Office of Environmental Quality Control
Office of the Governor
550 Halekauwila Street
Tani Office Building, Third Floor
Honolulu, Hawaii 96813

REVISED

ENVIRONMENTAL IMPACT STATEMENT FOR THE KAHALUU WASTEWATER TREATMENT AND DISPOSAL SYSTEM

PREPARED FOR:

DIVISION OF WASTEWATER MANAGEMENT
DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU

MARCH 1980

PREPARED BY:

R. M. TOWILL CORPORATION
HONOLULU, HAWAII

EXECUTIVE CHAMBERS

HONOLULU

GEORGE R. ARIYOSHI
GOVERNOR

April 23, 1980

Mr. Donald A. Bremner, Chairman
Environmental Quality Commission
550 Halekauwila Street, Room 301
Honolulu, Hawaii 96813

Dear Mr. Bremner:

Subject: Kahaluu Wastewater Treatment and Disposal System, Kahaluu, Oahu

Based upon the recommendation of the Office of Environmental Quality Control, I am pleased to accept the subject document as satisfactory fulfillment of the requirements of Chapter 343, Hawaii Revised Statutes. This environmental impact statement will be a useful tool in the process of deciding whether or not the action described therein should or should not be allowed to proceed. My acceptance of the statement is an affirmation of the adequacy of that statement under the applicable laws, and does not constitute an endorsement of the proposed action.

When the decision is made regarding the proposed action itself, I expect the proposing agency to weigh carefully whether the societal benefits justify the environmental impacts which will likely occur. These impacts are adequately described in the statement, and, together with the comments made by reviewers, provide a useful analysis of alternatives to the proposed action.

With warm personal regards, I remain,

Yours very truly,

George R. Ariyoshi

cc: Mr. Wallace Miyahira
Mr. Richard L. O'Connell

REVISED

ENVIRONMENTAL IMPACT STATEMENT
FOR THE
KAHALUU WASTEWATER TREATMENT
AND DISPOSAL SYSTEM
KOOLAUPOKO, OAHU, HAWAII
TAX MAP KEY: 4-6, 7, 8, 9

This Environmental Document is Submitted
Pursuant to Chapter 343, HRS

Proposing Agency:

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

Accepting Authority: Governor, State of Hawaii

Responsible Official: Wallace Miyahira — MAR 31 1980

Wallace Miyahira
Director & Chief Engineer

Date

Prepared By:

R. M. Towill Corporation
Consulting Engineers
677 Ala Moana Boulevard
Honolulu, Hawaii 96813

MARCH 1980

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SECTION I
SUMMARY

A. BACKGROUND

Urbanization of the Kahaluu and Kaneohe districts within the last two decades has caused significant adverse impacts on the water quality and ecology of Kaneohe Bay. Urbanization has caused physical changes because of concentrated discharges of sewage, accelerated sedimentation due to subdivision developments, pollutants from urban runoff, and channelization of streams within the watershed.

Major concerns of water quality management within the Kaneohe Bay area are sewage discharges, storm water runoff, and sediment transport. The regional wastewater planning of the Kahaluu area began with the 1972 (as amended) study entitled, "Water Quality Program for Oahu, With Special Emphasis on Waste Disposal." The study established a wastewater planning region for the Kahaluu-Kaneohe-Kailua region and recommended a wastewater collection, treatment and disposal system for the Kahaluu subarea of the region. Based on water quality and oceanographic investigations, the study concluded that wastewater discharges into Kaneohe Bay should be discontinued. The Kaneohe-Kailua system is essentially complete with the recent construction of the Mokapu Ocean Outfall and interconnected effluent pumping systems from the Kaneohe and Kailua Sewage Treatment Plants. The outfall and pumping systems have sufficient capacity to handle the Kailua-Kaneohe flows as well as the future flows from the Kahaluu subarea.

B. DESCRIPTION OF PROBLEM

Ahuimanu is the only district subarea within the planning area with a sewer system. The other subareas within the planning area use cesspools as the primary means of wastewater disposal. There are approximately 2000 cesspools presently being used of which approximately 20 percent are defective.

A significant quantity of surface water quality data for Kaneohe Bay and streams discharging into the Bay has been obtained. The data indicate that some of the State Water Quality Standards are exceeded while some are not. Fecal coliform and fecal streptococcus were detected in the streams of the planning area, indicating contamination from both human and animal sources.

The NPDES Permit for the Ahuimanu STP stipulates that the present effluent discharge to Ahuimanu Stream must be eliminated by February 28, 1983. In addition, the plant utilizes the "rapid block" unit for the activated sludge process. Past experience at plants using similar units indicates that this particular type unit produces poor effluent as the flow reaches 55 to 65 percent of its design capacity. The normal daily fluctuations in flow to the unit have been diagnosed as the cause of the problem.

C. EXISTING CONDITIONS

The 1977 population was estimated at 11,180 in the planning area. Most of the population is concentrated in the southern portion in the districts of Ahuimanu and Kahaluu. The northern portion is essentially rural in nature and is characterized by scattered farms and homes.

The geology of the planning area is associated with the Kailua and Koolau volcanic series. These volcanic rift zones in the upper reaches of the planning area are formed from a series of vertical dikes whch capture infiltrating rainfall and form a storage area for the groundwater supply of the island.

The lowlands of the planning area were formed from deposits of alluvial material and are generally poorly drained. There are numerous perennial streams which all discharge into Kaneohe Bay. Environmentally sensitive zones include Waihee Marsh, Kaneohe Bay, and the coastal zone of the planning area.

Eleven archaeological and historic sites have been registered in the planning area. The proposed action will not affect any

of these sites. Several endangered avian species have been identified within the planning area. The proposed action will not endanger their natural habitats.

D. FUTURE ENVIRONMENT WITHOUT THE PROJECT

Population projections were based on the State's Series II-F projections. These projections reflect a relatively low growth rate for the planning area. Based on current zoning and land use, the southern portion is expected to receive most of the growth. The northern portion is expected to remain agricultural, with a low growth rate.

Cesspools may no longer be a feasible method of disposing wastewater in the southern portion of the planning area because of the higher population densities predicted there. The concern is that the continued concentration of untreated wastewater in the southern area would further contaminate the surface and groundwater resources.

E. PROPOSED ACTION

It is proposed to construct a wastewater management system for the urbanized areas of Kahaluu, with the rural areas continuing to be serviced by on-site cesspools.

The no action or no project alternative is recommended for the rural northern section of the planning area because of insufficient data on the sources of pollution. An extensive field study is required to determine if the approximately 300 cesspools or nonpoint sources are the cause of the water quality problems. Positive action is temporarily deferred until a field investigation is undertaken for the adjacent North Oahu planning area where similar situations exist.

The proposed wastewater management system for the urban southern section consists of the following:

- Collection.
- Transmission of screened and degritted raw wastewater to Kaneohe Sewage Treatment Plant (STP).

- Treatment at Kaneohe STP.
- Effluent disposal through the Mokapu Ocean Outfall and sludge disposal to a municipal landfill.

The description of each component is summarized below.

1. Collection

   The collection system will collect the raw wastewater from the urbanized areas and convey the wastewater to the Ahuimanu STP Site. Approximately 65,500 lineal feet of gravity sewers, 14,000 lineal feet of force mains, and six sewage pumping stations will be installed. The existing Ahuimanu collection system will remain in service. The Ahuimanu STP site will be the central collection point for the wastewater.

2. Transmission to Kaneohe STP

   The collected wastewater will be transmitted outside of the Kahaluu planning area to the existing Kaneohe STP for treatment. The Ahuimanu STP will be abandoned and converted to a sewage pumping station. The proposed pumping facilities consist of the sewage pumps and an equalization basin wet well. The existing headworks facility of the Ahuimanu STP will be retained to screen and degrit the raw wastewater before pumping. The rest of the plant will be abandoned. The sewage pumps will be capable of pumping either screened and degritted raw wastewater or secondary effluent. The planned expansion of the headworks units at Kaneohe STP, which is required to accommodate the Kahaluu flows will not be ready in time. In the interim, it is proposed that the Ahuimanu STP will remain in service, with secondary effluent pumped to the effluent pumping station at the Kaneohe STP for disposal via the Mokapu Outfall. Following completion of the Kaneohe STP expansion, the Ahuimanu STP will be shut down and screened and degritted sewage will be pumped to the Kaneohe STP for treatment and disposal.

3. Treatment at Kaneohe STP

   The degree of treatment that will be required at Kaneohe STP will be determined in mid 1980 when the Environmental Protection Agency

(EPA) will rule on the secondary waiver application for the Mokapu Ocean Outfall. The level of effluent quality presently attainable by the trickling filters at Kaneohe STP does not comply with the EPA defined standard for secondary treatment. If the secondary waiver application is approved, the non-secondary effluent will continue to be discharged through Mokapu Ocean Outfall. If the application is disapproved, the Kaneohe STP will have to be upgraded to comply with EPA standards for secondary treatment. With the exception of the headworks, the plant has sufficient capacity to handle the design flows from Kahaluu.

4. Disposal

The treated Kahaluu wastewater will be initially pumped to the effluent pump station at the Kaneohe STP for direct disposal through the Mokapu Ocean Outfall. After expansion of the Kaneohe STP, the Kahaluu wastewater flows will be pumped directly to the headworks of the STP for treatment and disposal through the Mokapu Outfall. The present effluent discharge into Ahuimanu Stream from the Ahuimanu STP will be discontinued in compliance with the National Pollutant Discharge Elimination System (NPDES) permit. The Mokapu Ocean Outfall has been designed to include the Kahaluu flows. The sludge will continue to be trucked from Kaneohe STP to the Kapaa municipal landfill for disposal.

F. ENVIRONMENTAL IMPACT

The primary long-term beneficial impact of the proposed action would be the improvement of surface, groundwater and bay water quality in the area by elimination of approximately 1,700 cesspools and termination of the Ahuimanu STP discharge into Ahuimanu Stream. The primary adverse impact would be the high costs for sewer improvement districts that must be borne by the property owners.

Primary Impacts

Beneficial Impacts

1. Improvement of water quality and water environment.
2. Elimination of malfunctioning cesspools and resultant health hazards within proposed improvement districts.
3. Elimination of City cost of pumping cesspools within proposed improvement districts.

4. Simplification of City wastewater management operations by eliminating the sewage treatment plant at Ahuimanu.
5. Increased property values due to sewer improvements.

Adverse Impacts

1. Cost to Federal, State and City Government of the proposed facilities.
2. Cost to property owners within improvement districts for new sewer facilities and backfilling of cesspools.
3. User charges for operation and maintenance of the proposed system.
4. Increased taxes due to increased property values.
5. Construction nuisance and business disruption with minor economic losses.
6. Commitment of energy and resources to an expanded centralized wastewater system.
7. Temporary effects on water quality during construction at stream crossings.
8. The continued use of cesspools in the unsewered rural areas may be a potential source of water pollution.

SECTION II
PROJECT DESCRIPTION

A. PROJECT LOCATION

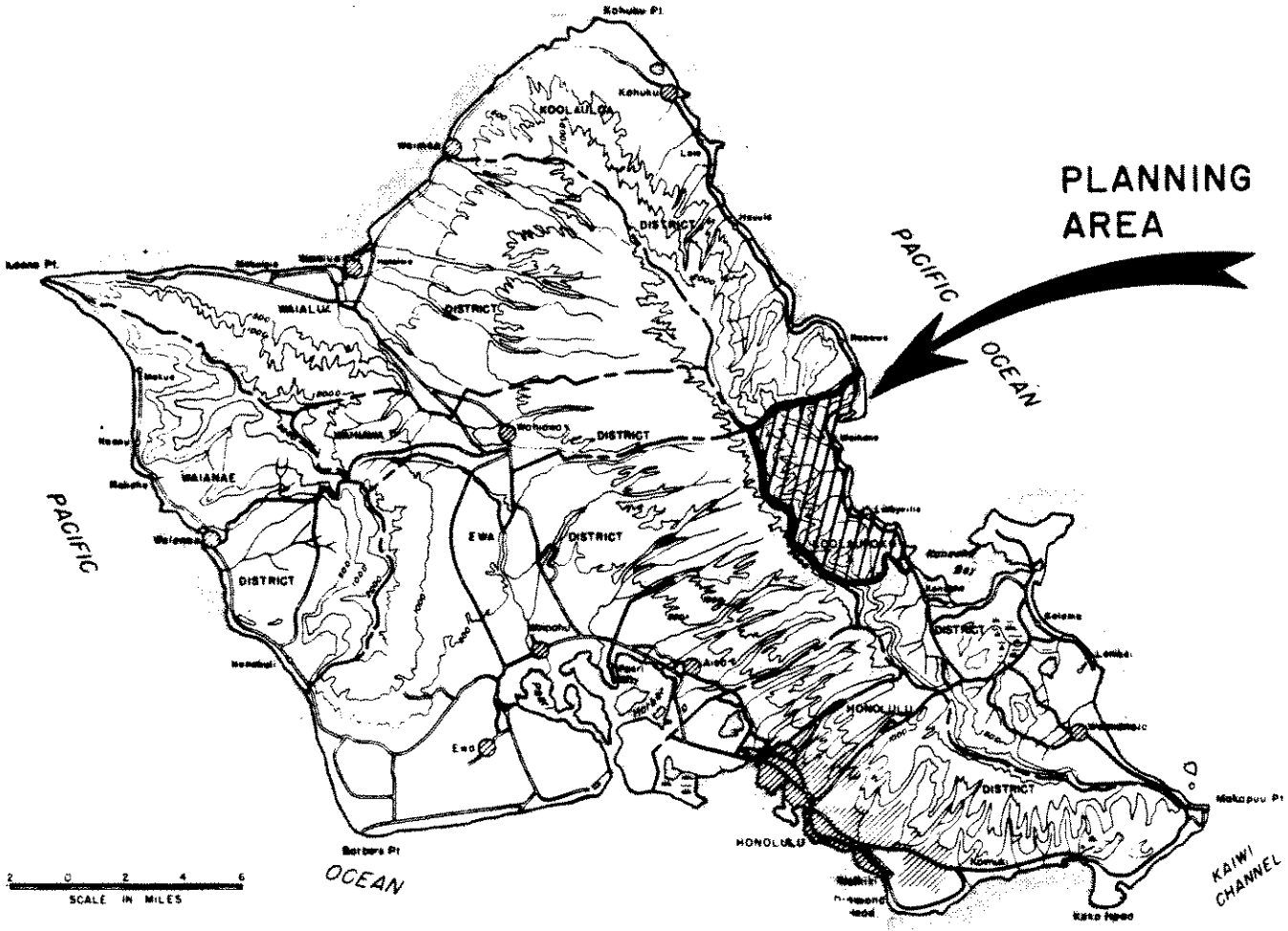
The project planning area is located on the windward coast of the Island of Oahu, State of Hawaii (Figure II-1). Situated within the northern portion of the judicial District of Koolaupoko on the windward side of the Island of Oahu, the planning area (Figure II-2) includes the areas of Kualoa, Hakipuu, Waikane, Waiahole, Kaalaea, Waihee, Kahaluu, Ahuimanu, and a portion of Heeia. The planning area encompasses an area of approximately 12,300 acres, or nearly 20 square miles.

The planning area is the Kahaluu portion of the Kahaluu-Kaneohe-Kailua wastewater planning region. The Kahaluu planning area boundaries extend from Kaneohe Bay to the Koolau Mountain Range ridgeline and in the north-south direction from Kaoio Point in Kualoa south to where the Kaneohe sewers currently terminate in Heeia. The area is made up of a suburban (urban fringe) area to the south at Ahuimanu, changing to a rural area in the central and northerly sections. The project planning area was determined by the Water Quality Management Plan for the City and County of Honolulu. This "208 Water Quality Plan" was completed in 1978 as a joint effort by the State Department of Health and the City and County of Honolulu to develop an area-wide waste treatment plan for the entire island of Oahu.

B. PURPOSE OF PROJECT

1. Background

Urbanization of the Kahaluu and Kaneohe districts within the last two decades has caused significant adverse impacts on the water quality and ecology of Kaneohe Bay. Numerous studies have been conducted to determine the ecological changes Kaneohe Bay has undergone because of urbanization. Urbanization has caused physical changes because of concentrated discharges of sewage, accelerated sedimentation due to subdivision developments, pollutants from urban runoff, and channelization of streams within the watershed.



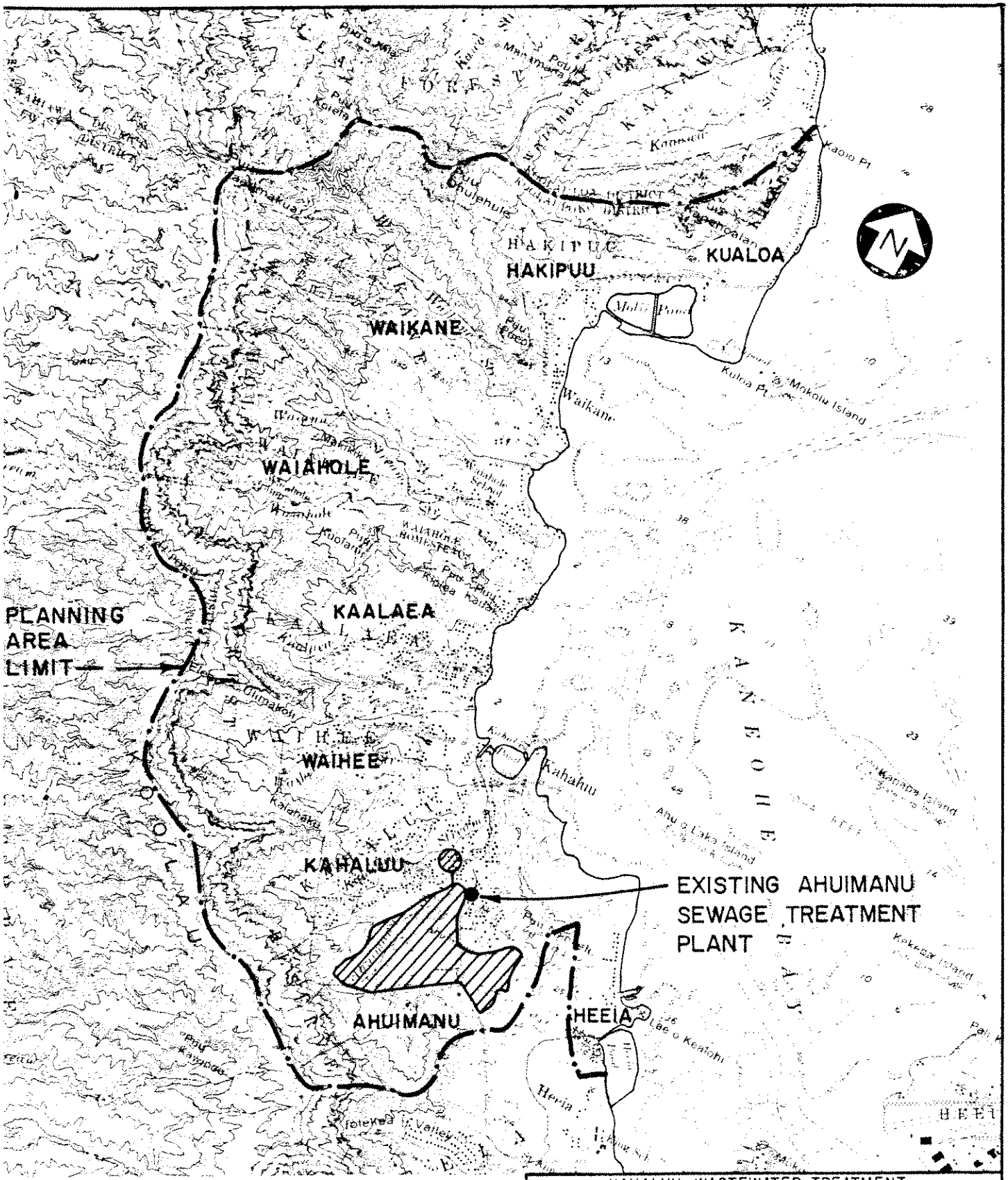
ISLAND OF OAHU

KAHALUU WASTEWATER TREATMENT
AND DISPOSAL SYSTEM
ENVIRONMENTAL IMPACT STATEMENT

FIGURE II-1

LOCATION MAP

CITY AND COUNTY OF HONOLULU
DEPARTMENT OF PUBLIC WORKS



KAHALUU WASTEWATER TREATMENT AND DISPOSAL SYSTEM
ENVIRONMENTAL IMPACT STATEMENT

FIGURE II-2

PLANNING AREA

CITY AND COUNTY OF HONOLULU
DEPARTMENT OF PUBLIC WORKS

Major concerns of water quality management within the Kaneohe Bay area were sewage discharges, storm water runoff, and sediment transport. The regional wastewater planning of the Kahaluu area began with the 1972 study entitled Water Quality Program for Oahu With Special Emphasis on Waste Disposal. The study developed regional wastewater management plans for the entire island of Oahu. It established a wastewater planning region for the Kahaluu-Kaneohe-Kailua region and recommended a wastewater collection treatment and disposal system for the subareas of the region after these subareas were studied in depth. Based on water quality and oceanographic investigations, the study concluded that wastewater discharges into Kaneohe Bay should be discontinued. The Kaneohe-Kailua system is now essentially complete with the recent construction of the Mokapu Ocean Outfall and interconnected disposal systems from the Kaneohe STP and the Kailua STP. The outfall has sufficient design capacity to handle the Kailua-Kaneohe and Kaneohe Marine Corps Air Station flows as well as the future flows from the Kahaluu subarea.

The wastewater management system for the Kahaluu planning area of the Kahaluu-Kaneohe-Kailua regional plan is now being examined in detail under Step 1 (Facility Plan) of the EPA Construction Grants Program. The Facility Plan developed a recommended wastewater system for Kahaluu which is compatible with the existing and future facilities in the Kahaluu-Kaneohe-Kailua planning region, the latest population projections for Kahaluu and the desires of the communities in the planning area.

2. Description of Problem

Ahuimanu is the only district subarea within the planning area with a sewer system. The other subareas within the planning area use cesspools as the primary means of wastewater disposal. There are approximately 2000 cesspools presently being used of which approximately 20 percent are defective.

A significant quantity of surface water quality data for Kaneohe Bay and streams discharging into the Bay has been obtained. The data indicate that some of the State Water Quality Standards are exceeded while some are not. Fecal coliform and fecal streptococcus were detected in the streams of the planning area, indicating possible low-level contamination from both human and animal sources.

The National Pollutant Discharge Elimination System (NPDES) Permit for the Ahuimanu STP stipulates that the present effluent discharge to Ahuimanu Stream must be eliminated by February 28, 1983. In addition, the plant utilizes the "rapid block" unit for the activated sludge process. Past experience at plants using similar units indicates that this particular type unit produces poor effluent as the flow reaches 55 to 65 percent of its design capacity. The normal daily fluctuations in flow to the unit have been diagnosed as the cause of the problem.

C. PROJECT SCOPE

The project scope for the Facility Plan included the following technical objectives:

Examine all alternatives for the facilities required to collect, treat and dispose of the flows from the planning area. The planning period shall be 20 years to comply with EPA requirements.

Examine in detail the alternative of treating wastewater from the planning area (including the Ahuimanu Sewage Treatment Plant area) at either the Kahaluu Wastewater Treatment Plant or the Kaneohe Sewage Treatment Plant, or both. (NOTE: New treatment plants are designated "wastewater treatment plants" or WWTP; existing treatment plants are designated "sewage treatment plants" or STP.)

Examine the retention of the Ahuimanu STP, with expansion if necessary.

Determine what sewer lines are necessary to convey or intercept the wastewater.

Determine what alternate treatment facilities besides central treatment plants are feasible.

Determine treatment levels for all alternatives.

Examine alternate effluent disposal systems, including land use.

Determine what sites and sizes are necessary for all facilities.

Enhance public health by eliminating cesspools where unsuitable.

Comply with the requirements of the Federal Water Pollution Control Act, Amendments of 1972 (Public Law 92-500).

Comply with the National Pollutant Discharge Elimination System (NPDES).

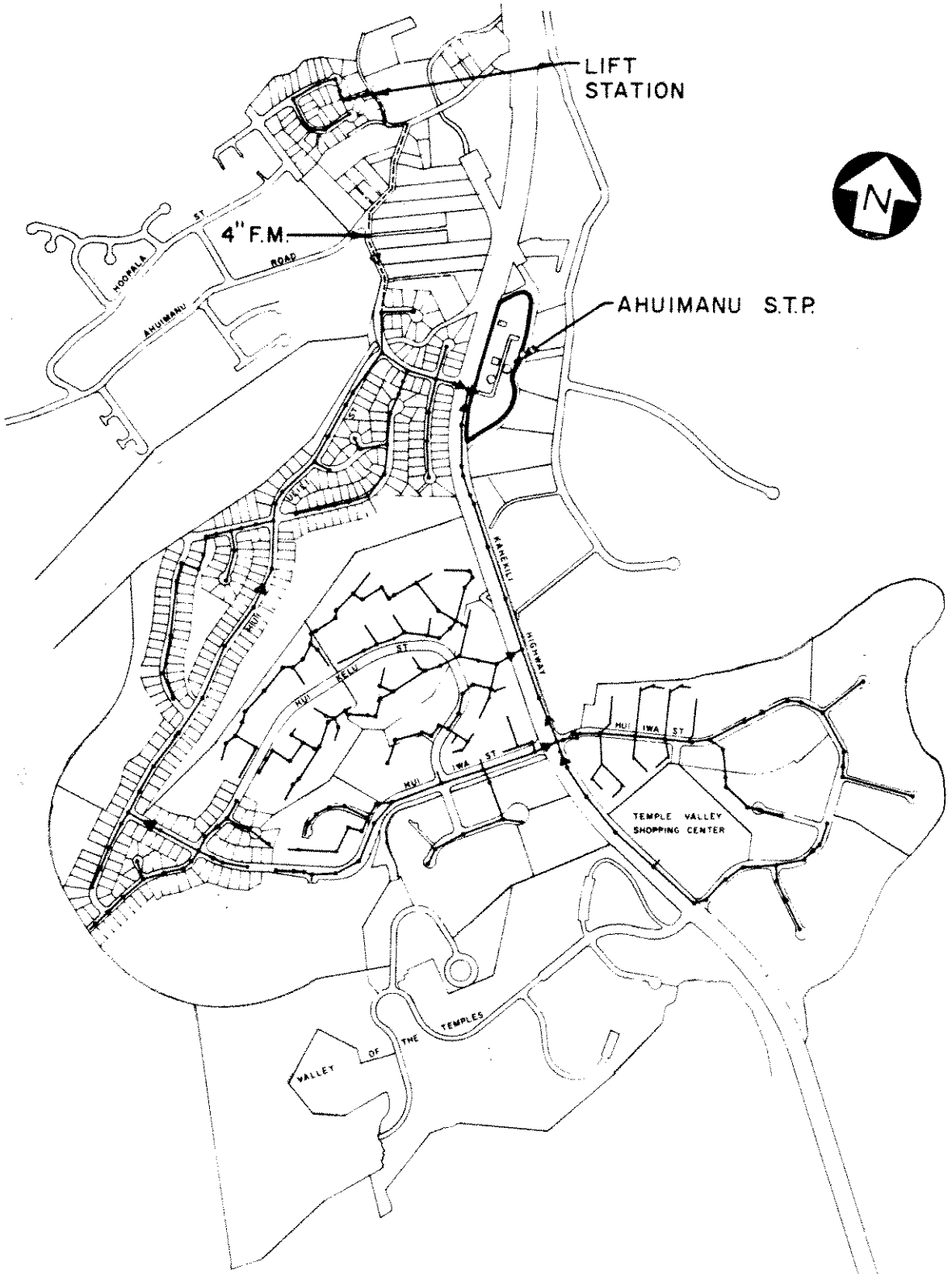
Comply with applicable State of Hawaii, Department of Health, Public Health Regulations.

D. EXISTING WASTEWATER TREATMENT SYSTEMS

1. Ahuimanu Sewage Treatment Plant (STP)

The tributary area for the Ahuimanu Sewage System is shown in Figure II-3. The facilities include a sewer system for the Ahuimanu subdivision, tertiary treatment plant and the outfall to Ahuimanu Stream. The tributary area of the sewage collection system encompasses approximately 1,175 homes and a 1977 population of 4,110, distributed over an area of approximately 180 acres.

The Ahuimanu STP operates as a tertiary treatment facility with capabilities of removing significant amounts of nitrogen and phosphorus through chemical addition. It is a "rapid block" activated sludge plant with an aerated grit chamber



LEGEND

——— EXISTING GRAVITY LINE

– – – – – EXISTING FORCE MAIN

———→ DIRECTION OF FLOW

1000' 500' 0 1000' 2000'

SCALE IN FEET

KAHALUU WASTEWATER TREATMENT AND DISPOSAL SYSTEM ENVIRONMENTAL IMPACT STATEMENT

FIGURE II-3

EXISTING SEWER SYSTEM IN AHUIMANU

CITY AND COUNTY OF HONOLULU
DEPARTMENT OF PUBLIC WORKS

and a separate primary and secondary clarifier. The tertiary components include an ammonia stripping basin and a lime addition facility before primary clarification. The sludge handling system includes an aerobic digester with mechanical dewatering using a filter press unit. At the effluent end of the system is a polishing pond with a mechanical aeration capability. A schematic layout of the plant is shown in Figure II-4.

Effluent disposal is via an outfall into Ahuimanu Stream which flows into Kahaluu Stream and eventually into Kaneohe Bay. Facilities for chlorinating the effluent prior to disposal are provided.

Sludge is currently being handled by dewatering and subsequent trucking to the Kapaa municipal landfill in Kailua for disposal.

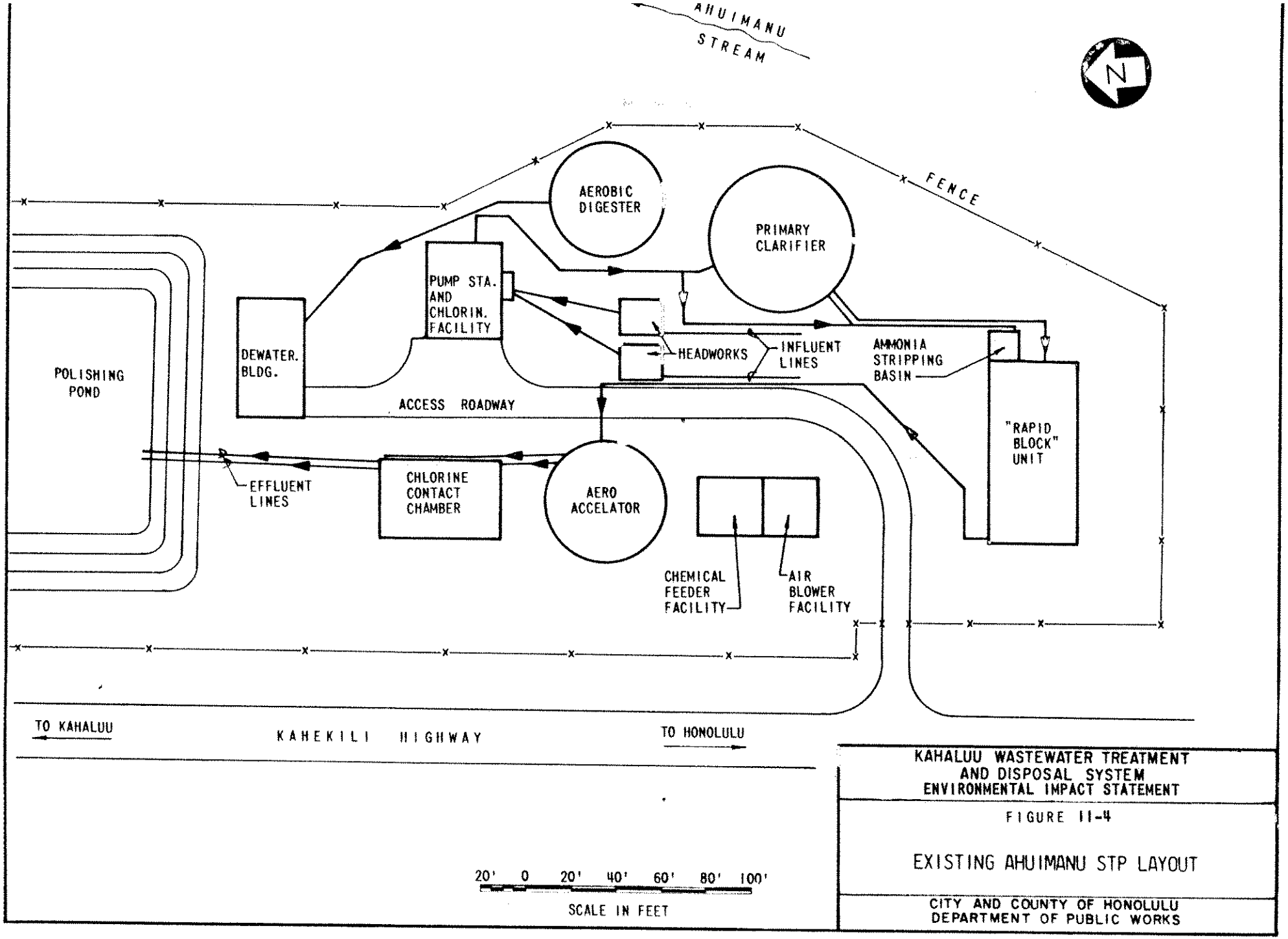
The average daily flow to the treatment plant is presently 0.3 MGD. Wet weather infiltration increases the flow to 0.4 or 0.5 MGD during occasional heavy rains. The design average daily flow capacity of the facility is 1.4 MGD. The wastewater characteristics are basically domestic in nature, but a service station, stores and a laundromat contribute to the flow.

The Ahuimanu STP "rapid block" system has experienced some operational difficulties in the past, but is presently operating within the limits specified in the NPDES permit. The plant should be able, with some modifications, to handle the design average flow of 1.40 MGD at a secondary treatment level, but a higher level of tertiary treatment would be very difficult.

2. On-Site Treatment and Disposal Systems

   a. System Descriptions

      With the exception of the Ahuimanu area, the entire planning area is serviced by approximately 2,000 on-site sewage treatment and disposal systems as of December



KAHALUU WASTEWATER TREATMENT AND DISPOSAL SYSTEM ENVIRONMENTAL IMPACT STATEMENT

FIGURE II-4

EXISTING AHUIMANU STP LAYOUT

CITY AND COUNTY OF HONOLULU
DEPARTMENT OF PUBLIC WORKS

1976. This number was determined by counting the number of homes in the planning area and subtracting the number serviced by the Ahuimanu system. The majority of these systems is individual 6- to 8-foot diameter cesspools with varying depths. There is a limited amount of more elaborate on-site treatment and disposal systems which are comprised of combinations of mechanical aeration (cavitette), septic tank, multiple cesspools, and/or leaching fields. The more elaborate disposal systems are used for multiple family units or in areas with soils of poor permeability. The exact number and locations of these units could not be determined since neither the County nor State keeps records for these private units. Verification of the use of these systems was obtained from the contractors and suppliers who furnish these units.

b. Quantity of Flows

The Water Quality Program for Oahu study estimated that the average per capita flow for the Kahaluu area was 75 to 78 gal/day. It is estimated that single cesspools servicing single family units receive as little as 150 gpd for small households and as much as 400 gpd for large households. A reasonable average is 275 gpd, which is equivalent to 3.5 people/unit at 78 gpcd. At this average, an estimated total of approximately 0.5 MGD is disposed in the planning area via on-site treatment, predominantly by cesspools..

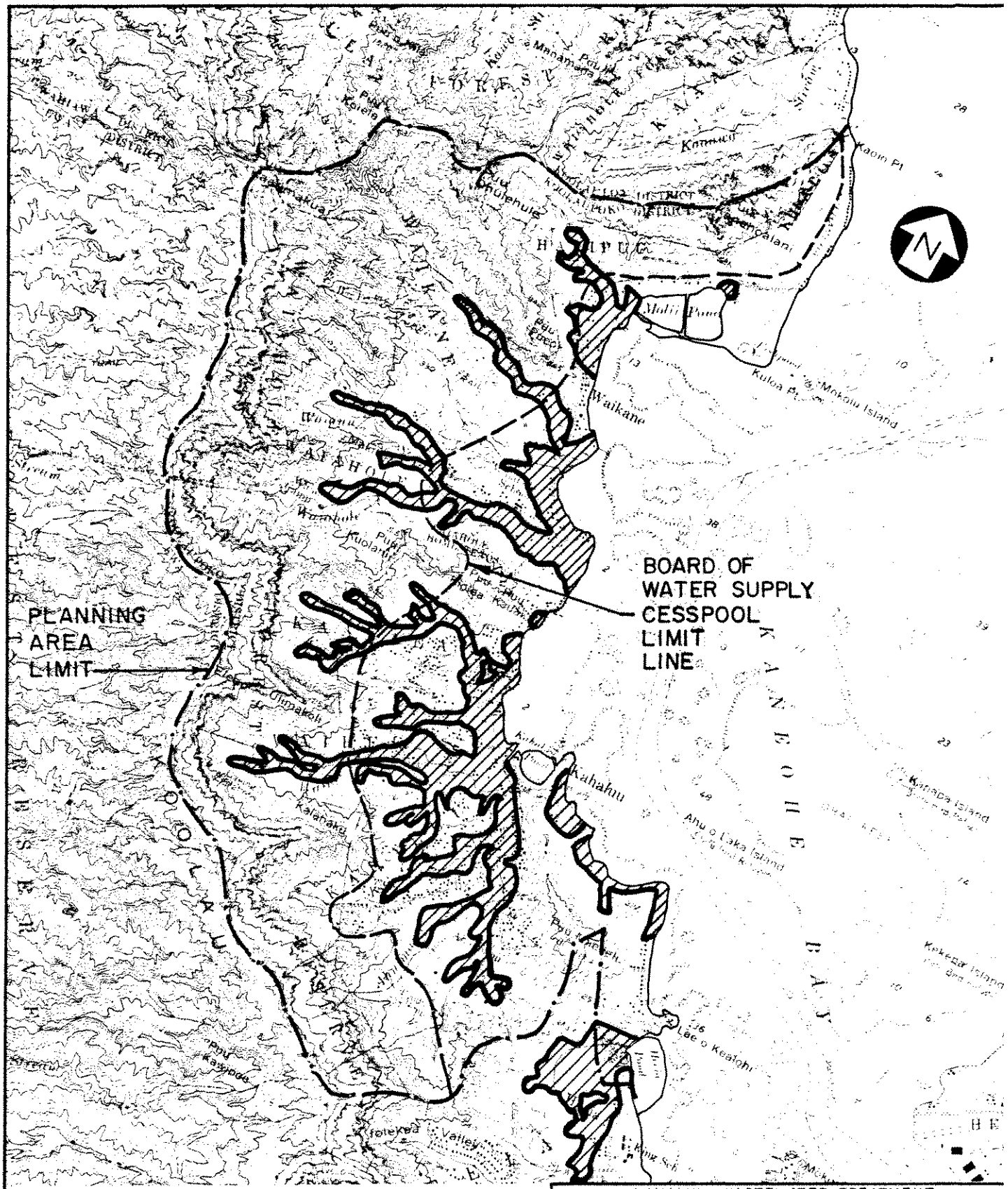
c. Performance

The performance of cesspools depends upon many factors. Some of the factors involved are the soil type and permeability, the height of the groundwater table, the method of installation and the quantity and quality of sewage discharged into it. Cesspools that receive waste from garbage grinders

and/or high grease sources will tend to clog much faster. Cesspools located in fine clayey soils tend to clog faster then cesspools located in very coarse porous soils. A high water table can reduce the quantity of sewage that the cesspool can handle. The method of installation, (i.e., how the cesspool was dug) can affect the permeability of the soil which is in immediate contact with the sewage. Cesspools with roughened soil faces generally have better seepage capacities than cesspools where the soil faces are sheared clean. The longer the cesspool has been in use the greater the probability that it will require pumping. The frequency of required pumping will also increase with age.

In general, cesspools located in stream valleys and in lowlands are more likely to require pumping due to the less permeable soils characteristically found in these areas. Figure II-5 indicates the planning area locations with severe soil limitations for wastewater disposal by cesspools. A small percentage of these cesspools require chemicals periodically to improve their performance. The City's Board of Water Supply has established a cesspool limit line (Figure II-5) to maintain the integrity of its inland water supply sources. No cesspools are allowed inland from this line.

Records of the City's Division of Wastewater Management indicate that approximately 350, or 20 percent, of the existing cesspools required pumping in 1977. The pumping frequency varied from 1 to more than 12 pumpings per cesspool. The overall average was 7 pumpings per cesspool pumped. There is a strong correlation of the locations of these defective cesspools and the poor soil areas indicated in Figure II-5.



LEGEND

AREA WITH SEVERE SOIL LIMITATIONS

ADAPTED FROM: SOIL SURVEY OF ISLANDS OF KAUAI, OAHU, MAUI, MOLOKAI AND LANAI, STATE OF HAWAII, AUGUST 1972.

KAHALUU WASTEWATER TREATMENT AND DISPOSAL SYSTEM
ENVIRONMENTAL IMPACT STATEMENT

FIGURE **11-5**

PLANNING AREA LOCATIONS WITH SEVERE SOIL LIMITATIONS FOR WASTEWATER DISPOSAL

CITY AND COUNTY OF HONOLULU
DEPARTMENT OF PUBLIC WORKS

E. GENERAL DESCRIPTION OF THE ACTION'S TECHNICAL CHARACTERISTICS

1. Subarea Evaluation

The planning area was subdivided into eight subareas for evaluation since each subarea has unique features which are best evaluated independent of each other. The subarea boundaries as shown in Figure II-6 were determined by population distribution, land use patterns, zoning, and geographic considerations.

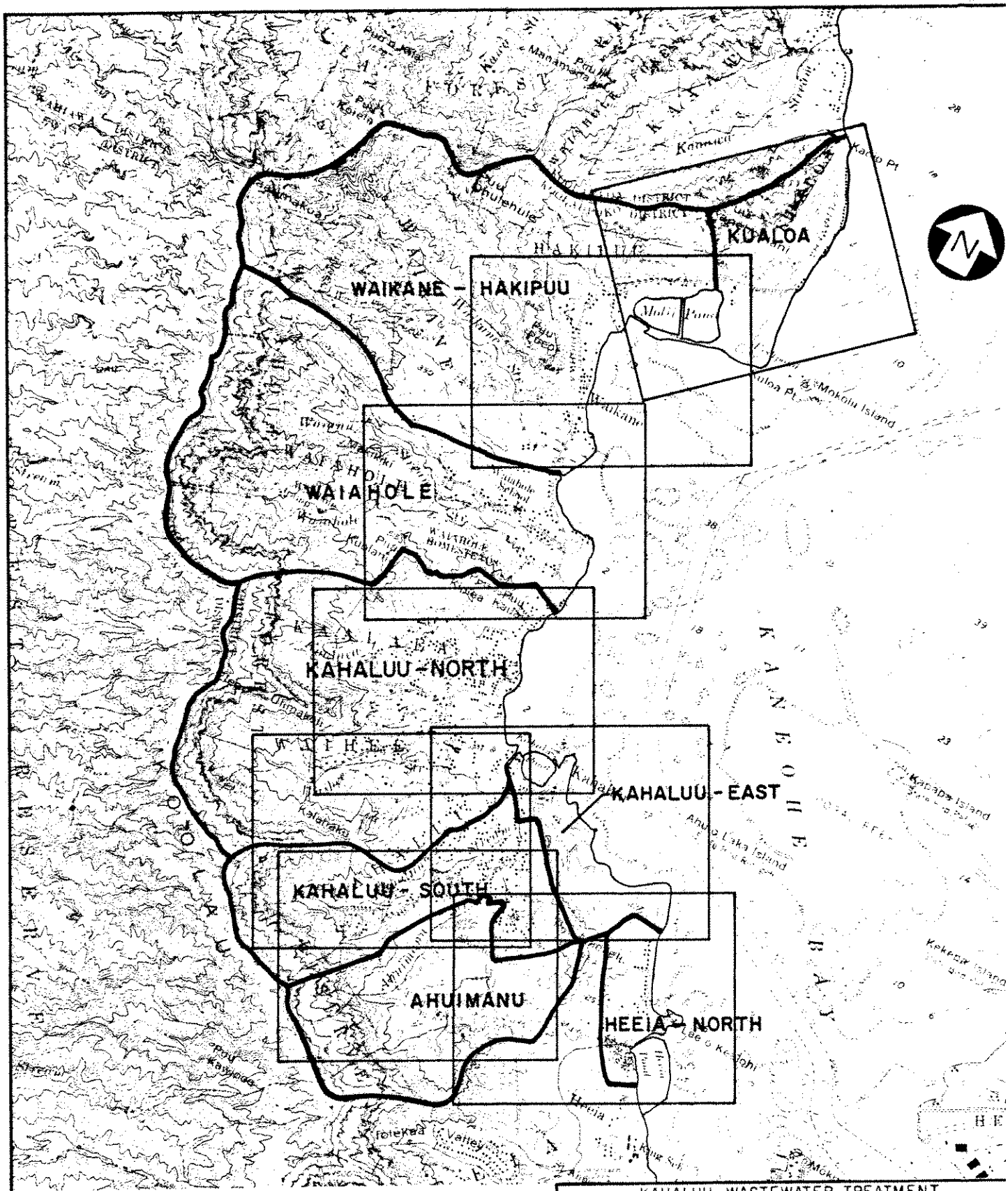
a. Demographic Projections

The Series II-F population projections contained in the State Department of Planning and Economic Development report entitled "Long-Range Population and Economic Simulations and Projections for the State of Hawaii" (March 1978) have been adopted by the City and County of Honolulu and the State 208 Water Quality Management Plan for purposes of development planning and facility planning. The City and County's Department of General Planning has disaggregated the II-F total by facility plan areas. The Division of Wastewater Management has used the Department of General Planning's breakdown to further detail the population projection for the planning area.

The southern portion of the planning area is expected to receive most of the projected population increase with the exception of the population increases resulting from developments planned for the Waiahole and Waikane Valleys in the northern portion. The new population projections represent a very low growth rate for the planning area.

b. Wastewater Flow Projections

The wastewater flows generated within each subarea for the beginning of the planning period (year 1980), end of the planning period (year 2000), and 50 years after the beginning of the planning period (year 2030) were determined (See Section VIII).



KAHALUU WASTEWATER TREATMENT AND DISPOSAL SYSTEM
ENVIRONMENTAL IMPACT STATEMENT

FIGURE **II-6**

SUBAREAS OF KAHALUU PLANNING AREA

CITY AND COUNTY OF HONOLULU
DEPARTMENT OF PUBLIC WORKS

2. Subareas to be Sewered

The no project alternative is recommended for the subareas of Heeia-North, Waiahole, Waikane-Hakipuu and Kualoa. This recommendation to remain on cesspools is based on the low population density, the agriculturally oriented lifestyle of these subareas, local opposition to development within these subareas, low projected wastewater flows and the excessive fiscal impacts associated with the other treatment and disposal alternatives. In addition, available data is insufficient to determine if cesspools or nonpoint sources are the cause of water quality problems. Positive action is deferred until further field investigation pinpoint the source of pollution. With the no project alternative, water pollution control measures for existing and new developments will continue to be enforced under the existing State Department of Health Regulations. Existing and new homes in these subareas will continue to use cesspools or other private on-site wastewater systems for wastewater disposal. Public funds will not be used to correct any defective cesspools. The present practice of pumping defective cesspools by the City and County of Honolulu will be continued.

A conventional wastewater collection system was considered to be the cost effective alternative for the Ahuimanu, Kahaluu-East, Kahaluu-North, and Kahaluu-South subareas. This determination was based on the following considerations.

a. Approximately 70 percent of the residential population of the planning area reside in these subareas.

b. Population densities are highest in these subareas and the quantity of raw wastewater being discharged into the ground in these high density subareas may be considered as a point source of pollution.

c. Proximity of the Ahuimanu collection and treatment system which can be readily expanded to serve these unsewered subareas.

d. State and City water quality management goal of eliminating discharge of wastewater into Kaneohe Bay.

e. Centralized system is much more reliable in achieving the desired water quality in highly populated areas than the other wastewater management alternatives.

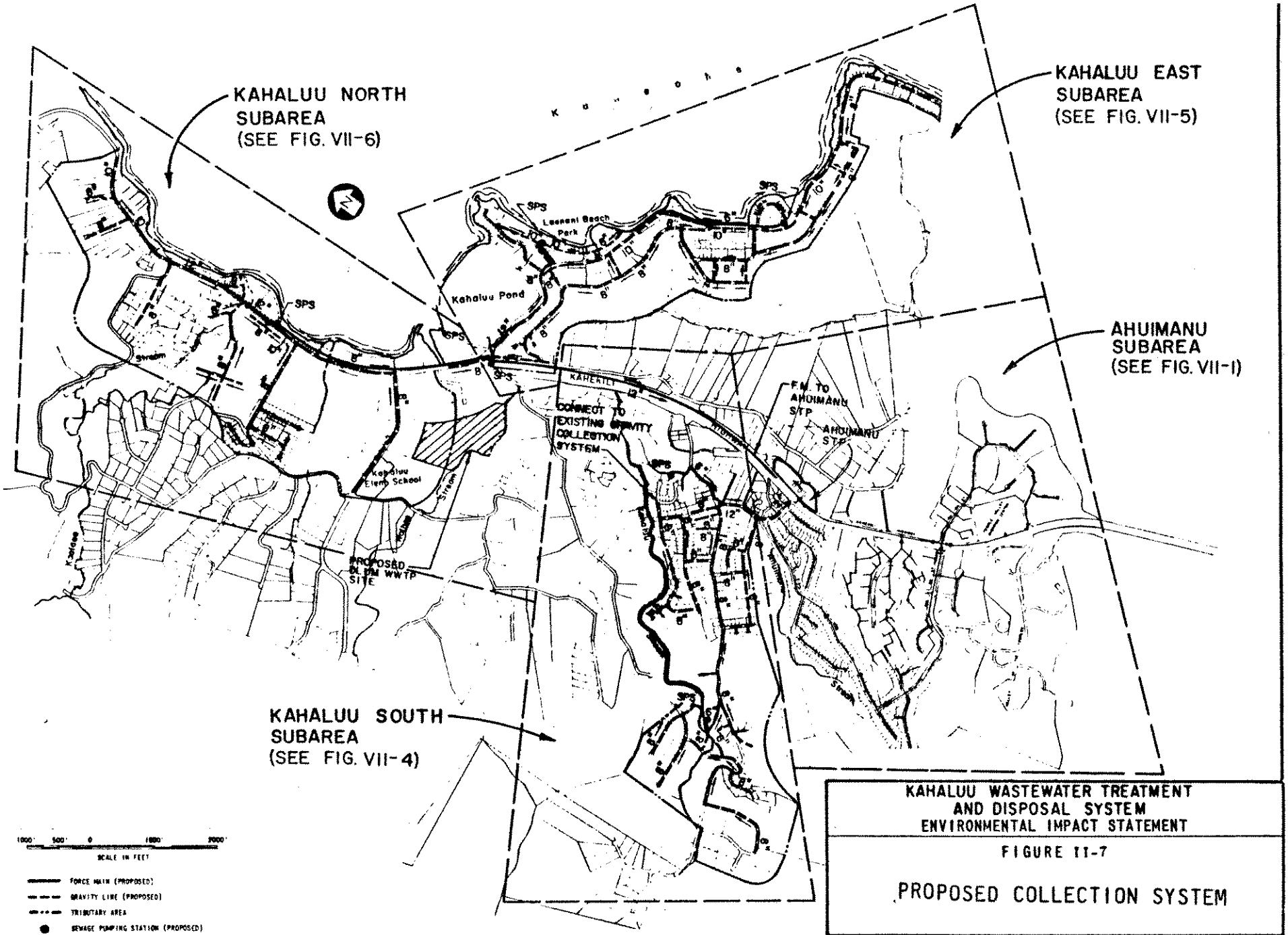
f. The Detailed Land Use Map indicates a concentration of urban land uses in the area encompassed by these subareas. The centralized collection system is compatible with these land uses.

3. Features of Proposed Action

A centralized collection system is proposed for the subareas of Ahuimanu, Kahaluu-South, Kahaluu-East and Kahaluu-North. The existing sewer system presently serving the Ahuimanu subarea will be retained and the collection system will be expanded to the unsewered subareas. The wastewater flows from these subareas will be conveyed to the Ahuimanu STP site for further treatment and disposal. By 1983, a new pumping station will be constructed at the Ahuimanu STP site for pumping treated effluent from the Ahuimanu STP through a new force main transmission line to the Kaneohe STP for disposal through the Kaneohe effluent pumping station and the Mokapu Outfall. After completion of the proposed expansion of the Kaneohe STP, the Ahuimanu STP will be shut down and the Ahuimanu sewage pumping station will then pump screened and degritted sewage to the Kaneohe STP for treatment and disposal through the Mokapu Outfall. This proposed project will also eliminate the present effluent discharge to Ahuimanu Stream in compliance with the NPDES Permit for Ahuimanu STP. The essential features of the proposed project are presented below.

a. Wastewater Collection System

The proposed new collection system for the Kahaluu-North, Kahaluu-South, and Kahaluu-East subareas is shown in Figure II-7. The existing sewer system serving the Ahuimanu



KAHALUU WASTEWATER TREATMENT AND DISPOSAL SYSTEM
ENVIRONMENTAL IMPACT STATEMENT

FIGURE II-7

PROPOSED COLLECTION SYSTEM

CITY AND COUNTY OF HONOLULU
DEPARTMENT OF PUBLIC WORKS

subarea is also shown. The planned collection systems for Kahaluu-South, Kahaluu-East and Kahaluu-North will not be constructed for several years, until the proposed expansion of the Kaneohe STP can accommodate the treatment and disposal of these additional flows. A description of the collection system by subareas is given below.

Ahuimanu Collection Subsystem

The existing Ahuimanu sewer system was initially provided by the developer of the area. These facilities have since been deeded to the City and are now operated and maintained by the City's Department of Public Works, Division of Wastewater Management. This sewer system presently services about 1,135 homes, and discharges approximately 0.3 MGD into the Ahuimanu STP.

The age of these sewers varies from one to seven years. They are in relatively good condition and require only occasional maintenance. An infiltration and inflow analysis was done to determine if excessive groundwater/stormwater was entering the collection system. It was determined that water entering the system was not excessive and repairs were not required. The Ahuimanu system consists of 15 miles of sewers varying in diameter from 4 inches to 15 inches, with 227 manholes and 110 cleanouts. This system will be expanded by the developer as building continues. An increase of 131 homes is projected for the year 2000 in this subarea.

Kahaluu-South Collection Subsystem

The Kahaluu-South subarea is adjacent to the north of the Ahuimanu subarea. A cluster of about 40 homes in this subarea is presently sewered by the Ahuimanu sewer system. The flows from these homes are pumped by a small sewage pump station (SPS) to a gravity interceptor sewer in the Ahuimanu subarea.

There are presently 600 homes in the subarea with a projected increase to 650 homes by the year 2000. The existing sewer system will be expanded to serve about 570 homes. There are approximately 80 homes that are scattered outside the proposed tributary area and will use on-site systems.

The existing sewer system will be expanded and the existing pump station will be replaced by a larger pump station to handle the increased flows. This new pump station (Kahaluu-South SPS No. 1) will be located across the street from the present SPS. Another pump station (Kahaluu-South SPS No. 2) will be required further inland. Parcels of land must be obtained for these two pump stations.

In addition to the 2 sewage pump stations, the new subsystem will consist of approximately 21,200 feet of gravity lines, and approximately 2,200 feet of force mains. A new gravity interceptor sewer will convey sewage directly to the Ahuimanu STP site for treatment and disposal.

Kahaluu-East Collection Subsystem

The Kahaluu-East subarea is the area along Kamehameha Highway from the Hygenic Store to Heeia. It is proposed to sewer all of the 550 homes projected for the area to the year 2000. There are presently 525 homes in this subarea. Because the Kahaluu-East subarea is almost fully developed based on present zoning, the proposed collection subsystem would have sufficient capacity to serve as the ultimate system for the area.

There are a few problem areas where houses located on the ocean side are at a much lower elevation than the roadway. It is not feasible to install a gravity line on the ocean side of these houses because of the lack of room, difficult access, irregular location of houses and complications in obtaining the required easements and permits. Therefore, individual pumping units are required for approximately 25 houses to lift sewage to the proposed gravity collection line in the road.

For hillside areas where the access roads parallel steep topographic contours, the houses on the lower side of the access road are connected to the gravity collection line in the next downhill access road via a sewer lateral through the intervening house lot.

lhe proposed Kahaluu-East sewer subsystem will consist of approximately 24,800 feet of gravity sewer lines within the existing road rights-of-way, three sewage pumping stations and approximately 8,600 feet of force mains.

The proposed Kahaluu-East SPS No. 1 will be located somewhere near, if not on, Miomio Loop. Because the Department of Wastewater Management Standards require this to be an aboveground station, an appropriate small parcel of land must be acquired.

The proposed Kahaluu-East SPS No. 2 will be located in the Kaenani Beach Park since the City and County already owns the land and no other readily available areas (vacant lots) have been found suitable.

The proposed Kahaluu-East SPS No. 3 will be located at the junction of the Kamehameha Highway and Kahekili Highway on the north side near the existing Texaco Service Station. This will require the acquisition of land but it will be less obtrusive than a sewage pump station on City land at the small park across the street. This pump station will convey flows from the Kahaluu-East subarea and the Kahaluu-North subarea to the Ahuimanu STP site.

Kahaluu-North Collection Subsystem

The Kahaluu-North subarea consists of the urban zoned lands north of the Hygenic Store and south of Waiahole. Population densities range from 0 to 15 people/acre. The low-lying areas are currently zoned for urban development and the upper valleys are zoned for agriculture.

Within the 770-acre low-lying urban area, about 530 homes out of 714 homes projected for the year 2000 would be serviced by sewers. At the present time, there are approximately 500 homes plus a number of small stores and local businesses in the area.

In the 670-acre agricultural upper valley area there are approximately 185 homes which will remain on cesspools.

The proposed Kahaluu-North sewer subsystem consists of collector sewers, a gravity interceptor sewer line along Kamehameha Highway, and a sewage pumping station (Kahaluu-North SPS No. 1) for lifting the sewage over Kahaluu Stream to Kahaluu-East SPS No. 3.

The proposed subsystem requires gravity sewer lines under two streams. Because of the very flat terrain along Kamehameha Highway, the gravity lines leading to the sewage pump station will have to be installed in trenches as deep as 20 feet, with some lengths below the groundwater table. Kahaluu-North SPS No. 1 is located to minimize the depth of the new gravity sewer lines. The force main from Kahaluu-North SPS No. 1 to Kahaluu-East SPS No. 3 will use the planned new bridge structure (300 feet long) to cross the enlarged flood control lagoon at the mouth of the Kahaluu Stream.

The collection system is a gravity system, but approximately 20 houses on the ocean side of Kamehameha Highway in the Kaalaea subarea must install individual pumping units to connect to the proposed new sewer line at a higher elevation on Kamehameha Highway.

b. Transmission of Wastewater Between Ahuimanu STP and Kaneohe STP

All of the collected wastewater will be conveyed to the Ahuimanu STP and subsequently pumped to Kaneohe STP for

treatment. The Ahuimanu STP will be abandoned and converted to a sewage pumping station. The only component of the existing plant that will remain in service will be the headworks to screen and degrit the raw wastewater prior to pumping.

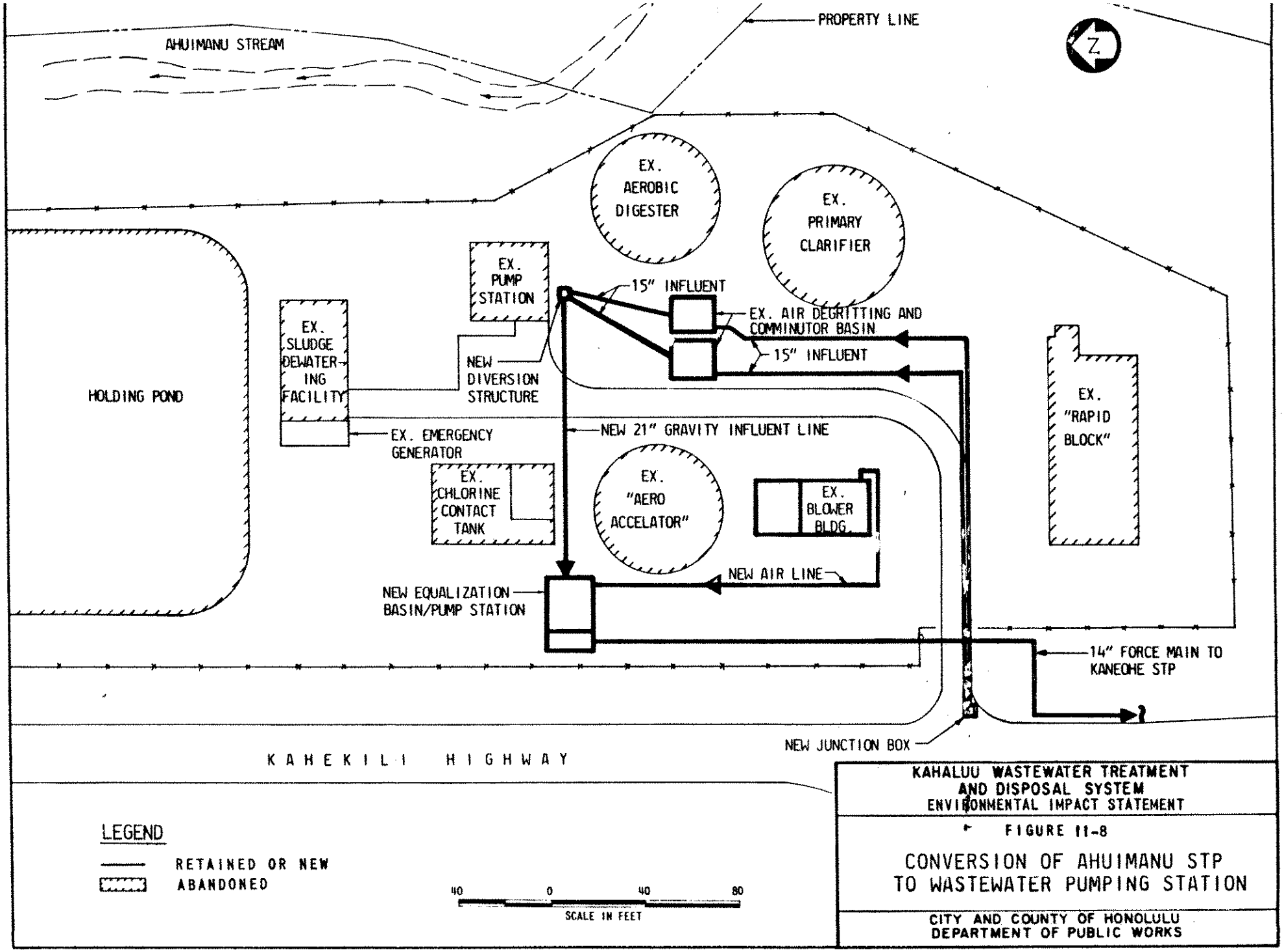
An equalization basin-wet well and the pump station are the new facilities proposed. The proposed layout of these new facilities is shown in Figure II-8. The equalization basin dampens the varying inflow rates and provides a uniform pumping rate to Kaneohe STP and thus eliminates any potential upsets at the plant due to hydraulic surges.

Modifications at Kaneohe STP are being planned to accommodate increased flows, including the wastewater flows from Kahaluu. Treatment at Ahuimanu STP will temporarily be required until the modifications are complete at Kaneohe. The sewage pumps will be selected to pump screened and degritted raw wastewater as well as secondary effluent.

The alignment and profile of the force main are shown in Figures II-9 and II-10, respectively. The 14-inch force main will follow Kahekili Highway, turn down Keaahala Road, to Anoi Road and Paleka Road, cross Kamehameha Highway to Waikalua Road, and cross under Kaneohe Stream to the Kaneohe STP.

c. Treatment at Kaneohe STP

The degree of treatment required at Kaneohe STP will be determined by the EPA's ruling on the secondary waiver application for Mokapu Ocean Outfall. The EPA's decision is expected sometime in mid-1980. If the application is approved, the present level of treatment provided by the trickling filters will be continued. If the waiver application is disapproved, the treatment level must be upgraded



KAHALUU WASTEWATER TREATMENT AND DISPOSAL SYSTEM
ENVIRONMENTAL IMPACT STATEMENT

FIGURE 11-8

CONVERSION OF AHUIMANU STP TO WASTEWATER PUMPING STATION

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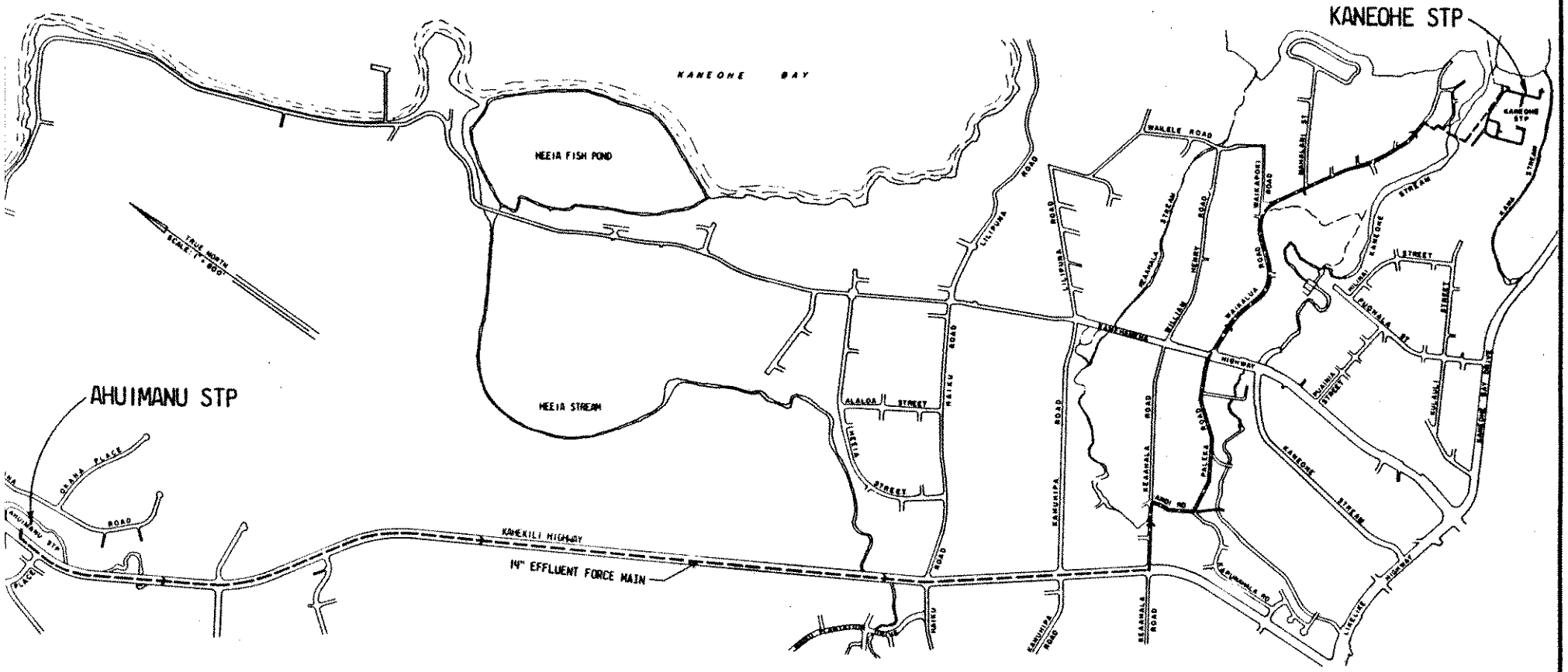
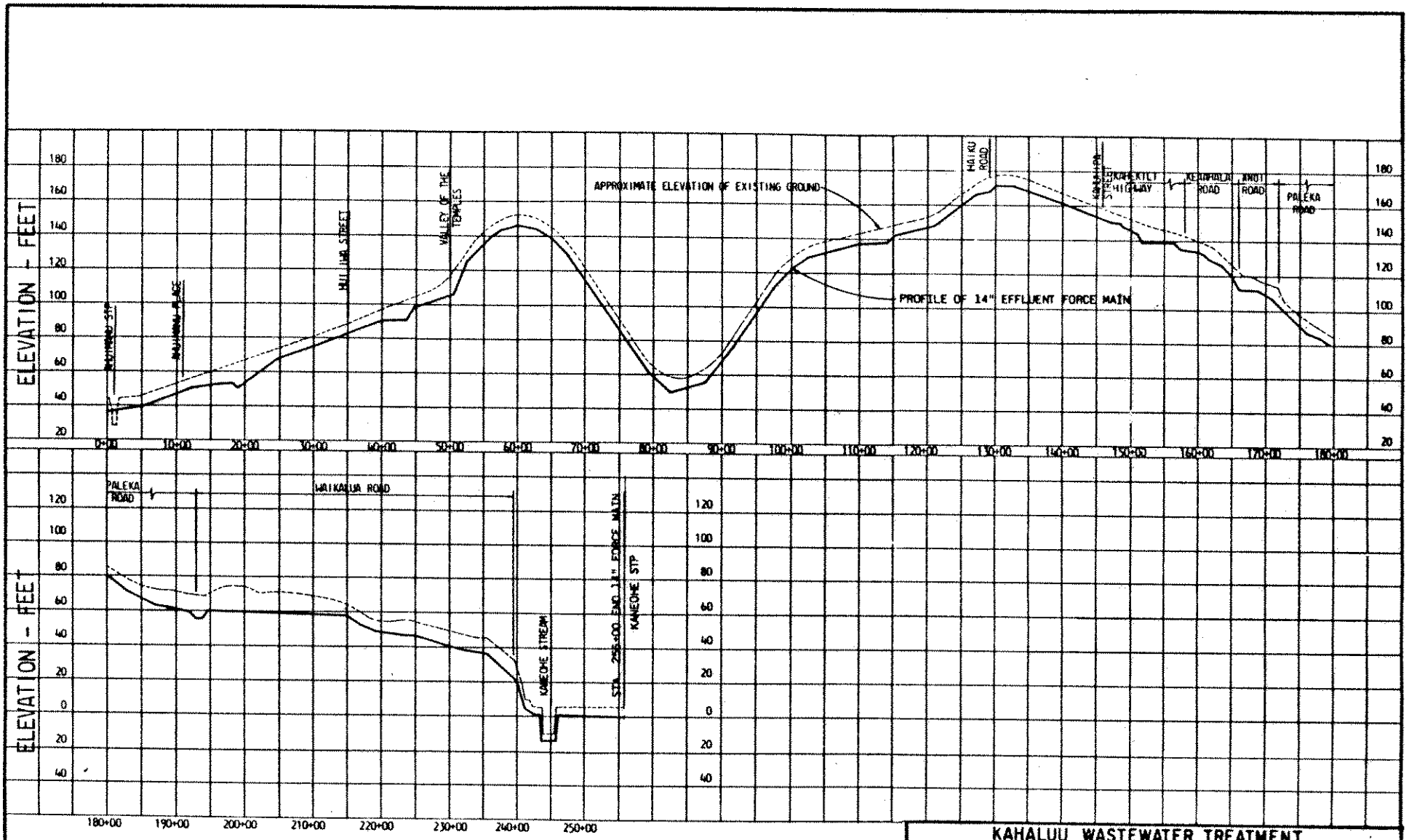


KAHALUU WASTEWATER TREATMENT
AND DISPOSAL SYSTEM
ENVIRONMENTAL IMPACT STATEMENT

FIGURE II-9

ALIGNMENT OF 14" EFFLUENT
FORCE MAIN

CITY AND COUNTY OF HONOLULU



KAHALUU WASTEWATER TREATMENT
AND DISPOSAL SYSTEM
ENVIRONMENTAL IMPACT STATEMENT

FIGURE II-10

PROFILE OF 14" EFFLUENT FORCE MAIN

CITY AND COUNTY OF HONOLULU
DEPARTMENT OF PUBLIC WORKS

since the present effluent quality from the trickling filters does not meet the secondary treatment criteria established by the EPA.

The implications of the secondary waiver application and the modifications to Kaneohe STP are addressed in a report entitled Addenda No. 1 to the Kailua and Kaneohe Facility Plans which is presently being prepared by the City and County of Honolulu.

d. Disposal

Effluent disposal facilities already exist which are adequately sized to include the Kahaluu wastewater flow for pumping effluent through the Mokapu Outfall. The outfall was designed to handle the year 2020 flows from the Kahaluu-Kaneohe-Kailua region using population projections much greater than presently planned.

The sludge will be disposed at the County operated Kapaa Landfill.

4. Arrangements for Implementation

a. Institutional Responsibilities

The City and County of Honolulu is responsible for implementing the proposed project. The Department of Public Works is the City's agency authorized to implement each phase of the project to completion. The Department of Public Works is required to prepare the plans and specifications of the project, arrange for Federal, State, and County funding, arrange for construction of the project, conduct project inspections, obtain all necessary clearances and permits, operate and maintain the constructed facilities, and collect sewer user charges.

The Department of Health, State of Hawaii, is the agency responsible for administering the Federal Construction Grants Program for Hawaii. The State is responsible for determining the amount and timing of Federal assistance to each County for which treatment works funding is needed. Under the Construction Grants Program, collection systems are eligible for Federal funding but they have low priority. The City and County's Improvement District mechanism will be implemented whereby the affected property owners will be assessed for their share of the total project cost for the collection system.

b. Implementation Steps

Compliance with the NPDES Permit for the Ahuimanu STP requires that the diversion facilities must be constructed and in operation by February 28, 1983. Therefore, the Step 2 (Design) of the Phase I facilities for diverting the present discharge from Ahuimanu Stream and conveying the wastewater to Kaneohe STP will commence as soon as the Step 1 (Facility Plan) effort is approved. The system of interceptors, pumping stations and force mains will be designed in the Phase II design effort. Design and construction of the Improvement District collection systems for the Kahaluu-North, Kahaluu-East, and Kahaluu-South subareas will also be initiated in Phase II.

The recommended schedule, by priority, for implementing the various phases of the proposed project is shown in Table II-1.

5. Project Costs

The total construction cost of a project includes the capital construction costs and the non-construction costs. The non-construction costs include the Step 2 cost of preparing the

TABLE II-1

PROJECT IMPLEMENTATION SCHEDULE

	Implementation Dates
Step 2 - Plans and Specifications	
1. Phase I - Sewage Pumping Station at Ahuimanu STP Site, Transmission Line and Appropriate Appurtenances Suitable for Treated Effluent or Screened and Degritted Wastewater	Following Facility Plan Completion
2. Phase II - Sewage Pumping Station, Interceptor Lines and Appropriate Appurtenances Between New Improvement Districts and Ahuimanu Improvement Districts Collection System	When Kaneohe STP Expansion is Designed
Step 3 - Construction	
1. Sewage Pumping Station at Ahuimanu STP site, Transmission Line and Appropriate Appurtenances Suitable for Treated Effluent or Screened and Degritted Wastewater	Put Into Use By February 1983
2. Sewage Pumping Station, Interceptor Line and Appropriate Appurtenances Between New Improvement Districts and Ahuimanu Improvement Districts Collection System	When Kaneohe STP Expansion is Constructed

plans and specifications of the proposed project and the additional expenses incurred as part of the Step 3 construction phase. Step 3 non-construction expenses include the cost of obtaining the necessary land and easements for the project, inspection costs, services of the Architect/Engineer, legal and administrative costs and interest costs during construction.

Under the Federal Construction Grants Program, certain costs are not eligible for Federal funding. For example, the specific costs for obtaining the land required for a sewage pump station, treatment facility, or sewer line are not eligible for Federal funding. These ineligible costs are shared by the property owner and the City and County.

The costs eligible under the Construction Grants Program are funded by the Federal, State and County governments. The Federal share is 75 percent, the State of Hawaii share is 10 percent, and the City and County of Honolulu share is 15 percent.

The construction of the collector sewers is implemented through the City and County Improvement District (I.D.) regulations. The costs of the I.D. project are shared by the individual landowners within the I.D. and the City and County. The landowners are assessed at a rate of 16 cents per square foot for single family zoned property and 24 cents per square foot for multiple family zoned property. Commercial properties are assessed at a rate of 20 cents per square foot. The I.D. project costs are limited to the street sewer system and the sewage lift stations. The costs of backfilling cesspools and connecting the house laterals to the street sewers are borne by the individual landowners.

Under the Construction Grants Program, the construction costs of the transmission system for conveying the collected wastewater to the treatment facility is eligible for Federal funding. The

eligible components are the interceptor sewers, sewage pumping stations, and force mains. The cost of obtaining the necessary land for the pumping stations are not eligible for Federal funding and must be borne by the City and County.

The transmission of wastewater from Ahuimanu STP to Kaneohe STP is eligible for Federal funding under the Construction Grants Program.

The costs of operations, maintenance, and replacement of the treatment facilities are borne by the users of these facilities. The City and County has adopted a sewer user charge system whereby single family residences are assessed at a rate of $4.85 a month, apartments at $3.40/unit per month, and commercial and industrial users at variable charges based on monthly flows. The City and County is presently reviewing the user charge rates based upon past experience for existing treatment works. The recommended user charge revisions are expected by early 1980.

The total construction costs and the proportionate shares for the property owner, and County, State, and Federal governments are shown in Table II-2. The annual O&M costs for each component of the proposed project is shown in Table II-3.

TABLE II-2

SUMMARY OF TOTAL CONSTRUCTION COSTS
AND PARTICIPANTS' PROPORTIONATE SHARE
(SEPTEMBER 1979)

		Total Construction Cost	Property Owners' Share	City & County Share	State Share	Federal Share
1.	Backfilling Cesspools - House Laterals	2,476,500	2,476,500	--	--	--
2.	Improvement District Collector Sewers	4,954,900	2,976,800	1,978,100	--	--
3.	Pumping Stations, Interceptor Sewers	4,355,600	--	717,000*	428,100	3,210,500
4.	Wastewater Transmission System	6,464,000	--	970,000	646,000	4,848,000
	TOTALS	$18,251,000	$5,453,300	$3,665,100*	$1,074,100	$8,058,500

*Includes land costs which are borne only by the City and County.

TABLE II-3

ESTIMATED ANNUAL OPERATION AND
MAINTENANCE (O&M) COSTS OF PROPOSED PROJECT

	Component	Annual O&M Cost ($)
1.	Proportionate Share of Treatment at Kaneohe STP	54,400* to 67,500**
2.	Transmission of Screened and Degritted Wastewater to Kaneohe STP	148,800
3.	Collection System	79,800
	ANNUAL COST	$283,000* to $296,100**

*Treatment by Trickling Filter at Kaneohe STP.
**Treatment by Activated Sludge at Kaneohe STP.

SECTION III
DESCRIPTION OF ENVIRONMENTAL SETTING

The existing physical, environmental, economic and social conditions in the planning area are described in this section. These conditions were considered when analyzing the alternatives and determining the impacts of the proposed actions.

A. PHYSICAL ENVIRONMENT

1. Climate

Mild and uniform temperatures prevail within the planning area with a dominance of cool northeast tradewinds. The mean annual temperature is about 75°F. The average annual rainfall (Figure III-1) ranges from about 50 inches along the coastal areas to about 150 inches along the higher Koolau Range, with about 70 percent of the rainfall occurring from November to April.

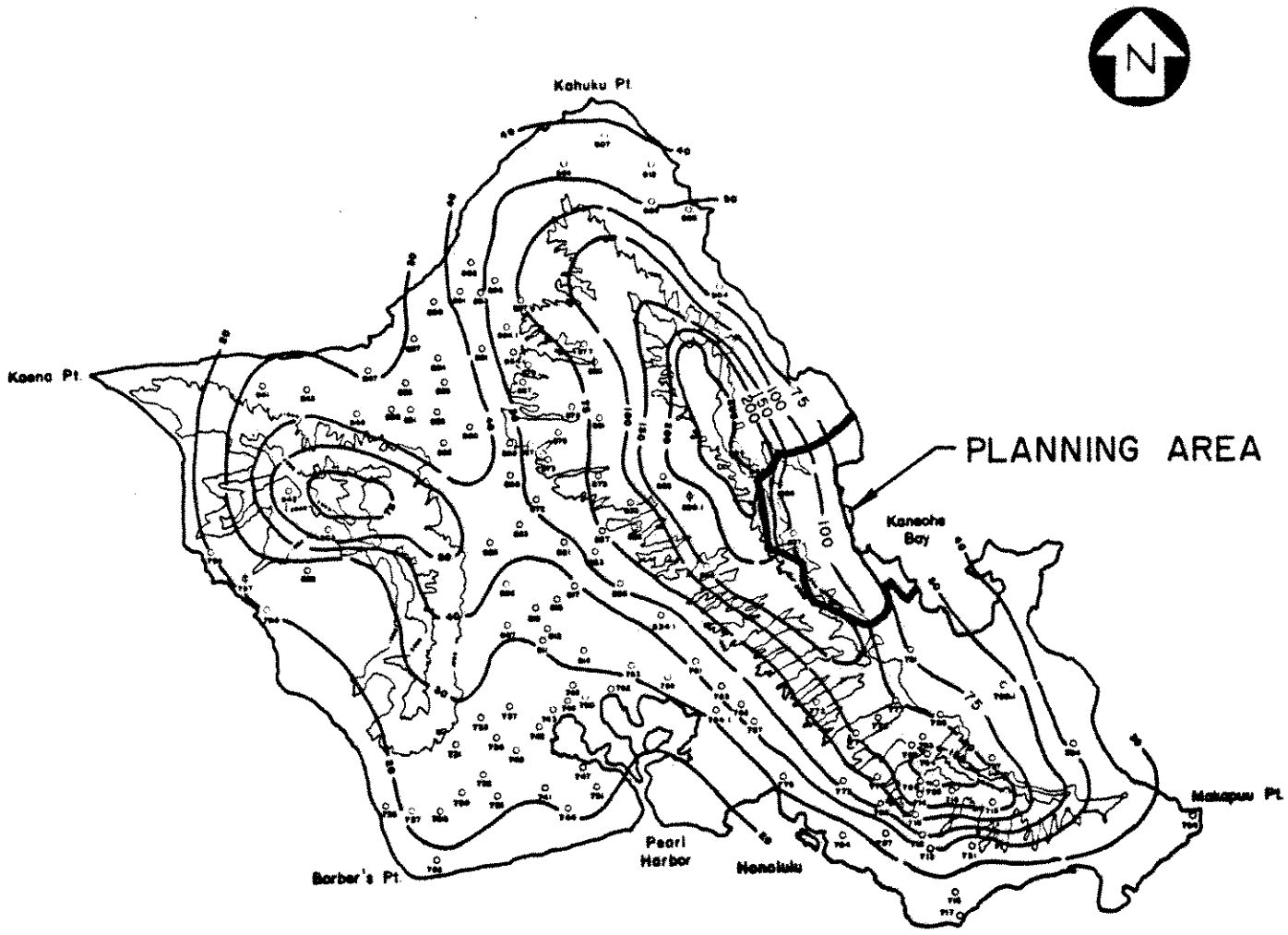
2. Geology

The lands of the planning area were formed as part of the Kailua and Koolau volcanic series. The high ground of the Koolau Range runs generally in a north-south direction and forms the western boundary of the planning area. The continuing processes of erosion, deposition, weathering and soil formulation have formed valleys and deposits of alluvial material. The Koolau rift zone along the Koolau Range is made up of a series of vertical, parallel dikes, which store infiltrating rainfall and form a storage area for groundwater supply.

3. Soils

The planning area includes the following three major soil associations:

a. Kaena-Waialua Association, generally occurring in the coastal plains, talus slopes, and in drainageways. The Kaena soils are poorly drained, dark colored silty clays or clays underlain by alluvium. The Waialua soils are moderately well



GRAPHIC SCALE IN MILES

LEGEND:

- Active Rain Gage
- Discontinued Rain Gage
- Contour Line
- Isohyetal Line
- Estimated Isohyetal Line

KAHALUU WASTEWATER TREATMENT
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FIGURE III-1

MEDIAN ANNUAL
RAINFALL MAP OF OAHU

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drained, dark reddish brown silty clays or clays underlain by alluvium.

b. Lolekaa-Waikane Association, generally occurs upland from the Kaena-Waialua Association, on the upland, fans and terraces. The soils are well drained and nearly level to very steep. The surface layer of the Lolekaa soils are of dark brown silty clay and the subsoil is dominantly silty, with gravelly alluvium substrata. The Waikane soils have a surface layer of dark silty clay with a subsoil of dark reddish brown silty clay and gravelly alluvium substrata.

c. Rock Land-Stony Steep Land Association, occurs along the steep and precipitous slopes and ridges of the Koolau Range. Rock land, comprising about 60 percent of the association is about 25 to 90 percent rock outcrop, with very shallow soil material occurs in the gulches and mountain sides. The stony steep land is a mass of boulders and stone deposited by water or gravity in the valley bottoms or on side slopes of drainageways.

4. Topography

The overall topography is relatively steep, except for the flat shoreline area. From the flat shoreline area, the terrain rises inland at slopes ranging from level to about 20 percent at the 200-foot contour. This area generally encompasses the bulk of the more flat and developable areas and comprises approximately 40 percent of the total area. Above the 200-foot contour the terrain slopes increase from 20 percent to 80 percent at the foothills of the Koolau Range where the precipitous terrain rises to nearly vertical at the ridge of the Koolau Range.

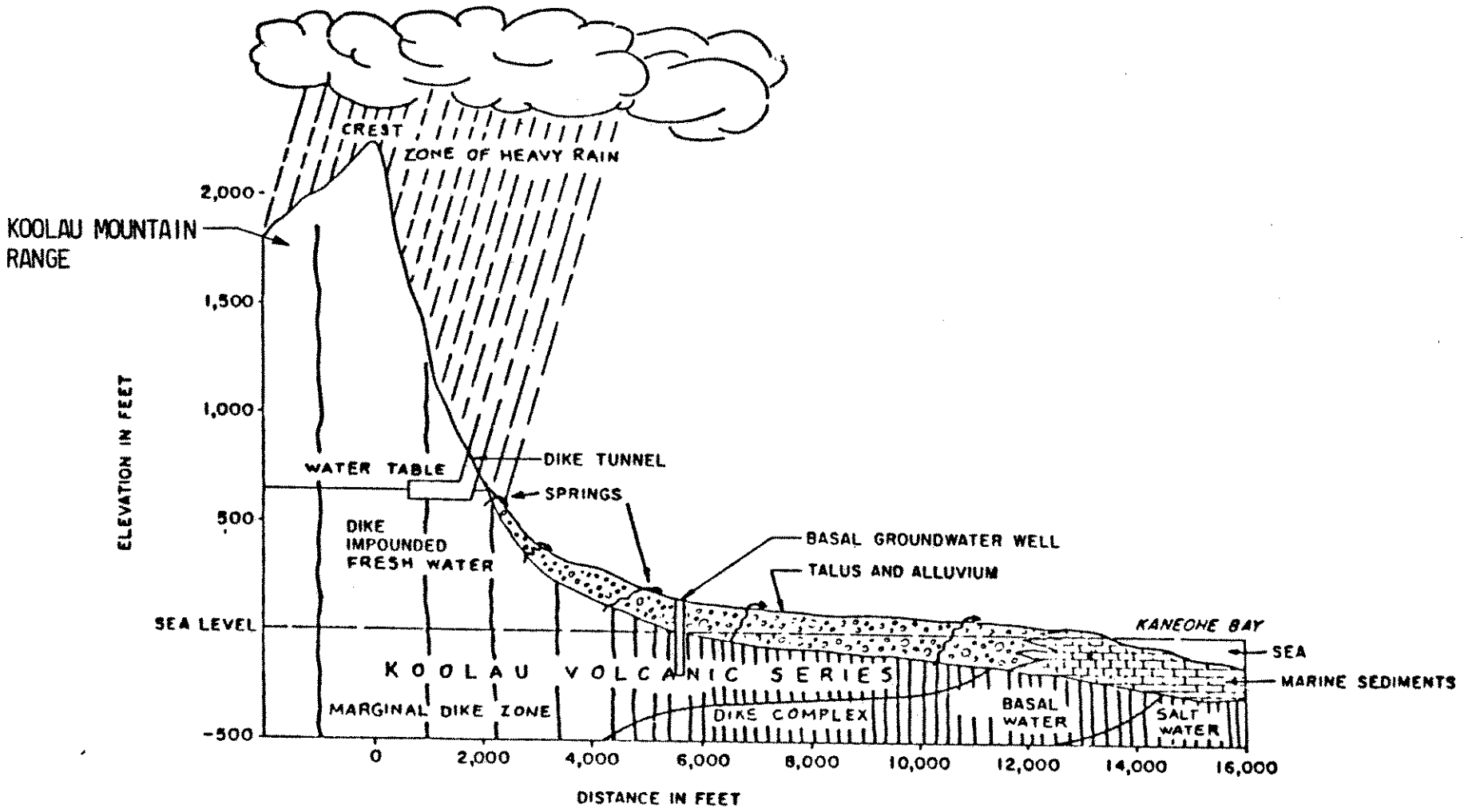
5. Hydrology

a. Groundwater

Infiltrating rainwater, trapped and impounded by a series of parallel vertical dikes in the Koolau Range is the main source of potable water for the Island of Oahu. Wells and tunnels tap this reservoir of water for domestic and agricultural uses. The fresh water basal lens floating on the denser salt water is another source of groundwater supply. Figure III-2 graphically illustrates the geological and hydrological cross section typical of the planning area. These potable water sources must be protected for the health and welfare of the island population.

b. Streams

The planning area includes a series of shallow valleys, less than 3 miles in length, beginning with Ahuimanu Valley at the south end and followed successively by Kahaluu, Waihee, Kaalaea, Waiahole, Waikane and Hakipuu toward the north end. Each valley is drained by a perennial stream (Figure III-3) bearing the same name as the valley, originating at the foothills of the Koolau Range and discharging into Kaneohe Bay. Ahuimanu Stream joins Kahaluu Stream. From that junction until the stream discharges into Kaneohe Bay, it is known as Kahaluu Stream. Waihee Stream joins Kahaluu Stream before the bay is reached. In Waiahole Valley, Waianu Stream joins Waiahole Stream and thereafter it is known as Waiahole Stream. The other streams are distinct and separate. An estimated average daily flow of 41.0 MGD is discharged from these streams into Kaneohe Bay as tabulated in Table III-1.



ADAPTED FROM: OAHU WATER PLAN, BOARD OF WATER SUPPLY, CITY AND COUNTY OF HONOLULU, 1963.

KAHALUU WASTEWATER TREATMENT AND DISPOSAL SYSTEM ENVIRONMENTAL IMPACT STATEMENT

FIGURE III-2

HYDROLOGIC CROSS SECTION

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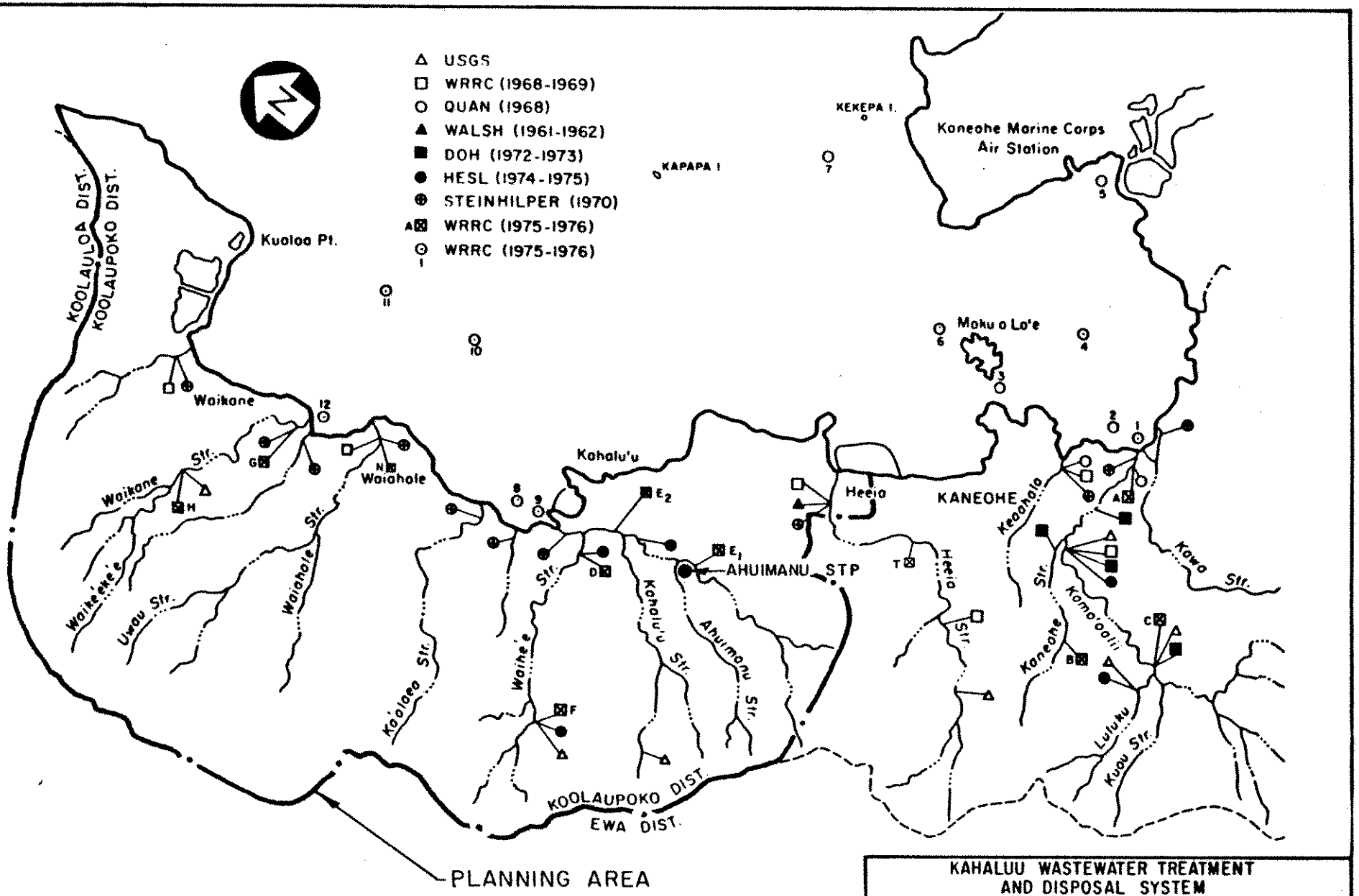

SOURCE: WATER QUALITY MONITORING, KANEOHE BAY AND SELECTED WATERSHEDS, JULY TO DECEMBER 1975 (1976)

KAHALUU WASTEWATER TREATMENT AND DISPOSAL SYSTEM ENVIRONMENTAL IMPACT STATEMENT

FIGURE III-3

STREAMS AND WATER QUALITY SAMPLING LOCATIONS

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TABLE III-1

MAJOR STREAMS WITHIN THE PLANNING AREA

	Stream	Basin Area (Acres)	Mean Daily Flow (MGD)
1.	Kahaluu (Including Ahuimanu, Kahaluu and Waihee)	3,715	20.0
2.	Unnamed, North of Waihee	310	0.8
3.	Kaalaea	920	2.4
4.	Waiahole	2,435	9.0
5.	Unnamed, Between Waiahole and Waikane	593	1.7
6.	Waikane	1,663	6.0
7.	Hakipuu	740	1.1
		TOTAL	41.0

Source: Sunn, Low, Tom & Hara, Inc., "Kaneohe Bay Urban Water Resources Data Evaluation Study: A Report of Available Information Including Analysis and Recommendations Pertaining to the Water Resources of Kaneohe Bay and Tributary Area," Prepared for the U.S. Army Engineer District, Honolulu, Hawaii, April 1976.

6. Water Quality

A significant quantity of surface water quality monitoring data for Kaneohe Bay and streams discharging into the bay has been gathered for the Kaneohe Bay Urban Water Resources Study (KBUWRS) by the Water Resources Research Center at the University of Hawaii for the U. S. Army Corps of Engineers. The study indicated that some of the State water quality standards for these water areas were exceeded while some were satisfied.

The data indicates that Kaneohe Bay is a fairly to poorly mixed system. The poor circulation in the southern portion causes long residence times (up to 39 days) and consequently the water quality there is poorer than that in the northern portions of the bay where circulation is better and the resulting residence time is shorter. Kaneohe Bay has the highest water quality classification, Class AA. Samplings from monitoring stations show that the nitrogen and phosphorus concentrations in the bay waters exceed the established water quality standards of 0.10 mg/l and 0.02 mg/l, respectively (see Table III-2). Nitrogen and phosphorus, both of which are algae stimulating nutrients, are found in higher concentrations in the southern portion of the bay and in lesser concentrations in the northern portion. Elimination of sewage effluent discharge in the southern area by the newly constructed Mokapu sewer outfall is expected to reduce phosphorus and nitrogen concentrations in the southern portion of the bay, but the concentrations are still expected to be high. The discharge of pollutants through streams into Kaneohe Bay has changed in recent years. The intensive agricultural growth of the nineteenth century followed by the recent urbanization of the area has greatly increased the amount of sediment, nutrients, and other pollutants discharged into the bay via streams.

Table III-2 indicates the present and proposed Department of Health (DOH) standards for water quality and the results of water quality analyses conducted at specific sampling stations (Figure III-3) on the streams of the planning area.

TABLE III-2

MEASURED POLLUTANTS IN STREAMS

Location	Sta.	No. Samples	Wet Weather	Total P (mg/l)	Total KN (mg/l)	Total Coliform #/100 ml Median	Total Coliform #/100 ml Geom. Mean	Fecal Coliform(FC) #/100 ml (Geom. Mean)	Fecal Strep(FS) #/100 ml	FC:FS Ratio	Stream Flow (cfs)	Source[5] of Pollution
Current DOH Standards												
Class AA				.02	0.10[1]	70[2]	230[3]	200(400)[4]				
Class 2				.20	N/A	1,000	(2,400)	200(400)				
Proposed DOH Standards												
Embayments				.020(0.035)	.20		N/A	200(400)				
Streams				Dry .030(0.06)	Dry .180(0.38)		N/A	200(400)				
				Wet .050(0.10)	Wet .250(0.52)		N/A	200(400)				
Streams												
Waikane	H	13		.025	.11	375	5,400	830	510	1.63	0.6	mixed
	G	13		.067	.09	240	5,600	780	1,550	0.50	0.8	animal
	G	6	X	.08	.30	-	-	5,280	5,800	0.91	12	animal
Waiahole	N	4	X	.115	.22	-	-	977	340	2.87	2.3	mixed
Waihee	F	13		.04	.06	4,300	4,000	330	303	1.09	1.7	mixed
	D	13		.29	1.21	78,000	100,000	19,900	28,200	0.71	3.4	animal
	D	6	X	.52	2.20	-	-	100,000	45,000	2.22	-	mixed
Kahaluu	E_2	13		.12	.71	20,000	19,820	3,900	1,810	2.15	3.1	mixed
	E_2	5	X	.29	1.08	30,000		17,550	7,200	2.44	7.4	mixed
Ahuimanu	E_1	13		.85	1.92	25,000	41,250	630	1,760	0.36	0.8	animal
Heeia	T	3	X	.03	.38	-	-	833	367	2.27	4.4	mixed
Kaneohe Bay												
Near Waiahole-Waikane	12	8		.07	.09			9	30	0.30		animal
	12	1	X	.035	.54		2,300	1,500	1,300	1.15		mixed
Near Kahaluu-Waihee	8	8		.05	.07		2	2	2	1.00		mixed
	9	8		.06	.12		185	185	1,120	0.17		animal
	9	3	X	.04	.56	-	-	20	3,270	0.01		animal

NOTE: Bacterial Standards are based on 30-day average, not to exceed given limits.
N/A - None available.
( ) Not more than 10% of samples to exceed these values for current standards.
Not to exceed these values more than 10% of time for proposed standards.

(1) Concentrations in terms of Total Nitrogen (TN) instead of Total Kjeldahl Nitrogen (Total KN).
(2) Based on median values, not arithmetic average.
(3) Not to exceed these values at any time.
(4) None available, however, it should not exceed limitations set for Class A, 1 and 2 waters of 200(400).
(5) FC:FS less than 1.0 indicates wastes from animal sources.
FC:FS greater than 4.0 indicates wastes from human sources.
FC:FS greater than or equal to 1.0 but less than or equal to 4.0 indicates human-animal mix.

SOURCE: "Water Quality Monitoring: Kaneohe Bay and Selected Watersheds, July to December 1975" Technical Report No. 98, Water Resources Research Center, University of Hawaii, Honolulu, Hawaii, May 1976.

The table indicates that the present DOH standard (0.20 mg/l) for total phosphorus for Class 2 streams was not exceeded in the Waiahole and Waikane streams but was exceeded in all the other streams. The proposed DOH phosphorus standards of 0.030 mg/l (dry) and 0.050 mg/l (wet) are much more stringent and were exceeded in all of the streams sampled.

The total Kjeldahl nitrogen readings in all of the streams exceeded the proposed DOH standards, with the exception of Waiahole Stream.

The fecal coliform (FC) analyses indicated that all streams sampled exceeded the present and proposed DOH standards, with higher concentrations in Ahuimanu and Waihee Streams. The fecal streptococcus (FS) content, although not addressed in the standards, was also high. The fecal streptococcal concentration can be compared with the fecal coliform concentration to indicate the probable cause of pollution (FC:FS greater than 4 implies human source; FC:FS less than 0.6 implies non-human warm blooded animal source; FC:FS greater than 0.6 but less than 4.0 implies mixed or "old" human sources). The ratio of FC:FS in Table III-2 ranges between 0.6 to 4.0, indicating the presence of mixed animal and human wastes. Fecal coliform found in the Waikane, Waiahole and Heeia Streams may indicate contamination of these streams by cesspools in the area. The high readings of pollutants in the lower reaches of Ahuimanu and Kahaluu Streams may relate to the discharge into Ahuimanu Stream from the Ahuimanu STP. In Waihee Stream, the high readings may be influenced by runoff from the piggery adjacent to Waihee Stream.

In summary, these studies quantify the degree of contamination of Kaneohe Bay and its tributary streams. These studies did not attempt to identify the sources of pollution. One can

speculate that cesspools may be one source of pollution but an extensive field study would be necessary to verify the specific locations and sources of pollution.

7. Floods and Tsunamis

The planning area is subjected to occasional flooding during periods of continuous rainfall. The recently completed flood insurance study by the U. S. Army Corps of Engineers identifies the lower reaches of Ahuimanu, Kahaluu, Waihee, Kaalaea, Waiahole and Waikane Streams and the low-lying coastal regions at the mouths of these streams as flood plains. These flood plain limits, based on an estimated 100-year flood peak discharges, are outlined on Figure III-4.

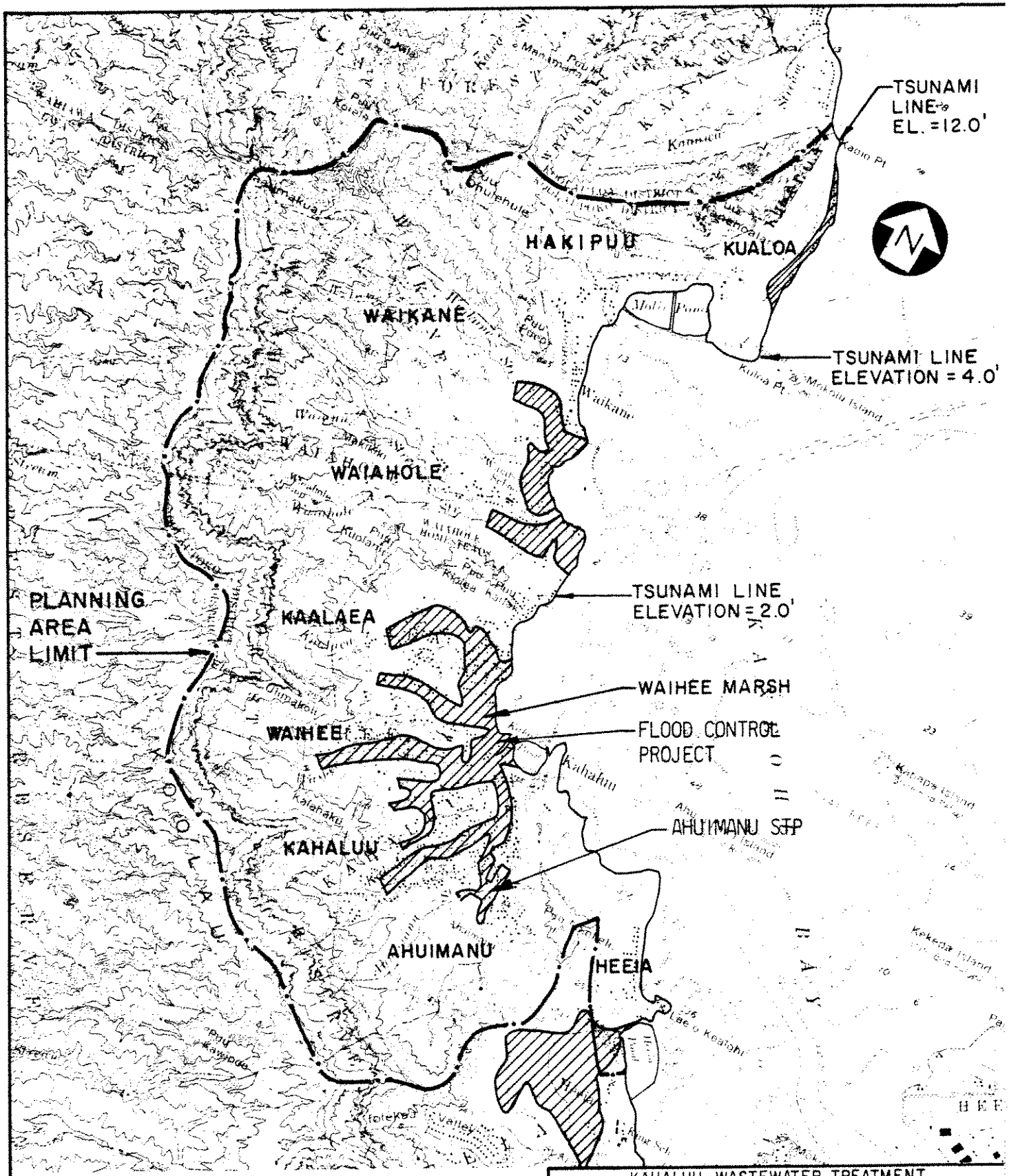
A flood control project for the Kahaluu-Waihee Stream by the U. S. Soil Conservation Service and City and County of Honolulu is currently underway. Completion of the project will alleviate much of the flood problems in this area.

The entire low coastal area along Kaneohe Bay is also subject to flooding by tsunami. However, tsunamis rarely occur and the inundations predicted do not exceed two feet above mean sea level in the planning area, except for the area between Kualoa Point and Kaoio Point where they may vary from 4 to 12 feet.

Construction of wastewater facilities within these flood areas will require that every precaution be taken to safeguard the facilities against costly flood damage.

8. Air Quality and Noise Levels

No useful data is available on the air quality and noise levels within the planning area. However, the lifestyle and physical character of the area have created an atmosphere of



KAHALUU WASTEWATER TREATMENT AND DISPOSAL SYSTEM
ENVIRONMENTAL IMPACT STATEMENT

FIGURE III-4

FLOOD PLAINS, WETLANDS, AND TSUNAMI LINE IN PLANNING AREA

CITY AND COUNTY OF HONOLULU
DEPARTMENT OF PUBLIC WORKS

clean air and low noise levels. More than 50 percent of the area's 12,300 acres is in forest reserve or conservation use, which helps create a clean, quiet environment. Cool prevailing northeast tradewinds and high annual rainfall also enhance the environment. The overall dense foliage cover and high rainfall keeps dust levels to a minimum and create an atmosphere of clean fresh air.

9. Environmentally Sensitive Areas

a. Wetlands

A comprehensive survey of Hawaii's low elevation wetlands entitled Wetlands and Wetland Vegetation of Hawaii was completed in 1977. It identified Waihee Marsh (Figure III-4) as the only wetland within the planning area. Waihee Marsh lies adjacent to Kamehameha Highway between Waihee Road and Wailehua Road and extends about 1,000 feet inland of the highway. A stream from the west empties into the marsh where it becomes undefined in the matted growth of bulrush, honohono and California grass, predominant throughout the 30 acres of the marsh. The underlying soil is mucky with 1 to 2 feet of standing water. Residential homes surround the marsh land. The proposed action will not disturb this sensitive area.

b. Coastal Zone

Chapter 205A, Hawaii Revised Statutes, establishes rules and regulations relating to environmental shoreline protection for all the islands of the State, for the purpose of preserving, protecting and restoring, where possible, the natural coastal zones of the islands. A permit is required for the construction of any development or structure within the Special Management Area (SMA)

established by the County Planning Commission. In general, the lands not less than 100 yards inland from the upper reaches of the wash of the waves and additional inland areas, as established by County, are included in the SMA. The area is specifically defined on tax maps on file with the Department of Land Utilization, City and County of Honolulu. The proposed action will involve some construction within the SMA.

c. Kaneohe Bay

Kaneohe Bay has a surface area of approximately 20 square miles with depths ranging from 50 feet to less than one foot. A shallow offshore barrier reef at the entrance to Kaneohe Bay separates it from the open ocean. There are two navigational channels through the barrier reef, one at the north with a 30-foot depth and one at the south with a 10-foot depth. It is estimated that the average daily tidal exchange for the bay is 26 billion gallons. Nine perennial streams, a number of intermittent streams, surface flows and direct groundwater leakage discharge an average total of approximately 75 MGD of fresh water into the bay, including portions outside the planning area. Two sewage treatment plants which previously discharged 4.0 MGD of effluent directly into the southern portion of Kaneohe Bay have diverted their discharge into the recently completed Mokapu Outfall off Kailua Bay. There is, however, 0.3 MGD of effluent still being discharged from the Ahuimanu tertiary STP into Ahuimanu Stream which empties into Kaneohe Bay.

Sedimentation of Kaneohe Bay has occurred from both marine and terrigenous sources. Since 1927, there has been an average shoaling of 3.3 feet within the lagoon of

Kaneohe Bay. It has been estimated that 60 percent of the sediment is carbonate material from the reefs, 13 percent from dredging spoils and 27 percent from terrigenous detritus. Eighty-seven percent of the land-derived component occurs in the south bay. Recent urbanization, and the associated development that goes with it, has increased the amount of sediment that stormwaters carry into the south portion of the bay.

Circulation within the bay is largely the result of the average daily tidal exchange of 26 billion gallons. Currents are strongest near the channels on the north and south ends of the barrier reef and are weaker in the confined southern part of the bay. The surface layer circulation is primarily dependent upon the wind. Currents are slower with depth and exhibit a tidal dependence near the two main channels. It is believed that the wastewater management plan for Kahaluu may be an important factor in restoring the marine environment of Kaneohe Bay to the designated Class AA water quality standard.

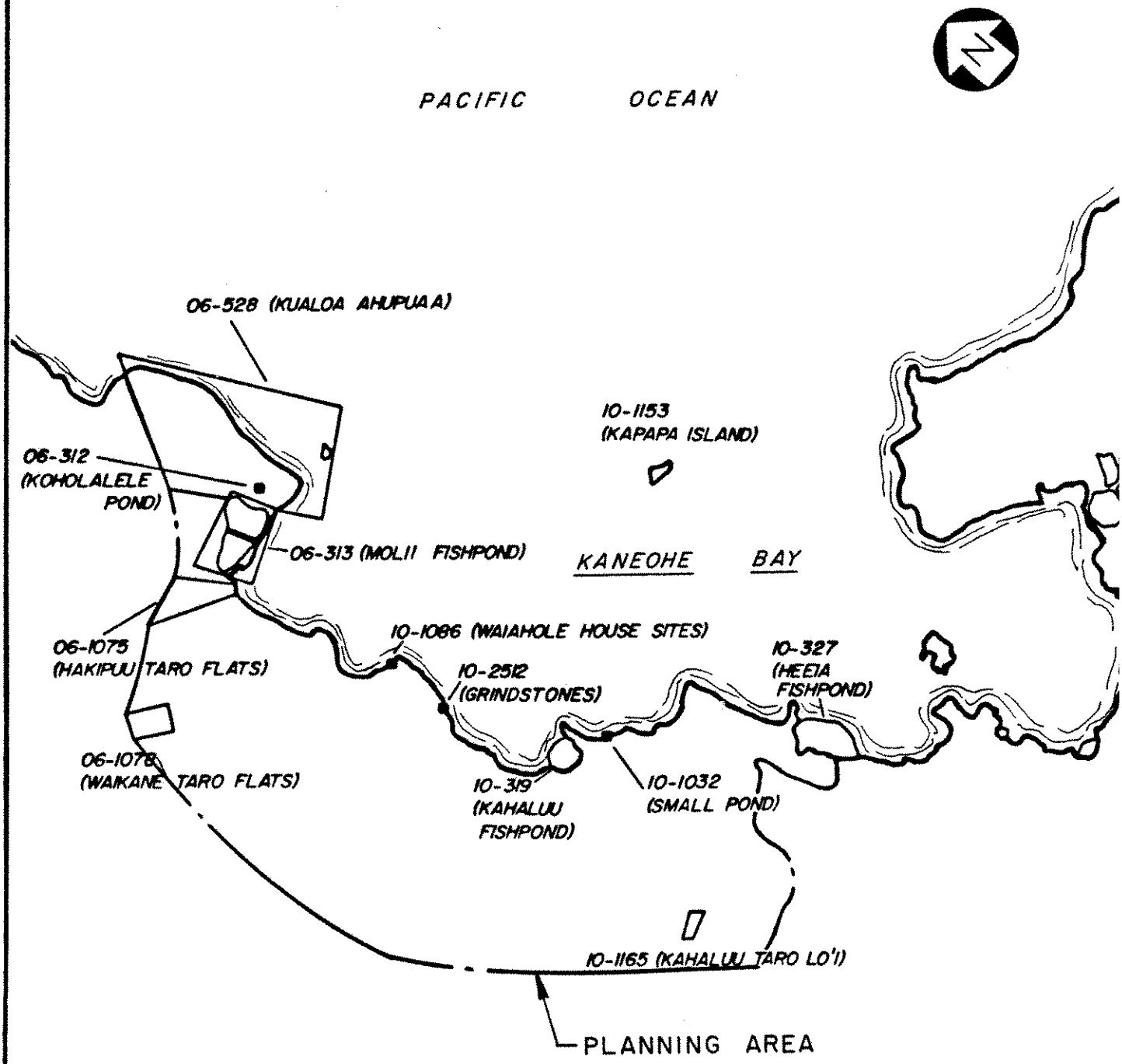
10. Historic and Archaeological Sites

The recent study entitled, Planning Alternatives for Historic Sites in the Kaneohe Bay Area lists eleven registered historic sites (Figure III-5) that have been identified within the planning area. Table III-3 lists the sites with their probable use, ownership and status in terms of National or State Registers of Historic Places.

11. Flora and Fauna

Flora

The planning area receives a high level of rainfall and is generally densely vegetated, especially in the undeveloped areas. Approximately 50 percent of the land is in forest reserve. There are no known endangered or rare flora species in those limited areas now being considered for the construction of wastewater facilities.



Adapted from: Kaneohe Bay Urban Resouces Study
U.S. Army Engineer District
Honolulu, September 1977

KAHALUU WASTEWATER TREATMENT
AND DISPOSAL SYSTEM
ENVIRONMENTAL IMPACT STATEMENT

FIGURE III-5

REGISTERED HISTORIC SITES
IN PLANNING AREA

CITY AND COUNTY OF HONOLULU
DEPARTMENT OF PUBLIC WORKS

TABLE III-3

REGISTERED HISTORIC SITES IN THE PLANNING AREA

	Site	Period	Owner	Registered Status
312	Kohalalele Pond	?	C	S
313	Molii Fish Pond	P & H	P	N & S
319	Kahaluu Fish Pond	P & H	P	N & S
327	Heeia Fish Pond	P & H	P	N & S
528	Kualoa Ahupua'a	P & H	C & P	N & S
1032	Small Pond	P	P	S
1075	Hakipuu Taro Flats	P & H	P	S
1078	Waikane Taro Flats	P & H	P	N & S
1086	Waiahole Houses	H	P	S
1165	Kahaluu Taro Lo'i	P	P	N & S
2512	Grindstones	?	P	S

Period: P = Precontact H = Historic ? = Unknown

Owner: C = County S = State F = Federal P = Private

Register Status: N = National S = State

Source: Chiniago, Inc., "Kaneohe Bay Urban Water Resources Study: Planning Alternatives for Historic Register Sites in the Kaneohe Bay Area, Oahu, Hawaii," Prepared for the U.S. Army Engineer District, Honolulu, Hawaii, September 1977.

Fauna

The wild animal life that inhabit the planning area include mongoose, rats, wild pigs, and feral dogs and cats.

The coastal regions include the natural habitats and feeding areas for many introduced exotic birds (cardinals, linnets, sparrows, myna birds and doves). Native herons habituate and feed in the fish ponds of Molii, Kahaluu and Heeia. The Hawaiian owl, pueo, is generally found in the open grassland areas. Figure III-6 indicates the bird habitats and feeding areas.

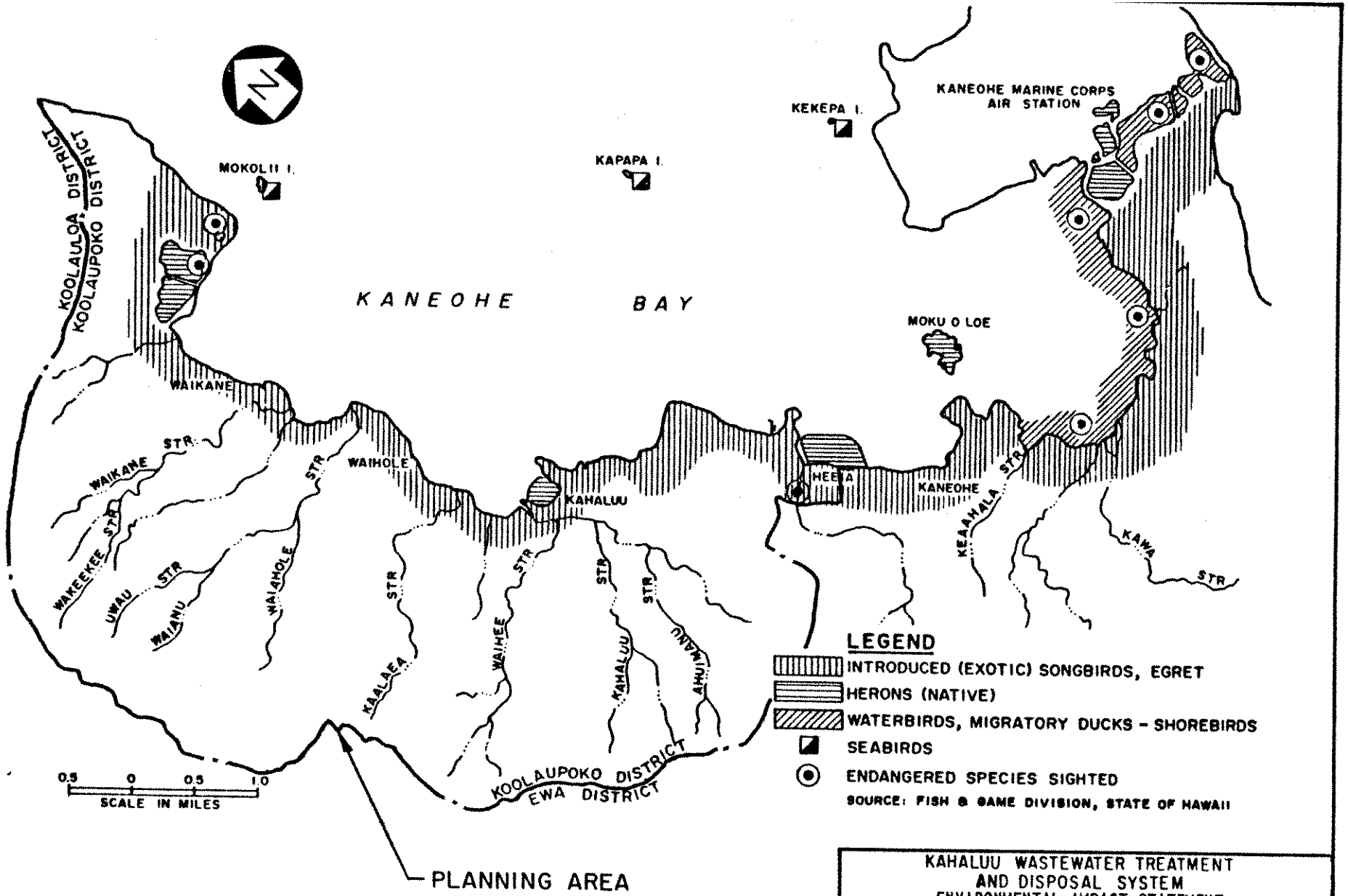
According to the State Division of Fish and Game, the endangered avian species includes the following:

Hawaiian Stilt (Himantopus h. knudseni)
Hawaiian Coot (Fulica americana alai)
Hawaiian Gallinule (Gallinula chloropus sanwichensis)
Hawaiian Duck or Koloa (Anas wyvilliana)
Oahu Creeper (loxops maculata maculata)
Hawaiian Owl or Pueo (Flammeos sandwichensis)

The marshy wet land areas along the shoreline, near mouths of streams and fish ponds, are the natural habitat for the endangered waterbirds. They have been sighted at Kualoa Point, Molii fish pond and the swamp lands near the mouth of Heeia Stream.

The State Department of Land and Natural Resources has reviewed the proposed project areas for possible effects upon endangered species. It concluded that the proposed action will not adversely affect either endangered or non-endangered species as long as reasonable care is taken during construction.

By enhancing Kaneohe Bay's water quality, the endangered avian species, especially, may be benefited.



KAHALUU WASTEWATER TREATMENT AND DISPOSAL SYSTEM ENVIRONMENTAL IMPACT STATEMENT

FIGURE III-6

BIRD HABITAT AND FEEDING AREAS

CITY AND COUNTY OF HONOLULU
DEPARTMENT OF PUBLIC WORKS

B. SOCIO-ECONOMIC ENVIRONMENT

1. Demographic Data

a. Current Population

The 1970 census population for the planning area was 7,100. The 1977 population was estimated to be 11,180. A count was made of the existing family units in the planning area, as of December 1976. In matching the estimated population with the family unit count, a ratio of 3.5 people/unit was derived. This ratio appears reasonable for the planning area. A breakdown of the existing (1977) population by location based on the housing count and 3.5 people/unit, is presented in Table III-4.

b. Population Projections

The City's Department of General Planning has adopted the State's "II-F" population projection for Oahu. Table III-5 indicates the population projections for Oahu and the individual wastewater facilities planning areas, based on apportioned percentages of Oahu's total population. Using the estimated current population distribution, allowing for known future development plans and distributing the remainder of the future population growth in a logical manner, a projected population distribution for the Kahaluu planning area is presented in Table III-6.

The southern portion of the planning area is expected to receive most of the projected population increase with the exception of the population increases resulting from the limited developments now planned for the Waiahole and Waikane Valleys in the northern portion.

The new population projections represent a very low growth rate for the planning area. Since Oahu's projected population is apportioned to the individual facilities planning areas by fixed percentages, and some areas are projected to grow faster than others; these fixed percentages must be reevaluated from time to time by the City Council.

TABLE III-4

EXISTING POPULATION DISTRIBUTION

Subarea	No. of Exist. Family Units (12/76)	Estimated 1977 Population Distribution	Percent of Total Population
AHUIMANU	1,135	3,970	35.5
Urban	1,135		
Agri.	-	3,970	
KAHALUU	1,200	4,200	37.6
Urban	1,150	4,030	
Agri.	50	170	
WAIHEE	110	380	3.4
Urban	50	170	
Agri.	60	210	
KAALAEA	465	1,630	14.6
Urban	350	1,230	
Agri.	115	400	
WAIAHOLE	90	320	2.9
Urban	32	120	
Agri.	58	200	
WAIKANE	70	250	2.2
Urban	38	140	
Agri.	32	110	
HAKIPUU	55	190	1.7
Urban	5	20	
Agri.	50	170	
KUALOA	68	240	2.1
Urban	62	220	
Agri.	6	20	
TOTAL	3,193	11,180	100.0
Urban	2,822	9,900	88.4
Agri.	371	1,280	11.6

NOTE:
1. Heeia-North data not included in totals.
2. Total 1976-1977 population given as 11,180, divided by 3,193 results in average of 3.50 people/unit.
3. All population figures rounded off to nearest ten people.

TABLE III-5

POPULATION PROJECTIONS FOR OAHU FACILITY PLAN AREAS

	1980	1985	1990	1995	2000
WEST MAMALA					
Honouliuli	141,000	162,900	183,900	206,000	226,800
Nanakai	730	780	840	890	950
EAST MAMALA					
Sand Island	333,000	348,400	358,900	368,700	373,900
KANEOHE-KAILUA					
Kailua	42,100	43,100	43,400	43,600	43,100
Kaneohe	34,900	37,100	38,500	39,900	40,600
Kahaluu	11,500	12,000	12,400	12,700	12,900
CENTRAL					
Wahiawa	19,100	19,800	19,900	19,700	18,800
Whitmore Village	2,200	2,300	2,300	2,300	2,200
Mililani	23,200	26,200	29,100	32,100	34,900
WAIANAE					
Waianae	28,400	30,200	31,600	33,000	34,000
WAIMANALO-HAWAII KAI					
Waimanalo	9,000	9,600	10,100	10,600	11,000
Hawaii Kai	25,100	27,400	29,500	31,600	33,500
WAIALUA-HALEIWA					
Waialua-Haleiwa	9,900	10,100	10,100	10,100	9,900
NORTH SHORE					
Kahuku	11,700	12,300	12,700	13,000	13,200

TABLE III-6

POPULATION PROJECTIONS FOR THE PLANNING AREA

	[1]Existing Population	[2]Est. 1980 Population	[3]No. of New Units Planned to be Constr. by 2000	[4]Resulting Population Increase (3.5 peo./ unit)	[5]Est. 2000 Population	[6]Est. 2030 Population
AHUIMANU	3,970	4,130		est. 300	4,430	4,900
KAHALUU	4,200	4,300		est. 200	4,500	4,800
WAIHEE	380	400		est. 50	450	600
KAALAEA	1,630	1,650		est. 100	1,750	2,100
WAIAHOLE	320	320	100 (min)	350	670	800
WAIKANE	250	250	114 (min)	400	650	700
HAKIPUU	190	200		negligible	200	300
KUALOA	240	250		negligible	250	300
TOTAL	11,180	11,500		1,400	12,900	14,500

[1]Total given population disaggregated by counting the number of houses in each area (as of Dec. 1976), multiplying by 3.5 people/house, and rounding off to the nearest ten. The 3.5 people/house was determined by dividing the total population for the area by the total number of houses.

[2]Estimated by adding population to the subareas, in proportion to their percent of the total population, past growth rate, potential for growth and character, so that the total equals the II-F population projection for that year.

[3]Listing of known planned developments; i.e., Windward Partners in Waikane and the State of Hawaii in Waiahole.

[4]Where known developments are planned, 3.5 people/unit are allowed for. The remainder of the population increase predicted by the II-F projections are distributed as in footnote #2.

[5]The sum of columns 2 and 4.

[6]Linear extrapolation of the II-F population projection for the entire planning area to the year 2030 and then distributing the population as in footnote #2 to the subareas.

[7]Heeia-North is not included in the above table since it was not within the original Kahaluu Facility Planning Area.

NOTE: Population projections and distributions given above are at best a rough approximation of the possible growth in the given subareas for the purposes of estimating sewage flow only. They do not attempt to limit or control growth within any given subarea.

It is anticipated that after the 1980 census, the population projections and the percentages used to distribute the population will be reevaluated. The 1980 census may result in a population higher than the projections for the Kahaluu area. The ultimate potential population for the area, based on existing zoning is approximately 40,000 people, yet the population projection now planned for for the year 2000 is only 12,900.

2. Lifestyle and Character of the Area

The character of the area varies widely from the northern to southern end of the planning area. The northern area is very rural in character with agriculture being the major source of income. Residents in the northern area are strongly opposed to any development which would change the lifestyle or character of their area. This feeling is strongest in the Waiahole and Waikane Valleys. Land developers desiring to subdivide and develop land within Waiahole-Waikane Valley have been under strong pressure to keep the land the way it is. It became such a community problem that the State of Hawaii bought 600 acres in Waiahole Valley at a cost of $6,000,000 to keep development from occurring. The southern area is very urbanized. Large subdivisions with high priced housing are typical for the southern area. There is little agriculture and most workers commute to work in other areas. Residents in the southern area do not seem to oppose future development and in many ways expect it to occur.

3. Significant Projects

a. Federal - Flood Control Project

A flood control project by the United States Soil Conservation Service and City and County of Honolulu is nearing completion in Kahaluu. This project includes channel improvements for Kahaluu and Waihee Streams near Kamehameha Highway, and a new bridge for Kamehameha Highway where Kahaluu Stream enters Kaneohe Bay. The

flood control project includes a park-like area around the enlarged water areas. This area around the flood control project will be part of a regional City park in Kahaluu. Acquisition of the park lands and administrative jurisdiction of the bridge are the responsibility of the City and County.

b. State - Hawaii Housing Authority

The Hawaii Housing Authority, State of Hawaii, recently purchased 600 acres of land in Waiahole Valley. This purchase resulted from pressure and lobbying by tenants of the valley who wanted the lifestyle and character of the valley to remain unchanged and opposed the landowner who wanted to sell the valley to developers. Subsequently the State developed a plan for the area which evaluated various alternatives for the State to develop the land and recover its investment. The plan developed several agriculturally oriented, residential development concepts. The residential developments vary from 100 to 300 units depending on the particular concept.

c. City - Park

Kualoa Park near the extreme north end of the Kahaluu planning area is a newly developed City park of 160 acres. The park is designed for an ultimate capacity of 1,000 visitors per day. Future expansion of the park is a possibility if the need arises to protect the natural environment of the nearby ancient Hawaiian fish pond. Kahaluu Park is a planned City park in central Kahaluu which Neighborhood Board #29 is actively promoting. This park area will include the above mentioned flood control improvements, a bay front area and such other areas which Neighborhood Board #29 can get approved.

d. Private Developments

Waikane Valley - Windward Partners, a majority and private landowner in Waikane Valley, intends to develop 144 two-acre lots on land zoned for agricultural use in the

valley and on the west side of Kamehameha Highway. This development is controversial because it might change the character of the valley by bringing in a large number of new residents, probably in the higher income brackets, who can afford the large acreage. In addition, Windward Partners is also planning to construct 14 houses in the residentially zoned land on the east side of Kamehameha Highway. These developments may have a significant impact on the character of the Waikane area. As of February 1980, the City Council has approved only 31 of the 144 proposed lots on the west side of the highway, expressly prohibiting ground disposal of wastewater above the "No-Pass Line" established by the Board of Water Supply. Also, a proposal for only 5 homes on the east side of the highway was pending before the City Council as of February 1980.

Ahuimanu Development - This residential area continues to grow. The developer recently announced the sale of 200 new units, with probably more sales in the future.

Foremost-McCormack is considering a large development below the southern edge of the planning area near Heeia but only a portion of this overall plan is being implemented at present. The bulk of the large development may not occur in the near future due to environmental, planning and financial constraints.

Lewers & Cooke, Inc., has developed plans for the construction of a 500-unit subdivision of mixed single-family and duplex units on a 147-acre site presently zoned for urban development in upper Waihee Valley.

SECTION IV

RELATIONSHIP OF PROJECT TO LAND USE

A. LAND USE

1. Land Use and Zoning

The existing land use designations, shown by State Land Use Districts, are presented in Figure IV-1. Table IV-1 indicates the 1975 existing land use areas. As shown in the table, approximately 13 percent of the area is used for residential purposes and approximately 15 percent for agriculture. Less than 1 percent is used for industrial and/or commercial uses. Conservation, preservation and/or land with public uses amount to approximately 59 percent. The remaining 12 percent is vacant usable land.

The City and County of Honolulu is currently using the Detailed Land Use Map (DLUM) as a guide for future development. The acreage of each of the existing Comprehensive Zoning Code districts for the DLUM of the planning area is presented in Table IV-2. Approximately 14 percent of the planning area is zoned for residential use which allows for an increase of 82 acres in residential area from existing land use. Approximately 3 percent of the planning area is zoned for commercial, industrial and hotel uses, which allows for an increase of 270 acres, from existing land use. Lastly, approximately 25 percent of the area is zoned for agriculture which allows for an increase of 10 percent, or 1200 acres, from existing land use.

2. Governmental Policies Affecting Land Use

Recently, the General Plan for Oahu (1977) was adopted by the City and County of Honolulu. The General Plan establishes the policies for long range comprehensive growth of the island. The General Plan provides guidance as to the long range population distribution on Oahu (Figure IV-2). For the Kahaluu planning area, the southern portion is classified as urban-fringe. This area coincides with the Kahaluu, Ahuimanu and Heeia districts. The northern half is classified as rural.

TABLE IV-1

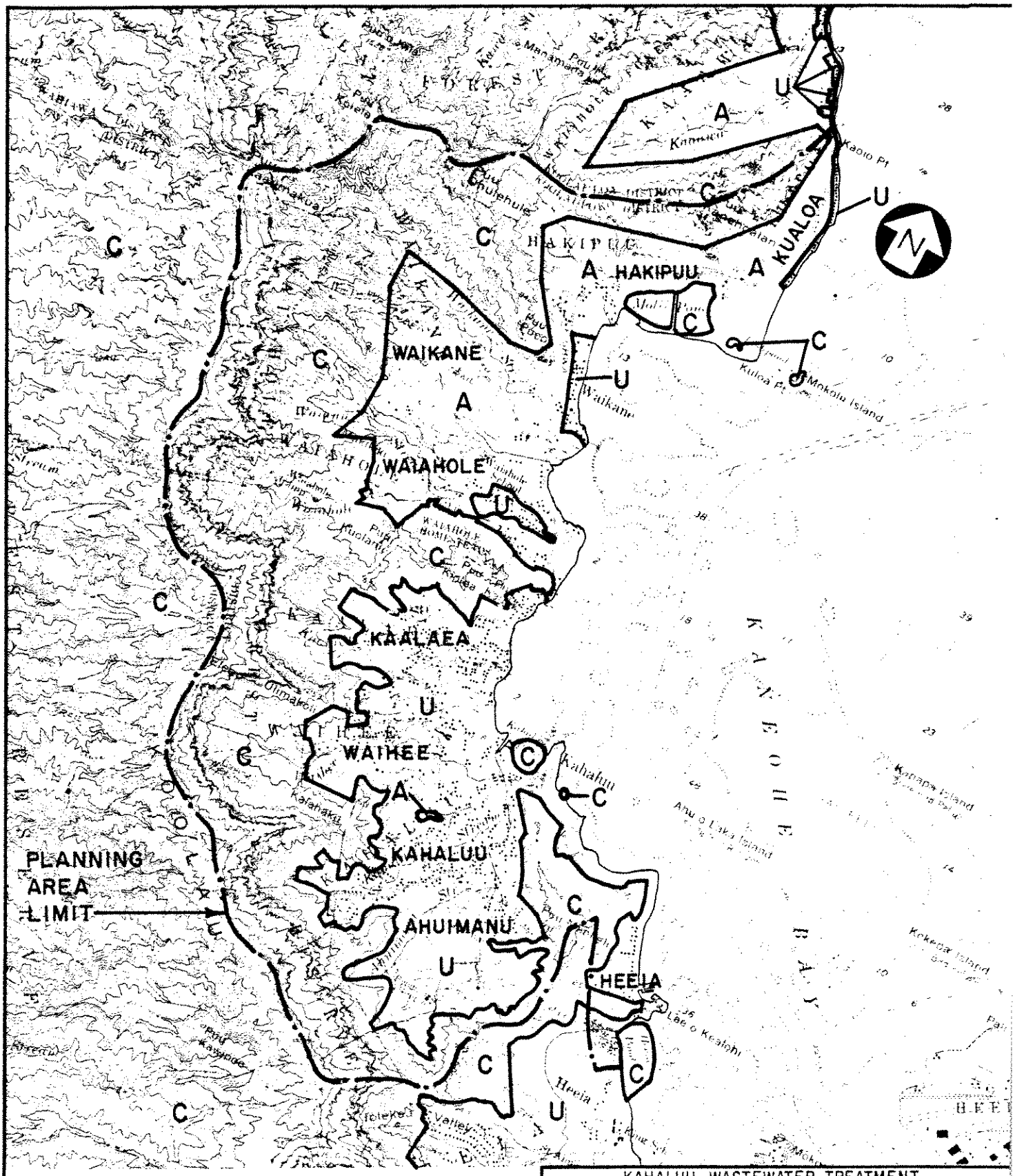
1975 EXISTING LAND USES WITHIN
STATE LAND USE DISTRICTS
IN THE PLANNING AREA
(In Acres)

Existing Land Use	State Land Use District			Total Acres
	Urban	Agricultural	Conservation	
Single Family	858	590	23	1,471
Multi Family	120	--	--	120
Industrial	23	2	12	37
Commercial	36	2	--	38
Agriculture	475	1,257	104	1,836
Vacant Usable	613	263	605	1,481
Other	658	544	6,117	7,319
TOTAL	2,783	2,658	6,861	12,302

TABLE IV-2

1975 COMPREHENSIVE ZONING CODE (CZC) DISTRICTS
IN THE PLANNING AREA
(In Acres)

CZC District	State Land Use Districts			Total Acres
	Urban	Agriculture	Conservation	
Residential	1,596	3	3	1,602
Apartment	71	--	--	71
Hotel	26	--	1	27
Commercial	36	--	--	36
Industrial	282	--	--	282
Agricultural	525	2,449	40	3,014
Preservation	156	206	6,817	7,179
Planned Development	92	--	--	92
TOTAL	2,784	2,658	6,861	12,303



LEGEND

A - AGRICULTURAL

C - CONSERVATION

U - URBAN

1 1/2 0 1 2 MILES

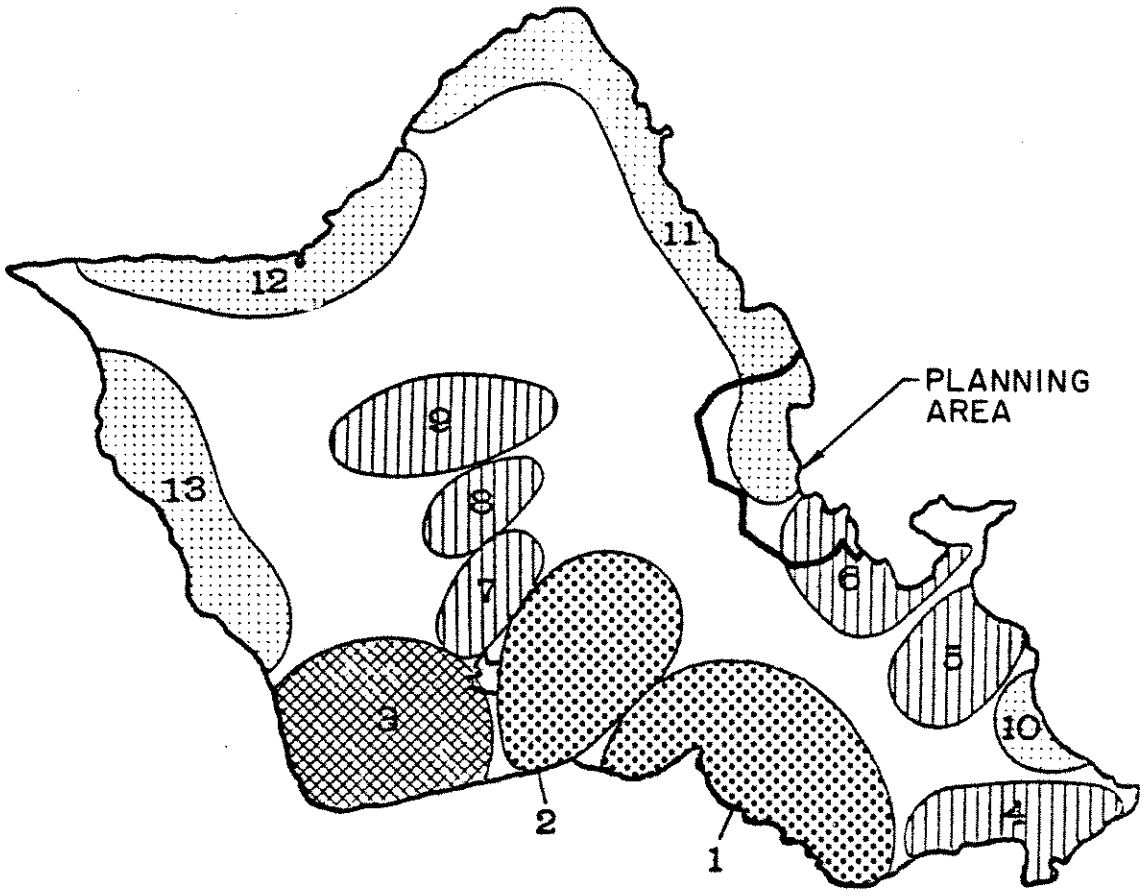
SCALE 1:62500

KAHALUU WASTEWATER TREATMENT AND DISPOSAL SYSTEM
ENVIRONMENTAL IMPACT STATEMENT

FIGURE **IV-1**

EXISTING STATE LAND USE CLASSIFICATION DISTRICTS

CITY AND COUNTY OF HONOLULU
DEPARTMENT OF PUBLIC WORKS



POPULATION AREAS

CITY AND COUNTY OF HONOLULU

LEGEND

PRIMARY URBAN CENTER
1. Honolulu (Waialae/Kahala-Halawa)
2. Aiea-Pearl City

SECONDARY URBAN CENTER
3. Ewa - Makakilo

URBAN-FRINGE
4. Aina Koa - Hawaii Kai
5. Kailua
6. Kaneohe - Ahuimanu
7. Waipahu - Crestview
8. Mililani - Waipio
9. Wahiawa

RURAL
10. Waimanalo
11. Kahaluu - Kahuku
12. North Shore
13. Waianae Coast

Adapted from: General Plan
City and County of Honolulu
January 18, 1977

KAHALUU WASTEWATER TREATMENT
AND DISPOSAL SYSTEM
ENVIRONMENTAL IMPACT STATEMENT

FIGURE IV-2

POPULATION AREAS

CITY AND COUNTY OF HONOLULU
DEPARTMENT OF PUBLIC WORKS

The City and County's Detailed Land Use Maps (DLUM's) and the Comprehensive Zoning Code (CZC) are the relevant documents pertinent to land use. The City and County is presently preparing Development Plans for each district of Oahu to replace the DLUM's. The completion date of these Development Plans is now estimated to be in 1980.

The relationship between the DLUM's and CZC is as follows. The land use shown on the CZC governs, regardless of what is shown on DLUM (also the Development Plan, when adopted). If the DLUM but not the CZC shows a use, the CZC must be amended. Present law allows only the property owner to initiate CZC amendments. Therefore, unless this statutory provision is revised, no widespread rezoning of the CZC to match the Development Plans is expected.

3. Kahaluu Neighborhood Development Plan

The local Kahaluu Neighborhood Board #29 has drawn up a proposed development plan which shows specific land use designations differing from the current City zoning. This plan is a local effort and should not be confused with the Development Plan presently being prepared by the City and County of Honolulu. There are three main areas of change between the existing DLUM and the neighborhood development plan. The first is a change to agriculture in the area zoned for urban development in the upper Waihee Valley. Second, there is a change in the lower valleys of Kahaluu and Waihee along Kamehameha Highway from commercial to a community center and park area. In connection with this community center concept, the Neighborhood Board is very opposed to the siting of a previously planned wastewater treatment facility in this area. Third, there is a change to residential in the area zoned for resort development along the shoreline in Kahaluu.

In addition, the Neighborhood Board would like to see little or no growth in the northern areas of Waiahole, Waikane, Hakipuu and Kualoa. This thinking conflicts with the developments proposed in Waiahole and Waikane Valleys by the State of Hawaii and Windward Partners, Inc.

The Oahu General Plan requires that development plans for specific areas be reexamined with residents of that area to receive their input. If the community desires are within the limits of the Oahu General Plan, attempts will be made to adjust the General Plan to correspond with the community desires.

B. COMPATIBILITY OF PROJECT WITH LAND USE POLICIES

The proposed project is consistent with the governmental land use policies and the development plan advocated by the local Neighborhood Board.

The proposed collection system will be expanded only into areas designated for urban use. The areas of Kahaluu, Ahuimanu and Heeia are classified as urban fringe, where some long range population growth is planned. The proposed collection system will serve the portion of Ahuimanu which is presently unsewered as well as Kahaluu.

The proposed project will not utilize the DLUM site set aside for a permanent wastewater treatment plant for Kahaluu. This action is compatible with the views of the local residents who oppose a treatment plant at this site.

The no project recommendation for the Waiahole, Waikane, Hakipuu and Kualoa subareas is consistent with the governmental land use policy and local opinion which advocate limited growth and a preservation of agricultural land.

SECTION V

THE PROBABLE IMPACTS OF THE PROPOSED ACTION ON THE ENVIRONMENT

The impacts of the proposed action on the environment may be classified in two categories: direct and indirect. Direct impacts are associated with the construction activity of the project, i.e., dust, noise, and traffic disruption. Direct impacts are generally of a short term nature. Indirect impacts may result from the provision of a public facility such as a sewerage system. Uncontrolled population growth, urban sprawl, induced land use changes, and pollution from urban runoff are some examples of indirect impacts. The effects of indirect impacts are generally long term in nature.

A. IMPACTS OF NO ACTION

The impacts of no action for the Waiahole, Waikane-Hakipuu, Kualoa, and Heeia-North subareas are limited to the indirect or long term type. Since no construction activity will be involved, there are no short term direct impacts. The indirect impacts are generally related to the retention of the on-site systems, primarily cesspools, as the wastewater management systems for the subareas.

1. Water Quality

The water quality problems associated with the no action alternative of the continued use of cesspools include the probable contamination of the groundwater and surface water resources by cesspool leachate. These water quality problems may warrant further monitoring and investigation by the State Department of Health but they are not believed to be significant at this time.

2. Indirect Economic and Social Impacts

The no project action is compatible with the desires of the residents who wish to maintain their present lifestyle and cultural values. This action will not induce any changes in land use or urbanization.

B. IMPACTS OF THE PROPOSED WASTEWATER SYSTEM

1. General

The environmental impacts of the proposed wastewater management system project are both direct and indirect. The short term direct impacts are associated with the construction of the facilities. The indirect and long term impacts are related to the long term operation of the facilities.

2. Direct Impacts

The proposed project consists of two separate systems: the collection system serving the Kahaluu-South, Kahaluu-East and Kahaluu-North subareas and the transmission system for conveying the wastewater from the Ahuimanu STP to the Kaneohe STP for treatment. The components of the collection system include gravity sewers, force mains, and pump stations. Components of the wastewater transmission system include a force main and a large sewage pump station at the Ahuimanu STP site.

The proposed work will not be in or near the identified historic or archaeological sites. The State Historic Preservation Office will be notified of any discoveries of this nature made during the work and appropriate measures will be taken.

The impacts of the construction of these facilities are discussed below.

a. Collection System

The alignment of sewers and force mains is almost entirely within existing roadways. Where there are no existing roadways, the sewers will be aligned in areas that will remain as open areas so that access may be provided for maintenance. A total of six sewage pump stations will be installed on small parcels of open land.

No buildings will be removed or torn down for this construction work, and there are no known areas of historical or archaeological significance or environmentally sensitive areas that will be affected by the construction activities. Excavation is expected to be by trenching machines, clam shell cranes or bulldozers. No blasting is expected to be necessary, however, some may be required if areas of unexpected exceptionally hard rock are encountered. Material excavated from trenches or foundations will be stockpiled near the excavation and used as backfill where allowed or disposed of at an approved disposal site.

For trench excavations, approximately 15 cubic yards of select material will be hauled in for pipe cushion per hundred feet of trench. Also, approximately 30 cubic yards of excess material per hundred feet of trench will be hauled away and disposed of at an approved diposal site.

Approximately 65,500 feet of gravity sewers and 14,400 feet of force mains will be installed.

Very little natural flora or fauna will be disturbed due to the location of most sewers under existing roadways. Temporary impacts include traffic inconveniences, higher noise levels, increased vehicle emissions and additional dust and particulate matter in the air. An additional impact will be the visual impact of the construction activities on the surrounding area.

b. Transmission of Wastewater Between Ahuimanu STP and Kaneohe STP

The transmission of wastewater from the Kahaluu planning area to the Kaneohe STP will require a new SPS and approximately 26,000 feet of force main. The SPS will be located at the site of the existing Ahuimanu STP.

It will have an equalization basin to moderate hydraulic surges and a pumping capacity of 1,200 gpm. Construction of the SPS, equalization basin and ancillary facilities at the Ahuimanu STP site will be wholly contained within the site. These are conventional construction projects and no adverse effects are expected at any location off the STP site itself. It will pump through approximately 26,000 feet of 14-inch diameter force main to the Kaneohe STP, with the alignment as shown on Figure II-9. Most of this force main is located along Kahekili Highway. Since Kahekili Highway is part of the primary roadnet serving the Island of Oahu, the primary impact will be the delays and inconvenience to traffic along this well-used route.

Since the force main is generally located within the road right-of-way, very little natural flora and fauna will be disturbed and historic sites will not be affected. The major environmental impact will be the disturbance to the Kaneohe Stream ecological system by the trenching operations for the force main crossing.

3. Indirect Impacts

a. Impacts Related to the Operation of the System

Operation and maintenance of the wastewater facilities will be performed by the Division of Wastewater Management, City and County of Honolulu. The maintenance staff is readily available at any time during the day to troubleshoot any operational problems or to handle emergencies.

The collection system should have a positive impact on groundwater quality since wastewater disposal by cesspools will be eliminated. The only adverse impacts associated with the operation of the collection system are the possible low-level noises from the sewage pump stations and possible odors emanating from sewer manholes. Another impact will be visual because of the aboveground portion of the sewage pump stations.

The impacts of operating the wastewater transmission system are similar to those of the collection system except that the sizes of the facilities are larger and the associated noise, odor and visual impacts are somewhat greater.

b. Induced Environmental Impacts

Construction of the proposed facilities will divert the present effluent discharge into Ahuimanu Stream (and Kaneohe Bay) from the Ahuimanu STP. This diversion will improve the water quality of these affected water bodies. One adverse impact that may result from effluent diversion is that the nutrients (nitrogen and phosphorus) in the effluent are beneficial to the marine ecosystem. The ecosystem equilibrium may be disturbed by this proposed action.

A positive impact will be the elimination of the discharge of cesspool effluent to the groundwater since the collection system will replace cesspools. Potential health hazards associated with defective cesspools will be reduced substantially. The pollutants which percolate through the soil will be eliminated after a while.

Another impact is that the existing Ahuimanu STP will be taken out of service and converted to a screened and degritted wastewater pumping station. The area now occupied by the treatment process can be used for other beneficial uses.

The incremental impacts of treating the Kahaluu Wastewater flows at Kaneohe STP should be minor since a large quantity of flow is already being treated there. The Kahaluu flows are less than 25 percent of the present design capacity of Kaneohe STP. Some plant expansion is planned to accommodate the growth in the Kaneohe area and the Kahaluu flows. Hydrogen sulfide may be a problem because of the long detention time.

SECTION VI

PROBABLE ADVERSE IMPACTS WHICH CANNOT BE AVOIDED

The effects of the unavoidable, adverse impacts of the proposed action are summarized in this SECTION. The rationale for proceeding with the proposed action in spite of these adverse impacts is discussed.

A. NO ACTION FOR HEEIA-NORTH, WAIAHOLE, WAIKANE-HAKIPUU, KUALOA SUBAREAS

1. Unavoidable, Adverse Impacts

The primary adverse environmental impact of "no action" is the continued discharge of cesspool effluent into the soil through the continued use of cesspools as the primary means of wastewater disposal.

There are approximately 300 cesspools presently in service in these subareas of which nearly 20 percent are defective. Under no action, no attempt will be made to improve the performance of these defective cesspools or those cesspools that may become defective in the future. The present practice of cesspool pumping by the City and County of Honolulu will be continued and the costs for this service will be subsidized in part by the public, at least for the near future.

Similarly, wastewater disposal in new developments in unsewered areas will be in accordance with the current regulations and policies of the State Department of Health and other regulatory agencies. Chapter 38: Private Wastewater Treatment Works and Individual Wastewater Systems, of the State Public Health Regulations lists the allowable types of disposal systems.

The potential problems associated with the continued use of cesspools include the required pumping of defective cesspools and the potential public health problems due to cesspool leachate contamination of groundwater and overflows during heavy rains. The monitoring of streams in the planning area has shown some evidence of pollution. Bacterial ratios indicate that the pollution is at least partially from human waste.

The small number of cesspools in some of these outlying areas does not appear to be sufficient to cause a real health hazard, but cesspools near the streams are suspected as a potential source of contamination. There are no extensive records of monitoring and investigation of stream and bay pollution by the Department of Health that could be used for further, more detailed analysis of the pollution problem. Cesspools therefore will remain as a probable source of some of the pollution in the streams of the planning area.

2. No Action Rationale

The rationale for proceeding with the no action recommendation in spite of these adverse impacts includes the following:

a. There is no affirmative demonstration that cesspool leachate is contaminating the surface and groundwater sources.

b. The subareas have a very low population density.

c. The subareas are agriculturally oriented.

d. There is a strong local opposition to any development within these subareas which might induce changes to their rural lifestyle.

e. There are adverse fiscal impacts associated with the installation, operation, and maintenance of an upgraded wastewater system. The cost per household would be excessive for families with low incomes. The initial capital cost for installing an individual on-site aerobic unit and effluent leaching field is about $4,000. The annual cost of operating and maintaining this system is about $270. In comparison, the cost to the homeowner of pumping a malfunctioning cesspool is $12.35 per call by the City truck.

B. WASTEWATER SYSTEM FOR AHUIMANU, KAHALUU-NORTH, KAHALUU-SOUTH, AND KAHALUU-EAST SUBAREAS

1. Adverse Impacts

The adverse environmental impacts that will be noticeable to the public include the possible odors emanating from sewer manholes and sewage pump stations and the visual impact created by fenced in sewage pump stations.

One significant adverse impact that may result is that the provision of a sewerage system may have effects beyond the correction of water quality problems. The most important indirect impacts are associated with changes of existing land use due to the sewerage system and the development it allows. The provision of a sewerage system allows planned development. Some impacts of urbanization are increased traffic, urban storm runoff, air pollution, and transportation costs and energy consumption.

Associated with urbanization are some fiscal impacts. These include increased costs associated with providing public services (police, fire, water, roads, education, transportation, recreation). To cover these costs, taxes and fees must be assessed. These assessments will be in addition to the normal sewer fees.

Another adverse impact is that the nutrient-rich effluent from the planning area is a natural resource which will be disposed in the ocean without deriving any potential benefits from its reuse. Another adverse impact is the high monetary cost and long term commitment of our capital and energy resources to the project.

The major economic impact to the property owners will be the initial assessment for the construction of the collection system. Property owners within the Sewer Improvement Districts will be assessed for the improvements at the following rates:

Residential (Single Family Zoning)	$0.16 per sq. ft of property
Multiple Family Zoning	$0.24 per sq. ft of property
Commercial Zoning	$0.20 per sq. ft of property

This assessment is payable to the City and County over a period of 20 years, including the interest charges. In addition, there is a one time cost for backfilling cesspools and installing the house sewers. In addition, the property owners are required to pay the monthly sewer charge for the operation and maintenance of the system.

2. Project Rationale

The project will permit compliance with the present NPDES permit requirement that requires diversion of the present Ahuimanu STP discharge from Ahuimanu Stream (and from Kaneohe Bay). It will improve the groundwater and surface water quality in the subareas. It will eliminate the potential public health problems in the subareas that derive from a high cesspool malfunctioning rate. It will provide a permanent, highly effective wastewater management system for the subareas.

The centralized system is the most cost effective pollution abatement alternative. The average present worth cost for the centralized system is $7,300 per household compared with $7,600 per capita for the next feasible alternative, the improved on-site system.

It is believed that these beneficial impacts outweigh the above adverse impacts.

SECTION VII
ALTERNATIVES TO THE PROPOSED ACTION

A. GENERAL

Wastewater management for the planning area includes several water pollution abatement alternatives. These are: optimization of the performance of existing facilities; no action; small systems, which include improved on-site systems and package plant systems; and the conventional centralized collection, treatment and disposal system. Wastewater management was evaluated on both a regional (Kahaluu-Kaneohe-Kailua) and local (Kahaluu planning area) basis.

Because of the diverse nature of the planning area, it was divided into eight localized subareas for evaluation. The water pollution abatement systems were evaluated for cost effectiveness for each subarea and cost estimates were prepared for each feasible alternative.

B. POLLUTION ABATEMENT SYSTEMS

1. Optimum Operation of Existing Facilities

This alternative evaluates the level of treatment attainable by optimizing the performance of existing facilities. The optimum operation evaluation serves as the baseline for planning additions or modifications to the existing facilities. The existing facilities in the planning area include the Ahuimanu system and approximately 2,000 cesspools. Optimizing the performance of these facilities is discussed below.

a. Ahuimanu STP

The existing facility at the Ahuimanu STP is a tertiary plant which discharges its effluent into Ahuimanu Stream. The plant is designed for 1.4 MGD and the present average daily flow is 0.3 MGD. Although it has been designed for tertiary treatment, the nutrient removal capabilities are less than that required by the Public Health Regulations for discharge into Ahuimanu Stream.

Upgrading the performance of the Ahuimanu STP to the required nutrient removal levels would require significant amounts of capital and operation and maintenance cost. The technology available today cannot provide a cost-effective method of removing nutrients to the required level of nearly 100 percent. The phosphorus level in the stream presently exceeds the Public Health Regulations without any discharge into the stream. In theory, this would require the treatment plant effluent to be of better quality than the stream before discharge would be permitted. In addition, the NPDES Permit Compliance Schedule requires that the discharge into Ahuimanu Stream must be eliminated by 1983. Therefore, it would not be feasible to optimize the Ahuimanu STP for continued discharge into Ahuimanu Stream.

b. On-Site Cesspools

Experience has shown that little can be done to significantly improve older cesspools whose capacity has declined and now require frequent pumping. Chemicals may be added to break down gelatinous materials which adhere to the walls of the cesspool and reduce its capacity. The solids which accumulate at the bottom of the cesspool can be periodically pumped out to improve its performance. Both of these methods offer only a short-term improvement until the same treatment is again required. Eventually the voids in the adjacent soil become clogged and the porosity of the soil at the cesspool perimeter is permanently impaired. The cesspool becomes essentially a holding tank and requires frequent pumping. At this point, the only solutions are to either install a new cesspool or an improved on-site system. However, the present method of financing cesspool pumping costs provides no incentive to the homeowner to abandon his defective cesspool. The homeowner is assessed a relatively inexpensive pumping charge of $12.35 on a per call basis or $4.85/month on an annual contract basis. Homeowners of chemically treated cesspools are charged $4.85/month. The cost of equipment for cesspool pumping and the operation,

maintenance and repair costs of disposing of pumped wastes are paid with City and County General Funds.

There are a number of modifications that could be initiated to prolong the service life of cesspools located in areas with poor soils that function satisfactorily at present but are likely to malfunction with time. However, institutional changes are required to provide the homeowner with the incentive to initiate these modifications. The 208 Wastewater Management Plan for the City and County of Honolulu addresses in detail the institutional changes that should be enacted to overcome the many problems associated with malfunctioning cesspools.

Some of the inexpensive measures a homeowner may take to extend his cesspool service life are to install flow restrictive plumbing fixtures and abstain from disposing his food wastes in the cesspool. Other more expensive measures are the installation of septic tanks and grease traps ahead of the cesspools. Multiple cesspools may also be considered. On-site aerobic pretreatment units are another possibility in which the cesspool is used for effluent disposal only.

2. No Action

The no action or no project alternative occurs when the methods of wastewater treatment and disposal presently used in the planning area are not improved and left basically as is. In other words, action to correct a suspected water quality problem is either delayed or postponed pending further study. With this alternative, the Ahuimanu STP will continue to operate at its present level of treatment and discharge its effluent into Ahuimanu Stream. The solids will continue to be disposed at the City and County operated Kapaa landfill. However, the NPDES permit for the plant stipulates that the present discharge

into Ahuimanu Stream be eliminated by February 1983. With this stipulation, it is not feasible to pursue the no action alternative for the Ahuimanu STP.

There are approximately 2,000 cesspools presently in service of which nearly 20 percent are defective. Under the no action alternative, no attempt will be made to improve the performance of these defective cesspools or those cesspools that may become defective in the future. Corrective action will be deferred until further studies affirmatively demonstrate that cesspool leachate is causing water quality problems. The present practice of cesspool pumping by the City and County of Honolulu will be continued.

Similarly, wastewater disposal in new developments in unsewered areas will be in accordance with the current regulations and policies of the State Department of Health and other regulatory agencies. Chapter 38: Private Wastewater Treatment Works and Individual Wastewater Systems of the State Public Health Regulations presents the allowable types of disposal systems.

3. Small Systems

Small wastewater systems are especially adaptable to low population density areas and offer economical alternatives to the more expensive conventional centralized systems of gravity sewers and centralized treatment and disposal. The use of such small systems is feasible in the many parts of the planning area which are rural and sparsely populated. Small systems can be segregated into on-site treatment requiring no collection system and small flow package plants requiring limited collection and disposal systems. Groundwater and surface water contamination, soil conditions, and economic factors will influence the choice of system.

a. On-Site Systems

(1) Cesspools

The cesspools in Hawaii are usually 6 to 8-foot in diameter and about 30 feet deep, with a concrete cover sealing the top. The sides are lined where soils dictate and are unlined in sandstones, corals, and similar hard materials. In Hawaii, cesspools have long provided relatively inexpensive means for wastewater treatment and disposal in heavily populated areas. Cesspools are presently used in all subareas of the planning area that are not sewered. The continued use of cesspools, especially in the remote sections of the planning area, is one alternative. Individual on-site cesspools or gang cesspools serving a cluster of houses are economical and effective methods of treating and disposing of sewage, where soils, water quality, geology favor such use.

(2) Septic Tank

Septic tanks have found only very limited use in Hawaii, since cesspools are allowed by regulations and operate effectively in many areas. In Hawaii, septic tanks are usually more expensive than cesspools except where cesspools are difficult to dig or are very deep and require lining. The leaching fields or seepage pits associated with septic tanks may create a health hazard during very wet weather and high runoff conditions, and could be a problem in some parts of the planning area.

(3) Waterless Toilet

A waterless toilet (clivus multrum) is a self-contained dry toilet with a special shape facilitating composting of sanitary waste. Its special structural features make it generally feasible only in the construction of new homes. These units may be

installed in existing homes but modifications to the plumbing, electrical system, and structure are required. The humus or decomposed solids in the clivus multrum move down on a sloped tray and are removed occasionally for disposal or reuse as a soil conditioner. The so called gray water which includes dishwater, shower or bath water and water other than from a watercloset is collected and disposed of separately, usually by direct discharge to a seepage pit or a garden. There has been some effort to promote the use of this unit in rural areas of Hawaii where composted waste might be used. This unit may find use where the homeowner does not object to the large size of the unit and the requirement for occasional removal of the solids.

Another version of a waterless toilet is oil operated and uses a special oil fluid to flush human waste into a holding tank. The oil is separated from the waste material and is recycled for use again in the system. The holding tanks require pumping and disposal of the waste at appropriate intervals.

(4) Individual Aerobic Units

There are several small aerobic treatment units about the size of a septic tank which are being sold for home use in Hawaii. These units reportedly aid in solving the problem of clogged leaching fields and seepage pits. The use of these systems in Hawaii is limited, and performance data is limited. However, the aerobic units can provide an effluent which is readily disposable where operation of septic tanks and cesspools is marginal due to poor soil conditions. There are special operational and maintenance costs which must be evaluated, since the units require power for pumps and aeration.

(5) Small System Disposal Techniques

Leaching fields, seepage pits, and evapo-transpiration beds are possible disposal means used for individual on-site systems. These techniques often result from attempts to solve disposal problems on rural sites which are not suitable for cesspools. In some cases developments have been stopped because soil tests indicate that cesspools alone will not function properly on the site.

b. Package Wastewater Treatment Plants (WWTP)

Small collection systems in combination with a package or prefabricated WWTP may be used where the area to be serviced is not large enough for a conventional centralized system or is remote from other centralized systems. An example to be considered is the region of Kualoa at the extreme northern end of the planning area with a localized and limited population. For small developments or clusters of homes, a package WWTP may be installed to treat sewage prior to disposal. These package plants are basically small aerobic units usually confined to a single tank or basin with the various unit processes therein. The degree of treatment may range from primary to tertiary and capacity from 5,000 gpd to 100,000 gpd or more.

Package WWTP's may be feasible as a local solution with construction and maintenance costs borne by the City. However they may be a special operational and maintenance problem for the City. Service crews must be trained for operation and maintenance of the plants and be available for troubleshooting at any time. Another problem is the location of an acceptable effluent disposal site in an area where injection wells are not recommended. Effluent disposal must be in compliance with Chapter 38 of the Public Health Regulations since it becomes a point source of pollution rather than a non-point source. Other

environmental problems must be faced, such as odor, noise, aesthetics and difficulty in land acquisition. If these problems can be economically solved, a package WWTP may be the answer in same areas.

The same basic reasoning applies also to small sewage lagoons, where lagoons are environmentally acceptable and land is available at a reasonable cost. In the use of lagoons consideration must be given to the possibility of groundwater pollution through percolation into the ground at the bottom of the lagoon. Sites are selected with soil conditions which limit percolation. In addition, sealers such as Bentonite can be applied to the bottom and sides of the lagoon. Rubber liners are also a possibility but the cost is high.

c. Non-Conventional Collection Systems

(1) Low Pressure System

This system employs the use of a pump and check valve at each house. A small force main is pressurized and the sewage is transported to a treatment site or to another part of the collection system such as a gravity collection line at a higher elevation. This system is useful in removing wastewater from homes in low areas where gravity sewers will not function. These systems have the construction advantage of using small pipes in shallow trenches, even in irregular terrain. Operation and maintenance costs of these systems are higher than a gravity sewer system, but may be economical where special problems with terrain or trenching exist.

(2) Vacuum System

This system has some of the advantages of the low pressure system, but operates on suction instead of

pressure. The technology of maintaining a vacuum is not as well known in Hawaii as the technology of other systems. It was not evaluated in detail.

4. Centralized Systems

The conventional centralized system consists of three subsystems: an areawide wastewater collection network, a facility to treat the raw wastewater, and disposal system for the effluent and solids. The conventional centralized system is cost effective in high density population areas or where small systems are impractical. A centralized system is uneconomical where urbanized centers are relatively small and widely scattered throughout the planning area.

The degree of treatment required is governed by the selected method of effluent disposal; e.g., the effluent limitations of the receiving body of water or land application considerations. Under current Federal and State regulations, the minimum degree of treatment required for a point source effluent discharge is secondary. In certain cases, tertiary, or advanced, treatment is required. The degree of treatment required for land application is dependent on the method of application and geological conditions of the site.

The common types of secondary treatment are the trickling filter and activated sludge processes. Another alternate method is aerated lagoons. If deep injection wells are selected as the means of effluent disposal, tertiary treatment may be required. Tertiary treatment provides additional removal of solids and nutrients. The treated sludge or solids may be either recycled as fertilizer and soil conditioners or may be disposed in municipal landfills.

The various means of effluent disposal include ocean outfalls, land application, injection wells and seepage pits. The effluent limitations for these various effluent disposal methods are governed by Chapters 37A and 38 of the Public Health Regulations.

C. ALTERNATIVE CENTRALIZED WASTEWATER SYSTEMS

1. Previous Wastewater Management Study

The 1972 study entitled, "Water Quality Program for Oahu with Special Emphasis on Waste Disposal" identified the regional solution as being the most cost effective system for the Kahaluu-Kaneohe-Kailua region. The recommended system was as follows:

"This system will ultimately include four treatment facilities. The existing Ahuimanu Plant will eventually be phased out and flows from this area conveyed to a new secondary treatment facility in Kahaluu. The existing Kaneohe Plant will be maintained and expanded as required. The KMCAS Plant, currently being upgraded to provide secondary treatment, will likewise be maintained. The existing Kailua Plant will continue to serve the Kailua area. The temporary plants serving Pohakupu, Kukanono, Maunawili Park, and Maunawili Estates will eventually be eliminated and raw waste from these areas conveyed to the Kailua facility. It is recommended that activated sludge processes be eventually incorporated at the existing Kaneohe and Kailua Plants.

Secondary effluent from the Kahaluu, Kaneohe, and KMCAS facilities will be pumped to an effluent pumping station at the Kailua Plant, from which the combined effluent from all four facilities will be discharged via a common ocean outfall sewer located off Mokapu Point."

The major concern of this regional study was the continuing degradation of the Class AA waters of Kaneohe Bay. To alleviate the problem, the study recommended that all point source wastewater discharges into Kaneohe Bay be eliminated.

The City and County of Honolulu has taken definite action to implement this recommended system. The key components outside of the Kahaluu planning area have been constructed and are in

operation. The regional effluent disposal system, consisting of the force mains, Kailua and Kaneohe effluent pumping stations, and Mokapu Ocean Outfall, was recently completed. Modifications to the Kailua and Kaneohe Sewage Treatment Plants are presently being evaluated. The only portions of this regional system which have not been implemented are the facilities for the Kahaluu planning area.

2. Regional System or Local System

The Water Quality Program for Oahu study recommended that the existing Ahuimanu STP be phased out and the flows be conveyed to a new secondary plant in Kahaluu. The effluent would be pumped outside of the planning area for disposal in the Mokapu Ocean Outfall.

This recommendation was based on a much higher population projection for the planning area than what is presently projected and used in the Facility Plan. The resultant reduction in wastewater flow indicated that a corresponding reduction in scale of the recommended centralized system for Kahaluu was necessary. Consequently, small flow systems were just as attractive as a large, conventional centralized system.

The Facility Plan reevaluated the Water Quality Program for Oahu (WQPO) recommendation. The alternative wastewater management schemes considered were local (Kahaluu planning area) management and regional (Kahaluu-Kaneohe-Kailua) management. The local wastewater management plan evaluated the cost effectiveness of treating and disposing the pollutant loads within the planning area. The regional wastewater management plan evaluated the cost effectiveness of (1) utilizing the existing and planned facilities in Kaneohe-Kailua for treating and disposing all or a substantial portion of the pollutant loads generated within the Kahaluu planning area, and (2) treating the pollutants within the planning area and disposing the effluent outside of the planning area (the WQPO recommendation).

About 70 percent of the 1977 estimated population of 11,180 reside in the Ahuimanu, Heeia and Kahaluu districts of the planning area. These districts located at the southern portion of the planning area comprise only about a fourth of the total land area. These districts with their comparatively high population densities were identified as the area where the centralized system would probably be the most cost-effective solution.

For the other less populated districts of the planning area, the small systems or no action alternatives appeared feasible. Extension of the Kahaluu-Ahuimanu collection system to service these lower density districts was another alternative that was considered.

The viable alternatives for collection, treatment and disposal for the centralized system were evaluated on the regional and local wastewater management plan basis. Due consideration was given to existing population densities, urban zoning, water quality, public opinion, and Federal and State regulations.

3. Collection System

The areas where a collection system were feasible are the urbanized districts of Kahaluu and Ahuimanu. Extensions of the collection system to serve the coastal and stream areas of the less densely populated districts of Heeia, Waiahole, Waikane, Hakipuu and Kualoa were also evaluated.

4. Treatment and Effluent Disposal Alternatives

The wastewater management options were treating and disposing the wastes within the planning area or transferring either raw or treated wastewater outside the planning area for disposal. The method and degree of treatment for the first, or local, wastewater management option depended upon the effluent disposal requirements. The various treatment alternatives are evaluated below:

a. Local Wastewater Management Treatment and Disposal Alternatives

The NPDES permit for the Ahuimanu STP mandates that effluent discharge into Ahuimanu Stream must be eliminated by 1983. The present state of the art cannot provide treatment levels that are consistent with the stringent effluent limitations of Ahuimanu Stream. Therefore, upgrading the performance of Ahuimanu STP is not feasible.

The Ahuimanu STP was intended to be a temporary plant until a regional plant for Kahaluu was constructed. The current City General Plan (Detailed Land Use Map) shows a WWTP site in Kahaluu adjacent to the Kahaluu Community Center. The construction of a new Kahaluu WWTP would make it economically unfeasible to continue operation of the Ahuimanu STP, since having two separate treatment plants in close proximity would be too costly to operate and maintain. The Ahuimanu STP already exists nearby and it would be more economical to operate this plant than to construct an entirely new plant at Kahaluu. The strong objections of the Kahaluu Neighborhood Board #29 to a WWTP at this site must also be recognized. In addition, testimony presented at a public hearing held on November 29, 1978 at Ahuimanu Elementary School opposed a treatment plant at the Kahaluu site. Therefore, the alternative of constructing a new treatment plant in the Kahaluu planning area was not feasible.

Since the existing effluent discharge into Ahuimanu Stream must be diverted by 1983, alternate means of disposing the effluent from the Ahuimanu STP were evaluated.

Injection wells may be used for disposal in conjunction with secondary or tertiary treatment. The chances of clogging the well walls are much less than with primary effluent or raw sewage. Limitations of injection wells include their location and the impact they have on the

groundwater supply. The Public Health Regulations states that any outlets connected to seepage pits or injection wells adjacent to Class AA waters such as Kaneohe Bay will require extensive BOD, SS and nutrient removals. The stipulated limits are more stringent than that achieved by secondary treatment.

The Water Quality Program for Oahu with Special Emphasis on Waste Disposal recommends that injection wells be utilized only for facilities with a capacity less than 5 MGD. The study also pointed out that the windward Oahu area is not geologically promising for injection and recommended that no injection wells be allowed inland of the Board of Water Supply "cesspool limit line." (See Figure II-5) The reason is that the dike complexes which run in the northwesterly direction impede the seaward movement of groundwaters. Therefore, the discharges of groundwater occur through seepage into the streams and runoff into the nearshore coastal water. Injected effluent in this area would eventually emerge in the stream flows and into the nearshore Class AA coastal waters. It was concluded that injection wells in this area were not feasible.

Land treatment involves the use of plants and soil to remove unwanted contaminants from wastewaters. Land treatment is capable of achieving removal levels comparable to the best available wastewater treatment technology. The method of effluent application to the land and the ultimate use of the effluent determine the required level of wastewater treatment. The potential applications of treated effluent are to irrigate crops and plants, and to recharge the groundwater through slow percolation through the soil.

At the present time, there is limited potential for large scale effluent disposal by land treatment in the planning area. The use of effluent to irrigate large areas of crops

and plants is not practical. The water supply for agricultural use is obtained from rainfall, stream diversions, and wells and is more than adequate. These sources provide the farmer with a supply that is readily available and at almost no cost. When considering the capital and operations and maintenance costs for transmission, distribution and storage, large scale effluent disposal by irrigation is not competitive.

Furthermore, there are presently no golf courses, sugarcane fields or large agricultural acreage in the planning area that would warrant consideration of land application of the entire wastewater flow from the planning area. However, there are several specific areas where land treatment was considered for more limited flows. For example, the use of wastewater in irrigating plots of forage grasses in the Waiahole-Waikane area was explored as a means of disposal. Kualoa Park has an existing irrigation system that could be used for land treatment of sewage flows in that area. However, there are complications of protecting the public and providing storage. Land application was not feasible on a large scale.

b. Regional Treatment and Effluent Disposal Alternatives

The feasible centralized system treatment and effluent disposal alternatives were (1) to collect and pump raw wastewater outside of the planning area for treatment and disposal and (2) collect and treat the wastewater within the planning area and dispose the effluent outside of the planning area. For both alternatives, the collection system will serve the densely populated districts of the planning area.

For both alternatives, the Kahaluu planning area wastewater will be disposed through the Mokapu Ocean Outfall. The outfall was designed to accommodate the projected wastewater

for the entire Kahaluu-Kaneohe-Kailua region for the year 2020. The 2020 projected design peak flow is 92.9 MGD.

For the first alternative, the collected wastewater is conveyed to the Ahuimanu STP site. The Ahuimanu STP is converted to a pump station to pump raw wastewater to Kaneohe STP. Another option is to use the existing facilities to screen and degrit the raw wastewater before pumping to prolong the service life of the pumping equipment. Modifications to the Kaneohe STP are required because of the additional Kahaluu flows.

In the second alternative, secondary treatment is provided at the Ahuimanu STP and the effluent pumped to the Kaneohe Effluent Pumping Station for disposal through the Mokapu Ocean Outfall. Until a sludge utilization plan is developed by the City and County, the sludge will be disposed at the municipal landfill.

The existing Ahuimanu STP can be converted from tertiary treatment to secondary treatment of the present low flows by simply withholding the chemical additives used to remove nitrogen and phosphorus. However, there are some strong doubts about the Ahuimanu "Rapid Block" system ever reaching the plant design capacity of 1.4 MGD at the secondary level. "Rapid Block" systems have usually performed below the design capacity as the systems have approached design flows. Experience has indicated that plant modifications and/or process modifications (e.g., more chemicals) would be required to bring the plant to full capacity as a secondary plant. Also, if flows were to exceed the 1.4 MGD flow, additional facilities would be required. However, the flow was not calculated to exceed 1.4 MGD before the end of the 20-year planning period. The space available at the Ahuimanu site will allow some flexibility for plant expansion and installing an effluent pumping station.

5. Sludge Utilization Plan

The City and County of Honolulu presently does not have a sludge utilization program in effect for Oahu. The sludges from Ahuimanu, Kaneohe, and Kailua STP are presently trucked to the nearby Kapaa Municipal Landfill (Sanitary) for disposal.

The City and County has recognized the potential benefits that may be gained by recycling sewage sludges. The City and County is planning to undertake a sludge utilization study on a regional or island wide basis instead of a planning area basis. Sludge utilization will not be addressed in this report since the City and County is presently preparing a report which will address the sludge utilization alternatives for the Kahaluu-Kaneohe-Kailua region.

D. ALTERNATIVES EVALUATION METHODOLOGY

In evaluating the various alternate wastewater systems, organizational advantages were derived in subdividing the entire planning area into eight subareas. Each subarea has unique features which are better analyzed independent of other subareas, so that proper emphasis can be given to each cost-effective alternative. Figure II-6 delineated the ground coverage of the eight subareas and refers to each by name. Heeia-North was not included in the original planning area but later added to bridge the gap between the planning area and the existing Kaneohe sewer system.

The evaluation process was structured to consider, first, the no action alternative, probably the least expensive and, last, the conventional centralized system alternative, probably the most expensive. For each subarea, the evaluation includes four alternative systems: no action, improved on-site systems, package plants, and centralized systems. Those systems which are obviously not feasible in a subarea are so identified. Only feasible systems are further analyzed with cost estimates.

It should be noted that the area being compared for the various alternatives within a given subarea is limited to the tributary area considered feasible for centralized systems. Unless water quality problems exist, sparsely populated land outside these designated tributary areas would continue to use on-site systems (cesspools), essentially the no action alternative.

The Ahuimanu subarea includes the existing Ahuimanu STP and the probable site for the sewage pumping station for transmission to Kaneohe and ultimate disposal through the Mokapu Outfall. The special analyses for centralized treatment and disposal systems for the entire planning area were considered in this subarea.

The intent of the no action alternative for the nonsewered subareas is to continue in the future, to at least the year 2000, with the existing system of cesspools. Making a cost-effective analysis of continued use of cesspools requires some assumptions in regard to the amount of cesspool pumping required. City records of cesspool pumping were used to determine a yearly cost of pumping. Consideration was given to an increase in pumping over the 20-year planning period, but an increase was not justified since City records indicate no increase over the last few years, and the population is not expected to increase dramatically. However, where no cesspool pumping is presently required, it was assumed that 5 percent would require pumping some time in the future. It was noted that the City does not routinely pump all cesspools. Under the no action alternative this could be considered as a technique for ensuring long-term performance. However, the cost of such area-wide and periodic pumping was not determined.

The Improved On-site System alternative included the evaluation of individual on-site units of an advanced type, with performance better than conventional cesspools. This evaluation assumes that all homes within the area under consideration would be required

to install an improved on-site treatment system. The improved on-site system could be a small, individual aerobic unit or waterless oil operated toilet plus gray water system, or some other of several available systems. For purposes of evaluation, improved individual aerobic units were selected. The aerobic unit was selected because it provides a secondary level of treatment and represents a cost which is comparable to other improved or advanced on-site systems. Information on cost was acquired from local firms doing business with these advanced systems. The disposal method used in conjunction with these systems is based on a leaching field. However, where existing cesspools are not severely impaired, they would be used in lieu of new leaching fields. Because of the lack of useful data, it is assumed that about half of the existing cesspools would be unusable as seepage pits and would require backfilling. The system concept of complete installation of improved on-site, individual systems is feasible only when considered as an alternative to the more expensive package plant and centralized system alternatives.

The Package Plant alternative included small systems with limited and conventional collection systems, small prefabricated treatment plants and local effluent disposal. The collection system for a package plant would be much smaller than for a centralized system. The use of a small package WWTP depends on the availability of a local disposal site for the effluent. If the wastewater flow is very small, the chances of finding a local site for disposal are much better than for large flows. In the cases where this alternative was evaluated, it was assumed that local disposal of effluent is feasible for that area. Where existing homes are to be sewered, it was considered in each case that an existing cesspool must be backfilled.

The Centralized System was the last alternative to be evaluated in each subarea. This system included the collection and conveyance of wastewater from each subarea to the Ahuimanu STP site. Selection

of the area to be sewered was based on an assessment of the present and future (year 2000) population density, zoning, soil permeability, and proximity to the Class AA waters of the bay and to other sewered areas. Collection systems were not considered to be economical for areas with 1-acre and larger lot sizes.

The boundary describing the tributary area of each subarea is generally the limits of the present residential zoning. The agricultural zoned lands, with a few exceptions, were not included in the tributary area because of the very low population densities associated with this particular zoning.

Within every subarea a preliminary design for a collection subsystem was developed. The centralized system alternative is evaluated for residential areas expected to have densities suitable for collection systems. In the case of Waiahole, anticipated future developments by the State in the residential area were analyzed. More than one alternative was considered for the centralized system for the Heeia-North and Kualoa subareas, since these subareas have special characteristics requiring analyses of additional alternatives. Extension of the collection system to the outlying subareas was predicated upon the use of a collection system in the adjacent subarea, otherwise the linking up of the various subarea collection systems for centralized treatment and disposal would not be possible. Tables VII-1, 2 and 3 present the populations (subarea totals and in the areas to be sewered) and sewered area sewage flows as determined for each of the eight subareas for the years 1980, 2000 and 2030. The year 1980 flows indicate essentially the present condition within each subarea. The year 2000 flows were used as the design flows and the basis for the comparative analyses developed for each subarea.

TABLE VII-1

PROJECTED WASTEWATER FLOWS
(BEGINNING OF PLANNING PERIOD)

	Col. 1		Col. 2	Col. 3	Col. 4	Col. 5	Col. 6	Col. 7	Col. 8	Col. 9
	POPULATION		Average Flow Per Capita (gpcd)	Average Sewage Flow (MGD)	Business/ Industrial Flow (MGD)	Infiltra. (MGD)	Design Average Flow (MGD)	Design Maximum Flow (MGD)	Inflow (MGD)	Design Peak Flow (MGD)
	Subarea Total	To Be Sewered								
Ahuimanu	4,130	4,130	78	0.322	0.040	0.070	0.432	1.446	0.438	1.884
Kahaluu-South	2,110	1,850	78	0.144	Negligible	0.064	0.208	0.712	0.400	1.112
Kahaluu-East	1,840	1,840	78	0.143	Negligible	0.052	0.195	0.682	0.325	1.007
Kahaluu-North	2,400	1,400	78	0.109	0.010	0.045	0.164	0.604	0.281	0.885
Heeia-North	70	-	-	-	-	-	-	-	-	-
Waiahole	320	-	-	-	-	-	-	-	-	-
Waikane-Hakipuu	450	-	-	-	-	-	-	-	-	-
Kualoa	250	-	-	-	-	-	-	-	-	-
TOTAL FOR PLANNING AREA	11,570	9,220	-	0.718	0.050	0.231	0.999	2.746	1.444	4.190

NOTES:

Column 5 - Infiltration is estimated as 3,000 gallons/mile of pipe/day for sewers above the groundwater table and as 5,000 gallons/mile of pipe/day for sewers in groundwater table.
Column 6 - Design Average Flow is the sum of Columns 3, 4, and 5.
Column 7 - Design Maximum Flow is calculated by multiplying the sum of Columns 3 and 4 by the appropriate Babbit factor and adding the infiltration (Column 5).
Column 8 - Inflow is calculated by multiplying the infiltration by 6.25. The 6.25 factor was derived from data for the existing Ahuimanu system, and compares closely with the factor used for the Kahaluu area in the WQPO Report.
Column 9 - Design Peak Flow is the sum of Columns 7 and 8.

TABLE VII-2

PROJECTED WASTEWATER FLOWS
(END OF PLANNING PERIOD)

	Col. 1		Col. 2	Col. 3	Col. 4	Col. 5	Col. 6	Col. 7	Col. 8	Col. 9
	POPULATION		Average Flow Per Capita (gpcd)	Average Sewage Flow (MGD)	Business/ Industrial Flow (MGD)	Infiltra. (MGD)	Design Average Flow (MGD)	Design Maximum Flow (MGD)	Inflow (MGD)	Design Peak Flow (MGD)
	Subarea Total	To Be Sewered								
Ahuimanu	4,430	4,430	78	0.346	0.060	0.080	0.486	1.562	0.500	2.062
Kahaluu-South	2,275	1,995	78	0.156	Negligible	0.068	0.224	0.752	0.425	1.177
Kahaluu-East	1,925	1,925	78	0.150	Negligible	0.062	0.212	0.684	0.388	1.072
Kahaluu-North	2,500	1,855	78	0.145	0.040	0.049	0.234	0.806	0.306	1.112
Heeia-North	(350)	(350)	(78)	(0.027)	(0.022)	(0.008)	(0.057)	(0.253)	(0.050)	(0.303)
Waiahole	670	470	78	0.037	Negligible	0.016	0.053	0.201	0.100	0.301
Waikane-Hakipuu	850	350	78	0.027	Negligible	0.008	0.035	0.143	0.050	0.193
Kualoa	250	230	78	0.018	0.050	0.007	0.075	0.347	0.044	0.391
TOTAL FOR PLANNING AREA	12,900	11,255	-	0.879	0.150	0.290	1.319	3.480	1.813	5.293

NOTES:

Column 5 - Infiltration is estimated as 3,000 gallons/mile of pipe/day for sewers above the groundwater table and as 5,000 gallons/mile of pipe/day for sewers in groundwater table.
Column 6 - Design Average Flow is the sum of Columns 3, 4, and 5.
Column 7 - Design Maximum Flow is calculated by multiplying the sum of Columns 3 and 4 by the appropriate Babbit factor and adding the infiltration (Column 5).
Column 8 - Inflow is calculated by multiplying the infiltration by 6.25. The 6.25 factor was derived from data for the existing Ahuimanu system, and compares closely with the factor used for the Kahaluu area in the WQPO Report.
Column 9 - Design Peak Flow is the sum of Columns 7 and 8.

TABLE VII-3

PROJECTED WASTEWATER FLOWS
YEAR 2030

	Col. 1		Col. 2	Col. 3	Col. 4	Col. 5	Col. 6	Col. 7	Col. 8	Col. 9
	POPULATION									
	Subarea Total	To Be Sewered	Average Flow Per Capita (gpcd)	Average Sewage Flow (MGD)	Business/ Industrial Flow (MGD)	Infiltra. (MGD)	Design Average Flow (MGD)	Design Maximum Flow (MGD)	Inflow (MGD)	Design Peak Flow (MGD)
Ahuimanu	4,900	4,900	78	0.382	0.080	0.095	0.557	1.735	0.594	2.329
Kahaluu-South	2,350	2,250	78	0.176	Negligible	0.078	0.254	0.852	0.488	1.340
Kahaluu-East	2,150	2,150	78	0.168	Negligible	0.066	0.234	0.814	0.412	1.226
Kahaluu-North	3,000	2,100	78	0.164	0.070	0.070	0.304	1.041	0.438	1.479
Heeia-North	(350)	(350)	(78)	(0.027)	(0.022)	(0.015)	(0.064)	(0.230)	(0.094)	(0.324)
Waiahole	800	500	78	0.039	Negligible	0.020	0.059	0.215	0.125	0.340
Waikane-Hakipuu	1,000	350	78	0.027	Negligible	0.015	0.042	0.150	0.094	0.244
Kualoa	300	230	78	0.018	0.050	0.010	0.078	0.350	0.063	0.413
TOTAL FOR PLANNING AREA	14,500	12,480	-	0.974	0.200	0.354	1.528	3.935	2.213	6.148

NOTES:

Column 5 - Infiltration is estimated as 3,000 gallons/mile of pipe/day for sewers above the groundwater table and as 5,000 gallons/mile of pipe/day for sewers in groundwater table.
Column 6 - Design Average Flow is the sum of Columns 3, 4, and 5.
Column 7 - Design Maximum Flow is calculated by multiplying the sum of Columns 3 and 4 by the appropriate Babbit factor and adding the infiltration (Column 5).
Column 8 - Inflow is calculated by multiplying the infiltration by 6.25. The 6.25 factor was derived from data for the existing Ahuimanu system, and compares closely with the factor used for the Kahaluu area in the WQPO Report.
Column 9 - Design Peak Flow is the sum of Columns 7 and 8.

E. EVALUATION OF SUBAREA ALTERNATIVES

1. Ahuimanu Subarea

The Ahuimanu subarea is shown on Figure VII-1. It is presently serviced by the Ahuimanu wastewater system which was initially provided by the developer of the area. These facilities have been deeded to the City and are now operated and maintained by the City's Division of Wastewater Management. The existing facilities are ideally located to make the regional interconnection of the Kahaluu planning area and the Kailua-Kaneohe facilities. The Ahuimanu subarea presently consists of approximately 1,135 homes which discharge approximately 0.3 MGD of sewage that is treated by the Ahuimanu STP and discharged into Ahuimanu Stream. For the year 2000, a total of 1,266 homes is projected for the Ahuimanu area. All would be on sewers, with the existing sewers being extended into the future development areas indicated on Figure VII-1.

a. No Action Alternative

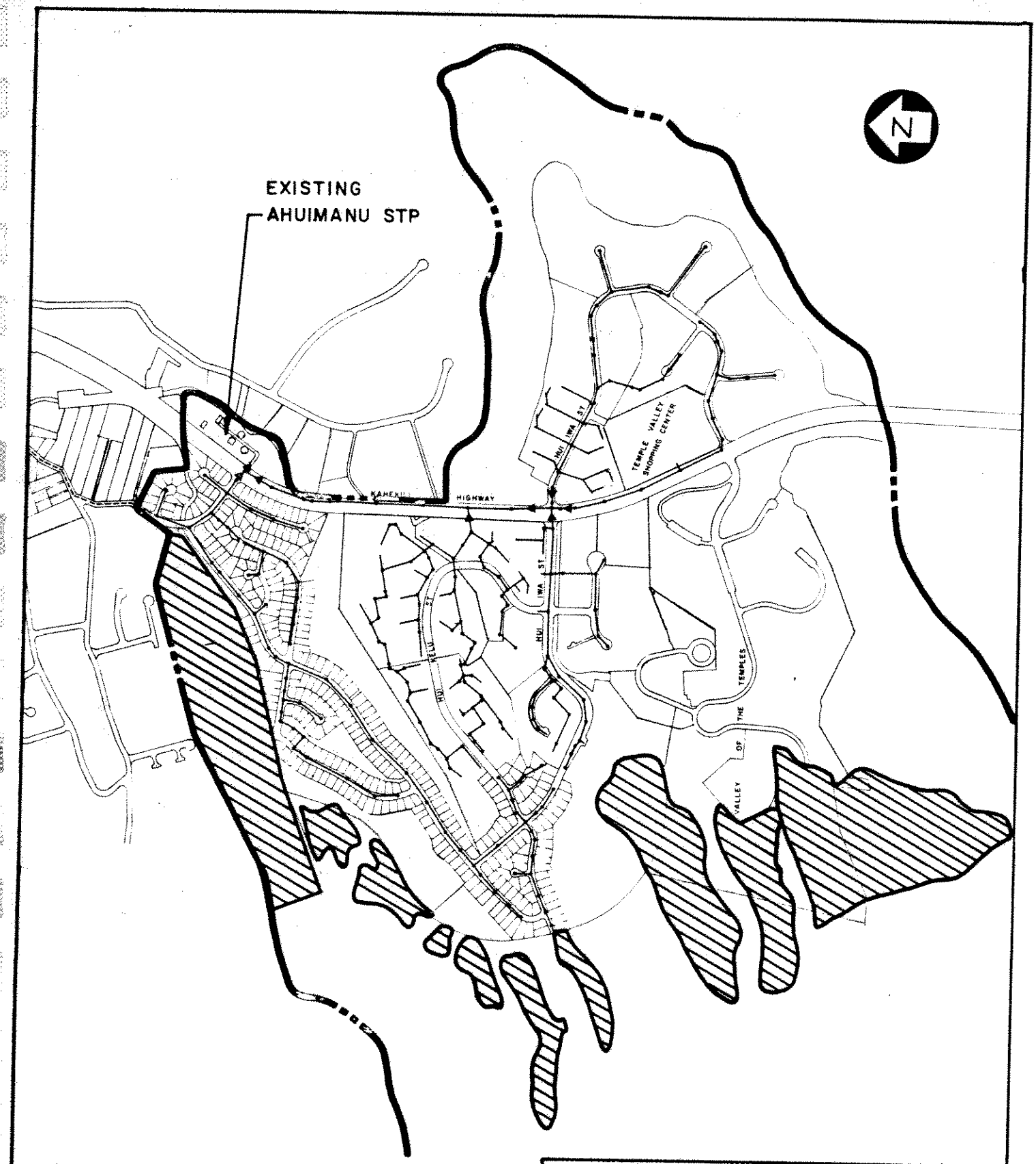
As discussed previously, the no action alternative for the Ahuimanu STP was not feasible since the NPDES Permit requires the elimination of the present discharge into Ahuimanu Stream by 1983.

b. Improved On-Site Systems Alternative

Improved on-site treatment was not feasible in Ahuimanu. The zoning and lot size are such that it is an urban area unsuitable for on-site treatment and disposal. Also, a centralized treatment and collection facility already exists in Ahuimanu. It would not be reasonable to provide on-site treatment and disposal in an urban area where a centralized system is readily available.

c. Package Plant Alternative

A package wastewater treatment plant in the Ahuimanu area wasnot a viable alternative because the Ahuimanu collection and treatment system already exists.



KAHALUU WASTEWATER TREATMENT AND DISPOSAL SYSTEM
ENVIRONMENTAL IMPACT STATEMENT

FIGURE VII-1

AHUIMANU SUBAREA

CITY AND COUNTY OF HONOLULU
DEPARTMENT OF PUBLIC WORKS

d. Centralized System Alternative

(1) Collection

The collection system at Ahuimanu is an existing one which was installed by the developer. The sewer system extends throughout the Ahuimanu development and presently discharges into the Ahuimanu STP. The collection system will be expanded in step with the development within the subarea.

(2) Treatment Alternatives

The regional wastewater treatment options were (1) convert the Ahuimanu STP to a sewage pumping station to pump the raw wastewater to Kaneohe STP for treatment (The Proposed Project); and (2) modify the Ahuimanu STP to a secondary plant and pump the effluent to the Kaneohe Effluent Pumping Station for disposal through the Mokapu Ocean Outfall.

The following treatment alternatives were evaluated:

Alternative 1: Secondary treatment at Ahuimanu STP with chemicals.
Alternative 2: Secondary treatment at Ahuimanu STP by expansion of existing facilities.
Alternative 3: Treatment at Kaneohe STP by trickling filters.
Alternative 4: Treatment at Kaneohe STP by activated sludge.

Secondary Treatment at Ahuimanu STP (Alternatives 1 and 2)

Secondary treatment at Ahuimanu STP was feasible but there is a possibility that the existing "rapid block" unit may not be able to handle the design flow of 1.4 MGD. Through actual experience, it has been found that as the flow through a "rapid block" system

approaches between 55 to 65 percent of design flow, the plant begins to malfunction. This experience has been gained by operation of "rapid block" plants at Ahuimanu, Mililani and Hawaii Kai on Oahu and Wailua on Kauai. The probable cause has been diagnosed as the daily fluctuations or hydraulic surges to the unit. Therefore, to handle the anticipated 1.3 MGD from the planning area, the plant or plant operations must be modified.

There were two modification alternatives considered to enable the Ahuimanu STP to handle 1.3 MGD at the secondary level of treatment. They were (1) to continue chemical treatment, and (2) to enlarge the existing facility by adding an activated sludge component in parallel with the "rapid block" unit.

Chemicals could be used to achieve a secondary quality effluent when the plant flow reaches the upper overload point or 0.9 MGD (65 percent of 1.4 MGD). Dependence on chemicals means the cost of operating the plant is subject to escalation in chemical cost. The other alternative of plant expansion would involve an initial capital investment in construction of facilities, but less operational cost for chemicals. Either alternative is expensive for the small flow involved.

Treatment at Kaneohe STP: Alternatives 3 and 4 (The Proposed Project)

The alternative to treatment at Ahuimanu STP is to construct a sewage pumping station at Ahuimanu for the pumping of raw or screened and degritted wastewater to the existing Kaneohe STP for treatment. This alternative would eliminate any treatment costs at Ahuimanu, but would add to treatment costs at the Kaneohe STP where the planning area flows would be incremental to the existing Kaneohe flows.

The City and County of Honolulu has applied for a waiver from the EPA secondary treatment requirements for the effluent discharged through the Mokapu Ocean Outfall. A ruling is expected in mid-1980. The level of effluent quality presently attainable by the trickling filters at Kaneohe STP does not comply with the EPA defined criteria for secondary treatment. If the secondary waiver application is approved, the less than secondary effluent will be allowed to be discharged through Mokapu Ocean Outfall. If the Waiver Application is disapproved, the plant will have to be upgraded to comply the EPA criteria for secondary treatment.

The design capacity of the Kaneohe STP to serve the Kaneohe area was determined from the pre-General Plan population projections. The flow projections were 7.6 MGD in 1982 and 11.3 MGD in 1993. The present design capacity is 4.3 MGD. The new General Plan population projection for Kaneohe requires a capacity of 4.3 MGD in the year 2000, with a 50 percent redundancy (required by EPA for new construction) for a total of 6.45 MGD. The Kahaluu flows for the year 2000 will be 1.3 MGD, plus 50 percent redundancy or a total of 1.95 MGD. Thus even adding the Kahaluu flows to the Kaneohe STP will result in a lower design capacity (8.4 MGD vs 11.3 MGD) in the year 2000 than originally planned.

In addition to the expansion, repair and replacement of existing degraded trickling filter units are necessary for proper operation. The expansion, plus either the rehabilitation of the trickling filters or the modification to activated sludge, would be required whether or not the Kahaluu flows were added to the Kaneohe STP.

Therefore, the present worth costs are only for the additional expansion of the Kaneohe STP to service

the Kahaluu flows. There will be a cost advantage to this expansion. Since repair and replacement or modification and expansion will be going on at the Kaneohe STP anyway, some unit costs of the additional expansion for the Kahaluu flows will be less than the unit costs of the work for Kaneohe.

The City and County is presently preparing a report entitled "Step 1 Addenda to the Kaneohe and Kailua Facility Plans" which will discuss in detail the modifications that may be required at both the Kaneohe and Kailua STP's.

(3) Effluent Disposal

There are basically two disposal schemes that might be employed: pump secondary effluent from Ahuimanu STP to the Kaneohe Effluent Pump Station (EPS) for discharge through the Mokapu Outfall; and pump screened and degritted sewage from a pump station at Ahuimanu to the Kaneohe STP for treatment and subsequent disposal via the Kaneohe EPS to the Mokapu Outfall (The Proposed Project).

An equalization basin will be required to dampen the fluctuations in the wastewater flows to Ahuimanu STP. Use of an equalization basin will make it possible to use smaller pumps and also reduce surging into the Kaneohe STP.

A 14-inch force main is necessary for pumping either screened and degritted raw wastewater or secondary effluent (The Proposed Project) along the entire route to the Kaneohe STP. This alignment conveys the flow directly to the Kaneohe STP. If secondary effluent is being conveyed, the force main will terminate at the Kaneohe effluent pumping station.

If screened and degritted sewage is conveyed, the force main will discharge into the primary clarifiers. The alignment and profile of this alignment were presented earlier in Figures II-9 and II-10, respectively.

(4) Costs of Treatment and Disposal Alternatives

Table VII-4 indicates the present worth costs for the feasible combinations of treatment and disposal alternatives for the proposed centralized system of the planning region.

TABLE VII-4

TREATMENT AND DISPOSAL ALTERNATIVES
FOR THE CENTRALIZED SYSTEM

	Alternative	Present Worth Cost
1.	Secondary Treatment at Ahuimanu STP with Chemicals	$3,702,900
	Pump Secondary Effluent to Kaneohe SPS	5,350,100
		$9,053,000
2.	Secondary Treatment at Ahuimanu STP with Expansion	$4,208,800
	Pump Secondary Effluent to Kaneohe SPS	5,350,100
		$9,558,900
3.	Pump Screened & Degritted Sewage to Kaneohe STP	$5,692,700
	Treat Sewage at Kaneohe Trickling Filter STP	3,043,400
		$8,736,100
4.	Pump Screened & Degritted Sewage to Kaneohe STP	$5,692,700
	Treat Sewage at Kaneohe Activated Sludge STP	3,221,400
		$8,914,100

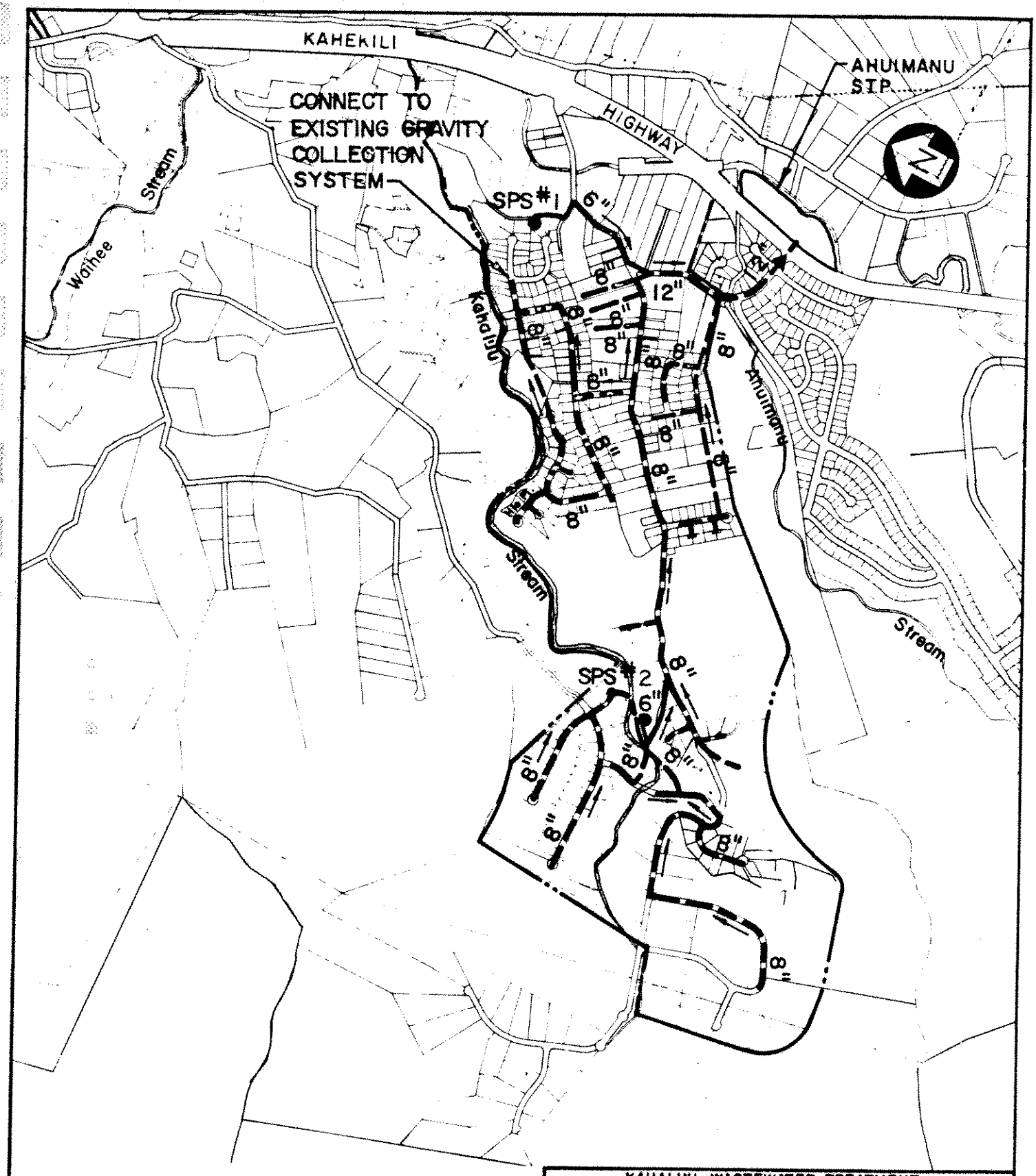
2. Kahaluu-South Subarea

This subarea includes the residentially zoned area between the Ahuimanu and Kahaluu Streams adjacent to the Ahuimanu development, and the adjacent area on the east side of Kahekili Highway, as shown on Figure VII-2. The area is unsewered and uses cesspools, except for approximately 40 houses at the northern end which are sewered and connected by a 4-inch force main to the existing Ahuimanu collection system. There are approximately 600 houses in the area with population densities ranging from 20 people/acre to less than one. Some portions of the area are fully developed. However, large undeveloped areas are zoned for residential use. By the year 2000, a total of 650 homes is projected for the subarea with approximately 570 of these homes to be sewered within the tributary area as shown on Figure VII-2.

a. No Action

No action would require the continued use of the existing cesspools. Currently, approximately 130 cesspools in this area require pumping an average of 6.7 times/year. At $35/pumping, this amount to $30,485/year for this subarea. The total present worth value of this alternative over a 20-year period at 6-5/8 percent is approximately $333,000, assuming that there is no significant change in the number of defective cesspools. Agricultural lands in the higher elevations of the subarea can generally remain on cesspools because the lots are large and cesspools can be located to minimize any potential health hazards caused by overflow or leachate. On the residentially zoned lands in Kahaluu-South, the typical lot size is small (5,000 to 10,000 square feet) so the potential for public health problems from cesspools is greater.

The proximity of the Kahaluu and Ahuimanu Streams to the subarea cesspools is another consideration. These streams now include pollutants in excess of State Water Quality



KAHALUU WASTEWATER TREATMENT AND DISPOSAL SYSTEM
ENVIRONMENTAL IMPACT STATEMENT

FIGURE VII-2

KAHALUU - SOUTH SUBAREA

CITY AND COUNTY OF HONOLULU
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Standards. It is suspected that the Kahaluu-South cesspools may contribute to this pollution but a detailed field investigation is required for verification.

The proximity of the Ahuimanu STP facilities for economical treatment and disposal makes the no action alternative less attractive. For the above reasons the no action alternative is not believed feasible for this subarea. An exception is the portion of the subarea which is adjacent to the east side of Kahekili Highway. It is thinly populated and cesspools are the most cost effective alternative at the present time for this portion of the subarea.

b. Improved On-Site Systems

Due to the close proximity of the Ahuimanu STP area, improved on-site systems are not economically feasible for the densely populated residential areas.

c. Package Plants

A package wastewater treatment plant in the Kahaluu-South area was not a viable alternative because of the close proximity to the existing Ahuimanu STP which has sufficient available capacity to handle the wastewater from this area.

d. Centralized Systems

Construction of a new collection system to sewer the Kahaluu-South subarea is a feasible alternative. Treatment and effluent disposal were discussed earlier under the Ahuimanu subarea.

A number of alternate alignments are possible because of the terrain in the tributary area. The most feasible configuration, based on the available topographic information is presented on Figure VII-2. The system consists mainly of gravity collection lines, with two sewage

pumping stations and force mains. The existing sewage pump station which services 40 homes in the northern portion of the subarea is a temporary facility and will have to be replaced by SPS No. 1, using a new 6-inch force main for the larger flows to be conveyed to this facility. The proposed collection system will convey sewage directly to the Ahuimanu STP site for treatment and disposal as discussed above under the Ahuimanu subarea.

Another alternate collection system alignment for this subarea was investigated. It considered the elimination of SPS No. 2 in the upper valley by a gravity line crossing under Kahaluu Stream and running along the stream until it reaches the gravity collection line proposed to be installed along Hio Place. This would require the installation of 1,500 linear feet of 8-inch gravity line in an undeveloped and somewhat difficult area, crossing under Kahaluu Stream at least once. The feasibility of this alternative cannot be confirmed without further surveys and investigations to be done during the design period; therefore, it was not included among the feasible alternatives. However, it will be investigated further during the design phase.

Table VII-5 summarizes the estimated present worth costs for the collection system indicated on Figure VII-2.

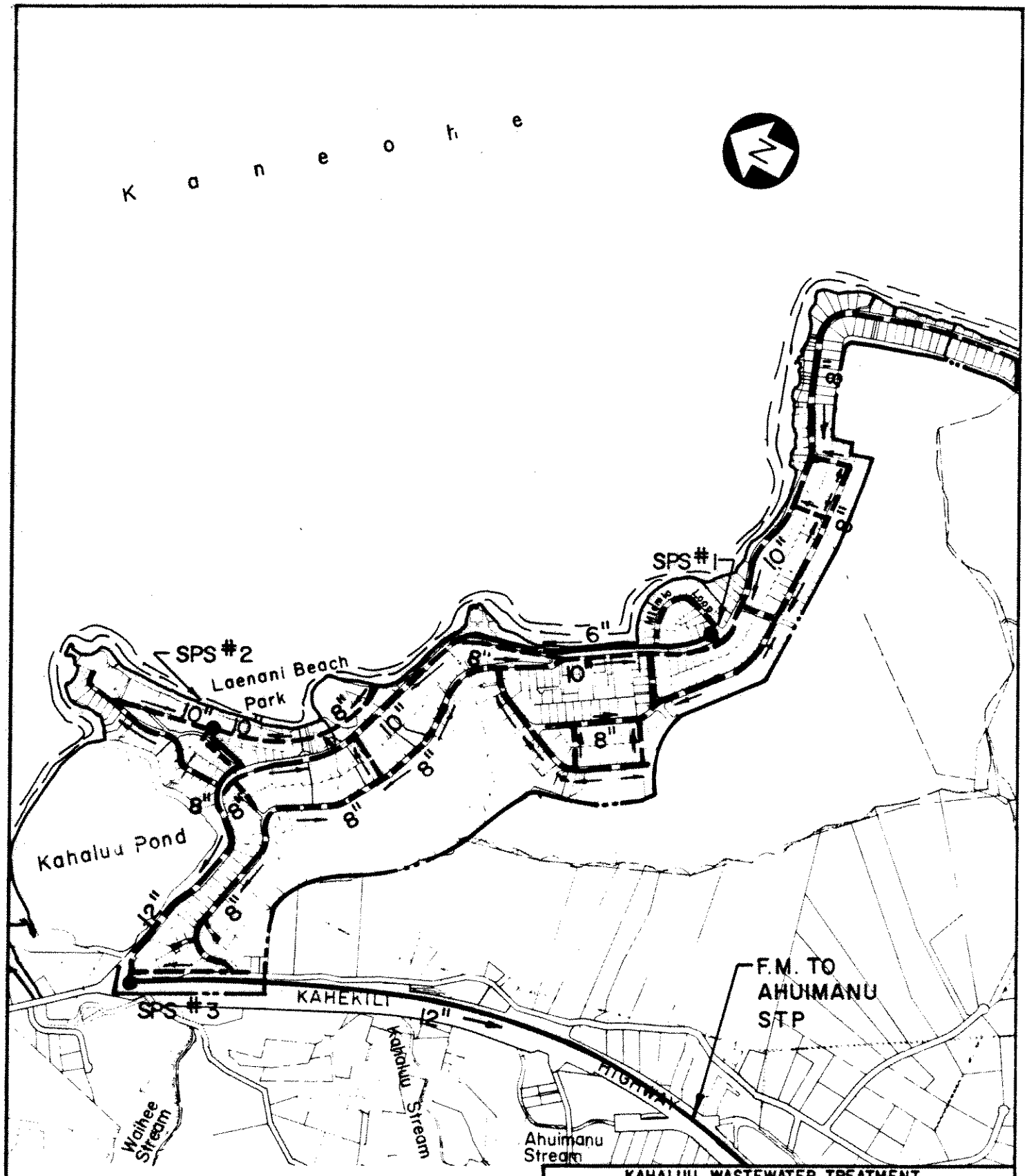
3. Kahaluu-East Subarea

This subarea includes the residential development from Heeia along the shoreline to Kahaluu Pond as shown in Figure VII-3. The current zoning is primarily residential with a small portion of the area zoned for resort development. Lot size range from 5,000 square feet to 10,000 square feet. However, the resort zoned land is already developed into residential parcels so there is no reason to plan for future resorts. The subarea is a shoreline community of single-family residences and includes a small store, a beach park and some multiple family dwellings. The subarea is currently unsewered and has an average population density ranging from 10 to 15 people/acre. There are presently 525 homes in the subarea which is nearly the ultimate density of the subarea provided the existing residential land use does not change. The tributary area indicated on Figure VII-3 includes all of the 550 homes projected for the subarea in the year 2000.

This subarea was evaluated separately because of its proximity to the Class AA bay waters, high population density and steep shoreline terrain. The wastewater management alternatives considered for this subarea are discussed below.

a. No Action

No action would require the continued use of the existing cesspools. Currently, approximately 115 cesspools require pumping an average of 7.7 times/year. At $35/pumping this amounts to approximately $31,000/year for the area. The total present worth value of pumping over a 20-year period at 6-5/8 percent is approximately $338,000. This could be expected to increase in the future as additional cesspools malfunction. Because of the proximity of the cesspools to the shoreline, it is suspected that the estimated 150,000 gpd (525 homes x 275 gpd/home) of sewage disposal in cesspools in the subarea may cause pollution in the adjacent bay waters, although this



KAHALUU WASTEWATER TREATMENT AND DISPOSAL SYSTEM
ENVIRONMENTAL IMPACT STATEMENT

FIGURE VII-3

KAHALUU - EAST SUBAREA

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cannot be quantified. The no action alternative was not considered feasible for this area for the following reasons: (1) the subarea has a relatively high population density, (2) numerous defective cesspools in the subarea and (3) the total subarea cesspool leachate is a significant quantity which probably pollutes the bay.

b. Improved On-Site Systems

The high population density (small lot size), and the probable pollution problems with continued disposal near Class AA waters indicate that the improved on-site treatment systems are not feasible as the ultimate solution for this area.

c. Package Plants

A package wastewater treatment plant in the Kahaluu-East area is not a feasible alternative because of the potential pollution problem with effluent disposal near Class AA waters. In addition, this package plant would be located less than a mile from the Ahuimanu STP. It is generally more cost-effective to consolidate the treatment and disposal facilities at one location instead of operating and maintaining two separate facilities within close proximity of each other.

d. Centralized Systems

Collection of wastewater and conveyance to the Ahuimanu STP site is a feasible alternative for this subarea since the area is nearly fully developed. The subarea will be sewered and the wastewater conveyed to the Ahuimanu STP site. Treatment and disposal alternatives were discussed previously under the Ahuimanu subarea.

A number of various sewer alignments were considered. Figure VII-3 indicates the configuration believed to be the most cost-effective based on the available topographic information. It consists primarily of gravity collection lines within the existing road rights-of-way with sewage pumping stations and force mains.

There are a few problem areas where houses located on the ocean side are at a much lower elevation than the roadway. It is not considered feasible to install an additional gravity line on the ocean side of these houses because of limited space, difficult access, irregular location of houses and complications in obtaining the required easements and permits. Therefore, individual pumping units will be required for approximately 25 houses to lift sewage to the proposed gravity collection line in the road.

For hillside areas where the access roads parallel steep topographic contours, the houses on the low side of the access road will be connected to the gravity collection line in the next downhill access road via a sewer lateral on an easement through the intervening house lot.

The present worth costs are presented in Table VII-5.

4. Kahaluu-North Subarea

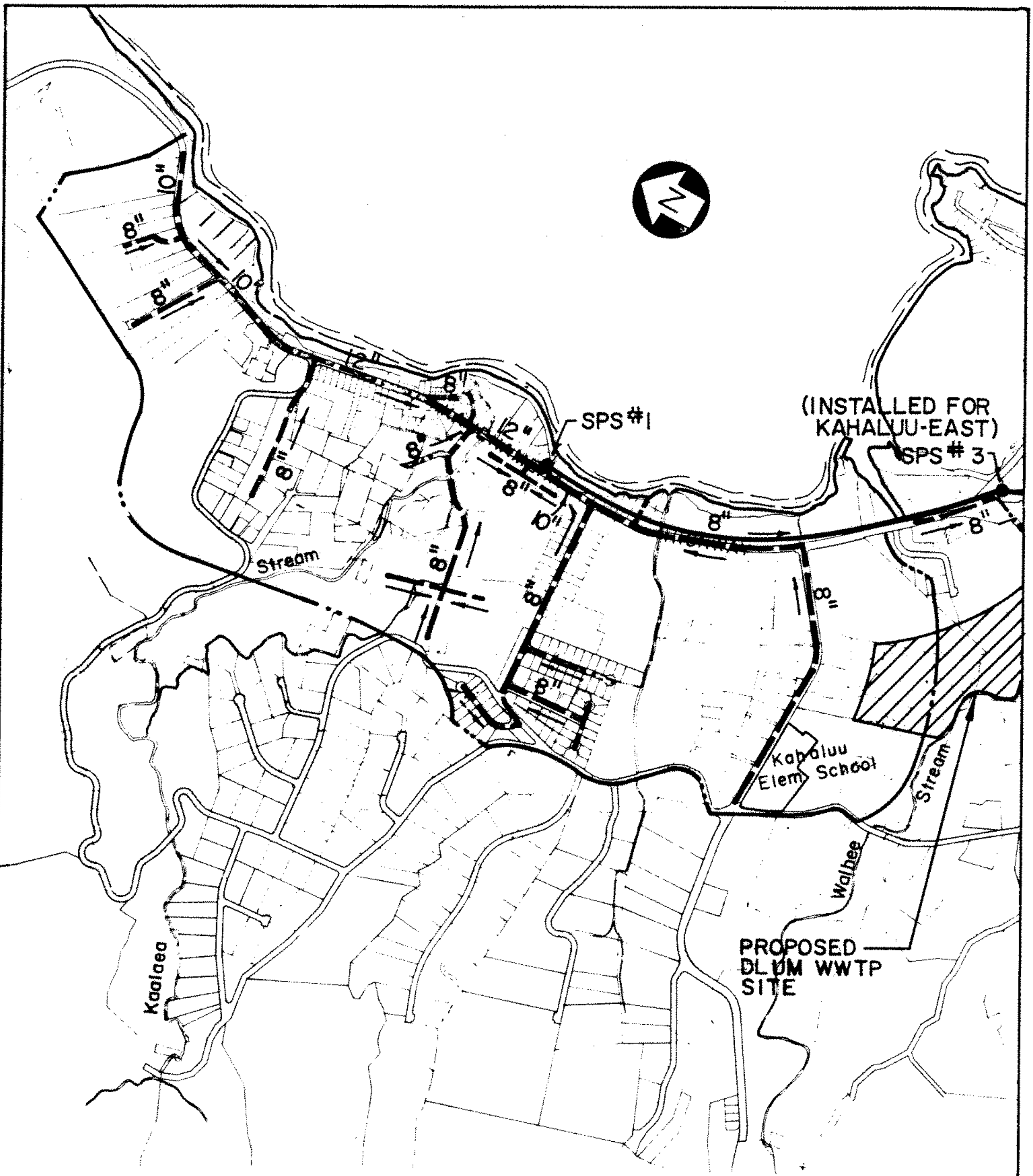
This subarea includes the areas of Kahaluu (north of the Waihee Stream), Waihee and Kaalaea, as shown on Figure VII-4. It is currently unsewered, using on-site cesspools, and has population densities ranging from 0 to 15 people/acre. The low-lying areas are currently zoned for urban development and the upper valleys are generally zoned for agriculture.

In the 770-acre low-lying urban area, there are presently about 500 homes plus a number of small stores and local businesses. The area has a substantial amount of vacant land available for future development. The existing zoning allows this subarea to be developed into a residential area with a central business/industrial area along portions of Kamehameha Highway. The Kahaluu Neighborhood Board prefers the elimination of much of the zoned business/industrial area in favor of the development of a centralized community center/park for the area adjacent to the mouth of the Kahaluu Stream. It is difficult to predict exactly what changes in zoning will occur for this controversial area. For the low projected growth and the small area involved, the change in zoning from business/industrial to a public park is not expected to have a significant impact on the required facilities.

In the 670-acre upper valley area there are approximately 185 homes on land which is predominately zoned for agriculture. A large portion of the upper Waihee Valley is currently zoned for urban development, although none has occurred yet.

The total number of homes projected for the entire subarea in the year 2000 was 714, with 530 of these homes to be sewered in the tributary area shown on Figure VII-4. The unsewered homes will use on-site systems.

The Kahaluu-North subarea is characterized by a relatively dense urban development in the low, level areas and a sparsely



1000' 500' 0 1000' 2000'

SCALE IN FEET

- FORCE MAIN (PROPOSED)
- GRAVITY LINE (PROPOSED)
- TRIBUTARY AREA
- ● SEWAGE PUMPING STATION (PROPOSED)

KAHALUU WASTEWATER TREATMENT
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FIGURE VII-4

KAHALUU - NORTH SUBAREA

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populated rural agriculture zone in the upper valleys. The wastewater management alternatives considered for this subarea are discussed below.

a. No Action

The no action alternative would require the continued use of the existing cesspools. Currently, approximately 70 cesspools in the urban zoned area require pumping an average of 6.6 times/year. At $35/pumping this amounts to $16,200/year. The total present worth value of this pumping over a 20-year period at 6-5/8 percent is approximately $177,000. This cost would probably increase over time as additional cesspools malfunction. One problem with the continued use of cesspools in the low-lying urban area is the public health hazard that may occur when cesspools located on relatively small residential lots malfunction. The other problem is caused by generally impermeable soil in the area, along with the high groundwater table, which severely limits the performance of the cesspools so that they require regular pumping. There is no direct evidence that the estimated 195,000 gpd of sewage presently disposed in cesspools in this subarea pollutes Kaneohe Bay. However, previous studies indicate that pollution from human sources does occur in the streams of the subarea and the probable source is the system of cesspools now in use. Water sampling in the subarea streams indicate a level of pollutants in excess of the State Water Quality Standards. These pollutants are believed to be derived, to some extent, from the system of cesspools in the area. A piggery along Waihee Stream also contributes heavily to the pollutants therein by runoff from the pig pens. Although pollution problems and the potential health hazards derived therefrom cannot be readily quantified, they are believed to be high enough to make this alternative not feasible for the low-lying urban portions of this subarea as indicated by the tributary area on Figure VII-4.

The no action alternative in the upper valley agricultural areas would require the continued use of on-site cesspools in an entirely different situation. Since there are low population densities in this area, the cesspools are distributed over a sufficient area and the potential for pollution of surface water bodies and the resulting public health risk if cesspools malfunction are minimized. Currently, only approximately 16 cesspools in this area require pumping an average of 6.6 times/year. The no action alternative appears feasible for the agricultural areas unless specific cesspools are positively identified as contributors to water pollution. Specific improvements would then be indicated.

b. Improved On-Site Systems

For the same reasons as with the no action alternative above, new, improved on-site systems are not suitable as the ultimate solution for the low-lying urban area. In small, isolated areas with impermeable soils or population densities too high for cesspools and too far from the central collection system to be economically sewered, improved on-site systems could be used for individual homes in lieu of cesspools.

c. Package Plants

A package wastewater treatment plant for the urbanized area is not considered to be cost-effective because of the relatively close proximity of the existing Ahuimanu STP for treatment and disposal. Use of a package plant would also present significant treatment and disposal problems in the low urban area. This alternative was not feasible for this subarea.

d. Centralized System

The centralized collection of wastewater, with conveyance to Ahuimanu STP site, is a feasible alternative for the low-lying urbanized area. The treatment and disposal alternatives were discussed earlier under the Ahuimanu subarea. Because of the extremely flat terrain and the three streams that must be crossed, several combinations of gravity lines, SPS and force mains were considered to collect sewage from this area. The most cost-effective configuration, based on the available topographic information, is presented on Figure VII-4. As shown, the system consists of a main interceptor line along Kamehameha Highway with a centrally located SPS No. 1 to pump the sewage over the Kahaluu Stream to Kahaluu-East SPS No. 3.

The Detailed Land Use Map for the Kahaluu-North subarea includes a 24-acre WWTP site next to the Kahaluu Elementary School and Community Center as indicated on Figure VII-4. This site has been on the Detailed Land Use Map for many years over the strong objections of the local community which prefers a park in this location. The useful area of the site has been reduced to 14 acres, since it was decided that other public uses could be carried out in buffer zones around the WWTP. Open park land was intended to separate the WWTP from the school and community center. However, it appears at the present time that the WWTP site is not necessary since other alternatives are more cost effective.

The proposed system will require gravity collection lines to cross under two streams. Because of the very flat terrain along this part of Kamehameha Highway, the gravity collection lines leading to the sewage pump stations will have to be installed in trenches as deep as 20 feet. Since the groundwater table along the shoreline

is only a few feet below the surface, installation of gravity lines in trenches 20 feet deep is expected to result in substantial construction costs and potentially high infiltration rates. The recommended location of SPS No. 1 results in a longer force main than if it were located farther to the south but it minimizes the depth of the required gravity collection lines. The force main from SPS No. 1 to SPS No. 3 will use the proposed new bridge structure (300 feet long) to cross the enlarged flood control lagoon at the mouth of the Kahaluu Stream.

The recommended collection system is a gravity system, but approximately 20 houses on the ocean side of Kamehameha Highway in the Kaalaea subarea must install individual pumping units to connect to the higher elevation of the proposed gravity line in Kamehameha Highway.

The present worth costs are summarized in Table VII-5.

5. Heeia-North Subarea

The planning area for the Kahaluu wastewater system includes an area along the shoreline in northern Heeia, as shown in Figures VII-5 and VII-6. These figures indicate alternate schemes for collection and conveyance of the wastewater to Kaneohe and Ahuimanu, respectively. The Heeia-North subarea was added to the Kahaluu planning area in order to close the unplanned gap between the Kahaluu planning area and the existing Kaneohe sewers. This subarea is currently unsewered, lying just north of the existing collection system for the Kaneohe STP. Heeia-North is a rural area with only 16 existing homes on leased land located between two more urbanized areas. A State small boat harbor is located near the southern end of the subarea. A Hawaiian Electric Company (HECO) facility is near the northern end of the subarea and several small commercial stores are near the boat harbor. The subarea is owned by the Bishop Estate and includes extensive acreage of unused land currently zoned for residential development.

HECO has been negotiating to buy the area (219 acres) from the Bishop Estate as a site for the construction of a power plant. There are many difficulties being encountered by HECO in obtaining the necessary clearances and approvals. At this time, it is not known whether HECO will succeed in development this area as a power plant site. If they do, the existing residences, which are all on leased land, will probably be terminated and no other residential development in the area will occur. If HECO does not develop the area as a power plant location, it is likely that either Bishop Estate, or some other developer, will develop the land as a residential area with an ultimate capacity of several hundred to a thousand houses. For cost comparison purposes in the wastewater management alternatives considered, the number of homes in the subarea was increased to 100 by the year 2000 as a reasonable amount of anticipated development.

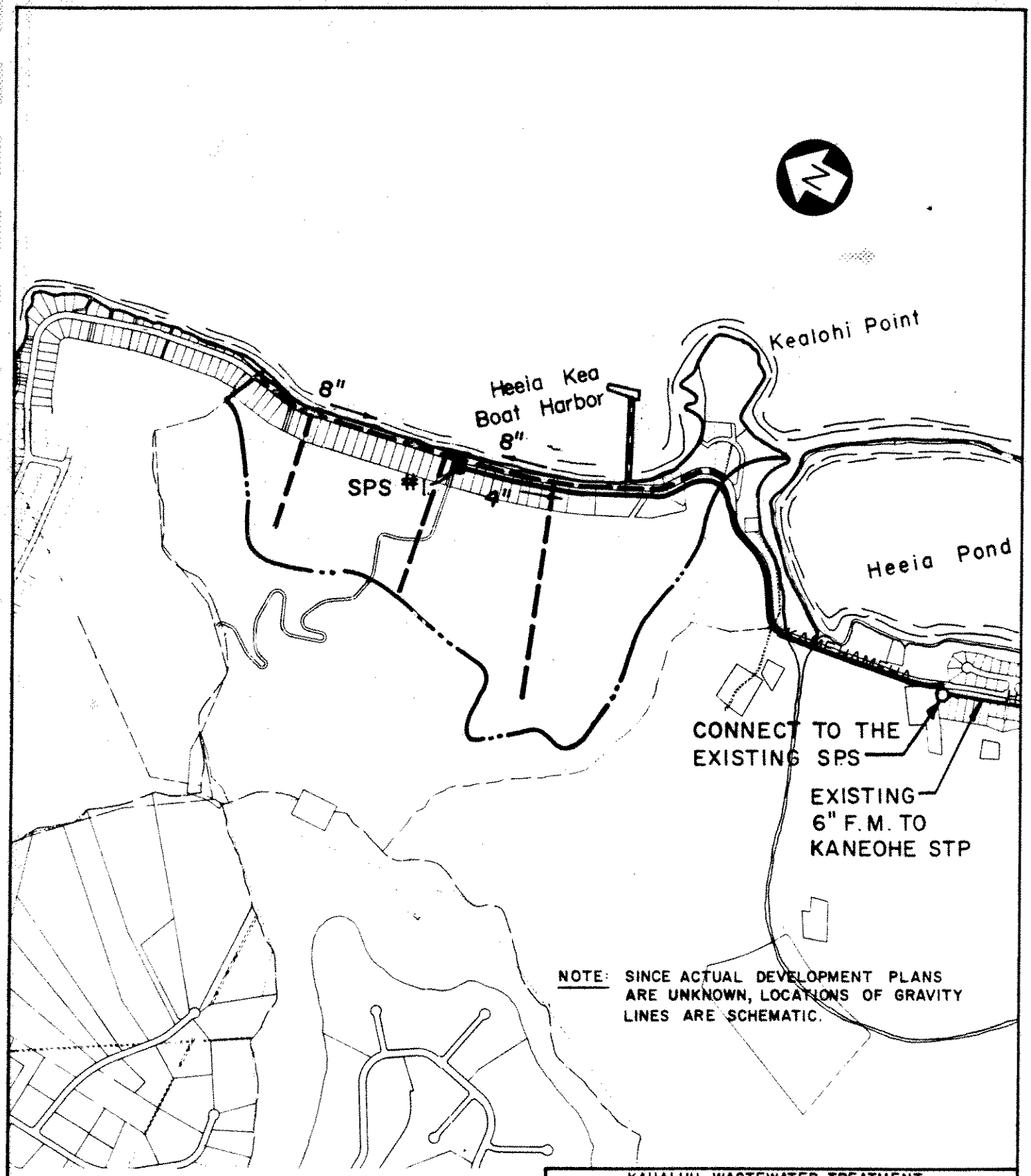

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FIGURE VII-5

HEEIA - NORTH SUBAREA
ALTERNATE #1

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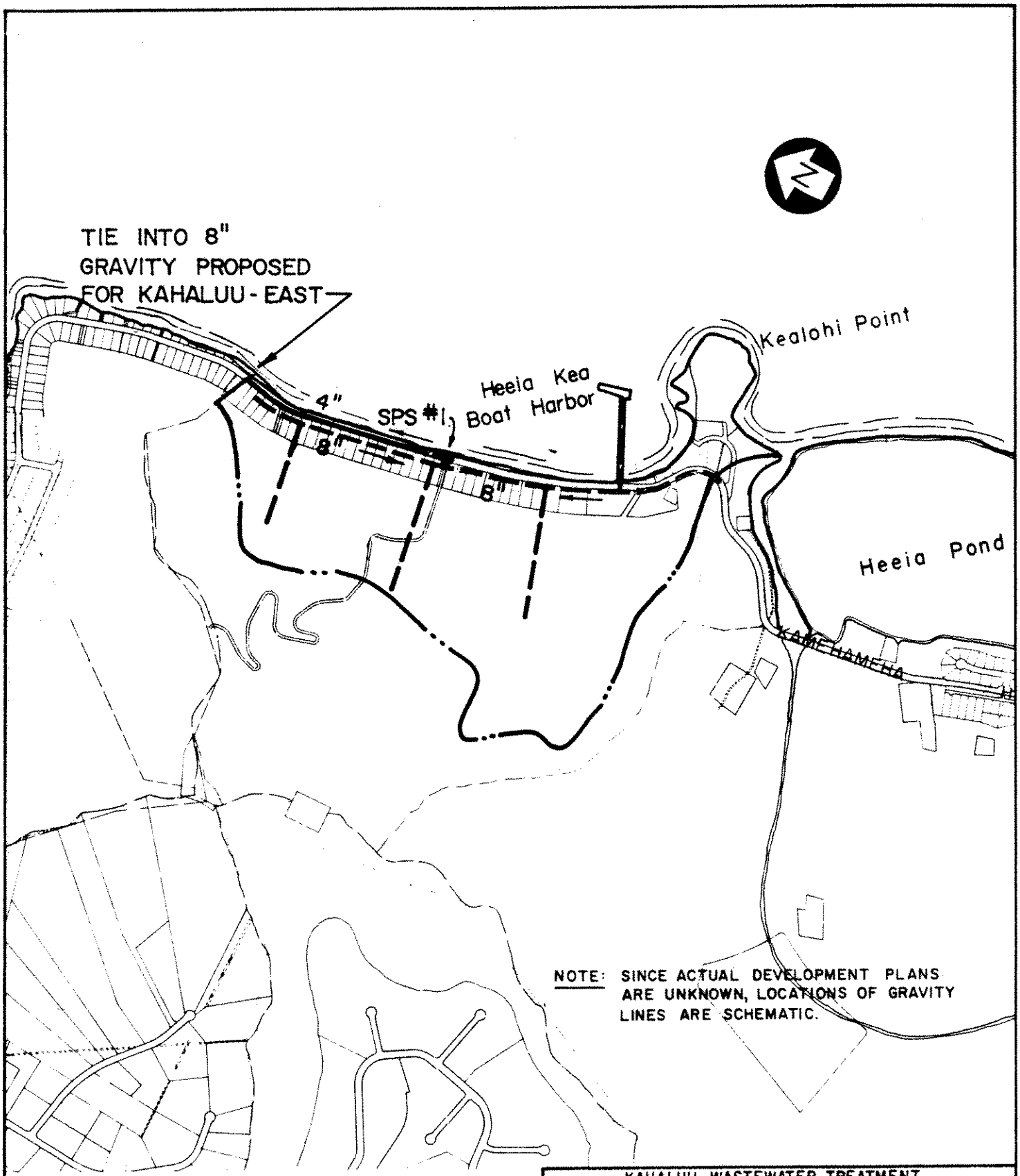

KAHALUU WASTEWATER TREATMENT AND DISPOSAL SYSTEM
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FIGURE VII-6

HEEIA - NORTH SUBAREA
ALTERNATE #2

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The area to the south of the tributary area is known as Heeia Landing. It is being planned for development by the Foremost-McCormack Development Joint Venture Company. Plans call for the installation of 4,359 residential units and a new sewer collection system which would replace the three temporary SPS in the area and convey all sewage flows to the Kaneohe STP. This would actually extend the existing Kaneohe collection system even closer to the Heeia-North subarea. This project has been held up for several years by an inability of the developer to obtain the required permits. At this time, it appears doubtful that they will be obtained because of the new constraints on population growth.

Another consideration is the wastewater flow from the small boat harbor, which is expected to expanded from 80 moorings to 300 moorings, some time before the year 2000, with a wastewater flow of 21,720 gpd.

a. No Action

No action would require the continued use of on-site cesspools. As long as this subarea is not developed into a large residential area or power plant site, the use of cesspools should not create any significant problems. Pumping of some cesspools will be required. However, because of the low density (large lot sizes) and the relatively few number of existing homes in the subarea, the number of pumpings is expected to be small. It was presumed that the State will provide any needed wastewater improvements within the boat harbor and therefore these were not included in the evaluation.

A no action alternative was feasible for this subarea. The sewage from the thinly distributed homes along Kamehameha Highway is probably not a significant health hazard.

b. Improved On-Site Systems

Installation of improved on-site systems may be considered for specific cases where an existing cesspool requires frequent pumping or for use in new home construction. Table VII-5 indicates the present worth of a complete installation of improved on-site systems for the projected 100 homes in the area. Again, the cost-effective analysis does not include improvements within the boat harbor which are presumed to be handled by the State. This alternative appears feasible when compared to the cost of a centralized system.

c. Package Plants

A package wastewater treatment plant in the Heeia-North subarea was not a feasible alternative because of the relatively close proximity of an existing centralized collection system. A package plant would also present treatment and disposal problems in this location adjacent to Class AA waters.

d. Centralized System

The centralized collection of wastewater, with conveyance to a central treatment and disposal facility, was not considered to be feasible due to the low population density. However, if the area is developed in the future with a larger residential population, a centralized collection system would be feasible. This will be especially true if the adjacent Heeia Landing development is constructed and the existing temporary collection system for that area is extended and replaced with a permanent system. If this is done, conveyance of sewage from the northern Heeia area to the Heeia Landing area is considered the most feasible alternative. The projected development of 100 homes by the year 2000 and the expanded boat harbor would be serviced by a gravity system (Alternate No. 1)

conveying sewage to a central SPS which would pump the sewage to the system proposed for the Heeia landing development as shown in Figure VII-5. The present worth cost of this alternative is $838,600.

The downstream connection to the Kaneohe collection system would occur at the existing SPS at the Alii Bluffs Subdivision on Kamehameha Highway. This existing SPS has a 6-inch force main carrying sewage to another SPS which connects to a 27-inch gravity interceptor sewer. If the larger development plans for Heeia Landing are implemented, the existing collection system in the area would be considerably changed.

Another feasible collection system (Alternate No. 2) was considered which consisted of pumping the wastewater to the Ahuimanu STP via the Kahaluu-East subsystem as shown in Figure VII-6. The present worth for this alternative is $785,200 which is less than the first alternative. However, a much longer sewage detention time before treatment is involved due to the longer conveyance system. Another consideration is that the Ahuimanu STP (or SPS) has a limited capacity, and may reach that limit before this area is ready to be sewered. For these reasons, conveying the wastewater to the Kaneohe sewer system (Alternate No. 1) is preferred.

Table VII-5 indicates the present worth costs for this subarea.

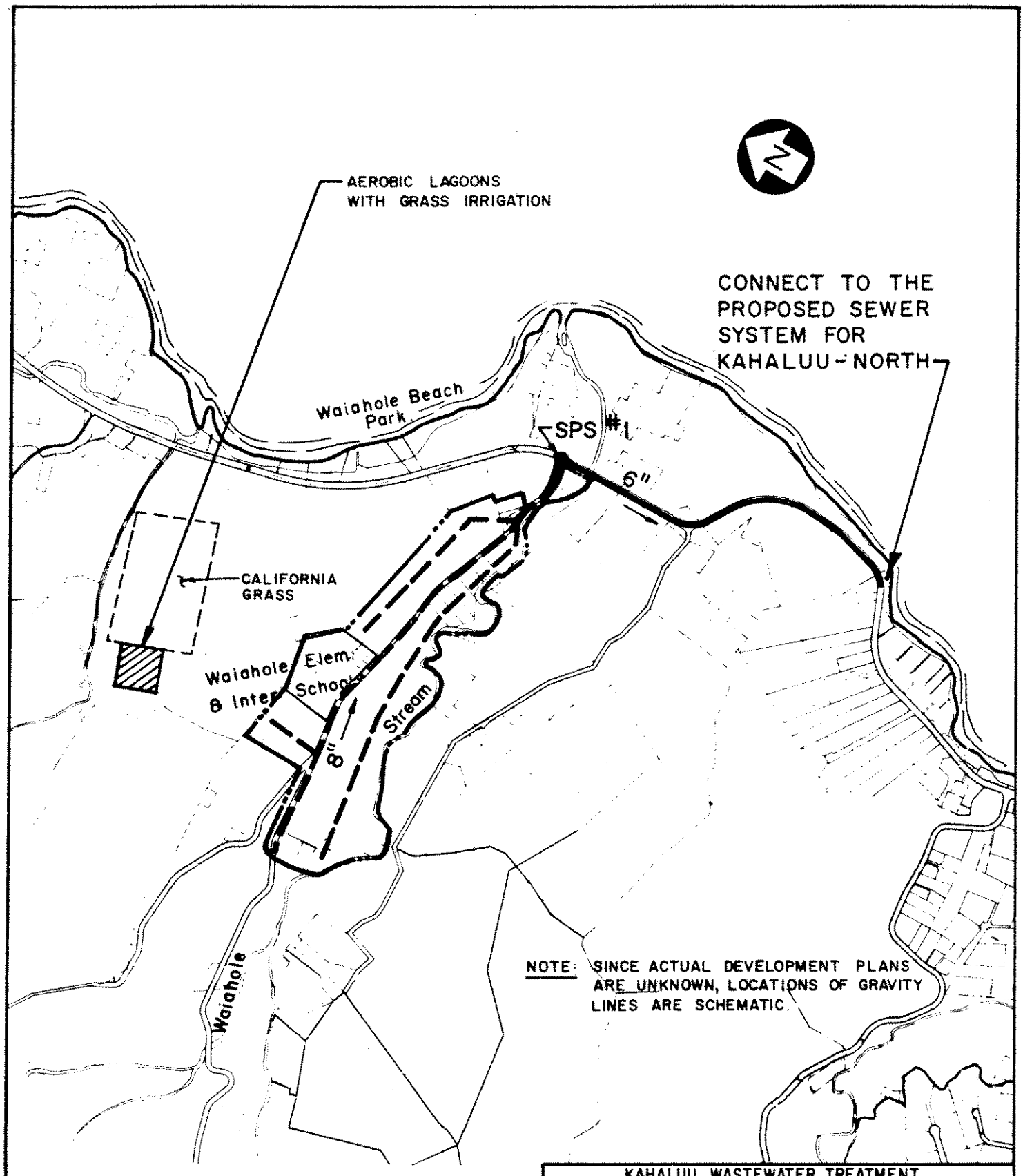
6. Waiahole Subarea

This subarea (Figure VII-7) includes all of the 600 acres recently purchased in Waiahole Valley by the State. It is currently an unsewered area. The majority of the land is zoned for agricultural use and has very low population densities. Near the center of the valley there are 44 acres of land zoned for residential use. This area is indicated on Figure VII-7 as the tributary area. In 1977, about 85 homes were located in the valley of which 35 are located in the central residential area along with an elementary school within the tributary area. The State has made a study to determine the optimum method for development of this subarea to recover their $6 million dollar expenditure. Plans now call for the construction of 100 to 300 new houses. Since local residents in the area want to maintain the characteristic rural setting of the valley, a number of alternative ways which preserve the setting but still provide more housing are being investigated. For purposes of comparative analyses, it is assumed that all of the alternatives considered will service an estimated 135 homes in the tributary area by the year 2000 when there will be a projected 191 homes in the entire subarea. The other 56 homes will be widely scattered outside the tributary area.

The wastewater management alternatives considered for this subarea are discussed below.

a. No Action

The alternative of no action will require the continued use of the existing 35 cesspools and the construction of cesspools to serve the estimated 100 new homes. Currently, there are no cesspools reported in the subarea which require pumping or chemical treatment. Based on the present performance record in other subareas, some pumping of cesspools can be expected in the next 20 years. It is difficult to determine the number of cesspools that will require pumping in the future. For estimating purposes, it is assumed that 10 percent of the cesspools will



KAHALUU WASTEWATER TREATMENT
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ENVIRONMENTAL IMPACT STATEMENT

FIGURE VII-7

WAIAHOLE SUBAREA

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require pumping and 5 percent will reouire chemical treatment. For the existing and new homes outside the tributary area, the no action alternative is feasible unless water quality problems can be directly attributed to cesspools.

The Waiahole Stream has in the past been reported as polluted in excess of the water quality standards, with existing cesspools a suspected source of pollution. Further study is necessary to determine if cesspools are causing the water quality problems.

b. Improved On-Site Systems

There are a number of alternatives and combinations of improved on-site systems available, which must be evaluated on a site by site basis. Generally, the installation of a treatment system (either anaerobic or aerobic) ahead of the disposal system will insure continued performance of the disposal system (cesspool, injection well or leaching field). A typical treatment system with a new disposal system is estimated to cost between $3,000 and $5,000 per installation. An installed cost of $4,400 was used in the estimate of costs for these individual systems.

This alternative is believed feasible as an alternative to package plant and centralized systems when the new State development of 100 homes or more is implemented. Table VII-5 indicates the present worth costs for improved on-site systems for 135 homes in the tributary area, including 35 existing and 100 new homes.

c. Package Plants

If areas in Waiahole are developed by the State into residential centers, a package treatment plant for these areas may be considered. This would require the central collection of sewage within a centralized population area so that it could be conveyed to the package treatment plant. Since Waiahole and Waikane are adjacent to one another, it would be cost effective to combine the flows of both areas into one package plant. The shared package treatment plant and disposal system might be located in the Waiahole Valley area as indicated on Figure VII-7. An installed package treatment plant for Waiahole-Waikane in the range of 88,000 gpd, providing secondary treatment, will cost approximately $2/gallon to construct.

Further examination of this alternative, considering the agricultural nature of the area, leads to the conclusion that sewage lagoons might be cost-effectively substituted for the package plant concept. This is especially true if the land required could be made available from the State at no cost.

There are advantages to lagoons where storage is required, as is the case where effluent disposal by irrigation is used. Approximately 4 acres would provide enough area for two aerobic lagoons, giving an adequate level of treatment for one of a number of disposal methods. Aerobic lagoons are chosen for reasons of economy and mitigation of odor problems.

To avoid high disposal costs resulting from the conveyance of the effluent to a distant area for disposal, some form of on-site disposal must be found to make this system economical. Possible on-site disposal systems are irrigation, injection wells, leaching fields, or new aquaculture techniques for effluent disposal.

Since the overall area is rural and land is available for agricultural use, irrigation of California Grass (Brachiaria Mutica) was explored as a disposal means for the package plant effluent. California Grass is used as a forage crop by dairies and a market now exists for this product on Oahu. The grass tolerates extremely wet conditions and shows considerable nutrient uptake, which makes it attractive as a candidate for wastewater irrigation disposal.

A cooperative study is now underway between the University of Hawaii Water Resources Research Center and the City Department of Public Works, Division of Wastewater Management, to evaluate growing California Grass as a crop and means of wastewater disposal.

Based on preliminary research data for California Grass, the estimated area required to handle 88,000 gpd of wastewater from Waiahole-Waikane would be approximately 15 acres. About $150 per month in income could reasonably be expected from grazing 15 acres of the grass land.

There are a number of feasible locations in the lower elevations around Waiahole for such a site. Assuming that land can be made available in Waiahole, this appears to be a feasible alternate for the Waiahole-Waikane subareas.

Table VII-5 indicates the present worth cost of a package WWTP/California Grass system based on the concept of shared facilities.

Leaching fields were examined as an alternate disposal means. Using the assumption of zero land cost (State land), leaching fields are estimated to cost approximately twice as much as the above irrigation system.

Aquaculture wastewater treatment was also explored, with the cooperation of individuals operating Aquatic Farms, the new Malaysian Prawn farm in Waikane. It was determined that pretreatment such as provided by a package plant would be desirable to limit the number and size of ponds required. Also, a means of disposal for the effluent is needed. In essence, the aquaculture facility requires a package plant and disposal facility plus the aquaculture ponds. Since development of this type of aquaculture technology is in the preliminary stages, a cash-producing aquaculture product cannot be guaranteed. Without an income from an aquaculture product, this treatment method does not appear economically feasible at this time. The only other justification for such an aquaculture system might be as a pilot project for development of the technology, which may improve the economics for use of the system in the future.

d. Centralized Systems

The more expensive collection of wastewater and conveyance to a central treatment and disposal facility is feasible only for the Waiahole area where a residential center is proposed by the State of Hawaii.

Based on the available topographic information and the assumption that only the existing residentially zoned land near the center of the valley will be developed, the most cost-effective central collection layout is shown on Figure VII-7. It consists of an 8-inch collection line along Waiahole Valley Road until it meets Kamehameha Highway. A sewage pumping station will be required at the intersection of Kamehameha Highway and Waiahole Road to convey sewage to the collection subsystem of the neighboring Kahaluu-North subarea. The 380 gpm sewage pump station and 6-inch diameter force main proposed to convey sewage to the Kahaluu-North subarea has been sized to accommodate

flows from the Waikane/Hakipuu and Kualoa areas also. If it is determined that these areas will not be sewered, a 4-inch diameter force main and 180 gpm pump could be used instead of the sizes shown.

The exact plan for future development by the State is unknown; but, should the State develop a number of individual areas as residential centers, as outlined in some of the alternatives in their planning study, additional collection lines would have to be provided to these areas.

Table VII-5 indicates the present worth cost estimate for a centralized collection subsystem in Waiahole Valley that would connect into the Kahaluu-North collection subsystem.

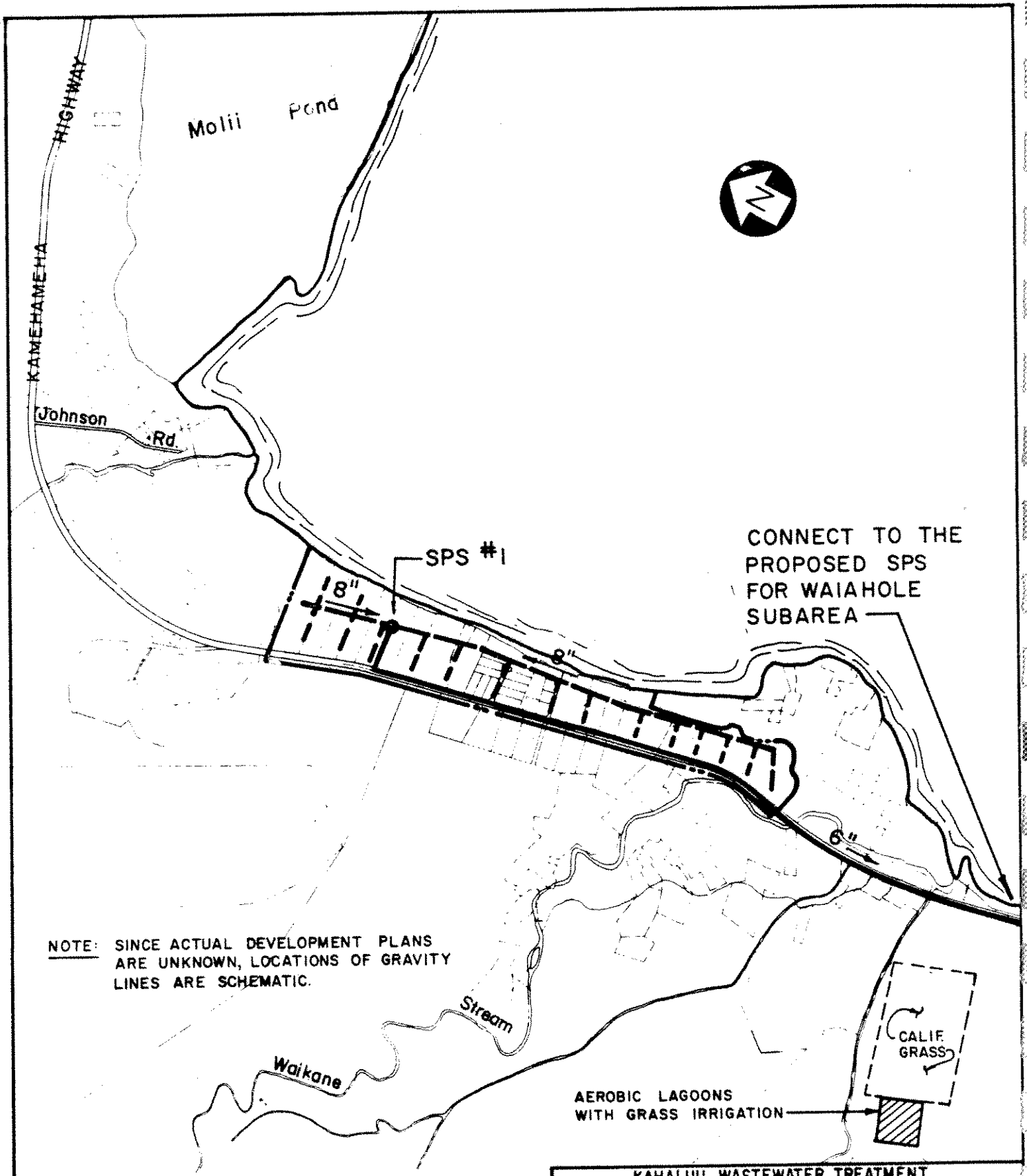
7. Waikane-Hakipuu Subarea

This subarea includes the lands in the Waikane and Hakipuu areas as shown in Figure VII-8. It is currently an unsewered area. The majority of the land is zoned for agricultural uses and has a very low population density. There is one 45-acre residentially zoned area located along the ocean side of Kamehameha Highway stretching from the Waikane subzone into the Hakipuu subzone. This is defined by the tributary area on Figure VII-8.

In 1977, there were approximately 125 houses in the entire Waikane-Hakipuu area of which only 45 were located in the residential area. Another 15 homes are located in an agricultural area along Johnson Road in the Hakipuu region. Otherwise, the remaining homes are widely scattered on very large lots. The Waikane Valley is owned by Windward Partners which is planning to develop 14 new units in the aforementioned residential area and up to 144 two-acre parcels in the agricultural zoned area, with over a hundred more to come at a later date. About half of the 144 agricultural lots planned by Windward Partners are in areas where the Board of Water Supply prohibits the use of cesspools. Nearly all of the lots to be developed later by Windward Partners, would be in these prohibited areas. There are additional unused agricultural and residential lands which can be developed. The majority of the land is controlled by one developer and a large ranch. For use in the comparative analyses of alternatives for the year 2000, a total of 243 homes are projected for the total subarea, including approximately 100 homes (45 existing plus 55 new) to be sewered within the tributary area.

a. No Action

A no action alternative will require the continued use of cesspools. Currently, approximately one-third of the



KAHALUU WASTEWATER TREATMENT AND DISPOSAL SYSTEM
ENVIRONMENTAL IMPACT STATEMENT

FIGURE VII-8

WAIKANE - HAKIPUU SUBAREA

CITY AND COUNTY OF HONOLULU
DEPARTMENT OF PUBLIC WORKS

cesspools in the residentially zoned area require pumping an average of 6.9 times/year. The no action alternative for the year 2000 was projected to have a similar cesspool malfunction rate, with 33 percent of the cesspools estimated to require pumping and 10 percent to require chemical treatment. Much of the Waikane residentially zoned land has low permeability type soils which probably accounts for the high malfunction rate for the existing cesspools.

Water quality data for Waikane Stream (Table III-2) indicate water pollution from animal and mixed sources. Further field investigation and monitoring are required to pinpoint the sources of pollution. Cesspools are an inexpensive means of disposal provided they do not contribute to the water pollution of the stream.

b. Improved On-Site Systems

Where cesspools are not suitable due to soil conditions or groundwater restrictions, new types of improved on-site systems may be used. There are a number of alternatives and combination of alternatives available which require evaluation on a site by site basis. For example, the proposed 144-unit development by Windward Partners is considering the use of oil operated waterless toilets for areas where cesspools are not allowed. These improved systems are considered feasible alternatives in areas zoned for residential development if the costs of the more expensive package plant and/or centralized systems are prohibitive.

Table VII-5 indicates the present worth cost of installing improved aerobic on-site systems for the 100 homes projected in the tributary area.

c. Package Plants

The package plant alternative would require conventional centralized collection of sewage within the tributary area and conveyance to a package treatment plant. As explained

above for the Waiahole subarea, it would be cost-effective to share the costs of package treatment plant and disposal system between these two subareas. Figure VII-8 indicates the general location of several potential sites in Waiahole Valley for joint use. Table VII-5 indicates the present worth cost of an aerobic lagoon system substituted for a package WWTP system, based on the concept of shared facilities, using California Grass irrigation as the disposal means. (See the corresponding subsection for the Waiahole subarea for a discussion of California Grass and the lagoon system.)

d. Centralized Systems

Conventional centralized collection of wastewater and conveyance to a central treatment and disposal facility is believed feasible for the populated areas in residential zoning. The economic viability of this alternative is contingent on use of a similar system in the adjacent Waiahole area, thus providing a link-up with the Kahaluu collection subsystem.

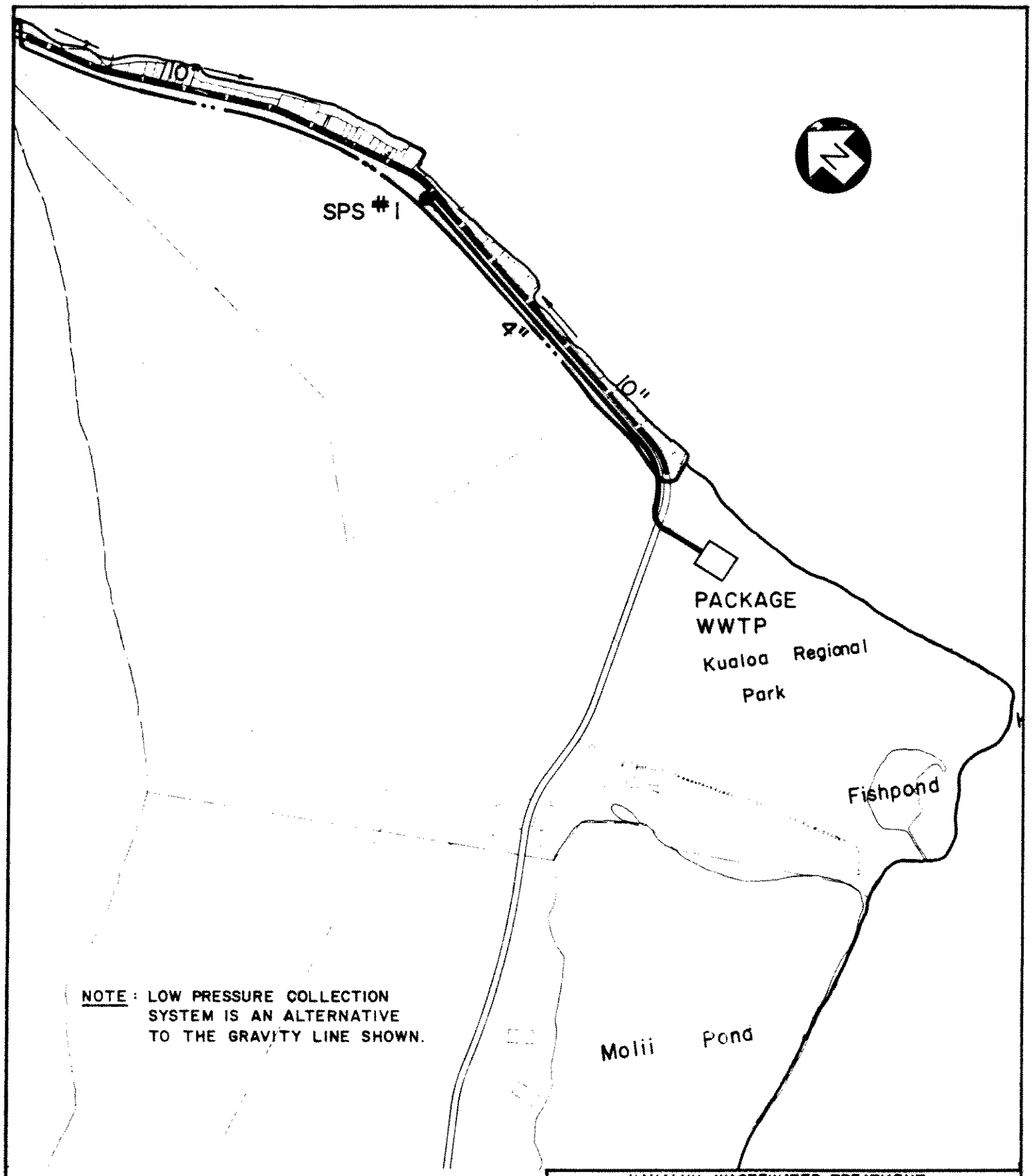
Based on the available topographic information, the most cost-effective centralized collection system layout is shown on Figure VII-8. It consists of a gravity collection system with a centrally located sewage pump station to convey the sewage to the proposed SPS at Waiahole and ultimately to the Ahuimanu STP site. The 260 gpm sewage pump station and 6-inch diameter force main has been sized to accommodate future flows from Kualoa. If it is determined that Kualoa is not to be sewered, a 120 gpm pump and 4-inch force main can be used instead of the sizes shown. This alternative is considered to be the solution which would be the most problem free, but the most expensive. Table VII-5 indicates the present worth of the proposed centralized collection system for Waikane-Hakipuu.

8. Kualoa Subarea

The Kualoa subarea (Figures VII-9 and VII-10) is a relatively isolated area with a small, linear array of homes along Kamehameha Highway and close to the shore of Kaneohe Bay. There are presently 62 homes and only 3 vacant lots for future development. The homes are presently using cesspools, many of which require frequent pumping and/or chemical treatment. The Kualoa Regional Park is undergoing a planned expansion by the City's Department of Parks and Recreation. At present, several improved on-site treatment and disposal systems (cavitettes) are used throughout the park. The eventual park capacity of 1,000 people per day will generate sewage flows of 50,000 gpd by the year 2000. The Department of Parks and Recreation would prefer to install a centralized sanitary sewer collection within the park, with a sewage pumping station connecting to a municipal interceptor on Kamehameha Highway. The centralized system alternative therefore includes the 50,000 gpd from the park. The no action, improved on-site and package WWTP system alternatives do not include the park flows.

a. No Action

The homes in Kualoa are presently using cesspools that are located adjacent to the shoreline. The effluent from the cesspools probably seeps into the nearshore waters. However, the Department of Health does not have bacteriological readings in the ocean waters near these waterfront houses, nor is there any evidence of green algae which might indicate cesspool contamination. The ocean water along the shore area is characterized by reversing tidal currents which should effectively dilute this small amount of cesspool leachate. Contamination of groundwater above the Kamehameha Highway is probably not a problem, since the majority of homes are along the ocean side of Kamehameha Highway.

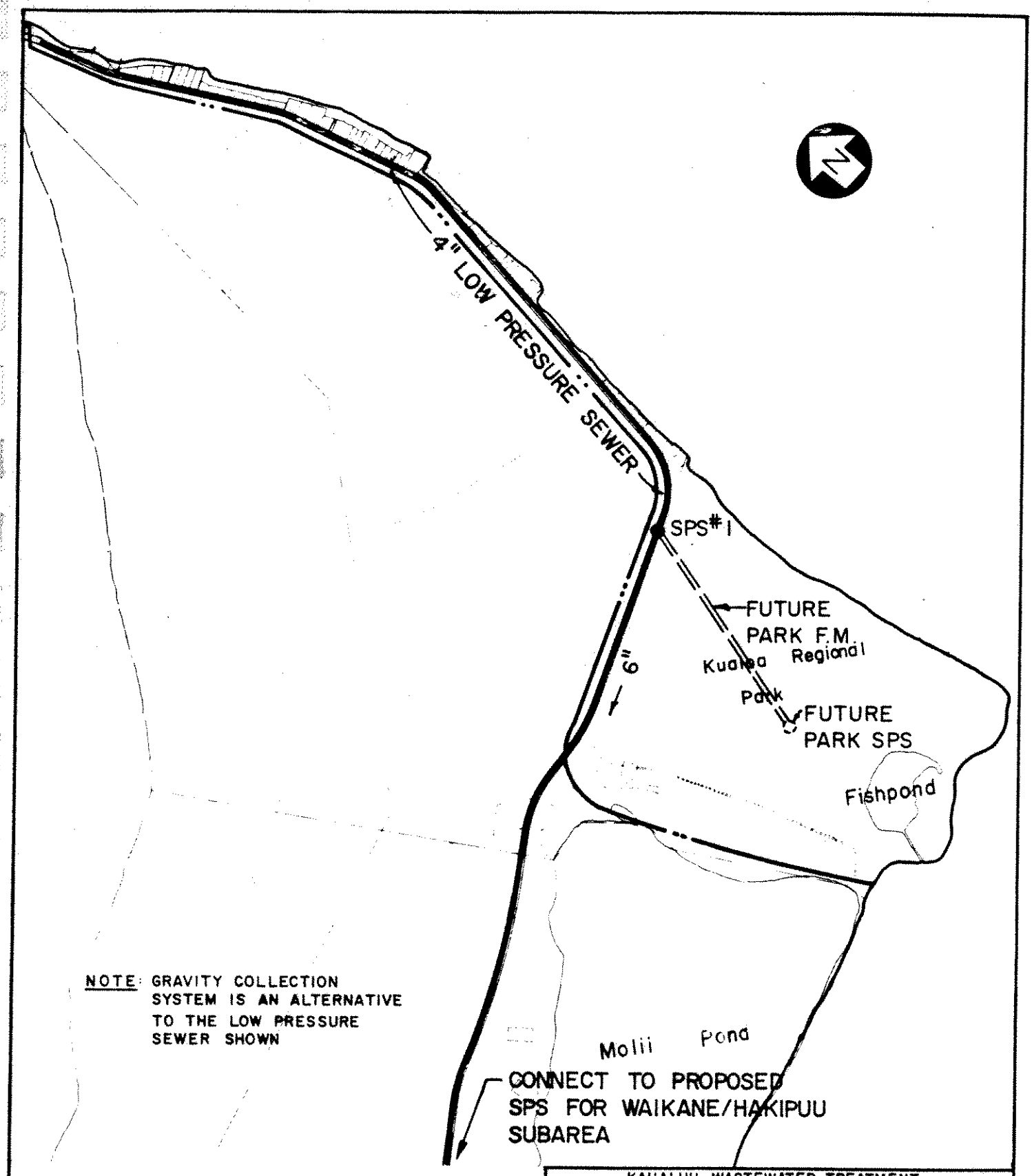


KAHALUU WASTEWATER TREATMENT
AND DISPOSAL SYSTEM
ENVIRONMENTAL IMPACT STATEMENT

FIGURE VII-9

KUALOA SUBAREA
PACKAGE WWTP

CITY AND COUNTY OF HONOLULU
DEPARTMENT OF PUBLIC WORKS



KAHALUU WASTEWATER TREATMENT AND DISPOSAL SYSTEM
ENVIRONMENTAL IMPACT STATEMENT

FIGURE VII-10

KUALOA SUBAREA
CENTRALIZED SYSTEM

CITY AND COUNTY OF HONOLULU
DEPARTMENT OF PUBLIC WORKS

The alternative of no action appears to be feasible from an economic view point. There are approximately 62 homes in the Kualoa area that are utilizing cesspools. Of these, several require occasional chemical treatment, while nine currently require pumping about seven times per year. Since the amount of pumping does not appear to be increasing year to year, it will be assumed to remain constant through the planning period. Table VII-5 shows the present worth cost of the "no action" alternative. The no action costs for the Regional Park are not included in this estimate.

b. Improved On-Site Systems

Improved on-site treatment includes the use of improved cesspools, septic tanks and home aeration units with seepage pits, leaching fields or injection wells. Improved on-site treatment and disposal systems are attractive for this subarea because of its remote location. These systems are feasible only if it can be demonstrated that cesspools are causing water pollution.

Existing Public Health regulations require a 50-foot setback from the shoreline for cesspools and leaching fields, which preclude their use in homes where lots are small. Switching from cesspools to an improved on-site treatment process may be feasible on particular lots which have room for effluent disposal facilities. An aerobic on-site treatment unit would cost approximately $4,400 per residence, depending on the type of facility. This alternative is expensive but feasible, if compared to the cost of a package plant or centralized system. Table VII-5 indicates the present worth costs of replacing all of the existing cesspools with new, improved on-site systems.

If improved on-site treatment is employed, the Kualoa Regional Park would also be irreversibly committed to its present on-site sewage treatment system.

c. Package Plant

A collection system and package WWTP was considered for Kualoa to service the projected total of 65 homes in the area. This alternative was examined using both gravity and low pressure sewage collection systems, coupled with a package WWTP and a leaching field for effluent disposal in the Kualoa Park area. The gravity collection system alternative and package plant location are shown on Figure VII-9. Use of the pressurized collection system would cost less than the conventional gravity sewers because they would not be as deep and would eliminate the SPS No. 1 shown in Figure VII-9 by conveying wastewater directly to the package WWTP.

This alternative was analyzed for cost comparison with the improved on-site and centralized systems. Table VII-5 summarizes the present worth of a package plant with a leaching field at Kualoa Park, using the gravity and low pressure collection systems as alternatives. Possible integration with the existing on-site treatment and disposal systems in the Regional Park was not considered because the existing systems are new and adequate for the foreseeable future.

d. Centralized System

It is feasible to incorporate the Kualoa area into the centralized system of collection, treatment and disposal, as indicated on Figure VII-10. The homes along the beach and the Regional Park would be included in the system. This would eliminate all problems of treatment and disposal at Kualoa Park, but would require a long force main to connect to the SPS in the Waikane-Hakipuu collection subsystem.

The collection system for Kualoa would be essentially the same for a package WWTP or centralized system. The collection system can be either a gravity system flowing to a low point or a low pressure sewer, both of which would be followed by pumping to the Waikane subarea. If a gravity collection system is used, SPS No. 1 must be located as shown in Figure VII-9. This will require the force main from the park to discharge into the south end of the gravity collection line shown in Figure VII-9. SPS No. 1 will then convey the wastewater to the Waikane subarea for connection to the collection subsystem in that area. If the low pressure sewer system collection alternative is used, the layout will be as shown in Figure VII-10. SPS No. 1 will provide the additional pumping capacity to convey the sewage to the Waikane SPS. Table VII-5 indicates the present worth of this collection subsystem, using a low pressure collection system. The continuity of the centralized collection system to Kualoa is contingent on the Waikane and Waiahole subareas becoming part of the centralized collection system. Both collection alternatives are sized to handle the year 2000 flows from Kualoa Park and the set of 65 homes along the shore.

TABLE VII-5

SUMMARY MATRIX OF FEASIBLE ALTERNATIVES
COST ESTIMATES AND AVERAGE COST PER HOUSEHOLD

ITEM	SUBAREAS OF PLANNING AREA								TOTAL
	Ahuimanu	Kahaluu South	Kahaluu East	Kahaluu North	(Heeia North)	Waiahole	Waikane-Hakipuu	Kualoa	
	SUBAREA FLOWS								
Subarea Pop. (Yr. 2000)	4,430	2,275	1,925	2,500	(350)	670	850	250	12,900
Number of Homes - Total in Subarea	1,266	650	550	714	(100)	191	243	71	3,685
Number of Homes - Assumed to be Sewered within Tributary Area	1,266	570	550	530	(100)	135	100	65	3,216
Flow (Yr. 2000), MGD to Centralized System	0.486	0.224	0.212	.234	(0.057)[8]	0.053	0.035	0.075[7]	1.319
	PRESENT WORTH COSTS - DOLLARS (SEPTEMBER 1979)								
1. CENTRALIZED SYSTEM									
Collection	Existing	$2,815,600	$5,092,000	$2,802,900	($838,600)[2]	$1,134,400	$1,097,800	$ 880,500[3]	$14,661,800
Treatment & Disposal[1]	$3,219,100	1,483,600	1,404,100	1,549,800	(79,400)[4]	351,000	231,800	496,700	8,736,100
TOTAL	$3,219,100	$4,299,200	$6,496,100	$4,352,700	($918,000)	$1,485,400	$1,329,600	$1,377,200	$23,397,900
Avg. Household Cost	$ 2,543	$ 7,542	$ 11,811	$ 8,213	($ 9,180)	$ 11,003	$ 13,296	$ 21,188	$ 7,275
2. SMALL SYSTEMS[6]									
a. No Action (Cesspools)	Not Feas.	Not Feas.	Not Feas.	Not Feas.	(Not Eval.)[10]	Not Eval.[10]	Not Eval.[10]	Not Eval.[10]	
b. Improved On-Site	Not Feas.	Not Feas.	Not Feas.	Not Feas.	($766,200)	$1,031,000[9]	$ 758,600[9]	$ 484,900	
Avg. Household Cost	--	--	--	--	($ 7,662)	$ 7,637	$ 7,586	$ 7,460	
c. Package WWTP	Not Feas.	Not Feas.	Not Feas.	Not Feas.	(Not Feas.)	$1,186,000[5,9]	$1,966,700[5,9]	$ 721,000[3]	
Avg. Household Cost	--	--	--	--	--	$ 8,785	$ 19,667	$ 11,092	

[1] Costs are spread over the entire area proportional to centralized system flow from the particular subarea to compare centralized and small system total cost. Should only the Ahuimanu & Kahaluu areas be sewered, the sum of all the costs must be absorbed by these four subareas.

[2] Cost is based on gravity collection system with flows to Kaneohe collection system. Should the flows be directed to Ahuimanu, the cost would be $785,200.

[3] Cost is based on low pressure collection system.

[4] Cost based on treatment at Kaneohe STP and does not include conveyance from Ahuimanu to Kaneohe.

[5] Package WWTP and disposal to serve both Waiahole and Waikane-Hakipuu.

[6] For cost comparison purposes the costs of the small systems are limited to the same set of homes to be sewered in the centralized system.

[7] Kualoa sewage flows include 50,000 gpd from Kualoa Park.

[8] Heeia-North sewage flows include 22,000 gpd from small boat harbor.

[9] Presumes additional developments.

[10] The continued use of cesspools in these low density areas was not evaluated for cost effectiveness because cesspools may be a probable cause of water pollution. Corrective action is deferred until the State of Hawaii conducts a field investigation to determine if cesspools are a source of pollution.

F. VIEWS OF PUBLIC AND CONCERNED INTERESTS ON ALTERNATIVES

1. Views of the Kahaluu Community

Public interest groups and private citizens desire more and better information and express an interest in sharing in the decisions which affect their lives and well-being of their community. The need for public involvement in developing this project was recognized by the City and County of Honolulu.

Since this project is so important to the the Kahaluu region, input from the Kahaluu Neighborhood Board No. 29 was solicited. The Board is comprised of members who are elected by the communities of the planning area and as such it represents the desires and interests of the people within the planning area. Several meetings were held with the Board to exchange ideas and information in order to develop viable wastewater management alternatives that will serve both the community needs and the long range planning goals of the area.

The Board expressed the community's strong objections to the location shown on the Detailed Land Use Map for a proposed Kahaluu Treatment Plant (Figure VII-4). This location is in the center of the area designated for a proposed regional community center and a treatment plant is not compatible with the surrounding land uses.

The community recognizes that cesspools in the populated, low-lying and poorly drained areas may represent a health hazard to the community and a source of water pollution in Kaneohe Bay. The community supports only those proposed services that meet the urgent needs of the residents at this time. Development of a permanent nature must be compatible with the rural lifestyle and conform to the goals and objectives of the community. In addition, the basic utilities such as water, electricity and sewers to support the anticipated growth must be planned and constructed according to these policies.

As such, the community recognizes that a sewer system is needed to serve the existing population along Kamehameha Highway. This sewer system should serve only the subareas of Ahuimanu, Kahaluu-South, Kahaluu-East, and Kahaluu-North. The community's position is that the Heeia-North, Waiahole, Waikane-Hakipuu, and Kualoa subareas should either remain on cesspools or use small package treatment plants. The agricultural areas should remain on cesspools.

2. Public Hearing

A public hearing presentation for the Kahaluu Wastewater and Disposal System was held on November 29, 1978 at the Ahuimanu Elementary School. The proposed project was presented, together with the estimated costs to the Federal, State and County agencies and to the private landowners. The responses to the recommended system presentation were favorable. There were no objections.

The public testimony given at the conclusion of the public hearing generally reiterated the Kahaluu community's opposition to any consideration of a treatment plant in the vicinity of the proposed community center. A sewage pump station at this site would be acceptable since it would require a minimum of space.

G. EVALUATION AND RANKING OF ALTERNATIVES

1. Principal Considerations

Selection of the most acceptable alternative involves making choices among all the alternatives based on monetary, environmental, social, political and other considerations. The significant costs, effects, and benefits of each must be evaluated and careful judgement must be exercised in selecting the recommended plan. Ideally, the alternative with the lowest present worth cost without experiencing any overriding adverse nonmonetary costs and public reaction would be considered the most acceptable alternative.

a. Environmental Considerations

Provision of sewerage systems may have effects beyond the correction of water quality problems. Environmental effects may be classified as direct and indirect. Direct impacts are those arising from actual construction activity. Examples are noise, dust, traffic slowdowns and other problems arising from construction activity; disturbance of environmentally sensitive areas such as wetlands and floodplains; disturbance of historical and archaeological sites; and land removed from other potential uses. Indirect impacts are induced by the presence or absence of a sewerage system and are difficult to anticipate and evaluate. The most important indirect impacts are associated with changes of existing land use induced by the system and the development that can be stimulated. Some adverse impacts of urbanization are traffic congestion, increased urban storm runoff, air pollution, and increased transportation costs and energy consumption.

b. Fiscal Considerations

Associated with urbanization are some fiscal impacts. These include increased costs associated with providing public services (police, fire, water, roads, education, sewers, transportation, recreation). To cover these costs, taxes and fees must be assessed.

c. Other Considerations

Another consideration is the capability of the State and City and County of Honolulu to bear their shares of the project cost. In addition, the ability of the users to pay the operation and maintenance of the wastewater facilities must be assessed. An important nonmonetary consideration is that the selected plan must meet applicable regulatory requirements and design and reliability criteria. Finally, the energy and resources which must be committed to each alternative must be evaluated.

2. Determination of Areas to be Sewered

The centralized collection system was selected as the recommended alternative for the Ahuimanu, Kahaluu-East, Kahaluu-North, and Kahaluu-South subareas. This determination was based on the following considerations:

a. Approximately 70 percent of the residential population of the planning area reside in these subareas.

b. Population densities are highest in these subareas.

c. Proximity of the Ahuimanu collection and treatment system which can be readily expanded to serve these unsewered subareas. and which minimizes the initial capital outlay.

d. State and City water quality management goal of eliminating discharge of wastewater into Kaneohe Bay.

e. Centralized system is much more reliable in achieving the desired water quality in highly populated areas than the other waste disposal alternatives.

f. The Detailed Land Use Map indicates a concentration of urban land uses in the area encompassed by these subareas. The centralized collection system is compatible with these land uses.

The cost effective analysis of alternative pollution abatement systems was not developed because overriding environmental and water quality considerations ruled out these alternative systems.

The centralized collection system for the other subareas was not feasible because of the following factors:

a. Low population density.

b. Subareas are agriculturally-oriented.

c. Strong local opposition to developments within these subareas.

d. Adverse environmental and fiscal impacts associated with a centralized system. As shown in Table VII-5, the average cost per household for a centralized collection system is not cost effective compared to individual on-site systems.

e. Centralized collection system is not compatible with the low density land use designations shown on the Detailed Land Use Map.

3. Ranking of Treatment and Disposal Alternatives for the Centralized System

The treatment and disposal alternatives are:

Alternative 1: Secondary treatment at Ahuimanu STP with chemicals, pump secondary effluent to Kaneohe effluent pumping station.

Alternative 2: Secondary treatment at Ahuimanu STP by addition of aeration and secondary clarifier tanks, pump secondary effluent to Kaneohe effluent pumping station.

Alternative 3: Secondary treatment by trickling filter process at Kaneohe STP pump screened and degritted wastewater to Kaneohe STP.

Alternative 4: Secondary treatment by activated sludge process at Kaneohe STP pump screened and degritted wastewater to Kaneohe STP.

For each of these four alternatives, effluent disposal will be through the Mokapu Ocean Outfall.

Selection of the final wastewater treatment alternative for the centralized system is contingent upon EPA's ruling on the City's secondary waiver application for the Mokapu Ocean Outfall. Therefore, the selection of the recommended treatment alternative at this time must include the two treatment situations (treatment at Ahuimanu and treatment at Kaneohe).

The Kaneohe STP treatment alternative selection will be addressed in a study presently being conducted by the City and County of Honolulu entitled "Step 1 Addenda for the Kaneohe and Kailua Facility Plans."

At Ahuimanu, the alternative of adding an activated sludge component in parallel with the existing rapid block system was selected over the alternative of chemical addition. The primary factor in determining the alternative was reliability. The chemical addition alternative has a lower present worth cost but it is based on a trouble free operating plant. The performance of the present system deteriorates when the flows exceed 55 to 65 percent of the design capacity of the rapid block unit.

Odor, upsets of the treatment process, and poor quality effluent and sludge are some of the problems that occur. The chemical addition alternative has lower present worth costs but the unforeseen costs that arise due to these problems are not included.

4. <u>No Action Plan for Heeia-North, Waiahole, Waikane-Hakipuu and Kualoa Subareas</u>

The recommended system for the Heeia-North, Waiahole, Waikane-Hakipuu, and Kualoa subareas is the no action alternative. This no action (or no project) alternative relies on the

current State Department of Health regulations to continue to enforce water pollution control measures in these subareas. Under this alternative, existing homes will continue to use cesspools for wastewater disposal and cesspools will continue to be pumped by the City and County as required.

The primary factors favoring this no action recommendation are low population density, low cost per home, low population growth projections, and adequate regulations which govern any water pollution which may be generated by any new development that may develop in the future. In each of these four subareas the current low population and low per capita income do not justify the expenditure of large sums for any improvements to the existing cesspool systems. The existing environmental situation in these areas does not pose any significant public health problem. The rationale for selecting the no action alternative for each subarea is discussed below.

Heeia-North Subarea

Selection of the most cost-effective alternative is complicated by the uncertainties in predicting the future land development trends and the corresponding wastewater flows for the subarea. There is strong opposition to development of any type in the subarea. Presently, there are several proposed development projects that are experiencing difficulty in obtaining the necessary permits and approvals.

If these proposed projects are allowed to proceed, the entire subarea could be completely urbanized by the year 2000. In this case, the centralized sewer system would probably be the most effective means of controlling water pollution. However, the centralized collection system to serve this future urban growth will not be eligible for Federal funding. The costs of the system will have to be borne by the developer who in turn passes it on to the consumer.

On the other hand, the no action or improved onsite system alternatives are feasible when restrictions are placed on urban growth. At this time the small population (70) of the subarea is on cesspools and generates a daily flow of approximately 7,000 gpd. For this small quantity of flow, the continued use of cesspools is an acceptable and inexpensive means of disposal.

Waiahole Subarea Alternatives

A consideration in the ranking of alternatives is the restoration of the water quality of Waiahole Stream. Fecal coliform and fecal streptococcus bacteria were found in Waiahole Stream, as in the other streams of the planning area, indicating the presence of human and animal wastes. A probable cause of this contamination is the leachate from unidentified cesspools along the stream and the wastes from feral animals inhabitating the upstream areas. However, in-depth field investigations must be conducted to identify the sources of pollution. This will be done as part of a new Facility Plan for North Oahu. Therefore for this subarea the "no action alternative" is in reality a "no immediate action alternative" with specific actions to be developed in the new Facility Plan.

The small on-site system alternative provides some degree of treatment prior to disposal of the wastewater on-site. For package plant and centralized collection system alternatives, the raw wastewater is collected and transported to a centralized area for treatment and disposal. From the water quality standpoint, these latter two alternatives are preferred. From the present worth cost standpoint, the small on-site system alternative is preferred.

One major drawback of the package plant and centralized collection system alternatives is that their existence may encourage urban growth in the subarea. The adverse impacts associated with urban development were discussed earlier in this Section. Another drawback is that the collection system is eligible for

Federal funding but has very low priority. All of the costs for installing the system may have to be borne by the residents and the City and County of Honolulu. At the present time the future development in Waiahole Valley is in doubt and there is no pressing situation which requires a new sewerage system in the subarea.

The summary present worth costs for the three feasible alternatives were made under the assumption that a limited number (100) of new homes are in existence. Without this additional development, there will be only the 35 existing homes in the area. Using the alternative (Improved On-Site System) with the least expensive cost per home ($1,031,000 ÷ 135 = $7,637), the cost per home of $7,637 is believed to be prohibitive.

Waikane-Hakipuu Subarea Alternatives

A consideration in the ranking of alternatives is the restoration of the water quality of Waiahole Stream. Fecal coliform and fecal streptococcus bacteria were found in Waiahole Stream, as in the other streams of the planning area, indicating the presence of human and animal wastes. A probable cause of this contamination is the leachate from unidentified cesspools along the stream and the wastes from feral animals inhabitating the upstream areas. However, in-depth field investigations must be conducted to identify the sources of pollution. This will be done as part of a new Facility Plan for North Oahu. Therefore for this subarea the "no action alternative" is in reality a "no immediate action alternative" with specific actions to be developed in the new Facility Plan.

Presently, cesspools are used in the subarea for disposal of wastewater. Most of the land is in agricultural use and the population density of the subarea is very low. The major landowner in the subarea is planning to develop 144 two-acre lots agricultural subdivision in Waikane Valley. This proposed project is very controversial since the local residents fear that it might change the rural character of the valley. If

this project wins acceptance, the population of the subarea will nearly double by the year 2000. A portion of this proposed development will be within the zone established by the Board of Water Supply where cesspools are not allowed, to protect the integrity of the municipal water supply sources. If the development project is denied the necessary approvals, population growth in the subarea will be minimal.

Kualoa Subarea Alternatives

The tributary area is limited to a narrow strip along the shoreline parallel to Kamehameha Highway. Based on current zoning and land use designation, this tributary area is developed to its maximum allowable density. No further development is possible without a change in the land use designation. All of the existing homes use cesspools.

Studies of this nearshore area have not been conducted to determine if cesspool leachate could be contaminating the nearshore waters. Until this can be confirmed by an extensive quantitative field investigation, it cannot be concluded that a water quality problem exists. The good circulation that exists in the open coastal waters indicates that the few homes along the shoreline would not significantly degrade the nearshore waters.

These two considerations in addition to the present worth costs weigh heavily in favor of the on-site system alternatives. One factor which favors the continued use of cesspools is that the present State Regulations govern only new construction of wastewater disposal systems and the City and County of Honolulu sewer ordinance applies to only new connections to existing or recently constructed municipal sewers. There is no legal basis for the State or City and County to force homeowners to upgrade their disposal system in areas where there are no municipal sewers. Thus, in areas with water

quality problems, institutional changes are required which provide incentives to the homeowner to upgrade his cesspool.

One particular area where a centralized collection system may be feasible is the Kualoa Park. The projected flow from the park by the year 2000 is 50,000 gallons/day. Cavitettes are presently used for wastewater disposal. The water bodies that must be protected from pollution are the nearshore recreational areas of the park and the nearby Molii Fishpond, a registered historic site and wildlife sanctuary. The costs for constructing the collection system will not be eligible for Federal funding. In addition, this alternative is feasible only if the interconnecting sewer subsystems linking Kualoa with the existing Ahuimanu collection system are constructed.

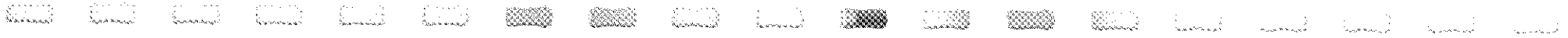
SECTION VIII

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

The proposed project will provide for a much needed wastewater system for the more populated areas in the Kahaluu planning area. The system will be designed to initially accommodate present Ahuimanu subarea waste loads and will be expanded to include new collection systems in the Kahaluu-South, Kahaluu-East and Kahaluu-North subareas as soon as the Kaneohe STP expansion can accommodate them. The prime objectives of eliminating the risk to public health, and the nuisance from malfunctioning cesspools, improving water quality, and providing for disposal of wastewater in an economical and environmentally acceptable manner will be accomplished by the proposed system.

The initial short term adverse impacts from the construction of the required facilities and those long term impacts from the operation of the system are to be balanced against the long term benefits of efficient and controlled wastewater management and the planned economic development of the area. The proposed action will improve the environment and thereby have a long term effect on enhancing and maintaining the quality of the environment. Groundwater, streams and Kaneohe Bay should be positively affected by the elimination of pollution by cesspools. Improved conditions in Kaneohe Bay should increase marine life and productivity of edible species. The regional approach, using the Mokapu Outfall, eliminates the worry over the local disposal of effluent which may have long term effects that are not evident. The deep ocean outfall provides a means to dispose of nutrient rich effluent where the environment is nutrient deficient, thus making a positive contribution to increased marine life over the long term.

Cesspools are generally considered short term or interim solutions to the wastewater disposal problem, except in very rural areas where the low densities make any improved system uneconomical. Therefore for any area that develops gradually from a low population density to a high population density some form of an improved wastewater system will ultimately be required to protect the environment. The proposed action is the recommended system to accomplish this, for this planning area and period of time.



SECTION IX
MEASURES TO MINIMIZE ADVERSE IMPACTS

A. GENERAL

All available means to minimize adverse effects will be used. The major adverse impacts are temporary due to construction. These impacts will be mitigated by well known measures usually used and included in contract specifications.

B. CONSTRUCTION

1. Inconvenience to motorists and pedestrians will be mitigated by:

    a. Regulating hours of construction to avoid peak commuter traffic periods.
    b. Construction scheduling.
    c. Public information.
    d. Specification requirements.

2. Noise will be mitigated by:

    a. Regulating hours of construction.
    b. Observance of noise control regulations.

3. Dust will be mitigated by:

    a. Regulating hours of construction.
    b. Requiring dust control by watering.
    c. Observance of air pollution regulations.

4. Interruption of business will be mitigated by:

    a. Regulating hours of construction.
    b. Specification requirements for prior approval of scheduling and phasing.
    c. Coordination meetings with local businesses.

5. Water pollution caused by the force main crossing Kaneohe Stream will be mitigated by:

   a. Construction during periods of low stream flow.
   b. Limiting disturbance of bottom materials.
   c. Control of spoil discharge into the stream.

C. AESTHETICS

1. The appearance of pump station structures above ground will be mitigated by:

   a. Landscaping.
   b. Architectural treatment.
   c. Careful siting.

D. OPERATIONS

1. Noise of SPS will be mitigated by:

   a. Housing the facility.
   b. Limiting openings.
   c. Landscaping.

2. Odor of SPS will be mitigated by:

   a. Aeration facilities.
   b. Operation and maintenance program.
   c. Careful siting.

3. Consumption of energy will be mitigated by:

   a. Equalization basins.
   b. Operation and maintenance program.
   c. Gravity flow where feasible in lieu of pumped flow.

E. ECONOMIC

1. User charges will be mitigated by:

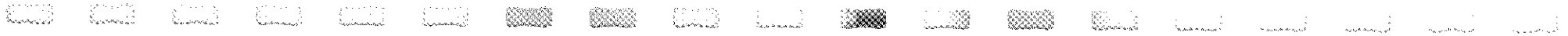
a. Financing construction of the treatment and disposal facilities by Federal, State and City and County funds thus spreading around the cost to the general public.

b. Keeping facilities to the minimum required for the year 2000.

c. Permitting payment of Improvement District assessments through long term (20 years), plus interest loans.

F. WATER QUALITY

In the four subareas (Waiahole, Waikane-Hakipuu, Kualoa and Heeia-North) which will remain unsewered, the State and City will ensure that future developments are in full compliance with regulations for private wastewater systems. In the near future the North Oahu Facility Plan will be initiated and will include an assessment of the current water quality situation in Waiahole and Waikane Streams.



SECTION X

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

The project will require several irreversible commitments of resources such as the material and capital invested in the new facilities and the manpower and energy used to operate and maintain the facilities.

The major commitments are the materials and funds associated with construction of the facilities and the Operations and Maintenance (O&M) costs.

The implementation of the proposed action will utilize resources and materials considered essential to complete the project. Financial, manpower, and material resources will be irreversible and irretrievable commitments for planning, engineering, construction, operation and maintenance of the proposed facilities. Electrical power will also be irreversibly committed, not only for the construction of the facilities but also for their operation. Some small land easements will be required for the alignment of sewers, and small sites will be acquired for sewage pumping stations. Commitments such as land are irretrievable as long as the facility is in use, however, they are retrievable if the facility is discontinued. The amount of land used for the proposed project is relatively small.

Another commitment will be the discharge of the nutrients in the treated wastewater into the ocean. The reuse of treated wastewater for irrigation has recently shown to be not only feasible but economical in some areas and under some conditions. Therefore, the wastewater itself can be considered a resource which would be irretrievably lost. However, the economic and local conditions at this time make recycling of wastewater impractical. Should conditions change this commitment to ocean disposal can be reversed and the treated wastewater can be reused for whatever purposes required.

Another long term commitment is the service charge that must be levied on the residents and commercial users of the wastewater facilities.

Reference is made to Section 204 of the Federal Water Pollution Control Act Amendments of 1972, Public Law 92-500, which stipulates that Federal grant applicants shall receive such grants only after it has been determined that the applicant has adopted or will adopt a system of charges wherein each recipient of wastewater services will pay his proportionate share of the costs of operation and maintenance to include replacement. This commitment is necessary to justify and obtain Federal grants which allow funds up to 75 percent of the construction costs of wastewater treatment works. The current City and County of Honolulu user charge system assesses each single family residence $4.85 per month. Non-residential users are charged $.36/1,000 gallons of water consumed or $.45/1,000 gallons of wastewater discharged.

SECTION XI

OTHER INTERESTS AND CONSIDERATIONS OF GOVERNMENTAL POLICIES OFFSETTING THE ADVERSE EFFECTS OF THE PROPOSED ACTION

Compliance with two environmental regulations help to offset the adverse effects of the proposed action. These are the Federal Water Pollution Control Act (FWPCA), as amended, and the Hawaii Statute on Environmental Quality (Chapter 342, Hawaii Revised Statutes).

The objective of the FWPCA is to "restore and maintain the chemical, physical, and biological integrity of the Nation's waters." To achieve this objective, the FWPCA mandated that the discharge of pollutants into the Nation's navigable waters be eliminated by 1985 and that a water quality be attained by July 1, 1983 which provides for the protection and propagation of fish, shellfish, and wildlife and provides for recreation in and on the water. The National Pollutant Discharge System (NPDES) was established to issue permits for the discharge of all effluents into the Nation's waters. One condition of this permit is that all effluents must receive at least secondary treatment before it can be discharged.

The Hawaii Statute on Environmental Quality has similar objectives as the FWPCA. Under the provisions of this Statute, the State Department of Health promulgates Public Health Regulations addressing the control and abatement of pollution. The regulations pertinent to water pollution abatement are Chapter 37: Water Pollution Control, Chapter 37A: Water Quality Standards, and Chapter 38: Private Wastewater Treatment Works and Individual Wastewater Systems. These regulations establish the effluent requirements applicable to treatment works in order to protect and preserve the water quality of the State.

The State of Hawaii and City and County of Honolulu share the mutual responsibility of restoring the pristine water quality of Kaneohe Bay. Kaneohe Bay is classified as Class AA and Chapter 37A of the Public Health Regulations does not permit the discharge of sewage effluent into Class AA waters. To comply with this regulation, the NPDES permit for Ahuimanu STP mandates that the discharge of effluent into Kaneohe Bay be eliminated by February 28, 1983.

In addition, the 208 Water Quality Management Plan for the City and County of Honolulu dated October 1978 identified disposal by cesspools as generally detrimental to public health. The plan recommended that cesspools be eliminated where practical or under certain conditions.

The proposed action will achieve the objectives set forth by these governmental policies. The proposed project will eliminate the present effluent discharge into Ahuimanu Stream (and Kaneohe Bay) and eliminate the disposal of raw wastewater by cesspools in highly populated areas.

SECTION XII

ORGANIZATIONS AND PERSONS CONSULTED

A. AGENCIES, ORGANIZATIONS, AND PERSONS CONSULTED FOR THE EIS PREPARATION NOTICE

The EIS Preparation Notice for the Kahaluu Wastewater Treatment and Disposal System was published in the September 8, 1978 issue of the Environmental Quality Commission Bulletin. The agencies, organizations and individuals who received a copy of the Preparation Notice are listed in Appendix A. The comments received and the response to comments are also included as Appendix B.

B. AGENCIES, ORGANIZATIONS, AND PERSONS CONSULTED FOR THE EIS

(To Be Included in the Final Submittal.)

SECTION XIII

SUMMARY OF UNRESOLVED ISSUES

The objective of the proposed action is to eliminate sewage discharges into Kaneohe Bay. The proposed centralized collection system for Ahuimanu, Kahaluu-North, Kahaluu-East, and Kahaluu-South subareas is expected to eliminate most of the sewage discharges in Kaneohe Bay.

However, the water quality problems in the rural subareas of Heeia-North, Waiahole, Waikane-Hakipuu, and Kualoa will not be corrected at this time. The overriding reasons for the no immediate project recommendation are that the alternatives are very costly and that sources of pollution in these thinly populated subareas have not been identified. The limited water quality data available for Heeia-North, Waiahole and Waikane-Hakipuu imply that the reported stream pollution is caused by both human and nonhuman sources. The State and the City plan to include these subareas in the new North Oahu Facility Plan to be undertaken in the near future. A key task will be to conduct field studies to determine the current water quality in the streams of these subareas.

The degree of treatment required for the Kahaluu flows at the Kaneohe STP will be determined by the EPA's ruling on the secondary waiver application for the Mokapu Ocean Outfall. The EPA's decision is expected sometime in mid-1980. If the application is approved, the present level of treatment provided by the trickling filters will be continued. If the waiver application is disapproved, the treatment level must be upgraded.

BIBLIOGRAPHY

Ahn, Chung Dho & Associates, Inc., March 1973. ENGINEERING REPORT FOR THE KAHALUU WASTEWATER TREATMENT PLANT EFFLUENT FORCE MAIN.

Ahn, Chung Dho & Associates, Inc., July 1972. MASTER PLAN REPORT KANEOHE-KAILUA DIVERSION LINE & OUTFALL.

Ahn, Chung Dho & Associates, Inc., August 1976. ALTERNATIVE WASTEWATER MANAGEMENT PLANS, KANEOHE SERVICE AREA.

Architects Hawaii, Inc., November 1977. WAIAHOLE VALLEY PLANNING STUDY.

City & County of Honolulu, July 1969. WATERSHED WORK PLAN, KAHALUU WATERSHED.

Elliot, Margaret E. and Hall, Erin Marie, September 1977. WETLANDS AND WETLAND VEGETATION OF HAWAII.

Environmental Communications, Inc., June 1978. DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR THE PROPOSED WAIKANE AGRICULTURAL SUBDIVISION.

General Planning, Department of, City & County of Honolulu, March 1974. PLANNING FOR OAHU AN EVALUATION OF ALTERNATIVE RESIDENTIAL POLICIES.

General Planning, Department of, City & County of Honolulu, September 1977. DATA BOOK FOR THE KAHALUU NEIGHBORHOOD.

Health, Department of, State of Hawaii, August 5, 1973. PUBLIC HEALTH REGULATIONS, CHAPTER 38, SEWAGE TREATMENT AND DISPOSAL SYSTEMS.

Health, Department of, State of Hawaii, May 25, 1974. PUBLIC HEALTH REGULATIONS, CHAPTER 37A, WATER QUALITY STANDARDS.

Health, Department of, State of Hawaii, April 7, 1978. PROPOSED PUBLIC HEALTH REGULATIONS, CHAPTER 37A, WATER QUALITY STANDARDS.

Health, Department of, State of Hawaii, May 17, 1978. PROPOSED PUBLIC HEALTH REGULATIONS, CHAPTER 38, PRIVATE WASTEWATER TREATMENT WORKS AND INDIVIDUAL WASTEWATER SYSTEMS.

Health, Department of, State of Hawaii and City and County of Honolulu, October 1978. WATER QUALITY MANAGEMENT PLAN FOR THE CITY AND COUNTY OF HONOLULU.

Kahaluu Planning Committee Report to Kahaluu Neighborhood Board No. 29, June 1976. COMMUNITY DEVELOPMENT PLAN PROGRESS REPORT AND RECOMMENDATION.

LR&I Development Four, December 1977. ENVIRONMENTAL IMPACT STATEMENT FOR THE PROPOSED KAALAEA CLUSTER CONDOMINIUM.

Planning & Economic Development, Department of, State of Hawaii, December 1976. WINDWARD OAHU REGIONAL PLAN.

Public Works, Department of, City & County of Honolulu, October 1970. DESIGN STANDARDS OF THE DIVISION OF SEWERS.

Public Works, Department of, City & County of Honolulu, April 1974. FINAL ENVIRONMENTAL IMPACT STATEMENT FOR KANEOHE-KAILUA SEWER SYSTEM INCLUDING MOKAPU OCEAN OUTFALL, KAILUA EFFLUENT FORCE MAIN, KAILUA EFFLUENT PUMP STATION, KANEOHE EFFLUENT FORCE MAIN, KANEOHE EFFLUENT PUMP STATION, KAHALUU EFFLUENT FORCE MAIN AND KAHALUU WASTEWATER TREATMENT PLANT.

Soil Conservation Service, U. S. Department of Agriculture, 1971. SOILS AND SEPTIC TANKS, BULLETIN 349.

Sunn, Low, Tom & Hara, Inc., February 1974. REPORT ON THE INFILTRATION/ INFLOW ANALYSIS FOR KANEOHE-KAILUA SEWER SYSTEM.

Towill, R. M. Corporation, August 1960. REPORT ON AN ENGINEERING INVESTIGATION & STUDY OF SANITARY COLLECTION FACILITIES FOR PORTIONS OF KANEOHE, HEEIA, AND HEEIA KEA, OAHU, HAWAII.

Towill, R. M. Corporation, 1979. THE FACILITY PLAN FOR THE KAHALUU WASTEWATER TREATMENT AND DISPOSAL SYSTEM.

U. S. Army Engineer District, Honolulu, Hawaii, July 1975. KANEOHE BAY URBAN WATER RESOURCES STUDY COMMUNITY PROFILE 1975.

U. S. Army Engineer District, Honolulu, Hawaii, April 1976. KANEOHE BAY WATER RESOURCES DATA EVALUATION.

U. S. Army Engineer District, Honolulu, Hawaii, April 1976. KANEOHE BAY WATER RESOURCES DATA EVALUATION APPENDICES I AND II.

U. S. Army Engineer District, Honolulu, Hawaii, January 1978. KANEOHE BAY URBAN WATER RESOURCES STUDY, INSTITUTIONAL ANALYSIS APPENDIX.

U. S. Corps of Engineers, W. Barrera, Jr., September 1977. PLAN ALTERNATE HISTORIC SITES.

U. S. Geological Survey, Report R48, May 1973. CHEMICAL QUALITY OF GROUND WATER IN HAWAII.

U. S. Environmental Protection Agency, May 1975, Rev. GUIDANCE FOR PREPARING A FACILITY PLAN.

U. S. Environmental Protection Agency, July 1975. COST EFFECTIVE WASTEWATER TREATMENT SYSTEMS: EPA 430/9-75-002.

U. S. Environmental Protection Agency, December 1975. HANDBOOK FOR SEWER SYSTEM EVALUATION AND REHABILITATION, EPA 430/9-75-021.

U. S. Environmental Protection Agency, October 1977. ALTERNATIVES FOR SMALL WASTEWATER TREATMENT SYSTEMS, VOL. 1, 2, & 3, EPA 625/4-77-011.

U. S. Environmental Protection Agency, January 1978. CONSTRUCTION COSTS FOR MUNICIPAL WASTEWATER TREATMENT PLANTS 1973-1977, MCD-37.

U. S. Environmental Protection Agency, April 25, 1978. WAIVER REGULATIONS FOR SECONDARY TREATMENT AND DISPOSAL. Federal Register, Vol. 43, Number 80.

U. S. Environmental Protection Agency, May 1978. CONSTRUCTION COSTS FOR MUNICIPAL WASTEWATER CONVEYANCE SYSTEMS: 1973-1977, MCD-38.

U. S. Environmental Protection Agency, May 1978. ANALYSIS OF OPERATIONS AND MAINTENANCE COSTS FOR MUNICIPAL WASTEWATER TREATMENT SYSTEMS. MCD-39.

Wastewater Management, Division of, Department of Public Works, City & County of Honolulu, July 1971. WATER QUALITY PROGRAM FOR OAHU WITH SPECIAL EMPHASIS ON WASTE DISPOSAL, FINAL REPORT, AS AMENDED.

Water Resources Research Center, University of Hawaii, August 1966. INFILTRATION AND PERCOLATION THROUGH OAHU SOILS IN SIMULATED CESSPOOL LYSIMETERS.

Water Resources Research Center, University of Hawaii, April 1967. SURVEY OF LITERATURE ON GROUND WATER RECHARGE AND SULFIDE GENERATION.

Water Resources Research Center, University of Hawaii, June 1967. INFILTRATION AND PERCOLATION STUDIES.

Water Resources Research Center, University of Hawaii, July 1975. RECYCLING OF SEWAGE EFFLUENT BY IRRIGATION. A field study on Oahu, final progress report for August 1971 to June 1975.

Water Resources Research Center, University of Hawaii, May 1976. WATER QUALITY MONITORING; KANEOHE BAY, JULY TO DECEMBER 1975.

Water Resources Research Center, University of Hawaii, August 1976. WET WEATHER WATER QUALITY MONITORING, KANEOHE BAY.

Windard Partners by Environmental Communications, Inc., February 1978. ENVIRONMENTAL IMPACT STATEMENT FOR THE PROPOSED WAIKANE RESIDENTIAL SUBDIVISION.

APPENDIX A

AGENCIES AND INDIVIDUALS RECEIVING THE EIS PREPARATION NOTICE

Mr. Ramon Duran
Chief Planning Officer
Department of General Planning
City & County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Mr. George Moriguchi, Director
Department of Land Utilization
City & County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Mr. Kazu Hayashida, Director
Department of Transportation Services
City & County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Mr. Tyrone Kusao, Director
Department of Housing and
Community Development
City & County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Mr. John Bohn, Administrator
Oahu Civil Defense Agency
City & County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Office of Environmental Quality Control
550 Halekauwila Street
Honolulu, Hawaii 96813

Dr. James S. Kumagai
Deputy Director for Environmental Health
State Department of Health
P. O. Box 3378
Honolulu, Hawaii 96801

Department of Planning and
Economic Development
State of Hawaii
P. O. Box 2359
Honolulu, Hawaii 96804

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

Department of Transportation
State of Hawaii
869 Punchbowl Street
Honolulu, Hawaii 96813

Department of Education
State of Hawaii
P. O. Box 2360
Honolulu, Hawaii 96804

Board of Agriculture
State of Hawaii
1425 South King Street
Honolulu, Hawaii 96814

Water Resources Research Center
University of Hawaii
2540 Dole Street
Honolulu, Hawaii 96822

State Historic Preservation Office
Department of Land and Natural Resources
P. O. Box 621
Honolulu, Hawaii 96809

Environmental Center
University of Hawaii
2540 Dole Street
Honolulu, Hawaii 96822

Corps of Engineers
Honolulu District
Department of the Army
Building 230
Fort Shafter, Hawaii 96858

Soil Conservation Service
U. S. Department of Agriculture
P. O. Box 5004
Honolulu, Hawaii 96813

Fish and Wildlife Service
U. S. Department of the Interior
P. O. Box 50167
Honolulu, Hawaii 96850

Pacific Division
Naval Facilities Engineering Command
Pearl Harbor, Hawaii 96860

Directorate of Facilities Engineering
Headquarters
U. S. Army Support Command, Hawaii
Department of the Army
Fort Shafter, Hawaii 96858

Public Works Department
U. S. Marine Corps Air Station
Kaneohe Bay, Hawaii 96863

Pacific Division
Naval Facilities Engineering Command
Pearl Harbor, Hawaii 96860

Life of the Land
404 Piikoi Street
Honolulu, Hawaii 96814

The Outdoor Circle
200 North Vineyard Boulevard
Honolulu, Hawaii 96817

League of Women Voters of Honolulu
1802 Keeaumoku Street
Honolulu, Hawaii 96822

Hawaiian Electric Co., Inc.
900 Richards Street
Honolulu, Hawaii 96813

Hawaiian Sugar Planters Association
P. O. Box 1057
Aiea, Hawaii 96701

Kaneohe Community Council
c/o Mr. Ed M. Slavish
44-394 Kaneohe Bay Drive
Kaneohe, Hawaii 96744

Neighborhood Board No. 30
c/o Kaneohe Satellite City Hall
46-024 Kamehameha Highway
Kaneohe, Hawaii 96744

Ahuimanu Investment Company
Room 200, Halau Building
International Market Place
2330 Kalakaua Avenue
Honolulu, Hawaii 96815

Windward Partners
1020 J Keolu Drive
Kailua, Hawaii 96734

Hawaii Housing Authority
1002 North School Street
Honolulu, Hawaii 96817

Foremost Homes Hawaii
P. O. Box 1225
Kailua, Hawaii 96734
Attention: Mr. Harvey Gerwig

Hawaiian Telephone Company
1177 Bishop Street
Honolulu, Hawaii 96813

GASCO, Inc.
1060 Bishop Street
Honolulu, Hawaii 96813

Mr. Hiram Fong
1102 Alewa Drive
Honolulu, Hawaii 96817

Neighborhood Board No. 29
c/o Kahaluu Community Center
47-232 Waihee Road
Kaneohe, Hawaii 96744

Mr. Douglas Miller
Shoreline Protection Alliance
P. O. Box 4247
Honolulu, Hawaii 96813

APPENDIX B

COMMENTS AND RESPONSES TO THE EIS PREPARATION NOTICE

1102 Alewa Drive
Honolulu, Hawaii 96817
August 28, 1978

RECEIVED
DEPT OF PUBLIC WORKS
AUG 31 2 19 PM '78

TO DIR
DEP
ENV
WWM

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

RECEIVED
SEP -8 PM 1 28
DEPT OF WASTEWATER MANAGEMENT

Dear Mr. Miyahira:

Subject: Environmental Impact Statement (EIS)
Preparation Notice for Kahaluu
Wastewater Treatment & Disposal System

I am objecting strenuously to the proposal to construct an alternate site for a primary or secondary Wastewater Treatment Plant at the identified site in Kahaluu or to use a part of the proposed site for a sewage pumping station as the proposal if carried out will be placing a sewer plant or a sewer pumping station approximately in the center of a most beautiful and large recreational, educational and community area.

The site location is bad as it will be located adjacent to a beautiful park and lagoon where hundreds of people will go for fresh air, much rest and recreation.

The site location is bad as it will be located just north of the Kahaluu Elementary School. The northeast tradewinds will blow the odors emanating from the plant directly into the school.

The site location is bad as it will be located adjacent to Kahaluu Community Center where many groups of people will be constantly meeting.

I believe it is more appropriate to use the present sewer plant site in Kahaluu and enlarge it a little to accommodate the extra sewage.

Sincerely yours,

Hiram L. Fong

Hiram L. Fong

HLF:hy

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DK		YM	
SCM		RHW	
REC'D	SEP 20 1978	RMTC	
WK		RDP	
MY		DKM	

RLW 9/27
CAR 9/27

SPP 78-239

September 15, 1978

Honorable Hiram L. Fong
1102 Alewa Drive
Honolulu, Hawaii 96817

Dear Senator Fong:

Subject: Environmental Impact Statement
Preparation Notice for the Kahaluu Wastewater
Treatment and Disposal System

We are in receipt of your August 28, 1978 letter regarding the subject EIS Preparation Notice. Progressing studies of wastewater management in Kahaluu indicate that there may be no need to use the alternate site in the central community area for wastewater treatment plant purposes.

Therefore the site in question will probably be free for the other beneficial uses to the community that you mentioned. Your comments were very helpful and are being given every consideration in preparing the EIS.

Should there be any questions, please call Cedric Takamoto at 523-4067.

Very truly yours,

WALLACE MIYAHIRA
Director and Chief Engineer

CT:ct

NEIGHBORHOOD BOARD NO. ~~29~~
IN KAHALUU
KAHALUU COMMUNITY CENTER
47-232 WAIHEE ROAD
KANEOHE, HAWAII 96744

Hoolia Koa, Kahalu'u, Waihe'e, Waiahole, Waikane, Hakipuu and Kualoa

STY 9/25
FLV 9/26
CAC

" Let us not ever have
an unhappy minority "

RMT2		STY	
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SCM		PHW	
REC'D SEP 22 1978 RMTC			
WK		RDP	
MY		DKM	

Sub-area 1
C.Hoe
G.Nakamoto
Sub-area 2
N.Hottendorf
R.Nakata
L.Wong
Sub-area 3
J.Harper
F.Reppun MD
Chairman
J.Wilson
Sub-area 4
Ed Salas
V.Van Epps
Sub-area 5
R.Bellinger
S.Souza
C.Tod
Sub-area 6
K.Payne
Secretary
B.Shimomoto
Vice-chm

20 September 1978

Mr. Wallace Miyahira, Director
Dept of Public Works
650 So. King St
Honolulu 96813

Dear Wally: Re: Kahalu'u WWT&DS

The Kahalu'u Neighborhood Board members are very appreciative of your efforts to make available to each one of us the R.M. Towill EIS; that corporation did send us the 14 copies we needed.

The Statement itself drew nothing but praise for its thoroughness and for the overall picture of our Neighborhood, which we can use from now on as a real reference.

At the meeting of KNB-29 on 13 September, the Board unanimously agreed to approve the EIS, and to specify the following:

1) Location of Treatment Plant (Ref: 5. a. on p. 25)
That it be located at the present Ahuimanu Plant

2) Level of Treatment (Ref: 5. b. on p. 25)
That the treatment be at a Secondary level

3) Disposal of Treated Effluent (Ref: 5. c. on p. 26)
That disposal should be through the ocean outfall at Mokapu.

The KNB-29 is of the opinion that the site earmarked for a new STP in Kahalu'u, mauka of the Lagoon and makai of the Elementary School, might be used as a booster pump site, if absolutely necessary, and with a minimum use of the land, the rest to be turned over to the Kahalu'u District Park and Civic Center.

Aloha,

FRED

J.I.Frederick Reppun MD
Chairman

cc R.M.Towill Corp.
EQC
Councilman Mateumoto

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

FRANK F. FASI
MAYOR

WALLACE MIYAHIRA
DIRECTOR AND CHIEF ENGINEER

SPP 78-258

RMT2		STY	
DK		YM	
SCM		PHW	
REC'D OCT 3 1978 RMTC			
WK		RDP	
MY		DKM	

September 26, 1978

J. I. Frederick Reppun M.D.
Chairman, Neighborhood Board No. 29
47-232 Waihee Road
Kaneohe, Hawaii 96744

FLV 9/27
CAC

Dear Dr. Reppun:

Subject: Kahaluu Wastewater Treatment and Disposal System - EIS Preparation Notice

We appreciate receiving your September 20, 1978 letter. We concur in your commendation of our consultant's work on the EIS Preparation Notice.

We look forward to maintaining our mutual effort toward achieving a satisfactory resolution of the wastewater treatment concerns in your area.

Should there be any questions, please call Cedric Takamoto at 523-4067.

Very truly yours,

Wallace Miyahira

WALLACE MIYAHIRA
Director and Chief Engineer

cc: R.M. Towill

CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813

FRANK F. FASI
MAYOR

RECEIVED
DEPT. OF PUBLIC WORKS
AUG 15 2 20 PM '78

TO ENVIR GEORGE S. MORIGUCHI
DIRECTOR

WWM 78/EC-4(JW)
P+PS LU8/78-3087

RECEIVED
AUG 16 PM 1 51
CITY & COUNTY OF HONOLULU
WASTEWATER MANAGEMENT

August 14, 1978

MEMORANDUM

TO : MR. WALLACE MIYAHIRA, DIRECTOR & CHIEF ENGINEER
DEPARTMENT OF PUBLIC WORKS

FROM : GEORGE S. MORIGUCHI, DIRECTOR

SUBJECT : EIS PREPARATION NOTICE, KAHALUU WASTEWATER TREATMENT & DISPOSAL SYSTEM

Our comments on the above are as follows:

1. We suggest that the EIS discuss the possibility of combining some of the alternatives outlined. In particular, the option of converting the Ahuimanu STP into a pump station and linking it to the Kaneohe system, while extending sewer lines only to selected nearby areas in Kahaluu where there are major concentrations of malfunctioning cesspools, should be given serious consideration.

2. The EIS should indicate the specific areas where cesspool performance is poor in order to demonstrate the need and cost-effectiveness of servicing these areas with a municipal sewer system.

3. The continued use of on-site disposal methods in areas north of Kahaluu Town would seem to be the most acceptable alternative in view of issues such as cost-effectiveness, socio-economic impacts and the low projected growth rate for this portion of the service area. The fact that certain developments have been proposed for Waiahole and Waikane Valleys by no means determines their inevitability. However, the availability of public sewers in this area would encourage development, in contrast to the General Plan policy.

4. The final statement on page 3, regarding projected urban and agricultural acreage, should be clarified. What is the basis, source and time frame for this estimate?

Should you have any questions on these comments, please call Mr. John Whalen of our staff at extension 4077.

GEORGE S. MORIGUCHI
Director of Land Utilization

GSM:sl

October 22, 1979

TO: MR. TYRONE KUSAO
DIRECTOR
DEPARTMENT OF LAND UTILIZATION

FROM: WALLACE MIYAHIRA
DIRECTOR AND CHIEF ENGINEER
DEPARTMENT OF PUBLIC WORKS

SUBJECT: KAHALUU WASTEWATER TREATMENT AND DISPOSAL SYSTEM
EIS PREPARATION NOTICE

We appreciate receiving your comments on the EIS Preparation Notice. The EIS is being prepared taking all relevant comments into account.

Should there be any further questions, please call Cedric Takamoto at 4067.

WALLACE MIYAHIRA
Director and Chief Engineer

CT:wpc

GEORGE R. ARIYOSHI
GOVERNOR OF HAWAII

SUSUMU ONO, CHAIRMAN
BOARD OF LAND & NATURAL RESOURCES

EDGAR A. HAMASU
DEPUTY TO THE CHAIRMAN

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

DIVISIONS:
CONSERVATION AND RESOURCES ENFORCEMENT
CONVEYANCES
FISH AND GAME
FORESTRY
LAND MANAGEMENT
STATE PARKS
WATER AND LAND DEVELOPMENT

RECEIVED DEPT OF PUBLIC WORKS DEC 7 8 01 AM '79

RECEIVED '79 DEC -7 PM 1 WASTEWATER MANAGEMENT

December 3, 1979

Mr. Wallace Miyahira
Director and Chief Engineer
City and County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Dear Sir:

SUBJECT: Environmental Impact Statement (EIS) Preparation Notice for Kahaluu Wastewater Treatment and Disposal System

In response to your letter of November 16, 1979 regarding the above named project the following is offered:

Your letter states that the pipelines for this project will be located in the existing road right-of-ways and for this portion of the project we concur that archaeological/historical sites are unlikely to be impacted within this portion of the project. However, in the portion of the project where the pipeline traverses lower Kaneohe Stream, and possibly at the six sites where sewage pump stations and collection systems are to be located, there may be archaeological sites which might be adversely impacted by your proposed development. In addition, because your document does not include a description or a map showing the location of the six sewage pump stations, we cannot address the possible impact of this construction on archaeological resources. It is therefore our recommendation that an archaeological reconnaissance by a qualified archaeologist be conducted in areas that will be impacted by construction of either pipe lines or pump stations and their associated collection systems, excluding those areas which are presently in road right-of-way.

Sincerely yours,

Susumu Ono
State Historic Preservation Officer

December 28, 1979

Mr. Susumu Ono
State Historic Preservation Office
Department of Land and Natural Resources
P. O. Box 621
Honolulu, Hawaii 96809

Gentlemen:

SUBJECT: Kahaluu Wastewater Treatment and Disposal System EIS Preparation Notice

We appreciate receiving your comments on the EIS Preparation Notice. The EIS is being prepared taking all relevant comments into account.

Should there be any further questions, please call Cedric Takamoto at 523-4067.

Very truly yours,

WALLACE MIYAHIRA
Director and Chief Engineer

CT:wpc

CITY AND COUNTY OF HONOLULU

HONOLULU MUNICIPAL BUILDING
650 SOUTH KING STREET
HONOLULU, HAWAII 96813

FRANK F. FASI
MAYOR

August 23, 1978

KAZU HAYASHIDA
DIRECTOR

MEMORANDUM

TO : WALLACE MIYAHIRA, DIRECTOR AND CHIEF ENGINEER
DEPARTMENT OF PUBLIC WORKS

FROM : KAZU HAYASHIDA, DIRECTOR

SUBJECT: ENVIRONMENTAL IMPACT STATEMENT (EIS)
PREPARATION NOTICE FOR KAHALUU
WASTEWATER TREATMENT & DISPOSAL SYSTEM

We have reviewed the Environmental Impact Statement Preparation Notice for the subject project and agree that the most significant traffic impact from the project will take place during the construction phase.

We recommend that detailed detour plans be prepared to alleviate any traffic congestion that may occur during the construction period.

for KAZU HAYASHIDA
Director

October 22, 1979

TO: MR. ROBERT WAY
DIRECTOR
DEPARTMENT OF TRANSPORTATION SERVICES

FROM: WALLACE MIYAHIRA
DIRECTOR AND CHIEF ENGINEER
DEPARTMENT OF PUBLIC WORKS

SUBJECT: KAHALUU WASTEWATER TREATMENT
AND DISPOSAL SYSTEM
EIS PREPARATION NOTICE

We appreciate receiving your comments on the EIS Preparation Notice. The EIS is being prepared taking all relevant comments into account.

Should there be any further questions, please call Cedric Takamoto at 4067.

WALLACE MIYAHIRA
Director and Chief Engineer

CT:wpc

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

RECEIVED AUG 24 PM 3 57 WASTEWATER MANAGEMENT

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August

TO: WALLACE S. MIYAHIRA
DIRECTOR & CHIEF ENGINEER
DEPARTMENT OF PUBLIC WORKS

FROM: EDWARD Y. HIRATA

SUBJECT: YOUR LETTER OF AUGUST 1, 1978 RELATING TO ENVIRONMENTAL IMPACT STATEMENT PREPARATION NOTICE FOR KAHALUU WASTEWATER TREATMENT AND DISPOSAL SYSTEM

We have no objections to the proposed project.

Water service for the project should be coordinated with us before beginning the preparation of construction plans for the project. The project will be assessed a pro rata share for our development of water system facilities that are necessary to accommodate your project. The pro rata share will be based on the size of your meter.

Construction plans for your proposed waste treatment facility should be submitted for our review of fire protection requirements and conformance to our construction standards. In addition, any plans to consider land treatment of sewage effluent and sludge should also be submitted for our review.

If you need any further information on this matter, please call Lawrence Whang at 548-5122.

Very truly yours,

EDWARD Y. HIRATA
Manager and Chief Engineer

Pure Water... man's greatest need – use it wisely

October 22, 1979

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

FROM: WALLACE MIYAHIRA
DIRECTOR AND CHIEF ENGINEER
DEPARTMENT OF PUBLIC WORKS

SUBJECT: KAHALUU WASTEWATER TREATMENT AND DISPOSAL SYSTEM
EIS PREPARATION NOTICE

We appreciate receiving your comments on the EIS Preparation Notice. The EIS is being prepared taking all relevant comments into account.

Should there be any further questions, please call Cedric Takamoto at 4067.

WALLACE MIYAHIRA
Director and Chief Engineer

CT:wpc

RECEIVED DEPARTMENT OF GENERAL PLANNING
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET
HONOLULU, HAWAII 96813
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TO ENVIL WWM

FRANK F. FASI
MAYOR

CITY AND COUNTY OF HONOLULU
WASTEWATER MANAGEMENT

RAMON DURAN
CHIEF PLANNING OFFICER

DGP8/78-2967(CT)

August 25, 1978

Mr. Wallace Miyahira
Director and Chief Engineer
Department of Public Works
City and County of Honolulu
Honolulu, Hawaii

Dear Mr. Miyahira:

EIS Preparation Notice for Kahaluu
Wastewater Treatment and Disposal System
Comments Requested August 1, 1978

We offer the following suggestions:

1. The EIS should include maps showing existing land uses, proposed future land uses per the officially adopted Detailed Land Use Map for the area, and current zoning.

   The EIS should indicate where applications for DLUM and zoning changes have been received, where applications for subdivisions are being processed, and where major development proposals are being considered.

   The Data Systems Branch of DGP has maps showing existing land uses. The Central Coordinating Agency at DLU is setting up a "master file" showing where applications for development activities are being processed.

2. The EIS should map areas where cesspools require pumping--how many, how often, and what percentage of the cesspools this constitutes. Areas where cesspools are likely to fail early because of poor soils conditions should be indicated.

3. The EIS should indicate what is required to upgrade the Ahuimanu sewage treatment plant to an effectively operating tertiary system in terms of the chemical-mechanical processing, and estimated costs.

   The EIS should provide a site layout of the Ahuimanu STP and adjacent areas to support the statement that expansion to fully effective tertiary treatment is not feasible.

4. A summary of costs of the alternatives considered should be included in the EIS.

5. The reports of the Corps of Engineers Kaneohe Bay Urban Water Resources Study may provide useful background information and maps for your EIS. We can make our set available to you on a loanout basis.

Thank you for affording us the opportunity of reviewing your preparation notice. We hope our comments will help you in your work.

Sincerely,

for RAMON DURAN
Chief Planning Officer

RD:fmt

October 22, 1979

TO: MR. GEORGE MORIGUCHI
CHIEF PLANNING OFFICER
DEPARTMENT OF GENERAL PLANNING

FROM: WALLACE MIYAHIRA
DIRECTOR AND CHIEF ENGINEER
DEPARTMENT OF PUBLIC WORKS

SUBJECT: KAHALUU WASTEWATER TREATMENT
AND DISPOSAL SYSTEM
EIS PREPARATION NOTICE

We appreciate receiving your comments on the EIS Preparation Notice. The EIS is being prepared taking all relevant comments into account.

Should there be any further questions, please call Cedric Takamoto at 4067.

WALLACE MIYAHIRA
Director and Chief Engineer

CT:wpc

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CITY & COUNTY OF HONOLULU
WASTEWATER MANAGEMENT

UNIVERSITY OF HAWAII

Water Resources Research Center

TO ENVIR
WWM

August 17, 1978

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

Dear Mr. Miyahira:

Subject: Environmental Impact Statement, Preparation Notice for Kahaluu Wastewater Treatment & Disposal System

We have reviewed the subject EIS and have the following comments:

1. There are other individual or low-density treatment systems that could be considered and evaluated besides the cesspool, Clivis multrum, and septic tank.

2. Its not readily apparent whether the inefficiency of "tertiary" treatment at the Ahuimanu STP is a result of design deficiencies or operational problems. This should be elaborated on as well as the economics of the higher level of treatment before setting aside this alternative from further consideration.

We look forward to reviewing the completed EIS.

Sincerely yours,

Reginald H. F. Young
Environmental Engineer

RHFY:jmn

2540 Dole Street · Honolulu, Hawaii 96822

October 22, 1979

Water Resources Research Center
University of Hawaii
2540 Dole Street
Honolulu, Hawaii 96822

Gentlemen:

SUBJECT: Kahaluu Wastewater Treatment
and Disposal System
EIS Preparation Notice

We appreciate receiving your comments on the EIS Preparation Notice. The EIS is being prepared taking all relevant comments into account.

Should there be any further questions, please call Cedric Takamoto at 523-4067.

Very truly yours,

Wallace Miyahira

WALLACE MIYAHIRA
Director and Chief Engineer

CT:wpc

CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII

FRANK F. FASI
MAYOR

ROBERT T. FUKUDA
DIRECTOR

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DIV. OF
WASTEWATER
MANAGEMENT

August 17, 1978

MEMORANDUM

TO : WALLACE MIYAHIRA, DIRECTOR AND CHIEF ENGINEER
DEPARTMENT OF PUBLIC WORKS

FROM : ROBERT T. FUKUDA, DIRECTOR

SUBJECT: ENVIRONMENTAL IMPACT STATEMENT (EIS) PREPARATION NOTICE FOR KAHALUU WASTEWATER TREATMENT AND DISPOSAL SYSTEM

We have reviewed the subject EIS Preparation Notice and find it to be acceptable. It has generally acknowledged our concerns for the recreational needs in the Kahaluu area.

In earlier discussions with Mr. Cedric Takamoto of your staff, our specific concerns were for the recreation potentials in the area surrounding the flood control project that is presently under construction. Our plans in this area include the expansion of Kahaluu Field with the development of a district park and a regional recreation area surrounding the flood control lagoon.

As pointed out in the notice, a Wastewater Treatment Plant site has been identified on the Detailed Land Use Map in the area that we have included in our planning for recreational uses. We, therefore, favor the alternate plan that would not require this site for a treatment plant. Second to this alternative would be the location of a sewage pumping station on a portion of this site or in the vicinity as required.

Robert T. Fukuda

ROBERT T. FUKUDA, DIRECTOR

October 22, 1979

TO: MR. RAMON DURAN
DIRECTOR
DEPARTMENT OF PARKS AND RECREATION

FROM: WALLACE MIYAHIRA
DIRECTOR AND CHIEF ENGINEER
DEPARTMENT OF PUBLIC WORKS

SUBJECT: KAHALUU WASTEWATER TREATMENT AND DISPOSAL SYSTEM EIS PREPARATION NOTICE

We appreciate receiving your comments on the EIS Preparation Notice. The EIS is being prepared taking all relevant comments into account.

Should there be any further questions, please call Cedric Takamoto at 4067.

Wallace Miyahira

WALLACE MIYAHIRA
Director and Chief Engineer

CT:wpc

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HAWAIIAN ELECTRIC COMPANY, INC.

Box 2750 / Honolulu, Hawaii 96840

TO ENV 11 ~~ENV 2-1~~
GENERAL
NV/6/NV

JOHN C. McCAIN, Ph.D
MANAGER, ENVIRONMENTAL DEPARTMENT

August 17, 1978

R. M. Towill Corporation
677 Ala Moana Blvd.
Suite 1016
Honolulu, HI 96813

CITY & CO. WASTEWATER MANAGEMENT
AUG 24 AM 9 42
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Dear Sirs:

SUBJECT: EIS Preparation Notice for the Kahaluu Wastewater Treatment and Disposed System

Several members of our staff have reviewed the EIS Preparation Notice for the Kahaluu Wastewater Treatment and Disposal System and have the following comments:

1. The project should have no substantial adverse impact on Hawaiian Electric Company's transmission and distribution system other than some possible relocation of lines due to the final design.

2. The commercial economics parameters discussion on page 10 should probably mention the fact that Hawaiian Electric has and plans to continue operation of a base yard at Heeia Kea.

Thank you for the opportunity to review the EIS preparation notice. I look forward to reviewing the draft EIS.

Yours truly,

JCMc:sw

cc: C & C Dept. of Public Works

October 22, 1979

Hawaiian Electric Co., Inc.
900 Richards Street
Honolulu, Hawaii 96813

Gentlemen:

SUBJECT: Kahaluu Wastewater Treatment
and Disposal System
EIS Preparation Notice

We appreciate receiving your comments on the EIS Preparation Notice. The EIS is being prepared taking all relevant comments into account.

Should there be any further questions, please call Cedric Takamoto at 523-4067.

Very truly yours,

WALLACE MIYAHIRA
Director and Chief Engineer

CT:wpc

STATE OF HAWAII
DEPARTMENT OF EDUCATION
P. O. BOX 2360
HONOLULU, HAWAII 96804

OFFICE OF THE SUPERINTENDENT

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TO ENV LU
WWM

August 14, 1978

Mr. Wallace S. Miyahira
Director and Chief Engineer
Department of Public Works
City and County of Honolulu
Honolulu, Hawaii 96813

Dear Mr. Miyahira:

SUBJECT: Environmental Impact Statement
Kahaluu Wastewater Treatment & Disposal System

We have reviewed the Preparation Notice for the subject project and would like to offer the following comments:

1. We do not concur with the proposed alternate site for the Wastewater Treatment Plant adjacent to our Kahaluu Elementary School. The school is downwind of the site and the higher noise and odor level would create an environment inconsistent with educational needs.

2. We would not object to the installation of a pumping station at the site provided the design of such an installation would have a minimal effect upon the school environment.

Thank you for the opportunity to review and comment on this project.

Sincerely,

CHARLES G. CLARK
Superintendent

CGC:HL:jl

cc Windward Oahu District
Harold K. Fukunaga

AN EQUAL OPPORTUNITY EMPLOYER

October 22, 1979

Department of Education
State of Hawaii
P. O. Box 2360
Honolulu, Hawaii 96804

Gentlemen:

SUBJECT: Kahaluu Wastewater Treatment
and Disposal System
EIS Preparation Notice

We appreciate receiving your comments on the EIS Preparation Notice. The EIS is being prepared taking all relevant comments into account.

Should there be any further questions, please call Cedric Takamoto at 523-4067.

Very truly yours,

WALLACE MIYAHIRA
Director and Chief Engineer

CT:wpc

780812

GEORGE R. ARIYOSHI
GOVERNOR OF HAWAII

STATE OF HAWAII
DEPARTMENT OF HEALTH
P.O. Box 3378
HONOLULU, HAWAII 96801

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GEORGE A. L. YUEN
DIRECTOR OF HEALTH

Audrey W. Mertz, M.D., M.P.H.
Deputy Director of Health

Henry N. Thompson, M.A.
Deputy Director of Health

James S. Kumagai, Ph.D., P.E.
Deputy Director of Health

In reply, please refer to
File: EPHE - SS

August 15, 1978

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CITY & COUNTY OF HONOLULU
WASTEWATER MANAGEMENT

Mr. Wallace Miyahira
Director and Chief Engineer
Department of Public Works
City & County of Honolulu
650 S. King St.
Honolulu, Hawaii 96813

Dear Mr. Miyahira:

Subject: Request for Comments on Proposed Environmental Impact Statement (EIS) for Preparation Notice for Kahaluu Wastewater Treatment & Disposal System

Thank you for allowing us to review and comment on the subject proposed EIS. Please be informed that we have no comments or objections to this project at this time.

We realize that the statements are general in nature due to preliminary plans being the sole source of discussion. We, therefore, reserve the right to impose future environmental restrictions on the project at the time final plans are submitted to this office for review.

Sincerely,

Brian H. Choy
for JAMES S. KUMAGAI, Ph.D.
Deputy Director for
Environmental Health

October 22, 1979

Dr. James S. Kumagai
Deputy Director for Environmental Health
State Department of Health
P. O. Box 3378
Honolulu, Hawaii 96801

Gentlemen:

SUBJECT: Kahaluu Wastewater Treatment
and Disposal System
EIS Preparation Notice

We appreciate receiving your comments on the EIS Preparation Notice. The EIS is being prepared taking all relevant comments into account.

Should there be any further questions, please call Cedric Takamoto at 523-4067.

Very truly yours,

Wallace Miyahira

WALLACE MIYAHIRA
Director and Chief Engineer

CT:wpc

GEORGE R. ARIYOSHI
GOVERNOR OF HAWAII

W. Y. THOMPSON, Chairman
BOARD OF LAND & NATURAL RESOURCES
EDGAR A. HAMASU
DEPUTY TO THE CHAIRMAN

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

DIVISIONS:
CONSERVATION
FISH AND GAME
FORESTRY
LAND MANAGEMENT
STATE PARKS
WATER AND LAND DEVELOPMENT

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August 29, 1978

Honorable Wallace S. Miyahira
Director and Chief Engineer
Department of Public Works
City and County of Honolulu
650 South King Street
Honolulu, HI 96813

Dear Mr. Miyahira:

We have reviewed the EIS preparation notice for expanding sewerage service in the vicinity of Kahaluu from 184 to 2200 acres.

We concur with your determination that an EIS is needed. We respectfully request that the EIS cover precautions against turbidity and accidental spillage during construction which may have adverse impact on aquatic life.

Very truly yours,

W. Y. THOMPSON
Chairman of the Board

cc: Division of Fish & Game

October 22, 1979

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

Gentlemen:

SUBJECT: Kahaluu Wastewater Treatment
and Disposal System
EIS Preparation Notice

We appreciate receiving your comments on the EIS Preparation Notice. The EIS is being prepared taking all relevant comments into account.

Should there be any further questions, please call Cedric Takamoto at 523-4067.

Very truly yours,

WALLACE MIYAHIRA
Director and Chief Engineer

CT:wpc

GEORGE R. ARIYOSHI
GOVERNOR

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STATE OF HAWAII
DEPARTMENT OF AGRICULTURE
1428 SO. KING STREET
HONOLULU, HAWAII 96814

78 06072

August 22, 1978

MEMORANDUM

To: Mr. Wallace S. Miyahara, Director
Department of Public Works, C&C of Honolulu

Subject: EIS Preparation Notice for Kahaluu Wastewater Treatment and Disposal System

The Department of Agriculture has reviewed the notice and submit the following comments for consideration:

- That the location of the proposed plant be in conformance with the State's Windward Oahu Regional Plan and the forthcoming City and County Windward Oahu Development Plan.
- Avoid, if possible, utilizing prime agricultural land if proposed site is outside of Urban District.

We appreciate the opportunity to comment.

John Farias Jr.

JOHN FARIAS, JR.
Chairman, Board of Agriculture

JF:w:h

October 22, 1979

Board of Agriculture
State of Hawaii
1425 South King Street
Honolulu, Hawaii 96814

Gentlemen:

SUBJECT: Kahaluu Wastewater Treatment and Disposal System
EIS Preparation Notice

We appreciate receiving your comments on the EIS Preparation Notice. The EIS is being prepared taking all relevant comments into account.

Should there be any further questions, please call Cedric Takamoto at 523-4067.

Very truly yours,

Wallace Miyahira

WALLACE MIYAHIRA
Director and Chief Engineer

CT:wpc

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UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

DEPT. OF PUBLIC WORKS

P. O. Box 50004, Honolulu, HI 96850 9 51 AM '78

ENVILL

WWM

PLPS

August 17, 1978

Mr. Wallace S. Miyahira
Director and Chief Engineer
Department of Public Works
City & County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

WASTEWATER MANAGEMENT

AUG 22 AM 8

Dear Mr. Miyahira:

Subject: EIS Preparation Notice for Kahaluu Wastewater Treatment and Disposal System, Koolaupoko, Oahu

We have reviewed the preparation notice and recommend that any new drafts be updated to include the PL-566 Kahaluu Flood Control Project improvements. These improvements will alter the existing drainage patterns of several streams. Information on the works of improvements can be obtained from the SCS State Office in the Prince Kuhio Federal Building.

Thank you for the opportunity to review this document.

Sincerely,

Donald Moniz acting

Jack P. Kanalz
State Conservationist

October 22, 1979

Soil Conservation Service
U. S. Department of Agriculture
P. O. Box 5004
Honolulu, Hawaii 96813

Gentlemen:

SUBJECT: Kahaluu Wastewater Treatment and Disposal System
EIS Preparation Notice

We appreciate receiving your comments on the EIS Preparation Notice. The EIS is being prepared taking all relevant comments into account.

Should there be any further questions, please call Cedric Takamoto at 523-4067.

Very truly yours,

Wallace Miyahira

WALLACE MIYAHIRA
Director and Chief Engineer

CT:wpc

780562

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

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16 August 1978

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DEPT. OF WASTEWATER MANAGEMENT

Mr. Wallace Miyahira
Director and Chief Engineer
Department of Public Works
City and County of Honolulu
650 South King Street
Honolulu, HI 96813

Dear Mr. Miyahira:

We have reviewed the environmental impact statement preparation notice for the Kahaluu Wastewater Treatment and Disposal System which we received on 5 August 1978.

The Flood Boundary and Floodway Maps, prepared by the US Department of Housing and Urban Development, Federal Insurance Administration, 24 February 1978, should be used in site selection to avoid potential flood damage or flood losses. The maps are available at the City and County of Honolulu, Department of Land Utilization.

The project may require a US Department of the Army permit for stream crossings, for any work on the shoreline waters or for the discharge of dredged or fill material into wetlands found in the Kahaluu and Ahuimanu areas. Your project plans should be coordinated with Mr. Stanley Arakaki, Chief, Operations Branch, phone 438-9258, as soon as possible to determine the need for a permit. If the project requires a permit, various alternatives such as alternative alignments to avoid unnecessary work in wetlands and other valuable waters, construction techniques to minimize environmental impacts, and other wastewater management techniques such as land treatment, will need to be considered and evaluated.

We thank you for the opportunity to participate in the Environmental Impact Statement review process.

Sincerely yours,

B. R. Schlapak

B. R. SCHLAPAK
Lt Col, Corps of Engineers
District Engineer

October 22, 1979

Corps of Engineers
Honolulu District
Department of the Army
Building 230
Fort Shafter, Hawaii 96858

Gentlemen:

SUBJECT: Kahaluu Wastewater Treatment
and Disposal System
EIS Preparation Notice

We appreciate receiving your comments on the EIS Preparation Notice. The EIS is being prepared taking all relevant comments into account.

Should there be any further questions, please call Cedric Takamoto at 523-4067.

Very truly yours,

Wallace Miyahira

WALLACE MIYAHIRA
Director and Chief Engineer

CT:wpc

7803795

DEPARTMENT OF THE ARMY
HEADQUARTERS UNITED STATES ARMY SUPPORT COMMAND, HAWAII
FORT SHAFTER, HAWAII

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P&PS

TO AUG 15 1978

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DIV. OF WASTEWATER MANAGEMENT

AFZV-FE-EE

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

Dear Mr. Miyahira:

We have reviewed the Environmental Impact Statement Preparation Notice for the Kahaluu Wastewater Treatment and Disposal System. It appears that all matters of concern to this command will be addressed. Nevertheless, we urge you to assure that the effects of the proposed action and all alternatives thereto on the ecology of Kaneohe Bay receive full analysis.

Thank you for the opportunity to comment.

Sincerely,

EARL P. RODOLPH
Colonel, CE
Director of Facilities Engineering

JAMES D. C. CHANG

1 Incl
Env Impact Stmt Prep
Notice for Kahaluu
Wastewater Treatment &
Disposal System

October 22, 1979

Directorate of Facilities Engineering
Headquarters
U. S. Army Support Command, Hawaii
Department of the Army
Fort Shafter, Hawaii 96858

Gentlemen:

SUBJECT: Kahaluu Wastewater Treatment and Disposal System EIS Preparation Notice

We appreciate receiving your comments on the EIS Preparation Notice. The EIS is being prepared taking all relevant comments into account.

Should there be any further questions, please call Cedric Takamoto at 523-4067.

Very truly yours,

WALLACE MIYAHIRA
Director and Chief Engineer

CT:wpc

7805766

GEORGE R. ARIYOSHI
GOVERNOR

STATE OF HAWAII
DEPARTMENT OF SOCIAL SERVICES AND HOUSING
HAWAII HOUSING AUTHORITY
P. O. BOX 17907
HONOLULU, HAWAII 96817

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Aug 15 2 18 PM '78

TO ENV
WWM

FRANKLIN Y. K. SUNN
EXECUTIVE DIRECTOR

WILLIAM A. HALL
ASSISTANT EXEC. DIRECTOR

IN REPLY REFER

TO: 0-158.1/1991

August 11, 1978

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

RECEIVED
'78 AUG 17 AM10 26
CITY & CO.
WASTEWATER
MANAGEMENT

Dear Mr. Miyahira:

Subject: Environmental Impact Statement (EIS)
Preparation Notice for Kahaluu
Wastewater Treatment & Disposal System

Thank you for permitting us to review this EIS Preparation Notice. Our anticipated schedule for Waiahole Valley appears to be compatible with your schedule. We would appreciate inclusion in any contemplated action in the future.

Sincerely yours,

FRANKLIN Y. K. SUNN
Executive Director

October 22, 1979

Hawaii Housing Authority
1002 North School Street
Honolulu, Hawaii 96818

Gentlemen:

SUBJECT: Kahaluu Wastewater Treatment
and Disposal System
EIS Preparation Notice

We appreciate receiving your comments on the EIS Preparation Notice. The EIS is being prepared taking all relevant comments into account.

Should there be any further questions, please call Cedric Takamoto at 523-4067.

Very truly yours,

WALLACE MIYAHIRA
Director and Chief Engineer

CT:wpc

780570

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
REGION NINE

ARIZONA
CALIFORNIA
NEVADA
HAWAII
GUAM
AMERICAN SAMOA

Hawaii Division
Box 50206
Honolulu, Hawaii 96850

August 18, 1978

IN REPLY REFER TO
HEC-HI

Mr. Wallace S. Miyahira
Director and Chief Engineer
Department of Public Works
City and County of Honolulu
650 So. King Street
Honolulu, Hawaii 96813

RECEIVED
'78 AUG 22 AM 8:30
CITY & CO. WASTEWATER MANAGEMENT

Dear Mr. Miyahira:

Subject: EIS Preparation Notice for Kahaluu Wastewater Treatment and Disposal System

Thank you for the opportunity of reviewing the subject EIS Preparation Notice.

We have no comments to offer at this time.

Sincerely yours,

Ralph T. Segawa
Division Administrator

By H. Nusumoto
Assistant Division Administrator

October 22, 1979

Federal Highway Administration
Hawaii Division
Region IX
U. S. Department of Transportation
P. O. Box 50206
Honolulu, Hawaii 96850

Gentlemen:

SUBJECT: Kahaluu Wastewater Treatment and Disposal System
EIS Preparation Notice

We appreciate receiving your comments on the EIS Preparation Notice. The EIS is being prepared taking all relevant comments into account.

Should there be any further questions, please call Cedric Takamoto at 523-4067.

Very truly yours,

Wallace Miyahira

WALLACE MIYAHIRA
Director and Chief Engineer

CT:wpc

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GEORGE R. ARIYOSHI
GOVERNOR

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CITY & COUNTY OF HONOLULU
DEPT. OF WASTEWATER MANAGEMENT

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
869 PUNCHBOWL STREET
HONOLULU, HAWAII 96813

RYOKICHI HIGASHIONNA PH.D.
DIRECTOR

DEPUTY DIRECTORS
WALLACE AOKI
DOUGLAS S. SAKAMOTO
CHARLES O. SWANSON

IN REPLY REFER TO:
STP 8.5029

August 21, 1978

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

Dear Mr. Miyahira:

Subject: Environmental Impact Statement Preparation Notice for Kahaluu Wastewater Treatment & Disposal System

In the preparation of the above-captioned statement, we recommend that the Heeia Kea Boat Harbor be included in the document. The harbor is within the project's planning area boundaries and its needs should be assessed. Since the harbor expansion plans are still conceptual and in the formulation stages, the specific sewage requirements have not yet been determined. As future users of the proposed system, we recommend that the EIS recognize the harbor's presence and impact.

On another point, we suggest continued coordination with our Land Transportation Facilities Division for lines and facilities to be located within the rights-of-way of State highways.

Very truly yours,

R. Higashionna

October 22, 1979

Department of Transportation
State of Hawaii
869 Punchbowl Street
Honolulu, Hawaii 96813

Gentlemen:

SUBJECT: Kahaluu Wastewater Treatment and Disposal System
EIS Preparation Notice

We appreciate receiving your comments on the EIS Preparation Notice. The EIS is being prepared taking all relevant comments into account.

Should there be any further questions, please call Cedric Takamoto at 523-4067.

Very truly yours,

WALLACE MIYAHIRA
Director and Chief Engineer

CT:wpc

HAWAIIAN TELEPHONE COMPANY

P.O. BOX 2200 • HONOLULU, HAWAII 96841 • TELEPHONE (808) 546-7733 • CABLE: TELHAWAII

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HERMAN S. L. HU
NETWORK PLANNING & ENGINEERING DIRECTOR

August 30, 1978

Mr. Wallace S. Miyahira
Director and Chief Engineer
Department of Public Works
City & County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Environmental Impact Statement (EIS)
Preparation Notice for Kahaluu
Wastewater Treatment and Disposal System

Dear Mr. Miyahira:

Hawaiian Telephone Company has no objections to the proposed project, but do have concerns regarding possible relocation of existing communication lines which may be in way of proposed sewer line construction. We would appreciate receiving early plans for the proposed sewer lines so we can minimize their effect on our existing facilities and can properly include the necessary expenditures for our work in our five-year construction budget.

Thank you for giving us the opportunity to comment on this project.

Sincerely,

Herman

October 22, 1979

Hawaiian Telephone Co.
1177 Bishop Street
Honolulu, Hawaii 96813

Gentlemen:

SUBJECT: Kahaluu Wastewater Treatment and Disposal System
EIS Preparation Notice

We appreciate receiving your comments on the EIS Preparation Notice. The EIS is being prepared taking all relevant comments into account.

Should there be any further questions, please call Cedric Takamoto at 523-4067.

Very truly yours,

Wallace Miyahira

WALLACE MIYAHIRA
Director and Chief Engineer

CT:wpc

APPENDIX C

LIST OF NECESSARY APPROVALS

Permits will be required from the following agencies:

A. A permit for grading, excavation and fills will be required pursuant to Ordinance No. 3968 (1972), Chapter 23, Revised Ordinance of Honolulu, 1969 as amended. The Contractor will obtain said permit from the Department of Public Works.

B. A U. S. Department of Army permit under Section 10 of the River and Harbor Act of 1899 and under Section 404 of the Federal Water Pollution Control Act Amendment of 1972 will be required for the construction of the force main under the mouth of Kaneohe Stream. The application for the permit will be submitted.

C. A special management permit pursuant to Section 7, Ordinance no. 4529, and Chapter 205-A HRS as amended by Act 176, SLH 1975, "Interim Shoreline Protection District for Oahu," will be required from the Honolulu City Council through the Department of Land Utilization. The application for the permit will be submitted after the acceptance of the EIS.

APPENDIX D

COMMENTS AND RESPONSES ON THE EIS

DEPARTMENT OF TRANSPORTATION
UNITED STATES COAST GUARD

COMMANDER
Fourteenth Coast Guard District
Prince Kalanianaole Federal Bldg.
300 Ala Moana Blvd.
Honolulu, Hawaii 96850

16450
Series 514
4 February 1980

Office of Environmental Quality Control
550 Halekauwila Street
Room 301
Honolulu, Hawaii 96813

Dear Sir:

The Coast Guard has reviewed the Environmental Impact Statement for the Kahaluu Wastewater Treatment and Disposal System and has no objection to the plan or constructive comments to offer at the present time.

Sincerely,

J. F. OTRANTO
Commander, U. S. Coast Guard
District Planning Officer
Fourteenth Coast Guard District
By Direction of the District Commander

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

FRANK F. FASI
MAYOR

WALLACE MIYAHIRA
DIRECTOR AND CHIEF ENGINEER

WPP 80-109

March 25, 1980

Commander J.F. Otranto, U.S.C.G.
District Planning Officer
Fourteenth Coast Guard District
300 Ala Moana Boulevard
Honolulu, Hawaii 96850

Dear Commander Otranto:

Subject: Environmental Impact Statement for the Kahaluu Wastewater Treatment and Disposal System, Koolaupoko, Oahu

Your letter of February 4, 1980 indicating no objection or comment on subject EIS is acknowledged.

Very truly yours,

FOR WALLACE MIYAHIRA
Director and Chief Engineer

BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU
630 SOUTH BERETANIA
HONOLULU, HAWAII 96843

8004750

KAZU HAYASHIDA
Manager and Chief Engineer

February 4, 1980

Mr. Richard L. O'Connell
Director
Office of Environmental
Quality Control
Room 301
550 Halekauwila Street
Honolulu, Hawaii 96813

Dear Mr. O'Connell:

Subject: Environmental Impact Statement for Kahaluu Wastewater Treatment and Disposal System, Koolaupoko, Oahu

We do not have any additional comments to our letter of August 21, 1979, which is appended to the document.

Should you have questions or require additional information, please call Lawrence Whang at 548-5221.

Very truly yours,

Kazu Hayashida

KAZU HAYASHIDA
Manager and Chief Engineer

cc: Dept. of Public Works

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

FRANK F. FASI
MAYOR

WALLACE MIYAHIRA
DIRECTOR AND CHIEF ENGINEER

WPP 80-111

March 25, 1980

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

FROM : WALLACE MIYAHIRA
DIRECTOR AND CHIEF ENGINEER

SUBJECT: ENVIRONMENTAL IMPACT STATEMENT FOR THE KAHALUU WASTEWATER TREATMENT AND DISPOSAL SYSTEM, KOOLAUPOKO, OAHU

Your letter of February 4, 1980 indicating no additional comments to subject EIS is acknowledged.

for WALLACE MIYAHIRA
Director and Chief Engineer

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CITY & COUNTY
WASTEWATER
MANAGEMENT

State of Hawaii
DEPARTMENT OF DEFENSE
OFFICE OF THE ADJUTANT GENERAL
3949 Diamond Head Road
Honolulu, Hawaii 96816

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PIP 3

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HIENG

Office of Environmental Quality Control
550 Halekauwila Street, Room 301
Honolulu, Hawaii 96813

Gentlemen:

Kahaluu Wastewater Treatment and Disposal System
Koolaupoko, Oahu

Thank you for sending us a copy of the "Kahaluu Wastewater Treatment and Disposal System" Environmental Impact Statement. We have no comments to offer at this time.

Sincerely,

signed

WAYNE R. TOMOYASU
Major, CE, HARNG
Contr & Engr Officer

cc: Dept of Public Works
City & County of Honolulu

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

FRANK F. FASI
MAYOR

WALLACE MIYAHIRA
DIRECTOR AND CHIEF ENGINEER

WPP 80-107

March 25, 1980

Major Wayne R. Tomoyasu, CE, HARNG
Construction and Engineering Officer
Department of Defense
State of Hawaii
3949 Diamond Head Road
Honolulu, Hawaii 96816

Dear Major Tomoyasu:

Subject: Environmental Impact Statement for the Kahaluu Wastewater Treatment and Disposal System, Koolaupoko, Oahu

Your letter of February 5, 1980 indicating no comment is acknowledged.

Very truly yours,

for WALLACE MIYAHIRA
Director and Chief Engineer

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CITY & COUNTY OF HONOLULU
WASTEWATER MANAGEMENT

HEADQUARTERS
NAVAL BASE PEARL HARBOR
BOX 110
PEARL HARBOR, HAWAII 96860

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TO ENV WWM

5 FEB 1980

Office of Environmental Quality Control
550 Halekauwila Street, Room 301
Honolulu, Hawaii 96813

Gentlemen:

Environmental Impact Statement
for the Kahaluu Wastewater
Treatment and Disposal System

The subject EIS has been reviewed and the U.S. Navy has no adverse comments. The proposed plan is viewed as desirable to protect the quality of the Kaneohe Bay waters.

Thank you for this opportunity of making comment.

Sincerely,

J. W. CARL
LIEUTENANT COMMANDER, CEC, USN
DEPUTY FACILITIES ENGINEER
BY DIRECTION OF THE COMMANDER

Copy to:
Department of Public Works
City and County of Honolulu

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

FRANK F. FASI
MAYOR

WALLACE MIYAHIRA
DIRECTOR AND CHIEF ENGINEER

WPP 80-108

March 25, 1980

Lieutenant Commander J.W. Carl, CEC
U.S. Navy
Deputy Facilities Engineer
Headquarters, Naval Base Pearl Harbor
Box 110
Pearl Harbor, Hawaii 96860

Dear Lt. Commander Carl:

Subject: Environmental Impact Statement for the Kahaluu Wastewater Treatment and Disposal System, Koolaupoko, Oahu

Your letter of February 5, 1980 indicating no adverse comments on subject EIS is acknowledged.

Very truly yours,

for WALLACE MIYAHIRA
Director and Chief Engineer

8008744

United States Department of the Interior

FISH AND WILDLIFE SERVICE
300 ALA MOANA BOULEVARD
P.O. BOX 50167
HONOLULU, HAWAII 96850

IN REPLY REFER TO:
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Room 6307

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February 5, 1980

TO Envir
WWM

Office of Environmental Quality Control
550 Halekauwila Street Room 301
Honolulu, Hawaii 96813

Re: Kahaluu Wastewater Treatment and Disposal Sytem, EIS

Dear Sir:

General Comments:

The EIS addresses most of the concerns of the U.S. Fish and Wildlife Service. We look forward to the improvement in Kaneohe Bay water quality and associated benefits that should result from the diversion of sewage away from this area.

Specific Comments:

We would like to see added to Section IX, Measures to Minimize Adverse Impacts, a plan to reduce erosion and subsequent increased turbidity and siltation of streams. Exposed soil and berms used during construction across stream beds should be covered or otherwise prevented from eroding into the streams. Silt traps should also be used to control turbid runoff in areas of steep topography or other areas subject to erosion.

We appreciate this opportunity to comment.

Sincerely yours,

Maurice H. Taylor

Maurice H. Taylor
Field Supervisor
Division of Ecological Services

cc: Dept. of Public Works

CONSERVE AMERICA'S ENERGY

Save Energy and You Serve America!

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

FRANK F. FASI
MAYOR

WALLACE MIYAHIRA
DIRECTOR AND CHIEF ENGINEER

WPP 80-106

March 25, 1980

Mr. Maurice H. Taylor
Field Supervisor
Division of Ecological Services
Fish and Wildlife Service
U.S. Department of the Interior
300 Ala Moana Boulevard
Honolulu, Hawaii 96850

Dear Mr. Taylor:

Subject: Environmental Impact Statement for the Kahaluu Wastewater Treatment and Disposal System, Koolaupoko, Oahu

Your letter of February 5, 1980 forwarded comments upon subject EIS. The general comments therein are acknowledged. The specific comment relating to stream pollution during construction is acknowledged. The only stream crossing in the project will be the force main crossing of Kaneohe Stream with the mitigation measures as indicated in Section IX. The more detailed measures which you outline will be considered in the development of the detailed construction specifications for contractor use.

Very truly yours,

for WALLACE MIYAHIRA
Director and Chief Engineer

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GEORGE R. ARIYOSHI
GOVERNOR

STATE OF HAWAII
DEPARTMENT OF AGRICULTURE
1428 SO. KING STREET
HONOLULU, HAWAII 96814

JOHN FARIAS, JR.
CHAIRMAN, BOARD OF AGRICULTURE

YUKIO KITAGAWA
DEPUTY TO THE CHAIRMAN

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WASTEWATER MANAGEMENT

February 6, 1980

Memorandum

To: Office of Environmental Quality Control

Subject: EIS for Kahaluu Wastewater Treatment and Disposal System; Koolaupoko, Oahu

The Department of Agriculture has reviewed the subject environmental impact statement and has no comments to offer at this time.

Thank you for the opportunity to comment.

JOHN FARIAS, JR.
Chairman, Board of Agriculture

cc: Department of Public Works
City and County of Honolulu

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

FRANK F. FASI
MAYOR

WALLACE MIYAHIRA
DIRECTOR AND CHIEF ENGINEER

WPP 80-105

March 25, 1980

Mr. John Farias, Jr.
Chairman, Board of Agriculture
State of Hawaii
1428 South King Street
Honolulu, Hawaii 96814

Dear Mr. Farias:

Subject: Environmental Impact Statement for the Kahaluu Wastewater Treatment and Disposal System, Koolaupoko, Oahu

Your letter of February 6, 1980 indicating no comments upon subject EIS is acknowledged.

Very truly yours,

for WALLACE MIYAHIRA
Director and Chief Engineer

8000782

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

FRANK F. FASI
MAYOR

GEORGE S. MORIGUCHI
CHIEF PLANNING OFFICER

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TO ENV

DGP2/80-311(CT)

February 7, 1980

MEMORANDUM

TO : MR. WALLACE MIYAHIRA, DIRECTOR AND CHIEF ENGINEER DEPARTMENT OF PUBLIC WORKS

FROM : GEORGE S. MORIGUCHI, CHIEF PLANNING OFFICER

SUBJECT: ENVIRONMENTAL IMPACT STATEMENT FOR THE KAHALUU WASTEWATER TREATMENT AND DISPOSAL SYSTEM, DECEMBER 1979--COMMENTS REQUESTED FEBRUARY 1, 1980

We offer the following comments.

1. Figure II-5 (between pp. II-7 and II-8) shows locations with severe soil limitations for wastewater disposal.

   The EIS should indicate what kind of wastewater treatment is generally recommended for the various areas, preferably over this same base (Figure II-5) or on another map at the same scale and orientation. This would provide a quick overview of what is proposed for the entire planning area.

2. The Summary of Unresolved Issues (p. XIII-1, Section XIII) should include the forthcoming ruling by the Environmental Protection Agency on the City's application for a waiver of secondary treatment for the effluent through the Mokapu Ocean Outfall. This is referred to on pages I-4 and 5, and II-15 and 16.

3. It is indicated that dust will be mitigated by regulating hours of construction (p. IX-1, Section B.3.a).

   Some elaboration of this or its elimination is advised.

4. It is indicated that the existing facility at the Ahuimanu STP is a tertiary plant designed for 1.4 mgd, with a present average daily flow of 0.3 mgd but with nutrient capabilities less than that required by regulations (pp. VII-1 and 2). It

is also indicated that converting the plant from tertiary to secondary treatment is a doubtful proposition because of the "rapid block" design (p. VII-16) and that we have experienced malfunctioning of other similar plants at Mililani, Hawaii Kai and Wailua as flows approach 55 to 65 percent of design flow (p. VII-26).

   The EIS should indicate when the City accepted this STP from the developer and why new homes continue to be added to this system if water quality requirements are not being met.

5. The EIS indicates that "the judicial districts of Kahaluu, Ahuimanu and Heeia are classified as urban fringe . . . " (p. IV-5). The geography is erroneous.

   The areas enumerated above are not judicial districts, but are all located in the Koolaupoko Judicial District.

Thank you for affording us the opportunity of reviewing the impact statement.

George S. Moriguchi
GEORGE S. MORIGUCHI
Chief Planning Officer

GSM:fmt

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

FRANK F. FASI
MAYOR

WALLACE MIYAHIRA
DIRECTOR AND CHIEF ENGINEER

WPP 80-110

March 25, 1980

TO : MR. GEORGE MORIGUCHI
CHIEF PLANNING OFFICER

FROM : WALLACE MIYAHIRA
DIRECTOR AND CHIEF ENGINEER

SUBJECT: ENVIRONMENTAL IMPACT STATEMENT FOR THE KAHALUU WASTEWATER TREATMENT AND DISPOSAL SYSTEM, KOOLAUPOKO, OAHU

Your letter of February 7, 1980 forwarding comments upon subject EIS is acknowledged. We offer the following specific responses:

1. The suggestion for a single system graphic is not feasible. The larger scale graphics of the collection system, force main, and treatment plant provide detailed information not readily shown on a single page.

2. The Summary of Unresolved Issues (Section XIII) will include the forthcoming ruling by the EPA on the City's application for a waiver of secondary treatment for the effluent through the Mokapu Ocean Outfall.

3. We feel that the discussion of dust regulation is adequate.

4. The Ahuimanu STP is meeting NPDES Permit requirements. Developments are being approved only if wastewater facilities are adequate.

5. The entry in the EIS has been revised per your suggestion.

Please contact Cedric Takamoto at local 4067 should you have any questions.

for WALLACE MIYAHIRA
Director and Chief Engineer

5004803

DEPARTMENT OF THE ARMY
HEADQUARTERS UNITED STATES ARMY SUPPORT COMMAND, HAWAII
FORT SHAFTER, HAWAII 96858

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Office of Environmental Quality Control
State of Hawaii
550 Halekauwila Street, Room 301
Honolulu, Hawaii 96813

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DIV. OF WASTEWATER MANAGEMENT

Gentlemen:

The Environmental Impact Statement (EIS) for the Kahaluu Wastewater Treatment and Disposal System, Koolaupoko, Oahu has been reviewed and we have no comments to offer. There are no Army installations or activities in the vicinity of the proposed project.

The EIS is returned in accordance with your request.

Sincerely,

Original signed by

PETER D. STEARNS
COL, EN
Director of Engineering and Housing

1 Incl
As stated

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

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

FRANK F. FASI
MAYOR

WALLACE MIYAHIRA
DIRECTOR AND CHIEF ENGINEER

WPP 80-104

March 25, 1980

Colonel Peter D. Stearns, USA
Director of Engineering and Housing
Headquarters, U.S. Army Support
Command
Fort Shafter, Hawaii 96858

Dear Colonel Stearns:

Subject: Environmental Impact Statement for the Kahaluu Wastewater Treatment and Disposal System, Koolaupoko, Oahu

Your letter of February 7, 1980 indicating no comments upon subject EIS is acknowledged.

Very truly yours,

for WALLACE MIYAHIRA
Director and Chief Engineer

GEORGE R. ARIYOSHI
GOVERNOR OF HAWAII

SUSUMU ONO, CHAIRMAN
BOARD OF LAND & NATURAL RESOURCES

EDGAR A. HAMASU
DEPUTY TO THE CHAIRMAN

DIVISIONS:
CONSERVATION AND RESOURCES ENFORCEMENT
CONVEYANCES
FISH AND GAME
FORESTRY
LAND MANAGEMENT
STATE PARKS
WATER AND LAND DEVELOPMENT

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

February 7, 1980

REF NO.: APO-1328

Environmental Quality Commission
550 Halekauwila Street
Honolulu, HI

Gentlemen:

We have reviewed the EIS for the Kahaluu Wastewater System.

We have no comments to add our letters of August 29, 1978 and December 3, 1979.

Very truly yours,

SUSUMU ONO, Chairman
Board of Land and Natural Resources

FRANK F. FASI
MAYOR

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

WALLACE MIYAHIRA
DIRECTOR AND CHIEF ENGINEER

WPP 80-103

March 25, 1980

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

Dear Mr. Ono:

Subject: Environmental Impact Statement for the Kahaluu Wastewater Treatment and Disposal System, Koolaupoko, Oahu

Your letter of February 7, 1980 indicating no additional comments upon subject EIS is acknowledged.

Very truly yours,

WALLACE MIYAHIRA
Director and Chief Engineer

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WASTEWATER MANAGEMENT

GEORGE R. ARIYOSHI
GOVERNOR OF HAWAII

STATE OF HAWAII
DEPARTMENT OF HEALTH
P.O. Box 3378
HONOLULU, HAWAII 96801

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GEORGE A. L. YUEN
DIRECTOR OF HEALTH
~~Audrey W. Mertz, M.D., M.P.H.~~
Deputy Director of Health
Henry N. Thompson, M.A.
Deputy Director of Health
James S. Kumagai, Ph.D., P.E.
Deputy Director of Health

In reply, please refer to:
File: EPHS-SS

February 7, 1980

MEMORANDUM

To: Mr. Wallace Miyahira, Director and Chief Engineer
Department of Public Works, City & County of Honolulu

From: Deputy Director for Environmental Health

Subject: Environmental Impact Statement (EIS) for Kahaluu Wastewater Treatment and Disposal System, Koolaupoko, Oahu

Thank you for allowing us to review and comment on the subject EIS. On the basis that the project will comply with all applicable Public Health Regulations, please be informed that we have no objections to this project.

The EIS is consistent with the State-Department of Health/Environmental Protection Agency Step 1 planning process. We have reviewed the EIS-Facility Plan and have been working with the City, consultant and EPA to finalize these documents.

We realize that the statements are general in nature due to preliminary plans being the sole source of discussion. We, therefore, reserve the right to impose future environmental restrictions on the project at the time final plans are submitted to this office for review.

for Brian J. Choy
MELVIN K. KOIZUMI

cc: OEQC

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

FRANK F. FASI
MAYOR

WALLACE MIYAHIRA
DIRECTOR AND CHIEF ENGINEER

WPP 80-112

March 25, 1980

Mr. Melvin K. Koizumi
Deputy Director for
Environmental Health
State Department of Health
P. O. Box 3378
Honolulu, Hawaii 96801

Dear Mr. Koizumi:

Subject: Environmental Impact Statement for the Kahaluu Wastewater Treatment and Disposal System, Koolaupoko, Oahu

Your letter of February 7, 1980 indicating no objections to the project at this time is acknowledged.

Very truly yours,

for WALLACE MIYAHIRA
Director and Chief Engineer

80 CC 772

DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT

CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813
PHONE 523-4181

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TO ENV II
WWY

FRANK F. FASI
MAYOR

EDWARD Y. HIRATA
MANAGING DIRECTOR

BARRY CHUNG
DIRECTOR

MYRA M. TAKASAKI
DEPUTY DIRECTOR

February 7, 1980

Environmental Quality Commission
550 Halekauwila Street, Room 301
Honolulu, Hawaii 96813

Gentlemen:

Subject: Kahaluu Wastewater Treatment
and Disposal System
Environmental Impact Statement

We have reviewed the Kahaluu Wastewater Treatment and Disposal System Environmental Impact Statement and have no comment.

Thank you for forwarding the EIS for our review.

We are retaining the copy of the Statement for our files.

Very truly yours,

Barry Chung

Barry Chung

cc: Office of Environmental Quality Control
Department of Public Works,
City and County of Honolulu

DEPARTMENT OF PUBLIC WORKS

CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813

FRANK F. FASI
MAYOR

WALLACE MIYAHIRA
DIRECTOR AND CHIEF ENGINEER

WPP 80-113

March 25, 1980

TO : MR. BARRY CHUNG, DIRECTOR
DEPARTMENT OF HOUSING AND
COMMUNITY DEVELOPMENT

FROM : WALLACE MIYAHIRA
DIRECTOR AND CHIEF ENGINEER

SUBJECT: ENVIRONMENTAL IMPACT STATEMENT FOR
THE KAHALUU WASTEWATER TREATMENT AND
DISPOSAL SYSTEM, KOOLAUPOKO, OAHU

Your letter of February 7, 1980 indicating no comments upon subject EIS is acknowledged.

FOR WALLACE MIYAHIRA
Director and Chief Engineer

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WASTEWATER MANAGEMENT

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

FRANK F. FASI
MAYOR

WALLACE MIYAHIRA
DIRECTOR AND CHIEF ENGINEER

WPP 80-101

March 25, 1980

Office of Environmental
Quality Control
550 Halekauwila Street
Room 301
Honolulu, Hawaii 96813

Gentlemen:

Subject: Environmental Impact Statement for the Kahaluu Wastewater Treatment and Disposal System

Thank you for this opportunity to review and comment on the subject project.

The project will not have any adverse environmental effect on any existing or planned facilities serviced by our department.

Very truly yours,

RIKIO NISHIOKA
State Public Works Engineer

MI:ssk
cc: Department of Public Works
City & County of Honolulu

Mr. Rikio Nishioka
State Public Works Engineer
Department of Accounting
and General Services
State of Hawaii
1151 Punchbowl Street
Honolulu, Hawaii 96813

Dear Mr. Nishioka:

Subject: Environmental Impact Statement for the Kahaluu Wastewater Treatment and Disposal System, Koolaupoko, Oahu

Your letter of February 8, 1980 indicating that subject project will have no adverse effect on your department's facilities is acknowledged.

Very truly yours,

WALLACE MIYAHIRA
Director and Chief Engineer

80 00793

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 15TH AIR BASE WING (PACAF)
HICKAM AIR FORCE BASE, HAWAII 96853

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REPLY TO ATTN OF: DEEV (Mr Shiroma, 449-1831) 8 FEB 1980

TO

SUBJECT: Environmental Impact Statement for the Kahaluu Wastewater Treatment and Disposal System, Koolaupoko, Oahu

TO: Office of Environmental Quality Control
550 Halekauwila Street, Room 301
Honolulu, Hawaii 96813

1. This office has reviewed the subject EIS and has no comment to render relative to the proposed project. Attached is a copy of the EIS for your further use.

2. We greatly appreciate your cooperative efforts in keeping the Air Force apprised of your project and thank you for the opportunity to review the document.

Original signed by

ROBERT Q. K. CHING
Chief, Engrg & Envmtl Plng Div
Directorate of Civil Engineering

1 Atch
EIS

Cy to: Department of Public Works
City & County of Honolulu
650 South King Street
Honolulu, Hawaii 96813
(w atch)

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WASTEWATER MANAGEMENT

CITY AND COUNTY OF HONOLULU DEPARTMENT OF PUBLIC WORKS

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

FRANK F. FASI
MAYOR

WALLACE MIYAHIRA
DIRECTOR AND CHIEF ENGINEER

WPP 80-102

March 25, 1980

Mr. Robert Q.K. Ching, Chief
Engineering and Environmental
Planning Division
Directorate of Civil Engineering
Headquarters 15th Air Base Wing (PACAF)
Hickam Air Force Base, Hawaii 96853

Dear Mr. Ching:

Subject: Environmental Impact Statement for the Kahaluu Wastewater Treatment and Disposal System, Koolaupoko, Oahu

Your letter of February 8, 1980 indicating no comments upon subject EIS is acknowledged.

Very truly yours,

for WALLACE MIYAHIRA
Director and Chief Engineer

DEPARTMENT OF PLANNING
AND ECONOMIC DEVELOPMENT

GEORGE R. ARIYOSHI
Governor

HIDETO KONO
Director

FRANK SKRIVANEK
Deputy Director

Kamamalu Building, 250 South King St., Honolulu, Hawaii • Mailing Address: P.O. Box 2359, Honolulu, Hawaii 96804

Ref. No. 0658

February 11, 1980

Mr. Richard O'Connell, Director
Office of Environmental Quality Control
550 Halekauwila Street, Room 301
Honolulu, Hawaii 96813

Dear Mr. O'Connell:

Subject: Environmental Impact Statement for the Kahaluu Wastewater Treatment and Disposal System, Koolaupoko, Oahu

We have reviewed the subject EIS and find that, in general, it has adequately identified and evaluated the significant environmental impacts which can be anticipated as a result of the proposed project.

Thank you for the opportunity to review and comment on this document.

Sincerely,

Hideto Kono

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

FRANK F. FASI
MAYOR

WALLACE MIYAHIRA
DIRECTOR AND CHIEF ENGINEER

WPP 80-100

March 25, 1980

Mr. Hideto Kono, Director
Department of Planning and
Economic Development
State of Hawaii
P. O. Box 2359
Honolulu, Hawaii 96804

Dear Mr. Kono:

Subject: Environmental Impact Statement for the Kahaluu Wastewater Treatment and Disposal System, Koolaupoko, Oahu

Your letter of February 11, 1980 indicating that subject EIS is generally adequate is acknowledged.

Very truly yours,

for WALLACE MIYAHIRA
Director and Chief Engineer

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GEORGE R. ARIYOSHI
GOVERNOR

WASTEWATER MANAGEMENT

STATE OF HAWAII
DEPARTMENT OF SOCIAL SERVICES AND HOUSING
HAWAII HOUSING AUTHORITY
P. O. BOX 17907
HONOLULU, HAWAII 96817

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FRANKLIN Y. K. SUNN
EXECUTIVE DIRECTOR

WILLIAM A. HALL
ASST. EXEC. DIRECTOR

IN REPLY REFER TO:
0-158.1/385

February 21, 1980

Office of Environmental Quality Control
550 Halekauwila Street, Room 301
Honolulu, Hawaii 96813

Gentlemen:

SUBJECT: EIS for Kahaluu Wastewater Treatment and Disposal System

Thank you for the opportunity to review the subject EIS. We have no comments to make on the EIS.

Sincerely,

FRANKLIN Y. K. SUNN
Original Signed

FRANKLIN Y.K. SUNN
Executive Director

HW:as

cc: Dept. of Public Works ✓
City and County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

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

FRANK F. FASI
MAYOR

WALLACE MIYAHIRA
DIRECTOR AND CHIEF ENGINEER

WPP 80-99

March 25, 1980

Mr. Franklin Y.K. Sunn
Executive Director
Hawaii Housing Authority
Department of Social Services
and Housing
State of Hawaii
P. O. Box 17907
Honolulu, Hawaii 96817

Dear Mr. Sunn:

Subject: Environmental Impact Statement for the Kahaluu Wastewater Treatment and Disposal System, Koolaupoko, Oahu

Your letter of February 21, 1980 indicating no comments on subject EIS is acknowledged.

Very truly yours,

for WALLACE MIYAHIRA
Director and Chief Engineer

DEPARTMENT OF TRANSPORTATION SERVICES

CITY AND COUNTY OF HONOLULU

HONOLULU MUNICIPAL BUILDING
650 SOUTH KING STREET
HONOLULU, HAWAII 96813

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FRANK F. FASI
MAYOR

ROBERT R. WAY
DIRECTOR

DPW
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TE2/80-309

February 22, 1980

Office of Environmental
Quality Control
550 Halekauwila Street, Room 301
Honolulu, Hawaii 96813

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ENVIRONMENTAL QUALITY CONTROL
WASTEWATER MANAGEMENT

Gentlemen:

Subject: Your Transmittal Dated February 4, 1980
Regarding Kahaluu Wastewater Treatment
and Disposal System E.I.S.

We have no comments on the E.I.S.

Very truly yours,

AKIRA FUJITA
Acting Director

cc: DPW

DEPARTMENT OF PUBLIC WORKS

CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET
HONOLULU, HAWAII 96813

FRANK F. FASI
MAYOR

WALLACE MIYAHIRA
DIRECTOR AND CHIEF ENGINEER

WPP 80-98

March 25, 1980

TO : MR. AKIRA FUJITA, ACTING DIRECTOR
DEPARTMENT OF TRANSPORTATION SERVICES

FROM : WALLACE MIYAHIRA
DIRECTOR AND CHIEF ENGINEER
DEPARTMENT OF PUBLIC WORKS

SUBJECT: ENVIRONMENTAL IMPACT STATEMENT FOR
THE KAHALUU WASTEWATER TREATMENT AND
DISPOSAL SYSTEM, KOOLAUPOKO, OAHU

Your letter of February 22, 1980 indicating no comments on subject EIS is acknowledged.

for WALLACE MIYAHIRA
Director and Chief Engineer

GEORGE R. ARIYOSHI
GOVERNOR

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
869 PUNCHBOWL STREET
HONOLULU, HAWAII 96813

RYOKICHI HIGASHIONNA, PH.D.
DIRECTOR

DEPUTY DIRECTORS
JAMES R. CARRAS
JAMES B. McCORMICK
DOUGLAS S. SAKAMOTO
JACK K. SUWA

IN REPLY REFER TO:

March 5, 1980

STP 8.6070

Dr. Richard O'Connell
Office of Environmental
Quality Control
550 Halekauwila St., Room 301
Honolulu, Hawaii 96813

Dear Dr. O'Connell:

Subject: Environmental Impact Statement
Kahaluu Wastewater Treatment
and Disposal System
Koolaupoko, Oahu

Thank you for giving us the opportunity to review the above-captioned statement. We have no substantive comments to offer other than to advise the applicant to continue coordination of his project with our Highways Division for lines and facilities to be located within our highway rights-of-way.

Very truly yours,

Ryokichi Higashionna

Ryokichi Higashionna
Director of Transportation

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

FRANK F. FASI
MAYOR

WALLACE MIYAHIRA
DIRECTOR AND CHIEF ENGINEER

WPP 80-97

March 25, 1980

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

Dear Dr. Higashionna:

Subject: Environmental Impact Statement for
the Kahaluu Wastewater Treatment and
Disposal System, Koolaupoko, Oahu

Your letter of March 5, 1980 indicating no substantive comments on subject EIS is acknowledged. Coordination with your Highways Division for lines and facilities to be located within your highway rights-of-way will be effected during the preparation of the plans and specifications for the proposed project.

Very truly yours,

WALLACE MIYAHIRA
Director and Chief Engineer

8001467

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University of Hawaii at Manoa

Environmental Center
Crawford 317 • 2550 Campus Road
Honolulu, Hawaii 96822
Telephone (808) 948-7361

Office of the Director

March 6, 1980

RE:0301

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WASTEWATER
MANAGEMENT

Mr. Richard O'Connell
Office of Environmental Quality Control
550 Halekauwila Street, Room 301
Honolulu, Hawaii 96813

Dear Mr. O'Connell:

Review of
Draft Environmental Impact Statement
Kahaluu Wastewater Treatment and Disposal System

The Environmental Center has reviewed the above cited DEIS with the assistance of Michael Chun, Public Health; Elizabeth Cunningham and John Sorensen, Environmental Center.

Overall while we found the EIS adequately addresses most environmental concerns, we would like to raise several questions and make some suggestions at this time.

Population Growth

The population projections for the planning area of Kahaluu, as presented in Tables III-5 and III-6, indicate an increase of 1,400 by the year 2000. However, the discussion of "Significant Projects" suggests that, if currently planned developments take place, as many as 800 to 1,000 new housing units would be constructed in the area. At an average of 3.5 people per unit, this amounts to a population growth of 2,800 to 3,500 people. How can these differences be explained? What are the implications of a larger-than-estimated population for the adequacy of the proposed system?

Project Capacity and Flexibility

We agree that leaving the rural northern sector of the Kahaluu planning district in cesspool at this time is reasonable. The EIS should, however, discuss in more detail the capacity of the proposed system. How many housing units is it capable of servicing? Is the system flexible enough so that it could be expanded to serve major future developments in the area?

Environmental Impacts

Since the proposed system will not cover all potential users in the planning district and since new developments will take place in the area which will use cesspools or related means of disposal, the EIS should discuss in greater detail the resultant impacts on the natural environment. Do the costs of a broader coverage by the system outweigh the benefits?

In conjunction with this idea, the EIS might state that the state DOH or the City and County might be able to monitor and detect in a quantitative sense the improvements in the southern sector after elimination of cesspools. This information could then be use to predict the extent of impact currently being attributed to cesspools in the north, and if whether the further elimination of cesspools would result in detectable improvements in water quality.

Thank you for the opportunity to review this document. We hope these suggestions are useful in preparing the final EIS.

Sincerely,

Doak C. Cox
Director

DCC:lnk

cc: C & C, Public Works √
Michael Chun
Elizabeth Cunningham
John Sorensen

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

FRANK F. FASI
MAYOR

WALLACE MIYAHIRA
DIRECTOR AND CHIEF ENGINEER

WPP 80-115

March 25, 1980

Dr. Doak C. Cox
Director, Environmental Center
University of Hawaii
Crawford 317
2550 Campus Road
Honolulu, Hawaii 96822

Dear Dr. Cox:

Subject: Environmental Impact Statement for the Kahaluu Wastewater Treatment and Disposal System, Koolaupoko, Oahu

Your letter of March 6, 1980 forwarded comments upon the subject EIS in the form of questions and suggestions. We offer the following responses:

POPULATION GROWTH

There is a difference between our smaller population projection and the larger population projection possible if all possible development takes place. A basic premise of the Facility Plan is that the II-F population projection, having been adopted by the City and County of Honolulu for purposes of development planning and facility planning, will be the limit for development. What developments occur depend on which developments are begun before reaching the limit.

PROJECT CAPACITY AND FLEXIBILITY

The proposed system design will adequately service the population as projected (see Section III) and the numbers of household units as detailed in Table VII-5. As indicated above, major future developments, significantly in excess of the population projections, are not provided for in the project. However, some flexibility does exist in the system for handling limited excesses of population.

ENVIRONMENTAL IMPACTS

Table VII-5 is the Summary Matrix of Feasible Alternatives, Cost Estimates and Average Costs per Household. A review of the average cost per household to provide sewers for the areas we propose not to be sewered indicates the range would be from $9,180 to $21,188. Thus the costs of a broader coverage outweigh the benefits.

We agree that the development of a correlation in the southern area between improvements in water quality and the elimination of cesspools should be considered when the cesspools are eliminated. This would occur too late, however, to be included in this EIS.

Your review of the EIS and your suggestions are appreciated.

Should you have any questions, please contact Cedric Takamoto at extension 4067.

Very truly yours,

Wallace Miyahira

WALLACE MIYAHIRA
Director and Chief Engineer

800453

GEORGE R. ARIYOSHI
GOVERNOR

RICHARD O'CONNELL
DIRECTOR

TELEPHONE NO.
548-6915

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STATE OF HAWAII
OFFICE OF ENVIRONMENTAL QUALITY CONTROL
OFFICE OF THE GOVERNOR
550 HALEKAUWILA ST
ROOM 301
HONOLULU, HAWAII 96813

WASTEWATER MANAGEMENT

March 11, 1980

Mr. Wallace Miyahira, Director
Department of Public Works
City and County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

SUBJECT: Environmental Impact Statement for Kahaluu Wastewater Treatment and Disposal System, Koolaupoko, Oahu

Dear Mr. Miyahira,

We have reviewed the subject document and offer the following comments for your consideration:

1. There should be more discussion regarding the relationship of the proposed action to the 208 Water Quality Plan.

2. The phasing of the subareas is geared for the year 2000. Are there any smaller incremental phases? If so, they should be discussed in the EIS.

3. The EIS indicates that the proposed project consists of federal, state, and county funding. Why was a joint state-federal EIS not prepared which fulfills both the National Environmental Policy Act (NEPA) and Chapter 343, Hawaii Revised Statutes in order to eliminate duplication of effort and reduce paperwork as required by state law and CEQ regulations? How has or will NEPA be complied with?

4. Page III-20

Some developments which the proposed action would service have been mentioned. Others such as the Kaalaea Cluster and Pulama Gardens should also be mentioned.

5. Page VII-17

The EIS indicates that the sludges from Ahuimanu, Kaneohe, and Kailua STP are trucked to the Kapaa Landfill. What is the estimated increase in sludge caused by the proposed action? Will Kapaa Landfill be able to handle this increase?

We trust that these comments will be helpful to you in preparing the revised EIS. An attached sheet lists the commenting parties.

If you should have any questions regarding this matter, please do not hesitate to contact us.

Sincerely,

Richard L. O'Connell
Director

Attachment

LIST OF COMMENTING PARTIES

FEDERAL

U.S. Coast Guard	February 4, 1980
*U.S. Fish and Wildlife Service	February 5, 1980
*U.S. Navy	February 5, 1980
*Department of the Air Force	February 6, 1980
*Department of the Army (Support Command)	February 7, 1980

STATE

*Department of Defense	February 5, 1980
*Department of Agriculture	February 6, 1980
*Department of Health	February 7, 1980
Department of Land & Natural Resources	February 7, 1980
*Department of Accounting & General Services	February 8, 1980
Department of Planning & Economic Development	February 11, 1980
*Hawaii Housing Authority	February 21, 1980
Department of Transportation	March 5, 1980

CITY & COUNTY OF HONOLULU

*Board of Water Supply	February 4, 1980
*Department of Housing & Community Development	February 7, 1980
*Department of Transportation Services	February 22, 1980
*Department of Land Utilization	February 29, 1980

*Denotes comment sent to DPW by reviewer

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

FRANK F. FASI
MAYOR

WALLACE MIYAHIRA
DIRECTOR AND CHIEF ENGINEER

WPP 80-116

March 25, 1980

Mr. Richard L. O'Connell, Director
Office of Environmental Quality Control
State of Hawaii
550 Halekauwila Street, Room 301
Honolulu, Hawaii 96813

Dear Mr. O'Connell:

Subject: Environmental Impact Statement for the Kahaluu Wastewater Treatment and Disposal System, Koolaupoko, Oahu

Your letter of March 11, 1980 forwarded your review comments on subject EIS. We offer the following responses:

1. Additional discussion of the 208 Water Quality Plan has been included in Section II.

2. The Year 2000 was selected as the limit of the 20-year planning period prescribed by the EPA. Smaller, incremental phases were not developed. However, Table II-1 does indicate the phased implementation schedule for the project.

3. The EPA in its review of the project determined that a NEPA EIS would not be required, due to the inherent non-controversial nature of the project, the inclusion of an Environmental Assessment within the Facility Plan format and the development of a complete EIS as required under State regulations.

4. The EIS mentions some of the larger private developments being considered for the area but does not attempt to be an all-inclusive listing because of the constantly changing numbers of proposed developments.

5. There will be no increase of sludge disposed at the landfill. The proposed action will eliminate sludge generation at the Ahuimanu STP but will increase the sludge loading at the Kaneohe STP by the same amount. The Kapaa Landfill has adequate capacity for the sludge disposal from the Kaneohe STP.

Your comments upon the EIS are appreciated.

Should you have any questions, please contact Cedric Takamoto at 523-4067.

Very truly yours,

Wallace Miyahira

WALLACE MIYAHIRA
Director and Chief Engineer