

Draft Environmental Statement
D-EPA-24004-HI

Wailuku - Kahului Wastewater
Treatment and Disposal System
County of Maui, Hawaii

Prepared by: Environmental Protection Agency, Region IX
100 California Street
San Francisco CA 94111

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100 California Street
San Francisco CA 94111

Responsible Official

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Paul De Falco, Jr.
Regional Administrator
May 1, 1973

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NOTE

The proposed treatment plant site is on land controlled by the Hawaii Department of Transportation. Its transfer to the County of Maui requires the approval of the Federal Aviation Administration. The Environmental Protection Agency assumes the role of "Lead Agency" as described in the guidelines for the preparation of environmental impact statements prepared by the Council on Environmental Quality, April 23, 1971. As "Lead Agency" the Environmental Protection Agency is responsible for the evaluation of the impact of both Agency's actions.

SUMMARY
DRAFT ENVIRONMENTAL STATEMENT
Environmental Protection Agency, Region IX
San Francisco, California

1. Administrative Action
2. The proposed project involves the construction of a new wastewater treatment and disposal system to serve the neighboring communities of Wailuku and Kahului on the Island of Maui, Maui County, Hawaii. EPA made a grant offer of \$4,801,260 in May 1971 to fund 50% of the eligible project cost. The project has been delayed due to engineering studies, public controversy and the ongoing environmental review.

Eligible work includes a 6 MGD activated sludge treatment plant with sand filtration, 16,000 feet of force main, 2 pump stations and 4 deep wells for gravity injection disposal.

3. The project will result in the substantial improvement of water quality in Kahului Bay and Kahului Harbor by the elimination of the existing discharge of 4.1 MGD of untreated municipal and industrial wastes.

Project construction will result in short-term noise, dust and inconvenience to local residences along the force main right-of-way. The proposed treatment plant site is adjacent to Kanaha Pond, a National Natural Landmark, a Wildlife Preserve, and the habitat of a large number of waterbirds including several rare and endangered species. Construction activities may be a source of disturbance to the birds. The pond, however, is surrounded on three sides by industrial facilities including Kahului Airport, and in this context, construction impact is expected to be minor. The disposal of effluent by deep well injection is not expected to affect Kanaha Pond.

The plant will accommodate and, to some extent, may encourage, population growth in the area during its design period. It is likely that this growth will have an adverse impact on water quality and some forms of wildlife (excluding Kanaha Pond which will be protected). Increased noise levels are also expected along with a continuation of existing patterns of socio-economic change in Wailuku-Kahului.

4. The following alternatives were considered:

A. General alternatives

1. No project.
2. Alternate treatment processes and disposal methods.
 - a. Primary treatment
 - b. Variations in secondary treatment with marine outfall disposal.
 - c. Tertiary treatment with immediate irrigation disposal.
3. Alternate plant sizing (4.5 MGD)

B. Site Alternatives

1. Quonset Hut Site
2. National Guard Site
3. Kaa Site
4. "Modified" Kaa Site

5. Attached is the list of agencies, groups, and individuals receiving copies of this statement for comment:
6. The proposed date for the submittal of this draft statement to the Council on Environmental Quality is May 4, 1973.

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I. DESCRIPTION OF THE PROPOSED ACTION

Description of the Proposed Project

The proposed project is the construction of a 6 MGD wastewater treatment and disposal system to serve the Wailuku-Kahului area of Maui, State of Hawaii. The project will provide secondary treatment by the activated sludge process, final clarification by sand filtration, and subsurface disposal by gravity injection wells. It will serve a 1982 design year population in the service area of 26,832 as well as commercial and industrial dischargers.

Sewerage will be collected by the County of Maui's existing sewer system. Two pump stations and 16,000 feet of force main will be constructed to convey wastes to the treatment plant. The two existing raw sewerage outfalls, located at either side of Kahului Harbor, will be abandoned. Figure 1 illustrates the configuration of major project elements.

Wastes collected in the Wailuku area will be intercepted near the existing Wailuku outfall. A pump station and a 20-inch force main will convey flows south along Kahului Beach Road to Kaahumanu Avenue. The pipe then follows Kaahumanu Avenue east to a second pump station near the junction with Hana Highway. At this point flows from the Kahului area are intercepted and the combined flows are pumped to the plant.

The proposed treatment plant and disposal site lie within a 19.4-acre parcel between an existing roadway north of Kanaha Pond and the beach. The plant layout is shown in Figure 2.

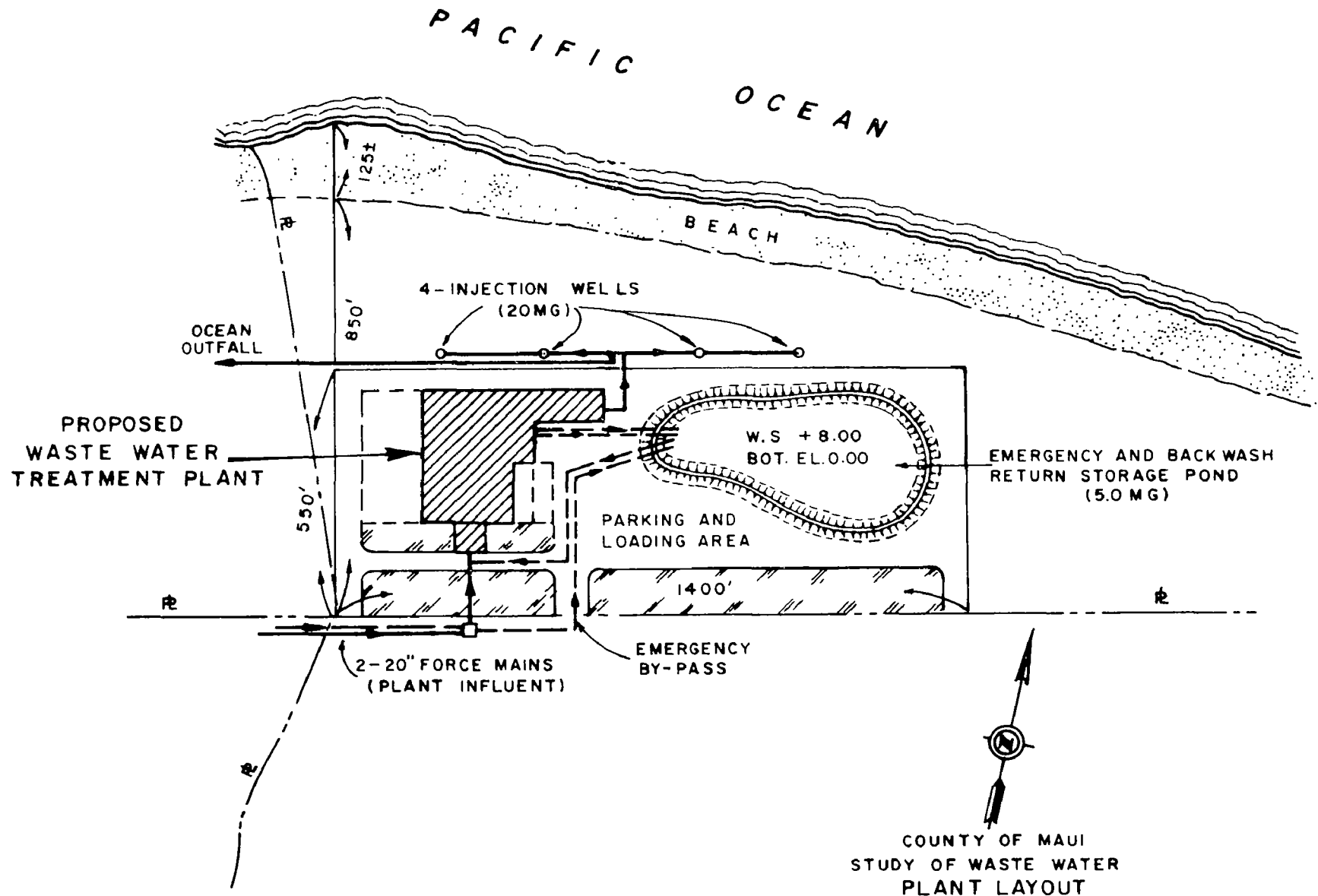
The activated sludge process provides secondary treatment. Sludge (biologically active solids which are removed by settling during the primary treatment stage) is re-introduced to the process to intensify the bacteriological breakdown of organic materials. Also, to maximize the removal of suspended solids, effluent will be filtered through a bed of sand prior to discharge. This step, along with final chlorination, should minimize clogging problems in the injection wells. An indication of the expected efficiency of the process is given below.

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Table One - Anticipated Plant Efficiency

	<u>Influent</u>	<u>Effluent(average)</u>	<u>% Removal</u>
Suspended solids	235 mg/l	10 mg/l	96%
Biochemical Oxygen Demand (BOD)	258 mg/l	10 mg/l	95%

Taken from Fig. 5A, "Study of Wastewater Treatment for Wailuku/Kahului", April 1971, Chung Dho Ahn & Associates, Consulting Engineers.



Source: Chung Dho Ahn and Associates, 1971, Study of
Wastewater Treatment and Disposal for Wailuku-Kahului
Consulting Engineer's Report for the County of Maui
Modified by the Environmental Protection Agency

Sludge that is not re-introduced to the process will be aerobically digested, dewatered by centrifuge and either reused as a soil conditioner or disposed of at a landfill site.

The major elements of the treatment facility are listed below:

- 3 Aerated Grit Chambers (20' x 10' x 8')
- 2 Aeration Tanks (170' x 60' x 15')
- 2 Secondary Clarifiers (125' x 60' x 10')
- 2 Aerobic Digestion Tanks (170' x 30' x 15')
- 2 Filters for Sand Filtration (90' x 16')
- 1 Centrifuge for Solids Concentration
- 1 Chlorine Contact Tank (94' x 46' x 5.3')
- An Irregularly Shaped Holding Pond (it will have a surface area of 123,000 sq. ft. and a capacity of 5.0 MG)
- 4 Gravity Injection Wells for final effluent disposal.

Effluent disposal will occur by gravity injection into the basalt aquifer. One well has already been drilled as a test well and up to 3 additional wells will be drilled as needed. Each well has a capacity of 2 MGD at designed operating head.

Additional information on these wells and other aspects of the proposed project will be provided in other sections of the statement.

The plant is located in a tsunami zone. The facility has been designed to minimize the effects of plant inundation. (It should be noted that protective measures are not designed to prevent inundation, but, merely to mitigate its adverse impact). All control panels will be at least 15' above ground level. An existing 16' sand dune will be retained seaward of the plant as a protective berm. Finally, the road areas on the plant site will be designed to serve as drainage channels during flood conditions.

Environmental Setting

Geography - Climate - History

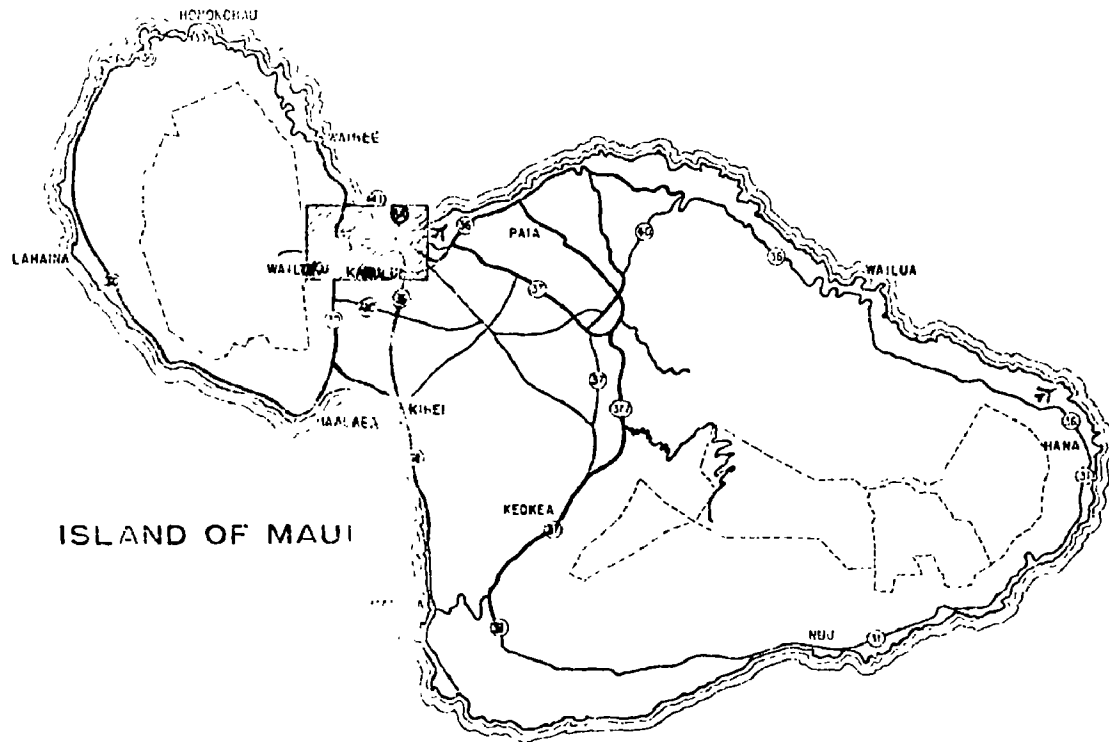
The Island of Maui, with an area of 728 square miles, is the second largest island in the State of Hawaii and the largest of a group of four that make up the County of Maui (the others are Molokai, Lanai and Kahoolawe).

The island is geologically youthful, composed of two large volcanic domes lying along an east-west axis. The eastern and larger portion of the island is dominated by Haleakala with an elevation of 10,025 feet. The western volcano is Puu Kukui with a height of 5,788 feet, connected to Haleakala by a narrow isthmus. Figure 3 shows the project area in relation to major geographic features.

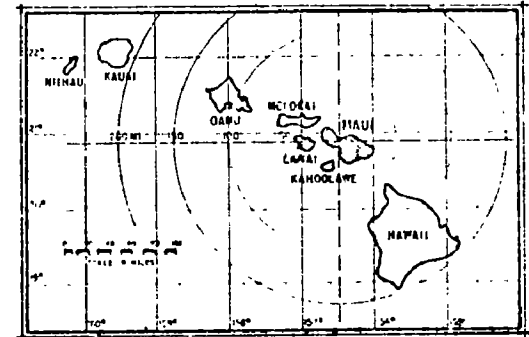
Coral sand beaches occur irregularly around the island with the widest and most extensive being along the southern or leeward shore. Beaches on the windward side, including those in the project area, tend to be comparatively narrow and are subjected to both high winds and heavy surf.

The trade winds originate from a nearly stationary high pressure area northwest of the Hawaiian Archipelago. These winds produce a substantial moderating effect on weather in the State, reducing the range of daily temperatures and generally, making the climate far cooler than equatorial regions on larger land masses.

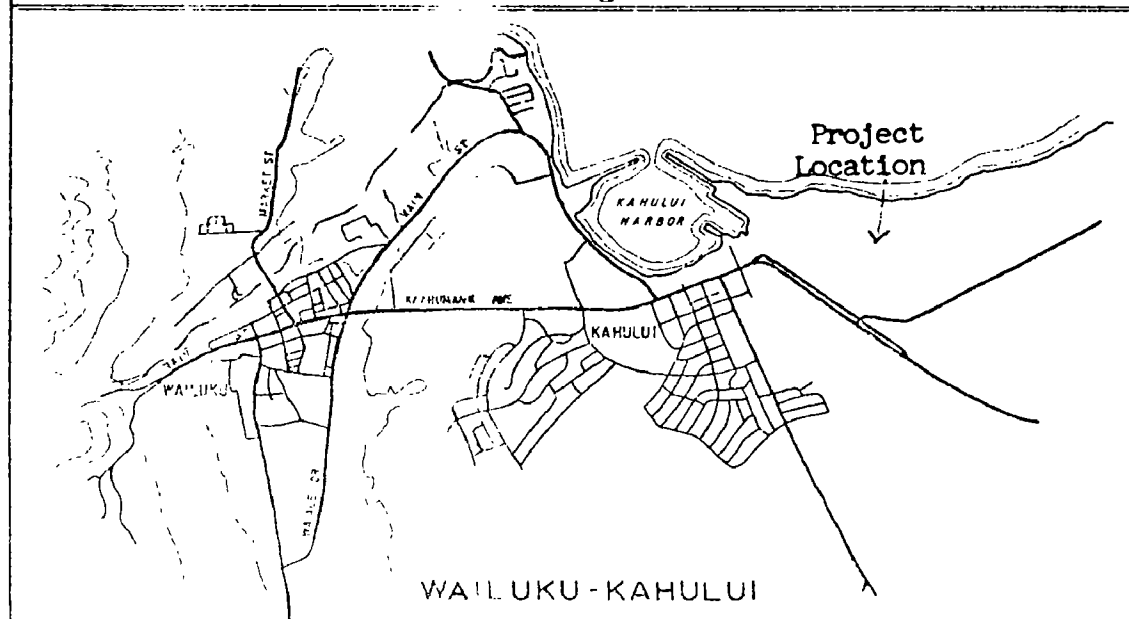
THE PREPARATION OF THIS MAP WAS FINANCED IN PART THROUGH AN URBAN PLANNING GRANT FROM THE HOUSING AND HOME FINANCE AGENCY, UNDER THE PROVISIONS OF SECTION 701 OF THE HOUSING ACT OF 1954, AS AMENDED



ISLAND OF MAUI

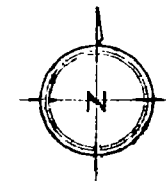


ORIENTATION MAP



WAILUKU-KAHULUI

VICINITY MAP



MAP BY COMMUNITY PLANNING INC
233 MERCHANT STREET

Source: Community Planning Inc, Urban Planning for Wailuku-Kahului, County of Maui State of Hawaii, 1962.

FIGURE THREE

Rainfall, except for winter storms, is almost exclusively a function of topography with windward areas of high elevation receiving extremely heavy precipitation and low-lying leeward areas very little. While most areas receive at least some precipitation year-round, the heaviest rains occur during the November to March "winter" season.

Historically, the Hawaiian Islands are thought to have been settled by Polynesians about a thousand years before Captain James Cook "discovered" them for the western world in 1778. King Kamehameha I, who forged all the Hawaiian peoples into a single Kingdom during this period, brought Maui under his rule the same year.

Maui was important to the white man first as a whaling station and trading post with most of the activity centering around the protected port town of Lahaina on the leeward coast. As the influence of North Americans grew into economic dominance, the isthmus on Maui became heavily cultivated in sugar cane and, to a much lesser extent, pineapple. The agricultural economy demanded inexpensive labor and plantation owners, throughout the nineteenth century, brought large numbers of "immigrants" to the Islands from China, Japan, the Philippines and Southern Europe.

The Wailuku-Kahului area gradually eclipsed Lahaina as the commercial center of Maui. The deep water port at Kahului was the key to development. Today the two communities combine to form the urban center of all of Maui County.

Socio-Economic Conditions

Between 1930 and 1970 the population of the Island of Maui experienced a net decline, dropping from 48,800 people to less than 39,000. The nadir was reached in 1960 when the number of people fell to 35,700. Since that time, the trend has reversed and, in 1970, the census population reached 38,700. Over 93% of that increase occurred in the Wailuku District. (Note: This is a census district and includes nearly all the isthmus shown in Figure 3.) In terms of the percentage of the island's population living in the Wailuku District, however, Wailuku's share has increased between each census period; from 41% in 1920 to approximately 57% in 1970. These figures reflect a shift in population patterns in concert with changes in the island's economic base.

Approximately 60% of the increase between 1960 and 1970 were "in-migrants," of whom 62% came from outside the State. Most of the "in-migrants" were people in the 30-54 age bracket with their dependents, while "out-migrants" tended to be people in the 15-24 age group.

The multi-racial heritage of Maui County is reflected in the composition of its population. As of June 1969, persons of Hawaiian ethnic stock made up 28% of the population. Philipinos, other Orientals, and Caucasians comprised 23, 27 and 19% respectively. All others made up the remaining 3%.

On Maui, as elsewhere in Hawaii, agriculture and the processing of agricultural products - primarily those associated with sugar and pineapple - have been undergoing a period of transition, declining from the completely dominant position they once occupied in comparison with other economic activities. At the same time, they have shifted from highly labor-intensive operations to those involving fewer people and increased mechanization.

Both in terms of the percentage of total employment and the number of people working, employment in sugar and pineapple industries reflect the downward trend. According to 1960 U. S. census figures, of slightly more than 13,500 total island employment in 1960, a little over 4,000 (29.6%) worked in manufacturing (predominantly sugar mills and pineapple canning) while almost 3,100 (22.9%) worked in agriculture or related activities. The 1970 census showed an increase in total employment to almost 15,500, yet employment in manufacturing and agriculture dropped to less than 2,300 (14.8%)

and a little over 2,000 (14.9%) respectively. In 1971, data from the Hawaiian State Department of Labor indicated that the portion of the island's work force devoted specifically to sugar and pineapple (both agricultural and manufacturing activities) was only 18% of total employment, with service industries, trade, and government following closely with 17, 16, and 14% respectively.

Within the Wailuku-Kahului area, employment figures are indicative of the urbanized character of this portion of the island. Of the 7,807 persons employed within the area in 1970, the rank of employment categories was as follows:

Table Two - Employment in Wailuku-Kahului

<u>RANK</u>	<u>TYPE OF EMPLOYMENT</u>	<u>NO. EMPLOYED</u>
1	Government	1,550
2	Wholesale and Retail	1,542
3	Manufacturing	1,215
4	Services	901
5	Agriculture	703
6	Contract Construction	638
7	Transportation, Commercial and Utility	637
8	Others	621

(Source: Information provided in proposed General Plan, Eckbo, Dean, Austin & Williams, Table IV, p. 10)

Family income within the Wailuku-Kahului area tends to be slightly higher than the island as a whole. Reported family income during 1969 (1970 U. S. census figures) showed the following pattern:

Table Three: Family Income

	<u>MAUI ISLAND</u>		<u>WAILUKU-KAHULUI</u>	
	<u>Number</u>	<u>Percent</u>	<u>Number</u>	<u>Percent</u>
Less than \$5,000	1,597	17.4	687	15.1
\$5,000 to \$7,999	1,849	20.1	741	16.4
\$8,000 to \$9,999	1,178	12.8	579	12.8
\$10,000 to \$14,999	2,373	25.8	1,290	28.5
\$15,000 to \$49,999	2,110	23.0	1,197	26.4
\$50,000 or more	79	0.9	35	0.8
TOTAL	9,186	100.0	4,529	100.0

(Source: Information provided in proposed General Plan,
Eckbo, Dean, Austin & Williams, p. 101(g), p 104).

In summary, the picture presented for Wailuku-Kahului differs from the island as a whole and is largely one of balance and diversity in both the economic and social sectors.

Land Use in the Project Area

Land use in Hawaii is regulated at the State level by the Land Use Commission in accordance with the State Land Use Law passed in 1961. The law established four categories of land use:

1. Urban
2. Agriculture
3. Conservation
4. Rural

Within these categories County governments have varying degrees of jurisdiction and responsibility over planning and zoning functions. The greatest latitude is provided within those districts classified as Urban. Jurisdiction for planning and zoning within the Agricultural and Rural classifications are restricted by limitations imposed by the Land Use Commission. Land uses within Conservation Districts are determined and administered by the State Department of Land and Natural Resources.

Land use classifications within the area to be serviced by the proposed project include Urban, Agricultural and Conservation Districts. While the bulk of the service area is within an Urban District, the surrounding lands, which are largely in sugar cane cultivation, are designated Agricultural. The proposed treatment plant site adjacent to Kanaha Pond, and the adjacent beach shoreline extending eastward to the Kahului Airport, fall within the only Conservation District in the project service area. In the immediate vicinity of the proposed plant site, adjacent to the Conservation District noted above, are Urban areas in industrial and commercial use.

Following a public hearing in July of 1972 the State Department of Land and Natural Resources approved the placement of the proposed treatment plant within the Conservation District as compatible with the policies of the State Land Use Law. Although the proposed site is State owned, it has

been under a joint system of administration by the Department of Land and Natural Resources and, owing to the constraints imposed upon it when title was transferred to the State from the Federal Government following World War II, by the State Department of Transportation in accordance with conditions stipulated by the Federal Aviation Administration. This complicated situation was made necessary by the need to regulate uses compatible with the operation of nearby Kahului Airport.

1970 urban land uses in the project area were estimated by the Chung Dho Ahn report cited earlier (Table 7, II-8). They are as follows:

Table Four - 1970 Land Use Acreages

<u>Land Use</u>	<u>Acres</u>
Residential	1,500
Business	105
Hotel	27
Apartment	16
Industrial	300
Civic	238

Water Quality in Kahului Bay and Kahului Harbor

Information on the water quality and beneficial uses of Kahului Bay and Kahului Harbor can be found in three documents

1. "Study of Pollution in Kahului Bay, Maui, Hawaii" prepared by Herschler and Randolph, Consulting Engineers, as a report to the Department of Health, State of Hawaii, December 1962.
2. "Water Quality Study - Near Shore Waters of the Island of Maui" prepared for the State Department of Health by Ultramar Chemical Water Laboratory, Honolulu, Hawaii, October 1968.
3. "Interim Plan Sub-basin, Waihee - Paia, County of Maui, State of Hawaii," prepared for the County of Maui by R. M. Towill, April 1971.

The Herschler and Randolph report defines the sources and extent of pollution in Kahului Bay, describes the movement of pollution through the Bay and recommends corrective measures. The Ultramar report presents basic physical, chemical and biological data gathered in the latter part of October 1968. The Towill report, while it contains no new specific information relative to water quality in the study area, updates the previous report with respect to sources of existing pollution and status of Bay waters as they relate to current Federal-State water quality standards. The most recent study available is "Study of Wastewater Treatment and Disposal for Wailuku-Kahului" prepared for the County of Maui by Chung Dho Ahn and Associates, April 1971. The objective of this report was to identify and quantify wastewater flows for the Wailuku-Kahului area and to set forth alternative methods of treatment and disposal. The report estimated the 1970 wastewater flow for the study area to be 4.1 MGD including infiltration into the existing sewer system (Table 10, II-9). This is an increase from the 3.6 MGD estimate of the 1970 Towill report and the 2.7 MGD estimate of the earlier Herschler and Randolph report.

According to the Herschler and Randolph report there were eleven sources (or potential sources) of pollution to the Bay in 1962:

1. Surface drainage from storm culverts and ditches
2. Surface "wash"

3. Kanaha Pond
4. Iao and Kalialinui streams
5. Bathers and boaters
6. Nonsewage pollution from harbor activity
7. Sanitary sewage from ships in the harbor
8. Sanitary sewage from Piers No. 1 and No. 2
9. Cesspools in the harbor area
10. The Kahului outfall
11. The Wailuku outfall

The industrial discharge from the Maui Electric Plant, approximately 29 MGD of thermal (heated water) effluent, should be added to the above list. Oxidation ponds serving Kahului Airport add an additional discharge to nearshore waters of approximately 20,000 gallons per day.

The review of the relative importance of the sources above by various consultants between 1962 and 1971 indicates that the two sewer outfalls are by far the most significant. The other sources are of minimal significance or are under a planned abatement control program.

The Herschler and Randolph report and the Ultramar report allow the formulation of several conclusions about present water quality conditions in the Harbor and the Bay. They are:

1. That currents, both surface and subsurface, follow a path westerly and northerly along the coast because of prevailing northeasterly winds.
2. That the water quality of Kahului Harbor is significantly influenced by the Kahului outfall.
3. That there is a layer of less saline water "floating" on the surface of the Harbor. This layer of water is probably created by ground-water seepage.
4. That fecal coliform concentrations are highest near the Kahului outfall but are apparently not a problem in Kahului Harbor.

5. Nutrient levels in the Bay exceed State water quality criteria (standards) for Class A waters as follows:

	<u>Mean Concentrations</u>	<u>Standards</u>
Total Nitrogen	.2540 mg/l (15 stations)	.15 mg/l
Total Phosphorous	.1404 mg/l (15 stations)	.025 mg/l

(Most of the waters in Kahului Bay are designated as Class A. The discharges interfere with the beneficial uses prescribed by this classification. Public health hazards have reportedly caused some areas to be closed to water contact recreational activities.)

6. While receiving water sampling data are quite limited, there does not appear to be any serious problem with regard to dissolved oxygen in the bay itself. Presumably heavy wave action and nearly constant winds tend to maintain a satisfactory level of aeration in most areas.

National, State and local policies call for the elimination of raw sewage discharges to public waters. In response to this policy a minimum of secondary treatment is required by the 1972 Amendments to the Federal Water Pollution Control Act. This Act is administered by the Environmental Protection Agency.

Existing Wastewater Situation

There is currently no municipal wastewater treatment facility serving the area. Sewage is collected and discharged untreated through two ocean outfalls located on either side of Kahului Harbor.

The Wailuku outfall consists of a 24-inch cast iron force main, 800 feet in length, discharging into 24 feet of water. It is in reasonably good operational condition.

The outfall from Kahului is an 18-inch main, 400 feet in length, discharging at a depth of 14 feet. It is in very poor condition and leaks badly along its underwater length. Since meters are not installed in either case, flows must be estimated. The flows for the service area in 1970 were estimated as follows:

Table Five - 1970 Estimated Waste Flows

<u>Source</u>	<u>Flow</u>
Residential Population for 16,500 people	1.98 mgd (U.S. census data at 120 gpcpd)
Hotels 350 rooms	.09 mgd
Airport - 1.3 million passengers	.02 mgd
commercial - 54 acres	.08 mgd
industrial - dry type	<u>.22 mgd</u>
Subtotal	2.39 mgd
Infiltration	<u>1.70 mgd</u>
Total	<u>4.09 mgd</u>

Source: "Study of Wastewater Treatment and Disposal for Wailuku-Kahului", Chung Dho Ahn & Associates, Table 10, II-9.

Description of Kanaha Pond

(The Pond is described in some detail in several of the testimonies in the attached appendix of the public hearing. Particularly notable are the testimonies of Mr. Colin Lennox and Mrs. Dorothy Pyle.)

Kanaha Pond has been described as "the most important water-bird area in Hawaii. Its preservation...is essential for survival of the Hawaiian Stilt." (Hawaii's Endangered Water-life, USDI, BSWF, 1968) and as "probably...the best area in the entire State for waterbirds" (Hawaii's Endangered Water-birds, USDI and DLNR, 1970). It encompasses 140 acres of shallow pond and brackish marsh. Irregular in shape, it includes some 80 surface acres of water with an average depth of 1.7 feet. It is situated approximately mid-way between the town of Kahului on the west and Kahului Airport on the east. On its north side, it is bounded by an old railroad right-of-way and the sand dunes which border Kahului Bay. Its southern perimeter is the angle formed by the intersection of the Hana Highway and Keoloni Place.

Its origins and a detailed description of its associated vegetation are described in "A Plan for Development of a Wildlife Sanctuary and Public Park in Kanaha Pond, Kahului-Maui", Division of Public Works, Department of Accounting and General Services, State of Hawaii, 1963.

The preceding report indicates that Kanaha Pond was built more than 200 years ago by King Kihapiilani as two fish ponds. The ponds were used to retain fish for food during periods when ocean fishing was not allowed under Hawaiian law.

The pond has undergone a major series of changes in this century. These include the filling of the western portion of the pond with dredge spoil, elimination of a rock wall which divided the pond, blockage of a connecting channel to the ocean and, of course, discontinuation of its use as a fish pond. Of greatest importance, however, is the encroachment of urbanization and industrial activities on adjacent areas.

The Maui Electric Power Plant and a group of storage tanks lie immediately to the northwest. To the east is Kahului Airport with a flight pattern almost directly over the pond. Commercial and industrial facilities line Hana Highway and the airport access road to the southwest and south respectively.

But, despite the many changes, it has retained much of its natural character at a time when similar natural areas are being engulfed by industrial developments, subdivisions, highways and airports. It has assumed an increasing importance both as a remnant of old Hawaii and as a wildlife sanctuary of considerable value. Kanaha Pond has been designated a National Natural Landmark and is also being considered for registration as a State Historical Site.

Its principle value as a wildlife refuge stems from its provision of a nearly optimum year-round habitat to a large number of waterbirds. These include the endangered Hawaiian Stilt and Hawaiian Coot as well as the threatened Hawaiian Black-crowned Night Heron. In recent years, over half of the population of migratory Shovelers and Pintails wintering in Hawaii have been found here. In late summer and early fall, it holds species of both Asian and North American shorebirds.

The booklet "Hawaii's Endangered Waterbirds", referred to earlier, provides limited information relative to the feeding and nesting requirements of the stilt and coot, but it is known that insects and small aquatic and marine invertebrates comprise most of the diet of both species. Both birds nest in pond environs and both suffer predation of their nests by the Mongoose.

Because of the many questions raised concerning the compatibility of the operation of the proposed wastewater treatment plant with the preservation of water quality within the pond, it is of interest to examine the information available on past and present water quality.

The 1963 study cited earlier ("A Plan for the Development of a Wildlife Sanctuary and Public Park in Kanaha Pond") described the condition of the pond at least as late as the early 1900's in the following terms:

The water was clear as natural springs filled the pond and overflowed continuously through an open ditch to Kahului Harbor. People swam in the ponds and there was no offensive odor..."

It is probable that over the past 30 to 40 years there has been a gradual decrease in the flow of fresh spring water into the ponds. Apparently, this was due to breakdown of the drainage and plugging of the springs by continuous silting in the pond. Silting must be the result of combined action of the hydraulic fill from harbor dredging, natural erosion from adjoining lands, grading and construction by the military during World War II, and deposits from tsunamis. With the loss of importance of the fish ponds to Kahului, there was little need to maintain the ponds."

On pages 12 to 14 of the same report, the results of a very limited August 1961 survey by the Department of Health are discussed. That study indicated the deposit of an organic sludge up to 18 inches thick in some areas. Overlying pond waters contained levels of dissolved oxygen varying from 37 to 87% of saturation. Chloride measurements in shallow water areas were found to be very high, in excess of 21,000 parts per million (ppm). This exceeds the chlorinity of sea water from Kahului Bay which varied from 13,000 to 19,000 ppm. It was concluded by the Department of Health that, from the stagnant condition of the pond and the apparent lack of permanent surface connections, the water in the pond originated from surface runoff and ground water sources.

Since it is generally acknowledged that the rate of inflow can sometimes prove insufficient to maintain a water level satisfactory for the adequate maintenance of the pond's ecological system, the State has taken action to make it possible to augment natural sources of water. The Department of Land and Natural Resources has installed a well south of the pond to provide a supplemental source of water when required. While it has not been used to date for this purpose, an irrigation well located south of the D.L.N.R. well was used on at least one occasion.

In summary, Kanaha Pond has remained a viable habitat despite man's intrusions. Yet, great care must be taken to analyze the impact of any new activity that may affect the pond.

Description of the Immediate Project Site

The proposed 19.4-acre plant site is heavily vegetated with tangled growths of Keawe and associated shrubs and grasses. The Keawe-shrub-grass plant association found here is not unique to this site and is, in fact, common to many areas in Maui which are in a similar "unimproved" condition.

The soil in the area is predominantly coral sand. Makai, or seaward of the plant site, low sand dunes rise to front a relatively steep beach facing Kahului Bay. Promiscuous dumping has occurred in the area damaging natural values.

Like most similar areas in a relatively undisturbed state, the site provides habitat for a variety of animal and plant life. Mammals which could be expected to be found would include feral and domestic cats and dogs, rats and mice, and the particularly predatory Indian Mongoose.

Although 47 species of birds have reportedly been observed at nearby Kanaha Pond, the majority of these are classified as "waterbirds" and are associated with the pond itself or its immediate shoreline. According to Berger (see pages 8-9 of the "Kanaha Pond Bird Study, Final Report", 9-20-72, by Andrew J. Berger, extracted portions of which are included in Appendix D), a number of introduced species of land birds are found in the Keawe thickets adjacent to Kanaha Pond. These include the Lack-necked Dove, Barred Dove, common Mynah, and others.

Human use of the project site is primarily for casual recreation such as strolling on the beach and observing wildlife in Kanaha Pond. As noted, however, there are also those who come to dump trash. A rough map of the immediate project area was included as Figure 2.

II. PROBABLE ENVIRONMENTAL IMPACT OF THE PROPOSED ACTION

This discussion of probable environmental effects has been divided into two general categories. First, are the expected primary, or direct, impacts of the construction and operation of the proposed wastewater treatment system. Second, is an analysis of the secondary or indirect impact of the project. The context is rather general in the second section, focusing on the role of the treatment system in accommodating expected long-term community change.

Primary Impact

Plant and Force Main Construction

The proposed project and the existing condition of the project site have been described in some detail in earlier sections. The construction of treatment and disposal facilities will fundamentally alter current conditions.

Site clearing operations will remove existing vegetation and alter the terrestrial habitat it provides. Like most urban encroachment on undeveloped areas, this forces displacement of resident animals. Disruption is certain and some mortality is likely, until the ecological system reaches a new level of relative equilibrium.

No rare, endangered or unique flora or fauna are known to exist on the immediate plant site. The small number of rats, mice, mongooses, feral dogs and cats, birds, and reptiles that currently range the proposed plant site would probably attempt to relocate to similar habitat areas east of the site.

Site clearance will not remove the sand dunes makai (seaward) of the site. Landscaping will include trees and other vegetation which may replace part of the habitat initially lost. Casual human use of the site will be restricted, although it will still be possible to walk along the beach seaward of the plant.

Aesthetically, the plant should not prove nearly as obtrusive as many other nearby facilities. The maximum height of buildings will be approximately 20 feet. The low profile and other landscaping techniques will almost completely conceal the plant from Kanaha Pond and all roads or streets except the actual limited access street leading to the plant.

Odors are always a possibility with a biological treatment process. There are no residences nearby, however, and any odor-causing equipment malfunction or process upset should have little effect. Under normal operating conditions, the plant will be virtually odor free.

The holding pond will store only treated, filtered, and chlorinated effluent and will not be a source of odors. Because of its dimensions, approximately 300 by 400 feet, waterbirds may land there occasionally. Should this occur, it will not adversely affect either the birds or the operation of the facility.

Consideration must be given to the effect of construction activities in the vicinity of the proposed plant as well as on the site itself. While these activities will be temporary (approximately 18 months) they nonetheless may prove disruptive. Aside from site clearance, these activities will include; construction of buildings, excavation for plant foundations, drilling of injection wells, vehicular traffic, and other related human activity. While this activity will be largely confined to the entry roadway to the plant site, the noise, dust, vehicle emissions and traffic created will radiate out from the site and impinge on the Kanaha Pond area. To judge the significance of this impingement, it is necessary to review existing conditions in the pond area.

Kanaha Pond has, and continues to be, subjected to transitory high-intensive noise from overflying aircraft and, to a lesser extent, noise from vehicle traffic south of the pond. Aircraft and vehicles, of course, are also sources of air pollutants. Industrial facilities near the pond also serve to create an aura of disruption. Thus, though construction related impacts are additive, they are temporary and are not expected to produce serious or enduring consequences for the

pond or its wildlife. In fact, these disturbances are likely to be more objectionable to persons visiting the pond to observe birdlife than to the birds themselves.

The construction of the force main along Kahului Beach Road and Kaahumanu Avenue can be expected to disrupt traffic and inconvenience local residence during part of the 18-month construction period. On completion of the project, trenches will be backfilled and the area restored to pre-construction condition.

Proper construction practices will serve to mitigate disruptive noise and dust, both along the force main route and at the plant site. Work will be scheduled for regular daylight hours and sources of dust will be watered. The relatively low volume of vehicle traffic involved means that emissions will not produce sufficient concentrations to create a hazard to wildlife or residents.

Plant Operation

The impact of the operation of the plant and disposal system has been studied extensively by the Environmental Protection Agency. There will be a substantial beneficial effect on water quality in Kahului Bay. While the issues are technically complex, and are discussed at length in Appendix A; it is EPA's conclusion that the operation of the proposed disposal system will not damage Kanaha Pond or its wildlife.

Impact on Kahului Bay

By way of review, under existing conditions approximately 4.1 MGD of untreated wastes are discharged into Kahului Bay. The identifiable effects on marine water quality are as follows:

1. Localized areas of undesirable bacterial concentration creating public health hazards.
2. Depressions of dissolved oxygen levels in the immediate vicinity of the outfalls.
3. Floating and shoreline accumulations of sewage materials.

The proposed project will eliminate these problems.

The effect of the nitrogen and phosphorous components of present discharges, however, are more difficult to assess. Presumably, heavy nuisance level growths of undesirable attached algae shoreward of the outfalls and within the harbor and along the breakwater are, in fact, a response to sewage-provided nutrients. It should be recognized, however, that nutrient supply is but one factor among many that control the kinds and abundance of vegetation whether in the terrestrial or marine environment. Other important factors in the marine environment are temperature, salinity, current, turbidity (as it affects light penetration) substrate (mud, sand, rock, etc.), and grazing by marine animals (fish, sea urchins, etc.). Assuming these other factors are not limiting in Kahului Bay, there is little question that high nutrient concentrations can lead to conditions of excessive growths of "undesirable" plant forms such as Ulva or sea lettuce.

It is because of this potential to stimulate plant growth that the fate of nutrients in sewage deserves special consideration. As a consequence of secondary treatment, only a small portion of the nitrogen and phosphorous components are removed from the wastewater flow. They are, however, largely oxidized to an inorganic state and pass into the discharge in a dissolved form.

The concentrations of nutrients which will result in objectionable plant growth in any given environment in which other limiting variables (a few which were noted above) interact, are usually difficult, if not impossible, to precisely define. Effluent disposal techniques in marine waters are normally designed to minimize plant growth problems by providing maximum dilution (to reduce nutrient-water concentrations) and dispersion (to minimize effects of total loading).

In the proposed project, effluent will be injected into the brackish basalt aquifer below a layer of caprock that underlies the project area. It will be incorporated into ground water flow and "leak" into Kahului Bay in a highly diluted form at an undetermined distance offshore. In the process of its movement through the injection zone, it is expected that a significant percentage of the inorganic phosphorous present will be sorbed out by the basalt.

Effluent can therefore be described as a highly diluted, well treated non-point discharge. While some nutrients, primarily inorganic nitrogen, will find their way into the bay, it is very doubtful that they will contribute a source of significant biostimulation.

The most controversial aspect of the proposed project is the potential effect of effluent disposal on Kanaha Pond. Based on the analyses of the National Wildlife Federation, the Bureau of Sports Fisheries and Wildlife (see Appendix D) and others, the nutrients contained in the effluent could, if they found their way into the pond in sufficient concentrations, set off a complex series of events that could upset the pond's ecological system.

Pond waters are very brackish and eutrophic conditions periodically exist in some areas. While water quality varies considerably and is hardly good by conventional standards, the pond nevertheless supports a food chain that includes, endangered water birds like the Hawaiian Coot and the Hawaiian Stilt. Many environmentalists are anxious to see existing water quality conditions maintained and the pond's viable ecological system left undisturbed. After a thorough analysis of geo-hydrological conditions in the area, it is EPA's conclusion that this goal can be met by the proposed method of disposal at the proposed project site. In short, injected effluent will not find its way into Kanaha Pond.

Owing to the complexity of the subject matter and the importance of the issue, a complete discussion of effluent disposal is necessarily both detailed and technical. Since the Council on Environmental Quality has recommended that such analyses be avoided in the body of environmental impact statements, the fate of injected effluent is thoroughly discussed in Appendix A of this document (Those concerned with this aspect of the project would be advised to read Appendix A before proceeding. What follows is only a rudimentary discussion of what will occur).

Injection wells will be drilled to a terminal depth of approximately 385 feet. The wells will be cased to a depth of approximately 180 feet and cemented to the caprock to protect its integrity. The zone of injection is the uncased hole below 180 feet.

The upper (or sedimentary) layers are comprised of unconsolidated, weathered sediments. They are separated from the lower (basalt) layers by a thin layer of nearly impermeable clay caprock. The impermeability of the caprock is proven by the sharp difference in the salinity of ground waters immediately above and immediately below this layer and by the immunity of water levels in observation piezometers to effects from operation of the test well.

Effluent will be injected below the caprock. While a complex variety of forces influence its movement, it will tend to disperse into, and move with, the basic ground-water flow horizontally in a northeasterly direction.

Although effluent will be fresher than the ground water into which it is being injected (and therefore lighter) any tendency to "float" or rise toward Kanaha pond will be thwarted by the caprock barrier.

Injected effluent, heavily diluted by diffusion into the saturated basalt aquifer, will move seaward and emerge only when the caprock pinches out at the submerged edge of the island. Although the distance from shore and the actual depth of discharge cannot be accurately predicted, it is EPA's judgement that both parameters will be more than sufficient to ensure the protection of water quality in Kahului Bay. It is doubtful that measureable concentrations of effluent will emerge at all. For all practical purposes it will have been totally diluted and dispersed, probably before reaching marine waters. Under these circumstances, effluent disposal will not affect Kanaha pond and in all likelihood, will not have a discernible impact on Kahului Bay.

Secondary Impact of the Proposed Project

Shore Erosion and Tsunami Danger

The coast line in the proposed project area is generally low with a narrow beach averaging forty feet in width along much of its length. Northeast winds and along-shore currents are rapidly eroding the beach in many sections. The most spectacular example is a pill box (fortified gun emplacement) constructed on the beach by the military in 1940 which is now reported to be some 100 feet from shore. During World War II, the military constructed a number of groins slightly east of the proposed plant site to retard the erosion process. But, persistent tradewinds have continued to push back the sand dunes backing the beach while wave action and currents carry beach material away.

The exact rate of erosion is not known, although recent surveys indicate that it constitutes a long-term threat to proposed project facilities and ultimately to Kanaha Pond. (See references below):

"Erosion and Accretion of Selected Hawaiian Beaches; 1962-1972" by J. F. Campbell for University of Hawaii. Sea Grant Program (Rpt. H.I.G.-72-20, Institute of Geophysics, Univ. of Hawaii) 1972.

Statement submitted at Public Hearing on the proposed project by R. P. Bruce, February 23, 1973. (See attached transcript, Appendix B)

Letter submitted to EPA as part of the Public Record on the February 23, 1973 Public Hearing by J. M. Johnson Ass't. Director of the Environmental Center, University of Hawaii. (See Appendix D)

The inability to measure the rate of erosion accurately, or to determine whether it is accelerating or declining, makes precise analysis of the erosion threat difficult. Since the treatment plant is more than 300 feet from the beach at its closest point, it would appear that there is no short-term danger.

Eventually, however, protective measures may be necessary. If this proves to be the case, the cost of these measures might be legitimately considered a long-term project cost. If an action is taken, such as the extension of the riprap wall currently protecting the Maui Electric Plant, it will, of course, also serve to protect the pond.

The impact of tsunami flooding will also be affected by the existence of the treatment facility at the proposed site. First, plant structures and berms will afford some protection to Kanaha Pond. In the period since 1837 few tsunamis have hit the Wailuku-Kahului area which would have been capable of topping the sixteen-foot natural berm (sand dune) protecting the plant. (The height of several very damaging waves is not precisely known). Clearly, however, the possibility exists that a tsunami could flood the site and release raw sewage into flood flows and ultimately into the pond. Still, it is likely that Kanaha Pond would be more disturbed by the salt water flood than by the sewage.

A salt water flood, even without damaging pumps and other electrical equipment, could upset the biological treatment process. This could also occur without plant inundation (and regardless of plant location) if the flooding of other areas of the community led to massive infiltration of salt water to the sewer system.

Overall, it is likely that tsunami flooding would cause serious environmental damage regardless of the existence of the facility. It seems unlikely that the release of untreated sewage from the plant would constitute more than a small part of that problem.

Secondary Impact Due to the Accommodation of Growth and Development

The Wailuku-Kahului area is currently guided by a General Plan prepared for and adopted by the County of Maui. In October of 1972, an updated plan was prepared and submitted to the County Planning Commission by the consulting firm Eckbo, Dean, Austin & Williams. Although this plan has not as of this writing been adopted, it provides some of the most current information available on the direction of community development. It has been relied upon heavily for this analysis.

The role of public wastewater treatment facilities in overall community development is a complex issue that must be judged on a case-by-case basis. There are situations where it has no bearing and others where it is a crucial factor.

It does not appear that the proposed project will directly cause growth in the Wailuku-Kahului area. Complex socio-economic forces at work over the past decade have led to increased urbanization. Kahului Harbor is the island's best deep-water port and Kahului Airport is the largest air transportation facility. Agriculture, primarily sugar cane cultivation and processing, continues to be a viable economic force. The area is also the seat of County government and the industrial center of the island. It has grown and developed to date without a wastewater treatment facility.

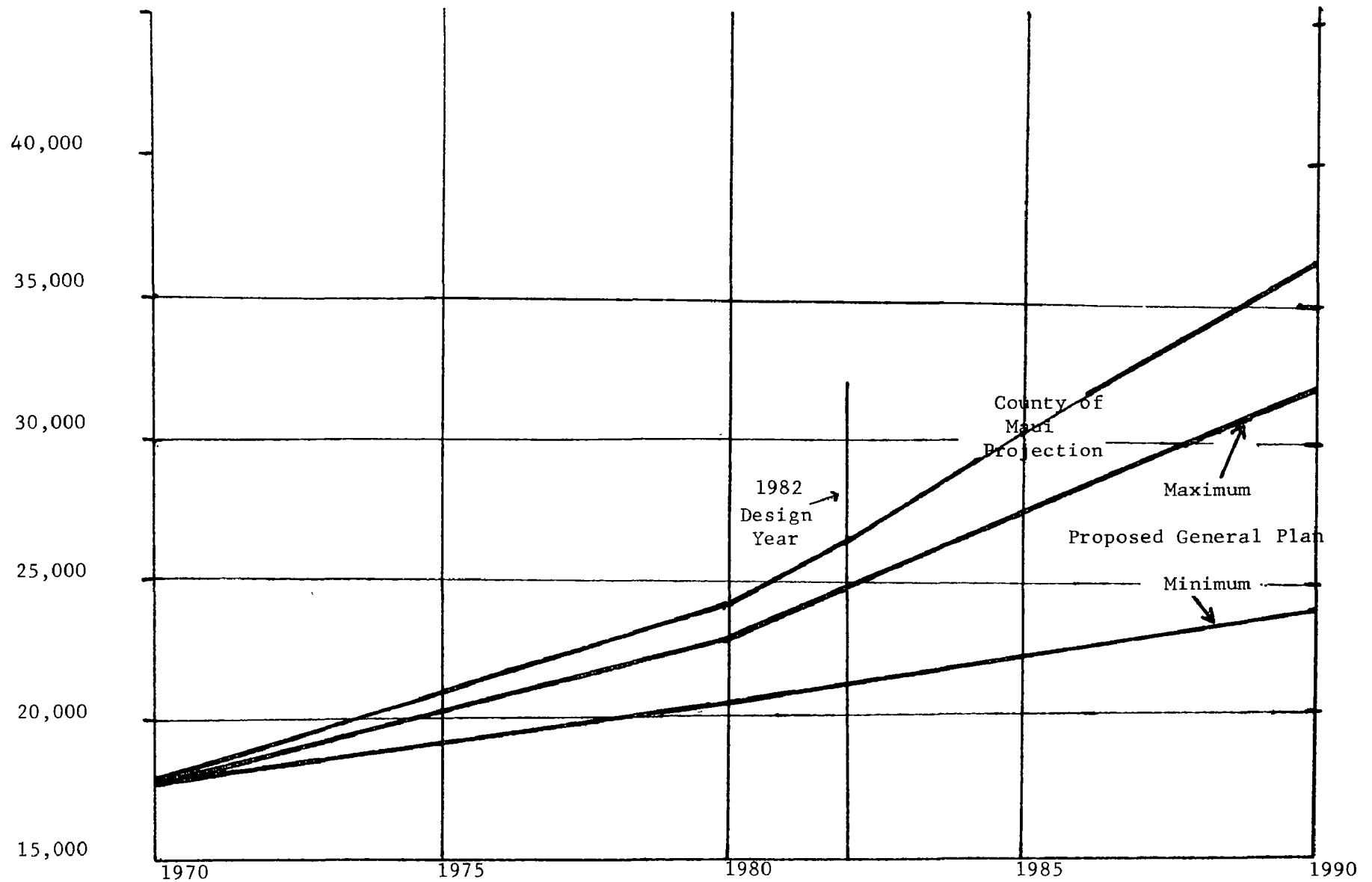
This is not to say that wastewater treatment will have no effect. Public awareness of the need for environmental protection has grown and is reflected in new State and Federal legislation. This legislation will play an increasingly larger role in such local decisions as the location of new industrial facilities. Industries with liquid wastes to dispose of which are not able to connect to public treatment systems will have to construct their own facilities, usually at additional cost to them. We can say then that the existence of the proposed treatment facility, as a minimum, will accommodate, and possibly encourage, growth and development in Wailuku-Kahului. Having made this determination, it is necessary to look briefly at some current trends, and very generally, discuss what these may mean in terms of environmental impact.

The proposed General Plan stresses retention of cane cultivation on prime agricultural lands. It concludes that, with few exceptions, growth projected through 1992 can be accommodated within existing Urban District boundaries. This is a strong indication that lands designated for parks and recreation will not be disturbed and that agriculture will not be threatened by urbanization. It is also evidence that while the community will be larger, its character, in terms of the balance of land uses, will not change appreciably.

Figure 4 compares several population projections that have been made for Wailuku-Kahului. The differences are due to variations in basic assumptions and methodology as well as slight differences in study area boundaries. The proposed project is designed to accommodate the highest growth rate shown through 1982. Obviously, if actual growth is less, the plant will reach design capacity at a later date. It should also be noted that the real-world growth that occurs will be determined by the sum of many influences and that the wastewater treatment facility is but one of them.

Assuming the actual population in 1982 will be somewhere between 21,000 and 26,000, and that proposed land uses will emerge, some generalizations can be made concerning the effect on environmental parameters.

Figure 4 - Comparative Population Projections



Water Quality

While elimination of the raw sewage discharge should substantially improve water quality and protect beneficial uses of bay waters, an increase in discharges from non-point sources can be expected to occur. Development covers permeable soils with houses, apartments, streets and highways, shopping centers, factories and parking lots, thereby increasing the amount of surface runoff. Increased quantities of debris, petroleum residues, pesticides and fertilizers will drain into the bay. Construction activities and careless erosion control practices can be a major contributor to siltation of the bay. On the other hand, large and potentially damaging industrial discharges, whether they are untreated organic wastes or toxic substances, should come under the effective control of provisions of the 1972 Amendments to the Federal Water Pollution Control Act.

In combination, the sources described above will add to the pollutant load entering coastal waters but should not exceed assimilative capacity if reasonable care is exercised. The Master Drainage Plan for Maui, prepared by R. M. Towill in October of 1971, will serve as a guide to local control of many problems.

Air Quality

Air quality is good on Maui and is expected to remain so. As the Federal Clean Air Act of 1970 is implemented, source control of the emissions of new automobiles and new industrial facilities, plus improvements to the control systems of existing facilities, in combination with favorable local meteorological conditions, should preserve air quality.

Noise

Noise pollution will probably increase as airport traffic grows the number of roads and highways multiplies, and the amount of construction activity increases. Improved noise control technology, particularly as applied to jet aircraft, will be of considerable benefit. Noise control has traditionally been left to local regulations and unless firm measures are adopted, it is probably valid to expect the problem to increase with population growth.

Wildlife

If public vigilance is maintained and the General Plan is implemented, Kanaha Pond should be preserved as a wildlife sanctuary. Urbanization, however, can be expected to destroy the habitat of many small animals such as mice, rats and mongooses.

Aesthetics

The impact here is difficult to predict, particularly since it is dependent on the values of the individual. Any change will be unpleasant to some while others, viewing the same developments, may be pleased. In general terms, the aesthetic impact of growth is a function of the day-to-day regulation of individual projects to ensure that they attempt to enhance, rather than degrade, their environment.

Recreation

Several major parks are planned which, if developed, should increase community enjoyment of open space. Overall improvement of water quality in the bay should enhance its enjoyment by many local residents.

Socio-Economic Conditions

Projections from various sources were used to draw up the following table showing proportional increases in several economic sections from a 1970 base:

Table Six

The Growth of Economic Parameters
(comparisons with 1970 base)

Parameter	1970	1980	1990	Numerical base
Residential	1.00	1.48	2.21	16,500 people
Hotel	1.00	1.86	2.28	350 rooms
Airport	1.00	4.08	6.15	1.3 million pass.
Commercial	1.00	1.57	2.22	54 acres
Industrial	1.00	1.93	2.66	150 acres

Table constructed from data presented in Tables 9 and 12, pp II 9 and II 10, of "Study of Wastewater Treatment and Disposal for Wailuku-Kahului" Chung Dho Ahn & Associates, April 1971.

This indicates a generally stable relative balance among the various sectors of the local economy, a situation that portends little fundamental change in community character. The increase in airport traffic indicates a high rate of growth for tourism on Maui, but this is expected to be felt primarily along the leeward coast. The very moderate anticipated increase in the number of hotel rooms in Wailuku-Kahului is further evidence that it is unlikely to become a major tourist center. Agriculture, particularly agriculturally-related manufacturing, may decline in relative importance. The pineapple processing industry may follow a distinct State-wide trend towards consolidation of operations and eventual phase-out.

In terms of employment, one would expect an expansion of the number of construction, service and government jobs coupled with a continued decline in the number of agriculturally-related jobs.

Socially, existing trends in shifting ethnic balance would probably continue with "immigrant" Caucasians increasing in number in relation to other groups. The "rural to urban" shift due in a large part to the phasing out of small plantation communities, should also continue. The standard of living, as measured in terms of material goods, should increase.

III. ADVERSE EFFECTS WHICH CANNOT BE AVOIDED SHOULD
THE PROPOSED ACTION BE IMPLEMENTED

Adverse Impacts Which Cannot be Avoided
Should the Proposal be Implemented

Most known adverse effects are short-term and are associated with construction activities. Noise, vehicle emissions, dust, traffic congestion and the possible impacts they will have on residents and wildlife have been discussed in the previous section.

Use of the immediate project site is likely to displace a number of small animals and replace native vegetation with an artificial landscape and man-made structures. Some casual recreational activities may also be curtailed.

In terms of secondary impact, the provision of the waste treatment facility for a larger population than now exists is at least part of a broader commitment to the increased urbanization of Wailuku-Kahului. Urbanization nearly always has adverse impacts on the natural environment. In this instance, it can be expected to damage water quality by increasing urban runoff and to destroy some forms of wildlife by encroaching on their habitat. Increased human activity can also be expected to result in greater noise pollution.

Construction activities will follow standard mitigatory practices such as watering to reduce dust. Interceptor construction along city streets will be coordinated with responsible County Departments to minimize inconvenience to motorists. Unless unforeseen time problems develop, construction will occur only during standard daylight working hours. While this will reduce the effect on local residents somewhat, it will, of course, do little for wildlife.

If the General Plan discussed is adopted and carefully implemented, the community will take a big step toward avoiding many of the environmental pitfalls of urban development. While this cannot eliminate all damage, it can lessen that which inevitably occurs.

IV. ALTERNATIVES TO THE PROPOSED ACTION

Alternatives to the Proposed Action

The discussion of alternatives is a fundamental part of an Environmental Impact Statement. In accordance with the Environmental Protection Agency's interim regulations of January 17, 1973, our purpose is to "develop, describe, and objectively weigh alternatives to any proposed action which involves significant trade-offs among the uses of available environmental resources."

For purposes of discussion, we are dividing alternatives into two classes. General alternatives include those options theoretically available when approaching any wastewater treatment system. Site alternatives are those that have been studied and discussed in relation to the Wailuku-Kahului system.

The focus of our discussion is the environmental impact of each alternative. We will also present, but not dwell on, comparative costs and engineering considerations which affect the desirability of each alternative. The following outline summarizes the organization of this section:

General Alternatives

1. No Project
2. Alternate Treatment Processes and Disposal Methods
3. Alternate Plant Sizing

Site Alternatives

1. Quonset Hut Site
2. National Guard Site
3. Kaa Site
4. Modified Kaa Site

General Alternatives

1. No Project

Overall, this alternative would be extremely damaging from an environmental viewpoint. Raw sewage would continue to be discharged into Kahului Bay. As the population grew, the already unacceptable conditions described earlier would worsen. Health hazards and violations of State water quality standards would preclude full public use of bay waters. Floating sewage debris would continue to be an aesthetic insult to most citizens and visitors.

There are those who may find benefits in the No Project alternative. In the short run, taxpayers would avoid the local share of project costs. At a later date, however, Federal and State funds may not be available and the entire cost of building a treatment system would fall on local citizens.

The continuing existence of water quality problems could conceivably serve to restrain growth and development in the area although, as we will see later, this is arguable. To the extent that it did, however, this alternative could indirectly help to avert some of the environmentally damaging aspects of urban development.

In summary, there are clear-cut environmental and social benefits to treating sanitary wastes in Wailuku-Kahului.

2. Alternate Treatment Processes and Disposal Methods

There are three major classifications of wastewater treatment: primary, secondary and tertiary. While there are a number of processes that fall within each of these classifications, they have substantially the same environmental impact and therefore will not be differentiated here. The cost figures on each of the alternative processes discussed below are based on location at the proposed site. Any differences in costs at alternate sites are assumed to be proportional.

Primary Treatment

Primary treatment involves the removal of settleable and floatable solids from the waste stream by physical and mechanical means. Large debris and grit are removed as the waste flow enters the treatment facility. Sewage is then retained in a series of tanks to allow suspended materials to settle out. Floatables are removed from the liquid surface with a skimming device. After the addition of chlorine gas to kill residual disease causing bacteria, effluent is discharged from the plant.

Biologically active material removed by settling is called sludge. Sludge requires digestion to reduce its volume and to stabilize the organic matter it contains.

Digested sludge is a virtually odorless heavy liquid, rich in inorganic nutrients. It is usually dewatered to facilitate disposal.

The average expected efficiency of a well-run primary facility is indicated below.

Table Seven
Efficiency of Primary Treatment

<u>Parameter</u>	<u>% Removal Expected</u>
Biochemical Oxygen Demand (BOD)	30-35
Suspended Solids	55-60
Settleable Solids	85-90

While primary treatment provides a considerably greater degree of environmental protection than no treatment, it is not considered adequate by modern standards. Depending on the method of discharge and the characteristics of the receiving water, primary effluent may still be a source of water quality problems. The significant amount of suspended organic material remaining can lead to discoloration and depressed levels of dissolved oxygen.

The issues governing the use of reclamation as a disposal method will be discussed later, but it should be noted here that primary treated effluent would not be suitable.

Primary treatment would also eliminate ground water injection as a method of disposal. Residual solids and organic growth would result in periodic clogging of the injection wells.

The only reliable method of disposing of primary treated effluent in this instance would appear to be by ocean outfall. This would be more expensive than the proposed project, despite the lesser degree of treatment (see Table 8) and would probably result in a continued violation of State water quality standards. Some of the additional problems of marine discharge into Kahului Bay will be discussed in the following section.

In summary, primary treatment is not a reasonable alternative for Wailuku-Kahului. It would be more expensive, inconsistent with the goal of reclamation, preclude injection disposal of effluent, and, finally, provide a lesser degree of environmental protection than the proposed project.

Secondary Treatment and Ocean Outfall Disposal

The activated sludge process discussed earlier in describing the proposed project is one method of secondary treatment. Sand filtration is not usually a part of that process, however, and since it adds approximately \$200,000 to proposed project costs, we will briefly discuss the effects of its exclusion.

Rapid sand filtration will help assure the efficiency of suspended solids removal. It is needed to minimize injection well clogging, particularly during periods of peak loading. Therefore, the alternative of the conventional activated sludge secondary process would almost surely necessitate a switch to ocean outfall disposal.

As shown earlier, an outfall would be considerably more expensive than ground-water injection. The County's consultants concluded that a 6,000 foot outfall with a 500-foot diffuser would be required to achieve desired dilutions (1,000 to 1). The discharge depth, despite this length, would be only 60 feet.

Prevailing winds and currents would tend to push the effluent plume toward Kahului Harbor if the outfall were located east of the harbor. It is possible that this could result in excessive nutrient concentrations in the confined waters of the harbor. While this problem could be partially averted by moving the outfall north of the harbor, there would be large operational costs involved in pumping effluent to the point of discharge.

In general terms an ocean outfall is a satisfactory method of effluent disposal. There is nearly always, however, a trade-off between environmental safety and economic costs. The situation in Kahului Harbor illustrates this principal. A "safe" outfall, that is one that results in a discharge into deep water with current conditions that promote high levels of dispersal, would be very costly. (See Table 8) A short "inexpensive" outfall would involve risks to the marine environment.

The most clear-cut environmental cost of outfall disposal is the impact of construction. Depending on bottom and shoreline conditions, a trench must be dredged and/or blasted. This results in the inevitable disruption of benthic and pelagic marine communities. This can be especially significant if a living coral reef must be crossed. While some

destruction can be averted by carefully controlled construction practices, there is always an adverse impact which cannot be avoided.

Tertiary Treatment

Strictly speaking, tertiary treatment is virtually any improvement made in effluent quality after secondary treatment. In this instance, however, we are defining it more specifically as a process that removes a substantial portion of total nutrients from the waste stream.

Nutrients (nitrogen and phosphorous) are an important consideration in effluent disposal for the several reasons discussed earlier. If they are removed, the environmental impact of any of the disposal methods is of less concern. Tertiary effluent can be discharged to the ground water system, most ocean and estuarine areas, or the land for irrigation with a high degree of safety. For these reasons, it is an extremely attractive alternative from a purely environmental viewpoint.

Perhaps the most attractive aspect of tertiary treatment is its compatibility with the most viable application of reclamation in the Wailuku-Kahului area; namely sugar cane irrigation. Other applications of reclaimed wastewater are extremely limited.

Reuse as municipal water supply is restrained by the possible public health dangers that stem from the presence of viruses in the effluent. While the extent of these dangers is the subject of extensive debate, where public health is concerned, it is only prudent, where any doubt exists, to err on the side of caution. For this reason EPA does not support the direct introduction of treated wastes to potable water supplies. This policy has the support of state and local public health officials nationwide.

Essentially, this limits the potential for reuse to augmentation of surface or ground-water surface flows, or irrigation of nonedible root crops, pasture lands or public recreation

areas. The two golf courses in the Wailuku-Kahului area are four and six miles from the proposed project site respectively, have sufficient and economical water supplies, and even in combination with other greenbelt areas, do not have sufficient capacities to use all the wastewater available. There is also a large additional expense involved in constructing distribution systems, particularly since they must be totally isolated from potable water systems. Since augmentation has not been proposed, it is apparent then, that the most viable method of reuse is irrigation of the extensive acreage planted in sugar cane south of the two communities.

Cane growers throughout Hawaii have been reluctant to use secondary effluent without extensive dilution. Their concern stems from the luxury uptake of nitrogen by cane in the latter stages of its two-year growing cycle. The presence of excessive nitrogen appears to increase the production of cane tissue at the expense of lower sucrose (sugar) content. This means a lower percentage of sucrose in the crusher juice and, essentially, a lower crop yield. For this reason, growers report that they can not make a commitment to accept water containing more than 5 mg/l nitrate (secondary treated sewage usually contains 35 mg/l) for irrigation. ("Study of Wastewater Treatment and Disposal for Wailuku/Kahului", April 1971, Chung Dho Ahn and Associates, p. IV-3)

There are still many questions to be answered about luxury nitrogen uptake. Research may show that secondary treated effluent is acceptable under certain conditions. Clearly, blending with water from other sources offers one solution but, as of this writing, the hard fact remains that growers are reluctant to accept secondary effluent because of the nitrogen problem.

To the extent that tertiary treatment can eliminate this source of concern, reclamation is that much more of a feasible disposal method. The problems of the distribution of effluent, particularly the question of who pays what costs, would of course, continue to be a factor.

The major detriment to tertiary treatment remains its economic cost. Tertiary treatment at the proposed project site would cost \$12,795,000 including injection disposal. It is felt that the potential benefits derived, though environmentally significant, do not justify this additional cost at this time. The proposed system does not, however, preclude the option of adding tertiary treatment at a later date.

3. Alternate Plant Sizing

The third category of general alternatives is plant sizing. Treatment plants are usually designed for a service life of 20 years. Waste loads are projected primarily on the basis of population and industrial growth over that period. Infiltration of ground-water or storm water runoff into the collection system is another major factor which must be considered.

There is always a significant element of doubt involved in long-term population projections. The complex array of social, economic and political factors that govern the growth of a particular area are subject to abrupt realignment. Since there are major economies of scale involved in the construction of most components of wastewater treatment systems, it has long been standard engineering practice to build for the highest reasonable growth rate. This philosophy is not unique to wastewater engineering but, has been applied to other public facilities as well.

We concluded in an earlier section that any capacity in the proposed plant in excess of current needs might serve as an encouragement to continued growth in the area. Since concern has been expressed that any further growth in Wailuku-Kahului might prove environmentally damaging, the alternative being considered here is a "no growth" (or limited growth) sizing. A capacity of 4.5 MGD has been chosen.

There are advantages to this sizing aside from any indirect effects it may have on the rate of growth. First, it is, in the short run, less expensive. At the proposed site the smaller facility would cost \$845,000 less than a 6 MGD plant. Proportional savings could be made at other sites. (See Table 8.) Second, because existing flows are very close to 4.5 MGD there would be some encouragement to the County to conserve plant capacity by correcting infiltration.

The relationship between capacity and growth remains speculative and problematic. While the existence of adequate capacity may help to encourage growth, the converse may not be true. The area has, after all, grown at an unprecedented rate in the past ten years without any sewage treatment capability. Clearly a smaller plant will not, by itself, halt development.

While this issue can not be definitively resolved, it is useful to discuss the risks inherent in a smaller plant so comparison can be made to the effects discussed earlier for the 6 MGD plant. If flows are allowed to increase beyond the plant's capacity to adequately treat them, major problems could develop.

Inadequately treated effluent would periodically result in clogged injection wells. Maintenance costs would be high and corrective measures would have to be taken. Since the wells are the only available method of disposal, it is possible that additional wells would have to be drilled to supplement clogged wells. The probability of a use being found for reclaimed wastes would be reduced in proportion to their decline in quality. Odor problems would occur with increasing frequency. Plant expansion would eventually be necessary unless the treatment facilities were bypassed and raw or partially treated wastes were once again allowed to enter Kahului Bay. The environmental and economic costs of these developments would be very high.

It is not EPA's policy to encourage uncontrolled and environmentally destructive development of an area by providing unneeded capacity. At the same time, it is not responsible, from an economic or environmental point of view, to provide only stop-gap solutions to water pollution problems. Other methods exist; methods properly under local jurisdiction, to directly control the environmental consequences of growth and development. Control of land use in Wailuku-Kahului is the most important tool available to State and local officials.

It seems likely that, in this instance, the sizing down of proposed plant capacity is a weak and possibly ineffective tool.

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Basic Assumptions of Table Eight

Delays caused by further engineering needs. All delay times begin after a decision is made as to chosen alternative.

- (1) No delay except for bidding and award time, 3 months.
- (2) No delay on pump stations and force mains, 6 months on treatment plant, 1 year on effluent disposal system.
- (3) No delay on pump stations and force mains, 1 year on treatment and disposal systems, 1 year on any new pump stations and force mains.
- (4) 1½ to 2 years on entire project.

The cost estimates, summarized on Table 8, are based primarily upon earlier estimates made by Chung Dho Ahn and Associates and James M. Montgomery, Consulting Engineers. An inflation rate of 14.5% per year is used to bring all alternative's cost to a single base date for comparison. The September 1973 base is used as it is assumed no construction will precede this date. The single base date comparison does not account for the additional cost attributable to inflation due to designed delays which would be required for most of the alternatives. The basis for differences in costs between alternatives and sites is given in more detail in the Appendix C.

Engineering costs were estimated as a percentage of construction cost by using ASCE Manual No. 45's "A" and "B" as a guide.

As soil tests have not been conducted at sites other than the present one, cost estimates have been given for plants both with and without piles. Piling should not be thought of as a "real" alternative as foundation requirements would be dictated by the results of soil test.

The cost estimates, as presented, for smaller treatment capacity still utilize the 6 mgd capacity system's interceptors, pump stations, force mains, and outfall (where applicable). It was felt that the potential cost savings was not substantial enough to over-balance the environmental disruption caused by return to these facilities in a few years with parallel construction.

Site Alternatives

The site alternatives listed below have all been studied as potential locations for the Wailuku-Kahului Wastewater Treatment Plant during public consideration of the project:

1. "Quonset Hut" site near Baldwin High School.
2. The "National Guard" site, north of Wailuku in an area controlled by the Hawaii State Department of Civil Defense.
3. Kaa site, approximately 4,000 feet east of the proposed Kanaha Pond site.
4. The "modified" Kaa site which involves construction of the treatment plant at Kanaha Pond and placement of the injection wells at Kaa.

Figure 5 shows their location in relation to the area to be serviced. Table 8 summarizes the economic cost at each location for each type of treatment process with alternate sizing and with alternate methods of disposal. All of these sites are on public (or public-controlled) land and none would require physical displacement of residents.

1. Quonset Hut Site

The Quonset Hut site is so-called because of a row of quonset huts that lie along the eastern edge of this triangular parcel of land. It is bordered on the west and north by Kanaloa Avenue, the east and north by Kahului Beach Road, and the south by Kaahumanu Avenue. Maui Community College, formerly Maui Vocational School, lies inside the southeast corner of the triangle.

The site offers few substantive advantages from either an engineering or an environmental point of view. Economically its cost is very close to that of the proposed site. (The difference represented in Table 8 is due to the soil studies, added odor control measures and test well needed at this site. If piles were needed for structural support the differences would be more dramatic.) It could, however, prove somewhat less expensive to operate.

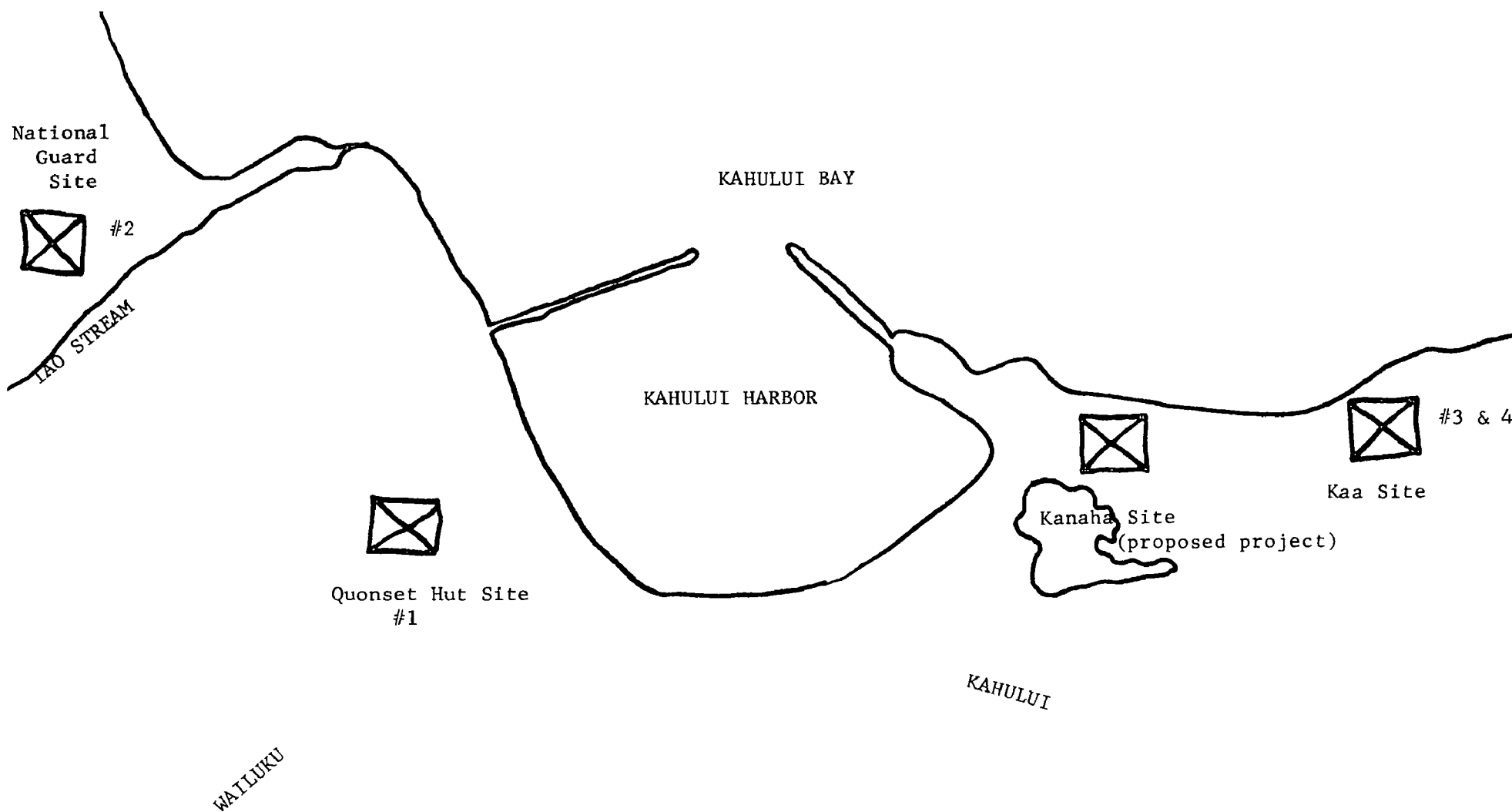


Figure 5

Relative Location of Alternative Sites

The site is not as suitable for deep well injection as the proposed site. Due to the direction of ground-water flow in the area, it is quite possible that injected effluent would emerge inside Kahului Harbor where it could cause water quality problems.

The limitations of deep well injection point to a marine outfall as the most reasonable means of disposal from this site. Since an outfall could not be constructed adjacent to the site (that is inside the harbor), effluent would have to be pumped a greater distance to reach the outfall point. This involves significantly greater operating expense as well as a larger initial capital outlay. Outfall disposal at this site would cost \$12,800,000 at proposed plant capacity.

Compatibility with future regionalization of wastewater treatment is another consideration. The Paia area to the east will, according to County long-range plans, be connected to an expanded Wailuku-Kahului facility by interceptor. The Quonset Hut site is farther from this area and would require a longer interceptor at increased cost. (This cost is not considered in the figures presented in Table 8).

Some of the additional costs of this site could be recovered if irrigation of cane fields was available as a disposal method. This site is somewhat closer to the most likely focal point of irrigation distribution near HC&S Reservoir No. 73. In summary, while this site is acceptable on an engineering basis, it is slightly more expensive in both the short and long-term.

Its main disadvantages are environmental. The key issue is land use compatibility. The site is planned for park use in the proposed Wailuku-Kahului General Plan. Some potential park land would be consumed by the plant, and while parks and treatment plants can be compatible neighbors (parks can, for example, use effluent for irrigation), the ever-present possibility of odors must be considered. Odors are also of concern because of the proximity of Baldwin High School and Maui Community College. Residential areas located nearby and downwind could also be affected.

Despite the low probability of odor problems in a well-run secondary facility, residents are concerned. The Environmental Protection Agency has received over 2500 signatures on petitions supporting the proposed project and specifically opposing location at the Quonset Hut site. While this does not, by itself, constitute proof of a major environmental problem, public opinion must be heavily considered in determining the reasonableness of a project site.

The disadvantages of the Quonset Hut site are:

1. It is not suitable for injection disposal.
2. It is slightly more expensive than the proposed project at this time.
3. It is of questionable compatibility with existing land use.
4. It is opposed by a substantial number of local residents.

Points that can be raised in its support are:

1. It is an acceptable alternative in engineering terms.
2. It is not vastly more expensive.
3. Regardless of the method or location of discharge there is no possibility of directly affecting Kanaha Pond.

2. National Guard Site

The National Guard Site is located on land controlled by the State Department of Civil Defense. Lying just north of Iao Stream, it is the least studied of the alternative locations. It was one of three sites considered in the "Interim Plan, Sub-basin Area, Waihee-Paia," prepared by the R. M. Towill Corporation for the County of Maui in April 1971. It was dropped by local decision-makers as being prohibitively expensive compared with the Quonset Hut site and the Kanaha Pond site. Table 8 shows that a 6 MGD secondary treatment facility with injection disposal would cost approximately \$12,390,000. The additional cost is primarily due to the additional force mains and pump stations required to convey wastes to the plant. This would also increase the cost of operation.

Geologically, the site is not well suited for deep well injection. The orientation of ground-water flows in the area is primarily east-northeast. As with the Quonset Hut site, this could well mean the emergence of injected effluent inside Kahului Harbor. The potential for water quality problems would, as we have seen, be present.

Outfall disposal would, of course, be more expensive. Also, were it constructed near the plant site, winds and currents would tend to push the effluent plume toward shore; a situation that could also lead to water quality problems.

This site is farther from the probable irrigation areas than any of the other locations, hence, the reclamation distribution system would be more expensive. It is also farther from Paia and, thereby, less consistent with future regionalization.

At the same time the primary advantage of this site in terms of environmental impact is also its location. It is remote from both residential areas and critical wildlife habitats; i.e., Kanaha Pond.

The cost of the National Guard site precluded its consideration beyond the preliminary planning stage. It would not appear that its advantages are great enough to outweigh these cost.

3. The Kaa Site

This site, also occasionally referred to as the "airport" site, is approximately 4,000 feet east of the proposed Kanaha Pond site. It is similar to the Kanaha Pond location in terms of vegetation and soil type. The proposed General Plan has designated it as an area for park development.

Its primary disadvantage is its cost. At this time, it is estimated that moving the plant and injection wells to this site would add more than \$2.5 million to project cost. The major factors in this cost difference are:

1. Design engineering, soil studies, and injection well testing have already been completed at the Kanaha site at 1971/72 prices.
2. Despite apparent similarities in the locations, additional soil studies and design work would be required.
3. The County engineering consultant's judgement that drilling and physical testing of injection capacity is required at this site despite its proximity to the completed Kanaha test well.
4. The additional 4,000 feet of force main needed to convey wastes to the plant.

The suitability of the Kaa site for injection is uncertain. It is known that the crucial layer of caprock pinches out to the east and is absent near Spreckelsville, about two miles from Kanaha Pond. If the caprock is also absent at Kaa, the site may not be suitable for injection and an alternative method of disposal would be required. This, of course, would result in additional cost beyond the figure quoted earlier (see Table 8).

If the caprock is present, however, there are certain advantages to this site. There would be virtually no question of injection disposal posing a threat to Kanaha Pond. Most of the short-term effects of plant construction and operation would also be avoided. Vulnerability to tsunami inundation and shoreline erosion would, however, continue to be of concern.

The suitability of the Kaa site is dependent on the existence of the caprock layer. Even if it is present, however, the advantage it has over the proposed project site (distance from Kanaha Pond) seems more psychological than substantial. While this does not belie the importance of the concerns of conscientious environmentalists, it makes it more difficult to justify the additional expenditures required.

4. Modified Kaa Site - Plant at Kanaha Pond with Disposal Wells at Kaa

This alternative is a compromise solution that would reduce the cost differential between the two sites (not counting inflation factors due to any delays in construction). Relocation of the injection wells would add a more modest \$700,000 to project cost. Some of this would be the cost of a new test well but, the major share would be the additional 4000 feet of pipe needed. Again, however, the crucial factor would be the existence of the caprock layer at Kaa.

The discussion of the environmental impact of this site is the same as that of the previous alternative with two exceptions. First, the impacts on Kanaha Pond from plant construction would remain. Second, less park-designated land at Kaa would be consumed.

In summary, the available evidence suggests that the Kaa site and the Modified Kaa site are as acceptable, from an environmental viewpoint, as the proposed Kanaha site. Except for the minor short-term impact of construction activities, however, there is no substantive reason for judging either location superior to the proposed project site. In this situation the Kanaha site must be favored because it is least expensive.

- V. THE RELATIONSHIP BETWEEN SHORT-TERM USES OF MAN's ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

Relationship Between the Local Short-term Uses of the Environment and Maintenance and Enhancement of Long-term Productivity

The proposed project will eliminate the existing abuse of coastal waters for raw sewage disposal. While these waters will continue to receive wastes, they will be in a form that will protect rather than damage long-term productive uses.

The immediate project site will be committed to a use that is incompatible with some other productive uses. It cannot, for example, become part of a park area as once proposed, or an industrial area like the land around it. It also represents man's physical intrusion onto the only side of Kanaha Pond not yet developed. While landscaping will minimize this impingement, there is no doubt that the character of the pond setting will be changed as a result of this project.

The decision to take action now to halt the raw sewage discharge to Kahului Bay seems justified on its face. There is broad public consensus on this point. The decision to build at the proposed site also appears to be warranted despite public controversy. The sections of this statement dealing with the anticipated impact of project construction and operation at the Kanaha site indicate that sufficient information is available to make a rational decision. In the absence of evidence that additional delay would provide significant additions to the body of knowledge surrounding this project, we believe the choice of the Kanaha site is justified.

VI. IRRETRIEVABLE AND IRREVERSIBLE COMMITMENTS OF RESOURCES
WHICH WOULD BE INVOLVED SHOULD THE PROPOSED ACTION BE
IMPLEMENTED

Irreversible and Irretrievable Commitments of Resources Which
Would be Involved in the Proposed Action Should it be Imple-
mented

Aside from the energy and materials consumed during construction, the project's primary irreversible commitments are the consumptive use of land at the project site and its role in accommodating population growth. The immediate project area will no longer be accessible to casual public use and cannot of course, be turned into a recreational area or industrial site. By accommodating population growth, the project may give additional impetus to urbanization in the Wailuku-Kahului area. Urbanization of course, precludes other general uses of the areas involved.

VII. A DISCUSSION OF PROBLEMS AND OBJECTIONS RAISED BY
OTHER FEDERAL, STATE AND LOCAL AGENCIES AND BY
INTERESTED PERSONS IN THIS REVIEW PROCESS

A Discussion of Problems and Objections Raised by Other Federal,
State, and Local Agencies and by Interested Persons in this
Review Process

The proposed project has generated significant public controversy. Because this is a draft environmental impact statement, we will not specifically address those concerns in this section trusting that the text of this statement has answered many of the questions asked.

On February 23, 1973 a public hearing was held in Wailuku-Kahului to invite public discussion. The transcript of that hearing and several other documents submitted as part of the public record on that hearing are appended to this statement.

APPENDIX A

A GEOHYDROLOGICAL ANALYSIS OF WASTEWATER DISPOSAL BY DEEP WELL INJECTION

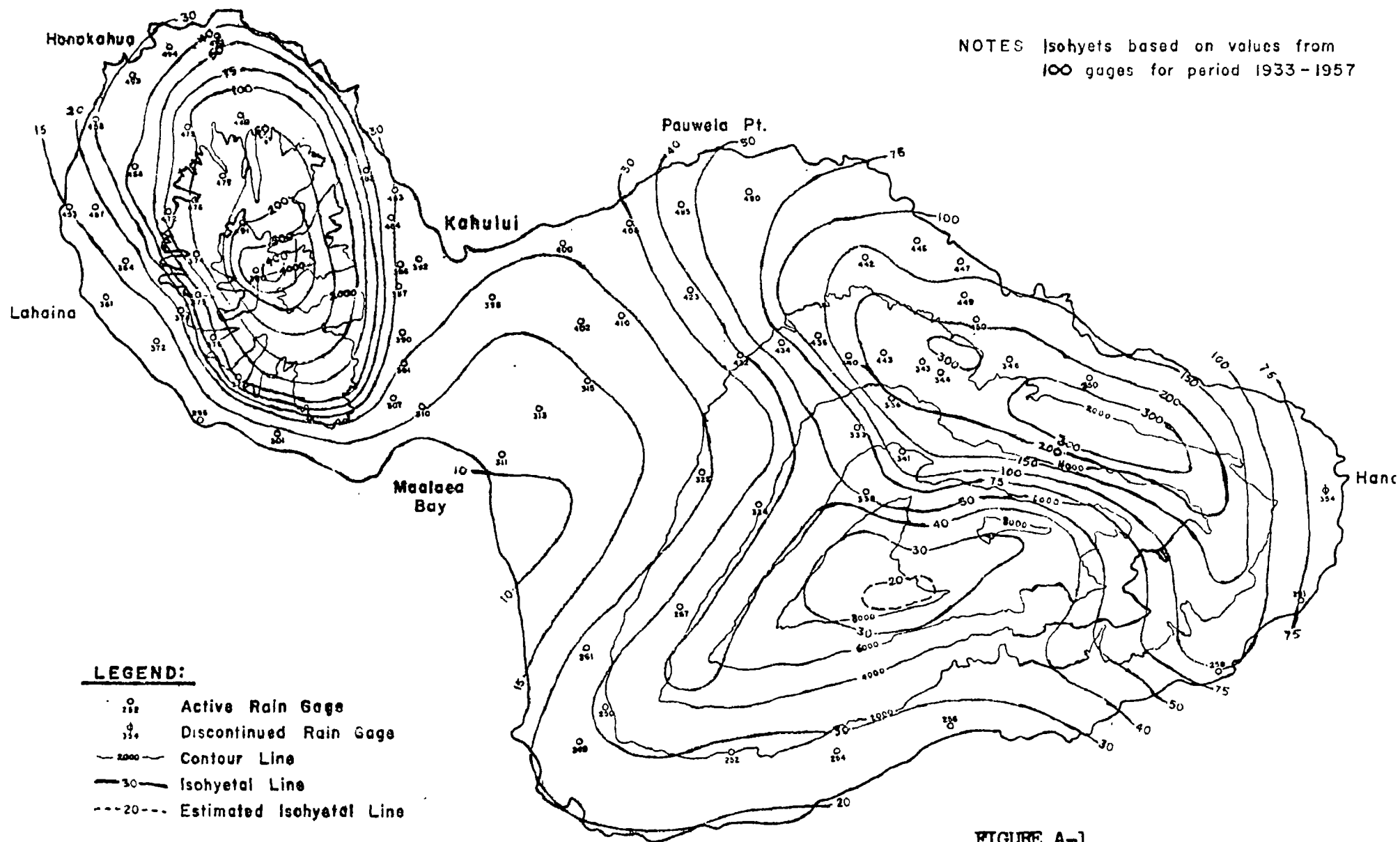
Geohydrology of the Injection Well Sites

Geology

The most comprehensive geologic and hydrologic description of the island of Maui was published by Sterns & McDonald (1942). Maui essentially was constructed from 2 volcanic centers, East Maui (Haleakala) and West Maui (Puu Kukui), that were united when westward flowing lavas from Haleakala overlapped and banked against the east slopes of the West Maui volcanic dome forming the isthmus. The bedrock underlying the isthmus of central Maui is a thick sequence of flows of the Honomanu volcanic series, abutting and overlying older volcanic rocks from West Maui and intercalated with consolidated sedimentary rocks also derived from West Maui. Overlying the Honomanu flows is the Kula Volcanic Series, also from Haleakala. These are thin flows and may extend under the isthmus near Kahului according to the geologic cross-section of Sterns & McDonald (1942, Pl. 1) which shows the flows terminating near the center of the isthmus against younger dune sands. The Kula flows would not be an important aquifer in this area but if present could provide some confining of water in the lower Honomanu flows. The Kula rocks represent the last emplacement of volcanic flows in the Wailuku-Kahului area and this activity was followed by a long period of quiescence with low rainfall, little erosion, and thus, little transport of detrital material. This may have been the time that the clay caprock, a weathering by-product, was formed. The northern isthmus area is immediately underlain by sedimentary rocks, some consolidated or partly consolidated ranging from gravels to clays to alluvium that are in places overlain and intercalated with unconsolidated deposits of beach sand, both quartzos and coral types.

Hydrology

The basal fresh ground water underlying the island of Maui occurs essentially as two lenses under both East and West Maui respectively. Almost all recharge takes place at the higher elevations of Haleakala and the West Maui mountains where precipitation is greatest (Fig. A-1). Natural discharge, other than evapotranspiration, commonly occurs near the shoreline as springs and seeps. The two lenses coalesce under the isthmus and in a trans-isthmus cross section, this water body too, would be typically lens-shaped. The principal of a lense of fresh water floating on a salt water substratum has been named



Source: Hawaii Water Authority, 1959, Water Resources in
Hawaii: Hawaii Water Authority, Territory of Hawaii.

FIGURE A-1
MEDIAN ANNUAL RAINFALL
ISLAND OF MAUI



after work by W. Badon Ghyben and Baurat Herzberg who made independent studies of the lens hydronamics in Europe at the close of the last century. This is the Ghyben-Herzberg theory. At about the same time, sugar plantation pioneers in Hawaii had gained a practical understanding of the lens concept without benefit of communication with the European scientists, and made use of the theory in developing their ground-water resources.

A simple uniform Ghyben-Herzberg lens probably does not exist anywhere in Maui. Both the East and West Maui massifs contain central core areas intruded by dike swarms. These dike complexes underlie the areas receiving the most rainfall and hence receive the most ground-water recharge. The dikes commonly are relatively impermeable and tend to act as subsurface dam. Thus, the basal fresh ground-water lenses are distorted in the center of both East and West Maui (Watson, 1964, Fig. 2) where the dike complexes store much water at elevations above the top of the lenses. Because all dikes probably leak trapped water, the higher heads behind the dikes are responsible for much recharge to the peripheral basal ground-water reservoir. On the isthmus, man has caused some modification of the original ground-water lens. This has been by withdrawal of ground-water supplies from wells and by irrigation of crop land which provides recharge to the basal ground water from unconsumed irrigation water.

Further modification of the natural ground-water body may be attributed to artificial recharge practices in central Maui. In the agricultural areas this has been in the form of induced leakage from ditches and reservoirs and deliberate spreading of irrigation waters. Other important artificial recharge in urban areas is by storm drainage disposal and diversion of steam flow into pits and injection wells. A good discussion of effects of artificial recharge on the Ghyben-Herzberg lens of Maui and other parts of Hawaii is in the report by Peterson and Hargis (1971). They also report (p. 8) that the first of four wells for the injection of industrial wastes from the Maui Land and Pineapple Company in Kahului was drilled in 1948. These wells are used for injection of a mixture of salt and fresh waters from the company's cooling and washing operations into the basalt aquifer beneath the caprock. The caprock in this area according to the well logs (Peterson and Hargis, 1971, p. 11) is clay and gravel. Analysis of the wastewater is not available but it is treated with ammonia to neutralize the sulphuric acid. The maximum injection rate recorded for the four wells (Peterson and Hargis, 1971, p. 10) is 3700 gpm with a head build-up of almost 7 feet.

According to Peterson and Hargus (1971) 17 recharge wells are used in the Wailuku-Kahului area for the disposal of storm run-off and to eliminate standing water in poorly drained areas after heavy rains. In addition, two 100 foot diameter disposal pits, 20 feet deep for drainage control have been constructed in Kahului. These are shallow injections and all are into the sedimentary rocks overlying the caprock. This recharge may be a source of contamination to the fresh basal ground-water body in an area up-gradient from the Kanaha Pond area. In June 1970 testing was done by the Kahului Development Company for injection well sites for four storm run-off disposal wells in the basalt aquifers. These tests indicated that highly permeable zones were available in the basalt and construction of the wells preceded (Peterson & Hargis, 1971, page 17). Recharge to the basalts under the Wailuku-Kahului area is added to the ground water flowing toward the area under Kanaha Pond. The source of much of the water in the Honomanu lavas under the norther isthmus is ground water from west Maui. According to flow lines superimposed on the ground-water contours of Takasaki (see figure A-2) the flow of ground water in the basalts under the Kanaha Pond area is from the west to a convergent area of flow lines north of the airport. Also according to the water-table contours shown on figure A-2 the ground-water head on the isthmus is low, 2 to 5 feet above sea level and according to Peterson and Hargis (1971, p. 18) it is little affected by daily or weekly sea level changes except in the large drawdown cones in some wells. However, near the shore, tidal fluctuations may imposed an effect of 1 foot or more in some wells.

Across the isthmus to the south and east of Kahului are large acreages of sugar cane that are irrigated from surface and ground-water supplies. Basal water, however, is the source most extensively developed and utilized for irrigation throughout most of the growing season at lower elevations (Tenorio, Young, and Whitehead, 1969, page 18). The Hawaii Commercial and Sugar Company, during the winter months, when the plantation's demand for irrigation water is not as great as in other months, is permitted by the State to use the excess water free of charge for artificial recharge on plantation lands. Artificial recharge began in the winter of 1950 and has continued every year since. However, the effect of this recharge on ground-water elevations and water quality of the basal fresh-water lens is not known (Hargis & Peterson, 1970, p. 18). North of the ground-water divide (fig. A-2) it is obvious from the flow-net that much of this artificial recharge is unconsumed irrigation water from the sugar cane fields and flows

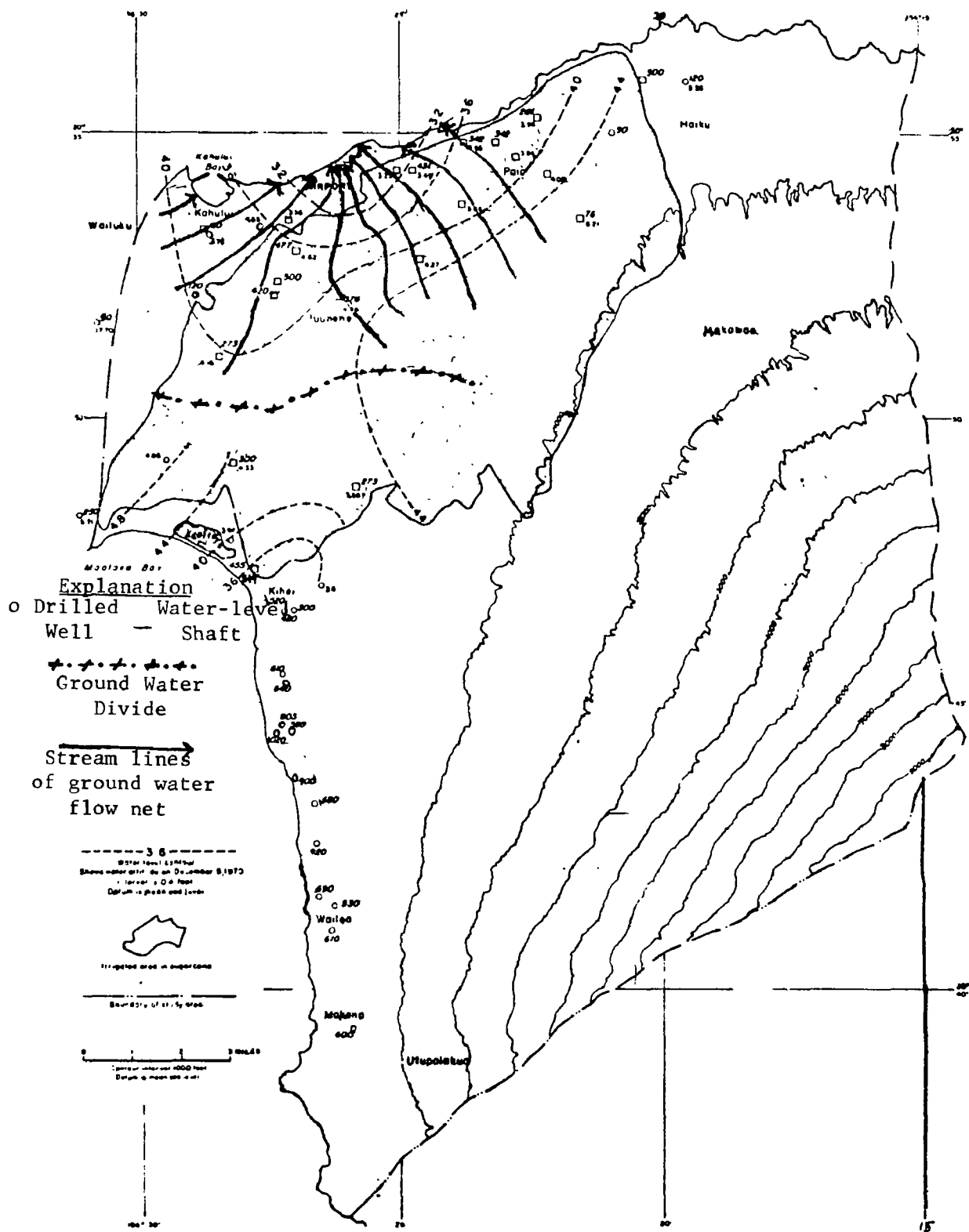


Figure A-2 Central Maui Showing Stream Lines of Flow Net and Water Level Contours Based on Near-Simultaneous Measurements Made on December 5, 1970

Source: Takasaki, K. J., 1972, Preliminary Report on the Water Resources of Central Maui: Division of Water and Land Development, Circ. C62, State of Hawaii, p. 36. Modified by the Environmental Protection Agency.

toward Kahului Bay. Interpretation of reports in Lau (1967, p. 261 & 266) on work done by D. C. Cox on Maui including the supervision of the drilling of an experimental at Spreckelsville leads to the conclusion that the caprock is missing or pinches out near Spreckelsville. Hence, with the pinching out of the caprock and defining its eastern edge, under the northern part of the irrigated sugar cane areas, much recharge from the cane fields can be tributary to ground water both above and below the caprock. Recharge, in the cane field areas underlain by caprock, will become part of the ground water in the surficial sediments and will be isolated from ground water in the basalt below the caprock.

The contact between the fresh water of the Ghyben-Herzberg lenses and the underlying sea water is not a sharp distinct interface such as would occur between two immiscible liquids, but a gradational third dimension of increasing salinity with depth. This zone is often referred to as the transition zone or mixing zone. It is thickened by tidal action, variations in recharge, and seasonal withdrawals of groundwater resources. Kleinecke (1971, p. 2) has attributed a thickening of the original transition zone (50% to less than 5% salt-water) from about 200 feet in 1881 to 500 feet in 1953 in area I of the Honolulu aquifer to overdraft by excessive pumping from this aquifer. The original dynamic balance between the fresh water in the lens and the seawater base has been disturbed by pumpage from the lens in the Maui isthmus. Thus there probably has been an increase in the thickness of the transition zone on this island also. An arbitrarily selected base for fresh water is to the level where the mixture contains 5% seawater (about 1725 ppm TDS). It would appear that the interface between the fresh-water lens and its transition zone will lie between the test well at the disposal site and the State well south of Kanaha Pond (see fig. A-3).

Injection Well - Kanaha Pond Site

Injection wells constructed with an outer conductor casing no deeper than the top of the caprock and containing an inner injection casing seated into at least the first dense basalt flow, cemented top to bottom, will function properly (fig. A-4). That is: injected fluids will be confined to the basalt aquifer beneath the caprock. The integrity of the caprock

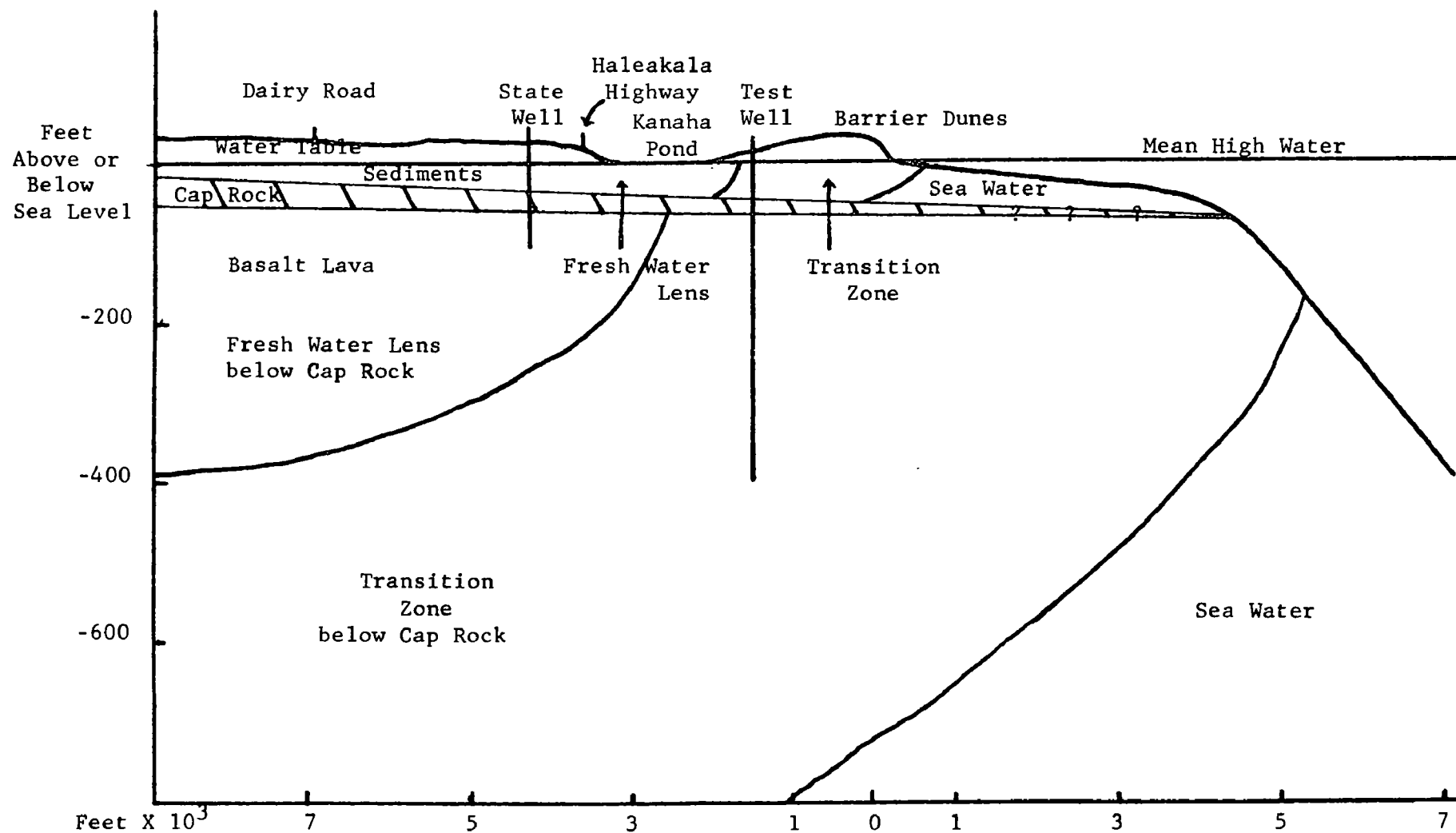


Figure A-3 Diagrammatic North-South Cross Section 800 Feet West of $156^{\circ} 27' 30''$ Longitude

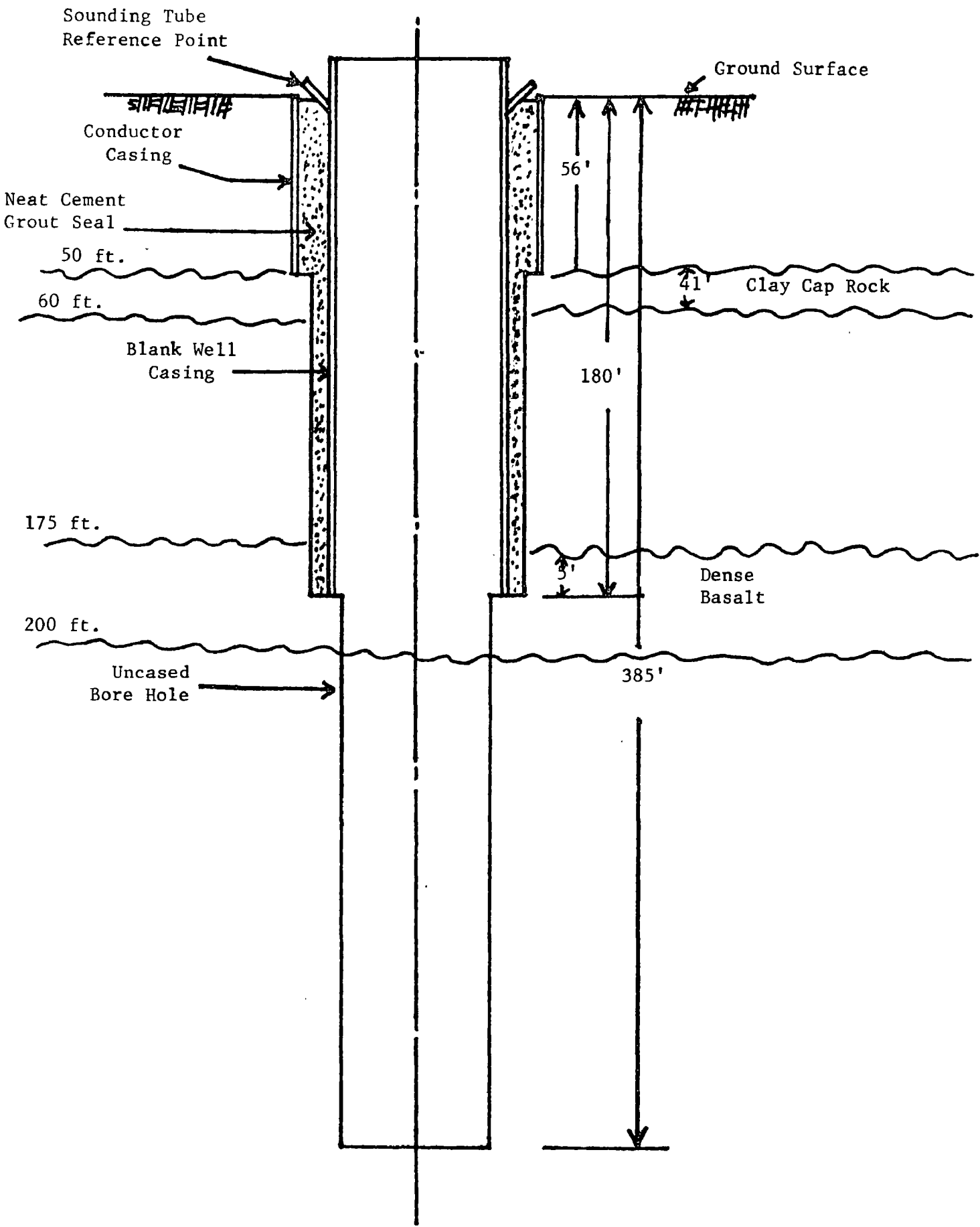


Figure A-4 Environmental Protection Agency's Recommendation for Injection Well Construction - Kanaha Pond Site

is supported by conductivity measurements and piezometer readings made during drilling of a test well and its subsequent test pumping by James M. Montgomery, Consulting Engineers Incorporated (1972, p. 3, fig. 5). Observations were made of water levels during pump tests in four piezometers installed in the area near the test hole and terminating in the sediments above the caprock. All fluctuations of water levels at these observation points can be attributed to tidal forces and no effects from pumping the test hole were noted in any piezometer. This is strong evidence of a hydraulic discontinuity between the sediment aquifer and the basalt aquifer. Above the caprock, water in the overlying sediments had a dissolved solids content (TDS) of about 2,275 ppm (conversion of specific conductants by $S. C. \times 0.75 = \text{average TDS}$ See Hem, 1970, page 99). Although the caprock position from the log and salinity measurements at 60 and 65 feet, respectively appear off by 5 feet when related to each other, this is not unusual nor unexpected when drilling, as such observations are not always precise. Beneath the caprock, the salinity jumps to approximately 3,445 ppm and increases to 10,400 ppm at 130 feet. The Montgomery report also states that from 110 feet downward the formation water has seawater characteristics, this is an error, as seawater has an average dissolve solid content to 34,500 ppm and a specific conductance of 50,000 to 55,000 micromhos per centimeter at 25° celsius. Hence, it is apparent that the formation water in the injection zone is less than 1/3 of the salinity of seawater. This is important in interpreting the injection test made by Montgomery (1972, p.5). Using properly prepared injection fluid (i.e. without suspended sediment and intrained gases) an injection rate of 5,900 gpm was obtained during a 9-hour test with a head of 0.23 feet. The 180 feet of casing installed with a surface elevation estimated to be 8 feet above land surface means that approximately 172 feet of the bore hole is cased below sea level. The total weight of seawater for 172.23 feet in the well to the top of the injection zone is 23,369 pounds. To provide the same weight to the same depth with fresh water an additional 655 pounds are needed or 5 more feet of head. Thus, injection of sewage effluent in the test well at the rate of 5,900 gpm can be accomplished with a five foot injection head. Since this is three times the design requirement then an operational head of 1.7 feet should be adequate. The EPA recommendation that injection heads be limited to 3 feet would not restrict the desired operation of the injection wells to less than the

design capacity and at the same time would ensure that no head pressure would build up under the caprock that would exceed the hydrostatic pressure on the top of the caprock in the area underlying the pond. The pumping test by Montgomery (1972, p. 4), indicates that high permeabilities, transmissibilities, and specific capacities are to be expected in the basalt aquifer beneath the Kanaha Pond area. Although the water level measurements made during the pumping test were not corrected for tidal effects and which may have resulted in some apparently anomalous specific capacity data; the hydraulic characteristics that the Montgomery report attributes to the basalt aquifer are of the right order of magnitude. This is confirmed by more sophisticated pump and injection tests made in 1970 and 1971 at the injection well site of the Kahului Developing Company (Peterson & Hargis, 1971, p. 29-38). Therefore, it is concluded that a properly designed, installed, and operated injection well can accept up to 2000 gpm with an injection head of less than 3 feet above mean sea level in many areas along the northern isthmus in the Honomanu Basalt.

The exact ratio of fresh water above and below sea level in the lens depends on the relative densities of the two liquids. A ratio of 40 to 1 is close enough for most interpretations (Peterson, 1972, p. 22). Hence, a three-foot head of fresh water would balance 120 feet could not be improved by drilling deeper without a corresponding increase of 1 foot injection head for each 40-foot interval of deepening. The test well was bottomed out at 385 feet and in an aquifer containing water at a little less than 1/3 the salinity of sea water this is probably about the maximum depth of injection of sewage effluent at this site.

After injection, the fate of the effluent must be considered. Injected effluent will move down gradient towards the discharge point northeasterly and out into Kahului Bay. But between injection well site and discharge in the bay many forces affect the behavior of the fluid. These must be considered. When water of a different density is injected into an aquifer between two confining beds a vertical front will move out in all directions from the well bore. However, a symmetrical cylinder of injected fluid is not obtained owing

to the inhomogeneity of the aquifer material and its non-isotropic hydraulic characteristics. When the interface between the injection fluid and the formation fluid stops moving or slows appreciably owing to cessation of injection, or part of the interface slows or stops because of hydraulic distortion of the injected body from movement in one direction on side of the cylinder, tilting of the interface will occur. The injected body beneath the Kanaha Pond site will be distorted and will send a plume of injected fluid down gradient from the well and hence have a stationary interface upgradient. The slowed or immobilized interface of two fluids of different density in an aquifer will start to tilt (sometimes called upwelling). This is a manifestation of the buoyancy force. Beneath the Kanaha Pond site the tilt of the interface will put the less dense effluent on top of the formation fluid. The rate of tilt and horizontal extent of the injected fluid cannot be predicted but both are expected to be small. The significance of this phenomenon may be determined by conversion of the State well to an observation well. This well is believed to be in the direction from the injection site towards the nearest pinch-out of the caprock.

During an injection test at the Kahului Development Company site, a recording conductivity bridge was placed in the Maui Land and Pineapple Company shaft 13, located 1200 feet away. Even though the shaft was pumped at a rate 2,800 gpm for 16 hours no salinity changes attributable to the injection test were observed (Peterson & Hargis, 1971, p. 33). The angle between the direction of ground-water flow and the direction to the State well from the Kanaha Pond test site is about the same as that prevailing in the above described test. Work done by Kumar and Kimbler (1970) on the problem of temporary storage of fresh water in saline aquifer indicates that any injection into aquifers that tends to cause the stratification or layering of the water into thin zones, nullifies the importance of tilt. Injection in the basalt will tend to cause injected fluid to be stratified in the most permeable clinker zones between dense lava flows. The thickest clinker zone identifiable from the log in the Montgomery report (1972, table 1B) is 26 feet (90-118 feet below land surface). Considering aquifers and aquifer hydraulics generally, this can be considered a thin zone.

A study by Gelhar and others (1972) indicates man hydrodynamic dispersion across the boundary of two fluids (i.e. the formation of a transition zone) in confined aquifer systems will retard the rate of tilting of the interface. Thus, though there is abundant information to indicate that a tilt of injected effluent-sailing water interface sufficient to bypass the interior edge of the caprock and permit effluent to seep into the upper sedimentary aquifers will not occur, it will be prudent to use the State well for continuous observations.

Other buoyancy forces at work will tend to cause the injected fluid in the injection zone (clinker zone) to move from the clinker zone and any succeeding clinker zones through shrinkage cracks in each overlying layer of dense basalt to an upper clinker zone or some other permeable zone underlying the caprock. The well construction recommended would seat the injection casing in at least the first dense basalt layer, and with the cementing recommended, any upper clinker zone would be isolated from direct intrusion by the injected effluent. In a saturated zone, as exists below the caprock, effluent movement upward must not only displace fluid, but do so with the weak buoyancy forces resulting from the association of fresh water and formation water having a density less than 1/3 sea water. There will be little movement up to the base of the caprock and the rate will be slow. Even if, injected effluent moves to beneath the caprock, the prevailing direction of ground-water movement is horizontal, and the rate of movement of any effluent away from the Kanaha Pond area is expected to be rapid. This expectation is based on the estimation of Peterson and Hargis (1971, p. 37), from the tests made in the basalt aquifer at the Kahului Development Company's injection, that the horizontal rate of ground-water movement is about 1 foot per minute, a high rate.

Even though buoyance forces may cause the emplacement of some effluent fluids beneath the bottom of the caprock, there will be no increase in hydraulic pressure on the bottom of the caprock. There is no evidence that the effluent will move through the caprock into the sediments underneath Kanaha Pond.

In a marine water environment there is considerable co-precipitation of the phosphate ion along with the positive colloid ferric hydroxide in marine sediments. Contaminated recharge to that part of the lens lying above the caprock may also come from leaking sewer systems and from fertilizers used on lawns and gardens in the urbanized parts of the northern isthmus. Northwest of Kanaha Pond, Maui Electric Company disposes its blow-down from their cooling towers into an unlined pond on sand dunes. Much of this water may percolate down in the permeable sands to the top of the older sedimentary rocks. If a ground-water divide exists under the dunes, then not all of this seepage will go to the ocean. Any seepage moving away from the ocean will move in part toward Kanaha Pond. There are no data to support the fate of the blow-down waste with respect to Kanaha Pond, but any monitoring program design for the pond area should take this possibility into consideration.

Alternative Disposal Well Sites

Three other sites have been proposed as alternative sites for disposal wells. All would be drilled into the Honomanu basalts and considering their more or less general uniformity, adequate disposal capacity and injection rates would be found. Of the three sites, the one near Kaa, north of the airport would be the most satisfactory, providing the caprock is present. As discussed earlier, there is evidence that the caprock pinches out between Kanaha Pond and Spreckelsville. Since the only way the sewage effluent can get into Kanaha Pond is by its incorporation into that part of the fresh-water lense that lies above the caprock, the fate of sewage effluent disposal where no caprock is present or near its terminal edge is a complex hydrologic question that would require investigation to determine its fate in the near-surface sedimentary rocks. Augering or some other form of test drilling would be an easy and economical way to search the subsurface for the presence of the caprock. Test drilling and pumping are not recommended for the basalt aquifer as Kaa lies in the zone of the convergence of the flow lines drawn on the water-table contour map for the basalt aquifer (see fig. A-2). The two sites west of Kanaha Pond, one at the National Guard Barracks and the other at the quanset huts near the high school cannot be recommended. They, or a major part of their effluent plumes lie in the flow-line net that streams directly to Kahului harbor. The caprock position under the

harbor is not known but the information presented in McCoy (See Moberly, 1963, fig. 62) indicates that there is a probability that the caprock terminates in the harbor. Release of nutrients inside Kahului Harbor would permit them to become concentrated there because of the poor flushing action available within the break-waters.

Although EPA recommends that the injection casing be seated and cemented no higher than the first dense basalt flow encountered below the caprock, the test well was seated at a depth of 180 feet which is below several dense basalt layers. Therefore, if construction of the additional injection wells is in a manner similar to the test well then the operation of the well field will have several barriers provided to restrict the movement of effluent upward to the bottom of the caprock. Dense basalt layers identifiable from the log of the test well for the interval between the caprock and the 180-foot basalt layer serving as the foundation for the injection casing are at 65-70 feet, 90-118 feet, and 165-175 feet. Peterson and Hargis (1971, p. 37) quote from an unpublished report by Bowels that in the vicinity of the Kahaluli Development Company's test wells the horizontal permeability might be as great as ten times the vertical permeability. This presumably refers to horizontal flow through the clinker zones as compared to vertical flow through joints in dense lava stratum. With such ratios of flow rates prevailing for each dense basalt layer and the intervening clinker zones and with a gross horizontal velocity of one foot per minute or more within each clinker zone, it is obvious that any effluent moving upward will be diluted as it passes from one clinker zone to the next through dense basalt layers.

Total nitrogen content of the sewage effluent expected is not more than 30 ppm. Chung Dho Ahn & Associates (1971, p. II-5) report 9.6 and 24 ppm total nitrate in analyses of outfall sewage for Kahului and Wailuku, respectively. Dilution should reduce nitrogen concentrations to near back-ground before any effluent reaches either the confining bottom of the caprock or the ocean.

As the effluent moves away from the well, and down gradient in the general direction of Kaa according to the flow lines shown on Figure A-2, a plume of effluent will develop in the basalt aquifer. This plume, and other mixing effects, will be brought about by three mechanisms. First, hydrodynamic dispersion, the process by which two miscible liquids will interfuse when hydrologic flow causes their boundary to move, is dependent in a large part on the effects of variable velocities along flow paths in the clinker zone. This is laminar flow and the dispersion actually results from combined effects of convection attributable to the velocity differences and to molecular diffusion. Molecular diffusivity of dissolved components across an interface of two liquids is a mixing mechanism that can go in both directions at the same time providing the concentration gradients for two components are in opposite directions such as chloride in formational water

and nitrates in the injected effluent. Thus, there would tend to be mutual dilution by the two fluids. However, this is not a rapid method of transport and probably is not a very important solute transport factor. A third force may be very important to the proposed injection of effluent into the transition zone. After and during mixing of both fluids they will be transported away from the injection site by the forces that cause cyclic flow of sea water from the ocean into the transition zone and back to the ocean. This principal has been described by Cooper (1964, p. C8) who attributes the mixing of sea water and fresh water into the zone of diffusion (transition zone) to the mechanism that he believes creates this zone. His thesis is that the effect of this is the same as if some of the salt ions were extracted from the sea water and injected into the flowing fresh water. The diluted sea water, becomes less dense than native sea water and rises up along a seaward path (fig. A-5). The resulting circulation is analogous to the circulation in thermal convection, differing only in that changes in density are produced by changes in concentration rather than by changes in temperature. Meanwhile, the salts that are introduced into the fresh-water environment are carried back to the sea by the flow of fresh-water system in the transition zone. The circulation, therefore, is induced by the transfer of salt out of the salt-water environment. The forces that effect this transfer must be powerful enough to recreate the zone of diffusion continuously as it is dissipated by the flow of mixed water to the sea. Molecular diffusion is much too feeble for this. A mechanism that appears powerful enough to cause sufficient mixing is the reciprocative motive of the salt-water fresh-water front resulting from ocean tides and from the rise and fall of the water table due to variations in recharge and other forces, including pumping. During the movement of a fresh-salt-water front in either direction, the convection component of dispersion causes elements of each fluid to be transferred into the opposite environment, wherein to a large extent they may become inseparably blended with the other fluid by the mixing action of molecular diffusion. The importance of this mixing mechanism is related to the amplitude of a tide-produced displacement of water which may be related to the tidal amplitude and the distance from the shoreline. The amplitude of the oscillation of water is attenuated as the distance inland from the shoreline increases. Hence, the thickness of the mixing zone decreases with distance from shoreline. This is brought out by comparing the slopes of the salinity profiles of the Kanaha Pond test well with

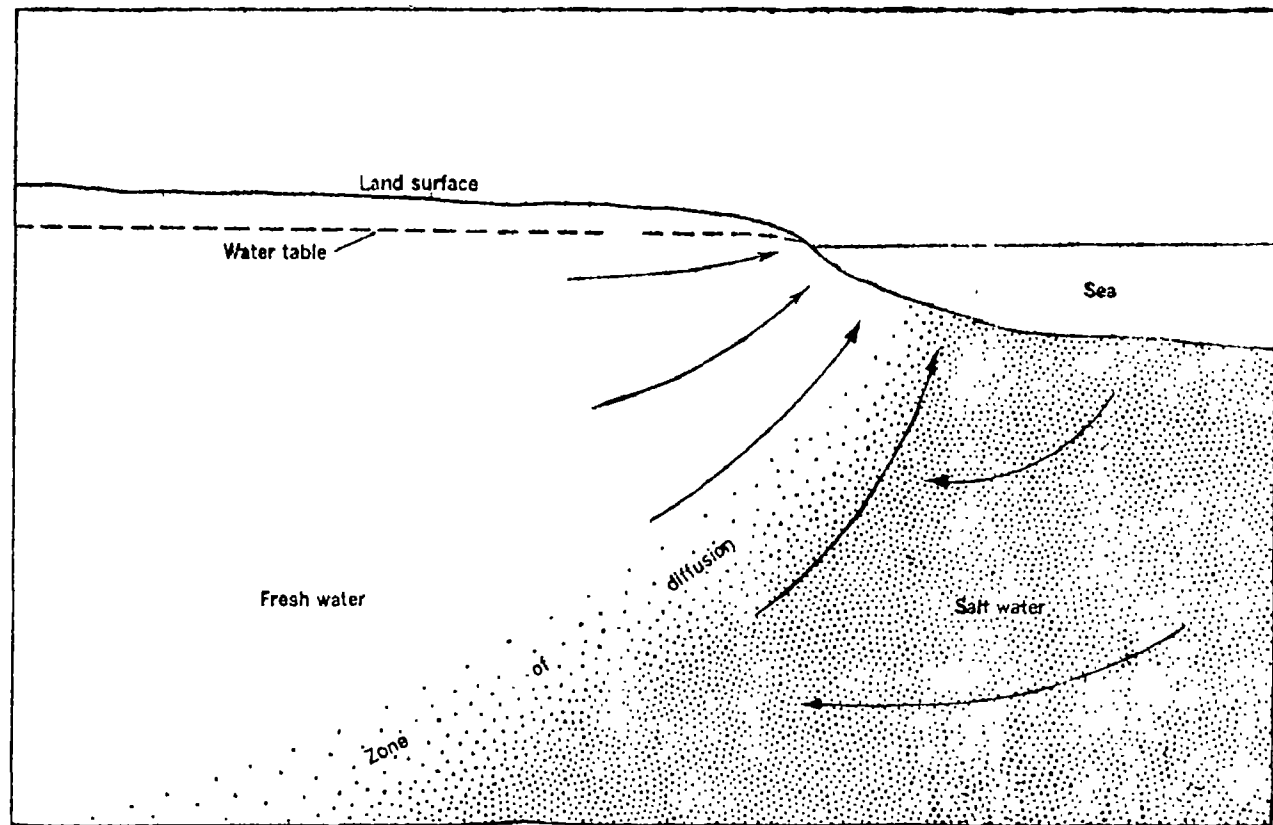


FIGURE A-5 Circulation of salt water from the sea to the zone of diffusion and back to the sea.

Source: Cooper, H.H., Jr., 1964, A Hypothesis Concerning the Dynamic Balance of Fresh Water and Salt Water in a Coastal Aquifer: In Sea Water in Coastal Aquifers, U. S. Geological Survey Water Supply Paper 1613-C, p. C1-C12.

that of the test well at the Kahalui fairgrounds (see figure A-6). The steeper slope for the Kanaha Pond test well indicates a much thicker transition zone than at the fairgrounds where the salinity profile from fresh to sea water salinity is less steep.

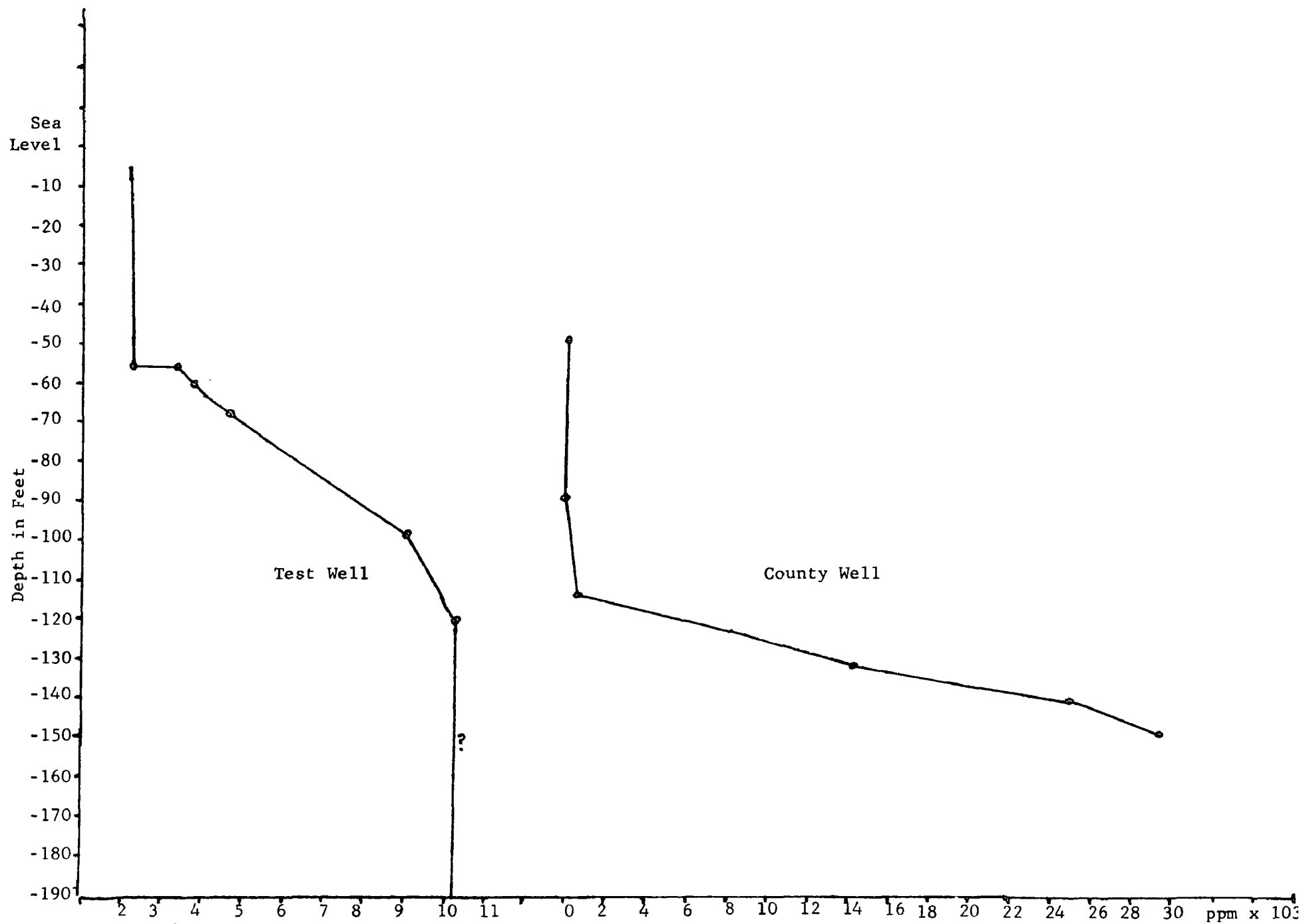


Figure A-6 Salinity Profiles for Test Well and County Well at Kahului Fair Grounds

Assuming steady state conditions have now obtained with respect to the tidal cycles and thickness of the transition zone, the average rate at which salts are carried into the transition zone by dispersion is balanced by the rate they are carried out by hydraulic flow. According to Cooper (1964, p. C11), the rate of dispersion produced by this process would doubtless be greater in an aquifer of cavernous limestone or basalt than in one of laminated sand. The efficiency of this hydraulic flow mechanism in a multiple aquifer such as is present here with layered volcanic rocks is not known, but the mechanism undoubtedly has some effect and it may be most important.

Emergence of the sewage effluent with the natural discharge of ground water out on the ocean floor cannot be described in detail. It is obvious that it will be released much diluted. Quantities of outflow of basal ground water to the ocean have not been estimated, but quality in the immediate vicinity of Kanaha Pond may be changed in quantifiable amounts. The discharge will be of the quality of the transition zone water found under the caprock, plus modifications by the injected effluent. Takasaki (1972, p. 35) was able to estimate the quantities of underflow from beneath the sugar cane area, part of which he believed to be tributary to the transition zone of the basalt and incorporated in the deeper part of the fresh-water lens. Part would also be tributary to that part of the lens overlying the caprock. Ground-water discharge sites offshore in Kahului Bay are not known as the submarine edge of the caprock has not been mapped. McCoy (1963, p. 98) made a survey of the beaches at Kahului Harbor and the area eastward from the harbor to Paia. East of the harbor, he found sand deposits at the mean lower low-water mark greater than four feet in thickness but reported a rocky bottom from there out to the beginning of Spartan Reef. He does not indicate whether the rocky interlude may be a window in the caprock and that the caprock also underlies the reef or that the caprock terminates here. Takasaki (1972, p. 35) believes that the high ground-water levels near the coast as indicated by his water-table contour map, are evidence that ground-water discharge to the sea occurs some distance offshore. Although the exact discharge zone is not known, the flow-net for the ground-water movement (figure A-2) does indicate that effluent injected in the Kanaha Pond area will be carried out into Kahului Bay and not discharged into Kahului Harbor.

Kanaha Pond Hydrology

Kanaha Pond is a small saline body of water perched and contained above the water table of the ground-water reservoir in the sedimentary beds on the northern part of the Maui isthmus. Average water level in the pond is about three feet above sea level, and the average depth is about 1.7 feet. Average height of the water table is about two feet above mean sea level, thus the pond bottom depresses into the underlying water table on an average of 0.7 foot (Fig. A-7). The bottom is believed to be impervious or nearly so, otherwise the water in the pond would leak out to the water-table aquifer. It has been reported that fresh water springs have been observed on the bottom of the pond. In order for upward leakage of fresh water into the pond to be possible, the ground-water reservoir in the sediments in this area must be confined. That is, an impervious layer from the pond bottom must extend inland and up the hydraulic gradient sufficient distance above sea level to cause the fresh water under the pond to have a head of three feet or more. If water table conditions exist, water cannot flow from a body with a two-foot head into a body of water with a three-foot head. There is no readily identifiable confining bed in the logs of the test well, the State well, or the County test well at the fairgrounds, but it is possible the drillers could have missed a thin clay stratum. The ground water in the sediments under the pond, if indeed confined under the pressure of three feet or more, would have a higher head than that reported for the ground water in the basalt aquifer beneath the caprock. Hence, any penetration of the caprock, when these conditions prevail, would cause water to flow from the sediments to the basalt aquifer. Artesian pressure above the caprock then would be a secondary line of defense above the caprock to isolate the pond and insulate it against transfer of any fluid to the pond from the basalt aquifer.

Water tributary to the pond can be expected from direct rainfall, slope wash from rain falling on the drainage basin tributary to the pond, probably irrigation tail water, and ground water.

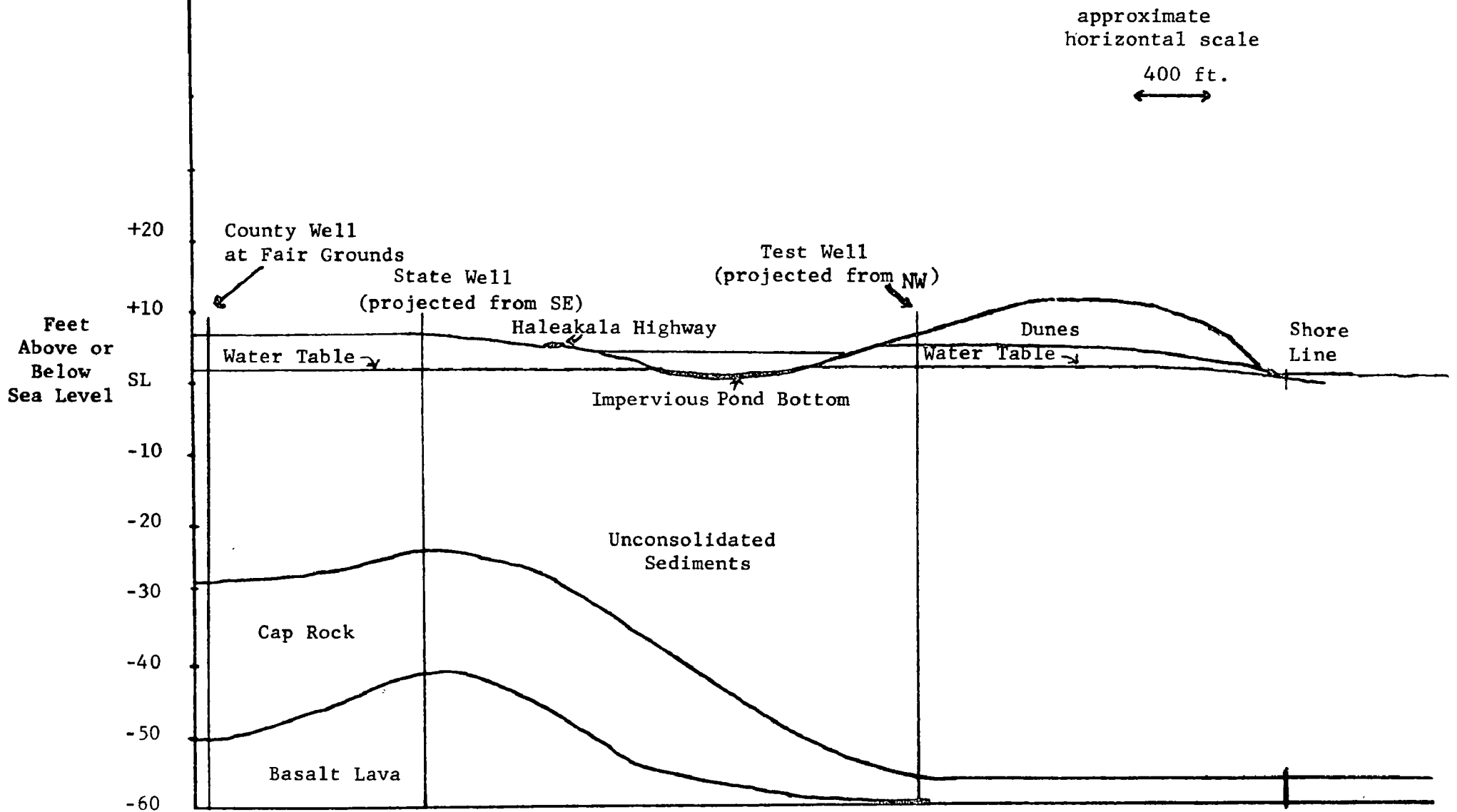


Figure A-7 NE-SW Cross-Section through Center of Kanaha Pond and County Test Hole at Kahului Fair Grounds

Ground-water, issuing from seeps and streams at or above the pond level, has been reported and it may be supported by unconsumed irrigation water either from direct application to the fields or from artificial recharge from ditches, spreading practices, and reservoir leakage in the sugar cane area.

According to Miura (1972) rainfall at the Kahului Airport (1/2 mile from the pond) averages 18.85" annually and most of this falls during the winter months. He also reports that median annual potential evaporation is greater than 90" from pan evaporation data obtained 2 miles south of the pond. Pond salinity will vary not only seasonally but also the average will vary from year to year. Some measurements reported and converted to equivalent total dissolved solid units:

24 Nov '71	17,000 ppm	(Miura, 1972)
23 Nov '62	15,400 ppm	(Davis, 1962)
25 Feb '71	4,300 ppm	(Lum, 1971)

Salinity in the ground-water reservoir in the sediments beneath the pond has been reported to be as much as 900 ppm at the State well in February 1971 (Lum, 1971) and in the test well as about 2,275 ppm (Montgomery, 1972, p. 3). Hence the test well is shown to have been drilled into the transition zone above the cap rock as well as into the transition zone below the cap-rock (fig. A-3). The inland or upgradient interface between the transition zone and the freshwater lens in the sediment is shown on fig. A-3 as occurring between the test well and the site on Kanaha Pond because all reviewed reports on the pond insist that only freshwater underlies the pond and is tributary to it. However, it is possible that the pond is underlain all or in part by this transition zone. If so, the salinity differences could result in osmotic transfer of water through the impermeable-semipermeable pond bottom acting as a semipermeable membrane. Such a mechanism of hydraulic transfer has been shown in the literature to be theoretically possible to explain many complex fresh-saline ground-water relationships. Much intense field work would be needed to prove that this is occurring here but because the position of the transition zone above the cap rock is not important to the safety of the pond from injected effluent contamination, such a study cannot be recommended in this report.

Possible sources of nutrients to the pond other than the injected effluent must be considered in order that false accusations are not made from erroneous interpretation of monitoring data. About 1/2 to 1 mile southwest of the pond 17 injection wells for storm drainage are operated. In addition to the wells two disposal pits about 100 feet in diameter and 20

feet deep are used in Kahului (Peterson and Hargis, 1971, p. 13). All subsurface disposal of storm water in this area southwest of Kanaha Pond is into the sedimentary beds overlying the caprock. This recharge carries nitrates into that part of the lens that flows toward the Kanaha Pond area. Concentrations of nitrates ranging from 3.5 to 7.0 ppm were found in one well (Peterson and Hargis, 1971, p. 15). In the same area are four industrial waste disposal wells but as these are all using that part of the lens lying below the caprock, i.e. the basalt aquifer, this waste will not be tributary to Kanaha Pond. Artificial recharge in the sugar cane areas south of Kanaha Pond can contribute much water carrying nitrates and phosphates to the sedimentary rocks overlying the caprock. Nitrate has been widely used in Hawaii to indicate the presence of return irrigation water in the subsurface (Peterson and Hargis, 1971, p. 38) and nitrates are expected to persist in the ground-water areas here that receive recharge from unconsumed irrigation waters. Phosphorous enrichment of ground-water bodies in Hawaii by percolating irrigation water has not been demonstrated as it is probably sorbed and fixed by most Hawaiian soils (Peterson and Hargis, 1971, p. 38). Phosphate can be removed by forming the mineral apatite with calcium which is readily available from the type of feldspar that is an essential constituent of basalt. Also phosphate can be removed rapidly by absorption of metal oxides, especially ferric hydroxide, which is a major factor in preventing concentrations of greater than a few tenths or hundredths of a ppm of phosphate from being present in solution in most waters (Hem, 1970, p. 185).

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APPENDIX B
TRANSCRIPT OF MAUI PUBLIC HEARING

BEFORE THE
U. S. ENVIRONMENTAL PROTECTION AGENCY

In the Matter of:

PUBLIC HEARING REGARDING PROPOSED
WASTE WATER TREATMENT AND DISPOSAL
SYSTEM,

WAILUKU-KAHULUI AREA.

Kahului Library,
Kahului, Maui, Hawaii.
Friday, February 23, 1973.

Pursuant to notice, the above-entitled matter came on for
hearing at 1:05 o'clock p.m.,

BEFORE:

CASSANDRA DUNN, Esq., Hearings Officer.

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P R O C E E D I N G S

HEARINGS OFFICER DUNN: Good afternoon, ladies and gentlemen, may I have your attention please? I there's anyone in the room who has not filled in a registration card, would you please do so, because we want to keep it as a record, and make it a part of the record.

My name is Cassandra Dunn and I am the Regional Legal Counsel for the United States Environmental Protection Agency, Region IX, and will be conducting the hearing.

I want to advise you of the ground rules of this hearing, so you will know what to expect and what you can and cannot do, so that the hearing can be run orderly, and so that we can ask for your cooperation, and so that everybody can be heard.

I apologize for a slight cold that I caught in Honolulu, but I will do the best I can and if you will listen, I think that we won't have any problems.

The hearing here today is to receive comments and information from the public regarding the proposed waste water treatment and disposal system for the Wailuku and Kahului area, consisting of a sewage treatment plant and equalizing storage pond, injection disposal wells and the pump stations and force mains at Kahului, Maui, Hawaii.

The notice of this public hearing was published in local newspapers and a copy of the publication will be made a part of the hearing record.

For the record, it's approximately 1:07 p.m. in the afternoon of February 23rd, 1973 and we are located in the Library in Kahului, Maui, Hawaii.

There will be an additional session this afternoon -- or I should say, this evening, at 7:00 p.m., in the Baldwin Auditorium and there will not be an additional session here at 7:00 p.m. It will be moved to the Baldwin Auditorium.

This is not a rule-making proceeding, nor is it an adversary type proceeding; and therefore, the Federal Administrative Procedures Act does not apply. Everyone will be heard, no matter how long it takes this afternoon and tonight. I will stay until everyone has what he has to say go on the record.

We generally handle these hearings on the following basis, as far as testimony is concerned from those who wish to make

statements. We hear all statements from representatives of the State, Interstate, Municipalities, and other agencies connected with the State, City, County, et cetera. Then we hear statements coming from Federal Agency representatives, including members of Congress and Senate.

Then we hear statements from the various industries that may be affected and statements from the environmental, civic and similar type groups and members of the public. However, the Hearings Officer does reserve the right to deviate from this schedule if someone has a problem, you feel that you need a specific time to give your statement, to make your comments, then, if you will let us know, we will try to deviate from that pattern and give you the chance to say what you have to say regarding this project, which is the subject of the public hearing today.

An official record is being made. There will be statements which will be received later. There have been some statements that have been received already, and, of course, there is a record made of any oral statement that will be made today and this evening.

The official record will be reproduced. We do have a Court Reporter here, taking the statements verbatim. If you want a copy of the official record personally, then you should make your own private arrangements with the Court Reporter, Mr. Chun.

All the written statements that have been received will be received today and will be received within 7 days from today, will be made a part of the record, but it will be reproduced in black and white only, so if you submit a record or a copy of your statement that cannot be reproduced in black and white, then you have got a problem and so have we, so make sure that your statements can be reproduced in black and white.

A copy of the official record will be made available for public examination and a copy will be placed in the Library -- excuse me, not in the Library, but at 1000 Bishop Street, Suite 601, in the EPA Offices in Honolulu. We will place a second copy in the Library here in Kahului. But this will be only after the Court Reporter has had a chance to transcribe the proceedings. It will probably be within oh, about 3 weeks to 4 weeks, because we will hold the record open for a period of 7 days from today.

Officially, the record will be held open until Friday, March 2nd. Any statements that you wish to submit for inclusion

in the record should be postmarked no later than March 2nd, Friday, 1973, and you may either mail your statements to 1000 Bishop Street, Suite 601, EPA Offices, or you may mail them to EPA 100 California Street, in San Francisco.

The record that is made of the public hearing today will be studied and evaluated to determine the necessity for an impact statement.

The Hearings Officer reserves the right to ask questions of anybody who is going to give testimony here today. However, I will be the only one who can ask questions and it will not be for cross-examination purposes. It will be solely to add to the information or ask for clarification. I have the right to limit the presentations to the issues at hand, to limit any or all presentation, if it isn't pertinent to the issue, and to strike or prohibit redundant or corroborative information, and, if you do have redundant or corroborative information somebody else has testified to, we ask that you submit it for the record in writing rather than taking the time orally.

There will be no member of the public or in the spectator section who will be permitted to ask any questions and there will be no interruptions from the floor; and, as I said before, everybody will have a chance to make their statement as long as it's relevant to the issues, and I ask your cooperation.

Mr. George A. Milme of ADS, Inc., has requested that we deviate from our process and that he be allowed to give his statement first, because he has to catch a plane later in the afternoon. Mr. Milme?

STATEMENT BY MR. GEORGE A. MILME

MR. MILME: Madam Chairman Dunn, ladies and gentlemen, Aloha. I know some of you here and most of them, I don't. However, I have a testimony here by ADS, Inc., for the Environmental Protection Agency for this public hearing, and it seems to us that we are once again struggling with the classic case, the need to protect our environment, as opposed to meeting a human vital problem, the proper disposal of waste.

Regarding the proposed pure activated sludge system, using rapid sand filters with a 5-acre plastic reservoir, shall we say, for emergency cases, at only a 4-foot water table, once it is filled up, either with rain or sewage, what is to become of it? Where does it go? I don't know. They have probably made arrangements for that; but regarding the proposed pure activated sludge system, it is our contention that it will not be

adequate, both in terms of sewage disposal and environmentally, not to mention economics.

This system was patented in England in 1913. It is used in New York, Chicago, has failed in a Hiperian sewage plant and Los Angeles, and for one thing, this proposed system is one of the trickiest to operate -- it depends on a good operator; and it requires considerable land. It produces an unwelcome odor and it offers a very slight reduction of only -- a BOD reduction of only -- oh, sometimes 20 to 25%, and the dried sludge has to be hauled off as land fill.

At the present time, it is employed, as far as we have been able to determine in large urban centers, presumably --- (interrupted)

HEARINGS OFFICER DUNN: Excuse me, I do hate to interrupt you, but it's my understanding of the hearing today, that the subject is with regards to the location.

MR. MILME: The location?

HEARINGS OFFICER DUNN: That's correct, and whether or not the Environmental Protection Agency should file an impact statement. We were asking for information with regard to these two subjects; and the point of this hearing today is to gather information to determine whether or not we should, in fact, file an impact statement. On that, do you have information?

MR. MILME: Yes, on the 120 acres that was originally planned, we had a 12-foot water table there and there was some discussion about a salt water or some type of infiltration -- we don't know the PH of it -- that has to be examined, but this system of ours can go underground, entirely, and there is no odor and no stench to it, or anything else. It's a new system.

HEARINGS OFFICER DUNN: Well, this is something that you place in your bids when you submit your bid, if you were going to bid on it, but this hearing is not for purposes of your advertising your product.

MR. MILME: I understand that.

HEARINGS OFFICER DUNN: This is strictly with regard to the location of the sewage treatment or sewage disposal system and, if you have any information with regard to whether we should or should not prepare an impact statement; and what you have said so far doesn't indicate to me that the information that you are offering is for that purpose.

MR. MILME: Well, perhaps my PR man was wrong when he wrote this up for me. He was supposed to be here to present it and not me. However, I wanted to say that we believe, from John Buse -- if John Buse is here, that we will offer -- would like to offer that original 120 acres that we can take care of -- that has a 12-foot surface water table rather than the 4-foot water table, and it will not be harmful for the birds and it will be odor free.

HEARINGS OFFICER DUNN: Well, now, are you telling us that you are offering some other land elsewhere?

MR. MILME: There originally was some land offered of 120 acres by the Quonset huts, originally.

HEARINGS OFFICER DUNN: Is this your land, sir? Is this your particular land? Do you own the land you are talking about?

MR. MILME: No, I don't have anything to do with the land at all; but I just say that it would be easier to put the system there rather than the one that they have recommended to put out here on the pond.

HEARINGS OFFICER DUNN: All right. Is this your opinion, sir? Are you expressing this as your opinion?

MR. MILME: This is not only my opinion, this is any of our opinions. Mr. William Buck Lum, who is the owner of the Marine Drilling Company, has been drilling wells around these Islands for the last 35 years, probably knows more secrets about what's underneath the ground than anybody else, and he and I, both agree, that it is -- that it should be at the original place rather than at the pond. I don't want to be out of line, and I don't want to be -- I have this written up for you, and if it's out of order, why, I don't know what to do.

HEARINGS OFFICER DUNN: Well, I don't mean to rule you out of order, sir. I just have to stick to the rules with regard to what can and cannot be said.

MR. MILME: Yes.

HEARINGS OFFICER DUNN: We have the issues here before us, and if we go off into left field, then I could be sitting here until this time next week, you understand. I will be glad to take your statement.

MR. MILME: All right.

HEARINGS OFFICER DUNN: And if you feel that you would like to have it submitted for the record, I will be glad to read it, and if you like, I can read it during the recess and go over those portions that may be pertinent, those portions that may not be pertinent.

MR. MILME: All right. Perhaps that's the best thing to do.

HEARINGS OFFICER DUNN: And the record will note your opinion, that you feel that the other location is better than the present proposed location.

MR. MILME: Yes. Thank you, ladies and gentlemen.

HEARINGS OFFICER DUNN: Mr. Milme, I would like to say thank you for coming and making the effort to give us the information. If you do have any information with regard to an alternate location for this proposed sewage treatment plant, may we suggest that you contact the County and give them your proposal, tell them what your proposal is and what your alternate location is, okay?

MR. MILME: Yes.

(Witness excused)

HEARINGS OFFICER DUNN: Mrs. Mae Mull, Secretary of the Hawaii Audubon Society. You may proceed.

STATEMENT BY MRS. MAE MULL

MRS. MULL: My name is Mae Mull; I am Secretary of the Hawaii Audubon Society.

The Hawaii Audubon Society works toward the goal of better protection of native wildlife in Hawaii. We have few victories to point to with pride. The birds are losing out as their living places are bulldozed, polluted, degraded, or filled in.

Is it a better world for people in Hawaii, when Hawaii's native wildlife disappears? Some people think we shouldn't care about birds, as the caring about Hawaiian birds is some kind of a luxury. That means you don't care about people. On the contrary, those of us who are in conservation work, care a great deal about people. We want our children and grandchildren to have a good life in Hawaii. We want the human race to survive. We want people to have decent living places with clean air and pure water; but the quality of human life depends on how

we use our natural environment.

We cannot destroy the natural world and fool ourselves that this is progress for people. Human beings, too, are a part of nature and we cannot ignore the laws of nature without great harm to ourselves.

The decline of Hawaii's birds and the loss of native ecosystems, is the barometer of what man is doing to the environment, that we have to live in, too.

We all agree that a solution must be found to the sewage problem, but is the only solution, putting the treatment plant between Kanaha Pond and the ocean? Is pumping the waste water under Kanaha Pond the only way to dispose of the effluent?

A long time ago, in 1952, before any environmentalists were around, Maui people and territorial people, recognized that Kanaha Pond was something special, and should be saved as a refuge for Hawaiian water birds and the migratory birds that spend 8 or 9 months of the year at Kanaha. A long time ago, Maui people sought and planned for a public park across from the Pond. It was such a beautiful beach and there was lots of room for recreation and picnicking.

We believe that those were good plans for people -- good plans for birds and good plans for people to enjoy birds. The State then made plans for a public park and bird sanctuary. The Legislature appropriated \$100,000 for that. Shouldn't these promises be kept? Is it wrong to want what was promised?

We urgently request the planners to find a better site for the sewage plant and a better way to reclaim the waste water.

The Audubon Society in Hawaii was started in 1939 by people who saw a crisis at hand. Native birds like the Hawaiian Stilt, Hawaiian Coot, Hawaiian Duck and migratory ducks and plovers, like the Koa Bird, were being over-hunted, and any numbers of birds were seriously declining. Audubon members worked hard to stop the shooting, so those birds could continue to exist in Hawaii. Then, in the 1950's and 1960's, huge development projects began to take over wetland areas and water birds lost huge chunks of habitat on Oahu. Today, right now this minute, there are hundreds of stilts, coots, herons, migratory ducks, plovers, living at Kanaha Pond. You could all go out there and enjoy them, as we did this morning. This is one of the few places left where stilts and coots can nest and raise their young.

It is essential to protect Kanaha Pond as a permanent sanctuary if Hawaii's endangered water birds are to survive as viable species.

HEARINGS OFFICER DUNN: Thank you very much, Mrs. Mull.

MRS. MULL: I would like to give you the copies of some Government publications, if you have not seen these -- "Hawaii's Endangered Wildlife", put out by the U. S. Bureau of Sport Fisheries & Wildlife and the State Division of Fish and Game; and these are available at those offices in Hawaii -- in Honolulu and in Maui. Also, this book that describes the status of native water birds -- Hawaii's endangered water birds, and it describes the importance of Kanaha Pond, not only to Maui, but to the State and to the Nation.

HEARINGS OFFICER DUNN: Thank you very much, Mrs. Mull.

(Witness excused)

HEARINGS OFFICER DUNN: Mr. John Cook?

STATEMENT BY MR. JOHN COOK

MR. COOK: Thank you. My name is John Cook. I am the Associate Director for Management, Western Region, the National Park Service. I am here today in an official capacity to speak for the National Park Service and I certainly hope I don't come across as another Mainland bureaucrat that has come to the Islands to tell the fine people of Hawaii what to do or what not to do.

Our Agency has a responsibility with regard to Kanaha Pond. It's probably a legitimate question -- in fact, it is, to ask why am I here today and to what do I address myself with regard to this proposed project? Kanaha Pond is a national, natural landmark, and is so registered. I won't read the statement I have prepared here -- it's ready for the record. I will merely highlight it and give you a bit of the rationale why we strongly urge that an environmental impact statement be prepared with regard to the project.

There are, as you have heard and will hear later on, rare and endangered species involved in the Kanaha Pond area. It is our sincere desire that an impact statement address itself to all of the alternatives and to the total impact of the proposed project, giving total disclosure of what these would be and with that, the decision can rationally be made within the confines of the National Environmental Policy Act.

The Kanaha Pond is important and is of national significance; therefore, its importance is not only to the people of Hawaii, but the University of Hawaii did an evaluation in 1969, which determined it was, indeed, unique and therefore it had value to all the peoples of the United States.

It's for those reasons that we urge that a full environmental impact statement be prepared, complete disclosure of all the alternatives, and to that, we will of course respond accordingly.

Thank you very much.

HEARINGS OFFICER DUNN: You have previously submitted copies of your statement to us, is that correct?

MR. COOK: Yes, I have, to the young lady at the door.

HEARINGS OFFICER DUNN: Thank you very much, Mr. Cook.

(Witness excused)

HEARINGS OFFICER DUNN: Mr. Lennox -- Mr. Colin Lennox?

STATEMENT BY MR. COLIN LENNOX

MR. LENNOX: Mrs. Dunn, Hearings Officer, and members of the Environmental Protection Agency concerned with this hearing, I would like to give a statement aimed primarily at the Hawaiian Stilt and its relationship to possible extinction. I have long been associated with this problem, from the year 1943 to '53, I was the Cabinet Officer in the Governor's Cabinet of the Territory of Hawaii, concerned with the protection administration of fish and wildlife. After the war, and we started reconstructing, the first thing to do was to know more about our wildlife and its relationship with its environment.

It had never been done in an overall scale and we employed, through the help of Aldo Leopold, whom conservationists know as one of the early founders of conservation in the United States, and employed on a contract, Mr. Charles Schwartz and his wife, both biologists -- wildlife biologists. In 18 months of field study, they came forth with the most definitive study and compilation on the game birds of Hawaii, of which, at that time, the stilt was one.

Now, this is over 25 years ago, and this is the opening statement on the Hawaiian Stilt. It is a wonder that the Hawaiian Stilt still exists. Further along -- I will just quote

a few places -- "these ponds" -- and it relates to the Kanaha among them -- "should be closed to all trespass and protected from drainage and pollution". Finally, the last paragraph: "The stilt is an endemic Hawaiian species that is greatly endangered but still has enough numbers and remnants of habitat, to be safe from extinction. The danger lies in the lethargy of thought and action, but there is still time."

He also covered the Nene Goose at that time. We took immediate action on the Nene Goose. That was easy. We could rear that in captivity and build up numbers for release.

We took almost immediate action, too, on the Kanaha Pond. I worked out with Mr. F.F. Baldwin, an arrangement to turn that over -- it was under HC&S Company ownership at that time, as a wildlife refuge, under the protection and general management of the Fish and Wildlife Service. So the interest in this pond is not dating from today or last week or 5 years ago, which, by the way, is the anniversary of a special event that we held on February 1st -- I happened to be the moderator, wherein the County offices, represented by the Mayor, the Governor's office, represented by the Land Office, and other dignitaries, gathered with the nature conservancy in the Hui Manu o Maui, to rededicate this pond as a Hawaiian Stilt refuge. It has also been called a national monument, as was told to you by the National Park.

I'm retired, now. I have had a lifetime of work in this field and am still very much concerned with conservation. The first knowledge I had of this sewage treatment plant was a Maui news article on December 7th, 1971. I must confess, I was away and had been out of the State for some months, and had only returned a few months before. On learning this, I joined a study group, of retired men, closely relating to the fields that affect this pond, in geology and hydrology; and we have spent, since February of last year, a considerable time -- so much time, that the other day, I decided I would take a look and try to make out how much it was. I keep a log of my daily activities. I have for years. I find 36 days entered in that, that I spent more than an hour on this pond problem and more than 100 hours altogether.

Now, in today's talk, we have gathered tremendous amounts of information on not only monitoring what has been done in the testing wells, but also on the habitat of the stilt and the factors concerned, its quality as a habitat. And I have undertaken the proposition of giving a little background on why this is such an important bird. It's a native bird of Hawaii. It's of a form of the Black Necked Stilt, which is widely distributed

over the United States Mainland. Actually, the stilt of that sort occurs also exactly as far away from Hawaii as you can get. In 1971, I photographed a very close resemblance to one of ours in Zulu Land, of South Africa, on the marsh there.

This is endemic to Hawaii as a sub-species. As I say, it closely relates to the one on the Mainland, but for anatomical -- minor anatomical references, as determined in the 1880's, when a specimen was sent on to Smithsonian, Mr. Stigner determined it as an additional species, but of a sub-nature to the Species Himantopus.

Other factors that make this a different species is the loss of its migratory habit, its fear of predators. It existed here long before the first man came. It was held sacred by the Hawaiians, and in its position, it has more claim to a heritage in Hawaii than man himself.

The populations of this bird, before Captain Cook, must have been in the untold thousands, because around the Coast, of particularly Kauai, Oahu and Maui, and on the North Kona areas of Hawaii, there were many brackish coastal marshes, providing habitat and food conditions suitable for a large population. The introduction of the first predators, particularly the mongoose and cat, caused a reduction in the nesting areas, and they had to move back from the edges of the marshes into high points in the marshes, where they were more successful in their nesting.

Then later in that 19th Century, man came in as a water-fowl hunter, with his shotgun, and it was on the list of approved game birds, up until 1941, long after ducks and plover had been taken off of that list.

The populations in 1944 were estimated at 200 by George Munro. This is for the Territory. I doubt very much if it ever got that low. However, when the Schwartzes made the study in 1947, which was a very detailed one in all areas of the Islands, they came up with an estimate of 1,000. Today, it ranges between 1200 and 1500. The census given on Maui as of June 29th, '72, was 475, plus or minus.

Now, what do these birds need as a habitat to secure their existence? They need shallow ponds fed by springs of fresh water or brackish water, such as the Kanaha, such as the Mana area on Kauai -- they occupied some thousands of acres, and have now, since 1920, been in sugar cane. That habitat is gone. The Kuapa Pond in Oahu -- now, Hawaii Kai Village -- or Land Development -- and so it goes.

Then there are other habitats that they use, which are not secure habitats. These, as I refer to as "secure" or being furnished by the basal ground water that occurs under all of the -- each one of our volcanic islands, where it breaks to the surface near the shore, bulrushes form, mud flats, and the ideal conditions, with which we find the stilt.

The "insecure" habitats are the shallow ponds that are filled after the winter rains, where water may stand as long as 6 months. Sometimes they find nesting there; always, they find some feeding. There are also the plantation reservoirs, which, as they become mud-filled, get shallow enough for them to feed in; and there are coastal lava pools. I have seen these birds in fair numbers on the Iao, in such pools, on Barbers Point, and the point in the center of the huge capillary forest there is an area that fills up after floods, and I have seen 20 and 30 and 50 in a flock. Lihue, the other day, I saw a reservoir being emptied of its mud up until a few weeks ago, was a habitat for a few birds. The Kealia Pond on this Island was -- is an ideal habitat when it has water on it and right now, because of the expenditure of money from Federal grants, there is work going on there in the raising of catfish and prawns, and there is a spillage over of water that is keeping a film of water on a good part of that pond and the birds are actually nesting on some of the banks; but should the pumping stop -- should that operation come to an end as uneconomic, it will revert back to what it was all the years in the past. In dry weather, it becomes a hardened mud flat; actually, before the War, I mean, before aviation got well started here, and we had airports, it was quite a common thing to land small planes on it.

Now, their food chain -- we say that these birds have to have certain types of food, and they do. They have evolved under certain feed that occurred here in Hawaii. They can make adjustments, but not the kind of adjustments that a species that has evolved under a much wider range. The dragon fly larva was considered one of the major ones. This has greatly diminished through a parasite that has gotten in here that has cut down the population of dragon flies. When I was a boy, the dragon flies were everywhere. Today, we rarely see them. Small fish, water snails, seeds and roots of plants are quoted by Munro. However, in the more detailed types of work that we are doing under our present knowledge of biology, where the intestinal tracts can be examined, where the snails can be identified as to their species, that has not been possible since this science has developed to its present understanding, because this is a protected bird, and there is one way of finding out what they are eating, and that is to shoot and kill them, and we can't do

that any more, so it has remained -- there is a paucity of knowledge, exacting knowledge, on exactly what these birds are feeding on.

Now, to come to what this may do to the sewage -- if the sewage treatment plant and injection wells, as planned, is put into this habitat. The geological and hydrologic evidence at hand, give more than a 50-50 chance that when 3 to 5 million gallons of water per day -- of treated water, is pumped into the injection wells, that some of it will mix with the ground water entering the springs, which have been feeding the Pond for hundreds of years. This water, although clarified and treated to the point where it is safe for irrigation and swimming in, is loaded with the nutrients of such, particularly, phosphates and nitrates, which, in time, will promote a growth of algae, that the foods which the stilt depends on will be eliminated. This will not be something that will occur in one year, 5 years, maybe even 10 years, but it will be the natural process. Such a condition would be ripe or also be right for a sudden drop in oxygen in very hot weather -- hot and still weather, and an outbreak of botulism could occur.

The resident population could be wiped out in two days, if such occurred.

The entire plant complex, with all of the activity associated with it, would very adversely affect the feeding and nesting of the birds. It should never be here.

Now, this hearing -- by the way, I have a copy of this outline, with its reference to go to the record, and I also have a copy of the Schwartz publication, coming from AUK, on their feeding. I have a copy of the Kanaha Pond, Hawaiian Stilt, which was prepared at the time it was rededicated as a stilt by the nature conservancy in the Hui Mano and I have a copy here of the Hawaiian Endangered Water Birds, published by the U. S. Bureau of Fisheries & Wildlife, U. S. Department of the Interior, Portland, Oregon, all of which I would like to leave for the file, but before closing, I would like to bring a few points to your attention.

First of all, you are entering Central Maui, with its biosphere, which means the living objects in this area -- living animals, two of whom are quite concerned about this problem. One is the stilt, naturally, and it has a very definite claim on a right in this environment. It has also reached the stage of an endangered species about where we have the Nene, at the time when we started the Nene project; and I have heard by hearsay, that the stilt is quite concerned about this. In fact, if

you can, some dark night, about 2002 hours, be at the Pond, you will see a sudden rising -- this is the hearsay -- you will see a sudden rising of the stilt, silently forming a dense formation and flying backwards in a protest flight. That's all they can say about it. However, man has a very definite need for sewage treatment, and he is vocal. There are two vocal groups -- I'm one, but the other group is in strong opposition of one of the two major sites that were recommended by the Austin Report, for which the County paid a very handsome sum; and it's a very complete report.

One site was the so-called "Quonset Hut" site. Here, most of the sewage flows to -- from the populated areas of Wailuku and Kahului by gravity. It is back far enough so that it is beyond the tidal wave line of any prior tidal waves. It offers an opportunity to utilize the treated water on a vast area of sand hills where water, laced with nutrients, such as phosphates and nitrates, would be of infinite value in making a -- in establishing a suitable vegetation. Also, if it has to be injected into the earth, to get rid of, into the lavas below, it is not in an area where waters that may come up from it, filled with these types of nutrients, would bother -- no water is taken from that area now that affects existing conditions; and also, there is an outfall already in, in the region of presently, the Wailuku sewage, which was water of this quality and it's this quality water that is being put into the Willamette River and other places on the Mainland and people are enjoying swimming in there, as they weren't able to do before these treatment plants went in. Those are the factors that seem so important to the value of the Quonset area as against the Kanaha.

But why is there this public outcry? It's certainly not because it's the building. The plant structure is a beautiful thing. In fact, it could be easily taken for a lush country club, if you have seen the plan. No, in my opinion, it's fear. It's fear on the part of people that their County of Maui and the engineers they employ, cannot build the kind of plant that is being built in many parts of the world and operated so that it will be free of foul odors.

Now, this fear is quite a natural one, because we have some horrible examples. We have the example of the plant at Kaneohe, using the Kaneohe -- taking care of the Kaneohe sewage. We have another one taking care of the Kailua sewage. Getting to the leeward of those, under almost any conditions, is an unpleasant experience. And naturally, a sewage treatment plant, carries that label.

Now, it has been said that the reason we can go to Kanaha

Pond, is that it will be far enough away; that the one at the Quonsets is right close to an area where there is a heavy human usage. Actually, if you will take the USGS Wailuku Quadrant -- the USGS map of the Wailuku Quadrant, and measure to the Baldwin High School, which is the area closest to the Quonset Hut area, downward -- to the leeward that is, of the tradewinds, which blow about 90% of the time, it is 3,500 feet to Baldwin High School. If you go to the area where it's proposed in the Kanaha Pond, it's 3,500 feet to the Maui Mall, which is also heavily used by people. If you go to the area where there are residences, from Quonset Hut area, it's 4,000 to the Sand Hills.

Now, if this stink pollution is the real factor that we are concerned with, then there is another site that you can go to -- one that was proposed last summer. This third site is in the noxious industrial area near Kanaha Point. Then, the distance would be -- this is a noxious industrial area now. It has a cement mixing plant, it has other heavy industry, and it's isolated and it's far enough away from the Pond so that injection waters would not possibly back up. The distance then to the Maui Mall would be 7,500 feet; to the Kahului industrial area, the other closest downwind developed area is 6,000.

Now, I belong to the other group that feels that it is most essential to protect the Kanaha Pond as a bird refuge, particularly for not only the Hawaiian Stilt, which is very close -- will not see us through many more generations if it is not protected -- and we can't raise it in captivity, on any big scale, that is -- that a clean smelling plant can be built and the advantages of the Quonset area would then prevail.

Such plants are being built in tourist areas in the West Indies now and many U. S. cities. I am speaking for the conservation, not only of the Kanaha Pond and its birds, but for the conservation of the water that could be saved from this vast treatment plant.

Thank you.

HEARINGS OFFICER DUNN: Did I understand you correctly, Mr. Lennox, when you said that your fear was that part of the effluent that came from this treatment plant would get into the Kanaha Pond? Is this your fear?

MR. LENNOX: Yes, I am just passing over that quite quickly, because one member of this Committee that spent so much time on it, who is a geologist-hydrologist, will be spinning a clarified picture of why that occurs -- why we say that.

HEARINGS OFFICER DUNN: You say that he is going to give testimony?

MR. LENNOX: Yes, Dr. Powers.

HEARINGS OFFICER DUNN: All right. Thank you, Mr. Lennox.

(Witness excused)

HEARINGS OFFICER DUNN: Mr. Darrah -- Mr. William Darrah?

STATEMENT BY MR. WILLIAM DARRAH

MR. DARRAH: Mrs. Dunn, Mr. DeFalco, Mr. Seeley, Aloha. My name is William Darrah. I am here as a representative of the National Wildlife Federation of Washington, D.C. I have also been here for about two years.

For the record, the Federation is advocating the preparation of an environmental impact statement on the subject project; also, we wish to go on the record in opposition to the proposed site, in favor of an alternative site, in this case described by the County as "Site A".

The primary concern of the National Wildlife Federation is that the integrity of Kanaha Pond not be interfered with by the introduction of effluent from the advanced sewage and treatment plant into the pond proper. Based upon information presented to us, to the State, we believe that there is such a substantial likelihood that such infiltration will occur, that we are now urging that additional testing occur. In this regard, we make the following comments:

Our general comments are -- first, we do not oppose injection, per se, as a method of disposal. In fact, given the proper assurances that the disposal aquifer is neither continuous with the potable water aquifer or an aquifer supplying the springs which feed Kanaha Pond, we support this disposal method and would not object to its use at an alternative site. However, injection of large quantities of waste water into lava rock, does not have a history of success in Hawaii. Information as to the ultimate path of the injected water is lacking. Accordingly, we believe that some degree of caution is warranted.

Incidentally, I have a number of sites which intersperse this presentation. They are in the prepared copy, which I will give to you.

We recognize that a municipal waste disposal into substrata

limestone is an accepted practice in Hawaii. Specifically, we acknowledge that the State Department of Land & Natural Resources has operated and monitored a 300-foot limestone seated injection well for the past 5 years in Waimanalo, Oahu. Much of the information that has been gained from the tests carried on at that site pertain directly to the instant project and for EPA's convenience, we attach a copy of the preliminary report, which was prepared on the Waimanalo project here, too.

As specifically relates to the proposed site and project, we make the following comments: Assuming arguendo, that one test bore and one pilot test injection is a sufficient basis upon which to make a reasoned judgment, as to where the effluent will disperse, it is the position of the Federation, that the pilot test which was performed, was not adequate. We urge that at least one additional test be performed; and that for that test to be deemed adequate, the following occur:

1. Effluent of a temperature and density similar to that of treated effluent be injected. The pilot test utilize sea water.
2. A maximum injection rate of 10,000 gallons per minute be achieved and maintained. While the test specifications for the test call for this rate, the actual maximum achieved was only about 6,500 gallons per minute, and that for only a limited time.
3. A radioisotopic tracing substance be introduced into the test injection for the purposes of determining where the effluent will go. The first test utilized fluoresceine dye. That tracing substance is not effective in a saline environment.
4. A continuous injection, 24-hour minimum duration of minimum 10,000 gallons per minute be performed, in order that the effect of tidal flow on the recipient aquifer and the required injection can be effectively measured.
5. A systematic sampling and monitoring program be maintained for a minimum period of one week subsequent to the test injection. No such monitoring program occurred during the first test and the monitoring period was, in fact, less than 4 hours.

It is now generally acknowledged that the perched bottom of Kanaha Pond is permeated by a number of fresh water springs and that these springs are supplied by the ground water slightly inland and below the Pond. In light of the assertion by Dr. Cox of the University Environmental Center, that the buoyancy effect of the warm, low density effluent and the cold dense

water in the aquifer has been overlooked, and the fact that the presence of numerous vertical fissures in the substrata lava rock is presently acknowledged, there appears a reasonable likelihood that the effluent will migrate inland and into the aquifer which supplies the springs in this Pond. Accordingly, the possibility of infiltration must be carefully examined.

In that regard, the following should be noted: It is indicated in the reports on the Waimanalo injection well, the ground water in coastal regions is continually migrating seaward, and there accordingly, an injection slug, in spite of any buoyancy effect will disperse an ellipsoid shape and then drift towards the sea, and that there will be no drift back. It has also been suggested that if inland migration does, in fact, occur, dilution of the effluent into the aquifer will be complete and the effort will be rendered neutral prior to its introduction into the pond.

The Federation urges that both of these theories may be in error and that in fact, both back drift and incomplete dilution may occur. First, there is data to indicate that there is only minimal hydrologic conductivity between the injection site and the sea and that if a head of sufficient strength to force the effluent laterally through the aquifer is generated, that same head will force the effluent through vertical fissures in the lava rock, and from there, through the breaches in the Pond bottom to the Pond. This is borne out by the test results of the Conservation Council of Hawaii, which indicated that the water level in the test well varied only about 7 inches during a period where there was experienced the 2-foot rise and fall of the tide, which is an indicator of low permeability.

Second and more important is the fact -- and various experts assert -- that the waste effluent will migrate under and inland of the Pond by acknowledging that the Maui Department of Land and Natural Resources well -- that's a State well, located inland of the Pond, in the same aquifer as the effluent, recipient aquifer will draw effluent to the surface. And this follows here with some sites.

An early criticism of the present site that it was so situated that existing force mains and trunk lines would lead directly to the plant, are subject to high rates of infiltration; and that because of the difficulty of an activated sludge type treatment plant, to treat highly diluted waste, this proposed plant will not function properly. The same criticisms indicated that Site A, which is the Quonset Hut site, is so located that infiltration can be almost completely avoided by initially limiting plant hookup to the Wailuku and West Kahului system, which

is a relatively low infiltration system and thereafter, the East Kahalui collection system, after it has been approved, can be hooked up.

Infiltration should be a primary consideration in plant location. As you are aware, by Section 201 (g)(3) of Public Law 92500, the Congress has indicated its intent that no funding be granted for plant construction after July 1st, 1973, where there is substantial infiltration of the associated collection system. The rationale implicit in the statute is that the cost of treating the infiltrate should never exceed the cost of repairing the system.

The existing Wailuku-Kahalui system, in total, has a high infiltration rate. Illustrative of this is the fact that the Kahalui pump station, located very near Site 1-B, the proposed site, pumps between 1.43 and 2 million gallons a day and has an infiltration factor of between 66 and 90%. However, the areas where intrusion occurs seems to be confined to a very small area in the extreme northeast section of Kahalui, approximately one mile from the proposed site. It also appears that this area of high infiltration is one that can be isolated from the remainder of the system with a relative degree of engineering ease. All other systems of the Kahalui collection system have moderate to high integrity. Obviously, the collection system must be repaired. As the County's own consultant concluded, without repair to this system, economic treatment and reuse of waste water is not possible. At the same time, the sewage treatment plant must be constructed as soon as possible. Construction and repair must then proceed concurrently. Optimunly, the completed sewage treatment plant will receive waste with minimal infiltrate.

If the proposed site is utilized, all of the infiltrate in the system, will have to be treated and injected, because the trunk lines feeding any plant at the proposed site, run through and connect to the area of high infiltration. If, however, Site A is utilized, the waste reaching the plant will have very little infiltrate, if that small part of the collection system, located in Northeast Kahalui and characterized by high infiltration is not connected until it is repaired.

In view of the foregoing, it appears that a more feasible alternative, economically, is to construct a sewage treatment plant at Site A, and at the same time, repair a limited section of the collection system where high infiltration presently occurs. When EPA is satisfied that the infiltration problem has been solved, they can authorize the connection of the remainder of the system.

To our knowledge, no one to this date has considered the impact of clearing 19.3 acres of the land which is presently covered with relatively dense undergrowth. The impact of a construction period of approximately 18 months in length; the impact of laying new trunk lines and force mains from the existing system to the plant site; the impact of trucks constantly hauling sludge from the plant, once the plant is completed; and the impact of a large physical structure which will ultimately complete the ongoing process of pond enclosure -- this is our areas of major concern which we believe EPA should consider and examine.

Some additional comments bearing directly on site location: Assuming that it is concluded by EPA that no infiltration of Kanaha Pond will result from effluent injection; infiltration of the collection system is not found to be a major factor in site determination; and the actual construction and maintenance of the plant will not have an unacceptable, adverse effect on the surrounding environment; there are still additional factors which must be considered in any reasoned analysis of the relative benefits of Site B -- proposed Site, over Site A. Specifically, from the consultant's report and the other documents which we have reviewed, it appears:

1. Siting A can reduce plant costs by as much as \$1,815,680. This figure does not include the additional cost of seeding the required erosion control revetment, in foundation rock, which is located 60 feet below beach level, which is no mean engineering task, and which that additional cost has never been estimated to our knowledge;

2. As Mr. Lennox indicated, that Site A is at a point where most of the existing sewage from the Wailuku-Kahalui sewage treatment system is presently conveyed by gravity;

3. That Site A is in an area where treated effluent could be more readily utilized for irrigation;

4. That Site A is not in a tsunami zone. We would emphasize that the method of protection proposed for Site 1-B, at an additional cost of \$140,000, has been characterized by Dr. Cox as of "questionable adequacy";

5. That Site A, in fact, is so located that if any odor is produced by the plant, it would have less adverse effect on the surrounding environment, because of the prevailing wind direction and population distribution. And this is not a concession on our part that the plant will produce odor; and

6. That Site B is located on land which is extremely unstable structurally; specifically, Site B, the proposed site, is in a "critically eroded and eroding area", Hawaii Regional Inventory of the National Shoreline Study, prepared by the Department of the Army, and has been further classified by the U. S. Soil Conservation Service as "highly pervious and of poor stability". That is to say, we have no assurances that if that plant is constructed on that tract of land, that that plant has a physical ability to remain there.

Finally, the Federation strongly disagrees that a policy of unlimited growth should be adopted and fostered by any County in Maui; and specifically urges in this regard, that building a sewage treatment plant, capable of sustaining a doubling of population in the subject area by the year 1985, is improper. Insofar as population projections in the consultant's report of 36,500 above the existing population of 16,500, is not supported, and in fact, is contradicted by presently experienced growth rates in the County, we reject them; and we particularly reject the notion initially put forth by EPA, that "the consequences of doubling the population are largely speculative". Both the need for additional capacity, in the effect of a population which would require that additional capacity, must be thoroughly examined by EPA.

Thank you.

HEARINGS OFFICER DUNN: I have a question, Mr. Darrah. I believe you stated that your information was that the land was not structurally sound and did you quote that from a U. S. Conservation Service leaflet of some kind?

MR. DARRAH: Yes, I did, Mrs. Dunn.

HEARINGS OFFICER DUNN: Could you give me the name of the leaflet and the page number? Or perhaps some other identification?

MR. DARRAH: Yes, the quote that the area is a "critically eroded and eroding area" is from the Hawaii Regional Inventory of the National Shoreline Study, U. S. Army Division -- or U. S. Army, Division Pacific Ocean, Honolulu, August, 1971; and we will provide a copy of that quote. Essentially, what the Army concludes is that that shoreline is continually eroding inland. In 1940, it was so situated to be approximately 100 feet out-board of where it is now. This can be readily seen by looking at the pillbox, which is now submerged in the water off the shore.

The quote that the soil is "highly pervious and of 'poor stability'", is from the Massive U. S. Soil Conservation Service Statewide Survey, which was published August, '72. The quote appears at Page 175 of that document.

HEARINGS OFFICER DUNN: This information is in the statement that you are presenting to us?

MR. DARRAH: Yes, it can be put in there, if you would like. I can xerox a page and also xerox the cover. The second one was an EPA sponsored study.

HEARINGS OFFICER DUNN: Over what period of time was this -- what did you say, approximately 100 feet of erosion? Over what period of time did this take place?

MR. DARRAH: Yes. Information of that nature was passed on to me second hand by John Bose, who could, when he makes his testimony tonight, more specifically tell you what the situation is. I have been told that the existing shoreline is actually 800 feet outboard of where -- the pre-existing shoreline -- the original shoreline is 800 feet outboard of where it is now.

HEARINGS OFFICER DUNN: Over what period of time?

MR. DARRAH: That, I don't know. I have been told that since 1940, the shoreline has eroded inland 100 feet.

HEARINGS OFFICER DUNN: So that's approximately 32 years, is that correct?

MR. DARRAH: I guess so, yes.

HEARINGS OFFICER DUNN: Okay. Have you anything else to offer?

MR. DARRAH: No, thank you.

HEARINGS OFFICER DUNN: Thank you very much for coming, Mr. Darrah.

MR. DARRAH: Thank you.

(Witness excused)

HEARINGS OFFICER DUNN: Mrs. Dorothy Pyle?

STATEMENT BY MRS. DOROTHY PYLE

BILL'S RECORDING SERVICE
PORTLAND, OREGON - HONOLULU HAWAII

MRS. PYLE: I have a rather brief statement to make. Actually, Kanaha Pond is most widely known as a wildlife refuge and the home of the --- (interrupted)

HEARINGS OFFICER DUNN: Excuse me, Mrs. Pyle. Your full name is Dorothy Pyle?

MRS. PYLE: Right.

HEARINGS OFFICER DUNN: And you are a resident of Maui?

MRS. PYLE: Yes, I am.

HEARINGS OFFICER DUNN: Are you representing someone other than yourself here today?

MRS. PYLE: Well, I could say I was representing my husband and a whole lot of my friends.

HEARINGS OFFICER DUNN: Okay, fine.

MRS. PYLE: Okay? Actually, I had better say that -- well, perhaps some attention should be paid to the fact that it's also an important historical -- a very important and valuable historical site. It has been connected with the Alii of Oahu, Maui and the Big Island. Although there is no concrete evidence, it being before the beginning of recorded history in Hawaii, the Pond is traditionally believed to have been constructed under the order of King Kapi'i'oho (phonetic) about 250 years ago. The Pond was, at that time, divided into two, by a stone wall or a kuapa and was built by laborers standing so closely together that they could pass stones from hand to hand.

There was an ancient kapu or taboo on the rock dividing wall, but this was broken down when a high priestess princess of Maui walked on it, in meeting her brother, Kanaha'o'kalani, who had been lost. The Pond is named after him -- Kanaha Pond. There are numerous other legends and stories involving this Pond.

For several years, I worked in Honolulu with -- as a historian for the Hawaiian Register of Historic Places. Now, this was an organization whose main purpose was to record and to evaluate historical sites and to place them on a register of historic sites for the State of Hawaii. I can say, with my past experience, having studied this information, that there is no doubt in my mind that within a short time, Kanaha Pond will be a State registered historic site; so it seems to me that besides it being a National, natural landmark, it also being a

State registered historical site, would give it double reason to be preserved.

I also -- this is my own personal opinion -- have a third reason why I think this Pond should be preserved and not be turned into a sewage treatment plant; and that is, that it is a one of a kind thing. When it's gone, it's going to be gone and there's no way in the world that we will be able to bring it back or restore it or find another one to take its place. It's the only one there is and that's all. So I would strongly recommend that an environmental impact statement be made on this area.

HEARINGS OFFICER DUNN: Well, the fact that it may be made into a State historical site and the fact that it is a National, natural landmark site -- now, what does that have to do with how the sewage treatment plant may affect the Kanaha Pond?

MRS. PYLE: Well, it would seem to me that historical sites should be kept in their historical nature or in their historical surroundings. The building of a sewage treatment plant on top of a historical site, to me, is kind of removing the historical value from the place.

HEARINGS OFFICER DUNN: I'm not sure -- do you have information that this sewage treatment plant is being built on top of the Pond?

MRS. PYLE: Well, I think that -- there is an example that can be used in this, if you want to use this kind of thing as an example. There are numerous registered National landmarks or National registered historic sites. One that I can think of was in an area either in Virginia or North Carolina, somewhere like that, where they wanted to build a bridge that would come into the historical area. Now, it wasn't going to knock down the buildings, it wasn't going to do anything like that; but it was decided by the National Advisory Council for Historic Preservation that that bridge not be built in that area, because it would have an adverse effect on the historical nature of the area. I think that even if the sewage treatment plant was not built directly upon the fish pond or the wildlife refuge, it would be in such a position and built in such a way that it would have an adverse effect in the area and thus ruin the historical value.

HEARINGS OFFICER DUNN: Have you anything else to add?

MRS. PYLE: No.

HEARINGS OFFICER DUNN: Thank you very much.

MRS. PYLE: I will leave you this -- this is the only copy I have.

HEARINGS OFFICER DUNN: Thank you.

MRS. PYLE: You are welcome.

(Witness excused)

HEARINGS OFFICER DUNN: Mr. Toshi Enomoto.

STATEMENT BY MR. TOSHI ENOMOTO

MR. ENOMOTO: Madam Chairman, good afternoon, ladies and gentlemen. I shall make it very short. I primarily wanted to ask this question publically, here: What happened to the plans for a park in the Kanaha area? So, since I have seen some of our councilmen here, I would like to direct that question to them.

Thank you very much.

HEARINGS OFFICER DUNN: Well, Mr. Enomoto, I'm sorry, it isn't a question and answer type of hearing. Perhaps you could --- (interrupted)

MR. ENOMOTO: Well, what I am trying to say is, that I am agin' this Kanaha Pond site for the sewage plant.

HEARINGS OFFICER DUNN: Did you wish to make any further statement as to why you are against it?

MR. ENOMOTO: Well, thank you for the time, then. Well, I grew up in Kahalui, and this may surprise Mrs. F. F. Baldwin here, but me -- myself and my constituents used to trespass in there and we used to search for mudhen eggs and make omelets with them; and long before the experts came over there to find out about the springs in that Kanaha Pond, we knew all about it.

So, I am a bird lover myself -- never changed -- fish lover, too, and I hope that instead of a sewage plant over there, that the State or the County will go ahead and open up the drainage ditch so that we can have that water which is now all piled up and without any outlet. We could have fish coming in, because it used to be a spawning ground for fish. We had all kinds of fish in the harbor, so I say this, let's have the fish to come back. Open up the place and take the sewage plant some place

else -- Maalaea, more better, you know -- Maalaea might be a better place. Talk about windage and all that, well, there you go.

(Laughter)

MR. ENOMOTO: So, I say, save Kanaha Pond for the birds and fish and open up the ditch, let the fish grow and the spawning grounds. We used to catch mullets over there, you know, at the outlet; and in fact, four of us, we were caught by the Fish & Game, one time, catching mullets out of season, you know. Thank you very much.

(Laughter and applause)

HEARINGS OFFICER DUNN: Thank you, Mr. Enomoto.

(Witness excused)

HEARINGS OFFICER DUNN: Mr. Janion? Is that the way to pronounce your name, sir, Janion?

MR. JANION: Janion.

STATEMENT BY MR. ALBERT JANION

MR. JANION: Mrs. Chairman, ladies and gentlemen, my name is Albert Janion; I am the President of the Maui Historical Society, although what I have to say has nothing to do with the Maui Historical Society. I am not speaking for them.

It seems to me, a very strange thing -- I remember very distinctly, and I think many of us do, that in 1970, when there was a question of extending the runway of the airport, in the direction of Spreckelsville, we put up a protest because we were bothered by the noise and there's always a potential danger to houses when there are planes in the area -- we have so far been fortunate, but there is that danger. However, we were told very distinctly by members of the Council and by members of the State Government, that no matter what might happen to humans, nobody was going to disturb those birds. Now, three years later, we have a complete change of heart.

Another thing, too, is that in today or yesterday's paper, I think, the Chamber of Commerce said that they approved the Kanaha Pond site, but they stipulated that adequate tsunami protection was made. Ladies and gentlemen, there is absolutely no protection against a tidal wave. I remember very distinctly in 1924, when the steamship KILAUEA was tied up, at the Claudine

Wharf (phonetic), I saw the ship picked up by the wave and put on the warehouse; and so far, we have not ever had a major tidal wave in the Hawaiian Islands, if you count the Krakatoa explosion in 1881 as the limit. In that case, the wave went over the tops of palm trees 90 feet in the air and at one point, the wave -- I think at ~~Anchow~~, in Java, was 123 feet high. That would take us almost up to Wailuku, but there can be no adequate tidal wave protection; and so, the building of a wall isn't going to help, because although so far, we have never had a major tidal wave, there is no telling what might happen. A volcano exploded less than a few weeks ago, which hasn't exploded for a thousand years, so you don't know where you are. All you can do is hope for the best. But I think that in view of everything that has been said, I couldn't possibly -- I am not an engineer and I couldn't possibly do anything than register my disapproval of the Kanaha Pond as a sewage site.

Thank you very much.

HEARINGS OFFICER DUNN: Well, Mr. Janion, how do you feel that a tidal wave is going to affect a sewage plant or --- (interrupted)

MR. JANION: Well, as I understand, there would probably be a building above the ground and that building would be liable to be washed out completely in a major tidal wave.

HEARINGS OFFICER DUNN: Isn't that true of all buildings in the area?

MR. JANION: Oh, yes; yes. Within, say, up to a certain height -- let's say up to 162 feet, yes.

HEARINGS OFFICER DUNN: And how does that affect -- how does that affect the presence of a sewage treatment plant on Kanaha Pond and the birds?

MR. JANION: Well, of course, the tidal wave itself, in recession, sucks out almost everything that it can.

HEARINGS OFFICER DUNN: Then it could also suck out the Pond, too, is that right?

MR. JANION: Oh, yes, it's possible. In Java -- there are 90 volcanoes in Java, and when they had the Krakatoa explosion, 100 -- I think 132 villages were completely wiped out, with a loss of 40,000 lives and many thousands of lives lost of people sucked out to sea and never heard of again. So it can do as much damage going out as it could do coming in, but we don't --

hopefully, we don't expect a wave of that size. There has only been one in the known history of the world, that size.

Of the small tidal waves that we have had here, the Quonset Hut area would be a much safer place. Thank you.

HEARINGS OFFICER DUNN: Now, this is with regard to your feeling that the sewage treatment plant itself would be safer in another location, is that what you are saying?

MR. JANION: Oh, it would be a safer place for a plant in another location, yes, definitely. Because, if you will look in the beginning of the telephone book, you will see, on the north shore, where the black line -- showing the tidal wave prone areas, and where the proposed site is, it is almost -- almost the thickest part of the black line. It is one of the most prone areas that is marked.

HEARINGS OFFICER DUNN: Now, I have forgotten -- when did you say was the last time we had a major tidal wave in Maui?

MR. JANION: Oh, that wasn't the last one. I was away for a great number of years, but I do remember very distinctly, the 1924 tidal wave. It might have been '25. I think it was '24; but where the shopping center now stands, there were people standing up to their knees in water, picking up fish, which is quite a good sized one.

HEARINGS OFFICER DUNN: Very well. Thank you, Mr. Janion.

MR. JANION: Thank you very much.

(Witness excused)

HEARINGS OFFICER DUNN: May I request that we not have any individual conversations among yourselves while we are having people give their statements and make their comments? Mr. David Enomoto.

STATEMENT BY MR. DAVID C.K. ENOMOTO

MR. ENOMOTO: Thank you. My name is David C.K. Enomoto. I am a resident of Kahului since 1917, to this date.

I have seen every tidal wave generated here in this harbor and I did work on all the necessary clearing up of all the debris, and et cetera.

I am not in favor, at the moment, of the sewage treatment

plant in Kanaha Pond. The reason for this, in Kahului, we have two problems -- the tidal wave -- excuse me -- and the erosion, along the seashore; and of course, we have our pollution problem -- the Wailuku outfall, which is on my left, where I reside in the Harbor View Tracts. We have the Kahului Sewage Plant right near the Kanaha Pond site. I live right alongside of both outlets of the outfall to the sewage systems.

I am not going to go into any details on the problem of pollution, but I think we are a little too fast in deciding where we should put the sewage plant. I know it's a problem with the engineers. They have regulated and put in a lot of time to see which is the best place. If I had to make my statement to economize, I would put that plant right where the second alternate plan is, proposed, for this reason: Not too long ago, I read in the paper where the Corps of Engineers was going to put in revetment along the Kahului Harbor area, along down to the section where I live, of course, up to this part of the area, what we call the breakwater -- it's going to be good. I agree. I wrote them a letter, stating my opinion. I go along with the idea, because when I served in the Harbor Board, 8 years, that was one of my pet projects, to try to protect Kahului from wave action, because I guess most of you know how the tidal waves generate and how they do subside, and et cetera. I have been in every tidal wave practically, when they were generated, other than in the evening, right from the pier where I was employed.

HEARINGS OFFICER DUNN: Mr. Enomoto, are you worried about the location of the sewage plant being destroyed or the sewage plant being destroyed by a tidal wave or are you worried about the Pond?

MR. ENOMOTO: Well, that problem, ma'am, is -- a tidal wave, when it comes in -- I am speaking for myself, please. I don't represent nobody. I am speaking as an individual, resident of Kahului from 1917 to '71, I worked 51 years for the Kahului Railroad. I started as a laborer, stevedore and came up to be a superintendent; and got into all these projects. But, speaking of a tidal wave, it is a lot of problems, because I believe more on the portion of erosion.

Now, I can give you an example -- if the sewage plant was built over there on the Kanaha site, you will never see a tidal wave come in or you will never see it come in for the next 20 years; but erosion will take place. If I go back there, to the year when I worked in there, putting in that drainage to clean up Kanaha Pond, under Mr. Bill Walsh, Mr. Watkins -- Wilbur Watkins, Harrison Foss (phonetic) -- they were the engineers for

Mr. Frank Baldwin; and Mr. Frank Baldwin wants to preserve Kanaha Pond. The reason why is because of the birds. But there was one big problem that we had -- we had a lot of rain in those years. Kanaha Pond used to flood quite a bit -- up to three feet of water. We had the only means of power generation plant and Maui was well, too. They had a generative cooling system of water going into the Pond -- that is, the surplus water coming in off the ditches or the plantation ditches, and of course, when the snow -- heavy rain up in the kula, they come clear down to the ditches and fill up Kanaha Pond, and then the water would overflow the roads.

HEARINGS OFFICER DUNN: What effect did you feel that this sewage treatment plant will have on Kanaha Pond and the birds? Do you have any information?

MR. ENOMOTO: Well, I am not an engineer, but I know, any sewage plant, there must be an inlet and an outlet. There must be some sort of pollution. All I know is what is in the papers -- they are going to drill so many feet down and the water is going to drill out -- well, I don't buy it, because I feel an outlet should be provided and the inlet should be protected. Now, I live right near the sewage plant. I don't see no problem as far as smell goes. What I am trying to say is, let's keep that Kanaha Pond as she is, with the protection, what we can give, with a contemplated, already generated project for parks that is going to be in that area, and let's look ahead 25 years. With the plant in that site, I don't think it is really going to be of any help for anyone in the future or to any advantage.

What is the rush? I don't think we should rush anything about it. You can put two small plants -- one small plant right way inside where the present site is, and put one in the outfall, and you can have two small plants -- or put a centralized plant, right in the central here, near the Quonset Huts here. Economically, I believe we can kill two birds with one shot and have a better operation.

Now, I am not arguing about that, but it's my thinking. But let's preserve Kanaha Pond and leave the birds the way they are. I lived 25 years right next to Kanaha Pond and I know the bird life. There were thousands of wild ducks. We had thousands of 'Akekekes, golden plovers -- we had mudhens, we had geese -- we had 'Auku'us and we had numerous other birds -- then, we had the Cardinals come in and I can almost tell when the birds are mating, when they are coming in -- just by the way they sing; and I love birds, just like my brother said, he loves birds and I love fish.

For the second reason is, the fishing grounds should be kept clean. Where we are now, where the sewage plant is going to be planned, you are going to have a certain amount of pollution out on the outside. It is not polluted there as yet. Kahului Harbor is polluted from the end of Maui Electric right down -- clear down to -- clear down to Paukukalo. And there is nothing you can do about absorbing -- well, all the reports that the Board of Health gives, and just to take it with a grain of salt and just live with it. Why can't we figure, take this plant and put it up there, when we can put it down there and put the contaminated water within the confines to the polluted water and make a go of it? I think economically, we are not widening the area -- confining the ocean area to a small area. We think that area I am talking about, rather than going out on the Kanaha Pond site and putting in the sewage plant and they are afraid to contaminate the water out there, and then, of course, we won't have a park there, we won't have a fishing ground there. We have a lot of fish lovers. I don't know how many of you here are skindivers and love to fish and we have good, clean fish.

There is no place in Maui today, that I can see. I have lived here long enough that we can say, "Well, oh, there is going to be our next spot." You get from Maalaea down to Wailea, I think is already taken up.

Now, there may be a sewage plant built in Lahaina, there may be one at Kāhe, there may be one in Baldwin Park, to take care of the Paia area. We have to take care of the Wailuku outfall and we have the Kahului outfall. We have five areas. I am not an engineer, but I think I am experienced enough to know what should be done and why the rush? Give these people here, sitting here -- for all I know, they are bird lovers and give Kanaha Pond a chance to exist; and I still maintain that Mr. Baldwin really could have eliminated Kanaha Pond with this respect.

As you know, when you drive up Kanaha Pond, you will see all the coral fill on the side of the road. And now you see some buildings coming up. We had a project of digging Kahului Harbor. We could have taken all of that sand and filled Kanaha Pond, but Mr. Baldwin said, "Just enough to cover the overflow water coming in, to take care of the Haleakala Highway -- the rest is pau"-- it ended right there and they got the engineers together, Mr. Wong, Mr. Watkins, Harrison Foss, and they designed the outfall, which was the present water outlet for Kanaha Pond. It was made in a float system, taking care of the high and low tide water level for the wave action that comes in -- water will come in through the Kanaha Pond. When the Kanaha

Pond fills up, the water will go out with the tide and kept the marine life active and we had thousands of fish all over. And today, we don't have it. Unfortunately, the tidal wave came along and knocked everything out, broke all the pipelines, and that is non-existent. And I am sorry to say -- we could have improved the place right after that and kept the Kanaha Pond more active. We would have more birds come in there and you will be surprised -- the more fresh water in there -- there is a spring in there-- there is a breakwater in there. We get in a boat, we go out there, and we used to drive in there. There's a lot of fish in there. But as you know, there is nothing -- water is stymied, it's real rough on the birds to live; but nevertheless, we do have spring water in there, which really exists for the life of the birds.

Now, I would like to say this, that as a person who has lived here long enough and seen what's going on, I like to see the future preserved -- keep that area open and the future contemplated, putting in parks along that area and keep the water clean out there, because I know, when the current comes in with the pollution of the Kahului Sewage System, the water will never reach that area. When they surveyed the Harbor, under Mr. Paul Low, I was the skipper of the boat that took the engineers out and dropped flags -- put a marker in there, and every morning, we would see how far the marker float will run and where they would sit back and start to dribble in, right within the Harbor, and we know just about where this spot the current will stop, and then when it is active again, it will start to go out, three miles, clear out to that 3-mile buoy that we have. That's the reason why we have two -- in my opinion, now -- that is the reason why we have two outfalls -- and facing to us, northeast and one going east, just because of this current action.

When I was on the Harbor Board, I made many, many talks regarding to this statement, when we were talking about harbors between the different Islands. And the wave action, when a tidal wave comes in, no matter when the tidal wave hits Kahului, it will hit Kahului right in the town, because of this reason. Now, the water will go -- follow the deep. Since we have dug the Harbor lately, for bigger ships to come in, when the tidal wave comes in, it is going to be more severe. Because I know, when it recedes -- when it comes in, it will never go to where I live, on the west side of the breakwater. It will never come in up this side, but it will take care of Kahului, right in between the area where the stores are.

That's the way it goes, and every tidal wave that we had, it acted the same way. We have turbulence one here, then come down and another turbulence, this way, but I am not an expert

on tidal waves, but we studied a lot of that wave action when I was with the Harbor Board, and that was a problem -- all the Islands to protect the harbors, and et cetera.

Now, I can go on and on, but I am sure, if you want to know anything, I will be very happy to say, because as I said, I represent myself, because I think I am the oldest one living here in Kahului, from 1917. I retired in '69 and I am still active. I will be close to 70 -- 69 and I have seen every speck of Kahului built from the year 1917.

Kahului town was built in the 20's --- (interrupted)

HEARINGS OFFICER DUNN: Mr. Enomoto, we are very appreciative of your extensive knowledge about Kahului and the buildings here and we congratulate you on your youthful appearance. Have you anything else to add with regard to the effect of the sewage treatment plant on Kanaha Pond only?

MR. ENOMOTO: Well, I would like to say this, I would rather not have it there.

HEARINGS OFFICER DUNN: All right, thank you.

(Applause)

HEARINGS OFFICER DUNN: Thank you very much, Mr. Enomoto; thank you very much.

(Witness excused)

HEARINGS OFFICER DUNN: Mrs. Gloria Foster?

STATEMENT BY MRS. GLORIA FOSTER

MRS. FOSTER: Madam Chairman, ladies and gentlemen, the speakers before me, especially Mr. Lennox, have expressed my very deep feelings about preserving Kanaha Pond.

I am a Maui girl; I was born in Paia, and as I grew up, I spent my recreation time between Lower Paia, Baldwin Park. At that time, we called it the "Kinney Beach", because Mr. Kinney had a house on a sand dune. I no longer find that sand dune there, and we used to hike clear down to Spreckelsville -- that whole area was a playground; and during all of the years -- all of these youthful years, even to this past year, I have seen tremendous changes on these beaches -- the erosion, especially, in NASCA, and where the Kanaha Pond is, where we used to play -- where we used to catch fish, we used to do everything that

all Hawaiian kids did. So from a standpoint of recreation, I would say, let us preserve Kanaha. Kanaha is a national treasure. Please, let us keep it.

Aloha.

(Applause)

HEARINGS OFFICER DUNN: Thank you, Mrs. Foster.

(Witness excused)

HEARINGS OFFICER DUNN: Mr. Neilson -- Mr. William Neilson.

STATEMENT BY MR. WILLIAM NEILSON

MR. NEILSON: My name is William Neilson, and I am speaking as an individual. I happen to be a neighbor of Mr. Enomoto's and he will probably throw me out of here when I get through.

At a meeting held in the Kahului Library conference room on March 19th, 1971, I stated that a proposed site on the airport would be ideal, because the airport property could not be used for residences. It would be a mistake to take 11 acres of good land from the Quonset Hut area.

I wish at this time to reaffirm my position. It is my understanding that the area required now for the Kahului-Wailuku Treatment Plant is 20 acres, as against the previously estimated 11 acres. To take 20 acres of land that should conceivably be used for residential sites, become part of the Maui War Memorial Complex, possibly be used in future expansion of Maui Community College, or be used as a park, would be a serious mistake in judgment, when there is available, land that cannot be used for these purposes, and for which the County will not have to pay.

Aside from freeing land for community purposes, an extra benefit would be that the airport sewer system could be easily tied into the County system, thus, doing away with the present open sewage stabilization pond now located on the airport.

For the above reasons, I urge that the sewage plant be located on the airport property. Respectfully submitted.

HEARINGS OFFICER DUNN: Thank you very much, Mr. Neilson.

(Witness excused)

HEARINGS OFFICER DUNN: Mr. Kobayashi.

STATEMENT BY MR. KEICHI KOBAYASHI

MR. KOBAYASHI: I am a little different from most of you. I take off my glasses to read.

My name is Keichi Kobayashi. I live in Wailuku, Maui, at 287 Lelehoku Street. I am in favor of the Wailuku-Kahului Sewage Treatment Plant. I am not for or against the Kanaha Pond site as the location for this plant.

I am opposed to the proposed alternate site behind the Quonset Huts on Kahului Beach Road. I am one of those people who live in the 1200-foot perimeter along with the Maui Community College, Baldwin High School, and the recreational complex. For me, 1200 feet is one foot too close for a sewage treatment plant.

I, too, would like to suggest alternate sites. The first site would be somewhere in the Pukalani area. There will never be danger from tsunamis. Residents in that area complained of lack of water. A large development, which includes a golf course, is being hindered, because of water problems. Effluent from the treatment plant could be used to irrigate the golf course and the homes in the area, as well as the sugar cane. Surely, this puka would blossom and become heavenly again.

Because costs of building the plant at this site can be prohibitive, I would like to suggest another alternate site. This site would be in Spreckelsville, in the Maui Country Club, Baldwin Park area. Certainly, this area is no more vulnerable to tsunamis than the Quonset Hut area. Again, effluent could be used to irrigate the recreational complex of the golf course and the parks. Much more cane lands, closer to this site, are available for irrigation also.

Finally, to the bird watchers, I say, take heart and keep the faith. One of the species that I thought was extinct, has made a comeback. The Koeas are back. I personally have not seen any of this species in the past, but from old time bird watchers' remarks, this specie is very hardy and can subsist in various elements, and with carpet bags in hand, they flit from place to place.

Thank you.

HEARINGS OFFICER DUNN: You have no comments to make with regard to the location of the sewage treatment plant near Kanaha Pond nor the effects that it would have on Kanaha Pond, which would indicate that we should prepare an impact statement?

MR. KOBAYASHI: No, I do not.

HEARINGS OFFICER DUNN: Okay. Thank you, Mr. Kobayashi.

(Witness excused)

HEARINGS OFFICER DUNN: Mr. Seebrick? Mr. K. C. Seebrick?
Yes, Mr. Seebrick?

STATEMENT BY MR. K. C. SEEBRICK

MR. SEEBRICK: Yes. I didn't expect to be called upon.
I put down I was willing to speak, if asked.

I first came to Maui in February of 1921 and I have moved over here and have lived here since 1953. I have been in the academic field and I have traveled over the Territory and then the State, so I feel I have a pretty good knowledge.

My field is administration, from the University and College point of view and I have been very, very much interested in Hawaii for a long time.

I am opposed to the location of this plant and building at Kanaha Pond, because, for many, many years, so much work was done to establish this monument and I think that it has not been established -- I know it has not been established that there will not be pollution. I am confident from seeing a number of tidal waves during this period, that it would be practically impossible to protect a plant that is put out at the place where they are planning on putting it now. Even without a tidal wave, the way in which that shoreline has changed, is to me, so clear an indication that it's the wrong place; and since there are alternate places, I think that more studies should be made and we should be more careful.

There is no question at all that we do need this sewage plant and we need it soon. But there are alternate places that, in my judgment, are much better for the future growth of Maui and for the protection of the people, as well as for the birds.

HEARINGS OFFICER DUNN: Thank you, Mr. Seebrick.

(Witness excused)

HEARINGS OFFICER DUNN: Let's take a 10-minute recess.

(Short recess)



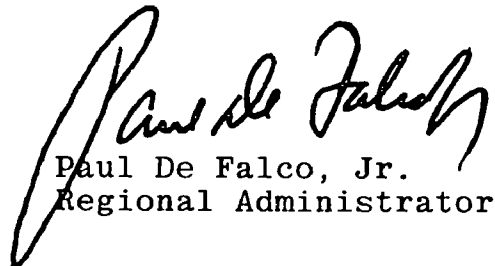
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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
100 CALIFORNIA STREET
SAN FRANCISCO, CALIFORNIA 94111

To Whom it May Concern:

The attached Draft Environmental Statement (D-EPA-24004-HI) for the construction of Wastewater Treatment and Disposal System, Wailuku-Kahului, County of Maui, Hawaii is hereby submitted for your review and comment. It has been prepared in compliance with the National Environmental Policy Act of 1969 and subsequent regulations prepared by the Council on Environmental Quality and the Environmental Protection Agency. Comments should be sent to this Office within thirty (30) days of the date of this letter. All comments received will be considered in the preparation of the Final Environmental Statement for this project.

Sincerely,



Paul De Falco, Jr.
Regional Administrator

Attachments

HEARINGS OFFICER DUNN: Ladies and gentlemen, please, would you take your seats? Ladies and gentlemen, would you take your seats, please? We are ready to reconvene the hearing.

If there is anyone who has not filled in a registration card, would you please do so? The registration card looks something like this (indicating), and they are available on the table in the back. Unless you fill out a registration card, your name will not appear in the record as having attended the hearing. If you do fill out a registration card, you will go on record as having attended.

Mrs. Margaret Sowers. Mrs. Margaret Sowers?

(No response)

HEARINGS OFFICER DUNN: Mr. Taylor -- Mr. Maurice Taylor?

STATEMENT BY MR. MAURICE TAYLOR

MR. TAYLOR: My name is Maurice Taylor. I am a Fish & Wildlife Biologist with the Bureau of Sport Fisheries & Wildlife; and at this time, I would like to make a brief oral statement in lieu of our former written statement, which will be mailed to you within the week.

HEARINGS OFFICER DUNN: You may do so, Mr. Taylor.

MR. TAYLOR: The Bureau of Sport Fisheries & Wildlife is concerned with the construction of the facility adjacent to Kanaha Pond. Our concern, basically, is the maintenance of water quality in the Pond for the endangered bird species and Kanaha Pond, as has previously been stated, and as we are aware, is one of the most important water bird habitats for endangered bird species in Hawaii. However, it is also important to the national and international efforts for the preservation of these birds.

However, the proposal to construct the well and facility on a narrow strip of land between the ocean and Kanaha Pond and inject treated effluent down into the water, is of concern to us, because of the potential upwelling of nutrient effluent into the Pond.

Although it has been stated that this upwelling won't occur, because the Pond is perched, there is an impervious layer beneath there. We are concerned that there is the probability, as stated in the environmental appraisal, that this could occur. With injected water -- this is effluent -- going

into the ground, it is possible that it could go back toward the Maui Electric Company or go back toward the Fish & Wildlife well or the State well, which adjoins the Pond. The well is intended for replenishing the water supply in the Pond, in the event of low rainfall in the area.

If the injected water in the reservoir below does reach the Wildlife well, then the water that would be pumped from that well into the Pond, would add nutrients to the Pond; and our concern, although the water will be secondarily treated -- our concern regarding nutrients, is in relation to the nitrogen and phosphates in this water -- enrichment of the Pond water through additions of nitrates and phosphates would result in excessive algae. This would adversely affect the water quality and the endangered bird species.

In view of the lack of positive assurances then, that the water quality will be maintained in the well; and that the enriched nutrients won't get up into the well, why, we would recommend that there be an environmental impact statement.

HEARINGS OFFICER DUNN: Do you have any independent information, other than what you have said here today, to the effect that there would be upwelling?

MR. TAYLOR: We have the information, as a result of the geological survey -- hydrological survey in the area, which indicates there is a probability that it could come back; or the probability that it will go out into the ocean. However, it also indicates that there is a lens -- fresh water lens, under the cap rock, that will extend to the Pond pump area, where the well is, and it did indicate that the treated effluent could be pumped out of the Wildlife well into the Pond.

HEARINGS OFFICER DUNN: Who prepared this survey, Mr. Taylor, do you know?

MR. TAYLOR: I believe it was Cook. No, Robert Scott, excuse me.

HEARINGS OFFICER DUNN: Do you have a copy of what he prepared?

MR. TAYLOR: Yes.

HEARINGS OFFICER DUNN: Okay. Have you conducted any tests of your own with regard to the possibility of upwelling?

MR. TAYLOR: No, we haven't.

HEARINGS OFFICER DUNN: Have you conducted any tests of your own with regard to the effect of nutrients -- even if we assume that some of the nutrients might get into the Pond? Have you any knowledge or information as to what that effect would be on the water in the Pond or how it would affect the birds?

MR. TAYLOR: I have not conducted any experiment in this particular pond area. However, the literature is full of the effects of enriched water by phosphates and nitrogen, causing excessive algae, using up oxygen and degrading the water quality for fish and wildlife resources. I can undoubtedly obtain considerable information along those lines.

HEARINGS OFFICER DUNN: You anticipate that your prepared formal document, which, as you say, was sent back to your office and has not yet been returned -- do you anticipate the return of this to you within the next 7 days?

MR. TAYLOR: Yes.

HEARINGS OFFICER DUNN: In time to submit it to us by March 2nd?

MR. TAYLOR: Yes.

HEARINGS OFFICER DUNN: Very well. Anything else to add, Mr. Taylor?

MR. TAYLOR: No, that's it.

HEARINGS OFFICER DUNN: Thank you very much, Mr. Taylor.

MR. TAYLOR: You are welcome.

(Witness excused)

HEARINGS OFFICER DUNN: Is Mrs. Margaret Sowers present?
Mrs. Sowers?

(No response)

HEARINGS OFFICER DUNN: Mr. Robert Bruce.

STATEMENT BY MR. ROBERT BRUCE

MR. BRUCE: Madam Chairman, ladies and gentlemen, I am speaking today as President of the Hui Manu o Maui -- that is our Local Bird Society; and I would like to state first, that

the Hui Manu feels that it is vital that an environmental impact statement be prepared on this proposed Kanaha Pond location. There is no question that the complete take-over of the former Agricultural lands, surrounding the Kanaha Pond by commercial, industrial -- commercial and industrial subdivision and development, in addition to reducing the Pond area by half, is posing a serious threat to the very existence of this important waterfowl refuge, and reasonable precaution should be taken against its further destruction.

The County's proposal to locate their sewage treatment plant on the natural sand dune barrier area, between the ocean and the Pond, appears to be the most dangerous threat to the Pond so far. The principal concern of the Hui Manu is that the proposed injection of 6 to 9 million gallons of highly nutrient sewage effluent water into the stable body of salt water under the Pond, will displace the salt water and some of it will rise up and contaminate the basal ground water springs, which are the main source of the replenishment for the Pond.

As these are geo-hydrological problems, and the Hui Manu and the Hawaii Chapter of the Conservation Council for Hawaii requested the volunteer services of Geologists Powers and myself, and others, to make an independent study of this complex problem, we made tests, which disproved the claims which had been made that the Pond water was not supplied from springs from the underground water table. We also checked the gradient of the ground water moving under the sand dunes toward the sea. We ran a 24-hour check on the relative tidal fluctuation of the underground salt water in the County's test well and in the ocean less than 150 feet away. We found that the rise and fall of the tide was dampened more than normally and that there was a higher than normal time lag between the comparative high and low tides in the sea and the well. This indicated that there would be considerable obstruction to free movement of water between the well and the sea and all the more possibility of the Pond pollution by the injected effluent.

We tested the salt water content at various locations around the Pond and proved that there was a wide variation, just as there was a variation in the vegetative growth of the Pond. Certain types of bulrushes were found to grow near the springs of fresher water, well enough from the ground water table.

I understand Mr. Colin Lennox has put those figures on the record. He and I -- I analyzed the water and he took the notes, and I think he has included it in his testimony. I didn't have the figures.

The attached xerox of an aerial photo of Kanaha Pond, which was taken in December, 1961, shows at that date, the encroachment of commercial and industrial development. Since then, the rapid increase of this type of development has, in 1973, filled in practically all the area above the main highway, above the Pond, the triangular lot above the Pond between the main highway and the road running along the top of the Pond towards the airport is now completely filled with a deep land fill. This lot used to be at pond level and was a feeding ground for the stilts.

The County's sewage treatment plant is now being proposed on the narrow sand dune lot between the Pond and the ocean. It is just one more encroachment on the ever accelerating pace of industrial development, which is threatening the very existence of the Pond. The destruction of the Pond's natural barrier sand dunes alone would have a serious environmental impact on the ecological balance of the Pond. I will treat this matter in more detail in my statement this evening. I am also going to make a statement this evening, on different subjects from these that I am covering now.

On the left-hand side of the Pond, as you look at the picture, the State of Hawaii is planning a below sea level drainage canal, more or less parallel to the Pond, all the way from the main highway to the ocean. This below sea level drainage canal could very well lower the water level and the shallow, stilt-feeding areas within the Pond, and then be one more cause of their extinction by this gradual destruction of their habitat.

The Hui Manu is naturally very disturbed about the adverse environmental impact of always developments around the Pond and we welcome the opportunity of calling them to the attention of the EPA, so that suggested alternate sites can be considered. The Hui Manu has, as one of its main purposes, in the last few years -- has had, as one of its main purposes in the last few years, the preservation of the Kanaha Pond and the protection of the endangered species of waterfowl, making what is probably the last stand in their native habitat there. We hope that some other site can be selected for the County's important sewage treatment plant.

Thank you.

HEARINGS OFFICER DUNN: Mr. Bruce, is it my understanding that you feel that the water will be running away from the Pond, therefore leaving it sort of like a dry mudhole?

MR. BRUCE: Yes. This is not caused by the sewage treat-

ment plant. This is caused by the drainage canal that is presently under consideration on the east side of the Pond. This is a Federal highway, so I am sure that there will be an impact statement made on that, when the time comes.

HEARINGS OFFICER DUNN: You mean there is a highway planned through that area?

MR. BRUCE: Yes, there is a highway planned -- it's the main Federal highway that crosses -- the new Federal by-pass highway that crosses the middle of the Island is now stopped at Puunene Avenue, specifically because the drainage was inadequate to meet Federal standards between there and the Pond and the airport.

HEARINGS OFFICER DUNN: Well now, what does the highway have to do with the sewage treatment plant that is proposed to be placed there?

MR. BRUCE: It has nothing to do with the sewage treatment plant. I merely brought it in, in conjunction with the other improvements and construction of commercial and industrial development. When this canal goes in, the Pond will be completely surrounded with such, and I was calling attention to the fact that the sewage treatment plant will then be on the ocean side, so that it will be completely surrounded by development. But the drainage at this time has nothing to do with the sewage treatment plant. My objection to the sewage treatment plant is the objection of this effluent water under the well and we made specific tests -- this is my business. I have been in charge of drilling lots of wells and water development in this Island; and we tested the water and actually, by the salt content of the water, we could tell that there was an upwelling of the basal -- the brackish water underground. That's what keeps the Pond -- keeps the water in the Pond in dry weather. As this Hawaiian that was here testified, that when they used to drain the Pond all the time, and it was continuously fed by those springs from the bottom of the Pond; and the statement was made that the Pond bottom was completely impervious and there was no water coming from the bottom of the Pond. We disproved that by actual tests.

HEARINGS OFFICER DUNN: And you say that there is water coming up from the bottom of the Pond now?

MR. BRUCE: Yes. And this is water that may be contaminated by the sewage effluent.

HEARINGS OFFICER DUNN: And a portion of the present water

that is coming up at the bottom of the Pond, according to your studies -- is it salt water?

MR. BRUCE: No, it's not salt water. It's fresh water, and they are going to inject fresh water into the salt water, and we know that fresh water will rise up through the salt water. This is just the law of gravity. There is no other way that it can do.

HEARINGS OFFICER DUNN: And it's your contention that the fresh water that rises up through the salt water will seep back into the Pond, rather than being thrown back into the ocean?

MR. BRUCE: Well, this will be completely covered. I don't want to take -- that's why I don't want to take the people's time. We have another man -- Dr. Powers, who is a Geologist, he will have a chart to show you what happens to this water. It is kind of an involved subject. This salt water that they are injecting -- this water, is completely static. It's stable. It's under the whole Island. It's everywhere, and it doesn't move; so there is nothing going to happen to that water. It will dissipate. When you inject it into that well, it will dissipate in a circular direction, under the Pond, under the beach, and everywhere else; but because it is fresh water, it will rise up and it is very liable to come through the cracks in the beach rock, and come up and pollute the recreation area along the shore. But I don't want to take your hearing up, because this will all be testified to tonight, and I am going to make a statement on this line tonight. I am talking now for the Hui Manu. I am going to talk for the Conservation Council for Hawaii, because -- the Maui Chapter of the Conservation Council -- we were requested to make an investigation of these things and report them to this hearing; but we weren't all able to be here now, so we are all going to report as a team, so that you will hear the testimony in proper consecutive order this evening.

HEARINGS OFFICER DUNN: Very well.

MR. BRUCE: Thank you very much.

HEARINGS OFFICER DUNN: Thank you, Mr. Bruce.

(Witness excused)

HEARINGS OFFICER DUNN: That is all the registration cards I have, of people who have requested time to make comments or give a statement. Is there anyone that I have missed?

(No response)

HEARINGS OFFICER DUNN: Is there anyone else who has not been called upon to make a statement or a comment, who wishes to make a statement or comment at this time?

(No response)

HEARINGS OFFICER DUNN: I would reiterate to you that the 7 o'clock session -- excuse me.

MR. LENNOX: Could I make one very short statement? In my letter of this application to make a speech here, I submitted this --- (interrupted)

HEARINGS OFFICER DUNN: Would you come up and use the mike, so that everybody can hear you?

MR. LENNOX: Yes, thank you. Mr. Bruce referred to a water study report that we made together, showing that the ground water from the basal ground water is breaking into the Kanaha Pond at rates that might be -- at the rate of something between 600 and 700 gallons per minute. Now, a copy of that report was sent with my letter to your office in Honolulu when I applied, and I would like to have that report a part of the record.

HEARINGS OFFICER DUNN: Very well.

MR. LENNOX: For you to review.

HEARINGS OFFICER DUNN: Very well. We will make it a part of the record, sir.

(Witness excused)

HEARINGS OFFICER DUNN: Is there anyone else who wishes to make a statement or comments at this time?

(No response)

HEARINGS OFFICER DUNN: If not, the hearing will be reconvened at 7 o'clock tonight, at the Baldwin Auditorium; and it will continue until everyone has been heard.

(Whereupon, at 3:22 o'clock p.m., an adjournment was taken until 7:12 o'clock p.m., at the Baldwin High School Auditorium.)

EVENING SESSION

HEARINGS OFFICER DUNN: Those of you who wish to give a statement and who has not already prepared a registration card, would you come down to the front and see Mr. DeFalco and fill out the registration card, if you wish to speak or offer comments. The rest of you should fill out a registration card during the recess. The registration cards are our only way of determining who was at the hearing and who was not; and if you wish to be included in the record or go on record as having been present, then you should fill out a registration card during the recess.

We have some persons who have indicated that they wish to speak, according to the registration cards. For those of you who were not present this afternoon at the Library, my name is Cassandra Dunn; and I am the Regional Legal Counsel for the United States Environmental Protection Agency, Region 9, located in San Francisco.

This hearing is to receive comments and information from the public regarding the proposed waste water treatment and disposal system for Wailuku-Kahului area, consisting of a sewage treatment plant and equalizing storage pond, injection disposal wells, pump stations and force mains, in Kahului, Maui, Hawaii.

The notice of this public hearing was published in the local newspapers; and a copy of the notice will be a part of this official record of the hearing.

For the record, we have reconvened this hearing, a few minutes past 7:00 p.m., February 23rd, in the Baldwin Auditorium, in Kahului, Maui, Hawaii.

This is not a rule-making proceeding nor is it an adversary type proceeding, and therefore, it will not be treated as such. The Administrative Procedures Act will not be applicable and we will make time for everybody to be heard tonight. We have made arrangements to continue here this evening until everybody has had a chance to make a statement or his comments with regard to the issues which are the subject of this hearing.

Generally, the following order will be handled at this hearing: Interested Federal Agencies representatives will first be heard, which includes Senators and Congressmen or Congress Ladies; State, interstate, municipal government representatives will then be heard; then various industries who are affected will be given the opportunity to make presentations; then environmental and civic groups or similar groups, and mem-

bers of the public. If there is anyone who wishes us to deviate from this order, then you should let us know right away by contacting the girl out front at the registration desk or Mr. DeFalco; and if you have justification for deviation, we will be glad to cooperate with you.

There will be an official record made. We have a Reporter present. Oral statements and written statements will be included in the official record. The record will be reproduced in black and white, so any written statements that you wish to present should be made on paper, which will reproduce in black and white. If you submit it on paper that will not reproduce in black and white, you and I both have a problem.

The official record will be available to the public in two different locations after the Reporter has had the opportunity to transcribe the same. It will be available at the EPA offices in Honolulu, located at 1000 Bishop Street, Suite 601. It will also be available at the Kahului Library here in Kahului. The record for this public hearing will be held open for a period of 7 days. Anyone who wishes to submit additional written comments, should have them postmarked not later than March 2nd, 1973.

You may mail your remarks, either to EPA in Honolulu, at 1000 Bishop Street, Suite 601; or you may mail them to the Environmental Protection Agency in San Francisco, at 100 California Street.

After the record has been prepared and made available to the public for examination, it will be considered by the Environmental Protection Agency in determining whether or not an impact statement should be made. You will have to forgive me, I caught a cold in Honolulu.

I, as the Hearings Officer, reserve the right to ask questions for additional information or for clarification on some statement that has been made. I reserve the right to limit presentations to the issues at hand and to limit oral presentation if it is not pertinent to the issues. Any redundant or corroborative material, which can be submitted for the record, should be so submitted rather than read aloud.

There will be no questions from any member of the audience or anyone from the floor, of any witness who is here to give testimony; and there will be no interruptions from the floor. I will be the only one to ask any questions, because we cannot take the time for everyone to ask questions of everybody who wants to make a statement or make their comments. And as I said,

everybody will be given a turn to make their comments or their statements.

If you disagree with something that someone has said, then we ask that you not interrupt; and if you want to make a statement to make comment with regard to what someone has said, then you should see either the girl at the registration desk or Mr. DeFalco, and we will schedule time for you to be heard. And we do ask for your cooperation so that the hearing can be handled in an orderly manner.

We have with us this evening, State Representative Alvin Amaral. Would you come forward, please?

STATEMENT BY STATE REPRESENTATIVE ALVIN T. AMARAL

MR. AMARAL: Thank you, Madam Chairman, dear. My name is Alvin T. Amaral. I am an elected public official, representing the 7th District -- Representative District in the Hawaii State House of Representatives. I live in the District to be served by the proposed waste water treatment and disposal system.

Madam Chairman, I am aware of the steps carefully taken by the County in arriving at the selection of a site and the approval of a system which will adequately handle the disposal of sewage, so as to enhance the environment of the District, prevent the pollution of the nearby ocean and promote the health, safety and welfare of my constituents.

I have confidence in our County officials, who have developed this system. They are the first ones who will be directly concerned with the protection of our environment and the welfare of our people. They are in daily contact with the people and have an intimate knowledge of their needs and desires.

The County of Maui is in the forefront of our State, in positive action to protect the environment of our County and eliminate all forms of pollution which may harm the health and safety of our people. I trust their judgment.

I have neither seen nor heard any convincing evidence to show that their judgment in the design of the system and selection of the site was wrong. I therefore support the County in its position and urge that the project be moved ahead as quickly as possible.

Thank you for the opportunity to express my views. Madam Chairman, I will submit my written statement to the EPA in a few

days to the Honolulu address.

HEARINGS OFFICER DUNN: You understand you should have it submitted by March 2nd?

MR. AMARAL: Yes, I will do it the first part of next week, I am sure.

HEARINGS OFFICER DUNN: Thank you very much, Mr. Amaral.

MR. AMARAL: Thank you.

(Witness excused)

HEARINGS OFFICER DUNN: Mr. Joseph Franco? Mr. Franco has requested that he be given priority because of a medical problem.

STATEMENT BY MR. JOSEPH FRANCO

MR. FRANCO: Thank you, Madam Chairman. My name is Joseph Franco and I am the Political Action Chairman of the ILWU, Maui Division.

Our organization represents approximately 5,000 workers in the County of Maui, many of whom, together with their families, live in the Central Maui area. The ILWU has consistently supported a policy of controlled growth for the County of Maui. While we are interested in providing for job security and the needs of our members, we have also taken an active interest in community problems, such as the protection of our environment.

We feel that the program of providing for the adequate collection and treatment of sewage is an important -- is most important to the planned growth of our County. We have the problem of raw sewage being discharged into the ocean at four locations. Two of these outfalls will be eliminated upon construction of the Wailuku-Kahului Sewage Treatment Plant.

To protect the health of our community and to insure the protection of our shoreline area, we feel that this project should proceed at the earliest possible date, so that we can go on to provide programs and projects to meet our needs in other areas. Many of the people we represent are still living in substandard dwellings in the plantation camps. We have worked with the employers in the past to provide the simple housing for our people, which they can afford. We are sure that these programs will continue in the future, but how can we try to meet these housing needs if the result is to continue

to pollute the waters of Kahului?

We are satisfied that the consultants, the County and the State, the Federal Government, have already made extensive studies into the question of locating the plant adjacent to Kanaha Pond. The Pond is already partly surrounded by industrial development and is close to the airport. There does not seem to be any major damage to the bird sanctuary from these activities.

It is also our understanding that the County will continually monitor the injection wells, and if necessary, relocate them if danger to the Pond becomes evidence.

In the long run, we support the reuse of the sewage effluent, perhaps to irrigate cane fields, to put more lands into production, while at the same time, preserve our valuable water resources for domestic use.

It has been suggested that the plant be relocated to another site adjacent to the Quonset Huts, near Kahului. This land costs the taxpayers of our County over \$10,000 an acre. A 20-acre site will have a cost to our community of \$200,000. We believe that this valuable land should be used for recreational, social, educational and cultural purposes, to benefit all the citizens of Maui.

In summary, we feel that this project is necessary for the orderly growth of our community. Further, we believe that we have delayed long enough. Additional time lost will only mean an added burden to all of the people and the taxpayers of the County. We have the plans prepared and a good bid. We have safeguards built in to protect the environment. We have land available at no cost. In the best interests of all, let us proceed at the present site as soon as possible.

HEARINGS OFFICER DUNN: Mr. Franco, do you speak for all of the members of the ILWU or are you here in an individual capacity, speaking for yourself?

MR. FRANCO: I was assigned here by the Division Director to speak on behalf of the membership of the ILWU, Maui Division

HEARINGS OFFICER DUNN: Very well. Thank you. Do you have anything else, Mr. Franco?

MR. FRANCO: That's all, ma'am. Thank you.

HEARINGS OFFICER DUNN: Thank you very much.

(Witness excused)

HEARINGS OFFICER DUNN: Dr. Richard Marland?

STATEMENT BY DR. RICHARD MARLAND

DR. MARLAND: Mrs. Dunn, I am Richard Marland, Interim Director, Office of Environmental Control, Office of the Governor, State of Hawaii. I want to thank you for this opportunity to present the views of my office and the State of Hawaii, on the important issue being heard here tonight.

First, I was privileged this afternoon to hear the testimony of many of the witnesses who are opposed to the location of the proposed sewage treatment plant. The statement of those witnesses were, for the most part, well presented and dealt with factors which are appropriate to a discussion of the environmental impact of the proposed plant. Most of the statements were directed toward the following 5 issues:

1. Threat to the water quality of Kanaha Pond from the effluent of the plant with its concomittant effects on the life processes of the birds, which are sanctuaried there -- especially the Hawaiian Stilt;
2. Recommendation that Kanaha Pond be rehabilitated and used as a park;
3. The use of alternative sites, which were described as "superior" from an environmental aspect;
4. Lower construction costs associated with the Quonset Hut area as a construction site; and
5. The threat of tsunami inundation.

My testimony will relate to these points and will put into the record, much of the information which my Office and other State Agencies have used to arrive at the conclusion that an environmental impact statement for the sewage treatment plant is not necessary.

We believe that the information documented in this testimony and that of others who will appear here tonight, will show that sufficient information exists to show that a negative declaration or a statement of non-impact, is an appropriate document for this project. The significant documents relating to this project are listed here in my testimony by title and by date. Most of them are already in the files of the Environmen-

tal Protection Agency. However, if additional copies are required for the purpose of this hearing, we will be pleased to prepare copies and submit them for the record. The earliest document is dated March 25th, 1971, and is a record of a public hearing -- of the public meetings held in various parts of Maui for the purpose of discussing the County-wide sewage general plan. Specifically, a meeting held March 19th, 1971, at the Kahului Library, dealt with the proposed Kahului Sewage Treatment Plant at the Kanaha Pond location. Approximately 40 persons who attended this hearing, supported that site. The summary of these public meetings were forwarded to the State of Hawaii and EPA on April 15th, 1971.

On April 2nd, 1971, an environmental assessment of the proposed Kahului Sewage Treatment Plant at the Kanaha Pond site, was forwarded, through the State of Hawaii, to the Environmental Protection Agency, as an attachment to a request for a construction grant. This application was approved by EPA and the grant offer was made.

On January 27th, 1972, an additional public hearing was held by the County of Maui on its comprehensive sewage and drainage master plan. Extensive discussion and comments were presented, both in support and in opposition to the proposed treatment plant at the Kanaha Pond site. Largely as a result of the information received at that public hearing, additional environmental studies were undertaken. One significant study, made in preparation for that January 27th, 1972 hearing, was the Kanaha Pond Baseline Data Study. This was conducted under the auspices of the Environmental Center of the University of Hawaii and included 10 different scientists plus the coordinative efforts from my office. This important document closes with the following statement, and I quote:

"It is highly unlikely that Kanaha Pond receives substantial recharge from the ground water body, even during the low water periods. The thick bottom cover of mud is quite impermeable and generally prevents interflow between the pond water and the ground water body. This is confirmed by the almost negligible tidal fluctuation in Kanaha Pond and by the large seasonal fluctuations of water levels in Kanaha Pond, in direct response to precipitation. It is most unlikely then, as indicated earlier, that recharge to Kanaha Pond comes primarily from surface runoff."

Public concern, which was certainly shared, both by the County and State officials, stipulated additional investigation of the environmental effects of this plant. On June 30, 1972, a statement was received by my office from Mr. John Buse II, in

which the Conservation Council for Hawaii, raised questions about the efficacy of sub-surface injection of sewage effluent at the proposed site. This report was referred to the Environmental Center of the University of Hawaii for analysis and confirmation or whatever results would be derived by that Center's study of the problem.

The response from the Environmental Center, dated September 14, 1972, concludes in part that the proposed underground disposal wells will have no significant effect on the water quality or ecology of Kanaha Pond. Dr. Doak C. Cox, Director of the Environmental Center, will have more specific testimony on this subject.

Concurrent with the studies of the Environmental Center, the Environmental Protection Agency conducted its own geo-hydrologic evaluation of the injection field. This report, prepared by Mr. Robert C. Scott states, and I quote: "The proposed injection well field will not cause leakage up to Kanaha Pond." Mr. Scott is a Geologist with the United States Department of the Interior.

The economic aspects of additional sites do not support the thesis that financial savings would be possible by using an alternative site. Correspondence addressed to Mr. Stanley Goshi was sent in the form of carbon copies to me. These described the increased costs associated with the alternative sites. I imagine that Mr. Goshi, himself, will present substantive testimony on this issue.

The use of an alternative site, located in the Quonset Hut area, was discussed at the public meeting held in March of 1971. This was the one in which the citizens present, agreed that the Quonset Hut site, should be reserved for the park, which is called for in the County's general plan; and that 11 acres of that site should not be sacrificed for the sewage treatment facility.

I would like also to place into the record, official actions in which Maui County and the State of Hawaii, have jointly carried out closely coordinated efforts on behalf of preserving and improving Kanaha Pond. There is currently a request for funds at the State level, to rehabilitate the Pond, under the auspices of the State Fish & Game Division, of the Department of Land and Natural Resources, since siltation from surface run-off is threatening the Pond, and it is the most important threat to the continued existence of this ecological treasure.

The State and County's concern for Kanaha Pond is also

demonstrated by the joint requirement of the County and my office, that construction of an industrial park could not proceed until provision had been made for the diversion of polluted surface drainage away from Kanaha Pond. Surely, with these demonstrations of concern for this important bird sanctuary, the State and County would not be so inconsistent as to allow its degradation from sewage effluent.

On the basis of the foregoing documents, and additional reports, which includes a pilot test injection well and others that I have not listed, the State of Hawaii concluded that there would be no significant environmental impact, which would be detrimental to the environment in and around Kanaha Pond. On this basis, Governor Burns authorized Mayor Carvalho to proceed with the advertising for bids to commence construction. Governor Burns' action was preceded by letters of approval from the Department of Planning and Economic Development, the Department of Land & Natural Resources, the Department of Health and the Office of Environmental Quality Control.

The final documents, which I would like to enter into the record, was received in my office on January 5th, 1973, and is a letter from Mr. Paul DeFalco, Jr., Regional Administrator, United States Environmental Protection Agency, to which is attached, an 11-paged environmental impact appraisal of this project. The conclusion reached in this appraisal is, and I quote --- (interrupted)

HEARINGS OFFICER DUNN: Dr. Marland, excuse me.

DR. MARLAND: You have that?

HEARINGS OFFICER DUNN: I don't like to interrupt, but really, the appraisal or the statement to which you make reference, I don't believe, is pertinent to the hearing that we have here today. One of the reasons we have had this hearing is to determine whether or not an impact statement would be in order, to be prepared by the United States Environmental Protection Agency; and the conclusions that may heretofore have been reached by our Regional Administrator, I don't believe would be a proper subject of the hearing at this time.

DR. MARLAND: Very well. I would say, that on the basis of the documents that constitute our files and the records of the Environmental Protection Agency, that we concur in the findings, which seem to be unanimous among the State and Federal Agencies involved in making the approvals. Our office and the State of Hawaii do concur in this finding and we believe that there is a sufficiency of scientific validation to warrant that

conclusion.

And I thank you for the privilege of presenting this information.

HEARINGS OFFICER DUNN: Thank you, Dr. Marland, for appearing.

(Witness excused)

HEARINGS OFFICER DUNN: I have been handed a substantial number of requests for time to speak and it looks like we are going to be here until the wee hours tomorrow morning. While the schedule of speakers was to include all those persons who wanted to speak from the State, County and other municipal agencies, we do have a gentleman who requests time to speak before 8:00 p.m.; and my watch says that it is getting on towards 8:00 o'clock now -- about 20 minutes to. So I would request that Mr. Hondo -- Norman Hondo, come forward and give his presentation.

And at this point, I would also request that those of you who have made requests to speak, limit your time, if you possibly can, to, at the very most, 10 minutes, so that everybody can be heard and feel comfortable about being heard. If you can do it in less time, I would appreciate it; and, if you have written statements, I believe that if you submitted your written statements, rather than read them aloud or perhaps you could point out the major parts of your written statement and then submit your written statement, it will go into the record anyway. That way, we could save a little time, if we could have your cooperation, please.

Mr. Hondo, would you proceed, please?

STATEMENT BY MR. NORMAN HONDO

MR. HONDO: Thank you, Madam Chairman. I am Norman Hondo, representing the Kahului Hotels.

At a meeting held on February 21st, 1973, the officers of the Hotels fronting on Kahului Bay, Kahului, Maui, namely, the Maui Hukilau Hotel, the Maui Palms Hotel and the Maui Beach Hotel, unanimously decided to urge the County of Maui to take immediate steps to proceed with the construction and operation of the proposed sewage treatment plant without further delay for the following vitally important reasons:

Kahului Harbor is being used by many people, primarily, young, local people, who surf all day whenever surf conditions are ideal, notwithstanding the contaminated conditions of the water. These young people surf without apparent knowledge that the Harbor is contaminated by the vast quantities of raw sewage which is being dumped into the ocean, just outside of Kahului Harbor. The health of these youngsters is in serious jeopardy.

2. Certain areas of the Harbor have a great potential of becoming a great popular water sports center for now, for the more than 20,000 people who live in the Kahului and Wailuku area of Central Maui. The Kahului and Wailuku area is the fastest growing community in the County of Maui and conveniently located recreational areas will become increasingly important as the population grows.

Kahului Harbor, particularly along the south shores, was once a great place for youngsters to swim during the days before the development of the new town of Kahului, when the volume of raw sewage was a fraction of what it is today. As a matter of record, a youngster became a national swimming star because he lived along the beach along Kahului Harbor and enjoyed diving for fish, coral, shells and many other forms of sea life, which once abounded and flourished in the Harbor.

Such ideal conditions for the development of our youth can be restored again if the sewage conditions can be corrected.

At a public meeting held at the Kahului Library on October 19th, 1972, the U. S. Corps of Engineers, Department of the Army, outlined a proposed plan, whereby improvements are to be made along the beach in Kahului Harbor for the recreation of local residents and hotel guests. The work involves the restoration of beaches along the public park, which was created through the efforts and public interests of local service clubs and Alexander & Baldwin, Inc. The restoration of the beach, which was lost when the Harbor was dredged a number of years ago, will mean recreation, such as picnics, swimming, wading, surfing, water-skiing, skin diving, et cetera, not only for our local people, but also for the thousands of visitors who are guests at our three Hotels.

In a day of a highly competitive market in the tourist industry, except for the brief period of shortage of hotel rooms as has occurred recently, it is highly important that we offer our visitors the best that we can, including uncontaminated beaches. This is extremely important in a day when our State is facing a huge deficit and when even our great Nation has to

devalue our dollar for the sake of our economy.

The three Hotels have invested heavily in improvements along the shoreline of Kahului. It provides convenience to the visitor because of its centralized location. It is a convenient meeting place for the many service organizations, in the highly populated Central Maui area, such as the Rotary, Lions and Kiwanis Clubs.

We believe that it is critically important that we proceed with the construction of the proposed plant as soon as possible. We understand that a proposed location was decided upon by professional consultants, only after they studied and gave every consideration to the various sites which were available. We believe firmly that a sewage treatment plant should be located in an area which is already industrialized, with gasoline storage tanks, Maui Electric Power Plant, concrete batching plants, et cetera. We most certainly do not believe it should be placed anywhere close to the resort Hotels, like Maui Palms, Maui Hukilau and the Maui Beach, our Community College, residential neighborhoods and potential apartment developments.

This was signed by "Maui Beach Hotels, Inc., Vice President, John Abe". Thank you for the time.

HEARINGS OFFICER DUNN: Thank you very much, sir.

(Witness excused)

HEARINGS OFFICER DUNN: Dr. Quisenberry.

STATEMENT BY DR. WALTER QUISENBERRY

DR. QUISENBERRY: Mrs. Dunn, I am Dr. Walter Quisenberry. I am the State Director of Health. Thank you very much for allowing me to present a brief position statement for the Department of Health in regard to the Wailuku-Kahului Sewage Treatment Plant.

I have submitted a brief statement. I will abbreviate it just a little bit more for the record.

The Department of Health supports the proposal to construct a secondary sewage treatment plant at the Kanaha Pond site. We believe that the site selection was based on the best available information and that the concerns relative to this site were adequately addressed.

The plans for the sewage treatment plant were reviewed by

our staff for adequacy of treatment. The plans called for secondary treatment of the sewage, with additional effluent polishing via sand filters prior to disposal into wells at the site. Approval of the design plans was granted by my Department in April of 1972.

Prior to final site selection, members of the Sanitary Engineering Branch of the Department of Health, met with representatives of the consultants of Montgomery Engineers of Pasadena, California, and the County of Maui. Of the sites proposed, it was mutually determined that a site in the Naval Air Station, Kahului airport area, was desirable. The final site selection was made by the County of Maui, in conjunction with their consultants. The Department of Health did not object to the site selected.

Subsequent to the selection of the sewage treatment plant site, concerns over possible intrusion of the effluent to Kanaha Pond were raised. Meetings were held to discuss this matter with recognized experts in geology. Mr. Robert C. Scott, a Geologist with the United States Department of the Interior, stated that in his opinion, the waters of Kanaha Pond would not be affected by the disposal of sewage effluent at this site. The Department of Health saw no reason to reject the proposal on the basis of contamination of Kanaha Pond, and once again, recommended approval of this site.

The Department of Health supports reasonable methods to end this raw sewage discharge. We believe that the plan for a secondary treatment plant at the proposed site, is the best available, to eliminate these discharges. We recommend that the construction proceed as quickly as possible.

We do not believe that an environmental impact statement is needed. Thank you very much.

HEARINGS OFFICER DUNN: Thank you very much, Dr. Quisenberry.

(Witness excused)

HEARINGS OFFICER DUNN: Mr. William Thompson.

STATEMENT BY MR. WILLIAM THOMPSON

MR. THOMPSON: Thank you, Mrs. Dunn. My name is William Thompson, Deputy to the Chairman, State Department of Land & Natural Resources.

On July 28th, 1972, the Board of Land & Natural Resources approved the Conservation District Use Application filed by the State Department of Transportation, for use of certain lands at Kahului, Maui, as a sewage treatment plant.

The treatment plant to be constructed and operated by the Maui County Department of Public Works adjoins the 273-acre Kanaha Pond. The proposed plant lies between the Kahului Airport and the Kahului Harbor industrial area, on lands under the jurisdiction of the State Department of Transportation. Use of these lands is subject to review and approval by the Federal Aviation Authority. Kanaha Pond itself is under the jurisdiction of the Department of Transportation, and similarly under control of the FAA.

For your ready reference, a copy of the Board of Land & Natural Resources decision will be attached to this report.

Other geological, hydrological and engineering reports, have been and will be filed with the EPA; and rather than repeat their analytical findings, I would prefer to supplement the Board's decision by describing our role in this matter pending before you.

The State Department of Land & Natural Resources, by law, controls uses within conservation lands. The County, through zoning powers, controls the uses of urban, rural and agricultural land districts. The site for the proposed Kahului Sewage Treatment is located, as I mentioned earlier, on Department of Transportation lands within the Conservation District boundaries. In accordance with regulations of our Department, Maui County, through the Department of Transportation, applied for the construction and use of the sewage treatment plant on said site. The application was the final step by the County to the State, in securing approval for the project. I use the word "final" -- inasmuch as the staff of our Department had been intimately involved in the evolvement of this project since early in 1971.

Personnel from both our Divisions of Fish & Game and Water & Land Development, have been working with the consultant and Maui County officials, in the proper location and management of this treatment plant.

Of the many programs administered by our Department, is the management of wildlife refuges throughout the State, by its division of Fish & Game. For many years now, we have sought to have control and jurisdiction of the Kanaha Pond wildlife refuge turned over to our Department. It was only in 1970, that, work-

ing together with the State Transportation officials, we secured their approval. With this in hand, we proceeded to prepare construction drawings and specifications for the enhancement and protection of Kanaha Pond and its water bird inhabitants. This project has been advertised and bids received. However, before this award can be made, we must receive the concurring approval of the FAA. This negotiation is now being carried out jointly by our Department and with the State Department of Transportation, with the FAA. It has been many years for us to arrive at this point in time, where the first major effort to protect Kanaha Pond is ready to get underway.

Indeed, it would be inconceivable for our Department, after working so hard for the preservation and protection of Kanaha Pond, to approve another undertaking that might bring about its destruction. In working out the final design of the proposed treatment plant, the protection of Kanaha Pond has been foremost in our deliberations. In the final analysis, we have reached the conclusion that the location of the treatment plant is desirable from an engineering point of view.

Further, the treatment plant, with its minimum amount of activity, is a compatible facility to the adjoining Kanaha Pond wildlife sanctuary. If I may put it another way -- our wildlife personnel would prefer a quiet type of facility, with a minimum amount of activity, in preference to the beach park, earlier proposed.

The question now hinges on the effectiveness of the injection wells. Our Department, in another of its many programs, carries out extensive well-drilling projects. Our staff has gained much expertise in underground hydrology over the past years. Further, they are quite familiar with sewage and water facilities.

It may interest you to know that our Department, through its Division of Water & Land Development, has constructed a sewage treatment plant at Waimanalo, Oahu, which utilizes injection wells for the disposal of sewage effluent. It has been the same staff, which, over the years, have worked with various engineering facilities, which includes sewage treatment plants and injection wells, that have reviewed and analyzed the data and findings of the consultant responsible for the design of the proposed treatment plant. They are in agreement with the findings.

To insure the proper operation of the injection wells, a monitoring program is mandated. Again, this monitoring program is not completely new to our staff. The injection wells at

Waimanalo are also being monitored.

Therefore, it has been the staff recommendation and action by the Board of Land & Natural Resources, to grant Maui County use of the Kahului site for a new sewage treatment plant. Because the design of the treatment plant is based on sound engineering principles and competent judgment, and a monitoring program that is a requirement for use of the area, we endorse the application of Maui County for the proposed Kahului Sewage Treatment Plant.

I would like to make one final comment. Due to the close watch we have kept of the design of this project, we feel our environmental concerns have been adequately answered. We therefore, did not require an EIS.

With the cooperation of the State Department of Transportation, the FAA, Maui County, and most certainly, those citizens who have helped us over the years to retain Kanaha Pond as a bird sanctuary, we have no fear that Kanaha Pond can become an even better bird refuge in the coming years.

Thank you.

HEARINGS OFFICER DUNN: I have a question, please, Mr. Thompson. You have said that you don't feel that an impact statement is required in this instance?

MR. THOMPSON: Yes.

HEARINGS OFFICER DUNN: Did I understand you correctly that you have made some tests of your own or is from reports and tests of others that you have had your people look at?

MR. THOMPSON: We had our staff present while tests were being conducted. We had staff that analyzed the results; and as I mentioned, we also have experience in this matter, due to the projects that we have -- well drilling and also the treatment plant with injection wells at Waimanalo on Oahu.

HEARINGS OFFICER DUNN: Now, these other projects that you are telling me about, are they similar in nature with regard to being near a bird sanctuary?

MR. THOMPSON: No, the projects are different -- the topography -- the geology, is slightly different. But I merely mentioned this to show that our staff is acquainted with this type of facility.

HEARINGS OFFICER DUNN: When your staff was present while tests were being made by other groups or other agencies, was the caliber of your staff equal to a caliber of those persons who were performing the tests?

MR. THOMPSON: I have no doubt about the competence of our staff in their recommendations or their findings.

HEARINGS OFFICER DUNN: If there was a Geologist making a test, did you also have a Geologist present representing your Agency? As an example?

MR. THOMPSON: I think this person would have a different skill. I think the Geologist who also witnessed the tests, had his different qualifications. I don't think I would say our staff is the equal of the other persons who were there, but based on the experience that our staff has, I don't think the other persons are similarly qualified for certain areas as our staff is.

HEARINGS OFFICER DUNN: You feel that your staff was competent and understood what was going on?

MR. THOMPSON: Yes, definitely.

HEARINGS OFFICER DUNN: Thank you very much, Mr. Thompson.

(Witness excused)

HEARINGS OFFICER DUNN: Mr. Nakamura?

STATEMENT BY MR. HOWARD NAKAMURA

MR. NAKAMURA: Thank you, Mrs. Dunn. I will make a few brief remarks this evening. My name is Howard Nakamura, Planning Director for the County of Maui. My comments will primarily be limited to some of the preliminary planning that has been involved in this project.

In mid-1970, the County of Maui contracted with consultant firm of R.M. Towill, Inc., to prepare a comprehensive sewer, water and drainage master plan for the County of Maui. The total project, although broken up into two phases, was funded cooperatively by the County, State and Federal Governments. The study was in response to requirements established by HUD and EPA, that such a comprehensive plan was needed precedent to further construction grants, as well as the desire of the County to prepare realistic guidelines for the construction of such facilities.

By March of 1971, preliminary plans had been prepared and were reviewed with the general public. A series of meetings were held at Kahului, Lahaina and Makawao. Relative to the particular matter under discussion, two alternative locations were proposed for the sewage treatment plant by the consultants -- one at the Kanaha site, ultimately selected, and the second in the vicinity of the Quonset Huts near Puoni and the Maui Community College.

Comments which were received at the public meetings, which had bearing on the final selection of the site, were as follows:

1. The expression that the proposed site near Kanaha Pond would be ideal, since it is located on airport property, owned by the State of Hawaii;

Secondly, that it would be a mistake to take 11 acres of land, which was the area under consideration at that time, from the Quonset Hut area, which had been proposed for recreation, cultural and educational uses;

3. That it would be desirable to integrate Paia, Pukalani and Makawao into the treatment plant, to create a regional collection and treatment system. The ultimate conclusion was that sewage generated from each of the two major study areas, which are Mailuku-Kahului and Makawao-Pukalani-Paia, should be conveyed to a single facility, located near Kanaha Pond for treatment and effluent disposal.

The report states that "the initial capital investment for providing a separate treatment facility versus the conveyance of sewage to the treatment facility located adjacent to Kanaha Pond, favors the latter alternative". In the final analysis then, when considering total cost, both in terms of the original capital investment and annual operations, the regional system proved to be more desirable.

Mr. Frank Doyle, representing the firm of R.M. Towill, will be able to discuss further, some of the planning and site selection considerations following my testimony. However, I would like to stress that many factors were taken into consideration in the selection of the plant site. These factors included potential tsunami damage, reuse of the effluent for irrigation, both of sugar cane and recreational areas, the compatibility of land use, possible objection by conservationists, the lower capital cost of a single site versus the lower cost, when considering the entire study area as a single regional system, possible odor problems, and the availability of land. In consideration of all of the above factors, it was recommended that

the present site be selected.

Ultimately, following public hearing as required by law, the sewage master plan was adopted by the County Planning Commission and the County Council. The master plan was then submitted to both HUD and EPA for certification and approved effective November 15, 1972.

I would also like to clarify the County's position as it relates to Kanaha Pond. It is unfortunate, if the impression has been conveyed that the disagreement over the site has arisen between those who favor the presentation of Kanaha Pond as a bird sanctuary and the County, which must then naturally be against such preservation. Nothing could be further from the truth. We have consistently, over the past years, initiated and supported actions to preserve the integrity of the bird sanctuary. We have opposed proposed actions by the FAA to fill in the area. We have advocated that the jurisdiction over the Pond be granted to the State Department of Land & Natural Resources.

HEARINGS OFFICER DUNN: Excuse me, Mr. Nakamura. I am not really concerned about what action you have taken to appease other persons in the area; nor am I concerned about what the other persons would say with regard to your inaction or your alleged inaction as they would see it. I am only concerned about what the testimony would be regarding whether or not EPA should prepare an impact statement, which of course, goes to the location of the Pond, the treatment, et cetera, and how it is going to affect the environment -- whether or not it is going to be sufficient to cause a significant change in the environment so as to justify or warrant our preparing an impact statement under the National Environmental Policy Act. Do you understand?

MR. NAKAMURA: Okay. I'm sorry, Madam Chairman, I was merely attempting in establishing what the County has done in the design of the treatment plant itself, to protect the Pond; that this would be consistent with our prior actions, but I will skip over this.

HEARINGS OFFICER DUNN: Thank you, Mr. Nakamura.

MR. NAKAMURA: In closing, Madam Chairman, I would like to point out that we have embarked upon a total program, which includes construction of systems for the entire County of Maui. We do have our funding available. Much of this has been done in response to standards established by the Federal Government.

We will hope to be able to proceed, if all goes well, in other areas. We feel that it is vital that we view the Wailuku-Kahului Treatment Plant, not as a single facility, but in its relationship to the totality of our program.

Thank you very much.

HEARINGS OFFICER DUNN: Thank you, sir.

(Witness excused)

HEARINGS OFFICER DUNN: Mr. Doyle?

STATEMENT BY MR. FRANK J. DOYLE

MR. DOYLE: Madam Chairman, good evening. My name is Frank Doyle. I am a Project Engineer with the consulting firm of R.M. Towill Corporation.

Our company, in mid-1970, was contracted by the County to prepare a comprehensive sewer draining and water master plan. My testimony this evening will relate to that part of the project, related to site selection of the proposed Wailuku-Kahului Sewage Treatment Plant.

The sewage master plan for the County of Maui provides a regional waste water management system, incorporating a single water treatment -- waste water treatment facility to service the contributing areas of Wailuku-Kahului and Paia-Pukalani-Makawao. The basis for formulating the recommendations for siting this waste treatment facility centered upon considerations of the existing sewage facilities servicing the contributing areas, acceptance of the site by the community, through their participation and involvement in public meetings, compatibility of the waste treatment facility with its surroundings, economics, and methods of effluent disposal.

Of the two primary sites considered, the site adjacent to Kanaha Pond was selected and recommended for the following reasons: A sewage treatment facility so located would be compatible with the present land use plan for the area. The site of the waste treatment facility is located so as to reduce the possibility of a nuisance problem, which may arise as the result of odors from the treatment facility.

Type of structures required for the development of the facility would be in keeping with the present requirements for zoning of the area adjacent to the airport site.

The plan also notes that consideration must be given to the possible objections for the site use by conservationists who may wish to keep Kanaha Pond free from any future development.

Tsunami protection must be evaluated and incorporated within the overall cost of development of the waste water treatment facility in the area.

The major considerations for not selecting the site in the Quonset Hut area of Kahului were: The relative location of the waste water treatment facility to the present and future residential sites. The direction of the prevailing winds is such that an undesirable nuisance could result, if an odor problem should develop at the waste treatment plant. Careful attention has to be given to this matter when completing the design phase of development for waste treatment, as odor problems for the treatment plant may be controlled; however, the actual degree of odor elimination is sometimes difficult to predict and the cost involved in achieving the desired objectives may, at times, be considerable.

The total intended use of the recreation complex must be evaluated, particularly in light of the amount of acreage lost from possible future recreation use, when acreage is set aside for the waste treatment facility.

The sewage master plan cited water reclamation for irrigation purposes as the most desirable means of effluent disposal. Pending legislation for a zero discharge, the amount of water available for irrigation purposes during the dry months of May and October, the water quality standards of the State Department of Health and the practical use of a community resource, fortify this recommendation.

Question marks of implementation are noted in the plan, wherein it is recognized that the development of a waste water reclamation program, could not be initiated without overcoming some obvious initial obstacles. The acceptance of water reuse by the sugar plantations is not without reservations. The conditions to be expected when irrigating with treated effluent are presently being investigated and evaluated. The immediate implementation of a major reuse program is not expected. A future implementation program is a realistic goal, which the County of Maui is now pursuing, in conjunction with the Department of Water Supply, the community, and the major water users.

In moving ahead with its projects for water enhancement and pollution abatement, the County of Maui has provided a

method of effluent disposal in keeping with the guidelines established by the sewage master plan and the requirements of the State Department of Health. Deep well disposal is an economic, recognized means of effluent disposal. It provides for the implementation of a pollution program now, while providing the backup means of disposal during the development of future, acceptable, workable and safe water reclamation programs.

As the professional engineer is responsible for the development of the sewage master plan for the County of Maui, we reiterate our recommendations as outlined in the plan and concur with the immediate implementation of the construction program.

HEARINGS OFFICER DUNN: Mr. Doyle, did you make any tests to determine whether or not there will be any -- I believe you call it "upwell waters coming into Kanaha Pond" from the injection wells?

MR. DOYLE: That was not a part of our scope of work. We cited in our master plan, the conditions under which a disposal well should be installed, pointing out that test wells would be required during the design phase and also citing the EPA guidelines at that time for well injection.

HEARINGS OFFICER DUNN: Very well. Thank you, Mr. Doyle.

(Witness excused)

HEARINGS OFFICER DUNN: Mr. Stanley Goshi?

STATEMENT BY MR. STANLEY S. GOSHI

MR. GOSHI: Thank you, Mrs. Dunn. My name is Stanley Goshi, and I am the Director of Public Works for the County of Maui.

Subsequent to the public meetings on the master plan, an application for a Federal grant was made on April 2nd, 1971. This application had, as its choice for a site, the State airport land, adjacent to Kanaha Pond. The application was approved, and a grant offer was made by the EPA on May 14th, 1971, with one of the conditions being that the County meet the requirements of the EPA policy on underground disposal. From this point in time, final design or preparation of plans and specifications were initiated for both a pilot injection well and a treatment plant project.

It may be interesting to note here that at a meeting of

the Kanaha Pond Advisory Committee, held on July 22nd, 1971, the Head of the Fish & Game Division of the State Department of Land & Natural Resources, made reference to two problems in regard to Kanaha Pond: (1) Proposed highway drainage and (2) Construction of a sewage treatment plant. His concern was the injection well method of disposing of the effluent. He stated that a study was to be made and that they will raise no objection, should they be assured that the effluent would not come into the Pond and adversely affect it.

The injection well project, after EPA approval of plans and specifications, permission to bid, award and notice to proceed, got under way in early December, 1971. The first indication of any joint opposition from the organizations now opposing the project, surfaced at a public hearing on the sewer master plan on January 27th, 1972. On March 29th, the Kanaha Pond Committee of the Conservation Council, submitted its preliminary findings on the test well.

Based on the questions now arising on the test well and subsequent consultant's report, the EPA dispatched a geo-hydrologist to review the test to our program. At a meeting held on May 24th, 1972, attended by representatives of the State Department of Land & Natural Resources, Office of the Environmental Quality Control, Department of Health, the Environmental Protection Agency, the County of Maui and its consultant, and the U. S. Bureau of Sports Fisheries & Wildlife, it was concluded that the injection would not contaminate Kanaha Pond.

On July 5, 1972, EPA approved the plans and specifications and requested that the emergency ocean outfall be deleted from the final plans. The outfall has been deleted.

Subsequent to a meeting of the Board of Land & Natural Resources, at which the County repeated its assurances to provide a monitoring system and to relocate the wells, if the Pond is affected, EPA advised the County to hold up on the project for a more complete review of the site location.

On August 8th, 1972, an EPA team from San Francisco met on Maui, with members of the conservation groups to discuss the site question.

On October 25, 1972, a meeting was held with representatives of the Conservation Council, Robert Bruce, Colin Lennox and Dr. Howard Powers, at which time it was announced that the EPA had authorized the County to call for bids. The conservation group present was queried on this point and agreed that the County proceed to advertise. Bidding then proceeded and

bids were opened on January 11th, 1973.

On February 2nd, the EPA advised the County that an environmental impact statement will be prepared and that a public hearing will be held on Maui on February 23rd, 1973. It should be pointed out at this time, that all of the delays and time lags imposed by the EPA, were at the request of some conservation groups. We feel that both the EPA and the County have cooperated fully with these groups to permit additional time for review.

HEARINGS OFFICER DUNN: Mr. Goshi, excuse me for interrupting, but does this have to do with whether or not we should file an impact statement as a result of some significant effect on the environment by reason of the construction of this project?

MR. GOSHI: Mrs. Dunn, I am trying to point out the time differential and the period permitted for review.

HEARINGS OFFICER DUNN: All right. You can proceed.

MR. GOSHI: We feel it should also be pointed out that every delay adds to cost increases as well as continuing the discharge of raw sewage into Kahului Bay. This brings us to the present, and to discuss some of the possible alternatives presently available to us.

On the assumption that the primary objection is the injection wells, we could do three things -- we could move them, we could go to a deep ocean outfall or we could go to tertiary treatment with injection. All of these alternatives would add approximately one year in time and additional costs of 2.0 million for location and 3.5 million for a deep ocean outfall or tertiary treatment. These estimates include engineering and construction cost increases for the one-year delay. The alternative of moving the complete plan to the Quonset Hut area is estimated to cost an additional 4.8 million dollars. The estimate includes engineering, extension of the force main from Paia, Pukalani-Makawao, and construction cost increases for the two-year delay. The choice of a deep ocean outfall instead of an injection well at this Quonset Hut site, would result in an additional cost of 7.5 million dollars.

On the premise that none of the alternatives that were mentioned earlier are acceptable, the relocation of the plant to an entirely new site, approximately 10,000 feet away, to an area southeast of the airport, would cost an additional estimated 7.5 million or 9.0 million, depending on the choice of effluent disposal method.

In continuing this testimony, I would like to touch upon a few items brought up against the Kanaha site. Our consultant will elaborate further on these items after my testimony.

1. On the subject of tsunami inundation, we would like to point out that this fact is not new and was recognized in the site selection and engineering measures have been incorporated in the final plans and specifications. It should also be pointed out that the alternate site is also susceptible to tsunami.

2. On beach erosion -- the Corps of Engineers has indicated that there has been insignificant change in the shoreline configuration over a 10-year period. To use this argument of beach erosion against the site would also mean that the very Pond itself would be endangered and protective measures to save the Pond itself would be necessary.

3. The question of infiltration and its possible effect on the plant operation was also brought up as an argument. The infiltration question is not new. It was recognized in the planning documents and the County is committed to a program to mitigate this problem. We have funds in the budget to initiate an infiltration reduction program. In any event, the infiltration affects either site.

4. There were questions brought up on the test well program, such as casing collapses and casing field leaks. These were minor problems during this phase that were corrected and have not shown up as problems since.

5. On effluent reuse, the ultimate plan of the County is to completely recycle the effluent for beneficial uses. To this end, the County Water Department is heading a committee of private and public organizations to attack this problem. Private members are the sugar companies that are to be an integral part of this plan. I repeat, that the injection wells are only an interim means of effluent disposal. The plant design includes provisions for the pumping of the treated effluent to areas where it can be used.

6. The use of the injection well and its effect upon the ecology of the Pond have been adequately covered. It should be pointed out that the County has offered a monitoring program and is now working out this program with the University of Hawaii, Water Resources Research Center.

All of the current discussion appears to indicate that the County, State and Federal people are not properly sympathetic

to the birds. I believe a review of the actions taken on this Pond will remove this stigma. We must ask ourselves about the efforts of the Advisory Committee, the efforts extended in the wood treatment plant problem and the fight to divert the drainage water. These are not the actions of organizations against the birds.

One small point that has never been brought about, but which I would like to insert in the record. Our consultant had originally proposed directed diesel engine power for the blowers, as being more economical than electric motors. Can you imagine the possible noise and exhaust from diesel engines running 24 hours a day? This proposal, even though cheaper, was ordered deleted from the final plans.

Again, I would like to make a point that formal objections to the site did not surface until January, 1972 -- a good 8 months after the grant was approved. The site selection and application were made in April of '71, after a public meeting on March 19th, in which no objections to the site were raised. Representatives of two of the opposing groups were present at that public meeting. Where was the opposition after news of the Federal grant were made public in mid-May of 1971?

HEARINGS OFFICER DUNN: Mr. Goshi, the objections or lack of objections to the project on behalf of anyone in Maui would seem not to have anything to do really with the effect of the project on the environment. As I understand, NEPA, an impact statement is supposed to be prepared by the necessary lead agent or lead agency, when there is a significant effect on the environment, irrespective of whether or not an objection is made. Is it your contention that the lack of objection warrants proceeding without an impact statement, in and of itself?

MR. GOSHI: Mrs. Dunn, I would say that one of the provisions of NEPA is the word "controversy".

HEARINGS OFFICER DUNN: Well, one of the provisions of NEPA is, that if there is a significant effect on the environment, then an impact statement has to be prepared. Another provision is that if there is significant controversy, then there should be an impact statement prepared. Now, is it your contention that there is not a significant controversy or that there is not a significant or a substantial -- possibility of substantial effect on the environment? Is this your position?

MR. GOSHI: That is my position.

HEARINGS OFFICER DUNN: Okay.

MR. GOSHI: At that time.

HEARINGS OFFICER DUNN: You may proceed.

MR. GOSHI: In closing, I would like to say that adequate time -- that there has been adequate time spent in the review of this project. In total, we have had over 9 months of time allotted for review, all at the requests of the conservationists. I believe that the County and the EPA have been more than cooperative in meeting these requests. Further delay at this point in time will only mean that raw sewage will continue to pour into Kahului Bay, at Paia and also at Lahaina; for we must not look at this project as a project in itself, but in the totality of this, to the entire sewer program for Maui County and its impact on the total economy of the County of Maui, including, but not limited, to the viability and continuation of the Maui Land & Pineapple Company Cannery.

The additional time and energy being expended for this one project only means that less is available for the rest of the County, for we are not unlimited in the resources that we possess. I believe, as Director of Public Works for the County of Maui, that the site selection, treatment process and method of effluent disposal, were based on sound and valid principles.

HEARINGS OFFICER DUNN: Mr. Goshi, during your statement, you mentioned something to the effect that you had obviated any decision to use diesel engines; and that you were using some alternative type method with regard to the sewage treatment system. The noise of the diesel engines would be quite loud, was this your position?

MR. GOSHI: My position on obviating the proposal to use diesel was based on the effect of exhaust and noise from a diesel engine running 24 hours a day, to run the blowers.

HEARINGS OFFICER DUNN: And what was your alternative to the use of engines?

MR. GOSHI: The electric engine -- electric motors.

HEARINGS OFFICER DUNN: What is the difference, if you know, between the noise of the electrical engine as opposed to that of the diesel engine? You have to remember, I am a girl and not mechanical.

MR. GOSHI: I do not have any definite figures of any decibel readings. It's just a connotation of a diesel engine belting exhaust into the atmosphere.

HEARINGS OFFICER DUNN: What type of noise will there be in the operation of this sewage treatment system, once it is constructed?

MR. GOSHI: Pardon me?

HEARINGS OFFICER DUNN: What type of noise? Is it going to be, well, like bells clanging, for instance, or a low hum or high hum, or angels' music, or rushing water? Can you give me any type of description?

MR. GOSHI: By the blower building, you would have, depending on where you stand, either a low hum or a high wind. Next to the aeration tanks, with air bubbling through, you will have a slight bubbling or water sound.

HEARINGS OFFICER DUNN: Has there been any determination as to what effect the noise of this electrical engine will be on the birds in Kanaha Pond?

MR. GOSHI: No.

HEARINGS OFFICER DUNN: Do you know or have you any information as to whether or not the noise of this particular type engine in the sewage treatment system, will be greater than that which is produced by the use of airplanes or aircraft in the general area?

MR. GOSHI: I would say that the noise of the airplane would be greater than the noise of the sewage treatment plant.

HEARINGS OFFICER DUNN: And is the same noise that would be generated by the use of the airport or the aircraft, in the same vicinity -- well, or in the same general area as the sewage treatment plant? As compared or -- in the proximity of Kanaha Pond, are they of the same general proximity?

MR. GOSHI: I don't follow that?

HEARINGS OFFICER DUNN: The airport or the aircraft noise and the sewage treatment system, are they both in the same general proximity of the Kanaha Pond? If you know? If you don't know -- I thought perhaps you might know. If you don't know, just answer that you don't know.

MR. GOSHI: Okay.

HEARINGS OFFICER DUNN: You do not know?

MR. GOSHI: I don't follow the line of questioning, as far as the proximity.

HEARINGS OFFICER DUNN: Well, is there an airport in the proximity of the Kanaha Pond?

MR. GOSHI: Yes.

HEARINGS OFFICER DUNN: Approximately how far away is it?

MR. GOSHI: I don't know the exact distance from the runway to the Pond, but the Pond itself is on airport property.

HEARINGS OFFICER DUNN: Is on the airport property?

MR. GOSHI: Yes.

HEARINGS OFFICER DUNN: Yes, I understood that. All right, Mr. Goshi. Thank you very much. Have you anything else to add?

MR. GOSHI: No, nothing.

HEARINGS OFFICER DUNN: Thank you very much.

(Witness excused)

HEARINGS OFFICER DUNN: Mr. Parsons?

STATEMENT BY MR. M. DEAN PARSONS

MR. PARSONS: Thank you, Mrs. Dunn. I will raise this up, if I may, please. My name is Dean Parsons; I am a Consulting Engineer and we are associated with Chung Dho Ahn & Associates of Honolulu, Hawaii; and I am the Project Engineer on the design of the Wailuku-Kahului waste water reclamation facility.

I would like to just add a few comments, if I may. I will not go into detail or reiterate what has been said previously; but I would like to comment briefly on why the site was selected and some of the reasons why we considered it to be a good site location.

One, the location of the waste water treatment facility is located next to land that is zoned as heavy industry.

2. Existing industrial buildings are located to the west of the site. The site is located in an area that could be effectively landscaped with natural growth and shrubbery, to screen the treatment facility structures from the public's view.

The location of the facility will be utilizing land that cannot be used for residential purposes.

The site is in an area that will permit gravity flow of waste water from Wailuku, Kahului, Paia, Pukalani and Makawao and will minimize the amount of pumping required for this regional facility.

I will make some comments also on the tsunami production; and we took the following considerations in our design. The treatment facility has, on its site -- there is, I should say, a natural sand dune, which people here locally refer to, and it's our contention that when we have this facility constructed on this site, that they will remain in their natural state. We would hope that these dunes would help dissipate any wave coming inland from the sea, and force the water to come in around and raise at a slow rate.

Our second consideration was that the hydraulic structures for this facility are designed to withstand inundation.

Another item we took into consideration is that all structures, housing, control panels, have been elevated.

Another thing that we took into consideration was that the finished grade within the plant site itself, is drained to allow the flow of water away from the structures.

I would like to comment on the soils investigations on this site for the construction of the facility. Soils and foundation investigations were conducted by Ernest K. Hirata & Associates, Incorporated. They are soils engineers, at the site, near the Kanaha Pond, and their recommendations were followed in the design of the treatment facilities.

Commenting on salt water infiltration, which would be possible within this vicinity -- if the salt water does infiltrate into the domestic sewage, it would not be detrimental to the natural treatment of sewage if it were blended into the waste being collected. Given sufficient time, the micro-organisms will and could adapt. A shock or a slug of sea water would, however, have the same impact on a treatment facility as a slug or a dumping of a septic tank pumping, or a heavy slug of industrial waste, such as might be expected from a pineapple processing plant. It has a tendency to upset the treatment process.

My last comment that I would like to make would be on water quality; and that is basically that the effluent from

this treatment facility, that will be injected into the ground water wells, will be of similar quality to that as discharged into free flowing rivers on the Mainland where body contact is permitted. Raw sewage will not be discharged into the injection wells. If it were, the injection wells would be plugged. Sewage will be treated by a modified, activated sludge process, with solids handling by aerobic digestion, centrifuging and disposal at a solid waste site; the liquid waste to be chlorified, chlorinated and will receive third stage treatment by rapid sand filtration.

Thank you. If you have any questions, I will be happy to answer them for you.

HEARINGS OFFICER DUNN: Yes, Mr. Parsons. You said something about the treatment process being upset and I wasn't sure that I understood that?

MR. PARSONS: Yes, basically, what I meant was that the process itself -- there are many ways that a plant can be upset. It can be returning -- the process is an activated sludge process and in returning sludge to provide food for your bugs or your micro-organisms to live in and produce a treatable method of reducing your solids, you can give too much solids return, or you can give not enough; and you can have the bugs die off because of starvation and they have a tendency to cannibalize and eat one another or to over feed and kill them, because there is too much food, and this is what I meant.

HEARINGS OFFICER DUNN: What is the possibility of any backup of the water or --- (interrupted)

MR. PARSONS: I am sorry, I can't hear you.

HEARINGS OFFICER DUNN: What is the possibility of any backup or what you call upwelling of the water into the Pond?

MR. PARSONS: We, in our testing on the injection wells, and evaluation by our hydro-geologists, it was their professional opinion that this would not occur. No tests were made to support this, other than through evaluation of existing data and professional opinion. I would like to add, however, that we have met with peoples here in the Islands, particularly on Maui, and it was our understanding that Mr. Doak Cox would provide a monitoring program which would be conducted during the construction of the treatment plant facility. We wrote the specifications so that the first items of work that would be conducted would be the construction of the three remaining injection wells, and the construction of additional monitoring

wells, approximately 12 to 15 -- I think Mr. Cox or Dr. Cox will elaborate later, probably, as to their total number, situated at various spots within the area to be able to catalog and be able to gain this additional information which you are speaking of.

HEARINGS OFFICER DUNN: Very well, Mr. Parsons. Do you have anything else to add?

MR. PARSONS: No, I don't, ma'am.

HEARINGS OFFICER DUNN: Thank you very much.

MR. PARSONS: Thank you very much.

(Witness excused)

HEARINGS OFFICER DUNN: Mr. Cox?

STATEMENT BY MR. DOAK C. COX

MR. COX: Madam Chairman, my name is Doak C. Cox. I am Director of the University of Hawaii Environmental Center.

The concerns of our Center relate to environmental aspects of the proposed Wailuku-Kahului Sewage Treatment Plant and injection wells. In the interest of time, I have abbreviated my testimony from an extended statement, which we are submitting in writing. Even so, I am afraid what I want to say will take a few minutes more than the 10 minutes you have suggested as a limit. I hope you will allow this extra time.

In preparation of our written statement, I have been assisted by Gordon Dugan, Jerry Johnson and Frank Peterson, members of the faculties of the Department of Civil Engineering, the Department of Geology and Geophysics, the School of Public Health and the Water Resources Research Center of the University. Neither our statement nor my testimony reflects an institutional position of the University.

Concerning points on which no new evidence has become available, our extended statement merely summarizes detailed discussions in a report prepared by our Center last September, copies of which we are making available for the record of this hearing. Since that report was prepared, we have had available to us, the overall plan for the proposed sewage treatment and disposal facilities and plans for ground water monitoring; and, provided by the Maui Chapter of the Conservation Council for Hawaii, hydrologic data pertinent to Kanaha Pond. My discussion

will relate to, first, the course of treated sewage effluent from the proposed injection wells; second, the possible effects of the effluent in Kanaha Pond; third, the possible effects of the effluent in coastal waters; fourth, other environmental aspects of the proposed site; fifth, some environmental aspects of alternative sites; and sixth, our conclusions.

On the basis of our earlier report and expanded written statement, or on the basis of my own knowledge -- I shall, of course, be pleased to expand on any discussion abbreviated in this oral testimony. As we showed in our earlier report, effluent from the injection wells will not be retained at the salt ground water horizon of injection, to flow seaward, thence, to points of discharge several miles at sea, as postulated by consultants to Maui County; but will rise in the vicinity of the injection wells, to become incorporated in the lower part of the Hertzberg Lens, a fresh or brackish ground water, overlying the salt water. This is because of the buoyancy of the nearly fresh effluent which will be injected into the wells.

We now recognize, however, that the rise will not necessarily occur immediately around each well, but may be diverted horizontally some hundreds of feet, depending on the local distribution of massive sections of the lava flows into which the injection is made. We cannot predict exactly to what horizon in the lens the effluent will rise, because of limitations in knowledge and to the density structure of the lens, the density of the injected effluent and the extent of mixing of the effluent with salt water during its rise to the lens. Within the lens, the effluent flow will tend to spread radially from the area of injection and will also move seaward, as part of the normal flow of the lens.

In the Kanaha Pond area, there is some eastward displacement of the normal flow, owing to the effect of a cap of sediments over the lava aquifer. Critical to the estimate of the extent of inland movement of effluent, is the velocity of natural seaward flow in the lens, which has not been investigated. The points of discharge of the lens ground water are at the shore and in shallow water nearby. Calculations based on data supplied by the Conservation Council, Maui Chapter, indicate that the net ground water inflow is on the order of 500,000 gallons per day. The inflow rate must be somewhat higher to allow for the -- the actual inflow rate, as distinct from the net inflow rate -- must be somewhat higher, to allow for an undetermined but probably small rate of seepage through the beach ridge. During storm periods, when run-off adds to the supply, the Pond overflows to the ocean.

Data supplied by the Maui Chapter on salinity variations in the Pond, demonstrate convincingly that the major supply of water to Kanaha Pond in normal weather is spring flow, which must be derived from the same lens to which the injected water will rise. The Pond, however, is fed by water from the top of the lens. The effluent will probably come to equilibrium in the lower part of the lens. There may, therefore, be no flow of effluent to the Pond and it is very unlikely that the effluent will constitute a major part of the Pond supply.

The highest contribution of effluent to the Pond might be made by the Kanaha Pond well, which taps the lower part of the lens, in part. This contribution would be made only during drought periods when the well is put into operation.

We have considered the effects of concentrations of biological oxygen demand, total dissolved solids, nutrients, trace metals and trace organics in the effluent, if part of the effluent greatly diluted, does enter the Pond. The natural oxygenization capacity of the Pond is obviously capable of overcoming the effects of a lack of dissolved oxygen in the ground water supply, and a high BOD in the organics through which the supply enters the Pond. The Pond biota are obviously capable of coping with great variability in total dissolved solids concentration. Hence, the small contributions of BOD and TDS from the effluent, after it has been filtered through the aquifer, will be quite insignificant.

A very high biological productivity of Kanaha Pond is already permitted by the nutrient supply to the Pond. Hence, the addition of a small additional nutrient supply from effluent entrained in the Pond supply, will probably have insignificant effects. Trace metal concentrations in typical sewage effluents are far lower than those already found in the Pond sediment, as are the concentrations of those trace organics, for which we have sediment analyses. Contribution of the trace substances to the Pond from the effluent will, therefore, simply add somewhat to already existing sources.

Of importance to the effects of the nutrients and the trace substances, is the possibility of cumulative effects. Accumulation of these substances must be limited, at least to some extent, by the surface discharge and flooding of the Pond during storms.

The possibility that the effluent from the sewage treatment plant might have significant effects on the water quality and ecology of Kanaha Pond, can then be summarized as follows: First, the Pond is fed from the same ground water lens as that

to which the effluent will flow. However, the effluent will recharge the lower part of the lens, while the Pond is fed primarily from the upper part of the lens. The density of the structure of the lens is such that little or no effluent is likely to reach the Pond. The greatest chance of significant amounts of effluent reaching the Pond, is by way of the Kanaha Pond well. The effluent would be greatly diluted if it reached the Pond, which, in any case, is only supplied from the well during drought periods.

If the effluent were to reach the Pond full strength, without dilution, it is possible that serious ecological effects would result. However, it is unlikely that significant ecological changes will result from such greatly diluted effluent, as might perhaps reach the Pond.

Now, on the possible effects on coastal waters -- concern over the ecological effects of the sewage treatment plant effluent injected near Kanaha Pond, should not be restricted to effects in the Pond. As I have already indicated, the effluent will emerge in the ocean in very shallow water, very close to shore. For reasons detailed in our earlier report, we believe that there will be considerable dilution of the effluent by the time it emerges; but quantitative estimation of the dilution is at this point impossible. The nutrients in the effluent should probably be of greatest concern, because of their stimulation of alga growth. Such stimulation has, apparently, resulted elsewhere from the discharge of sewage effluents in the near shore waters, through short outfalls. Considering the possible ranges of dilution, of the injected effluent from the Kahului-Wailuku plant, the diluted effluent might conceivably contain nutrient concentrations several times the natural concentration in the ocean, or only a small fraction of the natural concentrations.

We summarized the situation in our earlier report as follows: The effects of the diluted effluent in the sea water do not seem likely to be significant. However, in the light of the great concern over meeting coastal water standards, the assumption of insignificant coastal water quality effects, that is implicit in the recommendation of underground injection, is an indication of an out of sight, out of mind philosophy, which has been stimulated by the restriction of the water quality standards to surface and coastal ground waters -- coastal waters, excluding ground water.

In our previous report, we called attention to the hazard of tsunami inundation at the proposed Kanaha Pond site for the sewage treatment plant. We called attention to the fact that the landfill that was planned would not constitute adequate

protection against the hazard, but recognized that with suitable design, the plant could be made essentially tsunami-proof. We understand that attention has been given to such design.

The beaches along most of the coast from Kahului to Paia, have been retreating for many decades. Some years ago, it seemed that the rate of sand loss from this beach system was very nearly equal to the rate of sand mining, for lime manufacture, road surfacing and mixing in concrete, suggesting that the mining might be the cause of the retreat. Whether or not sand mining is still practiced on this coast, the beaches are still retreating and the configuration of the beach in the vicinity of Kanaha Pond, at least a few months ago, suggested that the recent retreat has been particularly severe in that vicinity. If beach retreat threatens the sewage treatment plant, it can, of course, be protected. But attempts to provide artificial protection against beach retreat have very frequently had unfortunate consequences on beach stability in nearby areas.

Comments on certain environmental aspects of two alternative sites that have been considered for the Kahului-Wailuku Sewage Treatment Plant seem appropriate. One of the sites is near the road to the west breakwater of Kahului Harbor. We think it should be noted that underground injection of effluent at this site may be quite infeasible. Successful injection of effluent at the Kanaha Pond site is made possible by the presence of lava flows from Haleakala, underlying the site at small depth. Near the west end of Kahului Harbor, the Haleakala lava flows, pinch out and inter-finger with alluvium from West Maui. Although Haleakala lavas are present near the surface at the Maui Pineapple Cannery, no lava flows were encountered at Maui Community College Well No. 17.2, at a depth -- standing to a depth of 68 feet; or at Maui County Well No. 17.1, extending to a depth of 110 feet, both near the west end of Kahului Harbor.

At the Wailuku Mill, a test hole drilled about 30 years ago, extended to a depth of 600 or 700 feet below sea level without encountering either lavas from Haleakala or lavas from West Maui. The permeability of the sediment inter-fingered with the Haleakala lavas in the vicinity of the west part of Kahului Harbor, is much too low to permit successful injection of sewage. No plans should be made to inject sewage in this area without test drilling to demonstrate the presence of lava at the site.

The other site to be considered is that in the sand dunes east of Kanaha Pond and northwest of Kahului Airport. Although there are beach and dune deposits at the surface, in part of

this area, the same lavas that are found at Kanaha Pond lie close to the surface there. Hence, underground injection should be equally feasible there. There are no ponds in the vicinity, so there would be no question of ecological effects in such ponds. The sewage treatment plant could be located on higher ground, further back from the shore than at Kanaha, reducing the hazards from tsunamis and beach retreat. The major disadvantages with this site are non-environmental ones, such as the greater distance that the sewage would have to be transported.

As will perhaps have been recognized from the discussion in the body of this statement, and in our previous report, we believe that the investigations which led to the selection of the Kanaha Pond site for the Wailuku-Kahului Sewage Treatment Plant, and of the selection of underground injection, as the means for disposal of effluent from the plant, have, in many ways, been inadequate and in some ways, have been misleading. We believe that plans based on more thorough and valid investigations might differ in some respects from those now being considered. However, we would not like to leave the impression that in our opinion, that construction and use of the plant as it is now planned, should be deferred.

Deferral would mean continuance of the present practice of discharging raw sewage to near shore waters, both east and west of Kahului Harbor, for the period sufficient for thorough re-examination and for a development of new plans if a change in site or means of effluent disposal seemed in order. It is our understanding that a favorable bid has been received for construction in accordance with the present plans.

Stronger evidence than is now available to us, that significant deleterious ecological effects will result from the implementation of the present plans -- stronger evidence of this kind, would have to be available to lead us to believe that deferral would be warranted. We do, however, recommend that plans being developed for more thorough investigation, of the course of flows injected in the proposed well, as a preliminary part of the construction program, be completed and implemented, so that if construction proceeds, the effects of injection can be monitored after the facilities are put into operation. And indeed, so that the major part of the construction program could be cancelled, even at a late date, if early information from this investigation warranted so drastic a step.

Thank you.

HEARINGS OFFICER DUNN: Mr. Cox, you mentioned at the first

part of your presentation that there could possibly be some harm to the Pond, and I assume to the birds, if there was a large amount of undiluted effluent reaching the Pond. What is the possibility of a large amount of undiluted effluent reaching the Pond? So that the birds would have access?

MR. COX: If you mean a large amount -- a large fraction of the total amount of water reaching the Pond, I should say the chances are nil.

HEARINGS OFFICER DUNN: Do you feel that the chances are nil, that there could be any effect --- (interrupted)

MR. COX: I said "nil".

HEARINGS OFFICER DUNN: Nil?

MR. COX: Nil.

HEARINGS OFFICER DUNN: Okay -- do you feel that there is a possibility that there would be some effect on the birds from any part of the water reaching the Pond?

MR. COX: The chances of effects on the birds or any of the rest of the biota, to a measurable extent, from such fractions of -- from the incorporation of effluent in such fractions of the total supply of the Pond as we conceive possible, we just don't think it will be measurable.

HEARINGS OFFICER DUNN: In your opinion or within your knowledge, what could cause large amounts of effluent to reach the Pond? Can you think of any situation?

MR. COX: Putting a direct pipeline.

HEARINGS OFFICER DUNN: I beg your pardon?

MR. COX: Putting a direct pipeline from the sewage treatment plant to the well. No, I can't see any way, given the present plans, any way by which large fractions of the effluent could reach the Pond.

HEARINGS OFFICER DUNN: When I refer to "large fractions", I mean sufficient waters to cause harm to the Pond, you understand?

MR. COX: Yes. Well, all I can give you is our opinion, that it's unlikely that measurable effects will result; but I

really can't put that likelihood in statistical terms, for example.

HEARINGS OFFICER DUNN: I understand. All right. Have you anything else to add, Dr. Cox?

MR. COX: No. You have in the record or will have in the record, some pretty bulky statements, which do have a great deal more, but unless there are questions that I can answer to your satisfaction, I am through.

HEARINGS OFFICER DUNN: All right. Very well. Thank you very much.

MR. COX: Thank you.

(Witness excused)

HEARINGS OFFICER DUNN: It's almost 9 o'clock. Let's take a 10-minute recess. We will reconvene in 10 minutes.

(Short recess)

HEARINGS OFFICER DUNN: Ladies and gentlemen, would you take your seats, please? If you will take your seats, we will continue with the hearing. Before we continue with another person who wishes to give a statement or comments in this hearing, I have just a couple of short announcements to make. We found someone's keys. Apparently, someone has misplaced their keys. There's someone's car keys that have been misplaced, and Mr. DeFalco has them.

I would like to remind you again, that if you have not already registered, you should do so in order to make sure that your registration card is a part of the official hearing record. We have a large number of registration cards that request time to make a statement or comment and I just wanted to remind you that if you wish to submit a written statement instead of making comments, we will be glad to accept it as a part of the record and you do have until March 2nd, as long as your statement is postmarked March 2nd, it will be made a part of the official record. And you should send it either to EPA in San Francisco, at 100 California Street, or to the EPA office in Honolulu at 1000 Bishop Street, Suite 601.

Is Councilman Molina ready to make his statement? Mr. Molina?

STATEMENT BY COUNCILMAN MANUEL S. MOLINA

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NOTARY PUBLIC

MR. MOLINA: Thank you, Madam. Manuel Molina, representing the Maui County Council. I have a letter and a resolution I would like to include into the record.

This letter is from the County Clerk dated February 20th, 1973. "Honorable Goro Hokama, Chairman of the Council, County of Maui, Wailuku, Maui. Dear Sir: Subject: Resolution No. 29 entitled 'Endorsing immediate construction of the Wailuku-Kahului waste water treatment and disposal system project'. The Council of the County of Maui, on February 16th, 1973, adopted the above-captioned resolution. Besides transmittal of certified copies to those designated in the resolution, the resolution resolves that certified copies of this resolution be presented at the public hearing for inclusion in the official records, referring to, of course, the public hearing scheduled for February 23rd, 1973, by the U. S. Environmental Protection Agency.

"Accordingly, we respectfully transmit two certified copies of Resolution No. 29, for presentation at said public hearing in the manner you deem appropriate. Respectfully, James Ushijima."

Resolution No. 29, introduced by Joseph E. Bulgo and E. Loy Cluney: "Endorsing immediate construction of the Wailuku-Kahului waste water treatment and disposal system project;

"Whereas, the U. S. Environmental Protection Agency will hold a public hearing on February 23rd, 1973; and

"Whereas, the purpose of this public hearing is to receive comments and information from the public for consideration and evaluation regarding the waste water treatment and disposal system for the Central Maui area; and

"Whereas, the Council of the County of Maui is a duly elected representative body of the people of the County of Maui; and

"Whereas, the Council has been fully appraised of the scope and intent of the project; and

"Whereas, the Council finds that the proposed system to be sited adjacent to the Kanaha Pond, offers a proper balance between man and his environment; and

"Whereas, the expeditious implementation of the system is in the best interests of the people and taxpayers of the County of Maui;

"Now therefore, be it resolved by the Council of the County of Maui, that it does hereby endorse and fully support the project at the Kanaha site for immediate construction; and

"Be it further resolved that certified copies of this resolution be presented at the public hearing for inclusion in the official records; and

"Be it further resolved that certified copies of this resolution be transmitted to the Honorable Hiram L. Fong, United States Senator; to the Honorable Daniel K. Inouye, United States Senator; to the Honorable Congressman Spark M. Matsunaga; to the Honorable Congresswoman Patsy D. Mink; to Mr. Russell Train, Chairman, Council of the Environmental Quality; to Mr. William D. Ruckelshaus, Administrator, Environmental Protection Agency; and to Mr. Paul DeFalco, Region IX, Administrator, Environmental Protection Agency."

Thank you very much.

HEARINGS OFFICER DUNN: Thank you, Mr. Molina.

MR. MOLINA: Can I leave this document with somebody or do you have one?

HEARINGS OFFICER DUNN: Leave the document with Mr. DeFalco.

(Witness excused)

HEARINGS OFFICER DUNN: Dr. Howard Powers? Dr. Powers, may I request, as I would request of any other speakers that appear here tonight, that you highlight your speech, if possible, to save time, and give us any written speech that you have made, if you have it in writing.

DR. POWERS: I shall be very short.

HEARINGS OFFICER DUNN: Thank you very much.

STATEMENT BY DR. HOWARD A. POWERS

DR. POWERS: I am a Geologist by the name of Howard Powers, retired now, and I have just a word or two to say about what will happen to the effluent from the well.

I can see it all right. I think our Chairman can see it.

(Referring to drawing)

The blue color represents the salt water that Dr. Cox has been speaking about -- the basal ground water table; the yellow is the Hertzberg Lens, which is brackish water, grading up to sweet water at the surface and this brown line through here, represents the bottom of the Pond sediments. As I say, it is very much of a cartoon. Now, when the consultants were doing their geology -- and all of us were concerned in the geology -- we all had the concept that the bottom of the lagoon sediments was fairly water-tight; and that the Kanaha Pond was being fed by springs from above this water-tight base of the sediments, not coming from the basal water table and the Hertzberg Lens.

Now, a study by the biologists from the University of Hawaii pointed out that there were two and probably three spring areas where the water seemed to be much too fresh to be coming from this water in the lagoon sediments. So it is my conviction now -- and geologists usually have to make an educated guess on what they can see -- it is my belief that the Kanaha Pond springs are coming from the same part of the Hertzberg Lens, which will be invaded by the sewer effluent.

HEARINGS OFFICER DUNN: Now, you said that you were making a guess on this, Dr. Powers. Do you have anything -- any other information, other than your guess? You mentioned someone from the University of Hawaii.

DR. POWERS: The salt content of the springs seems to be too fresh to be coming from the water which is trapped in this lagoon. Other collections of samples from the water and the lagoon are more salty than the water which is coming in the springs. The water is fresh enough to support palm trees and bulrushes, and it is a very fresh water -- almost as fresh as the water in the well which Dr. Cox mentioned, which is 500 parts per million salt.

That's all I have to say is the question that this interpretation would seem to indicate that there is every likelihood that the effluent from the well will enter the Pond in the same fashion that these springs now enter. As I say, we cannot prove it, but it is based on interpretation of the evidence of the freshness of the water.

Thank you.

HEARINGS OFFICER DUNN: What geological test did you, yourself, perform?

DR. POWERS: I made no separate geological tests whatso-

ever. Thanks to the courtesy of the County engineers, we looked at the corings from the drill and we were just trying to check out to see what we thought about the location of the well.

HEARINGS OFFICER DUNN: Very well. Do you have anything else to add, Dr. Powers?

DR. POWERS: I would like to submit this in writing a little later on, not tonight.

HEARINGS OFFICER DUNN: You are certainly welcome to submit anything additional you feel relevant to the subject, as long as you have it postmarked by March 2nd -- on or before that date.

DR. POWERS: Thank you.

HEARINGS OFFICER DUNN: Thank you, Dr. Powers.

(Witness excused)

HEARINGS OFFICER DUNN: Mr. William Mull?

STATEMENT BY MR. WILLIAM P. MULL

MR. MULL: My name is William Mull. I am President of the Hawaii Audubon Society, which has been working for 34 years to conserve Hawaii's water bird populations and their habitat.

We strongly support adequate sewage treatment and disposal for Wailuku and Kahului, and for all urban centers in the State, but not at the potential cost of such a unique and important ecological entity as Kanaha Pond, if such a loss can be avoided. In cooperation with the Maui Chapter of the Conservation Council for Hawaii, I will outline briefly, a few facts about the current status of Kanaha Pond in the overall context of water bird habitat and endangered species in Hawaii.

Studies by Federal, State and University biologists during the last decade, have established that Kanaha Pond supports year around populations of the Hawaiian Stilt, of from 71 to 558 birds; and Hawaiian Coots, from 20 to 166 birds, both of which are designated as endangered species by the U. S. Bureau of Sports Fisheries & Wildlife, and the Hawaii Division of Fish & Game. In addition, Kanaha Pond supports winter populations of ducks and other migratory birds that number up to over 1,000 individuals. These biologists regard Kanaha as the most important piece of water bird habitat remaining in Hawaii. The most

significant factor in their conclusion is the ability of Kanaha to fulfill the nesting requirements of the endangered Hawaiian Stilt and Coot. They state that Kanaha Pond is essential to the survival of the Hawaiian Stilt and the Hawaiian Coot.

In the larger context, Kanaha Pond is an essential part of the overall Hawaiian eco-system, an eco-system that is largely endangered. This is indicated by the fact that State and Federal authorities regard 28 out of Hawaii's 45 surviving species and sub-species of unique land and water birds, as threatened with extinction. In the National context, Hawaii's 28 endangered species represent well over half of the 52 endangered species of birds so designated by the U. S. Department of Interior for the entire Nation.

HEARINGS OFFICER DUNN: Excuse me for interrupting, Mr. Mull. Earlier this afternoon, we had some testimony that was similar to the testimony you are presenting here tonight with regard to Kanaha Pond being a refuge for the Hawaiian Stilt and other birds.

MR. MULL: Yes.

HEARINGS OFFICER DUNN: Do you have any information which would show me or show the Environmental Protection Agency, what the effect of the location of the sewage system will be toward the birds who occupy Kanaha Pond or something that would show me or show us that there is going to be a significant effect on the environment of these birds or a significant change in the environment as the result of locating the sewage system at the proposed location near the Pond?

MR. MULL: Yes. My comments -- I said they are brief -- they will be over with in a minute or two -- are pointed at demonstrating that if this well fails to do what has been claimed for it, but which has not been demonstrated, through the due process of the National Environmental Policy Act -- if this happens, the ecological effect will be significant in terms of Federal and State law. I am simply summarizing in a way that has not been summarized this afternoon, the pertinent legislation involved as well as my very brief statement on the status of these species, in the context of the Hawaiian Stilt and the Hawaiian Coot. I have about three more short paragraphs to read, which will complete my statement.

HEARINGS OFFICER DUNN: You may proceed.

MR. MULL: In the National context, Hawaii's 28 endangered species represent well over half of the 52 endangered species

of birds so designated by the U. S. Department of Interior for the entire Nation. Native Hawaiian plants, insects and other forms of life that make up our Hawaiian eco-systems are in similar bad shape.

On October 7, 1970, the U. S. Congress enacted Public Law 91-438, which concludes that "one of the most crucial situations to face this or any other civilization is the immediate or near potential of mankind to damage, possibly beyond repair, the earth's ecological system on which all life depends". In January of the same year, the President signed into law, the National Environmental Policy Act, which established the requirement and the machinery to assess the potential impact of Federally funded projects that might have a significant effect on our human environment. Also in 1970, the Hawaii State Legislature enacted two pieces of legislation -- Acts 139 and 195, to preserve natural areas and to protect native biota. Since then, the Government has issued an Executive Order -- the Governor, excuse me, has issued an Executive Order, requiring environmental impact statements on State projects. Last year, the State Legislature unanimously approved a bill to conserve and protect indigenous and endangered birds and mammals in Hawaii. Act 49, the Endangered Species Conservation Act was signed into law by Governor Burns on May 16th, 1972.

In this context of serious State and Federal action to conserve and protect the species and eco-systems that make up our essential natural environment, Kanaha Pond takes on an importance for the State and for the Nation that deserves the most cheerful and serious consideration. As it turns out, there was more involved than the whims of a few bird watchers and scientists when the State first set aside Kanaha Pond as a refuge in 1952; and when the Federal Government declared it a significant National landmark in 1968, deserving permanent protection. Clearly, the official machinery is available to weigh prudently, where and what kind of treatment and disposal facilities might best be set up to serve the community's needs, both for sewage treatment and for insured perpetuation of Kanaha Pond as a valuable element in Maui's natural environment. Thorough environmental impact statements, with objective assessments of alternative sites at both the State and Federal levels, will provide the best informed answer.

I have attached to the written copy of my testimony tonight, several documents that may or may not be available to EPA, which are pertinent to demonstrating how endangered these birds are and where they fit into these eco-systems, and what the authorities for these statements are. I think, although statements have been made to this effect -- this afternoon, for

example, I don't think the authority was stated. I am providing some of that authority as background for you in your considerations, along with my written testimony.

HEARINGS OFFICER DUNN: We will receive that information, if you will hand it to Mr. DeFalco.

MR. MULL: All right, thank you. I have already provided it.

(Witness excused)

HEARINGS OFFICER DUNN: Robert Bruce? Mr. Bruce, as I recall, you made a statement this afternoon to us?

MR. BRUCE: Yes, I am going to cover a different area completely tonight and I am not going to read a long report. I am just going to briefly summarize some of the things that I feel are very pertinent and have not been given adequate consideration.

STATEMENT BY MR. ROBERT P. BRUCE

MR. BRUCE: And the first thing is this matter of beach erosion. This is a very serious thing on the frontage of that lot that has been selected on the Kanaha Pond for the site. There is a report of the U. S. Army Engineers, dated August, 1971, which lists the area there as a critical erosion area of the beaches there; and there has been severe erosion over the period. I have been connected -- I didn't properly introduce myself, I guess. I was Head of the Land Department of the original owner of that land and I have been familiar with the Spreckelsville Beach for oh, at least 30 years and -- have seen this continuous erosion and it is very well indicated right near the site there. There is one pillbox that is 100 feet out in the water and that was originally built on a dune and one remark was made that the sand dunes are protecting -- would protect the site. The sand dunes are being continuously eroded and the only reason the sand dunes actually protect the site is if they can slowly and gradually shift back; and this has been occurring all along the Spreckelsville Beach. It's a very windy beach. There is a strong tradewind and it just picks the sand up off the beach and throws it up on the dune; and if improvements are set in there, they will eliminate the natural shifting barrier -- sand dunes, which are now the natural shoreline protection afforded the Kanaha Pond. However, to provide this natural protection to the Pond, these dunes have to be allowed to pile up high, with the wind-blown coral sand constantly being produced in the ocean, and allowed to shift to slowly

drift inland, ahead of this critically eroding shoreline. The elimination of this natural shifting barrier dune is just one more of the serious adverse impacts of allowing the sewage treatment plant to be built on this particular site.

The --- (interrupted)

HEARINGS OFFICER DUNN: Is it your contention, Mr. Bruce, that building the sewage treatment plant on that site is going to cause the erosion of the shoreline?

MR. BRUCE: No, the erosion of the shoreline -- I was referring to the dunes. The erosion of the shoreline has been going on there for all time. The Army Engineers said they can see the original indication of the shoreline being 800 feet from the shore.

HEARINGS OFFICER DUNN: Is it your contention -- maybe I misunderstood this. Is it your contention that building the sewage treatment plant in the location proposed is going to cause a drifting away of the dunes or an obviation or --- (interrupted)

MR. BRUCE: No, but it will limit the dune from being the natural protective barrier that it is now. If they have got a plant there, they are not going to allow the dune to shift over the plant. The lot along the shore is very narrow, particularly at the east end of the lot, where the holding pond is for the raw sewage. It gets to be only 300 feet. There are very clear indications that the shore has gone back oh, at least 300 feet in the last 30 years or 40 years; and we have records along there, you can look at maps that have been made and lots that have been surveyed, where there has been drastic erosion of the shoreline. It's listed as one of the most critical shorelines on Maui for erosion.

So, I don't want to take too much time -- there are lots of people here to report, and we are not going to be here all night, I hope, so I would like to take the privilege of submitting my report in writing at a later date.

I would like to say one thing, though, on the water in the Pond -- you are particularly interested in that. I actually went to all points in the Pond and took samples of the water and made tests of the salinity of those waters that are welling up into the Pond. There is no question in my mind that the Pond is being fed by underground springs from the water table; and there's no question, as Dr. Cox said, that the water will diffuse in all directions from the injection wells and it will

rise up through the salt water and pollute the lens. Whether it will stay in the bottom of the lens or gradually work up to the lens, is another matter. There are such things as lava tubes in these flows and other channels, and the water will follow the line of least resistance and it is liable to -- and some of the springs are delivering quite considerable quantity of water to the well and it's not only going to be in dry weather. This is one that may be a little redundant, but I did mention this afternoon that there is going to be a drainage canal built by the State of Hawaii to drain the road, and it is a sea level canal, and that might lower the level of the water in the Pond, so that to protect the site, the pump water would be run continuously. There is a real chance of that, and of course, I am very interested in -- I am President of the Hui Manu, the local bird society here, and we are interested, like lots of other people, in protecting the birds on that Pond. The County is, too, there is no question about that, and this is a direct threat to the Pond and the well then, might have to be run continuously, which would add greatly to the possibility of pollution from this effluent that will certainly rise up into the water table -- springs that are now feeding the Pond. And if the well is directing the water -- is drawing polluted effluent water in that direction, the springs that are feeding the Pond will also be polluted.

I will submit a report in writing before March the 2nd.

HEARINGS OFFICER DUNN: Thank you very much, Mr. Bruce.

(Witness excused)

HEARINGS OFFICER DUNN: Mr. John Bose?

STATEMENT BY MR. JOHN BOSE, II

MR. BOSE: I am John Bose, a member of the Kanaha Pond Committee, which has been over a year investigating this sewage treatment site; and I am also operator of the Maui Environmental Information Center and I have been collecting documents on this project since I first learned of it, over two years ago.

Before I go into my statement, if I may, I would like to ask the Chair for clarification of the nature of this meeting. I have letters to Senator Inouye, to Senator Fong, to Mr. Keenan of the National Wildlife Federation in Washington and to our organization, all accompanying letters of intent to file an environmental impact statement; and also a request to bring information to this meeting for a draft environmental impact statement. Now, this seems contrary to the statement made at

the opening of the meeting that you were still determining whether or not an environmental impact statement was to be done. All these people have been informed that it would, in fact, be done.

HEARINGS OFFICER DUNN: You mean by the letter of intent that was sent out?

MR. BOSE: Not only by a letter of intent, but by the personal letter to Senator Inouye says, "We shall do the environmental impact statement."

HEARINGS OFFICER DUNN: Who wrote that letter?

MR. BOSE: Mr. Paul DeFalco.

HEARINGS OFFICER DUNN: You know, in order to save some time, many times, letters of intent are sent out as a matter of procedure pending a more effective or more extensive study. It's like any other letter that can be sent out -- it can be sent out in order to save time later on, if, in fact, an impact statement is necessary. If one is not, then a letter of revocation can be sent out and the negative declaration or the impact appraisal, with a negative declaration, be sent along with the letter of revocation, Mr. Bose. Do you understand?

MR. BOSE: In the interest of saving time, I would like very much to see this procedure all, as a groundwork for the draft environmental impact statement and not delay it any further. We would like very much to have the project move as rapidly as possible, along with the County and everyone else.

HEARINGS OFFICER DUNN: At the close of this hearing, as I announced at the beginning of this session and the session earlier this afternoon, there will be an evaluation made of the information that is received here, to determine whether or not there is significant controversy or significant effect on the environment to justify an impact statement; and the information that is used here will -- or is gathered here, will be used, if such a statement is justified.

MR. BOSE: Then, would I be correct in informing Senator Inouye that the statement -- "that an environmental impact statement shall be prepared", is not actually a correct statement?

HEARINGS OFFICER DUNN: I didn't say that it wasn't a correct statement. I did not say that at all, Mr. Bose. I said that the letter was sent out in order to save time at a later time, if, in fact, it is determined by the information gathered

here, that an impact statement is necessary.

MR. BOSE: Thank you. One of the arguments against the Quonset Hut site is the odor problem. I agree that this area is no proper place for a cheap, poorly functioning, smelly sewage treatment plant. Neither is the Kanaha Pond site, which is less than a half mile upwind from the new Maui Mall Shopping Center. The fact is, that there is no excuse for constructing a smelly plant at either site. To protect the environment, the County is required to use the best, practical method of sewage treatment. For the Kihei Plant, the proposed method of sewage treatment is technically advanced beyond the older system proposed for the Wailuku-Kahului plant.

The complete mixed aerobic system proposed for Kihei will produce no odor, according to the design criteria. It will also have a lower operating and maintenance cost and be less subject to malfunction situations, requiring the temporary holding of raw sewage in open ponds. If the more advanced technique were employed in the Wailuku-Kahului plant, the plant would be far superior to the plan that has been presented to us up to this point.

Central Maui deserves no less than Kihei. The County should plan an odor-free plant for the Quonset Hut site. When this odor-free plant begins operating at the logical central location, it will produce each day, about 5 million gallons of clean, rich, sanitary irrigation water. The same nitrogen and other nutrients that would destroy the Kanaha Pond bird habitat, by producing an overgrowth of algae would transform the sandy green belt of parks and public open space into areas of lush, tropical growth. The brownish stubble at Maui Community College, produced by the brackish well water now used for sprinkling, would become healthy green.

Unfortunately, if the present County plan is followed, this valuable effluent will be thrown away. Any time when Maui is experiencing water shortages year after year, the County intends to pump all the reclaimed water into injection wells near Kanaha Pond. Federal requirements for sub-surface disposal permit this method only after "alternative measures have been explored and have been found less satisfactory in terms of environmental protection". The R. M. Towill sewage master plan does not support any conclusion that injection is the best alternative.

Furthermore, the Government policy, "considers this method of effluent disposal as a temporary means of ultimate disposal, to be discontinued as an alternative, enabling great environ-

mental protection" becomes available. We ask that the Federal policies be strictly enforced and that the more desirable alternative of irrigation use be required for this project. According to the County Engineer studies, utilizing the effluent from the Kanaha site, will cost \$195,000 more than the same utilization from the Quonset site, due to the less favorable location. The value of the irrigation water is more than \$100,000 each year. Surely, we cannot afford to throw away this valuable resource.

There are, at the present time, three main sewage collection systems to be served by this treatment plant -- the Wailuku system, all of Kahului, west of Hina Street and the east portion of Kahului. The system from Hina Street eastward, has a severe infiltration problem. The Chung Dho Ahn study indicates that each 100 gallons of material pumped from this system contains 75 gallons of ground water and only 25 gallons of sewage, due to leaky pipe joints and manholes. The study says, "Before secondary waste water treatment is feasible for Wailuku and Kahului, a program to rebuild sewers and manholes in areas where ground water is prevalent, must be undertaken." The report later states, "Virtually no dilution in the Wailuku flows." The Wailuku outfall serves the newer Kahului collection system west of Hina. All this undiluted sewage is delivered by gravity to locations very close to the Quonset Hut plant site.

If the Kanaha site is selected, this good sewage will have to be pumped directly through the area of severe ground water problem. Mr. Bruce, the Hydrologist in our Committee, has stated that this would be extremely poor planning, and the reasons are obvious.

From the evidence gathered by the Kanaha Pond Committee, over the past year, a portion of which have been reported in our statements tonight, we have drawn a comparison of the relative merits of the two proposed sites. In summary, Site B, the Kanaha Pond location, has the following disadvantages: It is in a flood plane and tsunami inundation zone, as indicated in the County's drainage master plan. The shoreline is critically eroding, as reported by the U. S. Army Corps of Engineers. The soil conditions are unstable for buildings, roads or ponds, as indicated in the U. S. Soils Conservation Service Survey of 1972. It is adjacent to a registered National natural landmark so designated because of the unspoiled character of the site, as described by the U. S. Department of Interior, August, 1971.

Initial costs, including sewage delivery, effluent utilization and tsunami protection, are \$450,000 greater than if the Quonset site, with the alternatives, would have been selected,

not including the unknown costs of shoreline stabilization. These figures are from the Towill and Chung Dho Ahn studies.

The disposal method for effluent is a wasteful, temporary expedient, in apparent violation of the FWQA policy of October the 5th, 1970. It could lead to the extinction of the endangered species of birds by destroying their last, best habitat.

The only serious objection to the Quonset Hut site is its proximity to Maui Community College and residential areas. The money saved by locating the plant at this site, could be used to insure an absolutely odor-free plant, with holding tanks instead of an open pond, designed to be completely compatible with the intended use of the area. The alternative site will occupy variable shoreline, a goodly proportion of the scant public sand beach for the entire Island. By all standards of good planning, beaches should be preserved as open space at all costs.

It is not too late to remedy the errors that have come from hasty planning, so that Maui will end up with the best possible sewage system, while protecting the environment to the best possible degree. And my feeling is, that if an honest environmental impact statement is prepared, in accordance with NEPA, the site will definitely be changed.

Thank you

HEARINGS OFFICER DUNN: Thank you very much, Mr. Bose.

(Witness excused)

HEARINGS OFFICER DUNN: Mr Cahill?

STATEMENT BY MR. RUSS CAHILL

MR. CAHILL: Thank you, Madam Chairman. I am Russ Cahill, of Kokomo, Maui. I am a Biologist, the President of the Maui Chapter of the Conservation Council for Hawaii; and the Chairman of the Committee which has just given testimony. I would like to make two points and then summarize our Committee's position on the matter before you. I will try not to be redundant.

I would also like to say, and this is not in my written testimony, that I feel that this plant siting situation is being handled as if it were an Island without a surrounding area; and it seems to me that it should be treated as indicated in the Council on Environmental Quality guidelines, for the poten-

tial of it being an incremental loss to the value of this wild-life refuge, and I will try to cover that.

My first point is, the high nutrient levels in the Pond. Kanaha Pond is a shallow body of water in a warm area. Its salinity varies from very low, at its fresh water spring areas, to very high in its brackish sections. It is a healthy ecosystem producing year after year, several individuals of the species listed by the Interior Department as endangered. If the effluent from this proposed plant brings the nutrient load of phosphates and nitrates in this Pond to a very high level, I feel that the following will happen:

1. Algae will bloom in great concentrations and the Pond will eutrophy.
2. Low oxygen levels will favor those species of microbe and micro-organisms which are anarobic.
3. There is a strong possibility that botulism will occur within the water bird populations, as it has recently, in the Kaelepulu Pond on Oahu, and in several plantation ponds on Kauai.
4. The population of water birds in Kanaha Pond will be decimated.

The second point I would like to make is the point of development encroachment. This Pond is a small remnant of its former size. Habitat has been lost in this area through several factors. The Kahului Harbor end has been filled with dredge spoil. The airport end has had several roads and bunkers built into it, cutting off good habitat area. The Pond is bordered on its harbor end by major petroleum storage facilities, several light industrial facilities, the Maui Electric Power Plant and a livestock feed sales outlet. On its mauka side is Maui's busiest highway; and on the opposite side of that, Maui's only major industrial sub-division and automobile sales facilities. In that area are dozens of structures which have been built during the last few years. On the airport end, rapid planning and construction efforts are being made to provide Governmental operations, base yard facilities and further industrial uses. Plans are on the drawing boards for large drainage canals through both ends of the Pond, to drain highways and future construction areas.

If this plant is built at its proposed location, we will have surrounded the Pond with industrial uses within a very few years. I feel strongly that this action will diminish the

value of this Pond as a wildlife refuge.

Now, I would like to summarize very briefly our Committee's position. First, Mr. Mull testified about the endangered Hawaiian birds and the fact that our record for bird extinctions in numbers of endangered and rare bird species, is unsurpassed in the world.

Mr. Lennox testified this afternoon, and was unable to be here tonight, about the historic loss of water bird habitat in Hawaii; and pointed out how important Kanaha Pond is in that context.

Dr. Powers gave you an idea of what the subterranean and submarine geology of the Kanaha Pond area consists of, and expressed the probability that effluent would come up in the Pond.

Mr. Bruce discussed the aspects of the tsunami inundation potential, shoreline erosion potential, and the suitability of the surface site.

John Bose covered the infiltration problem, the site alternative, and the disposal method.

You are probably curious about where we have obtained our information and why we are interested in this project. Our information comes first from experience. The testimony you have heard comes from individuals who have a total of over 120 years of experience in Hawaii, dealing with natural resources -- individuals who have seen these resources destroyed, not by one great cataclysm, but nicked and dined to death by projects such as this one. Our testimony and our concern comes from careful study -- over 300 hours of study, field work and discussions. The deeper we have dug into the consultants' reports and other data, the more we have become convinced that there is no good evidence to support the siting of this plant next to Kanaha Pond.

If there are reasons, we are ready to hear them. Indeed, we were ready to hear them over a year ago and the National Environmental Policy Act requires you to give us those reasons. We urge you as strongly as we can, to cut through the emotionalism and provincialism surrounding this controversy and look at the facts. We are sure that if you are objective, those facts will lead you to one course of action -- removal of the site to a location away from this irreplaceable wildlife refuge.

Thank you.

HEARINGS OFFICER DUNN: Thank you very much, Mr. Cahill.

(Witness excused)

HEARINGS OFFICER DUNN: Mr. Robert Martin? Is Mr. Martin here?

MR. ROBERT MARTIN: Yes, and I have no testimony.

STATEMENT BY MR. WILLIAM MARTIN

MR. MARTIN: Madam Chairman, my name is William Martin and I have been asked to read tonight, and enter into the record, a prepared statement by Mrs. Inez Ashdown, who is sick at home and is not able to be here tonight. Her statement is dated February 22nd, 1973 and reads as follows:

"Gentlemen, as a member of the Mayor's Citizens Committee on Kanaha Pond, I have worked hard toward preservation and safety of historic ponds and the bird sanctuaries. Like my fellow members, I feared what nearby bulldozing, building and probable use of chlorination, for purification purposes in the proposed sewage disposal plant, might do when erected almost beside the ponds. Consequently, I have started to discuss, argue, questioned and often lost my temper about 'all these new changes which now are ruining my homeland, so I feel like a stranger on Maui now'.

"Last evening, my oldest son, Agnus phoned us. I asked his opinion on the subject, because he is a factory manager and senior engineer for American Factors Plantation, at Lihue, Kauai. He knows all about the methods of waste disposal and purification and environmental balance of nature, et cetera. Agnus said that if this new sewage disposal plant be built and operated properly, there is no reason why it should not be beneficial, rather than a cause of danger to the ponds, the birds, the fish, plant life and the environment. I reminded him that since 1915, I have ridden horseback all in that area and have seen horses grazing with their heads in the pond water up to their eyes, to crop the fresh, green grass under water; that the personnel at the NASCA, Kahului, during World War II were the ones who filled in part of the ponds, so that now, during heavy storms, the birds cannot eat because of too deep water. Also, that I hope to see the ponds looking like a beautiful lake and park land and with the mullet and moi thriving there, too.

"New ~~maui~~ flood gates should be made, as in the time when Kaha-a-Pi'ilani first built between ponds. In Kanaha and Mau-oni

there are provided fish for the populace.

"Agnus met all the points with sensible logic and advised that I continue to trust Mayor Carvalho to protect the ponds and to see that the disposal plant does not affect the ponds adversely.

"Now, just for the record, I want to say that I shall go along with the modern plans and hope that no harm can come to the ponds or life there. Agnus added that the purified water from the new plant could be used for field irrigation, thus helping to save pure drinking water from Waiakamoe and other sources. He concluded by saying that no chlorine is necessary if the effluent is properly treated and that the plant actually could be a beautiful spot.

"Please count me now, as for the Mayor's plans. Respectfully, Inez Ashdown."

Thank you, Madam Chairman.

HEARINGS OFFICER DUNN: Thank you, Mr. Martin.

(Witness excused)

HEARINGS OFFICER DUNN: Mr. Eller -- Mr. W. M. Eller?

STATEMENT BY MR. W. M. ELLER

MR. ELLER: Madam Chairman, I am speaking -- my name is Willard Eller. I am speaking in behalf of the Maui Redevelopment Agency -- a short statement here.

The Maui Redevelopment Agency has followed with keen interest, the proposed construction of the Wailuku-Kahului Sewage Treatment Plant. We feel the sewage treatment facility, which will serve the entire population in the central and outlying areas of Maui, is much needed and long overdue.

Our Agency is presently preparing an urban renewal plan for the heart of Wailuku. This project is administered by the Department of Housing and Urban Development and will eventually upgrade the main business sector as well as improve the residential areas, which have deteriorated over the years.

The sewage collection system is substantially in existence and may be slightly improved. The sewage from this area will receive treatment at the proposed plant, which is considered an important support facility for our project.

Regarding the plant location, we feel that a site close to the industrial area, and away from human habitation, is much more desirable than one in the heart of the recreation and residential center of Maui.

In summary, the Agency is completely in favor of the proposed Wailuku-Kahului Sewage Treatment Plant as planned and located. Construction of this important facility should be allowed to commence without further delay. We request your help in making this possible.

Thank you very much, sincerely yours, Maui Redevelopment Agency.

HEARINGS OFFICER DUNN: Thank you, Mr. Eller.

(Witness excused)

HEARINGS OFFICER DUNN: Mr. Winston Miyahira?

STATEMENT BY MR. WINSTON S. MIYAHIRA

MR. MIYAHIRA: Madam Chairman, my name is Winston S. Miyahira. It's okay. You may call me "O'Hara", if it is easier.

HEARINGS OFFICER DUNN: Thank you.

(Laughter)

MR. MIYAHIRA: I represent this evening, the Kanaha Pond Citizens Committee, as Chairman of that Committee. I realize that time is running short, so I will briefly summarize what I have to say and file for your records, a written statement.

I think it's significant that some historical background be given about this Committee, because of its significance to the Pond. This Committee was formed in 1959, when the Legislature created or gave us an appropriation to improve the Kanaha Pond, which is really the reason why we are here, in connection with the sewage treatment plant. And this Committee, from its early inception in 1959, worked towards developing this Pond, which, as you have heard, is one of the best, if not the best, bird sanctuary left in the State of Hawaii.

However, we have, even before the problem of the sewage treatment plant, encountered many other problems. During the early part of our developmental plans, we encountered problems with the FAA; and incidentally, this is still a problem with us. The latest information is that the FAA has still not accepted

our developmental plans, and which is our main stumbling block from going forth with the development of the Kanaha Pond. We also encountered problems of drainage problems, flood control problems and numerous problems in housekeeping and managerial problems, that the Department of Land & Natural Resources has encountered also, as stated a while ago by Mr. William Thompson of that Department.

Actually, it has been 14 years of frustration. However, I would like to state here clearly that the frustration was, together with the County of Maui Government, the Department of Public Works, the Department of Planning, Department of Parks, as well as the State Department of Land & Natural Resources. I intend to say here, then, that the inter-government cooperation was nothing but excellent. We had the best of cooperation. I realize that this does not have anything to do with the impact statement requirement, but I think as a matter of history, it is important that our Committee knows about this.

With regard to the sewage treatment plant, the Citizens Committee is purely an advisory committee -- advisory in nature. However, its influence is felt because of our pointing out the various critical areas concerned -- areas that are called to our attention by members of the Committee. We do not have any hired employee, as such, but we do have members who are knowledgeable in certain areas of water problems. When the matter of the sewage treatment plant was considered by our Committee, we had to fall upon the expertise of our County Government, expertise of our Fish & Game Division of the State Land & Natural Resources; and through their information to us, as a Citizens Committee, we reacted, and relied upon them, and to place our faith in them, so that they may proceed to develop the Kanaha Pond Committee, in connection -- Kanaha Pond bird sanctuary, in connection with the sewage treatment plant. Mr. Takada of the Fish & Game Division stated for our records, and I would also like to make it clear that what I have to say is from the records of our meetings -- he stated that because of the assurance of the relocation plan given to us by the County of Maui, specifically that of assuring the Committee that if the sewage treatment plant development will show any signs of seepage of effluent in the Pond, that they would be willing to relocate the wells towards the east section, about 4,000 feet away from the original site. Mr. Takada of the Fish & Game Division then, felt, and for our information, that this kind of assurance is placing faith, that they will do everything in their power to preserve the Kanaha Pond bird sanctuary.

However, in view of further information that other conservation groups were in the process of conducting studies regard-

ing this project, the Kanaha Pond Citizens Committee decided to refer to its sub-committee, the assignment of obtaining whatever information available from such studies; and to compile and furnish our County authorities as well as the State authorities, with such information.

Now, our records indicate that our sub-committee Chairman, Mr. Robert Bruce, has subsequently furnished such information to our County authorities and to the Department of Land & Natural Resources.

I would like for the public to know, this evening, that when I say that we did, in the course of 14 years of struggle and frustration, that we had nothing but the best of cooperation -- as a matter of fact, we had nearly \$100,000 of appropriation, which was to lapse on December 31st of last year, which is about two months ago. Through the grace of our Governor, we were able to prevent the lapsing of the funds and to keep going in the developmental plans.

The records will also show that even before I, as Chairman of the Committee, approached our County fathers, the Mayor of our County, Mayor Carvalho, had written to Mr. -- Dr. Matsuda, the Director of the Department of Transportation, asking him to stop the lapsing of funds by speeding up the developmental plans of the Kanaha Pond; and thereby supporting -- giving his support to the developmental plans of the Kanaha Pond. I merely stated that for public information, that we did have nothing but the best cooperation of the County, as well as the State.

Now, the Citizens Advisory Committee has spent, as I said, many hours for the last 14 years, to insure the preservation of Kanaha Pond bird sanctuary. It is hoped that the findings of your EPA and other authorities that will be involved, will prove that the bird sanctuary and the sewage treatment plant can co-exist, without the necessity of any change of plans. However, if any findings should be adverse, we hope that the authorities will pursue a course -- or courses of action that will be in the best interests of man, as well as our total environment.

Thank you.

HEARINGS OFFICER DUNN: Thank you, sir.

(Witness excused)

HEARINGS OFFICER DUNN: Mr. Beggs -- Mr. Webb Beggs? Is Mr. Beggs here?

(No response)

HEARINGS OFFICER DUNN: Mr. Joseph Kealoha?

STATEMENT BY MR. JOSEPH KEALOHA

MR. KEALOHA: Madam Chairman, I am Joe Kealoha, President of the Maui County Board of Realtors.

Whereas, it is assumed that the potential tsunami damage and erosion problems have been taken into consideration, that plans to protect the sewage treatment plant are incorporated in said plan, the Maui County Board of Realtors endorses the Kanaha Pond for the sewage treatment plant site.

The Board will go on record to endorse said site that has been selected by the County of Maui, in the area adjacent to the Kanaha Pond in Kahului, because of the following reasons:

1. Enough studies have been made by consultants;
2. Plans are already drawn, bids are called for at a much less than estimated cost;
3. No one can assure us that our Island waters can withstand more raw waste without upsetting economical balance of marine life;
4. Any further delay may jeopardize the health, safety and welfare of the people of Maui.

Finally, number five, the site selected is away from any populated, residential and business area.

Therefore, the Maui County Board of Realtors requests that the EPA grant the County of Maui to proceed with the contract for the construction of the waste water treatment and disposal system in the area adjacent to the Kanaha Pond.

Thank you.

HEARINGS OFFICER DUNN: Thank you, sir.

(Witness excused)

HEARINGS OFFICER DUNN: Mr. William Willmore. Is Mr. Willmore present?

(No response)

HEARINGS OFFICER DUNN: Mr. Donald Ferrell? Is Mr. Ferrell present?

(No response)

HEARINGS OFFICER DUNN: Mr. Ferrell?

(No response)

HEARINGS OFFICER DUNN: Mr. Ferrell filled out a card, but apparently decided to leave and he has attached to his card, a statement; so I am going to see that the statement is incorporated into the record. Mr. James Sconyers -- S-c-o-n-y-e-r-s?

STATEMENT BY MR. JAMES M. SCONYERS

MR. SCONYERS: I am representing the Sierra Club, Hawaii Chapter, and I am going to condense my remarks even more than I originally intended to.

The Sierra Club agrees with everyone else, that there is a need for a sewage treatment plant in the Kahului-Wailuku area. However, we are opposed to presently accepting the Kanaha Pond site. We concur with the questions that have been raised and the doubts that have been expressed by such people as the Conservation Council, Audubon Society, and others; and to put it succinctly, on the basis of the evidence, including tonight's testimony, we feel there is sufficient conflicting interpretation and opinion of the effect of a plant in the Kanaha Pond area; and there is enough conflicting interpretation and opinion to warrant further study of the consequences of such a plant in that area; and the consideration of alternatives.

In short, we recommend the preparation of an environmental impact statement.

Thank you.

HEARINGS OFFICER DUNN: Thank you, Mr. Sconyers.

(Witness excused)

HEARINGS OFFICER DUNN: Mr. Charles Iwata?

STATEMENT BY MR. CHARLES O. IWATA

MR. IWATA: Madam Chairman, my name is Charles Iwata; I represent the United Public Workers Union, Maui Division.

I have a letter here, dated February 22nd, 1973, to Mr. Paul DeFalco, Regional Director, Office of Environmental Protection Agency, 100 California Street, San Francisco, California.

"Dear Mr. DeFalco: Proposed location of sewage treatment plant. In behalf of the UPW, ASME, Local 646, Maui Division, representing a membership of more than 1,100 members, please be advised that we support the Mayor's recommendation, the Maui County Council, and the Maui Chamber of Commerce, in the proposed location at Kanaha Pond, of the sewage treatment plant

"We believe that a project of this type should be located closer to the birds, rather than to schools.

"Your serious and sincere considerations regarding this matter will be greatly appreciated.

"Very sincerely yours, George Ventura, Vice President, UPW, ASME, Local 646, Maui Division."

Thank you.

HEARINGS OFFICER DUNN: Thank you, Mr. Iwata.

(Witness excused)

HEARINGS OFFICER DUNN: Mr. John Fernandez?

STATEMENT BY MR. JOHN M. FERNANDEZ

MR. FERNANDEZ: Madam Chairman and members of the United Environmental Protection Agency, my name is John M. Fernandez, a resident and property owner of Pukalani, Maui, and a former Director of Public Works.

I am speaking in behalf of myself and the Pukalani Community Association. We sincerely support the plans of the County of Maui to construct the sewage treatment plant at Kahului, in the vicinity of the Kanaha Pond, the designated location, which is within the close proximity of an existing sewage and oxidation pond presently serving the Kahului Airport and the housing area.

Up to this point, we have not heard of any adverse effects of the untreated effluent from the existing oxidation pond on this body of water.

We, the citizens of Pukalani, do respectfully request, that the Environmental Protection Agency, permit construction of the proposed Wailuku-Kahului treatment plant in the present selected location, adjacent to the Kanaha Pond, for the following reasons:

First, land is available adjacent to the presently existing heavy industrial development; therefore, no residents will be affected. The land is also available to the County of Maui at no cost. Since the plans are already prepared and were previously approved, construction should proceed as soon as possible, to eliminate the raw sewage outfalls presently being discharged outside of the Kahului Harbor.

Third, the plant is needed in order to meet the existing housing needs in Central Maui. Also, it is contemplated that eventually, this plant will be intercepting and treating the sewage from the Paia, Makawao and Pukalani area.

Fourth, we are convinced that the County of Maui, together with the consultants, who have expertise in this field, have taken all reasonable precautions to protect the Kanaha bird sanctuary. There seems to be no positive evidence to indicate that the plant will damage the Pond.

Fifth, further delays would only mean additional costs to the taxpayers of this County.

Sixth, we likewise support the County as being opposed to the site near the Quonset Huts, because of the close proximity to a residential and educational area. This site should be preserved for recreational, educational and cultural purposes.

We believe that the plant will result in improvement to the health and welfare of the surrounding community. This project has been in the planning stages for many years. Since its very inception, speaking from personal experience, environmental considerations and the need to protect the integrity of this Pond, have been a consideration of the County.

In conclusion, we strongly recommend that the construction of this necessary facility should begin immediately. Delay of this project is unreasonable. It should proceed forthwith.

Thank you very much for the opportunity to present our views in this matter.

Madam Chairman, I also have with me, a petition signed by the citizens of Makawao, Pukalani and the Haliimaile area, sup-

porting this project at this present location. The number amounts to some 274 signatures; and I would like to present this, to be injected into the record as testimony supporting this project.

Thank you, Madam Chairman.

HEARINGS OFFICER DUNN: Thank you, Mr. Fernandez. Would you give your material to Mr. DeFalco, please?

(Witness excused)

HEARINGS OFFICER DUNN: Mr. Ken Kato?

STATEMENT BY MR. KEN N. KATO

MR. KATO: Madam Chairman, my name is Ken Kato and I am a Biologist.

I am in favor of quality growth and development of Maui County. I am in favor of the immediate installation of the sewage treatment plant at the site proposed by the County Administration, for the following reasons:

First, the need for a sewage treatment plant in the Kahului-Wailuku area is undeniable. The County of Maui has utilized professional engineers, hydro-geologists, biologists and planners who have objectively selected the Kanaha site. Thus, from the standpoint of logistics, economics and even preservation of our environments, the experts have found the selected site in the best interests of the community.

Secondly, I am opposed to the squandering of County funds or any other funds, merely to pacify minority interests, who are, apparently, unwilling to accept the findings of the experts.

Thirdly, for many years, I was under the impression that the three species of waterfowl found in the Kanaha Pond area, namely, the Coot, 'Auku'u and Hawaiian Stilt, are found only in the Hawaiian Islands and are facing extinction. Recently, however, I have learned that these birds are not exclusively found in Hawaii, nor is extinction of the three species as eminent as I was led to believe. For example, the Black-Crowned Night Heron or 'Auku'u, is found in Eurasia, Africa, North and South America and the Pacific Islands. The Coot bears the scientific name of *fulica americana*. It is found from Canada to Ecuador, through the Pacific States. In some states, the Coot is a game bird.

The Black-Necked Stilt, too, is certainly not exclusively found in Hawaii. This species, *himantopus mexicanus*, is found in the Western and Southeastern United States to Peru. This species breeds in South Oregon, North Utah and South Colorado. The above information may be found in Roger Torrey Peterson's "Field Guide to Western Birds". Mr. Peterson is a renowned ornithologist, and I believe him.

It may be possible, that due to geographic isolation, these species may be different races. This, however, does not preclude inter-breeding of separate populations, nor does it preclude the possibility of introducing birds from more abundant areas, if the presence of these birds are found to be desirable. Thus, I do not believe relocation of the proposed sewage treatment plant is warranted, on the basis that the waterfowls could be driven to extinction.

Thank you.

HEARINGS OFFICER DUNN: Thank you, Mr. Kato.

(Witness excused)

HEARINGS OFFICER DUNN: Mr. Ty Benson? Is Mr. Benson present?

(No response)

HEARINGS OFFICER DUNN: Mr. Allen Barr?

STATEMENT BY MR. ALLEN W. BARR

MR. BARR: Madam Chairman, my name is Allen Barr. I am from Makawao. I am not an environmentalist, although I have a great deal of respect for them. I am not a missionary, although I have some respect for them, too. I am a resident, citizen, taxpayer and property owner in Maui County and a social studies teacher here at Baldwin High School. My particular concern is that the choice of the Kanaha Pond site for the Kahului-Wailuku Sewage Treatment Plant involves fraud and illegality. Whatever the impact of the plant itself on our natural environment, the fraudulent and illegal acts leading up to the Federal construction grant, will permanently scar our socio-political environment if they are not properly investigated and appropriately rectified by the Federal Government.

The grant application would have the Federal Government believe that the choice of the Kanaha Pond site is based upon the recommendations of the accompanying Chung Dho Ahn and R.M.

Towill Corporation studies. This is a misrepresentation of the truth. The Chung Dho Ahn study was completed under an illegal contract. The study was completed in early 1971 and is dated April 2nd, 1971. Contract No. 599, between Chung Dho Ahn and the County of Maui, under which the study was done, was presented to the Maui County Council for authorization more than 6 months later, in November of 1971. At the time the contract was signed and the study was done, the County had no legal authority to commit itself to the contract and Chung Dho Ahn had no legal bases to expect payment for its services.

Under such circumstances, whatever the professional competence and reputation of the consultant firm, the validity and objectivity of its recommendations must be doubted. If they did not recommend the site the County Administration wanted, the illicit contract could be declared null and void and payment would be withheld. This is no small pressure, when a \$475,000 contract is involved. Indeed, the arguments in the study point to Site A as the better site, so one must look beyond the study itself to account for a recommendation of Site B.

The R. M. Towill Corporation's recommendation of Site B must also be discounted. At a series of public meetings on the sewage water drainage master plan, held in late March, 1971, the public was told that the site of the plan was not yet determined. Mr. Frank Doyle, representing R. M. Towill Corporation, told people at the Makawao meeting, for example, that the site was not determined; Site A seemed the better and the public would have opportunity to react when the study was completed and one site was recommended as preferred. The Directors of Planning and Public Works were present and did not correct this information if it was wrong.

The public did not learn which site was recommended until more than 6 months later. The statement in the grant application that says there were only minor objections to Site B by a few residents concerned with odor, is a misrepresentation of fact to the Federal Government. The public was not informed of the site at that time and was not given opportunity to react.

The Mayor himself, told me in his office, during mid-April, 1971, that the preliminary report by R. M. Towill was not complete. I was naturally surprised to learn that the preliminary report submitted with the grant application was dated April 2nd, 1971. Apparently, this is another misrepresentation, but in any case, a safe one, since done privately to a single citizen.

More importantly, the Towill recommendation is this: I have a letter from a Towill engineer which says they were not

involved in locating the injection well, which is the same as the plant site. Apparently -- the injection well site, I'm sorry, which is the same as the plant site. Apparently, they were given the information of what site must be recommended. The decision of what site to specify in the grant application was not based upon the engineering studies. It was never made -- it has never been made public exactly why the site was selected. It appears to have been an expediency caused by the Federal Government itself.

The Government approved Hawaii's water quality standards, and agreed to accept applications for grants as of March 20th, 1971. Deadline for application was April 15th, 1971. To obtain the needed Federal monies, the County had to rush preparation of its application. Since Site A was not owned by the County at that time, it was apparently forced to commit itself to Site B.

The County Government has since had to further misrepresent the facts and mislead the public in order to justify a decision based upon expediency.

I respectfully request that the Environmental Protection Agency and the Federal Government, generally, take whatever time and pains are needed to determine the truth in the matters here raised. I further request that EPA do whatever it can to get the Federal Government to bear whatever additional costs result from this delay. This cost will be minor, compared to the price this Country and this County will pay for a Government which itself commits or condones illegality and dishonesty.

Thank you very much.

HEARINGS OFFICER DUNN: Thank you, Mr. Barr.

(Witness excused)

HEARINGS OFFICER DUNN: John Hanchett. Is Mr. Hanchett present?

STATEMENT BY MR. JOHN I. HANCHETT

MR. HANCHETT: Madam Chairman, my name is John Hanchett. I am Vice President of Hana Ranch, Inc., a corporation that is involved in environmental matters in Hana, simply because of its many varied interests in the Hana District. I appear before you because I want to emphasize an important aspect of this subject -- of the subject of this hearing, and I feel --

that I feel has not been given full consideration.

Our projects in Hana are not as complex as this one. However, they are every bit as important to us as this one is to this community. You are discussing a sewage treatment plant. Our discussions revolve around ancient Hawaiian structures, roadside foliage and anything that endangers the aesthetics of our area.

My experience has been with the people who are involved -- County officials, whose judgment is being questioned on site selection. I would like to state that during my association with them on environmental matters, I have found them responsible and dedicated in protecting our environment, as it affected our community. I find it hard to believe that these same County officials, who have demonstrated their deep concern for our environment in Hana, would not have the same deep concern in this community as regards the sewage treatment plant and its effect on the environment, in this instance, Kanaha Pond.

Instead, I find it easy to believe their study has been thorough and complete.

Thank you.

HEARINGS OFFICER DUNN: Thank you, Mr. Hanchett.

(Witness excused)

HEARINGS OFFICER DUNN: Mr. Machida -- Mr. Gerald Machida?

STATEMENT BY MR. GERALD MACHIDA

MR. MACHIDA: Thank you, Madam Chairman. My name is Gerald Machida; I am the Division Chief, Hawaii Government Employees.

I will not delve into the technical aspects of the question at hand, since it was done by the experts. I would, however, like to make the following brier position statement:

I am speaking as a native of the Island of Maui, a concerned citizen of the County of Maui, and as an employee of the Hawaii Government Employees' Association. As most residents of Maui, I have been following the status of the sewer treatment plant project over the past several months, through the news media, with only a passing interest and concern as to the merits of the proposed site adjacent to Kanaha Pond, as compared to the alternate site in back of the Quonset Huts. My passing interest and concern has evolved into a very deep concern, due

to the adverse remarks been hurled at the people responsible for the project.

These are people who are members of our organization -- the professional staff of the Planning and Public Works Departments, the Legislative body of the County and the Administration. I have every confidence in the decisions of this group of County employees; and I have this confidence in their capabilities for as long as I have been with the HGS, some 6 years.

They are experts in their respective fields and their decisions on past projects have been anything but detrimental to the community, as well as to the environmental and ecological concerns of Maui County.

Inasmuch as it seems to be pure conjecture on the part of those opposed to the project, I fully support the proposed plan and urge the approval of the site without any further costly delays.

Thank you.

HEARINGS OFFICER DUNN: Thank you, Mr. Machida.

(Witness excused)

HEARINGS OFFICER DUNN: Leslie Skillings? I notice that you have submitted to us, a copy of a written statement. Is this the statement that you were planning to give, Mr. Skillings?

MR. SKILLINGS: Yes, it is.

HEARINGS OFFICER DUNN: Could you highlight it for us, rather than read the thing through, and then perhaps, we could submit it to the record?

STATEMENT BY MR. LESLIE SKILLINGS

MR. SKILLINGS: I think after Allen finished, there is very little bit that I have to say, other than the fact that I am speaking for Life of The Land. I am Les Skillings, the Maui President, and I would like to say that Life of The Land is in full support of the positions that have been taken by the Conservation Council, the Kanaha Pond Advisory Committee and the National Wildlife Federation.

A great deal of time has been spent -- if I am going to highlight this -- my testimony revolved around the historical perspective of what has led up to tonight's hearing, and I

think briefly, I can state, and also document -- if you will notice, after the testimony, there is a chronology that runs for some 3 or 4 years. The problem that we are facing here is the fact that the County has not disclosed these studies, the reports. It has misled the public in its application to the Federal Government. I would like to quote this part -- it states in Section 6, public objection to the project, the County states, "The only objection raised were those connected with the location of the treatment plant. The few citizens living in the vicinity of the treatment plant site, Site B, the Kanaha Pond site, suggested alternative sites. However, none of these were feasible."

I attended one of the public meetings that were held on or around March 19th, 1971; and at that time, Frank Doyle presented alternatives with very little information as far as site location or disposal of affluent -- it should be "effluent". With that, the public had very little information on which to make any objection, but they were promised additional information. This additional information was not forthcoming and it is very difficult to have objections to the site when the public did not know or could not know until at least the publication of the bidding for the test well, for the Kanaha Pond site, and that was on May 26th, of '71, at its earliest.

I might point out, as Allen has done, there are some contract irregularities. I have asked through the past couple of years, repeatedly for the Towill report, which I first picked up on September 24th, 1970. I have been denied access to this. I first saw it, as you will see in the chronology, on December 5th, 1971; and after that point, I was denied to look at it again until after January the 8th, 1972, on the excuse that it had not been approved by the County Council. Now, this is ridiculous. It's too late, after it has been approved by the County Council, to make any kind of comment on a plan that is being adopted.

I would like to also point out the fact that Ordinance No. 716 of the County of Maui establishes regulations and development standards for areas subject to flood and tsunami inundation; and Site B, according to the drainage master plan for the County of Maui, is subject to both flooding and tsunami inundation.

I question whether this site is not in violation of the County's own ordinance, upon which our national flood insurance rests.

I have also attached a letter or a news article from the

Maui News as part of the documents, in which Howard Nakamura is quoted as saying that "we don't really have to enforce these things, in essence".

The last point that is interesting to make, as a comparison of the difference between what can be and what hasn't been, as far as the Wailuku-Kahului plant is concerned, is the present Lahaina-Kihei engineering studies, which are just out. These two called for what is called "a complete mix system", which is a new development in the activated sludge process in secondary treatment. This appears to be a much superior system to what is presently being planned for the Kahului-Wailuku site.

Now, one of the requirements of Federal law, is that the system be the most effective in the storage treatment and purification of waste. With the state of the art now, it would appear that the Wailuku-Kahului plans will not meet this requirement.

In summation, I think the problem as I see it, is one of too little planning, too much of a rush, with too little citizen input, with too much secrecy; and the environmental impact statement procedure will permit public participation, which has been absent to date. This is our chance to correct the mistake before we make an even greater one.

Thank you. I think you will find the chronology very interesting. I have submitted three copies.

HEARINGS OFFICER DUNN: Thank you, Mr. Skillings. Your written statement will be made a part of the record.

MR. SKILLINGS: Thank you.

(Witness excused)

HEARINGS OFFICER DUNN: Mr. Norman Saito -- S-a-i-t-o?

STATEMENT BY MR. NORMAN SAITO

MR. SAITO: Madam Chairman, I am Norman Saito. I am an Engineer and I have presented you with a written statement; and on the second paragraph, first item, I would like to make one correction -- the date is December, 1971.

I won't go through the whole letter, but I would like to say that unfortunately, there is only one person that has gone through the records I have in this matter. I think you will

find your upwelling question answered here.

Thank you.

HEARINGS OFFICER DUNN: Thank you, Mr. Saito.

(Witness excused)

HEARINGS OFFICER DUNN: Mr. Alvin Furuhaga, is that the way you pronounce it, or Furuhaga? Is Mr. Furuhaga here -- F-u-r-u-h-a-g-a?

(No response)

HEARINGS OFFICER DUNN: Mr. Gene Grounds?

STATEMENT BY MR. GENE H. GROUNDS

MR. GROUNDS: My name is Gene Grounds, and I am representing the Kahului Business & Professional Association.

In my written testimony, the Association is going on record as supporting the site at Kanaha Pond; and I won't read the total comments here.

I want to state, though, that the ecology of Kanaha Pond has suffered considerable abuse over the years, from such things as agricultural chemicals and aircraft noise; and it is to the credit of the animal and plant life that it has survived and been able to adapt to survive. Notwithstanding, we do not wish to abandon these few remaining species, which are rare.

The safeguards that the project engineers have designed into the system, are practical and realistic. Our County, State and Federal engineers have reviewed these systems and found these favorable.

Regarding the alternate site, the community itself has designated the alternate site area as a social gathering area for various community needs. Adjacent to this is the Community College, which is expanding yearly, the War Memorial Gym, along with the Little League Baseball Fields and the new Baseball Stadium, and other areas are projected for this area. This is Site A. So that this new site that is being proposed -- this Site A, would not be as desirable as Site B, from a community standpoint.

In summary, in looking at what has been stated here tonight, I would like to make a couple of comments. I don't feel

that the ecology of Kanaha Pond will be affected substantially. There are, what I feel, five factors involved here -- one is site, sound, the ground water effluent effect, the tsunami inundation and the one that I feel that is -- that might have some credence, but even that can be broken down, I feel, would be the erosion of the beach area.

As far as the site problem is concerned, the trees and other areas -- other things can be designed into the system to camouflage the area. Sound has already been discussed by Mr. Goshi as regarding use of electrical motors, as opposed to diesel. These sites, as I have noticed, have always been rather quiet, anyway.

The ground water situation, which Dr. Cox went into, and some of the questions that you brought out in cross-questioning him, indicate that the water -- the effluent water will be going into the bottom part of the lens and yet, the water in the Pond generally comes from the top part of the lens, so that even within the lens area -- I don't know how wide this is, but this -- there should be some safeguard factors there, plus coming through the ground itself would have a filtering process.

Tsunami -- Kahului itself is subject to tsunami, so we would not only have a problem with the sewage treatment site; we would also have a problem with the shopping centers and residential areas, too. And as was mentioned, the plant is designed to be able to absorb temporary set-backs.

The other question regarding your beach erosion, Mr. Bruce mentioned that the site is located 300 feet back from the shoreline area -- the existing shoreline area. This is about the size of a football field and if it has taken 40 years to go back the present distance that he mentioned, from 300 feet out, to the present location, it gives us ample opportunity to rectify any areas of beach erosion with the next 40 years.

Thank you.

HEARINGS OFFICER DUNN: Thank you very much, Mr. Grounds.

(Witness excused)

HEARINGS OFFICER DUNN: Mr. James Brock?

STATEMENT BY MR. JAMES BROCK

MR. BROCK: My name is James Brock. I am representing the firm of Tryck, Nyman & Hayes, which is an architectural-

engineering consulting firm.

We are not associated with any of the design involved in the plant nor the selection of it, or the sites. However, we are responding to a discussion of the site at one of the local professional society meetings. As a result of the discussions publicly here or within the profession here, we have discussed the site and resultant -- or considerations around the site within the firm, both here and in Honolulu, and feel that no new evidence seems to be available to indicate that the delay caused by the submission of an environmental impact statement and the time required to process such a statement would be justified.

We feel that the majority of the statements or all of the statements made by the conservation groups have been considered in the past. Although we have sympathy with them in their consideration of the Pond and the importance of the wildlife sanctuary, we don't believe that any significant change in their position exists today that did not exist two years ago; and that the evidence submitted in the last year and a half to two years will support the action taken by the Government to date. Thank you.

HEARINGS OFFICER DUNN: Thank you, Mr. Brock.

(Witness excused)

HEARINGS OFFICER DUNN: Mr. Rod Graybeal? Is Mr. Graybeal present?

(No response)

HEARINGS OFFICER DUNN: We have a request from Mr. Graybeal, representing the Maui Youth Council, and attached thereto is a statement. Since he is not present, we will make it a part of the record. Mr. Noboru Koito -- K-o-i-t-o -- Koito? Did I say it right, Mr. Koito?

STATEMENT BY MR. NOBORU KOITO

MR. KOITO: Madam Chairman, I am sorry, I have a difficult first name. It is Noboru -- Noboru Koito. I am here speaking in behalf of the Legislative Ad Hoc Committee of the Maui AJA Veterans, Incorporated. I am not speaking in behalf of the whole membership on a point that we haven't had any meeting to discuss this subject.

However, last Tuesday, our Committee had the privilege of listening to Mr. Cahill and also Mr. -- Mr. Cahill, of the Con-

ervation Group, and also Mr. Nakamura and Mr. Goshi of the County; and at this time, I would like to thank them for their very excellent presentations. Now, after weighing the matter carefully and with an open mind, we have come to this position -- just these Committee members -- that we would like to see the sewage plant located at the proposed site, adjacent to the Kanaha Pond, on the point that the County officials and those responsible are very mindful of the importance of ecology, of conservation and especially of the safeguard of the bird sanctuary there. And on that point, we feel that we would like to go along on this proposal.

Thank you.

HEARINGS OFFICER DUNN: Thank you, sir.

(Witness excused)

HEARINGS OFFICER DUNN: Mr. Bill Lesk? Is Mr. Lesk present?

(No response)

HEARINGS OFFICER DUNN: Mr. Edwin Silva?

STATEMENT BY MR. EDWIN T. SILVA

MR. SILVA: Madam Chairman, I am Edwin T. Silva of Kahului, representing a group of citizens; and I have here with me, a petition which I will not go into detail. It would take too much time; and it has 1,951 signatures from concerned residents of Kahului and our surrounding areas, including 95 signatures from Hale Mahaolu, housing for our senior citizens, who are in favor of the Kanaha Pond site; and we feel that there is no reason for an impact statement and we should proceed as soon as possible.

And we would like to submit this as our proof that we are concerned citizens of Kahului in regards to this site down in Kahului -- at Kanaha.

HEARINGS OFFICER DUNN: Very well. Thank you, sir.

(Witness excused)

HEARINGS OFFICER DUNN: Ronald Lau?

STATEMENT BY MR. RONALD LAU

MR. LAU: My name is Ronald Lau. I am a physical education teacher at Lihikai Elementary School. I have no facts to present but would like to insert some common sense as to why an impact statement should be made. First of all, all the studies showing that no threat is going to threaten the birds at Kanaha Pond remind me of someone playing with a sharp knife, that can hurt pretty bad sometimes. Why should man have the right to threaten the home of native birds already endangered, for the survival of their species? The sad fact is that the Kanaha Pond area is not the only choice to improve man's environment through sewage disposal; and if money, or the loss of it, through delays, is overriding reason why Kanaha Pond is the best area, I feel that the survival of native stilts and ducks are worth far beyond the monetary loss that the County may suffer.

We are in a position where we can have both the sewage plant and our native birds, if an alternate site is utilized; and this means any alternate site, not just the one behind the Quonset Huts.

It would indeed be an ironic crime against nature to have the sewage plant built in the Kanaha area to improve man's environment, and at the same time, very possibly destroying another of nature's creations, through man's pollutants.

Let us hope that any potential threat to Kanaha Pond never takes place. We should ask ourselves, "Do we want an Island with solely Mynah Birds flying around; and finally, as a postscript, we should remember that the native birds were here before all of us people came."

Thank you.

HEARINGS OFFICER DUNN: Thank you, Mr. Lau.

(Witness excused)

HEARINGS OFFICER DUNN: Hannibal Tavares? Is Mr. Tavares present?

STATEMENT BY MR. HANNIBAL TAVARES

MR. TAVARES: Madam Chairman, first of all, we want to apologize for the cold that you caught here. It is not quite in keeping with our Aloha spirit; and we hope that your recovery will be very speedy.

HEARINGS OFFICER DUNN: Thank you, Mr. Tavares.

MR. TAVARES: Since I know flattery will get me nowhere, I had better get on with the statement.

(Laughter)

MR. TAVARES: Madam Chairman, my name is Hannibal Tavares, and I am Director of Community Relations for Alexander & Baldwin, Incorporated; and I am speaking in behalf of that Company.

Alexander & Baldwin owns most of the land in the surrounding area and is also the owner of the H. C. & S. Sugar Company Plantation, which owns all of that beautiful green land that you see close by.

We strongly support the plans of the County of Maui to construct the sewage treatment plant at Kahului, to serve the needs of the Wailuku-Kahului area. Presently, raw sewage is discharging into the ocean at two points on either side of Kahului Harbor. While we feel that present practices have not resulted in harmful or detrimental effects over the years, nevertheless, requirements of recent Federal and State legislation, now prohibit the disposal of untreated sewage into the ocean.

The findings of the County of Maui show that the proposed sewage treatment plant will, when completed, result in compliance with the applicable health and environmental regulations. The proposed site is adjacent to the industrial area of Kahului and is some distance from the nearest residential area. The plant will not detract from the activities of the surrounding areas. The open ocean, with strong prevailing winds, make an ocean outfall effluent discharge extremely costly. The County has designed deep injection wells to dispose of the effluent during the initial operation of the sewage treatment plant. We believe that this system will be satisfactory.

The management of Kanaha Pond has been of much concern to the community. During periods when water levels have been low in the Pond, Alexander & Baldwin, Incorporated, has provided fresh water to maintain higher levels, and will continue to do so in the future. We have been advised by the County that should any problem develop respecting recharged well effluent entering the Pond, there are other feasible alternatives. Geological and hydrological studies indicate that such problems are highly unlikely and the injection wells will be compatible with the Pond.

Looking towards the future, the Mayor of this County has

established a task force to look into the possible future recycling of the effluent. Our Company is participating in this investigation and we feel confident that such recycling can be accomplished; and that the injection wells will be a temporary measure.

We support the proposed construction of the sewage treatment plant at the recommended site. We have considered the environmental impact of the proposal and find no meaningful evidence to suggest that harm will result. On the contrary, the plant, we feel, will enhance the human environment; will eliminate any threat of reduced water quality into the receiving waters of the ocean; and will result in improvement of the health and welfare of the surrounding community.

Construction of the sewage treatment plant should begin immediately. It is required to permit continued development of needed housing in Central Maui. Delay of this project is unreasonable.

Madam Chairman, after listening to a lot of the testimony tonight, I personally, speaking for myself and for the sake of the record, I would like you to know that I am formerly an elected County official, having missed being Mayor of this County by a few votes, and as a result, I think I am sensitive to the feelings and needs of the people of this County; and sitting here tonight, listening as patiently as you have, to all of the testimony, I am impressed by the meticulous detail that the officials who are charged with making this responsibility, have used, in coming to their conclusion in the selection of the site. I believe that they have been very careful in trying to protect the environment of this area; and I believe what they have done has, in fact, enhanced the environment of this area.

They talk about the beach erosion and the problems that this may cause. I feel that beach erosion is serious. Regardless of whether or not a treatment plant is placed there, we should do something about that erosion anyhow; and I would be in favor of getting the Corps of Engineers to get cracking on that.

HEARINGS OFFICER DUNN: You understand, Mr. Tavares, that we are not here to determine whether or not the Corps of Engineers should or should not do something? We are only here to gather information to determine whether --- (interrupted)

MR. TAVARES: Yes, ma'am, I am just reacting to a point that seemed to be made very strongly, and I feel that there are

other ways of tackling that problem, and I realize that it is not germane to what you are hearing tonight.

HEARINGS OFFICER DUNN: Well, I hope you won't get too emotional here, because we are really just trying to find some facts tonight. It's getting awfully late to be emotional.

MR. TAVARES: I know. It's just my size, Madam Chairman, you know.

(Laughter)

MR. TAVARES: I will be winding up in just one second.

HEARINGS OFFICER DUNN: All right.

MR. TAVARES: Madam Chairman, I believe, and I am confident that with the private industry here, working very closely with the EPA and the County and the State, we can find good use for that effluent. We can use it for various irrigation purposes in beautifying the highways and in beautifying part of the airport itself; in beautifying the civic and open areas nearby; and I don't believe that this would be a problem at all for us and I urge that we go along with this project and I do not think that an impact statement is necessary.

Thank you.

HEARINGS OFFICER DUNN: Thank you, Mr. Tavares.

(Witness excused)

HEARINGS OFFICER DUNN: Drew Hartnett? Is Mr. Hartnett here?

MR. HARTNETT: Yes.

STATEMENT BY MR. DREW HARTNETT

MR. HARTNETT: Good evening.

HEARINGS OFFICER DUNN: Good evening.

MR. HARTNETT: I hope I am last. I am Drew Hartnett. I am a resident of the Wailuku-Kahului area, the President of the Maui Jaycees and I am addressing you tonight on behalf of that organization -- an organization of approximately 90 members -- young men of this community, between the ages of 21 and 35.

I was asked to come here and express the views of the organization. We have considered the matter at hand this evening, have investigated the facts and the information available on it and the views of the membership have been expressed. I do not have them in writing at this time. A formal written statement will be submitted later.

As a preface, as I understand the discussions this evening, from having listened to your remarks, Mr. Examiner, the principal purpose is to determine whether there exists, a substantial question, as to whether or not the proposed project will have any substantial effect on the environment on the Kanaha Pond area. Am I correct in assuming that that is the --- (interrupted)

HEARINGS OFFICER DUNN: That is correct. Sufficient to justify or warrant an impact statement prepared by the United States Environmental Protection Agency. Another requirement of the National Environmental Policy Act is, whether or not there is sufficient controversy to justify or warrant an impact statement.

MR. HARTNETT: All right. Then I take it that it would also be germane to remark upon the contentions made by both sides, as determining whether or not that controversy was substantial? Would I also be correct in assuming that?

HEARINGS OFFICER DUNN: If you don't get too far afield.

MR. HARTNETT: All right. I will make my efforts to stay near afield. As we understand the contentions of the objectants to the present site -- and I would prefer to treat that first. They are primarily the danger to the wildlife presently existing in the Pond, which they have broken down into two sub-dangers -- water outflow and physical presence of the plant; and they have presented testimony by a Geologist and by -- I don't know if he was an ornithologist or not, but in any event, a bird fancier, that they feel that there is a substantial danger to the Pond and we were impressed with the thoroughness of the County's study, in respect to this matter, and the extent to which it was gone into by the County, by the private consultants hired by them, by the appropriate State Agencies and actually, by your own agency. And we were also impressed with the analysis of the results in the environmental impact appraisal, which we were given a copy of and read. We believe that to be based upon good, common sense and solid, hard data.

We have seen copies of certain of the letters filed by the objectants to this proposal and to this project, and we have

listened to this testimony given here tonight -- or I have. Some of the other members are here, but of course, the entire membership is not; and it appears to be based on substantially less substantial data -- if I can indulge in that redundancy -- than that which the County has used in arriving at their conclusions.

Essentially, the water outflow problem -- I would rather call it "water" than "effluent", because "effluent" seems kind of like a scare word that people like to use, so I would like to call it the "water outflow" -- they have removed 95% of whatever was in there when it came in; and then that is going to be injected into the ground at a level of approximately 250 feet, where it will be diluted by water which is already there -- further diluted. It will have to pass through a cap rock to get up into the Kanaha Pond. It's probably -- in fact, it is certainly going to be more dense than the fresh water, which has been referred to as a source of fresh water springs, and hence, unlikely to rise through that. And then, if it finally does get up there, we have to assume that this relatively pure water, which could be processed to drinkability, in a not too expensive further stage, is somehow going to have a substantial detrimental effect. Now, apparently, it would be conceded that if the outflow of this plant were pumped directly into the Pond, that that would have a detrimental effect; but what actually we have is a series -- and I think both sides would have to concede -- a series of very unlikely events would have to occur before an adverse effect of the sewage outflow, or the water outflow of this processing plant, into the Pond, could have any detrimental effect on the wildlife in it.

As to the physical presence of the plant, we think it's sophistry of the highest order to suggest that the fact that that plant was sitting there, could have any effect on these birds. These birds are overflowed by aircraft which produce tremendously high noise levels -- objectionably high noise levels, daily; and they don't leave. There is a major highway that runs right passed this Pond. That doesn't seem to bother the birds. It's used by trucks and traffic in large numbers; and there is a large light industrial area, which passes along one side of the Pond. That doesn't seem to disturb them, either. They congregate down near the buildings as well as up at the other end of the Pond. We have been out there and seen them. They don't seem to care about those buildings. So it seems to us pointless to suggest that the physical presence of the plant is going to have any substantial effect on these birds directly.

The matters of beach erosion and tidal wave inundation, I think, have been adequately covered by the engineering studies;

and the necessary precautions against either of those eventualities can, and undoubtedly would be taken.

In taking into consideration even what obviously is a very remote possibility, that the outflow of this plant could have any effect on the Pond, the County has conceded that they would relocate these wells, in such a way that that effect would be prevented.

So frankly, we feel that the objections that are being made to the location of the proposed site, lack common sense; and in the final analysis, in a war between experts, common sense has to be the judge. I have the fortune to be a trial lawyer and I have seen a lot of trials where you have doctors on both sides. Somewhere at the end of that trial, the jury has got to sit down and say, "Well, we have heard them on both sides and the one that had the best data is the winner." And I think that that is true in this case.

The alternative site proposed or recommended or sought after is on the same basis -- on the basis of common sense, impractical. It would be expensive -- it would cost, by the County's estimates, and I have no reason to doubt them, \$3,000,000 to move it now. It would be absolutely unacceptable to the public, living in that area, to exactly the same degree that it would be unacceptable -- allegedly unacceptable to the birds, to have it next to them. And I think if we have to weigh it on one side or the other, if the birds are going to be slightly disturbed by the presence of a sewage treatment plant in their neighborhood, it's somewhat better than disturbing all of the people, by putting a sewage treatment plant next to them. If that's the choice that has to be made. I don't think that it is, but if it were the only choice, then it seems to me that it is obvious that the birds are going to have to adjust to this new addition to their environment.

The contentions -- and I would like to respond to a couple of contentions that have been made tonight, not by name, but what I feel -- what I feel to be unjustified attacks upon the integrity of the County. I am not a County Attorney; I am a private attorney. In fact, I appear against the County most of the time, and I don't like them too well, but there have been some contentions made here that the contract is illegal, and my response to that would be that that is pure bunk. There have been some contentions made that the County has engaged in a lot of secrecy in handling of the documents and the reports in respect to this project, and I would say that that is pure bunk; that all of the reports, all of the documents, have been made available to us and we don't occupy any special place in

the heart of the County. We ran a project which attacked the County on an environmental issue just a few years ago. They made the documents and information available to us at that time.

With regard to the question of whether anything has been kept from the public, well, Madam Examiner, I think you have heard the public here tonight; and I would like to comment somewhat on what I think is the core issue here. The issue is, as you have agreed, whether or not there is a substantial controversy. And what I have heard tonight is objection made by a very small group of people. I live here, and I know who the people are who are objecting, and it is a small group of people. They don't represent the majority of the people in this community.

HEARINGS OFFICER DUNN: You will have to understand, though, Mr. Hartnett, that I don't recall seeing you at this afternoon's session.

MR. HARTNETT: No, I wasn't here at this afternoon's session.

HEARINGS OFFICER DUNN: And we had a substantial number of people at the afternoon session.

MR. HARTNETT: I'm sure that you did; I'm sure that you did. But, I know the people who have appeared here tonight, Madam Examiner, and I think that this is a point that should be made, that it is one that should be considered by the Environmental Protection Agency in determining whether or not a substantial question exists. I am not speaking of all of those who are objecting to the present location of the plant. I am certain that some of them are very sincere in their objections and in their fears. But I do feel that their fears are not founded upon hard facts; that the hard facts are that there is no substantial reason why the plant should not be constructed at the proposed site.

There are certain -- and I do wish to say this, that there are certain of the persons who have appeared here tonight and who have objected to the -- to speak in opposition to the project, who, in my considered judgment, based on experience with them over the past three years, do not speak out of sincerity but out of a desire to be the greatest conservationist to them all.

This matter has been studied in depth and thoroughly and the problem that is being discussed here tonight has been studied in depth and thoroughly by the County, by the State, by

the private consultants, by the Federal Government, by the Environmental Protection Agency, and up until a very few weeks ago, all of those people found that there was no substantial reason to fear that there would be any environmental impact -- substantial adverse environmental impact caused upon Kanaha Pond by this project; and there is no new data -- no new data has been submitted tonight by the objectants, which would cause this Agency to change its mind in that respect. The delay inherent in the preparation of the statement will inevitably cost the County of Maui and the people of this County, another 150 or \$200,000, even assuming that statement, as I do assume that it would, confirms the proposed site. There is no substantial reason to cause the taxpayers of this County to expend an additional 150 or \$200,000 over fears which are not grounded on fact. I believe that that is the situation that exists in this case, and it is the request of our organization and of myself personally, that the impact statement not be required and that the project be permitted to proceed at once.

Thank you very much.

HEARINGS OFFICER DUNN: Mr. Hartnett, thank you very much for appearing tonight.

(Witness excused)

HEARINGS OFFICER DUNN: Shall we take a 10-minute recess?

(Short recess)

HEARINGS OFFICER DUNN: Let's resume the hearing. Those of you who are going to make statements for the rest of the evening, would you please come down front and be ready to give your statement when your name is called?

Mr. Mac Harlan, come forward, please?

A SPECTATOR: He stepped out for a moment. Shall I go and get him?

HEARINGS OFFICER DUNN: I will call his name again. Pat Esclito? Is Pat Esclito here?

MR. ESCLITO: Yes.

STATEMENT BY MR. PAT ESCLITO

MR. ESCLITO: Madam Chairman, one of the attributes of a successful after dinner speaker is the brevity of his presen-

tation.

HEARINGS OFFICER DUNN: Hooray!

MR. ESCLITO: As we approach the breakfast hour, I, too, will take heed.

My name is Pat Esclito; I am a resident of Kahului; by profession, I am an educator; presently, I serve as President of the Filipino Catholic Community Association. I will be speaking on their behalf tonight and I would like to say that I have the confidence in the County, State and Federal Government. Furthermore, I believe that the review conducted by these branches of government is sufficient. I wholeheartedly support their conclusions, that the plant in no way will contaminate the waters of Kanaha Pond.

Thank you and good night.

HEARINGS OFFICER DUNN: Thank you very much, sir.

(Witness excused)

HEARINGS OFFICER DUNN: Sam Ho? Sam Ho?

(No response)

HEARINGS OFFICER DUNN: Peggy Ross?

STATEMENT BY PEGGY HAI ROSS

MRS. ROSS: Aloha.

HEARINGS OFFICER DUNN: Aloha.

MRS. ROSS: My name is Peggy Hai Ross, and I was born and raised in these Islands and I am 100% Hawaiian and the original people of these Islands. I represent the Hai clan and many of family is on these Islands and throughout the State; and now, I would like to know who you are, because I didn't get to know who you were and who do you represent?

HEARINGS OFFICER DUNN: Mrs. Ross, my name is Cassandra Dunn and I am a lawyer and I am the Regional Legal Counsel for the United States Environmental Protection Agency for Region IX, with Headquarters in San Francisco. Region IX, has in its territory, California, Nevada, Arizona, Hawaii, the Pacific Trust Territories, Guam and Wake Island; and I represent the United States Environmental Protection Agency here tonight as

a Hearing Officer, to gather information and comments from the citizens for evaluation and consideration, to determine whether or not an impact statement should be filed on the project near Kanaha Pond -- the proposed project; and we are here to gather information --- (interrupted)

MRS. ROSS: I gather by your title, you are quite qualified to be sitting where you are at, then.

HEARINGS OFFICER DUNN: I try hard.

MRS. ROSS: And I feel qualified, too, as a citizen of Hawaii and this Island.

HEARINGS OFFICER DUNN: And we recognize you as such.

MRS. ROSS: And I am one of the very few Hawaiians left; and like the birds of the sanctuary, which the opposing parties to this Kanaha site are referring to -- I was just but a little child and I remember my parents and many other Hawaiian people around that area, thrived on the fish that was in this Pond, and along the Bay -- in Kahului Bay.

I am going to read this, because I had no intention of making any presentation tonight, after listening to all these professional people. I am not qualified in any way.

HEARINGS OFFICER DUNN: Mrs. Ross, if there is anyone who is entitled to speak --- (interrupted)

MRS. ROSS: Thank you.

HEARINGS OFFICER DUNN: --- on behalf of Hawaii, it's certainly you.

MRS. ROSS: Thank you. I want to clarify myself, because I lived in the Mainland for 18 years in Idaho and my husband was with the Fish & Game Department and we owned a sanitation company. So thereby, I am interested in what is happening about in the Kanaha Pond area.

A bill was passed -- I am not sure about the date, through the United States Congress, through the initiative of the young Senator, Frank Church, of Boise, Idaho, to conserve all the remaining primitive areas of our National Forests. This bill was necessary because of the alarming concern for the gross neglect that was spiraling throughout the Nation by developers and different agencies, by disturbing and polluting the natural habitat of these primitive areas. And may I say again, I was

very involved with my husband's affairs, because he was with the Fish & Game and Forestry -- and their disregard for our depleting population of animal life.

The bill further describes that these natural habitats or sanctuaries were to be preserved and protected under the Federal laws. All the birds and animals. Then, too, to clean up and replenish our lakes, rivers and reservoirs with fish. It goes on further to say that these habitats may be condemned if it could not be rehabilitated or that the cause of the areas contaminated or polluted to be unfit for humans or animals.

I don't know anything about these fancy people with fancy titles. I don't know of a much quicker way to condemn a bird sanctuary by putting a sewage plant in the vicinity of the Kanaha Pond. By the same fact that I can still remember -- and this wasn't very long ago -- I am 50 years old; and I still remember when those areas were fishing areas for many people. And today, because of progress and all these buildings around that area, we no longer fish in these areas, because that water is very polluted.

If the airport and industrial activities around the Kanaha Pond hasn't yet killed off the birds because of noise pollution or carbon monoxide poisoning, then I will wager that it is the hopes of the administrators that the sewage plant will do the trick.

As a child, my folks and I -- the Hawaiian people across the highway, thrived on the fish off the Kanaha Pond and in the Bay areas. Today, they should be posting signs all along the bay around the area, warning the people of the pollution in these areas. I have seen so much of this down there. I can't believe this is the Bay that we used to swim in and fish in.

Just recently, and I just come home two years ago and that's why I'm still here. Just recently, fish was being caught and sold and that was caught off this Bay by Japanese ships and sold in our markets. If this raw sewage is good enough for the fishes and people, why then hasn't anyone as yet suggested the reprocessing of the sewage and dumping it into those stinky reservoirs to the irrigation of the sugar and the pineapple fields, long before this all occurred?

Reprocessing water from sewage is presently being done in the Mainland for drinking purposes and for other similar reasons. I have seen sewage plants in Texas, where this sifts all sewage waste to be processed and sold for fertilizer; and

the reprocessing of garbage was done in the same way. Why do we persist in putting sewage plants in the vicinity of business or residential areas? Why do we avoid the areas that are owned by the sugar and the pineapple companies? They have stolen enough of lands of the Hawaiian people and continue to get richer out of the sweating, bloody brows of its citizens; and it is about time that they relinquish some of these lands toward a sanitation location -- for this sewage plant, for free.

We have heard read -- and I have heard read, testimonies, from intelligent and highly intelligent types of people, and I heard that they are called the "new missionaries". They are the minority group. They have spoken with authority and are conscientious about our environment. If what they have said has fallen on deaf ears, just what does Howard Nakamura, Director of the Planning Commission, expect to get from the mass majority, that has been fooled by the old missionaries?

Hadn't I been married to this beautiful husband of mine and left this Island for a while -- I would have not been -- I would have been one amongst the mass majority, who have been fooled by the old missionaries, foreign monopolies and also the Unions and the present Administration. So that you Japanese here on these Islands are now taking over where they left off.

I am grateful to these new missionaries -- call them what you may; and I hope that you will be as conscientious and consistent as they want you to be. The bad faults of these missionaries -- new missionaries -- are that because they are young at heart and they are new residents. They are much smarter than all of us put together and they are the product of this new generation, and there are the few outstanding who truly care what is happening to me, and doing something about it.

I am one of the fortunate ones who have had the privilege and I am home to stay, because of this kind of rot gut things that are going on in this County.

I want to leave this to these new missionaries: "For the Lord said, 'Verily I say unto you, inasmuch as you have done it unto one of the least of these, my brethren, you have done it also unto me'."

Thank you for the efforts to helping me, my people, and my Hawaii; and I hope that when you leave, that you will remember that what these minority people are doing for the birds and trying to preserve -- granted, they are not the rarest in the world. They may be in Canada, in Africa, and everywhere else,

but we can't afford to go that far to see these birds. These birds were here before anybody else was and I can still remember, when we sat in that Kanaha area and lived in the Kanaha area, and the sky was white with birds, all along the beaches. Today, those beaches are completely polluted. I cannot believe that the limu that I used to pick up at that beach and used to eat, we Hawaiians cannot eat no more off these beaches, because they are completely polluted.

Why then do we persist and insist, with all the intelligent people, that sit in these hearings -- I feel that it is worthless. They are so smart. There are so many of them. They come packed with petitions, packed with experts, yet, they do not even hear the voice of the people; because they are only a few people. We have so darned many experts, we don't have people any more.

God bless you. Thank you.

HEARINGS OFFICER DUNN: Thank you, Mrs. Ross.

(Applause)

(Witness excused)

HEARINGS OFFICER DUNN: I had two cards tonight for a John Fernandez. Are there two John Fernandezes?

MR. FERNANDEZ: Just the one.

HEARINGS OFFICER DUNN: Okay. Mr. Ed Kaahui?

STATEMENT BY MR. ED KAAHUI

MR. KAAHUI: Madam Chairman, my name is Ed Kaahui. I represent some 200 students from Maui Community College, who are unable to be here tonight.

We have two points to make. One is that we strongly oppose the selection of the alternate site, which would be adjacent to our campus. By this selection, we would limit the growth and expansion of our campus; and we strongly oppose this.

The second point is that we respectfully request that the Environmental Protection Agency allow the construction of the Kahului-Wailuku sewage treatment plant site to be done in the Kanaha Pond area.

Thank you.

HEARINGS OFFICER DUNN: Thank you very much, sir.

(Witness excused)

HEARINGS OFFICER DUNN: Mr. Fred Ross?

STATEMENT BY MR. FREDERICK D. ROSS

MR. ROSS: Ma'am, I am Frederick D. Ross and I am a disabled veteran. I am two-thirds Cherokee Indian and the rest, you might say United Nations; and my wife, full Hawaiian.

I am no authority on this, but I have several different degrees. I have a degree in police work; I have a degree in sanitation; I also have a degree in fish and game; and I have plenty of experience in many other fields. But in Boise, Idaho, in the center of 500,000 people, sits a sewer plant. There is no smell. I helped construct it.

In the town of Cascade, Idaho, we done the same thing that they are trying to do here. We put in the wells. We polluted every well within 60 miles. You can imagine what happened.

In a town called McCall, Idaho, we also did the same thing. We ended up with our lakes, which there is a sign on that lake now, that says, "This lake is 15% hepatitis". The river, which is coming out of the lake, which is called the Payette Lake or the Payette River, is polluted. The fish are dying, the birds are dying.

At New Meadows, Idaho, we also constructed another plant. This plant was under the ground completely. This plant here was an acid plant. We have had no problems with that plant -- none whatsoever. The plant has been in for close to 20 years now. They have never touched it, they have never maintained it -- nothing. Then we want to put in a \$9,000,000 plant out here, which this plant here, we put it in for \$250,000.

In Alaska, we did the same thing. We put in a plant in Alaska. We had the same problems -- we had backup.

Also, Salt Lake City, in Utah -- they tried the same thing. They ended up polluting their Salt Lake and it took them years to clean it up.

Now, according to the 1st and the 5th and the 6th and the 14th Constitution of the United States, we have the right to

speaking at all County meetings and to find out what's going on and why, what, when and how and who, and so forth and so on; but everything is so hidden until after it is all said and done, then they go ahead and it's completed.

Now, they are going to run into some problems, especially here in Hawaii. Oil -- with this type of plant that they are talking about putting in down here at the Kanaha Pond, oil -- just a quart of oil poured into the plant, in with the water, will kill their bacteria. Then they are in trouble. They have got to stop and they have got to scrape out. If they get a heavy tidal wave -- I don't know what this tsunami is -- I have always heard of it as a tidal wave. When they get salt water inside of this plant, you break down also the bacteria. You have to stop and scrape out. You are in trouble. And this costs millions of dollars to do this; and if they put this plant in, next to the ocean, like they want to put it in, they are in deep trouble.

I have seen petitioned through this evening and heard on these petitions here tonight, which is only about 1% of the population of Kahului and Wailuku, and I feel that this ought to go to the vote of the people and if the people cannot have a vote on this, as to where this thing is to go, then I feel that there should be a Committee take it to the Federal Government and make the City -- the County Commissioners put in a bond to protect themselves from the lawsuit that they will get for putting in an \$8,000,000 sewage plant.

Just imagine, a water tap holding the pressure of about 5 to 15 pounds pressure, and a fire hose, holding anywhere from 50 to 100 pounds water pressure. What is that septic pump going to take, in order to pump it? It's going to take anywhere from 200 to 250 and maybe higher; and when they do this, it's going to push something. Pick up a piece of coral. You can blow through it. We are standing on coral. This is all coral. All of this low land down here is coral. Too, 300 years ago, there was no land in here. This was all under water. This was all reef. Now, if they go out here and they drill, and they are going to try something, they are going to be pushing silt right up out here in the middle of the cane field or in the middle of the road or in somebody's livingroom. Then they are going to really be in trouble.

Now, the birds -- I heard somebody say here this evening that these birds that are out here in the Kanaha Pond, that you can hunt them on the Mainland. I'm sorry, but they are mistaken. In the Mainland, if you are caught shooting one of these birds, it's 10 and 10 -- and 10 and 10, what I mean, is

10,000 and 10 years, especially the stilt.

Thank you.

HEARINGS OFFICER DUNN: Thank you very much, Mr. Ross.

(Witness excused)

HEARINGS OFFICER DUNN: Frank Tamaye. Is Frank Tamaye present?

MR. TAMAYE: How is that spelled, ma'am?

HEARINGS OFFICER DUNN: T-a-m-p-y-e?

MR. TAMAYE: T-a-m-a-y-e? Okay, that's me. Thank you.

HEARINGS OFFICER DUNN: Oh, I'm sorry.

STATEMENT BY MR. FRANK TAMAYE

MR. TAMAYE: Madam Chairman, my name is Frank Tamaye and I am from the Island of Oahu. I come to Maui quite often because I find that it is very beautiful and the people are just fantastic.

There has been a lot of expertise here tonight -- people from the Government, people from the University, and so forth, and a lot of people, like myself, I used to believe the experts, and in some ways, maybe I still do -- depends on the character of the individual. But a lot of people have been believing the experts and letting the experts make the important decision. Well, I would like to say, for the people of Maui, Kalama Park was a beautiful park, with a sandy beach. These experts, so to speak, came in and messed up the beach so bad, you can't lay on the sand any more. It's filled with boulders. So these are the kind of experts that perhaps are looking after your welfare.

I think it's about time community input is put into planning and all these important issues; and it seems like Kanaha Pond is the next thing to go, because many things haven't been answered, and as far as the experts committing themselves, saying that the Pond will not be polluted, I have never heard any one of them guarantee that fact. So if the sewer plant is built in Kanaha Pond, the possibility of pollution is there. Will it pollute the Pond and kill off the wildlife? Will the stench be so bad that the only course of action left would be to fill the Pond? After filling, will this Pond area be rezoned industrial, like the surrounding areas around it? And is this some kind of mad

scheme to kill off the wildlife for profit? I don't know. Profiteers have been known to do strange things.

With that in mind, I ask that the EPA should make a study for the people and report back to the community for their benefit.

Thank you.

HEARINGS OFFICER DUNN: Thank you, sir.

(Witness excused)

HEARINGS OFFICER DUNN: Douglas Sodetani? Is Mr. Sodetani here?

(No response)

HEARINGS OFFICER DUNN: He made a request to make a statement and did attach a copy of a written statement to his request, so we will make that a part of the record.

Mr. Meyer M. Ligoka? Is Mr. Ligoka here?

(No response)

HEARINGS OFFICER DUNN: The same is true of Mr. Ligoka. He made a request and attached a copy of his statement thereto, and that will be made a part of the record.

Mr. Hodges -- Tony Hodges?

STATEMENT BY MR. TONY HODGES

MR. HODGES: My name is Tony Hodges, and I am speaking as an individual and also as the Executive Director of Life of The Land.

First, I would like to say that I am very pleased to see this many people and I imagine there were more this afternoon, interested in sewage. Two years ago, this wasn't the case; and I would like to say, too, though I am in the minority tonight, it seems, as far as numbers of people, that I am very pleased that so many people are now interested in the environment.

I would like to say quickly that myself and Life of The Land wants sewage treatment -- not just on Maui, but on the other Islands; that as an organization, we have probably done

as much, if not more than the State Health Department to get sewage treatment plants in Hawaii. We took the State Health Department to Court 2½ years ago, at which time we found a minimum of 183 violations of the Federal Water Quality Standards and the State Water Quality Standards.

We want to see the sewage treated. One of the main reasons that there is any interest now in building the sewage treatment plant at Wailuku-Kahului or in Lahaina or in Honolulu, for that matter, is because of the Court action that was taken. To put it bluntly, Mayor Carvalho is interested in building the sewage treatment plant at this point because of that suit.

About a year and a half ago, I had a conversation with Mayor Carvalho --- (interrupted)

HEARINGS OFFICER DUNN: Mr. Hodges, that doesn't help me make any determination as to whether or not we would write an impact statement.

MR. HODGES: Yes, it will. Yes, it will. Well, I will back up for one minute, Mrs. Examiner, and point out -- say this -- I look forward to your environmental impact statement, and, as we have expressed to the Environmental Protection Agency, you either do it, or we go to Court. And I think it is very clear from what Mr. DeFalco said here, when he wrote to Mr. Keenan of the Wildlife Federation, he says, "In view of your interest in the matter, this is to advise you of our intention to prepare an environmental impact statement on proposed waste water treatment plant, Wailuku-Kahului, Maui, Hawaii." That's on February 2nd; and on February 6th, again, on the stationery of your Agency, your Region, says, "In accordance with the guidelines of the preparation of environmental impact statements, this constitutes a notice of intent to prepare such a statement for the proposed Agency action specified below, Wailuku-Kahului Sewage Treatment Plant," and a number is assigned to it -- "Impact Statement No. D EPA 2400-HI", for Hawaii -- Hawaiian Islands.

HEARINGS OFFICER DUNN: I am familiar with those pieces of correspondence.

MR. HODGES: Yes, you weren't familiar, though -- Mrs. Examiner, you were not familiar, I am afraid, with the letter signed by Paul DeFalco, in which he says, and I quote for you: "The Environmental Protection Agency --- (interrupted)

HEARINGS OFFICER DUNN: Mr. Hodges --- (interrupted)

MR. HODGES: --- Agency has determined that because of the considerable public controversy concerning this project, that an environmental impact statement shall be prepared."

HEARINGS OFFICER DUNN: Mr. Hodges, I not only was familiar with it, I had read it. The reason I asked what letter and by whom it was signed, is that there are numerous letters that come out of that Agency signed by Mr. DeFalco. So do not try to impeach my integrity by making statements to me like that from where you are standing. Now, I am willing to listen to anything in this world you have got to say with regard to whether or not we should prepare an impact statement.

MR. HODGES: Yes. I am saying --- (interrupted)

HEARINGS OFFICER DUNN: I really don't need any criticism about the County or any individual in the office to help me make such a decision on the record. If you have something, I am more than delighted to listen to it. I will sit here until 1:00 o'clock, if you want.

MR. HODGES: Fine. What I do have are statements by your Agency that you intend to prepare an impact statement, and I assume that (1) you will prepare it or (2) that this is an untruthful statement; and that's it.

HEARINGS OFFICER DUNN: We will prepare it unless we find information to the effect that we --- (interrupted)

MR. HODGES: Well, then, why did you tell Senator Inouye that you were going to prepare one? I just want that on the record, okay.

HEARINGS OFFICER DUNN: I am not here to argue --- (interrupted)

MR. HODGES: I want it very clearly on the record that your Agency has stated that you intend to do a draft impact statement, period. That's all, and we have the letters to prove it. You sent it to Senator Inouye, you sent it to Senator Fong, and if you are no longer of that mind, then I suggest that you tell them again in another letter that you don't intend to do one or that you are still looking into the matter. That's all. I simply want that on the record.

HEARINGS OFFICER DUNN: If we determine that we are not going to do one, Mr. Hodges, we certainly will tell them so.

MR. HODGES: Fine, and you have told them --- (interrupted)

HEARINGS OFFICER DUNN: And we don't need you policing our activities.

MR. HODGES: You had told them now that you intend to do one. You have told them that you intend to do one.

HEARINGS OFFICER DUNN: I am not here to get into a shouting match with you. Now, do you have anything else to say?

MR. HODGES: Fine, then I am saying that you should not allow, as Counsel for Region IX, Mr. DeFalco to send out letters which are apparently untruthful. That's all.

HEARINGS OFFICER DUNN: Mr. Hodges, I don't need you to tell me what my duty is with regard to my responsibilities as Regional Counsel of Region IX.

MR. HODGES: Well, do you, as of this date -- did the U. S. Environmental Protection Agency, intend to do a draft impact statement?

HEARINGS OFFICER DUNN: And I am not here to answer your questions. I am here to gather information with regard to whether or not we should prepare an impact statement. Now, do you have anything else to say?

MR. HODGES: Yes, ma'am, I do, and in that consideration, also has to do with the integrity of the United States Environmental Protection Agency. Okay? And we are discussing that here tonight.

HEARINGS OFFICER DUNN: The integrity of the United States Environmental Protection Agency is not on trial here.

MR. HODGES: We have a letter stating that you are going to do an impact statement, all right?

HEARINGS OFFICER DUNN: Forget the letter. We are not going to argue about it any more. If you have any other statement to make with regard to Kanaha Pond and the location of that sewage treatment plant, then you say it. If you don't, then I would appreciate it if you would just sit down.

MR. HODGES: Fine, and I simply want on the record, those questions to you, okay? And I have some other statements.

HEARINGS OFFICER DUNN: I am not here to answer questions. I am here to receive information.

MR. HODGES: You are here as an employee of the United States Government, all right?

HEARINGS OFFICER DUNN: Oh, you are so right.

MR. HODGES: And you are required by the National Environmental Policy Act, to prepare a draft impact statement, that's all. Not you, personally. I mean none of that personally. Okay, so we get off with that good start. Okay, I think that with regard to the Kanaha -- it's not the question of the Kanaha site. The fact is, the Environmental Protection Agency committed itself to the funds for Maui County before an environmental assessment was done; before a draft impact statement was done; before a negative declaration was done, all right? That, as you know, as an attorney, is illegal. You cannot commit the funds. You do that -- not you again, when I say "you", I mean EPA.

HEARINGS OFFICER DUNN: I am glad that you have a law degree, Mr. Hodges. Now, do you have anything else to say?

MR. HODGES: Yes, ma'am. If you will listen and be patient, it will all come out.

HEARINGS OFFICER DUNN: I am not here to listen to your alleged law degree and your legal determinations. I am here to gather information.

MR. HODGES: Fine, the part of the information --- (interrupted)

HEARINGS OFFICER DUNN: And I am going to have what you have said stricken from the record if you keep it up.

MR. HODGES: That will be your choice.

HEARINGS OFFICER DUNN: I am glad I can make some decisions around here. Thank you, Mr. Hodges.

MR. HODGES: Good for you. All right. One of the things that is not considered and hasn't been brought up here too much tonight is the fact that the sewage treatment plant, as now planned contains -- provides for a capacity of treatment which exceeds the present population. In this case, if the EPA approves a project of this nature, then the EPA would essentially be endorsing -- endorsing with funds, all right? And with approval, a project which perhaps will not cause, but which will permit an increase in population in the Wailuku-Kahului area; and that in the Council Environmental Quality Guidelines,

to NEPA, one of the things that is to be considered there is the effect of the project on the concentration and distribution or redistribution of population. And I would just like to recommend, anyway, in your considerations, that you look into the fact that this is planned to bring about or to permit the further growth of Maui County; that is, to increase population. And I know that this is pointed out in your environmental assessment, where it said that obviously, you know, the general agreement is that increase in population brings about a degradation of the environment, which, obviously would not be an enhancement of the environment.

Another thing to be considered here tonight, too, as you look at the -- as you suggest, the need for an impact statement, but I would suggest the content of the impact statement -- would be to look also at the other proposed plants for Maui County -- the other proposed sewage treatment plants and I will say here tonight and you can determine in your impact statement, in your analysis, whether -- you know, whether this is true. The County of Maui -- the reason that it is under a great deal of pressure to put this sewage treatment plant in quickly, though it has been dumping raw sewage for many years and has had a broken main out there or outfall for many years, and has not really been concerned with the sewage -- the reason that it is doing this is because in fact, it wants to build a sewage treatment plant at Kihei. Now, your Agency may not be aware of this, because they perhaps will not be applying for Federal funds for that; but the purpose of the plant at Kihei, where a very small number of people live, is to enable the development of an area called Wailea, by a company represented by Mr. Tavares.

HEARINGS OFFICER DUNN: That does not have any relevancy with regard to the --- (interrupted)

MR. HODGES: Yes, ma'am.

HEARINGS OFFICER DUNN: No, it doesn't, Mr. Hodges.

MR. HODGES: It does, ma'am, because --- (interrupted)

HEARINGS OFFICER DUNN: No, it doesn't, and I don't want to hear about it. Let's stick to the Kanaha Pond and the sewage treatment plant that is proposed -- or allegedly proposed.

MR. HODGES: You are talking about committing public funds -- \$4,000,000 plus, to a plant, all right, in Maui. And you are talking about committing it to this and I guess eventually, you are talking also about committing it to Lahaina, and I am saying that you must look -- one of the purposes of your impact

statement would be to look at what are the sewage needs for this Island. And when you would do that, I would hope that you would see that it's more important to provide sewage treatment, as in the case of Wailuku-Kahului, for areas where people are, not where we propose or Alexander & Baldwin proposes to put them.

And I think that if you look carefully, you will find that the County is playing a game of the pea under the shells with Federal funds; that they are getting your funds for this one and the Lahaina one, so that they can afford to build the Kihei one for A & B.

I think it was pointed out to you tonight again and I will just touch on that point once more -- many people have said that the sewage treatment plant is needed for the continued development. Now, the continued development of Wailuku-Kahului is something that the EPA has not yet taken a look at, and I would suggest that this would be a reason for an environmental impact statement -- in other words, to take a look at what would the continued development of the Island of Maui be; and how would it affect the quality of the human environment. If the sewage treatment plant is to be built for a doubling of the population, which apparently is what it allows in Wailuku-Kahului, then this would be one of the things that you would have to look at, the quality of the air, of the water, noise, this type of thing; and I believe that the environmental assessment which the EPA put out, touched on this and indicated this would be an area of concern that should be looked at; and this would be again, the purpose for an environmental impact statement.

And lastly, I would like to say, again, going back to what I began with, but when I mentioned parts of the law, I don't mean to speak to you as an attorney -- in other words, you know, putting myself to you as an attorney. I am not; but I do feel that other people are capable of reading the law and, you know, at least telling you what we think of it, just as attorneys give their opinions as to what the law is to a judge; and so, perhaps at one level lower, I offer that opinion to you; that I think it's very clear, you had the attorney come up here and told you that there was no controversy. I think that there is very obviously a controversy. There's obviously two points of view -- in fact, there are perhaps 10 points of view, and I think that the Environmental Protection Agency should certainly start its first, we will say, mechanical operations in Hawaii -- you know, its first ongoing sewage treatment plant -- get off to the right footing and get off on the right footing by preparing an environmental impact statement. You are going to be involved in many, many more in the State and we would hope

that in each case, an environmental impact statement would be approved -- or not approved, but prepared; and I think that you are aware that Mayor Fasi of Honolulu has already asked the Environmental Protection Agency to waive the need for an environmental impact statement on the Sand Island Sewage Treatment Plant; and apparently, he is encouraged in this request by the fact that there is some doubt as to whether or not an impact statement would be prepared for this plant.

Finally, I would like to say that I want, personally -- I know that Life of The Land does and I know that every person in this room does -- we all want the sewage treated. But for the purpose of expediency, it isn't worth gambling, and I think that the questions that have been raised here must be answered and the best format that I know of -- and I think perhaps it may be the best format that you know of, to accomplish that -- to answer those questions and to put the answers to those questions out to the public and to get feedback from them, is an environmental impact statement; and I would ask that the EPA comply with the wishes of Congress and with the guidelines of the Council on Environmental Quality and also with your own guidelines; and I didn't mean to get into a shouting match with you at all. I apologize for that.

HEARINGS OFFICER DUNN: Thank you, Mr. Hodges.

(Witness excused)

HEARINGS OFFICER DUNN: Is Bill Lesk available? Mr. Lesk?

(No response)

HEARINGS OFFICER DUNN: Alvin Furuhaga?

(No response)

HEARINGS OFFICER DUNN: Ty Benson? Is Mr. Benson present?

(No response)

HEARINGS OFFICER DUNN: William Willmore?

(No response)

HEARINGS OFFICER DUNN: Webb Beggs? Mr. Beggs?

(No response)

HEARINGS OFFICER DUNN: Mac Harlan? Mr. Harlan?

STATEMENT BY MR. MAC HARLAN

MR. HARLAN: My name is Mac Harlan. I represent the Kihei Community Association as past President and member of the Board of Directors.

I think after that last -- I should have brought a gallon of water to pour on the troubled waters -- a gallon of oil. I have been wondering all evening why you set this up so the speakers have their backs to the audience. When I am talking to a group, I would rather talk to them face to face. However, that's beside the point now.

Tonight, we have heard many experts, both pro and con, some not so expert; and a few red herrings have been drawn across the path. I think though, that the consensus of those present and 90% of the people of the Wailuku-Kahului area, if a Gallop type poll were to be produced, would vote in favor of what the findings are with respect to the location of the water treatment plant at Kanaha Pond. There has been nothing demonstrated to prove any ecological imbalance to occur to the bird life and animal life there.

So therefore, as a representative of our community -- and you may ask why Kihei is interested. I will tell you why. We have 2,000 taxpayers down there and we're going to help pay for this plant; and we are not interested in seeing anything done that will increase the cost by moving it to another location, which, in the opinion of most people, is less desirable. Therefore, we ask that we put full steam forth to complete this project and let's forego the impact statement.

(Applause)

HEARINGS OFFICER DUNN: Thank you very much, sir.

(Witness excused)

HEARINGS OFFICER DUNN: Sam Ho?

(No response)

HEARINGS OFFICER DUNN: Is there anyone I have missed? Is there anyone in the audience who --- (interrupted)

MR. FERNANDEZ: Madam Chairman, somebody put my name down -- John Fernandez and I didn't write that. Is it all right if I make a little statement? Somebody put my name down -- Fer-

andez. I didn't sign, but I would like to make a statement.

HEARINGS OFFICER DUNN: You would like to make a statement, sir?

MR. FERNANDEZ: Yes.

HEARINGS OFFICER DUNN: Would you come forward, please?

STATEMENT BY MR. JOHN FERNANDEZ

MR. FERNANDEZ: My name is John Fernandez from Lower Paia. And I heard a lot of these remarks -- some of these people, they are only trying to criticize our Mayor and the Councilmen. When they selected the Kanaha Pond, I think this is a good place, so I don't see what gripe they have about Kanaha Pond. Like these guys say about fraud. If they did make any wrong-doing, put them through Court, but they can find nothing wrong, so they are trying to criticize the Mayor and the Councilmen and Howard Nakamura. I think they made a good job.

Thank you.

(Applause)

HEARINGS OFFICER DUNN: Thank you, Mr. Fernandez.

(Witness excused)

HEARINGS OFFICER DUNN: Is there anyone else who would like to make a statement? Is there anyone I have missed or someone who forgot to fill out a registration card and whose name we didn't call?

(No response)

HEARINGS OFFICER DUNN: All right. I would like to remind you that the record will be held open until March 2nd, including the date of March 2nd. Your additional statements should be in writing and submitted to the Environmental Protection Agency, either at the Honolulu Office, 1000 Bishop Street, Suite 601; or the EPA Office in San Francisco, at 100 California Street. If your statements are postmarked on or before March 2nd, they will be included into the record.

The record will be made available after transcription by the Reporter and copies will be available to you for examination -- in fact, will be available to every member of the public, for examination at the Library in Kahului and also at the EPA Offices

in Honolulu, at 1000 Bishop Street.

Thank you all for coming. Thank you for your attention and your cooperation in making it a little easier tonight.

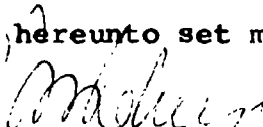
(Whereupon, at 12:07 o'clock a.m., the hearing in the above-entitled matter adjourned.)

BEFORE THE
U. S. ENVIRONMENTAL PROTECTION AGENCY

----- :
In the Matter of: :
 :
PUBLIC HEARING REGARDING PROPOSED :
WASTE WATER TREATMENT AND DIS- :
POSAL SYSTEM, :
 :
WAILUKU-KAHULUI AREA :
----- :

I, the undersigned Wm. Chun, hereby certify that I was Official Reporter in the above-captioned proceedings; that these proceedings were then and there recorded by me on the date stated in captioned Page 1 hereof; that thereafter, these proceedings were reduced by me and/or under my direction to typewriting; that the foregoing transcript, Pages 1 to 149, both inclusive, constitutes a full, true and accurate transcript of said proceedings, so recorded by me, and of the whole thereof.

IN WITNESS WHEREOF, I have hereunto set my hand this 5th day of March, 1973.



WM. CHUN,
Official Reporter
P. O. Box 3854,
Portland, Oregon 97208

APPENDIX C

ENGINEERING ANALYSIS OF PROJECT COST FOR VARIOUS ALTERNATIVES

APPENDIX C

Basic 6 MGD Secondary Treatment Plant Cost

The engineers \$5.5 million (M) estimate at August 1972 was confirmed by bids received. This included injection and monitoring wells to obtain a base cost for the 6 MGD treatment plant. The cost of the wells was removed from the \$5.5 million. ($\$5.5\text{M} - \$0.16\text{M} =$) $\$5.34\text{M} + 0.156 \times \$5.34\text{M} = \$6.15\text{M}$. The 0.156 factor is the result of 14.5% annual inflation for 13 months - August 1972 to September 1973. $14.5\% \times (13/12) = 0.156$.* Included in this secondary plant are: headworks building, grit chambers, comminuters, pipe galleries, aeration tank, aerobic digesters, sedimentation tanks, sand filters, chlorination facilities, centrifuges, sludge holding tank, chlorination building, garage, operations building, administration building, miscellaneous plumbing, pumping, spread footing foundation, landscaping, fencing, instrumentation, controls, motors, and effluent pond.

Basic 6 MGD Primary Plant Cost

The engineer's \$5.5M cost estimate (August 1972) for a secondary plant with wells was used as a base. The following items were reduced or eliminated in cost: aeration capacity, return activated sludge pumps, filtration, injection wells, air diffusers, sludge collectors, piping, structural steel, concrete, electrical equipment, and instrumentation. Still included would be buildings, sedimentation tanks, headworks, sludge handling facilities, emergency pond, and valving to facilitate conversion to secondary treatment. Cost reduction from the base equals \$1.8M. ($\$5.5\text{M} - \$1.8\text{M} =$) $\$3.7\text{M} + 0.156 \times \3.7M (inflation) = $\$4.28\text{M}$.

Basic 4.5 MGD Secondary Treatment Plant Cost

Cost were estimated to be 85% of the cost for a 6 MGD plant. $\$6.15\text{M} \times 0.85 = \5.2M . The engineering fee is taken to be \$0.15M if re-design is at the present site and \$0.32M if a new site is used. The same equipment as was in the 6 MGD plant is included.

Design would need to be such that the plant could be easily expanded to a larger size, as the 4.5 MGD size would have almost no capacity for growth. Buildings the size of the 6 MGD plant would be provided.

Piling Cost Estimate

The actual piling need was estimated at 1,000 piles, 50 feet long each, for a 6 MGD secondary plant. August 1972 cost estimate was \$10/ft. Inflating cost to September 1973, the price/ft. is \$11.55/ft. To obtain estimates for 4.5 MGD capacity and tertiary treatment multipliers of 0.75 and 1.40 respectively were used.

Size and Treatment	Piling Cost	Engineering Cost
6 MGD secondary	\$.58M	\$.038M
4.5 MGD secondary	\$.435M	\$.030M
6 MGD tertiary	\$.810M	\$.051M
4.5 MGD tertiary	\$.610M	\$.040M

Piling should not be thought of as a "real" alternative as its need will be dictated by results from soil test.

Tertiary Treatment Plant Additions - Cost

The engineer's August 1972 estimate for 6 MGD sizing was used and updated to September 1973. The 4.5 MGD sizing cost was taken as 75% of the 6 MGD cost.

Plant Size	Construction Cost	Engineering Cost
6 MGD tertiary addition	\$2.890M	\$.200M
4.5 MGD tertiary addition	\$2.200M	\$.150M

Outfall Cost

The engineer's August 1972 estimate for 6 MGD sizing was used and updated to September 1973. The smaller size was not considered as it was thought not to be significantly more economical.

	Construction Cost	Engineering Cost
6 MGD outfall	\$2.600M	\$.190M

Injection Well Cost

The engineer's August 1972 estimate was used and updated to September 1973. It was assumed that the 4.5 MGD sizing would cost only 75% of the 6 MGD sizing cost.

Size	Construction Cost	Test Well Cost	Engineering Cost
6 MGD injection wells	\$1.90M	\$.070M	\$.016M
4.5 MGD injection wells	\$.143M	\$.070M	\$.012M

Alternative A-1 Outfall at Present Site

1.	6000 L.F. Ocean Outfall		\$2,600,000
2.	Wailuku Waste Water Pump Station		1,040,000
3.	Wailuku Waste Water Force Main		900,000
4.	Kahului Waste Water Pump Station Renovations 20 & 21" Force Main		<u>950,000</u>
	Construction Cost		5,490,000
	Engineering Fee	- Current	475,000
		- New	<u>190,000</u>
	September 1973 Cost		\$6,155,000

Note: Engineering delay would be one year on the outfall portion of the project.

Alternative A-2 Primary Treatment & Ocean Outfall at Present Site

1. Primary Treatment Plant		\$ 4,280,000
2. 6000 L.F. Ocean Outfall		2,600,000
3. Wailuku Waste Water Pump Station		1,040,000
4. Wailuku Waste Water 21" Force Main		900,000
5. Kahului Waste Water Pump Station Renovation 20 & 21" Force Main		<u>950,000</u>
Construction Cost		9,770,000
Engineering Fee	- Current	475,000
	- New - Outfall	190,000
	- Conversion- primary from secondary	<u>75,000</u>
September 1973 Cost		\$10,510,000

Notes: Engineering delay would be 6 months on the plant portion and 1 year on the outfall portion. Current design would be used as basis for cutback; but provision to expand to secondary would be made.

Alternative A-3 Secondary Treatment & Ocean Outfall
at Present Site

1. Secondary Treatment Plant		\$ 6,150,000
2. 6000 L.F. Ocean Outfall		2,600,000
3. Wailuku Waste Water Pump Station		1,040,000
4. Wailuku Waste Water 21" Force Main		900,000
5. Kahului Waste Water Pump Station Renovations 20 & 21" Force Main		<u>950,000</u>
Construction Cost		11,640,000
Engineering Fee	- Current	475,000
	- New	<u>190,000</u>
September 1973 Cost		\$12,305,000

Notes: Engineering delay would be 6 months on the plant portion and 1 year on the outfall portion. Sand filtration is included.

Alternative A-4 Secondary Treatment & Injection Wells
at Present Site

1. Secondary Treatment Plant	\$6,150,000
2. Injection Wells & Monitoring Well	190,000
3. Wailuku Waste Water Pump Station	1,040,000
4. Wailuku Waste Water 21" Force Main	900,000
5. Kahului Waste Water Pump Station Renovations 20 & 21" Force Main	<u>950,000</u>
Construction Cost	9,230,000
Engineering Fee - Current	<u>475,000</u>
September 1973 Cost	\$9,705,000

Note: Delay would be 3 months due to bid & award time.

Alternative A-5 Tertiery Treatment & Injection Wells
at Present Site

1.	Secondary Treatment Plant w/Wells		\$ 6,340,000
2.	Tertiary Additions		2,890,000
3.	Wailuku Waste Water Pump Station		1,040,000
4.	Wailuku Waste Water 21" Force Main		900,000
5.	Kahului Waste Water Pump Station Renovations 20 & 21" Force Main		<u>950,000</u>
	Construction Cost		12,120,000
	Engineering Fee	- Current	475,000
		- New	<u>200,000</u>
	September 1973 Cost		\$12,795,000

Note: Engineering delays would be 1 year on treatment plant portions of project.

Alternative A-9 Secondary Treatment at Present Site
and Relocated Injection Wells to Kaa Site

1.	Secondary Treatment		\$ 6,250,000
2.	Injection Wells & Monitoring Well		190,000
3.	Wailuku Waste Water Pump Station		1,040,000
4.	Wailuku Waste Water 21" Force Main		900,000
5.	Kahului Waste Water Pump Station Renovations 20 & 21" Force Main		950,000
6.	4000 L.F. Connecting lines & Pumping to Wells		485,000
7.	Test Injection Well		<u>70,000</u>
	Construction Cost		9,885,000
	Engineering Fee	- Current	475,000
		- New	<u>81,000</u>
	September 1973 Cost		\$10,441,000

Note: Engineering delay will be 1 year for plant, wells
and connecting lines.

Alternative B-4 4.5 MGD Secondary Treatment and
Injection Wells at Present Site

1. Secondary Treatment Plant		\$5,200,000
2. Injection Wells & Monitoring Well		143,000
3. Wailulu Waste Water Pump Station		1,040,000
4. Wailuku Waste Water 21" Force Main		900,000
5. Kahului Waste Water Pump Station Renovations 20 & 21" Force Main		<u>950,000</u>
Construction Cost		8,233,000
Engineering Fee	- Current	475,000
	- New	<u>252,000</u>
September 1973 Cost		\$8,960,000

Note: Engineering delay would be 1 year on the plant and wells.

Alternative C-7 Secondary Treatment & Injection Wells
at Kaa Site with Piling

1. Secondary Treatment Plant with Piling	\$ 6,830,000
2. Injection Wells & Monitoring Well	190,000
3. Wailulu Waste Water Pump Station	1,040,000
4. Wailuku Waste Water 21" Force Main	900,000
5. Kahului Waste Water Pump Station Renovations 20 & 21" Force Main	950,000
6. Underground Pump Station at Present Plant Site	1,730,000
7. 4000 L.F. Additional 30" Force Main	360,000
8. Test Injection Well	<u>70,000</u>
Construction Cost	12,070,000
Engineering Fee - Current	475,000
- New	<u>361,000</u>
September 1973 Cost	\$12,906,000

Note: Engineering delays would be 1 year minimum on Plant, wells, new pump station, and new force main. All Kaa site alternatives have \$100,000 added to the basic plant cost to provide visual screening and tsunami protection.

Alternative D-7 4.5 Secondary Treatment Plant and
Injection Wells at Kaa Site with Piles

1.	Secondary Treatment Plant with Piles	\$ 5,735,000
2.	Injection Wells & Monitoring Well	143,000
3.	Wailulu Waste Water Pump Station	1,040,000
4.	Wailuku Waste Water 21" Force Main	900,000
5.	Kahului Waste Water Pump Station Renovations 20 & 21" Force Main	950,000
6.	Underground Pump Station at Present Plant Site	1,730,000
7.	4,000 L.F. Additional 30" Force Main	360,000
8.	Test Injection Well	<u>70,000</u>
	Construction Cost	10,928,000
	Engineering Fee - Current	475,000
	- New	<u>452,000</u>
	September 1973 Cost	\$11,855,000

Note: Engineering delays would be 1 year minimum on plant,
wells, new pump station and new force main.

Alternative E-6 6mgd Secondary Treatment Plant with
Ocean Outfall at Quonset Hut Site with Piles

1. Secondary Treatment Plant w/piles		\$ 6,950,000
2. 6000 L.F. Ocean Outfall		2,600,000
3. Wailuku Waste Water Pump Station		1,040,000
4. Wailuku Waste Water 18" Force Main		185,000
5. Kahului Waste Water Pump Station		925,000
6. Kahului Waste Water 24" Force Main		<u>515,000</u>
Construction Cost		12,215,000
Engineering Fee	- Current	475,000
	- New	<u>730,000</u>
September 1973 Cost		\$13,420,000

Note: Engineering delay would be 2 years for the entire project.

\$220,000 is added to the base cost for extensive visual screening and basin covering for odor control.

Alternative G-4 6 MGD Secondary Treatment w/Injection
Wells at National Guard Site

1.	Secondary Treatment Plant		\$ 6,150,000
2.	Injection Wells & Monitoring Well		190,000
3.	Kahului Waste Water Pump Station		900,000
4.	Kahului Waste Water 21" Force Main to Wailuku Pump Station		900,000
5.	Waikuku Waste Water Pump Station		2,500,000
6.	Wailuku Waste Water 30" Force Main 5,800'		525,000
7.	Test Injection Well		<u>70,000</u>
	Construction Cost		11,235,000
	Engineering Fee	Current	475,000
		New	<u>680,000</u>
	September 1973 Cost		\$12,390,000

Note: Engineering delays would be 2 years on entire project.

APPENDIX D

UNPUBLISHED DOCUMENTS REFERENCED IN THE TEXT

CONTENTS APPENDIX D

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