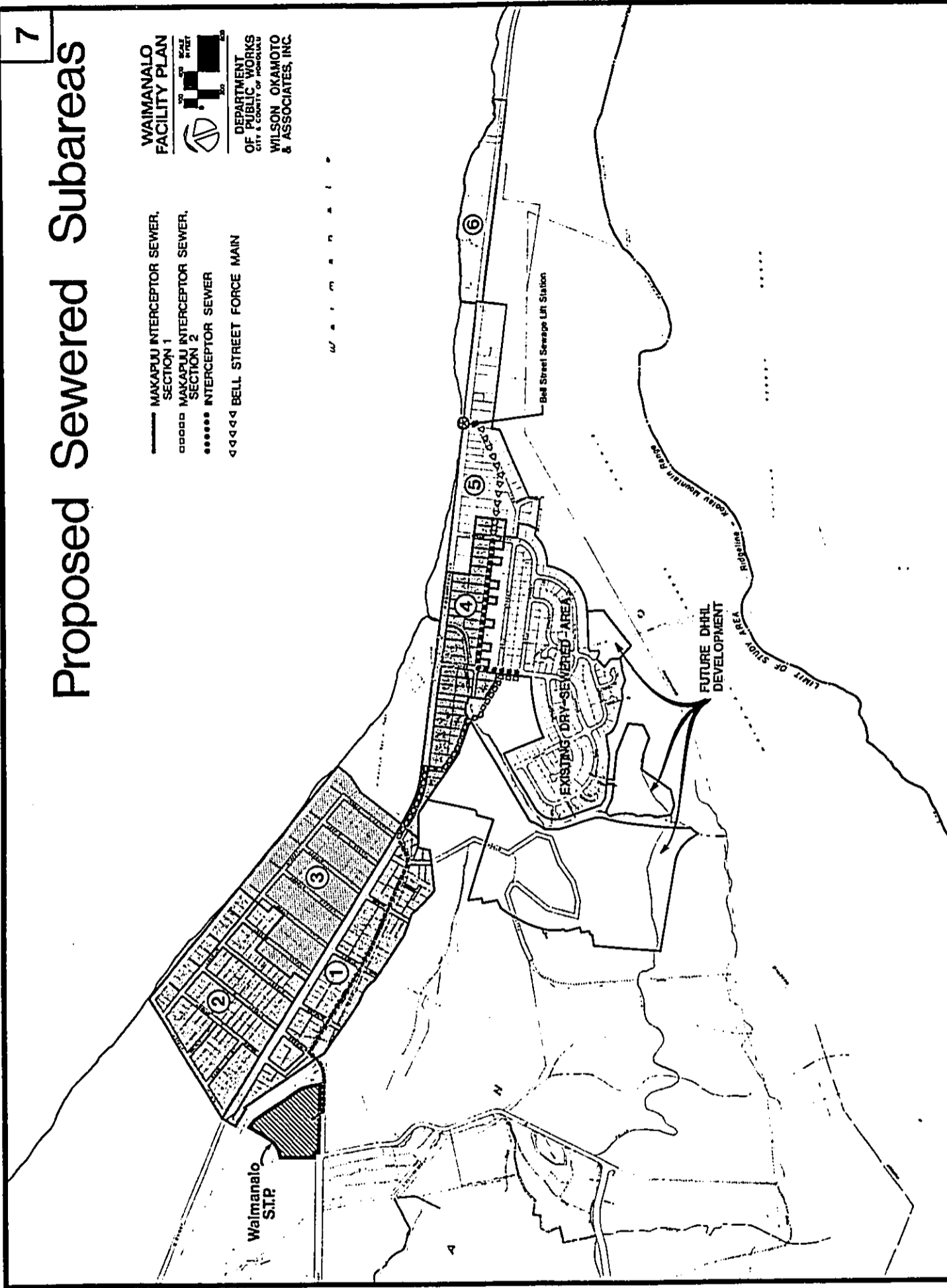


TABLE 2 - 2

PROPOSED SEWERED SUBAREAS IN THE
WAIMANALO PLANNING AREA

<u>Subarea</u>	<u>No. of Housing Units</u>
EXISTING RESIDENCES:	
1 (DHHL)	122
2 (Private)	177
3 (Private)	178
4 (DHHL)	73
5 (DHHL)	64
6 (Private)	34
Dry-Sewered Area (DHHL)	<u>276</u>
Subtotal	924
FUTURE DEVELOPMENT:	
DHHL	367
Total	<u>1,291</u>

2.3.1.2 Treatment System

By the year 2005, the Waimanalo STP is expected to receive an influent flow of 0.70 mgd. This estimated flow projection was based on (1) the total service area of about 2,210 housing units, (2) an occupancy rate of 4.12 persons per housing unit as determined by the 1980 census, and (3) a wastewater generation rate of 80 gallons per capita per day.

The capacity of the Waimanalo STP will not be exceeded by the projected wastewater flows through the year 2005. The facility is in excellent condition and all existing unit processes could remain in service through the 25-year period encompassed by this plan, provided that equipment are replaced as required and minor modifications are made. All major equipment associated with existing processes which were estimated to currently have a remaining life of less than ten years should be replaced. None of the existing unit processes require structural repairs. The proposed modifications include a septage receiving tank that will allow the operator control over the introduction of cesspool pumpage to the treatment processes, and installation of air-lift return sludge pumps in the final clarifiers to allow the operator more direct control over sludge return for the activated sludge process. With these modifications and equipment replacement, the plant would

be able to produce an effluent characteristic of a secondary treatment plant, i.e., an effluent BOD₅ and SS concentration of 30 mg/l.

Additional treatment improvements are required for the new injection wells proposed for the Waimanalo STP (see Section 2.3.1.3). These improvements will enhance well performance and reliability, as well as improve overall plant operations.

First, an effluent sand filter will be added to the existing plant. This filter is intended to reduce the quantity of suspended solids introduced into the wells that are capable of clogging the receiving stratum, and to provide a means of treating backwash water periodically removed from the wells. Effluent filtration will follow chlorination to minimize bacterial growth on the filter media.

An aerated equalization basin is another proposed improvement. The purpose of this basin is to equalize plant influent flow, attenuating peak flows. Plant operation is more efficient when the flow is uniform. The equalization basin will follow the aerated grit chamber in the treatment process.

The final requirement for injection well disposal is a storage tank for the backwash water produced during well maintenance. Backwash water will be pumped to this storage tank for removal of settleable materials prior to filtration.

A waste activated sludge thickener is proposed to lessen the demand for primary clarifier capacity, and allow the conversion of an existing clarifier into a storage tank. Waste activated sludge from the "Rapid Bloc" system would be pumped directly to the flotation thickener rather than recirculated through the primary clarifier.

2.3.1.3 Effluent Disposal

A new set of injection wells is proposed as the primary method for plant effluent disposal. Use of the plant effluent for irrigation purposes is also possible, but is dependent upon implementation of the Waimanalo Watershed Plan and Waimanalo Agricultural Park Plan (see Sections 3.2.5.1 and 3.2.5.2, respectively).

(a) New Injection Wells

At least three new injection wells will be required for the Waimanalo plant. The exact number will depend upon the actual injection capacity which will be determined by field pumping tests. The new wells will be situated in the vicinity

of the existing wells (see Figure 4). Each new well will be equipped with a backwash pump for maintenance purposes.

The Waimanalo STP site is both geographically and hydro-geologically favorable for injection well disposal. Geographically, the site is favored because it lies makai of the Board of Water Supply "no pass" line and State Department of Health proposed Underground Injection Control (UIC) line (See Figure 9). The site elevation is close enough to sea level so that potable water supplies will not be affected by subsurface discharge. Geologically, the site is favorable for deep well injection due to the presence of an injection interval permeable limestone layer at depths of approximately 70 to 200 feet, which is connected to the ocean. This layer is confined by impermeable strata above and below it.

The present wells have been in service since 1972. The age of these wells, in addition to their present condition and current operational difficulties, favor the construction of new wells over rehabilitation. It is reasonable to expect that with proper maintenance, the useful life of the new wells will be greater than the ten years obtained from the existing wells.

Rehabilitation would involve reborring the wells, and a regular aeration and/or back-flushing maintenance program. The disadvantages of rehabilitation are: (1) cave-ins that have occurred in all wells require that the wells be rebored and (2) the permeability of the receiving stratum near the wells characteristically decreases with long-term use. Reborring will escalate rehabilitation costs close to costs which would be incurred from new well construction. The decrease in permeability at the existing well sites would yield lower injection rates in rehabilitated wells than obtained from new wells within the same stratum. The existing wells could serve as an emergency back-up to the newly constructed wells.

(b) Irrigation Reuse

The proposed effluent irrigation system was developed as part of the Waimanalo Watershed Plan and Waimanalo Agricultural Park Plan by the U.S. Department of Agriculture, Soil Conservation Service; State Department of Land and Natural Resources; and Windward Oahu Soil Conservation District. These agencies will be responsible for construction and maintenance of the proposed irrigation system. Irrigation reuse is proposed as the secondary effluent disposal since the injection wells would still be required during periods when either weather or crop conditions preclude irrigation. Additionally, implementation of the watershed and agricultural park plans are uncertain at this time.

Irrigation reuse of effluent affords an ideal opportunity to both conserve the Island of Oahu's water supply and reduce effluent disposal costs (i.e., operation and maintenance costs for the injection wells). The treated effluent will be used to furrow irrigate bananas, orchards, and certain nursery crops. Effluent produced by the Waimanalo plant is considered to be of acceptable quality for irrigation purposes. There is sufficient land area in Waimanalo such that the entire plant flow could be utilized over the planning period, except during wet weather periods when crop irrigation would not be necessary. The plant would utilize the injection wells as a standby disposal method if the effluent irrigation system is implemented.

The Waimanalo Watershed Plan proposes to irrigate approximately 68 acres of farmland in Waimanalo with the treated effluent. The areas to be irrigated are located seaward of the Board of Water Supply "no pass" line within the vicinity of the STP.

In general, the plan proposes that chlorinated secondary treated effluent be pumped from the plant site to one cell of a two-cell reservoir located on State land at an elevation approximately 60 feet higher than the Waimanalo STP site. The transfer pumps would be located on the sewage treatment plant site. Each reservoir may accommodate a volume of processed STP effluent equal to approximately two or three days of plant production. From the reservoirs, effluent can be drawn on demand for irrigation by the users. To discourage algae growth in the reservoir, operation will be rotated with one cell of the reservoir in service while the other is emptied and dried.

2.3.1.4 Sludge Disposal

Composting and land disposal are proposed for handling digested and dewatered sludge produced by the Waimanalo STP. Primarily, the proposed sludge disposal method is composting, however, a marketing study is required to determine the economic feasibility of using compost material as a soil conditioner. This study will be conducted prior to implementation of the composting proposal. If composting is not found to be feasible, the sludge will continue to be landfilled. Even if the proposed composting facility is developed, landfilling will serve as a standby disposal method in the event of operational problems.

(a) Composting

Composting would produce a soil conditioner that may be utilized by nurseries, parks, golf courses, etc. The

marketing study will determine the exact users of this compost material. Composting would convert the problem of sludge disposal into beneficial resource recovery and a potential revenue generator. Furthermore, composting would eliminate the dependence of the treatment plant on landfills for disposal.

Since Waimanalo produces a small amount of sludge, a regional facility is envisioned that will compost the sludge produced at both the Waimanalo and proposed centralized Kaneohe-Kailua facilities. There is adequate space available along the western boundary of the Waimanalo plant for this proposed compost facility. Composting the sludge from Kaneohe-Kailua will eliminate the handling problems currently experienced at the Kapaa landfill because of the "pudding-like" consistency of this material.

The composting operation will produce 3,900 cubic yards per year of a stable humus-like organic material that can be conveniently stored and easily spread on land as an organic supplement (i.e., soil conditioner and nutrient source for plants and lawns). The aerated static pile method of composting is proposed for the Waimanalo plant. The sludge undergoes decomposition by thermophilic organisms whose activity elevates the sludge temperature to 60°C (140°F) or more. In the aerated static pile, the heat produced destroys pathogenic bacteria or organisms and results in a product which is essentially pasteurized.

(b) Land Disposal

Currently, the sewage sludge generated at the Waimanalo facility is trucked to the Kapaa landfill in Kailua. Approximately 0.3 tons per day of sludge is presently generated at the Waimanalo STP. This is expected to increase to 0.8 tons per day by the year 2005.

Although complaints have been raised by the landfill operating personnel concerning problems with handling mechanically dewatered sewage sludge, the sludge from the Waimanalo sludge drying beds has a relatively low moisture content, and does not contribute to this problem. Therefore, sludge disposal at Kapaa can continue and represents the least costly method if ultimate disposal of the sludge is sought. When the Kapaa landfill site is completely filled, the next closest landfill will be used.

2.3.2 On-site Treatment Facilities

On-site treatment facilities such as cesspools will continue to be used in the agricultural areas of Waimanalo. Presently, there are about 440 cesspools in these areas. Some of the agricultural lots have experienced significant cesspool problems (see Figure 6). However, it is too costly to service

these areas because of their low density. An analysis of existing cesspools in Waimanalo (see Section 2.2.2) indicates that approximately one-fourth of the defective cesspools are located in the unsewered agricultural area.

In the unsewered area, cesspool failures will continue to be a problem and require pumping by the City and County of Honolulu or private companies. No remedial measures will be implemented to extend the useful life of cesspools that presently malfunction or may malfunction in the future. Over time, the failure rate of cesspools may be expected to increase, particularly those located in unsuitable areas (i.e., poor soils). In extreme cases, cesspools may become permanently inoperable, serving only as holding tanks.

For new developments in the agricultural area, it is likely that cesspools will continue to be used. The State Department of Health Administrative Rules (Chapter 57, Private Wastewater Treatment Works and Individual Wastewater System) govern the types of systems that will be permitted.

The aerobic units at Makai Range Pier and Sea Life Park will also continue to be used.

2.3.3 Capital Costs

The total construction cost for the proposed wastewater facilities is estimated to be approximately \$4.7 million (1982 dollars), as presented in Table 2-3. In addition, the total equipment cost, including the replacement costs for existing equipment with ten or less years of remaining life, is estimated to be \$1.8 million (1982 dollars). These costs will be proportioned among the Federal, State, and City governments, and affected property owners.

TABLE 2-3
CAPITAL COSTS FOR THE
PROPOSED WAIMANALO WASTEWATER FACILITIES

	<u>Cost Items (1982 Dollars)</u>	
	<u>Construction</u>	<u>Equipment</u>
<u>WAIMANALO SEWAGE TREATMENT PLANT</u>		
Treatment System and Effluent Disposal ¹	925,000 ² /	1,639,000 ² /
(Central Composting Facility) ³	1,071,000 ² /	154,000 ² /
<u>EXPANSION OF THE SEWER SYSTEM</u>		
Makapuu Interceptor Sewer		
Section 1	800,000	--
Section 2	600,000	--
Bell Street Sewage Lift Station and Force Main	80,000	--
Proposed Sewered Subareas ⁴		
1 (DHHL)	202,000	--
2 (Private)	294,000	--
3 (Private)	292,000	--
4 (DHHL)	154,000	--
5 (DHHL)	171,000	--
6 (Private)	99,000	--
Proposed DHHL Development ⁵	--	--
	<u>4,688,000</u>	<u>1,793,000</u>

¹Additionally, an effluent irrigation system will be jointly financed by the U.S. Soil Conservation Service and State of Hawaii. The estimated construction cost is \$12.8 million (Waimanalo Watershed Plan and Environmental Impact Statement).

²Includes cost for electrical, instrumentation, and pipe line.

³Development of facility is dependent upon outcome of market feasibility study.

⁴Cost includes installation of sewerlines complete in place, manholes, backfill, paving, etc.

⁵To be financed by DHHL. The estimated construction cost is \$538,000 (Waimanalo Development and Master Plans for Hawaiian Home Lands).

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3.

DESCRIPTION OF THE ENVIRONMENTAL SETTING

CHAPTER 3

DESCRIPTION OF THE ENVIRONMENTAL SETTING

3.1 PHYSICAL ENVIRONMENT

3.1.1 Climate

The Waimanalo planning area has a climate that is generally typical of Windward Oahu. The temperatures in the area are mild and uniform, with the monthly average ranging from 70°F in January to 78°F in August. The average annual temperature is 74°F.

Average annual rainfall varies with elevation. At the shoreline, rainfall averages approximately 40 inches annually while the average annual rainfall is approximately 100 inches in the Koolau Mountain Range, as shown in Figure 8. There is also a seasonal variation in rainfall, with heavier rainfall occurring from November through April.

Prevailing winds in the area are the northeasterly tradewinds which occur approximately 80 percent of the time. A wind rose based on data collected at the Kaneohe Marine Corps Air Station (KMCAS) is also presented in Figure 8. Wind velocities at KMCAS are as follows:

0-3	knots	9% of the time;
4-10	knots	42% of the time;
11-22	knots	48% of the time; and
over 22	knots	1% of the time.

Relative humidity in the planning area ranges between 70 and 80 percent, and is somewhat higher during the winter months than the summer months. Overall, the climate is considered comfortable due to the cooling effect of the tradewinds.

3.1.2 Geology

A report on the geological conditions of the planning area was prepared in conjunction with the Waimanalo Facility Plan. The following discussion highlights the findings of the study entitled Geological Report on Feasibility of Effluent Disposal for Waimanalo prepared by Geolabs-Hawaii (January 25, 1982).

Geologically, Waimanalo can be separated into two areas, the inland portion and the seaward portion. As indicated in Figure 9, the demarcation between these areas is the 30-foot land elevation contour. A generalized geologic cross section of the Waimanalo area is presented in Figure 10.

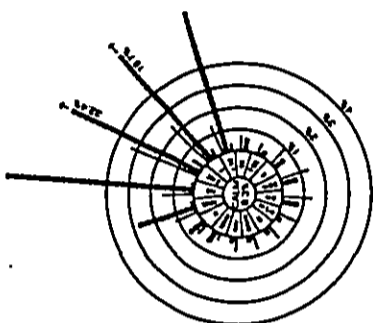
Climate 8

WAIMANALO FACILITY PLAN

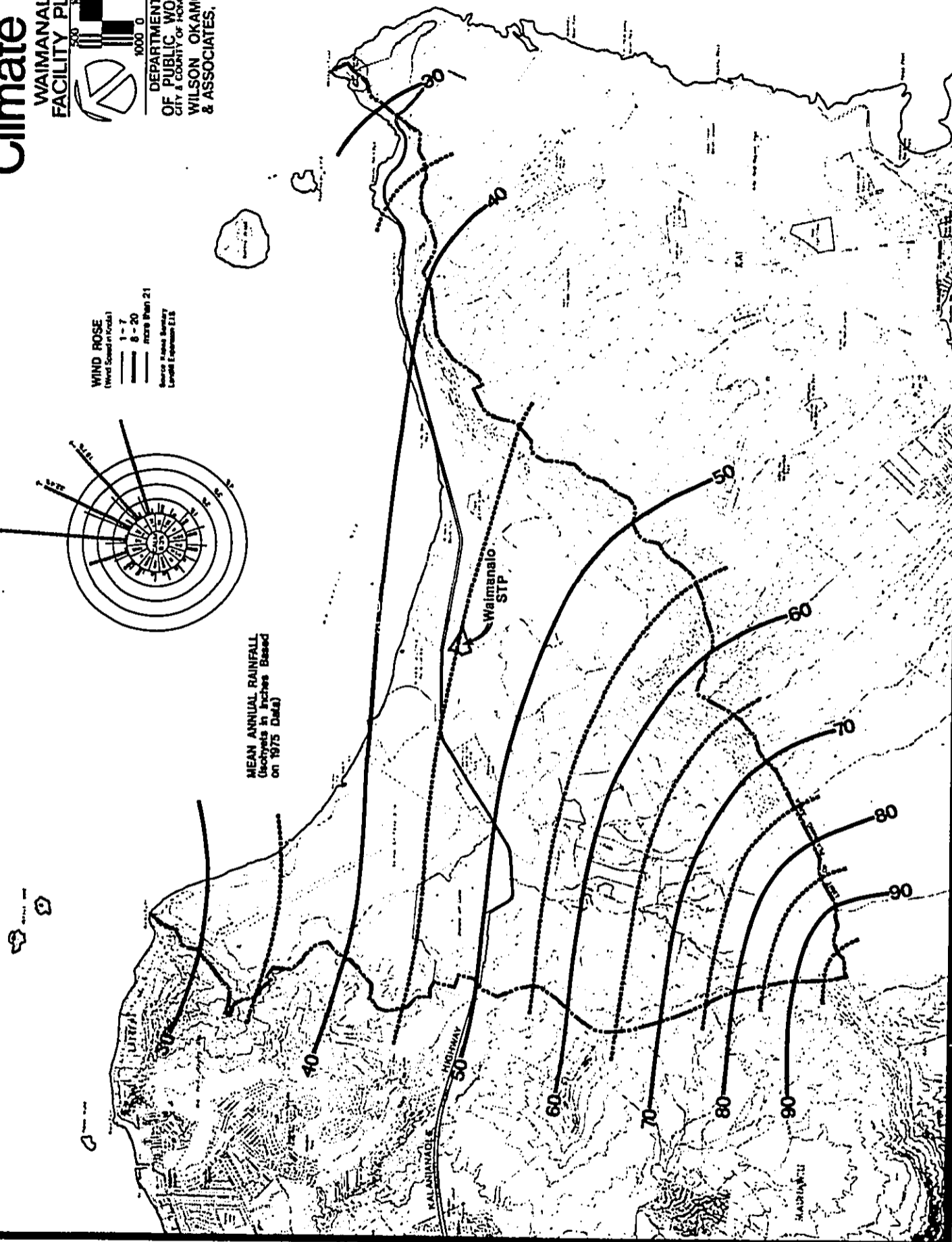


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WIND ROSE
(Wind Speed in MPH)
1-7
8-20
more than 21
Scale: 1 inch = 10 MPH
Source: Hawaii County
Local Experiment Station



MEAN ANNUAL RAINFALL
(isohyets in inches Based on 1975 Data)



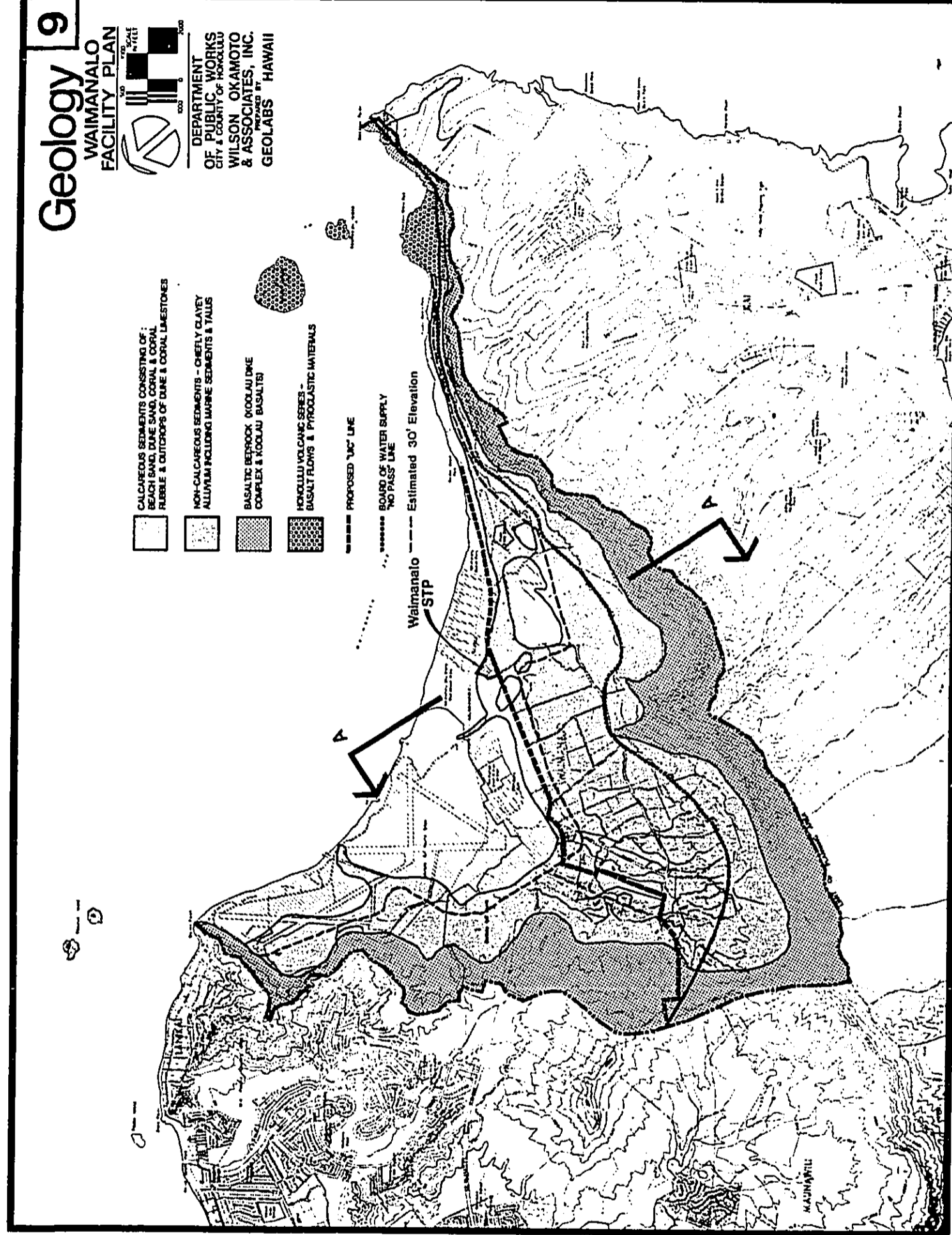
Geology 9

WAIMANALO FACILITY PLAN



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ENGINEERS ARCHITECTS
HONOLULU HAWAII

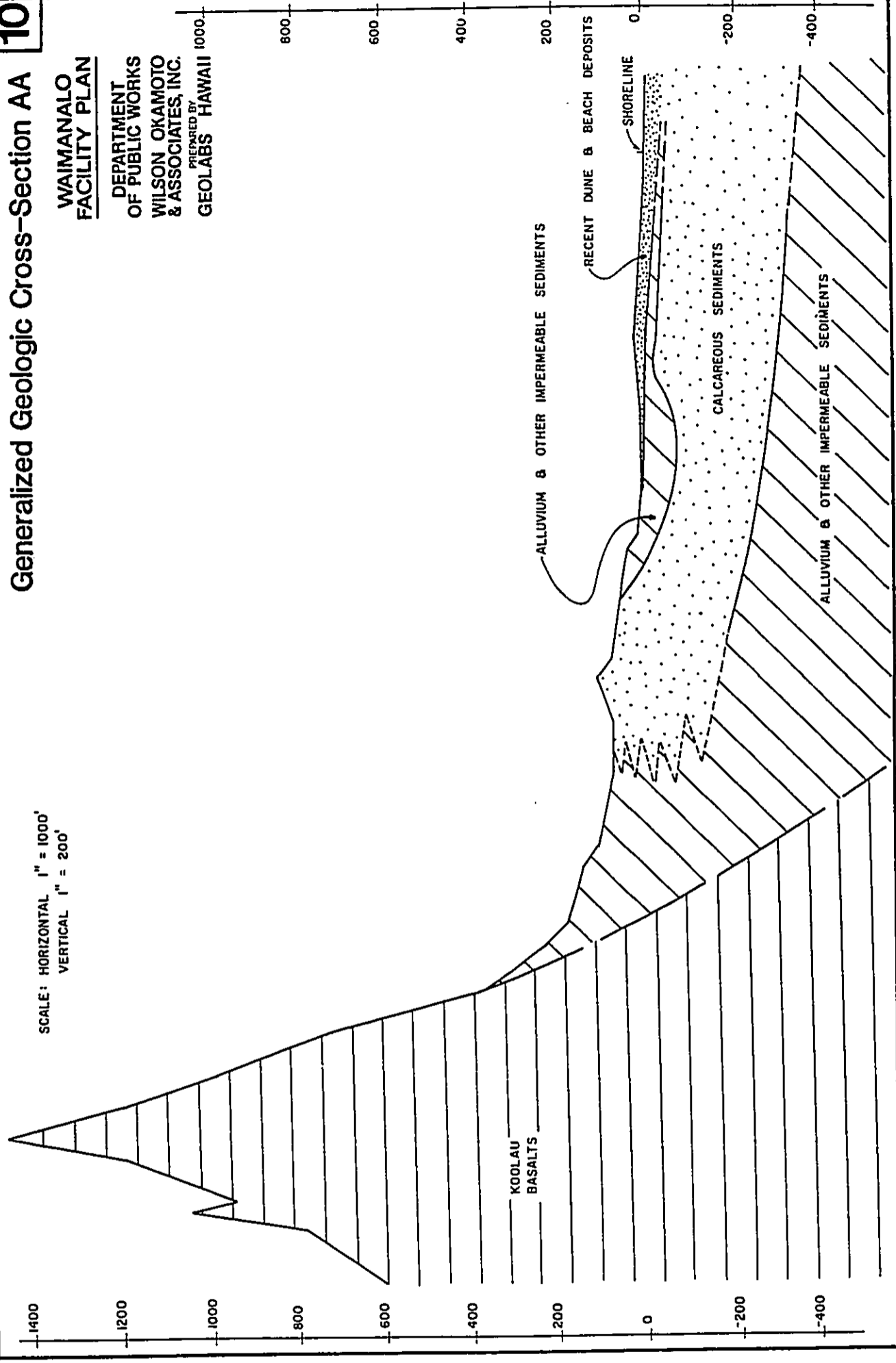
- CALCAREOUS SEDIMENTS CONSISTING OF: BEACH SAND, DUNE SAND, CORAL, & CORAL RUBBLE & OUTCROPS OF DUNE & CORAL LIMESTONES
- NON-CALCAREOUS SEDIMENTS - CHEELY CLAYEY ALLUVIUM INCLUDING MARINE SEDIMENTS & TALUS
- BASALTIC BEDROCK (KOOLOAU DUNE COMPLEX & KOOLOAU BASALTIC)
- HONOLULU VOLCANIC SERIES - BASALT FLOWS & PYROCLASTIC MATERIALS
- PROPOSED "A-C" LINE
- BOARD OF WATER SUPPLY "NO PASS" LINE
- Estimated 30' Elevation



Generalized Geologic Cross-Section AA 10

WAIMANALO
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PREPARED BY
GEOLABS HAWAII 1000

SCALE: HORIZONTAL 1" = 1000'
VERTICAL 1" = 200'



In the inland portion, subsurface materials consist predominately of alluvial clays and silts with some gravel interbeds. This layer is about 150 feet or more in thickness and underlain by basaltic bedrock. The alluvial materials generally have very low permeability and are not capable of transmitting significant amounts of water.

Conditions in the seaward portion are more complex. At or near the surface, there is a layer of sands and poorly consolidated limestones which extend to depths of approximately 20 to 30 feet below the surface and may be thinly mantled with recent alluvial clays in localized areas. This stratum represents a sequence of recent dune and beach deposits, and is generally very permeable and capable of transmitting large amounts of water.

Underlying this sand stratum is a layer of alluvium and other impermeable sediments which extend from 20 to 30 feet to depths varying between 35 feet to 110 feet, resulting from alluvial and lagoonal depositions during a lower stand of the sea. This sequence is generally impermeable and is not capable of transmitting water.

Beneath this impermeable layer is a thick stratum of calcareous sediments consisting of dune limestone from a lower stand of the sea over coral and associated limestones from a higher stand of the sea. This layer is quite porous, and therefore, is readily permeable and capable of transmitting large amounts of water. This is the permeable zone which has been used as the injection interval for the existing effluent disposal wells.

Below this permeable layer of calcareous sediments is another sequence of alluvial and other impermeable sediments deposited during very low stands of the sea, possibly during the subsidence of the island of Oahu. This sequence is relatively impermeable and incapable of transmitting water and serves as a basal confining layer to the overlying calcareous sediments.

There is no record of any well penetrating this basal confining sequence to the underlying basaltic bedrock and it can only be assumed that the basement rock lies at great depth (exceeding 1,000 feet) below the Waimanalo area.

Also encountered within the area of study were small amounts of the post-erosional Honolulu Volcanic Series. Most of this unit is tuff and cinder which occur on two off-shore islands off Makapuu Beach, and approximately fifty feet of basaltic lava flows overlying calcareous sediments at Sea Life Park. These lava flows are of moderate to low permeability and must be penetrated to reach the underlying highly permeable limestones.

3.1.3 Soils

According to the U.S. Soil Conservation Service (SCS) Soil Survey of Oahu, three soil associations predominate in the Waimanalo planning area: the Kaena-Waiialua, Lolekaa-Waikane, and Rock Land-Stony Steep Land Associations. The soil types occurring in Waimanalo, as determined in this survey, are presented in Figure 11 and their associated limitations for septic tank leaching fields are listed in Table 3-1. Although the SCS Soil Survey only identifies soil types to a depth of approximately five feet, an indication of the soil characteristics in the area is provided.

The soils of the Kaena-Waiialua Association occur on coastal plains, talus slopes, and in drainageways. They developed in alluvium and have a wide range of texture and drainage characteristics. The soils of this association occurring in Waimanalo include Kaena, Waiialua, Hanalei, Kawaihapai, Jaucas, Haleiwa, Kaloko, Mokuleia, and coral outcrop.

The soils of the Lolekaa-Waikane Association are found on fans and terraces upland from the areas where the Kaena-Waiialua Association occur. The association consists of well-drained, fine textured and moderately fine textured soils that are nearly level to very steep. Lolekaa, Waikane, Alaeloa, and Pohakupu soils comprise this association in Waimanalo.

The Rock Land-Stony Steep Land association is located along the steep and precipitous slopes of the Koolau Mountain Range. The soils of this association that have been identified in Waimanalo include Rock land, Rock outcrop, and Kawaihapai.

3.1.4 Topography

The overall topography of the planning area has considerable variability as the terrain rises inland from the shoreline to the Koolau Mountain Range (See Figure 12). The valley floor occupies about half of the planning area and consists of a flat coastal plain that changes into gentle rising lands with less than 12 percent slope in the inland regions. At the foothills of the Koolaus, the slope increases to 12 to 20 percent. In the remaining mountain region to the crest of the Koolau range, slopes range from 20 percent to nearly vertical.

WAIMANALO FACILITY PLAN



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Source: SOIL SURVEY, Soil Conservation Service, U.S. Department of Agriculture

Refer to: SOIL CHARACTERISTICS TABLE

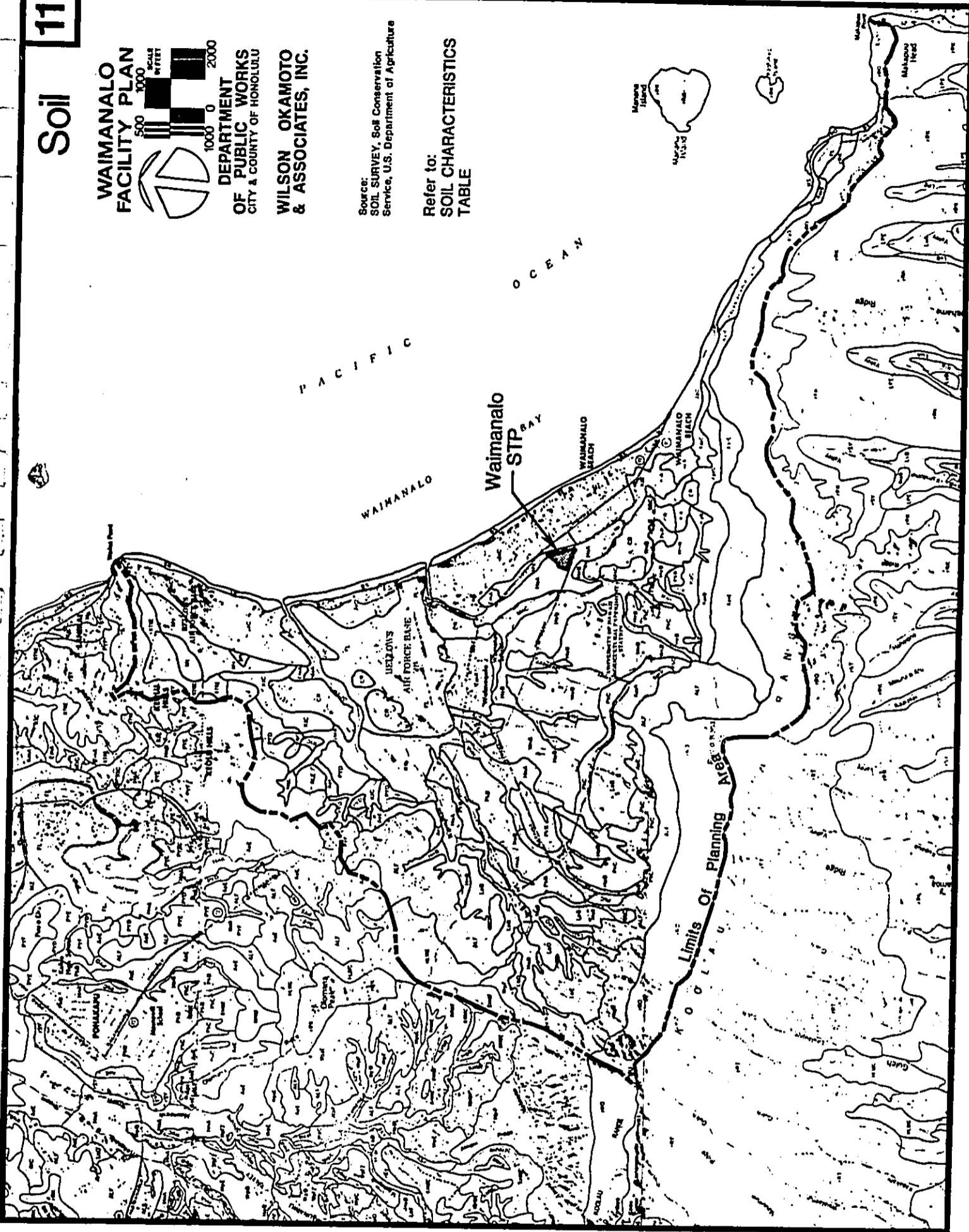


TABLE 3-1

CHARACTERISTICS OF SOIL TYPES FOUND IN THE
WAIMANALO PLANNING AREA

Map Symbol	Soil Type	Degree and Kind of Limitations for Septic Tank Filter Fields
KAENA - WAIALUA ASSOCIATION		
CR	Coral outcrop	NA
HeA	Haleiwa silty clay, 0-2% slopes	Slight, except where subject to local flooding
HeB	Haleiwa silty clay, 2-6% slopes	Ibid.
HnA	Hanalei silty clay, 0-2% slopes	Severe: high water table, subject to flooding
HnB	Hanalei silty clay, 2-6% slopes	Ibid.
HoB	Hanalei stony silty clay, 2-6% slopes	Ibid.
JaC	Jaucas sand, 0-15% slopes	Slight: rapid permeability
KaC	Kaena clay, 6-12% slopes	Severe: slow permeability, seepage
KaeB	Kaena stony clay, 2-6% slopes	Ibid.
KaeC	Kaena stony clay, 6-12% slopes	Ibid.
KaeD	Kaena stony clay, 12-20% slopes	Ibid.
KanE	Kaena very stony clay, 10-35% slopes	Ibid.
KfB	Kaloko clay, non-calcareous variant	Severe: slow to moderately slow permeability highwater table; poorly drained; marl layer at shallow depth (less than 20 inches.)
KlA	Kawaihapai clay loam, 0-2% slopes	Slight on 0-7% slopes; moderate on 7-15% slopes
KlaB	Kawaihapai stony clay loam, 2-6% slopes	Slight on 0-7%; stoniness
Ms	Mokuleia loam	Slight: loose sand at a depth of 20 inches; rapid permeability below a depth of 20 inches
Mt	Mokuleia clay loam	Ibid.
WnB	Waialua clay, 2-6% slopes	Slight on 0-8% slopes, moderate permeability. Moderate on 8-15% slopes; severe on slopes more than 15% stoniness in places
LOLEKAA - WAIKANE ASSOCIATION		
AeE	Alaeloa clay, 15-35% slopes	Slight on 3-7% slopes; moderate on 7-15% slopes; severe on slopes more than 15%
ALF	Alaeloa silty clay, 40-70% slopes	Ibid.
LoB	Lolekaa silty clay, 3-8% slopes	Slight on 3-8% slopes; moderate on 8-15% slopes; severe on slopes more than 15%
LoD	Lolekaa silty clay, 15-25% slopes	Ibid.

Table 3-1 (continued)

<u>Map Symbol</u>	<u>Soil Type</u>	<u>Degree and Kind of Limitations for Septic Tank Filter Fields</u>
LoE	Lolekaa silty clay, 25-40% slopes	Ibid.
PKB	Pohakupu silty clay loam, 0-8% slopes	Slight on 0-8% slopes; moderate on 8-15% slopes
PKC	Pohakupu silty clay loam, 8-15% slopes	Ibid.
WpF	Waikane silty clay, 40-70% slopes	Slight on 3-8% slopes; moderate on 8-15% slopes; severe on slopes more than 15%

ROCK LAND - STONY STEEP LAND ASSOCIATION

rRk	Rock land	NA
rRO	Rock outcrop	NA
klbc	Kawaihapai very stony clay loam, 0-15% slopes	Slight on 0-7% slopes; moderate on 7-15% slopes; stoniness

OTHERS

BS	Beaches	NA
EmA	Ewa silty clay loam, 0-2% slope	Slight: moderate permeability; severe where soil is moderately shallow
FL	Fill land, mixed	NA
HLMG	Helemano silty clay, 30-90% slopes	Severe on 30-90% slopes
KtC	Kokokahi clay, 6-12% slopes	Severe: slow and moderately slow permeability; seepage
KTKE	Kokokahi very stony clay, 0-35% slopes	Ibid.
MnC	Mamala stony silty clay loam, 0-12% slopes	Severe: coral at a depth of less than 20 inches; stony
PYD	Papaa clay, 6-20% slopes	Severe: slow permeability; slopes generally more than 10%
PYE	Papaa clay, 20-35% slopes	Ibid.
PYF	Papaa clay, 35-70% slopes	Ibid.

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

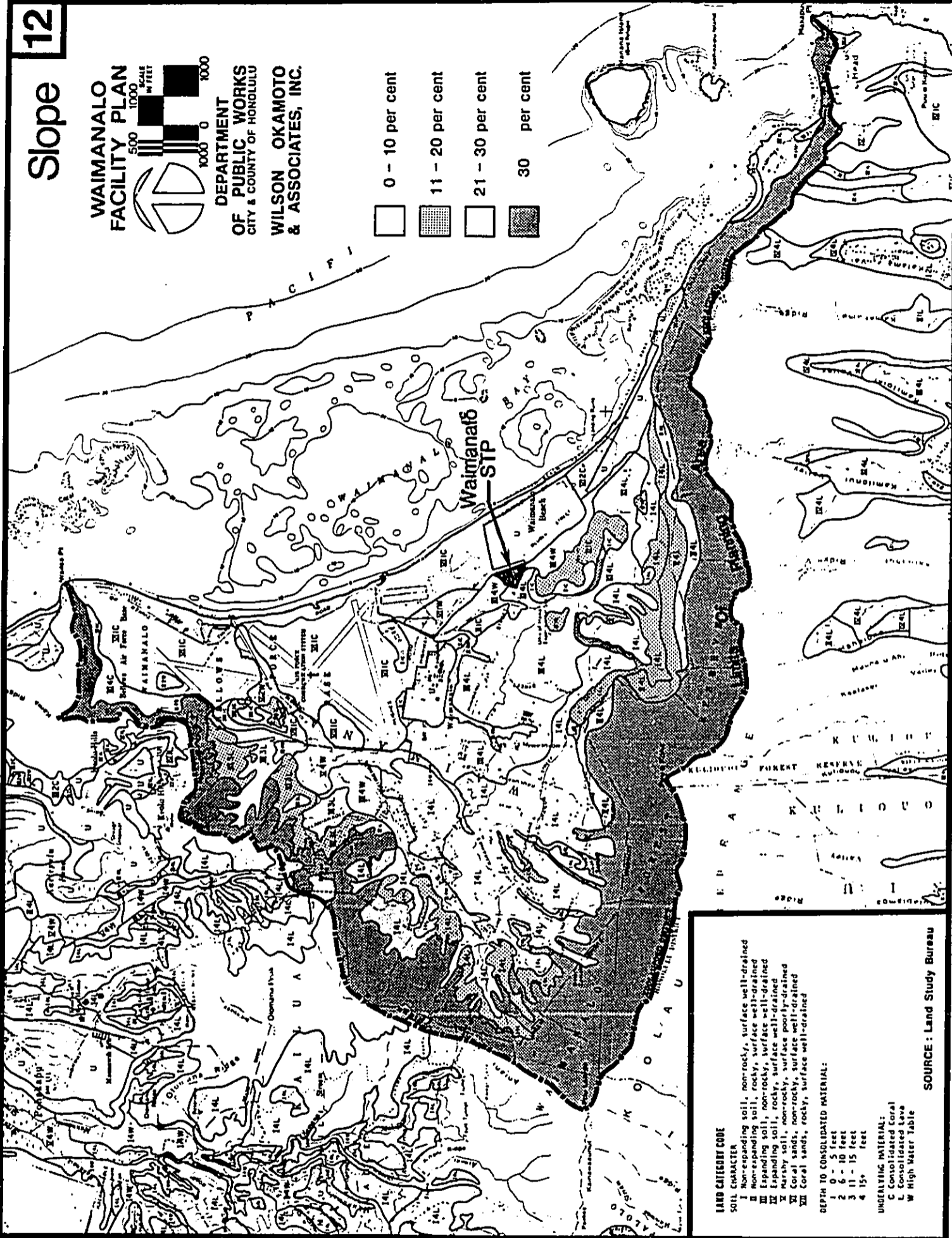
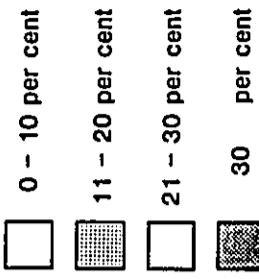
Slope

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LAND CATEGORY CODE
 SOIL CHARACTER
 I Non-expanding soil, non-rocky, surface well-drained
 II Non-expanding soil, rocky, surface well-drained
 III Expanding soil, non-rocky, surface well-drained
 IV Expanding soil, rocky, surface well-drained
 V Marshy soil, non-rocky, surface poorly-drained
 VI Coral sands, non-rocky, surface well-drained
 VII Coral sands, rocky, surface well-drained

DEPTH TO CONSOLIDATED MATERIAL:
 1 0 - 5 feet
 2 6 - 10 feet
 3 11 - 15 feet
 4 15+ feet

UNDERLYING MATERIAL:
 C Consolidated Coral
 L Consolidated Lava
 W High Water Table

SOURCE: Land Study Bureau

3.1.5 Hydrology

3.1.5.1 Streams

The two major stream systems that drain a large portion of the planning area are Waimanalo Stream and Inoaole Stream (See Figure 13). There are no designated wild, scenic or recreational river areas, pursuant to the federal Wild and Scenic Rivers Act.

The drainage basin for the Waimanalo Stream system is bounded by the Koolau Range, Aniani Nui Ridge and Waimanalo Bay, and encompasses a total area of approximately 4.9 square miles. This stream system is a network of water courses, including Waimanalo and Kahawai streams, draining into Waimanalo Bay. Two reservoirs, Kailua and Maunawili, are also situated in the upper basin area. Waimanalo Stream is perennial and measurements collected at a USGS gaging station located along its middle reach indicate an average flow of 5.0 cubic feet per second for all years of record. A secondary wetlands area has been identified along Waimanalo Stream (see Section 3.1.13).

The Inoaole Stream System drains an additional 3.3 square miles of land. Inoaole Stream is intermittent and the portion that lies in the flat coastal plains region of Waimanalo is affected by the tide.

3.1.5.2 Groundwater

Types of groundwater in Waimanalo include dike-impounded water, basal water, and perched (or alluvial) water (Waimanalo Watershed Plan and Environmental Impact Statement). The dike-impounded groundwater is stored in compartments in the Koolau Mountains where the rift zone of an extinct volcano was deeply eroded. This water is of high quality and is suitable for domestic use without the need for treatment. Basal water is restricted to calcareous sedimentary material and younger alluvium along the coast. This permeable rock stratum is overlain by caprock materials. The basal water is brackish and is presently not considered suitable for domestic use, but could serve as an important resource for future use. Groundwater perched above basal water is also generally of lower quality than dike-impounded water, but may also be important for future needs.

The City and County of Honolulu BWS has established a water conservation or "no pass" line to prevent the degradation of basal groundwater resources. In Waimanalo, this line is located just makai (seaward) of the Forest Reserve boundary in

Hydrology 13

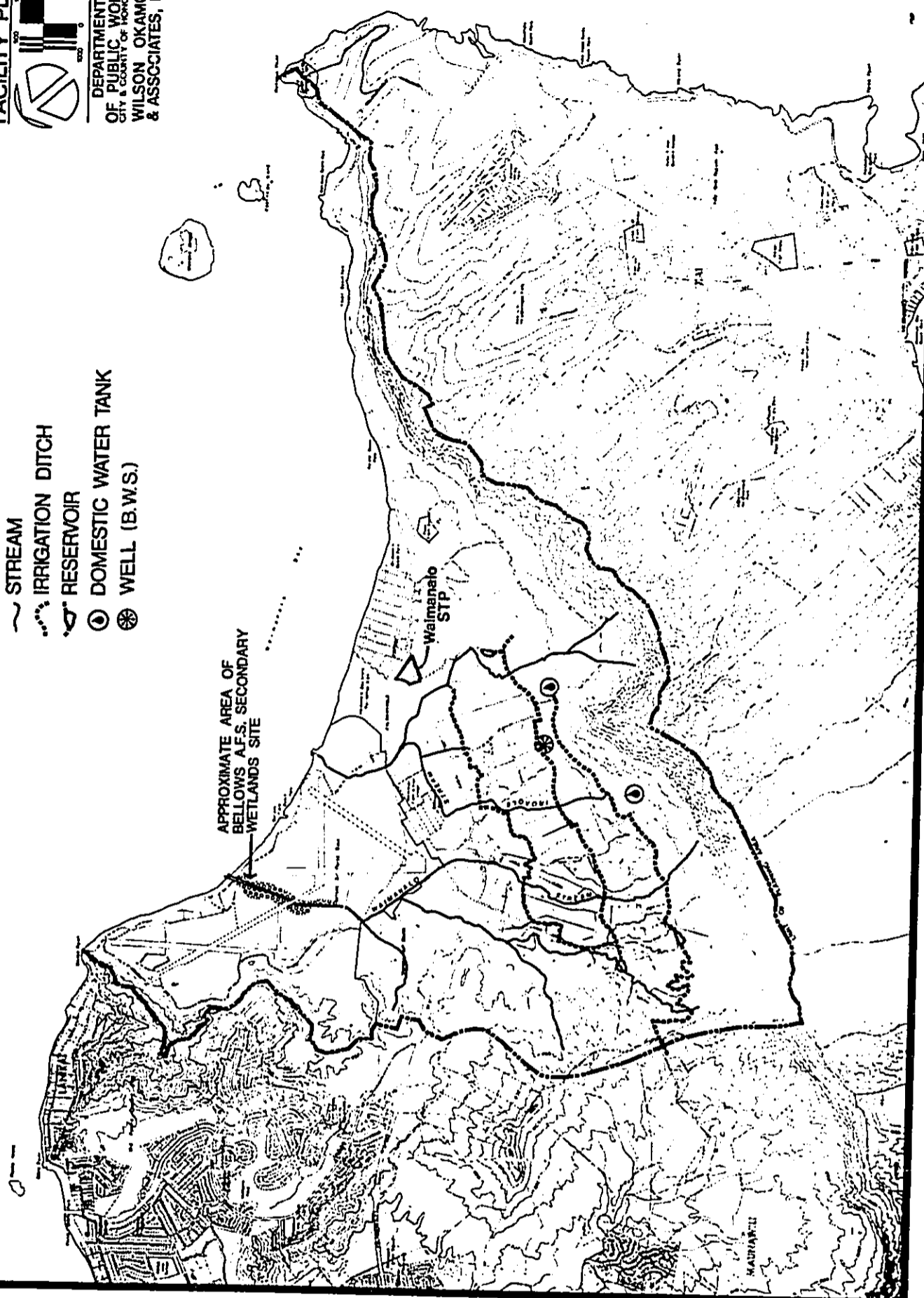
WAIMANALO
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- STREAM
- - - IRRIGATION DITCH
- ◡ RESERVOIR
- DOMESTIC WATER TANK
- ⊗ WELL (B.W.S.)

APPROXIMATE AREA OF
BELLOWS A.F.S. SECONDARY
WETLANDS SITE



the upper watershed, as shown in Figure 9. New cesspools are prohibited mauka (inland) of the "no pass" line. Very few cesspools are presently in use above the line because the line is located so far inland.

The State Department of Health has proposed another boundary under the State UIC Program to protect the quality of the State's underground sources of drinking water from pollution by subsurface disposal of fluids by well injection (proposed draft Chapter 23, Underground Injection Control, March 1, 1982). Individual cesspools for single-family dwellings are exempt under these regulations and will continue to be governed by the BWS "no pass" line. As shown in Figure 9, the proposed UIC boundary is situated seaward of the BWS line and includes a large portion of the Waimanalo area, however, the injection wells located at the existing Waimanalo Sewage Treatment Plant site are not affected by this boundary. The proposed UIC regulations and boundary are currently being revised, with adoption expected in 1983.

3.1.6 Water Quality

3.1.6.1 Streams

In accordance with Chapter 54 of Title 11, Administrative Rules, the State Department of Health has designated the inland waters in Waimanalo as Class 1 and Class 2. The Class 1 waters in Waimanalo are located in the forest reserve area along the eastern Koolau mountain ridgeline. These waters are to remain in their natural state as nearly as possible with an absolute minimum of human-caused pollution. The remaining inland waters are classified as Class 2 waters to protect their use for recreational purposes, propagation of fish and other aquatic life, and agricultural and industrial water supply.

Water quality data was monitored at a U.S. Geological Survey (USGS) gaging station located in the middle reach of Waimanalo Stream until 1975. Data compiled for this gaging station are summarized in Table 3-2. No USGS water quality data are available for Inoaole Stream.

The water quality of Waimanalo and Inoaole Streams was evaluated as part of the 1976 Flood Management Plans and Preliminary Engineering Studies for the Waimanalo Flood Control Project. Water quality data that were collected for both Waimanalo and Inoaole Streams on a short-term basis are presented in Table 3-3. From this study, both streams were

TABLE 3-2

USGS WATER QUALITY DATA FOR WAIMANALO STREAM
(Station No. 16249000)

<u>Parameter</u>	<u>Minimum Value</u>	<u>Maximum Value</u>	<u>Mean</u>
Suspended Solids (mg/l)	20.0	301.0	183.7
Turbidity (JTU)	0	5.0	1.5
pH	6.5	8.0	7.4
Dissolved Oxygen (mg/l)	6.4	8.6	7.4
Temperature (°C)	21.0	28.5	24.3
Conductance (micromhos/cm)	221.0	375.0	320.8

Source: File data from U.S. Geological Survey.

found to have generally satisfactory water quality, i.e., no unusual characteristics in terms of the various constituents that were measured. Subsequent testing conducted in conjunction with the Waimanalo Watershed Plan and Environmental Impact Statement, Waimanalo Watershed confirmed these findings.

Currently, there is some concern that cesspools may be contaminating surface waters in Waimanalo. High levels of coliform have been detected in these water bodies. However, because of the limited sampling data available, an extensive monitoring program will be required to identify the actual source(s) of surface water pollution. Existing livestock operations as well as cesspools may be contributing factors to the high observed coliform counts.

3.1.6.2 Groundwater

Recent groundwater quality data are extremely limited. Water drafted from the well, having the new BWS well designation number of 2043-02 (See Figure 13), recorded a chloride concentration of 38 mg/l in 1975 (City and County of Honolulu, Board of Water Supply). Studies have also been conducted at the Waimanalo plant site by the University of Hawaii during their investigation of shallow well disposal. In 1980, groundwater samples taken by the University of Hawaii at a depth between 5 and 15 feet had the following constituent concentrations:

Chloride	= 320 mg/l;
Total Dissolved Solids	= 1470 mg/l; and
Total Alkalinity	= 600 mg/l.

TABLE 3-3
SHORT-TERM WATER QUALITY DATA FOR WAIMANALO AND INOAOLE STREAMS

Date*	Sta.	Temp.	D.O.	pH	Turbidity	SS	NO ₂ +NO ₃ -N	Kjel-N	Tot-N	Tot-P	Coliform	
											Fecal	Total
		OC	mg/L		ftu	mg/L	mg/L	mg/L	mg/L	mg/L	No./100ml	No./100ml
Waimanalo Stream												
Nov 18, '74	1	23	4.1	7.5	42	12.5	1.5	2.0	3.5	0.223	2,400	2,400
Dec 3, '74	1	23	4.8	7.5	1.7	4.4	0.51	0.47	0.98	0.094	330	1,500
Dec 10, '74	1	23.5	6.0	7.7	2.4	7.3	0.48	0.53	1.0	0.093	3,300	7,900
Jan 13, '75	1	22	5.7	7.3	28	42	2.4	0.64	3.0	0.217	13,000	15,000
Nov 18, '74	2	22	5.9	7.6	13	13	0.46	0.43	0.89	0.112	2,400	2,400
Dec 3, '74	2	23	8.1	7.5	2.1	4.7	4.1	0.01	4.1	0.094	4,900	17,000
Dec 10, '74	2	24	9.0	7.6	1.8	5.3	4.6	0.03	4.6	0.097	11,000	54,000
Jan 13, '75	2	23	6.8	7.4	9.7	18	1.3	0.52	1.8	0.094	24,000	54,000
Nov 18, '74	3	24	8.9	7.5	13	6.0	1.7	1.2	2.9	0.485	2,400	2,400
Dec 3, '74	3	25	1.4	7.4	2.8	3.1	3.6	0.36	4.0	0.224	130	280
Dec 10, '74	3	24.5	3.0	7.7	1.4	2.8	4.2	0.03	4.2	0.205	49	1,300
Jan 13, '75	3	23	8.5	7.4	9.7	7.8	2.5	0.18	2.7	0.164	7,900	24,000
Inoaole Stream												
Dec 3, '74	4	25	3.9	7.5	4.1	4.9	1.0	0.81	1.8	0.097	790	3,300
Dec 10, '74	4	23.5	6.1	7.7	4.9	6.2	1.6	0.41	2.0	0.105	3,300	3,300
Nov 18, '74	5	23.5	2.2	7.6	17	4.0	2.2	0.59	2.8	0.288	920	1,600
Jan 13, '75	5	23	3.7	7.6	26	32	3.2	2.6	5.8	0.862	3,300	13,000
Jan 13, '75	6	23	5.7	7.1	25	7.0	7.8	0.32	8.1	0.367	3,300	18,000
Jan 13, '75	7	22.5	4.4	7.7	24	49	3.7	22	26	5.470	92,000	100,000

* The November 18, 1974 and January 13, 1975 samples represent wet weather flow, whereas the December 3 and 10, 1974 samples represent dry weather flow.

Source: Fukunaga and Associates, Inc. (August, 1976) Flood Management Plans and Preliminary Engineering Studies for the Waimanalo Flood Control Project. Prepared for the State of Hawaii, Department of Land and Natural Resources, Division of Water and Land Development.

3.1.7 Coastal Waters

3.1.7.1 Waimanalo Bay and Beach

A description of Waimanalo Bay and Beach is provided in the report entitled Beach and Surf Parameters in Hawaii. Waimanalo Beach stretches approximately 5.5 miles between Wailea Point and Makapuu Point, and is the longest continuous sand beach on the island of Oahu. It is stable and subject only to relatively small seasonal changes.

The bay is protected by a barrier reef that lies approximately one mile off-shore, except at the southeast end where the reef is about 500 yards from the shore. The central portion of the reef is about 10 to 12 feet deep, but at the northwest and southeast ends, the reef is relatively shallow. Numerous rip channels cut through the reef. Within the bay there are areas of sand deposits and patches of coral reef. Major features include a sand channel across the northern portion of the bay and a sand reservoir offshore from the Bellows Air Force Station. Beyond the reef, there is a uniform and fairly rapid drop in the ocean bottom.

The significant wave height at Waimanalo Bay may range from 1 to 13 feet, with a mode of 3 feet. Wave conditions range in period from 6 to 18 seconds.

Water circulation within Waimanalo Bay is complex and does not follow a specific pattern. Northwesterly currents prevail over most of the outward portion of the bay; however, the currents reverse at times, especially in shallow water. Circulation within the bay is weak and has a negligible influence on sand transport. Wave-induced currents in the surf zone, however, have a significant influence on sediment transport.

3.1.7.2 Water Quality

According to Chapter 54 of Title 11, State Department of Health Administrative Rules, the marine waters along Waimanalo are classified as Class AA and A. From Kaiona Beach Park to Makapuu Point, the waters are designated as class AA waters. The objective of this classification is to maintain the waters in their natural pristine state as nearly as possible with an absolute minimum of human-caused pollution or alteration of water quality. The marine waters along the remaining Waimanalo coastline are classified as Class A waters to protect their use for recreational purposes and aesthetic enjoyment.

The water quality of Waimanalo Bay was examined for the 1976 Flood Management Plans and Preliminary Engineering Studies for the Waimanalo Flood Control Project. At the time of sampling, certain water quality parameters sampled in the nearshore waters around Waimanalo Beach did not meet the governing State of Hawaii Water Quality Standards for Class A waters. Evidence of debris and terrestrial sediments near the stream mouths indicated that agricultural wastes, suspended materials, and soils were being transported to the beach area. Parameters exceeding the established standards included total nitrogen and phosphorous levels. However, acceptable levels of pH and dissolved oxygen were found, and total coliform concentrations were generally low. Although the State water quality standards have since been revised these findings provide a general indication of the overall water quality of Waimanalo Bay.

3.1.8 Flood Hazard

3.1.8.1 Flooding

Flooding of large areas in Waimanalo Valley during severe rainstorms has primarily been attributed to small carrying capacities of streams, inadequate road undercrossings (private bridges), and low-lying coastal plains. During past severe storms, there has been extensive damage to residential and commercial properties, agricultural crops, livestock, roads and highways, automobiles, fences, bridges, and the shoreline. The 1976 Flood Management Plans and Preliminary Engineering Studies for the Waimanalo Flood Control Project were prepared to prevent future flood hazards in the Waimanalo area.

Figure 14 presents the flood plains and floodways for the Waimanalo planning area as delineated by the Flood Insurance Rate, and Flood Boundary and Floodway Maps prepared for the City and County of Honolulu. The existing Waimanalo Sewage Treatment Plant is located within the 100-year flood boundary. The site is designated as an area of shallow flooding, with an average depth of 1 foot (Zone AO). The proposed STP improvements are subject to the provisions of City Ordinance 80-62, relating to Flood Hazard Districts and would require approval from the City and County of Honolulu, Department of Land Utilization.

3.1.8.2 Tsunami Inundation

During the major tsunamis that have occurred in Hawaii (1946, 1952, 1960), inundation along the Waimanalo coastline ranged between six and nine feet above the mean lower-low water level. There were no reports of shore erosion or property damage.

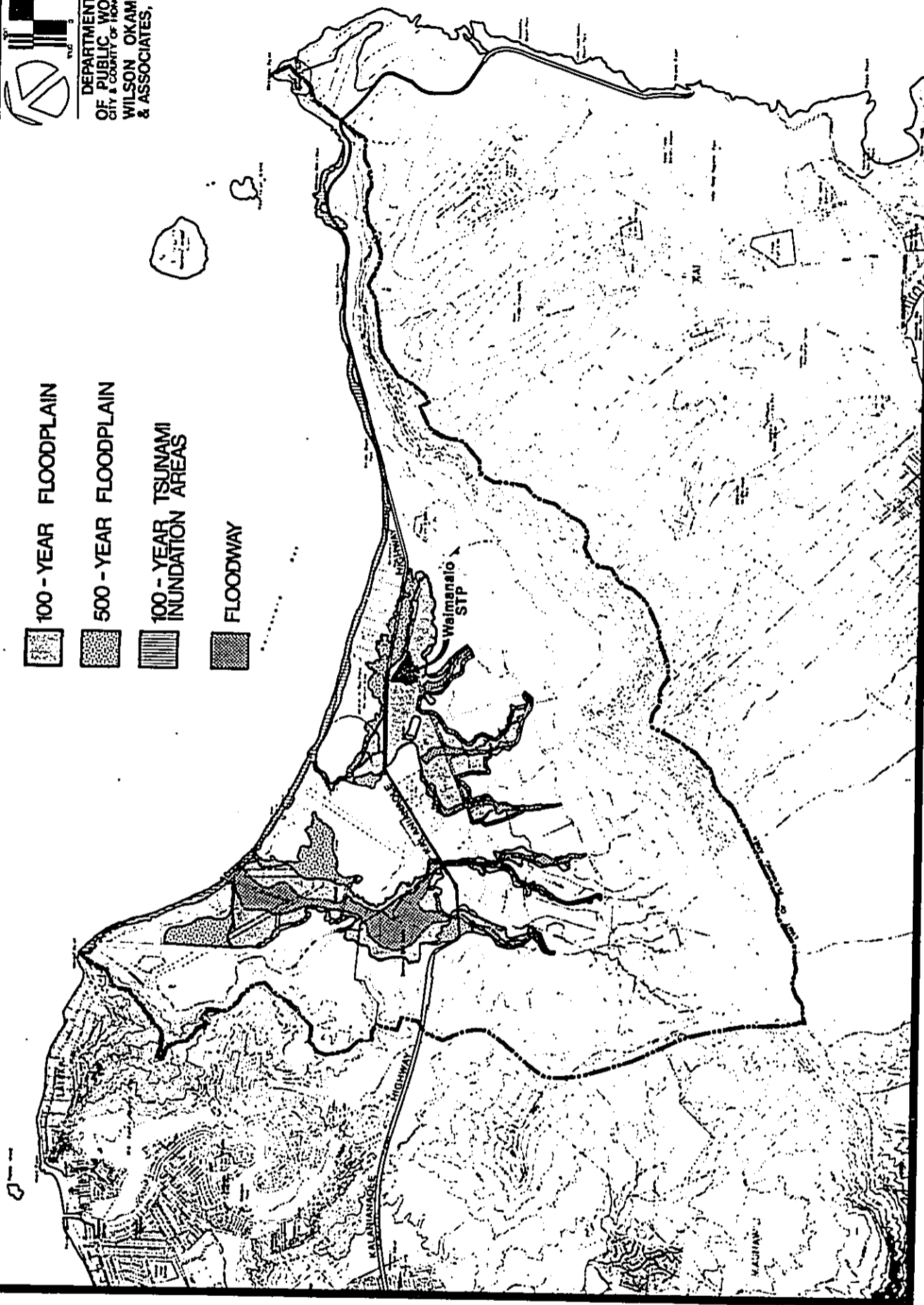
Flood/Tsunami Inundation Areas 14

WAIMANALO
FACILITY PLAN



DEPARTMENT
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CITY & COUNTY OF HONOLULU
WILSON OKAMOTO
& ASSOCIATES, INC.

- 100 - YEAR FLOODPLAIN
- 500 - YEAR FLOODPLAIN
- 100 - YEAR TSUNAMI INUNDATION AREAS
- FLOODWAY



Waimanalo is located along the southeastern coast of Oahu and is potentially vulnerable to tsunamis from all directions. However, the wide shallow reef extending about a quarter mile from the Waimanalo shoreline offers good protection to the area. The existing Waimanalo Sewage Treatment Plant is not located within the coastal high hazard zone or tsunami inundation area, as shown on Figure 14.

3.1.9 Air Quality

Waimanalo is not situated within an air quality maintenance or non-attainment area. Vehicular traffic and the coral quarry, operated by Pacific Concrete and Rock, are the major sources of air pollution in Waimanalo. However, the impact of these pollution sources is not considered to be significant. The rural character of the area and the prevailing northeast tradewinds help to keep pollution levels low. This is confirmed by air quality samples of particulate matter collected at the Waimanalo Sewage Treatment Plant monitoring site. Low concentrations of particulate matter have been reported and none of the samples collected from 1973 through 1978 have exceeded Hawaii's air quality standards.

The Waimanalo STP has not received any complaints of odor emanating from the plant.

3.1.10 Noise Levels

Existing noise levels in Waimanalo are generally low as a result of the rural lifestyle of the community. Vehicular traffic is the primary noise generator in the area, particularly along the major thoroughfare, Kalaniana'ole Highway. Another source of noise is the Pacific Concrete and Rock quarry. However, levels generated from the quarry site are not considered to be significantly high. There have been no complaints of noise attributable to the existing Waimanalo Sewage Treatment Plant.

3.1.11 Flora and Fauna

3.1.11.1 Flora

Flora within the Waimanalo planning area can be generally categorized into three sub-zones: conservation, cultivated plains, and shoreline (Flood Management Plans and Preliminary Engineering Studies for the Waimanalo Flood Control Project). The conservation zone, which includes the upper watershed and forest reserve regions, is characterized by panicum, Hilo grass, guava, staghorn fern, ohia-lehua, koa, and honohono grass. The cultivated plains include truck and diversified agricultural crops. The shoreline zone contains Kiawe, coconut, ironwood, koa haole, lantana, ilima, pili grass, Bermuda grass, and bristly foxtail.

3.1.11.2 Fauna

The inventory of fish and wildlife in the Waimanalo area is provided by the Waimanalo Watershed Plan and Environmental Impact Statement. The wetlands at Bellows Air Force Station provide habitat for four endangered endemic waterbird species. These waterbirds are the Hawaiian Duck (Anas wyvilliana), Hawaiian Coot (Fulica americana alai), Hawaiian Gallinule (Gallinula chloropus sandvicensis), and Hawaiian Stilt (Himantopus mexicanus knudseni).

A variety of other bird species has also been observed in Waimanalo Valley, including common mynahs, barred doves, spotted doves, Japanese white-eyes, red-crested cardinals, spotted munias, red-vented bulbuls, house sparrows, and cattle egrets.

Wildlife which typically inhabit the upper watershed region and open agricultural lands include feral dogs and cats, mongoose, and rats.

Aquatic fauna in Kailua Reservoir and Waimanalo Stream have also been recorded. Bullfrogs, tilapia, and mosquito fish have been observed in Kailua Reservoir. The aquatic fauna collected in Waimanalo Stream include the Hawaiian prawn, Tahitian prawn, goby, guppy, and green swordtail.

The fish and wildlife habitat in the area is not unique (Waimanalo Watershed Plan and Environmental Impact Statement). Most of the fauna found in the area are common introduced species, with the exception of the endangered waterbirds, Hawaiian shrimp, and goby.

3.1.12 Historic and Archaeological Sites

Four historic and archaeological sites in the Waimanalo planning area have been placed either on the Hawaii or National Register of Historic Places. Registered sites are listed in Table 3-4 and shown on Figure 15.

In addition, the Waimanalo Irrigation Ditch System has been determined eligible for the National Register of Historic Places (Waimanalo Watershed Plan and Environmental Impact Statement). The ditch system is presented in Figure 13 and described in Section 3.3.1.1.

3.1.13 Wetlands

The wetlands area at Bellows Air Force Station is categorized as a secondary area for endangered waterbirds by the Hawaiian Waterbirds Recovery Plan. Secondary areas, where

TABLE 3-4

HISTORIC PLACES IN THE WAIMANALO PLANNING AREA

Hawaii Register of Historic Places No.	Site	Location (TMK)	Register Status*
80:15:382	Pohakunui Heiau	4-1-27:22	sa
80:15:511	Bellows Field Archaeological Area	4-1-15:1,15	N
80:15:1031	Heiau	4-1-08:5	S
80:15:1037	Pahonu Turtle Pond	4-1-02:7	sa

- * S = Placed on the Hawaii Register of Historic Places.
 N = Placed on the National Register of Historic Places.
 a = Recommended for nomination to the National Register.

Source: Hawaii Historic Places Review Board. Hawaii Register of Historic Places. Revised December 30, 1981.

small numbers of birds exist, are of lesser importance. Currently, the wetlands are managed for endangered waterbirds through a cooperative agreement between the U.S. Fish and Wildlife Service, State Department of Land and Natural Resources, and U.S. Air Force. The approximate area of the site, consisting of ditches, streams and adjoining marsh lands, is 56 acres (see Figure 13).

3.1.14 Agricultural Lands of Importance

Agricultural lands are classified according to the Agricultural Lands of Importance to the State of Hawaii system. There are three classes of agriculturally important lands: prime agricultural, unique agricultural, and other important agricultural lands.

(1) Prime Agricultural Land - Land which has the soil quality, growing season, and moisture supply needed to produce sustained high yields of crops economically when treated and managed according to modern farming methods.

(2) Unique Agricultural Land - Land that has the special combination of soil quality, location, growing season, and moisture supply necessary to produce sustained high quality and high yields of a specific crop when treated and managed according to modern farming methods.

(3) Other Important Agricultural Land - Land other than Prime or Unique Agricultural Land that is also of Statewide or local importance for agricultural use.

In Waimanalo, Prime and Other Important Lands have been identified, as shown in Figure 16. Together, these two land classes comprise a major portion of the Waimanalo valley floor. Approximately 2,170 acres, excluding military and residential lands, are classified as Prime and Other Important farmlands (Waimanalo Watershed Plan and Environmental Impact Statement). There are no Unique lands classified in the area. The existing STP site is within the State Urban District and is situated on land not classified by the Agricultural Lands of Importance to the State of Hawaii system.

3.1.15 Recreational and Open Space Resources

Waimanalo contains numerous inland and shoreline recreational and open space resources. Existing resources in the planning area are listed in Table 3-5. Among the outstanding features in the region are Waimanalo Bay and the beach that extends along the shoreline. The existing sewage treatment plant is situated in close proximity to the Waimanalo Bay State Recreation Area.

3.2 SOCIOECONOMIC CHARACTERISTICS

3.2.1 Demographic Data

3.2.1.1 Existing Population and Housing Count

Current population estimates for Waimanalo are based on data from the 1980 Census. The facility planning area boundaries match the boundaries of Census Tract No. 113 fairly closely and are considered the same for all practical purposes.

As shown in Table 3-6, the 1980 population of Waimanalo was 9,132. Between 1970 and 1980, the Waimanalo population increased at an average annual rate of 3.03 percent. The housing count increased at a slightly faster rate, 4.07 percent, than the population rate during the same time period. There were 2,217 housing units in Waimanalo in 1980.

The number of persons per housing unit decreased slightly between 1970 and 1980. In 1980, there were 4.12 persons per housing unit, compared to 4.55 persons per housing unit in 1970.

Agricultural Lands of Importance 16

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Prepared with the assistance of the Soil
Conservation Service, United States Department
of Agriculture, University of Hawaii

- PRIME AGRICULTURAL LAND
- OTHER IMPORTANT AGRICULTURAL LAND

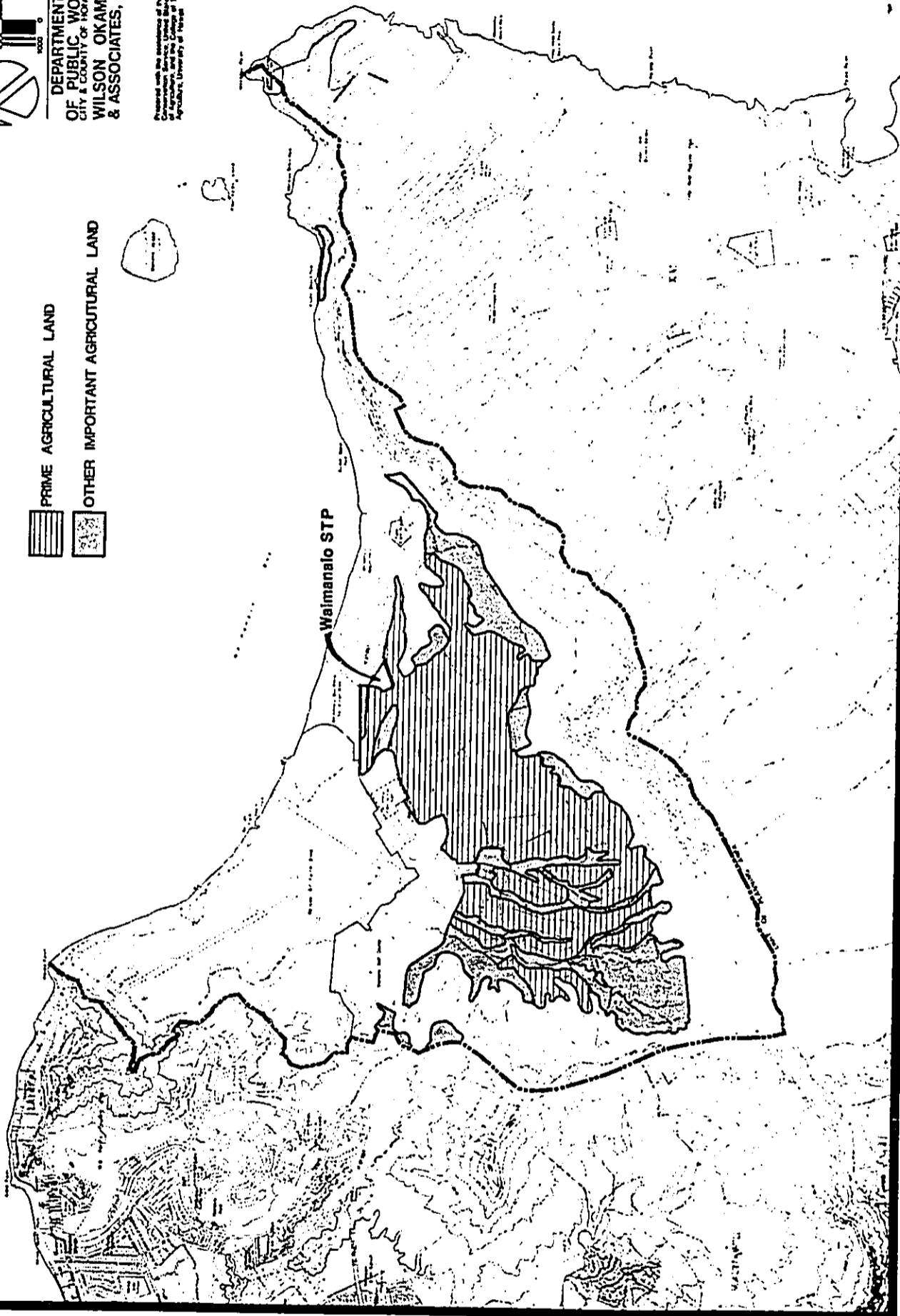


TABLE 3-5

EXISTING RECREATIONAL AND OPEN SPACE RESOURCES IN THE
WAIMANALO PLANNING AREA

<u>Recreational and Open Space Resources</u>	<u>Organizational or Governmental Jurisdiction</u>	<u>Acreage</u>	<u>Comments</u>
Bellows U.S.A.F. Station	Federal	32	
Waimanalo Bay State Recreation Area	State	124	
Waimanalo Forest Reserve	State	3,293	
Bellows Field Beach Park	County	54	
Kaiona Beach Park	County	4	State land
Kaupo Beach Park	County	8	State land; undeveloped
Makapuu Beach Park	County	47	State land
Waimanalo Community Beach Park	County	38	State land
Waimanalo District Park	County	25	
Olomana Golf Links	Private	130	

Source: Aotani & Hartwell Associates, Inc. Hawaii State
Comprehensive Outdoor Recreation Plan Technical
Report. Prepared for State Department of Planning
and Economic Development. Updated February 1982 by
Wilson Okamoto & Associates. December 1975.

TABLE 3-6

POPULATION AND HOUSING DATA FOR THE WAIMANALO
PLANNING AREA (CENSUS TRACT NO. 113)

<u>Demographic Parameter</u>	<u>1970</u>	<u>1980</u>	<u>Ten Year Increase</u>	<u>Average Annual Increase</u>
Resident Population	6,777	9,132	34.7%	3.03%
Housing Units	1,488	2,217	49.0%	4.07%
Persons/Housing Unit	4.55	4.12	-9.5%	-0.99%

Sources: U.S. Department of Commerce, Bureau of the Census.
1970 Census of Housing. August 1971.
State Department of Planning and Economic
Development. Statistical Report 143.
March 18, 1981.

3.2.1.2 Population Projections

The population projections for all Facility Plan areas are presented in the 208 Water Quality Management Plan for the City and County of Honolulu. The projections were based on the Series II-F projections developed by the State Department of Planning and Economic Development and the Oahu General Plan population distribution percentages. The projected population of Waimanalo during the 20-year facility planning period from 1985 to 2005 is listed in Table 3-7.

According to the projections, the population is expected to increase from 9,700 to 12,000, or about 24 percent between 1985 and 2005. This represents a very low average annual growth rate of only 1.1 percent. The anticipated growth rate is even lower than the 1.4 percent average annual rate of natural increase (live births over deaths) experienced statewide between 1970 and 1980. The 3 percent average annual growth rate experienced in Waimanalo between 1970 and 1980 is also higher than the projected growth rate expected during the planning period.

Much concern has recently been expressed by government officials and residents regarding the agricultural lots in Waimanalo Valley. Many of these lots carried deed restrictions which prohibited subdivision and non-agricultural use of parcels. The restrictive periods for most of these lots will be expiring within the near future. The future disposition of these lands is uncertain. Minimum agricultural lot sizes are

TABLE 3-7

POPULATION PROJECTIONS FOR THE WAIMANALO PLANNING AREA
BETWEEN THE YEARS 1985 AND 2005

<u>Year</u>	<u>Projected Population</u>
1985	9,700
1990	10,100
1995	10,600
2000	11,000
2005*	12,000

*Provided by City and County of Honolulu, Department of Public Works, Division of Wastewater Management.

Source: State of Hawaii, Department of Health, and City and County of Honolulu. Water Quality Management Plan for the City and County of Honolulu. December 1980.

two acres, and three acres for livestock or poultry according to the City Comprehensive Zoning Code. Extensive subdivision of agricultural parcels would result in an increase in housing units, population, and density outside of the urban activity areas.

3.2.2 Economic and Social Profile

3.2.2.1 Existing Community Character

Waimanalo is characterized as a rural community and has contributed significantly to the agricultural industry on Oahu (Waimanalo Agricultural Park Phase I Environmental Impact Statement). Currently, agriculture in Waimanalo is diversified, utilizes 21 percent of the land, and generates a gross income in excess of \$12 million annually. Major agricultural activities conducted in the valley include dairy and poultry operations, nurseries, and truck crops.

In general, commercial development is limited in Waimanalo. Sea Life Park is the major commercial activity located in the area. It is considered to be a significant visitor attraction on Oahu. Other Waimanalo stores and businesses are primarily neighborhood convenience type of establishments which serve the needs of local area residents. Most Waimanalo residents shop and conduct business activities outside the area in Kailua-Kaneohe or Honolulu (Waimanalo Watershed Plan and Environmental Impact Statement).

Most residents also commute to Honolulu and other areas for employment. In Waimanalo, the unemployment rate was 5.5% in 1979, according to statistics provided by the State Department of Labor and Industrial Relations. This is slightly less than the islandwide rate of 6.7% for the same year.

There is a high proportion of Hawaiians and part Hawaiians in Waimanalo (1980 Neighborhood Data Book: Waimanalo). This ethnic group accounted for 48 percent of the residents compared to 15 percent for Oahu as a whole. Also, the population is generally comprised of larger households. Approximately two-thirds of the Waimanalo households contain four or more persons. Income levels on the whole are lower than for the rest of Oahu. Nearly three-fourths of the households in Waimanalo have incomes below the 1979 Oahu median household income of \$20,700.

The block survey also indicated a predominance of single family housing in Waimanalo. More than three-fourths of the housing were single family units. Owner-occupied units also accounted for approximately three-fourths of the housing in Waimanalo. The current vacancy rate in Waimanalo is nearly 4 percent.

A 1980 Waimanalo Neighborhood Board survey revealed that residents favor retention of the area's rural character. There was strong opposition to urbanization of Waimanalo's agricultural land and especially to construction of multi-family dwelling units.

3.2.2.2 Economic Projections

Diversified agriculture is anticipated to continue to be the mainstay of Waimanalo's economic base in the foreseeable future. There is considerable potential for agricultural development of vacant and underutilized lands in Waimanalo. The State recognizes the importance of Waimanalo to the diversified agricultural industry and plans to develop an agricultural park that will encompass approximately 1,800 acres in the region. The park will help to meet the local demand for diversified agricultural crops, particularly bananas and ornamental potted plants. A major constraint in the future growth of agriculture in the planning area is the quantity, quality, and cost of water for irrigation.

The potential for expansion of other economic sectors is limited. It is expected that future commercial development will largely occur in the retail and service sections to satisfy the demand of local area residents.

Currently, most Waimanalo residents commute to other areas for employment because of the limited job opportunities in the area. This trend is anticipated to continue for the foreseeable future. Future commercial and industrial developments in Waimanalo are not expected to substantially expand the area's employment base.

3.2.3 Existing Land Use

Existing land uses in Waimanalo as of December, 1979 are listed in Table 3-8 and presented in Figure 17. These data were obtained from the City & County of Honolulu, Department of Land Utilization. Because there have been no major land use changes since 1979, the acreage estimates are considered to be representative of the current situation. The Waimanalo area is defined as the entire Census Tract No. 113.

As shown in Table 3-8, most of the land in Waimanalo is open space or used for agriculture. Agricultural uses are primarily situated in the central plains area and the forest reserve encompasses much of the upper watershed region along the Koolau Mountain Range. Military use at Bellows Air Force Station also accounts for a sizable portion of the existing land use in Waimanalo. Only 8 percent of the land is committed for residential purposes. Most of the residential development is low density single family houses clustered along Kalaniana'ole Highway. Waimanalo Beach and the coastal region are considered to be valuable recreational resources in the area. Public and private recreational areas account for approximately 4 percent of the land.

3.2.4 Land Ownership

Land ownership in Waimanalo can generally be divided into three categories: Federal government, State government, and fee simple private ownership (Waimanalo Watershed Plan and Environmental Impact Statement, Waimanalo Watershed). The State government is by far the largest land owner with approximately 4,050 acres or two-thirds of the land. Portions of these State lands have been developed for housing by the State Department of Hawaiian Home Lands and the Hawaii Housing Authority. Other State lands have been leased to farmers under general leases or revocable permits. The Federal government owns more than 900 acres at Bellows Air Force Station. The remaining acreage is owned in fee simple by numerous owners.

Existing Land Use & Proposed Developments 17

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- URBAN
- PARKS & RECREATION
- AGRICULTURE
- MILITARY
- FOREST RESERVE

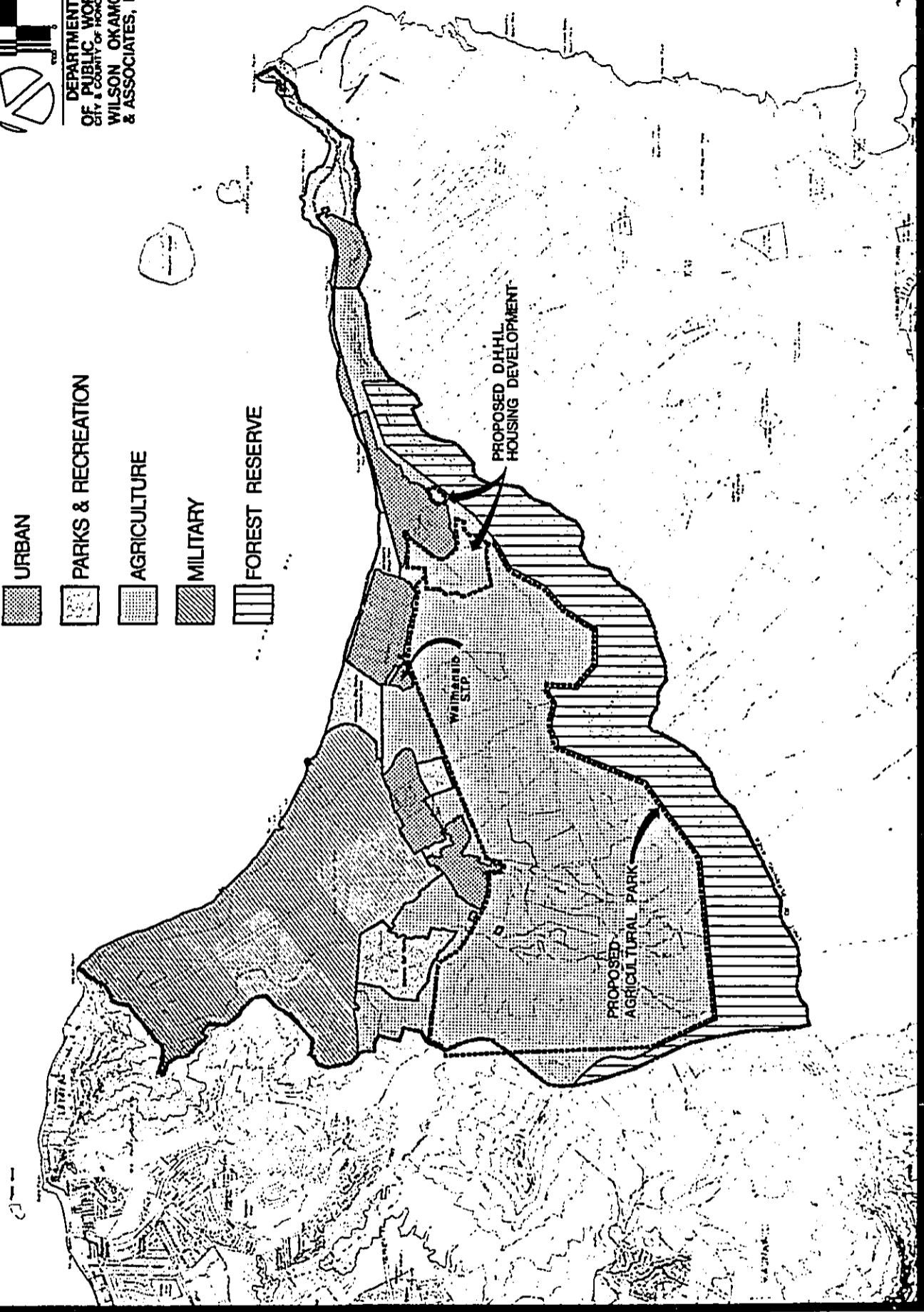


TABLE 3-8

EXISTING LAND USE WITHIN THE WAIMANALO
PLANNING AREA (CENSUS TRACT NO. 113)
AS OF DECEMBER 1979

<u>Land Use</u>	<u>Land Area (acres)</u>	<u>Percent of Total</u>
Residential	564.91	8.1
Commerical	100.82	1.5
Hotel	0.40	*
Public & Quasi-public Buildings	42.69	0.6
Recreational	299.59	4.3
Agricultural	1,447.13	20.8
Quarry	43.20	0.6
Military	918.90	13.2
Forest Reserve	1,414.59	20.4
Vacant Usable	1,545.22	22.2
Undevelopable & Other Open Space	515.75	7.4
Other	56.54	0.8
Total	6,949.74	99.9

*less than 0.1 percent.

Source: City and County of Honolulu, Department of Land Utilization.

3.2.5 Proposed Projects in Waimanalo

3.2.5.1 Waimanalo Watershed Plan

The proposed Waimanalo Watershed Plan is jointly sponsored by the State Department of Land and Natural Resources, Windward Oahu Soil and Water Conservation District, and U.S. Department of Agriculture Soil Conservation Service.

The objectives of the plan are as follows:

1. To improve agricultural water management through modernization of the existing antiquated irrigation system;
2. Use treated sewage effluent for irrigation;
3. Retain prime and important farmland in agricultural use;

4. Protect and preserve portions of the Waimanalo Irrigation System which may have historic value; and
5. Improve health and aesthetic quality through the provision of adequate solid waste collection sites.

The plan is closely integrated with the State's proposed plan for the Waimanalo Agricultural Park which is described in the next section.

According to the Watershed Plan, a total of 1,252 acres will be irrigated. The following are the major actions proposed by the plan:

1. Replace the existing Waimanalo Irrigation System with a gravity-pressure, piped distribution system capable of providing continuous service at full demand to 890 acres;
2. Construct a deep, off-channel reservoir for storage regulation and nematode control;
3. Develop a separate system for irrigating 68 acres with treated sewage effluent;
4. Continue BWS service to 294 acres;
5. Provide accelerated technical assistance; and
6. Provide solid waste convenience stations.

3.2.5.2 Waimanalo Agricultural Park

The State Department of Land and Natural Resources and State Department of Agriculture propose to develop an agricultural park in Waimanalo that will total approximately 1,800 acres in size, as shown in Figure 17. The agricultural park is intended to centralize compatible agricultural enterprises in order to lower capital improvement and operating costs. At Waimanalo, diversified agricultural crops such as bananas, flowers, tomatoes, and nursery products will be grown.

The development of the Waimanalo Agricultural Park is expected to proceed in five phases. Construction of Phase I is expected to be completed in 1984. There is presently no schedule for implementation of the remaining phases.

Phase I: Subdivision of 475 acres (TMK 4-1-08:13) into 17 lots, of which only 16 lots, or 120 acres, have

the potential for crop production; the remaining 355-acre lot will be used for grazing. Other improvements include construction of an internal roadway, 16-inch diameter waterline system, and electrical and street lighting systems.

Phase II: Construction of a 60-million gallon reservoir and replacement of open ditches with pipes.

Phases III & IV: Further replacement of ditches.

Phase V: Development of remaining agricultural lands.

The agricultural park plan includes utilization of treated effluent from the Waimanalo STP. Studies for the plan indicate that the Waimanalo STP effluent would be acceptable from a public health standpoint for specific irrigation use within the proposed agricultural park.

3.2.5.3 Development of Hawaiian Home Lands

The State Department of Hawaiian Home Lands (DHHL) is planning further development of its lands at Waimanalo. Under the Hawaiian Homes Act of 1920, DHHL has the responsibility to provide single-family residential lots for eligible native Hawaiians. According to DHHL records, there are currently 1,847 applications for lots at Waimanalo.

Four alternative schemes for residential development in Waimanalo have been proposed in the 1979 Waimanalo Development and Master Plans for Hawaiian Home Lands. The total development area for the plan is 289 acres, of which 109 acres are owned by DHHL and 180 acres by the State of Hawaii. State lands are included to provide more residential lots as well as to improve the use of the irregular-shaped DHHL lands. Maximum development of these lands would result in 1,050 new house lots, an elementary school, a park, community facilities, and related infrastructure improvements.

The alternative recommended by the plan and currently being pursued by DHHL involves only a portion of the entire development area. The remaining areas may be developed sometime in the future; however, no firm schedule is currently available. Due to this uncertainty, only the lots proposed under the recommended alternative are included in the Waimanalo Facility Plan projections.

Under the recommended alternative, DHHL proposes to develop 314 lots with a minimum lot size of 7,000 square feet. The development area is approximately 109 acres and is located in the vicinity of the existing DHHL homesteads, as shown in

Figure 17. The Pacific Concrete and Rock Company currently leases 85 acres of this total area. The remaining 24 acres can be developed by the DHHL upon completion of the Makapuu Interceptor.

Additional residential developments being proposed by DHHL include extensions of the existing homesteads area, referred to as Sites A and B. Development of both sites is contingent upon completion of the Makapuu Interceptor. Site A includes 10.6 acres of land to be subdivided into 38 lots. Site B includes 3.9 acres to be subdivided into 15 lots.

Because DHHL would like to expedite implementation of their proposed developments as well as provide adequate sewer service to existing DHHL lots, they are funding 25 percent of the cost for the Waimanalo Facility Plan and EIS. The other 75 percent is federally funded.

3.3 PUBLIC FACILITIES AND SERVICES

3.3.1 Water Supply

The State-operated Waimanalo Irrigation System and the Board of Water Supply domestic water system currently provide water to the Waimanalo area.

3.3.1.1 Domestic System

The domestic water system maintained by the BWS consists of a system of tunnels, wells, storage tanks and reservoirs, pumps, water mains, and fire hydrants. The system was originally designed to supply water for domestic use; however, it is currently being used for irrigation purposes by approximately 44 farm lots. Because the existing system is not sized to accommodate additional urban development, BWS is hesitant to approve new hookups and requires landowners to bear the cost of upgrading the service facilities in the event hookups to the system are allowed.

There is one deep water well and four high level tunnels in Waimanalo. The well site and domestic water tanks in Waimanalo are shown in Figure 13. The combined capacity of these sources is approximately 0.9 million gallons per day. According to the 1975 Oahu Water Plan, there are no plans for additional water source development in Waimanalo.

3.3.1.2 Waimanalo Irrigation System

The Waimanalo Irrigation System was installed by the Waimanalo Sugar Company to transfer water from Maunawili Valley to Waimanalo. The irrigation ditch system is presented in Figure 13. Water is collected from stream flows and springs by

the Maunawili Ditch and transported by a tunnel through Aniani Nui Ridge. The State currently has water rights to approximately 1.8 million gallons per day on a year to year license from Kaneohe Ranch Company; thirty-eight farms presently use this irrigation water.

During low flow periods, the Waimanalo Irrigation System does not satisfy the demand of existing farmlots. Water loss is largely attributable to the high seepage rates through the earth-lined transmission ditches and to reservoir overflow that occurs when the limited capacities are exceeded during high flows.

The proposed Waimanalo Agricultural Park includes major improvements to the existing irrigation system. These improvements consist of replacing the ditches and constructing an additional reservoir, as previously described.

3.3.2 Roadways

Waimanalo is located approximately 14 miles from downtown Honolulu by way of the Pali Highway. The other route to Honolulu extending around Makapuu Point is approximately 20 miles in distance. Kalaniana'ole Highway is the major thoroughfare linking Waimanalo with the rest of the island. Residential and commercial developments have been established along both sides of the highway to form a linear or "strip" pattern of urbanization.

3.3.3 Solid Waste Disposal

The Kapaa Sanitary Landfill is one of six solid waste disposal facilities on Oahu. This landfill serves the windward areas of Oahu and a portion of Honolulu. Dewatered sludge from the Waimanalo Sewage Treatment Plant is disposed at the Kapaa facility. The distance between the plant and landfill site is approximately seven miles.

The capacity of the Kapaa Sanitary Landfill is expected to be reached by the end of 1985. An adjacent site in Kalaheo has been tentatively designated to replace the Kapaa site. Another site that the City may develop within the next fifteen years as a replacement for the Windward sanitary landfill is Bellows Field.

3.3.4 Electrical Power

Hawaiian Electric Company (HECO) provides electrical power within the Waimanalo area. There is a HECO transformer which presently services the Waimanalo STP. This 500 KVA transformer has sufficient excess capacity for the proposed plant improvements.

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

4.

RELATIONSHIP TO LAND USE
PLANS, POLICIES, & CONTROLS

CHAPTER 4

RELATIONSHIP TO LAND USE PLANS, POLICIES, AND CONTROLS

4.1 STATE LAND USE DISTRICTS

Land use in Hawaii is classified into four State Land Use Districts: urban, rural, agriculture, and conservation. The State Land Use Districts for Waimanalo are delineated in Figure 18. As shown, urban lands encompass most of the Waimanalo coastal plains area, including Bellows Air Force Station. Estimated acreage for each of these districts in 1975 are presented in Table 4-1. There have been no major land use changes in Waimanalo since 1975.

TABLE 4-1

STATE LAND USE DISTRICTS IN THE WAIMANALO PLANNING AREA AS OF 1975

<u>State Land Use District</u>	<u>Land Area (acres)</u>	<u>Percent of Total</u>
Urban	2,203	31.6
Rural	0	0.0
Agricultural	2,641	37.9
Conservation	<u>2,129</u>	<u>30.5</u>
Total	6,973	100.0

Source: City and County of Honolulu, Office of Human Resources
Neighborhood Data Book: Waimanalo. 1980.

The State Plan and Functional Plans provide a set of goals and objectives for the orderly growth and development of the State.

4.2 OAHU GENERAL PLAN

The Oahu General Plan adopted by the City Council in 1977, outlines the long-range objectives and policies for future development to the year 2000. Waimanalo is designated as a "rural" population area in the General Plan.

4.3 KOOLAUPOKO DEVELOPMENT PLAN

The Koolaupoko Development Plan, adopted in April, 1983, is one of eight plans for Oahu that provides relatively

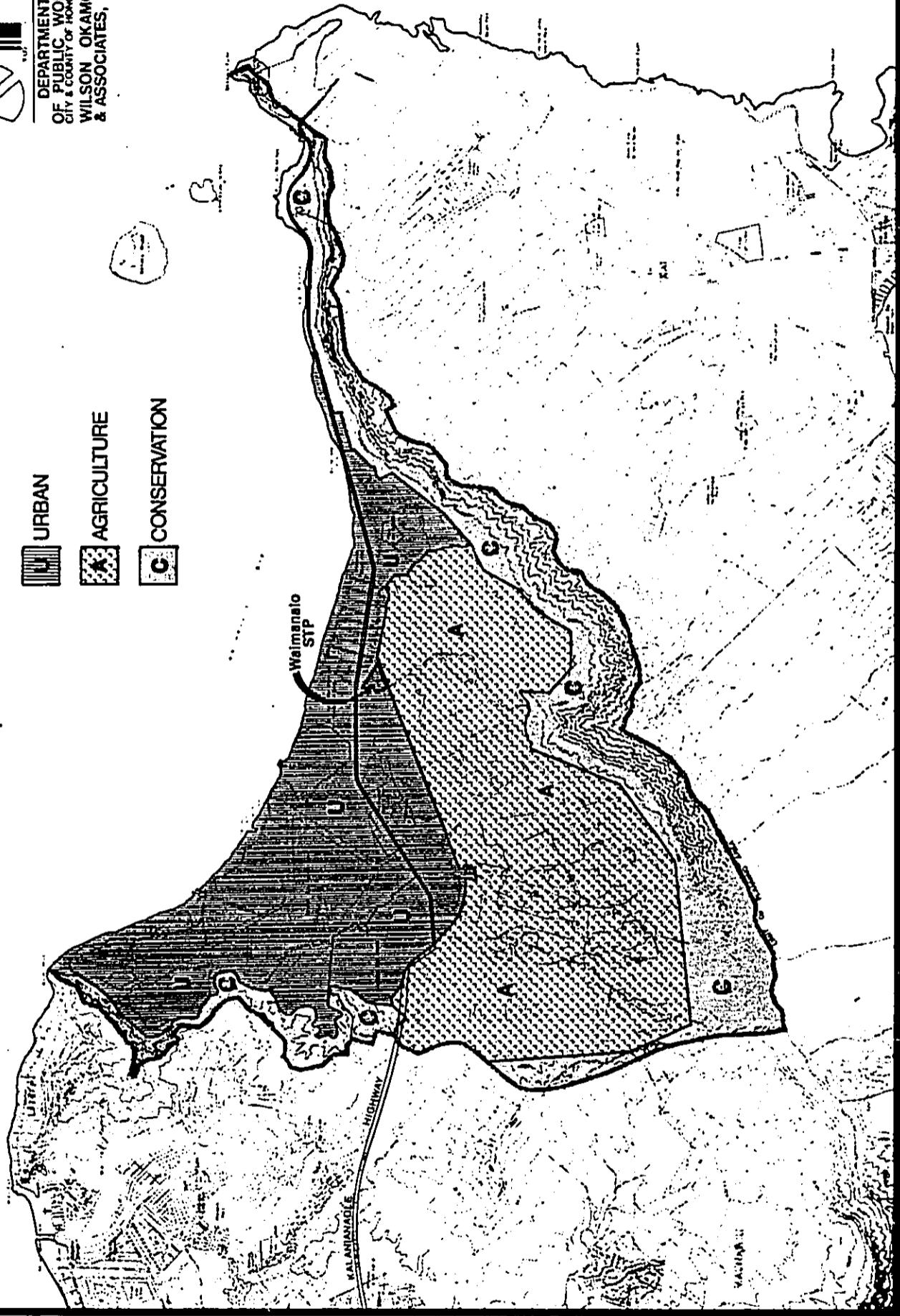
State Land Use Districts 18

WAIMANALO
FACILITY PLAN



DEPARTMENT
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- URBAN
- AGRICULTURE
- CONSERVATION



detailed schemes for implementing and accomplishing the objectives and policies of the Oahu General Plan on a regional basis. The plan establishes the desired sequence, patterns, and characteristics of future land uses and public facilities. The Development Plan for Koolaupoko spans the area from Kaoio Point at the northern end of Kaneohe Bay to Makapuu Point, and extends inland to the Koolaus.

The Development Plan land use map for the Waimanalo area is presented in Figure 19. As shown, the Development Plan generally intends to maintain the rural character of Waimanalo. The low-density residential area will continue to be surrounded by diversified agricultural pursuits. The Waimanalo STP site is designated as Public Facility by the Development Plan

A public facilities map accompanies the Development Plan. This map includes the Makapuu Interceptor Sewer, Sections 1 and 2.

4.4 ZONING

The City Comprehensive Zoning Code provides standards for building densities, type of structures that can be built, and on how each structure and land parcel can be used. Figure 20 presents the zoning designations for the Waimanalo area. As obtained from the City Department of Land Utilization, the estimated acreage for these zoning designations is listed in Table 4-2. Approximately 39 percent of Waimanalo is zoned for agricultural use. Preservation lands account for another 32 percent of the area. Although 30 percent of the Waimanalo area is zoned for residential purposes, the figure is misleading because Bellows Air Force Station and Olomana Golf Links are included. It is unlikely that these areas will be developed for residential uses in the near future.

Existing zoning in Waimanalo is not consistent with the recently adopted Koolaupoko Development Plan. A comparison of the Development Plan and zoning maps (see Figures 19 and 20, respectively) indicates that there is more land designated for residential development by the zoning map than the Development Plan map. The Development Plan ordinance, however, specifies that all zoning shall be brought into conformance with the Development Plan within a reasonable period of time. Therefore, the Development Plan is considered to be the prevailing City policy that will guide the future growth and development of Waimanalo.

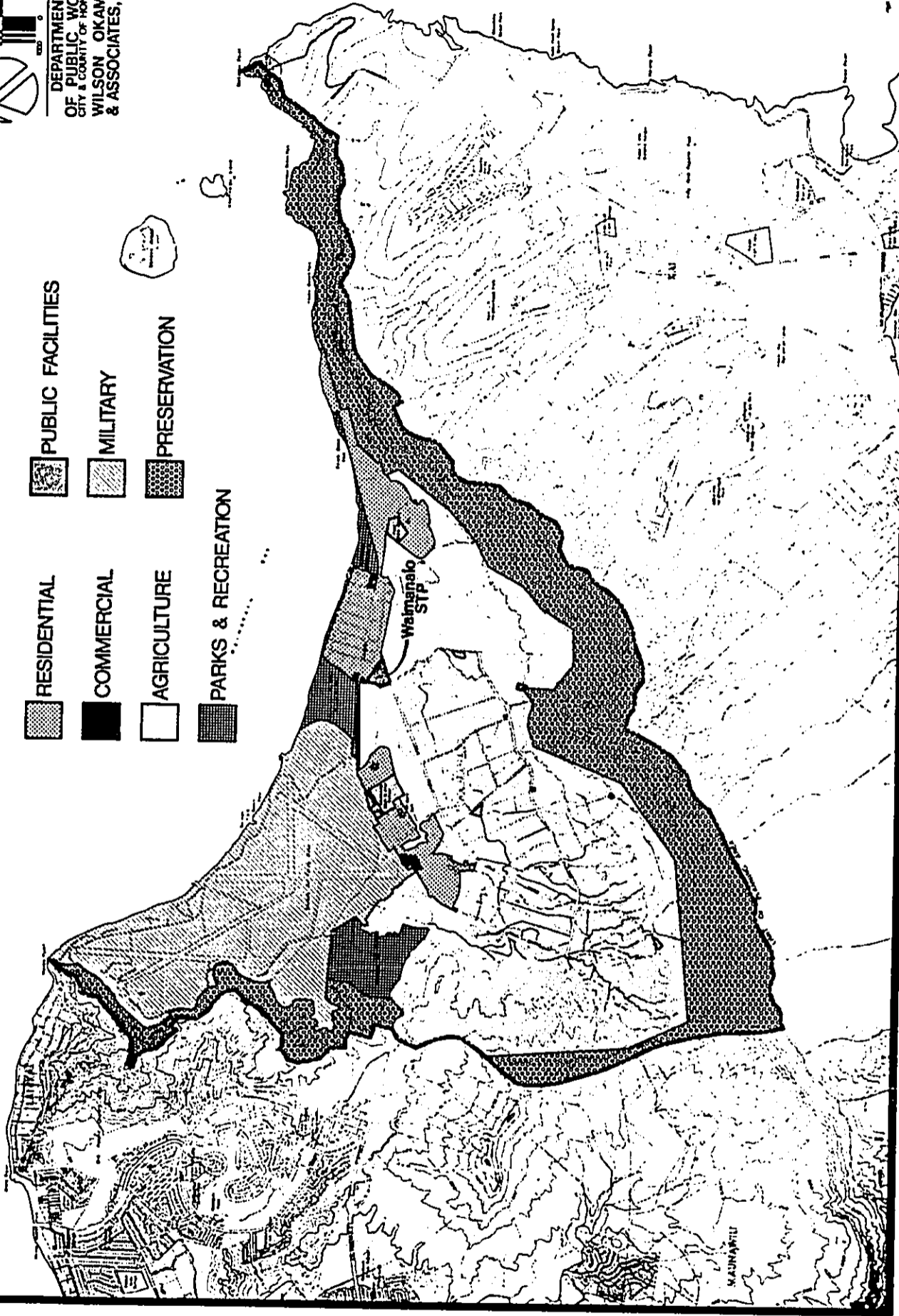
Koolaupoko Development Plan 19

WAIMANALO
FACILITY PLAN



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- | | | | |
|--|--------------------|--|-------------------|
| | RESIDENTIAL | | PUBLIC FACILITIES |
| | COMMERCIAL | | MILITARY |
| | AGRICULTURE | | PRESERVATION |
| | PARKS & RECREATION | | |



Zoning & Special Management Area 20

WAIMANALO
FACILITY PLAN



DEPARTMENT
OF PUBLIC WORKS
CITY & COUNTY OF HONOLULU
WILSON OKAMOTO
& ASSOCIATES, INC.

SPECIAL MANAGEMENT
AREA BOUNDARY

RESIDENTIAL (R-3 thru R-6, PD-H)

BUSINESS (B-2)

AGRICULTURE (AG-1)

PRESERVATION (P-1)

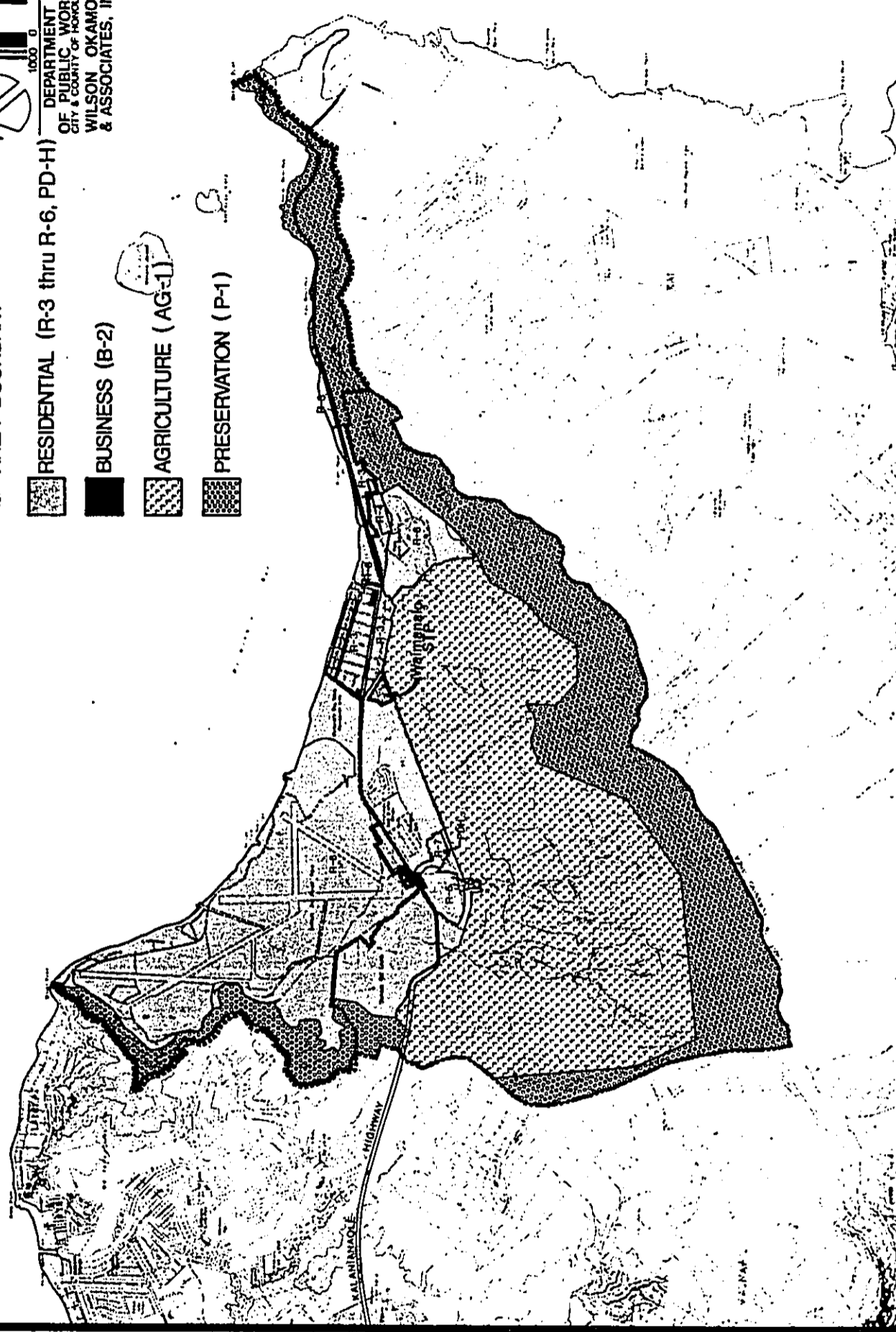


TABLE 4-2

CITY ZONING WITHIN THE WAIMANALO
 PLANNING AREA (CENSUS TRACT NO. 113)
 AS OF DECEMBER 1979

<u>Comprehensive Zoning Code Designation</u>	<u>Land Area (acres)</u>	<u>Percent of Total</u>
Residential (R-3 thru R-6, PD-H)	2,075	29.8
Business (B-2)	8	0.1
Agricultural (AG-1)	2,684	38.6
Preservation (P-1)	<u>2,195</u>	<u>31.5</u>
Total	6,962	100.0

Source: City and County of Honolulu, Department of Land Utilization.

4.5 COSTAL ZONE MANAGEMENT PROGRAM AND SPECIAL MANAGEMENT AREA

The Hawaii Coastal Zone Management (CZM) Program provides goals and objectives to guide the use, protection, and development of land and ocean resources within Hawaii's coastal zone, pursuant to Chapter 205A, Hawaii Revised Statutes. The CZM goals and objectives address recreational resources, historic resources, scenic and open space resources, coastal ecosystems, economic uses, coastal hazards, and managing development. These areas of concern are discussed by topic in other sections of this assessment. The proposed Waimanalo wastewater facilities will be implemented in a manner consistent with the Hawaii CZM Program to the maximum extent practicable.

In addition, a Special Management Area (SMA) has been designated to control development along the shoreline. Generally, the SMA includes lands extending not less than 100 yards inland from the upper reaches of the wash of the waves, and any additional areas designated by each County. Improvements within the SMA generally require a permit from the City and County Department of Land Utilization.

The SMA boundary along the Waimanalo coast is delineated in Figure 20. Although the existing Waimanalo Sewage Treatment Plant is not situated within the SMA, portions of the proposed sewer system will be located within this area.

The Koolaupoko Development Plan is considered to be the major policy document for establishing future land use patterns in Waimanalo. The Development Plan limits residential areas to existing housing, whereas both the State Land Use Districts and City Zoning Ordinance designate additional lands for residential development. The Waimanalo sewage system will not be able to service these additional residential lands.

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5.

POTENTIAL IMPACTS
& MITIGATION MEASURES

CHAPTER 5

POTENTIAL IMPACTS AND MITIGATION MEASURES

This section identifies the kinds of environmental impacts that may be expected from the proposed action. Environmental impacts are classified as either primary or secondary impacts. Primary or direct impacts are divided into short-term temporary impacts generated by construction activities and long-term impacts associated with the operation of the wastewater treatment system.

Secondary impacts are those impacts that indirectly result from population growth, or land use changes generated or facilitated by implementation of the Waimanalo Facility Plan. Housing development induced by the installation of sewers and the accompanying effects on public facilities or the environment are examples of secondary impacts.

5.1 PRIMARY IMPACTS

5.1.1 Typical Short-Term Impacts

The proposed action will require construction of the expanded sewer system, and treatment and disposal improvements at the Waimanalo STP. Should the State Waimanalo Agricultural Park be implemented, the selected plan also will involve the construction of the effluent irrigation system. Construction-related impacts are expected to be relatively similar for all aspects of the selected plan.

Expansion of the sewer system will involve the installation of interceptor and collector sewerlines, a sewage lift station, and a force main. At the Waimanalo STP, additional treatment facilities include a septage receiving tank, equalization basin, waste activated sludge thickener, and effluent sand filter. Disposal improvements to be constructed at the STP include injection wells and a compost facility. The proposed effluent irrigation system consists of a pump station at the Waimanalo STP, a storage reservoir at the Wing-King Reservoir site, and transmission pipelines along existing roadways (Waimanalo Watershed Plan and Environmental Impact Statement).

Since construction of these improvements will be located primarily at the existing plant site, and within or adjacent to existing road rights-of-way, the expected environmental impacts should not be significant. For the most part, construction related impacts will be temporary and confined to the immediate area surrounding the construction site.

Typical impacts that will occur during construction pertain to air quality, erosion, traffic, noise, safety, access, aesthetics, and resource areas. These impacts, which are unavoidable to some extent, will be mitigated through the strict adherence to governmental regulations and the implementation of appropriate control measures when necessary.

5.1.1.1 Air Quality

During construction, site preparation activities such as clearing, excavating, and backfilling will generate fugitive dust. In addition, construction vehicles are expected to increase exhaust pollutant concentrations in the atmosphere. These air quality impacts will primarily be confined to the immediate area surrounding the construction site. The prevailing northeast tradewinds will disperse most of the airborne pollutants.

Dust control measures will be employed in compliance with applicable governmental regulations and standards. Precautions such as frequent water sprinkling, immediate planting of ground cover, and dust screens may be implemented to minimize dust problems if site conditions warrant such action.

5.1.1.2 Erosion

Construction areas will become increasingly vulnerable to erosion during site preparation as the land is exposed to the natural elements. Strict compliance to City grading, erosion, and sediment control ordinances will minimize the potential adverse effects to stream and coastal waters.

Erosion control measures will be implemented as required. For example, clearing and excavation may be phased to minimize the area of disturbed lands subject to erosion. Also, disturbed areas may be planted or otherwise protected from erosion as soon as practical after construction.

5.1.1.3 Traffic

During construction of improvements at the existing Waimanalo STP site, the commuting work force will add to the normal traffic load during morning and afternoon peak hours. Additional traffic will be generated throughout the working day as machinery and materials are transported to and from the site. The overall traffic impact is expected to be minimal.

Installation of the sewerlines and irrigation transmission lines along existing roadways will unavoidably disrupt the traffic pattern and flow in Waimanalo. Flagmen or police officers will be stationed to direct traffic as required.

5.1.1.4 Noise

Construction activities will affect ambient noise levels within areas adjacent to the construction site. Noise will be generated primarily by the operation of construction equipment and vehicular traffic. At a distance of 50 feet, bulldozers (76-96 dB (A)), diesel-powered trucks (74-94 dB (A)), and jackhammers and rock drills (82-98 dB (A)) will produce the highest noise levels.

Construction-related noise will be intermittent rather than continuous throughout the construction period and will cease upon completion of the project. Scheduling of noise producing activities and noise levels will conform to City and State regulations.

5.1.1.5 Safety

Construction sites typically pose various safety hazards to the public, particularly during unattended periods when work is not occurring (i.e., weekends, evenings, holidays). This should not pose a significant problem at the Waimanalo STP site since it is secured by a perimeter fence and not accessible to the public. During installation of the sewerlines and irrigation lines along public roads, trenches will be covered and appropriate safety barriers will be erected. The contractor will adhere to all safety requirements and is expected to take additional precautions as required to minimize possible hazards.

5.1.1.6 Access

Installation of sewerlines and irrigation lines along roads may affect access to adjacent residences and businesses. Efforts will be made to the extent possible to minimize the inconvenience caused to these residences and businesses. Covers will be placed over open trenches to permit access during nonworking hours. Where several driveways provide access to a business, at least one driveway will be maintained for access, if possible. Adequate advance notice will be given to affected landowners so preparations and adjustments can be made.

5.1.1.7 Aesthetics

Construction sites typically present an unpleasant visual appearance. However, this visual impact is only a temporary condition and the disturbed area will be landscaped to its original condition following construction. The Waimanalo STP site is not visible from the highway while construction along the roadways will be clearly visible.

5.1.1.8 Resource Areas

Construction activities will be limited primarily to the existing Waimanalo STP site and existing road rights-of-way. Therefore, the impact on endangered flora and fauna species, and archaeological and historic sites is not expected to be significant. If any natural or cultural resources are discovered during construction, the proper authorities will be contacted.

5.1.2 Long-Term Impacts

This section identifies long-term impacts associated with each aspect of the proposed action: (a) Waimanalo sewage system (sewer system, treatment system, effluent disposal, and sludge disposal) and (b) on-site treatment facilities. Long-term impacts are summarized in Table 5-1.

5.1.2.1 Waimanalo Sewage System

(a) Sewer System

Impacts related to the operation and maintenance of the proposed sewer system are expected to be minimal. The sewerlines will be buried and the sewage lift station will be a small facility with two 110 gpm pumps. These improvements will be located within existing urban areas, either within or adjacent to road rights-of-way or easements.

Expansion of the sewer system to residential areas presently experiencing cesspool problems will have a significant beneficial impact. All residential areas with significantly high cesspool failure rates will be sewered under the proposed action. The public health and safety hazards associated with cesspool failures will be eliminated in these new service areas.

There will also be financial impacts upon property owners within designated Sewer Improvement Districts (ID). These districts are established by the City and County of Honolulu to help finance the construction of sewer improvement projects. The following costs (1983) will be incurred by affected property owners.

- o City Improvement District assessment - Property owners are assessed for their share of the improvement costs. The current assessment rate is \$0.16 per square foot for residential areas, or \$800 for a 5,000-square foot lot. Commercial areas are assessed \$0.20 per square foot.

Table 5-1

SUMMARY OF
PRIMARY LONG-TERM ENVIRONMENTAL IMPACTS
FOR THE PROPOSED ACTION

ASSESSMENT CRITERIA	Waimanalo Sewage System					Individual On-site Treatment Facilities
	Sewer System	Treat- ment System	Effluent Disposal		Sludge Disposal	
			Injection Wells	Irrigation Reuse	Composting	
<u>Construction Grants Criteria:</u>						
Historical & Archaeological Sites	0	0	0	0	0	0
Floodplains	0	0	0	0	0	0
Wetlands	0	0	0	0	0	0
Agricultural Lands	0	0	0	+	+	0
Coastal Zone Management	0	0	0	0	0	0
Flora & Fauna *	0	0	0	0	0	0
Air Quality	0	0	0	0	0	0
Groundwater Quality	0	0	0	0	0	0
Stream Water Quality	0	0	0	0	0	-
Ocean Water Quality	0	0	0	0	0	0
<u>Other Criteria:</u>						
Recreational and Open Space Resources	0	0	0	0	0	0
Noise	0	0	0	0	0	0
Odor	0	0	0	0	0	-
Public Health and Safety	+	+	+	0	0	-

*Includes fish and wildlife, and endangered species protection

Impact Assessment Legend:
+ Beneficial impact
0 Minimal or no impact
- Adverse impact

- o City sewer user charge - Property owners are charged monthly to help pay for operation and maintenance costs. The charge for single-family and duplex dwellings is \$9.05 per month. Multiple unit dwellings are charged \$6.35 per month. The non-residential charge for domestic strength wastewater is \$0.67 per 1,000 gallons of metered water usage, with a minimum monthly charge of \$9.05.
- o Cost of backfilling cesspools - This is the responsibility of individual property owners. The estimated backfilling cost is \$500 to \$1,000.
- o Installation of building sewers - Individual property owners are responsible for this installation cost of approximately \$2,000 to \$4,000.

Additionally, costs attributable to pumping and maintaining cesspools within the designated Sewer Improvement Districts will be eliminated.

(b) Treatment System

Overall, the proposed treatment modifications are expected to have a beneficial impact upon the environment due to improved plant operations and the higher quality of effluent produced. Effluent quality will be upgraded from the existing secondary level to advanced secondary treatment, particularly in regards to suspended solids removal. The proposed addition of effluent sand filtration, which reduces suspended material in the effluent, is intended to ensure the operational integrity of the new injection wells. The primary environmental impacts of the injection wells are discussed in Section 5.1.2.1 (c) below.

Since all proposed modifications will be contained within the existing Waimanalo STP site, other environmental impacts are not anticipated to be significant. The additional treatment facilities should not generate any unpleasant odors. In fact, the proposed flow equalization basin may reduce odors produced from the primary clarifiers during low flows.

As shown in Figure 14, the existing Waimanalo STP site is located within the 100-year flood plain. Adequate flood control measures (i.e., berms) will be implemented to minimize flood hazards. Proposed plant improvements and flood control measures will not affect the flood plain.

(c) Effluent Disposal

Injection Wells. Generally, the long-term environmental impacts of the proposed injection wells are not expected to be significant. As previously discussed in Section 2.3.1.3 (a), the existing STP site is an ideal location for injection wells due to geographic and geologic conditions. Also, the plant site is not located within the proposed State UIC boundary. With the addition of effluent sand filtration, and well maintenance equipment, the risk of structural deterioration and clogging within the new wells will be significantly reduced.

The new set of injection wells will be able to adequately handle projected effluent flow. This would eliminate use of the existing wells except as a back-up disposal system. As a result, the overflow problems presently associated with these existing wells will no longer pose a public health and safety hazard.

Irrigation Reuse. The use of treated effluent for irrigation purposes will conform to all applicable health and environmental regulations. Appropriate farming practices will be followed to minimize any potential adverse impacts. During wet weather periods or when the plant produces an excessive amount of effluent, the injection wells will be available for effluent disposal. Implementation of the treated effluent irrigation system is contingent upon the development of the Waimanalo Watershed Plan and Waimanalo Agricultural Park.

The environmental assessment in this report is based on the effluent irrigation system developed by the Waimanalo Watershed Plan. Treated effluent will be used to irrigate approximately 68 acres of State controlled lands in the vicinity of the existing Waimanalo STP. These lands include the Waimanalo Experiment Station operated by the University of Hawaii, College of Tropical Agriculture.

Currently, a major problem facing the agricultural industry in Waimanalo is the limited availability and poor quality of existing irrigation water. The proposed treated effluent irrigation system is part of the overall plan to satisfy the agricultural water needs in Waimanalo. Thus, the provision of irrigation water will contribute to the protection of important agricultural lands in the area.

The overall environmental impact of using treated effluent for irrigation is not expected to be adverse if the proper precautions are taken. In the event any serious problems arise in the future, this disposal plan can be discontinued and the injection wells used as the sole means of effluent disposal.

The most serious public health concern associated with the use of treated effluent is the potential transmission of pathogens which may still persist in the effluent. Strict compliance with health requirements will minimize this potential hazard.

Stormwater runoff from agricultural fields that use treated effluent can generally be controlled by conventional agricultural soil erosion control measures. This will provide for the protection of surface water quality and adjacent lands. The potential impact upon stream waters is not considered to be significant since Inoaole Stream, located in the vicinity of the irrigation service area, is intermittent. Contamination of groundwater resources is also not a concern because the potential service area is located seaward of the Board of Water Supply "no pass" line.

Odor will not be a serious problem because of the high quality of effluent that will be used. Furthermore, the potential irrigation fields and storage reservoir are located in a sparsely populated area inland and downwind from any existing residential developments. The northeast tradewinds will tend to disperse any odors that are generated, toward the mountains and away from these populated areas.

(d) Sludge Disposal

Composting. The environmental impacts of composting are related to (a) operations at the Waimanalo STP and (b) the application of compost as a soil conditioner. The proposed composting method consists of the controlled aerated static pile process which will ensure complete sludge pasteurization (killing human pathogens, parasites, etc.). Since the sludge will continue to be dewatered in the drying beds prior to composting, land disposal of the dewatered sludge can serve as a back-up in the event of operational problems.

The proposed compost facility is not expected to result in significant impacts upon the environment since it will be located within the existing Waimanalo STP site. Sludge from both the Waimanalo and Kaneohe-Kailua treatment plants will be handled by this facility. Transporting digested sludge from the Kaneohe-Kailua plant in covered trucks will have minimal impact upon the community.

A typical concern associated with composting is the generation of odors. The proposed facility will provide for odor control in the unlikely event that unpleasant odors are generated from the delivery of unstable sludge or process malfunctions.

The composted material may be applied as a soil conditioner to agricultural lands, lawns, parks, etc. Because the composting process will produce a pasteurized product, the use of this compost material should not pose any environmental problems. Provided proper land application methods are adhered to, the potential for environmental and public health hazards will be significantly reduced by strict adherence to pertinent governmental regulations and implementation of additional precautionary measures as required during compost application. Composting may contribute to the protection of important agricultural lands if the compost is used for agricultural purposes.

Land Disposal. There appears to be no serious environmental problems associated with the existing method of sludge disposal at the Kapaa Sanitary Landfill. The sludge is buried with municipal solid waste at the landfill site. Although there have been complaints by landfill personnel that sewage sludge is causing problems with their machinery, it is unlikely that sludge from the Waimanalo STP, which has a very low moisture content, is contributing to the problem.

Continued disposal of sludge at Kapaa is not expected to pose any future environmental problems. The amount of sludge to be produced at the Waimanalo STP will only constitute a small proportion of the total volume of solid waste at the landfill so the environmental impact will not be significant. If a new landfill site is required, the magnitude and significance of long-term impacts will depend on the specific site selected.

5.1.2.2 On-site Treatment Facilities

The unsewered area includes all agricultural lots in Waimanalo. Portions of the agricultural lots have experienced significant cesspool problems, however, it is too costly to service these areas.

Cesspool failures in the unsewered areas will continue to pose a public health hazard and odor nuisance. In fact, there may be a higher frequency of failures over the long term with the continued use of defective cesspools.

Another adverse impact is the potential contamination of a Board of Water Supply well (208 Water Quality Management Plan for the City and County of Honolulu). The well is located only about 100 feet from the nearest cesspool community (See Figure 13).

There also will be an economic impact associated with cesspool pumping. This impact involves the pumping cost

incurred by individual cesspool owners, as well as the operating cost incurred by the City and County of Honolulu to provide pumping services.

Cesspools will likely be used for new homes in the unsewered areas. These cesspools may also develop problems in the future.

5.2 SECONDARY IMPACTS

Secondary growth impacts are typically associated with the provision of additional treatment capacity and the expansion of the sewer system. Proposed improvements for the entire Waimanalo sewage system (including sewer, treatment, and disposal components) are not expected to have a significant impact on the planning area. The sewage system will not stimulate growth itself, but is intended to be supportive of the growth determined by the Oahu General Plan policies and regulations. Future growth patterns for Waimanalo are established in the Koolaupoko Development Plan.

The current treatment capacity of the Waimanalo STP is 0.7 mgd. There is sufficient excess capacity within the plant to accommodate the projected population of 12,000 for the entire planning area through the year 2005. Modifications and improvements proposed for the Waimanalo STP will not provide additional treatment capacity.

By the year 2005, the plant is expected to serve an approximate population of 8,730 persons or 2,120 housing units. This represents an increase of about 5,320 persons or 1,291 units over the present service area. Nearly two-thirds of these additional units are existing houses in areas with cesspool problems. New housing developments primarily proposed by the State Department of Hawaiian Home Lands account for the remaining units to be sewerred.

The sewer system for the Waimanalo STP will be expanded to serve areas designated by the proposed Koolaupoko Development Plan for residential use. This will encourage further inhabitation of the existing residential areas rather than scatterization of development in the agricultural areas. Additionally, the sewer system will accommodate new housing proposed by DHHL. These DHHL lands, designated for agricultural use by the proposed Development Plan, are not necessarily subject to State or City land use policies. According to a State Attorney General's opinion, the development of Hawaiian Home lands for purposes of the 1920 Hawaiian Homes Commission Act does not have to conform to State statutes, County ordinances, or County Charter provisions (Opinion No. 72-21). Extension of the Waimanalo STP sewer system will facilitate this proposed housing development.

6.

UNAVOIDABLE ADVERSE IMPACTS

CHAPTER 6

UNAVOIDABLE ADVERSE IMPACTS

Potential impacts from the proposed action are described in Chapter 5. A summary of the unavoidable adverse impacts is presented in this chapter. These impacts are primarily related to construction activities and on-site treatment facilities. Additionally, this chapter explains the rationale for proceeding with the proposed action despite the adverse impacts that may occur.

6.1 CONSTRUCTION ACTIVITIES

Construction activities are expected to adversely affect air quality, erosion potential, traffic, noise levels, safety, aesthetics, and resource areas. These unavoidable impacts will be mitigated through the strict adherence to governmental regulations and the implementation of appropriate control measures when necessary.

Since the construction of proposed improvements will be primarily located within the existing STP site, and road rights-of-way or easements, the expected environmental impacts should not be significant. For the most part, construction related impacts will be temporary and confined to the immediate area surrounding the construction site.

6.2 ON-SITE TREATMENT FACILITIES

In the unsewered area, cesspool failures are expected to have an adverse impact upon the environment. Potential impacts include groundwater contamination, odor, and public health problems. These impacts are unavoidable in certain areas of Waimanalo which are unsuitable for cesspools because of poor soil conditions.

The unsewered area is primarily comprised of agricultural lots. Because of the low population density, it is not cost effective to extend sewer service to this area. Additionally, only some of the agricultural lots have experienced significant cesspool problems.

7.
ALTERNATIVES

CHAPTER 7

ALTERNATIVES

This chapter briefly describes alternatives to the proposed action, which were considered for the Waimanalo Facility Plan. The various alternatives were evaluated based on cost effectiveness, environmental compatibility, resource and energy conservation, plant operations, and ease of implementation.

7.1 WAIMANALO SEWAGE TREATMENT PLANT

Various alternatives have been identified for the Waimanalo Sewage Treatment Plant based on the following findings:

1. The existing plant is in excellent condition and could remain in service for at least 25 years provided equipment are replaced as required.
2. The existing treatment capacity is adequate to handle the projected wastewater flows through the year 2005.
3. The hydraulic capacity of the existing plant will not be exceeded by the year 2005.
4. All disposal options will require a minimum of secondary treatment.

7.1.1 Treatment System

7.1.1.1 No Action

Under the no action alternative, improvements will not be made to the existing Waimanalo STP. Existing facilities will not be replaced or upgraded to improve the level of treatment and alleviate present problems and inefficiencies.

The treatment plant is currently in excellent condition, however, several pieces of equipment must be replaced in the near future in order to maintain present performance levels. If the necessary equipment is not replaced, the plant's level of treatment and/or treatment capacity is expected to decrease with time. The hydraulic capacity of the existing plant will be adequate for the flow anticipated at the end of the design period.

7.1.1.2 Energy Reduction Options

The existing Waimanalo Sewage Treatment Plant consists of conventional and proven processes for wastewater treatment. These processes include aerated grit removal, primary gravity sedimentation, activated sludge, anaerobic sludge digestion, and sand drying beds for sludge dewatering. The plant was designed in the early 1970's when energy costs were low in relation to their values today. Energy cost was not a major consideration in process selection for the plant. However, because of the rapid increase in energy costs during the past few years, each plant process was evaluated for potential replacement by a more energy efficient process. Table 7-1 presents the alternatives that were considered for each of these processes.

There are no alternative processes with significantly lower energy requirements that could be employed to replace primary sedimentation, anaerobic digestion, and the sludge drying beds. Each of these processes represent the most energy efficient process available for their respective task and each currently performs adequately.

The aerated grit chamber could be replaced with a less energy intensive sedimentation chamber. However, the aerated grit chamber offers operational and performance advantages over the horizontal velocity-controlled grit chamber.

Replacement of the activated sludge process with the less energy intensive trickling filter process was also considered. However, this replacement was not found to be cost effective since the lifetime savings in energy costs would not offset the cost of constructing a trickling filter.

7.1.2 Effluent Disposal

7.1.2.1 No Action

The three existing injection wells have been in service for approximately ten years. Originally, the injection capacity was measured at 4.3 mgd per well. In recent years, the operators have found it difficult to maintain capacity equivalent to existing flows through the plant (0.212 mgd) for all three wells. Initially, the wells were between 200 to 205 feet in depth. Currently, the wells are 139, 149 and 186 feet in depth. The decrease in well depth indicates that cave-ins have been significant. A further reduction in capacity would be expected if no action is taken.

TABLE 7-1

ALTERNATIVE TREATMENT PROCESSES

<u>Existing Process</u>	<u>Alternatives</u>
Aerated Grit Removal	Gravity Sedimentation
Primary Gravity Sedimentation	Dissolved Air Flotation Filtration (e.g., filter, screen)
Activated Sludge Process	Trickling Filter
Anaerobic Sludge Digestion	Aerobic Sludge Digestion
Sand Drying Bed for Sludge Dewatering	Mechanical Dewatering (e.g., vacuum filter, belt filter press, centrifuge)

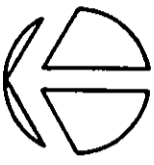
7.1.2.2 Ocean Outfall Disposal

Effluent disposal via a deep ocean outfall was considered as a disposal option. Secondary effluent would be pumped through a force main outfall and discharged at a sufficient depth to permit adequate mixing and dispersion, thus, minimizing its effect on receiving waters.

A detailed design of the Waimanalo outfall alternative would require a bathymetric survey, an ocean current and mixing study, a receiving water quality survey which takes into account seasonal variations, and a biological survey to ascertain potential effects on the existing ecosystem. However, a preliminary evaluation of the outfall alternative was made to see whether there are major or minor difficulties with this course of action.

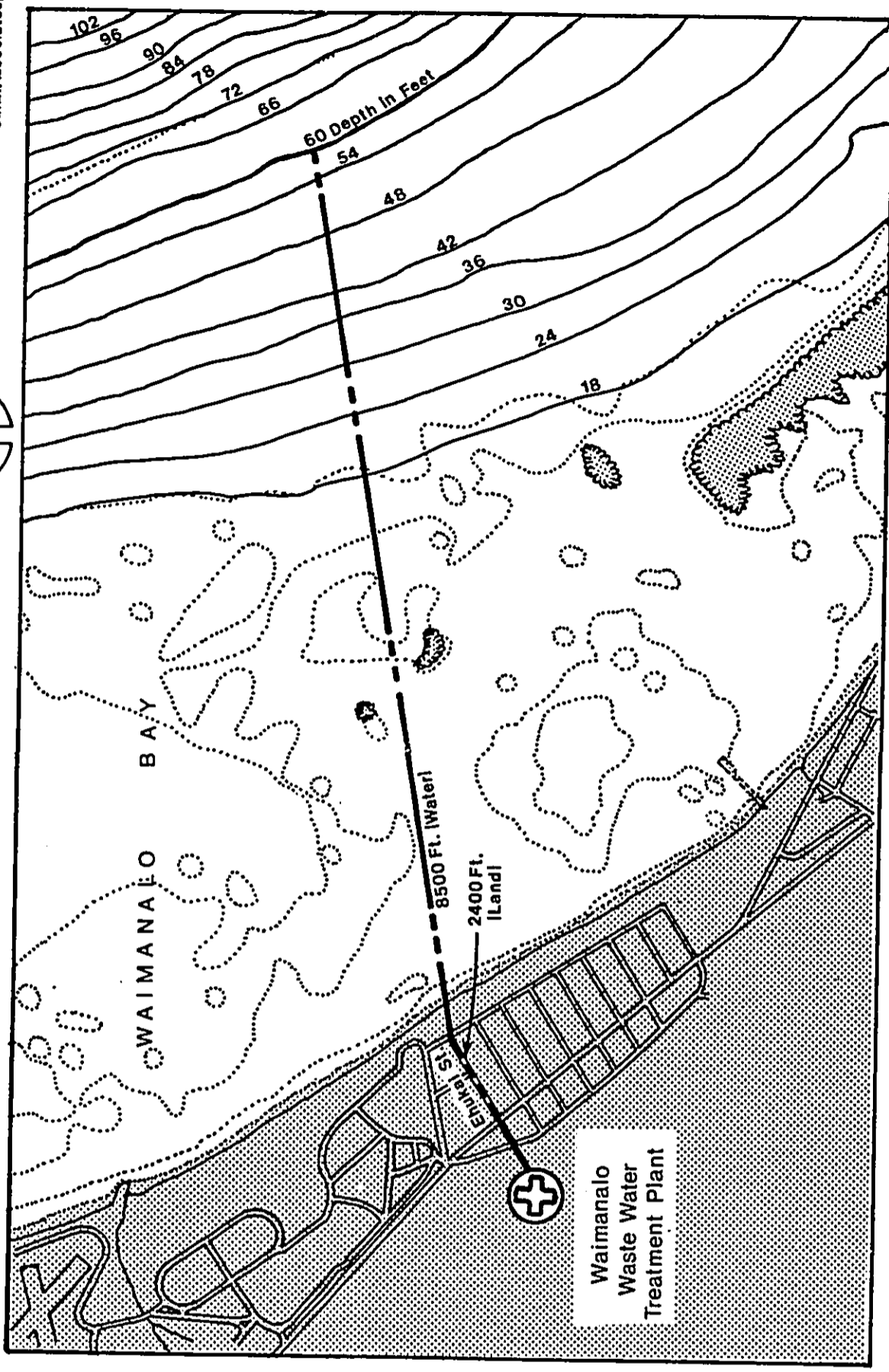
A preliminary outfall alignment is shown in Figure 21. This involves a land portion of about 2,400 feet and water portion of about 8,500 feet. This length of outfall is required to reach the minimum depth of 60 feet required by the State Department of Health. It is quite possible that upon a detailed evaluation, the DOH would require an outfall terminating at a greater depth in order to contain the zone of mixing within the 60 foot bathymetric contour line. Such an outfall would likely extend another 1,500 feet to reach a depth of around 100 feet.

Schematic of Waimanalo Ocean Outfall 21



WAIMANALO
FACILITY PLAN
DEPARTMENT
OF PUBLIC WORKS

WILSON OKAMOTO
& ASSOCIATES, INC.
PREPARED BY:
G.M.P. Associates, Inc.



The size of the outfall line should be large enough to handle the anticipated flow for the planning period but small enough to at least achieve scouring velocity (3 feet/sec) during the daily peak flow. A diameter of 24 inches is likely to be a good compromise between these two criteria.

Construction of the outfall would involve excavation and filling in both the land and offshore areas. This is necessary in order to eliminate high points where air may accumulate, and to protect the pipe from physical damage. In the area beyond the reef, the pipe will have to be protected from wave forces with armour rock.

The cost of constructing a deep ocean outfall far exceeds the cost of injection well disposal. A National Pollutant Discharge Elimination System (NPDES) permit would be required for ocean disposal. An ocean outfall also may adversely affect water quality, depending upon the location and design of the structure.

An ocean outfall was also considered in the initial design of the existing Waimanalo STP. Preliminary engineering and oceanographic investigations were conducted to determine the feasibility and costs of this disposal method (Technical Supplement to Ocean Outfall Report, Waimanalo Core Development). Because of the high cost of constructing an outfall estimated by this study, injection wells were investigated and ultimately selected for the Waimanalo STP.

7.1.2.3 Surface Water Disposal

Surface water disposal consists of discharging effluent into a stream or other surface water body. A pipe system is used to convey the effluent by gravity or pump from the STP. Ideally, the effluent is diluted by the body of water as it flows toward the ocean. Waimanalo Stream is the closest perennial stream near the Waimanalo plant, however, it is not capable of adequately assimilating treated effluent. The average flow in this stream is so low that dilution of pollutants would be minimal until the stream discharges into the ocean. Furthermore, all surface discharges from the streams would enter Waimanalo Bay at or near recreational public beaches and create a public health hazard.

7.1.2.4 Leach Field

A leach field is a shallow subsurface facility consisting of a layer of porous material such as crushed rock or drain tiles. The effluent is spread over the field by underground perforated pipes and then percolates into the

ground. It is necessary for the treated effluent to have a low concentration of suspended solids in order to avoid clogging of the pores in the porous layer and the soil beneath the leach field.

The leach field would be situated entirely within the existing Waimanalo STP site. Approximately 3.4 acres of land are required for this leach field, given the soil percolation rate at the treatment plant site. This acreage accounts for nearly all of the unused available land at the STP and, thus, would preclude the construction of any other facilities at the site. It is not possible to construct any type of permanent structure over the leach field so the surface area is virtually non-functional, except for unpaved parking. In addition, the leach field must be adequately flood proofed since the STP is located within the 100-year flood plain.

7.1.2.5 Evaporation Ponds

The pond system would consist of one or more open ponds which are filled with the treated effluent. The ponds are usually lined with an impervious material and are either dug into the ground or elevated on fill.

There will be a brine residue in the ponds as evaporation progresses which will require further disposal. A leach field or injection well will be required to dispose of the brine. Disposal of the suspended solids which are deposited at the bottom of the ponds will also be a problem. The deposited solids may include algae unless nutrients are removed from the effluent during the treatment process.

Approximately 350 acres of ponds will be required to handle the projected effluent flow from Waimanalo. This is based on historical pan evaporation data collected for the area (Pan Evaporation in Hawaii 1894-1970). Since a suitable site of this large size is not available in Waimanalo, evaporation ponds are not considered to be a viable alternative for effluent disposal.

7.1.3 Sludge Disposal

7.1.3.1 Incineration

Generally, incineration reduces the amount of solid material for ultimate disposal. The overall incineration process will have to be fueled by solid wastes or other types of fuels. Either dewatered untreated sludge or heat-treated sludge is used during the incineration process. Stabilization may decrease the volatile content of the sludge and increase the requirement for an auxiliary fuel. Heat-treated sludge may not require an auxiliary fuel to sustain the burning process.

The incinerator may be located at the Waimanalo STP site, or an existing incinerator located elsewhere on Oahu (e.g., Sand Island) may be utilized. An incinerator at the STP site would consist of a four-story structure with a smoke stack approximately 200 feet tall. Due to the small amount of sludge that will be generated at the Waimanalo STP, an incinerator would prove to be uneconomical. If another incinerator site is used, special handling in transporting the sludge and feeding the incinerator will be required. The environmental impacts of an incineration facility are expected to be significant. These impacts include potential degradation of air quality and odor generation.

7.1.3.2 Ocean Disposal

The ocean disposal alternative consists of dumping the sludge at a specific ocean dumping site. This dumping site must meet all applicable regulations.

Ocean disposal of sludge will require the following facilities: a) sufficient storage capacity at the STP to accommodate a minimum of one barge load of sludge; b) vehicles to transport the sludge from the STP or a pipeline and pumping system; c) a nearby docking facility; and d) a tug and barge contracted on a regular basis to transport the sludge from the docking facility to the ocean disposal site.

The environmental impacts of ocean disposal may be significant. Within the vicinity of the dumping site, water quality, and marine plants and animals may be adversely affected.

7.2 UNSEWERED AREA

Four alternatives were developed for the existing unsewered areas in Waimanalo: (a) on-site treatment facilities (no action), (b) optimum operation of existing and new cesspools, (c) alternative on-site treatment systems, and (d) expansion of the sewer system.

7.2.1 On-site Treatment Facilities (No Action)

Under the no action alternative, cesspools will continue to be utilized for sewage disposal within existing and new developments. This may result in public health risks as the cesspools become defective. Cesspool pumping services will continue to be provided by the City and County of Honolulu or private companies. The City may terminate pumping services if cesspool owners fail to reasonably minimize the frequency of cesspool pumping. The City fee for pumping services is substantially less than the private companies.

7.2.2 Optimum Operation of Existing and New Cesspools

This alternative involves the implementation of an effective maintenance program to prolong the life of cesspools. For example, cesspools may be purged with water or air, treated with chemicals or enzymes, or pumped on a pre-scheduled basis. In the case of older cesspools and cesspools located in areas with poor soils, these measures at best can only provide short-term relief. The performance of these cesspools may be expected to progressively deteriorate despite any corrective measures that are implemented.

7.2.3 Alternative On-site Treatment Systems

A wide range of alternative on-site systems may be feasible for the Waimanalo area, depending upon specific soil and geologic characteristics, hydrologic conditions, and cost considerations. Individual homeowners are responsible for installing these systems. Despite design differences among the alternatives, each system will utilize more advanced treatment and disposal methods than existing cesspools. Sparsely populated areas are particularly suited for these alternative systems since the cost of sewer installation per housing unit in such areas is generally very high.

Potential alternative systems include septic tanks, household aerobic units, and holding tanks. Waterless or low-water toilet systems can also be employed to decrease the required capacity of any of these alternative systems.

7.2.4 Expansion of the Sewer System

This alternative involves the installation of sewerlines and appurtenant facilities to collect and transport sewage to the Waimanalo STP. The sewer system may be expanded to service existing and/or new urban developments in Waimanalo.

8.

RELATIONSHIP BETWEEN LOCAL
SHORT-TERM USES OF THE
ENVIRONMENT AND THE MAINTENANCE
AND ENHANCEMENT OF LONG-TERM
PRODUCTIVITY

CHAPTER 8

RELATIONSHIP BETWEEN LOCAL SHORT-TERM USES OF THE ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

Proposed improvements to the Waimanalo STP and its sewer system will accommodate an expanded service area and provide a more efficient and cost-effective facility. The initial short-term adverse impacts from construction of the proposed improvements and the long-term impacts from the operation and maintenance of the expanded system must be weighed against the health and welfare of Waimanalo residents and the long-term benefits of an effective wastewater management program and facility.

The proposed improvements will be primarily situated within the existing plant site and road rights-of-way. The operation and maintenance of the existing plant will be greatly enhanced by these improvements and the newly sewerred areas will enjoy a safer and healthier environment.

A major problem has been the malfunction and deterioration of cesspools in several areas throughout the Waimanalo district. This condition poses a constant public health and safety threat to the residents. Cesspools are considered an effective means of wastewater disposal in low density residential or rural areas. However, as the density increases, a centralized wastewater treatment system is required to protect the environment and the public.

Effluent and sludge disposal methods proposed by the project include irrigation reuse and composting. These methods represent a benefit to the community and the environment through resource recovery. Since Waimanalo is an agricultural community, these recycled resources may be utilized within the immediate vicinity of the Sewage Treatment Plant.

The reuse of effluent for irrigation will improve the quality and quantity of the present irrigation water supply. This may improve crop production or open up new agricultural lands.

In addition, the composting facility will accommodate sludge from the Kaneohe-Kailua STP, which presently utilizes the sanitary landfill for disposal. This will eliminate present handling problems at the landfill site and may generate revenues from the sale of the compost as a soil conditioner.

The proposed project will greatly enhance the human environment and the long-term productivity of the land and community.

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9.

IRREVERSIBLE AND IRRETRIEVABLE
COMMITMENTS OF RESOURCES

CHAPTER 9

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS
OF RESOURCES

There will be an irreversible and irretrievable commitment of land and manpower for the construction, operation and maintenance of the proposed wastewater facilities. Capital and energy resources will also be committed to implement the proposed project, however, some of these resources may be recovered through the reuse of effluent for irrigation and the composting of sludge to produce a soil conditioner.

The commitment of resources in the implementation of the proposed project is by far outweighed by the benefits derived from an effective sewage treatment facility and wastewater management program.

10.

GOVERNMENTAL POLICIES
WHICH OFFSET ADVERSE
ENVIRONMENTAL IMPACTS

CHAPTER 10

GOVERNMENTAL POLICIES WHICH OFFSET ADVERSE ENVIRONMENTAL IMPACTS

As presented in Chapter 6, adverse impacts of the proposed action will result from construction activities, and cesspool failures within the unsewered area. Construction of the proposed improvements are necessary to comply with the Federal Water Pollution Control Act (FWPCA), as amended, and the Hawaii Statute on Environmental Quality (Chapter 342, Hawaii Revised Statutes). The objective of the FWPCA is to "restore and maintain the chemical, physical and biological integrity of the Nation's waters." The Hawaii Statute on Environmental Quality provides regulations at the State level to safeguard public health and preserve the quality of the environment. State Department of Health Administrative Rules promulgated under provisions of this law include Chapter 55, Water Pollution Control; Chapter 54, Water Quality Standards; and Chapter 57, Private Wastewater Treatment Works and Individual Wastewater Systems. The proposed action is intended to minimize widespread violation of these regulations and improve existing plant operations.

According to the facility planning guidelines established by the U.S. Environmental Protection Agency, proposed improvements must be cost effective. Based on EPA population density criteria, it was determined that sewerage the agricultural areas of Waimanalo would not be cost effective. Therefore, these areas will remain unsewered, despite the adverse impacts that are expected to occur.

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11.

SUMMARY OF UNRESOLVED ISSUES

CHAPTER 11

SUMMARY OF UNRESOLVED ISSUES

The major unresolved issues involve the proposed effluent irrigation system and composting facility. Implementation of both these proposed actions is uncertain at this time.

The effluent irrigation system is proposed as part of the Waimanalo Watershed Plan and Waimanalo Agricultural Park Plan. Agencies responsible for implementation of this proposed system include the State Department of Land and Natural Resources, Windward Oahu Soil and Water Conservation District, and U.S. Department of Agriculture Soil Conservation District. Despite the uncertainty of implementation, irrigation reuse is proposed because it will help to conserve the Island's water supply and reduce effluent disposal costs. Furthermore, new injection wells are also part of the proposed effluent disposal system since they can serve as the primary or standby disposal method.

The feasibility of marketing compost has not yet been determined. A study must be conducted prior to implementation of the proposed compost facility to resolve this marketing concern. If the market can be established, composting is considered to be the most viable sludge disposal method for Waimanalo. Composting will produce a useful soil conditioner, and eliminate the dependence of the Waimanalo and Kaneohe-Kailua treatment plants on landfills. However, because of the marketing uncertainties involved with composting, landfilling is proposed as the secondary method of disposal.

CHAPTER 12

LIST OF NECESSARY APPROVALS

The proposed action will be implemented in full compliance with applicable County, State, and Federal requirements. Following are the approvals and clearances which must be obtained prior to construction.

<u>Required Approval</u>	<u>Responsible Agency</u>	<u>Applicability</u>
1. Coastal Zone Management Certification	State Dept. of Planning and Economic Development	Proposed action will involve Federal funding
2. Notice of Intent to Drill	State Dept. of Land and Natural Resources	Required for effluent injection wells
3. Historic Sites Clearance	State Dept. of Land and Natural Resources, Historic Preservation Office	Proposed action will involve Federal funding
4. Permit for Construction within State Rights-of-Way	State Dept. of Transportation	Required for construction of sewerlines
5. Approval for Waste Disposal Facility	City and County of Honolulu, Board of Water Supply	Required for effluent injection wells
6. Special Management Area (SMA) Permit	City and County of Honolulu, Dept. of Land Utilization	Pump station and portions of the sewer lines are located in the SMA
7. Flood Hazard District Development Approval	City and County of Honolulu, Dept. of Land Utilization	STP site is located within the Flood Fringe District
8. Construction Permits (building, grading, grubbing, stockpiling)	City and County of Honolulu, Dept. of Public Works and Building Dept.	Required for construction-related activities

CHAPTER 13

ORGANIZATIONS AND PERSONS CONSULTED

The following organizations and persons were consulted during the preparation of the environmental assessment, the preparation notice and the draft environmental impact statement (DEIS).

Initial consultation letters were sent to each party. Consultation continued with all parties whom expressed comments and concerns, or raised questions. Further, coordination was maintained with agencies and organizations which had specific interests or concerns with the proposed project.

Comments to the draft EIS are reproduced in the Appendix, with response letters as applicable.

CITY AND COUNTY OF HONOLULU

Department of General Planning

Department of Housing & Community Development

Department of Land Utilization

Department of Parks & Recreation

Department of Transportation Services

Board of Water Supply

Office of Information and Complaint

STATE OF HAWAII

Department of Accounting and General Services

Department of Agriculture

Department of Defense

Department of Education

Department of Hawaiian Home Lands

Department of Health

- o Pollution Technical Review Branch
- o Office of Environmental Quality Control

Department of Land & Natural Resources

- o Division of Water & Land Development
- o Division of Forestry & Wildlife
- o Division of Aquatic Resources
- o Division of State Parks, Outdoor Recreation and Historic Sites

Department of Planning & Economic Development

Department of Social Services and Housing

- o Hawaii Housing Authority

Department of Transportation

University of Hawaii

- o Water Resources Research Center
- o Environmental Center

Windward Oahu Soil & Water Conservation District

FEDERAL

U.S. Department of Agriculture

- o Honolulu FmHA County Office
- o Soil Conservation Service

U.S. Air Force

- o 15th Air Base Wing
- o Bellows Air Force Station

U.S. Army

- o Engineering Headquarters
- o Corps of Engineers

U.S. Department of Commerce, International Trade Administration

U.S. Department of Energy

U.S. Department of Housing and Urban Development, Honolulu Area Office

U.S. Department of the Interior

- o Fish and Wildlife Service
- o Geological Survey

U.S. Environmental Protection Agency
U.S. Navy, Command Pacific Division
U.S. Department of Transportation, Federal Highway
Administration

PRIVATE AGENCIES, ORGANIZATIONS, COMMUNITY ASSOCIATIONS, ETC.

American Lung Association
Bernice P. Bishop Museum
Building Industry Digest
Church of Jesus Christ of Latter-Day Saints, Waimanalo 1st
and 2nd Wards
Environmental Law Center of the Pacific
Hawaiian Civic Club of America
Hawaiian Sugar Planters Association
Honolulu Advertiser
Honolulu Star Bulletin
Hui Mea Hana O Hawaii
Life of the Land
The Nalo News
Outdoor Circle
Pacific Business News
Save our Surf
Sierra Club
Sun Press Newspaper
Waimanalo Council of Community Organizations
Waimanalo Banyan Tree Association

Waimanalo Banyan Tree Townhouse Association

Waimanalo Hawaiian Homestead Association

Waimanalo Neighborhood Board No. 32

UTILITIES

GASCO, Inc.

Hawaiian Electric Co.

Hawaiian Telephone Company

INDIVIDUALS

Mr. Hayden Aluli

14.
REFERENCES

CHAPTER 14

REFERENCES

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APPENDIX

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APPENDIX

- A. Environmental Impact Statement Preparation Notice
 Comments and Responses
- B. Environmental Impact Statement
 Comments and Responses

APPENDIX

APPENDIX A: ENVIRONMENTAL IMPACT STATEMENT
PREPARATION NOTICE
COMMENTS AND RESPONSES

APPENDIX B: ENVIRONMENTAL IMPACT STATEMENT
COMMENTS AND RESPONSES

APPENDIX A

ENVIRONMENTAL IMPACT STATEMENT
PREPARATION NOTICE
COMMENTS AND RESPONSES

The following agencies and organizations provided comments on the EIS Preparation Notice. A total of 22 comment letters were received.

A double asterisk (**) indicates those which submitted written comments requiring substantive responses. The comment and response letters are reproduced in this appendix.

A single asterisk (*) indicates those which submitted written comments not requiring substantive responses. The comment letters are provided in this appendix.

A. CITY AND COUNTY OF HONOLULU AGENCIES

- **1. Board of Water Supply
- **2. Department of General Planning
- **3. Department of Housing and Community Development
- *4. Department of Parks and Recreation
- *5. Department of Transportation Services

B. STATE AGENCIES

- **1. Department of Accounting and General Services
- **2. Department of Agriculture
- *3. Department of Health
- **4. Department of Health, Office of Environmental Quality Control
- **5. Department of Land and Natural Resources
- **6. Department of Land and Natural Resources, State Parks
- *7. Department of Land and Natural Resources, Forestry and Wildlife
- *8. Department of Social Services and Housing, Hawaii Housing Authority
- **9. Department of Transportation
- **10. University of Hawaii, Water Resources Research Center

C. FEDERAL AGENCIES

- *1. U.S. Department of Agriculture, Soil Conservation Service
- **2. U.S. Air Force (Environmental Section)
- *3. U.S. Army Corps of Engineers
- *4. U.S. Department of Commerce, International Trade Administration

- *5. U.S. Department of the Interior, Geological Survey
- **6. U.S. Department of the Interior, Fish and Wildlife Service

D. OTHER

- **1. Hawaiian Electric Company, Inc.

COMMENTS TO EIS
PREPARATION NOTICE
WHICH REQUIRE RESPONSE

BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU
10 SOUTH BERETANIA
HONOLULU, HAWAII 96813

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



MICHAEL J. CHUN
DIRECTOR AND CHIEF ENGINEER

WPP 83-119

82-075
EWC
EILEEN R. ANDERSON, Mayor
YOSHIE H. FUJINAKA, Chairman
ROBERT A. SOUZA, Vice-Chairman
MILTON J. AGADER
MICHAEL J. CHUN
WALTER A. DODS, JR.
RYOKICHI HIGASHIONNA
DONNA M. HOWARD
EILEEN R. ANDERSON
Mayor
KAZU HAYASHIDA
Manager and Chief Engineer

December 10, 1982

February 28, 1983

TO: MICHAEL J. CHUN, DIRECTOR AND CHIEF ENGINEER
DEPARTMENT OF PUBLIC WORKS

FROM: KAZU HAYASHIDA
BOARD OF WATER SUPPLY

SUBJECT: YOUR MEMORANDUM OF DECEMBER 3, 1982,
ON THE EIS PREPARATION NOTICE FOR THE
WAIMANALO FACILITY PLAN

We anticipate no adverse impacts to our water system facilities in the area. However, we recommend the depths of the injection wells be no deeper than the original wells (205 feet maximum) should you plan to rehabilitate or construct new injection wells for effluent disposal. This would minimize potential adverse impacts to potable groundwater sources in the area.

If you have any questions, please contact Lawrence Whang at 315-3221.

Kazu Hayashida
KAZU HAYASHIDA
Manager and Chief Engineer

MEMORANDUM

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

FROM: MICHAEL J. CHUN
DIRECTOR AND CHIEF ENGINEER

SUBJECT: ENVIRONMENTAL IMPACT STATEMENT
PREPARATION NOTICE
WAIMANALO FACILITY PLAN

Thank you for your comments concerning the Environmental Impact Statement (EIS) Preparation Notice for the Waimanalo Facility Plan.

The injection well alternative for effluent disposal involves the construction of new wells that would have similar dimensions as the existing wells. These new wells would be sited in the vicinity of the existing wells and would utilize the same receiving stratum as the existing wells. The existing injection wells are not expected to be rehabilitated and would only serve as an emergency back-up system.

Due to the geological characteristics of the Waimanalo area, potable groundwater sources are not anticipated to be adversely affected by the proposed injection wells. An impermeable layer underlying the permeable injection zone will prevent groundwater contamination.

We hope that your comments have been adequately addressed. Your letter will be included in the EIS document.

Michael J. Chun
MICHAEL J. CHUN
Director and Chief Engineer

DEC 16 PM 2 54

REC'D

DEPARTMENT OF GENERAL PLANNING
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET
HONOLULU, HAWAII 96813

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DIRM
DEP
AGENCY
WMM

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



ILEEN M. ANDERSON
MANAGER

WILLARD T. CHOW
CHIEF PLANNING OFFICER

MICHAEL J. CHUN
DIRECTOR AND CHIEF ENGINEER

RALPH PARTHOORE
DEPUTY CHIEF PLANNING OFFICER

WPP 83-107

RECEIVED
JAN 25 1983

DGP12/82-4227

February 25, 1983

WILSON WYMAN & ASSOCIATES

MEMORANDUM

TO: Dr. Michael J. Chun, Director & Chief Engineer
Department of Public Works

VIA: Mr. Andrew I. T. Chang, Managing Director

SUBJECT: Environmental Impact Statement Preparation Notice
Waimanalo Facility Plan--Waimanalo, Oahu, Hawaii

TO: DR. WILLARD T. CHOW, CHIEF PLANNING OFFICER
DEPARTMENT OF GENERAL PLANNING

VIA: ANDREW I. T. CHANG, MANAGING DIRECTOR

FROM: MICHAEL J. CHUN, DIRECTOR AND CHIEF ENGINEER

SUBJECT: ENVIRONMENTAL IMPACT STATEMENT
PREPARATION NOTICE
WAIMANALO FACILITY PLAN

Our concern with the facility plan is the prospect that the public projects involving expansions to the existing wastewater treatment system may stimulate or induce secondary development effects. For example, the planned land use pattern shown on the proposed Koolauoko Development Plan is intended to maintain a rural and agricultural setting in Waimanalo.

Potential impacts on population and land use in the area resulting from an improved system, therefore, may require further discussion in the EIS.

Thank you for your comments concerning the Environmental Impact Statement (EIS) Preparation Notice for the Waimanalo Facility Plan.

The secondary growth impacts resulting from proposed improvements to the Waimanalo sewage system will be discussed in the EIS. Our preliminary findings indicate that these secondary impacts should not be significant since the sewage system is intended to facilitate future growth as established by governmental plans and policies such as the proposed Koolauoko Development Plan.

We hope that your comments have been adequately addressed.

APPROVED:

Ralph Partoore
WILLARD T. CHOW

Ralph Kawamoto
RALPH KAWAMOTO
Planner

Michael J. Chun
MICHAEL J. CHUN
Director and Chief Engineer

JAN 25 1983

DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT
CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813
PHONE 523-1101



IILEEN R. ANDERSON
MAYOR

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CITY AND COUNTY OF HONOLULU
FEB 15 1 48 PM '82

JOSEPH K. CONANT, DIRECTOR
CHARLES K. TORIC
DEPUTY DIRECTOR



DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813

MICHAEL J. CHUN
DIRECTOR AND CHIEF ENGINEER

WPP 83-112

December 13, 1982

February 28, 1983

MEMORANDUM

TO: Michael J. Chun, Director and Chief Engineer
Department of Public Works

FROM: Joseph K. Conant

SUBJECT: Environmental Impact Statement--Preparation Notice
Waimanalo Facility Plan
Waimanalo, Oahu, Hawaii

MEMORANDUM

TO: MR. JOSEPH K. CONANT, DIRECTOR
DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT

FROM: MICHAEL J. CHUN
DIRECTOR AND CHIEF ENGINEER

SUBJECT: ENVIRONMENTAL IMPACT STATEMENT
PREPARATION NOTICE
WAIMANALO FACILITY PLAN

WAIMANALO FACILITY PLAN
MANAGEMENT

We appreciate the opportunity you provided us to review and comment on the draft Waimanalo Sewage Treatment Plan.

We note that the existing treatment system serves only one-third of the total population and the remaining two-thirds are served by cesspools. It is our understanding that the system, as proposed, will serve the present population (9,132 people or 2,217 households) and will accommodate approximately 3,000 more people. It is also noted that the State of Hawaii owns approximately 4,050 acres, or two-thirds, of the property in the Waimanalo area. The existing residential land use in 1979 was 565 acres and lands zoned for proposed residential use amounted to 2,100 acres.

The planned facility, when implemented, will provide the stimulus to encourage the development of additional residential units, particularly on State lands, for low- and moderate-income families in the Waimanalo area. The Department of Housing and Community Development endorses the proposed project and looks forward to assisting in the development of low- and moderate-income housing in the area.

We will retain the Environmental Impact Statement report in our files.

Thank you for your comments concerning the Environmental Impact Statement (EIS) Preparation Notice for the Waimanalo Facility Plan.

The proposed collection system will only serve a portion of the entire 12,000 population projected for Waimanalo by the year 2005. The total collection system is estimated to be 2,120 housing units or about 8,730 people. Existing and future residences comprise the proposed service area. The sparsely populated agricultural lots are not expected to be severed due to the high cost per lot of constructing the sewer lines.

We hope that your comments have been adequately addressed. Your letter will be included in the EIS document.

MICHAEL J. CHUN
Director and Chief Engineer

RECEIVED

DEC 22 PM 2 18



MANAGEMENT

STATE OF HAWAII

DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES
P. O. BOX 119, HONOLULU, HAWAII 96819

DEC 16 1982

Dr. Michael J. Chun
Director and Chief Engineer
Department of Public Works
City and County of Honolulu
Honolulu, Hawaii

Dear Dr. Chun:

Subject: Waimanalo Facility Plan
Environmental Impact Statement
Preparation Notice

We have reviewed the subject preparation notice and have the following comments to offer:

1. Blanche Pope Elementary School, and Waimanalo Community Service Center are the facilities serviced by the Department of Accounting and General Services that are located in the unsewered area in Waimanalo.
2. Although we have not experienced problems with the cesspools serving the above facilities, they eventually will become filled and will have to be replaced.
3. We support extension of the sewer lines to the above facilities to eliminate the need for cesspools.

Thank you for allowing us to review the subject preparation notice.

Very truly yours,

Hideo Murakami
HIDEO MURAKAMI
State Comptroller

12/22
8-07552
DIBW
DEP WMT
PROJ
WUM
NCEO MURAKAMI
COMPTROLLER
SHIRAZE H. TOKUNAGA
DEPUTY COMPTROLLER
LETTER NO. (P) 2096.2

MP
DEC 25 PM 11 22

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813



LEN R. ANDERSON
MAYOR

Mr. Hideo Murakami

-2-

February 28, 1983

We hope that your comments have been adequately addressed. Your letter will be included in the EIS document.

Me ke aloha pumehana,

Michael J. Chun

MICHAEL J. CHUN
Director and Chief Engineer

MICHAEL J. CHUN, P.E.
DIRECTOR AND CHIEF ENGINEER

WPP 8J-120

February 28, 1983

Mr. Hideo Murakami
State Comptroller
Department of Accounting and
General Services
State of Hawaii
P. O. Box 119
Honolulu, Hawaii 96810

Dear Mr. Murakami:

Subject: Environmental Impact Statement
Preparation Notice
Waimanalo Facility Plan

Thank you for your comments concerning the Environmental Impact Statement (EIS) Preparation Notice for the Waimanalo Facility Plan.

Following are our responses to your comments:

1. Waimanalo Community Service Center

There is an existing 15-inch sewer main located along Kaimanalo Highway fronting the Waimanalo Community Service Center. Our preliminary findings indicate that this sewer main has sufficient capacity to handle the additional flow from the community center. The approval of a sewer connection application to the Division of Wastewater Management is required before the sewer later is designed for the center.

2. Blanche Pope Elementary School

Presently, we are in the process of determining the areas to be sewered in Waimanalo. The Makapuu Interceptor Sewer is being proposed to service the areas on the Makapuu side of the treatment plant. Blanche Pope Elementary School is located in this area and may be connected to the interceptor.

GEORGE R. ARIYOSHI
GOVERNOR



JACK K. SUWA
CHAIRMAN, BOARD OF AGRICULTURE
SUZANNE D. PETERSON
DEPUTY TO THE CHAIRMAN

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

State of Hawaii
DEPARTMENT OF AGRICULTURE
1428 So. King Street
Honolulu, Hawaii 96814

EILEEN R. ANDERSON
MAILER
P. O. Box 22159
Honolulu, Hawaii



MICHAEL J. CHUN
DIRECTOR AND CHIEF ENGINEER

December 21, 1982

To: Mr. Michael Chun, Director
Department of Public Works
City and County of Honolulu

February 28, 1983

Subject: Environmental Impact Statement Preparation Notice
Waimanalo Facility Plan -- Oahu, Hawaii
TRK: 4-1 Waimanalo, Oahu

Honorable Jack K. Suwa
Chairman
State Department of Agriculture
P. O. Box 22159
Honolulu, Hawaii 96822

The Department of Agriculture has reviewed the subject Preparation Notice and finds that the following topics have been noted for further discussion in the EIS:

- (1) Possible use of treated plant effluent to irrigate lands in agricultural use (pages 3-6, 6-10 and 11);
- (2) Possible use of treated sludge as a soil conditioner (pages 3-9, 6-12);
- (3) The uncertain future disposition of the Waimanalo farm lots currently under restrictive covenants regarding subdivision (page 4-18);
- (4) The importance of diversified agriculture in the region (page 4-19);
- (5) Objectives and actions proposed by the Waimanalo Watershed Plan (July 1981) (page 4-22);
- (6) The proposed Waimanalo Agricultural Park (pages 4-22 and 23);
- (7) The availability of domestic and irrigation water (pages 4-24 and 25), and;
- (8) Secondary growth impacts of the expansion of the existing collection system (pages 6-5 and 6).

Inasmuch as the existing facility is situated on land classified as "Prime" according to the Agricultural Lands of Importance to the State of Hawaii, the proposed treatment facilities should avoid, to the greatest extent possible, the use of lands adjacent to the existing facility site.

Thank you for the opportunity to comment.

Jack K. Suwa
JACK K. SUWA
Chairman, Board of Agriculture

"Support Hawaiian Agricultural Products"

Subject: Environmental Impact Statement
Preparation Notice
Waimanalo Facility Plan

Thank you for your comments concerning the Environmental Impact Statement (EIS) Preparation Notice for the Waimanalo Facility Plan.

Following is our response to your comment:

Comment:

void the use of lands adjacent to the existing facility site to protect important agricultural lands.

Response:

For further investigation of the ALISH maps by your staff, it was determined that the Waimanalo sewage treatment plant site is within the existing urban area and is not classified as "prime" lands. Additional lands will not be necessary for the proposed treatment plant improvements.

We hope that your comments have been adequately addressed. Your letter will be included in the EIS document.

Me ke aloha pumehana,

Michael J. Chun
MICHAEL J. CHUN
Director and Chief Engineer

0-011-1

12/12

Jacqueline Parnell
DIRECTOR
07557 TELEPHONE NO.
348-8815

DIRECTOR
DEPT. OF P.W.
WWM

RECEIVED
DEPT. OF P.W. WORKS
DEC 17 2 00 PM '82



STATE OF HAWAII
OFFICE OF ENVIRONMENTAL QUALITY CONTROL
310 HALEKUPUNA ST.
ROOM 301
HONOLULU, HAWAII 96813

December 16, 1982

OSAGE R. ARITOSHII
GOVERNOR

WATER
MANAGEMENT
DEC 22 PM 2 14

Dr. Michael J. Chun
Director and Chief Engineer
Department of Public Works
City and County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Dear Dr. Chun:

Subject: EIS Preparation Notice for the Waimanalo Facilities Plan

We understand that the Waimanalo area is primarily serviced by cesspools which have failed or are failing and acknowledge the need for the Waimanalo Sewage Treatment Plant expansion. However, it does not make sense to accumulate the sewage at the plant if the injection wells are not adequate for the task.

The information provided in the environmental assessment seems to indicate that the plant's injection wells have been a constant source of problems. As a result we question whether the use of injection wells is a viable effluent disposal alternative. If injection wells are to be used in the expansion, the pass problems should be worked out and enough capacity should be designed into the system so that the drainage ditch adjacent to the plant will never have to be utilized for emergency effluent removal.

A number of effluent and sludge disposal methods are discussed in this preparation notice. When the draft EIS is prepared we request at least an indication of which methods your department is considering as practical.

Sincerely,

Jacqueline Parnell
Jacqueline Parnell
Director

DEPARTMENT OF PUELC WORKS
CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813



M. R. ANDERSON
Mayor

MICHAEL J. CHUN, Ph.D.
DIRECTOR AND CHIEF ENGINEER

WPP 83-116

February 28, 1983

Ms. Jacqueline Parnell, Director
Office of Environmental
Quality Control
State of Hawaii
550 Halekauwila Street, Room 301
Honolulu, Hawaii 96813

Dear Ms. Parnell:

Subject: Environmental Impact Statement
Preparation Notice
Waimanalo Facility Plan

Thank you for your comments concerning the Environmental Impact Statement (EIS) Preparation Notice for the Waimanalo Facility Plan.

Following are our responses to your comments:

Comment:

Is the use of injection wells a viable alternative? If injection wells are used, past problems should be worked out and the use of the drainage ditch for emergency effluent removal should be eliminated.

Response:

A geological study of the feasibility of injection wells in Waimanalo was conducted by Geolabs-Hawaii (January 1982). This study concluded that the treatment plant site is well suited for injection well disposal. There is a permeable layer at depths of about 70 to 200 feet which is confined by upper and lower impermeable layers.

Ms. Jacqueline Parnell

-2-

February 28, 1983

Problems associated with the existing wells are due to structural deterioration of the wells and the lack of necessary maintenance equipment. Measures being considered to improve the performance of any new injection wells include better construction methods, pumps to periodically back-flush the wells, and sand filtration to upgrade effluent quality.

The injection well alternative proposes a new set of wells with the existing wells serving as an emergency back-up system. The combined capacity of these wells should be adequate for the projected flows so it is unlikely that the drainage ditch will have to be utilized.

Comment:

Indicate in the draft EIS which effluent and sludge disposal methods are considered to be practical for Waimanalo.

Response:

We are presently reviewing the various alternatives developed for Waimanalo. The selected plan will be described in the draft EIS.

We hope that your comments have been adequately addressed. Your letter will be included in the EIS document.

Me ke aloha punehana,

MICHAEL J. CHUN
Director and Chief Engineer

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JACIE R. ARTHUR
DIRECTOR OF WATER
8. JUN 11 PM 1:4



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DIVISIONS
ADULTIC RESOURCES
CONSERVATION AND
DEVELOPMENT
PROGRAMS
CONSERVATION ENFORCEMENT
FORESTRY AND WILDLIFE
LAND MANAGEMENT
STATE PLANS
WATER AND LAND DEVELOPMENT

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
P. O. BOX 621
HONOLULU, HAWAII 96809

January 4, 1983

DEPT OF LAND AND NATURAL RESOURCES
JAN 11 1983
11/11/83

Dr. Michael J. Chun
-2-
January 4, 1983

Dr. Michael J. Chun
Director and Chief Engineer
Department of Public Works
City and County of Honolulu
650 S. King Street
Honolulu, Hawaii 96813

Dear Dr. Chun:

We appreciate this opportunity to review the Environmental Impact Statement Preparation Notice for the Waimanalo Facility Plan which proposes to eliminate problems associated with existing wastewater facilities and to ensure that adequate wastewater facilities will be available to meet the current and future needs of the Waimanalo Community.

The subject Waimanalo Facility Plan requires investigation of alternative wastewater systems for Waimanalo in order to establish a viable wastewater management program for the region. Regarding the several alternatives for effluent disposal, we would like to offer the following comments.

1. In the proposal to use the three existing injection wells, it should be noted that the Department of Land and Natural Resources is proposing to develop a new injection well in the near future to replace one of the deteriorated wells. Further, we suggest the statement on page 3-5 be corrected to read "Originally, the injection capacity was measured at to 5 mgd per well" rather than 14 mgd.
2. We support and encourage the proposal of "Irrigation Reuse of Effluent". One of the policy directions of the State Water Resources Development Plan is to "increase the use of treated sewage effluent and other non-potable water for irrigation purposes."

3. That the City and County set up a periodic maintenance program for the existing injection wells such that they would operate efficiently. In this case, the County would be wholly responsible for the operation of the plant without any State involvement. This would then place the governmental agencies in their proper roles.

Thank you again for this opportunity to review this EIS Preparation Notice. Please contact us if you have any questions.

Very truly yours,

SUSUMU ONO
Chairman of the Board

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813



LEEN R. ANDERSON
Mayor

Mr. Susumu Ono

-2-

February 28, 1983

Response:

A maintenance program to be implemented by the City and County of Honolulu is presently being considered for the Waimanalo treatment plant. The development of this program will be coordinated with the Department of Land and Natural Resources.

We hope that your comments have been adequately addressed. Your letter will be included in the EIS document.

Me ke aloha pumehana,

MICHAEL J. CHUN
Director and Chief Engineer

MICHAEL J. CHUN
DIRECTOR AND CHIEF ENGINEER

WPP 83-115

February 28, 1983

Honorable Susumu Ono
Chairman
State Board of Land and
Natural Resources
P. O. Box 621
Honolulu, Hawaii 96809

Dear Mr. Ono:

Subject: Environmental Impact Statement
Preparation Notice
Waimanalo Facility Plan

Thank you for your comments concerning the Environmental Impact Statement (EIS) Preparation Notice for the Waimanalo Facility Plan.

Following are our responses to your comments:

Comment:

Note that the Department of Land and Natural Resources plans to have a new well to replace one of the deteriorated wells. Correct the statement regarding injection well capacity.

Response:

These revisions will be made in the draft EIS.

Comment:

The City and County should set up a periodic maintenance program for the existing injection wells.

RECEIVED

JUN -3 1982

STATE OF HAWAII



DEPARTMENT OF LAND AND NATURAL RESOURCES
DIVISION OF STATE PARKS
P. O. BOX 251
HONOLULU, HAWAII 96808

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M. R. ANDERSON
DIRECTOR
DIVISIONS:
AGRICULTURE DEVELOPMENT
PROGRAM
AGRICULTURAL RESOURCES
CONSERVATION
CONSERVATION ENFORCEMENT
FORESTRY AND WILDLIFE
LAND MANAGEMENT
STATE PARKS
WATER AND LAND DEVELOPMENT

December 27, 1982

MEMORANDUM

TO: Mr. Gordon Sob
Planning Office

FROM: Ralston H. Nagata, State Parks Assistant
Administrator

SUBJECT: EIS Waimanalo Facility Plan
Oahu, TRK 4-1-various

The proposed undertaking is adjacent to the Bellows Field Archaeological Area, which was placed on the National Register of Historic Places. This site has been important to Hawaiian archaeology because it is the oldest dated site in the Hawaiian Islands.

Surface indications of archaeological sites are minimal in the Waimanalo area. Buried archaeological sites will be found throughout the lowland, coastal areas. Because of the importance of the sites in the area, an archaeologist should be hired to monitor ground-disturbing activities in the project area. He should be given an opportunity to study archaeological finds discovered during construction. Time should be provided for analysis of the cultural remains recovered. Funds should be provided for laboratory dating of charcoal and volcanic glass, and a final report should be written and forwarded to our office for review and comment.

[Signature]
RALSTON H. NAGATA

cc: Mr. Michael J. Chun, Dept. of Public Works
City and County of Honolulu

255 552
1436

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



MICHAEL J. CHUN
DIRECTOR AND CHIEF ENGINEER
WPP 83-108

February 25, 1983

Mr. Ralston H. Nagata
State Parks Assistant Administrator
Division of State Parks
State Department of Land and
Natural Resources
P. O. Box 621
Honolulu, Hawaii 96809

Dear Mr. Nagata:

Subject: Environmental Impact Statement
Preparation Notice
Waimanalo Facility Plan

Thank you for your comments concerning the Environmental Impact Statement (EIS) Preparation Notice for the Waimanalo Facility Plan.

We recognize the archaeological significance of the Waimanalo area. The State Historic Preservation Officer will be consulted before any ground-disturbing activities are undertaken within areas which previously have not been excavated or graded to determine the necessity of hiring an archaeologist.

Construction work will primarily involve improvements within the existing treatment plant site and the installation of sewer lines. The potential impact of these activities on archaeological resources will be identified in the draft EIS.

We hope that our comments have been adequately addressed. Your letter will be included in the EIS document.

Me ke aloha pumehana,

[Signature]
MICHAEL J. CHUN
Director and Chief Engineer

REC'D

JUN 11 1983

MANAGEMENT

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION

December 27, 1982

Mr. Michael Chun
Director and Chief Engineer
Department of Public Works
City and County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Dear Mr. Chun:

EIS Preparation Notice
Waimanalo Facility Plan

Thank you for including us in your EIS consultation process for the Waimanalo Facility Plan.

Should the Waimanalo Facility Plan involve any construction work within the State highway right-of-way, your consultant should discuss in the draft EIS the coordination and the needed review and approval of the affected construction plans with our Highways Division.

Very truly yours,

Ryokichi Higashionna
Ryokichi Higashionna
Director of Transportation

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



IN P. ANDERSON
MAYOR

MICHAEL J. CHUN
DIRECTOR AND CHIEF ENGINEER

WPP 83-111

February 28, 1983

Honorable Ryokichi Higashionna
Director
State Department of
Transportation
869 Punchbowl Street
Honolulu, Hawaii 96813

Dear Dr. Higashionna:

Subject: Environmental Impact Statement
Preparation Notice
Waimanalo Facility Plan

Thank you for your comments concerning the Environmental Impact Statement (EIS) Preparation Notice for the Waimanalo Facility Plan.

The proposed collection system for the Waimanalo sewage treatment plant will involve construction work along Kalaniana'ole Highway. The necessary approvals will be identified and discussed in the draft EIS.

We hope that your comments have been adequately addressed. Your letter will be included in the EIS document.

Me ke aloha pumehana,

Michael J. Chun
MICHAEL J. CHUN
Director and Chief Engineer

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UNIVERSITY OF HAWAII AT MANOA
MANAGER III

Water Resources Research Center
Holmes Hall 253 • 2540 Dole Street
Honolulu, Hawaii 96822

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



EILEEN R. ANDERSON
CLERK

MICHAEL J. CHUN, Ph.D.
DIRECTOR AND CHIEF ENGINEER

JAN 3 3 25 PM '83

21 December 1982

WPP 83-113

February 28, 1983

Dr. Michael J. Chun
Director and Chief Engineer
Department of Public Works
City and County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Mr. Edwin T. Murabayashi
EIS Coordinator
Water Resources Research Center
University of Hawaii
Holmes Hall 283
2540 Dole Street
Honolulu, Hawaii 96822

Dear Dr. Chun:

Subject: EIS Preparation Notice for Waimanalo Facility Plan,
Oahu, Hawaii, November 1982

We have reviewed the subject material and offer the following comments:

1. P. 4-7, paragraph 4.1.5.2, Groundwater... "The dike-impounded groundwater is stored in compartments in the Koolau Mountains that were forced when the rift zone of an extinct volcano was deeply eroded..." Erosion has nothing to do with the formation of dike compartments.

P. 4-7, Figure 12, Slope. The correct source is "Land Study Bureau," not "Land Use Study Bureau," as shown on the map. Moreover, this citation is not listed in Chapter 10, "References."

This material was reviewed by WRRC personnel. Thank you for the opportunity to comment.

Sincerely,

Edwin T. Murabayashi

Edwin T. Murabayashi
EIS Coordinator, WRRC

EDM:jcm

Dear Mr. Murabayashi:

Subject: Environmental Impact Statement
Preparation Notice
Waimanalo Facility Plan

Thank you for your comments concerning the Environmental Impact Statement (EIS) Preparation Notice for the Waimanalo Facility Plan.

The draft EIS will be revised to reflect your comments about groundwater and the Land Study Bureau.

We hope that your comments have been adequately addressed. Your letter will be included in the EIS document.

Me ke aloha pumehana,

Michael J. Chun

MICHAEL J. CHUN
Director and Chief Engineer

AN EQUAL OPPORTUNITY EMPLOYER

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DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 15TH AIR FORCE WING (PACAF)
RICKAM AIR FORCE BASE, HAWAII 96853
DEC 23 11 09 AM '82



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



MICHAEL J. CHUN, P.E.
DIRECTOR AND CHIEF ENGINEER
WILLIAM A. BOWNETT
DEPUTY DIRECTOR

EILEEN R. ANDERSON
SECRETARY

21 UEL 1982

Environmental Impact Statement Preparation Notice, Waimanalo Facility Plan
(Your Ltr, 3 Dec 1982)

Dr Michael J. Chun
Director and Chief Engineer
Department of Public Works
City and County of Honolulu
650 South King Street
Honolulu HI 96813

January 20, 1983

Mr. Ross W. J. Lum
Deputy Director of Civil
Engineering
Department of the Air Force
Headquarters 15th Air Base Wing (PACAF)
Rickam Air Force Base, Hawaii 96853

1. This office has reviewed the subject EIS preparation notice and our comments are as follows:

a. Bellows Air Force Station (BAFS) is currently experiencing cesspool problems which are creating potential health hazards to its residents. The cesspool requires pumping weekly and at times, twice weekly. This could be attributed to the solid materials contained in the sewage clogging the fire sand strata surrounding the cesspools. The Air Force is investigating the possibility of installing a collection/force main system at BAFS and connecting it to the City sewage system along Kalamanaole Highway or the Lanikai Sewage System. Your comments on the feasibility of the two connection points are requested.

b. According to the preparation notice, the Facility Plan is consisting only the scattered areas adjacent to Kalamanaole Highway for possible sewer service. Areas such as BAFS and the agricultural farm areas will be excluded. Clarification on this is requested.

c. The Air Force installation at Bellows is an Air Force station and not an Air Force Base. The contents of the preparation notice should be corrected accordingly.

2. Your response to our queries / 21 January 1983 will be appreciated. Should you have any questions, please contact Mr Reggie Yamada at 449-1831.

Michael J. Chun
MICHAEL J. CHUN
Deputy Director of Civil Engineering

20 JAN 26 1983
U.S. AIR FORCE
HEADQUARTERS 15TH AIR FORCE WING
RICKAM AIR FORCE BASE, HAWAII 96853

Dear Mr. Lum:

Subject: Waimanalo Facility Plan, Environmental Impact Statement Preparation Notice

Thank you for your comments on the preparation notice. Should you decide to install a collection/force main system at Bellows Air Force Station, your connection point should be on Kalamanaole Highway.

Presently, Bellows Air Force station and the Agricultural designated areas are not considered in the service area of the Waimanalo Sewage Treatment Plant.

The preparation notice and the Environmental Impact Statement will be corrected to indicate the installation at Bellows as an Air Force Station and not a base.

If there are any questions, please call Mr. Jay Hamai at 523-4067.

Me ke aloha pumehana,

Michael J. Chun
MICHAEL J. CHUN
Director and Chief Engineer

WPP 83-34



United States Department of the Interior
 FISH AND WILDLIFE SERVICE
 300 ALA MOANA BOULEVARD
 P. O. BOX 50187
 HONOLULU, HAWAII 96850

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 JAN 21 1983

GILEEN R. ANDERSON
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Mr. Michael J. Chun
 Director and Chief Engineer
 City Department of Public Works
 650 South King Street
 Honolulu, Hawaii 96813

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



MICHAEL J. CHUN, Ph.D.
 DIRECTOR AND CHIEF ENGINEER

WPP 83-118

February 28, 1983

Re: EIS Preparation Notice
 Waimanalo Facility Plan
 Oahu, Hawaii

Dear Mr. Chun:

In response to your request of December 3, 1982, we have reviewed the Environmental Impact Statement Preparation Notice (EISP/N) for the Waimanalo Facility Plan. The notice adequately addresses water quality, and it does note the presence of Hawaii's four endangered waterbird species within the project area. However, the EISP/N does not speculate on how these species may be affected by the project. Direct effects as well as possible secondary effects which may occur as a result of increased sewerage should be addressed in the EIS. The discussion of project impacts on other fish, wildlife and plant resources might also be strengthened.

Six candidate endangered species of plants are known historically from the Waimanalo study site. These are:

- Santalum ellipticum var. littorale (Hbd.) Skottsb. - Coast sandalwood
- Vigia oahuensis Vogel
- Bidens graciloides Sherff
- Lebelia oahuensis Beck
- Capparis sandwicheana DC. var. sandwicheana
- Peperomia pectinosa H. & A.

We suspect that most may no longer be present; however, we do not anticipate that any of them will be affected by the proposed facilities plan.

We appreciate this opportunity to comment.

Sincerely yours,

 John I. Ford
 Acting Project Leader
 Office of Environmental Services

cc: WFS-EPO
 HD/SM
 HDAR
 EPA, San Francisco



Save Energy and You Serve America!

Mr. John I. Ford
 Acting Project Leader
 Office of Environmental Services
 Fish and Wildlife Service
 U.S. Department of the Interior
 300 Ala Moana Boulevard, Room 6307
 Honolulu, Hawaii 96850

Dear Mr. Ford:

Subject: Environmental Impact Statement
 Preparation Notice
 Waimanalo Facility Plan

Thank you for your comments concerning the Environmental Impact Statement (EIS) Preparation Notice for the Waimanalo Facility Plan.

We are presently in the process of selecting the collection, treatment, and disposal alternatives for the Waimanalo Facility Plan. An environmental assessment of the selected alternatives in terms of fish, wildlife, and plant resources will be provided in the EIS. Thank you for informing us about the candidate endangered species of plants historically identified in Waimanalo.

We hope that your comments have been adequately addressed. Your letter will be included in the EIS document.

Me ke aloha pumehana,

MICHAEL J. CHUN
 Director and Chief Engineer

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JAN 17 10 52

HAWAIIAN ELECTRIC COMPANY, INC.
Box 2750 Honolulu, Hawaii 96840

RICHARD L. O'CONNELL, P.E.
MANAGER, ENVIRONMENTAL DEPARTMENT
(808) 544-6400

January 10, 1983

00198 NV/G

GILKEN R. ANDERSON
MANAGER

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DEPT OF PUBLIC WORKS
JAN 12 4 21 PM '83

Dr. Michael J. Chun
Director and Chief Engineer
Department of Public Works
650 South King Street
Honolulu, Hawaii 96813

Dear Dr. Chun:

Subject: Environmental Impact Statement Preparation Notice -
Waimanalo Facility Plan, Oahu, Hawaii

We have reviewed the above Environmental Impact Statement Preparation Notice and offer the following comments:

- The process involved in preparing a facility plan is referenced on Page 1-3 and outlined in Table 1-1 of the Preparation Notice. On the Table is listed "Evaluation of Energy Requirements" for the proposed Waimanalo Facility Plan. This part of the EIS (when written) should address HECO's major area of concern, i.e. the availability of electrical facilities or the need to construct new facilities to serve the proposed wastewater (sewage) treatment plant.
- We note that under Chapter 4 - "Description of the Environmental Setting," there is no reference to electrical utilities in the Waimanalo area under Section 4.3 "Public Facilities and Services" to be found on Pages 4-24 and 25.

Thank you for the opportunity to comment on this Environmental Impact Statement Preparation Notice.

Sincerely,

Richard L. O'Connell
Manager, Environmental Department

JMP, Jr.:ca:

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



MICHAEL J. CHUN, P.E.
DIRECTOR AND CHIEF ENGINEER

WPP 83-117

February 28, 1983

Mr. Richard L. O'Connell
Manager
Environmental Department
Hawaiian Electric Company, Inc.
P. O. Box 2750
Honolulu, Hawaii 96840

Dear Mr. O'Connell:

Subject: Environmental Impact Statement
Preparation Notice
Waimanalo Facility Plan

Thank you for your comments concerning the Environmental Impact Statement (EIS) Preparation Notice for the Waimanalo Facility Plan.

We are presently in the process of selecting the collection, treatment, and disposal alternatives for the Waimanalo Facility Plan. The electrical facilities necessary to serve the selected alternatives will be determined in the next phase of the project. A description and evaluation of the existing electrical utilities will be provided in the EIS.

We hope that your comments have been adequately addressed. Your letter will be included in the EIS document.

Me ke aloha pumehana,

MICHAEL J. CHUN
Director and Chief Engineer

COMMENTS TO EIS
PREPARATION NOTICE
WHICH DO NOT REQUIRE RESPONSE

DEPARTMENT OF PARKS AND RECREATION
CITY AND COUNTY OF HONOLULU
 550 SOUTH KING STREET
 HONOLULU, HAWAII 96813



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 EILEEN R. ANDERSON
 WASTEWATER
 MANAGER

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 DEPT. OF PWS
 PRO. A.
 WWM
 EMIKO I. KUDO
 DIRECTOR
 SAM L. CARL
 SENIOR ENGINEER
 DEBORAH N. ARASHINA
 EXECUTIVE ASSISTANT

December 16, 1982

TO: MICHAEL J. CHUN, DIRECTOR AND CHIEF ENGINEER
 DEPARTMENT OF PUBLIC WORKS

FROM: EMIKO I. KUDO

SUBJECT: ENVIRONMENTAL IMPACT STATEMENT (EIS) PREPARATION NOTICE
 FOR THE MAIHANALO FACILITY PLAN

The proposed wastewater treatment improvements will not have any impact on recreation facilities in proximity to the project site.

Thank you for the opportunity to review the EIS Preparation Notice.

Emiko I. Kudo
 (Mrs.) EMIKO I. KUDO, Director

EIK:VC

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DEPARTMENT OF TRANSPORTATION SERVICES
CITY AND COUNTY OF HONOLULU
 HONOLULU MUNICIPAL BUILDING
 550 SOUTH KING STREET
 HONOLULU, HAWAII 96813



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 EILEEN R. ANDERSON
 WASTEWATER
 MANAGER

82 07631
 DEPT. OF PWS
 PRO. A.
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 DIRECTOR
 DEPT. DIRECTOR

TE 12/82-5739

December 21, 1982

MEMORANDUM

TO: MICHAEL J. CHUN, DIRECTOR & CHIEF ENGINEER
 DEPARTMENT OF PUBLIC WORKS

FROM: ROY A. PARKER, DIRECTOR

SUBJECT: ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE
 MAIHANALO FACILITY PLAN MAIHANALO, OAHU, HAWAII

We have no comments on the EIS Preparation Notice.

Roy A. Parker
 ROY A. PARKER

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WASTEWATER
MANAGEMENT

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P.O. Box 50006
Honolulu, Hawaii
96850

Soil
Conservation
Service

United States
Department of
Agriculture



December 20, 1982

Michael J. Chun
Director and Chief Engineer
Department of Public Works
City and County of Honolulu
650 South King Street
Honolulu, HI 96813

Dear Dr. Chun:

Subject: Environmental Impact Statement Preparation Notice,
Waimanalo Facility Plan, Oahu, Hawaii

We have reviewed the subject notice and find that it is compatible with the Waimanalo Watershed Plan. Indications are that this facility plan will improve the quality of the sewage effluent which is proposed for irrigation use in the watershed plan.

Thank you for the opportunity to review this notice.

Sincerely,

Stratford L. Whiting
STRAITFORD L. WHITING
District Conservationist

The Soil Conservation Service
is an agency of the
Department of Agriculture

g

PAUL A. TOM
Executive Director

STATE OF HAWAII
DEPARTMENT OF SOCIAL SERVICES AND HOUSING
HAWAII HOUSING AUTHORITY
P. O. BOX 17847
HONOLULU, HAWAII 96817



December 8, 1982

Department of Public Works
City and County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Gentlemen:

Subject: Environmental Impact Statement Preparation
Notice - Waimanalo Facility Plan, Oahu,
Hawaii

In discussing the subject matter with your staff, we have no comments to offer relative to the modification of the sewage treatment plant in Waimanalo.

Thank you for the opportunity to comment on this matter.

Sincerely,

Paul A. Tom
PAUL A. TOM
Executive Director

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OFFICE OF
WASTEWATER
MANAGEMENT



DEPARTMENT OF THE ARMY
PACIFIC OCEAN DIVISION, CORPS OF ENGINEERS
FT SHAFTER, HAWAII 96858
December 17, 1982

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DIV. OF WASTEWATER MANAGEMENT
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Mr. Michael Chun, Director
Department of Public Works
City and County of Honolulu
650 South King Street
Honolulu, HI 96813

Dear Mr. Chun:

Thank you for the opportunity to comment on the EIS preparation notice for the Waianalo Facility Plan, Oahu, Hawaii. We offer the following preliminary comment:

There is insufficient information to determine whether a Department of the Army permit is required.

We look forward to reviewing the environmental impact statement.

Sincerely,

Chun
Kisuk Cheung
Chief, Engineering Division

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UNITED STATES DEPARTMENT OF COMMERCE
International Trade Administration
District Office
300 Ala Moana Boulevard, Room 4106
P.O. Box 50026
Honolulu, Hawaii 96850

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DIV. OF WASTEWATER MANAGEMENT

December 7, 1982
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PRO. ACC.
W. W. M. S.

Michael J. Chun
Director and Chief Engineer
Department of Public Works
City and County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Dear Mr. Chun:

This is in response to your letter of December 3, 1982 received in our office on December 6, 1982, regarding: Environmental Impact Statement Preparation Notice, Waianalo Facility Plan, Oahu, Hawaii.

Our office has no input or comments to offer regarding the Plan. We have enclosed information about the International Trade Administration; our Honolulu District Office is one of 47 district offices of U.S. Department of Commerce and we assist United States citizens in exporting overseas to foreign countries.

Please contact our office if we can help you with export questions.

Sincerely,

M. H. Conner
M. H. Conner
International Trade Administration

Enclosure

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United States Department of the Interior

GEOLOGICAL SURVEY

Water Resources Division
P.O. Box 50166
Honolulu, Hawaii 96850

December 29, 1982

Mr. Michael J. Chun
Director and Chief Engineer
Department of Public Works
City and County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Dear Mr. Chun:

Subject: Environmental Impact Statement (EIS)
Preparation Notice Waialeale Facility Plan
Oahu, Hawaii

The Hawaii District Office of the U.S. Geological Survey, Water Resources Division, has reviewed the subject EIS preparation notice and has no comments at this time.

Thank you for giving us an opportunity to review the preparation notice.

Aloha,

Stephen L. Jones
Stephen L. Jones
District Chief

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DIV. OF
WASTEWATER
MANAGEMENT

APPENDIX B

ENVIRONMENTAL IMPACT STATEMENT
COMMENTS AND RESPONSES

Copies of the draft EIS were distributed to the following agencies and organizations during the EIS public review period from June 8, 1983 to July 8, 1983. A total of 28 letters were received with comments on the EIS.

A double asterisk (**) indicates those which submitted written comments requiring substantive responses. The comment and response letters are reproduced in this appendix.

A single asterisk (*) indicates those which submitted written comments not requiring substantive responses. The comment letters are provided in this appendix.

No asterisk indicates the agencies and organizations which did not submit written comments.

A. CITY AND COUNTY OF HONOLULU AGENCIES

1. Building Department
- *2. Fire Department
- *3. Department of General Planning
- *4. Department of Housing and Community Development
- **5. Department of Land Utilization
- *6. Department of Parks and Recreation
- **7. Police Department
- *8. Department of Transportation Services
- *9. Board of Water Supply

B. STATE AGENCIES

- *1. Department of Accounting and General Services
- **2. Department of Agriculture
- *3. Department of Defense, Office of Adjutant General
- **4. Department of Hawaiian Home Lands
- *5. Department of Health
- *6. Department of Health, Office of Environmental Quality Control
- **7. Department of Land and Natural Resources
8. Department of Land and Natural Resources, Historic Preservation Office
- *9. Department of Planning and Economic Development
- *10. Department of Planning and Economic Development, Energy Division
11. Department of Social Services and Housing

**COMMENTS TO DRAFT EIS
WHICH REQUIRE RESPONSE**

DEPARTMENT OF LAND UTILIZATION
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET
HONOLULU, HAWAII 96813 & 96814



SILVEN R. ANDERSON
MAYOR

MICHAEL M. McELROY
DIRECTOR

ROBERT B. JONES
SENIOR ENGINEER

LU6/83-2590(LH)

July 8, 1983

RECEIVED

JUL 11 1983

WILSON OKAMOTO & ASSOCIATES

Mr. Helvin K. Koizumi, Acting Director
Office of Environmental Quality Control
State of Hawaii
550 Halekiauila Street, Room 301
Honolulu, Hawaii 96813

Dear Mr. Koizumi:

Draft Environmental Impact Statement (EIS)
Waimanalo Wastewater Facilities
Tax Map Key: 4-1

We have reviewed the above EIS and have the following comments to offer:

1. Reference: Page 27, 3.1.8.1 Flooding
Comment: This section should mention that the proposed project is subject to the provisions of Ordinance No. 80-52, relating to Flood Hazard Districts.
2. Reference: Page 42, 4.3 Koolaupoko Development Plan (DP)
Comment: The site is designated as Public Facility by the DP. The corresponding Public Facilities Map designation is "site undetermined - Proposed Funding (7 years - future)".

Mr. Helvin K. Koizumi, Acting Director
Page 2

3. Reference: Page 54, 5.2 Secondary Impacts

Comment: The improved system will permit development of vacant lands in areas designated as residential in the Koolaupoko DP. A discussion of the potential impacts of increased urban development on the existing public facilities and services should be included in the document.

If you should have any questions, please contact Lorene Maki of our staff at 527-5349.

Very truly yours,

MICHAEL M. McELROY
Director of Land Utilization

MHH:sj

cc: DPW
Wilson Okamoto & Associates, Inc. ✓

MR. MICHAEL H. McELROY

-2-

JULY 26, 1983

Response:

The Development Plan limits residential land uses to existing developed areas. Since there are very few vacant lots within these residential areas, existing public facilities and services should not be significantly affected.

The proposed wastewater facilities will also accommodate new residences proposed by the State Department of Hawaiian Home Lands (DHHL). The necessary improvements to service this development will be made by DHHL.

Your comments will be included in the revised EIS.

Michael J. Chu

MICHAEL J. CHU
Director and Chief Engineer

cc: Office of Environmental Quality Control

Wilson Okamoto & Associates, Inc.

HPP 83-317

July 26, 1983

MEMORANDUM

TO: MR. MICHAEL H. McELROY, DIRECTOR
DEPARTMENT OF LAND UTILIZATION

FROM: MICHAEL J. CHU, DIRECTOR AND CHIEF ENGINEER

SUBJECT: WAIMANALO WASTEWATER FACILITIES
ENVIRONMENTAL IMPACT STATEMENT

Thank you for your comments to the subject EIS by your letter dated July 8, 1983 (TUG/83-2590 (LH)).

Comment:

Section 3.1.8.1 (Flooding) should mention that the proposed project is subject to the provisions of Ordinance 80-62, relating to Flood Hazard Districts.

Response:

This section will be revised as noted.

Comment:

The site is designated as Public Facility by the Development Plan. The corresponding Public Facilities Map designation is "Site undetermined - proposed funding (7 years - futuro)".

Response:

The solid waste disposal site designated on the Public Facilities Map will not necessarily be located at the Waimanalo Sewage Treatment Plant site. The map just indicates that the solid waste disposal site will be located somewhere in the Waimanalo area.

Comment:

A discussion of the potential impacts of increase development of vacant residential lands on the existing public facilities and services should be included.

RECEIVED

JUN 23 1983

WILSON OKAMOTO & ASSOCIATES

DI-ES

June 23, 1983

TO: MICHAEL M. McELROY, DIRECTOR
DEPARTMENT OF LAND UTILIZATION
CITY AND COUNTY OF HONOLULU

FROM: DOUGLAS G. GIBB, CHIEF OF POLICE
HONOLULU POLICE DEPARTMENT

SUBJECT: PROPOSED WAIMANALO WASTEWATER FACILITIES PROJECT

The Honolulu Police Department does not have, at this time, any objections to the proposed Waimanalo Wastewater Facilities project. However, due to the location of a section of the Makapuu Interceptor sewer and the 2-1/2 years construction time required to complete the entire project, we suggest considerable attention be paid to traffic flow and safety. Our records indicate five major and five minor traffic accidents within the proposed construction area over the last six months.

DOUGLAS G. GIBB
Chief of Police

cc: Department of Public Works
City and County of Honolulu
650 South King Street, 11th Floor
Honolulu, Hawaii 96813

Wilson Okamoto and Associates, Inc.
1150 South King Street, Suite 800
Honolulu, Hawaii 96813

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



SILEEN R. ANDERSON
MAIL ROOM

MICHAEL J. CHUN, Ph.D.
DIRECTOR AND CHIEF ENGINEER
MAURICE H. KATA
DEPUTY DIRECTOR

MPP 83-298

July 22, 1983

MEMORANDUM

TO: MR. DOUGLAS G. GIBB, CHIEF OF POLICE
POLICE DEPARTMENT

FROM: MICHAEL J. CHUN
DIRECTOR AND CHIEF ENGINEER

SUBJECT: WAIMANALO WASTEWATER FACILITIES
ENVIRONMENTAL IMPACT STATEMENT

Thank you for your comments to the subject EIS by your letter dated June 23, 1983.

Construction of the Makapuu Interceptor Sewer is only expected to require about 18 months according to the State Department of Hawaiian Home Lands. Traffic disruption during construction is an unavoidable impact identified in the EIS. Appropriate measures, such as stationing flagmen to direct traffic, will be implemented to mitigate these impacts as required.

Your comments will be included in the revised EIS.

for MICHAEL J. CHUN
Director and Chief Engineer

cc: Office of Environmental Quality Control
Department of Land Utilization, City and County of Honolulu
Wilson Okamoto & Associates, Inc.



STATE OF HAWAII
DEPARTMENT OF HAWAIIAN HOME LANDS
P. O. BOX 1079
HONOLULU, HAWAII 96813

July 8, 1983

PROJECT OFFICES
HAWAII OFFICE
P. O. BOX 175
HONOLULU, HAWAII 96813

PROJECT OFFICES
MAUI OFFICE
P. O. BOX 25
HONOLULU, HAWAII 96813

RECEIVED
JUL 12 1983

STATE OF HAWAII

Ms. Jacqueline Parnell, Director
Office of Environmental Quality Control
550 Halekauwila Street, Room 301
Honolulu, Hawaii 96813

Dear Ms. Parnell:

SUBJECT: Environmental Impact Statement (EIS)
Maimanalo Wastewater Facilities
Maimanalo, Koolauapoko, Oahu, Hawaii
Agency Action

The Department of Hawaiian Home Lands (DHHL) has reviewed the Environmental Impact Statement (EIS) for the Maimanalo Wastewater Facilities in Maimanalo, Oahu, and offer the following comments on the attached sheets.

The DHHL fully supports the proposed improvements. The construction of the Hakapu Interceptor Sewer is necessary for the DHHL to proceed with development of their lands in Maimanalo.

Thank you for the opportunity to comment on the EIS for the subject project.

Sincerely yours,

Georgiana K. Padeken
Georgiana K. Padeken
Chairman

GKP:RF:SW:JM

Enclosures

cc: Dept. of Land Utilization, City and County of Honolulu
Dept. of Public Works, City and County of Honolulu
Wilson Okamoto and Associates, Inc.

ENVIRONMENTAL IMPACT STATEMENT (EIS)
MAIMANALO WASTEWATER FACILITIES
MAIMANALO, KOOLAUPOKO, OAHU, HAWAII
AGENCY ACTION

Statement: Page 16; Table 2-3, Construction Costs for the Proposed Maimanalo Wastewater Facilities

Makapu Interceptor Sewer	(Cost 1982 Dollars)
Section 1	\$451,000
Section 2	315,000

Comments: Our consultant, Fukunaga and Associates, Inc., who is preparing detailed designs and plans for the Makapu Interceptor Sewer estimates the cost for Section 1 and Section 2 to be \$800,000 and \$600,000, respectively. The DHHL much earlier had estimated \$2.0 million for the construction of the project considering that the trunk sewer would be constructed deep, in existing improved roads and areas and would be subjected to limited working hours and require the following:

1. Stringent traffic controls
2. Conformance of additional safety regulations
3. Temporary access to existing lot
4. Minimum disruption of access and utility services to the homeowners.

Statement: Page 39, last paragraph; "Under the recommended alternative, DHHL proposes to develop 314 lots with the minimum lot size of 7,000 square feet. The development area is approximately 75 acres and is located in the vicinity of the existing DHHL homesteads, as shown in Figure 17. Approximately 24 acres of this area are available for immediate development. A portion is currently leased to Pacific Concrete and Rock for coral extraction; however, it is anticipated that the quarry operation will have advanced sufficiently to allow use of these lands."

Comments: The DHHL proposes to develop approximately 109 acres of Maimanalo lands under its Maimanalo Development and Master Plans.

85 acres of the 110 acres is currently leased to Pacific Concrete and Rock Company, Ltd., for coral extraction until 1988 and 1992. The quarry operations, besides providing general revenues to the DHHL, will remove the existing mounds, grade the lands to desired elevations, reduce the development cost and provide usable lands for the proposed development. The remaining 24 acres can be developed as soon as the Makapu Interceptor Sewer is constructed and funds become available to plan, design, prepare plans and contract documents and construct the site improvements.

GEORGE B. ABIYOSHI
GOVERNOR



JACK K. SUMA
CHAIRMAN, BOARD OF AGRICULTURE

State of Hawaii
DEPARTMENT OF AGRICULTURE
1428 S. King Street
P. O. Box 22159
Honolulu, Hawaii 96822
June 27, 1983



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

MICHAEL J. CHUN, Ph.D.
PHILIPPO AND CHIEF ENGINEER
MAURICE M. BARRA
DEPUTY DIRECTOR

WPP 83-295

EILEEN R. ANDERSON
MAILING

July 22, 1983

RECEIVED
JUL 29 1983
WILSON OKAMOTO & ASSOCIATES

MEMORANDUM

To: Mr. Michael H. McElroy, Director
Department of Land Utilization
City and County of Honolulu

Subject: Environmental Impact Statement for
Waimanalo Wastewater Facilities
TRK: 4-1 Waimanalo, Oahu

The Department of Agriculture has reviewed the subject EIS and finds that it adequately addresses all of our concerns.

Please note that the sentence on page 31 stating that "The existing STP site is situated on Prime agricultural lands", should be corrected to show that the proposed facility is within the State Urban District and on lands not classified according to the Agricultural Lands of Importance to the State of Hawaii (ALISH) system (see letter to Department of Agriculture from Department of Public Works, dated February 20, 1983).

Thank you for the opportunity to comment.

Jack K. Suma
JACK K. SUMA
Chairman, Board of Agriculture

cc: DEOC
Department of Public Works, C&C
Wilson Okamoto and Associates, Inc.

Honorable Jack K. Suwa, Chairman
Department of Agriculture
State of Hawaii
P. O. Box 22159
Honolulu, Hawaii 96822

Dear Mr. Suwa:

Subject: Waimanalo Wastewater Facilities
Environmental Impact Statement

Thank you for your comments to the subject EIS by your letter dated June 27, 1983.

As noted in your letter, the EIS will be corrected to show that the Waimanalo Sewage Treatment Plant is not classified according to the Agricultural Lands of Importance to the State of Hawaii (ALISH) system.

Your comments will be included in the revised EIS.

Me ke aloha pumehana,

Michael J. Chun
MICHAEL J. CHUN
Director and Chief Engineer

cc: Office of Environmental Quality Control
Department of Land Utilization, City and County of Honolulu
Wilson Okamoto & Associates, Inc.

"Support Hawaiian Agricultural Products"

Statement: Page 40, first paragraph, last sentence: "Site B includes 3.9 acres to be subdivided into 15 lots and a mini-park."

Comments: A mini-park for Site B is not required and has been deleted. The development of Sites A and B is contingent upon the construction of the Makapuu Interceptor Sewer, which will convey the sewage from the sites to the Waimanalo Sewage Treatment Plant.

WPP 83-316

July 26, 1983

Honorable Georgiana K. Padoken
Chairperson
State Department of
Hawaiian Home Lands
P. O. Box 1879
Honolulu, Hawaii, 96805

Dear Ms. Padoken:

Subject: Waimanalo Wastewater Facilities
Environmental Impact Statement

Thank you for your comments to the subject EIS by your letter dated July 8, 1983.

Comment:

The construction costs for the Makapuu Interceptor Sewer, Sections 1 and 2 presented in Table 2-3 on page 16 are incorrect. The correct costs are \$800,000 for Section 1 and \$600,000 for Section 2.

Response:

The construction costs will be appropriately corrected in the revised EIS.

Comment:

The description of future DMHL development in the EIS is not correct and should be revised. A total of approximately 109 acres of land will be developed in Waimanalo. Pacific Concrete and Rock Company currently leases 85 acres of this total. The remaining 24 acres can be developed upon construction of the Makapuu Interceptor and availability of funds.

Response:

The EIS will be revised as noted.

HONORABLE GEORGIANA K. PADEKEN

-2-

JULY 26, 1983

Comment:


The mini-park described on page 40 of the EIS should be deleted from the description of proposed DHL developments. Development of Sites A and B is contingent upon construction of the Makapuu Interceptor.

Response:

This revision will be incorporated into the EIS.

We hope that we have adequately addressed your comments. Your comments will be included in the revised EIS.

Me ke aloha pumehana,


MICHAEL J. CHUN
Director and Chief Engineer

cc: Office of Environmental Quality Control
Department of Land Utilization
City & County of Honolulu
Wilson Okamoto & Associates, Inc.

GEORGE S. AMYTHOR
DIRECTOR OF LAND



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
P. O. BOX 851
HONOLULU, HAWAII 96808

July 11, 1983

Department of Land Utilization
City and County of Honolulu
650 So. King Street, 7th Floor
Honolulu, Hawaii 96813

Gentlemen:

Thank you for the opportunity to review the environmental impact statement (EIS) for the proposed Waimanalo wastewater facilities.

We support the proposed sewer system improvements including use of treated effluent for irrigation purposes. However, we wish to point out that if the existing treatment plant is expanded, the State Department of Land and Natural Resources will not be responsible for the effluent disposal wells. The statement on page 5, under section 2.1.1.2 Treatment and Disposal, that the State of Hawaii is responsible for maintenance of the existing injection wells, is also incorrect.

In April 1973 an understanding was reached with the City that it would take over maintenance and operation of the system. A copy of that understanding is enclosed.

We have in addition other concerns to express and appreciate the opportunity to do so.

AQUATIC RESOURCES

In response to the applicant's EIS Preparation Notice and announcement of a public information meeting, we suggested by letter of December 29, 1982, that the EIS describe in detail sites and work for the alternatives considered; thoroughly discuss such "temporary," construction-related impacts as erosion-related sedimentation on aquatic environments; and address such potential long-range impacts as nutrient enrichment on freshwater and marine habitats, organisms, and public uses thereof.

In addition, because the project is intended to replace existing cesspools with municipal treatment, we anticipated it would improve the quality of waters, and thus the value of the associated aquatic resources to the public, in the Waimanalo area. To the extent that this would occur we are strongly in favor of the proposed project. However, the present draft of the EIS does not clearly address this matter. Although stream fauna and shoreline

BUSINESS DIVISION, CHAIRMAN
BOARD OF LAND & NATURAL RESOURCES
EDGAR A. HALEALU
DIRECTOR OF LAND

DIVISIONS:
PLANNING
CONSTRUCTION AND
COMMITMENT AND
CONSTRUCTION
LAND MANAGEMENT
WATER AND LAND DEVELOPMENT

RECEIVED
JUL 14 1983

WILSON OKAMOTO & ASSOCIATES

Dept. of Land Utilization

-2-

July 11, 1983

recreational uses receive passing mention (pp. 29 and 31-32, respectively), these are not quantified. There seems to be no discussion of marine life nor of public uses of the freshwater organisms identified. Measures to control erosion (and thus sedimentation of aquatic environments) are mentioned (p. 46) without comment actually to employ such measures. There is no schedule to indicate anticipated duration of "temporary" impacts. Possible disposal of treated effluents as irrigation water and of sludge as agricultural "compost" are dismissed as insignificant (p. 51) and without consideration of nutrients washing or leaching into aquatic habitats, except for vague reference to "appropriate" farming practices and "proper precautions" (p. 51) which would not seem within the applicant's power to effect.

While we believe that the proposed project is consistent with the State's interest in aquatic resources, the present draft of the subject EIS unfortunately offers little support to such belief.

RECREATION

Our concern is whether unpleasant odors will actually be controlled at the proposed Waimanalo wastewater facilities, particularly when existing sewage treatment plants (e.g., Sand Island, Sandy Beach, and Hanakuli) have not been successful. Specifically, does the technology exist to control unpleasant odors under all anticipated conditions that may occur at the Waimanalo site, and if so will it be used at Waimanalo? Will the proposed wastewater facilities be properly operated (e.g., properly staffed, trained, and maintained) at all times? If the technology or operation cannot or is highly unlikely to control unpleasant odors under all anticipated conditions at the site, then what will be the potential adverse impacts on the neighboring areas, particularly Waimanalo Bay State Recreation Area?

HISTORIC SITES

Surface indications of archaeological sites are minimal in the Waimanalo area. However, buried archaeological sites will be found throughout the lowland, coastal area, including the most ancient Hawaiian sites found in the Hawaiian Islands. Because of the importance of the sites in the area, an archaeologist should be hired to monitor ground-disturbing activities. He should be given an opportunity to study archaeological finds discovered during construction. Provisions should be made for analysis of the cultural remains recovered, including laboratory dating of charcoal and volcanic glass. A final report should be written and two copies forwarded to our historic sites office for review and comment.

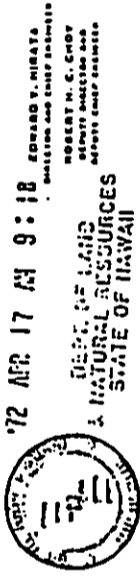
Very truly yours,

SUSAN O'NEIL, Chairman
Board of Land and Natural Resources &
State Historic Preservation Office

Encls.

cc: City & County, Dept. of Public Works
Wilson Okamoto and Associates, Inc.

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU
HONOLULU, HAWAII 96813



FRANK P. PAUL
DIRECTOR
RICHARD A. SHARPLESS
MANAGING DIRECTOR

EDWARD Y. HIRATA
CHAIRMAN AND MEMBER
ROBERT M. C. GIBBY
SECRETARY
DEPT. OF LAND & NATURAL RESOURCES
STATE OF HAWAII

Mr. Sunao Kido

2

Your letter of acceptance or approval by endorsement of this letter is all we need to authorize our personnel to begin operating the system.

Very truly yours,

Edward Y. Hirata
EDWARD Y. HIRATA
Director and Chief Engineer

APPROVED:

SUNAO KIDO
Chairman and Member

Date: April 18 1972

Mr. Sunao Kido
Chairman and Member
Board of Land and Natural Resources
State of Hawaii
BOX 621
Honolulu, Hawaii 96809

Dear Mr. Kido:

Subject: Waimanalo Sewerage System

The City is willing to immediately take over the operation and maintenance of the subject sewerage system with the following understanding:

1. The State will retain the fee title and be responsible for any major modifications or additions necessary to meet State or Federal Water Quality Standards.
2. The City will be allowed to connect to the system and will bear all normal operating, maintenance and repair costs.
3. The State will be responsible for fulfilling their commitments to complete the landscaping work by December 31, 1972 and to follow through on the correction of minor deficiencies involved in the work done by the contractors.
4. Future expansion of the system which may be necessitated by the addition of City flows will be constructed by the City.

The foregoing items have all been previously discussed with your Department.

C2E75-01
GD

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



GILBERT M. ANDERSON
MAYOR

MICHAEL J. CHUM, Ph.D.
DIRECTOR AND CHIEF ENGINEER

MAURICE H. KATA
DEPUTY DIRECTOR

WPP 83-346

August 5, 1983

RECEIVED
AUG 11 1983

PLANNING DIVISION & ADMINISTRATION

Honorable Susumu Ono, Chairman
Board of Land and Natural Resources
State of Hawaii
P. O. Box 621
Honolulu, Hawaii 96809

Dear Mr. Ono:

Subject: Waimanalo Wastewater Facilities
Environmental Impact Statement

Thank you for your comments to the subject EIS by your letter dated July 11, 1983. Following are point-by-point responses to your comments.

Comment:

The State of Hawaii is not responsible for maintenance of the existing injection wells, as stated in the EIS.

Response:

The EIS will be corrected to indicate that the City and County of Honolulu operates and maintains the wells.

Comment:

Because the project is intended to replace existing cesspools with municipal treatment, we anticipate that it would improve the quality of waters and, thus, the value of the associated aquatic resources to the public in the Waimanalo area. The EIS does not address this matter.

Response:

As stated on page 24 of the EIS, there is concern that cesspools may be contaminating surface waters in Waimanalo. However, limited water quality sampling data exists to identify the actual source(s) of water pollution. Because other factors (e.g., live-stock operations) may be involved, water quality may not

Honorable Susumu Ono -2- August 5, 1983

necessarily be improved by the proposed sewer system. Therefore, it can only be concluded, as indicated by the summary table on page 49 of the EIS, that the proposed sewer system will have minimal or no impact on water quality.

Comment:

Although stream fauna and shoreline recreational uses receive passing mention, these are not quantified. There seems to be no discussion of marine life nor of public uses of the freshwater organisms identified.

Response:

Data was not available to quantify or describe these conditions. Furthermore, detailed studies were not conducted since the proposed project is not expected to impact these conditions.

Comment:

Measures to control erosion are mentioned without commitment actually to employ such measures. There is no schedule to indicate anticipated duration of "temporary" impacts.

Response:

As stated on page 46 of the EIS, existing ordinances governing grading, erosion, and sediment control will be followed during construction. Strict adherence to these regulations will minimize the impact on aquatic environments. It is difficult to anticipate the duration of construction related impacts since the project phasing has not yet been determined.

Comment:

Possible disposal of treated effluents as irrigation water and of sludge as agricultural "compost" are dismissed as insignificant and without consideration of nutrients washing or leaching into aquatic habitats, except for vague reference to "appropriate" farming practices, and "proper precautions" which would not seem within the applicants power to effect.

Response:

Presently, there is insufficient data to adequately determine the impact of nutrients washing or leaching into aquatic habitats from agricultural lands that use treated effluent or compost. It is difficult to ascertain whether this impact is more or less detrimental than ordinary runoff or leaching presently occurring from agricultural lands.

Honorable Susumu Ono

-3-

August 5, 1983

It is important to note that the effluent irrigation system and composting facility are not the sole means of effluent and sludge disposal proposed for the Waimanalo sewage treatment plant. In the event any serious problems are encountered, there will be standby systems for both effluent and sludge disposal. These are new injection wells and continuation of landfilling, respectively.

Comment:

Does the technology exist to control unpleasant odors under all anticipated conditions that may occur at the Waimanalo site, and if so will it be used at Waimanalo? Will the proposed wastewater facilities be properly operated at all times? If the technology or operation cannot or is highly unlikely to control unpleasant odors under all anticipated conditions at the site, then what will be the potential adverse impacts on the neighboring areas, particularly Waimanalo Bay State Recreation Area?

Response:

The existing Waimanalo plant has not received any odor complaints since it was put into operation. Presently, there are no specific odor control measures at the Waimanalo plant. The technology exists to control unpleasant odors, however, these measures have not been necessary since the plant has been properly operated and maintained.

The additional facilities proposed for the plant are also not expected to generate unpleasant odors. The generation of odors is a typical concern with the proposed composting facility, however, the entire facility will be enclosed to contain odors during the composting process. Based on past experience with this kind of facility, odor generation is not expected to be a problem. Therefore, the neighboring areas should not be adversely affected.

Comment:

Because of the importance of buried archaeological sites in Waimanalo, an archaeologist should be hired to monitor ground-disturbing activities. The archaeological finds should be analyzed and reported to the State Historic Preservation Office.

Response:

We recognize the archaeological significance of the Waimanalo area. The State Historic Preservation Office will be consulted before any ground-disturbing activities are undertaken within areas which previously have not been excavated or graded to determine the necessity of hiring an archaeologist.

Honorable Susumu Ono

-4-

August 5, 1983

Construction of the proposed facilities will primarily be conducted within already developed areas such as the existing Waimanalo plant and road rights-of-way. The potential archaeological impact of these activities, therefore, is not expected to be significant.

We hope that your comments have been adequately addressed. Your comments will be included in the revised EIS.

Me ke aloha pumehana,



MICHAEL J. CHUN

Director and Chief Engineer

cc: Office of Environmental Quality Control
Department of Land Utilization,
City and County of Honolulu
Wilson Okamoto & Associates, Inc.

RECEIVED

JUN 28 1983

WILSON OKAMOTO & ASSOCIATES

SILEEN R. ANDERSON
ENGINEER

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



MICHAEL J. CHUN, Ph.D.
DIRECTOR AND CHIEF ENGINEER

MAURICE H. RATA
DEPUTY DIRECTOR

WPP 83-296

STP 8.9172

June 28, 1983

July 22, 1983

Ms. Jacqueline Parnell, Director
Office of Environmental Quality Control
550 Halekauwila Street, Room 301
Honolulu, Hawaii 96813

Dear Ms. Parnell:

Environmental Impact Statement
Waimanalo Wastewater Facilities
Waimanalo, Koolauapoko, Oahu, Hawaii

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

We have no comments other than to advise the proposing
agency that any work within our highway rights-of-way must
be coordinated with our Highways Division.

Very truly yours,

Ryokichi Higashionna

Ryokichi Higashionna
Director of Transportation

ALK:ko

cc: Dept. of Public Works,
City and County of Honolulu
-Wilson Okamoto

Honorable Ryokichi Higashionna
Director
Department of Transportation
State of Hawaii
889 Punchbowl Street
Honolulu, Hawaii 96813

Dear Dr. Higashionna:

Subject: Waimanalo Wastewater Facilities
Environmental Impact Statement

Thank you for your comments to the subject EIS by your letter
dated June 28, 1983 (STP 8.9172).

Coordination with the State Department of Transportation for
construction within State rights-of-way is included in the EIS
list of necessary approvals.

Your comments will be included in the revised EIS.

Ma kegaloha pumehana,

Michael J. Chun

For MICHAEL J. CHUN
Director and Chief Engineer

cc: Office of Environmental Quality Control
Department of Land Utilization, City and County of Honolulu
Wilson Okamoto & Associates, Inc.



University of Hawaii at Manoa

Environmental Center
Crawford 317 • 2550 Campus Road
Honolulu, Hawaii 96822
Telephone (808) 948-7361

Department of Land Utilization
City and County of Honolulu
650 South King Street, 7th Floor
Honolulu, Hawaii 96813

Director
Office of Environmental Quality Control
550 Halekauwā Street, Room 301
Honolulu, Hawaii 96813

July 8, 1983

RE#0380

RECEIVED

JUL 14 1983

WILSON OKAMOTO & ASSOCIATES

Dear Sir/Madam:

Draft Environmental Impact Statement
Waimanalo Wastewater Facilities
Waimanalo, Koolauapoko, Oahu

This Environmental Center review has been prepared with the assistance of Frank Peterson, Geology and Geophysics; Alexander Dollar, Public Health; Doak Cox and Mark Ingoglia, Environmental Center. The following comments are offered for your consideration.

Filtration/Injection Wells

Use of a new effluent sand filter is mentioned throughout the EIS (for example pages 43, 50, and 51) but a sand filter is not shown in the facility plans (page 3) or the flow chart (page 6). As is cited several times throughout the EIS a significant cause of malfunctioning in the existing injection wells is attributed to well structural deficiencies and caving. There is no indication, however, what modifications in the proposed new injection wells will be made to avoid these same problems. One recommendation is that the wells be fully cased throughout their entire length.

Socio-Economic Impacts

The socio-economic impacts of sewage installation and operating costs are severe considering nearly three-fourths of the households in Waimanalo have incomes below the 1979 Oahu median household income of \$20,700 and that the population is generally comprised of larger households. Considering average residential lot sizes, what will be the mean economic impact per household for the sewage system installation? What portion of the average yearly income will this economic impact comprise? What will the economic impacts be to the households comprising the lowest incomes per year? It appears an

AN EQUAL OPPORTUNITY EMPLOYER

DLU and OEQC

- 2 -

July 8, 1983

Initial sewage hookup expense of \$4,000 is likely plus the annual cost of \$109 per year. These financial burdens should be clarified to better define the socio-economic impacts of the wastewater facilities.

On-Site Treatment Facilities

Considering the economic burden of the sewage facilities to the Waimanalo residents, has consideration been given to alternative systems of wastewater management? Dry or composting toilets combined with grey water systems if managed properly, can provide safe waste disposal alternatives that are less costly than conventional sewage systems, conserve water which is a prime limitation to agricultural development in Waimanalo (page 35) and control health and ground water pollution and problems commonly associated with cesspools.

"On-site treatment facilities" are discussed in Chapter 6 of the DEIS under the heading of "Unavoidable Adverse Impacts." The impacts of on-site treatment facilities are clearly indicated as including: "cesspool failures--groundwater contamination, odor and public health problems" (page 56). Alternative methods of on-site treatment such as the use of dry toilets and Grey Water Systems similar to those used in other states and Europe may be a viable alternative to the unsewered area residents.

Considering the agricultural background of this community the concepts of composting cesspool system and the associated health and pollution problems currently plaguing the Waimanalo residents. The following references are excellent sources of information associated with the growing practice of Dry toilet technology:

Adams, R.B., Jon Averill, John Daniels, Compost Toilets: A Guide for Home Builders, National Center for Appropriate Technology, July, 1979.

Stoner, Carol Hopping, Goodbye to the Flush Toilet, Rodale Press, 1977.

California State, Water Resources Control Board, Rural Wastewater Disposal Alternative Final Report Phase I, March 1980.

We appreciate the opportunity to comment on this DEIS and hope you will find our suggestions useful in the preparation of the revised document.

Yours truly,

Jacquelin N. Miller
Acting Director

cc: DPW
Wilson Okamoto and Associates, Inc. ✓
Frank Peterson
Alexander Dollar
Doak Cox
Mark Ingoglia

CA375-01
610

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



GILEEN R. ANDERSON
MANAGER

MICHAEL J. CHUN, Ph.D.
DIRECTOR AND CHIEF ENGINEER

MAURICE H. KEAY
DEPUTY DIRECTOR

MPP 83-338

August 4, 1983

RECEIVED
AUG 10 1983
CITY OF HONOLULU

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

Dear Ms. Miller:

Subject: Waimanalo Wastewater Facilities
Environmental Impact Statement

Thank you for your comments to the subject EIS by your letter dated July 8, 1983 (RE: 0380). Following are point-by-point responses to your comments.

Comment:

Use of a new effluent sand filter is mentioned throughout the EIS but it is not shown on the facility plans or the flow chart. There is no indication what modifications in the proposed new injection wells will be made to avoid problems experienced with the existing wells. One recommendation is that the wells be fully cased throughout their entire length.

Response:

The facility plans (Figures 4 and 5) and flow chart (Table 2-1) are intended to only show existing features of the Waimanalo plant. The sand filter is not included since it is a new facility proposed for the plant.

Proposed modifications for the new injections wells include an effluent sand filter and well maintenance equipment. The effluent sand filter is intended to reduce the quantity of suspended solids introduced into the wells that are capable of clogging the receiving stratum, and to provide a means of treating backwash water periodically removed from the wells. Each new well will also be equipped with a backwash pump for maintenance purpose. Both these improvements are expected to enhance well performance and reliability.

Ms. Jacquelin N. Miller -2- August 4, 1983

Soil boring tests are required to determine the extent of casing necessary for the injection wells. The wells can be lined with a perforated casing, depending on the boring results.

Comment:

What will be the mean economic impact per household for the sewage system installation? What portion of the average yearly income will this economic impact comprise? What will the economic impacts be to the households comprising the lowest incomes per year? These financial burdens should be clarified to better define the socio-economic impacts of the wastewater facilities.

Response:

As stated in Section 5.1.2.1 (a) of the EIS (pages 48-50), the following costs will be incurred by property owners within designated sewer improvement districts. The initial sewer connection cost is estimated to range between \$3,300 and \$7,000.

City Improvement District assessment - Property owners are assessed for a share of the improvement costs. The current assessment rate is \$0.16 per square foot for residential areas, or \$800 for a 5,000-square foot lot. Commercial areas are assessed \$0.20 per square foot.

Cost of backfilling cesspools - This is the responsibility of individual property owners. The estimated backfilling cost is \$500 to \$1,000.

Installation of sewer line to the house - Individual property owners are responsible for this installation cost of approximately \$2,000 to \$4,000.

In addition, property owners are charged monthly to help pay for operation and maintenance costs. The charge for single-family and duplex dwellings is \$9.05 per month. Multiple unit dwellings are charged \$6.35 per month.

It is inappropriate to draw conclusions about the impact of the sewer connection expenses upon individual property owners based solely on income considerations. Other factors which affect an individual's ability to afford such expenses include financial arrangements provided by the government, existing mortgage payments, and the type of housing presently occupied (e.g., Department of Hawaiian Home Lands). Because these factors differ greatly among individuals, it is difficult to generalize and accurately determine these socioeconomic impacts within Waimanalo.

Ms. Jacquelin H. Miller

-3-

August 4, 1983

Comment:

Considering the economic burden of the sewage facilities to Waimanalo residents, has consideration been given to alternative systems of wastewater management?

Response:

The proposed wastewater facilities were determined during the facility planning process established by the Federal Construction Grants Program. Alternatives were developed and evaluated based on technical, economic, environmental, institutional, and social considerations to arrive at the proposed plan. Chapter 7 of the EIS describes the alternatives which were considered for Waimanalo.

Alternative on-site treatment systems, such as dry or composting toilets combined with grey water systems, were considered for the unsewered areas of Waimanalo. Individual homeowners would be responsible for installing these systems.

We hope that your comments have been adequately addressed. Your comments will be included in the revised EIS.

Me ke aloha pumehana,



MICHAEL J. CHUN
Director and Chief Engineer

cc: Office of Environmental Quality Control
Department of Land Utilization,
City and County of Honolulu
Wilson Okamoto & Associates, Inc.



DEPARTMENT OF THE ARMY
PACIFIC OCEAN DIVISION, CORPS OF ENGINEERS 83 -03723
FT. SHAFTER, HAWAII 96838

July 7, 1983

MANAGEMENT

*EVU 44 for
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RECEIVED
DEPT. OF PUBLIC WORKS
JUL 11 8 44 AM '83

Dr. Michael Chun, Director
Department of Public Works
650 South King Street, 11th Floor
Honolulu, HI 96813

Dear Dr. Chun:

Thank you for the opportunity to review the EIS for Waimanalo Wastewater Facilities. The following comments are offered:

- a. A Department of Army permit is not required.
- b. Portions of the proposed wastewater facilities alignments are within flood-prone areas according to the Flood Insurance Study for the City and County of Honolulu, prepared by the Federal Insurance Administration. Under the requirements of the National Flood Insurance Program, all public utilities and facilities such as sewer systems should be located and constructed to minimize or eliminate flood damage, and to reduce exposure to flood hazards.

Sincerely,

Michael Chun
Kisuk Cheung
Chief, Engineering Division

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



EILEEN R. ANDERSON
CHIEF

MICHAEL J. CHUN, Ph.D.
DIRECTOR AND CHIEF ENGINEER
MAURICE H. BATA
DEPUTY DIRECTOR

MPP 83-319

July 25, 1983

Mr. Kisuk Cheung, Chief
Engineering Division
Pacific Ocean Division,
Corps of Engineers
U.S. Department of the Army
Ft. Shafter, Hawaii 96858

Dear Mr. Cheung:

Subject: Waimanalo Wastewater Facilities
Environmental Impact Statement

Thank you for your comments to the subject EIS by your letter dated July 7, 1983.

Flood-prone areas in Waimanalo are identified in the EIS. Adequate flood control measures (i.e., berms) will be implemented to minimize flood hazards at the Waimanalo Sewage Treatment Plant site, which is located within the 100-year flood boundary. Furthermore, the proposed wastewater facilities will comply with the provisions of City Ordinance 80-62, relating to Flood Hazard Districts.

Your comments will be included in the EIS.

Me ke aloha pumehana,
Michael Chun
MICHAEL J. CHUN
Director and Chief Engineer

cc: Office of Environmental Quality Control
Department of Land Utilization,
City and County of Honolulu
Wilson Okamoto & Associates, Inc.



United States Department of the Interior

FISH AND WILDLIFE SERVICE
100 ALA MOANA BOULEVARD
P. O. BOX 50143
HONOLULU, HAWAII 96810

40785-14037

RECEIVED
JUL 25 1983
Room 6307
JUL 7 1983

Department of Land Utilization
City and County of Honolulu
650 South King Street, 7th Floor
Honolulu, Hawaii 96813

Dear Gentlemen:

The Service has reviewed the Environmental Impact Statement (EIS) for expansion and improvement of the Waimanalo Wastewater Facilities which was forwarded to us with the letter of the Environmental Quality Commission dated June 6, 1983. The project will benefit the community by providing service to previously unsewered areas and will help to alleviate potential public health problems associated with the Waimanalo Wastewater Facility and private cesspools.

The EIS acknowledges the four endangered waterbirds and candidate endangered/threatened plants which may be present within the project area (see our letter of January 21, 1983). We do not anticipate that they will be affected by the proposed facilities plan. The final EIS would be enhanced by an expanded discussion of direct and indirect impacts to fish and wildlife resources (page 49).

The specific number and location of the proposed injection wells should be specified in the final EIS (page 11 and figure 4). We encourage the reuse of chlorinated, secondary-treated effluent for irrigating crops; however, we advise that it be used in fields which do not directly drain into perennial streams (i.e. Waimanalo Stream). The final EIS should discuss potential impacts of such irrigation runoff on Inosole Stream during streamflow conditions.

Cesspool failures in the remaining unsewered areas which overflow into Waimanalo Stream tributaries would degrade water quality of the stream and watershed. The Bellows A.F.S. Secondary Wetlands site as well as the Bellows/Waimanalo Beach area may be affected by increased nutrient and bacterial concentrations. Reconsideration should be given to service problem areas such as Flamingo

Road which is located adjacent to an existing sewer subdivision (figure 3). We appreciate this opportunity to comment.

Sincerely,

William R. Kramer

William R. Kramer
Acting Project Leader
Office of Environmental Services

cc: NMFS - WPPD
HDAR
HDELM
EPA, San Francisco



Save Energy and You Serve America!

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



EILEEN R. ANDERSON
MAYOR

MICHAEL J. CHUM, Ph.D.
DIRECTOR AND CHIEF ENGINEER

MAURICE H. WATA
SENIOR DIRECTOR

WPP 83-359

August 10, 1983

RECEIVED
AUG 17 1983
WATER RESOURCES & AQUACULTURE

Mr. William R. Kramer
Acting Project Leader
Office of Environmental Services
Fish and Wildlife Service
U.S. Department of the Interior
P. O. Box 50167
Honolulu, Hawaii 96850

Dear Mr. Kramer:

Subject: Waimanalo Wastewater Facilities,
Environmental Impact Statement

Thank you for your comments to the subject EIS by your letter dated July 7, 1983. Following are point-by-point responses to your comments:

COMMENT:

The final EIS would be enhanced by an expanded discussion of direct and indirect impacts to fish and wildlife resources.

RESPONSE:

Fish and wildlife resources are identified in Section 3.1.11 (Flora and Fauna) and 3.1.13 (Wetlands). As described in these sections, Waimanalo Stream provides habitat for endangered waterbirds in the wetlands area and various aquatic fauna along the watercourse. The proposed wastewater facilities will be located at the existing Waimanalo Sewage Treatment Plant site and on the Makapuu side of the plant, and thus, will not affect the habitat areas.

The discussion of potential impacts in the EIS highlights significant impacts from the proposed facilities. Because the proposed facilities are expected to have minimal or no impact on fish and wildlife resources, as indicated on the summary table (page 49) and your letter, we feel it is not necessary to expand the discussion.

Mr. William R. Kramer -2- August 10, 1983

COMMENT:

The specific numbers and location of the proposed injection wells should be specified in the final EIS (page 11 and figure 4).

RESPONSE:

As discussed on page 11, at least three new injection wells will be required. Because field pumping tests have not been conducted, it is difficult to determine the exact number of wells that will be installed. The new wells will be situated in the vicinity of the existing wells. The revised EIS will include a figure showing the proposed facilities at the Waimanalo plant site.

COMMENT:

Treated effluent should not be used in fields which directly drain into perennial streams (i.e., Waimanalo Stream). The final EIS should discuss potential impacts of such irrigation runoff on Inoaole Stream during stream-flow conditions.

RESPONSE:

According to the Waimanalo Watershed Plan, the potential area for irrigation with treated effluent is located mauka of the Waimanalo Sewage Treatment Plant. This area does not drain directly into Waimanalo Stream, the only perennial stream identified in the planning area.

Presently, there is insufficient data to adequately determine the impact of irrigation runoff on Inoaole Stream. It is difficult to ascertain whether this impact is more or less detrimental than ordinary runoff presently occurring from agricultural lands. Generally, Inoaole Stream is not expected to be significantly impacted during streamflow conditions since runoff from fields using treated effluent will be diluted as it flows through the stream channel.

COMMENT:

Reconsideration should be given to service cesspool problem areas such as Flamingo Street which is located adjacent to an existing sewer subdivision.

Mr. William R. Kramer

-3-

August 10, 1983

RESPONSE:

The EIS discusses the unavoidable impact of cesspool failures within the unserved areas of Waimanalo. Because of the low population density in the agricultural areas, it is not cost effective to service such areas as Flamingo Street. Based on guidelines established by the U. S. Environmental Protection Agency, areas with densities less than 1.5 persons per acre are not cost effective to sewer.

We hope that your comments have been adequately addressed. Your comments will be included in the revised EIS.

Me ke aloha pumehana,



MICHAEL J. CHUN
Director and Chief Engineer

cc: Office of Environmental Quality Control
Department of Land Utilization,
City and County of Honolulu
Wilson Okamoto and Associates, Inc.



United States Department of the Interior

GEOMORPHOLOGICAL SURVEY
Water Resources Division
P.O. Box 50166
Honolulu, Hawaii 96850

June 22, 1983

RECEIVED

JUN 23 1983

WILSON OKAMOTO & ASSOCIATES

Ms. Jacqueline Parnell, Director
Office of Environmental Quality Control
550 Halekauwila Street, Room 301
Honolulu, Hawaii 96813

Dear Jackie:

We have reviewed the Environmental Impact Statement (EIS) for the Waimanalo Wastewater Facilities and have the following comments:

PAGE 23-24
ITEM J.1.6.1.

COMMENTS

Water quality monitoring at Waimanalo Stream (station 1624900) has been discontinued since 1975. Report HI-80-1 does not contain the information shown in Table 3-2. Parameter units in Table 3-2 should be corrected as follows:

Jtu to JTD, and micro ohms/cm to micromhos/cm.

Thank you for giving us the opportunity to review the EIS for the Waimanalo Wastewater Facilities. We are returning the EIS as requested.

Sincerely,

Reuben Lee
Acting District Chief

Enclosure

cc: Department of Land Utilization
Department of Public Works
Wilson Okamoto and Associates, Inc.

C-2375-01
GD

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



SILEEN R. ANDERSON
SENIOR

MICHAEL J. CHUN, Ph.D.
DIRECTOR AND CHIEF ENGINEER
MAURICE N. KAYA
DEPUTY DIRECTOR

HPP 83-294

July 22, 1983

Mr. Reuben Lee
Acting District Chief
Water Resources Division
Geological Survey
U. S. Department of the Interior
P. O. Box 50166
Honolulu, Hawaii 96850

RECEIVED

JUL 26 1983

WATER RESOURCES DIVISION

Dear Mr. Lee:

Subject: Waimanalo Wastewater Facilities
Environmental Impact Statement

Thank you for your comments to the subject EIS by your letter dated June 22, 1983.

The EIS will be corrected as noted in your letter. The correct reference for the Waimanalo Stream water quality data is U. S. Geological Survey file data and not Report HI-80-1, as indicated in the EIS.

Your comments will be included in the revised EIS.

Ma ke'oloha pumehana,

Michael J. Chun
for MICHAEL J. CHUN
Director and Chief Engineer

cc: Office of Environmental Quality Control
Department of Land Utilization, City and County of Honolulu
/ Wilson Okamoto & Associates, Inc.

COMMENTS TO DRAFT EIS
WHICH DO NOT REQUIRE RESPONSE

FIRE DEPARTMENT
CITY AND COUNTY OF HONOLULU
1455 S. BERTANIA STREET, ROOM 305
HONOLULU, HAWAII 96814



EILEEN B. ANDERSON
MAYOR

MELVIN H. NOKAKA
FIRE CHIEF
THOMAS C. O'LEONAKA
FIRE DEPUTY CHIEF

EILEEN B. ANDERSON
MAYOR



DEPARTMENT OF GENERAL PLANNING
CITY AND COUNTY OF HONOLULU
550 SOUTH KING STREET
HONOLULU, HAWAII 96813

WILLARD T. CHOW
CHIEF PLANNING OFFICER
RALPH PORTIMORE
CAPUTY CHIEF PLANNING OFFICER

July 8, 1983

DGP6/83-6922

July 7, 1983

RECEIVED
JUL 15 1983
WILSON OKAMOTO & ASSOCIATES

TO: MICHAEL M. McELROY, DIRECTOR ✓
DEPARTMENT OF LAID UTILIZATION
MS. JACQUELINE PARNELL, DIRECTOR
OFFICE OF ENVIRONMENTAL QUALITY CONTROL
FROM: MELVIN H. NOKAKA, FIRE CHIEF
SUBJECT: WAIMANALO WASTEWATER FACILITIES

We have reviewed the EIS and have no further comments at this time.

MELVIN H. NOKAKA
Fire Chief

cc: Department of Public Works
Wilson Okamoto and Associates, Inc.

RECEIVED
JUL 15 1983
WILSON OKAMOTO & ASSOCIATES

Mr. Melvin Koizumi, Acting Director
Office of Environmental Quality Control
State of Hawaii
550 Halekauwila Street, Room 301
Honolulu, Hawaii 96813

Dear Mr. Koizumi:

Waimanalo Wastewater Facilities
Environmental Impact Statement

Our comments on the proposed project were forwarded to you in our review of the Preparation Notice. Our concerns have been adequately addressed. We have no additional comments.

Sincerely,

RALPH KANAOKOTO
Planner

APPROVED:

WILLARD T. CHOW

cc: DLJ
DPW
Wilson Okamoto & Assoc., Inc.

DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT
CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813



EILEEN R. ANDERSON
MAYOR

JOSEPH K. CONANT
DIRECTOR
CHARLES M. TORIBIO
DEPUTY DIRECTOR

June 22, 1983

RECEIVED
JUN 24 1983

PLANNING & ASSOCIATES

Mr. Michael M. McElroy, Director
Department of Land Utilization
City and County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Dear Mr. McElroy:

Subject: Waimanalo Wastewater Facilities

We appreciate the opportunity to review and comment on the Waimanalo Wastewater Facilities Environmental Impact Statement.

We note that the residential development in the Waimanalo area calls for the development of 289 acres of State lands. The maximum development of these lands would result in 1,050 new house lots, an elementary school, a park, community facilities and related infrastructure improvements. Additionally, the total sewer system will include 2,120 housing units or about 8,730 people. The Department of Housing and Community Development looks forward to assisting in the development of low-moderate income housing in the area.

We will retain the EIS report for our files.

Sincerely,
JOSEPH K. CONANT
Original Signed
JOSEPH K. CONANT

cc: Department of Public Works
City and County of Honolulu
650 South King Street, 11th Floor
Honolulu, Hawaii 96813

Wilson Okamoto & Associates, Inc.
1150 South King Street, Suite 800
Honolulu, Hawaii 96813

DEPARTMENT OF PARKS AND RECREATION
CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813



EILEEN R. ANDERSON
MAYOR

EMIKO I. KUDO
DIRECTOR

SAM L. CARL
DEPUTY DIRECTOR

OSCAR K. ASANUMA
EXECUTIVE ASSISTANT

June 22, 1983

RECEIVED
JUN 24 1983

PLANNING & ASSOCIATES

Ms. Jacqueline Parnell, Director
Office of Environmental Quality Control
550 Halekumila Street, Room 301
Honolulu, Hawaii 96813

Dear Ms. Parnell:

SUBJECT: ENVIRONMENTAL IMPACT STATEMENT FOR
THE WAIMANALO WASTEWATER FACILITIES

The proposed wastewater facilities will not have any detrimental impact on recreation facilities in proximity to the project site.

Thank you for the opportunity to review the EIS.

Sincerely yours,

(Mrs.) EMIKO I. KUDO, Director

EIK:vc
cc: DPW
Wilson Okamoto & Asso.

ALVIN T. LUM
MAJOR GENERAL
ADJUTANT GENERAL



STATE OF HAWAII
DEPARTMENT OF DEFENSE
OFFICE OF THE ADJUTANT GENERAL
240 DUKOWICZ ROAD, HONOLULU, HAWAII 96813

GEORGE S. JANTZEN
Lieutenant Colonel

(P)1548.3

JUN 22 1983

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STATE OF HAWAII & ADJUTANT

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1983 JUN 16 10 53

STATE OF HAWAII & ADJUTANT

Mr. Michael McElroy
Director
Department of Land
Utilization
City & County of Honolulu
Honolulu, Hawaii

Dear Mr. McElroy:

Subject: Waimanalo Wastewater Facilities
Environmental Impact Statement

We have reviewed the subject EIS and have no comments
to offer.

Very truly yours,

HIDEO MURAKAMI
State Comptroller

MS:jl
cc: Department of Public Works
Wilson Okamoto and Associates, Inc.

Department of Land Utilization
City and County of Honolulu
650 South King Street, 7th Floor
Honolulu, Hawaii 96813

Ms. Jacqueline Parnell, Director
Office of Environmental Quality Control
550 Halekiauila Street, Room 301
Honolulu, Hawaii 96813

To Whom It May Concern:

Waimanalo Wastewater Facilities

Thank you for providing us the opportunity to review the proposed project,
"Waimanalo Wastewater Facilities" Environmental Impact Statement.

We have completed our review and have no comments to offer at this time.

Yours truly,

Jerry M. Matsuda
JERRY M. MATSUDA
Captain, HANG
Civil & Engr Officer

cc: Dept of Public Works - CSC of Hon.
Wilson Okamoto & Assoc., Inc.
Env. Quality Comm. w/EIS

GEORGE R. JAYSON
Governor of Hawaii



STATE OF HAWAII
DEPARTMENT OF HEALTH
P.O. BOX 307
HONOLULU, HAWAII 96813

RECEIVED
JUL 24 1983

WILSON OKAMOTO & ASSOCIATES

June 20, 1983

CHARLES G. CLARK
DIRECTOR OF HEALTH

JOHN F. CHAMBERS, M.D.
DEPUTY DIRECTOR OF HEALTH

HENRY N. THOMPSON, M.D.
DEPUTY DIRECTOR OF HEALTH

MELVIN K. KOIZUMI
DEPUTY DIRECTOR OF HEALTH

AARON M. HARRIS, M.D., A.S.
DEPUTY DIRECTOR OF HEALTH

In reply, please refer to
File: E1700-83

GEORGE R. JAYSON
Governor



STATE OF HAWAII
OFFICE OF ENVIRONMENTAL QUALITY CONTROL
405 MALEKUNA STREET
ROOM 301
HONOLULU, HAWAII 96813

July 6, 1983

MEMORANDUM

To: Mr. Michael M. McElroy, Director
Department of Land Utilization, City & County of Honolulu
Mrs. Jacqueline Parnell, Director
Office of Environmental Quality Control

From: Deputy Director for Environmental Health

Subject: Environmental Impact Statement (EIS) for Waimanalo Wastewater Facilities, Waimanalo, Koolaupeke, Oahu

Thank you for allowing us to review and comment on the subject EIS. On the basis that the project will comply with all applicable Public Health Regulations, please be informed that we do not have any objections to this project.

We realize that the statements are general in nature due to preliminary plans being the sole source of discussion. We, therefore, reserve the right to impose future environmental restrictions on the project at the time final plans are submitted to this office for review.

cc: Dept. of Public Works
Wilson Okamoto & Assoc. ✓

Melvin K. Koizumi
MELVIN K. KOIZUMI

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JUL 14 1983

WILSON OKAMOTO & ASSOCIATES

Mr. Michael J. McElroy, Director
Department of Land Utilization
City and County of Honolulu
650 South King Street, 7th Floor
Honolulu, Hawaii 96813

Dear Mr. McElroy:

Subject: Draft EIS for the Waimanalo Wastewater Facilities, Waimanalo, Oahu

Our main concerns regarding this project were made during the comment period for your preparation notice. We have no additional comments to make at this time.

Sincerely,

Melvin K. Koizumi
Melvin K. Koizumi
Acting Director

cc: DPW
Wilson Okamoto & Associates

Melvin K. Koizumi
Acting Director
TELEPHONE NO.
348 0313



DEPARTMENT OF PLANNING AND ECONOMIC DEVELOPMENT

Marumoto Building, 250 South King St., Honolulu, Hawaii • Mailing Address: P.O. Box 2259, Honolulu, Hawaii 96801

GEORGE R. ARTISON
Director
Kent H. Keith
Assistant Director

FRANK SPYRAKIS
Ref. No. 7-1-1983

JUN 7 1983

STATE OF HAWAII
ENVIRONMENTAL QUALITY COMMISSION
808 HALEKAUWILA ST.
ROOM 301
HONOLULU, HAWAII 96813

RECEIVED

July 1, 1983

RECEIVED

Mr. Michael McElroy
Director
Department of Land Utilization
City and County of Honolulu
650 South King Street, 7th Floor
Honolulu, Hawaii 96813

Dear Mr. McElroy:

Subject: Waimanalo Wastewater Facilities EIS,
Waimanalo, Oahu

We have reviewed the environmental impact statement (EIS) for the Waimanalo wastewater facilities and find that coastal zone management impacts are adequately addressed in the EIS.

Thank you for the opportunity to review this document.

Very truly yours,
Kent H. Keith
Kent H. Keith

cc: Office of Environmental Quality Control
Dept. of Public Works, City & County of Honolulu
Wilson Okamoto and Associates, Inc.

Dear Reviewer:

Attached for your review is an Environmental Impact Statement (EIS) that was prepared pursuant to Chapter 393, Hawaii Revised Statutes and the Rules and Regulations of the Environmental Quality Commission:

Title: Waimanalo Wastewater Facilities
Location: Waimanalo; Koolaupeko, Oahu, Hawaii
Classification: Agency Action

Your comments or acknowledgement of no comments on the EIS are welcomed. Please submit your reply to the accepting authority or approving agency:

Department of Land Utilization AND Office of Environmental Quality Control
City and County of Honolulu AND 550 Halekauwila Street, Room 301
650 South King Street, 7th Floor Honolulu, Hawaii 96813

Please send a copy of your reply to the proposing party:

Department of Public Works AND Wilson Okamoto and Associates, Inc.
City and County of Honolulu AND 1150 South King Street, Suite 800
650 South King Street, 11th Floor Honolulu, Hawaii 96813
Honolulu, Hawaii 96813

Your comments must be received or postmarked by: July 8, 1983

If you have no further use for this EIS, please return it to the Commission.

Thank you for your participation in the EIS process.

June 7, 1983

Comments
Frank Spyrakis
City & County of Honolulu



University of Hawaii at Manoa

Water Resources Research Center
Holmes Hall 203 - 2540 Dole Street
Honolulu, Hawaii 96822

12 July 1983

RECEIVED
JUL 20 1983

Department of Land Utilization
City and County of Honolulu
650 South King Street, 7th Floor
Honolulu, Hawaii 96813

Gentlemen:

SUBJECT: Environmental Impact Statement for Waimanalo Wastewater
Facility, TRK: 4-1, Koolaupoko, Oahu, June 1983

We have reviewed the subject EIS and have no comment to offer.
Thank you for the opportunity to comment. This material was reviewed
by WRRC personnel.

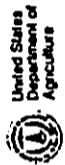
Sincerely,

Edwin T. Murabayashi
Edwin T. Murabayashi
EIS Coordinator

ETH:ja

cc: Jacqueline Parnell
DPW, C & C
Wilson Okamoto & Assoc., Inc.

AN EQUAL OPPORTUNITY EMPLOYER



United States
Department of
Agriculture

P.O. Box 50004
Honolulu, Hawaii
96850

July 6, 1983

RECEIVED
JUL 13 1983

Mr. Michael M. McElroy, Director
Department of Land Utilization
City and County of Honolulu
650 South King Street, 7th Floor
Honolulu, HI 96813

WILSON OKAMOTO & ASSOCIATES

Dear Mr. McElroy:

Subject: EIS for Waimanalo Wastewater Facilities, Waimanalo, Oahu
We reviewed the subject environmental impact statement and have no
comments to make.

Thank you for the opportunity to review this document.

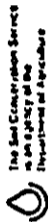
Sincerely,

Francis C. Lu
FRANCIS C. LU
State Conservationist

cc: Dr. Melvin K. Koizumi, Acting Director
Office of Environmental Quality Control
550 Hahaione St., Room 301
Honolulu, HI 96813

Department of Public Works
City and County of Honolulu
650 South King Street, 11th Floor
Honolulu, HI 96813

Wilson Okamoto and Associates, Inc.
1150 South King Street, Suite 800
Honolulu, HI 96813



The Soil Conservation Service
is an agency of the
Department of Agriculture



DEPARTMENT OF THE AIR FORCE
HEADQUARTERS WITH AIR BASE WING (PACAF)
HICKAM AIR FORCE BASE, HAWAII 96813

MEMO FOR
ATTENTION
DEEV (Mr. Yamada, 449-1831)

16 JUN 1983

SUBJECT: Draft Environmental Impact Statement for the Waimanalo Wastewater Facilities

RECEIVED

to
Ms. Jacqueline Parnell, Director
Office of Environmental Quality Control
550 Halekauwila Street, Room 301
Honolulu, HI 96813

JUN 17 1983

WELTON CRAWFORD & ASSOCIATES

1. This office has reviewed the subject EIS and has no comment relative to the proposed project.
2. We greatly appreciate your cooperative efforts in keeping the Air Force apprised of your project and thank you for the opportunity to review the document.

Robert M. Okazaki
ROBERT M. OKAZAKI
Chief, Engrg & Envtl Png Div
Directorate of Civil Engineering

Cy to: Department of Land Utilization
City & County of Honolulu
650 South King Street, 7th Floor
Honolulu, HI 96813

Department of Public Works
City & County of Honolulu
650 South King Street, 11th Floor
Honolulu, HI 96813

Wilson Okamoto and Associates, Inc.
1150 South King Street, Suite 800
Honolulu, HI 96813

July 5, 1983

Directorate of Facilities Engineering

RECEIVED

1983

Mr. Melvin Koiwani, Acting Director
Office of Environmental Quality Control
550 Halekauwila Street, Room 301
Honolulu, Hawaii 96813

Dear Mr. Koiwani:

The Environmental Impact Statement (EIS) for the Waimanalo Wastewater Facilities, Waimanalo, Koolaula, Oahu has been reviewed and we have no comments to offer. There are no Army installations or activities in the vicinity of the proposed project.

Please you for the opportunity to comment on the EIS.

Sincerely,

Original signed by
M. J. Carroll
M. J. Carroll
Director of Facilities Engineering

Copies Furnished:

Department of Land Utilization
City and County of Honolulu
510 South King Street, 7th Floor
Honolulu, Hawaii 96813

Department of Public Works
City and County of Honolulu
650 South King Street, 11th Floor
Honolulu, Hawaii 96813

Wilson Okamoto and Associates, Inc.
1150 South King Street, Suite 800
Honolulu, Hawaii 96813



HEADQUARTERS
NAVAL BASE PEARL HARBOR
BOX 110
PEARL HARBOR, HAWAII 96860

IN REPLY REFER TO:
002A:QIB:jem
SER 1543

19 JUL 1983

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JUL 15 1983

Office of Environmental Quality Control
550 Halekauwila Street, Room 301
Honolulu, Hawaii 96813

Gentlemen:

WILSON OKAMOTO & ASSOCIATES
Environmental Impact Statement
Waimanalo Wastewater Facilities

The EIS for the Waimanalo Wastewater Facilities has been reviewed and the Navy has no comments to offer. The EIS has been returned to the Environmental Quality Commission.

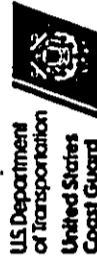
Thank you for the opportunity to review the EIS.

Sincerely,

M. J. B. B. B.

MAJOR B. B. B. B.
COMMANDER, U. S. NAVY
PACIFIC HARBOR
BY DIRECTOR OF THE COMMANDER

Copy to:
Environmental Quality Commission
Department of Public Works,
City and County of Honolulu
Wilson Okamoto & Associates, Inc. ←



U.S. Department
of Transportation
United States
Coast Guard

Commander (dpl)
Fourteenth Coast Guard District

Prince Kalerua
Fagan Building
300 Ala Moana Blvd.
Honolulu, Hawaii 96860
Phone: 546-2861

11000
Serial 556
15 June 1983

RECEIVED

JUL 1 1983

Jacqueline Parnell, Director
Office of Environmental Quality Control
550 Halekauwila Street, Room 301
Honolulu, Hawaii 96813

Dear Ms. Parnell:

The Fourteenth Coast Guard District has reviewed the Environmental Impact Statement for the Waimanalo Wastewater Facilities and has no objection or constructive comments to offer at the present time.

Sincerely,

J. E. Schwartz

J. E. SCHWARTZ
Commander, U. S. Coast Guard
District Planning Officer
By direction of

Commander, Fourteenth Coast Guard District

Copy: Department of Land Utilization
Department of Public Works
Wilson Okamoto and Associates, Inc.

HAWAIIAN ELECTRIC COMPANY, INC.
Box 2750 / Honolulu, Hawaii / 96840

APB

RICHARD L. O'CONNELL, P.E.
MANAGER, ENVIRONMENTAL DEPARTMENT
6881 344-4489

June 28, 1983

ENV 2-1
NV/6

RECEIVED

Department of Land Utilization
City and County of Honolulu
650 South King Street, 7th Floor
Honolulu, Hawaii 96813

JUN 29 1983

WILSON OKAMOTO & ASSOCIATES

Subject: Waimanalo Wastewater Facilities Environmental
Impact Statement

We have reviewed the above Environmental Impact Statement and find that the proposed facility should have no adverse effect on Hawaiian Electric Company's facilities.

Thank you for the opportunity to comment on this Environmental Impact Statement.

Sincerely,

R. O'Connell
Richard L. O'Connell
Manager, Environmental Department

JMP,Jr.:ca1

cc: Dept of Public Works

Wilson Okamoto & Assoc. ✓