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OFFICE OF ENVIRONMENTAL
QUALITY CONTROL
AN EQUAL OPPORTUNITY EMPLOYER
COUNTY OF KAUAI
DEPARTMENT OF PUBLIC WORKS
3021 UMI STREET
LIHUE, KAUAI, HAWAII 96766

March 3, 1993

Mr. Brian J.J. Choy
Office of Environmental Quality Control
220 S. King Street, 4th Floor
Honolulu, Hawaii 96813

Dear Mr. Choy:

SUBJECT: NEGATIVE DECLARATION FOR ELEELE
WASTEWATER TREATMENT PLANT EXPANSION PHASE I
TMK: 2-1-01:43 COUNTY OF KAUAI, HAWAII

The County of Kauai Department of Public Works has reviewed the comments received during the 30-day public comment period which began on October 23, 1992 and ended on November 22, 1992. The Department has determined that this project will not have significant environmental effect and has issued a negative declaration. Please publish this notice in the OEQC bulletin.

We have enclosed a completed OEQC Bulletin Publication Form and four (4) copies of the final Environmental Assessment.

Please contact Mr. Kiyoji Masaki, Chief Division of Engineering, at (808) 241-6622 if you have any questions.

Very truly yours,

ED RENAUD
Deputy County Engineer

HF/cu
Enclosure

1993-03-23-KA-FBA-Eleele Wastewater Treatment Plant Expansion Phase I MAR 23 1993

ENVIRONMENTAL ASSESSMENT FOR ELEELE WASTEWATER TREATMENT PLANT EXPANSION - PHASE I



PREPARED FOR:

DEPARTMENT OF PUBLIC WORKS
COUNTY OF KAUAI

FUKUNAGA AND ASSOCIATES, INC.

FINAL REPORT MARCH 1993

ELEELE WASTEWATER TREATMENT PLANT EXPANSION

PHASE I

FINAL

ENVIRONMENTAL ASSESSMENT

LOCATION: ELEELE
ISLAND OF KAUAI
STATE OF HAWAII

PROPOSING AGENCY: COUNTY OF KAUAI
DEPARTMENT OF PUBLIC WORKS

CONSULTANT: FUKUNAGA AND ASSOCIATES, INC
1388 KAPIOLANI BLVD., 2ND FLOOR
HONOLULU, HAWAII 96814

DATE: REVISED MARCH 1993

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CHAPTER ONE
GENERAL INFORMATION

1.1. Project

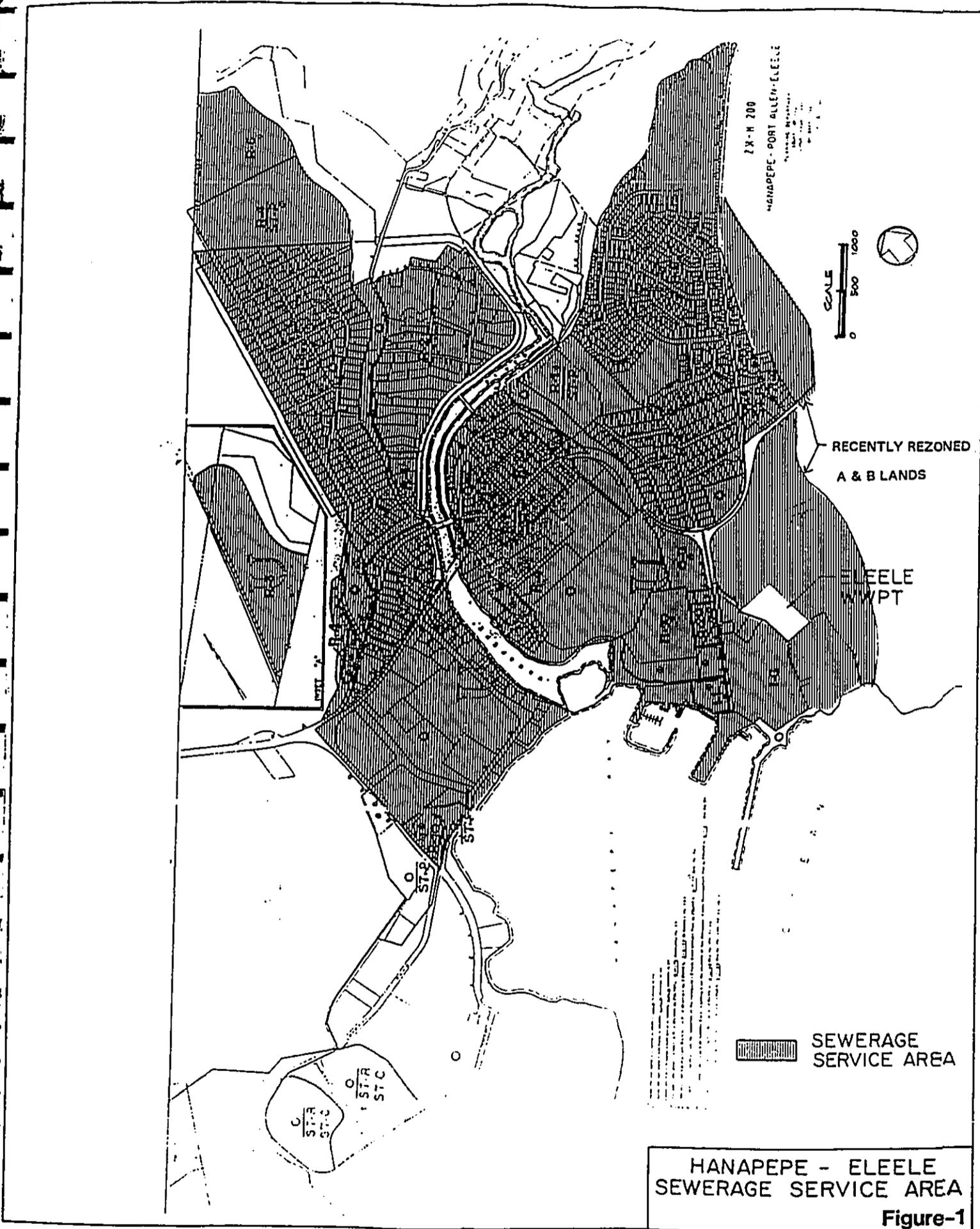
This project involves the design and construction of modifications to the Eleele Wastewater Treatment Plant (WWTP) to expand its treatment capacity from 0.4 million gallons per day (mgd) to 0.8 mgd.

The Hanapepe-Eleele community is presently served by the Eleele WWTP and individual on-site cesspool disposal systems. Municipal collection sewers are available for about 80 percent of the urban zoned areas and most of the properties have made connections to the municipal sewers. The Eleele WWTP and the total planning sewerage service area are shown in Figure-1.

The existing Eleele WWTP has a design capacity of 0.4 mgd. Current inflows to the WWTP average about 0.325 mgd. If all of the lots, including the recently completed 300 lot Hanapepe Cliffside development were developed with homes, and were connected to the municipal sewers, the inflow to the treatment plant would exceed the design capacity of 0.4 mgd.

A&B Properties, Inc. has begun construction of a residential subdivision of 144 lots (called Eleele Nani II). Ninety of those lots may be sold, but the remainder must wait until funding for Eleele WWTP expansion is obtained.

Accordingly, the County of Kauai has planned for the expansion of Eleele WWTP to accommodate the anticipated increased sewage flows through the year 2010, and to improve existing plant operations in a cost effective and environmentally compatible manner. The proposed expansion is also generally consistent with the County's Water Quality Management Plan dated December 1978 (208 Plan) both in scope and timing, except that the proposed plant expansion is to be 0.8 mgd instead of the 1.0 mgd as indicated in the 208 Plan.



HANAPEPE - ELEELE
 SEWERAGE SERVICE AREA
 Figure-1

1.2. Physical Information

1.2.1. Location

The project area is located on the south side of the Island of Kauai, and straddles the Waimea and Koloa districts as shown in Figure-2. The project focuses on the Eleele Wastewater Treatment Plant (WWTP) and its sewerage service area which includes the contiguous communities of Hanapepe, Eleele, and Port Allen. See Figure-1. The communities are within areas general planned by the State and zoned by the County for urban land uses including residential, commercial and industrial zoned areas.

1.2.2. Climate

The climate in the project area is generally mild and sunny throughout the year with mean monthly temperatures ranging from about 71 degrees F in January and December to about 79 degrees F in July and August. The area is considered to be relatively dry with mean annual rainfall at about 28 inches per year. Rainy months generally occur from December through March with mean monthly rainfall of about 3 to 5 inches per month. By comparison, the mean annual rainfall in Lihue is about 50 inches per year, and about 90 inches per year at Princeville. Rainfall data in the Hanapepe-Eleele area, compiled by McBryde Sugar Company for the past five years near Kiaha Reservoir, are summarized below:

YEAR	TOTAL ANNUAL RAINFALL (IN INCHES)
1985	29.4
1986	27.9
1987	27.3
1988	27.5
1989	27.7

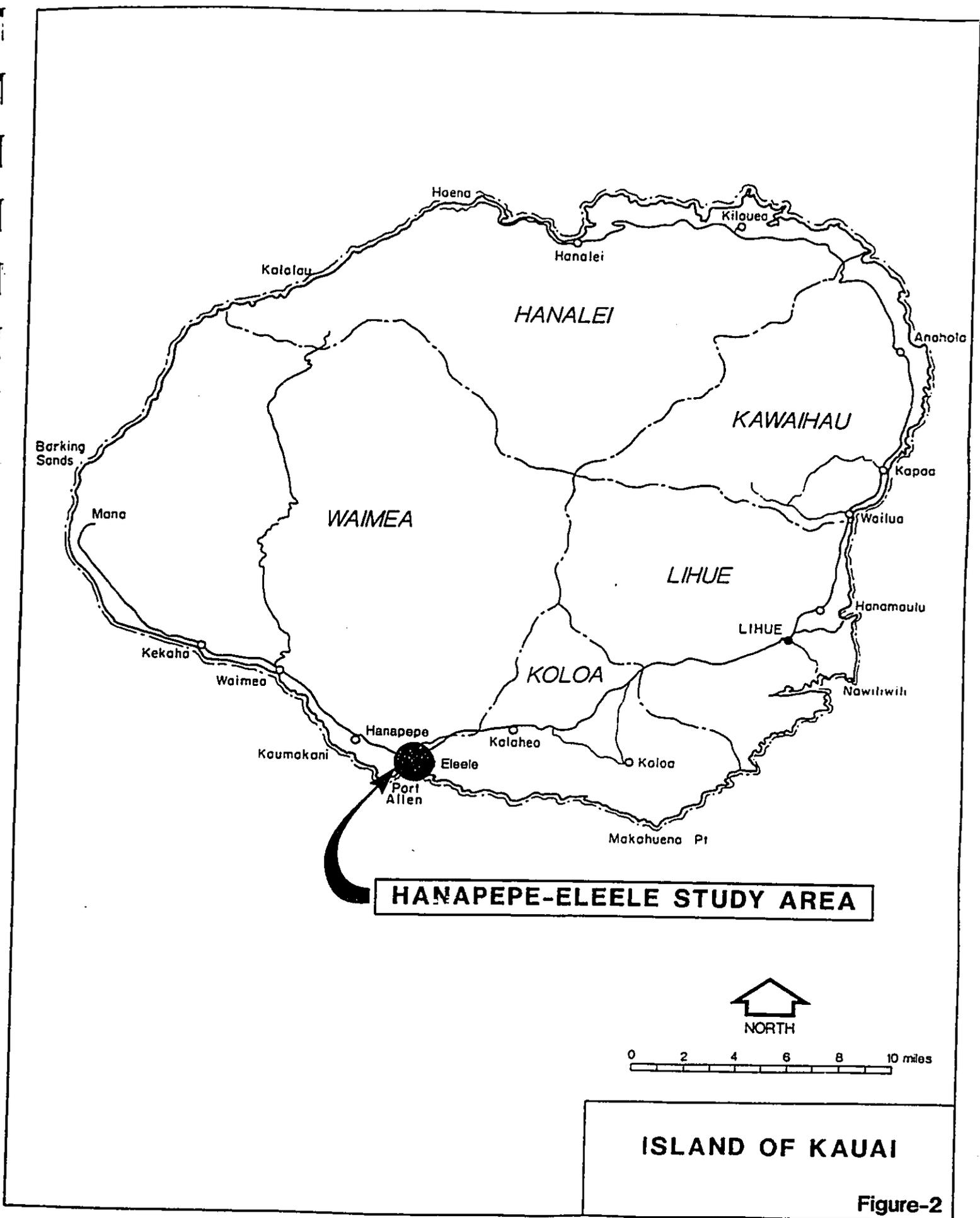


Figure-2

1.2.3. Geology

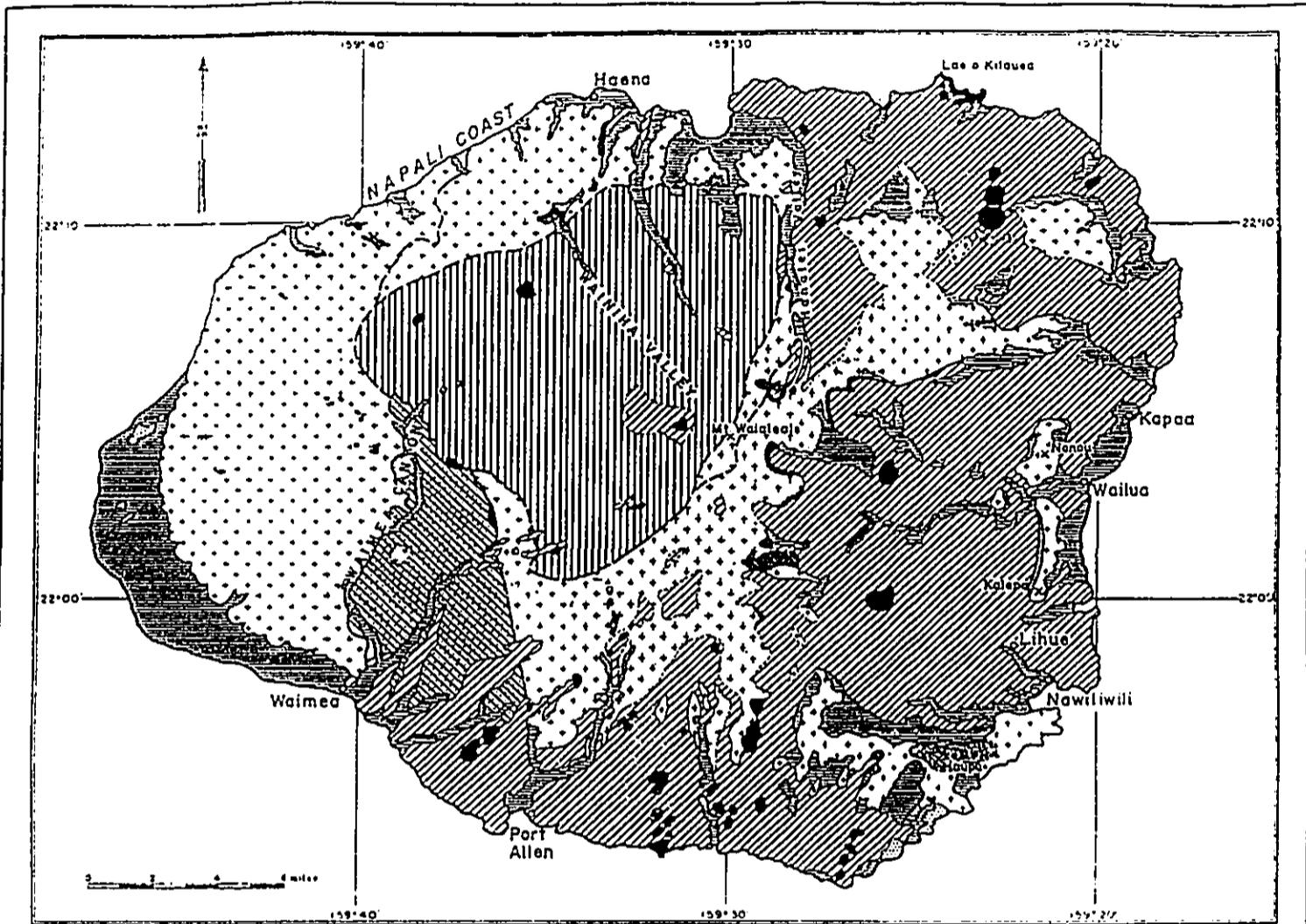
As shown in the above figures, the Hanapepe-Eleele study area is located along the southern coast of Kauai. According to the Geology and Ground-Water Resources of the Island of Kauai, Hawaii by G.A. MacDonald, D.A. Davis, and D.C. Cox, 1960, the island is fundamentally a single broad volcanic dome built by a basaltic shield volcano resembling the present active volcanoes of Kilauea and Mauna Loa on the Island of Hawaii. The lavas deposited in the area were described as being from early volcanic activities of the Waimea Canyon volcanic series. After the major volcanic shield was built, there was a long period of inactivity. Subsequently, volcanism resumed and lavas from that period of activity were described as from the Koloa Volcanic series. The near surface rock in the vicinity of the study area is from the Koloa Volcanic series. See Figure-3.

1.2.4. Soils

The United States Department of Agriculture Soil Conservation Service classifies the surface soils near the Eleele WWTP as Makaweli-Waiawa-Niu Association soils that have a moderately fine textured subsoil overlaying the basaltic bedrock. The surface soils is classified as MgB, a slightly acid dusky red silty clay loam comprising a layer of about 12 inches thick. The subsoil is dusky red, friable silt loam and silty clay. Permeability is moderate, runoff is slow, and the erosion hazard is slight. See Figure-4. Subsurface soils investigations for the initial phase of treatment plant construction indicated that a dense gray fractured AA lava rock layer exists throughout the site from about 3 feet to 7 feet below the surface.

1.2.5. Topography

From the shoreline, the land gradually rises inland to the island's highest point, Mt. Waialeale, at about 5,000 feet above sea level. The Hanapepe River and Hanapepe Valley splits the service area into four general service areas referred to as Hanapepe Heights and Hanapepe Town West, Hanapepe Town East, and the Eleele Heights-Port Allen areas. Ground elevations are relatively low within the Hanapepe Valley area rising from about 5 feet along the coast to about 15 feet a little ways into the valley. Hanapepe Heights and Eleele Heights are higher. Hanapepe Heights ground elevations vary from about 10 feet above sea level in Hanapepe Town to about 250 feet near the



EXPLANATION

Recent	[Pattern]	Alluvium, beach and dune sand, lagoonal clays and marls.	QUATERNARY
	[Pattern]	Lithified calcareous dune sand.	
Pliocene	[Pattern]	Breccia and conglomerate of Palikea formation.	TERTIARY
Pliocene	[Pattern]	Lavas of Kala volcanic series.	
Pliocene	[Pattern]	Lavas of Makaweli formation.	
Pliocene	[Pattern]	Lavas of Olakale formation.	
Pliocene	[Pattern]	Lavas of Heapu formation.	
Pliocene	[Pattern]	Lavas of Napali formation.	
	[Pattern]	Cones of Kilauea and Asauea Canyon volcanic series.	
	[Pattern]	Buried fault scarps.	
	[Pattern]	U.S. GEOLOGICAL SURVEY	

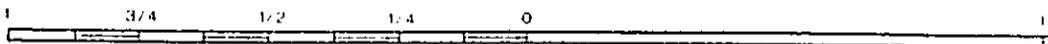
VOLCANIC SERIES MAP

Figure-3



P A C I F I C

O C E A N



top of residential zoned areas of Hanapepe Heights. Eleele-Port Allen ground elevations vary from about 10 near the sea shore to about 50 feet near the Eleele WWTP and to about 200 feet near the top of the proposed Eleele Nani II subdivision.

1.2.6. Hydrology and Floodplain

(1). Streams

The Hanapepe River is the major water way in the Hanapepe- Eleele sewerage service area, and drains the Hanapepe Valley. The watershed area is about 27 square miles. Low lying areas in Hanapepe Town near the ocean and along the river, and other areas along the sea coast are subject to flooding. See Flood Insurance Rate Map shown in Figure-5.

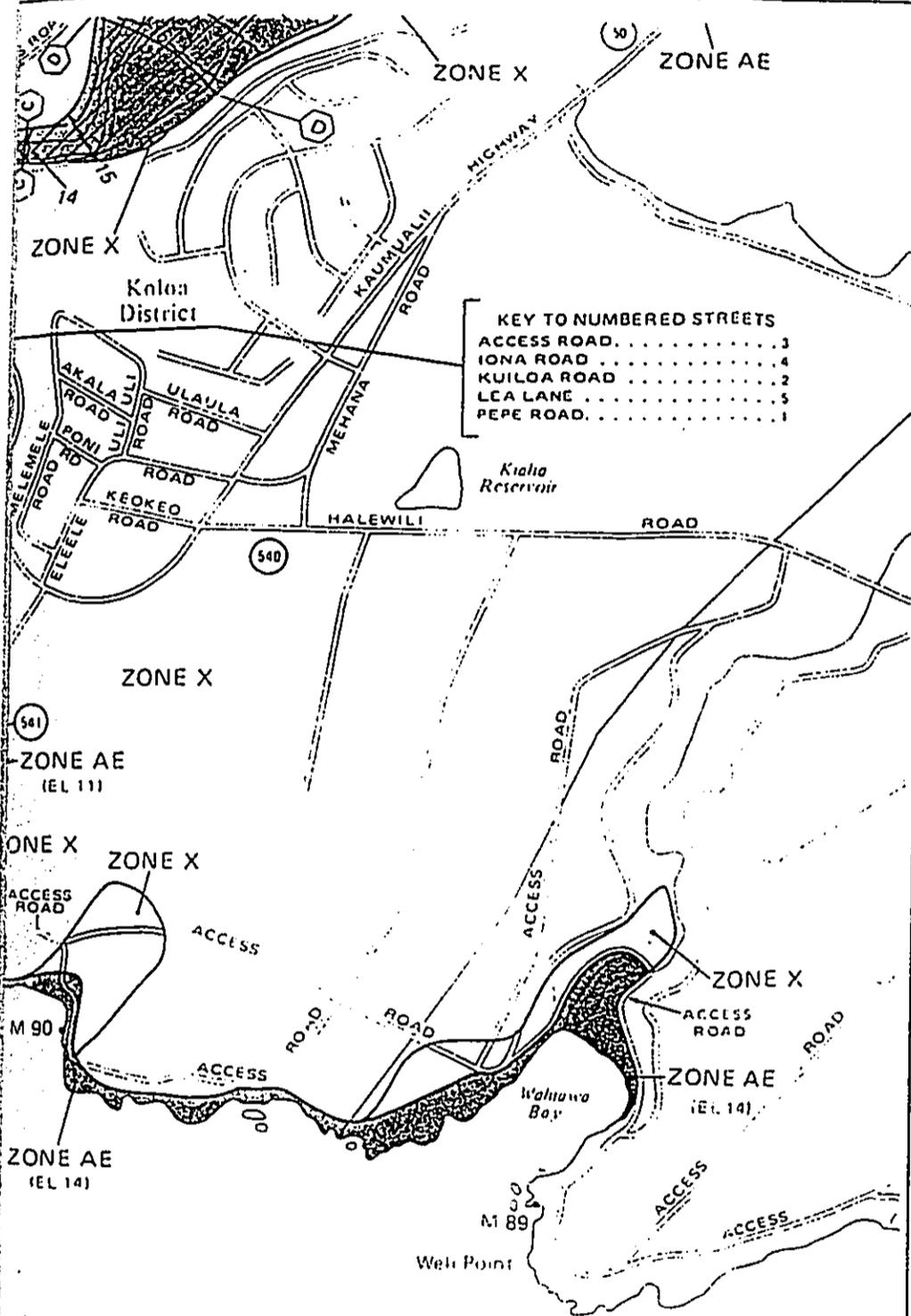
(2). GroundWater

According to the Kauai Water Use and Development Plan being finalized by RM Towill Corporation, the types of groundwater in the Hanapepe-Eleele study area include fresh basal, perched and brackish basal water. See Figure-6. The nearest source of potable water is in Hanapepe Valley at Hanapepe Wells "A" and "B". Both wells are owned and operated by the County of Kauai Department of Water. The wells are beyond the residential areas and about 2 miles northeast of the Eleele WWTP.

To protect underground sources of drinking water, the State DOH promulgated Public Health Regulations under Chapter 11-23 entitled "Underground Injection Control (UIC) Rules", and has established a "no pass" line to restrict the subsurface disposal of fluids which might contaminate underground sources of drinking water. The "no pass" line is shown in Figure-7. The Eleele WWTP is outside and downgradient of the restricted area. The County's Eleele WWTP discharges treated effluent via a system of 4 disposal wells, and is permitted to discharge under a State DOH UIC Permit No. UK-1212. The UIC permit has expired, and an application to renew the permit was submitted by the County of Kauai on February 10, 1993.

(3). Coastal Water

The Hanapepe River flows into Hanapepe Bay. Hanapepe Bay is also the site of Port



LEGEND

- SPECIAL FLOOD HAZARD AREAS INUNDATED BY 100-YEAR FLOOD**
- ZONE A** No base flood elevations determined
 - ZONE AE** Base flood elevations determined
 - ZONE AH** Flood depths of 1 to 3 feet (usually areas of ponding); base flood elevations determined
 - ZONE AD** Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
 - ZONE A99** To be protected from 100-year flood by Federal flood protection system under construction; no base elevations determined
 - ZONE V** Coastal flood with velocity hazard (wave action); no base flood elevations determined.
 - ZONE VE** Coastal flood with velocity hazard (wave action); base flood elevations determined.
- FLOODWAY AREAS IN ZONE AE**
- OTHER FLOOD AREAS**
- ZONE X** Areas of 500-year flood; areas of 100-year flood with average depths of less than 1 foot or with drainage areas less than 1 square mile, and areas protected by levees from 100-year flood.
- OTHER AREAS**
- ZONE X** Areas determined to be outside 500-year flood plain.
 - ZONE D** Areas in which flood hazards are undetermined.
- Flood Boundary
 - - - Floodway Boundary
 - - - Zone D Boundary
 - Boundary Dividing Special Flood Hazard Zones, and Boundary Dividing Areas of Different Coastal Base Flood Elevations Within Special Flood Hazard Zones.
 - 513 Base Flood Elevation Line; Elevation in Feet*
 - D — D Cross Section Line
 - IEL 9871 Base Flood Elevation in Feet Where Uniform Within Zone*
 - RM7x Elevation Reference Mark

*Referenced to the National Geodetic Vertical Datum of 1929

NOTES

This map is for use in administering the National Flood Insurance Program; it does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size, or all planimetric features outside Special Flood Hazard Areas.

Certain areas not in Special Flood Hazard Areas may be protected by flood control structures.

Boundaries of the floodways were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the Federal Emergency Management Agency.

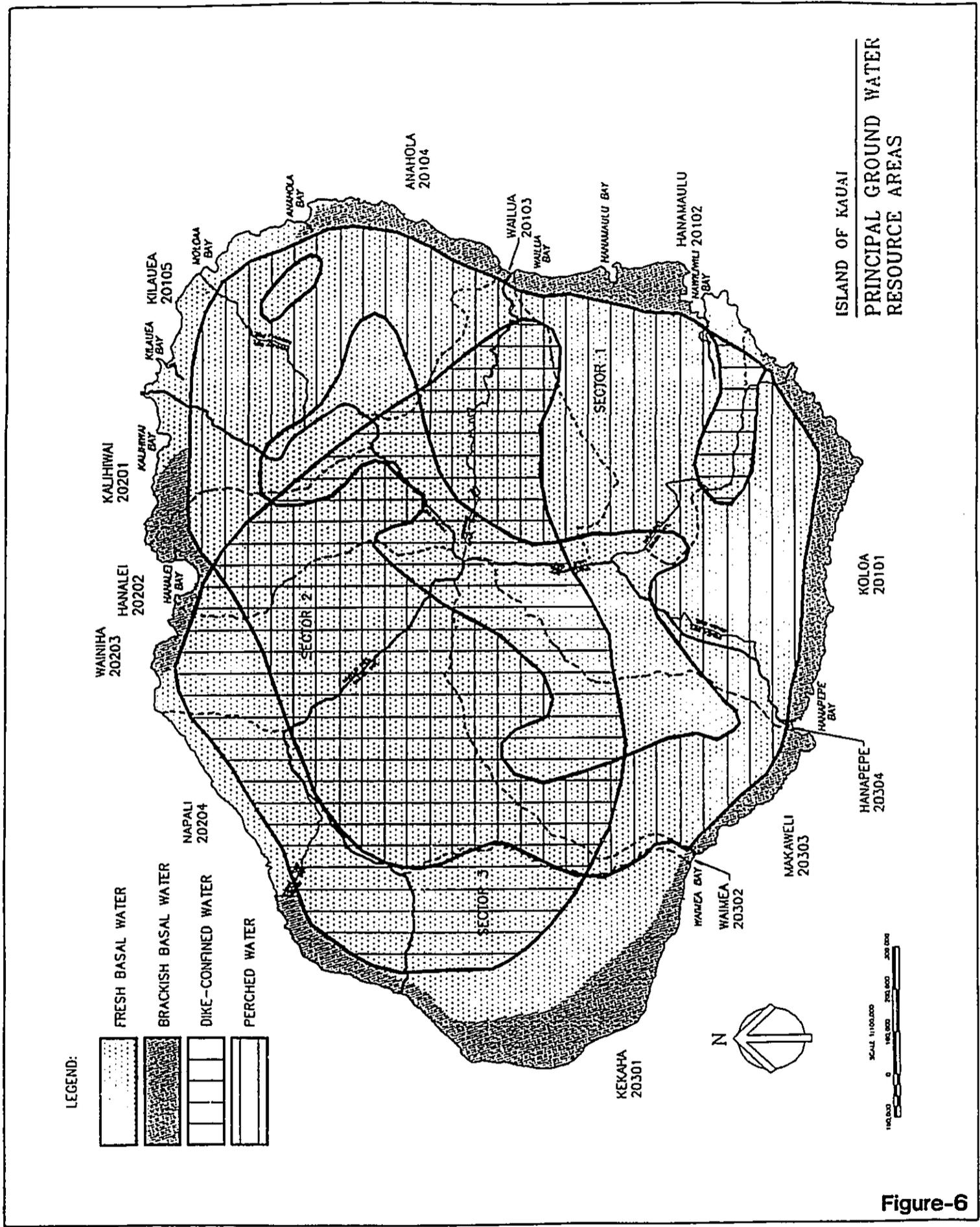
Floodway widths in some areas may be too narrow to show to scale. Floodway widths are provided in the Flood Insurance Study Report.

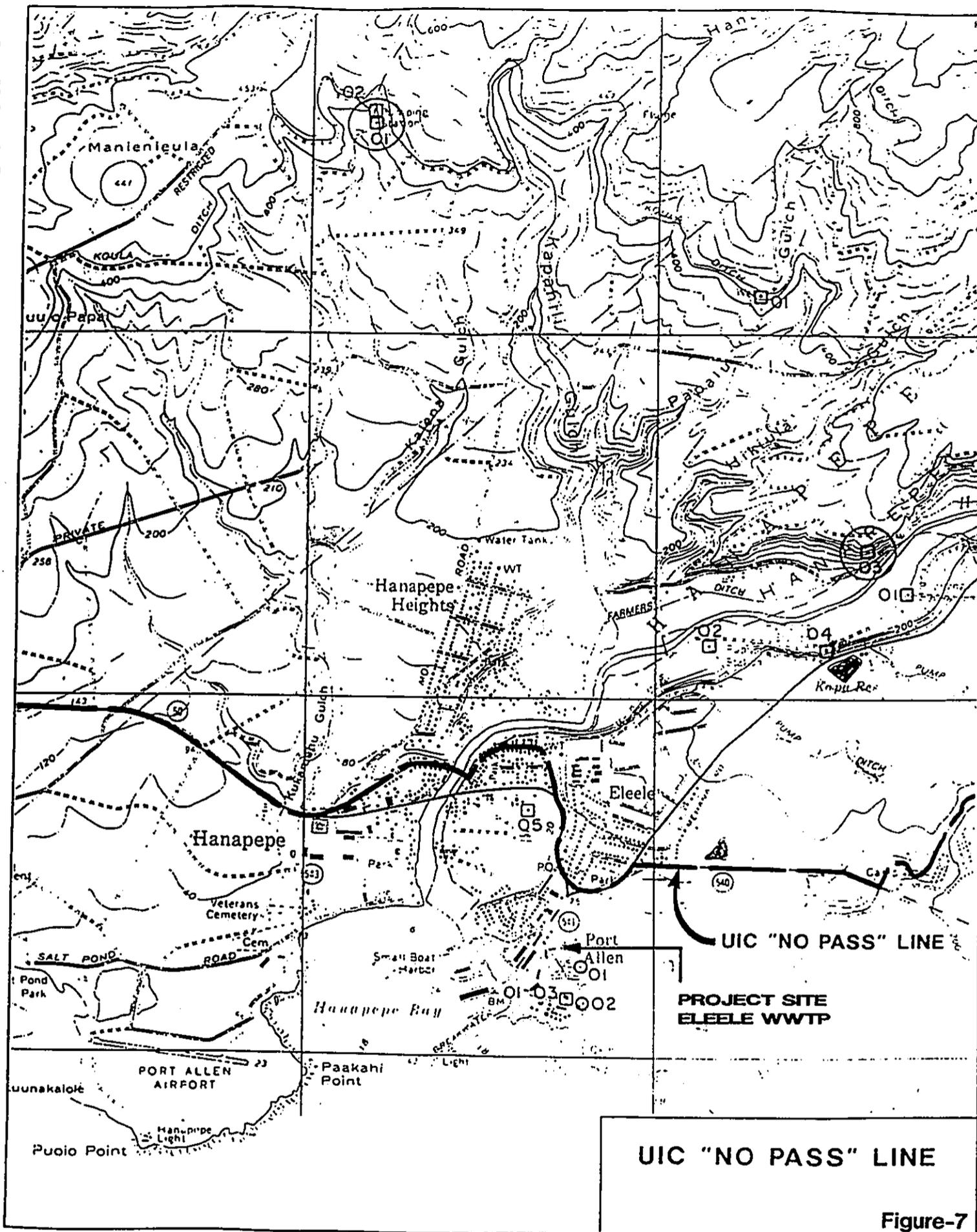
Coastal base flood elevations apply only landward of the shoreline. Elevation reference marks are described in the Flood Insurance Study Report.

For adjoining map panels see separate Flood Insurance Study Report.

FLOOD INSURANCE MAP

Figure-5





Allen, the second largest seaport serving the Island of Kauai, and a small boat harbor. According to Chapter 54 of the State DOH Public Health Regulations, the immediate off-shore waters of Port Allen and the small boat harbor are classified as "Class B". The remaining off-shore areas of Hanapepe Bay are classified as "Class A". The intent of these regulations is to protect off-shore waters from degradation, and any off-shore discharges must have a DOH permit.

Kauai Electric, a Division of Citizens Utilities Company presently discharges spent boiler cooling waters into Hanapepe Bay under a State DOH issued National Pollutant Discharge Elimination System and Zone of Mixing (NPDES/ZOM) Permit No. HI0000353.

(4). Special Management Area

The County of Kauai has established Special Management Area (SMA) ordinances to protect the natural resources of the coastal zone of Kauai. Any development or activity (which might have a detrimental impact on the SMA) proposed within the SMA must apply for a permit. The SMA extends from the shoreline inland to a demarcation line established by the County, and is shown on Figure-8. Eleele WWTP is not within the SMA zone, and does not require a SMA permit.

1.2.7. Biology

There are no endangered plants or animals within or near the project area, based on available information including a recent report by Andrew J. Berger dated February 1990 for A&B Properties.

1.2.8. Historic & Archaeological Sites

Based on available information including a report by Cultural Surveys Hawaii dated April 1990 for A&B Properties, there are no archaeological sites recorded or located within or adjacent to the project area. There is an old Japanese Cemetery about 2,500 feet southeast of the treatment plant site. Improvements at the Eleele WWTP site would not impact the cemetery.

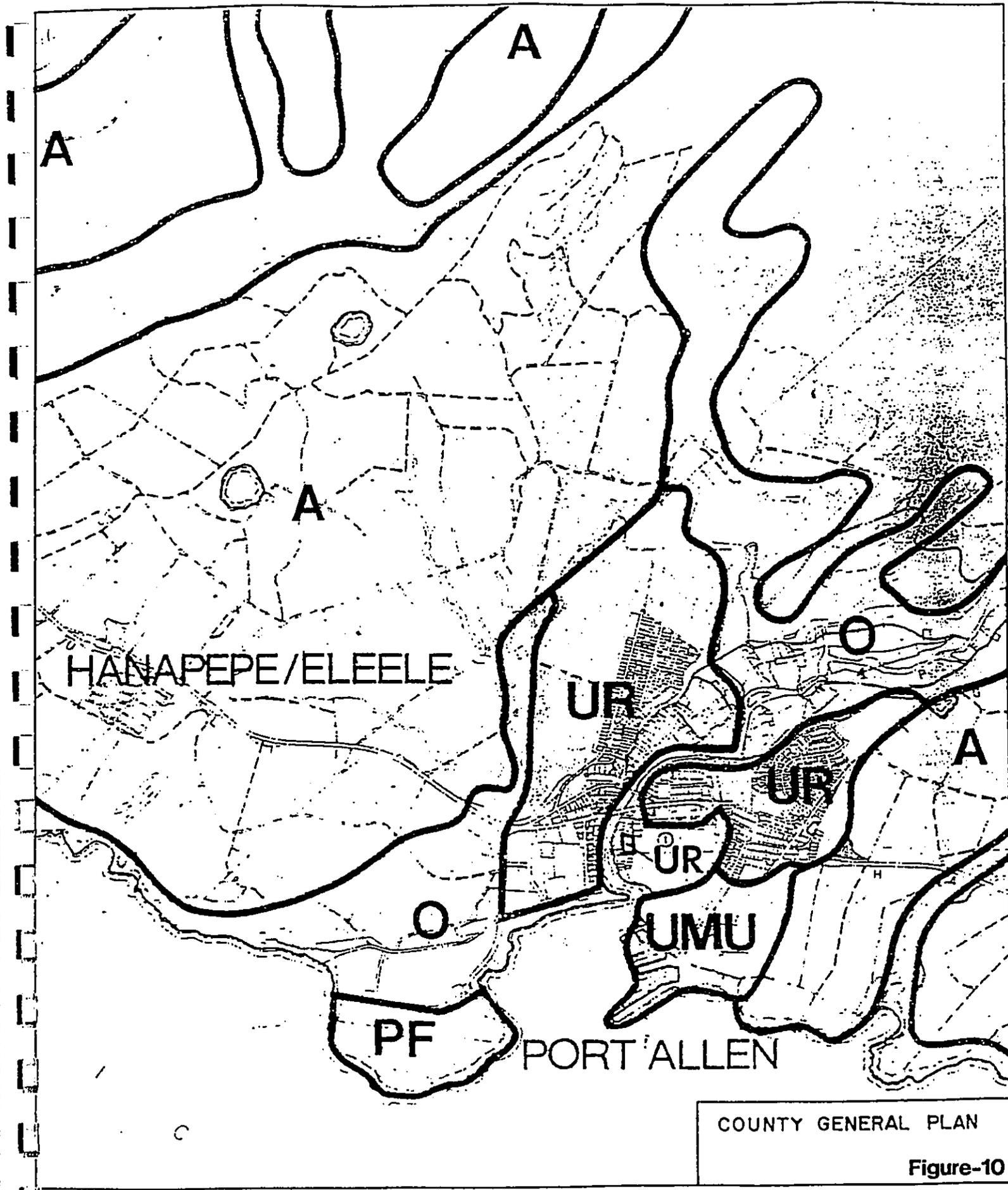
1.2.9. Land Use

Land use policies and designations are governed by State and County laws and regulations. The State Land Use Commission designates and establishes "general planned" boundaries for land districts or areas classified for Agriculture, Conservation, Rural, or Urban use. The State land use designations are shown in Figure-9. The County shares responsibility with the State Land Use Commission for regulating uses within areas designated for Agriculture, Rural and Urban Districts by adopting a County General Plan consistent with the State's plan, and implements this responsibility through the development of County zoning ordinances and land use maps. The County General Plan designates specific urban uses as follows:

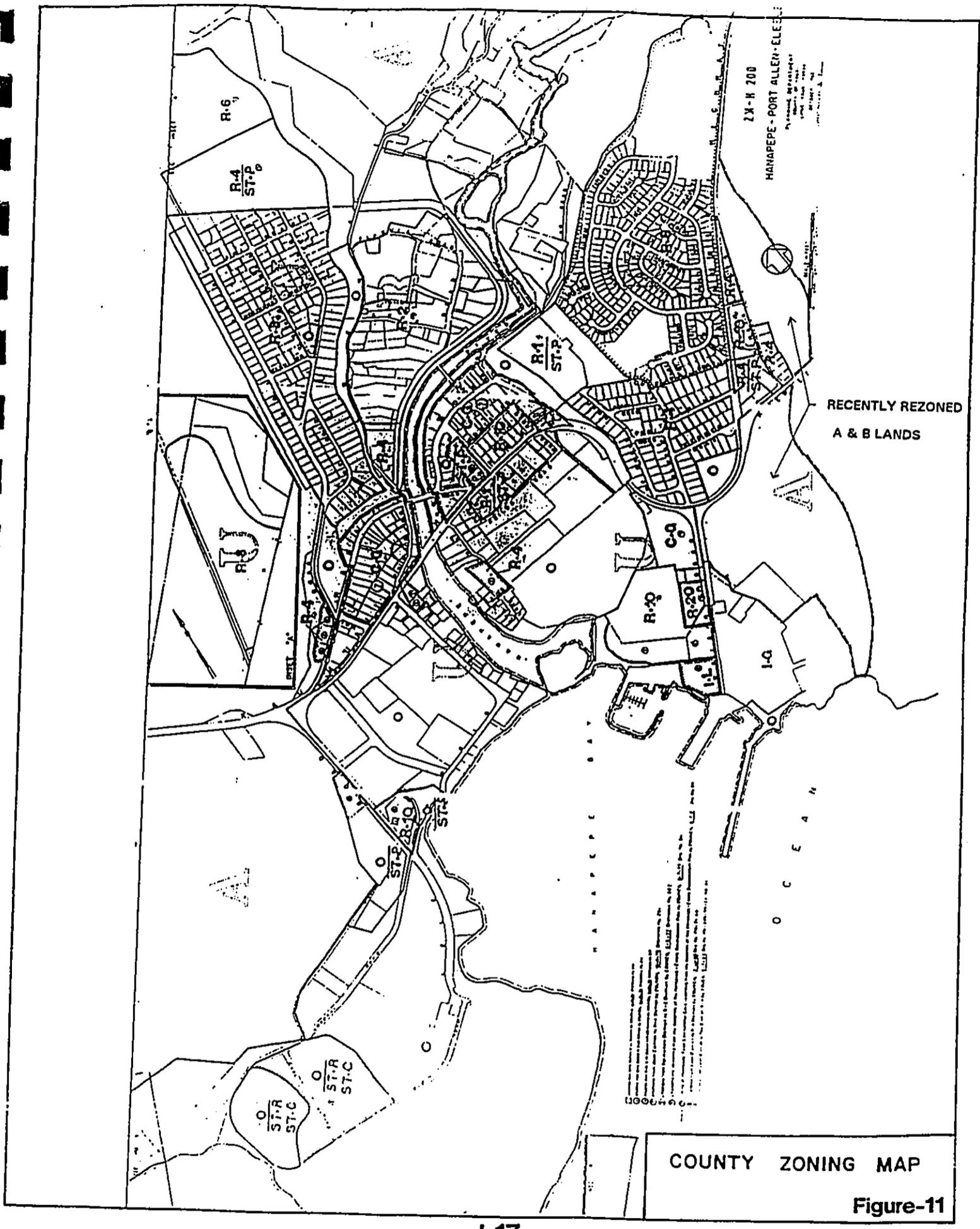
A	Agriculture
O	Open
PF	Public Facilities
R	Resort
RR	Rural Residential
UR	Urban Residential
UMU	Urban Mixed Use

The County General Plan for the Hanapepe-Eleele area is shown in Figure-10. County zoning ordinances implement the County General Plan, and establishes specific detailed requirements for Agriculture, Commercial, Industrial, Residential, Resort, and other specific special uses. The County Zoning Map for the Hanapepe-Port Allen-Eleele area is shown in Figure-11.

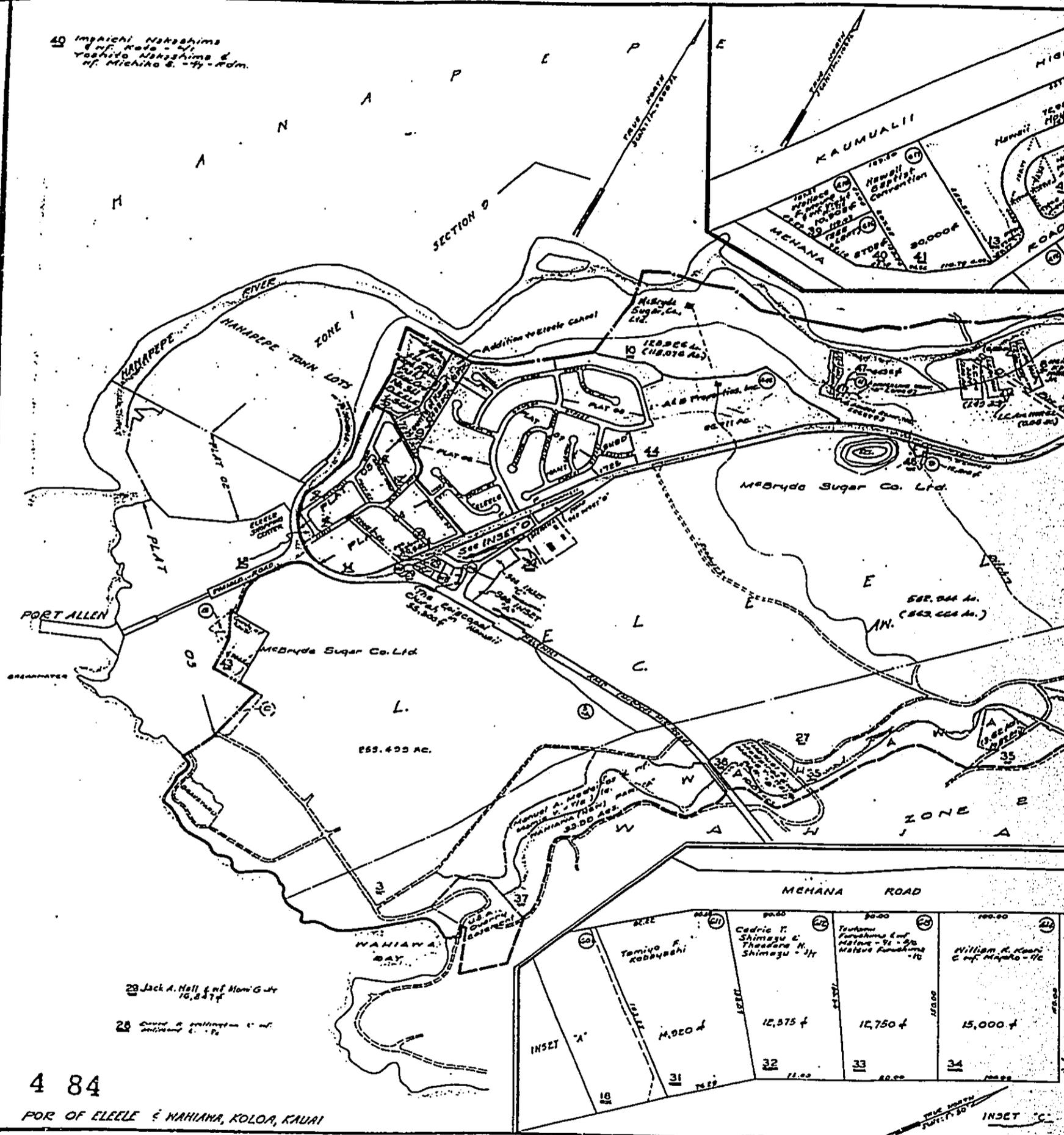
The areas surrounding the project area are zoned primarily for open or agricultural uses and are predominantly owned and used by McBryde Sugar Company for agricultural purposes. Figure-12 shows the land ownership information.



PLANNING DEPARTMENT

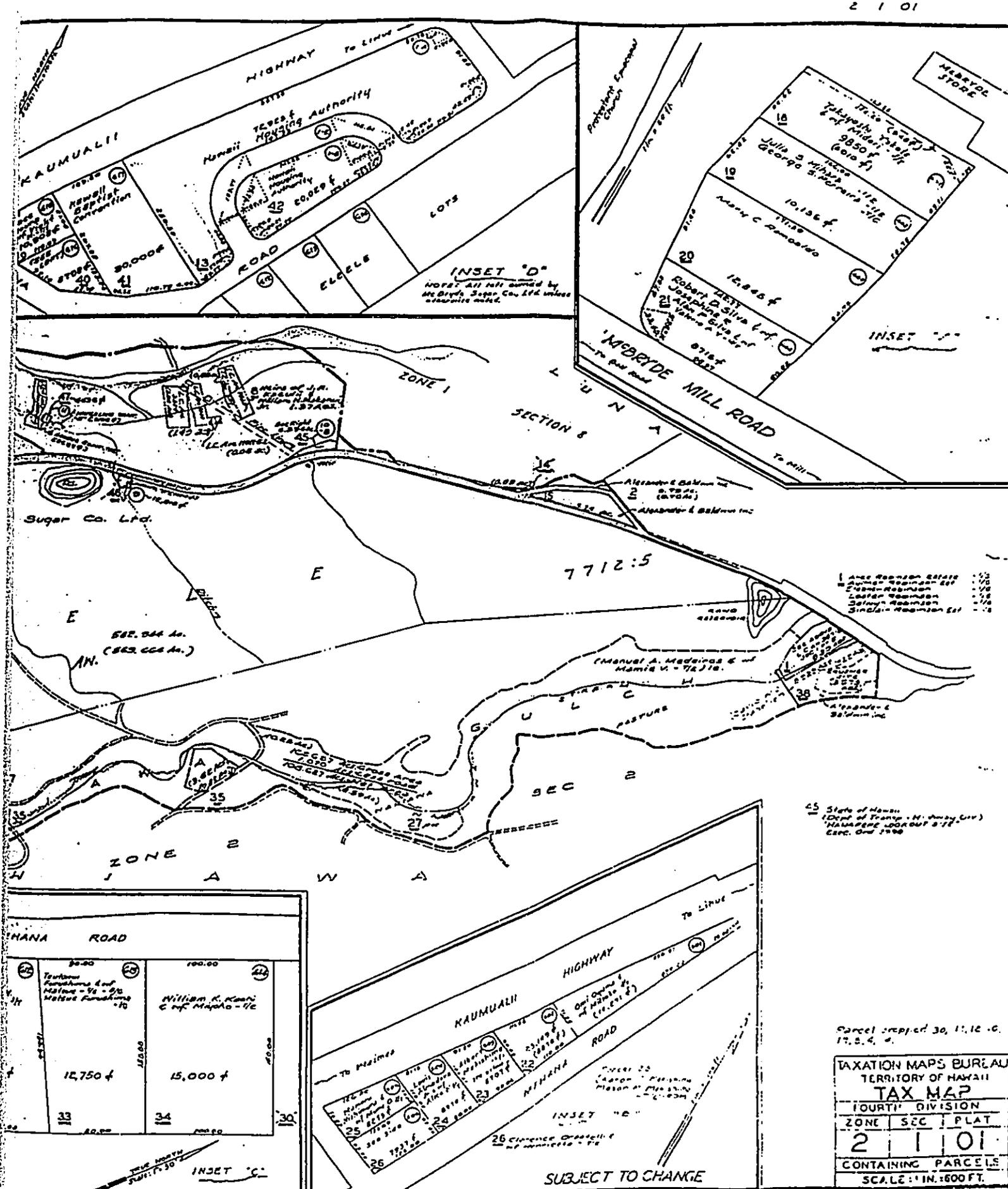


49 Impeichi Nakashima
 of Kala - 4/1
 Yoshito Nakashima &
 of Michiko S. - 7/4 - adm.



4 84

PORT OF ELEELE & WAIHANA, KOLOA, KAULI



- 1 Area Robinson Estate 1/20
- 2 Sumner Robinson Est 1/20
- 3 Sumner Robinson 1/20
- 4 Lester Robinson 1/20
- 5 Selwyn Robinson 1/20
- 6 Sinclair Robinson Est 1/20

45 State of Hawaii
 (Dept of Public Works - H. Amey Div.)
 'HAWAIIAN LOOKOUT' 8-11-19
 Exec. Ord 1960

Parcel mapped 30, 11, 12 - C.
 17, 8, 4, 4.

TAXATION MAPS BUREAU		
TERRITORY OF HAWAII		
TAX MAP		
FOURTH DIVISION		
ZONE	SEC	PLAT
2	1	01
CONTAINING PARCELS		
SCALE: 1" = 600 FT.		

1.3. Socio-economic Characteristics

1.3.1. Population and its Projections

(1). 1990 Bureau of Census Population Counts

According to preliminary reports from the Census Bureau, the County of Kauai had a population of 51,177 persons in 1990. The Hanapepe-Eleele study area straddles the boundary of census tracts 407 (Koloa District) and 408 (Waimea District). The census counts for those two areas were 6,468 and 2,913 respectively or a total of 9,381. Detailed 1990 census count data indicated that the population counts for Hanapepe and Eleele were 1,395 and 1,489 people, respectively. Based on the 1990 census population count of 2,884 and a housing unit count of 940 units, the estimated number of residents per housing unit is 3.1 persons. See Appendix A.

(2). Population Projection, Series M-K

The State Department of Business and Economic Development (DBED) Population and Economic Projections for the State of Hawaii to 2010 (Series M-K) dated November 1988 provides the most recent population projection data. According to the State DBED, the projections are based on objective analysis of past and current trends, and represent the most likely future given the known economic and demographic factors at the time the report was prepared. The resident population projections for the state total and County of Kauai are summarized below and indicated a 56% increase in population from the year 1990 to 2010.

<u>YEAR</u>	<u>STATE TOTAL</u>	<u>KAUAI</u>
1970	771,600	29,800
1975	886,200	33,400
1980	968,900	39,400
1985	1,051,500	45,400
1990	1,137,200	54,100 (51,177-1990 Census count)
1995	1,225,200	61,100
2000	1,285,100	68,200

2005	1,350,800	75,500
2010	1,435,500	84,600

(3). Population Projections for the Hanapepe-Eleele Study Area

Several population projections have been made specifically for the Hanapepe-Eleele area. These projections are summarized below and show the difficulty in applying any of these projections to the Eleele WWTP expansion project. Therefore, a different approach for projecting population and flows for this project is presented in Section 1.3.1(4) below.

The most recent projection (March 1991) was made in the Kauai Water Use and Development Plan prepared for the Department of Water, County of Kauai by R.M. Towill Corporation. The study is currently being finalized. Discussions with the R.M. Towill staff indicated that the 1990 population was about 2,800 and the projected year 2010 population would be about 5,461. The ultimate full development population was projected to be 13,400.

The County of Kauai Planning Department estimates that the existing Hanapepe-Eleele population is 3,000, and anticipates that the population will expand to approximately 5,500 when the following projects are all completed:

- A&B's 180 multi-family units and 100 single family units on recently re-zoned Urban lands, (within next 5 years)
- A&B's Eleele Nani Phase II of 144 single-family lots (under construction),
- State HFDC Hanapepe Cliffside project of 300 houses and lots (construction completed 1991).

Population projections were also made in Kauai County Highway Planning Study, dated October 1990, prepared by KAKU Associates. They projected a 5% growth rate relative to growth in the Lihue Hanamalu area as being 100%.

As a result of the 1972 Federal Water Pollution Control Act Amendments the State Department of Health (DOH) in cooperation with the County, developed The Water Quality Management Plan for the County of Kauai dated December 1978 which is more commonly referred to as the County's 208 Plan. This plan was adopted by Resolution of the Kauai County Council on July 3, 1979. The 1978 Plan was then

amended and updated after public hearings and EPA conditions, and the final 208 Plan document was prepared and dated December 1980. Population projections made in the 1980 208 Plan report indicated the 1990 population for the Hanapepe-Eleele district would be 4,000. The residential populations served by the Eleele Wastewater Treatment Plant (WWTP) were projected to be 2,000 people in 1990 and 4,000 by 1995.

Population projections were also made earlier in 1973 as part of the "Interim Water Quality Management Plans and Preliminary Engineering Report for Municipal Sewage Facilities for Hanapepe-Eleele Study Area". Projections in the 1973 report are considered to be outdated and not valid anymore, since the projections were made in the early 1970's, and criteria used for estimating population have been superseded. The projected full development population was estimated to be about 8,700 people.

(4) Population Projections Proposed for Sizing the Eleele WWTP Expansion

As part of the scope of work for expanding the existing Eleele WWTP, previous population projections were re-assessed in light of current conditions. Based on observations of the Hanapepe-Eleele area and a review of current land use, zoning maps, and proposed development plans for the area, population growth in the Hanapepe-Eleele area is expected to be strongly influenced by the availability of reasonably priced subdivided homesite and homes. The State developed Hanapepe Cliffside subdivision of about 300 lots scheduled for completion in 1991, and A&B Properties, Inc.'s Eleele Nani II subdivision of about 144 lots scheduled for construction in 1992 are expected to provide a good supply of reasonably priced homes and homesite and will encourage population growth in the area. After these two developments have been completed, there are only a few other smaller sites currently zoned for residential use that are vacant and available for development. However, there are two other sites that are designated urban in the County General Plan but not yet zoned. One site, abutting the Hanapepe Cliffside development, contains about 150 acres and is owned by the State of Hawaii. The State has leased the site to Olokele Sugar Company through the year 2000, and the site may become available for development thereafter. The second site involves about 24 acres adjacent to Kaumualii Highway and is owned by A&B Properties, Inc.. A&B Properties, Inc. intends to develop this property, after obtaining zoning and other government approvals, with about 180 multi-family units and 100 single-family house

lots. The State Land Use change from Agriculture to Urban use was approved in 1991.

By assuming full development at maximum allowable densities of all currently County zoned lands and General Plan designated areas, a maximum full build out population can be projected. The full build out population is projected to be 13,476 people. See Appendix A. Based on available project scheduling information, and assuming that the demand for affordable housing remains strong, a possible population projection scenario is indicated in Table 1.

The anticipated rate at which full development and occupancy could occur is critical to the population projections. Full development at maximum allowable densities is unlikely to happen, so that the full development projection of 13,476 within the zoned service area is considered to be conservative. Full development of housing projects has historically been strung out over a lengthy period. For example, Eleele Nani I developed in the early 1980's still has several vacant lots. The development and occupancy rates at the Hanapepe Cliffside and Eleele Nani II are important factors in the population projections of the area. In addition, A & B has received State Land Use approval for redesignation of agricultural lands for urban use, and plans to develop 180 multi-family units, 100 single family units, and various commercial and industrial acreages. Full development and occupancy of these lands will also affect the population projections. Table 1 was therefore developed to account for known land development projects, and assumes development and occupancy values according to available information and best estimates. Estimated sewage flows are based on 147 gpcd derived from current estimates of population served and flows monitored at the Eleele WWTP. The 147 gpcd and is considered to be conservative since a relatively large portion of the wastewater flows are generated from commercial enterprises. Accordingly, the flow projections in Table 1 for the various years best estimates based on available project development information, and the full build-out population and flows are considered to be conservative.

TABLE-1

ESTIMATED POPULATION PROJECTION

UNITS/YEAR	1991	1992	1993	1994	1995	1996	1997	1998- -2010	BEYOND 2010	LONG RANGE TO FULL BUILD UP
ESTIMATED EXISTING CONN. 1,726 425/710 x 2,884										
EXTENSIONS/CONN. EXIST. TO MUNICIPAL SEWERS (EST.)	100	100	100	100	100	100	100	100	400	458
300 HFDC UNITS x 4	400	400	400	100	100	100	100			
1/4 x 144 A&B UNITS x 4 (ELEELE NANI II)			144	144	144	144				
FUTURE A&B REZONING OF R-6, R-10 100 @ 4, 180 @ 2.5							425	425		
FUTURE 900 UNITS ON STATE LANDS LEASED TO OLOKELE x 4									1,800	1,800
MISC. GROWTH INC. R-10								410	410	3,146
CUMULATIVE POPULATION	1,726	2,226	2,870	3,214	3,558	3,902	4,527	5,462	8,072	13,476
ESTIMATED SEWAGE FLOW (MGD) @ 1.98 MGD/13,476 (= 147 gpcd)	0.25	0.33	0.42	0.47	0.52	0.57	0.66	0.80	1.19	1.98

1.3.2. Economic and Social Profile of the Project Area

The Hanapepe-Eleele communities could be characterized as primarily rural residential communities. The predominant land owner in the area is McBryde Sugar Company Ltd. Most of the surrounding area is zoned for agriculture, and is used for growing sugar cane and coffee by McBryde Sugar Company and Olokele Sugar Plantation. Most of the urban zoned lands have been developed into residential subdivisions. Commercial development is limited to the Hanapepe Town area, and a small neighborhood shopping center in Eleele. Many of the residents commute to Lihue, Poipu or other areas for employment.

1.4. Anticipated Sewage Flow

Based on the population projection scenario in Table-1, Figure-13 gives an anticipated sewage flow projection from Years 1991 to 2010. 147 gpcd is used to estimate and project sewage flows, and was obtained by divided full build out population 13,500 by the estimated "ultimate" average wastewater flow 1.98 mgd. The per capita generation rate is thought to be conservative. See Appendix A.

1.5. Wastewater Characteristics

Review of Eleele WWTP influent flow recordings indicate a general diurnal flow pattern with two peaks occurring from about 7 to 10 am and from about 5 to 10 pm.

According to the May 1991 County of Kauai Department of Water records, there were a total of 710 water connections in the Hanapepe-Eleele service area. A breakdown of the major types of users included 629 residential users, 65 non-residential users such as commercial, industrial, government and religious institutions, and 16 agricultural users. Most of the wastewaters generated from the Hanapepe-Eleele service area are expected to be domestic wastewater. According to Eleele WWTP records (see Table-2), typical average characteristics of wastewater entering the Eleele WWTP exhibit the following characteristics:

5 day Biochemical Oxygen Demand (BOD₅) = 200 mg/l

Suspended Solids (SS) = 150 mg/l

ANTICIPATED SEWAGE FLOW PROJECTION BASED ON TABLE-1

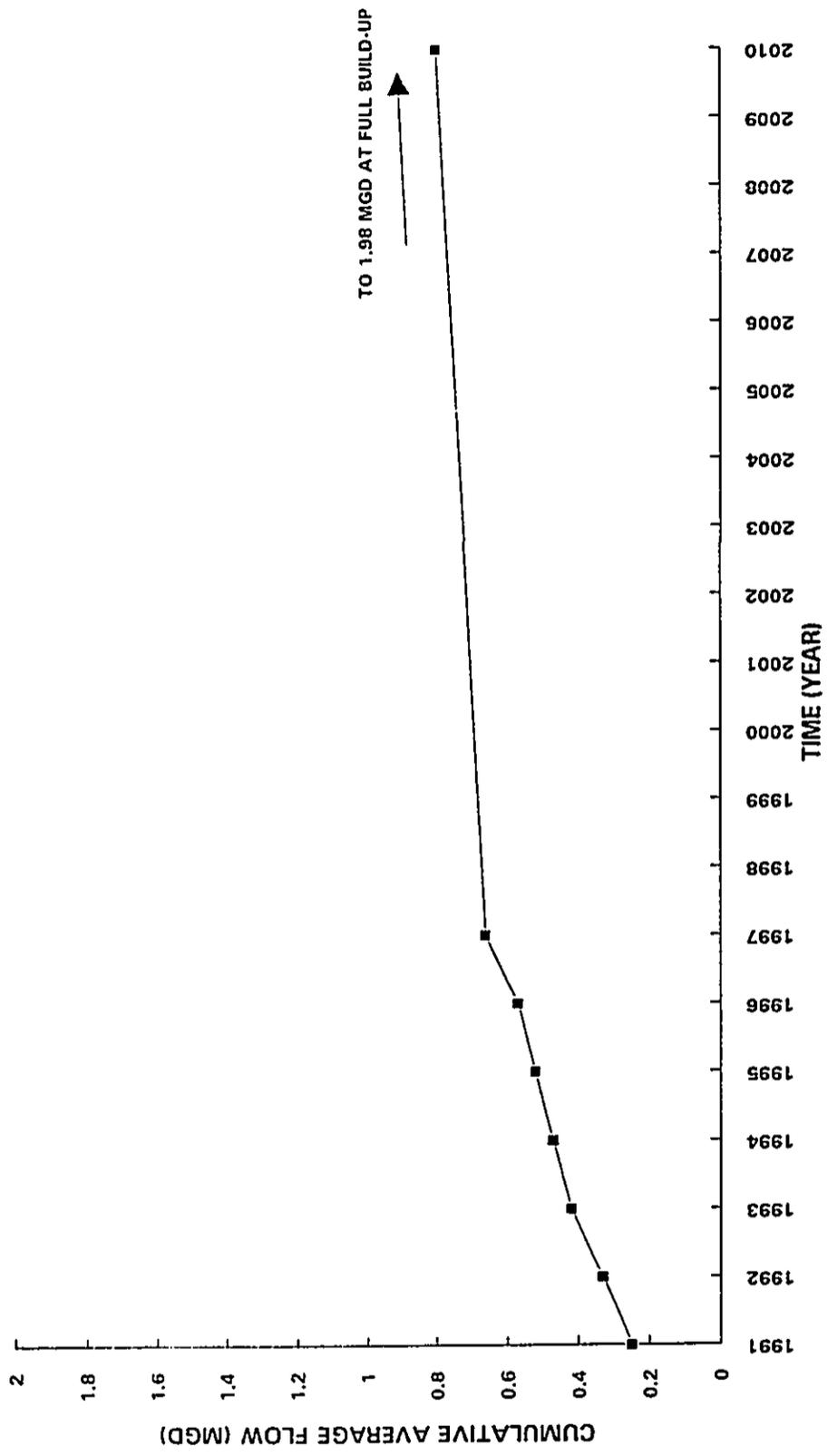


Figure-13

TABLE-2
ELEELE WWTP FLOW AND INFLUENT CHARACTERISTICS DATA

MONTH	FLOW (MGD)			SUSPENDED SOLIDS (MG/L)			BOD* (MG/L)					
	NO. DAYS	MAX.	MIN.	AVG.	NO. TESTS	MAX.	MIN.	AVG.	NO. TESTS	MAX.	MIN.	AVG.
9/89	30	0.285	0.245	0.253	7	240	52	140	4	243	78	166
10/89	31	0.267	0.235	0.251	6	278	56	131	4	185	130	176
11/89	30	0.268	0.232	0.252	2	110	100	105	2	215	210	213
12/89	31	0.231	0.205	0.217	7	170	60	108	4	228	140	184
1/90	31	0.536	0.206	0.247	6	206	52	129	4	210	148	183
2/90	28	0.234	0.206	0.220	6	136	64	98	3	208	133	181
3/90	31	0.248	0.196	0.213	7	228	92	156	4	235	143	182
4/90	30	0.213	0.191	0.201	7	208	96	158	3	250	210	227
5/90	31	0.223	0.199	0.212	9	292	108	172	3	200	125	173
6/90	30	0.239	0.208	0.225	4	224	112	189	2	215	158	187
7/90	31	0.232	0.202	0.217	8	176	72	123	3	280	188	240
8/90	31	0.237	0.212	0.220	8	266	112	182	4	255	195	232
YEAR	365	0.536	0.191	0.227	77	292	52	143	40	280	78	194

According to the original preliminary engineering investigation for the Eleele plant (Sunn, Low, Tom & Hara, 1973), the domestic sewage characteristics were projected to have slightly higher values. Design of the existing Eleele WWTP facilities were based on the following design values:

5 day Biochemical Oxygen Demand (BOD₅) = 216 mg/l
(0.18 lbs/cap/day)

Suspended Solids (SS) = 192 mg/l
(0.16 lbs/cap/day)

The Eleele WWTP, Phase I expansion design, will be based on the higher loadings indicated above, because septage will also be accepted at the plant for treatment. Introduction of the septage into the treatment facilities will be controlled to avoid upsetting the treatment processes.

Septage is the liquid and solid material pumped from a cesspool or a septic tank. Septage exhibits a wide range of characteristics depending on the accumulation of solids in the cesspool and the depth from which the septage is pumped.

According to the Study on the Management of Cesspool Septage and Waste Activated Sludge from Private Facilities prepared for the County of Kauai by M&E Pacific, Inc. dated June 1984, typical characteristics of septage were described as follows:

	Minimum	Maximum	Average
Total Suspended Solids (mg/l)	70	70,000	1,600
Volatile Suspended Solids (mg/l)	30	40,000	900
Five Day BOD - Total (mg/l)	70	8,000	600

The Eleele WWTP has been designated as one of the facilities which will accept septage. The anticipated service areas include Poipu, Koloa, Omao, Lawai, Kalaheo, Eleele, Hanapepe and Olokele. The estimated volume of septage generated from those areas is about 17,000 gallons per day.

Wasted activated sludge (WAS) is the liquid and solid material pumped from small

wastewater treatment plants which lack adequate sludge handling facilities. WAS can be undigested WAS or digested WAS. As with the septage, the WAS characteristics are expected to be extremely variable depending on the treatment plant effectiveness, pumping location, and pumping frequency. Estimated average WAS characteristics are:

Total Suspended Solids (mg/l)	=	3,400
Five Day BOD (mg/l)	=	1,700

Since undigested WAS presents similar treatment and disposal problems as cesspool septage, both wastewater streams can be combined and handled in a common receiving unit prior to controlled release into the Eleele WWTP treatment system. Digested WAS can also be placed in a receiving tank prior to further thickening and mechanical dewatering or discharged directly into a sludge drying bed. The estimated amount of WAS is about 3,700 gallons per day generated from the Poipu, Koloa and Omao areas.

1.6. General Descriptions of Public Facilities and Services

1.6.1. Water Supply

The County of Kauai Department of Water supplies water to the communities of Hanapepe and Eleele. As of April 1991, the approximate number of water connections in the Hanapepe-Eleele area was 708. Six hundred twenty-nine were for residential units, 44 for commercial and industrial, 19 for government and religious institutions, and 16 were for agricultural connections. The approximate average water demand is 0.5 million gallons per day (mgd).

1.6.2. Sanitary Sewage System

A municipal sewerage system owned and operated by the County of Kauai serves the Hanapepe-Eleele. A system of collector gravity sewers, 3 sewage lift stations and force mains convey the sewage to the Eleele WWTP for treatment and disposal. The three sewage lift stations are the Port Allen sewage pump station (SPS) and two lift stations at Hanapepe identified as SPS No.1 and SPS No.2. The Eleele WWTP has an existing capacity of 0.4 mgd. Current average wastewater flows amount to about

0.325 mgd.

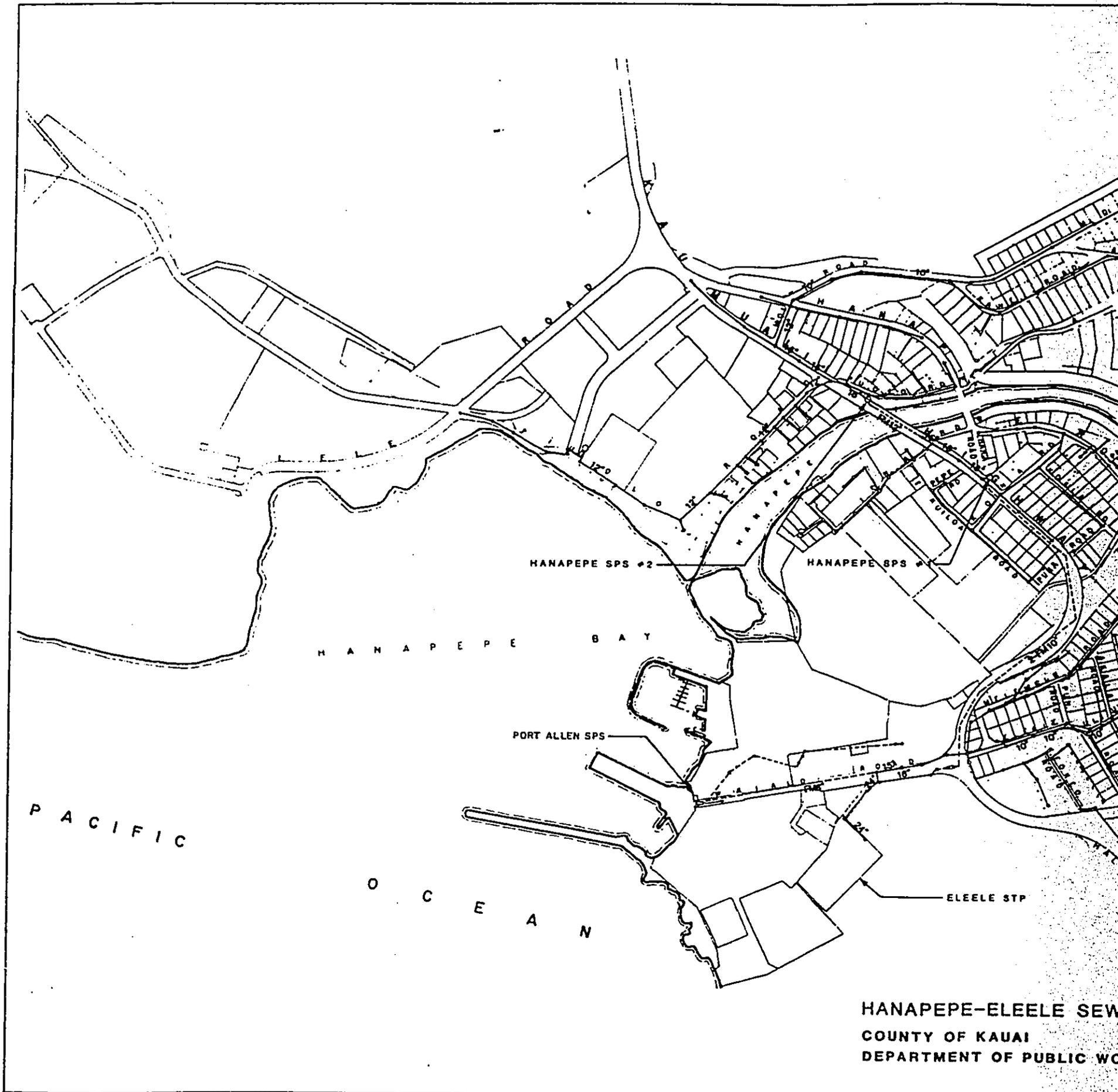
Sewage and wastewaters entering the sewers are conveyed to the Eleele WWTP are collected from the Hanapepe-Eleele area by a system of gravity sewers and three sewage pump stations (SPS). The existing system is shown in Figure-14, together with the tributary areas associated with each pumping system and major gravity collection system.

The Port Allen SPS serves the areas along Waialo Rd. below Kaumualii Highway, and is a prefabricated factory-built steel pump station with a reinforced concrete wet well. The Port Allen SPS has two pumps, each rated for 700 gpm at a total dynamic head of 70 feet. Flows are pumped via an 8" cast iron force main to a sewer manhole on Waialo Rd. across the Eleele WWTP access road intersection, from where it flows by gravity to the treatment plant. In the event of power failure conditions, an emergency diesel generator system at the Eleele WWTP automatically supplies the pump station with emergency power.

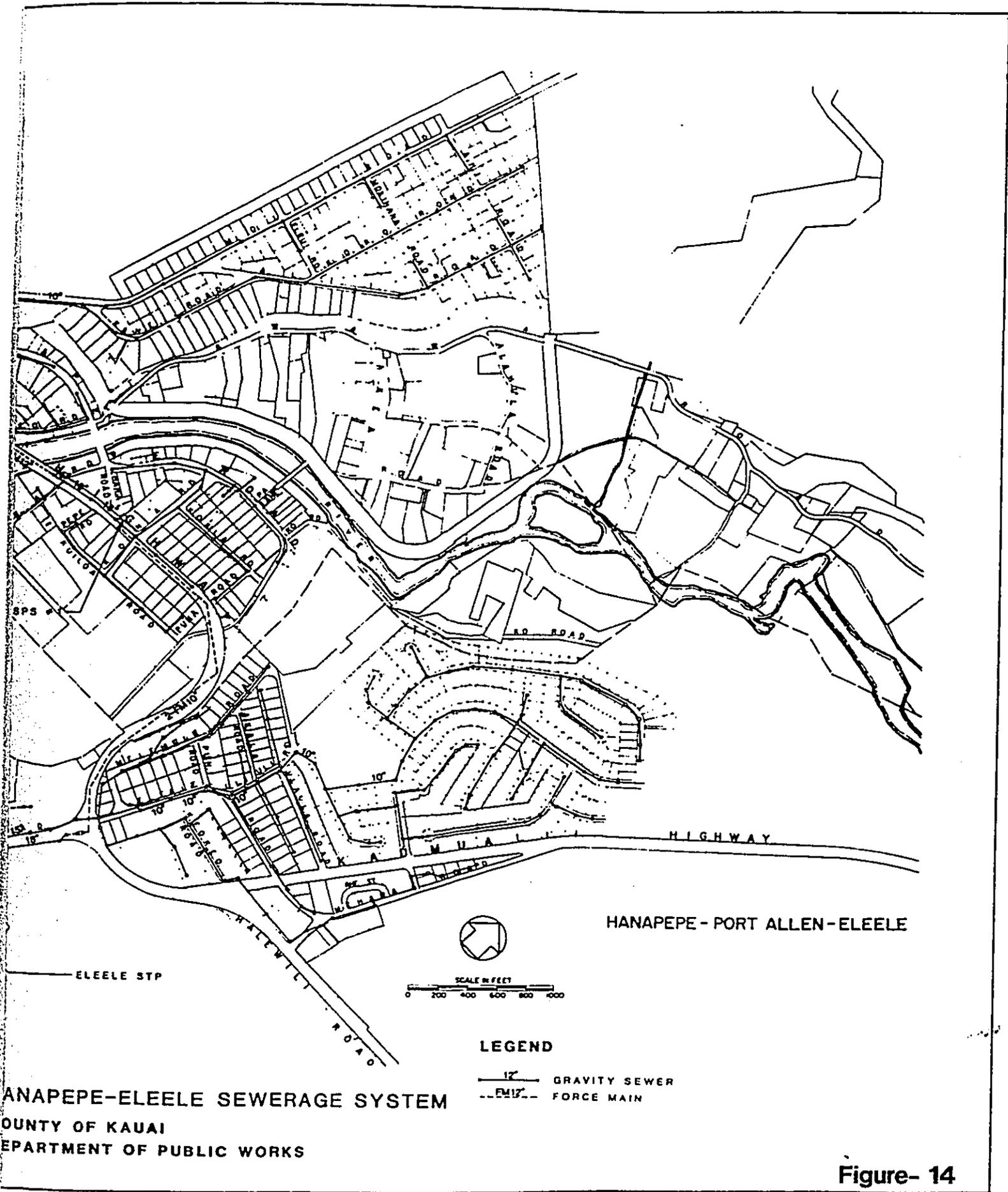
Sewage Pump Station No.1 (SPS No.1) is located just west of the Hanapepe River Bridge along Kaumualii Highway, and serves Hanapepe Town west, Hanapepe Heights, and around the Hanapepe Playground area. SPS No.1 has two pumps, each rated for 1150 gpm at a total dynamic head of 29 feet. Flows are pumped eastward via a 12" ductile iron force main located along Kaumualii Highway to a sewer manhole just across the Hanapepe River Bridge, from where it flows by gravity to Sewage Pump Station No.2.

Sewage Pump Station No.2 (SPS No.2) is located just east of the Hanapepe River Bridge along Kaumualii Highway adjacent to the Hanapepe Fire Station. SPS No.2 serves Hanapepe Town areas east of the Hanapepe River, and is similar in design and construction to SPS No.1. SPS No.2 has two pumps each with a rated capacity of 1250 gpm at a total dynamic head of 110 feet. Flows are pumped via a 10" and dual 10" asbestos cement force main located along Kaumualii Highway to a flow control box at the intersection of Kaumualii Highway and Waiola Road, from where it flows by an 18" vitrified clay gravity sewer to Eleele WWTP.

An automatic emergency 125 KW diesel generator system to support SPS No.1 and SPS No.2 during times of power failure is located adjacent to SPS No.2. The



HANAPEPE-ELEELE SEW
COUNTY OF KAUAI
DEPARTMENT OF PUBLIC WORKS



emergency generator system is operational.

In the unsewered areas, cesspool systems are used to collect sewage. Pumpage from failed cesspools, septage, and private treatment plant waste activated sludge (WAS) are trucked to the existing Eleele WWTP.

1.6.3. Drainage System

Storm water runoff generally flow overland and is intercepted by various swales, ditches and catch basins. Eventually, the storm runoff is conveyed via pipes, culverts, and ditches, and discharged into the ocean.

1.6.4. Electricity

Electricity is supplied by Kauai Electric, a Division of Citizens Utilities Company.

1.6.5. Solid Waste Disposal System

Solid wastes generated from residential areas are collected by the County's refuse crews. Solid wastes from multi-family, industrial and commercial areas are collected by private haulers. Solid Wastes collected from the Hanapepe-Eleele area are disposed of at the County's Kekaha Sanitary Landfill.

1.6.6. Road System

The main roadway serving the Hanapepe-Eleele area is the State owned Kaumualii Highway. Various County roads branching off the main highway serve the residential and town areas.

1.7. Regulatory Requirements

1.7.1. The Clean Water Act

Federal Water Pollution Control Act, amended as the Clean Water Act, PL 92-500 applies to discharge into open water. But it serves as the basis for the Hawaii's wastewater regulations.

1.7.2. Hawaii Administrative Rules - Public Health Regulations

(1). Chapter 62 - Wastewater Systems

Amendments to Chapter 62 effective August 30, 1991 severely restrict the construction of new cesspools and individual wastewater systems on the island of Kauai. Chapter 62 is applicable to all public and private wastewater treatment facilities. The regulation specifies effluent quality standards, approval requirements, and minimum design criteria for wastewater treatment and disposal facilities. Based on this regulation, the BOD₅ and suspended solids in the effluent discharged from the Eleele WWTP shall not exceed 30 mg/l. Treatment works utilizing a subsurface disposal system such as the effluent disposal wells at Eleele WWTP require continuous disinfection with a minimum chlorine residual of 0.1 mg/l.

(2). Chapter 55 - Water Pollution Control

The National Pollution Discharge Elimination (NPDES) permit system applies to effluent discharged into State waters. An NPDES permit is not required for the Eleele WWTP effluent discharged into existing injection wells. However, there is an NPDES permit for the WWTP emergency overflow system. The neighboring Kauai Electric Co. has an NPDES permit for their cooling wastewater discharge into the ocean.

(3). Chapter 54 - Water Quality Standards

This chapter classifies State receiving waters and sets up minimum water quality criteria. This regulation is not directly applicable to the Eleele WWTP. The regulations do impact the Kauai Electric coolant water supply and discharge system. Kauai Electric pumps coolant water from groundwater sources just downgradient from the Eleele WWTP, and discharges the spent coolant waters into the nearshore coastal waters after use. Kauai Electric has determined that a relatively high nitrate level of nitrate exists in their coolant water, and that the excessive nitrate levels may be originating in part from the Eleele WWTP effluent disposal system. If nitrate levels were in part attributable to the Eleele WWTP effluent, there is concern that increased flows to the treatment plant and consequent increased effluent disposal volumes would increase nitrate concentrations in the Kauai Electric coolant water discharge to a point where the NPDES permit requirements may be jeopardized. Actions to further

investigate the sources and to develop viable alternatives to resolve the potential problem are being taken by Kauai Electric Company. Eleele WWTP improvements proposed by the County of Kauai will increase the treatment plant's capacity by two times and reduce the nitrate levels in the discharge to about one-half the existing level. Therefore, the Eleele WWTP improvements should not worsen the existing situation, and therefore should not jeopardize the Kauai Electric's NPDES permit requirements.

(4). Chapter 23 - Underground Injection Control (UIC)

This law regulates injection wells for the protection of fresh groundwater resources. This law imposes permitting requirements for injection wells and establishes a UIC line along the coastal plains above which injection wells are not allowed. See Figure-7. The injection wells for Eleele WWTP are located outside and downgradient from the designated UIC "No Pass" line. Eleele WWTP has a UIC permit (DOH UIC Permit No. UK-1212) for their injection wells. The UIC permit has expired, and an application to renew the permit was submitted by the County of Kauai on February 10, 1993.

CHAPTER TWO

PROPOSED ACTION

2.1. Proposed Action

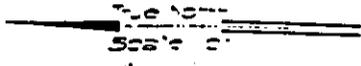
2.1.1. Existing Sewage Treatment System

The Eleele WWTP is a secondary treatment plant constructed in 1976, and has a design average daily flow capacity of 0.4 mgd. A site plan of the existing facilities is shown in Figure-15. Secondary treatment at Eleele WWTP includes screening, grit removal, biological treatment using the activated sludge process, sedimentation, and chlorination. The secondary treatment process results in an effluent with less than 30 mg/l of both BOD and suspended solids.) The treated effluent is presently being disposed of via one 12" diameter by 160' deep effluent disposal well. Sludge settled in the sedimentation tanks is aerobically digested, dewatered on sludge drying beds, and disposed of at the Kekaha Sanitary Landfill.

2.1.2. Proposed Action

The proposed action involves modifying the treatment plant facilities to accommodate a design average wastewater flow of 0.8 mgd. Specific major components of the proposed expansion are shown in Figure-16, and include:

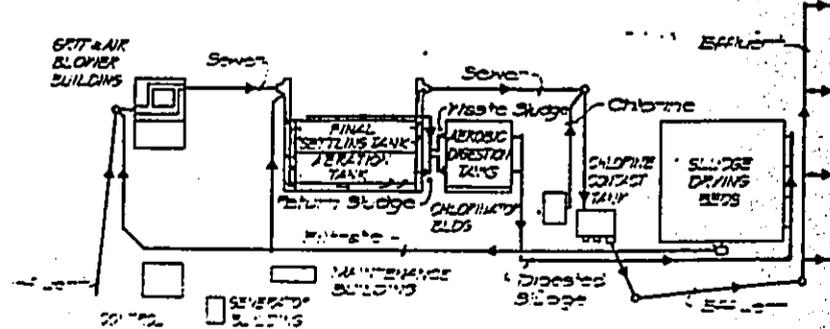
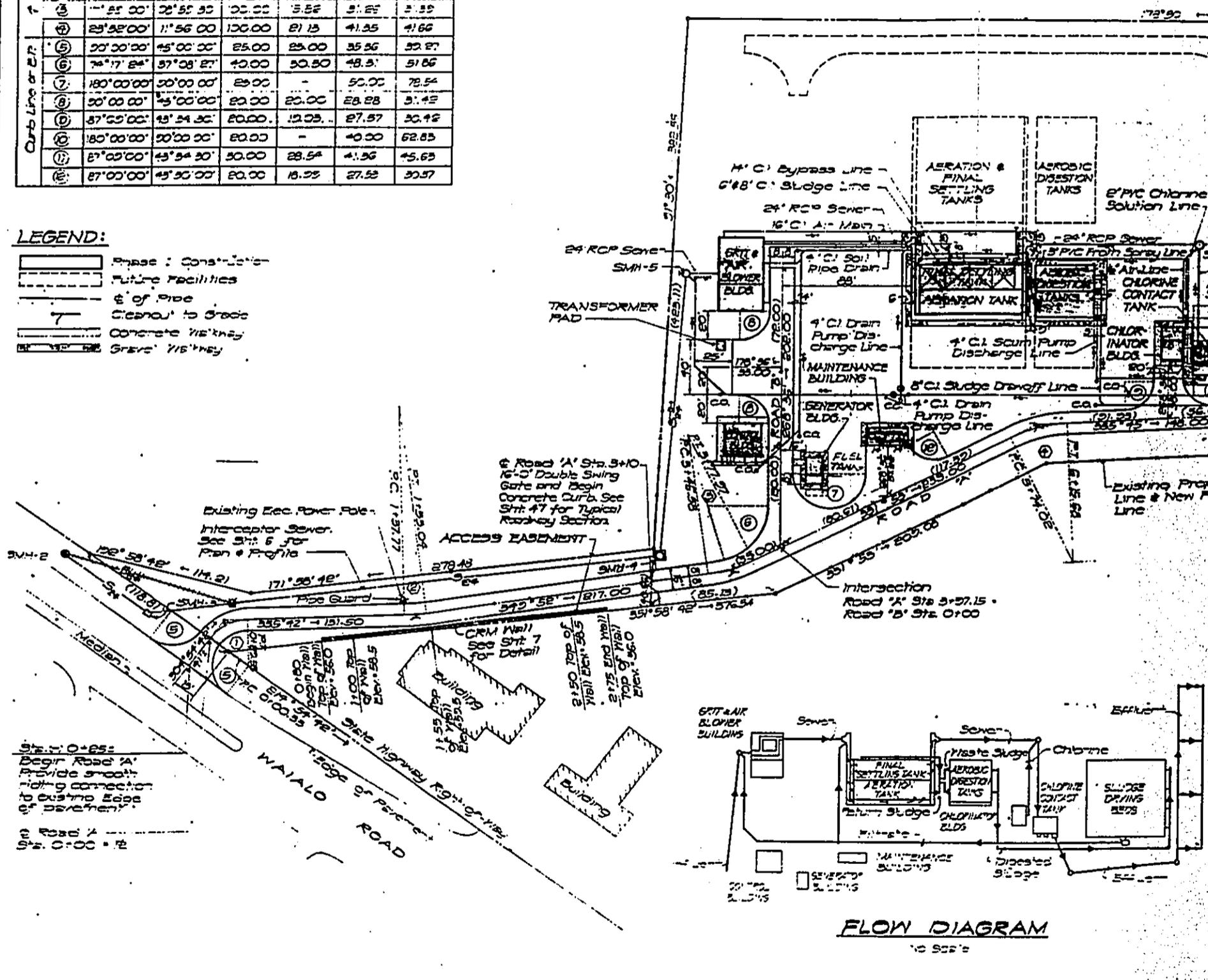
- 1) One 10,000 gallon septage receiving facilities.
- 2) Two new anoxic-aeration tanks.
- 3) New final settling tanks.
- 4) Modifications to the chlorine contact tank.
- 5) Conversion of the existing aeration and settling tanks to aerobic digestion tanks.



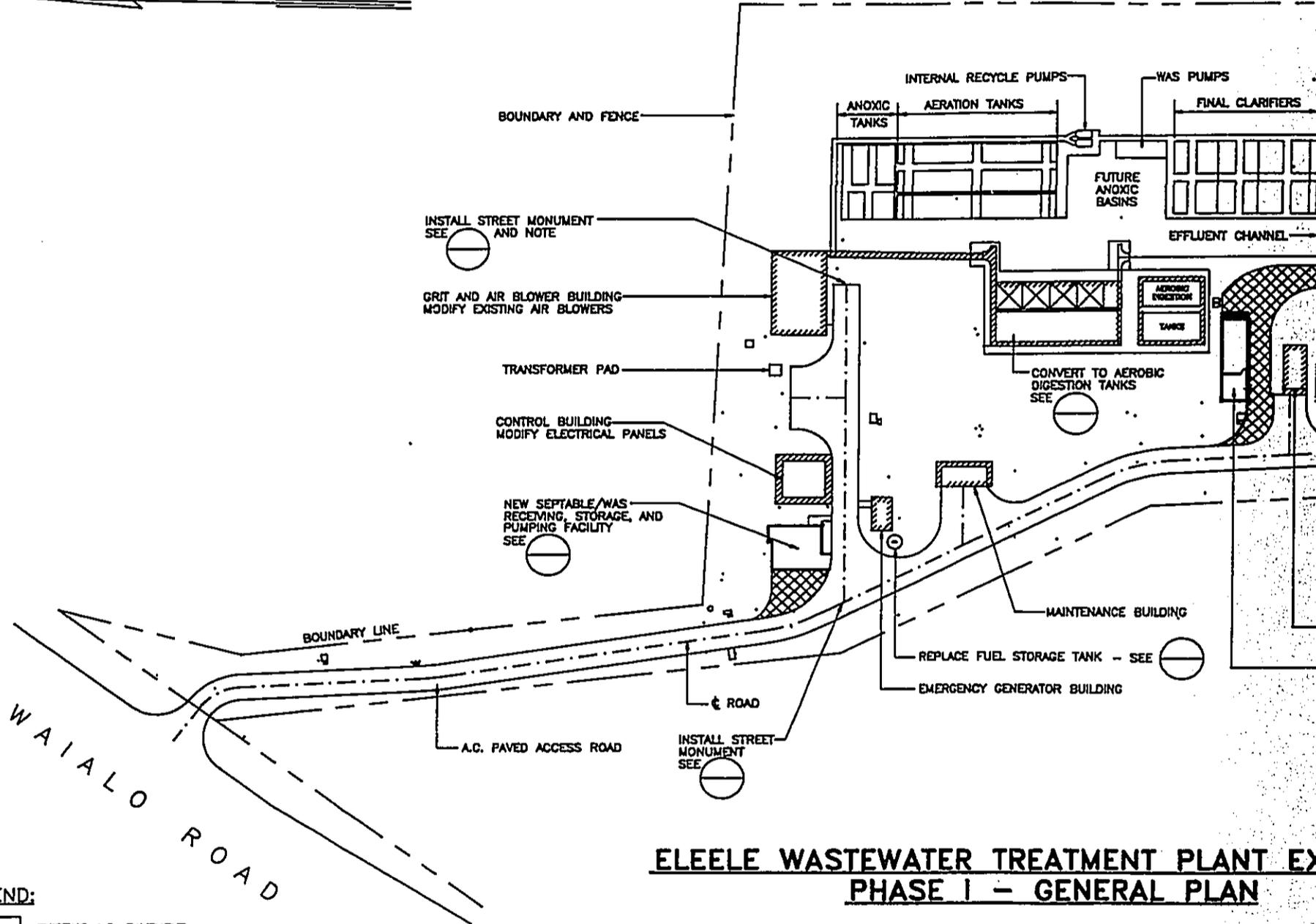
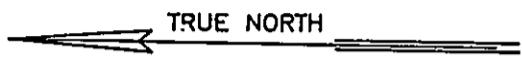
CURVE DATA						
NO	Δ	Δ/2	R	T	C ₁	C ₂
①	50°47'18"	25°23'39"	55.00	15.67	28.30	28.25
②	08°30'00"	04°15'00"	50.00	7.54	15.87	15.87
③	11°25'00"	05°42'30"	100.00	18.54	31.25	31.25
④	28°58'00"	14°29'00"	100.00	21.15	41.35	41.66
⑤	90°00'00"	45°00'00"	25.00	25.00	35.36	30.87
⑥	74°17'24"	37°08'42"	40.00	30.50	48.51	51.66
⑦	180°00'00"	90°00'00"	20.00	-	50.00	78.54
⑧	90°00'00"	45°00'00"	20.00	20.00	28.28	31.42
⑨	87°53'00"	43°56'30"	20.00	19.05	27.57	30.42
⑩	180°00'00"	90°00'00"	20.00	-	40.00	62.85
⑪	87°00'00"	43°30'00"	20.00	18.22	27.52	30.57

LEGEND:

- Phase: Construction
- Future Facilities
- 6" of Pipe
- Cleanout to Grade
- Concrete Walkway
- Gravel Walkway

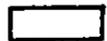


FLOW DIAGRAM
No Scale

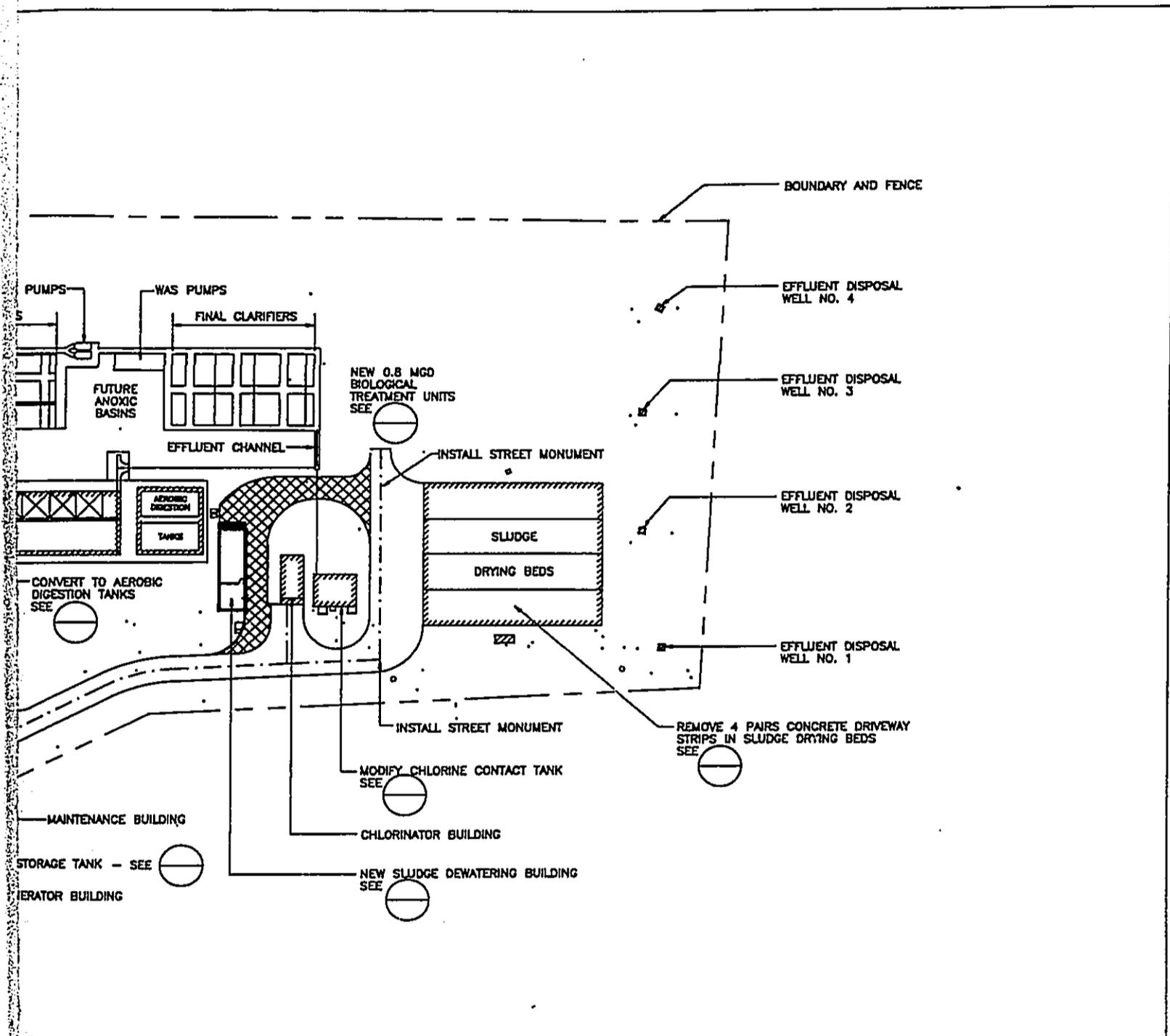


**ELEELE WASTEWATER TREATMENT PLANT EX
PHASE I - GENERAL PLAN**

LEGEND:

-  EXISTING A.C. PAVEMENT
-  EXISTING BUILDINGS/TANKS
-  NEW BUILDINGS/TANKS
-  NEW A.C. PAVEMENT





**WASTEWATER TREATMENT PLANT EXPANSION
GENERAL PLAN**

30 40 60 120
GRAPHIC SCALE IN FEET

Figure-16

6) Addition of a sludge dewatering building and equipment.

7) Miscellaneous electrical improvements

2.1.3. Effluent Disposal

Ultimately, the preferred method for effluent disposal is wastewater reclamation for agricultural irrigation. However, irrigation water is not in critically short supply in this area, and therefore, the relative value of sewage effluent at this time is considered to be low. Ground injection has been a satisfactory means of effluent disposal since the start-up of the existing facilities about 1977. The existing plant has one 4" diameter by 185' deep disposal well and three 12" diameter by 155' to 106' deep disposal wells. Since start-up of the plant in 1977, only the 4" diameter well has been used, until May 1992 when the well backed up and effluent disposal was switched to one of the 12" diameter wells.

Kauai Electric, a Division of Citizens Utilities Company presently pumps about 16 mgd of ground water for their cooling needs from wells (about 240' deep) located about 400 feet down gradient from the treatment plant effluent disposal wells. Preliminary investigations indicate that just about all of the treated effluent might be pumped by Kauai Electric as part of the ground water. The spent coolant waters are then discharged into the ocean at Hanapepe Bay under an NPDES/ZOM permit issued by the State Department of Health. The NPDES permit requires that the concentration of certain compounds not exceed specified limits. One of these regulated compounds is nitrate, which is a known constituent of treated sewage effluent. Kauai Electric has expressed their concern that increased sewage flows will increase the amount of nitrates in their zone of mixing and jeopardize their NPDES permit. Preliminary investigations indicate that increased treated sewage effluent flows may result in Kauai Electric discharges exceeding the NPDES limits for nitrates. However, the County of Kauai has determined that the nitrate problem is a Kauai Electric problem, and that Kauai Electric is responsible for taking care of that problem. In considering the broader picture of how best to resolve the nitrate problem and to determine if modifications to the treatment process could offer a viable solution, preliminary investigations were undertaken to develop some reasonable alternatives. The alternatives considered included the following:

- a. Effluent reclamation and re-use for agricultural irrigation.
- b. Restructuring of the Kauai Electric NPDES permit requirements.
- c. Modifying the treatment process to include nitrification and denitrification.
- d. Locate new off-site effluent disposal wells.
- e. Ocean outfall disposal.
- f. Relocation of the Kauai Electric wells.
- g. Casing off the upper portion of the Kauai Electric wells to minimize withdrawal of the treatment plant effluent.

A brief discussion of the alternatives follow.

Because of the large agricultural acreage nearby, McBryde Sugar Company was approached to consider accepting treated sewage effluent for agricultural irrigation. McBryde Sugar Company is currently converting a large number of their fields from sugar cane to coffee. The treated effluent could be used, but concern was expressed that irrigating with treated sewage effluent might detract from the company's marketing of "high quality" coffee beans to Hills Brothers. Accordingly, reclamation and re-use of the effluent for coffee irrigation was deemed, by McBryde Sugar Co., to be not viable.

The State Department of Health was approached about restructuring the NPDES permit to allow discharge of higher concentrations of nitrates. Because of the trend toward stricter EPA enforcement, more stringent EPA requirements, and the extensive research and document preparation time required to support such a proposal, this approach was determined to be too risky, and not capable of meeting the time constraints for having the plant expansion completed and in operation by 1993.

The least expensive alternatives appear to be either constructing nitrification/denitrification facilities at the Elele WWTP or to relocate the existing effluent disposal wells away from the Kauai Electric Company's pumping zone of

influence.

The longevity of injection wells is not predictable. Therefore, continued ground injection is considered only because it is relatively inexpensive, and is an expedient interim means of effluent disposal until more practical and beneficial uses can be developed for the treated sewage effluent.

The treatment plant site is located in an area where ocean outfall disposal may also be considered. The anticipated average discharge is relatively small, and the outfall could be designed to minimize adverse effects on the receiving ocean water quality and marine biology. However, an ocean outfall disposal is expensive to construct, and because of its high cost and extensive permitting requirements, ocean outfall disposal was considered to be less preferable than the other alternatives.

Relocation of the Kauai Electric wells was also considered, but was determined to be costly, require extensive planning and hydrogeological studies because of the large pumping rate required, not capable of meeting the County's time constraints, and therefore not feasible.

Casing off the top portion of the existing Kauai Electric wells was considered, but deemed to require extensive hydrogeological studies and potentially high costs, because the existing Kauai Electric wells are about 240 feet deep as compared to the Elele WWTP effluent wells which are about 155 feet deep. Anticipated work efforts to modify each of the four wells could include removing and replacing the pumping units, removing existing casings, deepening the wells so that the new casing would be effective in restricting treatment plant effluent flows and allow sufficient water to be pumped from the well, and installing the new casing. For cost comparison purposes, an estimate of 500 feet for each well was assumed as the requirement for additional drilling depth and casing depth to preclude withdrawing treatment plant effluent.

A comparison of estimated costs for the various effluent disposal alternatives is summarized as follows:

<u>ALTERNATIVE</u>	<u>ESTIMATED COST</u>	<u>REMARKS</u>
1. Effluent re-use for agricultural irrigation		Not viable
2. Restructuring Kauai Electric NPDES requirement		Not viable
3. Modifying treatment process to include nitrification /denitrification	\$1,700,000	
4. Locate new off-site effluent disposal wells	\$1,420,000	
5. Ocean outfall disposal (rough estimate)	\$3,000-10,000/FT (3-19 million)	Also require extensive preliminary engineering studies
6. Relocation of Kauai Electric wells, 4-20" dia. x about 250' deep plus pump relocation (rough estimate)	(3-5 million)	Also require extensive preliminary engineering studies
7. Remove/replace pumps. Drill existing Kauai Electric wells deeper. (say 500' deeper) Case the upper 500' of the Kauai Electric Wells	\$2,000,000 (4 x \$500,000)	Require extensive preliminary engineering studies

The County of Kauai has informed Kauai Electric of their determination that Kauai Electric is responsible for resolving the potential nitrate problem associated with their collecting and discharging of their coolant waters. Kauai Electric is investigating the problem and may find a more viable alternative than the ones identified above.

Engineering investigations to expand the Elele WWTP have been conducted, and have determined that a "state of the art" anoxic-aeration biological treatment system could be constructed within anticipated budgetary limits to significantly improve the treatment process stability and sludge settling characteristics, minimize sludge bulking, and produce high quality effluent. A secondary benefit of the anoxic-aeration process is the reduction of nitrogen levels in the effluent. It is anticipated that nitrate levels in the treated effluent could be reduced from the existing 17 to 20 mg/l nitrate levels to about 8 mg/l for the proposed treatment plant expansion design average daily flow of 0.8 mgd. The County of Kauai has agreed to incorporate the anoxic-aerobic process into the Elele WWTP expansion plans primarily for the operational benefits and secondarily for the reduction of nitrate levels to be discharged via the injection wells up to the capacity of the expanded plant.

2.1.4. Estimated Construction Costs for the Proposed Action

Preliminary estimated construction costs were based on Honolulu prices times a Kauai area factor of 1.35. Estimated are summarized as follows:

<u>DESCRIPTION</u>	<u>ESTIMATED COST</u>
1. Sitework	\$ 157,200
2. Septage Receiving Facility	\$ 495,200
3. New Anoxic-Aeration Tanks	\$ 2,058,100
4. Final Clarifiers	\$ 1,914,000
5. Mechanical Dewatering Facilities	\$ 576,200

6. Conversion of the existing Secondary System to Aerobic Digester	\$ 313,100
7. Chlorine Contact Tank Modifications	\$ 43,200
8. Miscellaneous including replacement of generator diesel fuel tank, and additional excavation for future secondary tanks	\$ 926,100
9. Electric Site Work including SCADA system	\$ 968,200
10. Off-site Electrical work at Hanapepe and Pt. Allen sewage lift stations	\$ 63,000

TOTAL ESTIMATED
CONSTRUCTION COST: \$ 7,514,300

2.1.5. Permits and Approvals

Implementation of the proposed plan will require permits and approvals from the following agencies:

Federal Agencies: None

State Agencies: State Department of Health -- Underground Injection Control Permit (Title 11 Chapter 23)

State Department of Health -- National Pollutant Discharge Elimination System

Commission on Persons with Disabilities

2.1.6. Alternatives to the Proposed Action

There is no reasonable alternative to the proposed action. The no action alternative is not reasonable because current public policy and laws prohibit the use of individual sewage systems, including cesspools, in the Hanapepe-Eleele residential zoned areas. If existing residential areas in the Hanapepe-Eleele sewerage service area were fully developed, the anticipated sewage flows would exceed the capacity of the existing Eleele WWTP. Additional residential subdivisions, commercial and industrial developments have been planned and designed by A&B Properties, Inc. and the County has committed to provide sewerage service.

If no action was taken, the already planned and engineered A&B developments could not proceed. A&B would suffer damages and would have been denied their right to develop their zoned lands to their highest and best use. Development of the presently zoned lands is permitted by County ordinances and is consistent with State and County land use and zoning policies. Denial of that right would be unreasonable.

The County of Kauai is responsible for providing the public with municipal sewage service and is fulfilling that responsibility by planning and implementing this project.

2.1.7. List of Agencies and Organizations Consulted

The following agencies and organizations were consulted during preparation of this environmental assessment

State Department of Health Safe Drinking Water Branch
State Department of Health Wastewater Branch
County of Kauai Planning Department
County of Kauai Department of Public Works
A & B Properties Inc.
Citizens Utilities Company Kauai Electric Division

CHAPTER THREE

ENVIRONMENTAL IMPACTS OF THE PROPOSED ACTION

3.1. Existing Environmental Conditions

The existing environmental conditions were described in Chapter One. It includes the physical and social environmental conditions of the project area, and other general background information.

3.2. Environmental and Economic Impacts

3.2.1. Short Term Impacts

Construction of the Eleele WWTP expansion will result in short term environmental impacts involving air quality, traffic, construction noise, access, aesthetics and erosion. However, the impacts would be temporary and are not expected to be significant because the construction work would be confined within the existing treatment plant site. These impacts can also be mitigated through the strict adherence to governmental regulations and the implementation of appropriate control measures when necessary.

Air quality may temporarily deteriorate due to the release of fugitive dust from excavation, backfilling and grading operations, and exhaust fumes from construction machinery and vehicles. The impact is expected to be minimal because of the small amount of dust that would be released into the atmosphere, and the small land area involved. The Contractors will also be required to implement dust control measures including spraying exposed areas with water.

Traffic along Kaumualii Highway and Waialo Road will increase slightly because of the construction activity. The increase will be temporary and is not expected to be significant because the construction work is anticipated to involve probably less than 30 people at any one time. Except for the occasional traffic congestion caused by

construction vehicles, access to the Hanapepe, Port Allen, and Eleele area will not be affected because there will not be any off-site roadway lane closures required by the construction. Flagmen or policemen will be stationed to direct traffic on the Kaumualii Highway and Waialo Road if necessary.

Construction work, machinery operation and truck traffic will generate temporary noise, particularly within the immediate surrounding area. Noise impacts are expected to be minimal because the adjacent areas are used for industrial purposes and the existing Kauai Electric facilities already generate a lot of background noise.

The treatment plant is located away from the Kaumualii Highway and Waialo Road. Construction at the treatment plant will not be readily visible from the highway or Waialo Road. Once the construction project is completed, the treatment facilities will be larger, but most of the facilities will be below ground. The aesthetic impact will be negligible.

During the period of construction, the project site land will be subject to excavating, grading and filling. The work will have an impact on local flora and fauna species, expose the land to the natural elements and result in an increasing erosion. However the impacts are in a short-term. Erosion control measures will be implemented as required. City grading, erosion and sediment control ordinances will be complied to minimize the potential adverse effects to coastal waters. Disturbed lands will be planted or otherwise protected from erosion as soon as possible after construction.

3.2.2. Long Term Impacts

There will be no long term impacts on historical and archaeological sites and wetlands because these do not exist within or near the treatment plant site.

The treatment plant site is not within a 100-year flood area, or a special management area of the Coastal Zone Management Program. However, the site is very close to those areas as well as to agricultural lands, streams and the ocean. Expansion of the treatment facilities will not adversely impact the adjacent agricultural lands, stream and the ocean. The treatment plant site is not located over a groundwater resource.

Expansion of the wastewater treatment plant will not have any long term impacts on

any recreational open space, nor any long term negative impacts on noise or aesthetics.

The very nature and purpose of the treatment facilities will occasionally result in the emission of some odors. However, those situations are expected to be infrequent, because the system will be designed to minimize odor emissions, and the operators will be trained to operate the plant effectively and to minimize the emission of odors.

Public Health and safety will be enhanced because individual cesspools and the potentials for ground water contamination associated with cesspools will be eliminated. The sewage and wastewater generated by the public will be treated in an effective environmentally safe manner. The treatment will result in high quality effluent which will not pollute the environment. The public will not normally be permitted to enter the treatment plant so there should be little or no public health or safety problems associated with the facility.

Treated effluent will continue to be disposed of via deep effluent disposal wells. Standard accepted hydrogeological methods of estimating the flow rate and dispersion of the effluent in the ground indicate that movement of the effluent through the soil structure could take several years, and that the effluent will be dispersed and diluted to such an extent that it would not be readily recognizable when it enters the ocean. The long term impact on the ocean is anticipated to be negligible.

Kauai Electric Company's nitrate concentration problem is being investigated and will be resolved by Kauai Electric Company.

The estimated construction cost for the proposed increment of expansion is not to exceed \$6,000,000.00. There will also be increased operating and maintenance costs associated with the increased plant capacity. However, costs for maintaining malfunctioning cesspools will be eliminated. Financing of the construction, operations, and maintenance of public works facilities are derived from taxes and sewer charges, so that there will be direct long term economic impacts.

3.2.3. Secondary Impacts

There will be secondary growth impacts associated with expansion of the Eleele

WWTP. Increasing the plant capacity will allow additional development to proceed according to existing land use and zoning regulations. This increment of plant expansion is intended to meet the public health demands of impending developments within the existing framework of land use and zoning regulations, and not serve to stimulate growth itself. Current land use and zoning regulations reflect the community's desire to retain the rural characteristics and environment. Development of the currently zoned lands would be consistent with the community's development plans. The ultimate size of the treatment plant is based on projected full development of the current land use and zoning regulations.

Another secondary impact is the increased utility consumption, such as for electricity and water. The treatment expansion will be designed to be as energy efficient as practical, and with considerations to conserving power and water resources. The existing electrical and water supply systems are adequate to support the plant expansion.

Small increases in truck traffic to the Eleele WWTP site are expected from transporting of septage and WAS. However, the traffic impacts on the Kaunualii Highway and Waialo Road should be minimal since septage and WAS are expected to be transported to the Eleele WWTP during non-peak traffic hours.

3.3. Possible Conflicts between the Proposed Action and the Objectives of Federal, Regional, and Local Land Use, Plans, Policies, and Controls for the Area Concerned

The proposed project is at the site of the existing Eleele WWTP. The proposed project is not within the SMA, see Figure-8, so a permit for the proposed project is not required. Presently, the Eleele WWTP discharges treated effluent into 4 disposal wells under a State DOH UIC Permit No. UK-1212.

The proposed improvements is consistent with government policies concerning wastewater treatment and disposal, and will provide for the adequate wastewater treatment of larger flows generated from the community and production of good quality effluent which would not degrade existing receiving water quality.

Based on the County General Plan, which is consistent with the State's plan, the

existing Eleele WWTP does not conflict with the designated land use development. See Figure-9 to Figure-11.

3.4. Relationship between Local Short-term Uses of Man's Environment and the Maintenance and Enhancement of Long-term Productivity

The practice of implementing individual sewage disposal systems such as cesspools is severely restricted by the Department of Health for public health reasons. Municipal sewerage systems are gradually being extended to existing areas served by cesspools, where practical, and all existing houses must connect to the municipal sewers when it becomes available. All new residential subdivisions, commercial and industrial developments must connect to the municipal sewerage system. The existing short-term uses of man's environment to dispose of domestic sewage and miscellaneous wastewaters via cesspools or other individual wastewater systems will be minimized.

Natural resources will be preserved and conserved to the extent possible.

The proposed Eleele WWTP expansion will be capable of accommodating all existing residents and proposed developments that are planned according to current County zoning regulations, and that are located within the defined Eleele WWTP service area as shown in Figure-1.

A "regional" sewerage system has the advantages of economy of scale, high quality treatment capabilities, reliability of performance, trained personnel and management effectiveness. Large capital cost expenditures, and continual costs for operations and maintenance are necessary, but will result in enhancing the environment and increasing long-term productivity, because of the significantly decreased potentials for contamination, nuisance, and degradation of the environment. However, long term use of a portion of the land is required to construct the treatment and disposal facilities.

3.5. Mitigation Measures to Minimize Impacts

Various construction measures and design features are expected to mitigate the impacts associated with the proposed project. These are described and summarized in Table-3.

The short term impacts associated with the construction process will be mitigated with effective scheduling of various work tasks to reduce the potentials for traffic congestion, dust and noise. Dust will be controlled by sprinkling with water.

Long term impacts associated with the implementation of the project will be mitigated by appropriate and low profile design, and competent efficient and effective operations and maintenance.

3.6. Irreversible and Irretrievable Commitments of Resources

There are several irreversible commitments of resources including land and financial resources to construct capital improvements, operate and maintain the facilities. The land commitment for Eleele WWTP is approximately 4.6 acres. Financial commitments for capital improvements vary with the scope of work. Financial commitments for operations and maintenance are relatively more predictable, and can be expected to generally increase according to the rate of inflation.

Because of the long term commitment to treating the sewage at a regional facility and disposing of the treated products in an environmentally safe manner, the commitment of land, labor, materials, energy, equipment and financial resources are practically irreversible and irretrievable.

3.7. Assessment of Environmental Impacts

Based on the analyses above, the proposed project is not anticipated to have any significant adverse impacts on the regulations and the environment of coastal water, groundwater, the local ecology, hydrology, and atmosphere. A Negative Declaration determination is anticipated.

In summary, there will be short term and temporary impacts involving noise, dust, and other aesthetics due primarily to construction operations and work. These impacts will be mitigated by adherence to governmental regulations, and implementation of

appropriate control measures when necessary.

There will be no negative impacts on historical, archaeological sites and wetlands because these do not exist within or near the project site.

The treated effluent will continue to be disposed of via effluent disposal wells. Negative environmental impacts to the ground water and nearby ocean waters are not anticipated. Although the treatment plant flows are expected to increase up to the 0.8 mgd design flow, the effluent quality is expected to be better than existing discharges, because the proposed anoxic-aerobic treatment process can maintain the existing low levels of BOD₅ and suspended as well as reduce the nitrate levels by about half of the existing.

Secondary growth impacts according to existing land use and zoning regulations are anticipated. Increasing the treatment plant capacity will provide cost effective and environmentally safe means for treating and disposing of the increased wastewater loads.

TABLE-3
MITIGATION MEASURES AND CONSIDERATIONS

Probable Effect	Duration	Mitigation Measures and Considerations
<u>Construction</u>		
Traffic congestion	Temporary	Construction schedules, public information and flagmen
Noise	Temporary	Construction schedules and public information
Dust	Temporary	Sprinkling, minimize areas to be excavated or graded
Visible Structures	Long-term	Appropriate Design, Low profile, and landscaping
<u>Treatment Plant Operations</u>		
Noise	Long-term	Housed in sound insulated facilities
Odor	Occasional	Good operations and operators Odor control equipment
Effluent Disposal	Long-term	Good operations and operators Chlorinator
Solids Handling	Long-term	Mechanical dewatering with sludge beds as standby Good operations

CHAPTER IV

ENVIRONMENTAL ASSESSMENT COMMENTS AND RESPONSES

Draft Environmental Assessments were submitted to the Office of Environmental Quality Control (OEQC) on October 2, 1992. An official 30-day comment period commenced on October 23, 1992 and extended to November 22, 1992. By the end of the 30-day comment period, no comments had been received by the OEQC.

Comments were made by the OEQC in their letters dated October 8, 1992 and January 4, 1993. Copies of the comments follow on page IV-2.

Copies of the draft Environmental Assessment were sent to the State of Hawaii Department of Health Safe Drinking Water Branch and the Wastewater Branch on October 18, 1992. See page IV-3. Since no comments were received by OEQC, follow up telephone calls to the agencies were made after the comment period expired. As of February 19, 1993, only the Safe Drinking Water Branch has commented. A copy of the Safe Drinking Water Branch's comment letter follow on page IV-4. A response to the Safe Drinking Water Branch's comment letter is included on page IV-5.

A copy of a letter transmitting the draft final Environmental Assessment to Citizens Utilities Company Kauai Electric Branch is included on page IV-5.



STATE OF HAWAII
OFFICE OF ENVIRONMENTAL QUALITY CONTROL
400 SOUTH KING STREET
FOURTH FLOOR
HONOLULU, HAWAII 96819
TELEPHONE 586-4185
October 8, 1992

Mr. Kiyoji Masaki
October 8, 1992
Page 2

- 4) Findings and reasons supporting the determination that the proposed action will or will not result in any significant impact must be included in the final environmental assessment.

If you have any questions, please call Jeyan Thirugnana at 586-4185.

Sincerely,

Brian J. J. Choy
Brian J. J. Choy
Director

c: ✓ Stanley Young, Fukunaga and Associates, Inc.

Mr. Kiyoji Masaki
County of Kauai
Department of Public Works
3021 Umi Street
Lihue, Hawaii 96766

Dear Mr. Masaki:

Subject: Draft Environmental Assessment for the Elele Wastewater Treatment Plant Expansion - Phase I

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

- 1) Please submit a letter of determination stating that a negative declaration is anticipated for the project. This letter must be submitted by the proposing agency and not the consultant.
- 2) According to the Environmental Impact Statement Rules, the proposing agency must consult with other agencies having expertise or jurisdiction as well as citizen groups and individuals. Therefore, please consult the following parties:
 - a) State Department of Health, Safe Drinking Water Branch, regarding the effluent disposal wells and the related Underground Injection Control permit.
 - b) State Department of Health, Clean Water Branch and Kauai Electric regarding the impact of the project's effluent disposal on Kauai Electric's coolant water discharge and National Pollution Discharge Elimination System permit.
 - c) State Department of Health, Wastewater Branch.
- 3) A list of agencies consulted must also be disclosed in the environmental assessment.



STATE OF HAWAII
OFFICE OF ENVIRONMENTAL QUALITY CONTROL
400 SOUTH KING STREET
FOURTH FLOOR
HONOLULU, HAWAII 96819
TELEPHONE 586-4185
January 4, 1993

Mr. Kiyoji Masaki
County of Kauai
Department of Public Works
3021 Umi Street
Lihue, Hawaii 96766

Dear Mr. Masaki:

SUBJECT: ELELE WASTEWATER TREATMENT PLANT EXPANSION - PHASE I, KOLOA, KAUAI

The Draft Environmental Assessment (EA) for the above project was submitted to our office on October 2, 1992 for publication in the October 23, 1992 OEQC Bulletin. Pursuant to Act 241, SLS 1992, your agency (or the applicant) is required to respond in writing to any comments received during the review period and prepare a final EA. This document must then be submitted to our office with a determination letter (either a Negative Declaration determination or an Environmental Impact Statement Preparation Notice determination). Notice of this determination will then be published in the OEQC Bulletin.

It has been more than two months since the Draft EA notice for this project was published in the Bulletin. Thus, please submit the Final EA or notify our office of the status of this project as soon as possible. If you have any questions about the Draft EA/Final EA process, please contact our staff at 586-4185. Thank you for your cooperation.

Sincerely,

Brian J. J. Choy
Brian J. J. Choy
Director

October 19, 1992

Safe Drinking Water Branch
Environmental Management Division
State Department of Health
Five Waterfront Plaza, Suite 250 C
500 Ala Moana Boulevard
Honolulu, Hawaii 96813

Attention: Mr. Chauncey Hew

Gentlemen:

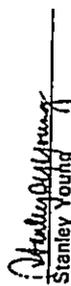
Subject: Draft Environmental Assessment
Eleele Wastewater Treatment Plant Expansion-Phase I

We are sending for your review and comments, two (2) copies of the subject environmental assessment.

Copies of the environmental assessment have been submitted to the Office of Environmental Quality Control for processing.

Please call us at 944-1821 if you have any questions concerning this project.

Very truly yours,


Stanley Young
Fukunaga and Associates, Inc.

cc. County of Kauai
Department of Public Works
Mr. Kiyoji Masaki

FUKUNAGA & ASSOCIATES, INC.



October 19, 1992

Wastewater Branch
Environmental Management Division
State Department of Health
Five Waterfront Plaza, Suite 250 D
500 Ala Moana Boulevard
Honolulu, Hawaii 96813

Attention: Mr. Johnny Ong

Gentlemen:

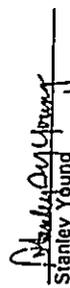
Subject: Draft Environmental Assessment
Eleele Wastewater Treatment Plant Expansion-Phase I

We are sending for your review and comments, two (2) copies of the subject environmental assessment.

Copies of the environmental assessment have been submitted to the Office of Environmental Quality Control for processing.

Please call us at 944-1821 if you have any questions concerning this project.

Very truly yours,


Stanley Young
Fukunaga and Associates, Inc.

cc. County of Kauai
Department of Public Works
Mr. Kiyoji Masaki

FUKUNAGA & ASSOCIATES, INC.



Mr. Stanley Young
February 9, 1993
Page 2

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

In reply, please refer to:

92-387/epo



STATE OF HAWAII
DEPARTMENT OF HEALTH
P. O. BOX 229
HONOLULU, HAWAII 96814

February 9, 1993

Mr. Stanley Young
Fukunaga and Associates, Inc.
1388 Kapiolani Boulevard, 2nd Floor
Honolulu, Hawaii 96814

Dear Mr. Young:

Subject: Environmental Assessment (EA)
Elele Wastewater Treatment Plant Expansion - Phase I
Elele, Kauai
TMK: 2-1-01

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

Wastewater

We have no objections to the proposed project, which involves the design and construction of modifications to the Elele Wastewater Treatment Plant in order to expand its treatment capacity from 0.4 million gallons per day (mgd) to 0.8 mgd.

We are also reviewing the assessment as part of the State Revolving Fund Program. If you should have any questions on this matter, please contact Ms. Lori Kajiwara of the Wastewater Branch at 586-4290.

Underground Injection Control (UIC)

1. The project site is currently identified as being located below the UIC Line.
2. We strongly support the implementation of the proposed anoxic-eration process because of the stated benefit of nitrogen reduction in the effluent. Without such a process, the UIC program's approval to increase flows to the injection wells would be difficult to justify in light of the algal problem in West Maui that might be fostered by sewage effluent injection wells in proximity to the coastline.
3. We would like to see stated in the EA that negative environmental impacts from the operation of injection wells is not anticipated, rather than conveying a message of "will not occur." The difference between these two attitudes is that under "anticipated" conditions, participants

of this project; owner, operator, and regulatory agencies, should always remain alert to changing environmental conditions that could warrant a reevaluation of and possible modification the project. Under a "will not occur" attitude, attention to the project and striving to improve it is lost in complacency.

If you should have any questions on this matter, please contact Mr. Chauncey Hew of the Safe Drinking Water Branch at 586-4258.

Very truly yours,

John C. Lewin
JOHN C. LEWIN, M.D.
Director of Health

c: Wastewater Branch
Safe Drinking Water Branch

1388 KAPOLANI BOULEVARD, 2ND FLOOR, HONOLULU, HAWAII 96814 PH. (808) 944-1821 FAX (808) 946-9339

February 19, 1993

Safe Drinking Water Branch
Environmental Management Division
State Department of Health
Five Waterfront Plaza, Suite 250 C
500 Ala Moana Boulevard
Honolulu, Hawaii 96813

Attention: Mr. Chauncey Haw

Gentlemen:

Subject: Final Environmental Assessment
Elele Wastewater Treatment Plant Expansion - Phase I

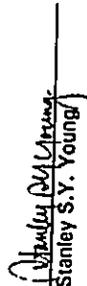
Thank you for your review and comments on the Environmental Assessment for the subject project.

With reference to your comment regarding using "negative environmental impacts from the operation of injection wells is not anticipated" in lieu of conveying a message of "will not occur," we have expanded paragraph 3.7 to summarize information which would support a negative declaration, and have included the following statement regarding effluent disposal wells: "Negative environmental impacts to the ground water and nearby ocean waters are not anticipated."

We also send you a copy of the final Environmental Assessment as will be filed with the Office of Environmental Quality Control.

Please call us if you have any questions concerning this transmittal.

Very truly yours,
Fukunaga and Associates, Inc.


Stanley S. Young

Enc.

FUKUNAGA & ASSOCIATES, INC.



1388 KAPOLANI BOULEVARD, 2ND FLOOR, HONOLULU, HAWAII 96814 PH. (808) 944-1821 FAX (808) 946-9339

February 19, 1993

Mr. Daniel J. McCarthy
Manager, Production
Citizens Utilities Company
Kauai Electric Division
P.O. Box 278
Eleele, Kauai, Hawaii 96705

Dear Mr. McCarthy,

Subject: Elele WWTP Expansion
Environmental Assessment

As discussed, we are sending for your information one (1) copy of the final Environmental Assessment for Elele Wastewater Treatment Plant Expansion - Phase I.

Please call us if you have any questions regarding this transmittal.

Very truly yours,
Fukunaga and Associates, Inc.


Stanley S. Young

Enc.

FUKUNAGA & ASSOCIATES, INC.





STATE OF HAWAII
DEPARTMENT OF HEALTH
P. O. BOX 509
HONOLULU, HAWAII 96808

February 17, 1993

Mr. Edmond Renaud
Deputy County Engineer
Department of Public Works
County of Kauai
3021 Uni Street
Lihue, HI 96766

Attention: Mr. Harry Funamura

Dear Mr. Renaud:

Subject: Environmental Assessment for
Eleele WWTP Expansion - Phase 1

The Department of Health (DOH) has reviewed the Environmental Assessment for the Eleele Wastewater Treatment Plant expansion project, Phase 1. The County is requesting a State Revolving Fund loan for this project. The DOH review noted a number of deficiencies:

1. An identification of the agencies consulted in making the environmental impact assessment is necessary;
2. A description and analysis of the impact of the project on any individual sensitive environmental issues that have been identified by the project management or through public participation, if any; and
3. A description and analysis of the impacts of the project on other anticipated public works projects, if any.

Please provide the additional information to our Wastewater Branch. If you require further clarification or assistance, please contact G. Gustafson at telephone 586-4301.

Sincerely,

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

DC:eo

1388 KAPOLANI BOULEVARD/2ND FLOOR/HONOLULU, HAWAII 96814/TEL: (808) 944-1821/FAX: (808) 946-8330

March 9, 1993

Wastewater Branch
Environmental Management Division
State Department of Health
Five Waterfront Plaza, Suite 250 D
500 Ala Moana Boulevard
Honolulu, Hawaii 96813

Attention: Mr. Harold Yee,

Subject: Eleele Wastewater Treatment Plant Expansion-Phase I
Final Environmental Assessment

Thank you for your review and comments dated February 17, 1993 regarding the Environmental Assessment for the subject project.

The final Environmental Assessment has been revised and addresses the comments noted in your letter. One copy of the final Environmental Assessment is enclosed for your reference and files.

Identification of the agencies consulted in preparing the environmental assessment is included in Chapter 2, paragraph 2.1.7.

The preliminary environmental assessment was submitted to the Office of Environmental Quality Control, and was open to public review and comments during the period from October 23, 1992 through November 22, 1992. No comments were received from the public.

One sensitive environmental issue was identified during the initial project investigations, and this involved a possible problem with the Citizens Utilities Company Kauai Electric Division regarding their pumpage and disposal of coolant waters into the nearby coastal waters. Citizens Utilities Company was concerned because the ground water source for their coolant water contained relatively high nitrate levels. They felt that much of the nitrates resulted from the disposal of Eleele WWTP effluent via effluent disposal wells, and that the increased plant capacity would increase the nitrate levels and jeopardize their coolant water discharge NPDES permit. The County of Kauai reviewed the situation, and determined that the coolant water discharge was a Citizens Utilities Company problem to resolve. As it turns out, the problem is moot, because the Eleele

Wastewater Branch
March 8, 1993
Page 2

WWTP expansion design incorporates an anoxic/aeration biological secondary treatment process which will enhance treatment process stability, and as a secondary benefit, reduce nitrate levels in the effluent to about one half the existing concentration. At the proposed expanded 0.8 mgd treatment plant capacity, there should not be an increase in the amount of nitrates discharged.

There are no other major anticipated public works projects in the area which would be impacted by the Eleele WWTP expansion. Additional homes are expected to be constructed within the State newly developed Cliffside subdivision and A&B Properties' Eleele Nani II subdivision. Expansion of the Eleele WWTP is necessary to accommodate the anticipated additional wastewater flows generated from the new subdivisions.

We hope these comments adequately address your concerns. Please call us if you have any questions concerning this transmittal.

Very truly yours,

FUKUNAGA AND ASSOCIATES, INC.

Stanley S.Y. Young
Stanley S.Y. Young

cc. Mr. Harry Funamura
County of Kauai
Department of Public Works

FUKUNAGA & ASSOCIATES, INC.

APPENDIX A
SELECTED POPULATION DATA

APPENDIX A

Table 1. Selected Population and Housing Characteristics: 1990
Hanapepe CDP, Hawaii

The population counts set forth herein are subject to possible correction for undercount or overcount. The United States Department of Commerce is considering whether to correct these counts and will publish corrected counts, if any, not later than July 15, 1991. The user should note that there are limitations to many of these data. Please refer to the technical documentation provided with Summary Tape File 1A for a further explanation on the limitations of the data.

Total population	1,395	Total housing units	503
SEX		OCCUPANCY AND TENURE	
Male	687	Occupied housing units	487
Female	708	Owner occupied	247
		Percent owner occupied	50.7
		Renter occupied	240
AGE		Vacant housing units	16
Under 5 years	112	For seasonal, recreational, or occasional use	2
5 to 17 years	260	Homeowner vacancy rate (percent)	-
18 to 20 years	39	Rental vacancy rate (percent)	1.2
21 to 24 years	53		
25 to 44 years	436	Persons per owner-occupied unit	2.86
45 to 54 years	122	Persons per renter-occupied unit	2.87
55 to 59 years	55	Units with over 1 person per room	64
60 to 64 years	58		
65 to 74 years	159	UNITS IN STRUCTURE	
75 to 84 years	76	1-unit, detached	449
85 years and over	25	1-unit, attached	19
Median age	34.9	2 to 4 units	19
Under 18 years	372	5 to 9 units	7
Percent of total population	26.7	10 or more units	1
65 years and over	260	Mobile home, trailer, other	8
Percent of total population	18.6		
HOUSEHOLDS BY TYPE		VALUE	
Total households	487	Specified owner-occupied units	205
Family households (families)	364	Less than \$50,000	3
Married-couple families	297	\$50,000 to \$99,999	29
Percent of total households	61.0	\$100,000 to \$149,999	72
Other family, male householder	27	\$150,000 to \$199,999	57
Other family, female householder	40	\$200,000 to \$299,999	35
Nonfamily households	123	\$300,000 or more	9
Percent of total households	25.3	Median (dollars)	148,800
Householder living alone	96		
Householder 65 years and over	44	CONTRACT RENT	
Persons living in households	1,395	Specified renter-occupied units paying cash rent	203
Persons per household	2.86	Less than \$250	71
		\$250 to \$499	70
GROUP QUARTERS		\$500 to \$749	47
Persons living in group quarters	-	\$750 to \$999	14
Institutionalized persons	-	\$1,000 or more	1
Other persons in group quarters	-	Median (dollars)	353
RACE AND HISPANIC ORIGIN		RACE AND HISPANIC ORIGIN OF HOUSEHOLDER	
White	231	Occupied housing units	487
Black	2	White	98
Percent of total population	0.1	Black	-
American Indian, Eskimo, or Aleut	6	Percent of occupied units	-
Percent of total population	0.4	American Indian, Eskimo, or Aleut	3
Asian or Pacific Islander	1,139	Percent of occupied units	0.6
Percent of total population	81.6	Asian or Pacific Islander	382
Other race	17	Percent of occupied units	78.4
Hispanic origin (of any race)	97	Other race	4
Percent of total population	7.0	Hispanic origin (of any race)	17
		Percent of occupied units	3.5

APPENDIX A

Table 1. Selected Population and Housing Characteristics: 1990
Eleele CDP, Hawaii

The population counts set forth herein are subject to possible correction for undercount or overcount. The United States Department of Commerce is considering whether to correct these counts and will publish corrected counts, if any, not later than July 15, 1991. The user should note that there are limitations to many of these data. Please refer to the technical documentation provided with Summary Tape File 1A for a further explanation on the limitations of the data.

Total population	1,489	Total housing units	465
SEX		OCCUPANCY AND TENURE	
Male	728	Occupied housing units	453
Female	761	Owner occupied	346
		Percent owner occupied	76.4
		Renter occupied	107
AGE		Vacant housing units	12
Under 5 years	111	For seasonal, recreational, or occasional use	1
5 to 17 years	301	Homeowner vacancy rate (percent)	-
18 to 20 years	46	Rental vacancy rate (percent)	2.7
21 to 24 years	61		
25 to 44 years	406	Persons per owner-occupied unit	3.45
45 to 54 years	118	Persons per renter-occupied unit	2.65
55 to 59 years	84	Units with over 1 person per room	91
60 to 64 years	63		
65 to 74 years	167	UNITS IN STRUCTURE	
75 to 84 years	105	1-unit, detached	382
85 years and over	27	1-unit, attached	18
Median age	35.7	2 to 4 units	52
Under 18 years	412	5 to 9 units	1
Percent of total population	27.7	10 or more units	2
65 years and over	299	Mobile home, trailer, other	10
Percent of total population	20.1		
HOUSEHOLDS BY TYPE		VALUE	
Total households	453	Specified owner-occupied units	329
Family households (families)	368	Less than \$50,000	6
Married-couple families	306	\$50,000 to \$99,999	28
Percent of total households	67.5	\$100,000 to \$149,999	132
Other family, male householder	17	\$150,000 to \$199,999	108
Other family, female householder	45	\$200,000 to \$299,999	51
Nonfamily households	85	\$300,000 or more	4
Percent of total households	18.8	Median (dollars)	149,500
Householder living alone	79		
Householder 65 years and over	46	CONTRACT RENT	
Persons living in households	1,478	Specified renter-occupied units paying cash rent	100
Persons per household	3.26	Less than \$250	49
		\$250 to \$499	17
GROUP QUARTERS		\$500 to \$749	16
Persons living in group quarters	11	\$750 to \$999	14
Institutionalized persons	-	\$1,000 or more	4
Other persons in group quarters	11	Median (dollars)	257
RACE AND HISPANIC ORIGIN		RACE AND HISPANIC ORIGIN OF HOUSEHOLDER	
White	251	Occupied housing units	453
Black	1	White	89
Percent of total population	0.1	Black	-
American Indian, Eskimo, or Aleut	5	Percent of occupied units	-
Percent of total population	0.3	American Indian, Eskimo, or Aleut	2
Asian or Pacific Islander	1,208	Percent of occupied units	0.4
Percent of total population	81.1	Asian or Pacific Islander	355
Other race	24	Percent of occupied units	78.4
Hispanic origin (of any race)	135	Other race	7
Percent of total population	9.1	Hispanic origin (of any race)	40
		Percent of occupied units	8.8

APPENDIX A

POPULATION DATA

- A. Estimated Hanapepe-Eleele 1990 population served by Eleele WWTP based on:

1990 Census population counts for Hanapepe = 1,395, and for Eleele = 1,489 for a total of 2,884.

Water connections = 710 per Department of Water (Eddie Doi)

Sewer connections = approximately 425 per Department of Public Works as of May 1991

Assuming all population served by water connections, then by proportion:

$$425/710 \times 2,884 = 1,726 \text{ persons}$$

- B. Estimated 1990 average per capita flow generation based on 0.225 MGD average daily inflow at Eleele WWTP:

$$225,000/1,726 = 130 \text{ gpcd}$$

- C. Projected Full Build Out population based on Land Use. (See attached Table III-1. Full build out population is 13476 persons. Estimated full build out flow is 1.98 MGD. Estimated full build out average per capita flow generation:

$$1,980,000/13,476 = 147 \text{ gpcd}$$

APPENDIX A

ESTIMATED UNIT COUNTS VS THEORETICAL COUNTS PER ZONING CODE

SERVUCE AREAS		ACRES	ACTUAL UNIT COUNT	THEORETICAL UNIT COUNT/ZONING
A. Port Allen SPS				
1	R-10	17.7	-	177
2	R-20	2.7	52	54
10	CG	7.6	-	-
11	IL	2.8	-	-
12	IG	35.6	-	-
B. SPS No. 1				
14	R-10	3.5	-	35
17	R-6	1.4	3	8
19	CG	21.5	-	-
20	R-6	26.4	158*	158
21	R-6	20	142*	120
22	R-6	74	217	444
23	R-4	4.2	6	17
24	R-4	1.8	3	7
25	R-4 STP	25.5	-	-
26	R-2	50.5	55	101
C. SPS No. 2				
All areas served by SPS No. 1 plus following:				
13	R-4	1.8	1	7
15	R-10	5.7	16	57
16	R-1 STP	6.3	-	-
18	CG	21.5	-	-
D. Gravity sewers from Eleele Heights				
3	R-4	37.8	92	151
4	R-4	2.9	8	12
5	R-4	2.4	6	10
6	R-10	3.2	1	32
7	R-6	103.5**	472	621
8	R-1 STP	14.0	-	-
9	R-4 STP	2.7	-	-
TOTALS			1,240	2,011

* State HDFC project 300 lots.

** 328 + 144 A&B Eleele Nani II.

APPENDIX A

SCHEDULED DEVELOPMENTS VERSUS REQUIRED ELEELE WWTP CAPACITY

	ZONE	ACRES	POP.	FLOW (MGD)	WWTP CAPACITY (MGD)	
A.	Existing 1990 conditions 425/710 x 2,884 = 1,726 @ 147 gpcd *		1,726	0.25	0.4	
	Remaining exist. 1990 census population of 2,884 - 1,726 = 1,158 remains to be served. Some sewers being extended to service areas and conn. being made. Sewer extension to other less dense areas must wait.		increasing			
B.	HFDC Hanapepe Cliffside 300 units @ 4 persons/unit completed 1991	R-6	1,200	0.18	0.4	
C.	A&B Properties Eleele Nani II. About 144 units scheduled for construction/ occupancy as soon as Eleele WWTP Phase I expansion completed. About 1994.	R-6	576	0.085	0.8	
D.	A&B Port Allen Industrial Improvements. About 1992.	IL	6		0.8	
E.	A&B Properties Port Allen/ Eleele Expansion. 1998 Residential				0.8	
	100 Single Fam Units	24	400	0.04		
	180 Multi-Fam Units	18	450	0.04		
	Commercial	10	-			
	Industrial	20	-			
F.	A&B Properties About 1995-2000.	R-10	20.5	820	0.08	0.8
G.	State lands currently leased to Olokele Sugar Way in future.	R-6	150.0	3,600	0.36	>1.0

* Average sewage generation per person based on the "ultimate" projected flow of 1.98 MGD divided by "ultimate" population of 13,476.