

HANNIBAL TAVARES
Mayor
ALVIN FUKUNAGA
Director



COUNTY OF MAUI
DEPARTMENT OF PUBLIC WORKS

200 SOUTH HIGH STREET
WAILUKU, MAUI, HAWAII 96793

December 17, 1990

DEC 24 11 25

OFFICE OF ENVIRONMENTAL QUALITY

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Wastewater Reclamation Division
FRED ARAKI, P.E.
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Solid Waste Division
GEORGE KAYA
Highways Division

Dr. Bruce Anderson, Acting Director
Office of Environmental Quality Control
465 S. King Street, Room 104
Honolulu, HI 96814

Dear Dr. Anderson:

SUBJECT: WAILUKU-KAHULUI WWRF ADDITIONS AND MODIFICATIONS
NEGATIVE DECLARATION

The Department of Public Works, County of Maui, has reviewed the attached Environmental Assessment for the Wailuku-Kahului WWRF Additions and Modifications, and has determined there are no significant impacts. Therefore, we have found this document to be a negative declaration.

If there are any questions concerning the environmental assessment, please contact Mr. David Wissmar of our Wastewater Reclamation Division at 243-7417.

Very truly yours,

Handwritten signature of Alvin K. Fukunaga in cursive script.
Alvin K. Fukunaga
Director of Public Works

DW:ym(WM91148)
attachs.
c: Mark Bluestein, Brown and Caldwell

1990-12-07-MA-FPA

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DEPARTMENT OF PUBLIC WORKS
WASTEWATER RECLAMATION DIVISION
COUNTY OF MAUI

ENVIRONMENTAL ASSESSMENT
AND
NEGATIVE DECLARATION

FOR THE

~~W~~WAILUKU-KAHULUI WASTEWATER RECLAMATION FACILITIES
ADDITIONS AND MODIFICATIONS ~~*~~

MAUI, HAWAII

December 7, 1990

PREPARED BY:



BROWN AND CALDWELL
CONSULTANTS

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ENVIRONMENTAL ASSESSMENT
AND
NEGATIVE DECLARATION

FOR THE

WAILUKU-KAHULUI WASTEWATER RECLAMATION FACILITIES
ADDITIONS AND MODIFICATIONS

MAUI, HAWAII

Introduction

This Environmental Assessment (EA)/Negative Declaration addresses proposed additions and modifications to the existing Wailuku-Kahului Wastewater Reclamation Facilities (WWRF), a regional sewage treatment plant serving the Wailuku, Kahului, Spreckelsville, and Paia areas on the island of Maui, Hawaii. The treatment plant is a public facility, owned and operated by the County of Maui.

The purpose of this document is to identify potentially significant impacts resulting from the project and mitigating measures that need to be incorporated in the design and construction. This EA has been prepared in accordance with the requirements of Chapter 343, Hawaii Revised Statutes (Environmental Impact Statements) and Chapter 200 of Title 11, Hawaii Administrative Rules (Department of Health - Environmental Impact Statement Rules).

The proposing agency (applicant) is the Wastewater Reclamation Division, Department of Public Works, County of Maui, 200 S. High Street, Wailuku, Maui, Hawaii, 96793. The contact person is Mr. Eassie Miller, P.E., Chief. The approving agency is the Department of Public Works, County of Maui (address above).

Agencies Contacted for Comment

Initially, on May 2, 1990, the following agencies were notified of the project in a package containing a description of each project element, a location map, and a site map:

U.S Fish and Wildlife Service
Hawaii Department of Land and Natural Resources (DLNR)
Hawaii Office of Environmental Quality Control (OEQC)
Hawaii Department of Health (DOH)
County of Maui Planning Department

Written comments were received from DLNR and the County Planning Department. A copy of these comments is contained in Appendix C of this document.

On October 16, 1990, a draft of this document was sent to the following agencies for review:

U.S. Army Corps of Engineers
Hawaii Department of Land and Natural Resources (DLNR)
Hawaii Department of Health (DOH)
County of Maui Planning Department
County of Maui Department of Water Supply

Written comments were received from each of the agencies sent a copy of the draft environmental assessment and negative declaration. Appendix F contains a copy of the comments. The issues raised during the review of the draft are addressed in this final document. In addition, a response to each comment is included in Appendix F.

Description of the Property and Surrounding Environment

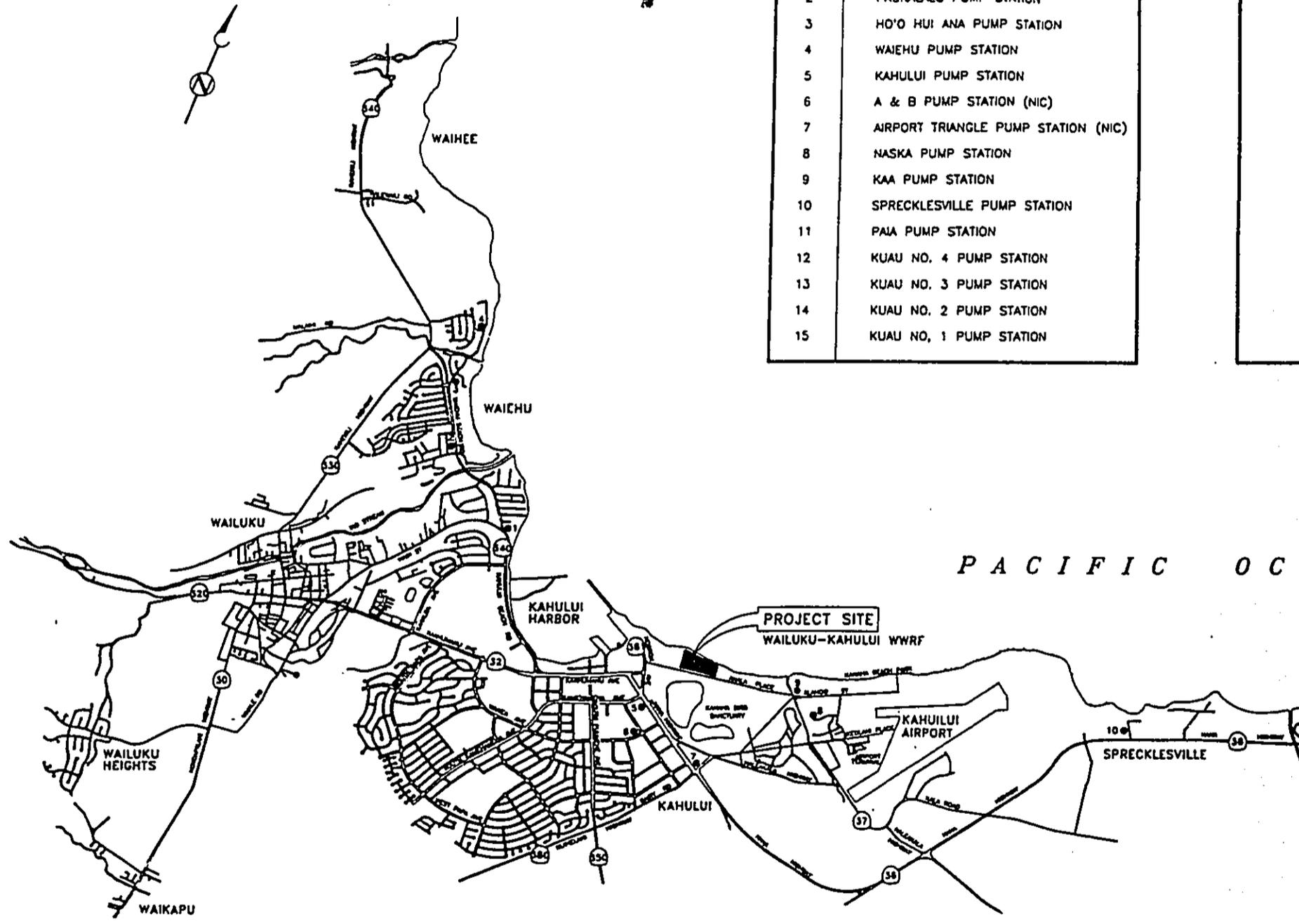
The WWRF is located on an 18.75-acre site located approximately one mile east of Kahului Harbor, along the north shore of the island of Maui. The tax key map number for the property is (2) 3-8-01:188 and the address of the treatment plant is 281 Amala Place, Kahului, Hawaii, 96732. The project also includes minor internal modifications to 13 sewage pumping stations associated with the WWRF. These pumping stations are located adjacent to the shoreline, within 6 miles of the treatment plant. The location of the project is shown on Figure 1.

The northern boundary of the treatment plant site is formed by the shoreline of Kahului Bay. The site is subject to inundation by tsunamis and is within the coastal flooding zone (V23), as determined by the Federal Emergency Management Agency. The National Flood Insurance Program Flood Insurance Rate Map for the area (Panel 190, effective 9/6/89) indicates that the regulatory (100-year) flood level is elevation 20 in the northern portion of the site and elevation 18 along the southern site boundary. All construction must comply with the County of Maui flood hazard district code for areas subject to coastal flooding.

The treatment plant is within the Coastal Zone Management Area and is therefore subject to the requirements of Chapter 205A, Hawaii Revised Statutes and the Special Management Area Rules and Regulations of the County of Maui.

Beginning approximately 250 feet south of the plant site is the Kanaha Pond Wildlife Sanctuary. The 143-acre sanctuary is administered by Hawaii Department of Land and Natural Resources. Kanaha Pond has a water surface of some 80 acres and an average depth of 1.7 feet. The pond was built more than

PUMP STATION KEY	
NUMBER	NAME
1	WAILUKU PUMP STATION
2	PAUKALALO PUMP STATION
3	HO'O HUI ANA PUMP STATION
4	WAIHU PUMP STATION
5	KAHULUI PUMP STATION
6	A & B PUMP STATION (NIC)
7	AIRPORT TRIANGLE PUMP STATION (NIC)
8	NASKA PUMP STATION
9	KAA PUMP STATION
10	SPRECKLESVILLE PUMP STATION
11	PAIA PUMP STATION
12	KUAU NO. 4 PUMP STATION
13	KUAU NO. 3 PUMP STATION
14	KUAU NO. 2 PUMP STATION
15	KUAU NO. 1 PUMP STATION



VICINITY MAP
SCALE: 1" = 2500'

BC Brown and Caldwell
Consultants

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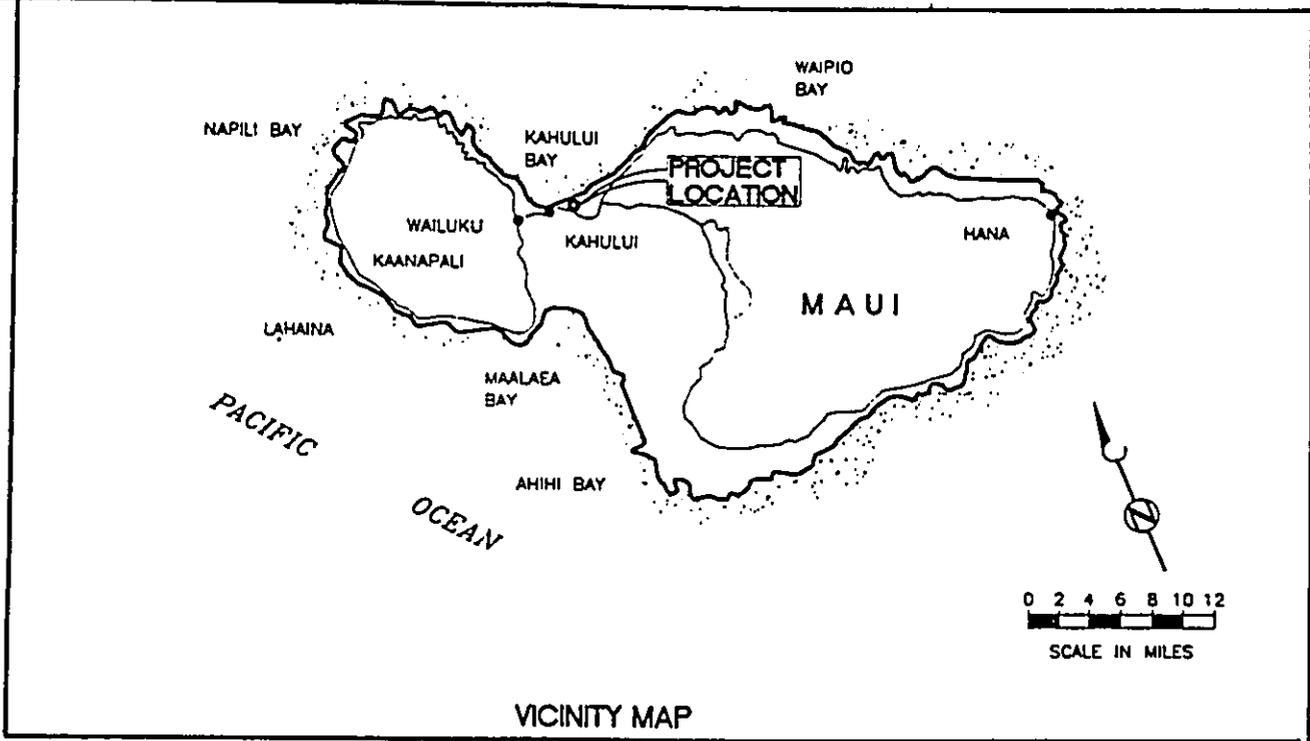
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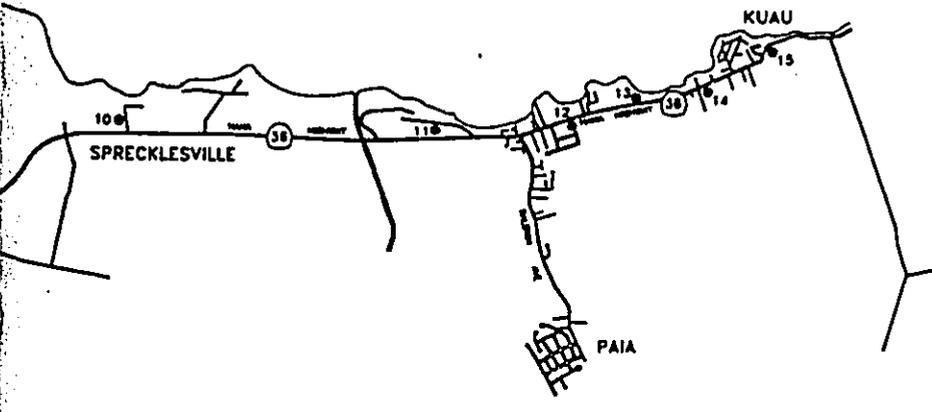
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DEPARTMENT OF PUBLIC WORKS
 COUNTY OF MAUI, HAWAII

WAILUKU-KAHULUI
 WASTEWATER RECLAMATION FACILITIES
 ADDITIONS AND MODIFICATIONS

Figure 1
 VICINITY MAP AND LOCATION MAP

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200 years ago by King Kapiiohookalani as two fish ponds. In the last century, changes in both the water flow patterns through the ponds and the dietary patterns of Maui citizens led to the abandonment of the ponds for raising of fish. However, at the same time, the importance of the area as a bird refuge emerged. Kanaha Pond is considered among the most important waterbird areas in the State of Hawaii. The wildlife sanctuary provides refuge for the endangered Hawaiian Stilt and Hawaiian Coot, and the threatened Hawaiian Black-Crowned Night Heron, as well as for migratory birds.

The area immediately west of the treatment plant is classified as heavy industrial in the Wailuku-Kahului community plan^{1,2}. This area includes oil tank farms, auto storage yards, warehouses, and a power plant operated by the Maui Electric Power Company. Kahului Harbor and its port facilities are located approximately 1/2 mile west of the treatment plant site.

Kahului Airport, the main airport for the island of Maui, begins a mile east of the WWRF. Kanaha Beach Park, a popular windsurfing and picnic site is located along the shoreline, 3/4 of a mile east of the treatment plant.

The area surrounding the treatment plant is in a State Land Use Commission-designated Conservation District; however, the plant site itself was set aside under Governor's Executive Order No. 3006.

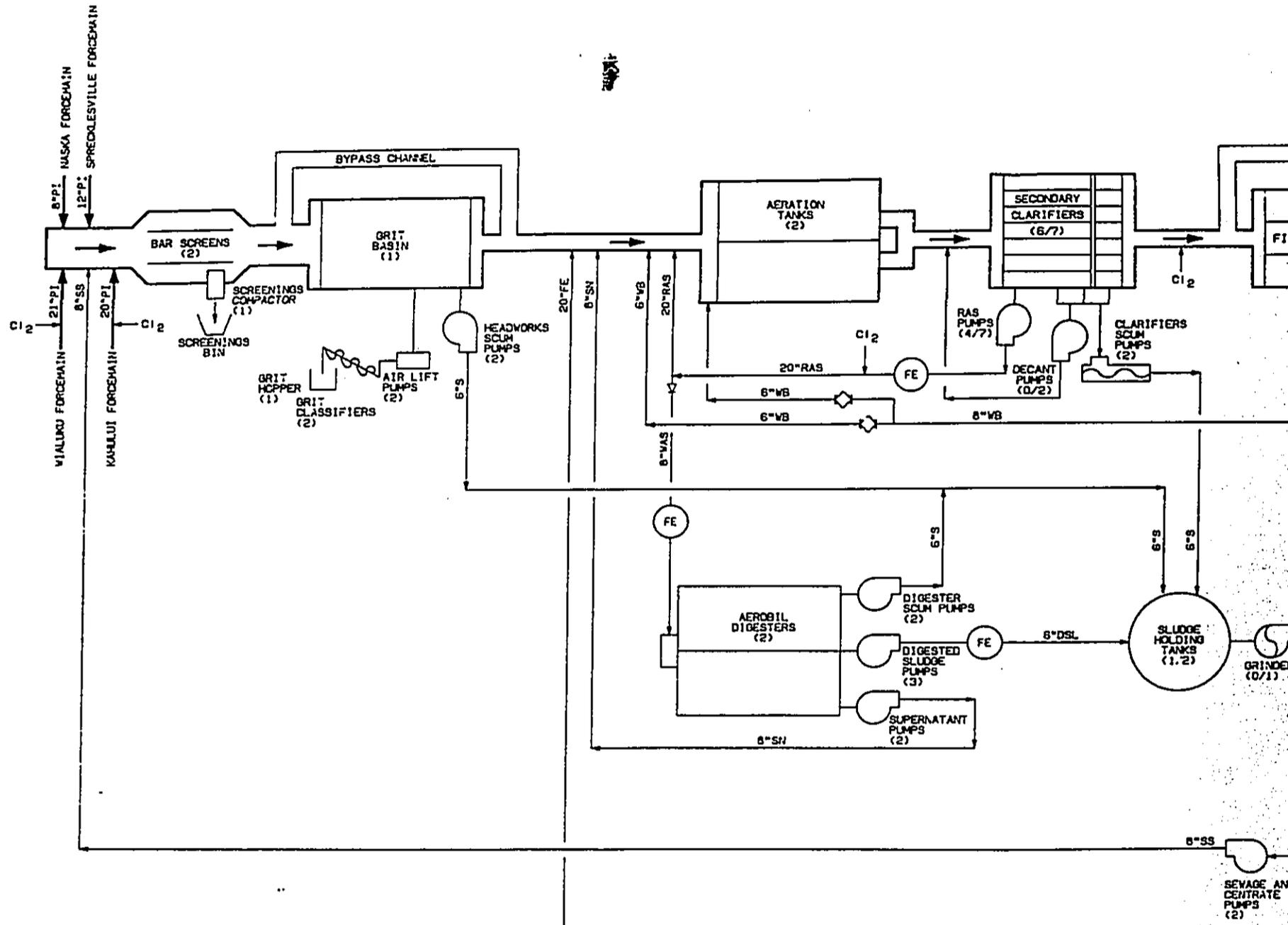
As described in Appendix D, effluent from the plant is injected into the aquifer below the plant site and eventually enters Kahului Bay, located immediately north of the plant. Kahului Bay has been designated by the Hawaii Department of Health as a Class A marine embayment. A description of the ambient water quality and the water quality standards that apply to Kahului Bay are included in Appendix E. Generally, turbidity within Kahului Bay is better than required; total nitrogen and total phosphorus concentrations are close to the regulated level; and ammonia, nitrate/nitrite and chlorophyll-a concentrations exceed current water quality standards.

The average annual rainfall in the area is about 18 inches, and the seasonal temperature varies from a mean high of 82° F to a mean low of 67°F. Prevailing tradewinds sweep across the plant site, generally coming from the northeast.

Existing Development on the Site

The existing facilities include an activated sludge wastewater treatment plant followed by sand filtration, associated solids handling facilities, and four gravity injection wells for disposal of effluent. Figure 2 is a process schematic for the plant. Figure 3 is an aerial photograph of the existing treatment plant site.

Structures on the site include large concrete tanks, four aluminum-sided buildings, two buildings made of split concrete block, and a 2.6-acre earthen holding pond with an asphalt lining. Figures 4 and 5 show the layout of the existing and modified plant. The treatment plant structures are elevated above



BC Brown and Caldwell Consultants

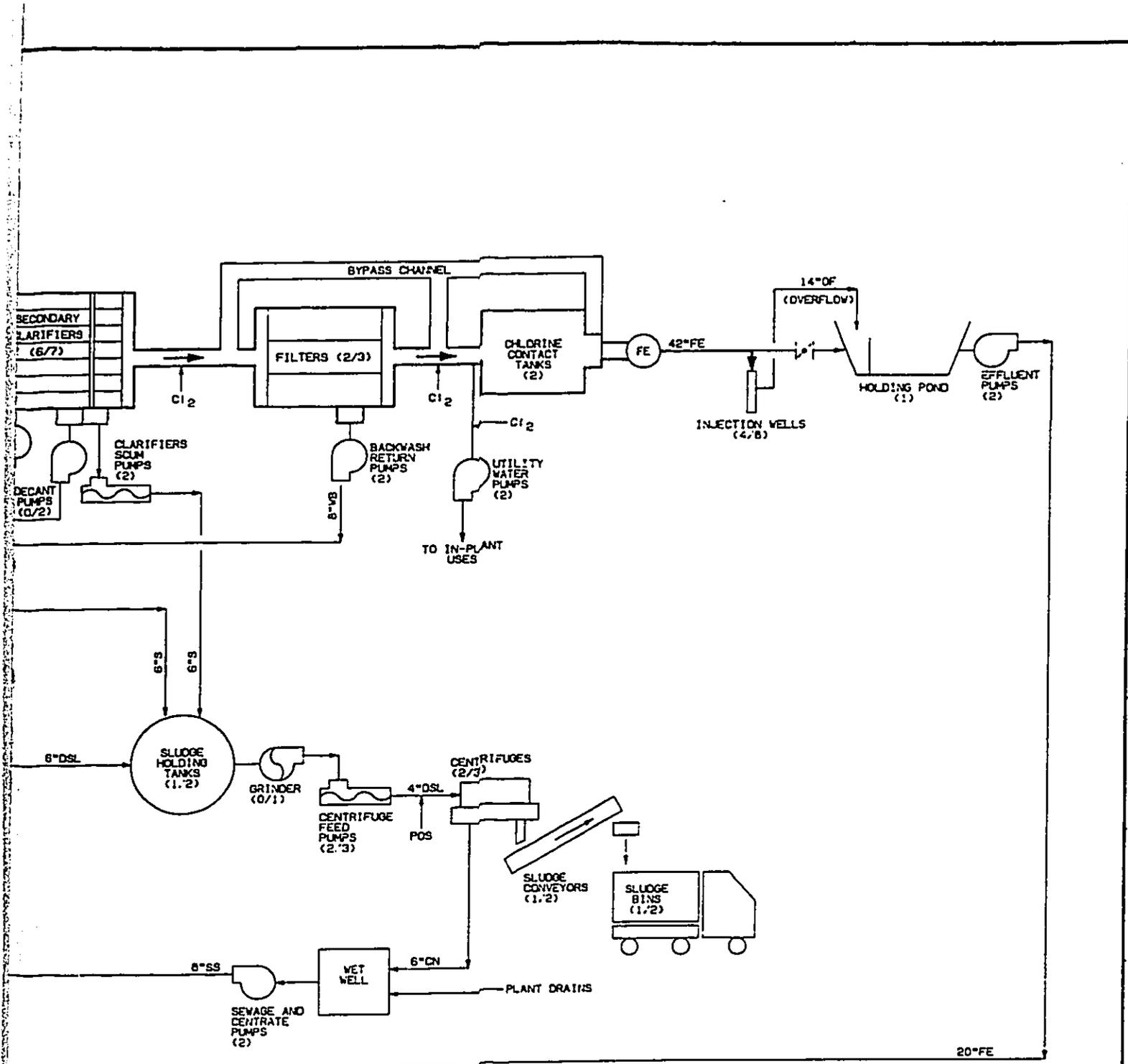
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NOTE: NUMBERS BELOW TANK AND EQUIPMENT NAMES INDICATE THE NUMBER OF UNITS. (BEFORE PROJECT/AFTER PROJECT).

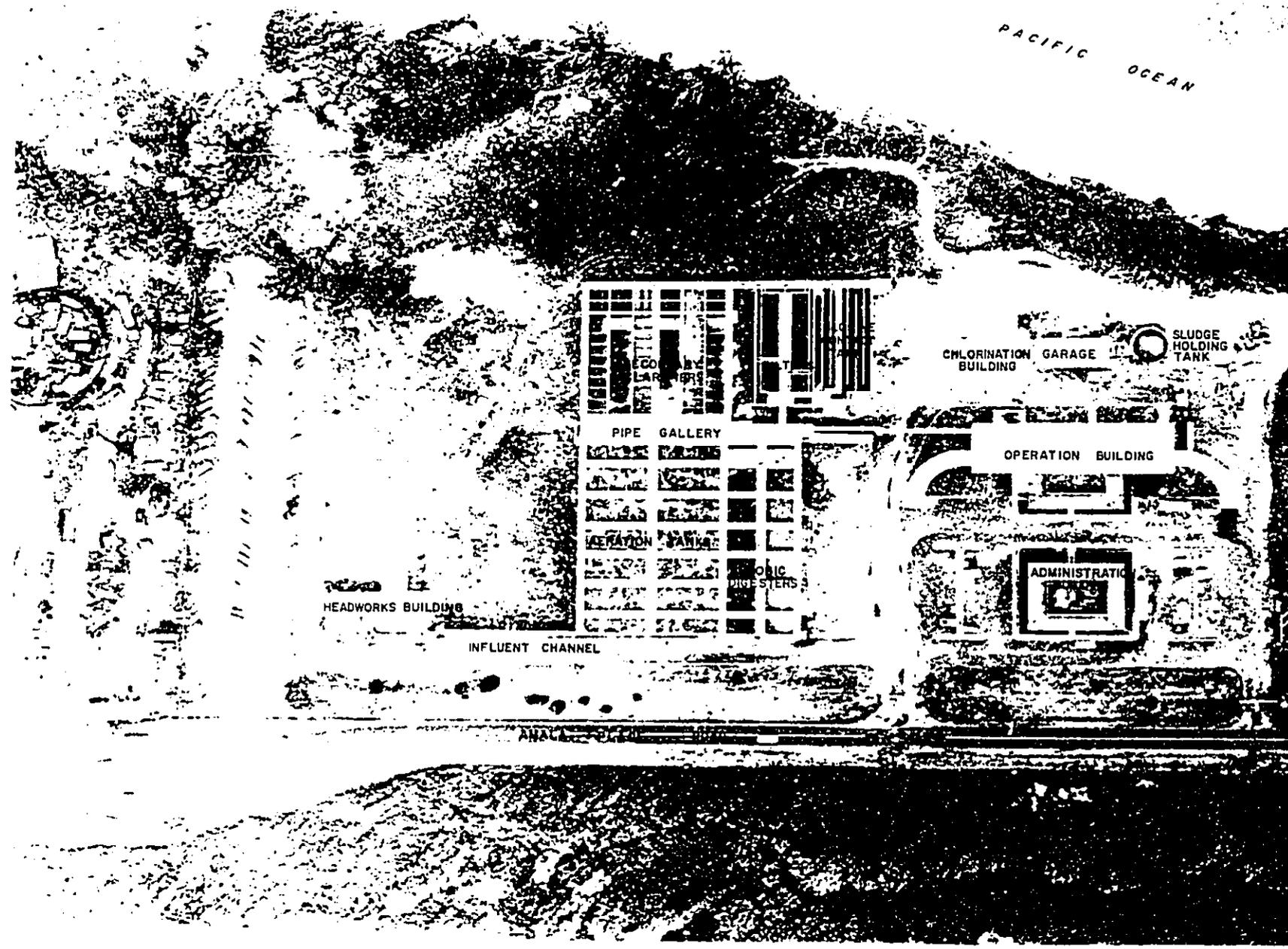
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	WAILUKU - KAHULUI WASTEWATER RECLAMATION FACILITIES ADDITIONS AND MODIFICATIONS		DRAWING NUMBER
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PACIFIC OCEAN



BC Brown and Caldwell
Consultants

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DEPARTMENT OF
COUNTY OF HAWAII

WAILUKU-
WASTEWATER RECLAMATION
ADDITIONS AND MODIFICATIONS

A B C D E F G H I J



DATE APP.

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COUNTY OF MAUI, HAWAII

WAILUKU-KAHULUI
WASTEWATER RECLAMATION FACILITIES
ADDITIONS AND MODIFICATIONS

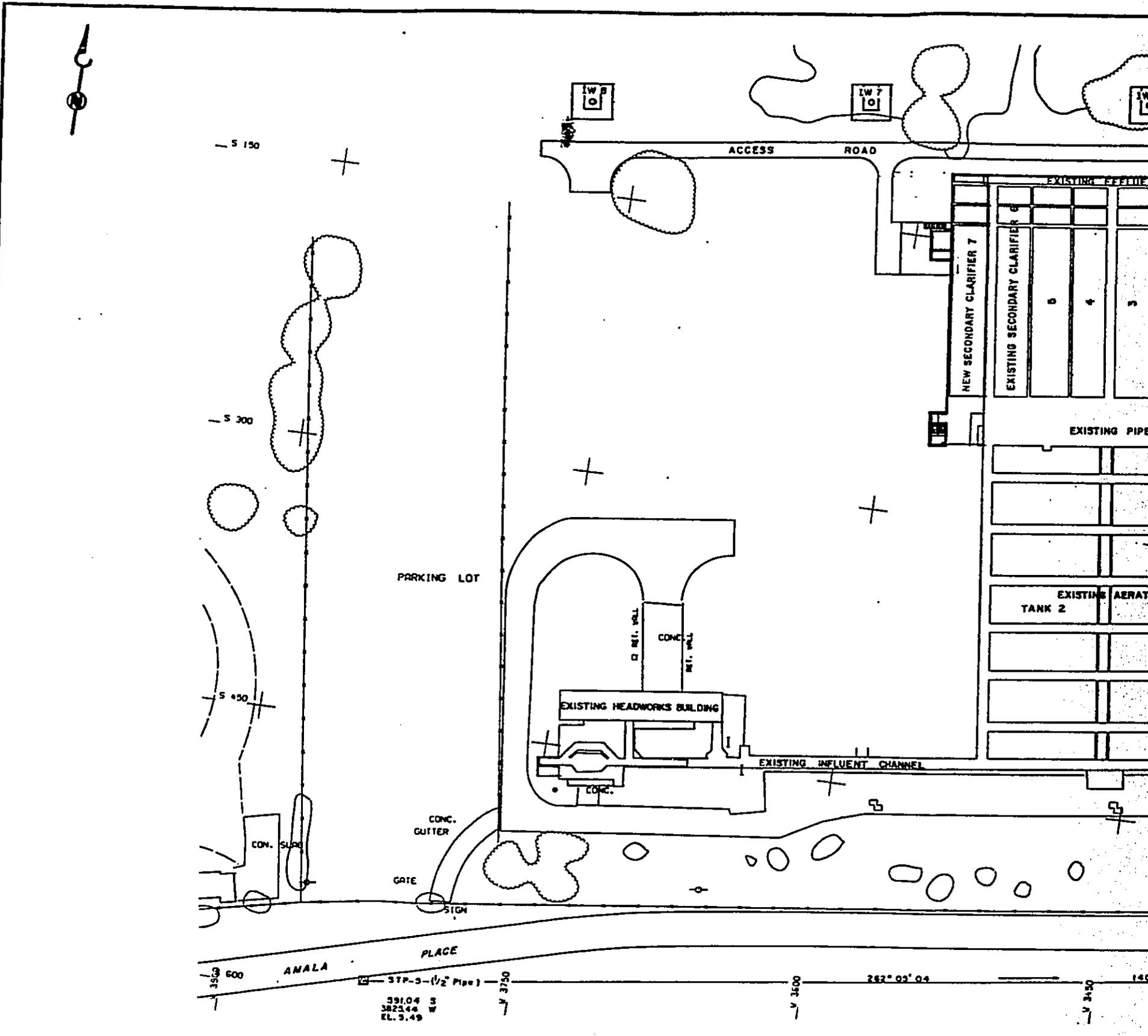
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Figure 3
EXISTING SITE PHOTOGRAPH

SCALE
1"=60'

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Consultants

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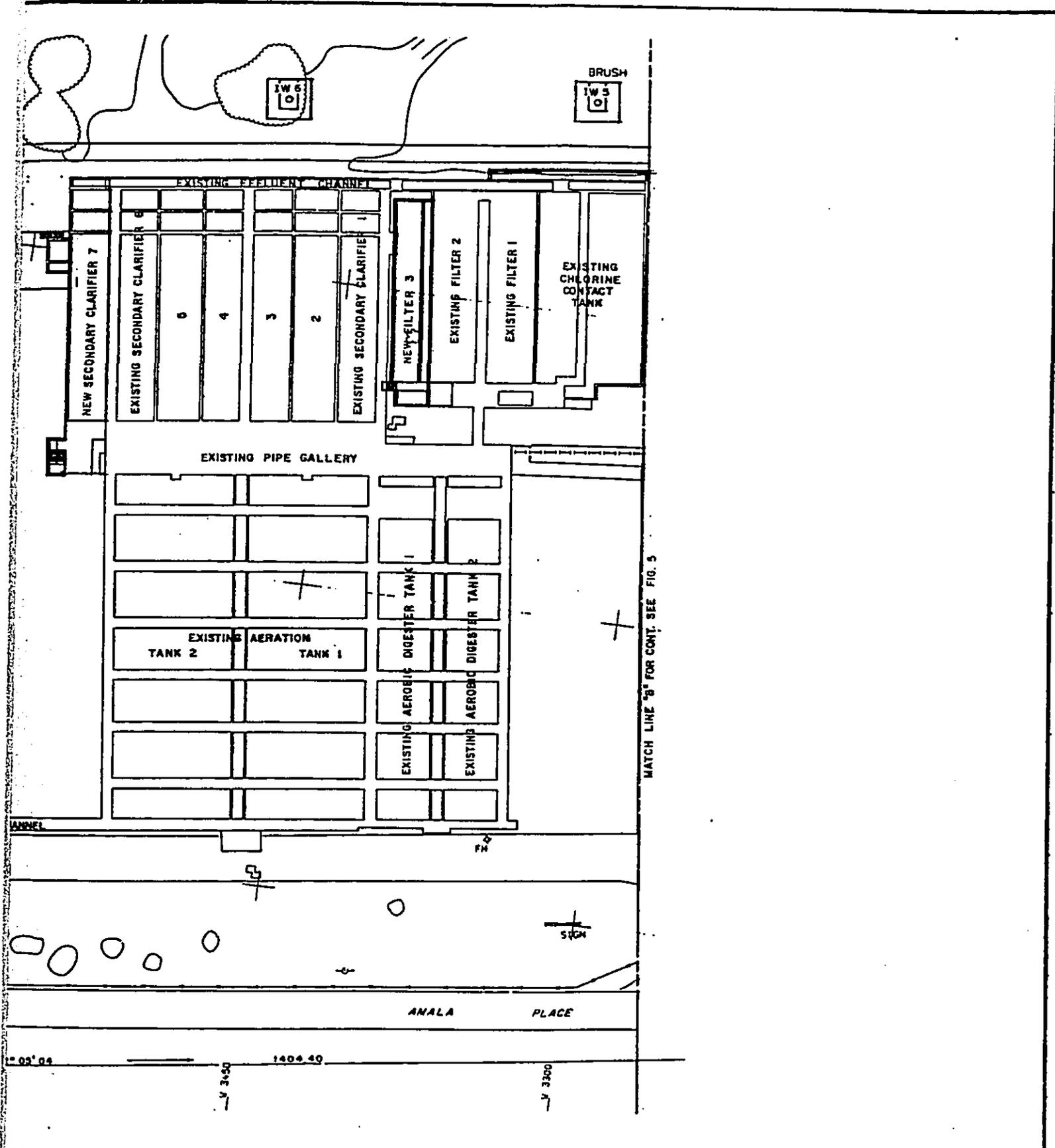
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DEPARTMENT OF
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 ADDITIONS AND IMPROVEMENTS



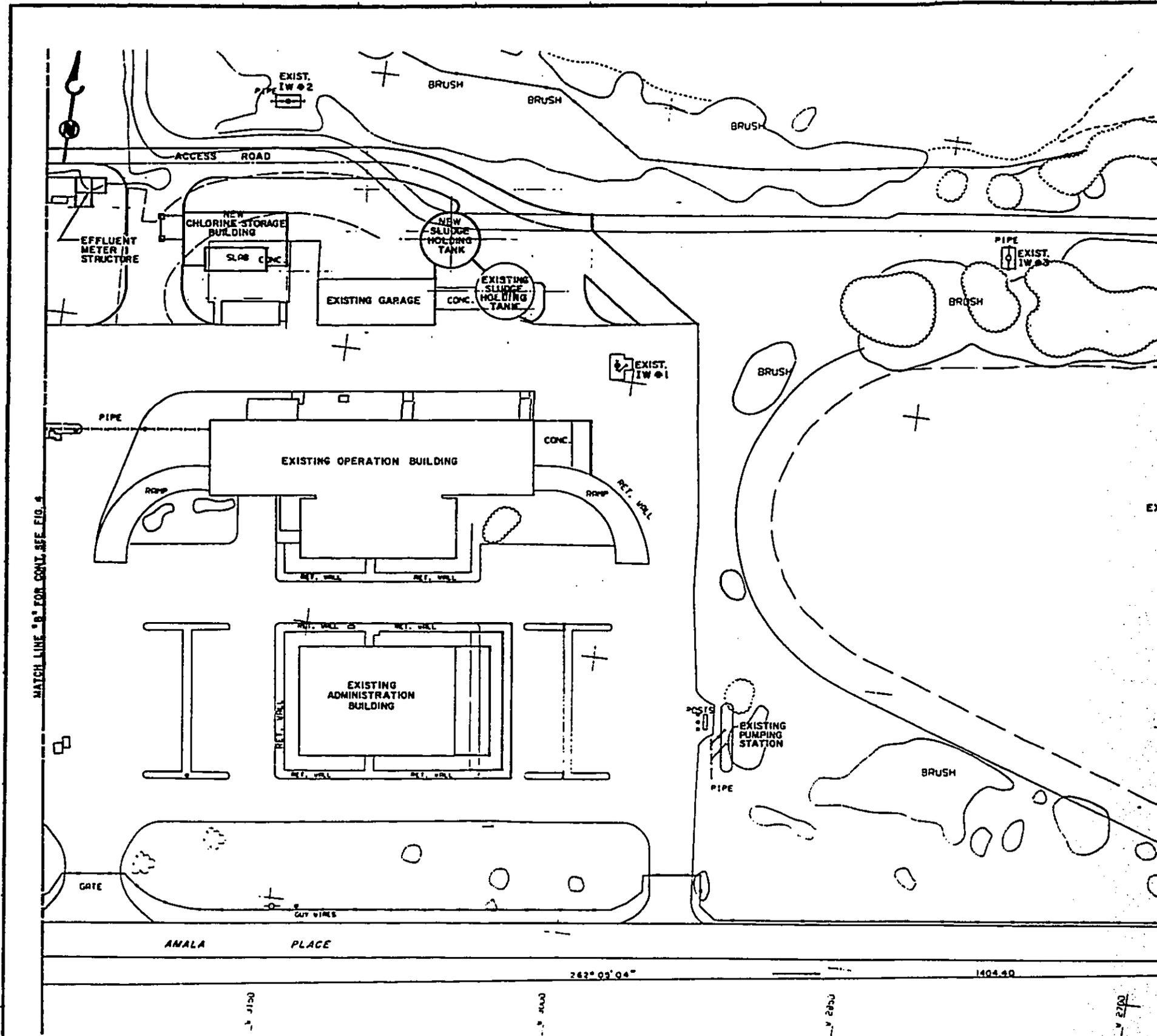
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 COUNTY OF MAUI, HAWAII
 WAILUKU-KAHULUI
 WASTEWATER RECLAMATION FACILITIES
 ADDITIONS AND MODIFICATIONS

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 Figure 4
 WEST SITE PLAN

SCALE 1" = 60'
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BC Brown and Caldwell
Consultants

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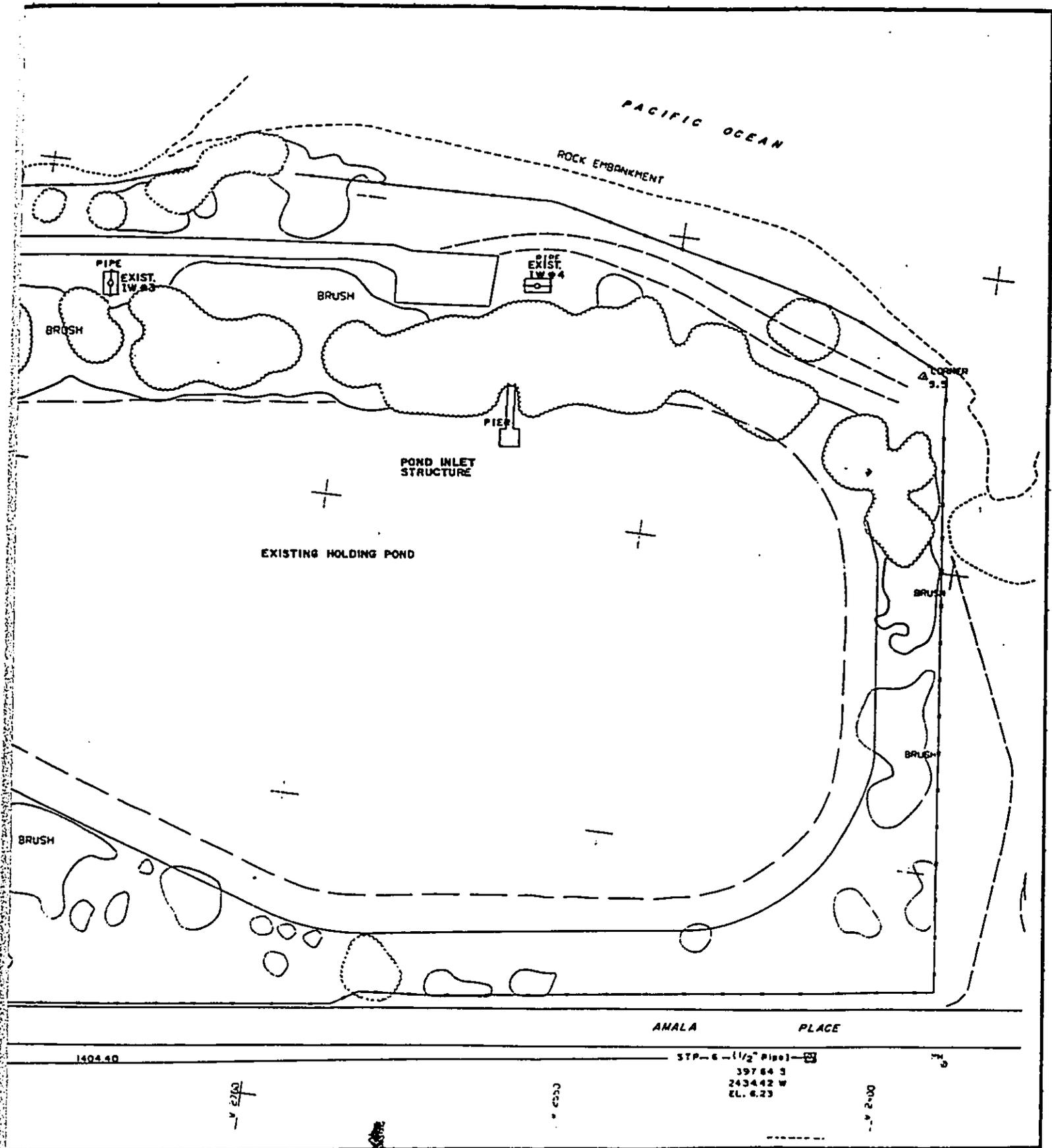
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	WALUKU-KAHULUI WASTEWATER RECLAMATION FACILITIES ADDITIONS AND MODIFICATIONS		DRAWING NUMBER
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the natural ground surface to reduce the exposure to flooding caused by tsunamis. An earthen berm along the southern boundary of the property visually shields the plant from Amala Place.

The western end of the plant property is currently used by the County of Maui to store impounded automobiles.

Project Background

The Wailuku-Kahului Wastewater Reclamation Facilities currently process approximately 5.5 million gallons per day (mgd) of wastewater from the Wailuku, Kahului, and Spreckelsville areas on the north side of Maui. This amount is approximately 90 percent of the plant's original design capacity. The sewage is treated to a secondary level, then filtered to remove remaining suspended solids.

The facility performs well and produces a high quality effluent. Final effluent biochemical oxidation demand (BOD₅) and total suspended solids (TSS) concentrations are commonly less than 3 mg/l. Much of the nitrogenous compounds entering the plant are oxidized (nitrification) and total nitrogen levels are commonly reduced through the plant, indicating that some denitrification occurs.

Disposal of the treated effluent is by gravity injection into the basalt aquifer below the plant site. The purpose of this injection is to transmit the plant effluent indirectly into the ocean. Studies of the fate of the injected effluent are summarized in Appendix D.

The existing facility was designed in 1972 to eliminate the discharge of 4.1 million gallons per day (mgd) of untreated sewage into Kahului Bay. The plant was designed for an average dry-weather flow (ADWF) of 6.0 mgd and a peak wet-weather flow (PWWF) of 15.0 mgd. Provisions were made and space was preserved for doubling the initial plant capacity. An Environmental Impact Statement⁷ (EIS) was prepared for the project by the US Environmental Protection Agency and completed in 1974. Operation of the treatment plant began in 1976. Facilities for conveying sewage from the Paia and Spreckelsville to the WWRF were completed in 1985.

In 1988, the County of Maui selected an engineering consultant to evaluate expansion options for the WWRF. The final report for this study³ was issued in August 1989. In this evaluation, the capacity of the existing plant was rated for an ADWF of 6.8 mgd and a PWWF of 13.5 mgd, provided several additions and modifications were made to improve reliability, safety, and energy efficiency of the facility.

Initially, the County of Maui decided to limit construction at the plant to only those necessary for the 6.8 mgd plant. The site is within a tsunami zone and the

continual onshore winds create a corrosive environment for outdoor equipment. However, due to delays in the schedule for construction of a new wastewater treatment plant in central Maui, the County of Maui has elected to undertake a limited expansion which would increase plant ADWF capacity by 1.1 mgd (for a total capacity of 7.9 mgd). The design and construction of the expansion will be paid for by developers requesting the additional treatment capacity.

The expanded plant capacity will be used primarily to allow construction of additional housing units for the Wailuku-Kahului area. The Wailuku-Kahului Community Plan anticipates extensive residential growth in this area, and currently there is a critical housing shortage on the island. The area served by the WWRF is the principal residential area for permanent Maui residents. *Wailuku*

It is County's intent to divert ADWF sewage flows in excess of 6.8 mgd from the Wailuku-Kahului WWRF collection system to the Central Maui treatment plant when the new facility begins operation, now scheduled for 1996. This will reduce the quantity of wastewater received at the Wailuku-Kahului plant in the future by approximately 1.1 mgd. Diversion facilities, which are now in the planning phase, will have capacity to divert even greater flows, allowing further reduction of wastewater flows to the WWRF.

Description of the Proposed Project

The proposed project consists of modifications and additions to existing facilities and limited additions to the plant. The modifications are intended to improve treatment performance, reliability, and capacity; increase safety; improve energy efficiency; decrease the chances of damage due to flooding, and reduce odors. Additions that are part of the project include a seventh secondary clarifier, a third effluent filter, four effluent injection wells, a building to enclose the chlorine storage area, a second sludge holding tank, a third dewatering centrifuge, a second emergency blower, and an extension to the administration building.

The project consists of distinct elements located throughout the plant. Appendix A describes each of these elements in more detail. Briefly, they are:

- **Headworks odor control**
To reduce the release of odorous gases at the headworks, the discharge of the four forcemains bringing wastewater to the treatment plant will be rerouted to below the water surface. A chlorination system will be provided to oxidize odor-producing compounds in the raw sewage entering the plant.
- **Scum-removal system modifications**
The skimmer in grit tank and the headworks scum pumps will be replaced.

- **Conversion to fine-pore diffusers**
The aeration diffusers and headers in the activated sludge aeration tanks will be replaced with a more energy-efficient equipment.
- **Dedicated return activated sludge pumps**
To improve the performance of the clarifiers and the ability to control the activated sludge process, four existing pumps located in a pipe gallery will be replaced with six smaller units, each dedicated to one of the six existing clarifiers.
- **Improved clarifier baffles**
Two wooden baffles will be added within each of the existing clarifiers to improve the performance of these treatment units.
- **One additional clarifier**
To increase treatment plant capacity, a seventh clarifier will be constructed adjoining the six existing tanks. The pipe gallery will be extended to accommodate the new clarifier.
- **One additional effluent filter**
To improve reliability of the treatment plant performance and expand plant capacity, a third effluent filter will be added between the existing clarifiers and filters.
- **Four additional underground injection wells**
To comply with Hawaii Department of Health regulations governing wastewater injection wells (Section 11-62-25, Hawaii Administrative Rules) which require 100 percent backup for disposal of peak flow, four additional wells will be provided. Three of the added wells are required to accommodate the capacity of the existing treatment plant. The fourth new well will be added to handle the expanded capacity of the plant. Additional wells may be required if testing after construction indicates that the new wells do not add sufficient capacity to meet regulatory requirements.
- **One additional sludge holding tank**
A second 30-foot-diameter sludge holding tank will be built adjacent to an existing nearly identical tank, to facilitate operation of the sludge dewatering system and accommodate increased plant capacity.
- **Centrifuge feed modifications**
A sludge grinder will be added to reduce the chance of plugging of the centrifuges. A third feed pump will be added, dedicated to the new centrifuge. A corrugated metal roof and wind break will be provided to protect new and existing equipment in the area.

- **One additional dewatering centrifuge**
A third centrifuge will be installed in the operations building to provide expanded plant capacity .
- **Dewatered sludge handling modifications**
A shuttle conveyor will be installed to improve collection of dewatered sludge generated at the plant.
- **Administration building additions and modifications**
A 750-square-foot addition will be made to the existing single-story building and 225 square feet of the building will be remodeled. These changes will add a women's locker room, expand the men's locker room, and provide a larger lunch and meeting room.
- **A chlorine storage building**
An 850-square-foot, single-story building will be added to enclose the chlorine gas cylinders and thereby contain a potential leak of toxic chlorine gas. Currently the cylinders are stored outdoors. A chlorine scrubber system will be provided to neutralize chlorine contained in the building in the event of a leak. Glass panels will be used for the walls of this structure. In compliance with the County of Maui flood hazard district code, these panels will break away in the event of high winds or water levels, as required for storage buildings located below the regulatory flood level. Straps will be provided for each of the cylinders to reduce the potential for leakage of chlorine from the cylinders in the event of inundation.
- **An additional engine-driven aeration blower**
A second engine-driven blower will be installed in the operations building to allow operation of the biological treatment process in the event of a power outage.
- **Addition of a SCADA system and replacement of the pumping station telemetry equipment**
A computerized system for monitoring equipment and alarm status at the plant and the outlying pumping stations will be provided. The telephone telemetry system connecting 13 pumping stations and the treatment plant will be replaced with a more reliable and capable radio-based system.
- **Flooding protection**
Watertight doors will be added to the pipe gallery in the secondary treatment structure, and support for critical aeration piping will be reinforced. All new structures and equipment will be designed to withstand flooding up to an elevation of 20 feet. The protective measures are not designed to prevent inundation of the plant site, but instead, to minimize the adverse affects.

Most of these project elements involve indoor equipment or modifications to existing structures. New free-standing structures included in the project are limited to the chlorine storage building and a sludge holding tank. These would be the most externally visible changes to the existing site, but would be in character with the facility. The one-story chlorine storage building would be no taller than the existing operation building. The sludge storage tank would be located adjacent to an identical existing sludge storage tank.

The modified treatment plant is expected to produce an effluent quality of 5 mg/l biochemical oxygen demand (BOD₅) and 5 mg/l total suspended solids (TSS). This effluent quality exceeds the level required by Department of Health (30 mg/l BOD₅, 30 mg/l TSS). This higher quality effluent provides increased protection of the injection wells and the receiving waters.

Environmental Impacts

The EIS for the original project⁷, completed in 1974, addressed environmental issue areas in compliance with the National Environmental Policy Act of 1969, as amended. Of particular concern at that time was siting of a sewage treatment plant along the coast in a zone of potential flooding from tsunamis, the location and performance of the injection wells, as well as the plant's proximity to Kanaha Pond, a wildlife sanctuary occupied by species of endangered birds. The EIS concluded that the actual physical presence of the treatment plant near Kanaha Pond would not adversely affect the wildlife inhabiting the pond, but required additional hydraulic studies during construction of the project to better demonstrate the behavior of the injected effluent with respect to Kanaha Pond. The subsequent study⁴, prepared by the USGS, concluded that no more than 2 percent of the injected wastewater would reach the top of the confined basalt aquifer below Kanaha Pond. Upon release into the unconfined aquifer, the effluent would be displaced seaward and would not enter the pond. The findings of this study are summarized in Appendix D of this assessment. No significant unmitigable impacts were identified by the EIS for the original project.

A number of environmental issue areas have been considered in preparing this EA. These issue areas have been divided into three categories:

1. those unaffected by project construction or operation;
2. those temporarily affected during construction of the project; and
3. those potentially impacted by facility operation.

Components of the environment unaffected. No environmental impacts from either construction or operation of the expanded WWRF are expected to occur to archeological, cultural, historic, or paleontological resources. The project is confined to existing developed sites. A letter from the Office of Conservation and Environmental Affairs of the DLNR, included in Appendix C of this report,

concur that the proposed project will have no effect on any significant historic sites.

No environmental impacts are expected to occur to agricultural lands, to terrestrial biological resources, nor to land use or recreation resources. All aspects of the project are located within the boundary of the existing treatment plant and pumping stations.

The additions and modifications to the WWRF will not change the level of noise emitted from the facility. The only piece of new equipment that will generate significant noise is the engine-driven blower. However, the blower will be located within the operations building and only will be operated in the event of a power outage or potentially during periods of peak aeration demand.

Components of the environment temporarily affected. Temporary impacts during construction may occur to local traffic patterns due to construction equipment (trucks and other heavy equipment) along local streets adjacent to the plant site. If necessary, rerouting of traffic would reduce potential impacts. Temporary typical construction noise is likely, but is mitigable. No sensitive receptors (schools, hospitals, residences) are near enough to the WWRF to be affected by noise. Some on-site dust associated with construction may also occur, but adverse effects can be mitigated. Drainage patterns for surface runoff may be altered temporarily during construction.

Components of the environment potentially impacted. During facility operation, the potential exists for impacts to air quality (odors), to public health and safety, to water quality, and thus to aquatic resources. These potential impacts are not expected to be significant, however, for the following reasons:

- Studies^{4,5,7} summarized in Appendix D indicate that the injected effluent does not enter Kanaha Pond and is discharged into the ocean 2,000 to 3,000 feet from the shoreline. The injected wastewater initially rises and then spreads radially, forming a roughly conical plume within the lava sequence underlying the treatment plant. The top of the plume is displaced slightly seaward, in response to the seaward flow of freshwater at the top of the aquifer. The effluent then travels laterally and ultimately enters the ocean. Effluent from the expanded plant is not expected to enter Kanaha Pond nor affect water levels within the pond. The source of water for Kanaha Pond is the upper level of the unconfined aquifer beneath and south of the wildlife sanctuary. This groundwater is unaffected by the injection of WWRF effluent.
- Filtered secondary-treated effluent, the product of the existing WWRF, will significantly exceed Federal requirements of the 1977 Clean Water Act, as amended, for discharge to the ocean. On the basis of the available evidence summarized in Appendix E, it is concluded that treatment of wastewater at the WWRF and subsequent injection of the effluent into the lava aquifer has improved ambient water quality and has not increased pollution in Kahului Bay during its period of operation. There is no evidence to suggest that water quality

in the receiving waters will be degraded by increased discharges from the WWRF, provided effluent quality remains at the high level achieved since the treatment plant began operation. Problems potentially caused by the introduction of the treated wastewater into the marine environment are largely confined to algal blooms, dissolved oxygen depression, and impacts on the phytoplankton and fisheries within the bay. These adverse impacts have not been observed during the last 14 years of operation of the existing treatment plant.

- The existing facility is presently causing no identified adverse effects on the environment. Inorganic nitrogen and chlorophyll-a concentrations in Kahului Bay exceed current water quality standards; however, there is no evidence that this is caused by the introduction of treated effluent from the WWRF.

- The proposed project is intended and expected to have the following beneficial effects:

1. reduce the risk of damage caused by a chlorine gas leak,
2. improve the reliability of the facility, thus reducing the possibility of a sewage spill,
3. reduce the potential for odors at the headworks,
4. lower the likelihood of damage due to flooding, and
5. reduce electrical energy consumption by improving the efficiency of aeration.

Mitigation Measures

To reduce the potential for noise impacts during construction, it is recommended that use of noisy equipment be confined to normal working hours, avoiding early mornings, nights and weekends.

Dust from construction should be reduced through normal construction measures such as regular sprinkling with plant effluent.

Measures should be taken to ensure that surface runoff during construction does not enter Kanaha Pond.

In the event that water quality impacts are identified in the future, there are several potential mitigating measures that could be implemented. They are:

- 1) divert all or a portion of the flow entering the WWRF to the Central Maui treatment plant (scheduled to begin operation in 1996). Diversion facilities are currently in the planning phase.

2) reclaim a portion of the plant effluent by applying it to adjacent golf courses, parks, traffic median strips, and/or agricultural lands. The County of Maui has hired an engineering consultant to investigate the potential for reclamation of treated wastewater produced by the plant.

3) construct a deep-water outfall, and

4) remove biostimulating nutrients (nitrogen and/or phosphorus) from the effluent.

Compliance with Government Statutes, Ordinances, and Rules

The proposed Wailuku-Kahului WWRf modifications and additions would be in conformance with goals set forth in the Maui County General Plan⁶ and the Wailuku-Kahului Community Plan¹, by providing an adequate sewer system, non-pollution of nearshore areas, protection of shoreline wetland resources, and the ability to accommodate anticipated population growth within the service area.

All new construction in the project will comply with the requirements set forth in the County of Maui flood hazard district code (Chapter 19.62, County of Maui Codes). New mechanical and electrical equipment located below the regulatory flood level will be suitable for short-term inundation. In accordance with code requirements, the walls between the supporting columns of the chlorine storage building are designed to breakaway when subject to wind and water loads between 10 and 20 pounds per square foot. This will prevent catastrophic damage to the building in the event of a tsunami.

It is anticipated that the following permits will be needed for this proposed project:

- a Special Management Area (SMA) use permit, in compliance with Chapter 205A, Hawaii Revised Statutes and Article II of the Rules and Regulations of the Planning Commission of the County of Maui. The project is located within the Coastal Zone Management Area.
- an Underground Injection Control (UIC) permit for the additional wells to dispose of treated effluent, and
- a building permit, a grading permit, an electrical permit, and a plumbing permit; in compliance with Chapters 16.24, 20.08, and 16.16 of the Maui County Code and Maui County Ordinance No. 1213.

The following permits will not be required:

- a Conservation District Use Application (CDUA). The area surrounding the treatment plant is in a State Land Use Commission-designated Conservation District; however, the plant site was set aside under

Governor's Executive Order No. 3006.

- a Shoreline Setback Variance. Although the shoreline forms the northern boundary of the plant site, all work on this project will be greater than 40 feet inland from the shoreline. A shoreline survey was prepared for this project. On September 13, 1990, the survey was certified by the Department of Land and Natural Resources, subject to appeal. A copy of the survey is included as Appendix B.

Determination

The proposed expansion of the Wailuku-Kahului Wastewater Reclamation Facilities (WWRF) is not expected to result in any significant unmitigable adverse environmental impacts and is expected to have long-term beneficial effects. The criteria used to determine whether an impact is significant are defined in Title 11, Chapter 200, Section 12 of Hawaii Administrative Rules.

The proposed project consists of modifications and improvements to existing facilities. Additions to the treatment plant included in the project are another secondary clarifier, an effluent filter, four new underground injection wells, and a new one-story building to enclose the chlorine storage area. The intent of the project is to improve treatment reliability and capacity, increase safety, improve energy efficiency, decrease the chances of damage due to flooding, and reduce odor. The proposed project will be confined within the existing plant site boundaries and will not cause an increase in building height. The completed project will not substantially alter the appearance of the existing WWRF.

Although not expected, the only potentially significant impact of the project would be on the near-shore marine waters, resulting from the deep-well injection of effluent. Mitigation measures have been identified which could be implemented if adverse impacts occur. Two of these measures (diversion of sewage and reclamation of the effluent) are currently under study.

This Notice of Determination, together with this Environmental Assessment, is filed as a Negative Declaration by the Department of Public Works, County of Maui. Contact person for the Department of Public Works is:

Mr. Eassie Miller, P.E., Chief
Wastewater Reclamation Division
Department of Public Works
County of Maui
200 South High Street
Maui, HI 96793

APPENDIX A

PROJECT DESCRIPTION

APPENDIX A

DESCRIPTION OF PROJECT

WAILUKU-KAHULUI WASTEWATER RECLAMATION FACILITIES ADDITIONS AND MODIFICATIONS

Project Background

The existing Wailuku-Kahului Wastewater Reclamation Facilities (WWRf) are located in Kahului, Maui, and serve as a regional wastewater treatment plant for the surrounding area; including Wailuku, Kahului, and Spreckelsville. The main liquid treatment units are activated sludge aeration tanks, secondary clarifiers, and effluent filtration. Final effluent disposal is into four gravity injection wells, located on the treatment plant site. Effluent enters the basalt aquifer 180 to 380 feet below the surface, beneath the caprock, and flows indirectly into the ocean. The principal solids treatment and handling processes are aerobic digestion and centrifuge dewatering. The dewatered cake is currently disposed of in a landfill, but the County is pursuing plans to compost the sludge for agricultural use.

The existing plant was designed in 1972 for an average dry-weather flow (ADWF) of 6.0 million gallons per day (mgd) and a peak wet-weather flow (PWWF) of 15.0 mgd. Provisions were made and space was preserved for doubling the initial plant capacity. Operation of the existing plant began in 1976. In 1988 the ADWF entering the treatment plant was 5.3 mgd.

Additions and improvements to the Wailuku-Kahului WWRf are addressed and evaluated in the August 1989 report, Kahului Wastewater Treatment Plant Facility Expansion Study, by Brown and Caldwell. In this evaluation, the capacity of the existing plant was rated for an ADWF of 6.8 million gallons per day and a PWWF of 13.5 mgd, provided several additions and modifications were made to improve reliability, safety, and energy efficiency of the plant. In addition to these general improvements, the current project includes an additional clarifier, effluent injection well, sludge holding tank, and dewatering centrifuge, which will increase the plant's ADWF capacity to 7.9 mgd and its PWWF capacity to 15.8 mgd.

Project Elements

The following specific elements comprise the project. The location of each project element is shown on the attached site map.

A. Headworks Odor Control. To reduce the odor released into the atmosphere from the headworks of the plant, the discharge pipes from the raw sewage force mains will be modified to discharge below the water surface, with a flap gate on each pipe to prevent back flow. In addition, provisions will be made to allow addition of chlorine solution into both the Wailuku and Kahului forcemains as they enter the plant headworks. A new chlorinator will be added into the existing chlorination building. A new chlorine vacuum pipe connecting the chlorinator and the headworks area will be included in the project, and a chlorine injector will be installed at the headworks. A second chlorine cylinder scale will be included in the chlorine storage building, to permit a higher rate of chlorine usage.

B. Scum Removal System Modifications. The chain and flight scum skimmer in the grit tank will be replaced with a telescopic skimming valve. The existing scum pumps will be replaced.

C. Conversion to Fine-Pore Diffusers. The existing coarse bubble diffusers in the two aeration tanks will be removed and replaced with fine-pore diffusers to increase oxygen transfer capacity and improve aeration efficiency. The new diffusers will be the tubular flexible-sheath type and will be mounted on the existing removable headers. Additional removable headers will be added in the first half of each tank to allow mounting of additional diffusers. The existing aeration blowers and air supply piping will be retained.

E. Dedicated Return Activated Sludge Pumps. The four existing RAS pumps in the pipe gallery will be replaced with six smaller pumps. Piping and valves will be added to the existing RAS piping to permit each pump to be dedicated to one clarifier. The new valving will provide for redundancy, to allow operation of a clarifier even when its dedicated RAS pump is out of service. The new pumps will have adjustable-frequency type variable speed drives. Controls for the RAS pumps will be modified to allow biasing of pump speeds to adjust for differences in solids loading among the clarifiers.

F. Improved Clarifier Baffles. To create conditions as close as possible to plug flow, wooden baffles will be placed across the head end and across the mid-point of each of the six existing clarifiers.

G. Additional Clarifier. To increase the capacity of treatment plant, a seventh secondary clarifier will be added immediately to the west of the existing battery of tanks. The new clarifier will be similar in design to the existing units, with the improved baffles described under Project Element F. The collector mechanism in the new clarifier will have nonmetallic chain and sprockets.

The pipe gallery, inlet conduit, and effluent channel will be extended to accommodate the new clarifier. The ventilation of the pipe gallery will be improved to provide for gallery addition. The existing exhaust fan will be replaced with three roof-mounted units, placed along the length of the gallery.

A new dedicated RAS pump, similar to the other new RAS pumps, will be provided for the additional clarifier. The adjustable-frequency type speed control of the new RAS will be integrated with the speed controls for the other new RAS pumps.

H. Additional Effluent Filter. A third effluent filter, similar in type to the existing two automatic backwash units, will be provided. The new filter will be located between the existing clarifiers and filters. The chlorine solution diffuser in the secondary effluent channel will be relocated to the west. To accommodate the additional wash water from the new effluent filter, the two existing waste backwash pumps will be removed and replaced with larger submersible-type centrifugal units. The new pumps will be rail-mounted and an access hatch will be installed in the deck above each pump. To the degree possible, the existing pump controls will be reused.

To provide space for the new filter, the clarifier existing scum sump will be removed and replaced with a sump located on the west side of the clarifiers. The new sump will be equipped with two centrifugal pumps for discharging clarifier skimmings to either the sludge storage tanks or the aerobic digesters.

I. Additional Injection Wells. Four additional injection wells for disposal of final effluent will be included in the project. Three of the wells are required to reliably dispose of flows up to the existing plant capacity. The fourth well is required to handle increased plant capacity. Similar to the four existing wells, the new wells will be approximately 380 feet deep but will be located in the northwest portion of the treatment plant site. To direct the effluent into the basalt aquifer beneath the caprock, the walls of the upper 180 feet of the well will be sealed with grout. Backwash from the new wells will be directed to the holding pond. The holding pond inlet structure will be modified to allow adjustment of the head on the injection wells.

J. Enclosure of Chlorine Storage Area. A building will be provided to enclose the chlorine cylinder storage area. The function of this enclosure is to contain chlorine gas in the event of a gas leak and to protect the cylinders from damage by high water. The building will have a concrete masonry frame and glass wall panels, designed to relieve wind and water pressure as required by the County of Maui flood hazard district code. The new building will contain storage space for six one-ton chlorine gas cylinders. The existing cylinder scale will be relocated and reused and a second scale will be installed. Mechanical ventilation and a chlorine gas scrubbing system will be provided to process contaminated air in the event of a gas leak. When chlorine is detected within the building, the ventilation will automatically shut down, large doors and all vents will automatically close, and visible and audible alarms will be activated. Panic hardware will be provided on all personnel doors. The chlorine scrubber will be the ejector-venturi type, utilizing liquid sodium hydroxide.

K. Digester Decant Modifications. To allow a wider band of decant elevations, the supernatant selectors in the aerobic digesters will be replaced with floating collectors, attached to existing supernatant piping with a flexible joint.

L. Additional Sludge Storage Tank. A 30-foot-diameter open circular tank, similar to the existing sludge storage tank, will be designed. The new tank will include an air mixing system and level monitoring.

M. Centrifuge Feed Modifications. To accommodate the additional centrifuge, a third centrifuge feed pump will be added, adjacent to the existing pumps. The suction of the new feed pump will connect to the existing suction manifold, and discharge piping will be provided to the centrifuge building. Existing controls will be modified to automatically shut down the appropriate feed pump when a centrifuge is stopped. A grinder will be added to the feed pump suction piping. The ability to bypass the grinder will be provided. The feed pumps and grinder will be protected from wind and rain with a lean-to shed.

O. Dewatered Sludge Handling Modifications. Provisions will be made to allow discharge of dewatered sludge into either of two roll-away storage bins. A bi-directional shuttle conveyor will be provided at the discharge of the existing conveyor. Roadways will be modified as necessary to accommodate placement of two storage bins. The concrete driveway will be extended to cover the area occupied by both bins. A UHMW liner will be added to the existing conveyor. The interlocks between all components of the dewatering system will be improved.

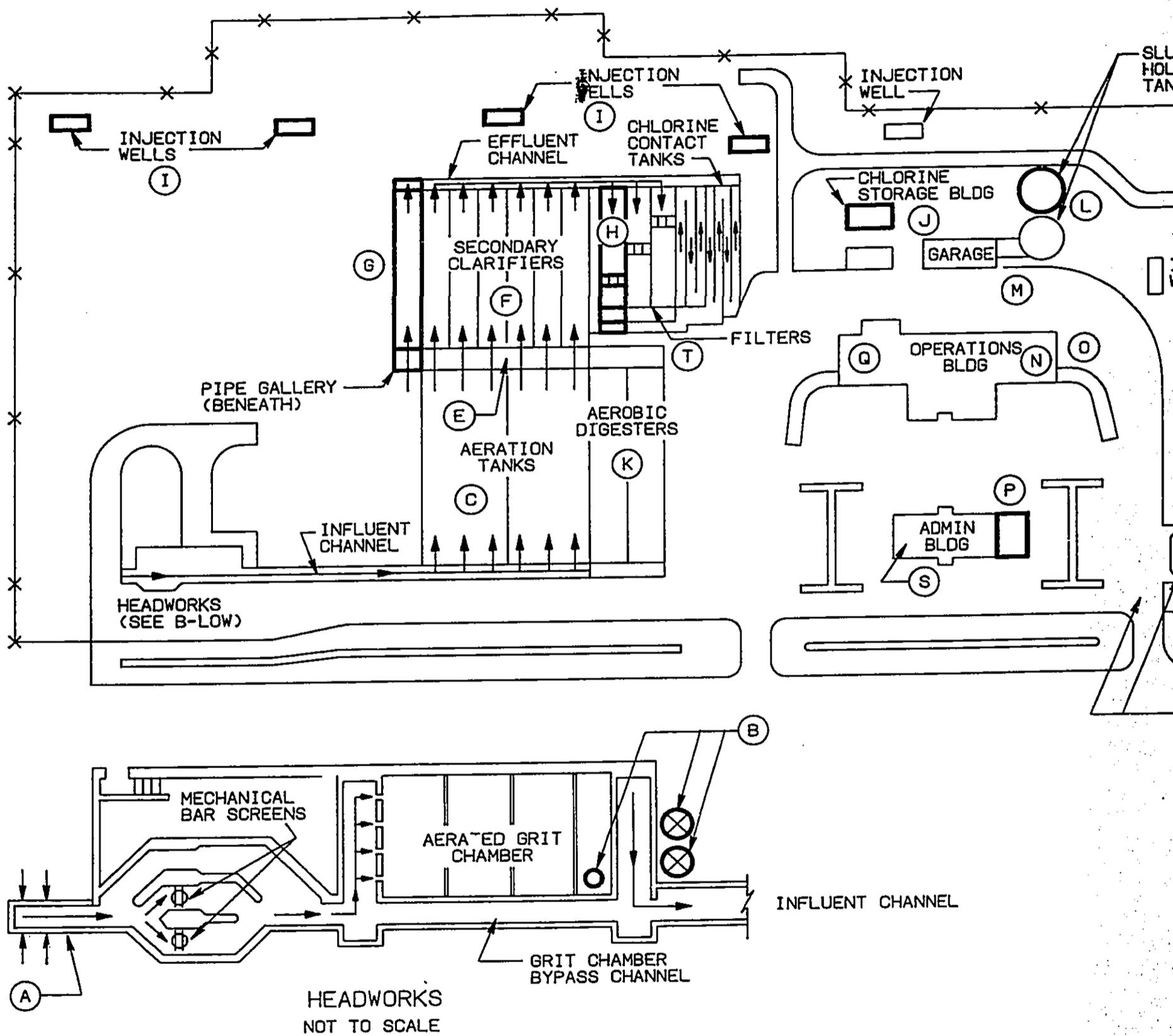
N. Additional Centrifuge. A third centrifuge will be installed. The new centrifuge will be identical to the existing Humbolt unit. A third centrifuge feed pump and a third polymer mixer, each dedicated to the new centrifuge, will be installed.

P. Administration Building Additions and Modifications. The men's locker room will be enlarged, the women's restroom will be replaced, and a women's locker room and shower will be added. The janitor's closet will be enlarged and relocated. A new lunch/meeting area will be added to the west of the building. The parking lot, roadways, landscaping, and irrigation adjacent to the building will be modified, as required to the modifications.

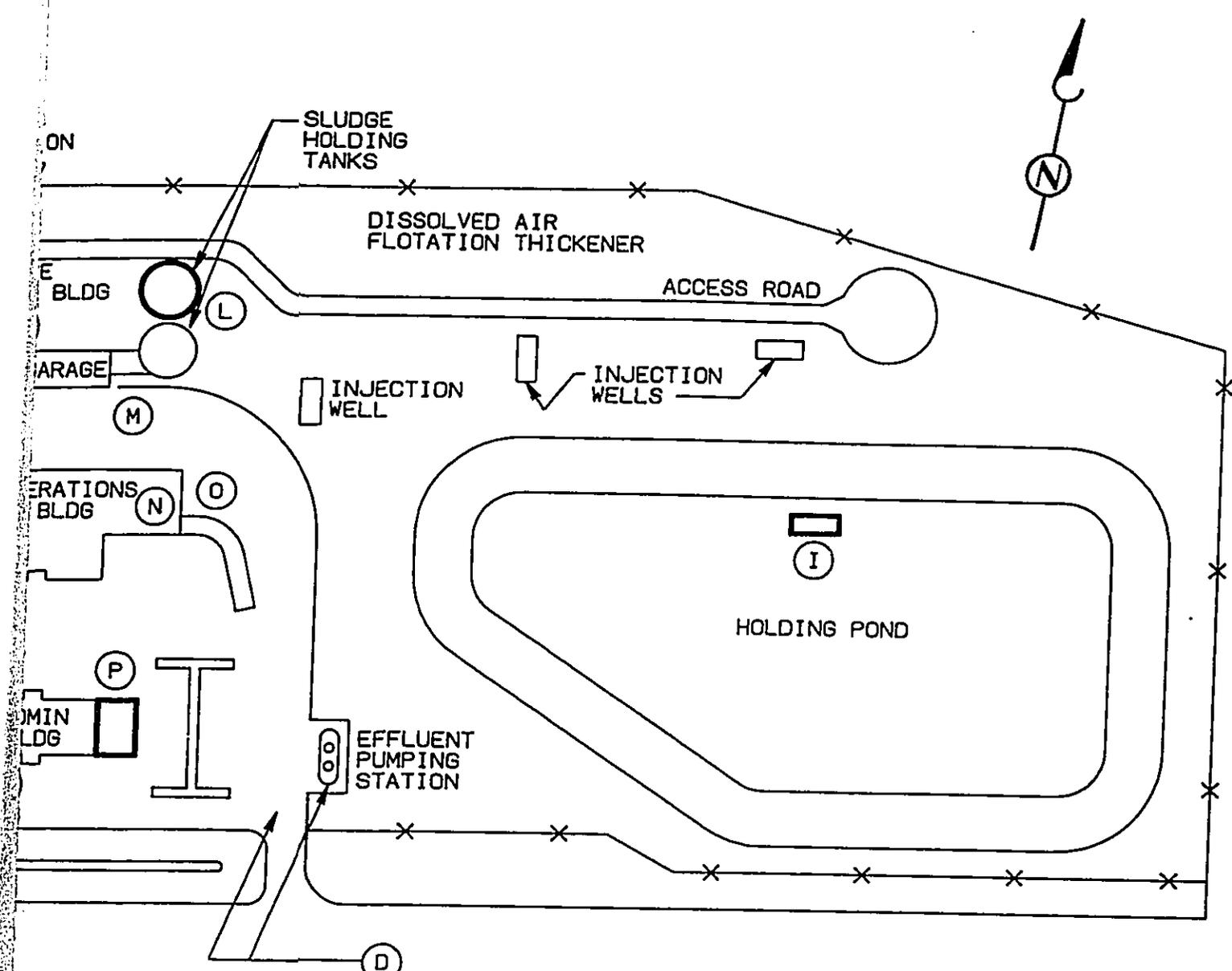
Q. Additional Engine-Drive Aeration Blower. A second engine-driven aeration blower will be provided in the spare bay provided in the operations building, to allow operation of the aeration tanks during a power outage. The new blower, engine, and support equipment will be identical to the existing units, to the degree possible. The existing fuel oil storage tank will be reused. The water cooler for the existing engine-driven blower will be replaced with a vertical unit housed in an extension of the operations building.

S. Addition of SCADA System. A personal-computer-based supervisory control and data acquisition (SCADA) system will be added in the control room in the Administration Building. The SCADA system will accommodate all signals and controls handled by the existing control panel. In addition, signals and controls associated with new equipment will be included in the SCADA system. Provisions will be made for adding 50 percent additional input and output signals in the future. To the degree possible, the SCADA system will be similar to the system to be added to the County's Lahaina Wastewater Treatment Plant. The existing telephone wire telemetry system connecting 13 of the existing remote pumping stations and the treatment plant will be replaced with a UHF radio telemetry system. The off-hour alarm system connected to the police station will be replaced with a system that telephones an answering service and sends a message to digital pagers. A remote terminal unit, transceiver, and antennae will be installed at each pumping station. Two transceivers, an antennae, and a telephone dialer will be installed at the treatment plant. The telemetry system will interface with the plant SCADA system.

T. Flooding Protection. Watertight doors will be added to both doors into the aeration structure equipment gallery. Air inlets to the gallery will be modified to keep water out of the gallery in the event of flooding. Bracing for the exposed section of the aeration header will be provided. For the purpose of design, the maximum water surface elevation will be the regulatory flood elevation, as defined by the Federal Emergency Management Agency.



WAILUKU KAHULUI WRF ADDITIONS AND MODIF
 PROJECT ELEMENTS LOCATION MAP



SCALE IN FEET

0 100 200

NOTE: SCALE IS APPROX.

ITIONS AND MODIFICATIONS
S LOCATION MAP

APPENDIX B

SHORELINE SURVEY

JOHN WAIHEE
GOVERNOR OF HAWAII



RMF	WES
DK	BTT
RYK	RFE
REC'D SEP 14 1990 RMTG	
GSY	
DKM	

WILLIAM W. PATY, CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES

DEPUTIES

KEITH W. AHUE
MANABU TAGOMORI
RUSSELL N. FUKUMOTO

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

P. O. BOX 621
HONOLULU, HAWAII 96809

SEP 13 1990

AQUACULTURE DEVELOPMENT
PROGRAM
AQUATIC RESOURCES
CONSERVATION AND
ENVIRONMENTAL AFFAIRS
CONSERVATION AND
RESOURCES ENFORCEMENT
CONVEYANCES
FORESTRY AND WILDLIFE
LAND MANAGEMENT
STATE PARKS
WATER AND LAND DEVELOPMENT

Ref:LM-GA

Mr. Robert K. Y. Lee
Project Manager
R. M. Towill Corporation
420 Waiakamilo Road #411
Honolulu, HI 96817-4941

Refer to:MA-90:127

Dear Mr. Lee:

Subject: Shoreline Certification Request
Applicant: R. M. Towill Corporation (Robert K. Y. Lee, RLS)
Property Owner: State of Hawaii
Location - Island: Maui District: Wailuku
Tax Map Key: (2) 3-8-01:188
Property Description: County of Maui Wastewater Treatment Plant Site (Governor's Executive Order No. 3006), Being a Portion of Grant 3343 to Claus Spreckels a Kahului
Land Management Case No.: MA-058

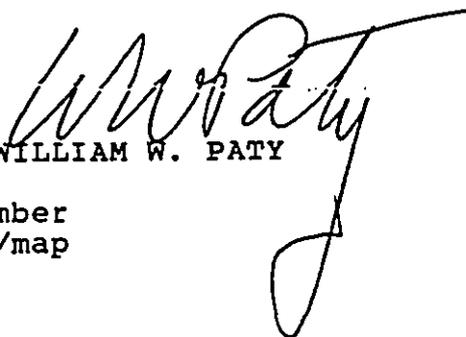
This is to inform you that the subject shoreline certification request has been certified but is subject to appeal.

Certified shoreline maps are being withheld until the appeal deadline of October 13, 1990.

Mr. Robert K. Y. Lee
Page 2

Should you have any questions regarding this matter, please
feel free to contact our Land Management Division at 548-6460.

Very truly yours,



W. W. Paty

WILLIAM W. PATY

cc Maui District Land Board Member
Maui District Land Office w/map
Survey Div., DAGS w/map

4765.65/1

PUBLIC NOTICE

Pursuant to Section 13-222-12, Hawaii Administrative Rules entitled "Shoreline Certification"

Date: Sept. 23, 1990 Number: 90-018

NOTICE OF APPLICATION: Application available for inspection at District Land Offices on the islands of Kauai, Hawaii and Maui and at Room 220, Kalanimoku Building, 1151 Punchbowl Street, Honolulu, Oahu

NOTICE OF SHORELINE CERTIFICATION OR REJECTION

LOCATION	APPLICANT	TAX MAP KEY	DATE CERTIFIED (C) OR REJECTED (R)
1) <u>Lots A-7-C-1 and B, Kapalua Dev. Subdiv. (Honokahua, Maui)</u>	George F. Newcomer Land Surveyors, Inc. for Kapalua Land Co., Ltd.	4-2-01:19 & 34	9/5/90(C)
2) <u>Wastewater Treatment Plant Site Being a Portion of Grant 3343 to Claus Spreckels (Kahului, Wailuku, Maui)</u>	R.M. Towill Corp. for County of Maui, Wastewater Treatment Plant Site	3-8-01:188	9/5/90(C)
3) <u>Ld. Ct. App. 999, Erosion to Lot 6 as Shown on Map 4 and Redesignation of Said Lot 6 Less Erosion as Lot 25 and Designation of Easement 1 Affecting Lot 25 (Kaipapau, Koolauloa, Oahu)</u>	H. Au and Associates, Inc. for Lynette Takayesu	5-4-11:40	9/5/90(C)
4) <u>Lot 939 of Ld. Ct. App. 242 (Map 10 at Puuloa Beach (Ewa, Oahu)</u>	Cummins & Cummins for Dominador S. Ramos	9-1-23:23	9/5/90(C)

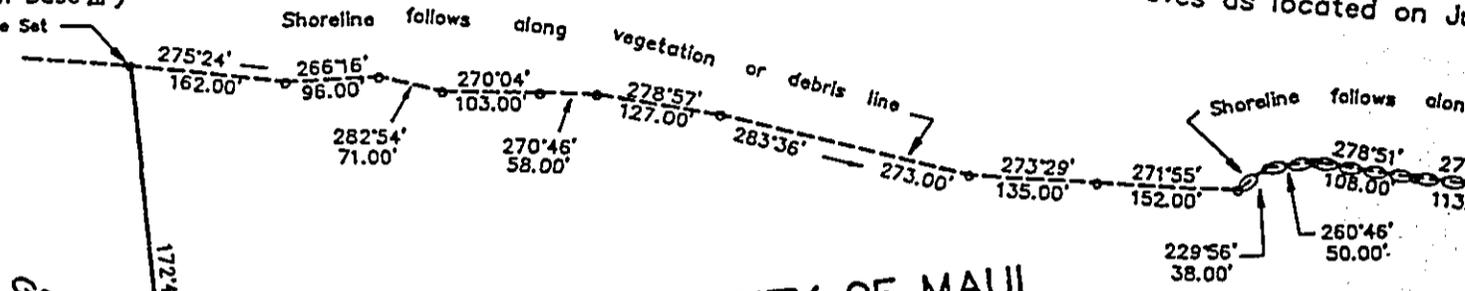
.....
APPEAL may be made to the Department of Land and Natural Resources in writing within twenty (20) days of the date of this notice:

Department of Land and Natural Resources
1151 Punchbowl Street, Room 220
Honolulu, Hawaii 96813
Tel. 548-6460
Page 13

S E A

136.28 N
3,951.12 W
(Maui North Base Δ)
1/2" Pipe Set

Shoreline follows along the upper reaches of the wash of the waves as located on J



GRANT

17246'34"
3343

TO

CLAUS SPRECKELS

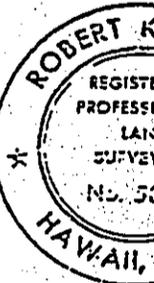
COUNTY OF MAUI
WASTEWATER TREATMENT
PLANT SITE
(C.S.F. 18,099)
18.984 Acres

Non-Exclusive Easement 10
for Wastewater Force Mains
(15' ft. wide)

PARCEL A, KAHULUI AIRPORT
(Governor's Executive Order 2427)
(C.S.F. 15,688)

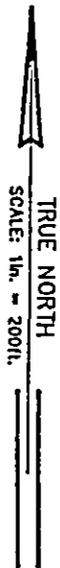
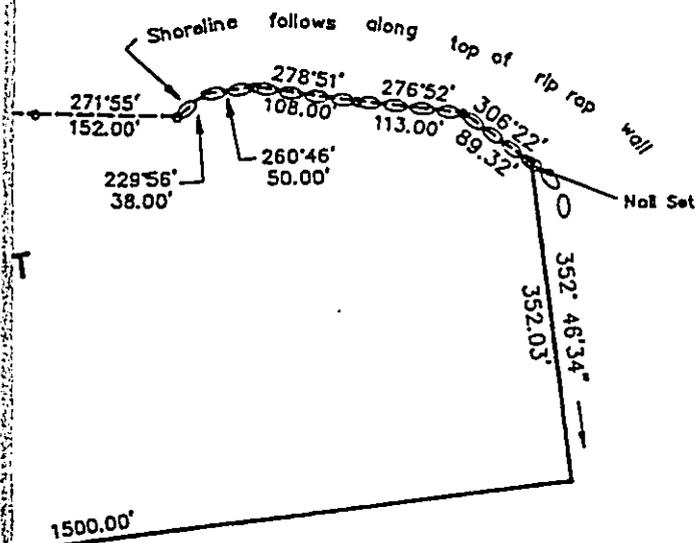
R.M. TOWILL CORPORATION
420 Waiakamilo Road
Suite 411
Honolulu, Hawaii

WASTEWATER
Being Portion
At
Tax



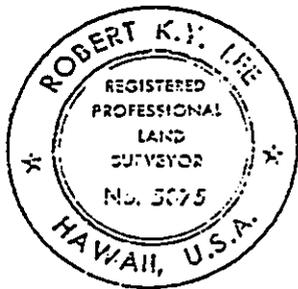
July 29, 1990
F.B.: 5905

the waves as located on June 4, 1990



SHORELINE SURVEY
OF
WASTEWATER TREATMENT PLANT SITE
Being Portion of Grant 3343 to Claus Spreckels
At Kahului, Wailuku, Maui, Hawaii
Tax Map Key: 3-8-01 : 188

CORPORATION
Kamilo Road
411
Kahului, Hawaii



This work was prepared by me
or under my direct supervision

By: Robert K.Y. Lee

Registered Professional Surveyor
Certificate Number 5075

10 x 15 = 1.04 Sq.Ft.

APPENDIX C

COMMENTS RECEIVED FROM AGENCIES NOTIFIED INITIALLY

HANNIBAL TAVARES
Mayor



T-63.56/R CHRISTOPHER L. HART
Planning Director
RALPH N. MASUDA
Deputy Planning Director

RECEIVED

1990 MAY -9 PM 2:19

WASTE MANAGEMENT DIV.
COUNTY OF MAUI

COUNTY OF MAUI
PLANNING DEPARTMENT
200 S. HIGH STREET
WAILUKU, MAUI, HAWAII 96793

MEMORANDUM:

May 5, 1990

TO: Mr. Eassie Miller, Chief,
Wastewater Reclamation Division

FROM: Christopher L. Hart, Planning Director

SUBJECT: WAILUKU-KAHULUI WASTEWATER RECLAMATION FACILITIES
ADDITIONS AND MODIFICATIONS

In response to your letter dated May 2, 1990 regarding the above referenced matter please be advised as follows:

1. The proposed Environmental Assessment for the project should address the following issues:
 - a. The project site is located within the flood inundation zone and the proposed assessment should address the impacts on the project especially as it relates to tsunami inundation.
 - b. The project site is adjacent to the ocean and the proposed increased injection of treated effluent (water) into the ground should also be addressed as it relates to the marine environment. Further, the Department of Land and Natural Resources Aquatic Resources and Water and Land Development Divisions should be contacted.
 - c. The project site is adjacent to the Kanaha Pond Wildlife Refuge and may have an impact. It is recommended that both the U.S. Department of Interior Fish and Wildlife Division and the State Department of Land and Natural Resources Forestry and Wildlife Division be consulted for input into the environmental assessment review.

Waste Management Division	S	R	A	W	P	H	U	U	
EASIE								X	
DIVISION			X						
ALEX									
JERRY									
ALAN									
YVONNE									
SIGNED	em							slu	

2xs

Memorandum - Eassie Miller
May 5, 1990
Page 2

- d. The environmental assessment report should include proposed mitigation measures to reduce any adverse environmental impacts as a result of the project. Of primary concern is measures for the prevention of raw sewage discharge into the ocean or nearby wildlife refuge from the plant and holding pond.
 - e. Odor is also of concern and appropriate mitigation measures should be identified in order to reduce any adverse impacts.
 - f. Another concern is the measures taken to prevent leakage from the chlorine tanks and measures utilized to clean up a chlorine spill (i.e. gas). Appropriate mitigation measures should be identified in the Assessment Report.
2. The subject property is located within the State Conservation District. It is recommended that the Department of Land and Natural Resources be contacted relative to the Conservation District Use Permit issued for the original treatment plant facility to ensure that a new CDUA permit is not required.

The property is located within the Limited (L) Subzone of the State Conservation District. The Subzones were established in 1978 after the original CDUA permit was approved by the State. Within the L Subzone a sewage treatment facility is not a permitted use unless it can qualify as a "governmental use not enumerated herein where public benefit outweighs any impact on the conservation district".

Further the subzone was created to include the following environmentally sensitive lands:

- a. Land susceptible to floods and soil erosion, lands undergoing major erosion damage and requiring corrective attention by the county, state, or federal governments; and

Memorandum - Eassie Miller
May 5, 1990
Page 3

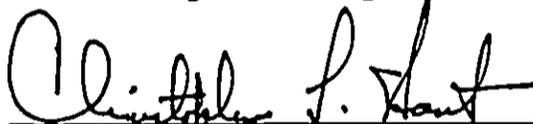
- b. Lands necessary for the protection of the health and welfare of the public by reason of the land's susceptibility to inundation by tsunami and flooding or to volcanic activity and landslides which incorporate a general slope of 40% or more.

The subject property was included due to its susceptibility to inundation by tsunami and flooding.

3. The project is located within the Special Management Area boundary of the County of Maui and based upon the preliminary information provided it appears that a Special Management Area (SMA) Use Permit (public hearing process) will be required. It should be noted that the issues identified in the Environmental Assessment pursuant to Chapter 200 of the Hawaii Revised Statutes are similar to the issues identified in the SMA Rules and Regulations.

Written documentation that compliance with the requirements of the Environmental Impact Statement Rules has been fulfilled should be included as part of the SMA Use Permit Application.

As a reviewing agency we would appreciate the opportunity to review and comment on the Environmental Assessment Report. If additional clarification is required please contact Ms. Colleen Suyama of my office.


CHRISTOPHER L. HART

cc: John Min
Brian Miskae
Colleen Suyama

APPENDIX D

INJECTION WELL HYDROGEOLOGY

APPENDIX D

INJECTION WELL HYDROGEOLOGY

This appendix is a summary of available information on the hydrogeology of the effluent injection wells at the Wailuku-Kahului Wastewater Reclamation Facilities (WWRF).

References

The primary reference for this appendix is a study of the WWRF injection wells¹, prepared by the USGS and published in 1977. As a condition for approval of the EIS for the original project, this work was done before operation of the plant, to verify that the existing injection wells would not have an adverse impact on Kanaha Pond. The study included field investigations and computer modeling of the lava rock aquifer, used to study the distribution of injected wastewater.

Other references include a report² describing investigations made in 1970 of a pilot injection well drilled at the plant site. This pilot well is one of the four existing wells now used for effluent disposal. An analysis of deep well injection³ was also prepared as part of the EIS for the original project.

Existing wells

Currently there are four injection wells used to dispose of effluent from the WWRF. The existing injection wells are located in the north-west portion of the plant site, 75 to 150 feet from the beach, aligned approximately parallel with the shoreline, and approximately 450 feet from the northern boundary of the Kanaha Pond Wildlife Sanctuary. The wells are located approximately 200 feet from each other. Each existing well has a bore diameter of 17 inches and is approximately 380 feet deep. The upper 180 feet of the wells are cased and cemented, preventing release of effluent into the upper strata. The treated wastewater is discharged into the open basaltic zone through the lower 200 feet of the well.

Each well is routinely rehabilitated to maintain its injection capacity. The most common rehabilitation method is to discharge air into a small pipe extending approximately 150 feet within the well. This release of air acts as an air lift pump, reversing the direction of flow within the well and dislodging wastewater solids that reduce injection capacity. Backwash water is diverted to a holding pond located on the plant site, and eventually pumped to the head of the plant. Alternatively, caustic soda is directed into the wells, to breakdown solids impeding the discharge of effluent.

New wells

Four additional injection wells are included in the proposed additions and modifications project. These new wells will be located in the north-east portion of the plant site, each 145 feet from its neighbor, 130 to 240 feet from the beach, and approximately 450 feet from the wildlife sanctuary boundary. As shown in Figure D-1, the new wells will be similar to the existing wells except that the diameter of their bore will be 14 inches.

Background geology

The WWRF site and the surrounding area, including Kanaha Pond, is underlain by a deep sequence of lava beds covered with a layer of sand and coral. The surface of the lava slopes down in a general north-west direction, as shown in Figure D-2. Below the plant site, the upper surface of the lava sequence is 60 to 85 feet below ground level (approximately 10 feet MSL). An irregular clayey layer is found just above the lava, overlain by a mixture of soft coral, coral debris and medium to fine sand.

The lava sequence underlying the area is composed of basalt flows a few feet to 50 feet deep, separated from each other by rubble, clinker, or cinder zones a few inches to a few feet thick. These porous horizontal layers and cracks in the basalt act as conduits for flow of groundwater through the lava sequence. The general direction of groundwater flow is northerly toward the ocean, generally normal to the shoreline. The principal source of this water is the slopes of Haleakala and the West Maui mountains. Rain falling in these areas infiltrates into the soil and flows through the ground toward the ocean. These groundwater flows converge in the Central Maui isthmus and enter Kahului Bay in the area adjacent to the WWRF, as shown in Figure D-3.

The groundwater beneath the treatment plant consists of a freshwater lens floating on underlying saline water. A transition zone, or zone of mixing, forms at the interface of the freshwater and saline water bodies. This transition zone is approximately 50 feet thick with its midpoint about 100 feet below the ground surface. The freshwater flows towards the ocean at a specific velocity of approximately 1.0 foot/day. In contrast, the saline water is essentially stationary with slight movement inland, as required to satisfy saline water diffusion upward through the transition zone, into the seaward-flowing base of the freshwater lens.

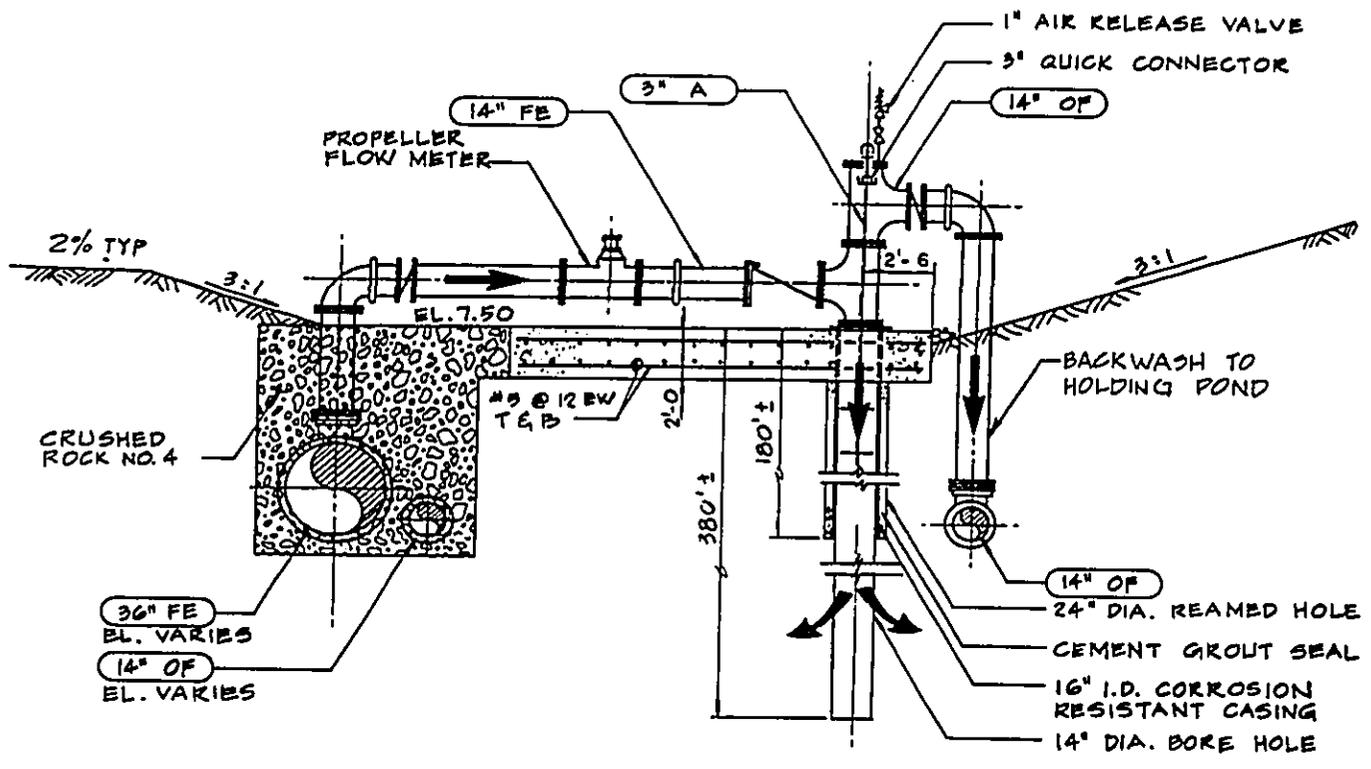


Figure D-1
New injection well construction

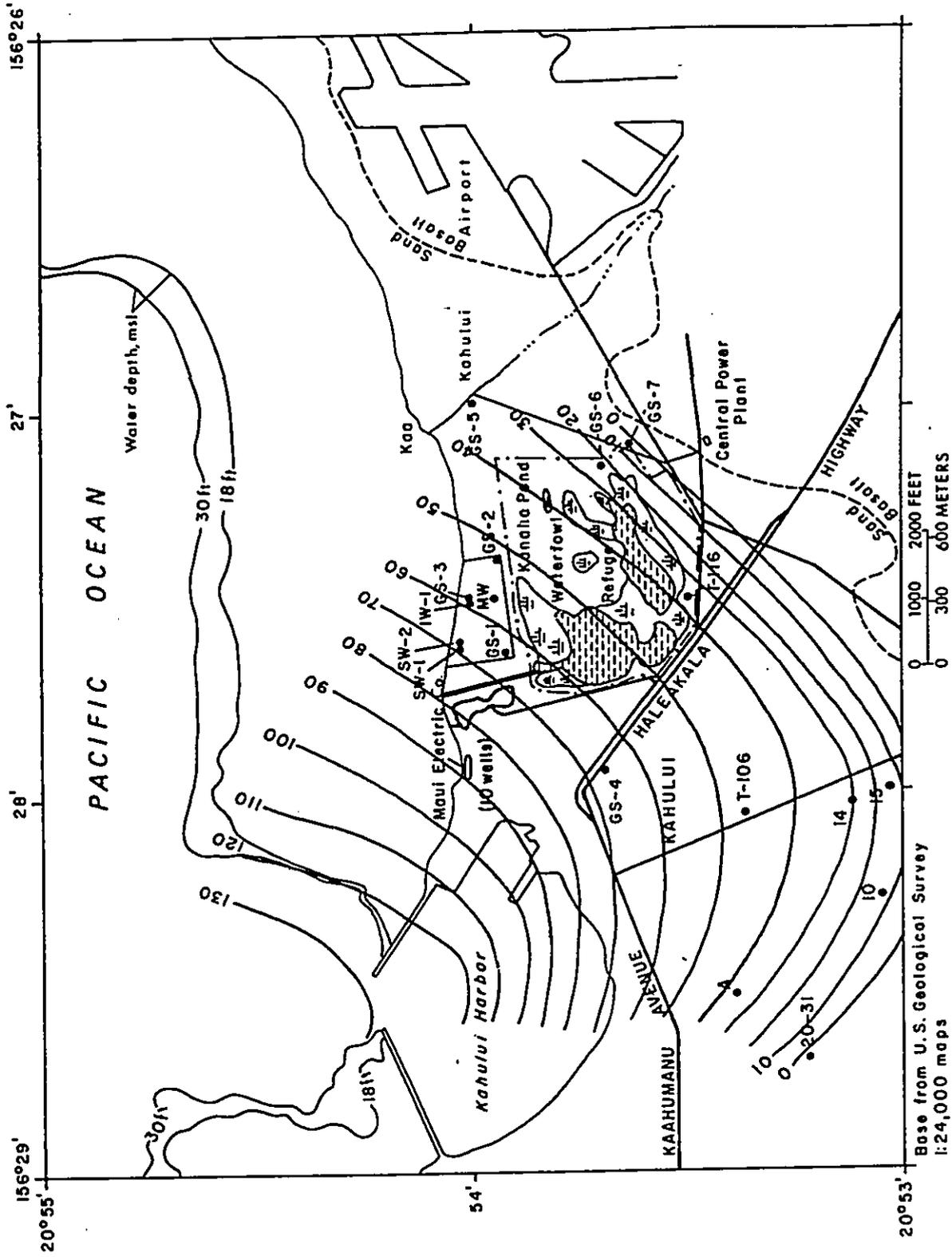


Figure D-2
 Map of area surrounding the injection wells, showing depth below mean sea level of the top of the lava rock sequence (From Reference 1)

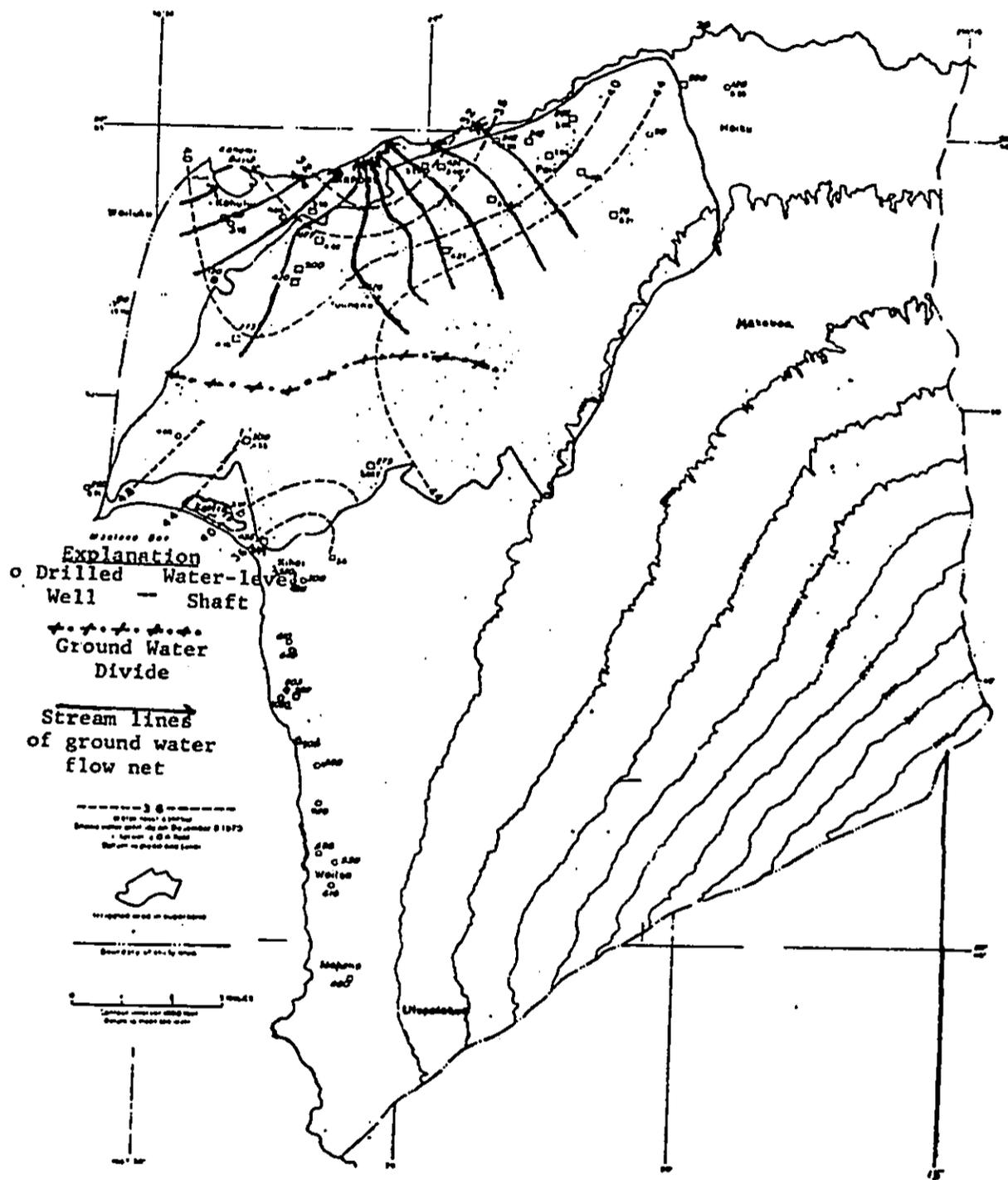


Figure D-3
 Map of Central Maui, showing water table contours and groundwater
 streamlines (From Reference 3)

The freshwater lens in the upper portion of the lava sequence is slightly confined by the clay layer, with heads a few tenths of a foot to a foot higher than in the overlying zone. This head differential indicates that there is limited mixing between the groundwater in the lava sequence and the coral/sand zone above it. Even within the lava sequence, the hydraulic conductivity in the horizontal direction is at least 10 to 100 times greater than in the vertical direction. The groundwater table below the plant site varies with the tidal cycle but averages between 2.0 and 3.0 feet above mean sea level (MSL).

The preceding discussion is summarized in Figures D-4 and D-5, which show the configuration of the geological and hydrogeological features of the region surrounding the injection wells.

Response to injection

Because the upper section of the injection wells is sealed, all of the effluent is injected from the lower section into the saline zone. However, the density of the injected wastewater is less than the groundwater in that zone, which has essentially the same salinity as the ocean. This buoyancy causes the injected water to move upward without significant change until it eventually intercepts the seaward flow of freshwater in the upper part of the lava sequence.

As shown in Figures D-6, the injected water also spreads radially as it rises, forming an roughly conical plume. The top of the plume is displaced slightly seaward, in response to the seaward flow of freshwater at the top of the aquifer. Modeling of the injection wells¹ indicates that the plume spreads at the top of the lava sequence to about 1,000 ft landward of the wells, 1,800 feet laterally on each side, and about 2,000 feet seaward.

A portion of the injected water discharges from the lava sequence by upward seepage into the base of the unconfined aquifer over the area of the plume, but principally seaward of the injection site. The modeling suggested that the part of the plume reaching the top of the lava sequence below Kanaha Pond contains 2 percent or less of the injected wastewater. Upward leakage from this part of the plume is displaced seaward and thus does not enter the pond. Little, if any, of the injected wastewater reaches the upper part of the unconfined aquifer landward of the treatment plant site. Ultimately the injected effluent enters the ocean with the native freshwater flow, within 2,000 to 3,000 feet of the beach.

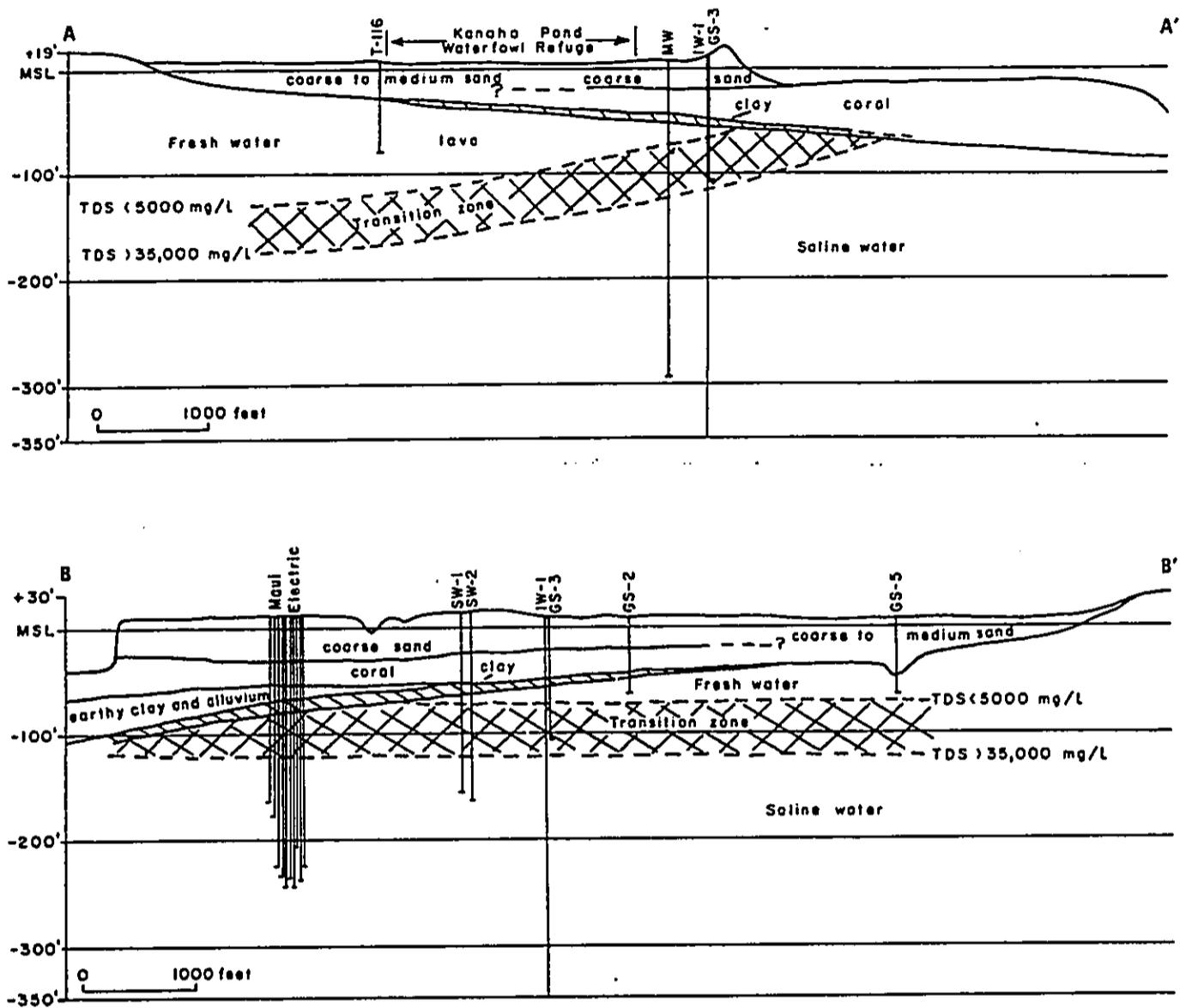


Figure D-5
 Cross-sections of the area surrounding the injection wells (From Reference 1)

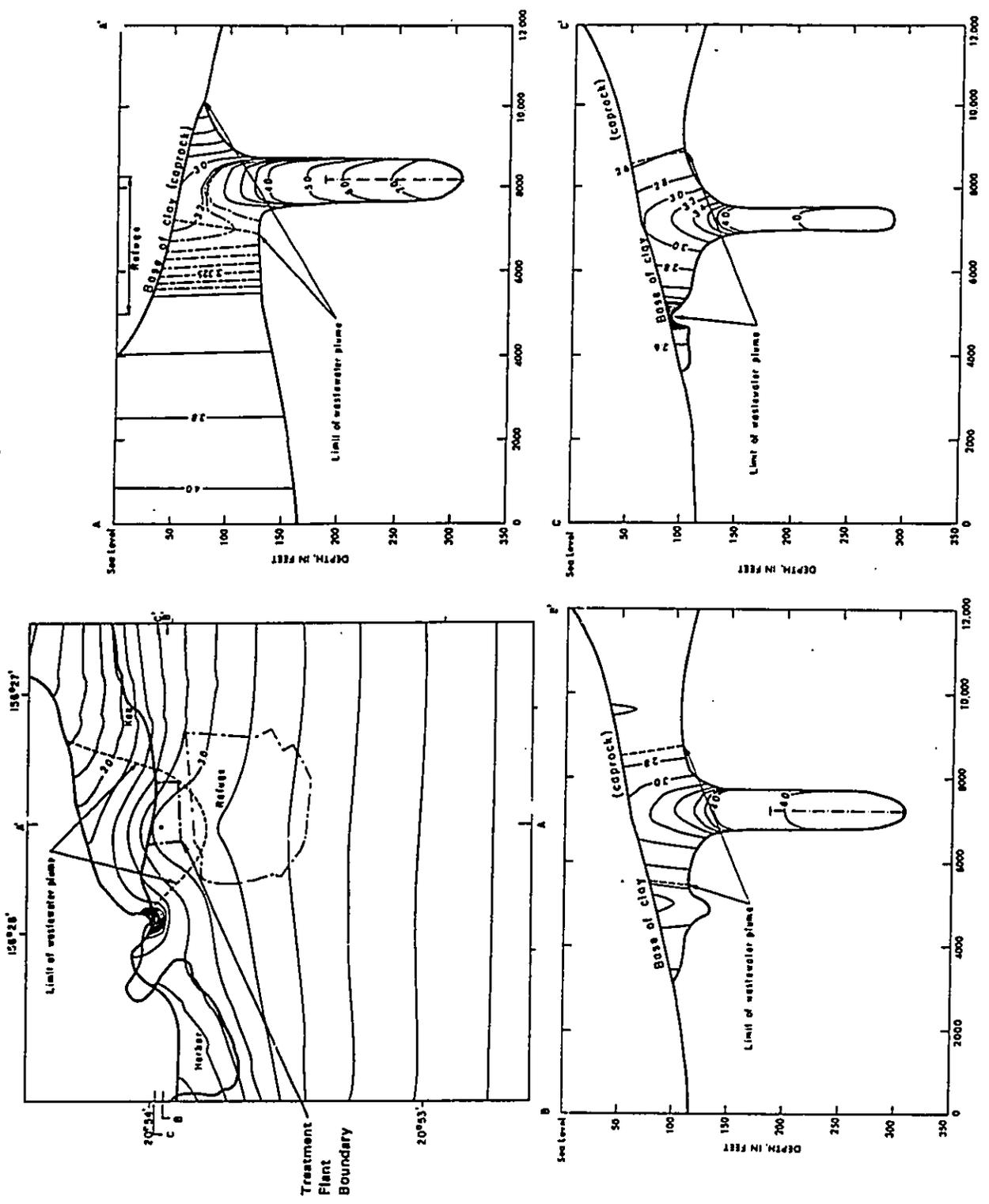


Figure D-6
 Plan and sections of the wastewater plume, showing head and wastewater
 distribution within the lava sequence (From Reference 1)

REFERENCES

1. Burnham, W.L., Steven P. Larson, and Hilton H. Cooper, Jr. Distribution of Injected Wastewater in the Saline Lava Aquifer, Wailuku-Kahului Wastewater Treatment Facility, Kahului, Maui, Hawaii. USGS Open-File Report No. 77-469. Prepared in cooperation with the County of Maui, Public Works Department, June 1977.
2. Chung Dho Ahn and Associates, Results of a Pilot Test on an Injection Well for the Wailuku-Kahului Wastewater Reclamation Facilities, WPC-Hawaii-45, Prepared for the County of Maui, 1970.
3. U. S. Environmental Protection Agency, "Geohydrology of the Injection Well Sites" , Appendix A of Final Environmental Statement, Wailuku-Kahului Wastewater Treatment and Disposal System, F-EPA-24004-II, June 1974.

APPENDIX E

RECEIVING WATER QUALITY

APPENDIX E

RECEIVING WATER QUALITY

This appendix summarizes available water quality data for the marine waters adjacent to the Wailuku-Kahului WWRF. Applicable water quality standards are identified and compared with ambient water quality. An assessment of the impact of increased injection of effluent from the WWRF is made.

Water quality standards

Standards for ambient water quality in Hawaii are defined in Title 11, Chapter 54 of Hawaii Administrative Rules¹. In this document, the water quality requirements are defined for several types of water bodies. Kahului Bay, the marine water body adjacent to the WWRF, is identified in Paragraph 11-54-06-a2A as a Class A embayment. Class A marine waters are to be protected to allow their use for recreational purposes and aesthetic enjoyment.

Water quality standards specific for embayments are listed in Table E-1. The "wet" criteria would apply to Kahului Bay because of the high volume of ground water that enters the bay, draining the northern half of central Maui and the adjacent slopes of Haleakala and the West Maui Mountains, as described in Appendix D.

Ambient water quality

Water quality in Kahului Bay and the adjacent shoreline is measured regularly by the Monitoring Section, Clean Water Branch, of the Hawaii Department of Health. Sampling stations in the area are identified in Figure E-1 and Table E-2.

Water quality measurements made at four sampling stations are summarized in Table E-3. The values in this table are the averages of all data available during the period of record. The geometric mean water quality standards, taken from Table E-1, are included in Table E-3 for comparison.

Annual average values for six water quality parameters measured at the Kahului Bay sampling station are plotted in Figures E-2 through E-7. Data for this station are only available from 1983 to the present. The figures also include the average of all measurements to date and the water quality standard.

Table E-1
Water quality standards for embayments

<u>Parameter</u>	<u>Geometric mean not to exceed the given value</u>	<u>Not to Exceed the given value more than ten percent of the time</u>	<u>Not to exceed the given value more than two percent of the time</u>
Total Nitrogen (ug N/L)	200.00* 150.00**	350.00* 250.00**	500.00* 350.00**
Ammonia Nitrogen (ug NH ₄ -N/L)	6.00* 3.50**	13.00* 8.50**	20.00* 15.00**
Nitrate & Nitrite Nitrogen (ug [NO ₃ +NO ₂]-N/L)	8.00* 5.00**	20.00* 14.00**	35.00* 25.00**
Total Phosphorus (ug P/L)	25.00* 20.00**	50.00* 40.00**	75.00* 60.00**
Light Extinction Coefficient (k units)	0.40* 0.15**	0.80* 0.35**	1.20* 0.60**
Chlorophyll <u>a</u> (ug/L)	1.50* 0.50**	4.50* 1.50**	8.50* 3.00**
Turbidity (N.T.U.)	1.50* 0.40**	3.00* 1.00**	5.00* 1.50**

*"Wet" criteria apply when the average fresh water inflow from the land equals or exceeds one percent of the embayment volume per day.

**"Dry" criteria apply when the average fresh water inflow from the land is less than one percent of the embayment volume per day.

Applicable to both "wet" and "dry" conditions:

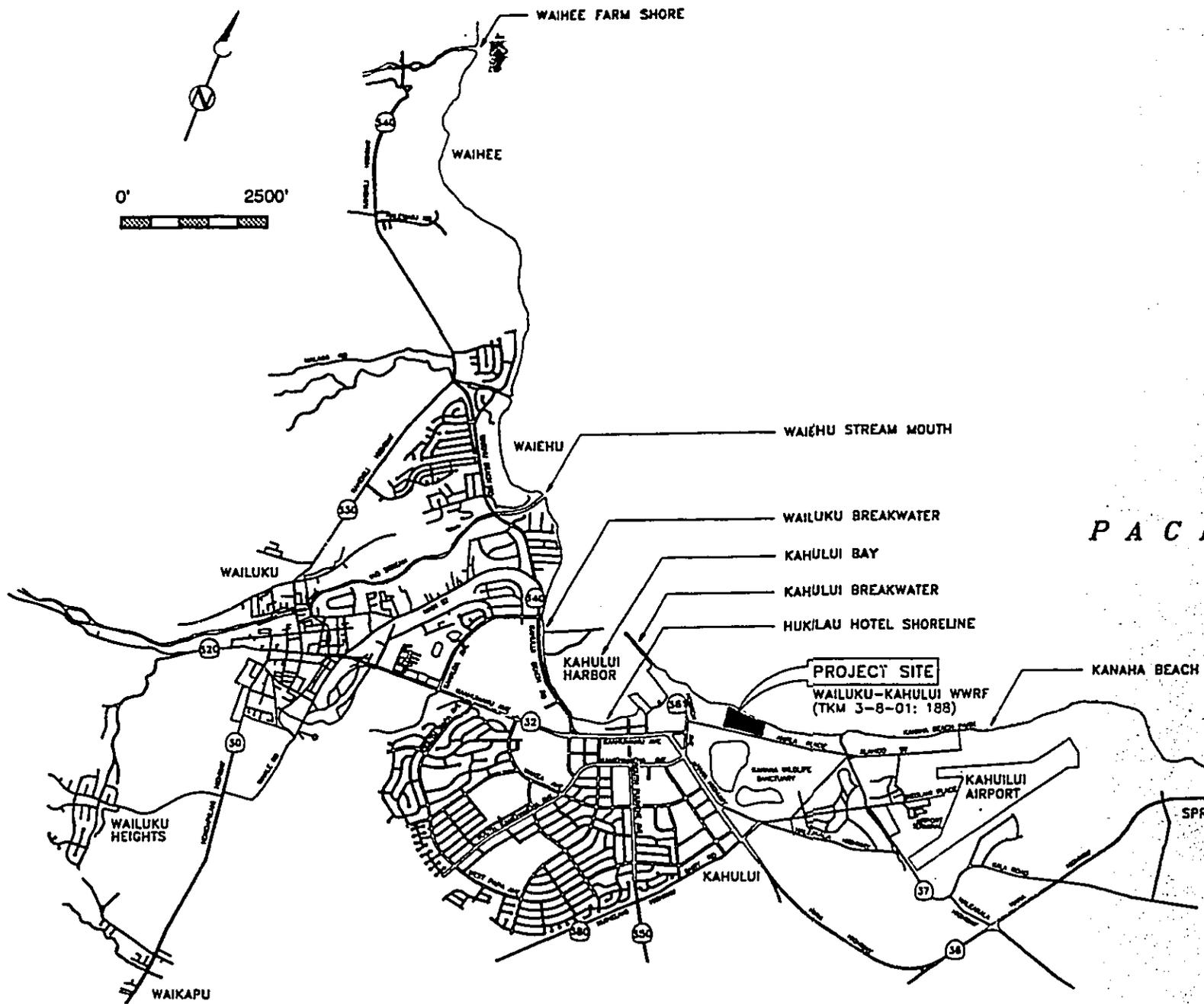
pH Units - shall not deviate more than 0.5 units from a value of 8.1.

Dissolved Oxygen - Not less than seventy-five percent saturation.

Temperature - Shall not vary more than one degree Celsius from ambient conditions.

Figure E-1

Location of Hawaii Department of Health water quality sampling sites
in the vicinity of the Wailuku-Kahului WWRF



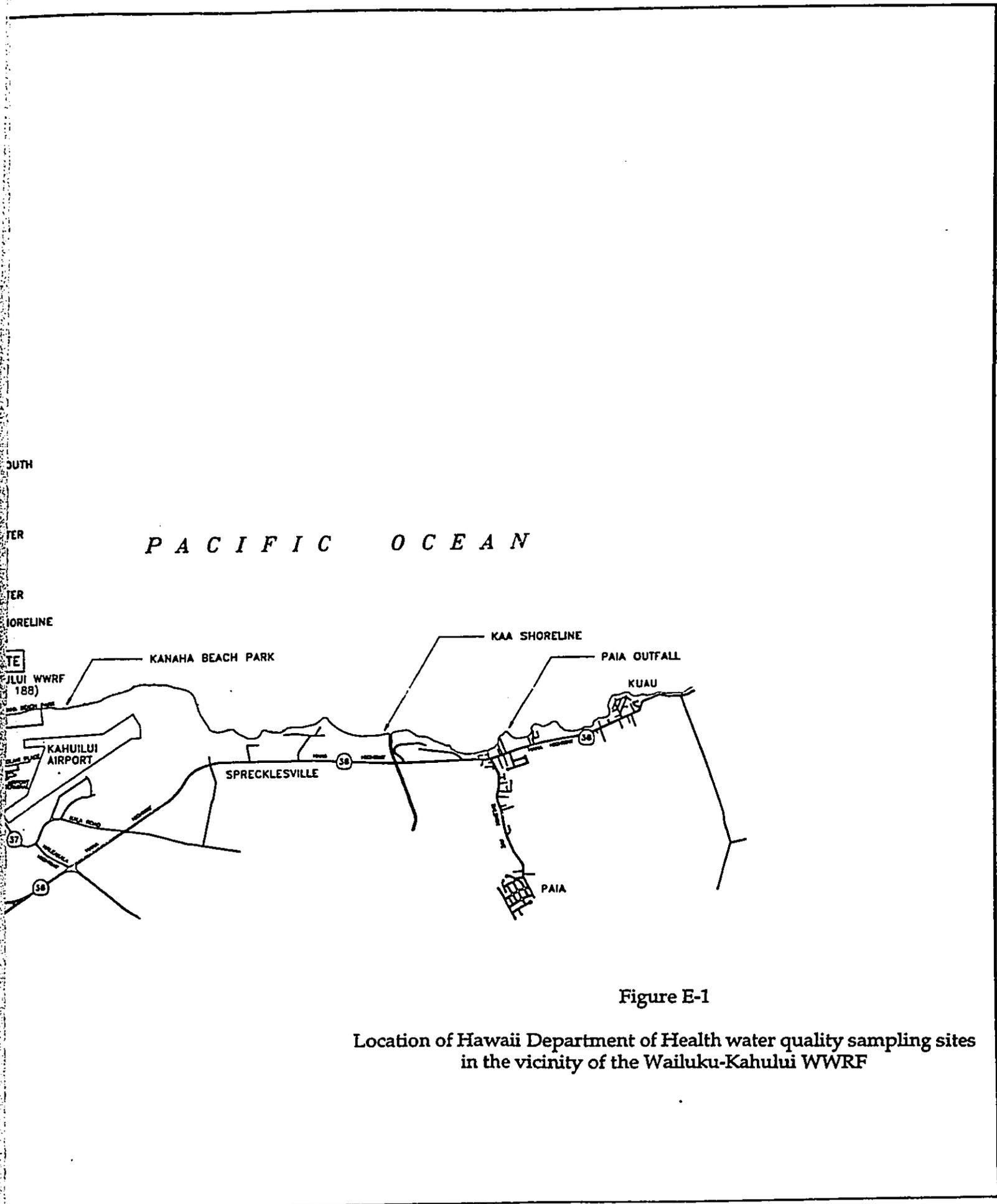


Figure E-1

Location of Hawaii Department of Health water quality sampling sites in the vicinity of the Wailuku-Kahului WWRf

Table E-2

Hawaii Department of Health water quality sampling sites
in the vicinity of the Wailuku-Kahului WWRP

Station number	Station name	Year of first measurement	Year of last measurement
654	Hukilau Hotel Shoreline	1973	1990
655	Kaa Shoreline	1989	1990
656	Kahului Breakwater	1973	1982
664	Paia Outfall	1973	1990
667	Waiehu Stream Mouth	1975	1990
668	Waihee Farm Shoreline	1973	1990
669	Wailuku Breakwater	1973	1982
677	Kanaha Beach Park	1989	1990
680	Kahului Bay	1983	1990

Table E-3
Comparison of water quality standards and measured water quality

Parameter	Geometric mean standard	Kahului Bay	Wailuku Breakwater	Kahului Breakwater	Kaa Shoreline
Total nitrogen, as N	200	212	220	318	290
Ammonia, as N	6.0	75	100	106	50
Nitrate + nitrite, as N	8.0	54	30	80	93
Total phosphorus, as P	25	25	59	53	62
Light extinction, k units	0.40				
Chlorophyll a	1.50	14.6	11.9	17.8	103
Turbidity, NTU	1.50	1.19	1.54	4.81	3.03
Date of first measurement		Feb-83	Feb-78	Feb-73	Sep-89
Date of last measurement		Aug-90	Jan-82	Jan-82	Aug-90

Notes:

1. Data obtained from STORET data base, maintained by the Hawaii Department of Health
2. Water quality standards are the criteria listed in Hawaii Administrative Rules, Title 11, Chapter 54 for embayments on "wet" coastlines.
3. Values are expressed in micrograms/liter, unless indicated otherwise.
4. Values shown for Kahului Bay station are geometric means of all measurements made during during the period of record. Values for other stations are arithmetic averages.

Total Nitrogen

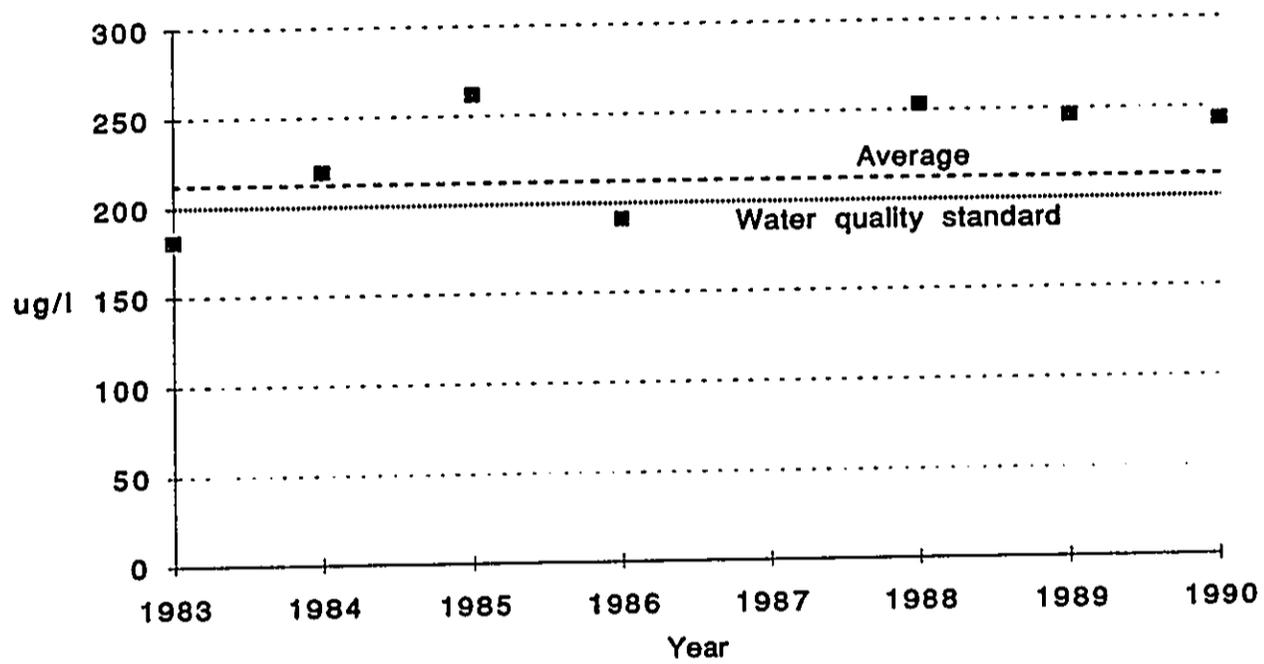


Figure E-2
Geometric mean values of total nitrogen
at Kahului Bay sampling station

Ammonia-N

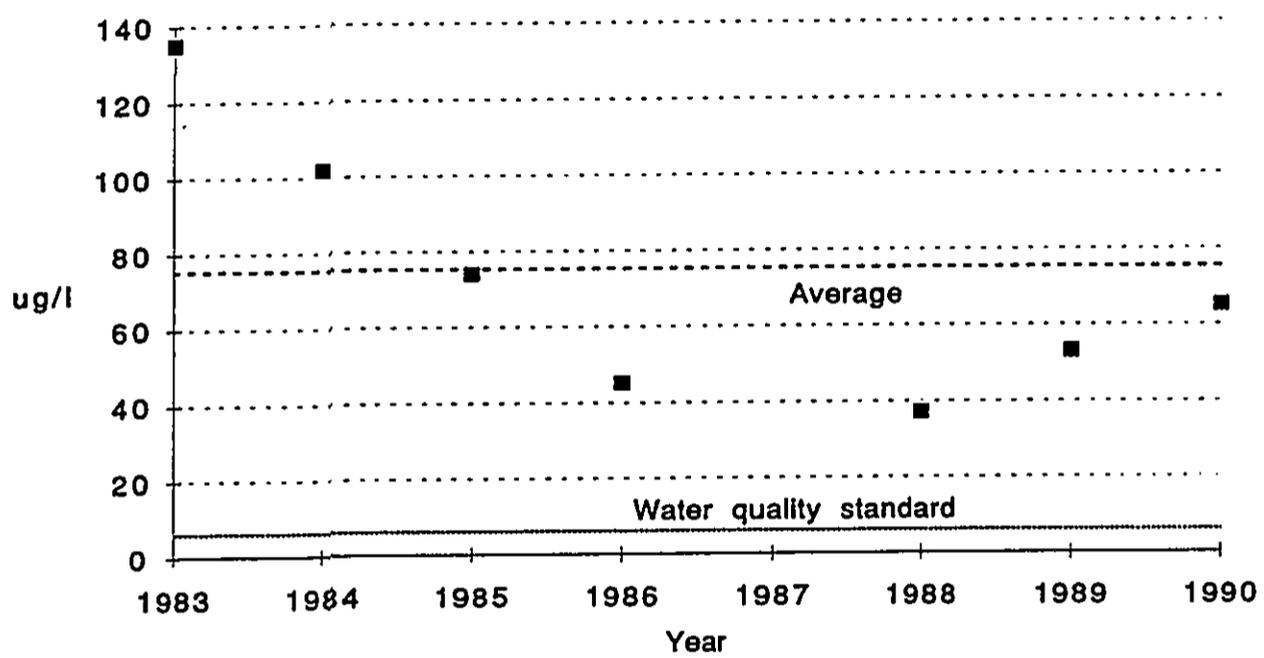


Figure E-3
Geometric mean values of ammonia nitrogen
at Kahului Bay sampling station

Nitrate and Nitrite N

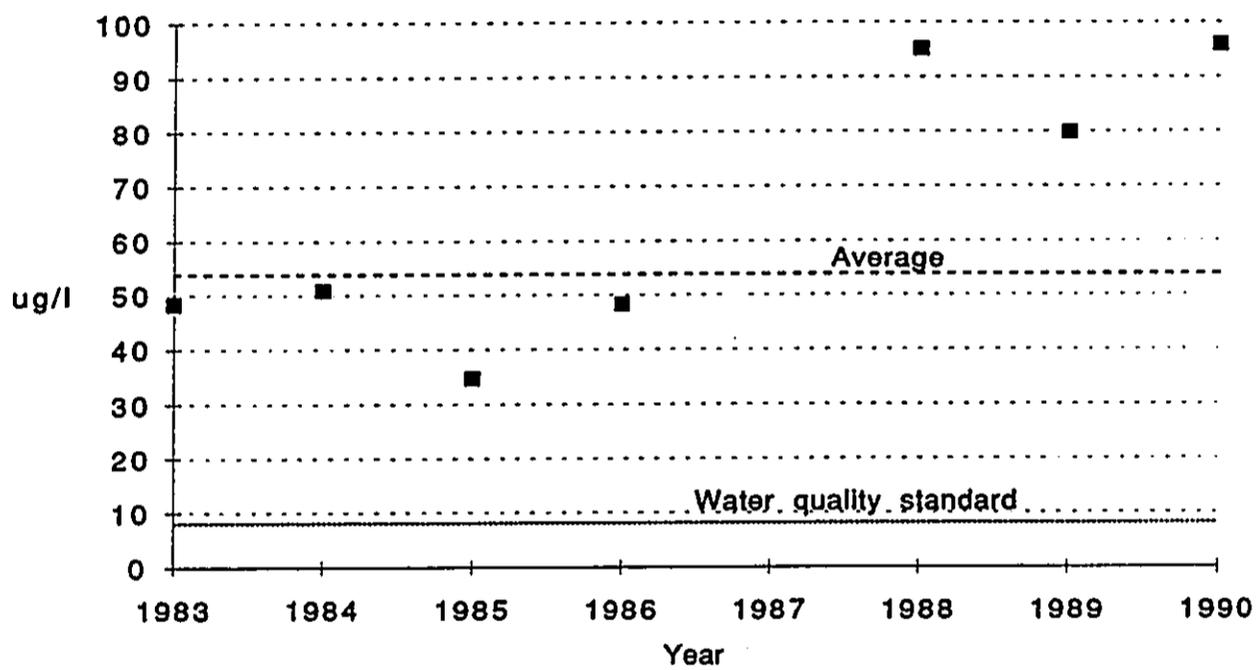


Figure E-4
Geometric mean values of nitrate and nitrite nitrogen
at Kahului Bay sampling station

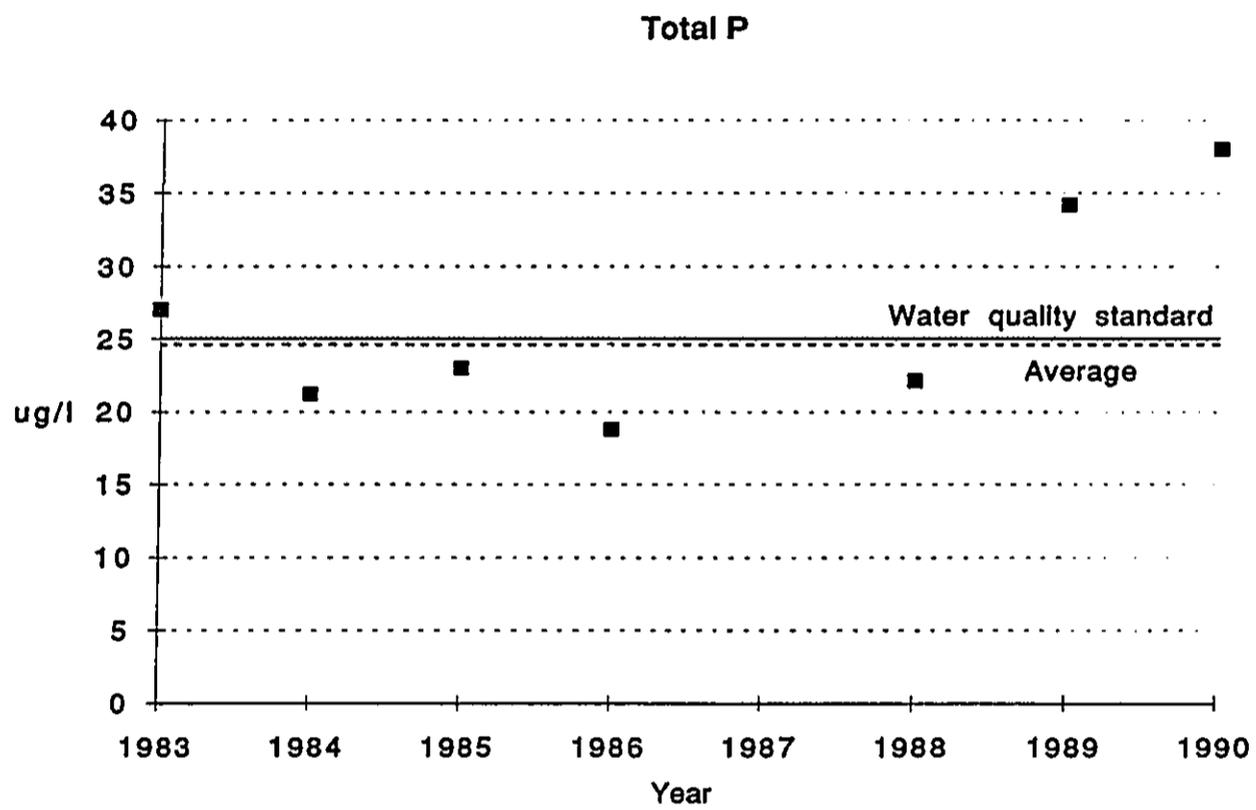


Figure E-5
 Geometric mean values of total phosphorus
 at Kahului Bay sampling station

Turbidity

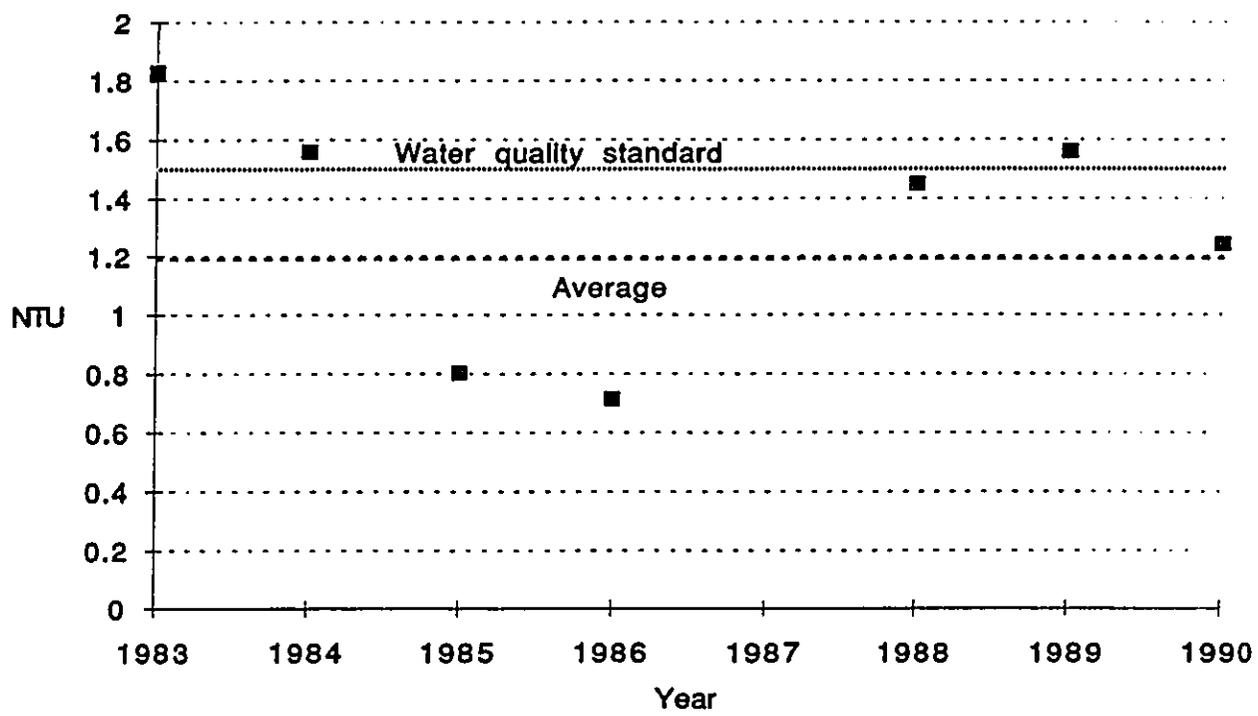


Figure E-7
Geometric mean values of turbidity
at Kahului Bay sampling station

Chlorophyll a

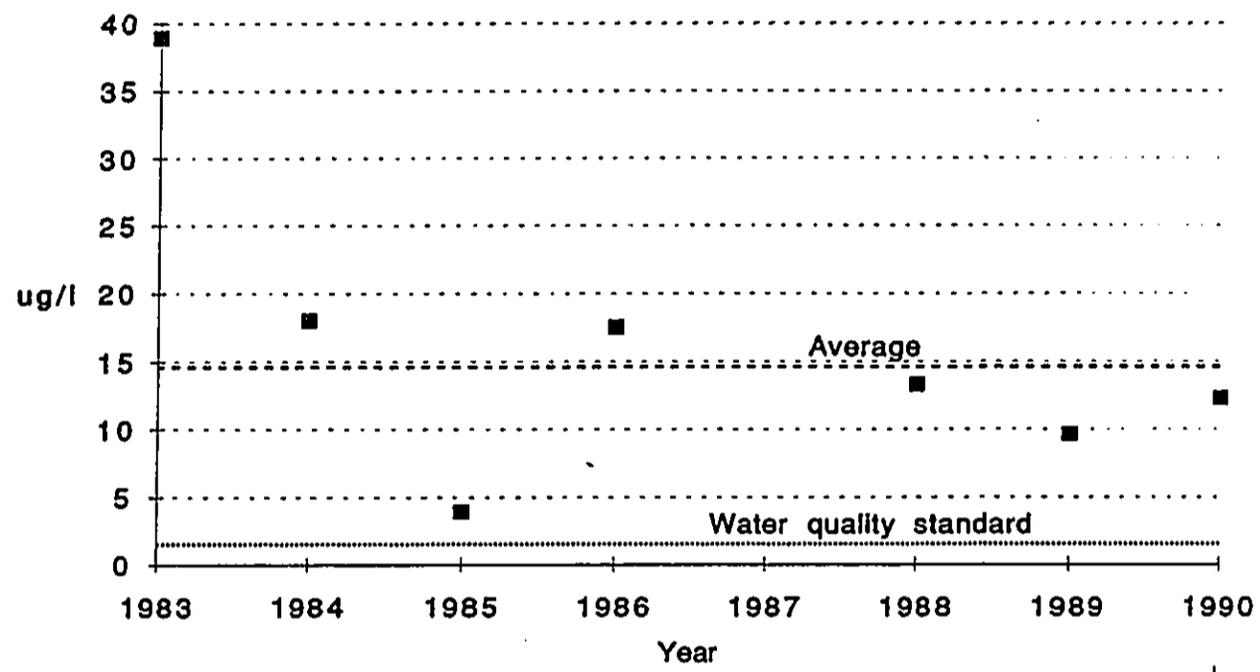


Figure E-6
Geometric mean values of chlorophyll-a
at Kahului Bay sampling station

The water quality data presented in Table E-2 and Figures E-2 through E-7 indicate that in Kahului Bay, turbidity is generally better than required; total nitrogen and total phosphorus concentrations are close to the regulated level; and ammonia, nitrate/nitrite and chlorophyll-a concentrations exceed the water quality standards. The poorer water quality measured at Kaa Shoreline is typical of shoreline data; pollutants tend to accumulate along windward coastlines.

Consistently high dissolved oxygen levels measured at the sampling stations adjacent to Kahului Bay indicate that dissolved oxygen saturation meets the water quality standard and that algal blooms and subsequent dissolved oxygen depression have not occurred.

The plots of water quality criteria do not show any specific trend in water quality over time since 1983. Total nitrogen levels have remained constant, ammonia concentrations have fallen, and nitrate/nitrite and total phosphorus levels have increased in the last 2 to 3 years.

It is interesting to note that while total nitrogen concentration within Kahului Bay is close to the water quality standard, concentrations of inorganic nitrogen (ammonia, nitrite, and nitrate) are significantly higher than the water quality standards. According to Dr. Hans Krock², a principal author of the Hawaii water quality standards, the high proportion of inorganic nitrogen in Kahului Bay suggests a large contribution of nitrogen from groundwater. This could be expected since rainwater and irrigation water applied to fertilized agricultural lands in central Maui drain into Kahului Bay through the aquifer and surface waterways. Organic nitrogen is generally plankton which is not contained in groundwater.

Impact of increase wastewater injection on marine water quality

While the discharge of effluent from the WWRF has been increasing since it began in operation in 1976, there does not appear to be a parallel increase in water quality constituents in Kahului Bay during the same period. This suggests that the treatment plant effluent is not a major source of bay pollution.

While specific data are not available from the Hawaii Department of Health, Eugene Arazawa³ of the Department recalls that water quality in the nearshore marine waters improved markedly when the WWRF began operation and the Wailuku and Kahului raw sewage outfalls were abandoned.

On the basis of the available evidence summarized in this appendix, it is concluded that treatment of wastewater at the WWRF and subsequent injection of the effluent into the lava aquifer has improved ambient water quality and has not increased pollution in Kahului Bay during its period of operation. There is

no evidence to suggest that water quality in the receiving waters will be degraded by increased discharges from the WWRF, provided effluent quality remains at the high level achieved since the treatment plant began operation.

REFERENCES

1. "Hawaii Administrative Rules, Title 11, Department of Health, Chapter 54, Water Quality Standards", Effective January 18, 1990.
2. Dr. Hans Krock, University of Hawaii, personal communication, December 5, 1990.
3. Eugene T. Arazawa, Supervisor, Monitoring Section, Clean Water Branch, Hawaii Department of Health, personal communication, December 3, 1990.

APPENDIX F

**COMMENTS RECEIVED FROM AGENCIES REVIEWING THE DRAFT
AND RESPONSES**

EXECUTIVE CORRESPONDENCE



DEPARTMENT OF THE ARMY
U. S. ARMY ENGINEER DISTRICT, HONOLULU
BUILDING 230
FT. SHAFTER, HAWAII 96858-5440

October 26, 1990

REPLY TO
ATTENTION OF.
Planning Division

Mr. Eassie Miller, Chief
Wastewater Reclamation Division
Department of Public Works
County of Maui
200 South High Street
Wailuku, Maui, Hawaii 96793

Dear Mr. Miller:

We have reviewed the Draft Environmental Assessment (EA) and Negative Declaration for the Wailuku-Kahului Wastewater Reclamation Facilities Additions and Modifications, Maui, Hawaii. The following comments are offered:

a. A Department of the Army permit is not required for the project.

b. The flood zone designation provided on page 2 of the EA is correct; however, the date of the Flood Insurance Rate Map should be changed to September 6, 1989.

c. The rock embankment shown in the East Site Plan (Figure 5) is a Federally-constructed shoreline protection project. Any proposed improvements affecting the shoreline protection project must be coordinated with the Corps of Engineers. For further information, please contact Planning Division at 438-8880.

Sincerely,

Kisuk Cheung
Director of Engineering

Copy Furnished:

Brown and Caldwell, Consultants
3480 Buskirk Avenue
Pleasant Hill, CA 94523-4342

**DO NOT WRITE ON THIS COVER AS IT IS INTENDED FOR RE-USE
RETURN IT WITH THE FILE COPIES TO ORIGINATING OFFICE**

Response to Comments by
Department of the Army
U.S. Army Engineer District, Honolulu
October 26, 1990

Comment: "... the date of the Flood Insurance Rate Map should be changed to September 6, 1989."

Response: The date has been changed in the final document.

JOHN WAIHEE
GOVERNOR OF HAWAII



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
P. O. BOX 821
HONOLULU, HAWAII 96809

WILLIAM W. PATY, CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES

DEPUTIES

KEITH W. AHUE
MANABU TAGOMORI
RUSSELL N. FURUMOTO

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RESOURCES ENFORCEMENT
CONVEYANCES
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
PROGRAM
LAND MANAGEMENT
STATE PARKS
WATER AND LAND DEVELOPMENT

REF:OCEA:CT

File: 91-175
Doc.: 0273E

NOV 19 1990

JOB 4963.56/2
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NOV 26 1990

BROWN AND CALDWELL

Mr. Eassie Miller, Chief
Wastewater Reclamation Division
Department of Public Works
County of Maui
200 South High Street
Wailuku, Maui, Hawaii 96793

Dear Mr. Miller:

Subject: Wailuku-Kahului Wastewater Reclamation Facilities
Additions and Modifications--Draft Environmental Assessment

Thank you for giving our Department the opportunity to comment on this matter. We have reviewed the materials you submitted and have the following comments.

Because four or more wastewater injection wells are planned, we have major concerns regarding the increased injection of effluent that could adversely affect the quality and water levels at Kanaha Pond. We must require the receipt of written assurances that the increase of injected effluent will not cause drastic changes in water levels at the Sanctuary. Rise in water level at the Pond could negate past and present habitat improvement projects at Kanaha.

Also, should the modification and addition project be approved, any flooding generated during construction be diverted away from Kanaha Pond and the drainage ditch located west of the project site.

Additionally, no construction equipment nor materials and supplies should be parked or stored along the Kanaha Pond Wildlife Sanctuary boundary fencing. Further, any damage to the fencing caused during construction be immediately repaired.

Mr. Eassie Miller

-2-

Doc. No.: 0273E

Finally, our Division of Land Management has reviewed the above-captioned subject matter and concludes that this proposed project is consistent with the scope of Governor's Executive Order No. 3006 dated April 9, 1980 to the County of Maui, Department of Public Works for sewage treatment plant purposes.

As such, a Conservation District Use Permit may not be required. To ensure compliance with the Executive Order No. 3006, please submit four copies of the construction plans for review prior to proceeding with any work. Three (3) of the copies will be returned to you.

If you have any questions, please call me or Cathy Tilton at our Office of Conservation and Environmental Affairs at 548-7837.

Very truly yours,


WILLIAM W. PATY

cc: Mark Bluestein, Brown and Caldwell

Response to Comments by
State of Hawaii
Department of Land and Natural Resources
November 19, 1990

Comment: "Because four or more wastewater injection wells are planned, we have major concerns regarding the increased injection of effluent that could adversely affect the quality and water levels at Kanaha Pond. We must require the receipt of written assurances that the increase of injected effluent will not cause drastic changes in water levels at the Sanctuary."

Response: Although the number of injection wells at the site is being increased from four to eight, effluent flow will not be increased proportionately. The primary purpose of adding injection wells is to provide 100 percent backup capacity, as required by Section 11-62 of the Hawaii Administrative Rules.

It is expected that all available wells will be operated simultaneously. Consequently, less flow will be injected into each well than currently handled by the existing wells. This will tend to reduce the size of the zone of influence of each well. Therefore, the potential for impacting Kanaha Pond will decrease with the addition of wells.

Modeling of the wells, described in Appendix D, suggested that the approximately 2 percent of the plume reaches the top of the lava sequence below Kanaha Pond. The top of the lava here is approximately 50 feet below the pond. Upward leakage from this part of the plume is displaced seaward and thus does not enter the pond.

Effluent from the expanded plant is not expected to enter Kanaha Pond nor affect water levels within the pond. The source of water for Kanaha Pond is the upper level of the unconfined aquifer beneath and south of the wildlife sanctuary. This groundwater is unaffected by the injection of WWRF effluent.

Comment: "... flooding generated during construction should be diverted away from Kanaha Pond and the drainage ditch located west of the project site." "... no construction equipment nor materials and supplies should be parked or stored along the Kahaha Pond Wildlife Sanctuary boundary fencing."

Response:

The comments are acknowledged and have been incorporated into the design documents. The Contractor has been directed to use only a designated area within the treatment plant boundaries for storage of materials and equipment. It is not expected that flooding will be caused by construction activities. In Section 02711 of the project manual, the Contractor has been directed to prevent any water generated during drilling of the injection wells from possible entrance into the wildlife sanctuary.

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NOV 1 1990

BROWN AND CALDWELL

JOHN WAIHEE
GOVERNOR OF HAWAII



JOHN C. LEWIN, M.D.
DIRECTOR OF HEALTH

STATE OF HAWAII
DEPARTMENT OF HEALTH
ENVIRONMENTAL MANAGEMENT DIVISION
FIVE WATERFRONT PLAZA, SUITE 250
500 ALA MOANA BOULEVARD
HONOLULU, HAWAII 96813

In reply, please refer to:
EMD-WWB

October 22, 1990

Mr. Eassie Miller, Chief
Wastewater Reclamation Division
Department of Public Works
County of Maui
200 South High Street
Wailuku, Maui, HI 96793

Dear Mr. Miller

Subject: Draft Environmental Assessment and Negative
Declaration for the Wailuku-Kahului Wastewater
Reclamation Facilities, Additions and Modifications.

The following comments were generated by the Wastewater Branch
staff from the review and evaluation of the subject report:

1. Since we recently reviewed the draft plans and specification
for the project, the timing of this Draft Environmental
Assessment and Negative Declaration is inappropriate.
2. The Department of Health is assessing it's policies regarding
the use of injection wells. We concur with the statement from
the Maui County Planning Department, May 5, 1990, in Appendix
C:

"The project sites adjacent to the ocean and the
proposed increased injection of treated effluent
(water) into the ground should also be addressed as
it relates to the marine environment."

This report did address the hydrogeologic characteristic of
the effluent but fell short in relating the chemical-physical
characteristics of the effluent to the impact on the marine
environment.

Should you have any questions or need additional information
contact Terry Kearney at 543-8296.

Sincerely,

Handwritten signature of James K. Ikeda in cursive.

JAMES K. IKEDA, ACTING CHIEF
Environmental Management Division

TK/eo

cc: Brown & Caldwell

Response to Comments by
State of Hawaii
Department of Health
Environmental Management Division
October 22, 1990

Comment: "This report did address the hydrogeologic characteristics of the effluent but fell short in relating the chemical-physical characteristics of the effluent to the impact on the marine environment."

Response: Appendix E, Receiving Water Quality, has been added to the document. This appendix summarizes available water quality data for the marine waters adjacent to the Wailuku-Kahului WWRF. Applicable water quality standards are identified and compared with ambient water quality.

On the basis of the available evidence summarized in Appendix E, it is concluded that treatment of wastewater at the WWRF and subsequent injection of the effluent into the lava aquifer has improved ambient water quality and has not increased pollution in Kahului Bay during its period of operation. There is no evidence to suggest that water quality in the receiving waters will be degraded by increased discharges from the WWRF, provided effluent quality remains at the high level achieved since the treatment plant began operation.

HANNIBAL TAVARES
Mayor



47103.0612

CHRISTOPHER L. HART
Planning Director

JOHN E. MIN
Deputy Planning Director

COUNTY OF MAUI
PLANNING DEPARTMENT
250 S. HIGH STREET
WAILUKU, MAUI, HAWAII 96793

November 7, 1990

NOV 11 1990

MEMORANDUM

TO: Mark Bluestein, Project Manager
Brown and Caldwell Consultants

FROM: Christopher L. Hart, Planning Director

SUBJECT: Draft Environmental Assessment and Negative
Declaration for the Wailuku-Kahului Wastewater
Reclamation Facilities Additions and Modifications

On May 5, 1990 my Department commented on the proposed addition and modifications to the existing plant in which several concerns were raised. Review of the draft report indicates that the following concerns have not been adequately addressed by the draft report:

1. Relative to the tsunami inundation zone we understand that the proposed construction will include measures to comply with the Flood Hazard District Ordinance. It is unclear whether the chlorine storage building and sludge storage building will be designed to withstand a flood elevation of 20 feet with watertight doors or whether it will utilize breakaway walls which would allow flood waters to pass through the structure. On page 12 the report proposes the first solution while on page 15 it identifies the breakaway walls. This should be clarified. Further, in the event that breakaway walls are utilized the report should address the mitigation measures to be taken in the handling of the chlorine tanks and sludge material to prevent contamination into the environment.
2. Relative to the injection wells although the previous Environmental Impact Statement is cited as the basis for no adverse impact, the draft report fails to update the information in the E.I.S. relative to the increased water injected into the ground and the resulting impacts. Does the 2 percent of injected wastewater below Kanaha Pond increase with the additional flows and if so, what is the resulting impact or mitigation measures required.

Memo - Mark Bluestein
November 7, 1990
Page 2

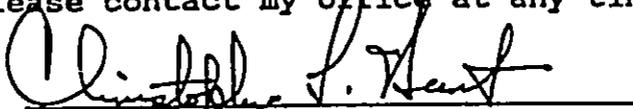
Further, the report states that other than increased algal blooms the increased flows of wastewater into the ocean has had no impact on the marine environment. What substantiating documents are there for your conclusions? These should be included in your report as well as responses from the proper agencies such as Aquatic Resources Division of the Department of Land and Natural Resources.

Further, responses from both the Department of Health and U.S. Fish and Wildlife should be included relative to no impact on groundwater resources and Kanaha Pond which is a federal wildlife reserve. It should be noted that since the 1974 E.I.S. report changes have occurred such as increased freshwater runoff into the area from existing development which may alter the conclusions made in the original report.

Since a Department of Health U.I.C. Permit is required which addresses the impacts of the injection well on groundwater resources as well as impacts on the surrounding environment, the preliminary information gathered for such a permit should be summarized and included in the draft report.

3. Relative to noise impacts, has a noise study been conducted which addresses the current noise generated by the plant and its impacts as well as the impacts from the proposed improvements? If such substantiating data is available it should be summarized and included in the draft report.
4. Relative to the Environmental Assessment (E.A.) for a Special Management Area Permit, a more detailed report should be submitted with your application than the information contained in the Negative Declaration which is a summary of the technical information which is used to make your conclusions. The E.A. document should include all technical information that would be analyzed by the respective County, State and Federal Agencies.

Thank you for the opportunity to comment. If additional clarification is required please contact my office at any time.


CHRISTOPHER L. HART
Planning Director

cc: Eassie Miller
David Wismar
Colleen Suyama

Response to Comments by
County of Maui—
Planning Department
November 7, 1990

Comment: "Relative to the tsunami inundation zone..... It is unclear whether the chlorine storage building and sludge storage building will be designed to withstand a flood elevation of 20 feet with watertight doors or whether it will utilize breakaway walls which would allow flood waters to pass through the structure.....the report should address the mitigation measures to be taken in the handling of chlorine and sludge material to prevent contamination of the environment."

Response: The sludge storage building will have breakaway walls, as required by the County of Maui Flood Hazard District Ordinance for storage buildings located below the regulatory flood level. Tie-down straps will be provided for each cylinder to reduce the potential for leakage of chlorine in the event of flooding. Currently the cylinders are located outdoors and are not secured. The intent of the chlorine storage building is to contain a potential leak from the cylinders, at times other than during a tsunami.

The sludge holding tank is a cylindrical tank with top of wall 1.5 feet above the regulatory flood level. The footings of the tank have been designed to prevent floating of the tank during inundation to elevation 20 feet, even when the tank is empty. Sludge will not be released into the environment as a result of flooding.

Comment: "...the draft report fails to update the information in the E.I.S. relative to the increased water injected into the ground and the resulting impact."

Response: The potential for impacting Kanaha Pond will decrease with the addition of wells, because the flow per well will be reduced. See response to comments by the Department of Land and Natural Resources.

Comment: "The report states that other than increased algal blooms, the increased flows of wastewater into the ocean has had no impact on the marine environment. What substantiating documents are there for your conclusions?"

Response: Appendix E, Receiving Water Quality, has been added to the final document. This appendix includes trend plots which do not show any specific trend in water quality over time. While the discharge of effluent from the WWRF has been increasing since it began in operation in 1976, there does not appear to be a parallel increase in water quality constituents in Kahului Bay during the same period. This suggests that the treatment plant effluent is not a major source of bay pollution.

Comment: "Responses from both the Department of Health and U.S. Fish and Wildlife should be included relative to no impact on groundwater resources and Kanaha Pond....."

Response: Both agencies were notified of the project. The Department of Health did not question the analysis of injection well geohydrology. U.S. Fish and Wildlife did not return comments.

Comment: "... the preliminary information gathered for (the Underground Injection Control) permit should be summarized and included in the draft report."

Response: The U.I.C. permit application was submitted to the Department of Health on September 10, 1990. This application does not address the impacts of the injection wells on the groundwater resources, nor the impacts on the surrounding environment. Instead it describes the proposed wells (included in this document) and the proposed testing procedure.

Comment: "... has a noise study been conducted which addresses the current noise generated by the plant and its impacts as well as the impacts from the proposed improvements?"

Response: A noise study has not been prepared. Neither the existing plant nor the modified facility has outdoor equipment that generates significant noise. In addition, the area immediately east of the treatment plant is zoned for heavy industry.



DEPARTMENT OF WATER SUPPLY
COUNTY OF MAUI
P.O. BOX 1109
WAILUKU, MAUI, HAWAII 96793-7109

October 31, 1990

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BROWN AND CALDWELL

Mr. Mark Bluestein
Brown and Caldwell Consultant
P.O. Box 8045
Walnut Creek, CA. 94596

Dear Mr. M. Bluestein:

RE: Wailuku-Kahului Wastewater Reclamation Facilities
Additions and Modifications - Draft Environmental Assessment
and Negative Declaration

The subject environmental assessment should address the following:

1. The domestic water used by the proposed modifications. The project should utilize the plant's effluent as much as possible and limit its domestic demand on the department's water system.
2. The contractor's use of this department's domestic water for dust control during construction. The plant's effluent should be used for this purpose.

Sincerely,

Rae M. Shikuma
Rae M. Shikuma
Director

↖ Add. 1 to
01560 3.0

cc: E. Miller/D. Wissman, Co. of Maui.

"By Water All Things Find Life"

Response to Comments by
County of Maui
Department of Water Supply
October 31, 1990

Comment: "The project should utilize the plant's effluent as much as possible and limit its domestic demand on the department's water system."

Response: Reclaimed effluent is used for all water requirements within the plant except in the administration building (drinking and washing), in the operations building (drinking and chemical makeup), and in the chlorination area (emergency eye wash and shower). All utility stations within the plant, as well as the irrigation system, are supplied with chlorinated plant effluent.

Comment: "The plant's effluent should be used (for dust control during construction.)"

Response: This requirement has been incorporated in Section 01560 of the project manual.

APPENDIX G

REFERENCES

APPENDIX G

REFERENCES

1. Aotani and Associates, Inc., Wailuku-Kahului Community Plan, Prepared for the County of Maui, October 1981, (Revised 11/6/87).
2. Aotani and Associates, Inc., Wailuku-Kahului Technical Report, Prepared for the County of Maui, November 1981.
3. Brown and Caldwell, Kahului Wastewater Treatment Facility Expansion Study. Prepared for the County of Maui Department of Public Works, August 1989.
4. Burnham, W.L., Steven P. Larson, and Hilton H. Cooper, Jr., Distribution of Injected Wastewater in the Saline Lava Aquifer, Wailuku-Kahului Wastewater Treatment Facility, Kahului, Maui, Hawaii. USGS Open-File Report No. 77-469. Prepared in cooperation with the County of Maui, Public Works Department, June 1977.
5. Chung Dho Ahn and Associates, Results of a Pilot Test on an Injection Well for the Wailuku-Kahului Wastewater Reclamation Facilities, WPC-Hawaii-45, Prepared for the County of Maui, 1970.
6. The General Plan of the County of Maui, June 1980.
7. U. S. Environmental Protection Agency, Final Environmental Statement, Wailuku-Kahului Wastewater Treatment and Disposal System, F-EPA-24004-HI, June 1974.