Water Resources Data for Hawaii and other Pacific Areas

Water Year 1977

Volume 1. Hawaii

U.S. GEOLOGICAL SURVEY WATER-DATA REPORT HI-77-1

Prepared in cooperation with the State of Hawaii
and with other agencies

CALENDAR FOR WATER YEAR 1977

1976

OCTOBER

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Volume 1 of water resources data for the 1977 water year for Hawaii and other Pacific Areas consist of records of stage, discharge, and water quality of streams; and water levels and water quality in wells and springs. This report contains discharge records for 114 gaging stations; water quality for 10 gaging stations, 102 partial-record flow stations and 155 wells; and water levels for 25 observation wells. Also included are 108 crest-stage partial-record stations and 20 low-flow partial-record stations. Additional water data were collected at various sites, not part of the systematic data collection program, and are published as miscellaneous measurements. These data represent that part of the National Water Data System operated by the U.S. Geological Survey and cooperating State, Federal, and other agencies in Hawaii.

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17b. Identifiers/Open-Ended Terms

17c. COSATI Field/Group

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PREFACE

This report was prepared by personnel of the Hawaii district of the Water Resources Division of the U.S. Geological Survey under the supervision of F. T. Hidaka, District Chief, and W. H. Robinson, Regional Hydrologist, Western Region. It was done in cooperation with the State of Hawaii and with other agencies.

This report is one of a series issued by State. General direction for the series is by J. S. Cragwall, Jr., Chief Hydrologist, U.S. Geological Survey, and G. W. Whetstone, Assistant Chief Hydrologist for Scientific Publications and Data Management.

Data for Hawaii and other Pacific Areas are in two volumes as follows:

Volume 1. State of Hawaii

Volume 2. Trust Territory of the Pacific Islands, Guam, Mariana Islands, Tutuila, American Samoa, and Saipan, Northern Mariana Islands

UNITED STATES DEPARTMENT OF THE INTERIOR

CECIL D. ANDRUS, Secretary

GEOLOGICAL SURVEY

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6th Floor, Room 6110
300 Ala Moana Boulevard
Honolulu, Hawaii 96850

1978

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WATER RESOURCES DATA FOR HAWAII AND OTHER PACIFIC AREAS, 1977

Volume 1

INTRODUCTION

Water resources data for the 1977 water year for Hawaii and other Pacific areas consist of records of stage, discharge, and water quality of streams; and water-levels and water quality of wells and springs. This report contains discharge records for 114 gaging stations; water quality for 10 gaging stations, 102 partial-record flow stations, and 155 wells; and water levels for 25 observation wells. Also included are data for 108 crest-stage partial-record stations and 20 low-flow partial-record stations. Additional water data were collected at various sites, not part of the systematic data collection program, and are published as miscellaneous measurements. These data represent that part of the National Water Data System operated by the U.S. Geological Survey and cooperating State, Territorial, and Federal agencies in Hawaii and other Pacific areas.

Through September 30, 1960 (June 30, 1960, for Hawaii and other Pacific areas), the records of discharge (or stage) of streams, and contents (or stage) of lakes and reservoirs were first published in a series of U.S. Geological Survey water-supply papers entitled, "Surface Water Supply of the United States." The records in Hawaii were contained in the series as "Surface Water Supply of Hawaii." Records for other Pacific areas were contained in one volume entitled, "Surface Water Supply of Mariana, Caroline, and Samoa Islands." Through water year 1960 these water-supply papers were in an annual series and then in a 5-year series for 1961-65 and 1966-70. Records of chemical quality, water temperatures, and suspended sediment were published from 1941 to 1970 in an annual series of water-supply papers entitled, "Quality of Surface Waters of the United States." Records of ground-water levels were published from 1935 to 1974 in a series of water-supply papers entitled, "Ground-Water Levels in the United States." Water-supply papers may be consulted in the libraries of the principal cities in the United States or may be purchased from Branch of Distribution, U.S. Geological Survey, 604 South Pickett Street, Alexandria, VA 22304.

Beginning with the 1961 water year (fiscal year for Hawaii) and continuing through water year 1974, streamflow data have been released by the Geological Survey in annual reports on a State-boundary basis. The Hawaii reports have included records for other Pacific areas. Through June 1967, the Hawaii reports were on a fiscal-year basis (the 12-month period July 1 to June 30) and discharges (except for Guam and Okinawa) were published in million gallons a day. Beginning with the 1967 water year, the Hawaii reports have been published on a water-year basis and with discharges entirely in cubic feet per second.

Water-quality records beginning with the 1964 water year, and ground-water data since the 1971 water year have been similarly released either in separate reports or in conjunction with streamflow records. These reports provided rapid release of preliminary water data shortly after the end of the water year. The final data were then released in the water-supply paper series mentioned above. Beginning with the 1975 water year, water data for streamflow, water-quality, and ground water are published as an official Survey report on a State-boundary basis. These official Survey reports carry an identification number consisting of the two-letter State abbreviation, the last two digits of the water year, and the volume number. For example, this report is identified as "U.S. Geological Survey Water-Data Report HI-77-1." Water-data reports are for sale by the National Technical Information Service, U.S. Department of Commerce, Springfield, Virginia, 22161.

COOPERATION

The U.S. Geological Survey and organizations of the State of Hawaii have had cooperative agreements for the systematic collection of streamflow records since 1909, and for water-quality records since 1967. Organizations that supplied data are acknowledged in station descriptions. Organizations that assisted in collecting data through cooperative agreement with the Survey are:

Hawaii Department of Land and Natural Resources, Division of Water and Land Development, R. T. Chuck, manager-chief engineer.
Hawaii Department of Transportation, B. Alvey Wright, director.
City and County of Honolulu, Board of Water Supply, Edward Y. Hirata, manager and chief engineer.
City and County of Honolulu, Division of Engineering, Kazu Hayashida, director and chief engineer.

Assistance in the form of funds or services are given by the Corps of Engineers, U.S. Army in collecting records for 11 gaging stations, 3 water-quality stations and 6 partial-record stations, and the U.S. Forest Service for 1 water-quality station published in this report.

The following organizations aided in collecting records:

Maui County Board of Water Supply; East Kauai Water Co., Ltd.; McBryde Sugar Co., Ltd.; East Maui Irrigation Co., Ltd.; and B. P. Bishop Estate.

HYDROLOGIC CONDITIONS

Streamflow during the first quarter of the 1977 water year indicated a below-normal to deficient trend at four representative or index stations on the four major islands. At the index station, Kalihi Stream near Honolulu, Oahu, monthly mean flow decreased significantly after October and was deficient for 7 consecutive months. A minimum daily discharge of 0.19 cfs (0.005 m^3/s) was the lowest ever recorded for February since records began in September 1913. Similarly, at Honopou Stream near Huelo, Maui, a minimum daily discharge of 0.38 cfs (0.01 m^3/s) for February was the lowest recorded for the period of record which began in December 1910. Streamflow varied seasonally after April and monthly mean flows were predominately in the normal range at all index stations for the remainder of the year. Monthly and annual mean discharge is compared with medians at four representative gaging stations in figure 1.

Deficient runoff during the last 8 months of 1975 continued into 1976 and became serious enough that a 9-month drought began in August 1976 which persisted to March 1977. In Lihue, Kauai, rainfall was below normal during 8 of the 12 months in 1976. In Honolulu, Oahu, and Kahului, Maui, precipitation was below normal every month during 1976 except February. In Hilo, Hawaii, rainfall was below normal for 9 of the 12 months in 1976.

The southwest section or Kona area in the island of Hawaii was declared a drought emergency area in January 1977. During the drought, water was hauled to stricken families in the drought affected area. Lawn watering and washing of vehicles were prohibited. Also, the central section in the island of Maui, was declared a drought area in mid-January. The area depends on surface water as their source of water supply and area residents were asked to reduce their water usage by 30 percent. Truck farmers were limited to two irrigations per week. In Honolulu, Oahu, rainfall was only 15 percent of the normal rainfall for the period September through December 1976 and December with only 0.06 inch (2 mm) was the driest December experienced in the 100 years that records have been kept. No drought emergency was declared but the Honolulu Board of Water Supply requested residents on a voluntary basis to reduce their normal usage by 10 percent. Commercial, industrial, and agricultural customers were asked to reduce water usage by 15 percent.

The island of Kauai was the least affected during the drought period. No drought emergency in any part of the island was declared. However, during the drought, sugar growers warily watched their crops and hoped for rain to supplement depleted irrigation systems.

The chemical quality of Hawaii's surface-water resources did not change appreciably during the 1977 water year. Maximum dissolved-solids content in surface waters generally occurred during January or February. Sediment discharge from Waikele Stream, measured at station 16213000, was lower than last water year because of below-normal precipitation. Traces of organochlorine insecticides, less than 0.04 microgram per liter dieldrin, were detected in water samples collected from station 16229300, Kalihi Stream at Kalihi on Oahu.

Records at five observation wells equipped with continuous recorder indicated that the ground-water levels reached minimum for their respective periods of records. The longest period of record for these wells is for Local number 3-2901-07 which began in August 1936. Three of minimum water levels occurred in March and two occurred in late August and early September in 1977. Analyses of water samples taken at more than 130 basal water-table wells did not show a significant increase in chloride contents.

DEFINITION TERMS

Definition of terms related to streamflow, water-quality, and other hydrologic data, as used in this report, are defined as follows:

Acre-foot (AC-FT, acre-ft) is the quantity of water required to cover 1 acre to a depth of 1 foot and is equivalent to 43,560 cubic feet or 325,851 gallons or 1,233 cubic meters.

Algae are mostly aquatic single-celled, colonial, or multi-celled plants, containing chlorophyll and lacking roots, stems, and leaves.

Aquifer is a geologic formation, group of formations, or part of a formation that contains sufficient saturated permeable material to yield significant quantities of water to wells and springs.

Artesian means confined and is used to describe a well in which the water levels stands above the top of the aquifer tapped by the well. A flowing artesian well is one in which the water level is above the land surface.

Bacteria are miscroscopic unicellular organisms, typically spherical, rod-like, or spiral and threadlike in shape, often clumped into colonies. Some bacteria cause disease, others perform an essential role in nature in the recycling of materials; for example, by decomposing organic matter into a form available for reuse by plants.

Total coliform bacteria are a particular group of bacteria that are used as indicators of possible sewage pollution. They are characterized as aerobic or facultative anaerobic, gram-negative, nonspore-forming, rod-shaped bacteria which ferment lactose with gas formation within 48 hours at 35°C. In the laboratory these bacteria are defined as all the organisms which produce colonies within 24 hours when incubated at 35°C ± 1.0°C on M-Endomedium (nutrient medium for bacterial growth). Their concentrations are expressed number of colonies per 100 mL of sample.

Fecal coliform bacteria are bacteria that are present in the intestine or feces of warmblooded animals. They are often used as indicators of the sanitary quality of the water. In the laboratory they are defined as all organisms which produce blue colonies within 24 hours when incubated at 44.5°C ± 0.2° C on m-FC medium (nutrient medium for bacterial growth). Their concentrations are expressed as number of colonies per 100 mL of sample.

Fecal streptococcal bacteria are bacteria found also in the intestine of warmblooded animals. Their presence in water is considered to verify fecal pollution. They are characterized as gram-positive, cocci bacteria which are capable of growth in brain-heart infusion broth. In the laboratory they are defined as all the organisms which produce red or pink colonies within 48 hours at 35°C ± 1.0°C on M-enterrococcus medium (nutrient medium for bacterial growth). Their concentrations are expressed as number of colonies per 100 mL of sample.

Bed material is the unconsolidated material of which a streambed, lake, pond, reservoir, or estuary bottom is composed.

Biomass is the amount of living matter present at any time, expressed as the weight per unit area or volume of habitat.

Ash mass is the mass or amount of residue present after the residue from the dry mass determination has been ashed in a muffle furnace at a temperature of 500°C for 1 hour. The ash mass values of zooplankton and phytoplankton are expressed in g/m^3 (grams per cubic meter), and periphyton and benthic organisms in g/m^2 (grams per square meter).

Dry mass refers to the mass of residue present after drying in an oven at 60°C for zooplankton and 105°C for periphyton, until the mass remains unchanged. This mass represents the total organic matter, ash, and sediment, in the sample. Dry mass values are expressed in the same units as ash mass.

Organic mass or volatile mass of the living substance is the difference between the dry mass and the ash mass, and represents the actual mass of the living matter. The organic mass is expressed in the same units as for ash and dry mass.

Wet mass is the mass of living matter plus contained water.

Cells/volume refers to the number of cells of any organism which is counted by using a microscope and grid or counting cell. Many planktonic organisms are multicelled and are counted according to the number of contained cells per sample, usually mililiters (mL) of liters (L).

CFS-day is the volume of water represented by a flow of 1 cubic foot per second for 24 hours. It is equivalent to 86,400 cubic feet, 1.9835 acre-feet, or 646,317 gallons or 2,447 cubic meters.

Chlorophyll refers to the green pigments of plants. Chlorphyll a and b are the two most common pigments in plants.

Color unit is produced by one milligram per liter of platinum in the form of the chloroplatinate ion. Color is expressed in units of the platinum-cobalt scale.

Coliform organisms are a group of bacteria used as an indicator of the sanitary quality of the water. The number of coliform colonies per 100 milliliters is determined by the immediate or delayed incubation membrane filter method.

Contents is the volume of water in a reservoir or lake. Unless otherwise indicated, volume is computed on the basis of a level pool and does not include bank storage.

Continuing record station is a specified site which meets one or all conditions listed:

1. When chemical samples are collected daily or monthly for 10 or more months during the water year.

2. When water temperature records include observations taken one or more times daily.

3. When sediment discharge records include those periods for which sediment loads are computed and are considered to be representative of the runoff for the water year.

Control designates a feature downstream from the gage that determines the stage-discharge relation at the gage. This feature may be a natural constriction of the channel, an artificial structure, or a uniform cross section over a long reach of the channel.

Control structure as used in this report is a structure on a stream or canal that is used to regulate the flow or stage of the stream or to prevent the intrusion of salt water.

Cubic foot per second (FT^3/S, ft^3/s) is the rate of discharge representing a volume of 1 cubic foot passing a given point during 1 second and is equivalent to 7.48 gallons per second or 448.8 gallons per minute or 0.02832 cubic meters per second.

Discharge is the volume of water (or more broadly, volume of fluid plus suspended sediment), that passes a given point within a given period of time.

Mean discharge (MEAN) is the arithmetic average of individual daily mean discharges during a specified period.

Instantaneous discharge is the discharge at a particular instant of time. If this discharge is reported instead of the daily mean, the heading of the discharge column in the table is "DISCHARGE (CFS)."

Dissolved refers to the amount of a substance present in true chemical solution. In practice, however, the term includes all forms of the substance that will pass through a 0.45-micrometer membrane filter, and thus may include some very small (colloidal) suspended particles. Analyses are performed on filtered samples.

Diversity index is a numerical expression of evenness of distribution of aquatic organisms. The formula for diversity index is:

$$\bar{d} = \sum_{i=i}^{s} \frac{n_i}{n} \log_2 \frac{n_i}{n}$$

Where n_i is the number of individuals per taxon, n is the total number of individuals, and s is the total number of taxa in the sample of the community. Diversity index values range from zero, when all the organisms in the sample are the same, to some positive number, when some or all of the organisms in the sample are different.

Drainage area of a stream at a specific location is that area, measured in a horizontal plane, enclosed by a topographic divide from which direct surface runoff from precipitation normally drains by gravity into the river above the specified point. Figures of drainage area given herein include all closed basins, or noncontributing areas, within the area unless otherwise noted.

Drainage basin is a part of the surface of the earth that is occupied by a drainage system, which consists of a surface stream or a body of impounded surface water together with all tributary surface streams and bodies of impounded water.

Gage height (G.H.) is the water-surface elevation referred to some arbitrary gage datum. Gage height is often used interchangeably with the more general term "stage," although gage height is more appropriate when used with a reading on a gage.

Gaging station is a particular site on a stream, canal, lake, or reservoir where systematic observations of hydrologic data are obtained.

Hardness of water is a physical-chemical characteristic that is commonly recognized by the increased quantity of soap required to produce lather. It is attributable to the presence of alkaline earths (principally calcium and magnesium) and is expressed as equivalent calcium carbonate ($CaCO_3$).

Hydrologic unit is a geographic area representing part or all of a surface drainage basin or distinct hydrologic feature as delineated by the Office of Water Data Coordination on the State Hydrologic Unit Maps; each hydrologic unit is identified by an 8-digit number.

Metamorphic stage refers to the stage of development that an organism exhibits during its transformation from an immature form to an adult form. This developmental process exists for most insects, and the degree of difference from the immature stage to the adult form varies from relatively slight to pronounced, with many intermediates. Examples of metamorphic stages of insects are egg-larva-adult or egg-nymph-adult.

Micrograms per gram (µg/g) is a unit expressing the concentration of a chemical element as the mass (micrograms) of the element sorbed per unit mass (gram) of sediment.

Micrograms per liter (UG/L, µg/L) is a unit expressing the concentration of chemical constituents in solution as mass (micrograms) of solute per unit volume (liter) of water. One thousand micrograms per liter is equivalent to one milligram per liter.

Milligrams per liter (MG/L, mg/L) is a unit for expressing the concentration of chemical constituents in solution. Milligrams per liter represent the mass of solute per unit volume (liter) of water. Concentration of suspended sediment also is expressed in mg/L, and is based on the mass of sediment per liter of water-sediment mixture.

Organism is any living entity, such as an insect, phytoplankter, or zooplankter.

Organism count/area refers to the number of organisms collected and enumerated in a sample and adjusted to the number per area habitat, usually square meters (m^2), acres, or hectares. Periphyton benthic organisms, and macrophytes are expressed in these terms.

Organism count/volume refers to the number of organisms collected and enumerated in a sample and adjusted to the number per sample volume, usually milliliters (mL) or liters (L). Numbers of planktonic organisms can be expressed in these terms.

Total organism count is the total number of organisms collected and enumerated in any particular sample.

Partial-record station is a particular site where limited streamflow and/or water-quality data are collected systematically over a period of years for use in hydrologic analyses.

Particle-size is the diameter, in millimeters (mm), of suspended sediment or bed material determined by either sieve or sedimentation methods. Sedimentation methods (pipet, bottom-withdrawal tube, visual-accumulation tube) determine fall diameter of particles in either distilled water (chemically dispersed) or in native water (the river water at the time and point of sampling).

Particle-size classification used in this report agrees with recommendations made by the American Geophysical Union Subcommittee on Sediment Terminology. The Classification is as follows:

Classification	Size (mm)	Method of analysis
Clay.....	0.00024 - 0.004	Sedimentation.
Silt.....	.004 - .062	Sedimentation.
Sand.....	.062 - 2.0	Sedimentation or sieve.
Gravel.....	2.0 - 64.0	Sieve.

The particle-size distributions given in this report are not necessarily representative of all particles in transport in the stream. Most of the organic material is removed and the sample is subjected to mechanical and chemical dispersion before analysis in distilled water. Chemical dispersion is not used for native water analysis.

Percent composition is a unit for expressing the ratio of a particular part of a sample or population to the total sample or population, in terms of types, numbers, mass, or volume.

Pesticides are chemical compounds used to control the growth of undesirable plants and animals. Major categories of pesticides include insecticides, miticides, fungicides, herbicides, and rodenticides.

Picocurie (Pc,pCi) is one trillionth (1×10^{-12}) of the amount of radioactivity represented by a curie (Ci). A curie is the amount of radioactivity that yields 3.7×10^{10} radioactive disintegrations per second. A picocurie yields 2.22 dpm (disintegrations per minute).

Plankton is the community of suspended, floating, or weakly swimming organisms that live in the open water of lakes and rivers.

Phytoplankton is the plant part of the plankton. They are usually microscopic and their movement is subject to the water currents. Phytoplankton growth is dependent upon solar radiation and nutrient substances. Because they are able to incorporate as well as release materials to the surrounding water, the phytoplankton have a profound effect upon the quality of the water. They are the primary food producers in the aquatic environment, and are commonly known as algae.

Blue-green algae are a group of phytoplankton organisms having a blue pigment, in additon to the green pigment called chlorophyll. Blue-green algae often cause nuisance conditions in water.

Diatoms are the unicellular or colonial algae having siliceous shell. Their concentrations are expressed as number of cells/mL of sample.

Green algae have chlorophyll pigments similar in color to those of higher green plants. Some forms produce algal mats or floating "moss" in lakes. Their concentrations are expressed as number of cells/mL of sample.

Zooplankton is the animal part of the plankton. Zooplankton are capable of extensive movements within the water column, and are often large enough to be seen with the unaided eye. Zooplankton are secondary consumers

feeding upon bacteria, phytoplankton, and detritus. Because they are the grazers in the aquatic environment, the zooplankton are a vital part of the aquatic feed web. The zooplankton community is dominated by small crustaceans and rotifers.

Polychlorinated biphenyls (PCBs) are industrial chemicals that are mixtures of chlorinated biphenyl compounds having various percentages of chlorine. They are similar in structure to organochlorine insecticides.

Primary productivity is a measure of the rate at which new organic matter is formed and accumulated through photosynthetic and chemosynthetic activity of producer organisms (chiefly, green plants). The rate of primary production is estimated by measuring the amount of oxygen released (oxygen method) or the amount of carbon assimilated by the plants (carbon method).

Milligrams of carbon per area or volume per unit time [mg $C/(m^2 \cdot time)$ for periphyton and macrophytes and mg $C/(m^3 \cdot time)$] for phytoplankton are units for for expressing primary productivity. They define the amount of carbon dioxide consumed as measured by radioactive carbon (carbon 14). The carbon 14 method is of greater sensitivity than the oxygen light and dark bottle method, and is preferred for use in unenriched waters. Unit time may be either the hour or day, depending on the incubation period.

Milligrams of oxygen per area or volume per unit time [mg $O_2/(m^2 \cdot time)$ for periphyton and macrophytes and mg $O_2/(m^3 \cdot time)$] for phytoplankton are the units for expressing primary productivity. They define production and respiration rates as estimated from changes in the measured dissolved oxygen concentration. The oxygen light and dark bottle method is preferred if the rate of primary production is sufficient for accurate measurements to be made within 24 hours. Unit time may be either the hour or day, depending on the incubation period.

Sediment is solid material that originates mostly from disintegrated rocks and is transported by, suspended in, or deposited from water; it includes chemical and biochemical precipitates and decomposed organic material, such as humus. The quantity, characteristics, and cause of the occurrence of sediment in streams are influenced by environmental factors. Some major factors are degree of slope, length of slope, soil characteristics, land usage, and quantity and intensity of precipitation.

Suspended sediment is the sediment that at any given time is maintained in suspension by the upward components of turbulent currents or that exists in suspension as a colloid.

Suspended-sediment concentration is the velocity-weighted concentration of suspended sediment in the sampled zone (from the water surface to a point approximately 0.3 ft above the bed) expressed as milligrams of dry sediment per liter of water-sediment mixture (mg/L).

Suspended-sediment discharge (tons/day) is the rate at which dry weight of sediment passes a section of a stream or is the quantity of sediment, as measured by dry weight or volume, that passes a section in a given time. It is computed by multiplying discharge times milligrams per liter times 0.0027.

Suspended-sediment load is quantity of suspended sediment passing a section in a specified period.

Total-sediment discharge (tons/day) is the sum of the suspended-sediment discharge and the bedload discharge. It is the total quantity of sediment, as measured by dry weight or volume, that passes a section during a given time.

Mean concentration is the time-weight concentration of suspended sediment passing a stream section during a 24-hour day.

Solute is any substance derived from the atmosphere, vegetation, soil, or rocks that is dissolved in water.

Specific conductance is a measure of the ability of a water to conduct an electrical current. It is expressed in micromhos per centimeter at 25°C. Specific conductance is related to the type and concentration of ions in solution and can be used for approximating the dissolved-solids content of the water. Commonly, the concentration of dissolved solids (in milligrams per liter) is about 65 percent of the specific conductance (in micromhos). This relation is not constant from stream to stream, and it may vary in the same source with changes in the composition of the water.

Stage-discharge relation is the relation between gage height (stage) and volume of water per unit of time, flowing in a channel.

Streamflow is the discharge that occurs in a natural channel. Although the term "discharge" can be applied to the flow of a canal, the word "streamflow" uniquely describes the discharge in a surface stream course. The term "streamflow" is more general than "runoff" as streamflow may be applied to discharge whether or not it is affected by diversion or regulation.

Subtrate is the physical surface upon which an organism lives.

Natural substrate refers to any naturally occurring emersed or submersed solid surface, such as a rock or tree, upon which an organism lives.

Artificial substrate is a device which is purposely placed in a stream or lake for colonization of organisms. The artificial substrate simplifies the community structure by standardizing the substrate from which each sample is taken. Examples of artificial substrates are basket samplers (made of wire cages filled with clean streamside rocks) and multi-plate samplers (made of hardboard) for benthic organism collection, and plexiglas strips for periphyton collection.

Suspended (as used in tables of chemical analyses) refers to the amount (concentration) of the total concentration in a water-sediment mixture. The water-sediment mixture is associated with (or sorbed on) that material retained on a 0.45 micrometer filter.

Taxonomy is the division of biology concerned with the classification and naming of organisms. The classification of organisms is based upon a hierarchical scheme beginning with Kingdom and ending with Species at the base. The higher the classification level, the fewer features the organisms have in common. For example, the taxomony of a particular mayfly, Hexagenia limbata, is the following:

Kingdom.....Animal
Phylum.....Arthropoda
Class.....Insecta
Order.....Ephemeroptera
Family.....Ephemeridae
Genus.....Hexageria
Species.....Hexagenia limbata

Time-weighted average is computed by multiplying the number of days in the sampling period by the concentrations of individual constituents for the corresponding period and dividing the sum of the products by the total number of days. A time-weighted average represents the composition of water that would be contained in a vessel or reservoir that had received equal quantities of water from the stream each day for the year.

Tons per acre-foot indicates the dry mass of dissolved solids in 1 acre-foot of water. It is computed by multiplying the concentration in milligrams per liter by 0.00136.

Tons per day is the quantity of substance in solution or suspension that passes a stream section during a 24-hour day.

Total load (tons) is the total quantity of any individual constituent, as measured by dry mass or volume, that is dissolved in a specific amount of water (discharge) during a given time. It is computed by multiplying the total discharge, times the mg/L of the constituent, times the factor 0.0027, times the number of days.

Turbidity of a sample is the reduction of transparency due to the presence of particulate matter. In this report it is expressed Jackson turbidity units (JTU).

WDR is used as an abbreviation for "Water-Data Reports" in the summary REVISIONS paragraph to refer to previously published State annual basic-data reports.

Weighted average is used in this report to indicate discharge-weighted average. It is computed by multiplying the discharge for a sampling period by the concentrations of individual constituents for the corresponding period and dividing the sum of the products by the sum of discharges. A discharge-weighted average approximates the composition of water that would be found in a reservoir containing all the water passing a given location during the water year after thorough mixing in the reservoir.

WRD is used as an abbreviation for "Water-Resources Data" in the REVISED RECORDS paragraph to refer to State annual basic-data reports published before 1975.

WSP is used as an abbreviation for "Water-Supply Paper" in references to previously published reports.

DOWNSTREAM ORDER AND STATION NUMBER

Records are listed in a downstream direction along the main stream, and stations on tributaries are listed between stations on the main stream in the order in which those tributaries enter the main stream. Stations on tributaries entering above all mainstream stations are listed before the first mainstream station. Stations on tributaries to tributaries are listed in a similar manner. In the lists of gaging stations and water-quality stations in the front of this report the rank of tributaries is indicated by indention, each indention representing one rank.

As an added means of identification, each gaging station, partial-record station, and water-quality station has been assigned a station number. These are in the same downstream order used in this report. In assigning station numbers, no distinction is made between partial-record stations and continuous-record gaging stations; therefore, the station number for a partial-record station indicates downstream order position in a list made up of both types of stations. Water-quality stations located at or near gaging stations or partial-record stations have the same number as the gaging or partial-record station. Gaps are left in the series of numbers to allow for new stations that may be established; hence, the numbers are not consecutive. The complete 8-digit number for each station, such as 16200000 which appears just to the left of the station name includes the 2-digit number "16" plus the 6-digit downstream order number "200000." In this report, the records are listed in downstream order by islands.

NUMBERING SYSTEM FOR WELLS AND MISCELLANEOUS SITES

Miscellaneous downstream order station numbers are not assigned to wells and miscellaneous sites where only random water-quality samples of discharge measurements are taken.

The well and miscellaneous site numbering system of the U.S. Geological Survey is based on the grid system of latitude and longitude. The system provides the geographic location of the well or miscellaneous site and a unique number for each site. The number consists of 15 digits. The first 6 digits denote the degrees, minutes, and seconds of latitude, the next 7 digits denote degrees, minutes, and seconds of longitude, and the last 2 digits is a sequential number for wells within a 1-second grid. In the event that the latitude-longitude coordinates for a well and a miscellaneous site are the same, assign sequential numbers "01," "02," etc. as one would for wells. See figure 12.

Beginning in 1971, the local well-numbering system for Hawaii was restructured to contain seven digits based on a non-arbitrary, unique one-minute grid system. One-minute parallel lines for both latitude and longitude are drawn on the map resulting in one-minute grids. Each grid is designated by a four-digit number. The first two digits represent minutes of latitude for the grid and the second two digits represent minutes of longitude for that grid. This establishes unique minute-grid numbers within each of the islands in the state except for the island of Hawaii where it encompasses an area more than one degree (60 minutes) of latitude and longitude. To establish unique minute-grid numbers for this island, 30 was added to the minutes of latitude in areas less than 19°00" of latitude, and 60 was added to the minutes of latitude in areas more than 20°00" of latitude. For the same reason, 30 was added to the minutes of longitude in areas less than 155°00" of longitude, and 60 was added to the minutes of longitudes more than 156°00" longitude. See figures 13 and 14.

To distinguish wells within a minute grid, two digits are added following the 4-digit minute-grid numbers with a dash separator. These two-digit numbers are assigned with the oldest well dug within the grid as 01 and increase chronologically, with fex exceptions, to the latest dug.

Since it is possible to have a same 6-digit number for wells on different islands, another digit distinguishing each of the islands, is added in front of the 6-digit number with a dash separator.

For continuity, the old well numbers are listed in parentheses after the new well numbers.

SPECIAL NETWORKS AND PROGRAMS

Hydrologic bench-mark station is one that provides hydrologic data for a basin in which the hydrologic regimen will likely be governed solely by natural conditions. Data collected at a bench-mark station may be used to separate effects of natural from manmade changes in other basins which have been developed and in which the physiography, climate, and geology are similar to those in the undeveloped bench-mark basin.

National stream-quality accounting network is an accounting network designed by the U.S. Geological Survey to meet many of the information demands of agencies or groups involved in national or regional water-quality planning and management. Both accounting and broad-scale monitoring objectives have been incorporated in the network design. Areal configuration of the network is based on the river-basin accounting units designated by the Office of Water Data Coordination in consultation with the Water Resources Council. Primary objectives of the network are (1) to depict areal variability of water-quality conditions nationwide on a year-by-year basis and (2) to detect and assess long-term changes in stream quality.

Pesticide program is a network of regularly sampled water-quality stations where samples are collected to determine the concentration and distribution of pesticides in streams where potential contamination could result from the application of the commonly used insecticides and herbicides. Operation of the network is a Federal interagency activity.

Radiochemical program is a network of regularly sampled water-quality stations where samples are collected to be analyzed for radioisotopes. The streams that are sampled represent major drainage basins in the conterminous United States.

Tritium network is a network of stations which has been established to provide baseline information on the occurrence of tritium in the Nation's surface waters. In addition to the surface-water stations in the network, tritium data are also obtained at a number of precipitation stations. The purpose of the precipitation stations is to provide an estimate sufficient for hydrologic studies of the tritium input to the United States.

EXPLANATION OF STAGE AND WATER-DISCHARGE RECORDS

Collection and computation of data

The base data collected at gaging stations consist of records of stage and measurements of discharge of streams or canals, and stage, surface area, and contents of lakes or reservoirs. In addition, observations of factors affecting the stage-discharge relation or the stage-capacity relation, weather records, and other information are used to supplement base data in determining the daily flow or volume of water in storage. Records of stage are obtained from either direct readings on a nonrecording gage or from a water-stage recorder that gives either a continuous graph of the fluctuations or a tape punched at selected time intervals. Measurements of discharge are made with a current meter, using the general methods adopted by the Geological Survey. These methods are described in standard text books, in Water-Supply Paper 888, and in U.S. Geological Survey Techniques of Water Resources Investigations, book 3, chapter A6.

For stream-gaging stations, rating tables giving the discharge for any stage are prepared from stage-discharge relation curves. If extensions to the rating curves are necessary to express discharge greater than measured, they are made on the basis of indirect measurements of peak discharge (such as slope-area or contracted-opening measurements, computation of flow over dams or weirs), step-backwater techniques, velocity-area studies, and logarithmic plotting. The daily mean discharge is computed from gage heights and rating tables, then the monthly and yearly mean discharges are computed from the daily figures. If the stage-discharge relation is subject to change because of frequent or continual change in the physical features that form the control, the daily mean discharge is computed by the shifting-control method, in which correction factors based on individual discharge measurements and notes by engineers and observers are used in applying the gage heights to the rating tables. If the stage-discharge relation for a station is temporarily changed by the presence of aquatic growth or debris on the control, the daily mean discharge is computed by what is basically the shifting-control method.

At some stream-gaging stations the stage-discharge relation is affected by the backwater from reservoirs, tributary streams, or other sources. This necessitates the use of the slope method in which the slope or fall in a reach of the stream is a factor in computing discharge. The slope or fall is obtained by means of an auxiliary gage set at some distance from the base gage. At some stations the stage-discharge relation is affected by changing stage; at these stations the rate of change in stage is used as a factor in computing discharge.

For some gaging stations there are periods when no gage-height record is obtained or the recorded gage height is so faulty that it cannot be used to compute daily discharge or contents. This happens when the recorder stops or otherwise fails to operate properly, intakes are plugged, the float is frozen in the well, or for various other reasons. For such periods the daily discharges are estimated on the bases of recorded range in stage, prior and subsequent records, discharge measurements, weather records, and comparison with records for other stations, in the same or nearby basins. Likewise daily contents may be estimated on the basis of operator's log, prior and subsequent records, inflow-outflow studies, and other information.

The data in this report generally comprise a description of the station and tabulations of daily and monthly figures. For gaging stations on streams or canals a table showing the daily discharge and monthly and yearly discharge is given. For gaging stations on lakes and reservoirs a monthly summary table of stage and contents or a table showing the daily contents is given. Tables of daily mean gage heights are included for some streamflow stations and for some reservoir stations. Records are published for the water year, which begins on October 1 and ends on September 30.

The description of the gaging station gives the location, drainage area, period of record, notations of revisions of previously published records, type and history of gages, general remarks, average discharge, and extremes of discharge or contents. The location of the gaging station and the drainage area are obtained from the most accurate maps available. River mileage, given under "LOCATION" for some stations, is that determined and used by the Corps of Engineers or other agencies. Periods for which there are published records for the present station or for stations generally equivalent to the present one are given under "PERIOD OF RECORD."

Previously published streamflow records of some stations have been found to be in error on the basis of data or information later obtained. Revisions of such records are usually published along with the current records in one of the annual or compilation reports. In order to make it easier to find such revised records, a paragraph headed "REVISED RECORDS" has been added to the description of all stations for which revised records have been published. Listed therein are all the reports in which revisions have been published, each followed by the water years for which figures are revised in that report. In listing the water years only one number is given; for instance, 1965 stands for the water year October 1, 1964, to September 30, 1965. If no daily, monthly, or annual figures of discharge are affected by the revision, the fact is brought out by notations after the year dates as follows: "(M)" means that only the instantaneous maximum discharge was revised; "(m)" that only the instantaneous minimum was revised; and "(P)" that only peak discharges were revised. If the drainage area has been revised, the report in which the revised figures was first published is given.

The type of gage currently in use, the datum of the present gage above mean sea level, and a condensed history of the types, locations, and datums of previous gages used during the period of record are given under "GAGE." In references to datum of gage, the phrase "mean sea level" denotes "Sea Level Datum of 1929" as used by the Topographic Division of the Geological Survey unless otherwise qualified.

Information pertaining to the accuracy of the discharge records and to conditions which affect the natural flow of the gaging station is given under "REMARKS." For reservoir stations information on the dam forming the reservoir, the capacity, outlet works and spillway, and purpose and use of the reservoir is given under "REMARKS."

The average discharge for the number of years indicated is given under "AVERAGE DISCHARGE", it is not given for stations having fewer than 5 complete years of record or for stations where changes in water development during the period of record cause the figure to have little significance. In addition, the median of yearly mean discharges is given for stream-gaging stations having 10 or more complete years of record if the median differs from the average by more than 10 percent. Under "EXTREMES" are given first, the extremes for the period of record, second, information available outside the period of record, and last, those for the current year. Unless otherwise qualified, the maximum discharge (or contents) is the instantaneous maximum corresponding to the crest stage obtained by use of a water-stage recorder (graphic or digital), a crest-stage gage, or a nonrecording gage read at the time of the crest. If the maximum gage height did not occur on the same day as the maximum discharge (or contents), it is given separately. Similarly, the minimum is the instantaneous minimum unless otherwise qualified. For some stations peak discharges are listed with EXTREMES FOR THE CURRENT YEAR; if they are, all independent peaks,

including the maximum for the year, above the selected base with time of occurrence and corresponding gage heights are published in tabular format. The base discharge, which is given in the table heading, is selected so that an average of about three peaks a year will be presented. Peak discharges are not published for any canals, ditches, drains, or for any stream for which the peaks are subject to substantial control by man. Time of day is expressed in 24-hour local standard time; for example, 12:30 a.m. is 0030, 1:30 p.m. is 1330. The minimums for these stations are published in a separate paragraph following the table of peaks.

The daily table for stream-gaging stations gives the mean discharge for each day and is followed by monthly and yearly summaries. In the monthly summary below the daily table, the line headed "TOTAL" gives the sum of the daily figures. The line headed "MEAN" gives the average flow in cubic feet per second during the month. The lines headed "MAX" and "MIN" give the maximum and minimum daily discharges, respectively, for the month. Discharge for the month also may be expressed in cubic feet per second per square mile (line headed "CFSM"), or in inches (line headed "IN"), or in acre-feet (line headed "AC-FT"). Figures for cubic feet per second per square mile and runoff in inches are omitted if there is extensive regulation or diversion, if the drainage area includes large noncontributing areas, or if the average annual rainfall over the drainage basin is usually less than 20 inches. In the yearly summary below the monthly summary, the figures shown are the appropriate daily discharges for the calendar and water years.

Footnotes to the table of daily discharge are introduced by the word "NOTE." Footnotes are used to indicate periods for which the discharge is computed or estimated by special methods because of no gage-height record, backwater from various sources, or other unusual conditions. Periods of no gage-height record are indicated if the period is continuous for a month or more or includes the maximum discharge for the year. Periods of backwater from an unusual source, of indefinite stage relation, or of any other unusual condition at the gage site are indicated only if they are a month or more in length and the accuracy of the records is affected.

For most gaging stations on lakes and reservoirs the data presented comprise a description of the station and a monthly summary table of stage and contents. For some reservoirs a table showing daily contents or stage is given. A skeleton table of capacity at given stages is published for all reservoirs for which records are published on a daily basis, but is not published for reservoirs for which only monthly data are given.

Data collected at partial-record stations follow the information for continuous-record sites. Data for partial-record discharge stations are presented in two tables. The first is a table of discharge measurements at low-flow partial-record stations, and the second is a table of annual maximum stage and discharge at crest-stage stations. The tables of partial-record stations are followed by a listing of discharge measurements made at sites other than continuous-record or partial-record stations. Occasionally, a series of discharge measurements are made within a short time period to investigate the seepage gains or losses along a reach of a stream or to determine the low-flow characteristics of an area. Such measurements are also given in special tables following the tables of partial-record stations.

Accuracy of field data and computed results

The accuracy of streamflow data depends primarily on (1) the stability of the stage-discharge relation or, if the control is unstable, the frequency of discharge measurements and (2) the accuracy of observations of stage, measurements of discharge, and interpretations of records.

The station description under "REMARKS" states the degree of accuracy of the records. "Excellent" means that about 95 percent of the daily discharges are within 5 percent; "good", within 10 percent; and "fair" within 15 percent. "Poor" means that daily discharges have less than "fair" accuracy.

Figures of daily mean discharge in this report are shown to the nearest hundredth of a cubic foot per second for discharges of less than 1 cfs; to tenths between 1.0 and 10 cfs; to whole numbers between 10 and 1,000 cfs; and to 3 significant figures above 1,000 cfs. The number of significant figures used is based solely on the magnitude of the figure. The same rounding rules apply to discharge figures listed for partial-record stations.

Discharge at many stations, as indicated by the monthly mean, may not reflect natural runoff due to the effects of diversion, consumption, regulation by storage, increase or decrease in evaporation due to artificial causes, or to other factors. For such stations, figures of cubic feet per second per square mile and of runoff in inches are not published unless satisfactory adjustments can be made for diversions, for changes in contents of reservoirs, or for other changes incident to use and control. Evaporation from a reservoir is not included in the adjustments for changes in reservoir contents, unless it is so stated. Even at those stations where adjustments are made, large errors in computed runoff may occur if adjustments or losses are large in comparison with the observed discharge.

Records of discharge collected by agencies other than the Geological Survey

The National Water Data Exchange, Water Resources Division, U.S. Geological Survey, National Center, Reston, Va 22092, maintains an index of water-data sites not published by the Geological Survey. Information on records available at specific sites can be obtained upon request.

Other data available

Information of a more detailed nature than that published for most of the gaging stations such as observations of water temperatures, discharge measurements, gage-height records, and rating tables is on file in the district office. Also most gaging-station records are available in computer-usable form and many statistical analyses have been made.

Information on the availability of unpublished data or statistical analyses may be obtained from the district office.

Publications

In each water-supply paper entitled, "Surface Water Supply of the United States" there is a list of numbers of preceding water-supply papers containing streamflow information for the area covered by that report. In addition, there is a list of numbers of water-supply papers containing detailed information on major floods in the area. Records for stations in Hawaii and other Pacific areas for the period October 1959 to September 1965, are in Water-Supply Paper 1937.

Two series of summary reports entitled, "Compilation of Records of Surface Waters of the United States" have been published; the first series covers the entire period of record through September 1950 (June 1950, for Hawaii), and the second series covers the period October 1950 to September 1960 (July 1950 to June 1960, for Hawaii and other Pacific areas). These reports contain summaries of monthly and annual discharge and monthend storage for all previously published records, as well as some records not contained in the annual series of water-supply papers. All records were reexamined and revised where warranted. Estimates of discharge were made to fill short gaps whenever practical. The yearly summary table for each gaging station lists the numbers of the water-supply papers in which daily records were published for that station. Records for stations in Hawaii and other Pacific areas are compiled in Water-Supply Paper 1319 through June 1950, in 1739 and 1751 for July 1950 to June 1960, in 1937 for October 1959 to September 1965, and 2137 for October 1966 to September 1970.

Special reports on major floods or droughts or of other hydrologic studies for the area have been issued in publications other than water-supply papers. Information relative to these reports may be obtained from the district office.

EXPLANATION OF WATER-QUALITY RECORDS

Collection and examination of data

Surface water samples for analyses usually are collected at or near gaging stations. The water-quality records are given immediately following the discharge records at these stations.

The descriptive heading for water-quality records gives periods of record for the various types of water-quality data (chemical, specific conductance, biological determination, water temperatures, sediment discharge), period of record, and extremes of pertinent data, and general remarks.

For ground-water records, no descriptive statements are given; however, the well number, depth of well, date of sampling and/or other pertinent data are given in the table containing the chemical analyses of the ground water.

Water analysis

Most methods for collecting and analyzing water samples are described in the U.S. Geological Survey Techniques of Water-Resources Investigations listed on a following page.

One sample can define adequately the water-quality at a given time if the mixture of solutes throughout the stream cross section is homogeneous. However, the concentration of solutes at different locations in the cross section may vary widely with different rates of water discharge, depending on the source of material and the turbulence and mixing of the stream. Some streams must be sampled through several vertical sections to obtain a representative sample needed for an accurate mean concentration and for use in calculating load.

Chemical-quality data published in this report are considered to be the most representative values available for the stations listed. The values reported represent water-quality conditions at the time of sampling as much as possible, consistent with available sampling techniques and methods of analysis. In the rare case where an apparent inconsistency exists between a reported pH value and the relative abundance of carbon dioxide species (carbonate and bicarbonate), the inconsistency is the result of a slight uptake of carbon dioxide from the air by the sample between measurement of pH in the field and determination of carbonate and bicarbonate in the laboratory.

For chemical-quality stations equipped with digital monitors, the records consist of daily maximum, minimum, and mean values for each constituent measured and are based upon hourly punches beginning at 0100 hours and ending at 2400 hours for the day of record. More detailed records (hourly values) may be obtained from the district office.

Water temperature

Water temperatures are measured at most of the water-quality stations. In addition, water temperatures are taken at time of discharge measurements for water-discharge stations. For stations where water temperatures are taken manually once or twice daily, the water temperatures are taken at about the same time each day. Large streams have a small diel temperature change; shallow streams may have a daily range of several degrees and may follow closely the changes in air temperature. Some streams may be affected by waste-heat discharges.

At stations where recording instruments are used, either mean temperatures or maximum and minimum temperatures for each day are published.

Sediment

Suspended-sediment concentrations are determined from samples collected by using depth-integrating samplers. Samples usually are obtained at several verticals in the cross section, or a single sample may be obtained at a fixed point and a coefficient applied to determine the mean concentration in the cross sections.

During periods of rapidly changing flow or rapidly changing concentration, samples may have been collected more frequently (twice daily or, in some instances, hourly). The published sediment discharges for days of rapidly changing flow or concentration were computed by the subdivided day method (time-discharge weighted average). Therefore, for those days when the published sediment discharge value differs from the value computed as the product of discharge times mean concentration times 0.0027, the reader can assume that the sediment discharge for that day was computed by the subdivided day method. For periods when no samples were collected, daily loads of suspended sediment were estimated on the basis of water discharge, sediment concentrations observed immediately before and after the periods, and suspended-sediment loads for other periods of similar discharge.

At other stations, suspended-sediment samples were collected periodically at many verticals in the stream cross section. Although data collected periodically may represent conditions only at the time of observations, such data are useful in establishing seasonal relations between quality and streamflow in predicting long-term sediment-discharge characteristics of the stream.

In addition to the records of the quantities of suspended sediment, records of the periodic measurements of the particle-size distribution of the suspended sediment and bed material are included.

Publications

The annual series of water-supply papers that contain information on quality of surface waters in Hawaii and other Pacific areas are listed below.

Water year	WSP No.	Water year	WSP No.	Water year	WSP No.
1964	1966	1967	2016	1970	2160
1965	1966	1968	2016	1971	A2170
1966	1996	1969	2150		

A In preparation.

EXPLANATION OF GROUND-WATER LEVEL RECORDS

Collection of the data

Only ground-water level data from a basic network of observation wells are published herein. This basic network contains observation wells so located that the most significant data are obtained from the fewest wells in the most important aquifers.

Each well is identified by means of (1) a 15-digit number that is based on latitude and longitude and (2) a local number that is provided for local needs. See figure 13.

Measurements are made in many types of wells, under varying conditions of access and at different temperatures, hence, neither the method of measurement nor the equipment can be standardized. At each observation well, however, the equipment and techniques used are those that will ensure that measurements at each well are consistent.

Water-level measurements in this report are given in feet with reference to either mean sea level (msl) or land-surface datum (lsd). Mean sea level is the datum plane on which the national network of precise levels is based; land-surface datum is a datum plane that is approximately at land surface at each well. If known, the altitude of the land-surface datum above mean sea level is given in the well description. The height of the measuring point (MP) above or below land-surface datum is given in each well description. Water levels in wells equipped with recording gages are reported for every fifth day and the end of each month (eom). To show the intraday variation in the ground-water levels caused by local pumping and tidal fluctuations, instantaneous maximum and minimum water levels are given with the mean water levels for the day.

Water levels are reported to as many significant figures as can be justified by the local conditions. For example, in a measurement of a depth to water of several hundred feet, the error in determining the absolute value of the total depth to water may be a few tenths of a foot, whereas the error in determining the net change of water level between successive measurements may be only a hundredth or a few hundredths of a foot. For lesser depths to water the accuracy is greater. Accordingly, most measurements are reported to a hundredth of a foot, but some are given only to a tenth of a foot or a larger unit.

Publications

Publication of ground-water level data for the United States in Water-Supply Papers was begun by the Geological Survey in 1935. From 1935 through 1939, a single Water-Supply Paper for each year covering the entire nations was issued (Water-Supply Papers 777, 817, 840, 845, and 886). From 1940 through 1974, separate Water-Supply Papers were issued for 6 sections of the United States. Water-level data for Hawaii are in the Water-Supply Papers listed below, each report containing one or more calendar years (January-December) of data. Data in this report are for the 12-month water year ending September 30.

Calendar year	WSP No.	Calendar year	WSP No.	Calendar year	WSP No.	Calendar year	WSP No.
1935	777	1942	949	1949	1161	1956-60	1770
1936	817	1943	991	1950	1170	1961-65	1855
1937	840	1944	1021	1951	1196	1966-70	2010
1938	845	1945	1028	1952	1226	1971-74	A2162
1939	886	1946	1076	1953	1270		
1940	911	1947	1101	1954	1326		
1941	941	1948	1131	1955	1409		

A In preparation.

Information about reports and other data on ground water in Hawaii may be obtained from the district office, at the address given on the back of the title page.

Thirty-four manuals by the U.S. Geological Survey have been published to date in the series on techniques describing procedures for planning and executing specialized work in water-resources investigations. The material is grouped under major subject headings called books and is further divided into sections and chapters. For example, Section A of Book 3 (Applications of Hydraulics) is on surface water. The chapter, the unit of publication, is limited to a narrow field of subject matter. This format permits flexibility in revision and publication as the need arises. The reports listed below are for sale by the U.S. Geological Survey, Branch of Distribution, 1200 South Eads Street, Arlington, VA 22202 (authorized agent of the Superintendent of Documents, Government Printing Office. Prices are effective January 1978 but are subject to change.

NOTE: When ordering any of these publications, please give the title, book number, chapter number, and "U.S. Geological Survey Techniques of Water-Resources Investigations".

1-D1. *Water temperature-influential factors, field measurement, and data presentation*, by H. H. Stevens Jr., J. F. Ficke, and G. F. Smoot: USGS--TWRI Book 1, Chapter D1. 1975. 65 pages. $1.60.

1-D2. *Guidelines for collection and field analysis of ground-water samples for selected unstable constituents*, by W.W.Wood: USGS--TWRI Book 1, Chapter D2. 1976. 24 pages. $0.85

2-D1. *Application of surface geophysics to ground-water investigations*, by A. A. R. Zohdy, G. P. Eaton, and D. R. Mabey: USGS--TWRI Book 2, Chapter D1. 1974. 116 pages. $1.90.

2-E1. *Application of borehole geophysics to water-resources investigations*, by W. S. Keys and L. M. MacCary: USGS--TWRI Book 2, Chapter E1. 1971. 126 pages. $1.75.

3-A1. *General field and office procedures for indirect discharge measurements*, by M. A. Benson and Tate Dalrymple: USGS--TWRI Book 3, Chapter A1. 1967. 30 pages. $1.00.

3-A2. *Measurement of peak discharge by the slope-area method*, by Tate Dalrymple and M. A. Benson: USGS--TWRI Book 3, Chapter A2. 1967. 12 pages. $0.35.

3-A3. *Measurement of peak discharge at culverts by indirect methods*, by G. L. Bodhaine: USGS--TWRI Book 3, Chapter A3. 1968. 60 pages. $0.40.

3-A4. *Measurement of peak discharge at width contractions by indirect methods*, by H. F. Matthai: USGS--TWRI Book 3, Chapter A4. 1967. 44 pages. $1.00.

3-A5. *Measurement of peak discharge at dams by indirect methods*, by Harry Hulsing: USGS--TWRI Book 3, Chapter A5. 1967. 29 pages. $0.35.

3-A6. *General procedure for gaging streams*, by R. W. Carter and Jacob Davidian: USGS--TWRI Book 3, Chapter A6, 1968, 13 pages. $1.00.

3-A7. *Stage measurements at gaging stations*, by T. J. Buchanan and W. P. Somers: USGS--TWRI Book 3, Chapter A7. 1968. 28 pages. $1.40.

3-A8. *Discharge measurements at gaging stations*, by T. J. Buchanan and W. P. Somers: USGS--TWRI Book 3, Chapter A8. 1969. 65 pages. $1.25.

3-A11. *Measurement of discharge by moving-boat method*, by G. F. Smoot and C. E. Novak: USGS--TWRI Book 3, Chapter A11. 1969. 22 pages. $1.20.

3-A12. *Fluorometric procedures for dye tracing*, by J. F. Wilson Jr.: USGS--TWRI Book 3, Chapter A12. 1968. 31 pages. $0.35. Not currently available.

3-B1. *Aquifer-test design, observation, and data analysis*, by R. W. Stallman: USGS--TWRI Book 3, Chapter B1. 1971. 26 pages. $0.70.

3-B2. *Introduction to ground-water hydraulics, a programed text for self-instruction*, by G. D. Bennett: USGS--TWRI Book 3, Chapter B2 1976. 172 pages. $2.50.

3-C1. *Fluvial sediment concepts*, by H. P. Guy: USGS--TWRI Book 3, Chapter C1. 1970. 55 pages. $0.65.

3-C2. *Field methods for measurement of fluvial sediment*, by H. P. Guy and V. W. Norman: USGS--TWRI Book 3, Chapter C2, 1970. 59 pages. $2.50.

3-C3. *Computation of fluvial-sediment discharge*, by George Porterfield: USGS--TWRI Book 3, Chapter C3. 1972. 66 pages. $2.10.

4-A1. *Some statistical tools in hydrology*, by H. C. Riggs: USGS--TWRI Book 4 Chapter A1. 1968. 39 pages. $1.60.

4-A2. *Frequency curves*, by H. C. Riggs: USGS--TWRI Book 4, Chapter A2. 1968. 15 pages. $0.35.

4-B1. *Low-flow investigations*, by H. C. Riggs: USGS--TWRI Book 4, Chapter B1. 1972, 18 pages. $0.65.

4-B2. *Storage analyses for water supply*, by H. C. Riggs and C. H. Hardison: USGS--TWRI Book 4, Chapter B2. 1973. 20 pages. $0.75.

4-B3. *Regional analyses of streamflow characteristics*, by H. C. Riggs: USGS--TWRI Book 4, Chapter B3. 1973. 15 pages. $0.65.

4-D1. *Computation of rate and volume of stream depletion by wells*, by C. T. Jenkins: USGS--TWRI Book 4, Chapter D1. 1970. 17 pages. $1.10.

5-A1. *Methods for collection and analysis of water samples for dissolved minerals and gases*, by Eugene Brown, M. W. Skougstad, and M. J. Fishman: USGS--TWRI Book 5, Chapter A1. 1970. 160 pages. $2.40.

5-A2. *Determination of minor elements in water by emission spectroscopy*, by P. R. Barnett and E. C. Mallory, Jr.: USGS--TWRI Book 5, Chapter A2. 1971. 31 pages. $0.80.

5-A3. *Methods for analysis of organic substances in water*, by D. F. Goerlitz and Eugene Brown: USGS--TWRI Book 5, Chapter A3. 1972. 40 pages. $0.90.

5-A4.* *Methods for collection and analysis of aquatic biological and microbiological samples*, edited by P.E. Greeson, T.A. Ehlke, G.A. Irwin, B.W. Lium, and K.V. Slack: USGS--TWRI Book 5, Chapter A4. 1977. 332 pages. $20.00.

5-A5.* *Methods for determination of radioactive substances in water and fluvial sediments*, by L.L. Thatcher, V.J. Janzer, and K.W. Edwards: USGS--TWRI Book 5, Chapter A5. 1977. 95 pages. $16.00.

5-C1. *Laboratory theory and methods for sediment analysis*, by H. P. Guy: USGS--TWRI Book 5, Chapter C1. 1969. 58 pages. $2.10.

7-C1. *Finite difference model for aquifer simulation in two dimensions with results of numerical experiments*, by P. C. Trescott, G. F. Pinder, and S. P. Larson: USGS--TWRI Book 7, Chapter C1. 1976. 116 pages. $2.30.

8-A1. *Methods of measuring water levels in deep wells*, by M. S. Garber and F. C. Koopman: USGS--TWRI Book 8, Chapter A1. 1968. 23 pages. $0.70.

8-B2. *Calibration and maintenance of vertical-axis type current meters*, by G. F. Smoot and C. E. Novak: USGS--TWRI Book 8, Chapter B2. 1968. 15 pages. $1.10.

*These publications are available ONLY from Superintendent of Documents, Government Printing Office, Washington, D.C. 20402. They are in looseleaf format and are subscription items. Additional supplements will be issued to subscribers at no extra cost. Checks should be made payable to Superintendent of Documents. Requester should emphasize to Superintendent of Documents that this is a subscription item.

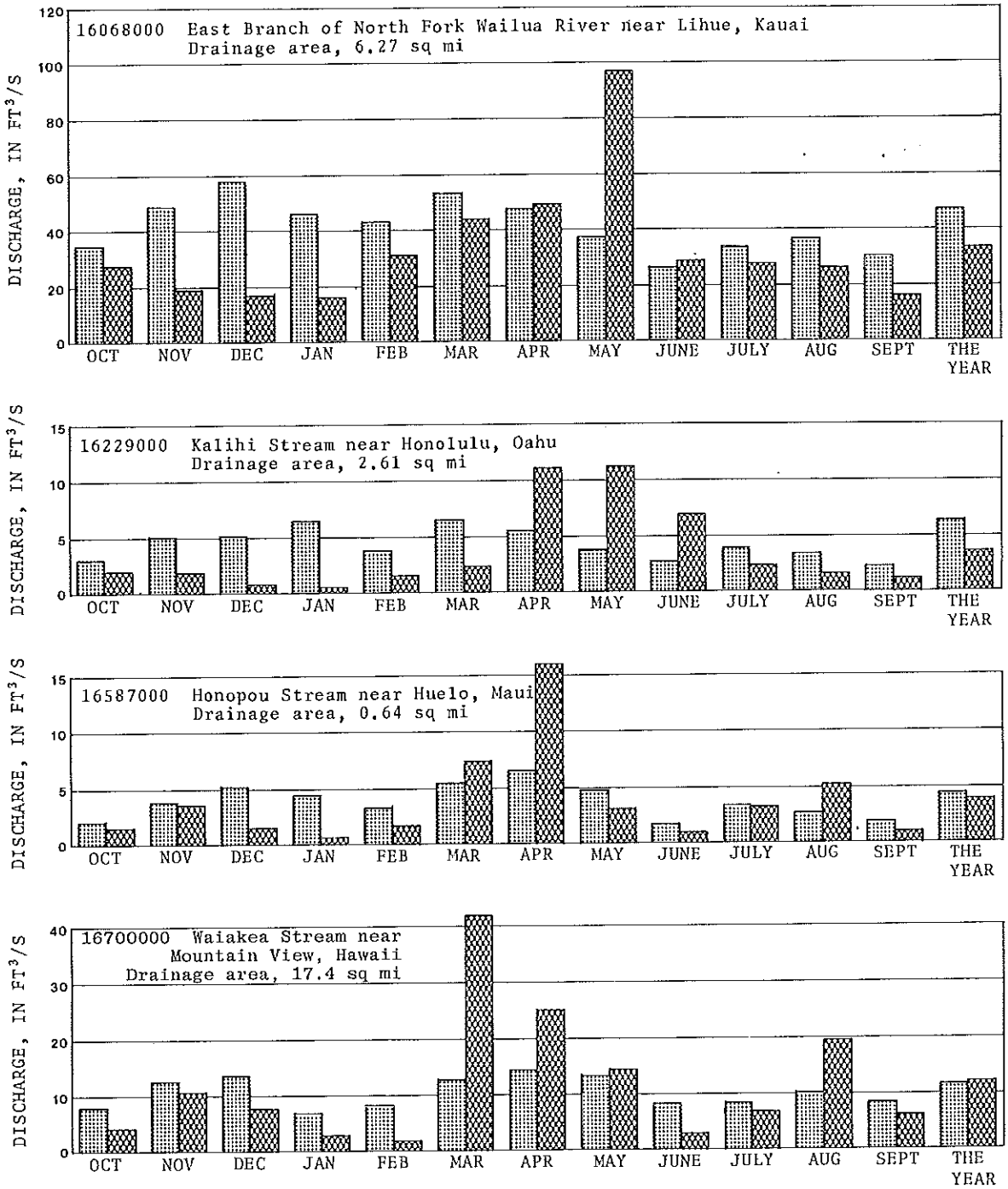

FIGURE 1.--DISCHARGE DURING 1977 WATER YEAR COMPARED WITH MEDIAN DISCHARGE FOR PERIOD 1941-70 FOR FOUR REPRESENTATIVE GAGING STATIONS.

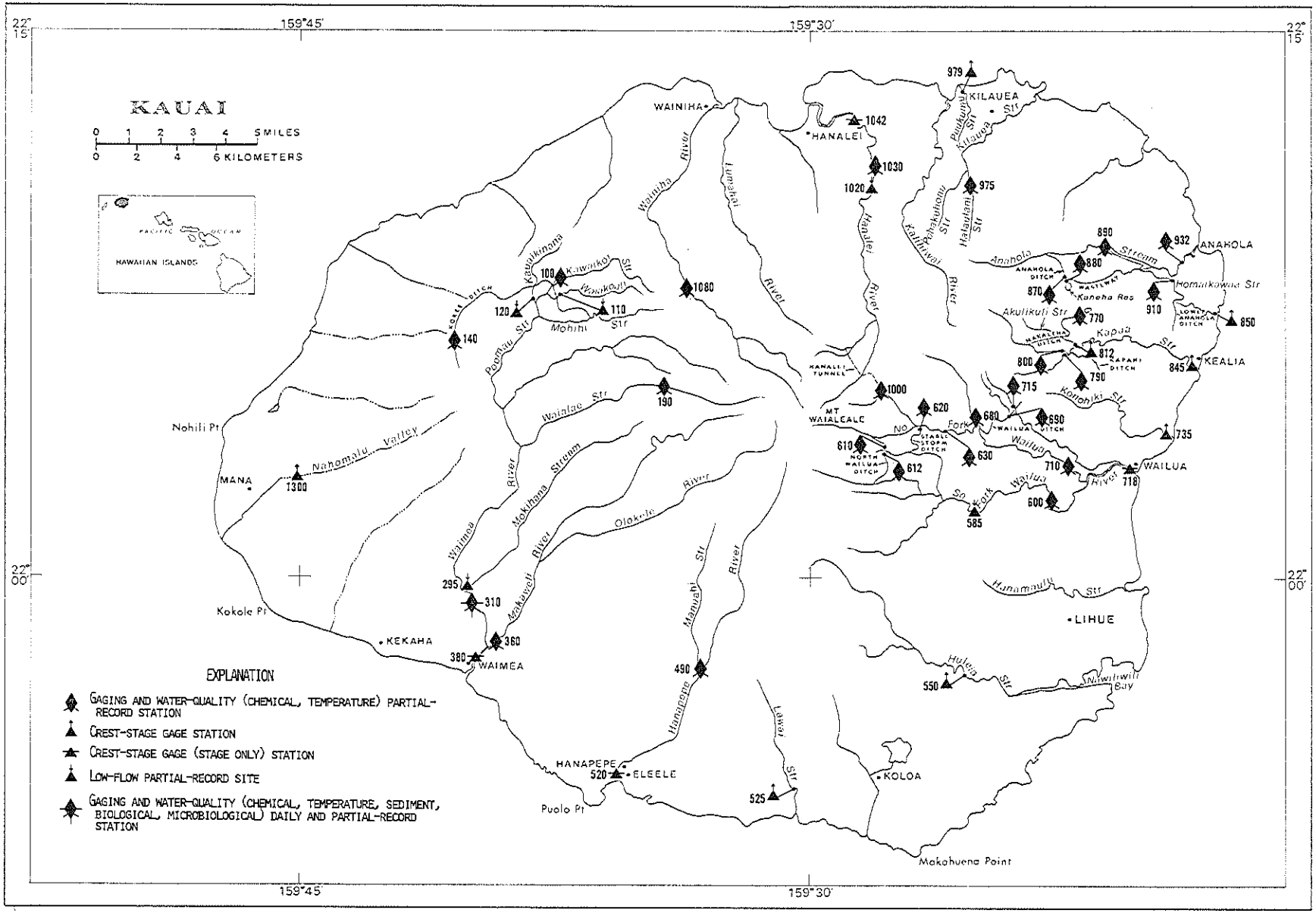

FIGURE 2.--MAP OF KAUAI SHOWING LOCATIONS OF GAGING, WATER-QUALITY, AND PARTIAL-RECORD STATIONS.

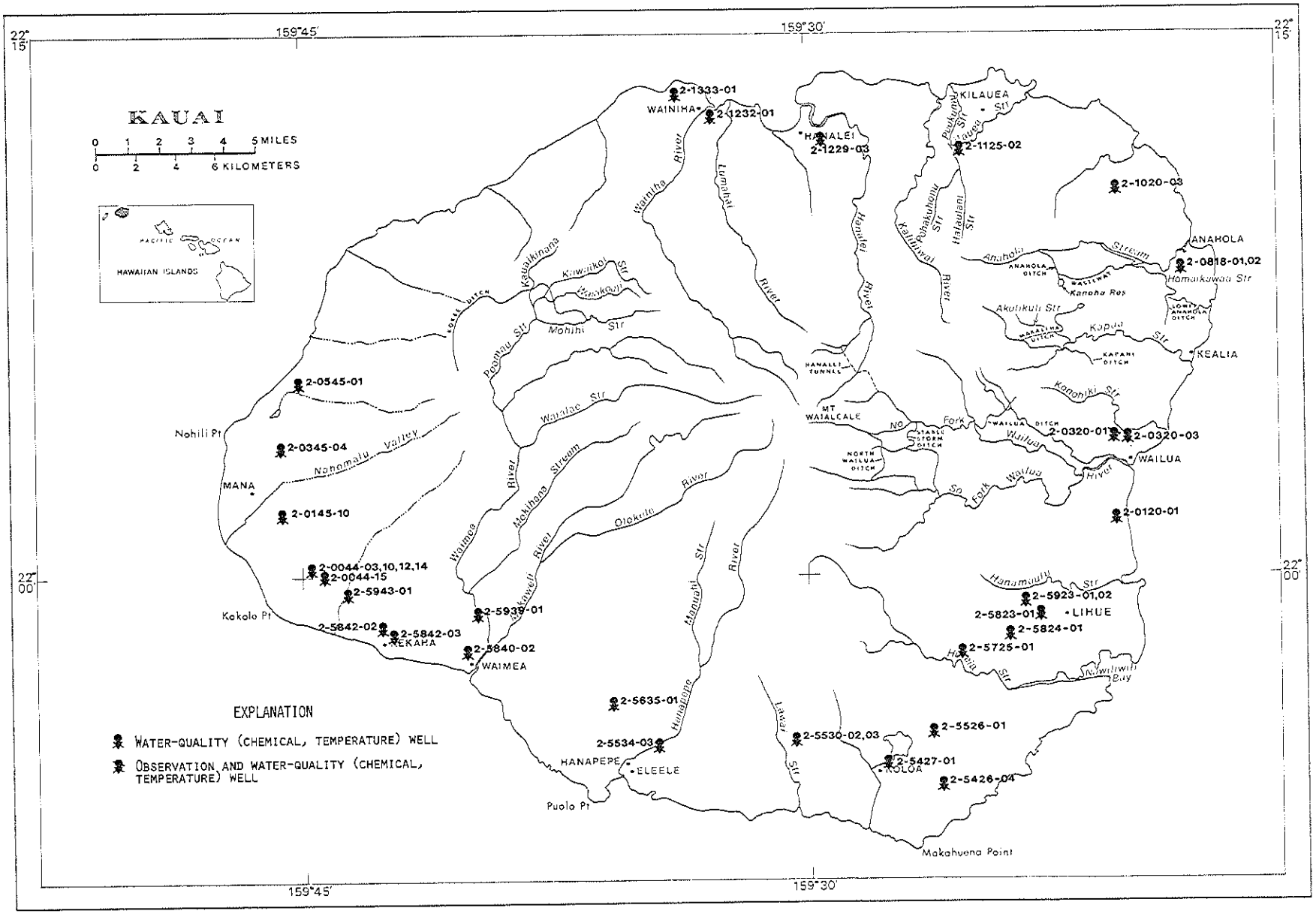

FIGURE 3.--MAP OF KAUAI SHOWING LOCATIONS OF OBSERVATION WELLS AND GROUND-WATER QUALITY SAMPLING SITES.

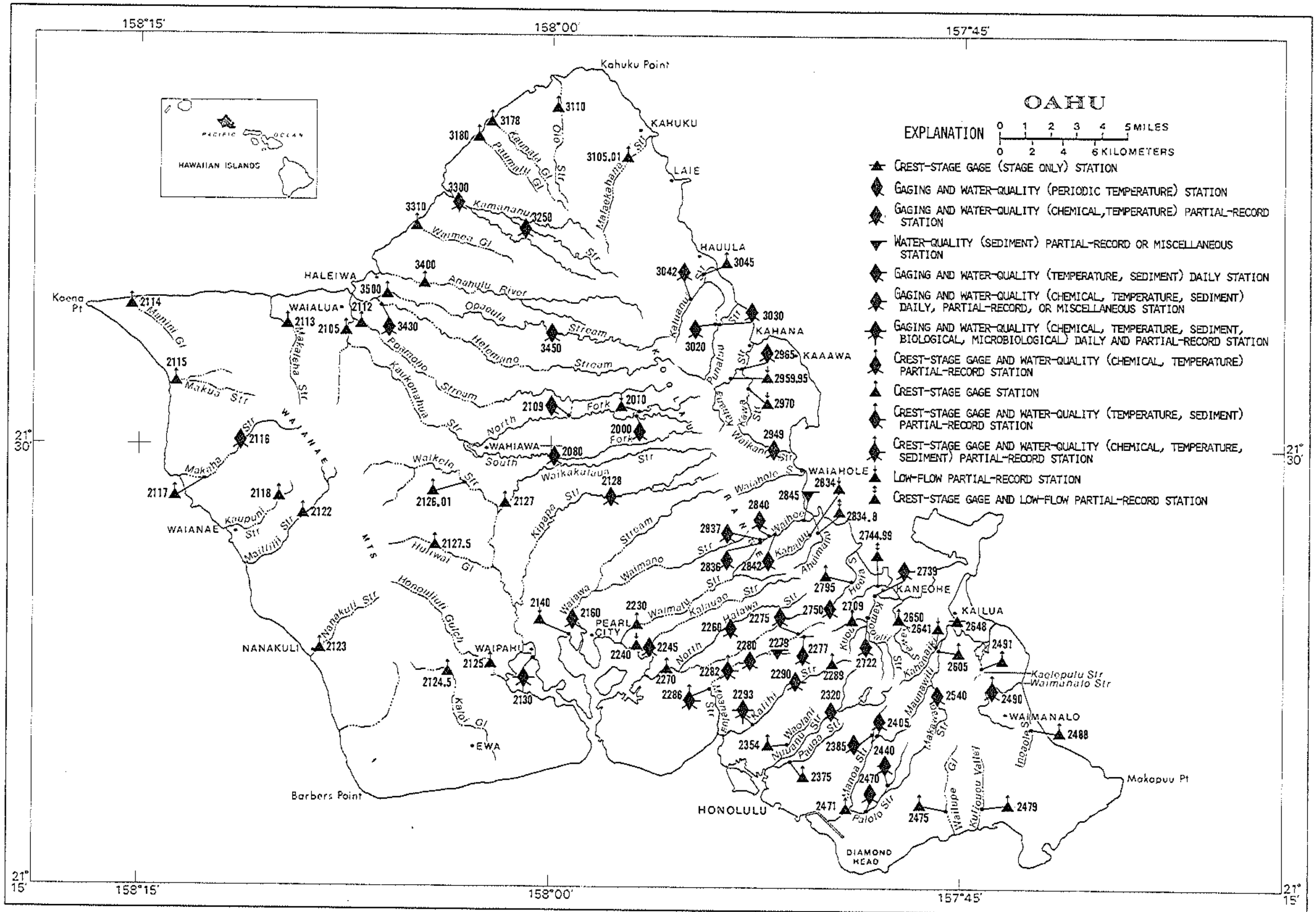

FIGURE 4.--MAP OF OAHU SHOWING LOCATIONS OF GAGING, WATER-QUALITY, AND PARTIAL-RECORD STATIONS.

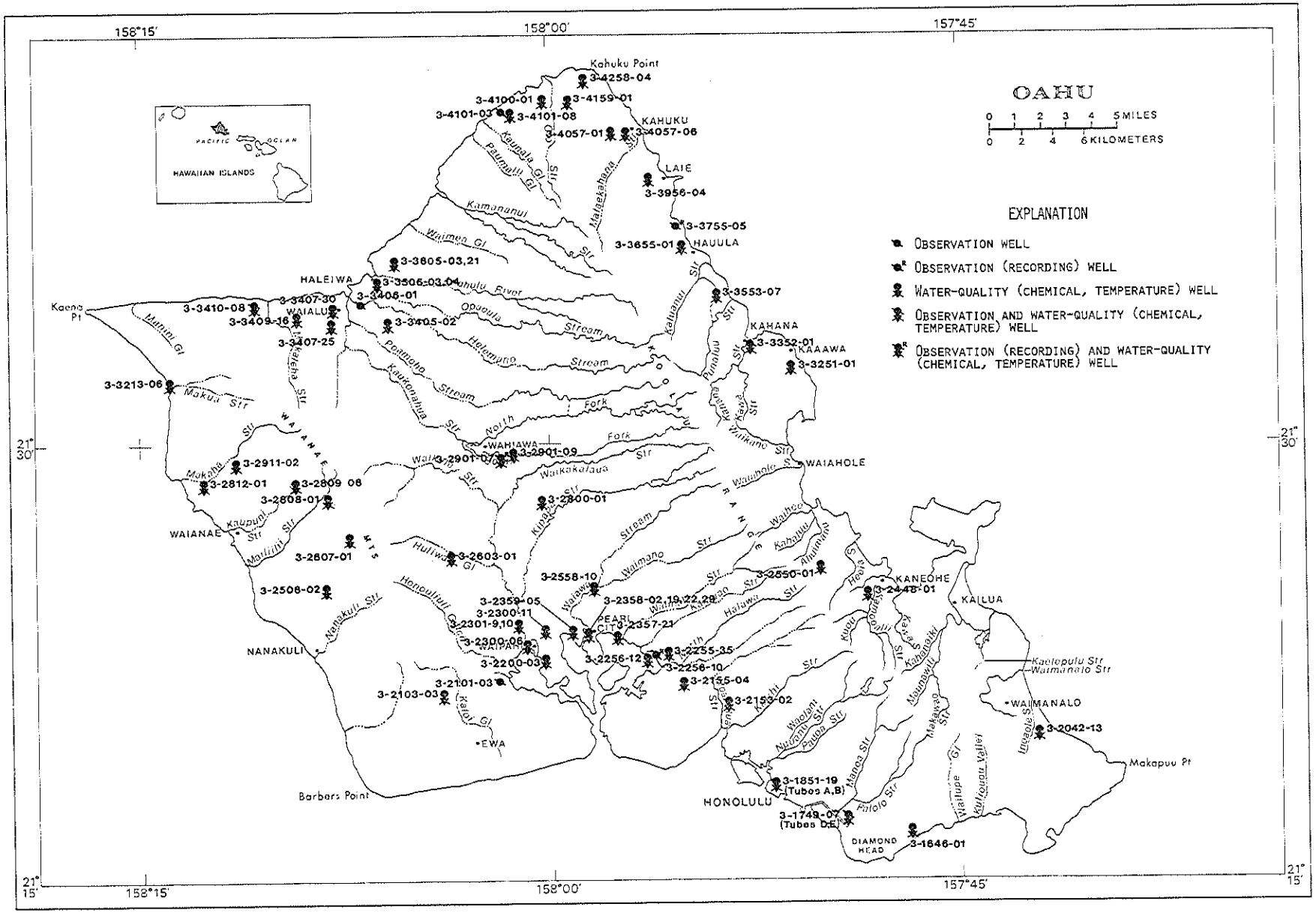

FIGURE 5.--MAP OF OAHU SHOWING LOCATIONS OF OBSERVATION WELLS AND GROUND-WATER QUALITY SAMPLING SITES.

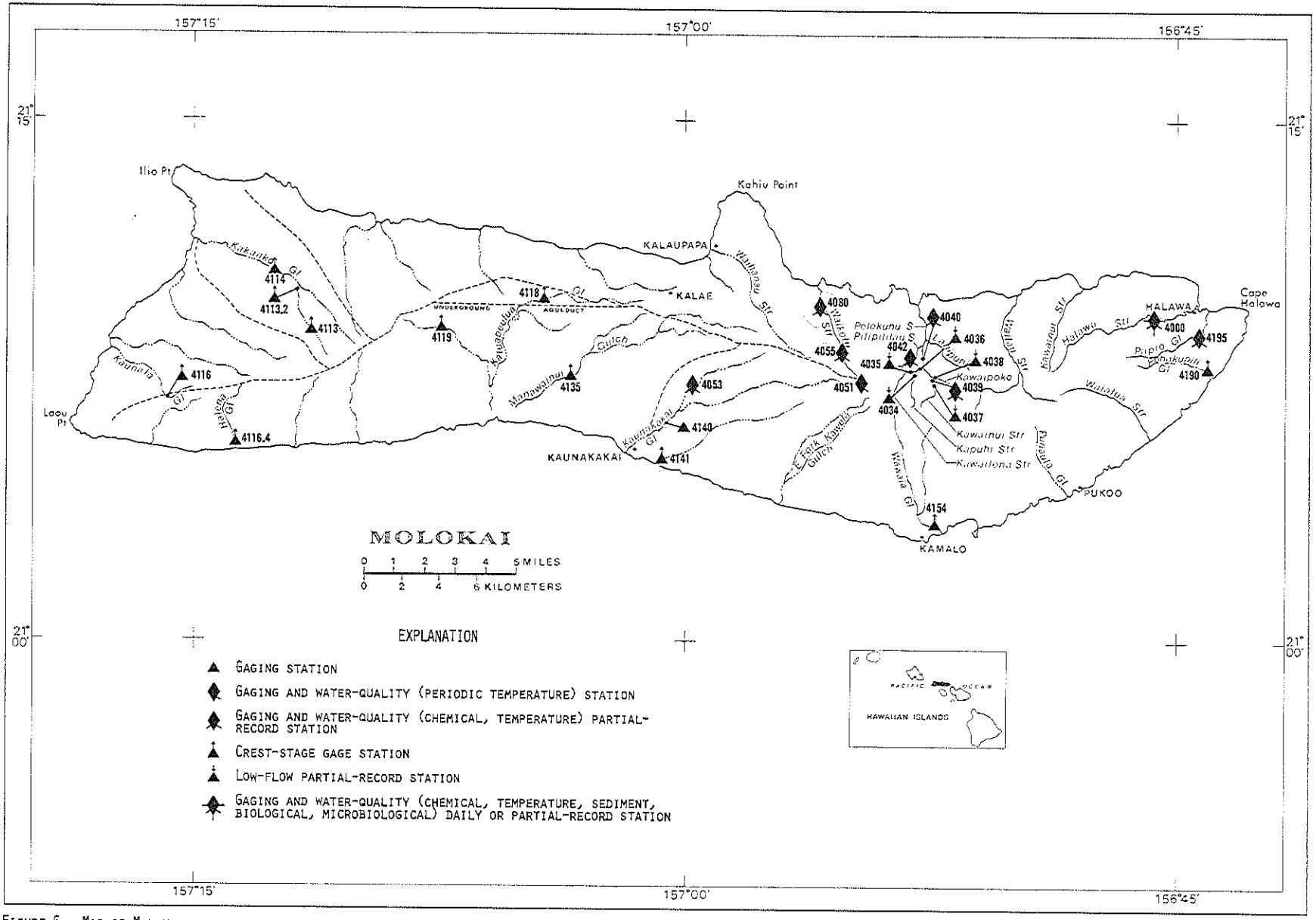

FIGURE 6.--MAP OF MOLOKAI SHOWING LOCATIONS OF GAGING, WATER-QUALITY, AND PARTIAL-RECORD STATIONS.

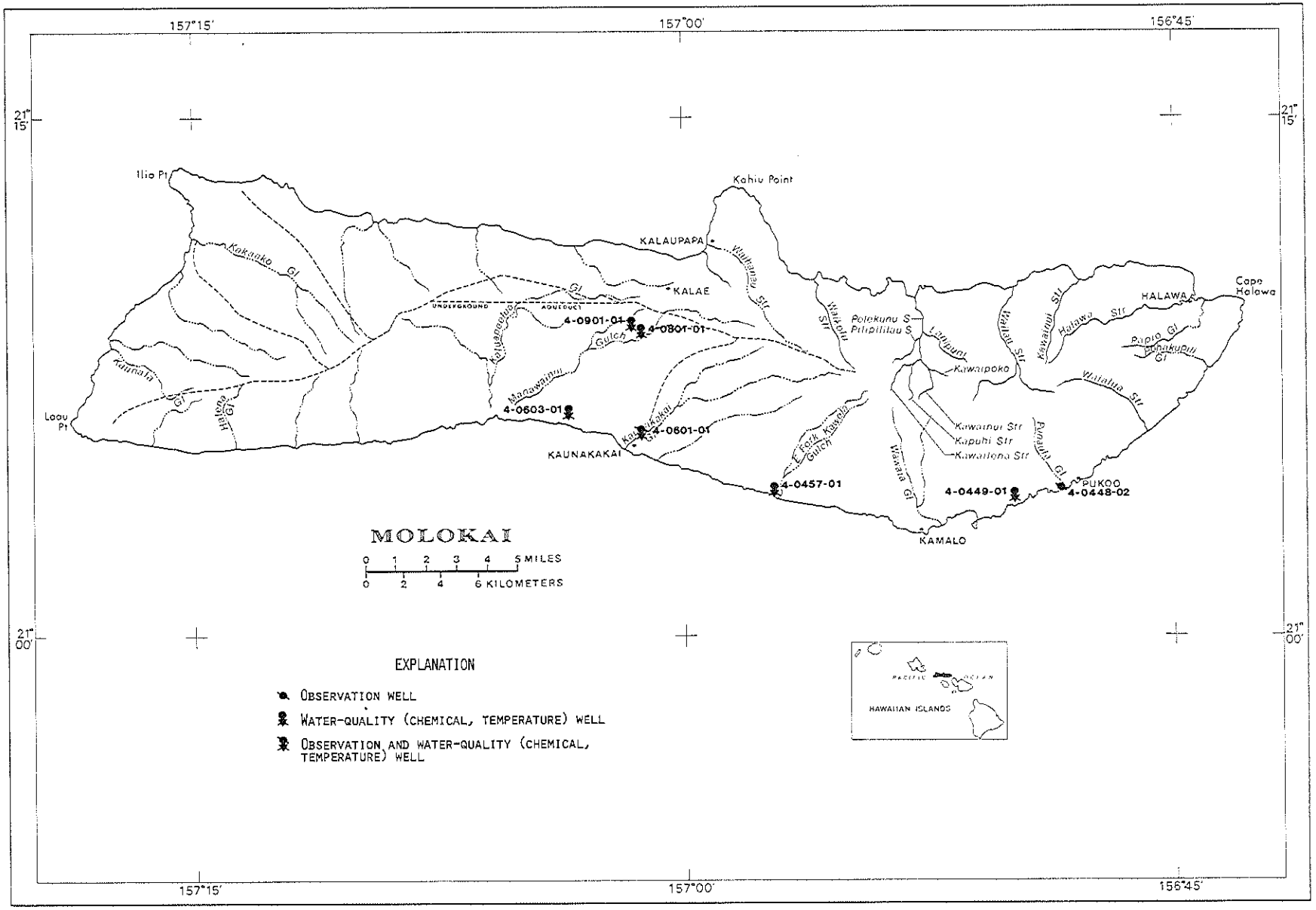

FIGURE 7.--MAP OF MOLOKAI SHOWING LOCATIONS OF OBSERVATION WELLS AND GROUND-WATER QUALITY SAMPLING SITES.

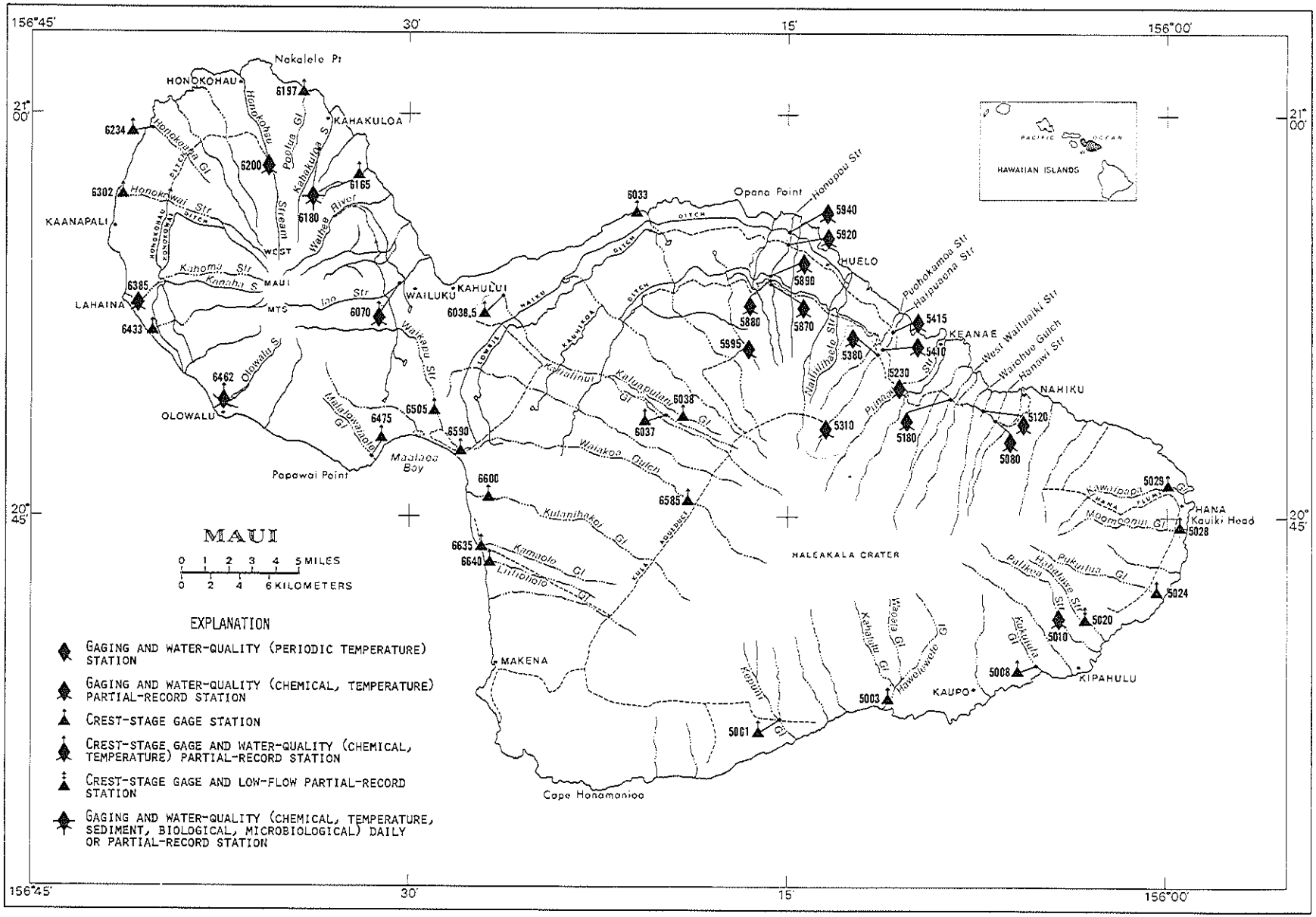

FIGURE 8.--MAP OF MAUI SHOWING LOCATIONS OF GAGING, WATER-QUALITY, AND PARTIAL-RECORD STATIONS.

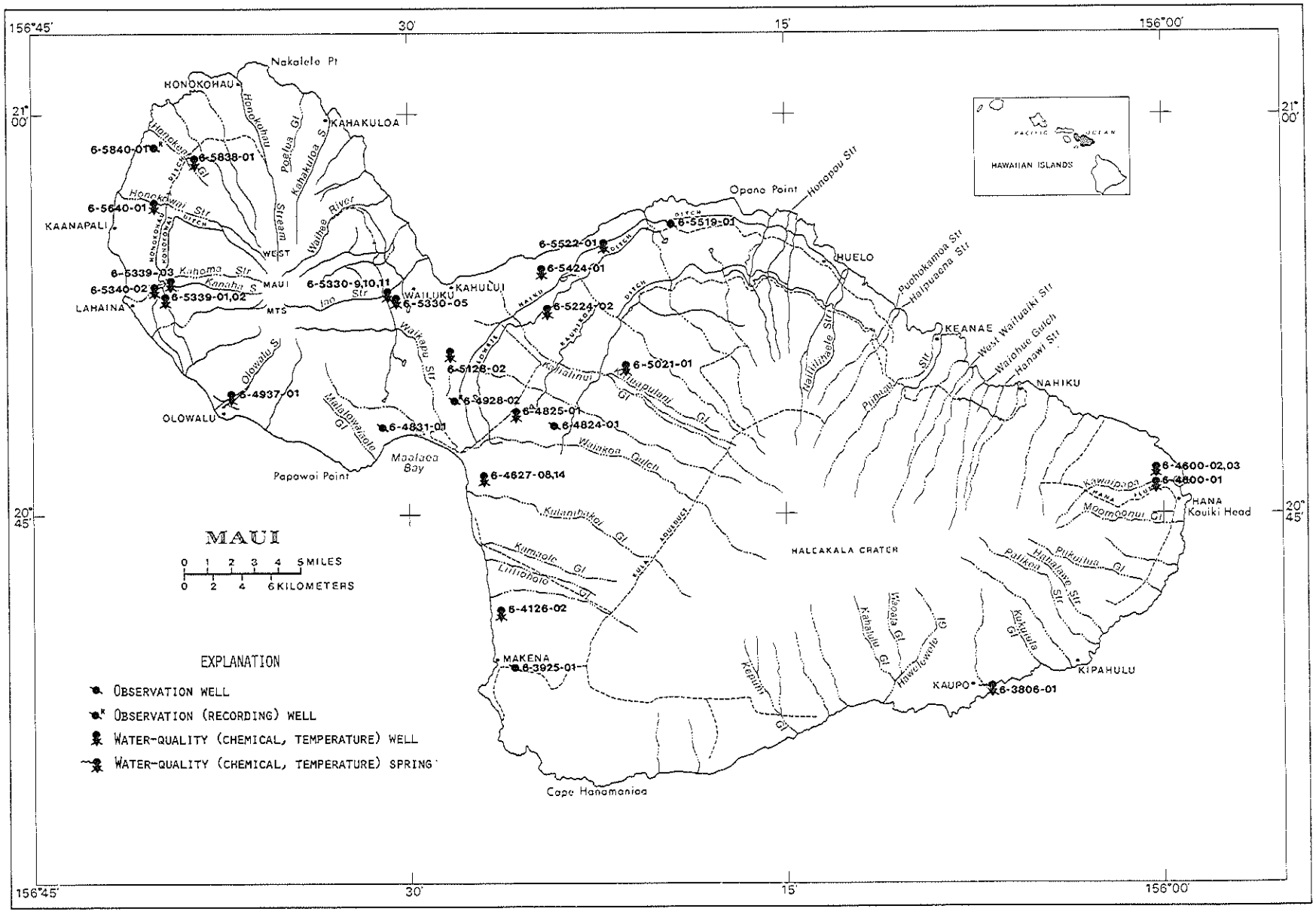

FIGURE 9.--MAP OF MAUI SHOWING LOCATIONS OF OBSERVATION WELLS AND GROUND-WATER QUALITY SAMPLING SITES.

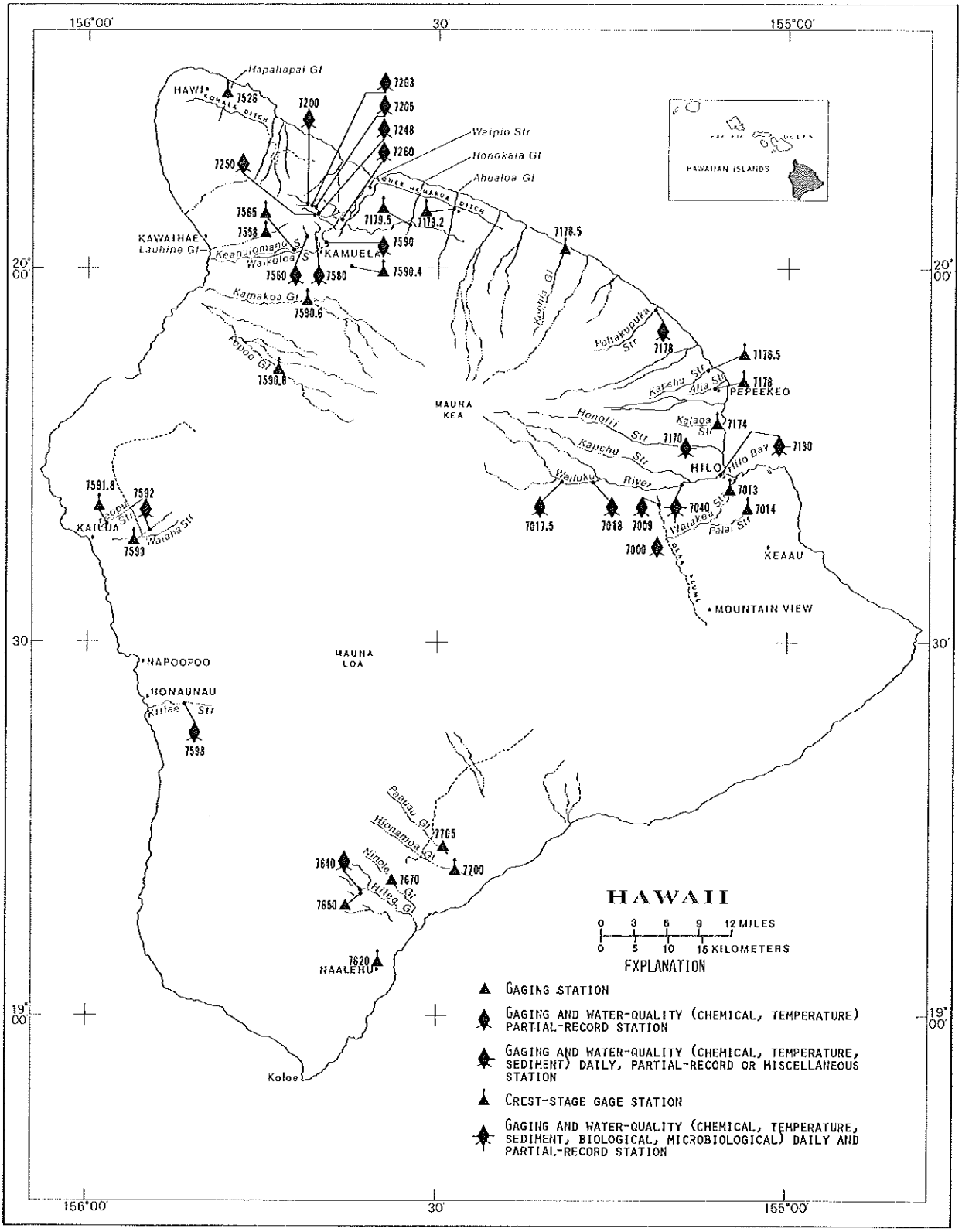

FIGURE 10.--MAP OF HAWAII SHOWING LOCATIONS OF GAGING, WATER-QUALITY, AND PARTIAL-RECORD STATIONS.

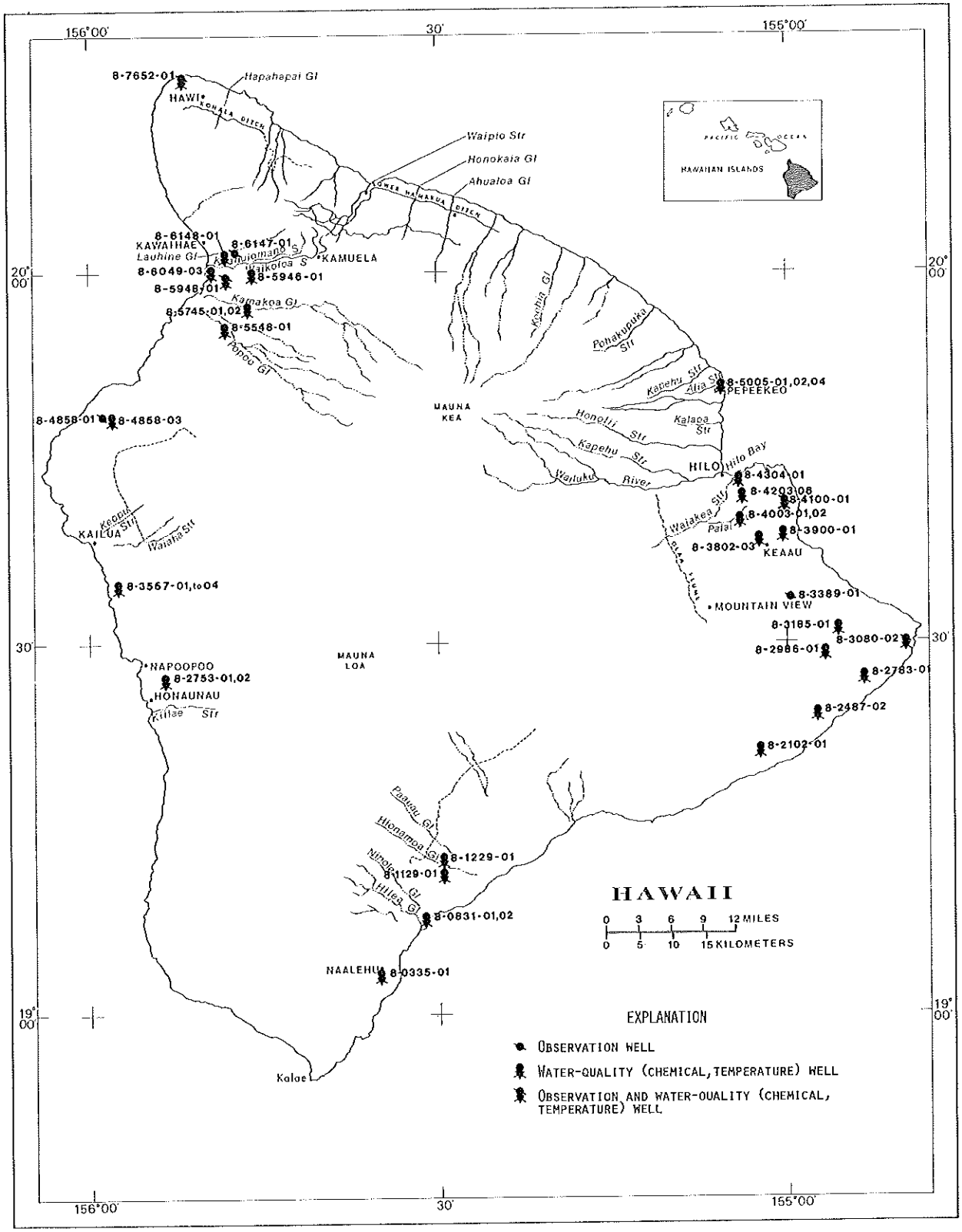

FIGURE 11.--MAP OF HAWAII SHOWING LOCATIONS OF OBSERVATION WELLS AND GROUND-WATER QUALITY SAMPLING SITES.

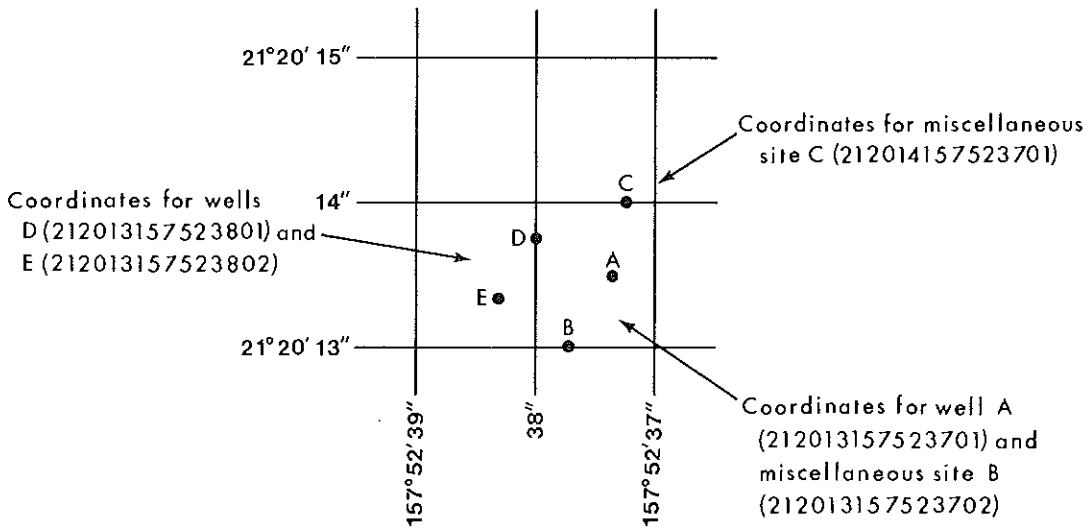

Figure 12. Sketch showing system for numbering wells and miscellaneous sites

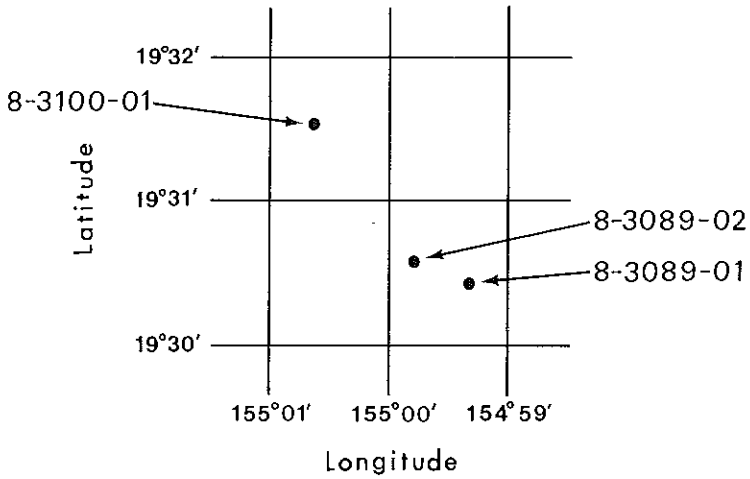

Figure 13. Sketch showing local well numbering system

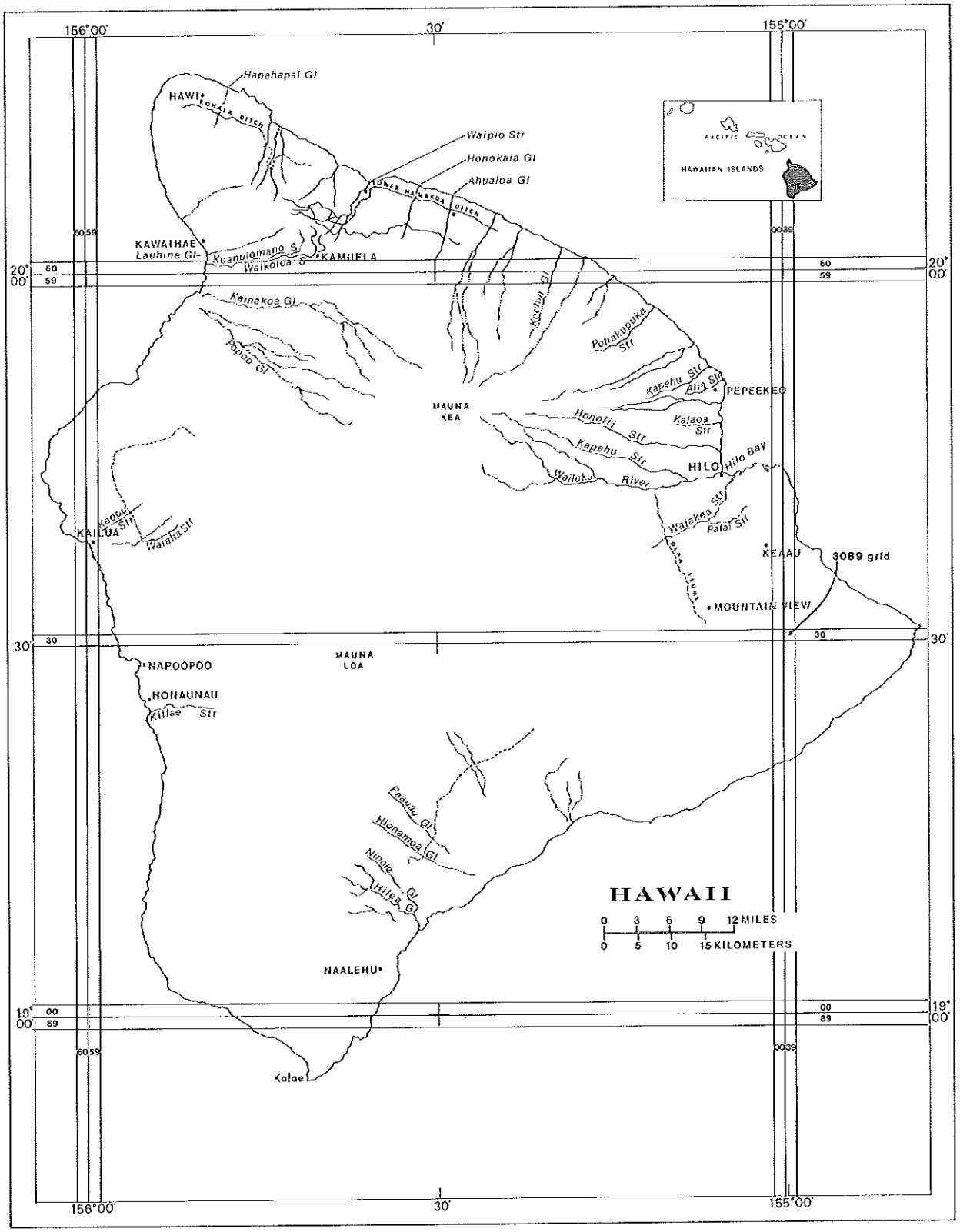

FIGURE 14.--MAP OF HAWAII SHOWING SYSTEM FOR NUMBERING LOCAL WELL NUMBERS.

HYDROLOGIC-DATA STATION RECORDS

HAWAII, ISLAND OF KAUAI

16010000 KAWAIKOI STREAM NEAR WAIMEA

LOCATION.--Lat 22°08'09", long 159°37'22", Hydrologic Unit 20070000, on left bank 0.2 mi (0.3 km) upstream from Kokee-Mohihi Road crossing, 2.5 mi (4.0 km) east of Kokee Lodge, and 12.5 mi (20.1 km) north of Waimea.

DRAINAGE AREA.--3.95 mi² (10.23 km²).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--April 1909 to October 1912, December 1912 to March 1913, May 1913 to June 1915, August 1915 to May 1916, July to December 1916, July 1919 to current year. Monthly discharge only for some periods, published in WSP 1319.

REVISED RECORDS (FISCAL YEARS).--WSP 555: 1920-21. WSP 1185: 1914-17(M), 1920-38(M), 1940-43(M), 1947(M). WSP 1719: 1912, 1921-25, 1927-32, 1936. WSP 2137: Drainage area.

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 3,420 ft (1,042 m) by barometer. Prior to May 26, 1910, nonrecording gage at site 300 ft (91 m) downstream at different datum.

REMARKS.--Records fair. No diversion above station.

AVERAGE DISCHARGE.--60 years (water years, 1912, 1914, 1920-77), 34.3 ft³/s (0.971 m³/s), 24,850 acre-ft/yr (30.6 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 11,300 ft³/s (320 m³/s) Jan. 13, 1967, gage height, 15.33 ft (4.673 m), from rating curve extended above 470 ft³/s (13.3 m³/s) on basis of slope-area measurements at gage heights 12.12 ft (3.694 m) and 13.43 ft (4.093 m); minimum, 1.14 ft³/s (0.032 m³/s) Sept. 21, 22, 1953.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,040 ft³/s (29.5 m³/s) May 12, gage height, 6.26 ft (1.908 m), from rating curve extended as explained above, no peak above base of 2,100 ft³/s (59.5 m³/s); minimum, 3.8 ft³/s (0.11 m³/s) Sept. 30.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.6	5.6	11	9.0	40	35	28	11	7.2	7.4	5.4	15
2	5.3	9.0	9.0	7.0	20	40	35	9.3	7.0	6.1	11	25
3	7.2	20	8.0	9.0	13	45	40	9.2	6.8	5.4	9.1	43
4	11	13	7.8	8.0	11	50	35	9.3	6.5	15	5.4	12
5	6.5	9.0	8.0	7.5	10	80	28	17	84	18	4.5	10
6	49	40	15	6.6	9.0	60	24	60	33	16	28	8.0
7	39	35	35	11	8.0	40	23	26	13	14	68	15
8	15	28	20	9.0	7.6	30	23	13	9.1	9.4	42	9.0
9	20	20	12	7.0	7.0	20	22	17	8.1	8.4	24	6.0
10	15	13	10	10	6.6	17	22	80	7.4	7.0	14	5.8
11	9.0	9.0	8.0	15	6.2	16	19	50	6.8	14	7.8	5.4
12	11	7.0	6.0	35	6.0	17	17	283	6.3	30	10	5.0
13	25	6.0	5.5	15	6.6	29	16	41	6.3	33	34	5.0
14	35	5.6	5.2	11	7.0	28	20	23	6.8	13	40	4.8
15	70	9.0	10	9.0	90	27	17	20	5.9	13	20	4.5
16	30	80	8.0	8.8	50	17	30	18	41	7.4	12	4.4
17	22	40	7.0	8.5	20	12	18	14	29	11	10	4.8
18	14	30	6.6	8.0	14	40	15	12	40	43	9.0	7.2
19	10	22	6.2	20	11	87	25	11	14	13	8.4	5.2
20	8.0	17	5.8	30	9.0	90	35	11	15	9.1	8.0	4.2
21	8.0	12	5.6	9.0	8.0	103	33	12	9.7	9.1	7.6	4.1
22	7.5	15	5.5	8.0	50	66	30	39	7.4	7.0	7.2	3.9
23	8.0	12	5.5	7.0	100	54	16	17	6.3	5.9	6.8	4.1
24	7.0	14	5.5	8.0	50	28	18	13	5.9	5.4	6.8	5.6
25	8.0	40	80	12	40	19	20	12	5.8	5.0	6.8	14
26	7.0	30	20	15	25	15	18	9.9	6.8	4.9	20	7.4
27	9.0	15	13	30	30	75	16	13	8.6	4.7	14	5.0
28	12	11	40	14	40	100	12	19	27	9.4	7.2	4.2
29	10	12	20	11	---	60	33	12	24	9.7	6.4	3.9
30	8.0	14	14	9.0	---	50	16	8.6	14	6.1	5.6	3.8
31	6.2	---	11	7.0	---	40	---	7.9	---	5.4	30	---
TOTAL	489.3	593.2	424.2	374.4	695.0	1390	704	898.7	468.7	365.8	489.0	255.3
MEAN	15.8	19.8	13.7	12.1	24.8	44.8	23.5	29.0	15.6	11.8	15.8	8.51
MAX	70	80	80	35	100	103	40	283	84	43	68	43
MIN	5.3	5.6	5.2	6.6	6.0	12	12	7.9	5.8	4.7	4.5	3.8
AC-FT	971	1180	841	743	1380	2760	1400	1780	930	726	970	506

CAL YR 1976 TOTAL 11846.2 MEAN 32.4 MAX 513 MIN 3.8 AC-FT 23500
WTR YR 1977 TOTAL 7147.6 MEAN 19.6 MAX 283 MIN 3.8 AC-FT 14180

NOTE.--No gage-height record Oct. 7 to Mar. 10.

16010000 KAWAIKOI STREAM NEAR WAIMEA--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1976-77.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	COLOR (PLATINUM-COBALT UNITS)	TURBIDITY (JTU)	HARDNESS (CA,MG) (MG/L)	NONCARBONATE HARDNESS (MG/L)	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG) (MG/L)	DISSOLVED SODIUM (NA) (MG/L)	PERCENT SODIUM
OCT										
07...	1315	19	130	4	5	2	.6	.8	2.8	55
AUG										
03...	1315	8.6	45	1	9	8	2.5	.7	3.2	43

DATE	SODIUM ADSORPTION RATIO	DISSOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	ALKALINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)	DISSOLVED FLUORIDE (F) (MG/L)
OCT									
07...	.6	.2	3	0	2	3.8	5.4	5.1	.0
AUG									
03...	.5	.1	1	0	1	8.0	3.2	5.9	.0

DATE	DISSOLVED SILICA (SIO2) (MG/L)	DISSOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	DISSOLVED SOLIDS (TONS PER AC-FT)	DISSOLVED SOLIDS (TONS PER DAY)	DISSOLVED NITRITE PLUS NITRATE (N) (MG/L)	DISSOLVED ORTHO. PHOSPHORUS (P) (MG/L)	DISSOLVED ORTHO PHOSPHATE (PO4) (MG/L)	DISSOLVED IRON (FE) (UG/L)	DISSOLVED MANGANESE (MN) (UG/L)
OCT									
07...	1.3	18	.02	.92	.01	.01	.03	450	0
AUG									
03...	2.8	19	.03	.44	--	--	--	220	0

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)
OCT					
07...	1315	19	24	6.1	17.0
DEC					
13...	1100	5.3	--	--	15.0
JAN					
31...	1150	6.2	32	6.1	15.5
MAR					
10...	1105	17	34	5.6	17.0
APR					
28...	1100	12	32	5.3	18.0
JUN					
15...	1345	5.8	28	5.9	22.0
SEP					
09...	1205	6.0	30	5.4	17.0

16014000 KOKEE DITCH NEAR WAIMEA

LOCATION.--Lat 22°06'42", long 159°40'43", Hydrologic Unit 20070000, on left bank, 0.3 mi (0.5 km) west of Highway 55, 1.9 mi (3.1 km) south of Kokee Lodge, and 10.5 mi (16.9 km) north of Waimea.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--September 1926 to current year.

GAGE.--Water-stage recorder and suppressed weir. Altitude of gage is 3,310 ft (1,009 m) by barometer. Prior to July 1, 1962, at datum 0.07 ft (0.021 m) higher.

REMARKS.--Records good. Ditch diverts at altitude 3,400 ft (1,040 m) from Mohihi Stream and all streams west which are tributary to Waimea River, for irrigation in vicinity of Kekaha. Records do not include waste water diverted at times at station.

AVERAGE DISCHARGE.--51 years, 24.2 ft^3/s (0.685 m^3/s), 17,530 acre-ft/yr (21.6 hm^3/yr).

EXTREME FOR PERIOD.--Maximum daily discharge, 105 ft^3/s (2.97 m^3/s) Dec. 2, 1929, Mar. 4, 1933; no flow at times.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	8.8	8.0	15	9.0	52	40	47	22	18	16	8.8	16
2	8.2	19	13	8.5	21	44	50	20	17	13	11	40
3	15	33	12	11	15	50	72	18	16	12	14	41
4	20	14	12	9.8	14	54	59	18	16	19	8.8	18
5	12	13	12	8.2	12	76	48	25	51	23	7.5	12
6	29	53	25	7.5	11	67	44	59	48	23	9.3	10
7	44	51	44	15	9.8	67	39	43	25	23	56	14
8	21	40	24	12	9.2	45	40	25	20	17	43	11
9	24	21	16	8.8	8.5	42	39	26	18	15	33	8.5
10	18	14	12	11	8.2	32	33	68	17	13	21	7.8
11	12	12	11	16	7.8	30	31	75	16	15	12	7.1
12	18	9.8	9.8	33	7.8	35	30	59	15	40	10	6.7
13	29	9.2	9.2	27	8.2	40	28	36	14	42	33	6.2
14	73	8.5	8.5	16	8.8	46	38	44	15	23	37	6.0
15	74	13	18	12	76	40	31	49	14	20	18	5.8
16	35	78	17	10	58	33	59	44	43	14	13	5.6
17	22	54	11	11	27	26	35	36	42	15	11	5.8
18	17	38	9.2	10	19	52	30	32	54	43	9.5	8.0
19	14	30	8.5	18	15	70	46	29	28	21	8.8	6.4
20	12	23	8.0	27	13	71	63	27	25	15	8.2	5.8
21	12	17	7.5	18	12	59	61	27	20	14	7.8	5.4
22	11	23	7.1	13	29	54	58	54	16	12	7.5	5.2
23	12	17	6.9	10	79	60	31	35	14	10	7.1	5.0
24	10	19	6.9	9.2	54	47	35	28	13	9.0	7.1	5.8
25	11	54	43	17	52	35	40	26	12	8.8	7.1	14
26	10	27	20	14	30	28	38	23	13	8.0	19	9.5
27	15	18	18	20	37	43	28	25	14	8.0	14	6.9
28	17	15	30	39	47	87	23	32	32	11	9.8	5.8
29	12	16	16	16	---	77	42	25	40	15	8.0	5.4
30	9.5	19	12	12	---	66	31	21	27	10	6.9	5.0
31	8.8	---	10	14	---	58	---	19	---	9.0	28	---
TOTAL	634.3	766.5	472.6	463.0	741.3	1574	1249	1070	713	536.8	495.2	309.7
MEAN	20.5	25.6	15.2	14.9	26.5	50.8	41.6	34.5	23.8	17.3	16.0	10.3
MAX	74	78	44	39	79	87	72	75	54	43	56	41
MIN	8.2	8.0	6.9	7.5	7.8	26	23	18	12	8.0	6.9	5.0
AC-FT	1260	1520	937	918	1470	3120	2480	2120	1410	1060	982	614

CAL YR 1976 TOTAL 10399.7 MEAN 28.4 MAX 97 MIN 6.0 AC-FT 20630
WTR YR 1977 TOTAL 9025.4 MEAN 24.7 MAX 87 MIN 5.0 AC-FT 17900

16014000 KOKEE DITCH NEAR WAIMEA--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1976-77.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	COLOR (PLATINUM-COBALT UNITS)	TURBIDITY (JTU)	HARDNESS (CA,MG) (MG/L)	NON-CARBONATE HARDNESS (MG/L)	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG) (MG/L)	DISSOLVED SODIUM (NA) (MG/L)	PERCENT SODIUM
OCT										
07...	1450	34	170	5	7	2	.9	1.2	3.3	47
AUG										
03...	1420	11	48	1	12	9	3.0	1.0	3.8	41

DATE	SODIUM ADSORPTION RATIO	DISSOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	ALKALINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)	DISSOLVED FLUORIDE (F) (MG/L)
OCT									
07...	.5	.6	6	0	5	4.8	5.2	6.3	.1
AUG									
03...	.5	.1	3	0	2	7.6	2.4	6.6	.0

DATE	DISSOLVED SILICA (SIO2) (MG/L)	DISSOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	DISSOLVED SOLIDS (TONS PER AC-FT)	DISSOLVED SOLIDS (TONS PER DAY)	DISSOLVED NITRITE PLUS NITRATE (N) (MG/L)	DISSOLVED ORTHO. PHOSPHORUS (P) (MG/L)	DISSOLVED ORTHO PHOSPHATE (PO4) (MG/L)	DISSOLVED IRON (FE) (UG/L)	DISSOLVED MANGANESE (MN) (UG/L)
OCT									
07...	2.1	23	.03	2.11	.06	.01	.03	400	0
AUG									
03...	3.9	22	.03	.67	--	--	--	190	0

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)
OCT					
07...	1450	34	29	6.3	15.5
DEC					
13...	1420	9.0	38	6.6	14.0
JAN					
31...	1435	14	40	5.7	15.5
MAR					
10...	1435	31	35	5.7	16.5
APR					
28...	1330	22	32	5.8	17.0
JUN					
15...	1440	14	35	6.0	19.0
AUG					
03...	1420	11	32	5.8	18.5
SEP					
09...	1425	8.6	40	5.6	17.0

16019000 WAIALAE STREAM AT ALTITUDE 3,820 FT (1,164 M), NEAR WAIMEA

LOCATION.--Lat 22°05'20", long 159°34'18", Hydrologic Unit 20070000, on left bank 5.0 mi (8.0 km) northeast of mouth, 6.4 mi (10.3 km) southeast of Kokee Lodge, and 11 mi (18 km) northeast of Waimea.

DRAINAGE AREA.--1.79 mi² (4.64 km²).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--January 1920 to July 1932, June 1952 to current year. Prior to July 1954, published as Waialae River at altitude 3,700 ft (1,128 m) near Waimea.

REVISED RECORDS (FISCAL YEARS).--WSP 1937: 1921, 1922-32(M), 1953(M), 1954. WSP 2137: Drainage area.

GAGE.--Water-stage recorder. Altitude of gage is 3,820 ft (1,164 m), from topographic map.

REMARKS.--Records fair. No diversion above station.

AVERAGE DISCHARGE.--36 years (water years, 1921-31, 1953-77), 22.4 ft³/s (0.634 m³/s), 16,230 acre-ft/yr (20.0 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,530 ft³/s (128 m³/s) Jan. 16, 1921, gage height, 8.44 ft (2.573 m), from rating curve extended above 1,100 ft³/s (31.2 m³/s) on basis of slope-area measurement at gage height 4.60 ft (1.402 m); minimum, 0.99 ft³/s (0.028 m³/s) May 17, 18, May 30 to June 2, 1966.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 957 ft³/s (27.1 m³/s) Feb. 28, gage height, 3.90 ft (1.189 m), no peak above base of 1,300 ft³/s (36.8 m³/s); minimum, 2.1 ft³/s (0.059 m³/s) Aug. 23, 24, Sept. 21-23.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.8	2.8	4.0	4.1	20	30	16	7.7	5.5	3.4	3.0	7.2
2	4.2	2.8	3.5	4.0	9.5	92	11	6.6	5.0	3.0	3.2	58
3	3.4	3.0	3.3	7.0	7.7	146	16	6.4	4.7	2.6	3.2	17
4	3.2	3.2	3.0	6.2	6.6	25	14	7.2	4.7	3.8	2.8	6.1
5	3.0	3.2	3.5	5.8	6.4	40	11	45	18	6.1	2.4	5.0
6	2.8	10	5.0	5.5	5.8	17	9.0	158	9.0	12	3.4	4.0
7	3.4	9.0	8.0	5.8	5.5	25	7.7	23	6.9	19	6.9	4.4
8	3.6	6.0	6.0	5.8	5.5	25	7.7	16	6.6	6.9	7.2	4.0
9	3.8	5.0	5.0	6.1	5.2	34	8.1	30	6.4	7.2	5.0	3.4
10	3.8	4.5	4.0	12	5.0	14	7.7	202	10	6.1	3.4	3.6
11	3.2	4.0	3.5	32	4.7	152	9.5	106	7.2	57	2.8	4.0
12	3.8	3.7	3.4	36	5.0	145	9.0	328	5.5	30	2.6	3.4
13	5.8	3.4	3.2	17	5.5	267	8.1	62	5.0	18	28	2.8
14	49	3.0	3.0	9.5	5.5	70	14	18	4.7	6.9	15	2.6
15	40	3.5	5.0	7.2	44	142	17	12	4.4	5.2	5.0	2.4
16	7.7	10	4.5	10	17	22	67	10	7.2	3.8	3.4	2.3
17	5.0	7.0	4.0	13	9.5	64	10	8.6	9.0	3.8	2.8	2.3
18	4.0	5.0	3.8	9.5	7.2	40	7.2	7.7	15	8.1	2.4	2.3
19	3.6	4.5	3.6	11	6.1	81	7.2	6.9	11	6.1	2.4	2.2
20	3.2	4.0	3.4	10	5.5	84	67	6.4	12	4.4	2.3	2.2
21	3.0	3.5	3.3	7.7	5.2	47	29	12	7.7	3.8	2.2	2.1
22	3.2	4.0	3.2	6.4	16	36	9.0	33	5.8	3.2	2.2	2.1
23	3.2	3.5	3.1	5.8	68	22	7.2	16	5.0	2.8	2.1	2.1
24	2.8	8.0	3.0	6.4	16	15	10	9.0	4.2	2.6	2.2	2.4
25	3.6	45	8.0	7.2	22	11	16	7.2	4.2	2.4	2.6	3.8
26	3.4	10	5.0	8.6	24	10	13	6.6	4.0	2.4	5.2	6.5
27	3.4	5.0	4.5	22	44	127	11	12	3.8	2.3	4.4	9.8
28	4.2	3.5	7.0	13	211	99	9.0	34	49	16	3.2	5.8
29	4.7	4.0	5.0	8.1	---	61	96	9.5	13	7.7	2.6	3.8
30	3.8	5.0	4.7	6.9	---	157	12	6.9	4.4	5.2	2.6	3.0
31	3.2	---	4.3	29	---	43	---	5.8	---	3.8	66	---
TOTAL	197.8	189.1	133.8	338.6	593.4	2143	536.4	1219.5	258.9	265.6	202.5	180.6
MEAN	6.38	6.30	4.32	10.9	21.2	69.1	17.9	39.3	8.63	8.57	6.53	6.02
MAX	49	45	8.0	36	211	267	96	328	49	57	66	58
MIN	2.8	2.8	3.0	4.0	4.7	10	7.2	5.8	3.8	2.3	2.1	2.1
AC-FT	392	375	265	672	1180	4250	1060	2420	514	527	402	358

CAL YR 1976 TOTAL 6956.9 MEAN 19.0 MAX 394 MIN 2.2 AC-FT 13800
WTR YR 1977 TOTAL 6259.2 MEAN 17.1 MAX 328 MIN 2.1 AC-FT 12420

NOTE.--No gage-height record Nov. 7 to Jan. 6.

16019000 WAIALAB STREAM AT ALTITUDE 3,820 FT (1,164 M), NEAR WAIMEA--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1972-1977.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTAN-TANEOUS DIS-CHARGE (CFS)	COLOR (PLAT-INUM-COBALT UNITS)	TUR-BID-ITY (JTU)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	DIS-SOLVED SODIUM (NA) (MG/L)	PERCENT SODIUM
OCT										
05...	0905	3.1	--	--	6	1	.6	1.2	3.4	53
JAN										
06...	1205	5.5	100	2	8	7	1.3	1.2	3.4	47
APR										
01...	0935	16	85	1	4	4	.6	.7	3.3	60
JUN										
16...	0930	7.5	56	2	16	13	2.2	2.5	3.0	29

DATE	SODIUM AD-SORP-TION RATIO	DIS-SOLVED PO-TAS-SIUM (K) (MG/L)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DIS-SOLVED SULFATE (SO4) (MG/L)	DIS-SOLVED CHLO-RIDE (CL) (MG/L)	DIS-SOLVED FLUO-RIDE (F) (MG/L)
OCT									
05...	.6	.2	7	0	6	4.5	3.5	6.1	.0
JAN									
06...	.5	.2	1	0	1	.6	7.0	6.9	.0
APR									
01...	.7	.3	0	0	0	.0	3.9	6.0	.0
JUN									
16...	.3	.2	3	0	2	6.0	4.9	6.1	.0

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTI-TUENTS) (MG/L)	DIS-SOLVED SOLIDS (TONS PER AC-FT)	DIS-SOLVED SOLIDS (TONS PER DAY)	DIS-SOLVED NITRITE PLUS NITRATE (N) (MG/L)	DIS-SOLVED ORTHO. PHOS-PHORUS (P) (MG/L)	DIS-SOLVED ORTHO PHOS-PHATE (PO4) (MG/L)	DIS-SOLVED IRON (FE) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)
OCT									
05...	5.0	24	.03	.20	.02	.01	.03	340	10
JAN									
06...	4.9	26	.04	.39	.02	.00	.00	320	10
APR									
01...	3.8	18	.03	.82	.06	.01	.03	260	10
JUN									
16...	4.7	25	.03	.51	--	--	--	330	0

DATE	TIME	INSTAN-TANEOUS DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)	DATE	TIME	INSTAN-TANEOUS DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)
OCT						APR					
05...	0905	3.1	32	6.4	16.0	01...	0935	16	28	5.5	14.0
JAN						JUN					
06...	1205	5.5	34	6.4	15.5	16...	0930	7.5	32	5.9	15.5

16031000 WAIMEA RIVER NEAR WAIMEA
(National stream-quality accounting network station)

LOCATION.--Lat 21°59'02", long 159°39'47", Hydrologic Unit 20070000, on right bank 1.3 mi (2.1 km) upstream from Makaweli River and 1.9 mi (3.1 km) north of Waimea Post Office.

DRAINAGE AREA.--57.8 mi² (149.7 km²).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--July 1910 to June 1918, July to October 1919, November 1943 to September 1968, October 1969 to September 1972 (discontinued as a continuous-record station, converted to a crest-stage partial-record station October 1972 to April 1975), May 1975 to current year.

GAGE.--Water-stage recorder. Datum of gage is 20.0 ft (6.10 m) above mean sea level (Department of Water, County of Kauai bench mark). Prior to Oct. 5, 1911, nonrecording gage at site 1.0 mi (1.6 km) downstream at different datum. Oct. 5, 1911, to Oct. 31, 1919, nonrecording gage at present site at different datum. Oct. 1, 1972, to Apr. 30, 1975, at site 60 ft (18.3 m) streamward at same datum.

REMARKS.--Records good. Several upstream diversions for power and irrigation.

AVERAGE DISCHARGE.--36 years (water years 1911-17, 1945-68, 1970-72, 1977), 132 ft³/s (3.738 m³/s), 95,630 acre-ft/yr (118 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 37,100 ft³/s (1,050 m³/s) Feb. 7, 1949, gage height, 19.3 ft (5.88 m), from rating curve extended above 5,200 ft³/s (147 m³/s) on basis of slope-area measurements at gage heights 10.28 ft (3.133 m) and 18.7 ft (5.70 m); practically no flow occasionally owing to upstream diversions.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Apr. 19, 1974, which destroyed the station reached a stage of 19.05 ft (5.806 m), from floodmarks, discharge, 29,100 ft³/s (824 m³/s), from rating curve extended above 2,000 ft³/s (56.6 m³/s) on basis of slope-area measurement at gage height 19.05 ft (5.806 m).

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 4,740 ft³/s (134 m³/s) May 12, gage height, 8.69 ft (2.649 m), from rating curve extended as explained above, no peak above base of 8,700 ft³/s (246 m³/s); minimum, 1.6 ft³/s (0.046 m³/s) Sept. 6.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.9	4.0	4.5	6.1	91	151	156	11	9.0	5.4	4.8	16
2	3.9	4.2	4.0	6.1	27	178	104	7.4	8.0	4.5	4.7	2.6
3	66	4.2	4.2	43	11	284	88	6.4	7.6	4.2	4.9	129
4	8.2	4.7	4.5	9.0	8.5	173	94	6.0	7.4	4.0	5.3	5.2
5	4.5	4.2	4.2	6.1	7.5	211	71	29	7.0	5.1	5.7	1.9
6	4.5	20	4.2	6.1	7.0	103	98	317	13	7.8	6.3	1.8
7	11	24	48	6.1	6.5	126	69	117	8.2	30	27	2.6
8	5.7	17	18	5.9	6.3	63	12	25	6.7	13	12	2.1
9	4.4	17	12	6.1	6.1	103	12	18	6.9	6.6	12	2.2
10	4.5	5.2	5.1	7.5	6.5	42	11	503	7.7	6.4	8.0	2.3
11	4.2	4.0	4.0	12	5.9	182	9.9	814	8.2	45	6.6	2.2
12	4.0	4.0	3.8	81	6.1	338	14	2190	6.9	70	6.1	2.2
13	4.5	3.9	3.6	61	6.8	518	11	819	6.0	35	196	2.3
14	178	4.5	3.8	18	6.8	324	12	350	5.8	23	179	2.5
15	323	4.7	3.6	10	310	360	20	286	5.4	5.7	11	2.2
16	41	203	3.9	9.0	104	111	159	174	5.6	5.2	2.9	2.0
17	7.7	37	4.0	10	19	85	40	133	8.2	4.9	2.8	2.4
18	4.7	12	3.9	9.9	5.7	125	14	113	11	4.9	3.2	2.6
19	3.6	6.2	3.8	8.5	4.2	273	11	101	16	11	2.9	3.0
20	3.4	4.8	4.9	12	4.0	355	106	79	9.6	7.0	2.8	3.5
21	3.6	4.3	4.5	11	3.9	200	159	14	8.2	6.0	2.6	3.1
22	3.4	4.2	4.5	7.7	3.9	170	27	73	5.8	5.6	2.8	3.0
23	3.8	4.0	5.5	6.5	524	110	7.8	60	4.9	5.0	5.3	2.8
24	4.0	5.6	5.7	8.0	123	59	9.9	34	4.9	5.0	2.7	2.3
25	3.6	267	5.3	7.7	32	26	25	19	4.9	5.1	2.3	2.2
26	3.8	24	5.9	8.5	18	16	27	15	5.1	4.3	2.1	2.5
27	4.0	5.3	11	14	71	335	17	13	5.8	4.6	2.3	2.7
28	4.4	4.2	44	53	461	873	11	35	5.4	5.7	2.4	3.1
29	5.5	3.9	8.2	17	---	377	171	40	138	15	2.2	2.7
30	5.3	3.9	9.9	9.9	---	969	55	15	13	8.7	2.2	2.8
31	4.4	---	7.5	9.0	---	572	---	11	---	5.5	74	---
TOTAL	736.5	715.0	260.0	485.7	1886.7	7812	1621.6	6427.8	360.2	369.2	604.9	217.8
MEAN	23.8	23.8	8.39	15.7	67.4	252	54.1	207	12.0	11.9	19.5	7.26
MAX	323	267	48	81	524	969	171	2190	138	70	196	129
MIN	3.4	3.9	3.6	5.9	3.9	16	7.8	6.0	4.9	4.0	2.1	1.8
AC-FT	1460	1420	516	963	3740	15500	3220	12750	714	732	1200	432

CAL YR 1976 TOTAL 30213.4 MEAN 82.6 MAX 3720 MIN 2.7 AC-FT 59930
WTR YR 1977 TOTAL 21497.4 MEAN 58.9 MAX 2190 MIN 1.8 AC-FT 42640

16031000 WAIMEA RIVER NEAR WAIMEA--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1971-1974, November 1974 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	COLOR (PLATINUM-COBALT UNITS)	TURBIDITY (JTU)	FECAL COLIFORM .7UM-MF (COL./100 ML)	STREPTOCOCCI (COLONIES PER 100 ML)	FECAL STREPTOCOCCI KF AGAR (COL. PER 100 ML)	HARDNESS (CA,MG) (MG/L)	NONCARBONATE HARDNESS (MG/L)
OCT												
18...	1130	4.6	120	7.3	24.5	--	4	140	1000	--	51	0
NOV												
08...	1045	24	135	7.1	22.0	--	6	1000	3200	--	50	0
DEC												
06...	1045	4.6	190	7.3	21.0	--	2	--	--	--	77	9
06...	1110	--	--	--	--	--	--	77	470	--	--	--
JAN												
03...	1230	40	115	7.5	21.5	--	4	860	--	5500	44	6
FEB												
07...	1300	--	--	--	--	--	--	84	--	350	--	--
07...	1310	6.3	195	8.1	22.5	--	2	--	--	--	76	1
MAR												
07...	1100	--	--	--	--	--	--	130	--	1400	--	--
07...	1115	45	80	7.2	22.0	--	6	--	--	--	28	2
APR												
04...	1115	82	75	7.2	20.0	--	5	240	--	2400	28	7
MAY												
02...	1300	--	--	--	--	--	--	270	--	570	--	--
02...	1315	7.3	110	8.0	23.5	--	5	--	--	--	45	0
JUN												
06...	1200	23	100	7.2	26.0	45	7	380	--	1200	39	6
JUL												
05...	1200	5.3	165	7.8	25.5	--	4	320	--	790	65	1
AUG												
01...	1310	3.5	170	8.2	27.0	--	4	--	--	--	62	0
01...	1330	--	--	--	--	--	--	170	--	350	--	--
SEP												
06...	1130	2.3	180	8.0	22.0	--	4	170	--	230	55	0

DATE	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG) (MG/L)	DISSOLVED SODIUM (NA) (MG/L)	PERCENT SODIUM	SODIUM ADSORPTION RATIO	DISSOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	ALKALINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
OCT												
18...	6.5	8.4	7.5	24	.5	.6	65	0	53	5.2	4.2	9.8
NOV												
08...	6.5	8.3	7.9	25	.5	.7	66	0	54	8.4	1.0	10
DEC												
06...	9.5	13	9.7	21	.5	.8	83	0	68	6.7	3.5	15
06...	--	--	--	--	--	--	--	--	--	--	--	--
JAN												
03...	5.7	7.3	6.8	25	.4	.7	47	0	39	2.4	6.9	9.9
FEB												
07...	--	--	--	--	--	--	--	--	--	--	--	--
07...	9.0	13	10	22	.5	.8	92	0	75	1.2	2.1	14
MAR												
07...	--	--	--	--	--	--	--	--	--	--	--	--
07...	3.5	4.6	5.3	29	.4	.4	31	0	25	3.1	5.3	8.8
APR												
04...	3.9	4.4	5.5	30	.5	.5	26	0	21	--	11	8.1
MAY												
02...	--	--	--	--	--	--	--	--	--	--	--	--
02...	5.7	7.5	7.2	26	.5	.5	55	0	45	.9	5.1	9.8
JUN												
06...	6.1	5.8	6.4	26	.4	.6	40	0	33	4.0	1.6	8.6
JUL												
05...	7.7	11	9.5	24	.5	.7	78	0	64	2.0	5.1	13
AUG												
01...	8.4	10	9.0	24	.5	.7	76	0	62	.8	1.8	13
01...	--	--	--	--	--	--	--	--	--	--	--	--
SEP												
06...	7.2	9.1	7.9	23	.5	.7	68	0	56	1.1	4.5	12

HAWAII, ISLAND OF KAUAI

16031000 WAIMEA RIVER NEAR WAIMEA--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	DIS-SOLVED FLUO-RIDE (F) (MG/L)	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED SOLIDS (RESI-DUE AT 180 C) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTI-TUENTS) (MG/L)	DIS-SOLVED SOLIDS (TONS PER AC-FT)	DIS-SOLVED SOLIDS (TONS PER DAY)	TOTAL NITRITE PLUS NITRATE (N) (MG/L)	TOTAL KJEL-DAHL NITRO-GEN (N) (MG/L)	TOTAL NITRO-GEN (N) (MG/L)	TOTAL NITRO-GEN (NO3) (MG/L)	TOTAL PHOS-PHORUS (P) (MG/L)
OCT											
18...	.1	21	85	90	.12	1.06	.01	.32	.33	1.5	.01
NOV											
09...	.1	22	92	89	.13	5.96	.08	.18	.26	1.2	.02
DEC											
06...	.1	25	112	118	.15	1.39	.02	.00	.02	.09	.00
06...	--	--	--	--	--	--	--	--	--	--	--
JAN											
03...	.1	21	85	82	.12	9.18	.10	2.3	2.4	11	.03
FEB											
07...	--	--	--	--	--	--	--	--	--	--	--
07...	.0	27	112	121	.15	1.91	.02	.11	.13	.58	.02
MAR											
07...	--	--	--	--	--	--	--	--	--	--	--
07...	.0	15	66	58	.09	8.02	.08	.14	.22	.97	.00
APR											
04...	.1	14	60	61	.08	13.3	.07	.18	.25	1.1	.00
MAY											
02...	--	--	--	--	--	--	--	--	--	--	--
02...	.1	19	84	82	.11	1.66	.08	.00	.08	.35	.01
JUN											
06...	.0	17	75	66	.10	4.80	.02	.02	.04	.18	.01
JUL											
05...	.1	22	106	108	.14	1.52	.02	.00	.02	.09	.02
AUG											
01...	.1	25	102	105	.14	.96	.00	.14	.14	.62	.02
01...	--	--	--	--	--	--	--	--	--	--	--
SEP											
06...	.1	21	92	96	.13	.58	.01	.13	.14	.62	.00

DATE	TIME	TOTAL ARSENIC (AS) (UG/L)	SUS-PENDED ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)	SUS-PENDED CAD-MIUM (CD) (UG/L)	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	SUS-PENDED CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	SUS-PENDED COBALT (CO) (UG/L)
OCT												
18...	1130	0	0	0	<10	<7	3	0	0	0	<50	<49
JAN												
03...	1230	0	0	0	<10	<7	3	0	0	0	<50	<50
APR												
04...	1115	0	0	0	<10	<7	3	0	0	0	<50	<50
JUL												
05...	1200	0	0	0	<10	<9	1	0	0	0	<50	<50

DATE	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	SUS-PENDED COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)	TOTAL LEAD (PB) (UG/L)	SUS-PENDED LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	SUS-PENDED MAN-GANESE (MN) (UG/L)
OCT											
18...	1	<10	<8	2	390	100	<100	<64	36	30	10
JAN											
03...	0	<10	<8	2	460	140	<100	<77	23	20	20
APR											
04...	0	--	<8	2	650	140	<100	<70	30	20	10
JUL											
05...	0	<10	<8	2	380	140	<100	<92	8	20	0

< Actual value is known to be less than the value shown

16031000 WAIMEA RIVER NEAR WAIMEA--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	SUS-PENDED MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	SUS-PENDED SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL ZINC (ZN) (UG/L)	SUS-PENDED ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)
OCT											
19...	20	.0	.0	.0	0	0	0	10	0	10	3.8
JAN											
03...	0	.0	.0	.0	0	0	0	10	0	10	3.9
APR											
04...	10	.4	.4	.0	0	0	0	10	0	10	2.8
JUL											
05...	20	.0	.0	.0	0	0	0	0	0	0	1.8

DATE	TIME	TOTAL PHYTO-PLANK-TON (CELLS PER ML)	CHLOR-A PERI-PHYTON CHROMO-SPECT-METRIC (MG/M2)	CHLOR-A PERI-PHYTON CHROMO-GRAPHIC FLUOROM (MG/M2)	CHLOR-B PERI-PHYTON CHROMO-SPECT-METRIC (MG/M2)	CHLOR-B PERI-PHYTON CHROMO-GRAPHIC FLUOROM (MG/M2)	BIOMASS CHLORO-PHYLL RATIO PERI-PHYTON (UNITS)	LENGTH OF EXPO-SURE (DAYS)
OCT								
18...	1130	1600	--	--	--	--	--	--
NOV								
08...	1045	540	--	--	--	--	--	--
DEC								
06...	1045	200	--	--	--	--	--	--
JAN								
03...	1230	1600	1.30	--	.528	--	828	28
APR								
04...	1115	420	--	--	--	--	--	--
MAY								
02...	1300	--	--	--	--	--	--	--
02...	1315	440	--	--	--	--	--	--
JUN								
06...	1200	600	--	--	--	--	--	--
JUL								
05...	1200	840	--	.408	--	.569	2255	29
AUG								
01...	1310	390	--	--	--	--	--	--
SEP								
06...	1130	560	--	--	--	--	--	--

DATE	TIME	INSTAN-TANEOUS DIS-CHARGE (CFS)	SUS-PENDED SEDI-MENT (MG/L)	SUS-PENDED SEDI-MENT DIS-CHARGE (T/DAY)	SUS. SED. SIEVE DIAM. % FINER THAN .062 MM
OCT					
19...	1130	4.6	4	.05	100
NOV					
08...	1045	24	10	.65	100
DEC					
06...	1045	4.6	--	--	--
06...	1110	--	3	--	100
JAN					
03...	1230	40	6	.65	100
FEB					
07...	1300	--	3	--	100
07...	1310	6.3	--	--	--
MAR					
07...	1100	--	5	--	100
07...	1115	45	--	--	--
APR					
04...	1115	82	9	2.0	100
MAY					
02...	1300	--	4	--	100
02...	1315	7.3	--	--	--
JUN					
06...	1200	23	9	.58	100
JUL					
05...	1200	5.3	4	.06	100
AUG					
01...	1310	3.5	--	--	--
01...	1330	--	3	--	100
SEP					
06...	1130	2.3	12	.08	100

16031000 WAIMEA RIVER NEAR WAIMEA--Continued

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER OCTOBER 1976 TO SEPTEMBER 1977

PHYTOPLANKTON

DATE	OCT 18,76		NOV 8,76		DEC 6,76		JAN 3,77		APR 4,77	
TIME	1130		1045		1045		1230		1115	
TOTAL CELLS/ML	1600		540		200		1600		420	
DIVERSITY: DIVISION	0.7		1.1		1.0		0.0		0.5	
.CLASS	0.7		1.1		1.0		0.0		0.5	
..ORDER	0.7		1.4		1.4		0.1		0.5	
...FAMILY	1.3		2.6		1.6		2.7		2.6	
....GENUS	1.3		2.7		1.6		2.8		3.0	
ORGANISM	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT
CHLOROPHYTA (GREEN ALGAE)										
.CHLOROPHYCEAE										
..CHLOROCOCCALES										
...HYDRODICTYACEAE										
....PEDIASTRUM	--	-	--	-	--	-	--	-	--	-
...OOCYSTACEAE										
....ANKISTRODESMUS	--	-	--	-	--	-	--	-	--	-
....SELENASTRUM	--	-	--	-	7	3	--	-	--	-
...SCENEDESMACEAE										
....SCENEDESMUS	--	-	--	-	--	-	--	-	--	-
..ZYGNEMATALES										
...DESMIDIACEAE										
....COSMARIUM	--	-	--	-	--	-	--	-	4	1
CHRYSOPHYTA										
.BACILLARIOPHYCEAE										
..CENTRALES										
...COSCINODISCACEAE										
....CYCLOTELLA	--	-	5	1	9	4	--	-	--	-
....MELOSIRA	--	-	23	4	--	-	11	1	--	-
..PENNALES										
...ACHNANTHACEAE										
....ACHNANTHES	--	-	--	-	--	-	300#	19	37	9
....COCCONEIS	--	-	5	1	--	-	23	1	7	2
....RHOICOSPHENIA	--	-	14	3	--	-	140	9	75#	18
...CYMBELLACEAE										
....AMPHORA	--	-	5	1	--	-	--	-	--	-
....CYMBELLA	--	-	51	9	--	-	45	3	15	4
....EPITHEMIA	--	-	--	-	2	1	--	-	--	-
...DIATOMACEAE										
....DIATOMA	--	-	--	-	--	-	11	1	--	-
...EUNOTIACEAE										
....EUNOTIA	--	-	--	-	--	-	--	-	4	1
...FRAGILARIACEAE										
....FRAGILARIA	--	-	19	3	--	-	23	1	22	5
....SYNEDRA	46	3	14	3	--	-	69	4	19	4
...GOMPHONEMATACEAE										
....GOMPHONEMA	46	3	33	6	5	2	150	9	22	5
...NAVICULACEAE										
....NAVICULA	230	15	70	13	32#	16	390#	25	139#	30
....PINNULARIA	--	-	--	-	--	-	11	1	--	-
...NITZSCHIACEAE										
....NITZSCHIA	--	-	51	9	2	1	400#	26	49	12
...SURIRELLACEAE										
....SURIRELLA	--	-	--	-	--	-	--	-	--	-
CYANOPHYTA (BLUE-GREEN ALGAE)										
.CYANOPHYCEAE										
..CHROCOCCALES										
...CHROCOCCACEAE										
....ANACYSTIS	--	-	--	-	9	4	--	-	--	-
..HORMOGONALES										
...OSCILLATORIACEAE										
....ARTHROSPIRA	--	-	--	-	--	-	--	-	--	-
....OSCILLATORIA	1100#	74	240#	44	140#	67	--	-	37	9
...RIVULARIACEAE										
....RAPHIDIOPSIS	92	6	--	-	--	-	--	-	--	-
EUGLENOPHYTA (EUGLENOIDS)										
.EUGLENOPHYCEAE										
..EUGLENALES										
...EUGLENACEAE										
....TRACHELOMONAS	--	-	--	-	--	-	--	-	--	-
PYRRHOPHYTA (FIRE ALGAE)										
.DINOPHYCEAE										
..PERIDINIALES										
...PERIDINIACEAE										
....PERIDINIUM	--	-	14	3	--	-	--	-	--	-

NOTE: # - DOMINANT ORGANISM; EQUAL TO OR GREATER THAN 15%
* - OBSERVED ORGANISM, MAY NOT HAVE BEEN COUNTED; LESS THAN 1/2%

16031000 WAIMEA RIVER NEAR WAIMEA--Continued

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER OCTOBER 1976 TO SEPTEMBER 1977

PHYTOPLANKTON

DATE	MAY 2,77		JUN 6,77		JUL 5,77		AUG 1,77		SEP 6,77	
TIME	1315		1200		1200		1310		1130	
TOTAL CELLS/ML	440		600		440		390		560	
DIVERSITY: DIVISION	0.9		1.0		1.2		0.6		1.2	
.CLASS	0.9		1.0		1.2		0.6		1.2	
..ORDER	1.0		1.3		1.4		1.3		1.5	
...FAMILY	2.4		2.5		2.8		2.6		2.3	
....GENUS	2.5		2.6		3.0		2.6		2.4	
ORGANISM	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT
CHLOROPHYTA (GREEN ALGAE)										
.CHLOROPHYCEAE										
..CHLOROCOCCALES										
...HYDRODICTYACEAE										
....PEDIASTRUM	--	-	--	-	13	3	--	-	--	-
...OOCYSTACEAE										
....ANKISTRODESMUS	--	-	4	1	--	-	16	4	7	1
....SELENASTRUM	--	-	--	-	--	-	--	-	7	1
...SCENEDESMACEAE										
....SCENEDESMUS	--	-	--	-	13	3	22	5	--	-
..ZYGNEMATALES										
...DESMIDIACEAE										
....COSMARIUM	--	-	--	-	--	-	--	-	--	-
CHRYSOPHYTA										
.BACILLARIOPHYCEAE										
..CENTRALES										
...COSCINODISCACEAE										
....CYCLOTELLA	3	1	29	5	32	7	86#	22	34	6
....MELOSIRA	--	-	--	-	92#	21	--	-	--	-
..PENNALES										
...ACHNANTHACEAE										
....ACHNANTHES	29	7	11	2	--	-	--	-	--	-
....COCCONEIS	--	-	--	-	--	-	--	-	--	-
....RHOICOSPHENIA	19	4	14	2	--	-	--	-	--	-
...CYMBELLACEAE										
....AMPHORA	--	-	--	-	--	-	--	-	--	-
....CYMBELLA	23	5	21	4	32	7	49	12	48	9
....EPITHEMIA	--	-	--	-	--	-	--	-	--	-
...DIATOMACEAE										
....DIATOMA	--	-	--	-	13	3	--	-	--	-
...EUNOTIACEAE										
....EUNOTIA	--	-	--	-	--	-	--	-	--	-
...FRAGILARIACEAE										
....FRAGILARIA	--	-	18	3	--	-	--	-	--	-
....SYNEDRA	13	3	21	4	32	7	16	4	21	4
...GOMPHONEMATACEAE										
....GOMPHONEMA	81#	18	64	11	25	6	49	12	49	9
...NAVICULACEAE										
....NAVICULA	94#	21	79	13	25	6	16	4	27	5
....PINNULARIA	--	-	--	-	--	-	--	-	--	-
...NITZSCHIACEAE										
....NITZSCHIA	16	4	68	11	38	9	130#	34	75	13
...SURIRELLACEAE										
....SURIRELLA	--	-	4	1	--	-	--	-	--	-
CYANOPHYTA (BLUE-GREEN ALGAE)										
.CYANOPHYCEAE										
..CHROCOCCALES										
...CHROCOCCACEAE										
....ANACYSTIS	--	-	--	-	--	-	--	-	--	-
..HORMOGONALES										
...OSCILLATORIACEAE										
....ARTHROSPIRA	--	-	--	-	130#	29	--	-	--	-
....OSCILLATORIA	160#	37	270#	45	--	-	--	-	290#	51
...RIVULARIACEAE										
....RAPHIDIOPSIS	--	-	--	-	--	-	--	-	--	-
EUGLENOPHYTA (EUGLENOIDS)										
.EUGLENOPHYCEAE										
..EUGLENALES										
...EUGLENACEAE										
....TRACHELOMONAS	--	-	--	-	--	-	5	1	7	1
PYRRHOPHYTA (FIRE ALGAE)										
.DINOPHYCEAE										
..PERIDINIALES										
...PERIDINIACEAE										
....PERIDINIUM	--	-	--	-	--	-	--	-	--	-

NOTE: # - DOMINANT ORGANISM; EQUAL TO OR GREATER THAN 15%
* - OBSERVED ORGANISM, MAY NOT HAVE BEEN COUNTED; LESS THAN 1/2%

16036000 MAKAWELI RIVER NEAR WAIMEA

LOCATION.--Lat 21°58'31", long 159°38'55", Hydrologic Unit 20070000, on left bank 0.7 mi (1.1 km) upstream from mouth and 1.9 mi (3.1 km) northeast of Waimea.

DRAINAGE AREA.--26.0 mi^2 (67.3 km^2).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--July 1943 to current year. Records for October 1911 to June 1917 at site 0.2 mi (0.3 km) downstream not equivalent owing to intervening diversion.

REVISED RECORDS.--WSP 2137: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 18.2 ft (5.55 m) above mean sea level (by stadia survey). Prior to June 16, 1959, at datum 1.00 ft (0.305 m) higher.

REMARKS.--Records good. Olokele ditch diverts all low flow from Olokele River 9 mi (14.5 km) above station for irrigation in vicinity of Makaweli.

AVERAGE DISCHARGE.--34 years, 89.2 ft^3/s (2.526 m^3/s), 64,630 acre-ft/yr (79.7 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 26,000 ft^3/s (736 m^3/s) Jan. 31, 1975, gage height, 15.51 ft (4.727 m), from rating curve extended above 3,200 ft^3/s (90.6 m^3/s) on basis of slope-area measurement at gage height 10.65 ft (3.246 m); minimum, 3.15 ft^3/s (0.089 m^3/s) July 19, 1951.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 4,660 ft^3/s (132 m^3/s) May 12, gage height, 7.06 ft (2.152 m), from rating curve extended as explained above, no peak above base of 4,700 ft^3/s (135 m^3/s); minimum, 9.7 ft^3/s (0.27 m^3/s) Sept. 22.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	12	12	13	13	69	111	95	28	28	24	14	48
2	11	12	12	65	30	232	60	23	26	19	13	107
3	16	12	12	49	32	558	49	20	23	16	12	34
4	17	12	11	20	23	148	43	19	23	32	11	18
5	36	12	11	15	19	59	35	126	45	32	11	13
6	13	15	58	16	17	40	29	503	30	30	25	12
7	12	14	49	16	15	48	27	113	24	60	31	16
8	12	43	57	15	14	77	26	62	23	29	28	12
9	12	17	19	15	14	84	25	256	34	31	22	11
10	12	13	14	18	13	33	23	772	53	21	15	45
11	12	12	14	35	12	278	29	809	31	191	12	17
12	12	12	13	97	13	425	27	1860	24	122	12	12
13	13	12	12	57	15	569	29	502	23	103	88	11
14	77	12	12	28	14	514	39	180	20	31	40	11
15	105	12	12	21	39	524	34	133	18	23	17	12
16	23	13	12	19	27	107	158	86	23	19	13	11
17	16	15	12	34	17	140	33	73	21	22	12	11
18	14	14	12	23	14	117	25	69	50	49	11	11
19	13	13	12	22	12	232	23	58	29	25	11	11
20	12	12	14	23	12	303	219	50	31	19	12	11
21	12	12	13	19	12	122	99	56	25	17	12	11
22	16	12	12	17	11	88	28	105	19	16	11	10
23	19	12	12	16	74	60	23	62	18	16	11	11
24	12	51	12	23	29	50	30	44	17	16	16	11
25	14	124	12	29	22	39	35	35	17	14	14	11
26	14	22	13	27	49	35	30	34	18	14	24	11
27	13	15	29	69	195	222	39	86	22	14	18	16
28	16	13	19	55	425	416	39	95	315	84	14	18
29	14	12	23	28	---	171	371	42	84	34	13	15
30	13	14	18	22	---	331	49	34	32	17	12	13
31	12	---	14	23	---	257	---	31	---	14	125	---
TOTAL	605	576	558	929	1238	6390	1771	6366	1146	1154	680	561
MEAN	19.5	19.2	18.0	30.0	44.2	206	59.0	205	38.2	37.2	21.9	18.7
MAX	105	124	58	97	425	569	371	1860	315	191	125	107
MIN	11	12	11	13	11	33	23	19	17	14	11	10
AC-FT	1200	1140	1110	1840	2460	12670	3510	12630	2270	2290	1350	1110

CAL YR 1976 TOTAL 23160.9 MEAN 63.3 MAX 1590 MIN 8.0 AC-FT 45940
WTR YR 1977 TOTAL 21974.0 MEAN 60.2 MAX 1860 MIN 10 AC-FT 43590

16036000 MAKAWELI RIVER NEAR WAIMEA--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1976-77.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTAN-TANEOUS DIS-CHARGE (CFS)	COLOR (PLAT-INUM-COBALT UNITS)	TUR-BID-ITY (JTU)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	DIS-SOLVED SODIUM (NA) (MG/L)	PERCENT SODIUM
OCT										
08...	1345	13	7	4	58	0	7.5	9.5	9.5	26
MAR										
15...	1325	800	25	10	11	3	1.6	1.7	4.0	43

DATE	SODIUM AD-SORP-TION RATIO	DIS-SOLVED PO-TAS-SIUM (K) (MG/L)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DIS-SOLVED SULFATE (SO4) (MG/L)	DIS-SOLVED CHLO-RIDE (CL) (MG/L)	DIS-SOLVED FLUO-RIDE (F) (MG/L)
OCT									
08...	.5	.9	71	0	58	29	3.1	16	.1
MAR									
15...	.5	.4	10	0	8	4.0	2.8	7.9	.1

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTI-TUENTS) (MG/L)	DIS-SOLVED SOLIDS (TONS PER AC-FT)	DIS-SOLVED SOLIDS (TONS PER DAY)	DIS-SOLVED NITRITE PLUS NITRATE (N) (MG/L)	DIS-SOLVED ORTHO. PHOS-PHORUS (P) (MG/L)	DIS-SOLVED ORTHO PHOS-PHATE (PO4) (MG/L)	DIS-SOLVED IRON (FE) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)
OCT									
08...	24	106	.14	3.72	.09	.02	.06	210	20
MAR									
15...	6.2	31	.04	67.0	.04	.25	.77	70	0

DATE	TIME	INSTAN-TANEOUS DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)
OCT					
08...	1345	13	150	6.6	22.0
DEC					
10...	1915	14	130	5.7	21.0
JAN					
28...	1330	46	93	7.3	20.0
MAR					
09...	1500	74	85	6.8	21.0
15...	1325	800	46	6.6	20.0
APR					
27...	1040	69	120	7.4	22.0
JUN					
14...	1500	17	140	7.6	27.0
AUG					
02...	1340	14	145	7.9	26.5
SEP					
07...	1435	16	130	7.4	21.0

16049000 HANAPEPE RIVER BELOW MANUAHI STREAM, NEAR ELEELE

LOCATION.--Lat 21°57'29", long 159°33'13", Hydrologic Unit 20070000, on left bank 200 ft (61 m) downstream from Manuahi Stream and 4.0 mi (6.4 km) northeast of Eleele.

DRAINAGE AREA.--18.5 mi² (47.9 km²).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--July 1917 to January 1921, December 1926 to current year. Prior to July 1952, published as "at Koula, near Eleele." Records for August 1910 to December 1916 at site 0.5 mi (0.8 km) upstream not equivalent owing to intervening inflow.

REVISED RECORDS (FISCAL YEARS).--WSP 740: 1931. WSP 1719: 1929-31(M). WSP 1937: 1918, 1919(M), 1920, 1921(M), 1927-28(M), 1930, 1936-37(M), 1941(P), 1943-46(P), 1947(M), 1948-52(P), 1955(M), 1956-57(P), 1958(M), 1960(M). WSP 2137: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 222 ft (67.67 m) above mean sea level (by stadia survey). July 1, 1917, to Jan. 22, 1921, nonrecording gage and Dec. 16, 1926, to June 30, 1951, water-stage recorder, at same site at datum 1.00 ft (0.305 m) higher.

REMARKS.--Records good. Hanapepe ditch diverts 3.0 mi (4.8 km) above station for irrigation in vicinity of Makaweli.

AVERAGE DISCHARGE.--53 years (water years, 1918-20, 1928-77), 87.0 ft³/s (2.464 m³/s), 63,030 acre-ft/yr (77.7 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 39,000 ft³/s (1,100 m³/s) Apr. 15, 1963, gage height, 14.87 ft (4.532 m), from rating curve extended above 7,600 ft³/s (215 m³/s) on basis of slope-area measurement of peak flow; minimum, 5.1 ft³/s (0.14 m³/s) May 21, 1954.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 3,600 ft³/s (102 m³/s) and maximum (*):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
May 10	1500	4600	130	6.67	2.033
June 28	1700	*4890	138	6.86	2.091

Minimum discharge, 13 ft³/s (0.37 m³/s) Dec. 31, Jan. 1, 9.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	18	14	14	13	22	60	75	31	24	20	17	35
2	22	14	14	50	16	188	86	24	24	18	18	161
3	20	14	14	34	21	450	74	21	23	17	17	43
4	30	14	14	15	16	101	45	28	20	41	17	20
5	19	14	14	14	15	30	20	131	24	27	16	18
6	18	17	35	15	15	20	19	580	19	27	18	17
7	18	15	27	15	15	39	18	127	19	39	37	19
8	15	21	58	14	15	80	19	91	24	22	50	17
9	15	14	15	13	15	73	18	665	29	24	18	17
10	15	14	14	14	14	54	19	840	36	17	17	52
11	16	14	14	27	14	136	27	782	24	308	16	17
12	16	14	14	48	14	210	19	1220	18	212	19	17
13	16	14	14	19	15	417	23	464	18	165	75	16
14	48	14	14	15	14	442	38	144	18	44	20	17
15	95	15	14	15	19	569	29	83	19	28	17	24
16	19	14	14	16	15	125	140	58	23	20	17	16
17	16	14	14	16	14	86	23	46	23	36	16	16
18	16	14	14	16	14	74	30	41	51	71	16	16
19	16	14	14	16	14	210	23	37	30	28	16	16
20	16	14	14	15	14	393	333	34	27	20	16	16
21	16	14	14	15	14	142	115	56	21	18	16	16
22	84	15	14	14	14	68	28	68	17	17	16	17
23	19	15	14	14	47	47	22	41	17	16	16	17
24	14	28	14	22	20	33	27	30	17	16	25	17
25	14	25	15	30	20	26	57	27	17	16	18	20
26	14	14	14	27	73	24	37	29	17	16	50	21
27	14	14	19	57	153	114	49	114	21	17	17	27
28	28	14	15	29	273	233	68	135	753	127	17	20
29	19	14	46	18	---	60	595	41	106	25	17	19
30	14	14	15	16	---	101	73	34	28	17	20	18
31	14	---	13	15	---	142	---	26	---	17	139	---
TOTAL	714	459	552	657	925	4747	2145	6048	1507	1486	804	762
MEAN	23.0	15.3	17.8	21.2	33.0	153	71.5	195	50.2	47.9	25.9	25.4
MAX	95	28	58	57	273	569	595	1220	753	308	139	161
MIN	14	14	13	13	14	20	18	21	17	16	16	16
AC-FT	1420	910	1090	1300	1830	9420	4250	12000	2990	2950	1590	1510

CAL YR 1976 TOTAL 23350 MEAN 63.8 MAX 1910 MIN 13 AC-FT 46310
WTR YR 1977 TOTAL 20806 MEAN 57.0 MAX 1220 MIN 13 AC-FT 41270

16049000 HANAPEPE RIVER BELOW MANUAHI STREAM, NEAR ELEELE--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1971-1977.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	COLOR (PLATINUM-COBALT UNITS)	TURBIDITY (JTU)	HARDNESS (CA,MG) (MG/L)	NONCARBONATE HARDNESS (MG/L)	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG) (MG/L)	DISSOLVED SODIUM (NA) (MG/L)	PERCENT SODIUM
OCT										
08...	1040	15	3	2	45	0	6.4	7.0	8.8	30
APR										
29...	1015	1000	55	30	13	4	1.8	2.1	4.6	42

DATE	SODIUM ADSORPTION RATIO	DISSOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	ALKALINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)	DISSOLVED FLUORIDE (F) (MG/L)
OCT									
08...	.6	.5	58	0	48	37	2.8	14	.0
APR									
29...	.6	.6	11	0	9	6.4	3.4	8.5	.1

DATE	DISSOLVED SILICA (SIO2) (MG/L)	DISSOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	DISSOLVED SOLIDS (TONS PER AC-FT)	DISSOLVED SOLIDS (TONS PER DAY)	DISSOLVED NITRITE PLUS NITRATE (N) (MG/L)	DISSOLVED ORTHO. PHOSPHORUS (P) (MG/L)	DISSOLVED ORTHO PHOSPHATE (PO4) (MG/L)	DISSOLVED IRON (FE) (UG/L)	DISSOLVED MANGANESE (MN) (UG/L)
OCT									
08...	23	91	.12	3.69	.03	.03	.09	40	10
APR									
29...	6.1	33	.04	89.1	.02	.00	.00	120	0

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)
OCT					
08...	1040	15	69	6.4	21.5
DEC					
14...	1135	14	70	6.5	19.5
JAN					
28...	1100	27	100	7.4	20.0
MAR					
09...	1045	64	90	7.1	20.5
APR					
29...	1015	1000	50	6.6	20.5
JUN					
14...	1020	18	140	7.8	23.0
AUG					
02...	1035	18	120	8.0	22.5
SEP					
07...	1055	17	125	7.6	21.0

16060000 SOUTH FORK WAILUA RIVER NEAR LIHUE

LOCATION.--Lat 22°02'24", long 159°22'58", Hydrologic Dnit 20070000, on right bank 0.2 mi (0.3 km) upstream from Wailua Falls and 4.3 mi (6.9 km) north of Lihue.

DRAINAGE AREA.--22.4 mi^2 (58.0 km^2).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--December 1911 to April 1919, June 1919 to March 1921, May 1921 to June 1957, August, September 1957, November 1957 to February 1958, June 1958 to current year. Monthly discharge only for some periods, published in WSP 1319. Published as "above Waiehu Falls, near Lihue" 1912-13.

REVISED RECORDS (FISCAL YEARS).--WSP 1249: 1941-47(M), 1948-51(P). WSP 1719: 1943-49. WSP 1937: 1958-60.

GAGE.--Water-stage recorder. Altitude of gage is 240 ft (73 m), from topographic map. Prior to Nov. 18, 1918, at site 0.3 mi (0.5 km) upstream at different datum. Nov. 18, 1918, to June 30, 1957, at site 10 ft (3 m) downstream from present site at datum 2.50 ft (0.762 m) higher and July 1, 1957, to June 23, 1958, at present datum.

REMARKS.--Records good. Lihue and Hanamaulu ditches divert upstream for irrigation of sugarcane in vicinity of Lihue.

AVERAGE DISCHARGE.--60 years (water years, 1913-18, 1920, 1922-24, 1926-56, 1959-77), 117 ft^3/s (3.313 m^3/s), 84,770 acre-ft/yr (105 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 87,300 ft^3/s (2,470 m^3/s) Apr. 15, 1963, gage height, 22.90 ft (6.980 m), from rating curve extended above 13,000 ft^3/s (368 m^3/s) on basis of slope-area measurement of peak flow; minimum, 1.69 ft^3/s (0.048 m^3/s) Sept. 21, 1953.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 9,690 ft^3/s (274 m^3/s) May 10, gage height, 15.79 ft (4.813 m), from rating curve extended as explained above, no other peak above base of 5,800 ft^3/s (164 m^3/s); minimum; 2.8 ft^3/s (0.079 m^3/s) Feb. 11, 12.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.4	4.6	3.4	4.0	22	111	39	85	10	7.5	7.8	12
2	4.9	4.2	3.4	4.0	13	170	41	53	9.3	5.5	5.3	25
3	12	4.2	3.4	6.6	22	349	50	44	9.0	7.5	6.0	48
4	10	4.4	3.4	5.7	12	194	22	43	8.7	33	4.9	7.3
5	12	4.4	3.4	4.4	11	95	6.4	139	53	22	4.8	5.3
6	6.6	5.1	4.0	4.2	8.1	67	5.3	510	23	14	6.2	4.8
7	6.6	4.6	5.7	7.1	5.7	55	4.9	194	24	15	44	4.6
8	5.7	4.4	14	6.0	3.2	13	4.8	152	33	8.7	111	4.6
9	5.3	5.1	11	4.8	3.1	60	4.8	849	94	20	38	4.6
10	4.6	4.8	51	4.2	3.0	71	5.3	957	99	30	8.7	29
11	4.6	4.8	13	4.4	2.8	18	5.3	1050	36	219	5.7	17
12	4.8	4.8	6.8	10	2.9	121	7.5	1620	36	252	4.9	6.0
13	6.2	4.6	5.5	5.5	3.1	183	6.8	722	17	268	198	5.3
14	42	4.9	4.9	4.8	3.1	315	18	361	9.9	80	127	4.8
15	157	4.9	4.6	4.6	87	327	9.0	261	8.7	53	23	4.6
16	31	5.3	4.2	4.2	54	122	80	158	8.4	24	9.0	6.0
17	60	5.3	4.0	4.0	16	64	15	109	9.0	51	5.7	5.5
18	24	4.4	4.0	4.2	5.7	59	11	103	30	140	5.3	14
19	6.6	4.2	3.9	4.0	3.9	84	14	96	14	78	4.9	5.7
20	5.5	4.0	3.9	4.0	3.5	201	466	91	16	39	4.8	5.1
21	5.3	3.9	3.7	4.0	3.4	91	227	91	9.0	11	5.3	4.9
22	41	3.9	3.7	3.9	3.4	56	63	132	7.8	7.8	5.3	5.1
23	42	3.9	3.7	3.7	35	47	59	76	6.6	13	4.9	6.0
24	5.7	3.7	3.7	3.9	24	28	68	31	6.2	27	6.3	5.5
25	4.4	17	4.2	26	7.5	7.1	82	14	6.2	9.3	9.0	5.3
26	4.4	4.4	4.6	23	93	5.3	147	16	6.4	5.5	13	15
27	17	3.5	5.3	6.8	311	20	203	93	6.6	5.3	11	54
28	18	3.4	5.3	9.6	220	201	128	148	247	71	5.1	27
29	16	3.4	4.6	4.6	---	20	590	107	105	44	4.6	5.7
30	7.1	3.4	4.2	3.4	---	90	132	75	19	6.8	4.6	4.4
31	5.1	---	4.4	3.1	---	122	---	20	---	7.8	59	---
TOTAL	579.8	143.5	204.9	192.7	982.4	3366.4	2515.1	8400	967.8	1575.7	753.1	352.1
MEAN	18.7	4.78	6.61	6.22	35.1	109	83.8	271	32.3	50.8	24.3	11.7
MAX	157	17	51	26	311	349	590	1620	247	268	198	54
MIN	4.4	3.4	3.4	3.1	2.8	5.3	4.8	14	6.2	5.3	4.6	4.4
AC-FT	1150	285	406	382	1950	6680	4990	16660	1920	3130	1490	698

CAL YR 1976 TOTAL 27361.6 MEAN 74.8 MAX 1510 MIN 3.4 AC-FT 54270
WTR YR 1977 TOTAL 20033.5 MEAN 54.9 MAX 1620 MIN 2.8 AC-FT 39740

16060000 SOUTH FORK WAILUA RIVER NEAR LIHUE--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1971-1977.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTAN-TANEOUS DIS-CHARGE (CFS)	COLOR (PLAT-INUM-COBALT UNITS)	TUR-BID-ITY (JTU)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	DIS-SOLVED SODIUM (NA) (MG/L)	PERCENT SODIUM
OCT										
28...	1320	9.4	6	2	37	11	5.4	5.7	7.8	31
JUL										
25...	1330	8.0	6	1	38	12	5.6	5.4	8.2	32

DATE	SODIUM AD-SORP-TION RATIO	DIS-SOLVED PO-TAS-SIUM (K) (MG/L)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DIS-SOLVED SULFATE (SO4) (MG/L)	DIS-SOLVED CHLO-RIDE (CL) (MG/L)	DIS-SOLVED FLUO-RIDE (F) (MG/L)
OCT									
28...	.6	.7	32	0	26	4.1	5.8	13	.0
JUL									
25...	.6	.7	31	0	25	5.0	4.4	16	.1

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTI-TUENTS) (MG/L)	DIS-SOLVED SOLIDS (TONS PER AC-FT)	DIS-SOLVED SOLIDS (TONS PER DAY)	DIS-SOLVED NITRITE PLUS NITRATE (N) (MG/L)	DIS-SOLVED ORTHO. PHOS-PHORUS (P) (MG/L)	DIS-SOLVED ORTHO PHOS-PHATE (PO4) (MG/L)	DIS-SOLVED IRON (FE) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)
OCT									
28...	13	67	.09	1.79	.01	.02	.06	190	--
JUL									
25...	15	71	.10	1.53	--	--	--	220	8

DATE	TIME	INSTAN-TANEOUS DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)
OCT					
28...	1320	9.4	110	7.1	26.0
NOV					
29...	1210	3.7	150	7.5	22.5
DEC					
21...	1235	3.7	135	7.4	21.5
JAN					
21...	1240	3.9	140	7.1	23.5
FEB					
24...	1420	12	108	7.2	22.5
MAR					
25...	1305	6.3	108	7.1	24.0
APR					
26...	1455	100	83	7.0	19.0
JUN					
02...	0915	9.5	130	7.1	24.5
29...	1535	43	66	6.5	24.0
AUG					
31...	0955	116	95	7.0	19.5

16061000 NORTH WAILUA DITCH NEAR LIHUE

LOCATION.--Lat 22°03'56", long 159°28'14", Hydrologic Unit 20070000, on left bank 300 ft (91 m) downstream from intake, 7.9 mi (12.7 km) west of Wailua House Lots, and 8.8 mi (14.2 km) northwest of Lihue.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--July 1932 to current year.

REVISED RECORDS (FISCAL YEAR).--WSP 770: 1933.

GAGE.--Water-stage recorder and sharp-crested weir. Datum of gage is 1,105.45 ft (336.941 m) above mean sea level (levels by Lihue Plantation Co.).

REMARKS.--Records good. Ditch diverts from North Fork Wailua River for power and irrigation in vicinity of Lihue.

AVERAGE DISCHARGE.--45 years, 18.8 ft^3/s (0.532 m^3/s), 13,620 acre-ft/yr (16.8 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 59 ft^3/s (1.67 m^3/s) Dec. 21, 1933, Apr. 24, 1934; no flow at times.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	15	16	16	16	16	20	20	18	17	16	16	21
2	17	16	15	23	16	24	20	17	17	16	17	22
3	18	16	15	20	16	27	22	17	17	16	16	21
4	19	16	15	18	16	22	22	18	17	17	16	20
5	18	16	15	17	16	21	21	19	20	17	17	19
6	18	17	20	17	15	21	20	20	18	18	17	20
7	18	16	20	18	16	22	20	18	18	17	18	19
8	18	18	22	16	16	23	21	18	19	17	19	18
9	17	16	20	16	15	24	20	20	19	17	17	19
10	17	16	21	18	15	22	20	20	19	17	17	24
11	17	16	19	17	14	25	21	18	17	20	16	21
12	18	16	18	20	15	25	20	18	17	20	17	20
13	18	16	17	19	15	26	22	16	18	20	20	20
14	20	17	17	18	4.9	27	21	15	17	18	17	20
15	20	17	18	16	12	25	22	14	17	17	17	21
16	18	20	16	23	17	22	23	14	18	17	16	20
17	17	19	16	16	16	23	20	15	18	17	16	20
18	16	18	16	17	16	22	20	16	19	19	16	18
19	16	17	16	17	16	23	21	16	18	18	16	18
20	17	16	16	16	16	23	22	16	18	17	16	20
21	17	16	16	15	15	22	18	17	17	16	16	20
22	18	16	16	15	19	21	20	16	16	16	16	21
23	17	16	16	14	25	21	22	16	16	16	16	20
24	17	19	16	16	20	21	22	15	17	16	20	20
25	17	19	19	20	20	20	22	15	17	16	18	20
26	17	17	16	17	25	20	22	19	17	16	20	20
27	17	16	20	18	25	24	22	21	19	16	17	21
28	18	16	18	17	22	23	20	19	20	18	18	20
29	17	17	20	16	---	21	21	16	18	16	17	18
30	17	16	18	16	---	24	18	18	17	16	20	18
31	16	---	16	19	---	21	---	17	---	16	22	---
TOTAL	540	503	539	541	469.9	705	625	532	531	529	537	599
MEAN	17.4	16.8	17.4	17.5	16.8	22.7	20.8	17.2	17.7	17.1	17.3	20.0
MAX	20	20	22	23	25	27	23	21	20	20	22	24
MIN	15	16	15	14	4.9	20	18	14	16	16	16	18
AC-FT	1070	998	1070	1070	932	1400	1240	1060	1050	1050	1070	1190

CAL YR 1976 TOTAL 6186.4 MEAN 16.9 MAX 25 MIN 3.7 AC-FT 12270
WTR YR 1977 TOTAL 6650.9 MEAN 18.2 MAX 27 MIN 4.9 AC-FT 13190

16061000 NORTH WAILUA DITCH NEAR LIHUE--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1976-77.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	COLOR (PLATINUM-COBALT UNITS)	TURBIDITY (JTU)	HARDNESS (CA,MG) (MG/L)	NONCARBONATE HARDNESS (MG/L)	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG) (MG/L)	DISSOLVED SODIUM (NA) (MG/L)	PERCENT SODIUM
OCT										
20...	1010	17	2	2	25	6	4.6	3.3	4.4	27
JUL										
20...	1205	16	4	1	26	1	4.4	3.6	4.5	27

DATE	SODIUM ADSORPTION RATIO	DISSOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	ALKALINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)	DISSOLVED FLUORIDE (F) (MG/L)
OCT									
20...	.4	.5	23	0	19	3.7	5.8	5.2	.0
JUL									
20...	.4	.4	30	0	25	1.0	1.0	5.5	.0

DATE	DISSOLVED SILICA (SIO2) (MG/L)	DISSOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	DISSOLVED SOLIDS (TONS PER AC-FT)	DISSOLVED SOLIDS (TONS PER DAY)	DISSOLVED NITRITE PLUS NITRATE (N) (MG/L)	DISSOLVED ORTHO. PHOSPHORUS (P) (MG/L)	DISSOLVED ORTHO PHOSPHATE (PO4) (MG/L)	DISSOLVED IRON (FE) (UG/L)	DISSOLVED MANGANESE (MN) (UG/L)
OCT									
20...	18	54	.07	2.48	.07	.03	.09	50	0
JUL									
20...	18	52	.07	2.33	--	--	--	30	0

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)
OCT					
20...	1010	17	72	7.0	19.0
NOV					
30...	1015	16	70	6.8	18.5
DEC					
20...	1150	15	72	7.7	17.0
JAN					
19...	1300	16	66	7.4	20.0
FEB					
17...	0935	16	66	7.6	18.5
MAR					
21...	1155	22	70	7.5	19.0
APR					
19...	1040	22	75	7.2	18.5
MAY					
20...	1210	16	75	7.3	20.0
JUN					
20...	1255	18	68	7.5	20.0
JUL					
20...	1205	16	73	7.7	22.0
AUG					
19...	1130	16	85	7.5	22.0
SEP					
19...	1245	17	75	8.0	22.0

16061200 NORTH WAILUA DITCH BELOW WAIKOKO STREAM, NEAR LIHUE

LOCATION.--Lat 22°03'34", long 159°28'00", Hydrologic Unit 20070000, on left bank 380 ft (116 m) downstream from Waikoko Stream, 8.1 mi (13.0 km) west of Wailua, and 8.4 mi (13.5 km) northwest of Lihue.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--January 1965 to current year.

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 1,070 ft (326 m), from topographic map.

REMARKS.--Records good. Ditch diverts from North Fork Wailua River and Waikoko Stream for power and irrigation in vicinity of Lihue.

AVERAGE DISCHARGE.--12 years, 24.6 ft^3/s (0.697 m^3/s), 17,820 acre-ft/yr (22.0 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 58 ft^3/s (1.64 m^3/s) Oct. 11, 1966; no flow Jan. 1-18, 1965.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	18	19	17	18	18	25	21	21	20	20	19	22
2	21	19	17	25	19	26	21	20	20	19	20	24
3	21	19	17	24	18	30	22	20	19	20	19	22
4	20	18	16	20	18	24	21	21	19	20	19	21
5	21	18	16	19	18	22	21	24	22	20	20	20
6	21	19	21	19	17	22	21	29	21	21	20	21
7	20	19	23	20	17	22	20	23	21	21	23	20
8	20	22	25	18	18	24	21	23	22	20	25	20
9	19	19	26	18	16	25	20	27	23	21	22	20
10	19	18	24	20	16	24	21	28	23	21	21	25
11	19	18	22	20	16	25	21	28	21	26	20	22
12	20	18	21	22	16	26	21	32	20	25	21	21
13	21	18	20	21	16	27	22	25	20	25	28	20
14	27	18	19	21	5.5	30	22	22	20	21	22	21
15	28	20	20	19	14	28	22	20	19	21	21	22
16	23	22	18	20	20	24	24	20	20	20	20	21
17	22	21	18	19	18	23	21	20	20	21	20	21
18	20	19	18	18	18	23	21	20	21	23	20	20
19	20	19	17	20	17	23	22	20	20	22	19	20
20	21	18	17	18	17	25	28	20	20	21	19	20
21	20	18	17	17	16	23	22	20	20	20	19	20
22	23	18	16	17	19	22	21	21	20	20	19	21
23	22	17	16	16	24	22	22	20	19	19	19	21
24	21	22	16	19	21	22	22	20	19	19	21	20
25	20	22	20	27	22	21	22	20	19	19	20	20
26	20	19	18	23	26	21	23	21	19	19	21	22
27	20	18	21	22	27	25	27	24	20	19	20	23
28	23	18	20	20	26	25	26	24	23	25	20	21
29	23	19	21	19	---	22	28	21	21	20	20	20
30	21	18	20	18	---	25	22	21	20	20	21	20
31	20	---	18	21	---	22	---	20	---	19	24	---
TOTAL	654	570	595	618	513.5	748	668	695	611	647	642	631
MEAN	21.1	19.0	19.2	19.9	18.3	24.1	22.3	22.4	20.4	20.9	20.7	21.0
MAX	28	22	26	27	27	30	28	32	23	26	28	25
MIN	18	17	16	16	5.5	21	20	20	19	19	19	20
AC-FT	1300	1130	1180	1230	1020	1480	1320	1380	1210	1280	1270	1250

CAL YR 1976 TOTAL 7860.0 MEAN 21.5 MAX 34 MIN 16 AC-FT 15590
WTR YR 1977 TOTAL 7592.5 MEAN 20.8 MAX 32 MIN 5.5 AC-FT 15060

16061200 NORTH WAILUA DITCH BELOW WAIKOKO STREAM, NEAR LIHUE--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1976-77.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTAN-TANEOUS DIS-CHARGE (CFS)	COLOR (PLAT-INUM-COBALT UNITS)	TUR-BID-ITY (JTU)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	DIS-SOLVED SODIUM (NA) (MG/L)	PERCENT SODIUM
OCT										
20...	1125	22	6	4	25	0	4.2	3.6	4.7	28
JUL										
20...	1030	21	6	1	25	1	4.3	3.4	4.7	29

DATE	SODIUM AD-SORP-TION RATIO	DIS-SOLVED PO-TAS-SIUM (K) (MG/L)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DIS-SOLVED SULFATE (SO4) (MG/L)	DIS-SOLVED CHLO-RIDE (CL) (MG/L)	DIS-SOLVED FLUO-RIDE (F) (MG/L)
OCT									
20...	.4	.5	32	0	26	5.1	6.3	5.9	.0
JUL									
20...	.4	.3	29	0	24	2.3	1.3	6.4	.0

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTI-TUENTS) (MG/L)	DIS-SOLVED SOLIDS (TONS PER AC-FT)	DIS-SOLVED SOLIDS (TONS PER DAY)	DIS-SOLVED NITRITE PLUS NITRATE (N) (MG/L)	DIS-SOLVED ORTHO. PHOS-PHORUS (P) (MG/L)	DIS-SOLVED ORTHO PHOS-PHATE (PO4) (MG/L)	DIS-SOLVED IRON (FE) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)
OCT									
20...	15	56	.08	3.33	.34	.02	.06	90	0
JUL									
20...	16	51	.07	2.91	--	--	--	30	0

DATE	TIME	INSTAN-TANEOUS DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)
OCT					
20...	1125	22	70	7.0	19.5
NOV					
19...	0940	19	75	6.4	16.5
DEC					
20...	1050	17	79	7.8	16.5
JAN					
19...	1105	19	67	7.4	19.5
FEB					
17...	1035	18	66	7.6	18.5
MAR					
21...	1240	22	70	7.4	19.0
APR					
19...	1000	22	76	7.0	18.5
MAY					
20...	1015	20	74	7.2	20.0
JUN					
20...	1110	20	69	7.3	19.5
JUL					
20...	1030	21	72	7.3	20.5
AUG					
19...	0950	20	85	7.4	21.0
SEP					
19...	1045	20	78	7.6	21.0

16062000 STABLE STORM DITCH NEAR LIHUE

LOCATION.--Lat 22°04'09", long 159°26'46", Hydrologic Unit 20070000, on left bank 100 ft (30 m) downstream from intake, 7.8 mi (12.6 km) northwest of Lihue, and 7.9 mi (12.7 km) west of Kapaa.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--December 1936 to current year.

GAGE.--Water-stage recorder and sharp-crested weir. Altitude of gage is 710 ft (216 m) by barometer.

REMARKS.--Records good. Ditch diverts from North Fork Wailua River for irrigation of sugarcane in vicinity of Lihue.

AVERAGE DISCHARGE.--40 years (water years 1938-77), 10.7 ft^3/s (0.303 m^3/s), 7,750 acre-ft/yr (9.56 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 71 ft^3/s (2.01 m^3/s) Apr. 3, 1948; no flow at times each year.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.72	.88	16	.88	.42	.88	.18	.18	.06	.12	.12	.42
2	.72	23	23	.88	.42	.57	.18	.28	.06	.12	.12	.42
3	.57	30	14	.88	.42	.57	.18	.28	.06	.12	.12	.42
4	20	28	1.0	.88	.42	.42	.28	.28	.06	.12	.06	.57
5	30	16	.88	17	.42	.42	.28	.28	.06	.12	.06	.57
6	32	.88	.72	26	.28	.42	.28	.28	.06	.12	.12	.57
7	30	.72	.72	28	.28	.42	.28	.28	.06	.12	.18	.57
8	17	26	.57	24	.28	.42	.28	.28	.06	.12	.18	.57
9	.88	29	.42	24	.28	.42	.28	.28	.06	.12	.18	.57
10	.88	28	.28	26	12	.42	.28	.45	.06	.12	.18	.57
11	18	28	.28	28	20	.42	.28	.18	.06	.12	.18	.57
12	34	26	.28	28	20	.42	.28	1.0	.06	.12	.18	.57
13	37	26	.42	27	20	.28	.28	.12	.06	.12	.18	.72
14	48	30	.42	26	26	.42	.28	.12	.06	.12	.18	.72
15	15	32	.42	23	45	.28	.28	.12	.06	.12	.18	21
16	1.0	36	.57	25	33	.28	.28	.12	.06	.12	.18	28
17	1.0	32	.57	22	26	.28	.28	.12	.06	.12	.18	28
18	.88	30	.42	23	24	.28	.28	.12	.06	.12	.18	26
19	.88	24	.42	26	23	.28	.28	.06	.06	.12	.18	26
20	.72	22	.42	22	22	.28	.28	.06	.06	.12	.18	27
21	.57	25	.42	22	22	.28	.18	.06	.06	.12	.18	27
22	.57	25	.57	22	30	.28	.18	.06	.06	.12	.74	28
23	.28	24	16	21	25	.18	.18	.06	.06	.12	.72	28
24	.28	15	23	24	15	.18	.18	.06	.06	.12	19	26
25	.28	1.0	21	13	32	.18	.18	.06	.12	.12	9.7	26
26	21	.88	21	1.0	44	.18	.18	.06	.12	.12	1.0	28
27	32	.57	7.4	.88	47	.18	.28	.06	.12	.12	.42	28
28	36	.57	.88	.72	14	.18	.28	.06	.19	.12	.42	26
29	21	.57	1.0	.72	---	.18	.20	.06	.12	.12	.28	25
30	1.0	.57	.88	.57	---	.18	.18	.06	.12	.12	.42	24
31	.88	---	.88	.42	---	.18	---	.06	---	.12	.42	---
TOTAL	403.11	561.64	154.84	504.83	503.22	10.36	7.32	5.55	2.23	3.72	36.42	429.83
MEAN	13.0	18.7	4.99	16.3	18.0	.33	.24	.18	.074	.12	1.17	14.3
MAX	48	36	23	28	47	.88	.28	1.0	.19	.12	19	28
MIN	.28	.57	.28	.42	.28	.18	.18	.06	.06	.12	.06	.42
AC-FT	800	1110	307	1000	998	21	15	11	4.4	7.4	72	853

CAL YR 1976 TOTAL 2480.54 MEAN 6.78 MAX 48 MIN .06 AC-FT 4920
WTR YR 1977 TOTAL 2623.07 MEAN 7.19 MAX 48 MIN .06 AC-FT 5200

HAWAII, ISLAND OF KAUAI

16062000 STABLE STORM DITCH NEAR LIHUE--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1976-77.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTAN-TANEOUS DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)
OCT					
20...	1020	.65	90	6.4	23.5
NOV					
19...	1110	26	92	6.4	18.0
DEC					
20...	0935	.51	90	7.6	17.0
JAN					
19...	0945	24	78	7.4	20.0
FEB					
17...	1245	26	75	8.0	17.5
MAR					
21...	0950	.28	95	7.6	19.5
APR					
19...	1300	.24	90	8.1	19.5
MAY					
20...	0920	.04	109	6.4	23.5
JUN					
20...	0925	.08	85	6.9	21.5
JUL					
20...	0920	.13	84	6.9	21.5
AUG					
19...	0905	.16	100	7.3	21.0
SEP					
19...	0945	26	88	7.7	21.0

16063000 NORTH FORK WAILUA RIVER AT ALTITUDE 650 FT (198 M), NEAR LIHUE

LOCATION.--Lat 22°04'02", long 159°26'21", Hydrologic Unit 20070000, on right bank 0.5 mi (0.8 km) downstream from intake of Stable storm ditch and 7.6 mi (12.2 km) northwest of Lihue.

DRAINAGE AREA.--5.29 mi^2 (13.70 km^2).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--September 1914 to March 1915, May 1915 to October 1918, December 1918, March 1919, June 1919 to current year. Monthly discharge only for some periods, published in WSP 1319.

REVISED RECORDS (FISCAL YEARS).--WSP 555: 1921. WSP 1569: 1915-27(M), 1943-47 (M), 1948-56(P). WSP 2137: Drainage area.

GAGE.--Water-stage recorder. Altitude of gage is 650 ft (198 m), from topographic map. Prior to Sept. 9, 1944, at datum 2.0 ft (0.61 m) higher.

REMARKS.--Records fair. Since 1925, Hanalei tunnel (see sta 16100000) has diverted from Hanalei River basin into North Fork Wailua River above station; North Wailua and Stable storm ditches (see sta 16061000 and 16062000) divert water above station for power development and irrigation in vicinity of Lihue.

AVERAGE DISCHARGE.--61 years (water years, 1916-18, 1920-77), 73.4 ft^3/s (2.079 m^3/s), 53,180 acre-ft/yr (65.6 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 13,200 ft^3/s (374 m^3/s) Nov. 12, 1955, gage height, 13.53 ft (4.124 m), from rating curve extended above 2,300 ft^3/s (65.1 m^3/s) on basis of slope-area measurement at gage height 10.65 ft (3.246 m); minimum, 0.23 ft^3/s (0.007 m^3/s) June 5, 1968.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 3,700 ft^3/s (105 m^3/s) May 12, gage height, 8.24 ft (2.512 m), from rating curve extended as explained above, no other peak above base of 2,800 ft^3/s (79.4 m^3/s); minimum, 0.53 ft^3/s (0.015 m^3/s) Dec. 25.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	24	32	8.2	20	23	138	37	74	32	30	20	52
2	119	12	.70	104	21	145	42	62	31	26	29	101
3	66	1.2	8.0	62	22	325	88	57	28	22	20	56
4	51	.84	20	25	21	110	82	69	29	49	22	34
5	5.6	11	21	9.8	21	65	49	174	137	37	47	32
6	18	42	66	.64	20	51	37	360	65	55	66	30
7	5.6	33	40	2.5	21	64	33	104	73	45	99	40
8	19	48	76	.70	23	92	36	120	94	41	123	30
9	33	1.0	66	.64	20	108	31	386	113	41	69	32
10	27	.77	64	1.6	9.2	84	31	448	103	44	49	144
11	12	.77	32	20	1.0	133	44	342	49	172	40	55
12	15	.70	25	3.2	.91	166	33	985	45	135	61	39
13	19	.70	23	1.3	.91	214	49	232	41	141	313	34
14	152	1.6	22	1.2	16	301	42	126	36	52	102	48
15	158	14	26	.84	114	200	44	94	31	41	65	33
16	65	41	23	1.7	15	88	104	78	44	34	52	7.8
17	47	1.6	22	1.0	5.2	84	36	65	48	41	48	7.0
18	39	.77	22	.91	3.0	70	33	54	71	100	45	5.9
19	36	.70	22	1.0	1.8	90	95	48	44	60	42	4.9
20	48	.64	21	.91	1.6	117	321	54	48	37	42	6.3
21	40	.64	20	.84	1.3	72	104	67	38	32	44	7.0
22	173	.70	20	.84	28	58	58	65	30	30	40	8.7
23	58	.64	7.6	.84	121	51	60	51	28	27	36	7.7
24	40	49	.58	1.1	35	45	72	39	27	22	30	5.6
25	42	35	6.6	76	12	38	76	40	29	21	22	5.9
26	21	22	3.9	26	72	36	72	40	30	23	52	17
27	3.2	23	34	39	156	153	239	120	40	21	33	14
28	29	23	24	23	238	196	195	106	190	119	39	5.9
29	21	23	39	22	---	52	414	47	90	29	32	4.4
30	38	22	23	21	---	150	98	51	38	26	33	3.7
31	34	---	21	24	---	55	---	36	---	23	127	---
TOTAL	1458.4	443.27	807.58	493.56	1023.92	3551	2655	4554	1702	1576	1842	871.8
MEAN	47.0	14.8	26.1	15.9	36.6	115	88.5	147	56.7	50.8	59.4	29.1
MAX	173	49	76	104	238	325	414	985	190	172	313	144
MIN	3.2	.64	.58	.64	.91	36	31	36	27	21	20	3.7
AC-FT	2890	879	1600	979	2030	7040	5270	9030	3380	3130	3650	1730

CAL YR 1976 TOTAL 26234.15 MEAN 71.7 MAX 600 MIN .58 AC-FT 52040
WTR YR 1977 TOTAL 20978.53 MEAN 57.5 MAX 985 MIN .58 AC-FT 41610

16063000 NORTH FORK WAILUA RIVER AT ALTITUDE 650 FT (198 M), NEAR LIHUE--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1976-77.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTAN-TANEOUS DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)
OCT					
28...	1020	23	63	6.9	19.5
NOV					
24...	1005	.65	110	7.4	20.0
DEC					
21...	1025	22	90	7.5	16.5
JAN					
21...	0925	.83	102	6.9	20.0
FEB					
24...	1025	44	75	7.1	18.0
MAR					
28...	1035	62	75	7.2	22.5
APR					
25...	1350	56	82	7.2	20.0
JUN					
01...	1430	29	89	7.6	22.5
30...	1040	37	85	7.3	21.5
JUL					
29...	1355	28	80	7.4	22.5
AUG					
30...	1455	32	75	7.1	20.0

16068000 EAST BRANCH OF NORTH FORK WAILUA RIVER NEAR LIHUE

LOCATION.--Lat 22°04'19", long 159°25'05", Hydrologic Unit 20070000, on right bank 1,200 ft (366 m) upstream from mouth and 7.2 mi (11.6 km) northwest of Lihue.

DRAINAGE AREA.--6.27 mi² (16.24 km²).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--July 1912 to September 1914, December 1914 to March 1915, May 1915 to March 1919, June 1919 to current year. Monthly discharge only for some periods, published in WSP 1319.

REVISED RECORDS (FISCAL YEARS).--WSP 770: 1932-33. WSP 1719: 1916. WSP 1937: 1918. WSP 2137: Drainage area.

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 500 ft (152 m), from topographic map. Prior to Dec. 31, 1914, nonrecording gage at site 725 ft (221 m) downstream at different datum. Dec. 31, 1914, to May 10, 1934, water-stage recorder at site 75 ft (23 m) upstream at present datum.

REMARKS.--Records good. No diversion above station.

AVERAGE DISCHARGE.--62 years (water years, 1913-14, 1916-17, 1920-77), 48.4 ft³/s (1.371 m³/s), 35,070 acre-ft/yr (43.2 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 18,400 ft³/s (521 m³/s) Nov. 12, 1955, gage height, 14.7 ft (4.48 m), from floodmarks, from rating curve extended above 2,700 ft³/s (76.5 m³/s); minimum, 6.8 ft³/s (0.19 m³/s) July 3, 13, 1926.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 1,900 ft³/s (53.8 m³/s) and maximum (*):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
May 9	1830	1980	56.1	5.77	1.759
May 12	0200	*2180	61.7	5.98	1.823

Minimum discharge, 12 ft³/s (0.34 m³/s) Feb. 11, 12.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	16	17	15	13	13	49	24	42	22	21	18	20
2	45	18	14	22	14	50	25	36	27	19	19	31
3	33	18	14	18	14	109	52	33	22	18	18	22
4	21	16	14	15	13	58	52	34	21	22	16	16
5	19	16	14	13	17	41	30	42	47	19	26	15
6	21	25	20	13	13	34	26	93	29	24	36	15
7	19	18	19	21	13	38	24	45	32	22	48	17
8	18	28	22	14	14	37	24	47	35	22	55	14
9	18	18	22	13	13	37	23	194	38	21	28	15
10	17	16	40	13	13	34	24	547	33	18	24	25
11	17	17	19	18	12	39	27	353	25	46	21	18
12	27	16	16	18	12	42	24	641	24	51	27	15
13	28	16	15	15	13	59	31	158	22	74	125	14
14	130	18	15	15	20	80	29	94	21	35	35	15
15	81	39	16	14	103	64	26	70	20	29	27	16
16	32	58	15	13	33	43	47	57	23	24	24	15
17	27	21	14	13	20	38	25	49	25	29	21	15
18	24	18	14	13	16	36	36	43	35	58	20	15
19	22	18	14	17	15	48	75	39	25	38	18	14
20	22	16	14	14	14	72	125	36	22	28	18	13
21	22	16	13	13	14	42	67	39	22	25	18	13
22	22	16	13	13	59	36	38	36	19	23	17	14
23	21	16	13	13	118	34	33	33	18	22	16	15
24	18	16	13	13	35	30	41	30	18	21	18	14
25	18	16	16	40	32	28	53	28	18	20	16	15
26	19	15	15	19	44	27	58	27	19	21	18	14
27	18	15	31	16	74	30	71	41	27	19	16	15
28	27	15	18	15	111	35	72	33	39	34	15	14
29	21	15	20	13	---	27	235	28	101	23	15	13
30	18	15	15	13	---	38	56	27	24	21	16	13
31	18	---	13	13	---	26	---	24	---	19	33	---
TOTAL	859	582	526	486	878	1361	1473	2999	849	866	822	480
MEAN	27.7	19.4	17.0	15.7	31.4	43.9	49.1	96.7	28.3	27.9	26.5	16.0
MAX	130	58	40	40	118	109	235	641	101	74	125	31
MIN	16	15	13	13	12	26	23	24	18	18	15	13
AC-FT	1700	1150	1040	964	1740	2700	2920	5950	1680	1720	1630	952

CAL YR 1976 TOTAL 15163 MEAN 41.4 MAX 558 MIN 13 AC-FT 30080
WTR YR 1977 TOTAL 12181 MEAN 33.4 MAX 641 MIN 12 AC-FT 24160

16068000 EAST BRANCH OF NORTH FORK WAILUA RIVER NEAR LIHUE--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1972-77.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	COLOR (PLATINUM-COBALT UNITS)	TURBIDITY (JTU)	HARDNESS (CA,MG) (MG/L)	NONCARBONATE HARDNESS (MG/L)	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG) (MG/L)	DISSOLVED SODIUM (NA) (MG/L)	PERCENT SODIUM
OCT										
22...	1010	21	2	1	34	6	4.4	5.7	7.3	31
JUL										
25...	0920	20	5	1	35	2	4.5	5.7	8.1	33

DATE	SODIUM ADSORPTION RATIO	DISSOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	ALKALINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)	DISSOLVED FLUORIDE (F) (MG/L)
OCT									
22...	.5	.4	35	0	29	18	6.8	10	.1
JUL									
25...	.6	.6	40	0	33	10	1.2	13	.0

DATE	DISSOLVED SILICA (SIO2) (MG/L)	DISSOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	DISSOLVED SOLIDS (TONS PER AC-FT)	DISSOLVED SOLIDS (TONS PER DAY)	DISSOLVED NITRITE PLUS NITRATE (N) (MG/L)	DISSOLVED ORTHO. PHOSPHORUS (P) (MG/L)	DISSOLVED ORTHO PHOSPHATE (PO4) (MG/L)	DISSOLVED IRON (FE) (UG/L)	DISSOLVED MANGANESE (MN) (UG/L)
OCT									
22...	16	68	.09	3.86	.00	.02	.06	130	10
JUL									
25...	15	68	.09	3.73	--	--	--	200	8

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)
OCT					
22...	1010	21	108	6.5	22.5
NOV					
22...	0935	16	109	6.5	18.5
DEC					
22...	1005	13	110	7.2	17.5
JAN					
25...	1005	42	100	7.0	20.5
FEB					
22...	0940	18	110	7.0	21.0
MAR					
25...	1020	29	100	7.1	20.5
APR					
25...	1105	32	90	7.1	20.0
MAY					
24...	1035	30	95	6.9	22.0
JUN					
28...	1005	17	107	6.8	22.0
JUL					
25...	0920	20	106	6.8	--
AUG					
23...	1015	17	110	7.2	20.5
SEP					
26...	1010	14	110	7.3	22.0

16069000 WAILUA DITCH NEAR KAPAA

LOCATION.--Lat 22°04'34", long 159°24'04", Hydrologic Unit 20070000, on right bank 2,000 ft (610 m) downstream from Wailua Reservoir, 5.2 mi (8.4 km) west of Kapaa, and 7.0 mi (11.3 km) north of Lihue.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--November 1936 to current year.

GAGE.--Water-stage recorder. Sharp-crested weir since Feb. 4, 1965. Datum of gage is 462.3 ft (140.91 m) above mean sea level (by stadia survey).

REMARKS.--Records good. Ditch diverts water from North Fork Wailua River to reservoir, 2,000 ft (610 m) above station and thence to fields for irrigation of sugarcane in vicinity of Kapaa.

AVERAGE DISCHARGE.--40 years, (water years 1938-77), 14.8 ft^3/s (0.419 m^3/s), 10,720 acre-ft/yr (13.2 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 63 ft^3/s (1.78 m^3/s) June 4, 1937; no flow at times.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	24	26	21	5.3	22	8.7	28	16	20	26	28	38
2	24	32	22	5.1	24	8.9	28	16	20	22	30	27
3	24	32	24	5.1	26	8.5	28	16	20	22	30	8.9
4	24	31	26	4.9	29	8.1	29	16	20	22	30	7.5
5	24	30	26	10	28	7.9	29	16	20	12	34	7.3
6	26	29	27	14	28	8.1	29	16	20	.00	36	8.3
7	24	29	30	14	28	8.1	16	16	20	.00	35	15
8	19	29	31	15	28	15	9.1	16	20	.00	36	20
9	12	29	31	15	30	19	9.3	13	20	.00	35	23
10	13	28	31	15	32	17	9.1	1.8	20	.00	35	25
11	13	27	30	15	30	16	8.9	2.2	19	.00	35	25
12	21	21	31	15	29	16	8.9	2.0	20	.00	35	29
13	25	16	28	15	27	16	16	1.5	20	11	35	31
14	18	16	31	15	26	16	25	1.0	20	20	36	31
15	6.0	16	33	15	15	16	29	.93	20	20	35	32
16	1.1	17	33	15	8.3	16	29	.93	20	21	35	31
17	.93	18	33	19	8.7	16	28	1.1	20	21	35	30
18	7.1	10	33	24	8.9	16	32	5.7	20	23	36	30
19	12	6.5	33	25	9.1	16	33	11	20	25	36	29
20	12	6.5	33	24	9.1	16	27	10	20	25	35	30
21	12	6.9	33	23	9.1	16	15	10	20	25	35	29
22	17	7.3	32	22	9.3	16	8.3	10	20	20	35	27
23	21	14	21	21	9.1	16	8.9	10	20	18	35	27
24	21	13	16	20	9.3	16	9.3	15	23	19	35	27
25	21	6.5	16	13	9.3	16	14	20	29	22	35	27
26	20	6.3	16	6.3	9.1	16	20	20	30	25	35	30
27	20	6.3	14	6.7	8.9	16	20	20	31	25	35	32
28	19	6.3	8.7	7.1	8.7	20	20	20	32	25	35	32
29	19	13	5.9	7.5	---	26	18	20	31	25	37	31
30	20	18	5.9	7.9	---	29	16	20	31	25	38	30
31	20	---	5.7	15	---	29	---	20	---	25	38	---
TOTAL	540.13	546.6	761.2	434.9	518.9	485.3	600.8	364.16	666	524.00	1075	770.0
MEAN	17.4	18.2	24.6	14.0	18.5	15.7	20.0	11.7	22.2	16.9	34.7	25.7
MAX	26	32	33	25	32	29	33	20	32	26	38	38
MIN	.93	6.3	5.7	4.9	8.3	7.9	8.3	.93	19	.00	28	7.3
AC-FT	1070	1080	1510	863	1030	963	1190	722	1320	1040	2130	1530

CAL YR 1976 TOTAL 5815.23 MEAN 15.9 MAX 36 MIN .93 AC-FT 11530
WTR YR 1977 TOTAL 7286.99 MEAN 20.0 MAX 38 MIN .00 AC-FT 14450

HAWAII, ISLAND OF KAUAI

16069000 WAILUA DITCH NEAR KAPAA--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1976-77.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTAN-TANEOUS DIS-CHARGE (CFS)	COLOR (PLAT-INUM-COBALT UNITS)	TUR-BID-ITY (JTU)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	DIS-SOLVED SODIUM (NA) (MG/L)	PERCENT SODIUM
OCT 20...	1220	11	7	2	27	0	4.1	4.1	--	--
JUL 20...	1415	26	22	3	28	3	4.3	4.3	6.3	32

DATE	SODIUM AD-SORP-TION RATIO	DIS-SOLVED PO-TAS-SIUM (K) (MG/L)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DIS-SOLVED SULFATE (SO4) (MG/L)	DIS-SOLVED CHLO-RIDE (CL) (MG/L)	DIS-SOLVED FLUO-RIDE (F) (MG/L)
OCT 20...	--	1.4	35	0	29	11	6.8	8.4	.0
JUL 20...	.5	.4	31	0	25	6.2	1.2	9.0	.0

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTI-TUENTS) (MG/L)	DIS-SOLVED SOLIDS (TONS PER AC-FT)	DIS-SOLVED SOLIDS (TONS PER DAY)	DIS-SOLVED NITRITE PLUS NITRATE (N) (MG/L)	DIS-SOLVED ORTHO. PHOS-PHORUS (P) (MG/L)	DIS-SOLVED ORTHO PHOS-PHATE (PO4) (MG/L)	DIS-SOLVED IRON (FE) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)
OCT 20...	13	--	--	--	.00	.19	.58	110	--
JUL 20...	13	54	.07	3.86	--	--	--	260	8

DATE	TIME	INSTAN-TANEOUS DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)
OCT 20...	1220	11	88	6.7	23.0
NOV 19...	1340	6.5	90	6.5	21.5
DEC 20...	1345	33	95	7.3	22.0
JAN 19...	1450	25	94	7.6	24.5
FEB 17...	1455	8.8	90	7.3	18.0
MAR 21...	1430	16	79	7.3	21.5
APR 19...	1430	33	87	6.9	23.5
MAY 20...	1400	10	75	6.8	26.0
JUN 20...	1440	20	86	6.9	26.5
JUL 20...	1415	26	88	6.9	23.5
AUG 19...	1330	35	90	7.0	22.0
SEP 19...	1405	31	89	7.4	22.0

16071000 NORTH FORK WAILUA RIVER NEAR KAPAA

LOCATION.--Lat 22°03'08", long 159°22'22", Hydrologic Unit 20070000, on right bank 1.1 mi (1.8 km) upstream from confluence with South Fork, 3.7 mi (6.0 km) southwest of Kapaa, and 5.0 mi (8.0 km) north of Lihue.

DRAINAGE AREA.--17.9 mi² (46.4 km²).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--July 1952 to current year.

REVISED RECORDS.--WSP 2137: Drainage area. WDR HI-75-1: 1974.

GAGE.--Water-stage recorder. Altitude of gage is 18 ft (5.5 m), from topographic map.

REMARKS.--Records good. Wailua and Aahoaka ditches (see stas 16069000 and 16070000) divert above station for irrigation of sugarcane in vicinities of Kapaa and Wailua, respectively.

AVERAGE DISCHARGE.--25 years, 128 ft³/s (3.625 m³/s), 92,740 acre-ft/yr (114 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 53,200 ft³/s (1,510 m³/s) Nov. 12, 1955, gage height, 19.88 ft (6.059 m) in gage well, 20.8 ft (6.34 m), from floodmarks, from rating curve extended above 3,700 ft³/s (105 m³/s) on basis of slope-area measurement of peak flow; minimum, 2.12 ft³/s (0.060 m³/s) Oct. 28, 1953.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 4,170 ft³/s (118 m³/s) May 12, gage height, 7.08 ft (2.158 m), from rating curve extended as explained above, no other peak above base of 4,100 ft³/s (116 m³/s); minimum, 4.5 ft³/s (0.13 m³/s) Sept. 8.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	25	18	6.7	42	30	180	56	135	46	35	19	33
2	68	8.3	6.7	97	13	192	44	105	46	30	27	51
3	78	7.5	6.5	106	16	414	130	82	41	28	18	155
4	56	7.2	6.5	51	12	190	118	86	40	78	13	103
5	20	7.2	6.7	30	12	120	76	178	157	62	15	30
6	9.3	42	20	6.9	11	94	51	386	96	88	68	5.0
7	22	29	24	8.0	11	97	43	180	109	94	145	5.8
8	8.4	53	35	6.2	12	116	48	168	134	82	130	4.5
9	31	8.3	46	6.0	6.9	126	54	510	176	76	79	14
10	25	7.5	137	6.0	6.0	120	86	728	144	66	49	133
11	21	7.7	51	6.7	5.8	128	76	848	76	213	35	68
12	8.3	7.5	33	18	5.8	192	63	1650	68	197	56	19
13	29	7.2	22	6.7	5.6	219	76	555	62	225	322	12
14	207	7.5	9.3	6.5	5.8	350	65	286	52	69	110	21
15	216	7.5	7.5	6.5	140	268	49	186	47	58	61	21
16	94	67	7.7	6.5	18	140	128	155	59	41	44	8.0
17	66	8.3	6.7	6.7	6.2	122	49	143	55	59	31	9.6
18	56	7.7	6.7	6.5	6.5	110	59	130	112	153	22	5.5
19	51	8.0	6.7	6.7	12	130	140	118	69	89	20	5.4
20	59	7.2	6.5	6.2	6.2	189	402	112	58	55	21	5.4
21	55	7.2	6.2	6.2	5.6	116	219	108	62	43	21	5.2
22	132	7.2	6.2	6.0	20	103	112	120	43	35	22	5.3
23	82	7.2	6.2	6.0	222	89	87	86	38	31	19	5.4
24	52	9.2	6.2	6.2	74	84	118	66	31	42	22	5.4
25	52	67	6.7	52	41	72	124	63	17	37	8.6	5.6
26	45	40	6.9	23	113	68	155	63	14	21	30	5.3
27	18	40	34	8.3	235	126	282	133	28	18	16	8.8
28	43	37	21	12	306	165	219	126	133	106	16	7.6
29	23	28	52	6.0	---	58	590	73	235	43	14	5.2
30	23	7.5	51	13	---	150	189	70	52	29	14	4.9
31	25	---	44	52	---	82	---	54	---	22	126	---
TOTAL	1700.0	573.9	692.6	626.8	1358.4	4610	3908	7703	2300	2225	1593.6	767.9
MEAN	54.8	19.1	22.3	20.2	48.5	149	130	248	76.7	71.8	51.4	25.6
MAX	216	67	137	106	306	414	590	1650	235	225	322	155
MIN	8.3	7.2	6.2	6.0	5.6	58	43	54	14	18	8.6	4.5
AC-FT	3370	1140	1370	1240	2690	9140	7750	15280	4560	4410	3160	1520

CAL YR 1976 TOTAL 38469.7 MEAN 105 MAX 1390 MIN 6.2 AC-FT 76300
WTR YR 1977 TOTAL 28059.2 MEAN 76.9 MAX 1650 MIN 4.5 AC-FT 55660

HAWAII, ISLAND OF KAUAI

16071000 NORTH FORK WAILUA RIVER NEAR KAPAA--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1971-1977.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	COLOR (PLATINUM-COBALT UNITS)	TURBIDITY (JTU)	HARDNESS (CA,MG) (MG/L)	NON-CARBONATE HARDNESS (MG/L)	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG) (MG/L)	DISSOLVED SODIUM (NA) (MG/L)	PERCENT SODIUM
OCT										
06...	1300	9.0	7	2	37	0	5.3	5.7	9.3	35
JUL										
18...	1225	94	6	4	28	1	4.1	4.3	6.5	33

DATE	SODIUM ADSORPTION RATIO	DISSOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	ALKALINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)	DISSOLVED FLUORIDE (F) (MG/L)
OCT									
06...	.7	.8	47	0	39	30	3.4	10	.0
JUL									
18...	.5	.5	33	0	27	1.7	1.4	9.2	.1

DATE	DISSOLVED SILICA (SIO2) (MG/L)	DISSOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	DISSOLVED SOLIDS (TONS PER AC-FT)	DISSOLVED SOLIDS (TONS PER DAY)	DISSOLVED NITRITE PLUS NITRATE (N) (MG/L)	DISSOLVED ORTHO. PHOSPHORUS (P) (MG/L)	DISSOLVED ORTHO PHOSPHATE (PO4) (MG/L)	DISSOLVED IRON (FE) (UG/L)	DISSOLVED MANGANESE (MN) (UG/L)
OCT									
06...	17	79	.11	1.92	.08	.01	.03	100	0
JUL									
18...	14	57	.08	14.5	--	--	--	160	0

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)
OCT					
06...	1300	9.0	120	6.4	22.0
DEC					
08...	1115	87	130	6.8	20.5
JAN					
14...	1100	6.4	140	7.2	22.5
MAR					
09...	1000	185	78	7.2	19.5
APR					
15...	1020	40	80	7.2	19.5
JUN					
02...	1115	48	108	8.0	24.0
JUL					
18...	1225	94	90	7.5	24.0
AUG					
31...	1205	155	80	7.2	21.0

16071500 LEFT BRANCH OPAEKAA STREAM NEAR KAPAA

LOCATION.--Lat 22°04'43", long 159°23'55", Hydrologic Unit 20070000, on left bank 0.4 mi (0.6 km) upstream from mouth, 0.6 mi (1.0 km) northeast of Wailua Reservoir, and 4.9 mi (7.9 km) west of Kapaa.

DRAINAGE AREA.--0.65 mi^2 (1.68 km^2).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--May 1960 to current year. Prior to July 1960, published as Left Branch Opaikaa Stream near Kapaa.

REVISED RECORDS.--WSP 2137: Drainage area.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 458.4 ft (139.72 m) above mean sea level (by stadia survey).

REMARKS.--Records good. No diversion above station. Recording rain gage located at station.

AVERAGE DISCHARGE.--17 years, 2.67 ft^3/s (0.076 m^3/s), 1,930 acre-ft/yr (2.38 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 724 ft^3/s (20.5 m^3/s) Jan. 31, 1975, gage height, 5.58 ft (1.701 m), from rating curve extended above 415 ft^3/s (11.8 m^3/s); minimum, 0.09 ft^3/s (0.003 m^3/s) Sept. 27-30, 1968.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 70 ft^3/s (1.98 m^3/s) May 10, gage height 2.30 ft (0.701 m), from rating curve extended as explained above, no other peak above base of 70 ft^3/s (1.98 m^3/s); minimum, 0.47 ft^3/s (0.013 m^3/s) for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.83	.83	.67	.60	.47	1.4	1.3	2.2	2.2	1.9	1.4	1.3
2	.83	.83	.67	.60	.53	1.4	1.2	2.1	2.1	1.8	1.4	1.4
3	1.0	.83	.67	.60	.53	1.9	1.4	2.1	2.1	1.8	1.4	1.5
4	.91	.75	.67	.60	.47	1.8	1.4	2.0	2.1	1.9	1.3	1.3
5	.83	.75	.67	.60	.47	1.4	1.3	2.0	3.2	1.7	1.4	1.2
6	.83	.91	.75	.60	.47	1.3	1.2	2.5	2.4	1.7	1.5	1.2
7	.75	.83	.75	.83	.47	1.3	1.1	2.1	3.6	1.7	1.7	1.2
8	.67	.83	.60	.67	.47	1.3	1.1	2.1	8.9	1.7	1.8	1.2
9	.67	.83	.75	.60	.47	1.3	1.1	6.3	5.3	1.7	1.6	1.2
10	.67	.75	2.7	.60	.47	1.2	1.1	16	4.1	1.7	1.6	1.4
11	.67	.75	.91	.67	.47	1.2	1.1	19	3.4	2.0	1.5	1.2
12	.75	.75	.75	.67	.47	1.2	1.1	19	3.1	1.8	1.5	1.1
13	.83	.75	.67	.60	.47	1.4	1.1	11	2.9	2.1	2.2	1.0
14	1.3	.75	.67	.53	.53	1.6	1.1	6.8	2.8	1.8	2.0	1.0
15	1.7	.75	.67	.47	2.0	1.6	1.0	5.7	2.7	1.6	1.8	1.0
16	1.1	1.1	.60	.47	1.0	1.4	1.0	5.0	2.7	1.5	1.7	1.0
17	1.0	.83	.60	.47	.75	1.3	.91	4.4	2.5	1.5	1.6	1.0
18	.91	.75	.60	.47	.67	1.3	2.0	4.1	2.5	1.6	1.6	1.0
19	.83	.67	.60	.53	.67	1.3	2.6	3.9	2.5	1.6	1.6	.91
20	.83	.67	.60	.47	.67	1.6	4.3	3.6	2.3	1.6	1.6	.91
21	.83	.67	.60	.47	.67	1.4	2.3	3.4	2.2	1.5	1.6	.83
22	.83	.67	.60	.47	.67	1.3	1.7	3.2	2.1	1.5	1.6	.75
23	.83	.67	.60	.47	.91	1.3	1.6	2.9	2.1	1.4	1.6	.75
24	.83	.67	.60	.47	.75	1.3	1.6	2.8	2.0	1.4	1.6	.75
25	.83	.67	.60	.91	.83	1.3	1.5	2.7	2.0	1.4	1.5	.75
26	.83	.67	.60	.67	.91	1.2	2.5	2.7	2.0	1.5	1.5	.75
27	.83	.67	.67	.60	2.0	1.2	2.7	2.7	2.1	1.5	1.5	.91
28	1.0	.67	.67	.60	1.8	1.3	2.2	2.4	2.1	1.7	1.4	.91
29	.83	.67	.67	.53	---	1.3	3.2	2.4	2.1	1.6	1.3	.75
30	.83	.67	.60	.53	---	1.3	2.4	2.3	2.0	1.5	1.4	.75
31	.83	---	.60	.53	---	1.4	---	2.2	---	1.4	1.5	---
TOTAL	27.21	22.61	22.38	17.90	21.06	42.5	50.11	151.6	84.1	51.1	48.7	30.92
MEAN	.88	.75	.72	.58	.75	1.37	1.67	4.89	2.80	1.65	1.57	1.03
MAX	1.7	1.1	2.7	.91	2.0	1.9	4.3	19	8.9	2.1	2.2	1.5
MIN	.67	.67	.60	.47	.47	1.2	.91	2.0	2.0	1.4	1.3	.75
AC-FT	54	45	44	36	42	84	99	301	167	101	97	61

CAL YR 1976 TOTAL 775.24 MEAN 2.12 MAX 42 MIN .60 AC-FT 1540
WTR YR 1977 TOTAL 570.19 MEAN 1.56 MAX 19 MIN .47 AC-FT 1130

16071500 LEFT BRANCH OPAEKAA STREAM NEAR KAPAA--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1976-77.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	COLOR (PLATINUM-COBALT UNITS)	TURBIDITY (JTU)	HARDNESS (CA,MG) (MG/L)	NON-CARBONATE HARDNESS (MG/L)	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG) (MG/L)
JUL 18...	1000	1.6	25	8	26	3	3.5	4.2

DATE	DISSOLVED SODIUM (NA) (MG/L)	PERCENT SODIUM	SODIUM ADSORPTION RATIO	DISSOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	ALKALINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)
JUL 18...	9.0	42	.8	.6	28	0	23	11	1.2

DATE	DISSOLVED CHLORIDE (CL) (MG/L)	DISSOLVED FLUORIDE (F) (MG/L)	DISSOLVED SILICA (SIO2) (MG/L)	DISSOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	DISSOLVED SOLIDS (TONS PER AC-FT)	DISSOLVED SOLIDS (TONS PER DAY)	DISSOLVED IRON (FE) (UG/L)	DISSOLVED MANGANESE (MN) (UG/L)
JUL 18...	13	.0	12	57	.08	.25	70	40

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)
DEC 08...	0945	66	130	6.9	20.5
JAN 18...	0915	.61	107	6.7	21.0
MAR 03...	1020	2.0	95	6.8	20.0
APR 15...	1150	1.0	90	6.7	20.0
JUN 02...	1345	2.1	90	6.8	23.0
JUL 18...	1000	1.6	100	6.6	22.0
AUG 31...	1430	1.5	105	7.0	20.0

16077000 MAKALEHA DITCH NEAR KEALIA

LOCATION.--Lat 22°07'06", long 159°22'04", Hydrologic Unit 20070000, on left bank at end of last tunnel from which flow enters Mimino Reservoir, 3.9 mi (6.3 km) northwest of Kealia, and 4.0 mi (6.4 km) northwest of Kapaa.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--December 1936 to current year.

GAGE.--Water-stage recorder and Parshall flume. Datum of gage is 518 ft (158 m) above mean sea level (by stadia survey).

REMARKS.--Records good. Ditch diverts from Makaleha Stream for irrigation of sugarcane in vicinity of Kealia.

AVERAGE DISCHARGE.--40 years (water years 1938-77), 6.72 ft^3/s (0.190 m^3/s), 4,870 acre-ft/yr (6.00 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 31 ft^3/s (0.88 m^3/s) Aug. 1, 1961; no flow at times.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	7.3	7.0	5.8	.24	5.7	.09	7.3	.47	7.0	5.8	7.3	11
2	8.0	7.8	5.7	.24	6.4	.09	8.0	4.7	8.9	8.2	7.8	11
3	9.6	8.9	5.5	.24	7.0	.09	16	8.2	7.0	7.8	6.6	11
4	8.4	7.3	5.5	.02	6.0	4.0	11	10	8.7	11	6.4	8.1
5	7.5	6.8	5.6	2.1	5.8	4.9	.93	11	16	11	9.8	7.1
6	8.5	9.4	6.3	5.5	5.6	.02	.63	15	17	12	12	7.9
7	9.7	9.0	6.4	7.6	6.0	.02	.47	13	11	11	13	9.0
8	9.4	10	8.7	6.6	7.3	.02	.47	13	3.2	12	13	6.4
9	8.7	8.2	9.0	6.1	5.6	.02	.42	9.5	5.6	12	11	9.7
10	7.5	7.0	11	5.8	5.2	5.9	.33	4.5	2.1	10	9.3	11
11	7.4	7.4	9.3	6.4	5.2	9.8	6.6	9.2	1.1	16	7.4	10
12	9.9	7.5	7.4	7.3	3.6	13	9.3	6.9	.74	16	9.1	7.5
13	11	6.8	7.0	6.4	1.6	14	12	3.5	6.3	16	14	7.1
14	11	8.3	6.5	6.5	3.8	4.9	11	1.8	8.3	14	13	6.8
15	11	9.3	7.9	6.1	9.0	.02	9.4	1.1	7.4	12	10	8.9
16	11	11	6.5	5.8	8.2	.02	12	.69	11	9.4	7.9	7.0
17	8.0	9.7	6.1	5.7	8.0	.02	9.7	.47	10	13	7.3	8.6
18	4.3	8.7	5.8	5.5	7.4	3.5	6.1	.33	16	15	6.8	7.3
19	6.9	7.6	6.8	7.4	7.3	12	.87	.28	13	15	6.4	6.4
20	6.4	7.1	7.1	7.0	7.0	12	1.4	.21	11	12	6.4	6.0
21	6.3	6.8	6.0	6.2	2.9	4.3	3.8	.17	11	10	7.0	6.1
22	6.9	7.3	5.3	5.8	.02	.28	11	.14	8.0	8.4	6.4	7.0
23	7.3	6.8	4.7	5.6	.06	.04	9.3	5.7	7.1	7.1	6.1	8.4
24	6.5	5.9	4.0	5.5	.02	.04	12	7.5	7.3	4.9	7.0	7.3
25	6.5	.42	4.4	7.4	3.1	3.2	14	7.3	9.0	6.1	6.6	8.3
26	8.0	.33	3.2	7.4	11	6.5	7.0	8.2	10	7.1	9.1	6.4
27	7.4	.33	6.6	8.2	11	7.6	.58	14	14	6.8	6.9	8.2
28	10	2.6	9.3	7.6	4.0	10	.52	14	11	12	7.3	8.2
29	9.4	6.2	5.4	6.4	---	6.8	.52	10	7.9	10	7.0	7.1
30	7.6	6.2	.33	6.1	---	6.6	.47	10	2.2	9.7	8.6	6.8
31	8.0	---	.28	6.1	---	7.9	---	7.6	---	8.0	12	---
TOTAL	255.4	207.68	189.41	170.84	153.80	137.67	183.11	198.46	258.84	329.3	268.5	241.6
MEAN	8.24	6.92	6.11	5.51	5.49	4.44	6.10	6.40	8.63	10.6	8.66	8.05
MAX	11	11	11	8.2	11	14	16	15	17	16	14	11
MIN	4.3	.33	.28	.02	.02	.02	.33	.14	.74	4.9	6.1	6.0
AC-FT	507	412	376	339	305	273	363	394	513	653	533	479

CAL YR 1976 TOTAL 2241.04 MEAN 6.12 MAX 14 MIN .02 AC-FT 4450
WTR YR 1977 TOTAL 2594.61 MEAN 7.11 MAX 17 MIN .02 AC-FT 5150

HAWAII, ISLAND OF KAUAI

16077000 MAKALEHA DITCH NEAR KEALIA--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1976-77.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	COLOR (PLATINUM-COBALT UNITS)	TURBIDITY (JTU)	HARDNESS (CA,MG) (MG/L)	NONCARBONATE HARDNESS (MG/L)	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG) (MG/L)	DISSOLVED SODIUM (NA) (MG/L)	PERCENT SODIUM
OCT 19...	1355	6.6	3	1	33	8	5.4	4.9	--	--
JUL 19...	1410	14	35	5	21	3	3.3	3.1	6.4	39

DATE	SODIUM ADSORPTION RATIO	DISSOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	ALKALINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)	DISSOLVED FLUORIDE (F) (MG/L)
OCT 19...	--	1.5	31	0	25	197	7.7	11	.0
JUL 19...	.6	.3	22	0	18	5.6	2.6	9.8	.0

DATE	DISSOLVED SILICA (SIO2) (MG/L)	DISSOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	DISSOLVED SOLIDS (TONS PER AC-FT)	DISSOLVED SOLIDS (TONS PER DAY)	DISSOLVED NITRITE PLUS NITRATE (N) (MG/L)	DISSOLVED ORTHO. PHOSPHORUS (P) (MG/L)	DISSOLVED ORTHO PHOSPHATE (PO4) (MG/L)	DISSOLVED IRON (FE) (UG/L)	DISSOLVED MANGANESE (MN) (UG/L)
OCT 19...	19	--	--	--	.00	.39	1.2	30	--
JUL 19...	11	47	.06	1.85	--	--	--	80	0

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)
OCT 19...	1355	6.6	100	5.4	24.0
NOV 19...	1400	7.5	52	6.5	18.5
DEC 19...	1345	6.8	38	6.3	19.5
JAN 19...	1345	7.4	76	6.9	20.0
FEB 18...	1415	7.6	90	6.8	21.0
MAR 18...	1400	.02	110	6.8	20.0
APR 18...	1350	7.0	98	7.2	20.0
MAY 23...	1300	11	74	6.9	21.0
JUN 17...	1315	7.9	98	6.9	22.0
JUL 19...	1410	14	75	6.8	21.5
AUG 22...	1405	6.0	150	6.5	21.0
SEP 20...	1330	5.8	130	7.7	22.0

16079000 KAPAHI DITCH NEAR KEALIA

LOCATION.--Lat 22°06'09", long 159°22'28", Hydrologic Unit 20070000, on right bank 500 ft (152 m) downstream from intake and 4.0 mi (6.4 km) west of Kealia.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--April 1909 to February 1911, May 1911, July 1911 to May 1914, July 1915 to April 1917, June 1917 to current year. Published as "at Kapahi, near Kapaa" prior to January 1914 and as "at Kapahi, near Kealia" January to December 1913.

GAGE.--Water-stage recorder and Parshall flume. Datum of gage is 377.1 ft (114.94 m) above mean sea level (by stadia survey). Prior to Nov. 26, 1936, at site 61 ft (19 m) upstream at datum 2.52 ft (0.768 m) higher.

REMARKS.--Records good. Ditch diverts from Kapaa Stream for irrigation of sugarcane in vicinity of Kapaa.

AVERAGE DISCHARGE.--59 years (water years, 1918-20, 1922-77), 6.35 ft^3/s (0.180 m^3/s), 4,600 acre-ft/yr (5.67 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 138 ft^3/s (3.91 m^3/s) Feb. 6, 1913; no flow at times.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.3	2.9	2.9	.58	2.5	8.0	3.2	2.2	3.8	4.4	2.6	5.5
2	6.3	5.7	2.8	.58	3.0	12	5.2	4.3	3.8	4.1	3.6	8.6
3	8.7	4.7	2.8	.58	3.3	15	9.4	5.6	3.5	3.8	3.2	5.9
4	4.6	2.8	2.8	.58	2.8	14	4.3	5.6	3.6	6.1	2.8	2.5
5	3.3	2.6	2.8	4.2	2.6	13	6.6	2.7	2.2	4.2	8.3	2.6
6	13	12	6.0	2.6	2.5	15	11	.58	1.1	5.2	13	2.5
7	8.3	3.9	8.6	12	2.5	17	6.8	.51	.38	4.9	22	3.5
8	4.8	8.0	7.4	3.6	3.0	18	1.3	.51	1.0	5.7	19	2.8
9	3.6	3.6	7.4	2.9	2.5	13	.31	.88	.31	4.7	6.1	3.5
10	3.0	2.9	22	2.8	2.5	8.4	.31	1.3	.19	5.2	3.9	7.3
11	2.9	2.8	5.7	8.4	2.5	5.0	1.8	2.1	.19	18	3.2	3.9
12	9.2	2.8	3.2	8.5	3.6	7.6	3.3	2.4	.19	21	6.8	3.2
13	13	2.8	2.9	3.3	5.9	7.2	7.3	.60	6.0	35	15	2.6
14	24	3.0	2.8	3.5	9.0	6.4	4.9	.51	5.7	10	5.9	2.5
15	5.4	5.7	3.5	2.8	41	6.4	3.2	.45	5.6	6.0	3.6	2.6
16	.38	15	2.9	2.6	15	8.6	6.7	1.1	5.9	4.1	4.1	2.4
17	.38	5.9	2.8	2.6	5.4	13	3.6	3.2	8.0	7.6	3.3	2.9
18	3.8	4.1	2.6	2.5	5.0	13	6.4	1.8	16	27	3.0	2.6
19	4.6	3.0	4.0	11	3.6	9.2	5.8	.74	7.0	14	2.8	2.4
20	4.2	.51	3.7	6.1	3.0	14	.38	1.4	5.7	5.7	2.8	2.4
21	4.7	.51	2.5	3.3	5.7	12	.60	3.3	5.2	4.1	2.8	2.4
22	3.6	1.1	2.9	2.8	14	13	1.1	2.8	4.7	3.6	2.5	2.5
23	3.5	2.9	3.2	2.6	19	13	.98	4.1	4.1	3.6	2.3	2.8
24	3.2	2.2	3.6	2.6	17	13	1.3	4.9	3.9	4.9	2.3	2.9
25	3.0	.38	11	41	15	8.3	5.8	4.6	4.2	3.5	2.3	2.8
26	3.9	.45	7.4	12	8.7	3.2	9.6	4.6	4.7	2.9	4.0	2.5
27	3.2	.45	11	5.6	.45	3.3	.38	11	10	2.8	2.6	9.6
28	9.7	2.1	3.5	3.9	8.2	4.6	1.3	7.5	9.8	8.9	2.3	3.9
29	5.9	3.2	1.9	2.9	---	3.5	1.3	4.9	15	3.5	2.3	3.0
30	3.0	3.2	.66	2.8	---	7.6	2.6	4.9	10	3.3	2.5	2.9
31	3.0	---	.58	2.8	---	3.3	---	4.1	---	2.8	14	---
TOTAL	173.46	111.20	147.84	164.02	209.25	308.6	116.76	95.18	151.76	240.6	174.9	107.5
MEAN	5.60	3.71	4.77	5.29	7.47	9.95	3.89	3.07	5.06	7.76	5.64	3.58
MAX	24	15	22	41	41	18	11	11	16	35	22	9.6
MIN	.38	.38	.58	.58	.45	3.2	.31	.45	.19	2.8	2.3	2.4
AC-FT	344	221	293	325	415	612	232	189	301	477	347	213

CAL YR 1976 TOTAL 2137.00 MEAN 5.84 MAX 29 MIN .00 AC-FT 4240
WTR YR 1977 TOTAL 2001.07 MEAN 5.48 MAX 41 MIN .19 AC-FT 3970

HAWAII, ISLAND OF KAUAI

16079000 KAPAHI DITCH NEAR KEALIA--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1976-77.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTAN-TANEOUS DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)
OCT					
19...	1500	4.7	60	5.6	24.0
NOV					
19...	1530	3.3	50	6.5	19.0
DEC					
20...	1535	2.6	40	6.5	20.0
JAN					
19...	1525	7.0	30	6.9	20.0
FEB					
18...	1515	4.3	120	7.2	21.5
MAR					
22...	1215	14	110	7.3	19.5
APR					
18...	1530	4.5	120	7.5	20.0
MAY					
23...	1445	5.9	122	7.2	23.5
JUN					
17...	1425	5.0	130	7.3	22.5
JUL					
19...	1535	28	81	6.9	21.5
AUG					
22...	1530	2.5	160	7.4	22.0
SEP					
20...	1510	2.5	132	7.9	24.0

16080000 KAPAA STREAM AT KAPAHI DITCH INTAKE, NEAR KAPAA

LOCATION.--Lat 22°06'15", long 159°22'29", Hydrologic Unit 20070000, on right bank at Kapahi ditch intake, 3.8 mi (6.1 km) northwest of Kapaa, and 4.3 mi (6.9 km) northwest of Wailua.

DRAINAGE AREA.--3.86 mi² (10.00 km²).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--July 1936 to current year. Prior to July 1959, published as Kapaa River at Kapahi ditch intake, near Kapaa.

REVISED RECORDS.--WSP 2137: Drainage area.

GAGE.--Water-stage recorder and concrete-masonry control. Datum of gage is 381.8 ft (116.37 m) above mean sea level (by stadia survey). Prior to July 1, 1962, at datum 0.07 ft (0.021 m) higher.

REMARKS.--Records good. Entire low flow is diverted above station at times for irrigation of sugarcane. Records do not include flow of Kapahi ditch (see sta 16079000).

AVERAGE DISCHARGE.--41 years (20.6 ft³/s (0.583 m³/s), 14,920 acre-ft/yr (18.4 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 7,670 ft³/s (217 m³/s) Jan. 25, 1956, gage height, 5.41 ft (1.649 m), present datum, from rating curve extended above 2,800 ft³/s (79.3 m³/s); no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,530 ft³/s (43.3 m³/s) May 9, gage height, 2.72 ft (0.829 m); no peak above base of 1,900 ft³/s (53.8 m³/s); no flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	6.9	.00	17	.00	13	.00	2.9	.00	.00
2	.73	.00	.00	9.9	.00	17	5.8	4.0	.00	.00	.00	7.0
3	.54	.00	.00	11	.00	31	43	.00	.00	.00	.00	.30
4	.00	.00	.00	8.3	.00	8.4	57	.10	.00	.03	.00	.29
5	.00	.00	.00	1.6	.00	.02	13	2.9	56	.00	2.2	.00
6	4.2	.44	.00	.00	.00	.00	2.8	17	15	.00	1.2	.00
7	.00	.00	.00	3.3	.00	1.9	4.2	7.6	53	.00	2.7	.06
8	.00	4.0	.00	.00	.00	4.2	7.6	15	129	.00	12	.00
9	.00	.00	.00	.00	.00	8.3	9.9	84	54	.00	.00	.00
10	.00	.00	.91	.00	.00	5.0	9.9	181	27	.90	.00	6.0
11	.00	.00	.00	2.6	.00	.00	5.4	199	18	5.4	.00	.00
12	6.6	.00	.00	.00	.00	2.4	.00	258	17	.00	8.2	.00
13	1.4	.00	.00	.00	.00	8.3	2.7	48	4.2	3.4	78	.00
14	79	.00	.00	.00	20	28	.00	25	.00	.00	9.5	.00
15	59	19	.00	.00	95	19	.00	19	.00	.00	2.2	.00
16	12	68	.00	.00	8.7	6.6	3.2	16	.00	.00	.00	.00
17	7.6	.42	.00	.00	4.2	.00	.00	12	2.6	.06	.00	.00
18	3.7	.00	.00	.00	.00	.00	2.5	11	1.5	9.6	.00	.00
19	.00	.19	.00	.18	.00	.00	78	11	.00	.19	.00	.00
20	.00	2.2	.00	.00	.00	1.3	48	9.9	.00	.00	.00	.00
21	.00	1.5	.00	.00	.00	.00	26	13	.00	.00	.00	.00
22	.00	1.4	.00	.00	34	.00	5.5	13	.00	.00	.00	.00
23	.00	.00	.00	.00	48	.00	4.5	5.8	.00	.00	.00	.00
24	.00	.73	.00	.00	1.9	.00	13	.00	.00	.00	.00	.00
25	.00	9.1	.00	28	7.8	.00	19	.00	.00	.00	.00	.00
26	.00	8.3	.00	.00	13	.00	28	.00	.00	.00	.00	.00
27	.00	8.3	13	.00	38	.00	25	2.9	.00	.00	.00	.84
28	.19	3.7	.58	.00	42	.00	28	.06	13	.26	.00	.00
29	.00	.00	4.7	.00	---	.00	74	.00	.00	.00	.00	.00
30	.00	.00	9.1	.00	---	.00	17	.00	3.4	.00	.00	.00
31	.00	---	7.6	.00	---	.00	---	.00	---	.00	6.5	---
TOTAL	174.96	127.28	35.89	71.78	312.60	158.42	533.00	968.26	393.70	22.74	122.50	14.49
MEAN	5.64	4.24	1.16	2.32	11.2	5.11	17.8	31.2	13.1	.73	3.95	.48
MAX	79	68	13	28	95	31	78	258	129	9.6	78	7.0
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	347	252	71	142	620	314	1060	1920	781	45	243	29

CAL YR 1976 TOTAL 4225.94 MEAN 11.5 MAX 300 MIN .00 AC-FT 8380
WTR YR 1977 TOTAL 2935.62 MEAN 8.04 MAX 258 MIN .00 AC-FT 5820

HAWAII, ISLAND OF KAUAI

16080000 KAPAA STREAM AT KAPAHI DITCH INTAKE, NEAR KAPAA--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1976-77.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTAN-TANEOUS DIS-CHARGE (CFS)	COLOR (PLAT-INUM-COBALT UNITS)	TUR-BID-ITY (JTU)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	DIS-SOLVED SODIUM (NA) (MG/L)	PERCENT SODIUM
JAN 21...	1455	7.0	7	2	43	7	5.6	7.1	8.8	30
JUL 28...	0935	6.6	5	3	43	4	7.0	6.3	8.7	30

DATE	SODIUM AD-SORP-TION RATIO	DIS-SOLVED PO-TAS-SIUM (K) (MG/L)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DIS-SOLVED SULFATE (SO4) (MG/L)	DIS-SOLVED CHLO-RIDE (CL) (MG/L)	DIS-SOLVED FLUO-RIDE (F) (MG/L)
JAN 21...	.6	.4	44	0	36	.7	5.4	13	.0
JUL 28...	.6	.5	48	0	39	3.1	2.0	12	.0

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTI-TUENTS) (MG/L)	DIS-SOLVED SOLIDS (TONS PER AC-FT)	DIS-SOLVED SOLIDS (TONS PER DAY)	DIS-SOLVED NITRITE PLUS NITRATE (N) (MG/L)	DIS-SOLVED ORTHO. PHOS-PHORUS (P) (MG/L)	DIS-SOLVED ORTHO PHOS-PHATE (PO4) (MG/L)	DIS-SOLVED IRON (FE) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)
JAN 21...	21	83	.11	1.57	.03	.05	.15	200	10
JUL 28...	16	76	.10	1.35	--	--	--	170	0

DATE	TIME	INSTAN-TANEOUS DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)
JAN 21...	1455	7.0	117	8.0	19.0
FEB 25...	1110	11	85	7.0	20.5
APR 22...	1025	6.3	125	7.1	19.5
JUL 28...	0935	6.6	125	7.4	24.5

HAWAII, ISLAND OF KAUAI

16087000 ANAHOLA DITCH WASTEWAY NEAR KEALIA

LOCATION.--Lat 22°08'16", long 159°22'28", Hydrologic Unit 20070000, on right bank 300 ft (91 m) downstream from wasteway gates on Anahola ditch, 500 ft (152 m) north of Kaneha Reservoir, 3.8 mi (6.1 km) west of Anahola and 4.9 mi (7.9 km) northwest of Kealia.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--July 1936 to current year.

GAGE.--Water-stage recorder and sharp-crested weir. Datum of gage is 825 ft (251 m) above mean sea level (by stadia survey).

REMARKS.--Records good. Water that passes station flows into Kaupaku Stream and thence into Anahola Stream 2 mi (3 km) below gaging station 16089000 on Anahola Stream.

AVERAGE DISCHARGE.--41 years, 4.64 ft^3/s (0.131 m^3/s), 3,360 acre-ft/yr (4.14 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 84 ft^3/s (2.38 m^3/s) Nov. 12, 1955; no flow at times.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.78	1.3	.47	.47	.11	.04	.02	5.7	.11	.11	.11	.04
2	.62	1.3	.33	.47	.11	.04	.02	3.5	.11	.11	.19	.04
3	.33	.94	.33	.33	.11	.11	.02	.47	.11	.11	.11	.04
4	.33	1.3	.33	.11	.11	.11	8.5	.47	.11	.19	.11	.04
5	.62	1.5	.33	.19	.11	.19	13	.47	.11	.19	.19	.04
6	.94	1.5	.47	.33	.11	.19	9.3	.33	.04	.19	.19	.04
7	.62	1.3	.62	.33	.11	.19	7.4	.19	.04	.19	.62	.04
8	.94	1.3	.62	.33	.04	.19	6.3	.19	.11	.19	.78	.04
9	.94	1.3	.47	.33	.04	.19	5.7	1.9	.11	.19	.47	.04
10	1.1	1.3	.47	.47	.04	.19	5.4	20	.04	.19	.19	.04
11	.94	1.3	.47	.47	.04	.11	5.4	22	.00	.19	.11	.04
12	.94	1.3	.33	.47	.04	.11	1.6	28	.00	.19	.19	.04
13	.78	1.3	.33	.33	.04	.11	.33	16	.00	.11	.19	.04
14	.62	1.3	.33	.33	.04	.19	.19	12	.00	.04	.04	.04
15	.62	1.3	.33	.33	.04	.19	.19	9.6	.00	.04	.04	.04
16	.78	.94	.47	.19	.04	.19	.19	8.3	.04	.04	.04	.04
17	.78	3.6	.47	.19	.04	.19	.19	7.4	.04	.04	.04	.11
18	.78	6.0	.47	.20	.04	.11	.04	4.2	.19	.11	.04	.19
19	.94	5.1	.47	.15	.04	.04	9.5	.78	.11	.08	.04	.19
20	.94	4.4	.47	.19	.04	.04	9.3	.47	.11	.11	.11	.08
21	.94	4.1	.47	.11	.04	.03	.33	.33	.11	.68	.11	.11
22	1.1	6.6	.47	.04	.04	.02	.19	.33	.11	.35	.11	.19
23	.94	4.4	.33	.04	.11	.02	.11	.33	.02	.33	.11	.33
24	.94	4.4	.33	.11	.04	.02	.11	.19	.00	.19	.11	.33
25	1.1	4.9	.33	.19	.11	.02	.00	.11	.02	.19	.11	.47
26	.94	4.6	.33	.04	.04	.03	.00	.19	.11	.19	.11	.11
27	.94	4.6	.47	.04	.04	.04	.00	.19	.11	.19	.11	.04
28	.94	1.5	.47	.04	.04	.19	.00	.11	.19	.33	.11	.04
29	.94	.47	.47	.04	---	.04	.00	.11	.11	.19	.04	.04
30	.78	.33	.47	.04	---	.04	1.2	.11	.19	.19	.04	.04
31	1.1	---	.47	.11	---	.03	---	.04	---	.11	.04	---
TOTAL	26.00	75.48	13.19	7.01	1.75	3.20	84.53	144.01	2.35	5.55	4.80	2.91
MEAN	.84	2.52	.43	.23	.063	.10	2.82	4.65	.078	.18	.15	.097
MAX	1.1	6.6	.62	.47	.11	.19	13	28	.19	.68	.78	.47
MIN	.33	.33	.33	.04	.04	.02	.00	.04	.00	.04	.04	.04
AC-FT	52	150	26	14	3.5	6.3	168	286	4.7	11	9.5	5.8

CAL YR 1976 TOTAL 975.57 MEAN 2.67 MAX 19 MIN .04 AC-FT 1940
WTR YR 1977 TOTAL 370.78 MEAN 1.02 MAX 28 MIN .00 AC-FT 735

16087000 ANAHOLA DITCH WASTEWAY NEAR KEALIA--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1976-77.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)
OCT					
19...	1115	.86	49	6.6	23.5
NOV					
19...	1110	5.0	55	6.6	18.5
DEC					
29...	1140	.50	60	6.6	19.0
JAN					
19...	1040	.10	40	6.5	20.0
FEB					
18...	1055	.04	70	6.7	20.0
MAR					
18...	1200	.06	90	6.3	20.0
APR					
18...	1115	.14	90	6.5	19.5
MAY					
31...	0930	.07	80	6.8	23.5
JUN					
17...	1025	.05	78	6.5	22.5
JUL					
19...	1035	.07	63	6.4	23.0
AUG					
22...	1030	.07	100	6.2	21.0
SEP					
29...	1045	.06	90	6.4	23.5

16088000 ANAHOLA DITCH ABOVE KANEHA RESERVOIR, NEAR KEALIA

LOCATION.--Lat 22°08'10", long 159°22'28", Hydrologic Unit 20070000, on left bank at point of discharge into Kaneha Reservoir, 500 ft (152 m) below wasteway gates, and 4.8 mi (7.7 km) northwest of Kealia.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--December 1921 to current year. Records for May 1915 to December 1921 at site 520 ft (158 m) upstream not equivalent owing to intervening diversion.

GAGE.--Water-stage recorder and Parshall flume. Datum of gage is 821.8 ft (250.48 m) above mean sea level (Lihue Plantation bench mark). Dec. 9, 1921, to June 2, 1934, at site 480 ft (146 m) upstream at different datum.

REMARKS.--Records good. Ditch diverts water from Anahola Stream to Kaneha Reservoir, where it is stored for irrigation. Flow sometimes diverted above station by Anahola ditch wasteway (see sta 16087000).

AVERAGE DISCHARGE.--53 years (water years, 1923-25, 1928-77), 4.14 ft^3/s (0.117 m^3/s), 3,000 acre-ft/yr (3.70 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 62 ft^3/s (1.76 m^3/s) Nov. 12, 1947; no flow at times.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.4	2.3	1.7	1.4	2.3	12	3.5	1.0	3.6	4.1	3.0	4.6
2	5.9	5.5	1.6	3.5	2.2	11	13	2.5	3.5	3.6	4.4	6.8
3	5.4	3.8	1.4	5.0	2.4	15	21	4.8	3.3	3.3	3.8	4.6
4	2.6	2.0	1.4	1.8	2.3	8.7	8.9	6.2	3.5	4.8	2.9	2.8
5	1.9	1.8	1.4	1.4	2.0	7.2	.20	9.1	13	3.9	4.2	2.4
6	6.4	3.6	2.8	2.3	1.8	5.9	.13	13	11	5.3	5.3	2.9
7	4.9	4.4	7.2	6.7	1.8	6.8	.13	8.2	14	4.6	8.2	3.8
8	4.2	7.0	6.2	2.0	3.6	8.2	.09	8.7	8.9	4.8	8.7	2.4
9	3.6	2.6	7.2	1.6	2.0	11	.06	12	11	4.4	5.7	3.2
10	2.0	2.0	13	1.4	1.8	8.0	.06	.43	10	4.1	4.1	7.9
11	1.9	2.0	5.3	4.2	1.7	5.7	.04	.38	6.6	10	3.5	3.8
12	6.1	3.3	3.3	4.4	1.7	9.1	2.9	.44	6.6	9.3	5.3	2.8
13	10	2.2	2.8	3.5	1.8	12	6.6	.28	5.7	12	11	2.4
14	19	2.4	2.3	3.2	5.0	12	5.9	.20	4.6	7.2	6.4	2.4
15	15	6.1	2.4	1.8	22	8.7	3.9	.20	4.1	6.4	5.0	2.9
16	8.7	16	2.0	1.6	13	5.5	7.2	.20	6.2	5.0	4.3	2.3
17	5.7	3.3	1.8	1.4	5.9	5.3	6.8	.16	5.7	6.1	3.8	2.8
18	4.1	.09	1.7	2.0	4.3	6.8	4.1	2.5	9.3	8.9	3.6	2.6
19	3.5	.09	3.2	8.2	3.5	10	2.3	5.3	5.7	6.4	3.5	2.2
20	3.3	.09	2.4	8.4	2.9	10	4.7	5.1	4.8	5.1	3.2	1.9
21	2.8	.06	1.6	4.3	2.6	5.9	10	5.7	5.3	4.7	3.0	1.9
22	3.9	.06	1.4	2.6	8.3	5.0	7.2	7.0	3.9	3.8	2.9	2.2
23	3.2	.04	1.2	2.3	22	5.3	5.9	6.4	3.6	3.5	2.6	2.8
24	2.0	.00	1.2	3.7	8.9	4.1	10	4.6	3.6	3.3	2.6	2.9
25	2.0	.00	3.7	19	14	3.5	9.8	4.1	4.1	3.3	2.2	4.8
26	2.4	.00	2.2	7.0	14	3.2	14	4.1	7.8	3.3	2.6	2.6
27	2.2	.00	7.5	4.6	15	4.1	11	7.7	7.6	3.0	2.2	2.0
28	8.2	.98	3.9	3.6	14	4.4	12	7.2	7.9	6.8	2.3	1.9
29	3.5	4.4	2.2	3.0	---	3.0	14	5.0	6.8	5.0	2.0	1.9
30	3.0	2.4	1.8	2.8	---	5.3	7.2	4.8	6.2	3.5	3.2	1.8
31	4.1	---	1.6	2.6	---	4.1	---	4.1	---	3.3	9.5	---
TOTAL	152.9	78.51	99.4	121.3	182.8	226.8	192.61	141.39	197.9	162.8	135.0	92.3
MEAN	4.93	2.62	3.21	3.91	6.53	7.32	6.42	4.56	6.60	5.25	4.35	3.08
MAX	19	16	13	19	22	15	21	13	14	12	11	7.9
MIN	1.4	.00	1.2	1.4	1.7	3.0	.04	.16	3.3	3.0	2.0	1.8
AC-FT	303	156	197	241	363	450	382	280	393	323	268	183

CAL YR 1976 TOTAL 1314.42 MEAN 3.59 MAX 21 MIN .00 AC-FT 2610
WTR YR 1977 TOTAL 1783.71 MEAN 4.89 MAX 22 MIN .00 AC-FT 3540

16088000 ANAHOLA DITCH ABOVE KANEHA RESERVOIR, NEAR KEALIA--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1976-77.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	COLOR (PLATINUM-COBALT UNITS)	TURBIDITY (JTU)	HARDNESS (CA,MG) (MG/L)	NONCARBONATE HARDNESS (MG/L)	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG) (MG/L)	DISSOLVED SODIUM (NA) (MG/L)	PERCENT SODIUM
OCT 19...	1010	3.6	3	2	22	7	2.7	3.8	7.0	40
JUL 19...	0925	5.9	45	10	18	5	2.0	3.1	6.4	43

DATE	SODIUM AD-SORPTION RATIO	DISSOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	ALKALINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)	DISSOLVED FLUORIDE (F) (MG/L)
OCT 19...	.6	.5	19	0	16	7.6	5.1	11	.0
JUL 19...	.7	.4	15	0	12	6.0	2.1	11	.0

DATE	DISSOLVED SILICA (SIO2) (MG/L)	DISSOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	DISSOLVED SOLIDS (TONS PER AC-FT)	DISSOLVED SOLIDS (TONS PER DAY)	DISSOLVED NITRITE PLUS NITRATE (N) (MG/L)	DISSOLVED ORTHO. PHOSPHORUS (P) (MG/L)	DISSOLVED ORTHO PHOSPHATE (PO4) (MG/L)	DISSOLVED IRON (FE) (UG/L)	DISSOLVED MANGANESE (MN) (UG/L)
OCT 19...	9.5	49	.37	.88	.01	.01	.03	50	--
JUL 19...	6.7	39	.05	.62	--	--	--	90	0

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)
OCT 19...	1010	3.6	80	6.6	22.5
NOV 19...	0955	.10	55	6.7	18.0
DEC 20...	0955	2.5	60	6.7	19.0
JAN 19...	1010	7.3	44	6.6	19.5
FEB 18...	1000	4.1	79	6.8	20.0
MAR 18...	1225	5.9	80	6.3	20.0
APR 18...	1005	3.8	90	6.6	19.5
MAY 23...	0950	9.1	72	6.7	20.5
JUN 17...	0945	4.7	74	6.7	22.5
JUL 19...	0925	5.9	67	6.6	22.0
AUG 22...	0930	3.1	110	6.2	21.0
SEP 20...	0930	1.9	88	7.2	22.5

HAWAII, ISLAND OF KAUAI

16089000 ANAHOLA STREAM NEAR KEALIA

LOCATION.--Lat 22°09'05", long 159°21'17", Hydrologic Unit 20070000, on right bank at intake of Lower Anahola ditch and 4.7 mi (7.6 km) northwest of Kealia.

DRAINAGE AREA.--4.27 mi² (11.06 km²).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--August to December 1910, January 1913 to November 1918, January 1919, March 1919 to current year. Monthly discharge only for some periods, published in WSP 1319. Published as Anahola River above dam at Kiokala, near Kealia prior to July 1913 and as Anahola River near Kealia July 1913 to June 1958.

REVISED RECORDS (FISCAL YEARS).--WSP 1719: 1915, 1916-18(M). (WATER YEAR).--WSP 2137: 1965(P), drainage area.

GAGE.--Water-stage recorder and combination concrete dam and orifice control. Datum of gage is 295.11 ft (89.950 m) above mean sea level (Highway Department bench mark). Prior to May 4, 1934, at site 0.1 mi (0.2 km) upstream at different datum.

REMARKS.--Records poor. Records include flow in Lower Anahola ditch (see sta 16091000). Anahola ditch (see sta 16088000) diverts 3 mi (5 km) above station for irrigation in vicinity of Kealia.

AVERAGE DISCHARGE.--62 years (water years, 1914-17, 1920-77), 22.6 ft³/s (0.640 m³/s), 16,370 acre-ft/yr (20.2 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 19,600 ft³/s (555 m³/s) Jan. 25, 1956, gage height, 14.6 ft (4.45 m), from floodmarks, from rating curve extended above 590 ft³/s (16.7 m³/s); minimum, 1.9 ft³/s (0.054 m³/s) Oct. 30 to Nov. 1, Nov. 7-11, 1973.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,320 ft³/s (37.4 m³/s) May 12, gage height, 4.84 ft (1.475 m); no peak above base of 2,200 ft³/s (62.3 m³/s); minimum, 3.9 ft³/s (0.110 m³/s) Oct. 1, 2.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.0	4.8	5.6	4.5	5.6	12	7.6	13	9.0	8.4	6.4	8.8
2	19	7.7	5.5	4.6	5.7	12	148	12	8.8	7.6	6.4	11
3	9.7	5.5	5.3	5.6	5.5	15	185	12	8.6	7.2	6.8	13
4	6.0	4.2	5.3	4.5	5.3	10	141	12	8.8	7.8	5.8	6.5
5	4.7	4.1	5.6	4.4	5.1	9.6	41	12	58	7.4	7.9	5.6
6	13	4.8	6.8	4.7	5.0	8.8	29	29	28	8.0	13	6.0
7	10	5.2	12	17	5.1	8.8	24	14	64	7.7	23	6.1
8	5.6	9.0	9.8	5.2	5.1	8.8	21	14	23	7.6	35	5.3
9	5.6	4.8	16	4.6	4.7	10	20	72	56	7.8	16	5.8
10	4.5	4.2	60	4.3	4.6	9.2	19	188	31	7.6	11	13
11	4.3	4.1	13	5.3	4.6	7.7	16	168	19	33	7.8	6.1
12	6.5	5.2	9.6	7.8	4.6	8.6	16	344	17	31	13	5.0
13	10	4.6	8.2	6.0	4.7	9.8	17	60	14	54	83	4.8
14	81	4.3	7.6	7.0	66	10	16	30	14	21	25	4.6
15	56	23	7.2	4.7	94	9.2	15	22	13	19	17	4.7
16	13	102	6.5	4.3	18	7.1	17	19	12	15	13	4.6
17	9.6	11	6.1	4.1	11	6.5	16	18	12	16	11	5.2
18	8.6	8.0	5.7	4.4	9.8	7.4	16	17	18	28	10	4.7
19	7.7	6.8	5.3	17	8.6	8.4	67	16	11	19	8.4	4.6
20	7.2	6.1	5.3	23	7.8	10	41	14	10	15	7.8	4.4
21	6.9	5.8	4.7	8.0	7.1	7.1	20	14	10	15	7.7	4.4
22	6.1	7.2	4.6	5.7	32	6.6	13	14	9.8	14	7.4	4.2
23	7.2	6.0	4.4	4.9	75	6.4	13	13	9.4	12	7.1	4.4
24	5.7	5.6	4.4	14	12	6.0	28	12	4.4	11	7.2	6.0
25	5.6	5.6	5.2	52	20	5.6	19	12	9.4	11	6.6	6.2
26	5.6	5.5	5.5	11	18	5.3	31	11	12	10	7.1	4.8
27	5.1	5.3	17	9.6	21	5.7	17	14	13	9.8	6.6	4.4
28	14	5.2	8.2	7.6	25	6.4	17	12	12	17	6.4	4.6
29	6.4	8.6	5.5	6.5	---	5.8	36	11	12	8.8	5.8	5.6
30	5.3	6.8	4.9	6.1	---	6.5	14	9.8	9.6	6.6	6.0	4.6
31	5.5	---	4.6	5.8	---	6.4	---	9.5	---	6.5	20	---
TOTAL	359.3	291.0	275.4	274.2	490.9	256.7	1080.6	1218.3	541.8	449.8	415.2	179.0
MEAN	11.6	9.70	8.88	8.85	17.5	8.28	36.0	39.3	18.1	14.5	13.4	5.97
MAX	81	102	60	52	94	15	185	344	64	54	83	13
MIN	4.0	4.1	4.4	4.1	4.6	5.3	7.6	9.5	8.6	6.5	5.8	4.2
AC-FT	713	577	546	544	974	509	2140	2420	1070	892	824	355

CAL YR 1976 TOTAL 7004.6 MEAN 19.1 MAX 439 MIN 3.7 AC-FT 13890
WTR YR 1977 TOTAL 5832.2 MEAN 16.0 MAX 344 MIN 4.0 AC-FT 11570

16089000 ANAHOLA STREAM NEAR KEALIA--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1976-77.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	COLOR (PLATINUM-COBALT UNITS)	TURBIDITY (JTU)	HARDNESS (CA,MG) (MG/L)	NONCARBONATE HARDNESS (MG/L)	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG) (MG/L)	DISSOLVED SODIUM (NA) (MG/L)	PERCENT SODIUM
OCT										
28...	1255	14	100	20	12	8	1.4	2.0	5.1	47
JUL										
28...	1405	34	5	3	44	10	8.0	5.9	9.4	31

DATE	SODIUM ADSORPTION RATIO	DISSOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	ALKALINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)	DISSOLVED FLUORIDE (F) (MG/L)
OCT									
28...	.6	.5	4	0	3	.4	7.5	8.8	.0
JUL									
28...	.6	.5	42	0	34	2.1	1.9	15	.0

DATE	DISSOLVED SILICA (SIO2) (MG/L)	DISSOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	DISSOLVED SOLIDS (TONS PER AC-FT)	DISSOLVED SOLIDS (TONS PER DAY)	DISSOLVED NITRITE PLUS NITRATE (N) (MG/L)	DISSOLVED ORTHO. PHOSPHORUS (P) (MG/L)	DISSOLVED ORTHO PHOSPHATE (PO4) (MG/L)	DISSOLVED IRON (FE) (UG/L)	DISSOLVED MANGANESE (MN) (UG/L)
OCT									
28...	3.5	31	.04	1.17	.03	.01	.03	350	10
JUL									
28...	12	73	.10	6.70	--	--	--	40	0

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)
OCT					
28...	1255	14	54	7.2	20.0
NOV					
29...	1220	5.5	95	7.0	19.0
DEC					
21...	1045	4.7	85	7.0	19.0
JAN					
21...	1250	8.1	85	7.0	18.5
FEB					
23...	1430	72	65	6.6	19.5
MAR					
29...	1005	6.0	110	7.3	21.0
APR					
22...	1405	13	95	7.2	20.5
MAY					
31...	1040	9.4	111	7.7	23.5
JUN					
27...	1110	12	105	7.3	23.5
JUL					
29...	1405	34	119	7.5	27.0
AUG					
29...	1040	5.7	92	6.9	22.0

16091000 LOWER ANAHOLA DITCH NEAR KEALIA

LOCATION.--Lat 22°08'14", long 159°19'31", Hydrologic Unit 20070000, on left bank 100 ft (30 m) downstream from last wasteway, 1.5 mi (2.4 km) southwest of mouth of Anahola Stream, and 2.8 mi (4.5 km) northwest of Kealia.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--December 1936 to current year.

GAGE.--Water-stage recorder and Parshall flume. Datum of gage is 276.11 ft (84.158 m) above mean sea level (Highway Department bench mark).

REMARKS.--Records good. Ditch diverts from Anahola Stream for irrigation of sugarcane in vicinity of Anahola.

AVERAGE DISCHARGE.--40 years (water years 1938-77), 3.13 ft^3/s (0.089 m^3/s), 2,270 acre-ft/yr (2.80 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 18.6 ft^3/s (0.53 m^3/s) June 1, 1938; no flow at times each year.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.4	6.1	4.8	.02	6.2	6.4	4.7	.06	.06	.02	3.6	3.6
2	4.1	6.2	4.9	.02	6.1	6.7	.42	.13	.09	.02	3.5	3.6
3	4.3	6.0	4.9	.02	6.2	6.6	.20	1.4	.13	.02	3.5	3.4
4	4.9	6.5	3.3	1.4	6.0	6.0	.09	4.1	.13	.04	3.2	3.0
5	4.0	6.0	3.0	3.4	3.3	4.2	.13	4.1	.06	.06	3.5	2.7
6	4.1	3.4	4.2	4.4	3.0	8.2	.17	3.0	.12	.06	3.9	2.9
7	4.8	3.4	3.8	5.9	4.2	5.9	.13	.17	.09	.75	4.4	3.3
8	4.2	7.0	3.9	4.6	3.9	6.9	.06	.17	.09	1.7	4.8	3.3
9	3.5	6.1	3.4	4.2	3.8	6.8	.09	.15	.06	1.4	4.6	3.1
10	3.3	5.6	4.6	6.0	4.1	7.1	.09	.19	.12	1.4	4.1	3.0
11	4.7	5.7	4.1	6.3	3.7	6.0	.06	.04	.09	2.0	3.6	2.7
12	5.0	5.0	4.3	6.2	2.9	2.6	3.2	.04	.06	2.4	3.2	3.0
13	5.0	3.5	4.5	6.0	2.2	2.5	5.7	.02	.06	2.2	4.6	2.8
14	5.4	3.5	4.4	6.4	3.8	4.4	5.7	.02	.04	2.0	4.3	2.7
15	5.1	4.6	4.8	4.3	7.1	4.7	2.2	.02	.04	2.0	4.3	2.2
16	3.9	6.0	4.4	4.1	6.0	4.7	.06	.00	.04	2.0	4.1	2.1
17	3.5	5.2	4.7	4.9	5.1	5.0	.04	.00	.02	1.8	3.9	2.0
18	5.5	4.9	3.9	4.7	5.4	4.8	.04	.00	.02	2.2	3.9	1.9
19	6.0	5.2	3.9	4.9	3.5	2.8	.02	.00	.02	2.3	3.5	1.9
20	5.9	3.8	4.4	4.8	3.0	3.0	.06	.02	.07	2.2	3.1	2.0
21	6.0	3.5	5.1	4.4	4.8	4.8	.14	.02	.07	2.2	3.0	2.4
22	5.6	5.1	4.9	3.8	4.8	4.7	.13	.02	.03	2.0	3.4	2.2
23	3.4	4.2	3.9	3.4	6.2	4.7	.13	.02	.04	1.7	3.6	2.2
24	3.1	3.5	3.5	5.2	5.4	4.9	.13	.04	.04	1.7	3.6	2.3
25	4.9	.61	3.8	8.2	5.4	4.7	.27	.02	.04	1.8	3.4	2.3
26	5.3	.46	3.8	6.6	4.4	3.0	.19	.02	.02	1.8	3.4	2.6
27	5.7	.38	4.2	7.2	4.7	3.0	.15	.02	.02	1.9	3.3	2.6
28	5.6	1.8	5.4	7.1	6.6	4.8	.10	.02	.02	2.2	3.2	2.6
29	5.7	4.2	3.4	4.8	---	5.8	.06	.02	.02	3.0	3.1	2.6
30	3.4	5.4	.06	4.3	---	4.9	.06	.02	.02	3.7	3.2	2.5
31	3.8	---	.02	4.1	---	5.7	---	.02	---	3.6	3.8	---
TOTAL	144.1	132.85	122.28	141.66	131.8	156.3	24.52	13.87	1.73	52.17	114.6	79.5
MEAN	4.65	4.43	3.94	4.57	4.71	5.04	.82	.45	.058	1.68	3.70	2.65
MAX	6.0	7.0	5.4	8.2	7.1	8.2	5.7	4.1	.13	3.7	4.8	3.6
MIN	3.1	.38	.02	.02	2.2	2.5	.02	.00	.02	.02	3.0	1.9
AC-FT	286	264	243	281	261	310	49	28	3.4	103	227	158

CAL YR 1976 TOTAL 1121.68 MEAN 3.06 MAX 8.1 MIN .00 AC-FT 2220
WTR YR 1977 TOTAL 1115.38 MEAN 3.06 MAX 8.2 MIN .00 AC-FT 2210

16091000 LOWER ANAHOLA DITCH NEAR KEALIA--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1976-77.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)
OCT					
19...	1230	9.6	--	--	23.5
NOV					
19...	1230	7.5	64	6.9	18.5
DEC					
20...	1215	4.0	70	6.9	19.5
JAN					
19...	1220	6.0	120	6.7	20.0
FEB					
18...	1225	7.4	85	6.7	21.0
MAR					
22...	0940	7.9	95	6.8	19.0
APR					
18...	1210	.03	110	7.2	20.0
MAY					
23...	1045	.01	115	6.7	22.5
JUN					
17...	1120	.01	117	6.6	24.0
JUL					
19...	1145	2.8	109	6.5	21.5
AUG					
22...	1030	4.3	120	6.5	21.5
SEP					
20...	1130	2.0	123	7.2	24.0

16093200 ANAHOLA STREAM AT ANAHOLA

LOCATION.--Lat 22°08'42", long 159°18'59", Hydrologic Unit 20070000, on downstream side of old highway bridge at Anahola, 0.1 mi (0.2 km) upstream from Highway 56, and 0.9 mi (1.4 km) upstream from mouth.

DRAINAGE AREA.--9.24 mi² (23.93 km²).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--Annual maximum, water years 1962-65, November 1964 to current year.

REVISED RECORDS.--WSP 2137: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is at mean sea level (by stadia survey). Apr. 12, 1962, to Nov. 19, 1964, crest-stage gage at same site and datum.

REMARKS.--Records fair. Anahola and Lower Anahola ditches (see sta 16088000 and 16091000) divert above station for irrigation of sugarcane in vicinities of Kealia and Anahola, respectively.

AVERAGE DISCHARGE.--12 years (water years 1966-77), 35.2 ft³/s (0.997 m³/s), 25,500 acre-ft/yr (31.4 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 13,000 ft³/s (368 m³/s) May 15, 1965, gage height, 16.0 ft (4.88 m), from rating curve extended above 5,800 ft³/s (164 m³/s) on basis of contracted-opening measurement of peak flow; minimum, 2.1 ft³/s (0.059 m³/s) Oct. 25, 1975.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,810 ft³/s (51.3 m³/s), May 12, 1977, gage height, 9.14 ft (2.786 m), no peak above base of 2,200 ft³/s (62.3 m³/s); minimum, 4.2 ft³/s (0.12 m³/s) Sept. 30.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.5	8.0	8.7	11	8.4	23	13	32	14	14	6.1	7.6
2	23	10	8.7	12	8.7	23	191	26	14	13	5.8	7.2
3	12	10	8.4	13	9.6	30	222	18	14	12	6.5	12
4	7.6	8.0	7.2	10	8.4	21	214	16	13	12	5.8	6.1
5	5.8	7.6	6.9	10	6.1	14	66	17	72	13	6.5	5.4
6	10	6.5	8.4	11	5.8	21	40	36	47	13	10	5.4
7	13	6.9	12	32	6.9	18	32	25	80	12	17	6.1
8	6.5	16	10	13	6.9	17	29	23	31	10	30	6.1
9	6.5	11	11	11	6.9	18	28	103	87	10	12	6.1
10	5.8	9.1	84	14	6.9	17	26	298	44	10	6.9	11
11	5.4	9.6	23	14	7.2	16	25	368	28	26	5.8	6.5
12	6.5	8.7	16	21	6.5	10	18	589	27	22	6.5	5.8
13	12	7.6	14	14	6.1	13	15	137	24	57	122	5.4
14	143	6.9	13	18	21	18	16	76	19	17	25	5.4
15	91	27	13	12	152	18	17	157	18	14	13	5.4
16	21	177	13	11	45	14	20	50	18	10	9.6	5.1
17	14	16	12	12	14	14	18	43	17	12	8.4	5.8
18	13	16	11	11	13	14	18	32	24	23	7.6	5.1
19	13	14	11	30	9.6	11	104	25	18	15	7.2	4.8
20	12	11	13	41	8.7	14	60	24	16	12	6.5	4.8
21	12	10	13	10	11	12	47	29	16	10	6.5	4.8
22	10	13	13	6.9	19	12	24	36	16	10	6.9	4.8
23	10	11	11	6.1	100	11	23	28	14	9.1	6.5	4.8
24	8.4	10	10	6.1	23	11	44	19	14	8.7	6.5	5.1
25	8.7	10	10	98	33	10	43	18	14	8.7	6.1	5.4
26	9.6	10	12	18	30	8.0	47	18	16	8.7	6.1	5.8
27	11	10	27	12	32	8.4	39	20	18	8.7	6.1	4.8
28	19	9.6	26	10	39	12	28	20	16	13	5.8	4.8
29	9.6	10	15	7.6	---	12	52	25	21	9.1	6.1	5.8
30	6.9	11	14	6.9	---	9.6	39	21	14	6.9	6.1	4.5
31	6.1	---	12	6.9	---	9.6	---	16	---	6.1	18	---
TOTAL	536.9	491.5	467.3	509.5	644.7	459.6	1558	2345	784	426.0	398.9	177.7
MEAN	17.3	16.4	15.1	16.4	23.0	14.8	51.9	75.6	26.1	13.7	12.9	5.92
MAX	143	177	84	98	152	30	222	589	87	57	122	12
MIN	4.5	6.5	6.9	6.1	5.8	8.0	13	16	13	6.1	5.8	4.5
AC-FT	1060	975	927	1010	1280	912	3090	4650	1560	845	791	352

CAL YR 1976 TOTAL 9722.0 MEAN 26.6 MAX 635 MIN 4.5 AC-FT 19280
WTR YR 1977 TOTAL 8799.1 MEAN 24.1 MAX 589 MIN 4.5 AC-FT 17450

16093200 ANAHOLA STREAM AT ANAHOLA--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water year 1971-77.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	COLOR (PLATINUM-COBALT UNITS)	TURBIDITY (JTU)	HARDNESS (CA,MG) (MG/L)	NON-CARBONATE HARDNESS (MG/L)	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG) (MG/L)	DISSOLVED SODIUM (NA) (MG/L)	PERCENT SODIUM
OCT										
28...	1040	47	130	20	12	3	1.7	2.0	5.2	47
MAY										
11...	0945	460	140	100	18	5	2.6	2.9	8.6	49
JUL										
28...	1120	8.0	4	1	40	3	6.0	6.1	14	43

DATE	SODIUM ADSORPTION RATIO	DISSOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	ALKALINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)	DISSOLVED FLUORIDE (F) (MG/L)
OCT									
28...	.6	.4	12	0	10	.8	4.7	9.0	.0
MAY									
11...	.9	1.0	16	0	13	4.1	4.1	16	.0
JUL									
28...	1.0	.5	45	0	37	4.5	5.2	15	.1

DATE	DISSOLVED SILICA (SIO2) (MG/L)	DISSOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	DISSOLVED SOLIDS (TONS PER AC-FT)	DISSOLVED SOLIDS (TONS PER DAY)	DISSOLVED NITRITE PLUS NITRATE (N) (MG/L)	DISSOLVED ORTHO. PHOSPHORUS (P) (MG/L)	DISSOLVED ORTHO PHOSPHATE (PO4) (MG/L)	DISSOLVED IRON (FE) (UG/L)	DISSOLVED MANGANESE (MN) (UG/L)
OCT									
28...	3.3	33	.04	4.19	.00	.01	.03	260	0
MAY									
11...	7.1	51	.07	63.3	.13	.01	.03	110	20
JUL									
28...	13	32	.11	1.77	--	--	--	130	0

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)
OCT					
28...	1040	47	55	7.4	21.5
NOV					
24...	1040	22	120	6.8	19.0
DEC					
21...	1245	13	95	7.2	19.5
JAN					
21...	1040	11	100	7.2	18.5
FEB					
23...	1130	118	65	6.6	21.0
MAR					
29...	1335	15	119	7.3	23.5
APR					
22...	1335	23	110	7.1	19.5
MAY					
11...	0945	460	80	6.8	21.0
31...	1430	16	125	7.7	25.0
JUN					
27...	1420	17	125	7.6	25.5
JUL					
28...	1120	8.0	141	7.2	26.0
AUG					
29...	1140	7.6	110	7.1	21.5

16097500 HALAULANI STREAM AT ALTITUDE 400 FT (122 M), NEAR KILAUEA

LOCATION.--Lat 22°10'54", long 159°25'17", Hydrologic Unit 20070000, on left bank 0.5 mi (0.8 km) upstream from confluence with Pohakuhonu Stream and 2.3 mi (3.7 km) south of Kilauea.

DRAINAGE AREA.--1.9 mi^2 (3.08 km^2).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--November 1957 to current year.

REVISED RECORDS.--WSP 2137: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 391.8 ft (119.42 m) above mean sea level (by stadia survey).

REMARKS.--Records good. No diversion above station.

AVERAGE DISCHARGE.--19 years (water years 1959-77), 11.2 ft^3/s (0.317 m^3/s), 8,110 acre-ft/yr (10.0 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,070 ft^3/s (58.6 m^3/s) Aug. 6, 1959, gage height, 8.30 ft (2.530 m), from rating curve extended above 190 ft^3/s (5.38 m^3/s) on basis of slope-area measurement of peak flow; minimum, 1.8 ft^3/s (0.051 m^3/s) Sept. 6-8, 1968.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 283 ft^3/s (8.01 m^3/s) Dec. 10, gage height 3.39 ft (1.033 m), no peak above base of 580 ft^3/s (16.4 m^3/s); minimum, 3.7 ft^3/s (0.11 m^3/s) Jan. 17, 18.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.4	4.8	4.2	4.2	4.9	13	5.1	10	5.7	6.6	5.7	5.9
2	11	5.1	4.1	4.9	4.8	13	30	8.7	5.8	6.2	6.2	8.9
3	5.7	4.6	4.1	5.1	4.9	15	52	7.8	5.6	5.9	5.5	6.8
4	4.9	4.4	4.0	4.1	4.8	11	71	8.6	5.5	5.9	5.3	5.5
5	4.6	4.4	4.0	4.2	4.6	9.3	21	13	22	5.9	8.7	5.3
6	6.4	4.6	5.0	5.3	4.4	7.9	12	26	13	6.2	8.7	5.5
7	5.3	4.9	6.5	7.6	4.4	7.9	9.4	14	14	5.9	18	5.5
8	4.9	6.9	15	4.4	4.6	8.1	8.4	13	12	5.7	33	5.3
9	4.8	4.8	6.4	4.1	4.2	11	7.8	35	11	5.7	14	5.3
10	4.4	4.6	29	4.1	4.2	10	7.1	33	12	5.7	9.6	7.1
11	4.4	4.4	8.4	4.2	4.2	8.4	7.8	40	8.7	11	8.0	5.5
12	5.5	5.7	6.4	4.6	4.2	9.6	6.9	59	8.1	22	19	5.1
13	8.4	4.8	5.7	4.9	4.1	12	7.5	23	7.6	33	22	4.9
14	44	4.8	5.3	4.6	4.2	17	7.5	15	6.9	15	11	4.9
15	31	13	5.1	4.1	21	13	6.5	11	6.6	9.9	9.2	4.9
16	13	21	4.9	3.9	8.1	9.3	8.1	9.8	7.1	7.5	8.0	4.9
17	9.0	6.6	4.6	3.8	5.7	8.1	9.6	8.7	6.9	8.7	7.3	4.9
18	7.4	5.6	4.6	7.1	4.9	8.1	6.7	7.9	9.3	19	6.9	4.9
19	6.4	5.1	4.6	15	4.6	8.4	29	7.4	6.9	13	6.5	4.8
20	6.4	4.9	4.4	9.6	4.4	12	32	7.0	6.4	9.3	6.3	4.6
21	5.7	4.8	4.2	6.2	4.2	8.1	22	7.3	6.4	8.4	6.1	4.6
22	5.5	5.1	4.2	4.9	9.4	7.1	12	7.7	5.9	7.6	5.9	4.8
23	5.3	4.6	4.1	4.6	27	6.9	9.3	7.0	5.7	6.9	5.6	4.8
24	4.9	4.5	4.1	7.4	8.1	6.2	11	6.3	5.7	6.6	5.6	5.1
25	4.9	4.5	4.8	21	23	5.9	9.1	6.1	5.7	6.4	5.3	5.3
26	4.9	4.5	4.2	9.0	25	5.5	13	6.0	6.6	6.6	5.5	4.8
27	4.8	4.4	11	7.3	19	5.7	11	8.1	7.1	5.9	5.3	4.6
28	6.2	4.2	6.9	6.2	18	5.7	15	7.9	17	11	5.3	4.6
29	5.5	5.9	5.7	5.7	---	5.3	36	6.4	10	6.9	5.1	4.6
30	5.3	4.4	4.9	5.5	---	5.7	14	6.1	7.4	6.2	5.7	4.4
31	4.9	---	4.6	5.1	---	5.3	---	5.9	---	6.2	9.5	---
TOTAL	249.8	171.9	195.0	192.7	244.9	279.5	497.8	432.7	258.6	286.8	283.8	158.1
MEAN	8.06	5.73	6.29	6.22	8.75	9.02	16.6	14.0	8.62	9.25	9.15	5.27
MAX	44	21	29	21	27	17	71	59	22	33	33	8.9
MIN	4.4	4.2	4.0	3.8	4.1	5.3	5.1	5.9	5.5	5.7	5.1	4.4
AC-FT	495	341	387	382	486	554	987	858	513	569	563	314

CAL YR 1976 TOTAL 3786.9 MEAN 10.3 MAX 140 MIN 3.9 AC-FT 7510
WTR YR 1977 TOTAL 3251.6 MEAN 8.91 MAX 71 MIN 3.8 AC-FT 6450

HAWAII, ISLAND OF KAUAI

16097500 HALAULANI STREAM AT ALTITUDE 400 FT (122 M), NEAR KILAUEA--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1976-77.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	COLOR (PLATINUM-COBALT UNITS)	TURBIDITY (JTU)	HARDNESS (CA,MG) (MG/L)	NONCARBONATE HARDNESS (MG/L)	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG) (MG/L)	DISSOLVED SODIUM (NA) (MG/L)	PERCENT SODIUM
NOV 10...	1200	4.6	3	1	39	8	5.1	6.3	7.2	29
JUL 15...	1010	9.8	18	4	29	3	3.9	4.7	6.8	33

DATE	SODIUM ADSORPTION RATIO	DISSOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	ALKALINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)	DISSOLVED FLUORIDE (F) (MG/L)
NOV 10...	.5	.4	37	0	30	3.0	5.5	10	.1
JUL 15...	.5	.3	32	0	26	4.1	1.7	12	.0

DATE	DISSOLVED SILICA (SIO2) (MG/L)	DISSOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	DISSOLVED SOLIDS (TONS PER AC-FT)	DISSOLVED SOLIDS (TONS PER DAY)	DISSOLVED NITRITE PLUS NITRATE (N) (MG/L)	DISSOLVED ORTHO. PHOSPHORUS (P) (MG/L)	DISSOLVED ORTHO PHOSPHATE (PO4) (MG/L)	DISSOLVED IRON (FE) (UG/L)	DISSOLVED MANGANESE (MN) (UG/L)
NOV 10...	19	72	.10	.99	.01	.00	.00	120	0
JUL 15...	15	60	.03	1.59	--	--	--	130	0

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)
NOV 10...	1200	4.6	115	7.3	20.0
DEC 07...	1050	6.2	120	6.8	19.5
JAN 13...	1020	4.6	110	6.9	20.0
MAR 02...	1100	13	90	6.9	22.0
APR 12...	1010	7.2	95	6.4	20.0
MAY 26...	1430	6.2	133	7.3	23.5
JUL 15...	1010	9.8	92	7.1	22.0
AUG 26...	1100	6.0	96	6.6	21.0

16100000 HANALEI TUNNEL OUTLET NEAR LIHUE

LOCATION.--Lat 22°05'02", long 159°27'50", Hydrologic Unit 20070000, on right bank at outlet of Hanalei tunnel, 2.2 mi (3.5 km) downstream from intake on Kaapoko Stream, and 9.4 mi (15.1 km) northwest of Lihue.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--July 1932 to current year.

GAGE.--Water-stage recorder and sharp-crested weir. Altitude of gage is 1,210 ft (369 m), from tunnel-profile.

REMARKS.--Records good. Tunnel diverts water from Kaapoko Stream and Hanalei River into North Branch of North Fork Wailua River, from which it is later diverted for irrigation in vicinity of Lihue and Kapaa. Prior to Feb. 24, 1976 records do not include water by-passing at times above station.

AVERAGE DISCHARGE.--45 years, 27.3 ft^3/s (0.773 m^3/s), 19,780 acre-ft (24.4 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 99 ft^3/s (2.80 m^3/s) Apr. 11, 25, 26, 1942; no flow at times.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	19	21	17	17	17	35	25	24	17	17	9.1	30
2	23	23	17	36	17	36	28	23	17	12	11	34
3	23	21	17	28	17	48	42	23	17	10	9.1	30
4	24	21	17	21	17	34	39	25	17	15	14	25
5	20	21	17	19	16	30	30	34	35	15	27	26
6	26	25	27	19	16	28	26	47	25	19	32	26
7	22	23	24	21	16	31	25	29	26	16	37	26
8	23	30	28	17	17	36	26	33	23	15	39	24
9	21	21	23	17	16	38	25	46	25	16	32	27
10	20	20	23	19	16	33	24	45	26	17	29	39
11	20	20	19	22	16	43	28	40	21	29	28	29
12	27	19	19	19	16	44	25	55	21	26	33	26
13	30	20	17	18	16	47	28	30	20	27	44	25
14	47	22	17	17	21	49	27	24	19	17	33	29
15	39	26	21	17	42	46	28	22	18	14	28	30
16	27	32	17	17	27	33	32	21	23	13	27	26
17	23	22	17	17	21	33	25	20	24	17	27	27
18	22	21	17	17	19	31	23	19	26	23	26	25
19	21	16	17	20	17	36	31	19	22	17	25	24
20	25	13	17	17	17	39	43	20	23	14	25	25
21	23	17	17	17	17	32	29	23	20	13	26	26
22	30	17	17	16	27	30	23	23	17	12	25	27
23	25	17	17	16	45	27	26	21	17	11	25	27
24	22	23	17	18	26	26	30	17	17	7.7	28	26
25	23	20	20	28	27	24	24	17	17	7.7	27	26
26	23	17	17	18	36	23	26	19	19	7.7	28	26
27	22	17	26	19	39	38	36	30	21	7.7	25	26
28	30	17	19	17	42	34	37	28	32	25	27	25
29	23	18	25	17	---	28	48	20	25	11	24	24
30	23	17	19	16	---	40	27	21	18	10	27	23
31	22	---	18	17	---	28	---	17	---	9.5	37	---
TOTAL	768	617	600	594	636	1080	886	835	648	471.3	834.2	809
MEAN	24.8	20.6	19.4	19.2	22.7	34.8	29.5	26.9	21.6	15.2	26.9	27.0
MAX	47	32	28	36	45	49	48	55	35	29	44	39
MIN	19	13	17	16	16	23	23	17	17	7.7	9.1	23
AC-FT	1520	1220	1190	1180	1260	2140	1760	1660	1290	935	1650	1600

CAL YR 1976 TOTAL 9370.0 MEAN 25.6 MAX 52 MIN 13 AC-FT 18590
WTR YR 1977 TOTAL 8778.5 MEAN 24.1 MAX 55 MIN 7.7 AC-FT 17410

16100000 HANALEI TUNNEL OUTLET NEAR LIHUE--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1976-77.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTAN-TANEOUS DIS-CHARGE (CFS)	COLOR (PLAT-INUM-COBALT UNITS)	TUR-BID-ITY (JTU)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	DIS-SOLVED SODIUM (NA) (MG/L)	PERCENT SODIUM
OCT										
29...	1140	23	4	2	30	6	4.6	4.5	6.1	30
JUL										
29...	1035	12	3	1	25	0	4.2	3.6	4.6	28

DATE	SODIUM AD-SORP-TION RATIO	DIS-SOLVED PO-TAS-SIUM (K) (MG/L)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DIS-SOLVED SULFATE (SO4) (MG/L)	DIS-SOLVED CHLO-RIDE (CL) (MG/L)	DIS-SOLVED FLUO-RIDE (F) (MG/L)
OCT									
29...	.5	.6	29	0	24	5.8	1.1	8.5	.1
JUL									
29...	.4	.4	32	0	26	5.1	1.0	5.6	.0

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTI-TUENTS) (MG/L)	DIS-SOLVED SOLIDS (TONS PER AC-FT)	DIS-SOLVED SOLIDS (TONS PER DAY)	DIS-SOLVED NITRITE PLUS NITRATE (N) (MG/L)	DIS-SOLVED ORTHO. PHOS-PHORUS (P) (MG/L)	DIS-SOLVED ORTHO PHOS-PHATE (PO4) (MG/L)	DIS-SOLVED IRON (FE) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)
OCT									
29...	15	55	.07	3.42	.06	.02	.06	150	20
JUL									
29...	15	50	.07	1.62	--	--	--	20	0

DATE	TIME	INSTAN-TANEOUS DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)
OCT					
29...	1140	23	94	6.9	20.0
NOV					
30...	1025	17	--	--	17.5
DEC					
22...	1100	17	78	6.6	18.0
JAN					
24...	1115	16	81	7.5	18.0
FEB					
17...	1100	21	80	7.5	17.5
MAR					
28...	1040	32	64	6.9	19.0
APR					
26...	1120	24	85	7.2	19.0
JUN					
01...	1045	16	80	7.3	19.0
29...	1100	22	68	7.0	19.5
AUG					
30...	1130	24	70	7.0	17.0

16103000 HANALEI RIVER NEAR HANALEI

LOCATION.--Lat 22°11'31", long 159°27'57", Hydrologic Unit 20070000, on right bank 2.6 mi (4.2 km) southeast of Hanalei School and 4.9 mi (7.9 km) upstream from mouth.
DRAINAGE AREA.--19.1 mi² (49.5 km²).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--January 1912 to November 1919, annual maximum, water years 1962-63, December 1962 to current year.
REVISED RECORDS (WATER YEARS).--WSP 1937: Drainage area. WSP 2137: 1962(M), 1963-65(P).
GAGE.--Water-stage recorder and crest-stage gage. Datum of gage is 35.8 ft (10.91 m) above mean sea level (by stadia survey). Jan. 1, 1912, to Nov. 20, 1919, nonrecording gage at site 0.2 mi (0.3 km) upstream at different datum. Jan. 26 to Dec. 26, 1962, crest-stage gage at present site and datum.
REMARKS.--Records good. Since 1925, Hanalei tunnel (see sta 16100000) has diverted from Hanalei River and its tributary Kaapoko Stream above station to North Branch of North Fork Wailua River for irrigation. China ditch above station diverts for irrigation of taro in vicinity of Hanalei.
AVERAGE DISCHARGE (since diversion to Hanalei tunnel).--14 years (water years 1964-77), 219 ft³/s (6.202 m³/s) 158,700 acre-ft/yr (196 hm³/yr).
EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 24,900 ft³/s (705 m³/s), Apr. 19, 1974, gage height, 14.28 ft (4.353 m), from rating curve extended above 9,600 ft³/s (272 m³/s); minimum, 31 ft³/s (0.88 m³/s) Sept. 30, Oct. 1, 2, 5, 12, 13, Nov. 3, 1975 (revised).
EXTREMES FOR CURRENT YEAR.--Maximum discharge, 4,120 ft³/s (117 m³/s) May 12, gage height, 7.08 ft (2.158 m), no peak above base of 9,200 ft³/s (261 m³/s); minimum, 41 ft³/s (1.16 m³/s) Sept. 30.
REVISIONS.--The annual minimum discharges for the water years 1970-76 have been revised, and revised daily discharges, in cubic feet per second are given below. These figures supersede those published in the reports for 1970-76.

Water Year	Date	Discharge (ft³/s)	Discharge (m³/s)	Water Year	Date	Discharge (ft³/s)	Discharge (m³/s)
1970	Mar. 14, 15, 29, 30, 1970	54	1.53	1974	Oct. 6, 7, 1973	39	1.10
1971	Aug. 26-28, 1971	51	1.44	1975	Sept. 30, 1975	31	.88
1972	Oct. 17, 18, 1971	51	1.44	1976	Oct. 1, 2, 5, 12, 13, Nov, 3, 1975	31	.88
1973	Sept. 16, 17, 1973	37	1.05				

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1974 TO SEPTEMBER 1975
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	79	78	135	358	700	68	111	96	61	234	52	42
2	78	73	107	180	327	68	182	85	60	72	58	39
3	80	79	96	271	231	70	189	83	58	46	53	38
4	94	81	90	353	453	74	286	83	58	43	151	37
5	100	78	84	246	201	79	313	79	58	42	56	37
6	83	108	82	242	151	69	283	224	57	41	48	37
7	116	113	79	617	131	101	357	378	56	41	45	36
8	168	166	80	797	119	151	181	102	56	43	44	36
9	151	150	132	1380	109	73	236	79	56	43	45	36
10	123	754	84	1220	102	142	163	72	58	41	48	41
11	92	605	78	455	96	235	96	70	56	42	70	53
12	83	234	100	615	126	580	83	65	60	64	55	36
13	80	148	78	978	524	513	76	115	58	91	46	36
14	149	123	79	568	533	905	71	299	67	106	44	35
15	128	126	127	285	172	214	68	136	62	56	51	34
16	187	256	97	210	347	337	72	279	57	46	45	35
17	96	731	78	172	403	171	122	103	54	43	51	35
18	88	609	75	151	180	151	224	80	54	98	82	34
19	83	294	112	135	133	115	130	76	53	256	46	34
20	80	2010	493	129	121	109	85	86	52	82	51	34
21	77	2860	730	119	114	109	172	64	52	99	46	34
22	74	2590	762	107	886	98	153	62	59	58	45	33
23	73	845	308	98	300	158	96	62	62	50	55	33
24	72	434	214	608	150	149	200	62	52	47	49	33
25	70	266	159	271	90	186	537	60	52	46	44	33
26	69	202	455	135	80	76	223	58	52	44	42	35
27	82	170	283	110	72	76	284	55	57	43	40	42
28	302	147	226	120	70	3130	240	54	70	42	40	34
29	122	129	159	500	---	1040	184	54	59	42	39	33
30	86	173	129	1000	---	202	140	53	58	42	47	32
31	88	---	136	3000	---	147	---	51	---	42	62	---
TOTAL	3253	14632	5847	15430	6921	9596	5557	3222	1724	2085	1650	1072
MEAN	105	488	189	498	247	310	185	104	57.5	67.3	53.2	35.7
MAX	302	2860	762	3000	886	3130	537	373	70	256	151	42
MIN	69	73	75	98	70	68	68	51	52	41	39	32
AC-FT	6450	29020	11600	30610	13730	19030	11020	6390	3420	4140	3270	2130

CAL YR 1974 TOTAL 108752 MEAN 298 MAX 3700 MIN 69 AC-FT 215700
WTR YR 1975 TOTAL 70989 MEAN 194 MAX 3130 MIN 32 AC-FT 140800

16103000 HANALEI RIVER NEAR HANALEI--Continued

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	32	32	94	43	90	599	763	200	96	103	89	58
2	32	32	86	50	63	174	750	160	88	286	85	56
3	35	31	78	57	58	105	1120	140	85	100	84	56
4	40	40	71	51	56	90	475	152	82	86	77	56
5	32	58	67	42	2590	113	365	129	78	75	74	55
6	44	195	62	1200	1590	102	334	113	76	73	73	56
7	131	80	60	876	314	103	253	102	73	79	94	54
8	59	162	109	323	238	141	462	130	76	76	78	62
9	35	195	68	211	149	1680	637	88	79	127	72	90
10	36	190	60	285	123	264	672	83	143	88	75	76
11	40	149	56	144	107	149	274	80	89	72	71	125
12	33	76	53	98	96	123	338	78	200	68	71	84
13	44	57	582	79	96	98	293	76	94	66	92	64
14	70	50	454	73	84	84	202	73	74	64	85	58
15	43	49	133	424	86	79	204	72	117	63	73	65
16	36	61	88	439	184	370	200	116	160	64	69	61
17	38	53	85	111	391	1150	160	83	88	70	246	56
18	42	59	72	88	188	1190	250	192	98	64	158	76
19	115	44	65	93	133	2190	540	104	112	96	439	56
20	1120	47	62	1030	120	274	250	177	81	739	135	53
21	88	44	59	697	150	353	400	184	75	121	110	76
22	62	51	56	242	350	487	520	312	71	160	88	196
23	52	80	54	137	159	322	700	274	88	102	74	61
24	51	848	52	102	120	202	230	194	79	88	69	56
25	47	849	50	84	110	353	170	287	71	96	66	54
26	87	1630	49	73	98	369	150	151	80	200	73	61
27	70	1100	48	67	102	821	400	292	98	220	75	110
28	52	215	66	62	143	298	800	144	90	188	72	70
29	46	135	49	58	84	209	400	176	75	125	65	58
30	44	98	49	116	---	257	450	107	75	149	64	55
31	42	---	49	316	---	881	---	102	---	125	59	---
TOTAL	2698	6620	2986	7671	8063	13540	12762	4481	2791	3993	3055	2024
MEAN	87.0	221	96.3	247	278	437	425	145	93.0	129	98.5	67.5
MAX	1120	1630	582	1200	2590	2100	1120	312	200	739	439	125
MIN	32	31	48	42	56	79	150	72	71	63	59	53
AC-FT	5350	13130	5920	15220	15990	26860	25310	8890	5540	7920	6060	4010

CAL YR 1975 TOTAL 59561 MEAN 163 MAX 3130 MIN 31 AC-FT 118100
WTR YR 1976 TOTAL 70684 MEAN 193 MAX 2590 MIN 31 AC-FT 140200

HAWAII, ISLAND OF KAUAI

16103000 HANALEI RIVER NEAR HANALEI--Continued

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	58	61	54	49	60	252	160	115	65	86	71	66
2	88	123	52	111	50	220	140	98	66	81	76	136
3	75	79	52	104	52	611	200	93	64	77	71	93
4	66	62	52	57	50	200	160	98	63	87	68	59
5	60	59	52	52	48	230	140	223	517	88	71	55
6	144	88	82	59	49	150	130	601	221	93	130	52
7	86	78	71	110	54	200	130	294	127	98	234	62
8	71	114	123	56	54	250	160	202	180	89	316	50
9	69	67	85	52	50	230	180	977	219	86	131	51
10	61	62	82	52	45	170	160	816	170	80	87	145
11	58	60	64	52	45	500	120	529	99	277	71	59
12	105	59	56	63	45	600	92	1560	92	297	112	52
13	132	57	54	54	50	660	104	392	86	429	555	48
14	872	56	52	55	191	500	103	175	76	145	173	56
15	552	276	62	49	879	600	96	133	72	115	82	57
16	162	493	52	48	183	150	235	112	95	92	70	50
17	104	94	50	47	88	250	103	103	87	134	61	52
18	86	77	49	49	67	200	85	92	155	253	57	51
19	77	70	49	64	60	250	302	86	92	139	54	46
20	77	69	48	69	56	350	715	82	81	100	52	44
21	74	63	46	51	52	250	348	96	82	92	51	47
22	279	69	46	47	272	200	141	119	71	85	49	46
23	98	62	46	46	975	180	115	94	67	78	47	52
24	71	65	46	53	220	160	151	75	66	76	52	49
25	71	76	64	137	296	140	121	72	67	74	49	52
26	72	59	53	61	328	170	180	79	74	73	56	53
27	70	56	154	56	439	250	295	129	85	72	48	49
28	117	56	67	52	649	220	213	157	581	255	52	46
29	77	62	87	48	---	180	930	83	341	95	46	43
30	67	58	60	46	---	350	168	75	104	84	46	42
31	65	---	52	80	---	200	---	69	---	74	223	---
TOTAL	4110	2770	1962	1929	5406	8873	6087	7640	4165	3874	3261	1763
MEAN	133	91.0	63.3	62.2	193	286	203	246	139	125	105	58.8
MAX	872	493	154	137	975	660	930	1560	581	429	555	145
MIN	58	56	46	46	45	140	85	69	63	72	46	42
AC-FT	8150	5410	3890	3830	10720	17600	12070	15150	8260	7680	6470	3500

CAL YR 1976 TOTAL 67182 MEAN 184 MAX 2590 MIN 42 AC-FT 133300
WTR YR 1977 TOTAL 51800 MEAN 142 MAX 1560 MIN 42 AC-FT 102700

Note.--No gage-height record Mar. 3 to Apr. 11.

16103000 HANALEI RIVER NEAR HANALEI--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1971-77.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTAN-TANEOUS DIS-CHARGE (CFS)	COLOR (PLAT-INUM-COBALT UNITS)	TUR-BID-ITY (JTU)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	DIS-SOLVED SODIUM (NA) (MG/L)	PERCENT SODIUM
NOV										
10...	1100	58	2	1	35	0	5.1	5.5	6.3	28
JUL										
13...	1105	529	70	20	17	3	2.7	2.6	5.2	39

DATE	SODIUM AD-SORP-TION RATIO	DIS-SOLVED PO-TAS-SIUM (K) (MG/L)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DIS-SOLVED SULFATE (SO4) (MG/L)	DIS-SOLVED CHLO-RIDE (CL) (MG/L)	DIS-SOLVED FLUO-RIDE (F) (MG/L)
NOV									
10...	.5	.4	46	0	38	2.9	1.1	7.8	.1
JUL									
13...	.5	.4	18	0	15	8.6	2.0	7.8	.0

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTI-TUENTS) (MG/L)	DIS-SOLVED SOLIDS (TONS PER AC-FT)	DIS-SOLVED SOLIDS (TONS PER DAY)	DIS-SOLVED NITRITE PLUS NITRATE (N) (MG/L)	DIS-SOLVED ORTHO. PHOS-PHORUS (P) (MG/L)	DIS-SOLVED ORTHO PHOS-PHATE (PO4) (MG/L)	DIS-SOLVED IRON (FE) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)
NOV									
10...	18	67	.09	10.5	.01	.01	.03	110	0
JUL									
13...	8.7	38	.05	54.3	--	--	--	160	0

DATE	TIME	INSTAN-TANEOUS DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)
NOV					
10...	1100	58	95	7.4	20.0
DEC					
03...	1030	52	105	6.8	19.5
JAN					
12...	1030	62	92	6.7	20.0
MAR					
01...	1000	239	80	6.9	21.0
APR					
11...	1005	103	75	7.1	19.0
MAY					
25...	1315	76	112	7.6	24.0
JUL					
13...	1105	529	61	6.8	22.0
AUG					
25...	1050	46	100	6.9	21.0

16108000 WAINIHA RIVER NEAR HANALEI

LOCATION.--Lat 22°08'20", long 159°33'38", Hydrologic Unit 20070000, on left bank at Puwainui Falls, 1.5 mi (2.4 km) upstream from Wainiha powerplant intake, and 6.0 mi (9.6 km) southwest of Hanalei.

DRAINAGE AREA.--10.2 mi^2 (26.4 km^2).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--August 1952 to February 1956, October 1957 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 960 ft (293 m), from topographic map.

REMARKS.--Records good. No diversion above station.

AVERAGE DISCHARGE.--22 years (water years, 1953-55, 1959-77), 141 ft^3/s (3.993 m^3/s), 102,200 acre-ft/yr (126 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 28,100 ft^3/s (796 m^3/s) Apr. 19, 1974, gage height, 9.47 ft (2.886 m), from rating curve extended above 1,100 ft^3/s (31.2 m^3/s) on basis of slope-area measurement at gage height 7.72 ft (2.353 m); minimum, 34.8 ft^3/s (0.99 m^3/s) Feb. 12, 1954.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Feb. 17, 1956, which destroyed the station, reached a stage of 14.1 ft (4.30 m), from floodmarks, discharge, about 40,000 ft^3/s (1,130 m^3/s), from unit-discharge study.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 2,850 ft^3/s (80.7 m^3/s) June 28, gage height, 4.92 ft (1.500 m), from rating curve extended as explained above, no peak above base of 3,600 ft^3/s (102 m^3/s); minimum, 40 ft^3/s (1.13 m^3/s) Feb. 10-12.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	52	50	48	48	59	190	70	60	49	43	62	99
2	58	61	47	182	44	244	72	53	54	41	57	132
3	57	60	47	82	45	458	160	55	48	41	46	115
4	62	56	46	53	42	172	137	97	54	89	46	76
5	55	57	47	48	42	185	89	200	200	88	90	65
6	74	125	164	46	41	126	62	540	83	122	92	62
7	68	97	118	59	45	165	60	129	61	101	140	67
8	74	149	159	48	46	195	83	154	54	86	124	44
9	75	62	60	46	41	180	68	265	61	87	88	44
10	59	54	54	60	40	121	65	290	98	109	72	91
11	58	50	50	80	40	406	107	192	53	267	54	65
12	114	50	48	70	40	455	73	696	57	191	73	52
13	107	50	47	56	41	558	104	156	62	199	195	50
14	492	54	46	47	50	393	93	80	50	75	84	53
15	305	86	62	45	328	489	113	63	47	62	70	52
16	93	274	48	50	119	130	200	57	98	49	61	56
17	67	100	46	50	62	182	74	53	96	82	58	64
18	59	75	45	46	49	144	57	50	127	157	51	54
19	54	65	45	58	45	215	77	48	83	81	50	48
20	60	56	44	48	43	295	364	62	91	56	50	51
21	60	52	44	45	42	205	152	108	65	64	55	51
22	58	56	43	43	214	156	69	119	48	44	53	51
23	55	50	43	42	456	134	62	84	43	41	50	51
24	50	122	43	44	108	97	82	59	42	42	49	51
25	65	81	72	72	111	70	65	63	50	42	44	51
26	67	54	53	49	173	70	77	63	56	42	47	51
27	63	50	135	60	215	207	130	175	69	51	44	51
28	108	48	67	50	584	201	162	182	370	186	71	51
29	67	54	102	44	---	130	460	70	70	85	44	51
30	56	53	61	42	---	298	80	69	49	73	50	51
31	57	---	52	64	---	137	---	53	---	64	215	---
TOTAL	2749	2251	1986	1777	3165	7008	3467	4345	2388	2760	2285	1850
MEAN	88.7	75.0	64.1	57.3	113	226	116	140	79.6	89.0	73.7	61.7
MAX	492	274	164	182	584	558	460	696	370	267	215	132
MIN	50	48	43	42	40	70	57	48	42	41	44	44
AC-FT	5450	4460	3940	3520	6280	13900	6880	8620	4740	5470	4530	3670

CAL YR 1976 TOTAL 47934 MEAN 131 MAX 1190 MIN 43 AC-FT 95080
WTR YR 1977 TOTAL 36031 MEAN 98.7 MAX 696 MIN 40 AC-FT 71470

16108000 WAINIHA RIVER NEAR HANALEI--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1971-77.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTAN-TANEOUS DIS-CHARGE (CFS)	COLOR (PLAT-INUM-COBALT UNITS)	TUR-BID-ITY (JTU)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	DIS-SOLVED SODIUM (NA) (MG/L)	PERCENT SODIUM
OCT										
05...	1300	51	5	1	20	9	2.6	3.3	9.2	31
MAR										
30...	1600	210	25	1	13	2	2.2	1.9	3.9	35

DATE	SODIUM AD-SORP-TION RATIO	DIS-SOLVED PO-TAS-SIUM (K) (MG/L)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DIS-SOLVED SULFATE (SO4) (MG/L)	DIS-SOLVED CHLO-RIDE (CL) (MG/L)	DIS-SOLVED FLUO-RIDE (F) (MG/L)
OCT									
05...	.4	.9	26	0	21	2.6	2.0	.5	.0
MAR									
30...	.4	.3	14	0	11	3.6	1.9	5.9	.0

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTI-TUENTS) (MG/L)	DIS-SOLVED SOLIDS (TONS PER AC-FT)	DIS-SOLVED SOLIDS (TONS PER DAY)	DIS-SOLVED NITRITE PLUS NITRATE (N) (MG/L)	DIS-SOLVED ORTHO. PHOS-PHORUS (P) (MG/L)	DIS-SOLVED ORTHO PHOS-PHATE (PO4) (MG/L)	DIS-SOLVED IRON (FE) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)
OCT									
05...	17	43	.06	5.92	.12	.02	.06	30	0
MAR									
30...	9.2	32	.04	18.1	.31	.02	.06	80	0

DATE	TIME	INSTAN-TANEOUS DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)
OCT					
05...	1300	51	66	7.2	20.0
JAN					
06...	1000	45	75	7.1	17.5
MAR					
30...	1600	210	46	6.8	19.5
JUN					
16...	1205	127	36	6.5	20.0

16200000 NORTH FORK KAUKONAHUA STREAM ABOVE RIGHT BRANCH, NEAR WAHIAWA

LOCATION.--Lat 21°31'09", long 157°56'53", Hydrologic Unit 20060000, on left bank 140 ft (43 m) upstream from Mauka ditch intake and Right Branch, and 4.5 mi (7.2 km) northeast of Wahiawa.

DRAINAGE AREA.--1.38 mi² (3.57 km²).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--May 1913 to July 1953, April 1960 to current year. Monthly discharge only for some periods, published in WSP 1319. Prior to August 1953, published as Left Branch of North Fork Kaukonahua Stream near Wahiawa.

REVISED RECORDS (FISCAL YEARS).--WSP 1219: 1931-33(M), 1935(M), 1937-38(M). WSP 1319: 1914, 1917-18(M), 1920-23(M), 1925(M), 1927-30(M). WSP 1719: Drainage area.

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 1,150 ft (351 m), from topographic map.

REMARKS.--Records good. No diversion above station.

AVERAGE DISCHARGE.--54 years (water years, 1914-24, 1927-52, 1961-77), 16.6 ft³/s (0.470 m³/s), 12,030 acre-ft/yr (14.8 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,490 ft³/s (155 m³/s) Jan. 1, 1933, gage height, 11.7 ft (3.57 m), from floodmarks, from rating curve extended above 68 ft³/s (1.93 m³/s) by test of model of station site; maximum gage height, 12.46 ft (3.798 m) Apr. 15, 1963; minimum, 0.12 ft³/s (0.003 m³/s) Mar. 2, 13, 1941.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 1,300 ft³/s (36.8 m³/s) and maximum (*):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Apr. 19	1330	2030	57.5	7.55	2.301
Apr. 20	1000	*2370	67.1	8.12	2.475
May 9	2030	1460	41.3	6.56	1.999

Minimum discharge, 0.16 ft³/s (0.005 m³/s) Feb. 12-14.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.8	2.1	.85	.46	.20	4.6	6.2	12	35	3.6	3.4	4.4
2	3.1	1.9	.72	9.4	.18	32	4.1	9.4	14	3.2	6.0	36
3	1.9	2.5	.72	1.1	.20	34	11	18	16	2.8	3.1	9.7
4	1.5	1.6	.68	.60	7.5	7.1	18	39	7.6	3.6	11	6.4
5	1.9	1.6	.68	.40	.64	4.6	18	23	8.9	10	47	3.8
6	3.2	2.0	8.1	.37	.31	8.4	7.1	168	9.6	6.5	6.8	10
7	5.0	1.6	27	.34	.26	7.0	5.3	18	5.5	4.6	6.8	14
8	1.4	2.2	8.2	.31	.24	13	6.4	43	5.4	3.4	4.1	38
9	1.2	1.6	1.6	.31	.20	7.6	3.8	134	6.6	3.5	3.5	24
10	1.1	1.3	8.1	.28	.18	7.6	4.2	24	4.6	59	3.8	10
11	1.6	1.5	1.8	.28	.18	11	51	18	4.0	44	3.0	5.1
12	7.9	2.4	1.1	.26	.16	18	8.8	39	3.8	84	67	4.1
13	21	1.3	3.3	.26	.16	25	5.1	18	5.1	25	19	3.6
14	12	6.3	1.6	.24	.16	11	5.3	18	5.7	15	4.7	3.5
15	72	2.2	1.0	.24	44	30	5.7	11	3.6	9.2	3.8	3.8
16	6.2	29	.85	.24	23	7.1	6.2	8.6	3.1	20	3.6	3.0
17	3.4	2.6	.76	.24	1.8	12	8.5	8.3	3.5	12	3.2	3.0
18	2.6	1.6	.72	.24	.76	12	4.2	7.1	5.3	24	3.0	2.7
19	2.3	23	.64	.24	.43	32	122	11	3.0	7.3	2.7	2.5
20	12	7.0	.60	.22	.28	38	294	6.6	4.8	5.5	13	2.5
21	6.2	7.8	.52	.22	.24	8.6	18	25	3.2	4.9	12	2.7
22	2.4	2.6	.49	.22	.22	6.6	10	11	2.8	6.5	3.2	2.0
23	1.9	1.8	.46	.20	38	5.7	11	6.2	2.6	4.2	2.6	2.2
24	2.8	1.5	.43	.20	26	5.3	21	5.1	2.6	3.6	2.5	5.9
25	4.1	1.8	.43	4.9	11	8.0	26	4.9	2.7	8.7	2.3	2.5
26	3.1	1.2	.43	.76	9.6	4.1	12	5.5	2.1	5.7	3.6	2.1
27	23	.95	.37	.31	6.0	3.6	19	48	64	3.5	2.8	1.7
28	15	.90	.37	.24	67	7.3	58	70	76	62	4.2	1.5
29	3.0	.90	.43	.20	---	5.7	220	9.2	7.2	5.3	2.8	1.4
30	7.6	1.4	1.2	.20	---	14	18	8.8	12	4.6	45	1.5
31	3.6	---	.80	.20	---	24	---	13	---	3.6	15	---
TOTAL	235.8	116.15	74.95	23.68	238.90	414.9	1007.9	840.7	330.3	458.8	314.5	213.6
MEAN	7.61	3.87	2.42	.76	8.53	13.4	33.6	27.1	11.0	14.8	10.1	7.12
MAX	72	29	27	9.4	67	38	294	168	76	84	67	38
MIN	1.1	.90	.37	.20	.16	3.6	3.8	4.9	2.1	2.8	2.3	1.4
AC-FT	468	230	149	47	474	823	2000	1670	655	910	624	424

CAL YR 1976 TOTAL 4108.75 MEAN 11.2 MAX 102 MIN .37 AC-FT 8150
WTR YR 1977 TOTAL 4270.18 MEAN 11.7 MAX 294 MIN .16 AC-FT 8470

16200000 NORTH FORK KAUKONAHUA STREAM ABOVE RIGHT BRANCH, NEAR WAHIAWA--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1971-77.

REMARKS.--Miscellaneous chemical analyses published for this station for 1968, 1970 water years.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	HARDNESS (CA,MG) (MG/L)	NONCARBONATE HARDNESS (MG/L)	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG) (MG/L)	DISSOLVED SODIUM (NA) (MG/L)	PERCENT SODIUM	SODIUM ADSORPTION RATIO
MAR									
01...	1350	4.8	5	2	.5	.9	5.1	67	1.0

DATE	DISSOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	ALKALINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)	DISSOLVED FLUORIDE (F) (MG/L)	DISSOLVED SILICA (SIO2) (MG/L)
MAR									
01...	.9	4	0	3	4.0	1.9	9.5	.0	3.7

DATE	DISSOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	DISSOLVED SOLIDS (TONS PER AC-FT)	DISSOLVED SOLIDS (TONS PER DAY)	DISSOLVED NITRITE PLUS NITRATE (N) (MG/L)	DISSOLVED ORTHO. PHOSPHORUS (P) (MG/L)	DISSOLVED ORTHO PHOSPHATE (PO4) (MG/L)	DISSOLVED IRON (FE) (UG/L)	DISSOLVED MANGANESE (MN) (UG/L)
MAR								
01...	24	.03	.31	.00	.01	.03	50	0

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)
OCT					
05...	1415	1.6	45	5.9	21.5
NOV					
24...	1315	1.4	50	7.1	19.0
JAN					
05...	1325	.42	56	6.3	19.0
MAR					
01...	1350	4.8	45	6.2	19.5
APR					
11...	1230	26	53	6.3	19.0
MAY					
31...	1420	10	57	6.5	22.0
JUL					
13...	1145	22	36	6.1	21.5
AUG					
15...	1500	4.1	48	7.2	24.5

16208000 SOUTH FORK KAUKONAHUA STREAM AT EAST PUMP RESERVOIR, NEAR WAHIAWA

LOCATION.--Lat 21°29'32", long 157°59'54", Hydrologic Unit 20060000, on right bank on upstream side of dam at East Pump Reservoir, 2.3 mi (3.7 km) east of Wahiawa Post Office, and 7.1 mi (11.4 km) north of Waipahu.

DRAINAGE AREA.--4.04 mi² (10.46 km²).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--July 1957 to June 1963, water years 1963-64 (annual maximum), July 1964 to current year.

GAGE.--Water-stage recorder and Ogee-type dam control. Datum of gage is 860.35 ft (262.235 m) above mean sea level. July 1, 1963, to June 30, 1964, crest-stage gage at same site and datum.

REMARKS.--Records fair. Prior to 1960, diversions from reservoirs above station for use at Schofield Barracks.

AVERAGE DISCHARGE (since termination of diversions to Schofield Barracks).--15 years (water years, 1961-62, 1965-77), 22.1 ft³/s (0.626 m³/s), 16,010 acre-ft/yr (19.7 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,460 ft³/s (155 m³/s) Apr. 15, 1963, gage height, 11.33 ft (3.453 m), from rating curve extended above 1,100 ft³/s (31.2 m³/s) on basis of computation of peak flow over dam; no flow Dec. 24, 25, 27, 28, 1960, Feb. 23, 24, 1963, and many days in 1977.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,640 ft³/s (46.4 m³/s) Apr. 20, gage height, 6.02 ft (1.835 m), no other peak above base of 1,100 ft³/s (31.2 m³/s); no flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.2	2.2	.55	.35	.00	6.1	17	20	33	5.7	3.7	5.2
2	4.4	1.3	.68	15	.00	26	9.7	15	39	4.3	5.4	42
3	5.7	1.1	.60	2.0	.00	25	9.6	19	30	3.8	4.8	21
4	2.7	1.2	.52	.60	.00	15	14	52	14	4.2	3.2	6.4
5	6.5	1.1	.46	.40	.00	6.6	21	24	11	4.8	55	8.7
6	5.5	1.1	.52	.26	.00	14	9.9	155	16	8.5	11	12
7	7.3	1.2	44	.20	.00	14	9.2	33	9.1	6.0	9.0	57
8	3.2	1.1	12	.14	.00	7.7	11	42	8.3	7.1	5.9	34
9	2.4	1.2	2.5	.12	.00	6.4	5.3	130	20	7.2	4.3	12
10	2.7	.97	4.9	.10	.00	3.8	4.6	56	8.8	32	3.5	15
11	2.2	.78	4.9	.08	.00	4.4	19	31	6.8	43	3.1	5.5
12	8.6	1.3	1.5	.07	.00	20	9.3	72	6.6	70	43	4.3
13	22	1.5	.84	.06	.00	16	5.8	44	8.5	38	41	3.8
14	12	.95	1.6	.05	.00	8.7	5.4	36	11	12	5.9	3.4
15	110	.96	1.2	.04	25	21	5.2	28	7.5	11	4.0	3.1
16	13	34	.79	.03	8.0	9.1	6.7	17	5.5	11	3.3	3.1
17	4.8	4.6	.64	.02	2.5	4.6	5.4	15	6.5	30	2.9	3.0
18	3.3	1.8	.56	.01	1.1	10	6.0	14	12	19	2.6	3.6
19	2.6	18	.42	.00	.66	64	152	18	5.7	12	2.4	2.6
20	2.4	16	.45	.00	.42	106	379	14	4.9	6.8	2.3	2.2
21	5.4	7.3	.35	.00	.29	24	47	39	4.8	6.2	8.5	2.0
22	2.7	3.8	.28	.00	.20	16	21	31	4.2	6.0	3.7	2.0
23	2.0	1.5	.29	.00	10	13	15	13	4.1	5.7	2.2	2.0
24	1.7	1.1	.58	.00	21	8.5	22	11	3.8	4.6	1.8	13
25	1.6	1.1	.53	.00	29	9.6	71	9.8	4.6	4.5	1.9	8.3
26	1.9	1.1	.34	.00	6.2	6.3	21	9.1	3.9	5.8	3.9	3.2
27	1.8	.93	.27	.00	9.4	5.1	14	17	52	4.7	3.1	2.1
28	6.7	.71	.25	.00	49	8.1	57	53	85	29	3.0	1.8
29	3.2	.60	.35	.00	---	8.6	251	13	18	8.2	2.0	1.5
30	1.7	.59	.80	.00	---	16	36	10	15	5.3	47	1.5
31	5.2	---	.50	.00	---	49	---	12	---	4.8	19	---
TOTAL	258.4	111.09	84.17	19.53	162.77	552.6	1260.1	1056.9	459.6	421.2	312.4	285.3
MEAN	8.34	3.70	2.72	.63	5.81	17.8	42.0	34.1	15.3	13.6	10.1	9.51
MAX	110	34	44	15	49	106	379	155	85	70	55	57
MIN	1.6	.59	.25	.00	.00	3.8	4.6	9.1	3.8	3.8	1.8	1.5
AC-FT	513	220	167	39	323	1100	2500	2100	912	835	620	566

CAL YR 1976 TOTAL 6574.93 MEAN 18.0 MAX 200 MIN .25 AC-FT 13040
WTR YR 1977 TOTAL 4984.06 MEAN 13.7 MAX 379 MIN .00 AC-FT 9890

16208000 SOUTH FORK KAUKONAHUA STREAM AT EAST PUMP RESERVOIR, NEAR WAHIAWA--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1971-77.

REMARKS.--Miscellaneous chemical analyses published for this station for 1968, 1970 water years.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTAN-TANEOUS DIS-CHARGE (CFS)	COLOR (PLAT-INUM-COBALT UNITS)	TUR-BID-ITY (JTU)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	DIS-SOLVED SODIUM (NA) (MG/L)	PERCENT SODIUM
MAR										
03...	1145	22	45	10	7	4	.8	1.2	6.0	63

DATE	SODIUM AD-SORP-TION RATIO	DIS-SOLVED PO-TAS-SIUM (K) (MG/L)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DIS-SOLVED SULFATE (SO4) (MG/L)	DIS-SOLVED CHLO-RIDE (CL) (MG/L)	DIS-SOLVED FLUO-RIDE (F) (MG/L)
MAR									
03...	1.0	.6	3	0	2	7.6	4.2	12	.0

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTI-TUENTS) (MG/L)	DIS-SOLVED SOLIDS (TONS PER AC-FT)	DIS-SOLVED SOLIDS (TONS PER DAY)	DIS-SOLVED NITRITE PLUS NITRATE (N) (MG/L)	DIS-SOLVED ORTHO. PHOS-PHORUS (P) (MG/L)	DIS-SOLVED ORTHO PHOS-PHATE (PO4) (MG/L)	DIS-SOLVED IRON (FE) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)
MAR									
03...	2.7	29	.04	1.72	.02	.01	.03	100	20

DATE	TIME	INSTAN-TANEOUS DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)
OCT					
04...	1645	2.5	47	5.4	22.5
05...	1010	6.2	50	5.4	22.5
NOV					
29...	1120	.58	57	5.4	19.5
JAN					
06...	1630	.26	63	5.9	20.5
MAR					
03...	1145	22	59	5.8	1.0
APR					
05...	1625	17	50	6.3	22.0
MAY					
16...	1530	16	50	6.0	23.0
JUL					
06...	1130	8.1	58	6.6	23.5
AUG					
26...	1100	2.2	60	6.7	26.5

16210900 POAMOHO TUNNEL NEAR WAHIAWA

LOCATION.--Lat 21°31'12", long 157°58'51", Hydrologic Unit 20060000, on left bank 5 ft (2 m) downstream from tunnel outlet and 3.6 mi (5.8 km) northeast of Wahiawa Post Office.

PERIOD OF RECORD.--July 1958 to current year.

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 1,120 ft (341 m), from topographic map.

REMARKS.--Records good. Tunnel diverts from Poamoho Stream to North Fork Kaukonahua Stream to augment storage in Wahiawa Reservoir. Periodic determinations of water temperature for the current year are published elsewhere in this report.

AVERAGE DISCHARGE.--19 years, 4.86 ft^3/s (0.138 m^3/s), 3,520 acre-ft/yr (4.34 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 265 ft^3/s (7.50 m^3/s) Mar. 16, 1968; no flow at times.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.54	.41	.34	.01	.00	3.3	4.8	4.8	4.2	1.4	.58	1.1
2	.71	.32	.21	18	.00	5.7	2.9	3.9	5.9	1.3	.54	2.7
3	1.4	.36	.15	1.9	.00	12	2.5	4.2	6.6	1.1	.62	4.6
4	.58	.47	.12	.62	.00	5.8	3.8	19	3.6	1.0	.47	1.1
5	1.2	.27	.10	.27	.00	2.8	8.5	11	2.9	1.1	5.3	1.9
6	1.6	.30	2.3	.15	.00	4.6	4.0	49	4.7	1.4	2.2	.74
7	2.2	.34	9.1	.09	.00	3.8	3.5	12	2.7	1.2	1.6	1.7
8	.74	.30	3.2	.06	.00	3.3	2.8	18	2.4	.88	.93	2.1
9	.34	.27	.88	.03	.00	4.4	2.1	29	2.2	.74	.71	5.8
10	.23	.21	.44	.02	.00	7.2	1.8	19	1.9	12	.50	6.8
11	.17	.15	.30	.02	.00	17	11	12	1.8	9.3	.47	1.5
12	.23	.11	.21	.02	.00	29	2.9	25	1.7	12	12	.88
13	6.7	.11	.15	.01	.00	38	1.8	13	1.8	7.1	17	.66
14	3.3	1.6	.66	.01	.00	11	1.8	16	2.1	2.9	1.9	.58
15	22	1.3	.38	.01	16	18	2.1	9.4	2.0	2.1	1.1	.47
16	4.0	14	.21	.01	12	7.3	2.7	6.6	1.5	1.6	.83	.44
17	1.4	2.3	.15	.01	1.8	5.6	5.6	8.0	1.4	3.6	.66	.38
18	.93	.74	.10	.01	.54	7.3	2.8	5.3	1.6	2.3	.58	.41
19	.66	7.0	.07	.01	.23	9.6	15	4.7	1.4	2.0	.47	.47
20	6.6	4.6	.05	.01	.13	25	71	4.2	1.3	1.3	.50	.34
21	4.8	1.7	.04	.01	.06	6.2	13	23	1.3	1.1	1.8	.25
22	1.3	1.4	.03	.00	.03	5.1	6.8	4.8	1.2	.98	.88	.21
23	.88	.62	.02	.00	14	3.9	5.1	3.5	1.1	.93	.50	.19
24	.62	.47	.02	.00	5.5	3.2	6.6	3.1	1.1	.78	.38	1.2
25	.66	1.1	.01	.00	12	3.5	18	3.0	1.1	.70	.36	.81
26	.78	.88	.01	.00	6.1	2.8	7.0	3.0	1.0	.70	.50	.34
27	1.8	.38	.01	.00	2.8	2.3	4.4	12	5.2	.70	.62	.23
28	4.6	.27	.01	.00	16	3.1	6.9	25	27	3.6	.41	.19
29	1.1	.23	.01	.00	---	3.0	32	5.0	4.7	1.8	.78	.15
30	.58	.23	.01	.00	---	5.4	8.0	3.6	2.0	.93	4.3	.12
31	.54	---	.01	.00	---	16	---	3.3	---	.78	8.0	---
TOTAL	73.19	42.44	19.30	21.28	87.19	275.2	261.2	363.4	99.4	79.32	67.49	38.36
MEAN	2.36	1.41	.62	.69	3.11	8.88	8.71	11.7	3.31	2.56	2.18	1.28
MAX	22	14	9.1	18	16	38	71	49	27	12	17	6.8
MIN	.17	.11	.01	.00	.00	2.3	1.8	3.0	1.0	.70	.36	.12
AC-FT	145	84	38	42	173	546	518	721	197	157	134	76

CAL YR 1976 TOTAL 1307.97 MEAN 3.57 MAX 22 MIN .01 AC-FT 2590
WTR YR 1977 TOTAL 1427.77 MEAN 3.91 MAX 71 MIN .00 AC-FT 2830

16211600 MAKAHA STREAM NEAR MAKAHA

LOCATION.--Lat 21°30'16", long 158°10'59", Hydrologic Unit 20060000, on right bank 1.5 mi (2.4 km) northeast of Kaneaki Heiau and 3.4 mi (5.5 km) northeast of Makaha.

DRAINAGE AREA.--2.31 mi² (5.98 km²).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--July 1959 to current year.

REVISED RECORDS.--WSP 1937: Drainage area.

GAGE.--Water-stage recorder and concrete-masonry control. Datum of gage is 938.64 ft (286.097 m) above mean sea level (Waianae Plantation bench mark).

REMARKS.--Records good. Wells and water-development tunnels in the vicinity and above the station may affect low-flow records. Recording rain gage located at station.

AVERAGE DISCHARGE.--18 years, 1.92 ft³/s (0.054 m³/s), 1,390 acre-ft/yr (1.71 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,170 ft³/s (33.1 m³/s) Mar. 13, 1962, gage height, 6.50 ft (1.981 m), from floodmarks, from rating curve extended above 51 ft³/s (1.44 m³/s) on basis of slope-area measurement of peak flow; no flow at times.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage known since at least 1953, about 7.8 ft (2.38 m) Nov. 24, 1954, from information by local resident. Discharge, about 1,700 ft³/s (48.1 m³/s).

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 78 ft³/s (2.21 m³/s) Nov. 16, gage height, 2.68 ft (0.817 m), from rating curve extended as explained above, no peak above base of 200 ft³/s (5.66 m³/s); minimum, 0.01 ft³/s (<0.001 m³/s) several days in September.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.11	.07	.90	.19	.43	.97	3.8	.73	.87	.40	.15	.07
2	.16	.11	.79	.19	.47	.77	2.6	.67	1.0	.40	.13	.09
3	.23	.07	.71	.18	.41	.67	7.3	.66	.90	.39	.13	.07
4	.29	.06	.65	.17	.36	.62	12	.70	.85	.37	.13	.08
5	.38	.08	.61	.17	.33	.63	10	.71	2.2	.36	.16	.07
6	1.7	.11	.59	.17	.29	1.5	5.2	1.6	2.0	.39	.13	.07
7	1.9	.13	.58	.17	.25	1.1	3.4	1.3	1.1	.59	.13	.07
8	.76	.15	.61	.17	.22	.87	2.6	.91	.99	.54	.14	.07
9	.59	.20	.61	.19	.20	1.0	2.1	2.3	.89	.44	.13	.08
10	.49	.22	.56	.17	.19	.82	1.7	9.5	.73	.39	.12	.09
11	.42	.23	.52	.19	.17	.67	1.5	10	.68	.51	.11	.09
12	.38	.22	.47	.21	.17	.56	1.4	10	.67	1.0	.14	.08
13	.34	.19	.44	.27	.17	.78	1.2	8.4	.63	.71	.13	.08
14	.40	.18	.46	.27	.15	.76	1.1	7.2	.61	.56	.13	.08
15	1.1	.21	.43	.27	7.1	.67	1.1	4.4	.57	.47	.14	.07
16	.76	14	.40	.27	4.1	.70	1.1	3.4	.54	.44	.13	.05
17	.59	2.7	.38	.27	1.6	.57	1.0	2.7	.54	.42	.13	.04
18	.49	1.6	.35	.23	1.1	.59	.95	2.3	.52	.42	.13	.06
19	.42	4.0	.35	.23	.82	.64	1.4	2.0	.51	.41	.11	.04
20	.37	3.8	.34	.26	.72	.53	1.2	1.7	.54	.36	.11	.02
21	.32	2.1	.31	.24	.63	.53	.97	1.5	.52	.33	.10	.02
22	.26	1.6	.31	.25	.57	.48	.83	1.4	.48	.29	.09	.01
23	.21	1.2	.31	.22	1.7	.44	.75	1.3	.46	.26	.08	.02
24	.18	1.3	.29	.20	1.6	.41	.75	1.2	.44	.23	.07	.02
25	.16	3.0	.27	.20	1.0	.38	3.0	1.1	.43	.22	.07	.02
26	.13	1.6	.27	.18	.79	.35	1.7	1.1	.43	.22	.07	.01
27	.13	1.2	.26	.23	.75	.34	1.1	1.2	.56	.19	.09	.02
28	.11	1.0	.23	.86	1.7	.98	.94	1.6	.70	.19	.05	.01
29	.09	1.0	.22	.56	---	3.3	1.0	1.1	.48	.17	.04	.01
30	.09	1.1	.21	.51	---	4.9	.90	.96	.43	.16	.09	.03
31	.07	---	.19	.45	---	4.3	---	.86	---	.16	.07	---
TOTAL	13.63	43.43	13.62	8.14	27.99	31.83	74.59	84.50	22.09	11.99	3.43	1.54
MEAN	.44	1.45	.44	.26	1.00	1.03	2.49	2.73	.74	.39	.11	.051
MAX	1.9	14	.90	.86	7.1	4.9	12	10	2.2	1.0	.16	.09
MIN	.07	.06	.19	.17	.15	.34	.75	.66	.43	.16	.04	.01
AC-FT	27	86	27	16	56	63	148	168	44	24	6.8	3.1

CAL YR 1976 TOTAL 798.43 MEAN 2.18 MAX 283 MIN .03 AC-FT 1580
WTR YR 1977 TOTAL 336.78 MEAN .92 MAX 14 MIN .01 AC-FT 668

16211600 MAKAHA STREAM NEAR MAKAHA--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1972-77.

REMARKS.--Miscellaneous chemical analyses published for this station for 1968-71 water years.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTAN-TANEOUS DIS-CHARGE (CFS)	COLOR (PLAT-INUM-COBALT UNITS)	TUR-BID-ITY (JTU)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	DIS-SOLVED SODIUM (NA) (MG/L)	PERCENT SODIUM
FEB										
23...	1200	.65	11	4	29	0	4.1	4.5	8.6	39

DATE	SODIUM AD-SORP-TION RATIO	DIS-SOLVED PO-TAS-SIUM (K) (MG/L)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DIS-SOLVED SULFATE (SO4) (MG/L)	DIS-SOLVED CHLO-RIDE (CL) (MG/L)	DIS-SOLVED FLUO-RIDE (F) (MG/L)
FEB									
23...	.7	.7	36	0	30	3.6	5.2	12	.0

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTI-TUENTS) (MG/L)	DIS-SOLVED SOLIDS (TONS PER AC-FT)	DIS-SOLVED SOLIDS (TONS PER DAY)	DIS-SOLVED NITRITE PLUS NITRATE (N) (MG/L)	DIS-SOLVED ORTHO. PHOS-PHORUS (P) (MG/L)	DIS-SOLVED ORTHO PHOS-PHATE (PO4) (MG/L)	DIS-SOLVED IRON (FE) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)
FEB									
23...	26	79	.11	.14	.31	.05	.15	220	10

DATE	TIME	INSTAN-TANEOUS DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)
OCT					
06...	1215	.52	120	6.9	21.0
NOV					
26...	1230	1.7	90	6.5	19.0
JAN					
10...	1310	.16	135	6.6	19.5
FEB					
23...	1200	.65	105	7.2	19.5
23...	1315	.65	105	7.2	19.5
APR					
15...	1715	.94	96	7.1	21.0
MAY					
27...	1350	1.2	108	7.3	20.5
JUL					
11...	1520	.48	115	6.6	21.5
AUG					
25...	1240	.03	160	6.7	21.0

16212800 KIPAPA STREAM NEAR WAHIAWA

LOCATION.--Lat 21°28'13", long 157°57'40", Hydrologic Unit 20060000, on left bank 1,700 ft (520 m) downstream from forest-reserve boundary, 4.9 mi (7.9 km) southeast of Wahiawa Post Office, and 6.3 mi (10.1 km) northeast of Waipahu.

DRAINAGE AREA.--4.29 mi² (11.11 km²).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--January 1957 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 690 ft (210 m), from topographic map.

REMARKS.--Records good. At times, a small amount of water is diverted from the gage pool for domestic use. Recording rain gage located at station.

AVERAGE DISCHARGE.--20 years, 10.7 ft³/s (0.303 m³/s), 7,750 acre-ft/yr (9.56 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,680 ft³/s (161 m³/s) May 14, 1963, gage height, 12.29 ft (3.746 m), from rating curve extended above 300 ft³/s (8.50 m³/s) on basis of slope-area measurements at gage heights 7.96 ft (2.426 m) and 12.29 ft (3.746 m); no flow at times.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 930 ft³/s (26.3 m³/s) and maximum (*):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Apr. 19	1430	1140	32.3	7.39	2.252
June 28	1530	*1620	45.9	8.29	2.527

Minimum discharge, no flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.80	.17	.15	.00	.00	4.9	15	5.4	15	2.6	.74	1.2
2	.40	.11	.11	3.0	.00	5.8	7.0	3.7	11	2.0	.57	15
3	.26	.06	.06	1.6	.00	12	5.6	3.4	12	1.7	.48	8.1
4	11	.11	.02	.44	.09	6.0	12	27	5.6	1.5	.40	1.8
5	4.8	.13	.00	.17	.29	3.7	18	6.5	4.3	1.6	15	3.0
6	3.9	.11	.33	.08	.06	5.5	5.8	123	14	1.7	3.7	.92
7	5.8	.11	24	.01	.00	4.7	5.8	20	5.5	1.3	1.3	.62
8	1.1	.11	4.4	.00	.00	3.8	3.6	42	21	1.3	.92	8.4
9	.44	.11	.92	.00	.00	5.4	2.0	108	59	1.3	.80	11
10	.23	.09	.52	.00	.00	7.7	1.6	31	6.0	30	.48	25
11	.15	3.2	1.2	.00	.00	6.8	13	26	3.9	25	.36	1.9
12	2.6	4.3	.36	.00	.00	20	4.3	28	3.4	22	46	.92
13	5.0	.80	.54	.00	.00	21	2.6	21	4.3	16	27	.52
14	4.1	1.8	2.6	.00	.00	12	1.8	22	4.3	4.7	2.8	.40
15	43	1.9	.74	.00	59	29	2.1	12	3.2	3.7	1.2	.32
16	6.5	30	.32	.00	32	8.4	3.6	8.7	2.8	2.7	.80	.29
17	2.1	3.2	.40	.00	3.9	5.1	9.0	7.3	2.0	3.3	.52	.26
18	1.1	1.0	.44	.00	1.2	5.8	3.9	6.0	3.7	5.2	.40	.20
19	.80	17	.32	.00	.57	8.1	79	11	2.4	2.6	.29	.15
20	.74	8.4	.17	.00	.36	19	98	4.3	1.8	1.4	.26	.13
21	2.7	4.2	.11	.00	.17	7.0	20	7.1	2.2	1.2	.66	.24
22	2.2	2.2	.05	.00	.09	6.0	12	9.0	1.6	1.1	.80	.32
23	1.4	.74	.02	.00	16	3.7	7.0	5.1	1.2	1.0	.36	.23
24	.57	.44	.00	.00	9.4	2.4	18	3.6	1.0	.80	.23	3.7
25	.40	.40	.00	.00	12	2.1	34	3.1	1.1	.74	.20	1.8
26	.32	.92	.00	.00	6.0	1.7	11	3.2	1.2	.80	.29	.57
27	.26	.44	.00	.00	2.9	1.2	6.3	15	7.6	.80	.29	.29
28	.55	.23	.00	.00	37	7.8	7.5	37	127	11	.26	.15
29	1.3	.15	.00	.00	---	4.5	50	7.0	11	2.8	.15	.13
30	.44	.13	.00	.00	---	22	9.0	5.1	4.3	1.7	9.3	.11
31	.23	---	.00	.00	---	52	---	5.1	---	1.5	9.0	---
TOTAL	105.19	82.56	37.78	5.30	181.03	305.1	468.5	616.6	343.4	155.04	125.56	87.67
MEAN	3.39	2.75	1.22	.17	6.47	9.84	15.6	19.9	11.4	5.00	4.05	2.92
MAX	43	30	24	3.0	59	52	98	123	127	30	46	25
MIN	.15	.06	.00	.00	.00	1.2	1.6	3.1	1.0	.74	.15	.11
AC-FT	209	164	75	11	359	605	929	1220	681	308	249	174

CAL YR 1976 TOTAL 2687.47 MEAN 7.34 MAX 107 MIN .00 AC-FT 5330
WTR YR 1977 TOTAL 2513.73 MEAN 6.89 MAX 127 MIN .00 AC-FT 4990

16212800 KIPAPA STREAM NEAR WAHIAWA--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1970-73, February 1973 to current year.

PERIOD OF DAILY RECORD.--
SUSPENDED SEDIMENT DISCHARGE: February 1973 to current year.

INSTRUMENTATION.--Automatic pumping sediment sampler since February 1973.

REMARKS.--In addition to the sediment sampler record, samples were collected at this station.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SEDIMENT CONCENTRATIONS: Maximum daily mean, 905 mg/L Apr. 19, 1974; minimum daily mean, 0 mg/L on many days during September 1975, December 1976, January and February 1977.
SEDIMENT DISCHARGE: Maximum daily 4,110 tons (3,730 tonnes) Apr. 19, 1974; minimum daily, 0 ton (0 tonne) on many days each year.

EXTREMES FOR CURRENT YEAR.--
SEDIMENT CONCENTRATIONS: Maximum daily mean, 480 mg/L June 28; minimum daily mean, 0 mg/L on many days during the year.
SEDIMENT DISCHARGE: Maximum daily, 534 tons (484 tonnes) June 28; minimum daily, 0 ton (0 tonne) on many days during the year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	COLOR (PLATINUM-COBALT UNITS)	TURBIDITY (JTU)	HARDNESS (CA,MG) (MG/L)	NONCARBONATE HARDNESS (MG/L)	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG) (MG/L)	DISSOLVED SODIUM (NA) (MG/L)	PERCENT SODIUM
MAR										
04...	1525	4.8	65	15	51	6	1.4	1.9	7.8	57

DATE	SODIUM ADSORPTION RATIO	DISSOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	ALKALINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)	DISSOLVED FLUORIDE (F) (MG/L)
MAR									
04...	1.0	1.0	6	0	5	8.8	5.1	15	.1

DATE	DISSOLVED SILICA (SIO2) (MG/L)	DISSOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	DISSOLVED SOLIDS (TONS PER AC-FT)	DISSOLVED SOLIDS (TONS PER DAY)	DISSOLVED NITRITE PLUS NITRATE (N) (MG/L)	DISSOLVED ORTHO. PHOSPHORUS (P) (MG/L)	DISSOLVED ORTHO PHOSPHATE (PO4) (MG/L)	DISSOLVED IRON (FE) (UG/L)	DISSOLVED MANGANESE (MN) (UG/L)
MAR									
04...	4.5	44	.06	.57	.99	.01	.03	120	0

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)
OCT					
07...	1245	6.2	43	6.2	23.5
NOV					
15...	1415	1.7	63	6.2	23.5
DEC					
17...	1315	.39	60	6.4	20.5
MAR					
04...	1525	4.8	75	6.3	22.0
MAY					
11...	1345	21	58	6.1	21.5
JUN					
29...	1350	8.1	38	6.0	25.0
AUG					
10...	1010	.54	60	6.2	25.0
SEP					
28...	1010	.16	77	7.0	21.5

16212800 KIPAPA STREAM NEAR WAHIAWA--Continued

SUSPENDED-SEDIMENT DISCHARGE (TONS/DAY), WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
		OCTOBER			NOVEMBER			DECEMBER	
1	0.80	7	0.02	0.17	3	.00	0.15	2	.00
2	0.40	5	0.01	0.11	3	.00	0.11	2	.00
3	0.26	4	.00	0.06	3	.00	0.06	2	.00
4	11	100	9.9	0.11	3	.00	0.02	0	.00
5	4.8	50	0.65	0.13	3	.00	.00	0	.00
6	3.9	30	0.32	0.11	3	.00	0.33	3	.00
7	5.8	20	0.31	0.11	3	.00	24	25	1.6
8	1.1	12	0.04	0.11	3	.00	4.4	8	0.10
9	0.44	8	0.01	0.11	3	.00	0.92	4	0.01
10	0.23	6	.00	0.09	3	.00	0.52	3	.00
11	0.15	4	.00	3.2	12	0.10	1.2	3	0.01
12	2.6	12	0.08	4.3	10	0.12	0.36	2	.00
13	5.0	10	0.14	0.80	3	0.01	0.54	5	0.01
14	4.1	8	0.09	1.8	6	0.03	2.6	5	0.04
15	43	70	10	1.9	6	0.03	0.74	3	0.01
16	6.5	9	0.16	30	35	2.8	0.32	2	.00
17	2.1	5	0.03	3.2	10	0.09	0.40	2	.00
18	1.1	4	0.01	1.0	6	0.02	0.44	2	.00
19	0.80	3	0.01	17	15	0.69	0.32	2	.00
20	0.74	3	0.01	8.4	10	0.23	0.17	2	.00
21	2.7	8	0.06	4.2	8	0.09	0.11	2	.00
22	2.2	6	0.04	2.2	5	0.03	0.05	2	.00
23	1.4	5	0.02	0.74	3	0.01	0.02	2	.00
24	0.57	3	.00	0.44	3	.00	.00	0	.00
25	0.40	3	.00	0.40	3	.00	.00	0	.00
26	0.32	3	.00	0.92	3	0.01	.00	0	.00
27	0.26	3	.00	0.44	3	.00	.00	0	.00
28	0.55	5	0.01	0.23	2	.00	.00	0	.00
29	1.3	5	0.02	0.15	2	.00	.00	0	.00
30	0.44	3	.00	0.13	2	.00	.00	0	.00
31	0.23	3	.00	---	---	---	.00	0	.00
TOTAL	105.19	---	21.94	82.56	---	4.26	37.78	---	1.78

DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
		JANUARY			FEBRUARY			MARCH	
1	.00	0	.00	.00	0	.00	4.9	18	0.24
2	3.0	10	0.08	.00	0	.00	5.8	12	0.19
3	1.6	6	0.03	.00	0	.00	12	14	0.45
4	0.44	5	0.01	0.09	4	.00	6.0	5	0.08
5	0.17	4	.00	0.29	5	.00	3.7	4	0.04
6	0.08	3	.00	0.06	3	.00	5.5	8	0.12
7	0.01	2	.00	.00	0	.00	4.7	6	0.08
8	.00	0	.00	.00	0	.00	3.8	5	0.05
9	.00	0	.00	.00	0	.00	5.4	5	0.07
10	.00	0	.00	.00	0	.00	7.7	8	0.17
11	.00	0	.00	.00	0	.00	6.8	12	0.22
12	.00	0	.00	.00	0	.00	20	15	0.81
13	.00	0	.00	.00	0	.00	21	12	0.68
14	.00	0	.00	.00	0	.00	12	6	0.19
15	.00	0	.00	59	44	13	29	52	8.4
16	.00	0	.00	32	12	1.0	8.4	10	0.23
17	.00	0	.00	3.9	5	0.05	5.1	4	0.06
18	.00	0	.00	1.2	4	0.01	5.8	4	0.06
19	.00	0	.00	0.57	3	.00	8.1	8	0.17
20	.00	0	.00	0.36	2	.00	19	20	1.0
21	.00	0	.00	0.17	2	.00	7.0	6	0.11
22	.00	0	.00	0.09	2	.00	6.0	5	0.08
23	.00	0	.00	16	11	1.3	3.7	3	0.03
24	.00	0	.00	9.4	10	0.25	2.4	3	0.02
25	.00	0	.00	12	12	0.39	2.1	3	0.02
26	.00	0	.00	6.0	10	0.16	1.7	3	0.01
27	.00	0	.00	2.9	8	0.06	1.2	3	0.01
28	.00	0	.00	37	175	43	7.8	15	0.32
29	.00	0	.00	---	---	---	4.5	10	0.12
30	.00	0	.00	---	---	---	22	96	39
31	.00	0	.00	---	---	---	52	301	69
TOTAL	5.30	---	0.12	181.03	---	59.22	305.1	---	122.03

16212800 KIPAPA STREAM NEAR WAHIAWA--Continued

SUSPENDED-SEDIMENT DISCHARGE (TONS/DAY), WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
		APRIL			MAY			JUNE	
1	15	35	1.4	5.4	5	0.07	15	18	0.73
2	7.0	13	0.25	3.7	4	0.04	11	12	0.36
3	5.6	12	0.18	3.4	6	0.06	12	15	0.49
4	12	15	0.49	27	23	2.1	5.6	8	0.12
5	18	18	0.87	6.5	12	0.21	4.3	6	0.07
6	5.8	8	0.13	123	145	75	14	15	0.57
7	5.8	8	0.13	20	20	1.1	5.5	8	0.12
8	3.6	5	0.05	42	45	10	21	78	23
9	2.0	5	0.03	108	218	160	59	160	57
10	1.6	5	0.02	31	35	2.9	6.0	6	0.10
11	13	25	0.88	26	20	1.4	3.9	5	0.05
12	4.3	8	0.09	28	22	1.7	3.4	5	0.05
13	2.6	6	0.04	21	18	1.0	4.3	8	0.09
14	1.8	4	0.02	22	24	1.4	4.3	6	0.07
15	2.1	6	0.03	12	12	0.39	3.2	5	0.04
16	3.6	6	0.06	8.7	8	0.19	2.8	4	0.03
17	9.0	15	0.36	7.3	6	0.12	2.0	4	0.02
18	3.9	10	0.11	6.0	4	0.06	3.7	4	0.04
19	79	371	376	11	20	0.59	2.4	3	0.02
20	98	305	156	4.3	8	0.09	1.8	3	0.01
21	20	20	1.1	7.1	8	0.15	2.2	4	0.02
22	12	10	0.32	9.0	6	0.15	1.6	3	0.01
23	7.0	8	0.15	5.1	5	0.07	1.2	3	0.01
24	18	56	13	3.6	5	0.05	1.0	3	0.01
25	34	96	9.8	3.1	5	0.04	1.1	3	0.01
26	11	20	0.59	3.2	5	0.04	1.2	3	0.01
27	6.3	8	0.14	15	30	1.2	7.6	34	5.9
28	7.5	20	0.41	37	64	10	127	480	534
29	50	102	22	7.0	10	0.19	11	44	1.3
30	9.0	10	0.24	5.1	5	0.07	4.3	27	0.31
31	---	---	---	5.1	5	0.07	---	---	---
TOTAL	468.5	---	584.89	616.6	---	270.45	343.4	---	624.56

DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
		JULY			AUGUST			SEPTEMBER	
1	2.6	18	0.13	0.74	3	0.01	1.2	8	0.03
2	2.0	12	0.06	0.57	3	.00	15	29	3.9
3	1.7	10	0.05	0.48	3	.00	8.1	12	0.26
4	1.5	6	0.02	0.40	3	.00	1.8	7	0.03
5	1.6	6	0.03	15	16	1.1	3.0	9	0.07
6	1.7	6	0.03	3.7	7	0.07	0.92	6	0.01
7	1.3	4	0.01	1.3	4	0.01	0.62	6	0.01
8	1.3	4	0.01	0.92	3	0.01	8.4	10	0.23
9	1.3	4	0.01	0.80	3	0.01	11	12	0.36
10	30	160	51	0.48	3	.00	25	8	0.54
11	25	42	3.2	0.36	2	.00	1.9	5	0.03
12	22	20	1.2	46	143	45	0.92	4	0.01
13	16	13	0.56	27	41	5.8	0.52	3	.00
14	4.7	10	0.13	2.8	15	0.11	0.40	3	.00
15	3.7	8	0.08	1.2	9	0.03	0.32	3	.00
16	2.7	10	0.07	0.80	6	0.01	0.29	3	.00
17	3.3	12	0.11	0.52	4	0.01	0.26	3	.00
18	5.2	8	0.11	0.40	4	.00	0.20	3	.00
19	2.6	5	0.04	0.29	4	.00	0.15	3	.00
20	1.4	4	0.02	0.26	4	.00	0.13	3	.00
21	1.2	4	0.01	0.66	8	0.01	0.24	3	.00
22	1.1	3	0.01	0.80	5	0.01	0.32	3	.00
23	1.0	3	0.01	0.36	4	.00	0.23	3	.00
24	0.80	3	0.01	0.23	4	.00	3.7	12	0.12
25	0.74	3	0.01	0.20	4	.00	1.8	6	0.03
26	0.80	3	0.01	0.29	4	.00	0.57	5	0.01
27	0.80	3	0.01	0.29	4	.00	0.29	4	.00
28	11	13	0.39	0.26	4	.00	0.15	4	.00
29	2.8	8	0.06	0.15	4	.00	0.13	4	.00
30	1.7	8	0.04	9.3	38	3.4	0.11	4	.00
31	1.5	6	0.02	9.0	20	0.49	---	---	---
TOTAL	155.04	---	57.45	125.56	---	56.08	87.67	---	5.64
YEAR	2513.73		1808.42						

16213000 WAIKELE STREAM AT WAIPAHU
(National stream-quality accounting network station)

LOCATION.--Lat 21°23'11", long 158°00'49", Hydrologic Unit 20060000, on left bank 300 ft (91 m) upstream from bridge on Highway 90 and 0.3 mi (0.5 km) southwest of sugar refinery at Waipahu.

DRAINAGE AREA.--45.7 mi^2 (118.4 km^2).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--June to October 1951, December 1951 to October 1959, July 1960 to current year.

REVISED RECORDS (FISCAL YEAR).--WSP 1639: 1955(M). (WATER YEARS).--WSP 1937: Drainage area. WSP 2137: 1965.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 1.37 ft (0.418 m) above mean sea level. Prior to July 1, 1960, at site 300 ft (91 m) downstream at datum 1.30 ft (0.396 m) higher.

REMARKS.--Records good. Diversions above station for irrigation of sugarcane in vicinity of Waipahu.

AVERAGE DISCHARGE.--24 years (water years, 1953-59, 1961-77), 38.5 ft^3/s (1.090 m^3/s), 27,890 acre-ft/yr (34.5 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 13,600 ft^3/s (385 m^3/s) Nov. 28, 1954, gage height, 14.82 ft (4.517 m), site and datum then in use, from rating curve extended above 730 ft^3/s (20.7 m^3/s) on basis of slope-area measurement of peak flow; minimum, 0.02 ft^3/s (0.001 m^3/s) Oct. 3, 1975.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 996 ft^3/s (28.2 m^3/s) June 28, gage height, 4.37 ft (1.332 m), no peak above base of 1,300 ft^3/s (36.8 m^3/s); minimum, 0.36 ft^3/s (0.010 m^3/s) Sept. 22.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	9.4	9.8	17	17	19	25	54	28	11	12	7.9	6.5
2	9.4	8.9	16	17	18	15	26	19	28	12	4.3	5.3
3	11	10	18	18	18	17	17	12	17	15	2.7	23
4	14	8.3	21	18	18	21	18	37	22	15	2.3	23
5	27	5.2	16	17	18	14	31	32	25	11	5.6	20
6	20	7.6	13	18	17	15	23	156	27	7.8	19	13
7	8.2	5.7	10	17	18	17	12	72	16	7.3	17	4.5
8	7.6	9.3	18	18	19	12	25	71	11	6.4	13	9.5
9	5.1	12	11	18	18	12	19	109	82	8.3	6.7	15
10	3.5	10	12	18	14	15	15	144	23	22	6.2	23
11	6.1	7.9	17	18	9.5	13	18	109	16	47	5.9	20
12	5.2	4.7	17	18	6.9	27	13	123	25	37	18	11
13	8.3	11	8.4	18	5.8	38	8.4	93	20	30	78	2.1
14	18	15	6.3	18	6.0	26	6.3	75	13	20	27	4.0
15	49	13	7.1	18	21	35	5.6	63	12	12	15	4.6
16	42	34	9.2	18	81	27	9.1	41	12	14	8.8	1.7
17	12	25	8.0	17	26	13	10	26	8.7	18	4.6	6.4
18	9.0	15	14	17	9.5	12	13	26	9.7	23	4.4	11
19	8.6	11	18	17	4.5	13	96	29	12	12	4.5	8.2
20	9.5	36	8.1	17	3.1	40	276	25	9.5	8.0	5.2	3.2
21	6.2	23	3.9	17	4.2	25	58	22	7.7	6.3	7.0	2.5
22	4.1	17	6.1	17	6.5	17	27	36	6.2	5.6	7.2	3.1
23	6.1	14	12	18	6.2	13	18	25	7.0	7.0	5.0	4.5
24	9.5	15	16	18	38	9.6	28	18	5.4	11	6.9	6.8
25	9.3	21	17	18	19	7.4	96	16	7.8	7.4	8.3	15
26	8.7	20	18	19	16	8.0	52	16	19	3.3	9.1	7.8
27	7.7	17	19	18	9.2	7.5	19	24	22	2.4	11	2.2
28	7.9	17	18	20	49	7.9	16	56	183	4.8	12	2.8
29	5.6	20	17	18	---	16	67	34	62	12	10	5.8
30	4.4	18	17	18	---	23	39	26	17	8.6	8.1	3.8
31	7.9	---	17	19	---	89	---	15	---	10	13	---
TOTAL	360.3	441.4	426.1	552	498.4	630.4	1115.4	1578	737.0	416.2	353.7	269.3
MEAN	11.6	14.7	13.7	17.8	17.8	20.3	37.2	50.9	24.6	13.4	11.4	8.98
MAX	49	36	21	20	81	89	276	156	183	47	78	23
MIN	3.5	4.7	3.9	17	3.1	7.4	5.6	12	5.4	2.4	2.3	1.7
AC-FT	715	876	845	1090	989	1250	2210	3130	1460	826	702	534

CAL YR 1976 TOTAL 11449.9 MEAN 31.3 MAX 968 MIN 2.0 AC-FT 22710
WTR YR 1977 TOTAL 7378.2 MEAN 20.2 MAX 276 MIN 1.7 AC-FT 14630

16213000 WAIKELE STREAM AT WAIPAHU--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1967-72. April 1973 to current year.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: April 1973 to current year.
WATER TEMPERATURES: April 1973 to current year.
SUSPENDED SEDIMENT DISCHARGE: July 1972 to current year.

INSTRUMENTATION.--Water-quality monitor since April 1973. Automatic pumping sediment sampler since July 1972.

REMARKS.--In addition to the water-quality monitor record, samples were collected once a month.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: Maximum 679 micromhos/cm Oct. 14, 1976; minimum, 30 micromhos/cm Apr. 19, 1974.
WATER TEMPERATURES: Maximum, 30.0°C May 6, 1973; minimum, 16.0°C Mar. 16, 1976.
SEDIMENT CONCENTRATIONS: Maximum daily mean, 3,420 mg/L Feb. 7, 1976; minimum daily mean, 10 mg/L May 10, Aug. 10, 29-31, Sept. 1, 1974, Oct. 29 to Nov. 2, Nov. 15-17, Dec. 11, 12, 1975.
SEDIMENT DISCHARGE: Maximum daily, 32,200 tons (29,200 tonnes) Apr. 19, 1974; minimum daily, 0.07 ton (0.06 tonne) Sept. 4, Oct. 1, 1975.

EXTREMES FOR CURRENT YEAR.--
SPECIFIC CONDUCTANCE: Maximum, 679 micromhos/cm Oct. 14; minimum, 70 micromhos/cm May 6.
WATER TEMPERATURES: Maximum, 29.0°C Oct. 14; minimum, 19.5°C Apr. 20.
SEDIMENT CONCENTRATIONS: Maximum daily mean, 946 mg/L June 28; minimum daily mean, 15 mg/L on many days during the year.
SEDIMENT DISCHARGE: Maximum daily, 1,000 tons (907 tonnes) June 28; minimum daily, 0.07 ton (0.06 tonne) Sept. 16.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTAN-TANEOUS DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)	TUR-BID-ITY (JTU)	FECAL COLI-FORM .7UM-MF (COL./ 100 ML)	STREP-TOCOCCI (COL-ONIES PER 100 ML)	FECAL STREP-TOCOCCI KF AGAR (COL. PER 100 ML)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)
OCT												
26...	1315	6.8	470	6.1	25.1	6	>6000	>10000	--	90	5	14
NOV												
22...	1245	8.0	400	6.4	22.7	6	--	--	--	58	8	10
22...	1300	--	--	--	--	--	490	450	--	--	--	--
DEC												
27...	1145	19	440	6.5	21.6	6	420	--	1200	60	0	10
JAN												
24...	1100	18	455	6.4	21.2	4	480	--	1000	64	0	10
FEB												
22...	1145	5.9	510	6.4	22.3	6	730	--	2100	73	14	13
MAR												
28...	1300	4.6	410	7.0	22.7	9	12000	--	120000	58	5	10
APR												
25...	1145	55	180	6.8	22.2	55	1600	--	10000	32	10	6.7
MAY												
23...	1100	23	300	6.5	23.1	8	1800	--	1800	44	5	8.0
JUN												
27...	0900	28	650	6.7	25.1	3	2400	--	8300	110	61	19
JUL												
25...	0930	4.1	535	6.7	24.5	6	900	--	2000	94	24	14
AUG												
22...	1100	7.0	500	7.0	23.8	6	1400	--	530	73	15	13
SEP												
26...	0730	7.2	570	6.6	24.0	9	28000	--	889000	98	41	16

> Actual value is known to be greater than the value shown
B Results based on colony count outside the acceptable range (non-ideal colony count).

16213000 WAIKELE STREAM AT WAIPAHU--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	DIS-SOLVED SODIUM (NA) (MG/L)	PERCENT SODIUM	SODIUM AD-SORP-TION RATIO	DIS-SOLVED PO-TAS-SIUM (K) (MG/L)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DIS-SOLVED SULFATE (SO4) (MG/L)	DIS-SOLVED CHLO-RIDE (CL) (MG/L)	DIS-SOLVED FLUO-RIDE (F) (MG/L)
OCT												
26...	11	68	63	3.3	5.0	92	0	75	117	25	85	.2
NOV												
22...	8.0	59	64	2.9	3.5	61	0	50	39	20	66	.2
22...	--	--	--	--	--	--	--	--	--	--	--	--
DEC												
27...	8.4	60	67	3.4	3.7	74	0	61	37	21	79	.2
JAN												
24...	9.4	63	67	3.4	3.7	116	0	95	74	24	75	.2
FEB												
22...	9.9	64	64	3.3	4.3	72	0	59	46	20	90	.2
MAR												
29...	8.0	55	66	3.1	3.7	65	0	53	10	23	70	.2
APR												
25...	3.6	19	54	1.5	2.5	26	0	21	6.6	13	25	.2
MAY												
23...	5.9	39	64	2.6	3.0	48	0	39	24	16	45	.1
JUN												
27...	16	96	61	3.5	4.5	64	0	53	20	30	150	.1
JUL												
25...	12	70	63	3.3	4.2	73	0	60	23	25	110	.2
AUG												
22...	9.8	68	65	3.5	4.6	70	0	57	11	28	83	.2
SEP												
26...	14	75	61	3.3	4.6	69	0	57	28	28	120	.2

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED SOLIDS (RESI-DUE AT 180 C) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTI-TUENTS) (MG/L)	DIS-SOLVED SOLIDS (TONS PER AC-FT)	DIS-SOLVED SOLIDS (TONS PER DAY)	TOTAL NITRITE PLUS NITRATE (N) (MG/L)	TOTAL AMMONIA NITRO-GEN (N) (MG/L)	TOTAL KJEL-DAHL NITRO-GEN (N) (MG/L)	TOTAL NITRO-GEN (N) (MG/L)	TOTAL NITRO-GEN (NO3) (MG/L)	TOTAL PHOS-PHORUS (P) (MG/L)	DIS-SOL-VED-PHOS-PHORUS (P) (MG/L)
OCT												
26...	58	316	312	.43	5.80	.00	--	.87	.87	3.9	1.7	--
NOV												
22...	48	260	236	.35	5.62	3.5	--	.59	4.1	18	1.3	--
22...	--	--	--	--	--	--	--	--	--	--	--	--
DEC												
27...	60	304	278	.41	15.6	3.3	--	1.2	4.5	20	1.5	--
JAN												
24...	63	313	305	.43	15.2	4.0	--	.77	4.8	21	1.8	--
FEB												
22...	63	328	309	.45	5.23	4.3	--	.58	4.9	22	1.7	--
MAR												
29...	54	282	256	.38	3.50	3.2	--	.77	4.0	18	1.5	--
APR												
25...	20	115	103	.16	17.1	.23	--	.12	.35	1.6	.04	--
MAY												
23...	39	193	180	.26	12.1	2.7	--	.56	3.3	14	1.2	--
JUN												
27...	57	403	398	.55	30.5	2.6	--	1.3	3.9	17	1.2	--
JUL												
25...	59	331	330	.45	3.66	3.3	--	1.1	4.4	19	2.0	--
AUG												
22...	60	322	301	.44	6.09	4.2	--	1.7	5.9	26	2.7	--
SEP												
26...	60	358	352	.49	6.96	3.1	.61	--	--	--	4.8	3.5

16213000 WAIKELE STREAM AT WAIPAHU--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	TOTAL ARSENIC (AS) (UG/L)	SUS-PENDED ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)	SUS-PENDED CAD-MIUM (CD) (UG/L)	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	SUS-PENDED CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	SUS-PENDED COBALT (CO) (UG/L)
NOV												
22...	1245	0	0	0	<10	<10	0	0	0	0	<50	<50
FEB												
22...	1145	0	0	0	<10	<10	0	0	0	0	<50	<50
MAY												
23...	1100	1	1	0	<10	<10	0	0	--	0	<50	--
AUG												
22...	1000	1	0	1	<10	<9	1	4	0	4	<50	<49
SEP												
26...	0730	--	--	--	--	--	--	--	--	--	--	--

DATE	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	SUS-PENDED COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)	TOTAL LEAD (PB) (UG/L)	SUS-PENDED LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	SUS-PENDED MAN-GANESE (MN) (UG/L)
NOV											
22...	0	<10	<6	4	550	40	<100	<99	1	80	50
FEB											
22...	0	<10	<8	2	670	30	<100	<98	2	110	50
MAY											
23...	0	<10	<9	1	1400	90	<100	<100	0	130	50
AUG											
22...	1	<10	<8	2	440	30	<100	<92	8	90	20
SEP											
26...	--	--	--	--	--	--	--	--	--	--	--

DATE	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	SUS-PENDED MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	SUS-PENDED SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL ZINC (ZN) (UG/L)	SUS-PENDED ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)
NOV											
22...	30	.0	.0	.0	1	0	1	0	0	0	3.9
FEB											
22...	60	.0	.0	.0	2	0	2	0	0	0	1.8
MAY											
23...	80	.0	.0	.0	0	0	0	10	5	5	3.5
AUG											
22...	70	.2	.2	.0	1	1	0	10	10	0	2.1
SEP											
26...	--	--	--	--	--	--	--	--	--	--	2.3

DATE	TIME	TOTAL ALDRIN (UG/L)	TOTAL ATRA-ZINE (UG/L)	ATRA-ZINE IN BOTTOM MATERI-AL (UG/KG DRY SOLIDS)	TOTAL CHLOR-DANE (UG/L)	TOTAL DDD (UG/L)	TOTAL DDE (UG/L)	TOTAL DDT (UG/L)	TOTAL DI-AZINON (UG/L)	TOTAL DI-ELDRIN (UG/L)
NOV										
22...	1245	ND	ND	ND	ND	ND	ND	ND	ND	ND
FEB										
22...	1145	ND	ND	--	ND	ND	ND	ND	ND	ND
JUN										
27...	0900	ND	ND	ND	ND	ND	ND	ND	ND	ND
SEP										
26...	0730	--	ND	--	--	--	--	--	--	--

< Actual value is known to be less than the value shown.
ND Material specifically analyzed for but not detected.

16213000 WAIKELE STREAM AT WAIPAHU--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TOTAL ENDRIN (UG/L)	TOTAL ETHION (UG/L)	TOTAL HEPTA-CHLOR (UG/L)	TOTAL HEPTA-CHLOR EPOXIDE (UG/L)	TOTAL LINDANE (UG/L)	TOTAL MALA-THION (UG/L)	TOTAL METH-OXY-CHLOR (UG/L)	TOTAL METHYL PARA-THION (UG/L)	TOTAL METHYL TRI-THION (UG/L)	TOTAL PARA-THION (UG/L)
NOV 22...	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
FEB 22...	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
JUN 27...	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SEP 26...	--	--	--	--	--	--	--	--	--	--

DATE	TOTAL TOX-APHENE (UG/L)	TOTAL TRI-THION (UG/L)	TOTAL 2,4-D (UG/L)	2,4-D IN BOTTOM MA-TERIAL (UG/KG)	TOTAL 2,4,5-T (UG/L)	2,4,5-T IN BOTTOM MA-TERIAL (UG/KG)	TOTAL SILVEX (UG/L)	SILVEX IN BOTTOM MA-TERIAL (UG/KG)	SIMA-ZINE TOTAL COUL-SON COND. (UG/L)	SIMA-ZINE IN BOTTOM MATERI-AL (UG/KG DRY SOLIDS)
NOV 22...	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
FEB 22...	ND	ND	ND	--	ND	--	ND	--	ND	--
JUN 27...	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SEP 26...	--	--	ND	--	ND	--	ND	--	ND	--

DATE	TIME	TOTAL PHYTO-PLANK-TON (CELLS PER ML)	CHLOR-A PERI-PHYTON CHROMO-SPECT-METRIC (MG/M2)	CHLOR-A PERI-PHYTON CHROMO-GRAPHIC FLUOROM (MG/M2)	CHLOR-B PERI-PHYTON CHROMO-SPECT-METRIC (MG/M2)	CHLOR-B PERI-PHYTON CHROMO-GRAPHIC FLUOROM (MG/M2)	BIOMASS CHLORO-PHYLL RATIO PERI-PHYTON (UNITS)	LENGTH OF EXPO-SURE (DAYS)
OCT 26...	1315	67000	--	--	--	--	--	--
NOV 22...	1245	630	31.5	--	13.4	--	36.6	27
DEC 27...	1145	74	--	--	--	--	--	--
JAN 24...	1100	160	--	--	--	--	--	--
FEB 22...	1145	210	--	--	--	--	--	--
MAR 28...	1300	240	--	--	--	--	--	--
APR 25...	1145	130	--	--	--	--	--	--
MAY 23...	1100	450	--	--	--	--	--	--
JUN 27...	0900	160	--	--	--	--	--	--
JUL 25...	0930	170	--	--	--	--	--	--
AUG 22...	1000	370	--	1.69	--	2.38	1491	28
SEP 26...	0730	290	--	--	--	--	--	--

ND Material specifically analyzed for but not detected

16213000 WAIKELE STREAM AT WAIPAHU--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTAN-TANEOUS DIS-CHARGE (CFS)	SUS-PENDED SEDI-MENT (MG/L)	SUS-PENDED SEDI-MENT DIS-CHARGE (T/DAY)	SUS. SED. SIEVE DIAM. % FINER THAN .062 MM
OCT					
26...	1315	6.8	7	.13	100
NOV					
22...	1245	8.0	--	--	--
22...	1300	--	6	--	100
DEC					
27...	1145	19	9	.46	100
JAN					
24...	1100	18	10	.49	100
FEB					
22...	1145	5.9	9	.14	100
MAR					
28...	1300	4.6	12	.15	100
APR					
25...	1145	55	43	6.4	100
MAY					
23...	1100	23	21	1.3	100
JUN					
27...	0900	28	12	.91	100
JUL					
25...	0930	4.1	20	.22	100
AUG					
22...	1000	7.0	21	.40	100
SEP					
26...	0730	7.2	15	.29	100

HAWAII, ISLAND OF OAHU

16213000 WAIKELE STREAM AT WAIPAHU--Continued

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

PHYTOPLANKTON

DATE	OCT 26,76		NOV 22,76		DEC 27,76		JAN 24,77		FEB 22,77		MAR 28,77	
TIME	1315		1245		1145		1100		1145		1300	
TOTAL CELLS/ML	67000		630		74		160		210		280	
DIVERSITY: DIVISION	0.0		0.6		1.5		0.6		0.4		0.5	
.CLASS	0.0		0.6		1.5		0.6		0.4		0.5	
..ORDER	0.0		0.7		1.7		0.6		0.4		0.5	
...FAMILY	0.0		0.9		2.5		0.8		0.4		1.3	
....GENUS	0.0		0.9		2.9		1.7		0.4		1.3	
ORGANISM	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT
CHLOROPHYTA (GREEN ALGAE)												
.CHLOROPHYCEAE												
..CHLOROCOCCALES												
...OOCYSTACEAE												
....ANKISTRODESMUS	--	-	--	-	2	3	--	-	--	-	--	-
...SCENEDESMACEAE												
....CRUCIGENIA	--	-	--	-	9	12	--	-	--	-	--	-
....SCENEDESMUS	--	-	--	-	--	-	--	-	--	-	--	-
....TETRASTRUM	--	-	--	-	18#	24	--	-	--	-	--	-
..VOLVOCALES												
...CHLAMYDOMONADACEAE												
....CHLAMYDOMONAS	--	-	--	-	4	6	--	-	3	2	--	-
CHRYSOPHYTA												
.BACILLARIOPHYCEAE												
..CENTRALES												
...COSCINODISCACEAE												
....CYCLOTELLA	*	0	--	-	--	-	--	-	--	-	--	-
....MELOSIRA	--	-	9	1	--	-	--	-	--	-	--	-
..PENNALES												
...ACHNANTHACEAE												
....ACHNANTHES	--	-	*	0	--	-	--	-	--	-	--	-
....COCCONEIS	--	-	*	0	--	-	--	-	--	-	--	-
....RHOICOSPHENIA	--	-	--	-	--	-	--	-	*	0	--	-
...CYMBELLACEAE												
....CYMBELLA	--	-	--	-	--	-	7	4	--	-	--	-
....EPITHEMIA	--	-	--	-	4	6	--	-	--	-	--	-
...DIATOMACEAE												
....DIATOMA	--	-	--	-	7	9	--	-	--	-	--	-
...FRAGILARIACEAE												
....SYNEDRA	--	-	9	1	--	-	--	-	--	-	6	2
...GOMPHONEMATACEAE												
....GOMPHONEMA	--	-	16	3	2	3	4	2	*	0	17	6
...NAVICULACEAE												
....ANOMOEONEIS	--	-	--	-	--	-	--	-	--	-	--	-
....FRUSTULIA	--	-	--	-	--	-	--	-	--	-	--	-
....NAVICULA	--	-	35	6	16#	21	*	0	3	2	6	2
....PINNULARIA	--	-	*	0	--	-	--	-	*	0	--	-
....STAURONEIS	--	-	--	-	--	-	*	0	--	-	--	-
...NITZSCHIACEAE												
....NITZSCHIA	--	-	12	2	--	-	14	9	7	3	--	-
...TABELLARIACEAE												
....TABELLARIA	--	-	--	-	--	-	--	-	*	0	--	-
CYANOPHYTA (BLUE-GREEN ALGAE)												
.CYANOPHYCEAE												
..CHROOCOCCALES												
...CHROOCOCCACEAE												
....ANACYSTIS	--	-	--	-	11#	15	--	-	--	-	--	-
..HORMOGONALES												
...NOSTOCACEAE												
....ANABAENA	--	-	--	-	--	-	--	-	--	-	55#	20
...OSCILLATORIACEAE												
....LYNGBYA	--	-	--	-	--	-	63#	39	--	-	--	-
....OSCILLATORIA	67000#	100	540#	86	--	-	74#	46	200#	94	190#	70
EUGLENOPHYTA (EUGLENOIDS)												
.EUGLENOPHYCEAE												
..EUGLENALES												
...EUGLENACEAE												
....EUGLENA	--	-	--	-	--	-	--	-	--	-	--	-
....TRACHELOMONAS	--	-	*	0	--	-	--	-	--	-	--	-

NOTE: # - DOMINANT ORGANISM; EQUAL TO OR GREATER THAN 15%
* - OBSERVED ORGANISM, MAY NOT HAVE BEEN COUNTED; LESS THAN 1/2%

HAWAII, ISLAND OF OAHU

16213000 WAIKELE STREAM AT WAIPAHU--Continued

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

PHYTOPLANKTON

DATE	APR 25,77	MAY 23,77	JUN 27,77	JUL 25,77	AUG 22,77	SEP 26,77
TIME	1145	1100	0900	0930	1000	0730
TOTAL CELLS/ML	130	450	160	170	370	290
DIVERSITY: DIVISION	0.7	0.3	1.2	1.1	0.9	1.6
.CLASS	0.7	0.3	1.2	1.1	0.9	1.6
..ORDER	0.7	0.3	1.2	1.1	0.9	1.6
...FAMILY	0.7	0.4	1.4	1.6	1.5	1.6
....GENUS	0.7	1.3	1.4	1.6	1.6	1.6

ORGANISM	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT
CHLOROPHYTA (GREEN ALGAE)												
.CHLOROPHYCEAE												
..CHLOROCOCCALES												
...OOCYSTACEAE												
....ANKISTRODESMUS	--	-	--	-	--	-	--	-	--	-	--	-
...SCENEDESMACEAE												
....CRUCIGENIA	--	-	--	-	--	-	--	-	--	-	--	-
....SCENEDESMUS	--	-	--	-	13	8	--	-	--	-	130#	46
....TETRASTRUM	--	-	--	-	--	-	--	-	--	-	--	-
..VOLVOCALES												
...CHLAMYDOMONADACEAE												
....CHLAMYDOMONAS	--	-	--	-	--	-	--	-	--	-	--	-
CHRYSOPHYTA												
.BACILLARIOPHYCEAE												
..CENTRALES												
...COSCINODISCACEAE												
....CYCLOTELLA	--	-	--	-	--	-	--	-	--	-	--	-
....MELOSIRA	--	-	--	-	--	-	--	-	--	-	--	-
..PENNALES												
...ACHNANTHACEAE												
....ACHNANTHES	--	-	--	-	--	-	--	-	--	-	--	-
....COCCONEIS	--	-	--	-	--	-	--	-	--	-	--	-
....RHOICOSPHENIA	--	-	--	-	--	-	--	-	--	-	--	-
...CYMBELLACEAE												
....CYMBELLA	--	-	--	-	--	-	--	-	--	-	--	-
....EPITHEMIA	--	-	--	-	--	-	--	-	--	-	--	-
...DIATOMACEAE												
....DIATOMA	--	-	--	-	--	-	--	-	--	-	--	-
...FRAGILARIACEAE												
....SYNEDRA	*	0	--	-	--	-	18	11	--	-	--	-
...GOMPHONEMATACEAE												
....GOMPHONEMA	25#	20	12	3	3	2	9	6	52	14	--	-
...NAVICULACEAE												
....ANOMOEONEIS	--	-	--	-	--	-	--	-	9	2	--	-
....FRUSTULIA	--	-	*	0	--	-	--	-	--	-	--	-
....NAVICULA	--	-	12	3	10	6	*	0	43	12	--	-
....PINNULARIA	--	-	--	-	--	-	--	-	--	-	--	-
....STAURONEIS	--	-	--	-	--	-	--	-	--	-	--	-
...NITZSCHIACEAE												
....NITZSCHIA	--	-	--	-	13	8	18	11	26	7	22	8
...TABELLARIACEAE												
....TABELLARIA	--	-	--	-	--	-	--	-	--	-	--	-
CYANOPHYTA (BLUE-GREEN ALGAE)												
.CYANOPHYCEAE												
..CHROCOCCALES												
...CHROCOCCACEAE												
....ANACYSTIS	--	-	--	-	--	-	--	-	--	-	--	-
..HORMOGONALES												
...NOSTOCACEAE												
....ANABAENA	--	-	--	-	--	-	--	-	--	-	--	-
...OSCILLATORIACEAE												
....LYNGBYA	--	-	250#	54	--	-	--	-	--	-	--	-
....OSCILLATORIA	100#	80	180#	41	120#	73	110#	67	240#	65	110#	38
EUGLENOPHYTA (EUGLENOIDS)												
.EUGLENOPHYCEAE												
..EUGLENALES												
...EUGLENACEAE												
....EUGLENA	--	-	--	-	--	-	9	6	--	-	22	8
....TRACHELOMONAS	--	-	--	-	3	2	--	-	--	-	--	-

NOTE: # - DOMINANT ORGANISM; EQUAL TO OR GREATER THAN 15%
* - OBSERVED ORGANISM, MAY NOT HAVE BEEN COUNTED: LESS THAN 1/2%

16213000 WAIKELE STREAM AT WAIPAHU--Continued

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	381	336	357	491	439	457	498	460	480	454	433	442
2	428	384	398	477	442	460	501	457	483	455	441	445
3	475	422	439	468	441	453	519	472	493	459	433	446
4	471	425	447	463	433	446	554	481	511	454	438	446
5	452	311	367	467	440	449	505	441	457	455	436	445
6	426	367	391	470	450	458	459	444	453	445	436	441
7	365	343	354	474	453	463	456	390	441	454	442	447
8	374	335	354	530	449	468	343	241	283	457	440	448
9	415	361	385	560	473	509	398	345	356	445	440	443
10	428	411	418	519	453	490	446	395	412	445	436	441
11	536	422	456	536	448	480	484	433	466	448	440	445
12	431	423	425	466	451	460	499	466	487	448	440	444
13	494	424	438	549	449	481	499	446	470	444	437	441
14	679	374	504	562	506	531	449	439	444	447	437	443
15	376	178	300	511	482	496	481	444	460	446	438	442
16	302	228	245	635	241	455	492	436	448	448	439	444
17	331	247	293	458	337	376	517	454	480	450	438	445
18	379	330	350	430	391	410	515	452	485	452	441	448
19	399	369	383	468	426	443	514	500	509	455	441	448
20	417	397	406	445	265	316	511	449	477	457	439	448
21	441	413	423	390	283	336	454	440	448	452	438	447
22	439	415	425	412	374	394	473	439	448	452	439	447
23	434	415	428	437	404	417	493	444	471	454	443	450
24	428	416	428	429	415	422	464	445	452	456	441	451
25	513	427	445	468	435	456	456	443	450	460	443	451
26	529	470	497	477	457	466	460	447	452	473	440	459
27	464	428	441	476	443	455	452	426	435	474	457	466
28	454	438	446	467	440	452	461	429	441	475	458	465
29	456	430	444	516	461	485	456	437	445	461	439	451
30	456	433	443	486	455	473	452	441	446	467	442	450
31	484	463	476	---	---	---	451	434	442	473	457	466
MONTH	679	178	407	635	241	448	554	241	452	475	433	448

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	480	463	470	277	179	218	206	124	163	362	282	330
2	465	453	460	323	282	305	271	211	243	395	306	354
3	465	450	459	329	282	312	336	272	296	371	326	349
4	502	453	471	288	249	263	361	273	323	366	173	289
5	478	436	456	313	289	303	295	211	255	263	170	219
6	458	437	448	345	315	327	270	208	231	271	70	178
7	486	449	462	341	276	309	304	275	291	270	91	152
8	502	477	489	344	293	312	429	295	357	307	143	229
9	504	485	495	346	328	336	443	365	406	225	76	172
10	503	479	490	395	329	352	471	368	401	229	76	140
11	505	482	487	359	296	328	410	325	393	380	147	250
12	508	463	478	362	229	301	335	257	291	290	166	210
13	479	460	471	296	188	233	378	329	350	373	183	240
14	485	460	472	273	221	249	378	361	370	400	272	300
15	487	174	448	296	158	237	393	380	388	387	270	310
16	206	136	154	268	185	236	404	371	390	370	331	350
17	302	174	246	312	270	292	396	384	390	350	303	320
18	403	309	380	353	316	336	370	317	340	369	318	337
19	424	391	407	366	333	345	371	95	269	356	297	334
20	458	422	438	352	183	264	113	93	102	322	285	308
21	491	438	457	266	211	238	214	109	161	352	324	340
22	492	475	484	292	266	279	259	202	240	442	335	388
23	482	457	466	340	294	318	306	260	281	342	302	315
24	458	158	258	344	308	322	365	235	336	364	326	342
25	265	210	239	361	340	349	255	118	165	392	350	369
26	347	245	302	393	361	374	208	120	159	398	366	381
27	344	331	337	408	391	402	276	208	254	400	310	369
28	359	119	247	419	400	408	319	279	298	338	167	238
29	---	---	---	403	306	341	336	110	223	292	251	277
30	---	---	---	332	291	303	273	147	196	360	290	319
31	---	---	---	295	107	179	---	---	---	369	334	358
MONTH	508	119	410	419	107	302	471	93	285	442	70	292

HAWAII, ISLAND OF OAHU

16213000 WAIKELE STREAM AT WAIPAHU--Continued

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	374	355	365	414	301	357	425	416	421	380	308	337
2	357	216	259	483	345	402	426	415	421	396	381	388
3	325	276	310	520	423	475	434	423	428	419	239	314
4	429	249	293	545	483	521	440	429	434	483	412	447
5	451	354	412	549	454	504	440	430	436	532	470	498
6	445	289	373	498	422	444	440	287	346	528	428	483
7	348	283	310	441	413	424	481	402	441	425	396	407
8	347	316	329	475	411	424	477	456	470	430	404	414
9	343	83	163	525	415	433	484	471	477	434	310	371
10	273	165	222	551	230	489	492	475	484	390	203	278
11	371	262	307	259	168	206	478	441	464	415	373	398
12	545	352	488	236	179	208	449	227	427	426	392	412
13	548	397	491	242	185	214	284	124	161	397	374	384
14	434	365	379	285	203	251	428	295	357	411	387	400
15	392	364	372	360	288	318	441	359	402	427	412	422
16	400	367	381	503	339	381	496	361	415	427	416	422
17	429	376	390	508	400	457	406	396	401	561	422	442
18	412	383	399	424	278	340	416	404	409	572	458	517
19	421	404	413	347	299	324	425	415	419	583	497	538
20	413	381	397	390	339	358	437	411	426	510	433	458
21	411	396	404	406	377	393	469	425	442	452	423	434
22	424	413	418	419	404	411	475	461	469	437	418	428
23	444	415	425	477	412	422	484	454	465	441	427	436
24	432	419	426	522	463	500	475	447	458	515	415	439
25	450	429	434	523	465	496	455	442	448	576	516	557
26	534	448	503	472	437	450	455	434	446	573	471	526
27	649	427	553	440	426	434	525	435	459	472	424	442
28	451	128	260	438	430	432	556	530	543	435	422	429
29	297	149	222	427	311	345	555	528	542	512	428	464
30	356	265	297	416	333	365	530	485	502	475	463	469
31	---	---	---	448	415	429	498	312	416	---	---	---
MONTH	649	83	367	551	168	394	556	124	433	583	203	432
YEAR	679	70	339									

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	25.0	22.5	23.5	24.5	21.5	22.5	23.0	22.5	23.0	22.5	21.0	22.0
2	24.5	22.0	23.5	23.5	22.5	23.0	22.5	22.0	22.5	22.5	21.5	22.0
3	24.5	23.0	24.0	23.5	22.5	23.0	23.0	22.5	23.0	22.5	21.0	21.5
4	24.0	22.5	23.5	23.0	22.5	22.5	23.5	22.0	22.5	22.5	21.0	21.5
5	25.0	23.0	24.0	23.0	22.0	22.5	23.0	21.5	22.0	22.5	21.5	21.5
6	25.0	23.0	24.0	23.5	22.0	22.5	22.5	21.5	22.0	22.5	21.0	21.5
7	24.5	22.5	23.5	23.5	22.0	22.5	22.5	22.0	22.0	22.5	21.5	22.0
8	24.5	22.5	23.0	24.5	22.0	23.0	22.0	21.0	21.5	22.5	21.0	22.0
9	24.0	22.0	23.0	25.0	23.0	24.0	22.5	21.0	22.0	22.5	21.5	22.0
10	24.0	22.0	23.0	24.0	22.5	23.0	23.0	22.0	22.5	23.0	21.5	22.0
11	25.0	22.0	23.0	24.0	22.0	23.0	23.0	22.0	22.5	22.5	21.5	22.0
12	23.5	22.0	22.5	23.0	21.5	22.0	23.5	22.0	22.5	22.5	21.5	22.0
13	24.5	22.0	23.0	25.5	21.5	23.0	22.5	22.0	22.5	22.5	21.5	22.0
14	29.0	23.0	25.5	25.5	23.0	24.0	22.5	21.5	22.0	22.5	21.5	22.0
15	25.0	22.5	23.5	25.5	23.0	23.5	22.5	21.5	22.0	22.5	21.5	22.0
16	24.5	22.5	23.5	26.0	22.0	24.0	23.0	21.0	21.5	22.5	21.5	22.0
17	24.0	22.0	23.0	23.5	21.5	22.0	23.0	22.0	22.5	23.0	22.0	22.0
18	23.5	22.0	22.5	23.0	22.0	22.5	23.5	21.0	22.5	22.5	21.5	22.0
19	24.0	21.5	22.5	23.0	22.5	22.5	23.5	22.0	23.0	22.5	21.5	22.0
20	24.0	22.0	23.0	22.5	21.0	22.0	22.5	21.5	22.5	22.5	21.5	22.0
21	23.5	22.0	23.0	23.0	22.0	22.5	22.5	21.0	22.0	22.5	21.0	22.0
22	24.0	22.0	23.0	23.5	22.0	22.5	23.0	21.0	22.0	22.5	21.0	21.5
23	24.5	22.5	23.0	23.5	22.0	23.0	23.0	22.0	22.5	22.5	21.0	21.5
24	23.5	22.0	23.0	22.5	22.0	22.0	22.5	21.5	22.0	22.5	21.0	21.5
25	24.5	22.0	23.0	23.0	22.0	22.0	22.5	21.5	22.0	22.5	21.5	22.0
26	25.5	23.5	24.5	22.5	21.5	22.0	22.5	21.0	22.0	22.5	21.0	21.5
27	24.0	22.5	23.0	23.0	21.0	22.0	22.5	21.5	21.5	22.5	21.5	21.5
28	24.0	22.5	23.0	22.5	21.5	22.0	22.5	21.0	21.5	22.5	21.0	21.5
29	23.5	22.0	22.5	23.0	21.5	22.0	22.5	21.5	22.0	22.5	21.0	21.5
30	23.5	21.5	22.5	23.0	22.5	23.0	22.5	21.5	22.0	22.5	21.0	22.0
31	24.5	22.5	23.5	---	---	---	22.5	21.0	22.0	23.0	21.5	22.0
MONTH	29.0	21.5	23.5	26.0	21.0	22.5	23.5	21.0	22.0	23.0	21.0	22.0

HAWAII, ISLAND OF OAHU

16213000 WAIKELE STREAM AT WAIPAHU--Continued

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	FEBRUARY			MARCH			APRIL			MAY		
1	23.0	21.5	22.0	23.0	21.5	22.0	22.5	21.0	22.0	25.0	23.0	24.0
2	23.0	21.5	22.0	23.5	22.0	22.5	23.0	22.0	22.5	24.0	22.5	23.5
3	23.0	21.5	22.0	23.5	22.0	22.5	23.5	22.0	23.0	24.0	22.0	23.0
4	23.0	21.5	22.0	23.0	22.0	22.5	23.5	22.0	22.5	24.5	22.0	23.0
5	22.5	21.5	22.0	23.0	21.5	22.0	23.0	21.5	22.5	24.5	22.0	23.5
6	23.0	21.5	22.0	23.0	21.5	22.0	23.5	21.0	22.0	23.5	20.5	22.0
7	23.0	21.5	22.0	22.5	21.5	22.0	24.0	22.0	22.5	24.5	20.0	22.0
8	23.5	22.5	23.0	23.0	21.5	22.0	25.0	22.0	23.5	24.0	23.0	23.5
9	24.0	22.0	23.0	23.5	21.5	22.5	24.5	23.0	24.0	22.5	21.0	22.5
10	23.5	22.0	22.5	24.0	22.0	22.5	25.5	22.0	23.5	22.5	20.5	21.5
11	23.5	21.5	22.5	23.0	22.0	22.5	24.5	22.5	23.5	23.0	21.5	22.5
12	23.5	21.5	22.5	23.5	22.5	22.5	24.0	22.5	23.0	23.0	22.0	22.5
13	23.0	21.5	22.5	22.5	21.5	22.0	24.5	22.0	23.0	23.0	21.5	22.5
14	23.0	21.5	22.5	23.5	22.0	22.5	24.0	22.0	23.0	23.5	22.0	22.5
15	22.5	21.0	22.0	24.0	22.0	22.5	24.0	22.0	23.0	24.0	22.0	23.0
16	21.5	20.0	20.5	23.5	21.5	22.5	24.5	22.0	23.0	23.5	22.0	23.0
17	22.5	20.5	21.5	24.0	22.0	23.0	24.0	22.0	23.0	25.0	22.0	23.0
18	23.0	21.5	22.5	24.0	22.0	23.0	23.0	22.0	22.5	25.5	22.5	23.5
19	23.5	21.0	22.0	24.0	22.0	23.0	22.5	20.0	21.5	24.0	22.5	23.5
20	23.5	21.0	22.5	22.5	22.0	22.0	21.0	19.5	20.0	25.0	22.5	23.5
21	23.0	21.5	22.5	23.0	21.0	22.0	23.5	20.0	21.5	25.0	23.0	23.5
22	23.5	22.5	23.0	23.0	21.5	22.0	24.0	21.5	22.5	24.5	22.5	23.5
23	23.0	22.0	22.5	23.0	22.0	22.5	23.0	22.0	22.5	24.5	22.5	23.5
24	22.0	21.0	22.0	23.5	21.5	22.5	24.0	22.5	23.0	25.0	22.5	23.5
25	22.5	21.5	22.0	23.5	21.5	22.5	22.5	21.5	22.0	24.5	22.5	23.5
26	23.5	22.0	22.5	24.5	21.5	22.5	22.0	20.0	21.0	25.0	22.5	23.5
27	24.0	22.5	23.0	24.0	21.5	22.5	24.5	21.5	22.5	25.0	23.0	23.5
28	22.5	21.5	22.0	23.5	22.0	22.5	25.5	23.0	24.0	25.0	22.5	23.5
29	---	---	---	23.5	22.5	23.0	24.0	22.5	23.5	25.0	23.0	24.0
30	---	---	---	23.5	22.0	22.5	24.0	21.5	23.0	25.5	23.0	24.5
31	---	---	---	22.5	21.0	22.0	---	---	---	26.0	23.5	24.5
MONTH	24.0	20.0	22.5	24.5	21.0	22.5	25.5	19.5	22.5	26.0	20.0	23.0

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	JUNE			JULY			AUGUST			SEPTEMBER		
1	25.0	23.0	24.0	25.5	23.0	24.0	25.0	23.0	24.0	26.0	23.5	24.5
2	25.0	23.0	24.0	26.5	23.0	24.5	25.5	22.5	24.0	25.5	23.5	24.0
3	25.0	23.0	24.0	25.5	24.5	25.0	26.0	22.5	24.0	25.5	23.5	24.5
4	26.0	22.5	24.0	26.0	24.0	25.0	26.0	22.5	24.0	26.0	24.5	25.0
5	25.0	23.0	23.5	25.0	23.5	24.5	25.0	23.0	24.0	26.5	24.0	25.0
6	24.5	23.0	24.0	25.5	22.5	24.0	27.0	24.0	25.5	25.5	23.5	24.5
7	23.0	22.0	22.5	25.5	23.0	24.0	26.5	24.0	25.0	25.0	23.0	23.5
8	23.5	22.0	22.5	25.5	23.0	24.0	26.0	24.0	25.0	25.0	22.5	24.0
9	23.0	20.5	22.0	25.5	22.5	24.0	27.5	24.5	26.0	25.0	23.5	24.5
10	24.5	21.5	23.0	25.5	24.5	25.0	27.5	24.5	26.0	26.5	23.5	25.0
11	25.0	22.5	23.5	25.0	22.5	24.0	26.5	24.0	25.0	26.0	24.0	25.0
12	27.0	23.5	25.5	25.5	23.0	24.0	26.0	23.5	24.5	25.0	23.5	24.5
13	26.0	23.5	25.0	26.0	23.0	24.5	25.5	23.5	24.5	25.0	23.0	23.5
14	25.0	23.0	24.0	25.5	23.0	24.0	26.0	24.0	25.0	25.0	22.0	23.5
15	25.5	23.0	24.0	26.0	23.0	24.5	25.5	24.0	24.5	25.0	23.0	24.0
16	25.5	23.0	24.0	27.5	23.5	25.0	27.0	23.0	24.5	25.0	23.0	23.5
17	24.5	23.0	24.0	26.0	24.5	25.0	26.0	23.5	24.5	25.5	22.5	24.0
18	25.5	23.0	24.0	26.0	24.0	25.0	25.5	23.0	24.0	25.5	24.5	25.0
19	25.5	23.0	24.0	26.0	23.0	24.5	26.0	23.0	24.0	26.5	23.5	25.5
20	24.5	23.0	23.5	26.0	23.0	24.0	26.0	23.0	24.5	25.0	22.5	24.0
21	25.0	22.5	23.5	25.5	23.0	24.0	26.0	23.0	24.5	25.0	22.5	23.5
22	25.5	22.5	24.0	25.5	23.0	24.0	25.5	23.5	24.5	25.0	22.5	23.5
23	25.0	22.5	24.0	26.0	22.0	24.0	26.5	23.5	25.0	24.5	23.0	23.5
24	24.5	22.5	23.5	26.5	24.5	25.5	26.5	24.0	25.0	25.5	22.5	24.0
25	25.5	22.5	24.0	26.0	24.0	25.0	24.5	24.0	24.0	27.0	24.5	25.0
26	25.5	22.5	24.0	25.5	22.5	24.0	25.5	23.5	24.0	25.0	23.0	24.0
27	26.0	23.5	25.0	25.5	22.5	24.0	27.0	23.5	25.0	24.5	22.0	23.0
28	23.5	21.5	22.5	25.5	23.0	24.0	26.5	24.5	25.5	24.0	22.0	23.0
29	23.0	21.5	22.0	25.0	24.0	24.5	26.5	24.5	25.5	26.0	22.5	24.0
30	25.0	22.5	23.5	26.0	23.0	24.5	26.5	24.5	25.5	24.5	22.5	23.5
31	---	---	---	25.5	23.5	24.5	26.5	24.5	25.5	---	---	---
MONTH	27.0	20.5	23.5	27.5	22.0	24.5	27.5	22.5	24.5	27.0	22.0	24.0
YEAR	29.0	19.5	23.0									

HAWAII, ISLAND OF OAHU

16213000 WAIKELE STREAM AT WAIPAHU--Continued

SUSPENDED-SEDIMENT DISCHARGE (TONS/DAY), WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
		OCTOBER			NOVEMBER			DECEMBER	
1	9.4	20	0.51	9.8	30	0.79	17	25	1.1
2	9.4	20	0.51	8.9	30	0.72	16	25	1.1
3	11	20	0.59	10	30	0.81	18	30	1.5
4	14	20	0.76	8.3	30	0.67	21	30	1.7
5	27	25	1.8	5.2	30	0.42	16	30	1.3
6	20	25	1.4	7.6	30	0.62	13	30	1.1
7	8.2	20	0.44	5.7	30	0.46	10	30	0.81
8	7.6	20	0.41	9.3	80	2.0	18	35	1.7
9	5.1	20	0.28	12	60	1.9	11	30	0.89
10	3.5	20	0.19	10	40	1.1	12	30	0.97
11	6.1	25	0.41	7.9	30	0.64	17	30	1.4
12	5.2	25	0.35	4.7	25	0.32	17	25	1.1
13	8.3	30	0.67	11	30	0.89	8.4	25	0.57
14	18	30	1.5	15	30	1.2	6.3	20	0.34
15	49	150	20	13	35	1.2	7.1	20	0.38
16	42	70	7.9	34	60	5.5	9.2	25	0.62
17	12	35	1.1	25	40	2.7	8.0	25	0.54
18	9.0	25	0.61	15	25	1.0	14	25	0.94
19	8.6	20	0.46	11	25	0.74	18	25	1.2
20	9.5	20	0.51	36	50	4.9	8.1	20	0.44
21	6.2	20	0.33	23	25	1.6	3.9	20	0.21
22	4.1	20	0.22	17	25	1.1	6.1	20	0.33
23	6.1	20	0.33	14	25	0.94	12	20	0.65
24	9.5	20	0.51	15	25	1.0	16	15	0.65
25	9.3	20	0.50	21	40	2.3	17	15	0.69
26	8.7	20	0.47	20	35	1.9	18	15	0.73
27	7.7	25	0.52	17	30	1.4	19	15	0.77
28	7.9	25	0.53	17	30	1.4	18	15	0.73
29	5.6	25	0.38	20	30	1.6	17	15	0.69
30	4.4	25	0.30	18	30	1.5	17	15	0.69
31	7.9	25	0.53	---	---	---	17	15	0.69
TOTAL	360.3	---	45.02	441.4	---	43.32	426.1	---	26.53

DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
		JANUARY			FEBRUARY			MARCH	
1	17	15	0.69	19	25	1.3	25	40	2.7
2	17	15	0.69	18	25	1.2	15	20	0.81
3	18	15	0.73	18	25	1.2	17	25	1.1
4	18	15	0.73	18	25	1.2	21	20	1.1
5	17	15	0.69	18	30	1.5	14	20	0.76
6	18	15	0.73	17	30	1.4	15	20	0.81
7	17	15	0.69	18	25	1.2	17	20	0.92
8	18	15	0.73	19	20	1.0	12	20	0.65
9	18	15	0.73	18	20	0.97	12	20	0.65
10	18	20	0.97	14	20	0.76	15	20	0.81
11	18	20	0.97	9.5	25	0.64	13	25	0.88
12	18	20	0.97	6.9	25	0.47	27	25	1.8
13	18	20	0.97	5.8	20	0.31	38	30	3.1
14	18	20	0.97	6.0	20	0.32	26	40	2.8
15	18	20	0.97	21	165	54	35	100	9.5
16	18	20	0.97	81	270	59	27	35	2.6
17	17	15	0.69	26	25	1.8	13	25	0.88
18	17	15	0.69	9.5	20	0.51	12	25	0.81
19	17	15	0.69	4.5	20	0.24	13	25	0.88
20	17	15	0.69	3.1	20	0.17	40	40	4.3
21	17	15	0.69	4.2	20	0.23	25	30	2.0
22	17	15	0.69	6.5	20	0.35	17	25	1.1
23	18	15	0.73	6.2	20	0.33	13	25	0.88
24	18	15	0.73	38	80	8.2	9.6	25	0.65
25	18	20	0.97	19	25	1.3	7.4	25	0.50
26	19	20	1.0	16	20	0.86	8.0	30	0.65
27	18	20	0.97	9.2	20	0.50	7.5	30	0.61
28	20	20	1.1	49	168	41	7.9	25	0.53
29	18	20	0.97	---	---	---	16	30	1.3
30	18	25	1.2	---	---	---	23	30	1.9
31	19	25	1.3	---	---	---	89	298	102
TOTAL	552	---	26.31	498.4	---	181.96	630.4	---	149.98

16213000 WAIKELE STREAM AT WAIPAHU--Continued

SUSPENDED-SEDIMENT DISCHARGE (TONS/DAY), WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
		APRIL			MAY			JUNE	
1	54	110	16	28	20	1.5	11	20	0.59
2	26	60	4.2	19	15	0.77	28	35	2.6
3	17	30	1.4	12	15	0.49	17	25	1.1
4	18	25	1.2	37	50	5.0	22	25	1.5
5	31	25	2.1	32	30	2.6	25	25	1.7
6	23	20	1.2	156	175	136	27	25	1.8
7	12	20	0.65	72	70	14	16	20	0.86
8	25	15	1.0	71	122	32	11	30	0.89
9	19	15	0.77	109	148	111	82	236	81
10	15	15	0.61	144	219	134	23	40	2.5
11	18	15	0.73	109	261	92	16	25	1.1
12	13	15	0.53	123	280	139	25	25	1.7
13	8.4	15	0.34	93	90	23	20	25	1.4
14	6.3	15	0.26	75	50	10	13	25	0.88
15	5.6	15	0.23	63	35	6.0	12	20	0.65
16	9.1	15	0.37	41	30	3.3	12	20	0.65
17	10	15	0.41	26	20	1.4	8.7	20	0.47
18	13	20	0.70	26	30	2.1	9.7	20	0.52
19	96	432	239	29	30	2.3	12	20	0.65
20	276	579	622	25	25	1.7	9.5	20	0.51
21	58	80	13	22	25	1.5	7.7	20	0.42
22	27	25	1.8	36	25	2.4	6.2	20	0.33
23	18	20	0.97	25	25	1.7	7.0	20	0.38
24	28	40	3.0	18	20	0.97	5.4	20	0.29
25	96	390	144	16	20	0.86	7.8	20	0.42
26	52	150	21	16	20	0.86	19	20	1.0
27	19	30	1.5	24	25	1.6	22	40	2.4
28	16	25	1.1	56	30	4.5	183	986	1000
29	67	100	18	34	20	1.8	62	309	63
30	39	25	2.6	26	20	1.4	17	50	2.3
31	---	---	---	15	20	0.81	---	---	---
TOTAL	1115.4	---	1100.67	1578	---	736.56	737.0	---	1173.61

DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
		JULY			AUGUST			SEPTEMBER	
1	12	30	0.97	7.9	30	0.64	6.5	20	0.35
2	12	20	0.65	4.3	30	0.35	5.3	20	0.29
3	15	20	0.81	2.7	30	0.22	23	40	2.5
4	15	20	0.81	2.3	30	0.19	23	20	1.2
5	11	15	0.45	5.6	30	0.45	20	15	0.81
6	7.8	15	0.32	19	30	1.5	13	15	0.53
7	7.3	15	0.30	17	25	1.1	4.5	15	0.18
8	6.4	15	0.26	13	25	0.88	9.5	20	0.51
9	8.3	15	0.34	6.7	25	0.45	15	20	0.81
10	22	30	1.8	6.2	25	0.42	23	25	1.6
11	47	40	5.1	5.9	25	0.40	20	15	0.81
12	37	30	3.0	18	122	31	11	15	0.45
13	30	30	2.4	78	284	77	2.1	15	0.09
14	20	30	1.6	27	30	2.2	4.0	15	0.16
15	12	25	0.81	15	25	1.0	4.6	15	0.19
16	14	25	0.94	8.8	25	0.59	1.7	15	0.07
17	18	25	1.2	4.6	25	0.31	6.4	20	0.35
18	23	30	1.9	4.4	20	0.24	11	20	0.59
19	12	30	0.97	4.5	20	0.24	8.2	15	0.33
20	8.0	30	0.65	5.2	30	0.42	3.2	15	0.13
21	6.3	30	0.51	7.0	30	0.57	2.5	15	0.10
22	5.6	30	0.45	7.2	30	0.58	3.1	15	0.13
23	7.0	30	0.57	5.0	25	0.34	4.5	15	0.18
24	11	30	0.89	6.9	25	0.47	6.8	15	0.28
25	7.4	30	0.60	8.3	25	0.56	15	15	0.61
26	3.3	30	0.27	9.1	30	0.74	7.8	15	0.32
27	2.4	30	0.19	11	30	0.89	2.2	15	0.09
28	4.8	40	0.52	12	30	0.97	2.8	20	0.15
29	12	40	1.3	10	30	0.81	5.8	30	0.47
30	8.6	30	0.70	8.1	30	0.66	3.8	30	0.31
31	10	30	0.81	13	30	1.1	---	---	---
TOTAL	416.2	---	32.09	353.7	---	127.29	269.3	---	14.59
YEAR	7378.2		3657.93						

16216000 WAIAWA STREAM NEAR PEARL CITY

LOCATION.--Lat 21°23'57", long 157°58'51", Hydrologic Unit 20060000, on left bank 100 ft (30 m) upstream from lower bridge on Highway 90, 0.6 mi (1.0 km) northwest of Pearl City, and 2.0 mi (3.2 km) northeast of Waipahu.

DRAINAGE AREA.--26.4 mi² (68.4 km²).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--June 1952 to current year.

REVISED RECORDS.--WSP 1569: Drainage area.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 1.81 ft (0.552 m) above mean sea level.

REMARKS.--Records fair. Low flow affected by effluent from sewage treatment plant and occasional small irrigation diversion and return flow above station.

AVERAGE DISCHARGE.--25 years, 32.4 ft³/s (0.918 m³/s), 23,470 acre-ft/yr (28.9 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 23,400 ft³/s (663 m³/s) Jan. 5, 1968, gage height, 20.56 ft (6.267 m), from rating curve extended above 1,100 ft³/s (31.2 m³/s) on basis of slope-area measurements at gage heights 17.1 ft (5.21 m) and 20.56 ft (6.267 m); minimum, 1.7 ft³/s (0.048 m³/s) Nov. 8, 9, 1973, Jan. 26, Sept. 25, 27, 1977.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 2,300 ft³/s (65.1 m³/s) and maximum (*):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
May 6	1415	2310	65.4	8.38	2.554
May 9	2200	3530	100	9.80	2.987
June 9	0015	*5640	160	11.94	3.639

Minimum discharge, 1.7 ft³/s (0.048 m³/s) Jan. 26, Sept. 25, 27.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.2	2.6	3.2	3.2	2.3	13	43	13	7.3	4.7	3.2	3.6
2	2.7	2.5	2.9	2.6	2.4	11	20	9.8	28	3.6	3.0	2.7
3	2.9	2.5	3.6	2.6	2.3	15	14	7.4	17	3.2	2.8	13
4	25	2.3	4.1	2.6	2.1	14	38	54	15	2.8	2.7	5.8
5	13	2.8	3.6	2.5	2.4	7.9	39	20	8.1	3.0	17	3.5
6	7.1	2.7	3.8	2.5	2.4	6.6	16	566	38	3.6	11	2.8
7	9.4	2.5	3.0	2.4	2.5	9.0	8.6	81	10	3.6	4.1	2.4
8	4.5	2.5	3.1	2.5	2.7	6.0	6.3	120	313	3.6	3.5	2.3
9	3.7	2.4	3.8	2.6	3.1	6.6	5.6	373	641	4.3	3.5	2.3
10	3.7	2.3	2.8	2.6	3.0	6.3	5.5	143	22	17	2.6	26
11	3.9	2.9	2.7	2.6	2.6	5.8	14	91	12	39	2.3	5.1
12	4.1	2.8	2.6	2.4	3.1	22	10	115	9.1	32	40	2.7
13	7.2	2.5	2.6	2.4	2.9	51	6.0	94	7.7	21	31	3.0
14	7.8	2.6	2.5	2.3	2.8	32	5.7	131	8.5	12	6.5	3.6
15	129	2.9	2.5	2.4	7.8	46	5.6	46	8.0	6.5	3.6	4.3
16	26	7.0	2.7	2.4	81	22	5.6	23	6.2	5.3	3.5	5.1
17	8.1	5.7	2.6	2.4	9.4	12	5.6	15	5.5	7.9	3.2	3.8
18	4.5	3.0	2.5	2.3	4.2	8.5	5.9	12	4.9	9.4	3.2	3.3
19	3.4	2.8	2.4	2.3	3.5	15	255	9.7	4.5	7.6	3.8	3.6
20	4.8	9.8	2.6	2.4	3.4	69	410	6.9	3.8	4.9	4.0	3.2
21	4.3	4.0	2.5	2.2	3.2	22	50	5.5	4.1	4.0	3.6	3.0
22	3.4	3.1	3.2	2.4	3.0	15	20	7.8	3.9	3.8	3.6	2.8
23	2.8	2.9	2.8	2.6	24	10	12	6.2	3.6	3.3	3.6	2.7
24	2.8	2.9	3.1	2.6	36	6.8	8.9	4.9	4.6	3.3	3.0	2.8
25	2.8	3.1	3.0	2.5	23	5.9	40	3.8	3.5	3.3	3.3	2.7
26	3.1	2.6	3.0	2.2	14	5.7	20	3.3	3.2	3.3	3.0	2.6
27	3.0	2.6	2.9	2.1	8.2	5.5	8.7	5.9	12	3.5	2.8	2.4
28	2.5	2.6	2.8	2.3	42	6.7	14	70	189	7.4	2.8	3.0
29	3.4	2.7	2.7	2.3	---	12	84	15	26	8.8	2.7	2.4
30	2.5	3.2	2.7	2.3	---	8.2	28	7.7	7.6	4.0	2.6	2.4
31	2.5	---	3.2	2.1	---	94	---	5.9	---	3.3	10	---
TOTAL	307.1	96.8	91.5	75.6	299.3	570.5	1205.0	2066.8	1427.1	243.0	195.5	128.9
MEAN	9.91	3.23	2.95	2.44	10.7	18.4	40.2	66.7	47.6	7.84	6.31	4.30
MAX	129	9.8	4.1	3.2	81	94	410	566	641	39	40	26
MIN	2.5	2.3	2.4	2.1	2.1	5.5	5.5	3.3	3.2	2.8	2.3	2.3
AC-FT	609	192	181	150	594	1130	2390	4100	2830	482	388	256

CAL YR 1976 TOTAL 7005.4 MEAN 19.1 MAX 969 MIN 2.3 AC-FT 13900
WTR YR 1977 TOTAL 6707.1 MEAN 18.4 MAX 641 MIN 2.1 AC-FT 13300

HAWAII, ISLAND OF OAHU

16216000 WAIAWA STREAM NEAR PEARL CITY--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1973-77.

REMARKS.--Miscellaneous chemical analyses published for this station for 1968-72 water years.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTAN-TANEOUS DIS-CHARGE (CFS)	COLOR (PLAT-INUM-COBALT UNITS)	TUR-BID-ITY (JTU)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	DIS-SOLVED SODIUM (NA) (MG/L)	PERCENT SODIUM
MAR										
09...	1130	7.4	8	8	110	57	18	15	64	56
APR										
25...	1300	30	44	25	51	32	8.6	7.1	26	52

DATE	SODIUM AD-SORP-TION RATIO	DIS-SOLVED PO-TAS-SIUM (K) (MG/L)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DIS-SOLVED SULFATE (SO4) (MG/L)	DIS-SOLVED CHLO-RIDE (CL) (MG/L)	DIS-SOLVED FLUO-RIDE (F) (MG/L)
MAR									
09...	2.7	3.9	61	0	50	25	24	120	.1
APR									
25...	1.6	1.7	23	0	19	18	10	52	.0

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTI-TUENTS) (MG/L)	DIS-SOLVED SOLIDS (TONS PER AC-FT)	DIS-SOLVED SOLIDS (TONS PER DAY)	DIS-SOLVED NITRITE PLUS NITRATE (N) (MG/L)	DIS-SOLVED ORTHO. PHOS-PHORUS (P) (MG/L)	DIS-SOLVED ORTHO PHOS-PHATE (PO4) (MG/L)	DIS-SOLVED IRON (FE) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)
MAR									
09...	30	319	.43	6.37	2.3	1.2	3.7	110	80
APR									
25...	12	139	.18	10.7	.57	.09	.28	120	20

DATE	TIME	INSTAN-TANEOUS DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)
OCT					
21...	1135	3.1	750	6.9	24.0
DEC					
01...	1135	3.2	1400	6.9	22.0
JAN					
20...	1140	2.7	1120	6.7	22.0
MAR					
09...	1120	7.4	580	6.6	22.5
09...	1130	7.4	580	6.6	22.5
APR					
25...	1000	30	250	6.3	21.5
25...	1300	30	250	6.3	21.5
JUN					
09...	1000	86	100	6.4	21.0
SEP					
01...	1135	3.2	750	6.8	24.5

16224500 KALAUAO STREAM AT MOANALUA ROAD, AT AIEA

LOCATION.--Lat 21°23'07", long 157°56'22", Hydrologic Unit 20060000, on left bank at downstream side of Moanalua Road bridge, 0.4 mi (0.6 km) northwest of Aiea Post Office, and 2.3 mi (3.7 km) southeast of Pearl City Post Office.

DRAINAGE AREA.--2.59 mi² (6.71 km²).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--July 1957 to current yar.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 11.71 ft (3.569 m) above mean sea level. Nov. 15, 1965, to June 16, 1966, at datum 0.04 ft (0.012 m) higher. Prior to Nov. 15, 1965, and June 17, 1966, to Sept. 30, 1970, at datum 1.04 ft (0.317 m) higher.

REMARKS.--Records poor. No diversion above station.

AVERAGE DISCHARGE.--20 years, 2.83 ft³/s (0.080 m³/s), 2,050 acre-ft/yr (2.53 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,580 ft³/s (73.1 m³/s) May 14, 1963, gage height, 6.63 ft (2.021 m), datum then in use, from rating curve extended above 77 ft³/s (2.18 m³/s) on basis of slope-area measurements at gage heights 6.29 ft (1.917 m) and 6.63 ft (2.021 m); no flow for many days in 1970-74, 1977.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 511 ft³/s (14.5 m³/s) June 8, gage height, 3.98 ft (1.213 m), from rating curve extended as explained above, no other peak above base of 300 ft³/s (8.50 m³/s); no flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.04	.03	.05	.06	.10	.16	5.1	.41	.08	.00	.00	.00
2	.05	.03	.05	.06	.06	.13	1.8	.04	.80	.00	.00	.00
3	.05	.03	.11	.06	.13	1.1	10	.01	.36	.00	.00	.00
4	.93	.02	.05	.06	.07	1.4	12	1.5	.10	.00	.00	.00
5	.07	.06	.05	.06	.06	.33	13	1.3	1.0	.00	.00	.00
6	.05	.01	.05	.05	.05	.20	3.1	21	8.5	.00	.00	.00
7	3.3	.02	.07	.05	.05	.07	1.1	6.1	.66	.00	.00	.00
8	.10	.03	.07	.05	.06	.07	.25	5.1	59	.00	.00	.00
9	.05	.04	.07	.05	.05	.05	.08	17	30	.00	.00	.00
10	.05	.07	.06	.05	.05	.05	.04	12	2.9	.00	.00	1.2
11	.07	.06	.05	.06	.06	.07	.02	7.0	.93	.00	.00	.00
12	.14	.07	.06	.07	.05	.11	.00	13	.23	.00	.00	.00
13	.05	.06	.04	.08	.05	3.1	.01	12	.07	.00	.00	.00
14	.10	.04	.04	.10	.05	1.7	.00	32	.03	.00	.00	.00
15	9.4	.04	.03	.07	.05	.91	.01	7.8	.00	.00	.00	.00
16	2.2	.04	.02	.06	.05	1.0	.00	2.6	.00	.00	.00	.00
17	.18	.03	.02	.06	.07	.25	.00	1.2	.00	.00	.00	.00
18	.12	.02	.03	.06	.06	.16	.23	.50	.00	.00	.00	.00
19	.09	.03	.03	.05	.05	.25	27	.21	.00	.00	.00	.00
20	.08	.42	.04	.11	.03	8.3	25	.11	.00	.00	.00	.00
21	.04	.06	.05	.05	.03	2.3	5.7	.10	.00	.00	.00	.00
22	.04	.05	.04	.06	.03	1.9	1.6	.24	.00	.00	.00	.00
23	.03	.06	.07	.06	.06	.94	.41	.25	.00	.00	.00	.00
24	.04	.04	.05	.06	2.2	.23	.59	.15	.00	.00	.00	.00
25	.03	.04	.05	.06	1.0	.08	5.6	.10	.00	.00	.00	.00
26	.04	.05	.05	.06	.34	.05	.41	.07	.00	.00	.00	.00
27	.04	.06	1.1	.06	.06	.04	.08	.05	.00	.00	.00	.00
28	.04	.05	.05	.06	.05	.23	.04	2.7	.44	.00	.00	.00
29	.03	.05	.05	.06	---	.03	2.2	1.0	.00	.00	.00	.00
30	.02	.05	.06	.06	---	.11	1.6	.20	.00	.00	.00	.00
31	.03	---	.10	.06	---	8.6	---	.09	---	.00	.00	---
TOTAL	17.50	1.66	2.66	1.92	4.97	33.92	116.97	145.83	105.10	.00	.00	1.20
MEAN	.56	.055	.086	.062	.18	1.09	3.90	4.70	3.50	.000	.000	.040
MAX	9.4	.42	1.1	.11	2.2	8.6	27	32	59	.00	.00	1.2
MIN	.02	.01	.02	.05	.03	.03	.00	.01	.00	.00	.00	.00
AC-FT	35	3.3	5.3	3.8	9.9	67	232	289	208	.00	.00	2.4

CAL YR 1976 TOTAL 533.61 MEAN 1.46 MAX 43 MIN .01 AC-FT 1060
WTR YR 1977 TOTAL 431.73 MEAN 1.18 MAX 59 MIN .00 AC-FT 856

16224500 KALAUAO STREAM AT MOANALUA ROAD, AT AIEA--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1972-77.

REMARKS.--Miscellaneous chemical analyses published for this station for 1968, 1970-71 water years.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	COLOR (PLATINUM-COBALT UNITS)	TURBIDITY (JTU)	HARDNESS (CA,MG) (MG/L)	NON-CARBONATE HARDNESS (MG/L)	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG) (MG/L)	DISSOLVED SODIUM (NA) (MG/L)	PERCENT SODIUM
MAR 08...	1500	.06	8	10	130	3	22	17	50	46
APR 25...	1500	1.5	44	10	43	5	7.7	5.8	15	42

DATE	SODIUM ADSORPTION RATIO	DISSOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	ALKALINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)	DISSOLVED FLUORIDE (F) (MG/L)
MAR 08...	1.9	2.6	149	0	120	48	25	67	.1
APR 25...	1.0	1.2	46	0	38	9.3	5.8	21	.1

DATE	DISSOLVED SILICA (SIO2) (MG/L)	DISSOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	DISSOLVED SOLIDS (TONS PER AC-FT)	DISSOLVED SOLIDS (TONS PER DAY)	DISSOLVED NITRITE PLUS NITRATE (N) (MG/L)	DISSOLVED ORTHO. PHOSPHORUS (P) (MG/L)	DISSOLVED ORTHO PHOSPHATE (PO4) (MG/L)	DISSOLVED IRON (FE) (UG/L)	DISSOLVED MANGANESE (MN) (UG/L)
MAR 08...	39	298	.41	.05	.27	.06	.13	40	90
APR 25...	17	97	.13	.39	.05	.00	.00	80	0

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)
OCT 20...	1330	.07	625	7.1	24.0
NOV 30...	1145	.05	625	6.9	23.0
JAN 19...	1500	.05	650	6.5	23.5
MAR 08...	1500	.06	460	6.7	24.0
APR 25...	1430	1.5	160	6.9	22.0
25...	1500	1.5	160	6.9	22.0
JUN 08...	1330	.09	360	6.8	23.0

16226000 NORTH HALAWA STREAM NEAR AIEA

LOCATION.--Lat 21°23'46", long 157°53'37", Hydrologic Unit 20060000, on left bank 2.7 mi (4.3 km) upstream from confluence with South Halawa Stream and 2.7 mi (4.3 km) northeast of Aiea Post Office.

DRAINAGE AREA.--3.45 mi^2 (8.94 km^2).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--August 1929 to June 1933, July 1953 to current year. Monthly discharge only May, June 1931, published in WSP 1319.

REVISED RECORDS (FISCAL YEARS).--WSP 1319: Drainage area. WSP 1719: 1954-55(P), 1956, 1957(P), 1958-59.

GAGE.--Water-stage recorder. Altitude of gage is 320 ft (98 m), from topographic map.

REMARKS.--Records fair. Recording rain gage located at station.

AVERAGE DISCHARGE.--27 years (water years, 1930-32, 1954-77), 4.95 ft^3/s (0.140 m^3/s), 3,590 acre-ft/yr (4.43 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,650 ft^3/s (188 m^3/s) Feb. 28, 1932, gage height, 13.36 ft (4.103 m), from rating curve extended above 420 ft^3/s (11.9 m^3/s); maximum gage height, 13.46 ft (4.103 m) May 14, 1963; no flow at times each year.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 593 ft^3/s (16.8 m^3/s) June 8, gage height, 8.91 ft (2.716 m), from rating curve extended above 44 ft^3/s (1.25 m^3/s) on basis of slope-area measurements at gage heights 10.3 ft (3.14 m), 13.04 ft (3.975 m), and 13.46 ft (4.103 m), no other peak above base of 570 ft^3/s (16.1 m^3/s); no flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.32	.00	.01	.00	.00	.11	5.3	2.4	1.1	.18	.00	.11
2	.16	.00	.01	.00	.00	.12	2.3	1.3	3.3	.10	.00	.10
3	.11	.00	.00	.00	.00	3.5	32	.94	1.7	.07	.00	2.0
4	.07	.00	.00	.00	.00	2.8	29	8.3	.94	.05	.00	.87
5	1.2	.00	.00	.00	.00	.87	37	2.8	8.6	.03	3.1	.30
6	8.7	.00	.00	.00	.00	.53	8.1	40	14	.03	.58	.16
7	6.4	.00	.00	.00	.00	.39	2.9	14	2.1	.02	.21	.09
8	.63	.00	.00	.00	.00	.27	1.5	13	61	.02	1.0	.06
9	.25	.00	.00	.00	.00	.21	.80	31	44	.02	.30	2.8
10	.13	.00	.00	.00	.00	.15	.53	24	7.4	.02	.16	2.1
11	.07	.00	.00	.00	.00	.13	.39	13	3.6	1.6	.10	.39
12	5.9	.00	.00	.00	.00	.86	.53	18	2.2	6.7	8.8	.20
13	6.5	.00	.00	.00	.00	4.0	.32	19	1.4	3.8	3.4	.10
14	.94	.00	.00	.00	.00	2.5	.18	43	1.1	1.1	.48	.06
15	29	.00	.00	.00	.01	1.9	.12	24	.94	.68	.25	.03
16	5.0	11	.00	.00	.01	1.7	.09	7.2	.68	.30	.11	.02
17	1.5	.27	.00	.00	.00	.87	.07	3.7	.53	.32	.06	.02
18	.53	.12	.00	.00	.00	.63	.07	2.4	.58	.32	.03	.02
19	.27	7.2	.00	.00	.00	.63	42	1.7	.53	.16	.02	.01
20	.14	3.5	.00	.00	.00	8.0	40	1.2	.30	.08	.02	.02
21	.07	.53	.00	.00	.00	3.4	13	2.5	.23	.04	.02	.01
22	.03	.23	.00	.00	.00	3.1	3.9	2.5	.20	.02	.02	.01
23	.02	.13	.00	.00	1.8	2.2	1.7	2.1	.21	.02	.01	.00
24	.02	.07	.00	.00	2.9	1.2	10	1.5	.10	.02	.01	.01
25	.02	.05	.00	.00	2.3	.80	6.3	.94	.08	.01	.01	.00
26	.02	.03	.00	.00	.74	.53	1.1	.68	.07	.01	.00	.00
27	.02	.03	.00	.00	.35	.27	.58	.94	.07	.01	.00	.00
28	.02	.02	.00	.00	.23	.23	6.2	10	1.3	.01	.00	.00
29	.01	.02	.00	.00	---	.16	15	3.1	1.2	.01	.00	.00
30	.01	.01	.00	.00	---	.15	5.9	1.9	.35	.01	.00	.00
31	.00	---	.00	.00	---	4.6	---	1.2	---	.00	.00	---
TOTAL	68.06	23.21	.02	.00	8.34	46.81	266.88	298.30	159.81	15.76	18.69	9.49
MEAN	2.20	.77	.001	.000	.30	1.51	8.90	9.62	5.33	.51	.60	.32
MAX	29	11	.01	.00	2.9	8.0	42	43	61	6.7	8.8	2.8
MIN	.00	.00	.00	.00	.00	.11	.07	.68	.07	.00	.00	.00
AC-FT	135	46	.04	.00	17	93	529	592	317	31	37	19

CAL YR 1976 TOTAL 1050.22 MEAN 2.87 MAX 63 MIN .00 AC-FT 2080
WTR YR 1977 TOTAL 915.37 MEAN 2.51 MAX 61 MIN .00 AC-FT 1820

16226000 NORTH HALAWA STREAM NEAR AIEA--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1971, 1976-77.

REMARKS.--Miscellaneous chemical analyses published for this station for 1970, 1973 water years.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTAN-TANEOUS DIS-CHARGE (CFS)	COLOR (PLAT-INUM-COBALT UNITS)	TUR-BID-ITY (JTU)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	DIS-SOLVED SODIUM (NA) (MG/L)	PERCENT SODIUM
MAR										
08...	1230	.30	4	1	34	10	5.4	4.9	13	45
APR										
22...	1330	3.0	2	1	39	14	6.2	5.7	14	43

DATE	SODIUM AD-SORP-TION RATIO	DIS-SOLVED PO-TAS-SIUM (K) (MG/L)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DIS-SOLVED SULFATE (SO4) (MG/L)	DIS-SOLVED CHLO-RIDE (CL) (MG/L)	DIS-SOLVED FLUO-RIDE (F) (MG/L)
MAR									
08...	1.0	.8	29	0	24	18	5.2	26	.0
APR									
22...	1.0	.9	31	0	25	5.0	3.0	25	.0

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTI-TUENTS) (MG/L)	DIS-SOLVED SOLIDS (TONS PER AC-FT)	DIS-SOLVED SOLIDS (TONS PER DAY)	DIS-SOLVED NITRITE PLUS NITRATE (N) (MG/L)	DIS-SOLVED ORTHO. PHOS-PHORUS (P) (MG/L)	DIS-SOLVED ORTHO PHOS-PHATE (PO4) (MG/L)	DIS-SOLVED IRON (FE) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)
MAR									
08...	19	89	.12	.07	.01	.02	.06	20	10
APR									
22...	20	90	.12	.73	.00	.00	.00	20	0

DATE	TIME	INSTAN-TANEOUS DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)
OCT					
20...	1110	.12	110	7.0	21.5
NOV					
30...	1025	.01	145	6.9	19.0
MAR					
08...	1200	.30	145	6.4	20.5
08...	1230	.30	145	6.4	20.5
APR					
22...	1300	3.2	140	7.0	22.0
22...	1330	3.0	140	7.0	22.0
JUN					
08...	1120	.87	120	6.7	21.5
JUL					
21...	1130	.04	145	6.6	23.0

16227500 MOANALUA STREAM NEAR KANEOHE

LOCATION.--Lat 21°23'29", long 157°51'05", Hydrologic Unit 20060000, on left bank 3.3 mi (5.3 km) northeast of Tripler Hospital and 3.6 mi (5.8 km) southwest of Kaneohe Post Office.

DRAINAGE AREA.--0.94 mi^2 (2.43 km^2).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1968 to current year.

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 660 ft (201 m), from topographic map.

REMARKS.--Records fair. No diversion above station. Recording rain gage and evaporation pan located at station.

AVERAGE DISCHARGE.--9 years, 1.23 ft^3/s (0.035 m^3/s), 891 acre-ft/yr (1.10 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,530 ft^3/s (43.3 m^3/s) Nov. 26, 1970, gage height, 8.07 ft (2.460 m), from rating curve extended above 18 ft^3/s (0.51 m^3/s) on basis of slope-area measurement at gage height 5.94 ft (1.811 m); no flow for many days each year.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, about 250 ft^3/s (7.08 m^3/s) Apr. 19, gage height unknown, no other peak above base of 250 ft^3/s (7.08 m^3/s); minimum, no flow most of time.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.00	.00	.00	.29	.28	.00	.00	.00
2	.00	.00	.00	.00	.00	.00	.00	.18	.29	.00	.00	.00
3	.00	.00	.00	.00	.00	.00	.47	.13	.27	.00	.00	.00
4	.00	.00	.00	.00	.00	.00	11	.59	.21	.00	.00	.00
5	.00	.00	.00	.00	.00	.00	10	.43	1.5	.00	.10	.00
6	.87	.00	.00	.00	.00	.00	2.6	7.3	.60	.00	.00	.00
7	.31	.00	.00	.00	.00	.00	.95	2.2	.30	.00	.00	.00
8	.00	.00	.00	.00	.00	.00	.49	1.9	18	.00	.00	.00
9	.00	.00	.00	.00	.00	.00	.28	6.8	3.0	.00	.00	.34
10	.00	.00	.00	.00	.00	.00	.14	4.1	.80	.00	.00	.26
11	.00	.00	.00	.00	.00	.00	.13	1.9	.40	.00	.00	.00
12	1.5	.00	.00	.00	.00	.00	.09	11	.20	.00	3.0	.00
13	.30	.00	.00	.00	.00	.00	.07	5.8	.10	.74	1.4	.00
14	.15	.00	.00	.00	.00	.00	.03	7.2	.04	.35	.23	.00
15	4.5	.00	.00	.00	.00	.00	.00	2.5	.00	.14	.01	.00
16	.20	.50	.00	.00	.00	.00	.00	1.4	.00	.00	.00	.00
17	.02	.00	.00	.00	.00	.00	.00	1.0	.00	.00	.00	.00
18	.00	.00	.00	.00	.00	.00	.00	.76	.00	.00	.00	.00
19	.00	.02	.00	.00	.00	.00	15	.63	.00	.00	.00	.00
20	.00	.00	.00	.00	.00	.00	10	.54	.00	.00	.00	.00
21	.00	.00	.00	.00	.00	.00	2.0	.63	.00	.00	.00	.00
22	.00	.00	.00	.00	.00	.00	.93	.65	.00	.00	.00	.00
23	.00	.00	.00	.00	.00	.00	.57	.55	.00	.00	.00	.00
24	.00	.00	.00	.00	.00	.00	2.0	.43	.00	.00	.00	.00
25	.00	.00	.00	.00	.00	.00	1.6	.36	.00	.00	.00	.00
26	.00	.00	.00	.00	.00	.00	.53	.30	.00	.00	.00	.00
27	.00	.00	.00	.00	.00	.00	.32	.31	.00	.00	.00	.00
28	.00	.00	.00	.00	.00	.00	.25	1.6	.00	.00	.00	.00
29	.00	.00	.00	.00	---	.00	1.0	.65	.00	.00	.00	.00
30	.00	.00	.00	.00	---	.00	.50	.41	.00	.00	.00	.00
31	.00	---	.00	.00	---	.00	---	.32	---	.00	.00	---
TOTAL	7.85	.52	.00	.00	.00	.00	60.95	62.86	25.99	1.23	4.74	.60
MEAN	.25	.017	.000	.000	.000	.000	2.03	2.03	.87	.040	.15	.020
MAX	4.5	.50	.00	.00	.00	.00	15	11	18	.74	3.0	.34
MIN	.00	.00	.00	.00	.00	.00	.00	.13	.00	.00	.00	.00
AC-FT	16	1.0	.00	.00	.00	.00	121	125	52	2.4	9.4	1.2

CAL YR 1976 TOTAL 105.92 MEAN .29 MAX 11 MIN .00 AC-FT 210
WTR YR 1977 TOTAL 164.74 MEAN .45 MAX 18 MIN .00 AC-FT 327

16227500 MOANALUA STREAM NEAR KANEOHE--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1970-71, 1972 to current year.

PERIOD OF DAILY RECORD.--
SUSPENDED SEDIMENT DISCHARGE: October 1971 to current year.

INSTRUMENTATION.--Automatic pumping sediment sampler since October 1971.

REMARKS.--In addition to the sediment sampler record, water-quality sample was collected during the year.

EXTREMES FOR PERIOD OF RECORD.--
SEDIMENT CONCENTRATIONS: Maximum daily mean, 303 mg/L Nov. 25, 1975; minimum daily mean, 0 mg/L on many days each year.
SEDIMENT DISCHARGE: Maximum daily, 162 ton (147 tonnes) Nov. 25, 1975; minimum daily, 0 ton (0 tonne) on many days each year.

EXTREMES FOR CURRENT YEAR.--
SEDIMENT CONCENTRATIONS: Maximum daily mean, 150 mg/L June 8; minimum daily mean, 0 mg/L on many days during year.
SEDIMENT DISCHARGE: Maximum daily, 7.3 tons (6.6 tonnes) June 8; minimum daily, 0 ton (0 tonne) on many days during year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)
APR 04...	1100	16	82	6.8	19.0

16227500 MOANALUA STREAM NEAR KANEOHE--Continued

SUSPENDED-SEDIMENT DISCHARGE (TONS/DAY), WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
		OCTOBER			NOVEMBER			DECEMBER	
1	.00	0	.00	.00	0	.00	.00	0	.00
2	.00	0	.00	.00	0	.00	.00	0	.00
3	.00	0	.00	.00	0	.00	.00	0	.00
4	.00	0	.00	.00	0	.00	.00	0	.00
5	.00	0	.00	.00	0	.00	.00	0	.00
6	0.87	30	0.07	.00	0	.00	.00	0	.00
7	0.31	10	0.01	.00	0	.00	.00	0	.00
8	.00	0	.00	.00	0	.00	.00	0	.00
9	.00	0	.00	.00	0	.00	.00	0	.00
10	.00	0	.00	.00	0	.00	.00	0	.00
11	.00	0	.00	.00	0	.00	.00	0	.00
12	1.5	30	0.12	.00	0	.00	.00	0	.00
13	0.30	10	0.01	.00	0	.00	.00	0	.00
14	0.15	5	.00	.00	0	.00	.00	0	.00
15	4.5	50	0.61	.00	0	.00	.00	0	.00
16	0.20	15	0.01	0.50	20	0.03	.00	0	.00
17	0.02	5	.00	.00	0	.00	.00	0	.00
18	.00	0	.00	.00	0	.00	.00	0	.00
19	.00	0	.00	0.02	5	.00	.00	0	.00
20	.00	0	.00	.00	0	.00	.00	0	.00
21	.00	0	.00	.00	0	.00	.00	0	.00
22	.00	0	.00	.00	0	.00	.00	0	.00
23	.00	0	.00	.00	0	.00	.00	0	.00
24	.00	0	.00	.00	0	.00	.00	0	.00
25	.00	0	.00	.00	0	.00	.00	0	.00
26	.00	0	.00	.00	0	.00	.00	0	.00
27	.00	0	.00	.00	0	.00	.00	0	.00
28	.00	0	.00	.00	0	.00	.00	0	.00
29	.00	0	.00	.00	0	.00	.00	0	.00
30	.00	0	.00	.00	0	.00	.00	0	.00
31	.00	0	.00	---	---	---	.00	0	.00
TOTAL	7.85	---	0.83	0.52	---	0.03	.00	---	.00

DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
		JANUARY			FEBRUARY			MARCH	
1	.00	0	.00	.00	0	.00	.00	0	.00
2	.00	0	.00	.00	0	.00	.00	0	.00
3	.00	0	.00	.00	0	.00	.00	0	.00
4	.00	0	.00	.00	0	.00	.00	0	.00
5	.00	0	.00	.00	0	.00	.00	0	.00
6	.00	0	.00	.00	0	.00	.00	0	.00
7	.00	0	.00	.00	0	.00	.00	0	.00
8	.00	0	.00	.00	0	.00	.00	0	.00
9	.00	0	.00	.00	0	.00	.00	0	.00
10	.00	0	.00	.00	0	.00	.00	0	.00
11	.00	0	.00	.00	0	.00	.00	0	.00
12	.00	0	.00	.00	0	.00	.00	0	.00
13	.00	0	.00	.00	0	.00	.00	0	.00
14	.00	0	.00	.00	0	.00	.00	0	.00
15	.00	0	.00	.00	0	.00	.00	0	.00
16	.00	0	.00	.00	0	.00	.00	0	.00
17	.00	0	.00	.00	0	.00	.00	0	.00
18	.00	0	.00	.00	0	.00	.00	0	.00
19	.00	0	.00	.00	0	.00	.00	0	.00
20	.00	0	.00	.00	0	.00	.00	0	.00
21	.00	0	.00	.00	0	.00	.00	0	.00
22	.00	0	.00	.00	0	.00	.00	0	.00
23	.00	0	.00	.00	0	.00	.00	0	.00
24	.00	0	.00	.00	0	.00	.00	0	.00
25	.00	0	.00	.00	0	.00	.00	0	.00
26	.00	0	.00	.00	0	.00	.00	0	.00
27	.00	0	.00	.00	0	.00	.00	0	.00
28	.00	0	.00	.00	0	.00	.00	0	.00
29	.00	0	.00	---	---	---	.00	0	.00
30	.00	0	.00	---	---	---	.00	0	.00
31	.00	0	.00	---	---	---	.00	0	.00
TOTAL	.00	---	.00	.00	---	.00	.00	---	.00

HAWAII, ISLAND OF OAHU

16227500 MOANALUA STREAM NEAR KANEOHE--Continued

SUSPENDED-SEDIMENT DISCHARGE (TONS/DAY), WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
		APRIL			MAY			JUNE	
1	.00	0	.00	0.29	3	.00	0.28	5	.00
2	.00	0	.00	0.18	3	.00	0.29	5	.00
3	0.47	20	0.03	0.13	5	.00	0.27	5	.00
4	11	30	0.89	0.59	15	0.02	0.21	3	.00
5	10	15	0.41	0.43	10	0.01	1.5	15	0.06
6	2.6	10	0.07	7.3	80	1.6	0.60	10	0.02
7	0.95	10	0.03	2.2	20	0.12	0.30	5	.00
8	0.49	10	0.01	1.9	20	0.10	18	150	7.3
9	0.28	10	0.01	6.8	90	1.7	3.0	30	0.24
10	0.14	15	0.01	4.1	20	0.22	0.80	10	0.02
11	0.13	20	0.01	1.9	15	0.08	0.40	5	0.01
12	0.09	10	.00	11	120	3.6	0.20	5	.00
13	0.07	10	.00	5.8	15	0.23	0.10	3	.00
14	0.03	10	.00	7.2	50	0.97	0.04	3	.00
15	.00	0	.00	2.5	15	0.10	.00	0	.00
16	.00	0	.00	1.4	8	0.03	.00	0	.00
17	.00	0	.00	1.0	5	0.01	.00	0	.00
18	.00	0	.00	0.76	3	0.01	.00	0	.00
19	15	120	4.9	0.63	3	0.01	.00	0	.00
20	10	50	1.4	0.54	3	.00	.00	0	.00
21	2.0	15	0.08	0.63	15	0.03	.00	0	.00
22	0.93	10	0.03	0.65	10	0.02	.00	0	.00
23	0.57	5	0.01	0.55	10	0.01	.00	0	.00
24	2.0	30	0.16	0.43	5	0.01	.00	0	.00
25	1.6	10	0.04	0.36	5	.00	.00	0	.00
26	0.53	5	0.01	0.30	5	.00	.00	0	.00
27	0.32	5	.00	0.31	5	.00	.00	0	.00
28	0.25	5	.00	1.6	20	0.09	.00	0	.00
29	1.0	20	0.05	0.65	10	0.02	.00	0	.00
30	0.50	5	0.01	0.41	5	0.01	.00	0	.00
31	---	---	---	0.32	5	.00	---	---	---
TOTAL	60.95	---	8.16	62.86	---	9.00	25.99	---	7.65

DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
		JULY			AUGUST			SEPTEMBER	
1	.00	0	.00	.00	0	.00	.00	0	.00
2	.00	0	.00	.00	0	.00	.00	0	.00
3	.00	0	.00	.00	0	.00	.00	0	.00
4	.00	0	.00	.00	0	.00	.00	0	.00
5	.00	0	.00	0.10	10	.00	.00	0	.00
6	.00	0	.00	.00	0	.00	.00	0	.00
7	.00	0	.00	.00	0	.00	.00	0	.00
8	.00	0	.00	.00	0	.00	.00	0	.00
9	.00	0	.00	.00	0	.00	0.34	20	0.02
10	.00	0	.00	.00	0	.00	0.26	10	0.01
11	.00	0	.00	.00	0	.00	.00	0	.00
12	.00	0	.00	3.0	30	0.24	.00	0	.00
13	0.74	15	0.03	1.4	15	0.06	.00	0	.00
14	0.35	10	0.01	0.23	5	.00	.00	0	.00
15	0.14	5	.00	0.01	3	.00	.00	0	.00
16	.00	0	.00	.00	0	.00	.00	0	.00
17	.00	0	.00	.00	0	.00	.00	0	.00
18	.00	0	.00	.00	0	.00	.00	0	.00
19	.00	0	.00	.00	0	.00	.00	0	.00
20	.00	0	.00	.00	0	.00	.00	0	.00
21	.00	0	.00	.00	0	.00	.00	0	.00
22	.00	0	.00	.00	0	.00	.00	0	.00
23	.00	0	.00	.00	0	.00	.00	0	.00
24	.00	0	.00	.00	0	.00	.00	0	.00
25	.00	0	.00	.00	0	.00	.00	0	.00
26	.00	0	.00	.00	0	.00	.00	0	.00
27	.00	0	.00	.00	0	.00	.00	0	.00
28	.00	0	.00	.00	0	.00	.00	0	.00
29	.00	0	.00	.00	0	.00	.00	0	.00
30	.00	0	.00	.00	0	.00	---	---	---
31	.00	0	.00	.00	0	.00			
TOTAL	1.23	---	0.04	4.74	---	0.30	0.60	---	0.03
YEAR	164.74		26.04						

16227700 MOANALUA STREAM TRIBUTARY NEAR KANEOHE

LOCATION.--Lat 21°23'27", long 157°50'53", Hydrologic Unit 20060000, on left bank 3.4 mi (5.5 km) northeast of Tripler Hospital and 3.6 mi (5.8 km) southwest of Kaneohe Post Office.

DRAINAGE AREA.--0.62 mi^2 (1.61 km^2).

PERIOD OF RECORD.--October 1968 to current year.

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 700 ft (213 m), from topographic map.

REMARKS.--Records fair. No diversion above station. Recording rain gage located at station.

AVERAGE DISCHARGE.--9 years, 0.727 ft^3/s (0.021 m^3/s), 527 acre-ft/yr (650,000 m^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 892 ft^3/s (25.3 m^3/s) Feb. 1, 1969, gage height, 5.57 ft (1.698 m), from rating curve extended above 28 ft^3/s (0.79 m^3/s) on basis of slope-area measurement at gage height 5.19 ft (1.582 m); no flow at times most years.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 150 ft^3/s (4.25 m^3/s) and maximum (*):

Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)
Apr. 19	1315	*500	14.2	4.75	1.448
May 12	1855	230	6.51	3.94	1.201
June 8	1800	178	5.04	3.73	1.137

No flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.03	.00	.00	.00	.00	.02	1.5	.30	.44	.22	.14	.01
2	.01	.00	.00	.00	.00	.01	.24	.35	.36	.22	.14	.01
3	.00	.00	.00	.00	.00	.11	5.7	.45	.31	.18	.14	.20
4	.12	.00	.00	.00	.00	.19	4.9	.73	.27	.14	.17	.09
5	.01	.00	.00	.00	.00	.08	3.1	.33	2.3	.18	.68	.04
6	.64	.00	.00	.00	.00	.03	.88	6.4	1.1	.18	.14	.03
7	.21	.00	.10	.00	.00	.00	.48	.92	.32	.26	.14	.01
8	.07	.00	.01	.00	.00	.00	.32	1.6	18	.27	.13	.04
9	.04	.00	.00	.00	.00	.00	.24	5.1	2.8	.28	.12	.52
10	.01	.00	.00	.00	.00	.00	.22	1.8	.76	1.2	.14	.15
11	.01	.07	.00	.00	.00	.00	.43	1.1	.52	.26	.14	.10
12	1.4	.01	.00	.00	.00	.45	.31	11	.44	1.2	2.1	.08
13	.22	.00	.00	.00	.00	.30	.28	2.4	.44	.45	.45	.06
14	.15	.00	.00	.00	.00	.19	.27	3.5	.50	.28	.18	.05
15	4.9	.00	.00	.00	.00	.13	.22	.85	.52	.24	.16	.02
16	.41	4.0	.00	.00	.03	.08	.22	.62	.44	.25	.14	.00
17	.16	.10	.00	.00	.00	.07	.21	.50	.44	.22	.15	.02
18	.14	.04	.00	.00	.00	.04	.25	.40	.32	.18	.14	.00
19	.14	.10	.00	.00	.00	.06	19	.35	.27	.19	.14	.00
20	.10	.08	.00	.00	.00	.13	3.4	.30	.27	.22	.15	.00
21	.11	.04	.00	.00	.00	.14	.71	.90	.27	.22	.15	.00
22	.13	.03	.00	.00	.00	.11	.43	.70	.27	.22	.14	.00
23	.10	.02	.00	.00	.72	.13	.36	.45	.27	.18	.14	.00
24	.10	.03	.00	.00	.20	.12	1.5	.35	.22	.14	.12	.00
25	.10	.08	.00	.00	.17	.07	.80	.30	.18	.18	.14	.00
26	.10	.05	.00	.00	.07	.03	.35	.34	.18	.19	.11	.00
27	.10	.04	.00	.00	.00	.02	.38	.60	.18	.22	.08	.00
28	.08	.03	.00	.00	.00	.03	.50	3.0	.22	.57	.05	.00
29	.05	.02	.00	.00	---	.25	1.0	.45	.22	.20	.01	.00
30	.03	.01	.00	.00	---	.14	.30	.50	.22	.31	.14	.00
31	.01	---	.00	.00	---	1.3	---	.35	---	.17	.04	---
TOTAL	9.68	4.75	.11	.00	1.19	4.23	48.50	46.94	33.05	9.22	6.81	1.43
MEAN	.31	.16	.004	.000	.043	.14	1.62	1.51	1.10	.30	.22	.048
MAX	4.9	4.0	.10	.00	.72	1.3	19	11	18	1.2	2.1	.52
MIN	.00	.00	.00	.00	.00	.00	.21	.30	.18	.14	.01	.00
AC-FT	19	9.4	.2	.00	2.4	8.4	96	93	66	18	14	2.8

CAL YR 1976 TOTAL 155.20 MEAN .42 MAX 8.4 MIN .00 AC-FT 308
WTR YR 1977 TOTAL 165.91 MEAN .45 MAX 19 MIN .00 AC-FT 329

16228000 MOANALUA STREAM NEAR HONOLULU

LOCATION.--Lat 21°22'53", long 157°52'22", Hydrologic Unit 20060000, on left bank 1.8 mi (2.9 km) northeast of Tripler Hospital and 5.0 mi (8.0 km) north of Honolulu Post Office.

DRAINAGE AREA.--2.73 mi^2 (7.07 km^2).

PERIOD OF RECORD.--June 1926 to current year.

REVISED RECORDS (FISCAL YEARS).--WSP 935: 1931(M). WSP 1319: 1927-30(M), 1932-41(M). WSP 1569: Drainage area.

GAGE.--Water-stage recorder and concrete weir. Datum of gage is 338.12 ft (103.059 m) above mean sea level (city and county of Honolulu bench mark). Prior to July 1, 1960, at datum 1.00 ft (0.305 m) higher.

REMARKS.--Records fair. No diversion above station. Recording rain gage located at station.

AVERAGE DISCHARGE.--51 years, 3.14 ft^3/s (0.089 m^3/s), 2,270 acre-ft/yr (2.80 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,580 ft^3/s (130 m^3/s) Nov. 18, 1930, gage height, 12.58 ft (3.834 m), present datum, from rating curve extended above 110 ft^3/s (3.12 m^3/s) by test of model of station site; no flow at times each year.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 537 ft^3/s (15.2 m^3/s) Apr. 19, gage height, 5.03 ft (1.53 m), no other peak above base of 400 ft^3/s (11.3 m^3/s); no flow most of time.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.00	.00	1.5	.05	.07	.00	.00	.00
2	.00	.00	.00	.00	.00	.00	.28	.03	.05	.00	.00	.00
3	.00	.00	.00	.00	.00	.00	21	.02	.04	.00	.00	.00
4	.00	.00	.00	.00	.00	.00	18	.02	.03	.00	.00	.00
5	.00	.00	.00	.00	.00	.00	15	.01	1.2	.00	.50	.00
6	.00	.00	.00	.00	.00	.00	3.6	25	5.6	.00	.40	.00
7	.00	.00	.00	.00	.00	.00	.92	7.0	.55	.00	.10	.00
8	.00	.00	.00	.00	.00	.00	.14	4.9	49	.00	.03	.00
9	.00	.00	.00	.00	.00	.00	.03	19	24	.00	.02	.00
10	.00	.00	.00	.00	.00	.00	.01	12	4.2	.00	.01	.00
11	.00	.00	.00	.00	.00	.00	.02	5.6	2.0	.00	.01	.00
12	.00	.00	.00	.00	.00	.00	.00	34	1.1	.00	5.0	.00
13	.00	.00	.00	.00	.00	.00	.00	23	.49	.00	1.5	.00
14	.00	.00	.00	.00	.00	.00	.00	34	.17	.00	.40	.00
15	9.0	.00	.00	.00	.00	.00	.00	9.0	.05	.00	.10	.00
16	1.4	1.0	.00	.00	.00	.00	.00	4.1	.03	.00	.04	.00
17	.04	.00	.00	.00	.00	.00	.00	2.4	.02	.00	.01	.00
18	.00	.00	.00	.00	.00	.00	.00	1.3	.00	.00	.00	.00
19	.00	.00	.00	.00	.00	.00	51	.73	.00	.00	.00	.00
20	.00	.00	.00	.00	.00	.00	23	.36	.00	.00	.00	.00
21	.00	.00	.00	.00	.00	.04	5.2	.86	.00	.00	.00	.00
22	.00	.00	.00	.00	.00	.03	1.9	.62	.00	.00	.00	.00
23	.00	.00	.00	.00	.00	.06	.65	.35	.00	.00	.00	.00
24	.00	.00	.00	.00	.00	.04	.81	.14	.00	.00	.00	.00
25	.00	.00	.00	.00	.00	.02	2.3	.06	.00	.00	.00	.00
26	.00	.00	.00	.00	.00	.01	.24	.04	.00	.00	.00	.00
27	.00	.00	.00	.00	.00	.00	.04	.04	.00	.00	.00	.00
28	.00	.00	.00	.00	.00	.00	.02	2.1	.00	.00	.00	.00
29	.00	.00	.00	.00	---	.00	.60	.96	.00	.00	.00	.00
30	.00	.00	.00	.00	---	.00	.27	.28	.00	.00	.00	.00
31	.00	---	.00	.00	---	7.4	---	.10	---	.00	.00	---
TOTAL	10.44	1.00	.00	.00	.00	7.60	146.53	188.07	88.60	.00	8.12	.00
MEAN	.34	.033	.000	.000	.000	.25	4.88	6.07	2.95	.000	.26	.000
MAX	9.0	1.0	.00	.00	.00	7.4	51	34	49	.00	5.0	.00
MIN	.00	.00	.00	.00	.00	.00	.00	.01	.00	.00	.00	.00
AC-FT	21	2.0	.00	.00	.00	15	291	373	176	.00	16	.00

CAL YR 1976 TOTAL 371.07 MEAN 1.01 MAX 43 MIN .00 AC-FT 736
WTR YR 1977 TOTAL 450.36 MEAN 1.23 MAX 51 MIN .00 AC-FT 893

16229000 KALIHI STREAM NEAR HONOLULU

LOCATION.--Lat 21°22'00", long 157°50'49", Hydrologic Unit 20060000, on right bank 1.9 mi (3.1 km) upstream from Kamanaiki Stream and 4.1 mi (6.6 km) north of Honolulu Post Office.

DRAINAGE AREA.--2.61 mi² (6.76 km²).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--September 1913 to April 1914, July 1914 to current year. Monthly discharge only for some periods, published in WSP 1319.

REVISED RECORDS (FISCAL YEARS).--WSP 1569: Drainage area. WSP 1719: 1921-22(M), 1923-24, 1925-26(M), 1927-28, 1929-32(M), 1935, 1937, 1938-39(M), 1943(M), 1948-52(P), 1955-56, 1957-58(M), 1959.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 464.40 ft (141.549 m) above mean sea level. Prior to Oct. 12, 1923, at datum 2.00 ft (0.610 m) lower.

REMARKS.--Records fair. No diversion above station.

AVERAGE DISCHARGE.--63 years (water years 1915-77), 6.77 ft³/s (0.192 m³/s), 4,900 acre-ft/yr (6.04 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, about 12,400 ft³/s (351 m³/s) Nov. 18, 1930, gage height, 13.81 ft (4.209 m), from rating curve extended above 280 ft³/s (7.93 m³/s) on basis of indirect measurements at gage heights 8.9 ft (2.71 m), 10.96 ft (3.341 m), and 11.27 ft (3.435 m); minimum, 0.09 ft³/s (0.003 m³/s) Oct. 22, 1933, July 29, 1966.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 700 ft³/s (19.8 m³/s) and maximum (*):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Apr. 19	1300	1040	29.5	8.12	2.475
May 12	1900	*1070	30.3	8.18	2.493

Minimum discharge, 0.19 ft³/s (0.005 m³/s) Feb. 14.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.1	.73	.91	.57	.43	1.6	6.2	4.4	4.6	2.0	1.1	1.0
2	.91	.73	.91	1.2	.36	2.3	4.6	4.0	4.9	1.8	1.2	2.3
3	.82	.82	.91	.80	.43	2.4	36	5.7	3.8	1.6	1.1	2.2
4	1.4	.57	.82	.70	.73	1.8	33	7.5	3.2	1.6	1.1	1.2
5	1.9	.57	.82	.65	.36	1.4	21	5.4	9.8	2.5	2.4	1.1
6	3.2	.65	1.0	.60	.30	1.5	9.1	24	6.9	2.4	1.4	.91
7	2.4	.65	1.8	.57	.30	1.1	6.2	9.1	4.4	2.3	1.4	1.0
8	1.1	.65	1.0	.62	.36	1.1	4.6	10	71	2.1	1.3	1.5
9	.91	.57	.91	.70	.36	1.1	3.4	20	21	1.9	1.1	3.4
10	.82	.57	.82	.60	.30	.91	3.2	13	8.7	2.6	1.0	2.3
11	.73	.73	.73	.55	.30	1.1	5.4	11	6.8	3.0	.91	1.4
12	5.0	.73	.65	.50	.24	3.4	3.6	66	5.4	8.5	7.2	1.2
13	2.6	.57	1.1	.47	.24	5.1	3.0	29	5.1	5.0	2.8	1.1
14	2.2	1.2	.73	.45	.19	2.6	2.6	34	5.1	3.0	1.8	1.1
15	22	.82	.73	.42	4.2	2.0	2.3	13	4.4	2.4	1.5	1.0
16	4.6	18	.65	.40	5.8	1.5	2.2	10	3.8	1.8	1.3	.91
17	2.3	1.6	1.0	.45	1.1	1.6	2.0	8.4	3.8	2.0	1.4	1.1
18	1.8	1.1	.70	.40	.59	1.2	3.6	7.1	3.6	2.2	1.2	1.2
19	1.5	6.9	.60	.35	.50	1.3	72	6.2	3.4	2.0	1.1	.91
20	1.5	3.2	.70	.50	.43	3.2	37	5.4	3.2	1.7	1.1	.82
21	1.3	1.9	.60	.40	.30	2.4	12	8.9	2.8	1.6	1.1	.82
22	1.1	1.4	.55	.35	.30	2.2	7.7	5.6	3.0	1.7	1.1	.73
23	1.1	1.2	.50	.30	9.2	2.0	6.8	5.1	2.4	1.5	.91	.73
24	1.0	1.4	.45	.30	5.1	1.5	8.5	4.4	2.4	1.4	.82	1.0
25	1.0	1.6	.50	.70	3.2	1.4	6.8	4.0	2.3	1.3	.82	.73
26	.91	1.1	.45	.43	2.0	1.2	5.1	3.8	2.2	1.2	1.3	.65
27	.91	1.1	.43	.30	1.5	1.0	4.9	4.6	2.0	2.0	1.4	.65
28	1.2	1.1	.57	.30	2.3	2.1	5.4	6.8	3.0	3.0	.82	.57
29	.91	1.1	.43	.30	---	3.4	8.7	4.2	2.0	1.5	.82	.50
30	.82	1.1	.43	.36	---	4.4	5.4	3.8	1.9	1.8	2.9	.57
31	.73	---	.50	.24	---	11	---	3.8	---	1.3	1.4	---
TOTAL	69.77	54.36	22.90	15.48	41.42	70.81	332.3	348.2	206.9	70.7	46.80	34.60
MEAN	2.25	1.81	.74	.50	1.48	2.28	11.1	11.2	6.90	2.28	1.51	1.15
MAX	22	18	1.8	1.2	9.2	11	72	66	71	8.5	7.2	3.4
MIN	.73	.57	.43	.24	.19	.91	2.0	3.8	1.9	1.2	.82	.50
AC-FT	138	108	45	31	82	140	659	691	410	140	93	69

CAL YR 1976 TOTAL 1093.87 MEAN 2.99 MAX 41 MIN .43 AC-FT 2170
WTR YR 1977 TOTAL 1314.24 MEAN 3.60 MAX 72 MIN .19 AC-FT 2610

16229000 KALIHI STREAM NEAR HONOLULU--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1972, 1974-77.

REMARKS.--Miscellaneous chemical analyses published for this station for 1969, 1973 water years.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	COLOR (PLATINUM-COBALT UNITS)	TURBIDITY (JTU)	HARDNESS (CA,MG) (MG/L)	NONCARBONATE HARDNESS (MG/L)	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG) (MG/L)	DISSOLVED SODIUM (NA) (MG/L)	PERCENT SODIUM
NOV 23...	0920	1.1	4	3	35	4	5.9	4.0	13	44
JAN 26...	1430	.34	23	8	41	7	6.3	6.2	14	42
APR 26...	0930	4.8	3	2	35	15	5.9	5.0	14	45
AUG 25...	0945	.82	7	1	39	7	6.7	5.4	14	43

DATE	SODIUM ADSORPTION RATIO	DISSOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	ALKALINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)	DISSOLVED FLUORIDE (F) (MG/L)
NOV 23...	1.0	.8	38	0	31	3.0	3.7	23	.1
JAN 26...	.9	.9	42	0	34	4.2	11	23	.0
APR 26...	1.0	1.0	25	0	21	2.5	6.1	25	.0
AUG 25...	1.0	1.1	39	0	32	2.5	7.1	22	.1

DATE	DISSOLVED SILICA (SIO2) (MG/L)	DISSOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	DISSOLVED SOLIDS (TONS PER AC-FT)	DISSOLVED SOLIDS (TONS PER DAY)	DISSOLVED NITRITE PLUS NITRATE (N) (MG/L)	DISSOLVED ORTHO. PHOSPHORUS (P) (MG/L)	DISSOLVED ORTHO PHOSPHATE (PO4) (MG/L)	DISSOLVED IRON (FE) (UG/L)	DISSOLVED MANGANESE (MN) (UG/L)
NOV 23...	12	83	.11	.25	.39	.01	.03	200	20
JAN 26...	13	93	.13	.09	.20	.01	.03	340	10
APR 26...	13	83	.11	1.08	.06	.00	.01	100	0
AUG 25...	14	90	.12	.20	--	--	--	270	20

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)
OCT 26...	0905	1.0	140	6.6	21.0
NOV 23...	0920	1.1	140	7.3	18.5
DEC 27...	0850	.46	160	7.3	19.5
JAN 26...	1350	.34	160	7.2	19.0
26...	1430	.34	160	7.2	19.0
FEB 23...	0830	.82	160	7.2	20.0
MAR 28...	0810	1.1	150	7.1	19.5
APR 26...	0930	4.8	140	7.2	20.0
JUL 26...	1120	1.2	130	6.9	21.0
AUG 25...	0945	.82	160	7.4	21.0

16229000 KALIHI STREAM NEAR HONOLULU--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SUSPENDED SEDIMENT (MG/L)	SUSPENDED SEDIMENT DISCHARGE (T/DAY)
NOV				
24...	1315	1.1	12	.04
24...	1415	1.1	3	.01
24...	1505	1.2	37	.12
FEB				
23...	1440	9.1	29	.71
23...	1455	9.1	28	.69
23...	1510	13	30	1.1
MAR				
28...	1135	5.4	74	1.1
28...	1227	5.1	35	.48
28...	1326	4.9	24	.32
28...	1435	4.2	18	.20
APR				
19...	1725	119	322	103
19...	1800	95	144	37
19...	1830	80	74	16
19...	1900	73	42	8.3
APR				
19...	1930	84	89	20
MAY				
10...	1145	19	22	1.1
10...	1245	15	15	.61
10...	1345	13	14	.49
12...	1810	380	970	995
12...	1830	286	710	548
12...	1840	303	1650	1350
12...	1850	475	1850	2370
12...	1905	1080	1650	4810
12...	1925	655	1100	1950
12...	1945	530	515	737
12...	2015	303	225	184
12...	2045	225	125	76
12...	2115	145	81	32
12...	2135	132	64	23

16229300 KALIHI STREAM AT KALIHI
(National stream-quality accounting network station)

LOCATION.--Lat 21°20'29", long 157°52'36", Hydrologic Unit 20060000, on right bank at Kalihi, 0.4 mi (0.6 km) northwest of Bishop Museum, and 2.4 mi (3.9 km) northwest of Honolulu Post Office.

DRAINAGE AREA.--5.18 mi² (13.42 km²).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--Water year 1962 (annual maximum), July 1962 to current year.

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 70 ft (21 m), from topographic map. Aug. 28, 1961, to June 30, 1962, crest-stage gage at site 600 ft (183 m) downstream at different datum.

REMARKS.--Records fair. No diversion above station. Recording rain gage located at station.

AVERAGE DISCHARGE.--15 years, 11.2 ft³/s (0.317 m³/s), 8,110 acre-ft/yr (10.0 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 7,110 ft³/s (201 m³/s) Apr. 19, 1974, gage height, 9.98 ft (3.042 m), from rating curve extended above 180 ft³/s (5.10 m³/s) on basis of slope-area measurement at gage height 9.98 ft (3.042 m); minimum, 0.16 ft³/s (0.005 m³/s) June 24, 1966.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of May 14, 1960, reached a stage of 8.0 ft (2.44 m) from floodmarks, present site and datum, discharge, 6,350 ft³/s (180 m³/s), from slope-area measurement of peak flow.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 2,140 ft³/s (60.6 m³/s) May 12, gage height, 5.65 ft (1.722 m), from rating curve extended as explained above, no other peak above base of 1,600 ft³/s (45.3 m³/s); minimum, 0.49 ft³/s (0.014 m³/s) Feb. 7.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.2	1.3	1.3	.90	1.7	2.7	19	6.0	7.8	2.6	2.4	1.7
2	1.9	1.2	1.3	2.4	.80	6.4	9.6	5.3	7.8	2.6	2.4	4.0
3	1.4	1.4	1.3	1.1	.63	8.5	39	6.9	6.1	2.6	2.2	4.4
4	4.4	1.1	1.3	.99	1.4	3.9	31	14	5.0	2.7	2.0	2.5
5	2.1	1.4	1.3	1.0	.71	3.6	26	8.9	9.5	2.9	3.8	2.2
6	7.8	1.3	1.5	.92	.56	5.3	12	43	12	2.9	2.4	1.8
7	4.4	1.3	3.2	.80	.49	2.7	7.5	18	6.1	2.7	2.2	1.5
8	2.0	1.3	1.5	.86	.63	2.3	5.9	18	86	2.7	1.8	2.0
9	1.6	1.1	1.2	1.0	.56	2.3	4.7	25	27	2.3	1.5	3.8
10	1.4	.98	1.1	.90	.63	1.6	4.2	21	10	3.9	1.6	3.4
11	1.3	1.1	1.0	.80	.56	3.9	8.2	23	7.5	4.7	2.1	2.2
12	6.2	1.3	1.0	.71	.56	13	4.7	202	6.5	12	8.2	1.4
13	3.6	1.1	1.3	.71	.71	29	4.0	60	6.1	6.9	3.5	1.4
14	3.2	1.6	1.4	.71	.90	7.6	3.8	109	6.6	4.1	2.4	1.2
15	25	1.3	1.1	.63	9.6	7.7	3.8	25	6.0	3.0	2.0	1.2
16	6.5	20	.90	.63	12	4.0	3.4	16	5.0	2.8	2.4	1.4
17	3.6	2.7	1.0	.71	2.2	5.1	3.2	12	4.7	3.3	2.2	1.8
18	2.7	1.7	1.1	.63	1.3	3.1	11	9.5	4.0	3.3	1.8	2.8
19	2.4	12	1.2	.63	1.0	6.3	131	8.4	3.7	2.8	1.8	1.7
20	2.3	5.5	1.1	.71	1.0	16	140	7.3	3.6	2.4	1.6	1.5
21	2.1	2.9	1.2	.71	.78	7.7	24	14	3.4	2.4	1.4	1.4
22	1.8	2.2	1.1	.63	.71	7.3	13	8.4	3.6	2.0	1.2	1.2
23	1.6	1.9	1.1	.56	18	5.6	9.5	8.9	3.6	1.7	1.2	1.4
24	1.7	2.2	.90	.56	11	3.8	11	6.1	3.1	1.7	1.1	1.5
25	1.6	3.3	.80	.80	7.4	3.5	10	5.3	3.1	1.7	1.1	1.1
26	1.4	1.7	.71	.71	4.3	2.6	6.9	5.3	3.2	1.6	1.4	.99
27	1.9	1.6	.80	.71	3.4	2.2	6.1	7.3	2.8	2.2	1.2	.92
28	1.8	1.4	.80	.71	4.5	5.6	6.9	12	4.0	5.1	1.1	.85
29	1.4	1.4	.63	.71	---	9.6	12	6.5	2.8	2.4	1.0	.85
30	1.3	1.4	.71	1.0	---	8.8	7.3	5.7	2.8	3.1	2.8	.92
31	1.3	---	.71	.71	---	37	---	5.7	---	2.6	2.4	---
TOTAL	103.9	80.68	35.56	25.55	88.03	228.7	578.7	723.5	263.4	99.7	66.2	55.03
MEAN	3.35	2.69	1.15	.82	3.14	7.38	19.3	23.3	8.78	3.22	2.14	1.83
MAX	25	20	3.2	2.4	18	37	140	202	86	12	8.2	4.4
MIN	1.3	.98	.63	.56	.49	1.6	3.2	5.3	2.8	1.6	1.0	.85
AC-FT	206	160	71	51	175	454	1150	1440	522	198	131	109

CAL YR 1976 TOTAL 1860.84 MEAN 5.08 MAX 102 MIN .63 AC-FT 3690
WTR YR 1977 TOTAL 2348.95 MEAN 6.44 MAX 202 MIN .49 AC-FT 4660

HAWAII, ISLAND OF OAHU

16229300 KALIHI STREAM AT KALIHI--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1970-74, 1975 to current year.

REMARKS.--Available pesticide data for water year 1975 are also published for this station.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTAN-TANEOUS DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)	TUR-BID-ITY (JTU)	FECAL COLI-FORM .7UM-MF (COL./ 100 ML)	STREP-TOCOCCI (COL-ONIES PER 100 ML)	FECAL STREP-TOCOCCI KF AGAR (COL. PER 100 ML)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)
OCT												
26...	0945	1.4	245	6.8	23.1	3	3900	3100	--	73	1	16
NOV												
22...	1030	2.2	225	6.8	21.9	3	5300	7000	--	63	2	12
DEC												
27...	1000	.73	300	6.8	21.0	3	2200	--	623000	93	6	19
JAN												
24...	0900	.53	340	6.6	21.0	8	3700	--	9800	100	9	22
FEB												
22...	0915	.60	355	7.1	22.5	3	2500	--	14000	98	6	21
MAR												
28...	0930	5.0	325	6.9	22.5	6	5000	--	52000	95	10	20
APR												
25...	0945	9.7	165	7.4	20.5	8	3300	--	13000	47	10	10
MAY												
23...	0830	10	235	7.1	20.7	4	9100	--	26000	69	12	15
JUN												
27...	1115	2.9	230	7.7	24.0	5	17000	--	3000	67	14	14
JUL												
25...	1100	1.6	260	7.7	24.0	1	6200	--	16000	73	5	15
AUG												
22...	1200	1.2	280	7.1	25.5	2	4600	--	3900	75	7	16
SEP												
26...	0930	1.0	300	6.5	24.0	4	8700	--	13000	84	7	17

DATE	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	DIS-SOLVED SODIUM (NA) (MG/L)	PERCENT SODIUM	SODIUM AD-SORP-TION RATIO	DIS-SOLVED PO-TAS-SIUM (K) (MG/L)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DIS-SOLVED SULFATE (SO4) (MG/L)	DIS-SOLVED CHLO-RIDE (CL) (MG/L)	DIS-SOLVED FLUO-RIDE (F) (MG/L)
OCT												
26...	8.1	22	39	1.1	1.3	88	0	72	22	7.0	30	.1
NOV												
22...	7.9	20	40	1.1	1.3	74	0	61	19	8.3	30	.1
DEC												
27...	11	26	37	1.2	1.3	106	0	87	27	7.4	40	.1
JAN												
24...	12	30	38	1.3	1.4	116	0	95	47	10	44	.1
FEB												
22...	11	28	38	1.2	1.5	112	0	92	14	11	42	.0
MAR												
28...	11	29	39	1.2	1.4	104	0	85	21	17	44	.1
APR												
25...	5.4	15	40	1.0	1.0	45	0	37	2.9	9.8	22	.1
MAY												
23...	7.4	20	38	1.1	1.3	68	0	56	8.6	13	29	.1
JUN												
27...	7.8	21	40	1.1	1.1	65	0	53	2.1	7.8	31	.0
JUL												
25...	8.7	24	41	1.2	1.2	83	0	68	2.6	8.8	32	.1
AUG												
22...	8.4	26	43	1.3	1.5	82	0	67	10	11	36	.1
SEP												
26...	10	25	39	1.2	1.4	94	0	77	48	8.3	40	.1

B Results based on colony count outside the acceptable range (non-ideal colony count).

16229300 KALIHI STREAM AT KALIHI--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED SOLIDS (RESI-DUE AT 180 C) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTI-TUENTS) (MG/L)	DIS-SOLVED SOLIDS (TONS PER AC-FT)	DIS-SOLVED SOLIDS (TONS PER DAY)	TOTAL NITRITE PLUS NITRATE (N) (MG/L)	TOTAL AMMONIA NITRO-GEN (N) (MG/L)	TOTAL KJEL-DAHL NITRO-GEN (N) (MG/L)	TOTAL NITRO-GEN (N) (MG/L)	TOTAL NITRO-GEN (NO3) (MG/L)	TOTAL PHOS-PHORUS (P) (MG/L)	DIS-SOL-VED PHOS-PHORUS (P) (MG/L)
OCT 26...	17	151	145	.21	.57	.17	--	.39	.56	2.5	.07	--
NOV 22...	14	136	130	.19	.81	.19	--	.00	.19	.84	.07	--
DEC 27...	19	181	176	.25	.36	.25	--	.25	.50	2.2	.09	--
JAN 24...	20	208	197	.28	.30	.20	--	.21	.41	1.8	.07	--
FEB 22...	20	202	190	.27	.33	.22	--	.21	.43	1.9	.09	--
MAR 28...	17	193	190	.26	2.61	.21	--	.26	.47	2.1	.08	--
APR 25...	12	100	97	.14	2.62	1.0	--	.64	2.5	11	.59	--
MAY 23...	12	134	131	.13	3.62	.19	--	.30	.49	2.2	.02	--
JUN 27...	9.8	120	125	.16	.94	.05	--	.15	.20	.89	.03	--
JUL 25...	11	135	142	.18	.58	.09	--	.12	.21	.93	.04	--
AUG 22...	17	153	157	.21	.50	.49	--	.57	1.1	4.7	.08	--
SEP 26...	19	163	167	.22	.44	.09	.04	--	--	--	.07	.06

DATE	TIME	TOTAL ARSENIC (AS) (UG/L)	SUS-PENDED ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)	SUS-PENDED CAD-MIUM (CD) (UG/L)	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	SUS-PENDED CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	SUS-PENDED COBALT (CO) (UG/L)
NOV 22...	1030	0	0	0	<10	<10	0	0	0	0	<50	<50
FEB 22...	0915	0	0	0	<10	<10	0	0	0	0	<50	<50
MAY 23...	0830	0	0	0	10	10	0	0	--	0	<50	--
AUG 22...	1200	0	0	0	<10	<8	2	10	10	0	<50	<49
SEP 26...	0930	--	--	--	--	--	--	--	--	--	--	--

DATE	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	SUS-PENDED COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)	TOTAL LEAD (PB) (UG/L)	SUS-PENDED LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	SUS-PENDED MAN-GANESE (MN) (UG/L)
NOV 22...	0	<10	<8	2	300	30	<100	<97	3	10	10
FEB 22...	0	<10	<8	2	540	180	<100	<96	4	70	10
MAY 23...	0	<10	<7	3	480	90	<100	<98	2	20	10
AUG 22...	1	<10	<9	1	270	160	<100	<69	31	10	0
SEP 26...	--	--	--	--	--	--	--	--	--	--	--

< Actual value is known to be less than the value shown.

16229300 KALIHI STREAM AT KALIHI--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	SUS-PENDED MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	SUS-PENDED SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL ZINC (ZN) (UG/L)	SUS-PENDED ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)
NOV											
22...	0	.0	.0	.0	0	0	0	0	0	0	3.2
FEB											
22...	60	.0	.0	.0	0	0	0	0	0	0	2.7
MAY											
23...	10	.0	.0	.0	0	0	0	20	10	6	2.8
AUG											
22...	10	.0	.0	.0	0	0	0	10	4	6	3.2
SEP											
26...	--	--	--	--	--	--	--	--	--	--	2.0

DATE	TIME	TOTAL ALDRIN (UG/L)	TOTAL ATRA-ZINE (UG/L)	ATRA-ZINE IN BOTTOM MATERI-AL (UG/KG DRY SOLIDS)	TOTAL CHLOR-DANE (UG/L)	TOTAL DDD (UG/L)	TOTAL DDE (UG/L)	TOTAL DDT (UG/L)	TOTAL DI-AZINON (UG/L)	TOTAL DI-ELDRIN (UG/L)
NOV										
22...	1030	ND	ND	--	ND	ND	ND	ND	ND	.04
FEB										
22...	0915	ND	ND	--	.0	ND	ND	ND	ND	.04
JUN										
27...	1115	ND	ND	ND	ND	ND	ND	ND	ND	.01
SEP										
26...	0930	--	ND	--	--	--	--	--	--	--

DATE	TOTAL ENDRIN (UG/L)	TOTAL ETHION (UG/L)	TOTAL HEPTA-CHLOR (UG/L)	TOTAL HEPTA-CHLOR EPOXIDE (UG/L)	TOTAL LINDANE (UG/L)	TOTAL MALA-THION (UG/L)	TOTAL METH-OXY-CHLOR (UG/L)	TOTAL METHYL PARA-THION (UG/L)	TOTAL METHYL TRI-THION (UG/L)	TOTAL PARA-THION (UG/L)
NOV										
22...	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
FEB										
22...	ND	ND	ND	.01	ND	ND	ND	ND	ND	ND
JUN										
27...	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SEP										
26...	--	--	--	--	--	--	--	--	--	--

DATE	TOTAL TOX-APHENE (UG/L)	TOTAL TRI-THION (UG/L)	TOTAL 2,4-D (UG/L)	2,4-D IN BOTTOM MA-TERIAL (UG/KG)	TOTAL 2,4,5-T (UG/L)	2,4,5-T IN BOTTOM MA-TERIAL (UG/KG)	TOTAL SILVEX (UG/L)	SILVEX IN BOTTOM MA-TERIAL (UG/KG)	SIMA-ZINE TOTAL COUL-SON COND. (UG/L)	SIMA-ZINE IN BOTTOM MATERI-AL (UG/KG DRY SOLIDS)
NOV										
22...	ND	ND	ND	--	ND	--	ND	--	ND	--
FEB										
22...	ND	ND	ND	--	ND	--	ND	--	ND	--
JUN										
27...	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SEP										
26...	--	--	ND	--	ND	--	ND	--	ND	--

ND Material specifically analyzed for but not detected

16229300 KALIHI STREAM AT KALIHI--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	TOTAL PHYTO-PLANK-TON (CELLS PER ML)	CHLOR-A PERI-PHYTON CHROMO-SPECT-METRIC (MG/M2)	CHLOR-A PERI-PHYTON CHROMO-GRAPHIC FLUOROM (MG/M2)	CHLOR-B PERI-PHYTON CHROMO-SPECT-METRIC (MG/M2)	CHLOR-B PERI-PHYTON CHROMO-GRAPHIC FLUOROM (MG/M2)	BIOMASS CHLORO-PHYLL RATIO PERI-PHYTON (UNITS)	LENGTH OF EXPO-SURE (DAYS)
OCT								
26...	0945	32	--	--	--	--	--	--
NOV								
22...	1030	220	3.55	--	3.15	--	65.1	27
DEC								
27...	1000	160	--	--	--	--	--	--
JAN								
24...	0900	160	--	--	--	--	--	--
FEB								
22...	0915	80	--	--	--	--	--	--
MAR								
28...	0930	220	--	--	--	--	--	--
APR								
25...	0945	310	--	--	--	--	--	--
MAY								
23...	0830	1400	--	--	--	--	--	--
JUN								
27...	1115	380	--	--	--	--	--	--
JUL								
25...	1100	820	--	--	--	--	--	--
AUG								
22...	1200	180	--	.601	--	1.72	4443	28
SEP								
26...	0930	1200	--	--	--	--	--	--

DATE	TIME	INSTAN-TANEOUS DIS-CHARGE (CFS)	SUS-PENDED SEDI-MENT (MG/L)	SUS-PENDED SEDI-MENT DIS-CHARGE (T/DAY)	SUS. SED. SIEVE DIAM. % FINER THAN .062 MM
OCT					
26...	0945	1.4	3	.01	100
NOV					
22...	1030	2.2	2	.01	100
DEC					
27...	1000	.73	2	.00	100
JAN					
24...	0900	.53	3	.00	100
FEB					
22...	0915	.60	3	.00	100
MAR					
28...	0930	5.0	5	.07	100
APR					
25...	0945	9.7	6	.16	100
MAY					
23...	0830	10	6	.16	100
JUN					
27...	1115	2.9	4	.03	100
JUL					
25...	1100	1.6	3	.01	100
AUG					
22...	1200	1.2	6	.02	100
SEP					
26...	0930	1.0	4	.01	100

16229300 KALIHI STREAM AT KALIHI--Continued

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

PHYTOPLANKTON

DATE	OCT 26,76	NOV 22,76	DEC 27,76	JAN 24,77	FEB 22,77	MAR 23,77
TIME	0945	1030	1000	0930	0915	0930
TOTAL CELLS/ML	9	220	160	160	40	220
DIVERSITY: DIVISION	0.0	0.9	1.1	0.1	0.9	1.8
.CLASS	0.0	0.9	1.1	0.1	0.9	1.9
..ORDER	0.0	1.0	1.1	0.1	0.9	1.9
...FAMILY	1.3	1.3	1.4	0.1	1.9	2.9
....GENUS	1.3	1.4	1.6	0.1	1.6	3.2

ORGANISM	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT
CHLOROPHYTA (GREEN ALGAE)												
.CHLOROPHYCEAE												
..CHLOROCOCCALES												
...OOCYSTACEAE												
....ANKISTRODESMUS	--	-	--	-	4	3	--	-	--	-	19	9
....CHODATELLA	--	-	--	-	--	-	--	-	--	-	13	6
....OOCYSTIS	--	-	--	-	--	-	--	-	--	-	--	-
...SCENEDESMACEAE												
....SCENEDESMUS	--	-	--	-	9	5	--	-	--	-	--	-
CHRYSOPHYTA												
.BACILLARIOPHYCEAE												
..CENTRALES												
...COSCINODISCACEAE												
....CYCLOTELLA	--	-	3	1	--	-	--	-	--	-	--	-
....MELOSIRA	--	-	--	-	--	-	--	-	--	-	--	-
..PENNALES												
...ACHNANTHACEAE												
....ACHNANTHES	*	0	--	-	4	3	--	-	3	7	--	-
....COCCONEIS	--	-	--	-	2	1	--	-	--	-	--	-
....RHOICOSPHENIA	5	17	3	1	15	9	*	0	5	13	--	-
...FRAGILARIACEAE												
....SYNEDRA	--	-	--	-	--	-	3	2	3	7	19	9
...GOMPHONEMATACEAE												
....GOMPHONEIS	--	-	--	-	--	-	--	-	--	-	25	12
....GOMPHONEMA	21	67	13	6	*	0	*	0	--	-	16	7
...NAVICULACEAE												
....NAVICULA	--	-	21	10	4	3	--	-	--	-	31	14
....PINNULARIA	--	-	--	-	--	-	--	-	--	-	--	-
....STAURONEIS	--	-	--	-	--	-	*	0	--	-	--	-
...NITZSCHIACEAE												
....DENTICULA	--	-	--	-	--	-	--	-	--	-	--	-
....NITZSCHIA	5	17	5	2	4	3	*	0	3	7	19	9
...SURIRELLACEAE												
....CYMATOPLEURA	--	-	--	-	--	-	--	-	--	-	--	-
....SURIRELLA	--	-	--	-	--	-	--	-	--	-	--	-
CYANOPHYTA (BLUE-GREEN ALGAE)												
.CYANOPHYCEAE												
..HORMOGONALES												
...NOSTOCACEAE												
....APHANIZOMENON	--	-	--	-	--	-	--	-	--	-	--	-
...OSCILLATORIACEAE												
....LYNGBYA	--	-	--	-	--	-	--	-	--	-	--	-
....OSCILLATORIA	--	-	160#	76	120#	72	160#	98	27#	67	--	-
....SPIRULINA	--	-	3	1	2	1	--	-	--	-	--	-
...RIVULARIACEAE												
....RAPHIDIOPSIS	--	-	--	-	--	-	--	-	--	-	41#	19
...SCYTONEMATACEAE												
....PLECTONEMA	--	-	--	-	--	-	--	-	--	-	--	-
EUGLENOPHYTA (EUGLENOIDS)												
.CRYPTOPHYCEAE												
..CRYPTOMONADALES												
...CRYPTOCHRYSIDACEAE												
....CHRODOMONAS	--	-	--	-	--	-	--	-	--	-	--	-
...CRYPTOMONADACEAE												
....CRYPTOMONAS	--	-	--	-	--	-	--	-	--	-	19	9
.EUGLENOPHYCEAE												
..EUGLENALES												
...EUGLENACEAE												
....EUGLENA	--	-	5	2	--	-	--	-	--	-	--	-
....LEPOCINCLIS	--	-	--	-	--	-	--	-	--	-	--	-
....TRACHELOMONAS	--	-	--	-	--	-	--	-	--	-	16	7

NOTE: 9 - DOMINANT ORGANISM; EQUAL TO OR GREATER THAN 15%
* - OBSERVED ORGANISM, MAY NOT HAVE BEEN COUNTED; LESS THAN 1/2%

16229300 KALIHI STREAM AT KALIHI--Continued

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

PHYTOPLANKTON

DATE	APR 25,77		MAY 23,77		JUN 27,77		JUL 25,77		AUG 22,77		SEP 26,77	
TIME	0945		0830		1115		1100		1200		0930	
TOTAL CELLS/ML	310		1400		380		820		180		1200	
DIVERSITY: DIVISION	0.6		0.5		0.3		1.5		0.9		0.3	
.CLASS	0.6		0.5		0.3		1.5		0.9		0.3	
..ORDER	0.6		0.5		0.4		1.5		0.9		0.3	
...FAMILY	2.0		0.7		1.7		1.8		2.4		2.0	
....GENUS	2.4		1.6		2.0		1.8		2.5		2.0	
ORGANISM	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT
CHLOROPHYTA (GREEN ALGAE)												
.CHLOROPHYCEAE												
..CHLOROCOCCALES												
...OOCYSTACEAE												
....ANKISTRODESMUS	--	-	--	-	--	-	--	-	--	-	--	-
....CHODATELLA	--	-	--	-	--	-	--	-	--	-	--	-
....OOCYSTIS	--	-	--	-	--	-	150#	18	--	-	--	-
...SCENEDESMACEAE												
....SCENEDESMUS	--	-	--	-	--	-	--	-	--	-	--	-
CHRYSOPHYTA												
.BACILLARIOPHYCEAE												
..CENTRALES												
...COSCINODISCACEAE												
....CYCLOTELLA	--	-	--	-	3	1	--	-	--	-	--	-
....MELOSIRA	--	-	*	0	--	-	--	-	--	-	--	-
..PENNALES												
...ACHNANTHACEAE												
....ACHNANTHES	83#	27	*	0	3	1	--	-	--	-	--	-
....COCCONEIS	--	-	--	-	16	4	--	-	--	-	--	-
....RHOICOSPHENIA	42	13	*	0	100#	27	28	3	36#	20	*	0
...FRAGILARIACEAE												
....SYNEDRA	--	-	15	1	--	-	28	3	--	-	--	-
...GOMPHONEMATACEAE												
....GOMPHONEIS	--	-	--	-	--	-	--	-	--	-	--	-
....GOMPHONEMA	10	3	27	2	13	3	9	1	29#	16	--	-
...NAVICULACEAE												
....NAVICULA	90#	29	24	2	25	7	9	1	36#	20	15	1
....PINNULARIA	3	1	*	0	--	-	--	-	--	-	--	-
....STAURONEIS	--	-	--	-	--	-	--	-	--	-	--	-
...NITZSCHIACEAE												
....DENTICULA	--	-	--	-	3	1	--	-	--	-	--	-
....NITZSCHIA	35	11	60	4	190#	51	9	1	15	8	--	-
...SURIRELLACEAE												
....CYMATOPLEURA	--	-	--	-	--	-	--	-	7	4	--	-
....SURIRELLA	--	-	--	-	--	-	--	-	7	4	--	-
CYANOPHYTA (BLUE-GREEN ALGAE)												
.CYANOPHYCEAE												
..HORMOGONALES												
...NOSTOCACEAE												
....APHANIZOMENON	--	-	--	-	--	-	--	-	--	-	150	12
...OSCILLATORIACEAE												
....LYNGBYA	--	-	590#	43	--	-	--	-	--	-	--	-
....OSCILLATORIA	45	15	640#	47	22	6	510#	62	51#	28	400#	32
....SPIRULINA	--	-	--	-	--	-	--	-	--	-	--	-
...RIVULARIACEAE												
....RAPHIDIOPSIS	--	-	--	-	--	-	--	-	--	-	150	12
...SCYTONEMATACEAE												
....PLECTONEMA	--	-	--	-	--	-	--	-	--	-	490#	40
EUGLENOPHYTA (EUGLENOIDS)												
.CRYPTOPHYCEAE												
..CRYPTOMONIDALES												
...CRYPTOCHRYSIDACEAE												
....CHROOMONAS	--	-	*	0	--	-	--	-	--	-	--	-
...CRYPTOMONADACEAE												
....CRYPTOMONAS	--	-	--	-	--	-	--	-	--	-	--	-
.EUGLENOPHYCEAE												
..EUGLENALES												
...EUGLENACEAE												
....EUGLENA	--	-	--	-	--	-	--	-	--	-	36	3
....LEPOCINCLIS	--	-	--	-	--	-	83	10	--	-	--	-
....TRACHELOMONAS	--	-	--	-	--	-	--	-	--	-	--	-

NOTE: # - DOMINANT ORGANISM; EQUAL TO OR GREATER THAN 15%
* - OBSERVED ORGANISM, MAY NOT HAVE BEEN COUNTED; LESS THAN 1/2%

16232000 NUUANU STREAM BELOW RESERVOIR 2 WASTEWAY, NEAR HONOLULU

LOCATION.--Lat 21°20'57", long 157°49'40", Hydrologic Unit 20060000, on right bank beside Old Pali Road in upper Nuuanu Valley, 0.2 mi (0.3 km) downstream from reservoir 2 wasteway, and 3.5 mi (5.6 km) northeast of Honolulu Post Office.

DRAINAGE AREA.--3.35 mi² (8.68 km²).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1913 to January 1921, September 1921 to current year.

REVISED RECORDS (FISCAL YEARS).--WSP 985: 1921-35(M). WSP 1319: 1931. WSP 1569: Drainage area. WSP 1639: 1931, 1935.

GAGE.--Water-stage recorder and sharp-crested weirs. Datum of gage is 631.71 ft (192.545 m) above mean sea level. Prior to Sept. 7, 1915, nonrecording gage at same site at datum 0.03 ft (0.009 m) lower and Sept. 7, 1915, to Mar. 31, 1918, at same datum.

REMARKS.--Records fair. Low-flow regulation by reservoirs 2, 3, and 4, capacities, 21 acre-ft (25,900 m³), 34 acre-ft (41,900 m³), and 1,630 acre-ft (2.01 hm³), respectively. Honolulu Board of Water Supply diverts ground water from tunnels in drainage area.

AVERAGE DISCHARGE.--61 years (water years 1915-16, 1918-20, 1922-77), 7.11 ft³/s (0.201 m³/s), 5,150 acre-ft/yr (6.35 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,990 ft³/s (198 m³/s) Jan. 16, 1921, gage height, 8.74 ft (2.664 m), from floodmarks, from rating curve extended above 420 ft³/s (11.9 m³/s) by test of model of station site; minimum, 0.09 ft³/s (0.003 m³/s) Sept. 10, 11, 1925.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 240 ft³/s (6.80 m³/s) and maximum (*):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Apr. 19	1700	486	13.8	4.48	1.366
May 12	1930	*746	21.1	4.96	1.512

Minimum discharge, 0.34 ft³/s (0.010 m³/s) Jan. 23-25.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.99	.80	.96	.85	.69	1.0	3.1	3.9	6.2	3.5	2.5	1.6
2	.90	.73	.91	1.1	.56	1.3	2.4	3.7	6.1	3.5	2.5	1.8
3	.63	.93	.89	.88	.46	1.5	6.9	4.3	5.9	3.6	2.4	1.9
4	.75	.80	.87	.86	.53	1.2	9.9	5.3	5.9	3.4	2.4	1.6
5	1.7	.72	.88	.60	.46	1.1	9.2	3.8	7.0	3.3	3.0	1.6
6	2.0	.72	1.1	.46	.46	1.1	5.4	14	6.3	3.4	2.4	1.6
7	1.8	.68	1.3	.46	.46	.91	3.3	6.0	5.9	3.4	2.4	1.5
8	.90	.86	1.1	.48	.38	.76	2.8	8.0	35	3.1	2.2	2.0
9	.85	.69	.97	.57	.38	.91	2.6	22	10	3.1	2.2	2.9
10	.89	.70	.99	.73	.38	.91	2.5	10	6.0	3.5	2.1	2.0
11	.72	1.6	.97	.71	.38	1.2	3.5	9.8	5.6	3.4	2.1	1.5
12	1.8	1.1	.96	.76	.42	2.5	2.5	84	5.5	8.6	5.3	1.5
13	1.1	.67	1.3	.81	.42	5.0	2.2	49	5.2	4.2	2.9	1.5
14	1.4	1.5	1.1	.81	.46	1.8	2.1	85	5.3	3.2	2.0	1.4
15	8.6	1.1	1.0	.76	2.6	1.7	2.0	32	5.0	3.1	2.0	1.4
16	2.2	11	.88	.81	3.0	1.2	1.9	6.8	4.7	3.1	2.0	1.4
17	1.4	1.5	.54	.76	.78	2.0	2.0	6.4	4.8	3.2	2.0	1.8
18	.90	1.1	.54	.76	.57	1.5	2.7	6.3	4.7	3.4	1.9	1.6
19	.82	4.5	.54	.62	.46	1.5	38	25	4.6	3.0	1.8	1.4
20	1.4	2.7	.55	.47	.46	3.1	16	34	4.1	2.9	2.4	1.3
21	1.1	1.5	.60	.47	.42	1.6	7.8	7.7	4.1	2.9	2.1	1.3
22	1.0	1.3	.57	.46	.42	1.4	5.5	7.0	4.2	2.9	1.6	1.3
23	1.1	1.2	.64	.46	6.2	1.4	4.6	6.3	4.0	2.8	1.6	1.2
24	1.3	1.5	.62	.34	3.5	1.2	5.4	6.2	4.0	2.8	1.8	1.3
25	1.1	1.8	.61	.50	2.0	1.1	4.8	6.1	3.9	2.7	2.0	1.2
26	.70	1.1	.61	.45	1.4	.91	3.9	6.1	3.9	2.7	1.7	1.2
27	1.1	1.0	.63	.47	.88	.92	3.8	6.4	3.8	2.7	1.6	1.2
28	1.4	1.1	.61	.51	1.6	1.8	5.1	8.0	4.1	3.3	1.7	1.2
29	1.0	1.0	.64	.50	---	2.6	8.0	6.2	3.7	2.7	1.6	1.2
30	.80	1.1	.71	.53	---	2.3	4.5	6.0	3.7	2.8	3.6	1.1
31	.82	---	.80	.53	---	7.2	---	6.0	---	2.6	2.0	---
TOTAL	43.17	47.00	25.39	19.48	30.73	54.62	174.4	491.3	183.2	102.8	69.8	45.5
MEAN	1.39	1.57	.82	.63	1.10	1.76	5.81	15.8	6.11	3.32	2.25	1.52
MAX	8.6	11	1.3	1.1	6.2	7.2	38	85	35	8.6	5.3	2.9
MIN	.63	.67	.54	.34	.38	.76	1.9	3.7	3.7	2.6	1.6	1.1
AC-FT	86	93	50	39	61	108	346	974	363	204	138	90

CAL YR 1976 TOTAL 1020.60 MEAN 2.79 MAX 18 MIN .54 AC-FT 2020
WTR YR 1977 TOTAL 1287.39 MEAN 3.53 MAX 85 MIN .34 AC-FT 2550

16232000 NUUANU STREAM BELOW RESERVOIR 2 WASTEWAY, NEAR HONOLULU--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1971-77.

REMARKS.--Miscellaneous chemical analyses published for this station for 1970 water year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTAN-TANEOUS DIS-CHARGE (CFS)	COLOR (PLAT-INUM-COBALT UNITS)	TUR-BID-ITY (JTU)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	DIS-SOLVED SODIUM (NA) (MG/L)	PERCENT SODIUM
MAR										
09...	1515	.98	6	4	37	10	5.1	6.0	11	39
APR										
20...	1600	18	14	9	34	14	5.5	5.0	12	42

DATE	SODIUM AD-SORP-TION RATIO	DIS-SOLVED PO-TAS-SIUM (K) (MG/L)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DIS-SOLVED SULFATE (SO4) (MG/L)	DIS-SOLVED CHLO-RIDE (CL) (MG/L)	DIS-SOLVED FLUO-RIDE (F) (MG/L)
MAR									
09...	.8	.5	34	0	28	14	9.1	22	.0
APR									
20...	.9	.9	25	0	21	3.2	6.0	22	.0

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTI-TUENTS) (MG/L)	DIS-SOLVED SOLIDS (TONS PER AC-FT)	DIS-SOLVED SOLIDS (TONS PER DAY)	DIS-SOLVED NITRITE PLUS NITRATE (N) (MG/L)	DIS-SOLVED ORTHO. PHOS-PHORUS (P) (MG/L)	DIS-SOLVED ORTHO PHOS-PHATE (PO4) (MG/L)	DIS-SOLVED IRON (FE) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)
MAR									
09...	11	82	.11	.22	.06	.02	.06	180	20
APR									
20...	13	77	.10	3.74	.07	.02	.06	100	0

DATE	TIME	INSTAN-TANEOUS DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)
OCT					
21...	1550	.96	125	7.1	23.0
DEC					
01...	1515	.96	140	7.0	20.0
JAN					
21...	1305	.47	140	6.6	19.5
MAR					
09...	1455	.98	140	6.6	21.0
09...	1515	.98	140	6.6	21.0
APR					
20...	1550	18	130	7.1	21.0
20...	1600	18	130	7.1	21.0
JUN					
09...	1615	4.8	140	6.6	23.0
JUL					
18...	1525	3.5	125	6.8	23.0
SEP					
01...	1535	1.6	130	7.1	23.0

16238500 WAIHI STREAM AT HONOLULU

LOCATION.--Lat 21°19'55", long 157°48'12", Hydrologic Unit 20060000, on left bank 100 ft (30 m) upstream from bridge on Waaloa Way, 700 ft (210 m) upstream from confluence with Waiakeakua Stream, and 4.2 mi (6.8 km) northeast of Honolulu Post Office.

DRAINAGE AREA.--1.14 mi² (2.95 km²).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--May 1913 to January 1921, August 1925 to current year. Prior to July 1960, published as West Branch Manoa Stream near Honolulu.

REVISED RECORDS (FISCAL YEARS).--WSP 1319: 1930-32(M), 1939(M). WSP 1569: Drainage area.

GAGE.--Water-stage recorder and combination Parshall flume and V-notch weir. Datum of gage is 289.84 ft (88.343 m) above mean sea level (Honolulu Board of Water Supply bench mark). Prior to June 17, 1914, non-recording gage at same site at different datum. June 17, 1914, to Jan. 16, 1921, water-stage recorder at site 150 ft (46 m) upstream at different datum, Aug. 4, 1925, to Mar. 15, 1928, at present site at datum 2.35 ft (1.021 m) lower and Mar. 16, 1928 to Mar. 23, 1977 at datum 1.00 ft (0.305 m) higher.

REMARKS.--Records fair.

AVERAGE DISCHARGE.--59 years (water years, 1914-20, 1926-77), 3.61 ft³/s (0.102 m³/s), 2,620 acre-ft/yr (3.23 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,250 ft³/s (92.0 m³/s) Jan. 16, 1921, gage height, 10.4 ft (3.17 m), from floodmarks, site and datum then in use, from rating curve extended above 60 ft³/s (1.70 m³/s); minimum, 0.07 ft³/s (0.002 m³/s) Jan. 17, 18, 1977.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 310 ft³/s (8.78 m³/s) and maximum (*):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Apr. 19	1630	588	16.7	4.98	1.518
May 12	1930	*776	22.0	5.49	1.673

Minimum discharge, 0.07 ft³/s (0.002 m³/s) Jan. 17, 18.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.78	.32	.46	.14	.54	1.0	2.6	2.8	5.9	1.4	1.6	.92
2	.65	.38	.38	.14	.14	2.0	2.0	2.5	4.3	1.3	1.4	1.8
3	.54	.46	.38	.17	.14	1.9	4.4	6.5	3.4	1.1	.87	2.1
4	1.2	.17	.38	.17	.38	1.4	7.4	5.8	2.6	1.2	.89	1.1
5	2.8	.32	.38	.17	.14	1.2	5.3	3.7	4.3	1.2	4.6	.87
6	4.6	.32	.38	.17	.12	1.6	3.3	19	2.9	.93	1.5	.91
7	1.4	.26	.78	.17	.12	1.2	2.4	5.8	2.1	.84	1.5	.91
8	.74	.38	.46	.14	.12	1.7	1.9	8.8	37	.68	1.1	3.1
9	.59	.32	.32	.14	.12	1.5	1.6	30	11	.83	.95	5.6
10	.51	.17	.32	.14	.09	1.1	1.5	10	4.3	1.9	.86	2.2
11	.46	2.2	.26	.14	.09	2.1	3.6	9.3	3.5	4.6	.78	1.5
12	2.9	.54	.26	.17	.12	3.2	1.9	67	3.0	19	9.2	1.2
13	.75	.26	1.0	.26	.14	5.0	1.6	16	2.8	4.8	2.7	1.1
14	2.0	1.5	.38	.12	.14	3.0	1.5	15	3.7	2.9	1.5	.92
15	20	.38	.26	.10	3.5	2.2	1.4	6.5	2.8	2.0	1.2	.84
16	2.3	12	.17	.09	2.7	1.6	1.2	5.0	2.3	3.2	.99	.77
17	1.4	.86	.17	.08	.46	2.4	1.3	4.4	2.9	2.5	.89	1.4
18	1.4	.62	.17	.09	.21	1.6	2.3	3.9	2.2	2.5	.71	.95
19	1.0	8.5	.17	.12	.17	1.7	56	3.5	2.1	1.7	.68	.69
20	1.7	2.4	.17	.12	.14	2.9	15	3.1	2.0	1.4	1.2	.63
21	1.0	1.4	.17	.12	.14	2.1	5.9	4.0	1.9	1.5	.84	.60
22	.86	.86	.17	.12	.17	2.5	3.6	3.9	2.2	1.6	.60	.57
23	.54	.70	.17	.12	12	2.1	3.1	3.1	1.7	1.3	.52	.53
24	.54	.78	.14	.12	4.3	1.7	4.9	2.5	1.7	1.1	.48	.82
25	.54	1.3	.14	1.0	2.6	1.4	3.0	2.2	1.5	1.3	.84	.57
26	.46	.54	.21	.14	1.7	1.1	2.4	2.0	1.7	1.0	.96	.56
27	1.0	.38	.21	.12	1.4	.98	2.3	3.8	1.8	1.4	.55	.47
28	1.2	.38	.26	.12	1.9	1.6	4.9	5.9	1.8	5.0	.46	.48
29	.46	.42	.17	.12	---	2.1	8.3	2.8	1.5	2.3	.42	.43
30	.38	.54	.38	.09	---	2.4	3.9	2.4	3.2	2.5	6.4	.43
31	.32	---	.21	.09	---	4.9	---	2.6	---	1.7	1.6	---
TOTAL	55.02	39.66	9.48	5.00	33.79	63.18	160.5	263.8	124.1	76.68	48.79	34.97
MEAN	1.77	1.32	.31	.16	1.21	2.04	5.35	8.51	4.14	2.47	1.57	1.17
MAX	20	12	1.0	1.0	12	5.0	56	67	37	19	9.2	5.6
MIN	.32	.17	.14	.08	.09	.98	1.2	2.0	1.5	.68	.42	.43
AC-FT	109	79	19	9.9	67	125	318	523	246	152	97	69

CAL YR 1976 TOTAL 847.95 MEAN 2.32 MAX 31 MIN .14 AC-FT 1680
WTR YR 1977 TOTAL 914.97 MEAN 2.51 MAX 67 MIN .08 AC-FT 1810

16238500 WAIHI STREAM AT HONOLULU--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1972-77.

REMARKS.--Miscellaneous chemical analyses published for this station for 1970-71 water years.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTAN-TANEOUS DIS-CHARGE (CFS)	COLOR (PLAT-INUM-COBALT UNITS)	TUR-BID-ITY (JTU)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	DIS-SOLVED SODIUM (NA) (MG/L)	PERCENT SODIUM
MAR 07...	1300	1.2	7	5	49	10	7.9	7.1	11	32
APR 20...	1015	22	33	25	32	11	5.2	4.7	9.4	38

DATE	SODIUM AD-SORP-TION RATIO	DIS-SOLVED PO-TAS-SIUM (K) (MG/L)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DIS-SOLVED SULFATE (SO4) (MG/L)	DIS-SOLVED CHLO-RIDE (CL) (MG/L)	DIS-SOLVED FLUO-RIDE (F) (MG/L)
MAR 07...	.7	.8	47	0	39	19	10	22	.0
APR 20...	.7	1.0	26	0	21	4.2	6.2	18	.0

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTI-TUENTS) (MG/L)	DIS-SOLVED SOLIDS (TONS PER AC-FT)	DIS-SOLVED SOLIDS (TONS PER DAY)	DIS-SOLVED NITRITE PLUS NITRATE (N) (MG/L)	DIS-SOLVED ORTHO. PHOS-PHORUS (P) (MG/L)	DIS-SOLVED ORTHO PHOS-PHATE (PO4) (MG/L)	DIS-SOLVED IRON (FE) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)
MAR 07...	16	99	.13	.32	.07	.02	.06	170	10
APR 20...	13	71	.10	4.22	.08	.04	.12	100	0

DATE	TIME	INSTAN-TANEOUS DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)
OCT 18...	1115	1.2	140	7.1	21.5
NOV 29...	1200	.50	160	6.8	21.0
JAN 17...	1150	.09	200	6.4	21.5
MAR 07...	1300	1.2	160	6.6	20.0
APR 20...	1010	22	120	7.0	20.0
APR 20...	1015	22	120	7.0	20.0
JUN 06...	1130	2.7	125	6.8	20.5
JUL 18...	0930	3.0	135	6.8	21.5
AUG 29...	1120	.58	175	7.0	22.0

16240500 WAIAKEAKUA STREAM AT HONOLULU

LOCATION.--Lat 21°19'53", long 157°48'12", Hydrologic Unit 20060000, on right bank 5 ft (2 m) downstream from bridge on Waaloa Way, 500 ft (152 m) upstream from confluence with Waihi Stream, and 4.2 mi (6.8 km) northeast of Honolulu Post Office.

DRAINAGE AREA.--1.06 mi² (2.75 km²).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--May 1913 to January 1921, August 1925 to current year. Prior to July 1960, published as East Branch Manoa Stream near Honolulu.

REVISED RECORDS (FISCAL YEARS).--WSP 1319: 1919(M), 1930-33(M). WSP 1569: Drainage area. WSP 1937: 1949(M), 1960(M).

GAGE.--Water-stage recorder and combination Parshall flume and concrete weir. Datum of gage is 294.50 ft (89.764 m) above mean sea level (Honolulu Board of Water Supply bench mark). Prior to May 20, 1914, nonrecording gage at site 200 ft (61 m) upstream at different datum. May 20, 1914, to Jan. 16, 1921, water-stage recorder at site 30 ft (9 m) upstream at different datum. Aug. 18, 1925, to Mar. 15, 1928, water-stage recorder at present site at datum 2.99 ft (0.911 m) lower, and Mar. 16, 1928, to Oct. 18, 1933, at datum 0.41 ft (0.125 m) higher than present datum.

REMARKS.--Records fair. Honolulu Board of Water Supply at times diverts a small amount of ground water from tunnel above station. Occasional small diversions for irrigation above station.

AVERAGE DISCHARGE.--59 years (water years, 1914-20, 1926-77), 5.07 ft³/s (0.144 m³/s), 3,670 acre-ft/yr (4.53 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,090 ft³/s (87.5 m³/s) Jan. 16, 1921, gage height, 10.4 ft (3.17 m), from floodmarks, site and datum then in use, from rating curve extended above 58 ft³/s (1.64 m³/s); minimum, 0.6 ft³/s (0.017 m³/s) June 7, 8, 1926.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 310 ft³/s (8.78 m³/s) and maximum (*):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Apr. 19	1400	*594	16.8	3.94	1.201
May 12	1800	588	16.7	3.93	1.198
June 8	1800	409	11.6	3.54	1.079

Minimum discharge, 1.0 ft³/s (0.028 m³/s) for several days in February.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.1	1.7	1.6	1.3	1.8	1.4	2.0	2.5	5.0	2.6	2.2	2.4
2	2.0	1.8	1.5	1.4	1.1	1.8	1.6	2.5	4.3	2.5	2.2	2.8
3	1.9	1.8	1.5	1.3	1.2	1.7	7.7	4.7	3.6	2.5	2.1	3.1
4	3.0	1.6	1.6	1.3	1.4	1.4	11	6.5	3.0	2.5	2.1	2.4
5	4.7	1.8	1.5	1.3	1.2	1.4	8.6	3.7	5.6	2.5	4.9	2.2
6	8.3	1.7	1.6	1.3	1.1	2.0	3.7	10	4.0	2.5	2.6	2.2
7	3.4	1.7	2.1	1.3	1.1	1.6	2.5	4.6	2.9	2.4	2.6	2.3
8	2.2	1.9	1.5	1.3	1.1	1.7	2.0	6.1	30	2.3	2.3	3.7
9	2.0	1.6	1.5	1.4	1.0	1.6	1.8	12	12	2.4	2.1	7.1
10	1.9	1.6	1.5	1.3	1.0	1.3	1.8	8.0	4.9	3.5	2.1	4.8
11	1.9	5.6	1.4	1.2	1.0	2.3	3.0	7.0	4.0	5.1	2.0	2.8
12	7.0	2.0	1.4	1.2	1.0	2.8	1.9	58	3.6	12	13	2.5
13	2.6	1.6	7.2	1.2	1.0	3.8	1.6	19	3.3	6.1	3.5	2.4
14	6.6	2.5	1.5	1.2	1.0	2.0	1.6	13	4.1	4.1	2.5	2.2
15	25	1.7	1.4	1.2	5.5	1.7	1.6	6.9	3.2	3.3	2.3	2.2
16	4.0	12	1.4	1.2	4.5	1.4	1.5	5.4	3.0	4.0	2.2	2.1
17	2.7	2.1	1.4	1.2	1.5	2.3	1.6	4.4	3.6	3.6	2.1	2.8
18	2.3	1.8	1.4	1.2	1.2	1.6	2.4	3.9	2.9	4.0	2.1	2.2
19	2.2	13	1.3	1.4	1.1	1.8	83	3.6	2.8	3.1	2.1	2.1
20	2.6	4.7	1.3	1.2	1.0	1.6	13	3.4	2.7	2.8	2.4	2.0
21	2.1	2.7	1.3	1.1	1.0	2.0	5.7	4.0	2.6	2.9	2.3	2.0
22	2.0	2.1	1.3	1.1	1.1	2.4	4.0	3.6	3.2	3.4	2.1	2.0
23	2.0	1.9	1.3	1.1	20	1.9	3.7	3.3	2.7	2.6	2.1	2.0
24	1.9	1.9	1.3	1.1	5.0	1.6	4.4	3.0	2.8	2.4	2.0	2.4
25	1.9	2.1	1.3	3.1	2.7	1.5	2.9	2.8	2.6	2.4	2.5	2.0
26	1.8	1.8	1.3	1.2	1.9	1.3	2.6	2.8	3.3	2.3	2.5	2.0
27	2.3	1.7	1.3	1.1	1.6	1.3	2.5	3.9	3.3	2.4	2.2	1.9
28	2.5	1.6	1.3	1.2	1.7	2.0	3.7	4.3	3.2	4.5	2.1	2.0
29	1.8	1.6	1.3	1.1	---	2.1	5.2	3.1	2.9	2.6	2.2	1.9
30	1.8	1.6	1.3	1.1	---	3.1	3.0	2.9	3.8	2.8	5.4	1.9
31	1.8	---	1.3	1.1	---	3.2	---	3.1	---	2.4	2.8	---
TOTAL	110.3	83.2	44.9	39.7	65.8	59.6	191.6	222.0	138.9	104.5	87.6	76.4
MEAN	3.56	2.77	1.45	1.28	2.35	1.92	6.39	7.16	4.63	3.37	2.83	2.55
MAX	25	13	7.2	3.1	20	3.8	83	58	30	12	13	7.1
MIN	1.8	1.6	1.3	1.1	1.0	1.3	1.5	2.5	2.6	2.3	2.0	1.9
AC-FT	219	165	89	79	131	118	380	440	276	207	174	152

CAL YR 1976 TOTAL 1153.3 MEAN 3.15 MAX 41 MIN 1.1 AC-FT 2290
WTR YR 1977 TOTAL 1224.5 MEAN 3.35 MAX 83 MIN 1.0 AC-FT 2430

16240500 WAIAKEAKUA STREAM AT HONOLULU--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1972-77.

REMARKS.--Miscellaneous chemical analyses published for this station for 1970-71 water years.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTAN-TANEOUS DIS-CHARGE (CFS)	COLOR (PLAT-INUM-COBALT UNITS)	TUR-BID-ITY (JTU)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	DIS-SOLVED SODIUM (NA) (MG/L)	PERCENT SODIUM
MAR										
07...	1515	1.6	4	2	41	3	7.0	5.8	10	34
APR										
20...	1110	14	6	6	31	11	5.5	4.2	8.8	37

DATE	SODIUM AD-SORP-TION RATIO	DIS-SOLVED PO-TAS-SIUM (K) (MG/L)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DIS-SOLVED SULFATE (SO4) (MG/L)	DIS-SOLVED CHLO-RIDE (CL) (MG/L)	DIS-SOLVED FLUO-RIDE (F) (MG/L)
MAR									
07...	.7	.6	47	0	39	12	5.9	18	.0
APR									
20...	.7	.9	25	0	21	5.0	4.2	15	.0

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTI-TUENTS) (MG/L)	DIS-SOLVED SOLIDS (TONS PER AC-FT)	DIS-SOLVED SOLIDS (TONS PER DAY)	DIS-SOLVED NITRITE PLUS NITRATE (N) (MG/L)	DIS-SOLVED ORTHO. PHOS-PHORUS (P) (MG/L)	DIS-SOLVED ORTHO PHOS-PHATE (PO4) (MG/L)	DIS-SOLVED IRON (FE) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)
MAR									
07...	20	92	.13	.40	.22	.04	.12	40	10
APR									
20...	15	68	.09	2.57	.32	.03	.09	40	30

DATE	TIME	INSTAN-TANEOUS DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)
OCT					
18...	1345	2.5	125	7.2	22.0
NOV					
29...	1410	1.7	140	7.2	20.5
JAN					
17...	1510	1.2	140	6.8	22.0
MAR					
07...	1515	1.6	135	6.8	22.0
07...	1530	1.6	135	6.8	22.0
APR					
20...	1110	14	115	6.9	20.0
20...	1215	14	115	6.9	20.0
JUN					
06...	1415	3.5	140	7.1	22.0
JUL					
18...	1130	4.2	125	6.9	21.5
AUG					
29...	1355	2.2	140	7.1	22.0

16244000 PUKELE STREAM NEAR HONOLULU

LOCATION.--Lat 21°18'36", long 157°47'27", Hydrologic Unit 20060000, on right bank 200 ft (60 m) upstream from bridge on Palolo Avenue, 0.6 mi (1.0 km) upstream from confluence with Waiomao Stream, and 4.8 mi (7.7 km) east of Honolulu Post Office.

DRAINAGE AREA.--1.18 mi² (3.06 km²).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--June 1926 to current year.

REVISED RECORDS (FISCAL YEARS).--WSP 835: 1930(M). WSP 1569: Drainage area. WSP 1639: 1927-29(M), 1931(M), 1932, 1933-34(M). WSP 1719: 1935(M), 1937-40(M), 1942(M), 1948-59(P).

GAGE.--Water-stage recorder and V-notch weir. Datum of gage is 344.78 ft (105.089 m) above mean sea level (Honolulu Board of Water Supply bench mark).

REMARKS.--Records poor. No diversion above station.

AVERAGE DISCHARGE.--51 years, 1.95 ft³/s (0.055 m³/s), 1,410 acre-ft/yr (1.74 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,600 ft³/s (73.6 m³/s) Apr. 11, 1930, gage height, 7.75 ft (2.362 m), from rating curve extended above 71 ft³/s (2.01 m³/s) by test of model of station site; minimum, 0.08 ft³/s (0.002 m³/s) Oct. 31, 1929.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 140 ft³/s (3.96 m³/s) and maximum (*):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Apr. 19	a1400	*690	19.5	5.32	1.622
May 12	1815	435	12.3	4.65	1.417
June 8	1730	255	7.22	3.94	1.201

Minimum discharge, 0.20 ft³/s (0.006 m³/s) Feb. 10, 11.

a About.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.48	.45	.50	.29	.24	.60	.96	1.4	.79	.62	.50	.36
2	.48	.45	.45	.29	.26	.65	.80	1.4	.76	.54	.50	.36
3	.50	.45	.45	.29	.23	.60	1.9	2.3	.88	.54	.50	.36
4	.50	.44	.45	.28	.23	.55	3.5	3.1	.70	.54	.50	.36
5	.51	.44	.43	.28	.23	.60	6.5	1.7	.90	.54	.55	.36
6	2.1	.45	.40	.26	.23	.71	4.5	5.9	1.6	.54	.55	.36
7	1.4	.45	.41	.26	.23	.55	3.5	2.8	1.1	.54	.50	.36
8	.55	.44	.39	.26	.23	.55	2.9	3.3	26	.54	.50	.40
9	.55	.41	.36	.26	.23	.50	2.4	8.6	8.9	.54	.50	.77
10	.55	.40	.36	.26	.23	.50	2.1	5.9	3.0	.60	.45	.45
11	.55	.54	.36	.26	.23	.50	4.1	4.1	1.5	.90	.55	.40
12	.71	.46	.37	.26	.23	.70	2.1	41	.95	4.5	2.6	.40
13	.62	.42	.35	.26	.23	.84	2.0	16	.80	.95	.60	.40
14	.66	.40	.32	.26	.23	.79	1.9	7.7	1.2	.71	.55	.40
15	9.4	.40	.32	.26	1.3	.71	1.9	3.5	.77	.61	.45	.40
16	1.7	4.9	.32	.26	1.6	.64	1.8	2.0	1.0	.80	.50	.40
17	.71	.48	.32	.26	.43	.60	1.8	1.6	1.3	.90	.50	.45
18	.71	.44	.32	.26	.38	.57	3.2	1.3	1.0	.92	.55	.40
19	.71	5.6	.32	.26	.36	.72	29	1.2	.85	.70	.71	.40
20	.73	3.0	.32	.26	.36	1.1	20	1.1	.70	.77	.83	.40
21	.71	.77	.36	.26	.34	.99	3.1	1.3	.55	.77	.55	.40
22	.70	.55	.32	.26	.32	.90	2.0	1.5	.55	.71	.55	.36
23	.67	.60	.29	.26	6.0	.68	1.4	1.3	.54	.71	.50	.36
24	.63	.60	.36	.27	2.8	.60	1.5	1.0	.53	.65	.50	.36
25	.60	.65	.36	.29	.86	.58	2.0	.90	.52	.65	.50	.36
26	.57	.55	.40	.30	.55	.55	1.6	.81	.84	.60	.45	.36
27	.55	.55	.40	.28	.60	.52	1.5	.89	.64	.60	.45	.36
28	.53	.55	.40	.26	.60	2.1	1.5	1.0	.50	.65	.45	.36
29	.50	.55	.39	.25	---	1.8	2.4	.87	.56	.55	.40	.36
30	.50	.50	.29	.23	---	2.7	1.7	.85	.84	.55	.40	.36
31	.48	---	.29	.23	---	2.0	---	.81	---	.55	.40	---
TOTAL	30.56	26.89	11.38	8.22	19.76	26.40	115.56	127.13	60.77	24.29	18.04	11.83
MEAN	.99	.90	.37	.27	.71	.85	3.85	4.10	2.03	.78	.58	.39
MAX	9.4	5.6	.50	.30	6.0	2.7	29	41	26	4.5	2.6	.77
MIN	.48	.40	.29	.23	.23	.50	.80	.81	.50	.54	.40	.36
AC-FT	61	53	23	16	39	52	229	252	121	48	36	23

CAL YR 1976 TOTAL 409.96 MEAN 1.12 MAX 19 MIN .26 AC-FT 813
WTR YR 1977 TOTAL 480.83 MEAN 1.32 MAX 41 MIN .23 AC-FT 954

NOTE.--No gage-height record Mar. 11 to Apr. 21.

HAWAII, ISLAND OF OAHU

16244000 PUKELE STREAM NEAR HONOLULU--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1974, 1976-77.

REMARKS.--Miscellaneous chemical analyses published for this station for 1970, 1973 water years.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	COLOR (PLATINUM-COBALT UNITS)	TURBIDITY (JTU)	HARDNESS (CA,MG) (MG/L)	NONCARBONATE HARDNESS (MG/L)	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG) (MG/L)	DISSOLVED SODIUM (NA) (MG/L)	PERCENT SODIUM
MAR 10...	1400	.42	2	1	63	8	9.2	9.6	18	38
APR 21...	1600	3.0	3	3	56	17	9.1	8.0	16	38

DATE	SODIUM ADSORPTION RATIO	DISSOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	ALKALINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)	DISSOLVED FLUORIDE (F) (MG/L)
MAR 10...	1.0	1.1	66	0	54	67	9.7	26	.1
APR 21...	.9	1.4	47	0	39	19	6.9	27	.0

DATE	DISSOLVED SILICA (SIO2) (MG/L)	DISSOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	DISSOLVED SOLIDS (TONS PER AC-FT)	DISSOLVED SOLIDS (TONS PER DAY)	DISSOLVED NITRITE PLUS NITRATE (N) (MG/L)	DISSOLVED ORTHO. PHOSPHORUS (P) (MG/L)	DISSOLVED ORTHO PHOSPHATE (PO4) (MG/L)	DISSOLVED IRON (FE) (UG/L)	DISSOLVED MANGANESE (MN) (UG/L)
MAR 10...	24	142	.19	.16	2.6	.08	.25	10	10
APR 21...	20	116	.16	.94	.93	.01	.03	30	0

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)
OCT 19...	1400	.65	200	6.6	22.5
DEC 03...	1500	.45	240	6.4	22.0
JAN 18...	1410	.24	220	6.0	22.0
MAR 10...	1400	.42	225	6.2	22.0
APR 21...	1600	3.0	200	6.6	22.0
JUN 07...	1450	1.1	220	6.5	22.5
JUL 19...	1440	.70	230	6.5	22.5
AUG 30...	1340	.38	235	6.8	22.5

16247000 PALOLO STREAM NEAR HONOLULU

LOCATION.--Lat 21°17'35", long 157°48'25", Hydrologic Unit 20060000, on left bank 250 ft (76 m) downstream from bridge on Palolo Avenue and 3.9 mi (6.3 km) east of Honolulu Post Office.

DRAINAGE AREA.--3.63 mi^2 (9.40 km^2).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--April 1952 to current year.

REVISED RECORDS (FISCAL YEARS).--WSP 1569: Drainage area. WSP 1937: 1953, 1955-60.

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 95 ft (29 m), from topographic map.

REMARKS.--Records poor. Honolulu Board of Water Supply diverts ground water from tunnels in drainage area.

AVERAGE DISCHARGE.--25 years, 5.59 ft^3/s (0.158 m^3/s), 4,050 acre-ft/yr (4.99 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,270 ft^3/s (121 m^3/s) Dec. 18, 1967, gage height, 5.98 ft (1.823 m), from rating curve extended above 140 ft^3/s (3.96 m^3/s) on basis of slope-conveyance study and slope-area measurements at gage heights 3.92 ft (1.195 m) and 4.13 ft (1.259 m); minimum, 0.02 ft^3/s (0.001 m^3/s) June 25, 1958.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 500 ft^3/s (14.2 m^3/s) and maximum (*):

Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)
Apr. 19	1430	1070	30.3	3.52	1.073
May 12	1915	*1730	49.0	4.16	1.268
June 8	1745	742	21.0	3.12	.951

Minimum discharge, 0.31 ft^3/s (0.009 m^3/s) on Jan. 17 and Feb. 8.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.1	1.0	1.1	.48	1.1	1.2	2.4	2.6	2.3	1.1	.93	.75
2	1.0	1.0	1.0	.82	.70	2.0	1.6	2.1	2.3	1.0	1.0	1.0
3	1.2	1.3	.94	.48	.65	1.2	12	6.4	2.3	1.0	.93	2.0
4	1.5	1.1	.81	.45	.65	1.1	22	10	1.6	1.0	.93	.95
5	1.9	2.5	.77	.49	.53	1.7	30	4.0	2.9	1.0	2.7	.69
6	12	1.2	1.3	.52	.45	2.7	13	14	5.0	.94	2.0	.96
7	5.2	1.1	.72	.48	.41	1.4	7.9	3.8	2.1	.95	1.9	.69
8	1.8	1.1	.78	.47	.39	1.2	5.9	7.2	84	1.1	1.6	.83
9	1.4	1.1	.72	1.1	.39	1.2	5.1	19	26	.97	1.2	6.2
10	1.2	1.1	.69	.50	.40	1.0	5.0	15	12	1.1	1.2	2.4
11	1.2	1.3	.65	.45	.42	1.3	15	14	9.1	1.6	1.0	.78
12	3.4	1.4	.64	.42	.38	1.4	7.2	180	5.1	12	8.7	.67
13	2.6	1.2	.72	.45	.36	1.7	5.6	64	1.8	2.9	2.3	.64
14	3.3	1.3	1.1	.55	.39	1.3	5.1	30	3.2	1.3	1.4	.61
15	25	1.3	.70	.40	15	1.3	4.9	11	2.4	1.3	1.2	.56
16	3.2	26	1.5	.41	11	1.2	4.6	5.0	2.1	1.4	1.1	.57
17	1.9	1.8	.61	.46	1.4	1.0	4.2	3.6	2.5	1.6	1.0	.96
18	1.6	1.2	.68	.46	.95	1.0	8.2	3.2	1.9	1.6	.93	.70
19	1.5	29	.61	.43	.75	1.2	154	2.7	1.7	1.3	.85	.58
20	1.4	13	.65	1.9	.69	2.7	50	2.3	1.5	1.3	.70	.56
21	1.6	2.7	.58	.45	.57	2.0	7.2	3.6	1.3	1.3	.70	.54
22	1.6	1.3	.59	.40	.55	2.3	2.7	3.6	1.3	1.3	.77	.55
23	1.2	1.2	.62	.41	45	1.4	1.7	3.6	1.3	1.2	.77	.79
24	1.2	1.3	.48	.41	12	1.2	2.0	1.9	1.2	1.1	.70	.92
25	1.1	2.3	.54	1.0	3.9	1.2	11	1.6	1.2	1.1	.93	.61
26	1.1	1.1	.50	.60	2.0	1.1	4.3	1.4	1.9	1.1	1.0	.56
27	1.4	1.1	.49	1.7	1.4	1.0	3.4	1.7	1.4	1.1	.85	.68
28	1.3	1.1	.43	.51	1.4	8.5	3.7	2.3	.99	2.3	.77	.56
29	1.3	1.1	.45	.46	---	5.5	14	1.4	1.6	1.2	.77	.54
30	1.3	1.3	.49	.55	---	11	4.6	1.4	2.2	1.2	2.2	.51
31	1.0	---	.44	.75	---	8.2	---	1.4	---	1.0	1.0	---
TOTAL	87.5	104.5	22.30	18.96	103.83	72.2	418.3	423.8	186.19	50.36	44.03	29.36
MEAN	2.82	3.48	.72	.61	3.71	2.33	13.9	13.7	6.21	1.62	1.42	.98
MAX	25	29	1.5	1.9	45	11	154	180	84	12	8.7	6.2
MIN	1.0	1.0	.43	.40	.36	1.0	1.6	1.4	.99	.94	.70	.51
AC-FT	174	207	44	38	206	143	830	841	369	100	87	58

CAL YR 1976 TOTAL 1207.94 MEAN 3.30 MAX 72 MIN .43 AC-FT 2400
WTR YR 1977 TOTAL 1561.33 MEAN 4.28 MAX 180 MIN .36 AC-FT 3100

HAWAII, ISLAND OF OAHU

16247000 PALOLO STREAM NEAR HONOLULU--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1971-77.

REMARKS.--Miscellaneous chemical analyses published for this station for 1970 water year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	COLOR (PLATINUM-COBALT UNITS)	TURBIDITY (JTU)	HARDNESS (CA,MG) (MG/L)	NON-CARBONATE HARDNESS (MG/L)	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG) (MG/L)	DISSOLVED SODIUM (NA) (MG/L)	PERCENT SODIUM
MAR 10...	1000	1.0	12	1	84	16	14	12	27	41
APR 21...	1030	7.2	13	4	66	21	12	8.7	20	39

DATE	SODIUM ADSORPTION RATIO	DISSOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	ALKALINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)	DISSOLVED FLUORIDE (F) (MG/L)
MAR 10...	1.3	.9	22	30	68	.1	15	45	.1
APR 21...	1.1	1.4	55	0	45	.6	11	34	.0

DATE	DISSOLVED SILICA (SIO2) (MG/L)	DISSOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	DISSOLVED SOLIDS (TONS PER AC-FT)	DISSOLVED SOLIDS (TONS PER DAY)	DISSOLVED NITRITE PLUS NITRATE (N) (MG/L)	DISSOLVED ORTHO. PHOSPHORUS (P) (MG/L)	DISSOLVED ORTHO PHOSPHATE (PO4) (MG/L)	DISSOLVED IRON (FE) (UG/L)	DISSOLVED MANGANESE (MN) (UG/L)
MAR 10...	19	176	.24	.48	.46	.04	.12	30	0
APR 21...	19	136	.18	2.64	.68	.04	.12	80	50

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)
OCT 19...	0950	1.4	260	8.8	22.5
DEC 03...	1020	.95	270	9.1	21.0
JAN 18...	1115	.51	900	9.0	27.0
MAR 10...	1000	1.0	300	9.0	23.5
APR 21...	1030	7.2	240	8.2	23.5
JUN 07...	1000	2.4	230	9.0	26.0
JUL 19...	0925	1.5	400	8.9	24.0
AUG 30...	0950	.96	280	9.4	26.0

16254000 MAKAWAO STREAM NEAR KAILUA

LOCATION.--Lat 21°21'49", long 157°46'02", Hydrologic Unit 20060000, on left bank 650 ft (198 m) upstream from mouth, 2.7 mi (4.3 km) southwest of Kailua, and 4.3 mi (6.9 km) southeast of Kaneohe Courthouse.

DRAINAGE AREA.--2.04 mi^2 (5.28 km^2).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--November 1912 to June 1916, January 1958 to current year.

REVISED RECORDS.--WSP 1937: Drainage area.

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 80 ft (24 m), from topographic map. Prior to Jan. 1, 1958, nonrecording gage at sites about 200 ft (61 m) upstream at different datums.

REMARKS.--Records fair. Maunawili ditch diverts 1.5 mi (2.4 km) above station for irrigation in vicinity of Waimanalo.

AVERAGE DISCHARGE.--21 years (water years, 1914-15, 1959-77), 4.99 ft^3/s (0.141 m^3/s), 3,620 acre-ft/yr (4.46 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,000 ft^3/s (170 m^3/s) Feb. 4, 1965, gage height, 12.41 ft (3.783 m), from rating curve extended above 470 ft^3/s (13.3 m^3/s) on basis of slope-area measurement of peak flow; minimum, 0.43 ft^3/s (0.012 m^3/s) Sept. 8-12, 14, 16-20, 22, 23, 1964.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 2,060 ft^3/s (58.3 m^3/s) May 12, gage height, 8.68 ft (2.646 m), no other peak above base of 390 ft^3/s (11.0 m^3/s); minimum, 0.97 ft^3/s (0.027 m^3/s) Jan. 24, Feb. 14, 20.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.8	1.6	1.4	1.3	1.3	1.1	2.5	2.4	3.4	2.2	1.6	1.4
2	1.7	1.7	1.4	1.3	1.2	1.1	1.6	2.6	3.2	2.1	1.6	1.5
3	1.7	1.6	1.3	1.3	1.2	1.1	18	2.6	3.1	2.1	1.6	1.5
4	1.8	1.5	1.4	1.3	1.2	1.2	28	2.5	3.0	2.1	1.6	1.4
5	3.5	1.5	1.4	1.4	1.2	1.2	14	2.5	3.3	2.1	2.0	1.4
6	2.9	1.5	1.4	1.4	1.1	1.3	7.2	3.2	3.6	2.1	1.7	1.4
7	3.3	1.5	1.4	1.5	1.2	1.2	5.3	2.5	3.6	2.0	1.7	1.3
8	2.2	1.5	1.4	1.5	1.5	1.3	4.1	3.6	5.0	2.0	1.6	1.4
9	2.1	1.5	1.4	1.5	1.4	1.1	4.3	3.3	3.4	1.9	1.6	1.6
10	2.1	1.5	1.4	1.5	1.4	1.3	3.3	3.7	3.0	2.0	1.5	1.4
11	2.0	1.7	1.3	1.4	1.4	1.4	3.1	5.2	2.9	2.1	1.5	1.4
12	3.0	1.4	1.3	1.3	1.1	1.5	3.0	156	2.8	2.2	2.1	1.3
13	2.3	1.3	1.5	1.3	1.1	1.2	2.8	32	2.9	2.0	1.7	1.3
14	2.3	1.5	1.4	1.2	1.1	1.1	2.7	17	2.8	2.0	1.6	1.3
15	4.3	1.4	1.3	1.1	1.2	1.1	2.6	11	2.7	1.9	1.6	1.3
16	3.6	2.1	1.3	1.1	1.2	1.0	2.5	9.0	2.6	1.9	1.5	1.3
17	2.6	1.4	1.4	1.1	1.1	1.2	2.5	7.9	2.6	1.9	1.5	1.4
18	2.4	1.4	1.3	1.1	1.1	1.1	2.8	7.1	2.7	1.9	1.5	1.4
19	2.0	2.0	1.3	1.1	1.1	1.1	20	6.6	2.7	1.8	1.5	1.2
20	1.7	1.7	1.3	1.1	1.1	1.2	5.9	5.2	3.3	1.8	1.5	1.2
21	1.7	1.6	1.3	1.1	1.1	1.2	3.9	5.1	2.6	1.8	1.5	1.2
22	1.7	1.5	1.3	1.1	1.1	1.2	3.3	4.7	2.6	1.8	1.4	1.2
23	1.7	1.4	1.2	1.1	1.8	1.2	3.2	4.4	2.6	1.7	1.4	1.2
24	1.6	1.5	1.2	1.1	1.3	1.1	3.3	5.1	2.4	1.7	1.4	1.2
25	1.6	1.5	1.2	1.5	1.2	1.1	3.5	5.2	2.4	1.7	1.5	1.2
26	1.6	1.4	1.2	1.1	1.2	1.1	2.9	5.4	2.4	1.7	1.5	1.3
27	1.7	1.4	1.2	1.4	1.1	1.1	3.3	5.6	2.3	1.7	1.4	1.3
28	1.7	1.4	1.2	1.2	1.2	1.6	4.6	5.1	2.3	1.8	1.5	1.3
29	1.6	1.6	1.2	1.1	---	2.2	3.5	3.7	2.2	1.7	1.4	1.2
30	1.6	1.5	1.2	1.2	---	3.4	2.5	3.5	2.2	1.7	1.7	1.2
31	1.5	---	1.3	1.1	---	6.7	---	3.3	---	1.6	1.5	---
TOTAL	67.3	46.1	40.8	38.8	34.2	45.7	170.2	337.0	86.6	59.0	48.7	39.7
MEAN	2.17	1.54	1.32	1.25	1.22	1.47	5.67	10.9	2.89	1.90	1.57	1.32
MAX	4.3	2.1	1.5	1.5	1.8	6.7	28	156	5.0	2.2	2.1	1.6
MIN	1.5	1.3	1.2	1.1	1.1	1.0	1.6	2.4	2.2	1.6	1.4	1.2
AC-FT	133	91	81	77	68	91	338	668	172	117	97	79

CAL YR 1976 TOTAL 885.4 MEAN 2.42 MAX 28 MIN 1.2 AC-FT 1760
WTR YR 1977 TOTAL 1014.1 MEAN 2.78 MAX 156 MIN 1.0 AC-FT 2010

HAWAII, ISLAND OF OAHU

16254000 MAKAWAO STREAM NEAR KAILUA--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1974, 1976-77.

REMARKS.--Miscellaneous chemical analyses published for this station for 1968, 1970, 1972 water years.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTAN-TANEOUS DIS-CHARGE (CFS)	COLOR (PLAT-INUM-COBALT UNITS)	TUR-BID-ITY (JTU)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	DIS-SOLVED SODIUM (NA) (MG/L)	PERCENT SODIUM
FEB 14...	1330	1.1	6	3	59	0	10	8.3	16	37
MAY 11...	1000	4.0	40	10	62	1	11	8.5	16	35

DATE	SODIUM AD-SORP-TION RATIO	DIS-SOLVED PO-TAS-SIUM (K) (MG/L)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DIS-SOLVED SULFATE (SO4) (MG/L)	DIS-SOLVED CHLO-RIDE (CL) (MG/L)	DIS-SOLVED FLUO-RIDE (F) (MG/L)
FEB 14...	.9	.6	75	0	62	19	2.9	21	.0
MAY 11...	.9	1.1	75	0	62	3.8	5.4	19	.0

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTI-TUENTS) (MG/L)	DIS-SOLVED SOLIDS (TONS PER AC-FT)	DIS-SOLVED SOLIDS (TONS PER DAY)	DIS-SOLVED NITRITE PLUS NITRATE (N) (MG/L)	DIS-SOLVED ORTHO. PHOS-PHORUS (P) (MG/L)	DIS-SOLVED ORTHO PHOS-PHATE (PO4) (MG/L)	DIS-SOLVED IRON (FE) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)
FEB 14...	30	126	.17	.37	.02	.04	.12	180	10
MAY 11...	28	126	.17	1.36	.05	.00	.00	240	0

DATE	TIME	INSTAN-TANEOUS DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)
NOV 11...	1340	1.5	220	6.8	21.0
DEC 23...	1130	1.4	220	7.4	20.5
FEB 14...	1320	1.1	210	6.9	21.0
14...	1330	1.1	210	6.8	21.0
MAR 28...	1450	1.4	220	7.2	21.5
MAY 11...	1000	4.0	210	7.5	21.5
JUN 30...	1410	2.2	210	6.2	22.5
AUG 10...	1405	1.3	200	6.8	23.0
SEP 19...	1325	1.2	220	6.6	23.5

16272200 KAMOOALII STREAM BELOW LULUKU STREAM NEAR KANEOHE

LOCATION.--Lat 21°23'47", long 157°48'23", Hydrologic Unit 20060000, on left bank 300 ft (91 m) downstream from Luluku Stream, 1.0 mi (1.6 km) southwest of Castle High School and 1.9 mi (3.1 km) northwest of the intersection of State Highways 61 and 83.

DRAINAGE AREA.--3.81 mi² (9.87 km²).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--November 1976 to September 1977.

GAGE.--Water-stage recorder and concrete control.

REMARKS.--Records fair.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 968 ft³/s (27.4 m³/s) May 12, gage height, 4.68 ft (1.426 m), no other peak above base of 700 ft³/s (19.8 m³/s); minimum, 3.4 ft³/s (0.096 m³/s) Feb. 10, 11.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1		4.8	5.0	4.1	4.4	5.0	7.7	6.4	8.1	7.0	6.1	5.3
2		5.5	5.0	4.1	4.1	5.6	7.0	6.4	8.1	6.7	6.1	5.6
3		5.3	5.0	4.1	4.1	5.0	80	6.4	7.7	6.4	5.8	5.6
4		5.2	5.0	4.1	4.1	4.7	46	6.4	7.4	6.7	5.8	5.6
5		4.8	5.0	4.1	3.8	4.7	18	6.4	11	6.4	7.0	5.3
6		5.1	5.3	4.1	3.8	5.3	11	9.2	11	6.1	6.1	5.3
7		5.3	5.8	4.4	3.8	4.8	9.2	7.0	8.9	6.4	5.8	5.0
8		5.2	5.3	4.1	3.8	4.7	8.1	7.0	61	6.2	5.8	5.3
9		5.2	5.0	4.1	3.8	4.7	7.4	14	15	6.4	5.6	5.8
10		5.0	5.0	4.1	3.4	4.5	7.0	11	11	8.0	5.8	5.3
11		5.0	5.0	4.1	3.4	4.1	7.6	11	9.2	7.7	5.6	5.0
12		5.0	5.0	4.1	3.6	5.0	6.7	105	8.9	7.7	8.5	4.7
13		5.0	5.6	4.4	3.6	4.4	6.4	21	8.8	7.0	6.7	5.0
14		5.6	5.0	4.1	3.8	4.4	6.4	23	9.2	7.0	6.1	5.0
15		5.3	5.0	4.1	5.8	4.4	6.4	13	8.8	6.7	6.1	5.0
16		8.5	4.7	4.1	5.6	4.1	6.4	11	8.5	7.0	6.1	5.0
17		5.6	5.0	3.8	4.7	4.4	6.4	11	8.5	7.4	6.4	5.0
18		5.3	4.7	3.8	4.1	4.1	7.7	10	8.5	7.4	6.4	5.0
19		6.1	4.7	3.8	4.1	4.7	16	10	8.5	6.7	6.1	4.7
20		5.8	4.7	3.8	4.1	4.4	10	10	8.5	6.7	5.8	4.7
21		5.6	4.4	3.8	4.4	4.1	7.7	10	8.5	6.7	6.1	4.5
22		5.3	4.4	3.8	4.7	4.1	7.0	9.6	8.1	6.4	5.6	4.7
23		5.3	4.4	3.8	5.6	4.1	7.0	10	8.1	6.4	5.3	4.8
24		5.3	4.1	3.8	5.6	4.1	8.4	8.9	7.7	6.1	5.3	4.9
25		5.6	4.1	5.0	5.3	4.1	8.5	8.9	7.7	6.1	5.3	4.7
26		5.3	4.1	3.8	5.0	3.8	7.0	8.5	7.7	6.1	5.3	4.9
27		5.0	3.8	4.1	5.0	3.8	6.7	8.5	7.7	6.1	5.0	4.9
28		5.0	3.8	4.1	5.0	7.9	7.0	9.2	8.4	6.7	5.0	4.8
29		5.3	4.1	3.8	---	7.4	7.4	8.5	7.0	6.4	5.3	4.8
30		5.0	4.1	4.1	---	7.4	6.7	8.5	7.0	6.4	5.6	4.7
31		---	4.1	4.1	---	14	---	8.5	---	5.8	5.3	---
TOTAL		161.3	146.2	125.6	122.5	157.8	354.8	404.3	314.5	206.8	182.8	150.9
MEAN		5.38	4.72	4.05	4.38	5.09	11.8	13.0	10.5	6.67	5.90	5.03
MAX		8.5	5.8	5.0	5.8	14	80	105	61	8.0	8.5	5.8
MIN		4.8	3.8	3.8	3.4	3.8	6.4	6.4	7.0	5.8	5.0	4.5
AC-FT		320	290	249	243	313	704	802	624	410	363	299

HAWAII, ISLAND OF OAHU

16272200 KAMOOALII STREAM BELOW LULUKU STREAM NEAR KANEOHE--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--November 1976 to current year.

PERIOD OF DAILY RECORD.--
SUSPENDED SEDIMENT DISCHARGE: November 1976 to current year.

INSTRUMENTATION.--Automatic pumping sediment sampler since November 1976.

REMARKS.--In addition to the sediment sampler record, water-quality samples were collected during the year.

EXTREMES FOR CURRENT YEAR.--
SEDIMENT CONCENTRATIONS: Maximum daily mean, 726 mg/L June 8; minimum daily mean, 3 mg/L Apr. 14-17.
SEDIMENT DISCHARGE: Maximum daily, 694 tons (630 tonnes) May 12; minimum daily, 0.05 ton (0.04 tonne) Apr. 14-17.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	COLOR (PLATINUM-COBALT UNITS)	TURBIDITY (JTU)	HARDNESS (CA,MG) (MG/L)	NONCARBONATE HARDNESS (MG/L)	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG) (MG/L)	DISSOLVED SODIUM (NA) (MG/L)	PERCENT SODIUM
FEB										
10...	1415	3.3	6	6	53	0	7.9	8.3	15	38

DATE	SODIUM ADSORPTION RATIO	DISSOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	ALKALINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)	DISSOLVED FLUORIDE (F) (MG/L)
FEB									
10...	.9	.7	65	0	53	4.1	2.3	18	.0

DATE	DISSOLVED SILICA (SIO2) (MG/L)	DISSOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	DISSOLVED SOLIDS (TONS PER AC-FT)	DISSOLVED SOLIDS (TONS PER DAY)	DISSOLVED NITRITE PLUS NITRATE (N) (MG/L)	DISSOLVED ORTHO. PHOSPHORUS (P) (MG/L)	DISSOLVED ORTHO PHOSPHATE (PO4) (MG/L)	DISSOLVED IRON (FE) (UG/L)	DISSOLVED MANGANESE (MN) (UG/L)
FEB									
10...	23	110	.15	.98	.54	.04	.12	80	0

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)
JAN					
17...	1550	4.0	190	7.6	23.0
FEB					
10...	1410	3.3	190	7.4	22.5
10...	1415	3.3	190	7.4	22.5
MAR					
21...	1640	3.8	190	7.6	22.5
APR					
05...	1030	17	180	7.1	21.0
MAY					
04...	1630	6.2	180	7.6	23.0
SEP					
21...	1450	4.3	180	6.7	25.5

16272200 KAMOOALII STREAM BELOW LULUKU STREAM NEAR KANEOHE--Continued

SUSPENDED-SEDIMENT DISCHARGE (TONS/DAY), WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
		OCTOBER			NOVEMBER			DECEMBER	
1				4.8	10	0.13	5.0	20	0.27
2				5.5	10	0.15	5.0	15	0.20
3				5.3	10	0.14	5.0	15	0.20
4				5.2	10	0.14	5.0	15	0.20
5				4.8	10	0.13	5.0	15	0.20
6				5.1	10	0.14	5.3	20	0.29
7				5.3	10	0.14	5.8	30	0.47
8				5.2	10	0.14	5.3	15	0.21
9				5.2	10	0.14	5.0	15	0.20
10				5.0	10	0.14	5.0	15	0.20
11				5.0	10	0.14	5.0	20	0.27
12				5.0	12	0.16	5.0	20	0.27
13				5.0	12	0.16	5.6	20	0.30
14				5.6	15	0.23	5.0	20	0.27
15				5.3	30	0.43	5.0	25	0.34
16				8.5	50	1.1	4.7	30	0.38
17				5.6	30	0.45	5.0	25	0.34
18				5.3	30	0.43	4.7	20	0.25
19				6.1	30	0.49	4.7	15	0.19
20				5.8	30	0.47	4.7	15	0.19
21				5.6	30	0.45	4.4	10	0.12
22				5.3	30	0.43	4.4	10	0.12
23				5.3	20	0.29	4.4	10	0.12
24				5.3	20	0.29	4.1	10	0.11
25				5.6	20	0.30	4.1	10	0.11
26				5.3	15	0.21	4.1	10	0.11
27				5.0	15	0.20	3.8	10	0.10
28				5.0	15	0.20	3.8	10	0.10
29				5.3	20	0.29	4.1	10	0.11
30				5.0	20	0.27	4.1	10	0.11
31				---	---	---	4.1	10	0.11
TOTAL				161.3	---	8.38	146.2	---	6.46

DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
		JANUARY			FEBRUARY			MARCH	
1	4.1	10	0.11	4.4	10	0.12	5.0	8	0.11
2	4.1	10	0.11	4.1	10	0.11	5.6	10	0.15
3	4.1	10	0.11	4.1	10	0.11	5.0	5	0.07
4	4.1	10	0.11	4.1	10	0.11	4.7	5	0.06
5	4.1	5	0.06	3.8	10	0.10	4.7	5	0.06
6	4.1	5	0.06	3.8	8	0.08	5.3	5	0.07
7	4.4	5	0.06	3.8	8	0.08	4.8	8	0.10
8	4.1	5	0.06	3.8	8	0.08	4.7	8	0.10
9	4.1	5	0.06	3.8	8	0.08	4.7	8	0.10
10	4.1	5	0.06	3.4	8	0.07	4.5	8	0.10
11	4.1	5	0.06	3.4	8	0.07	4.1	8	0.09
12	4.1	8	0.09	3.6	8	0.08	5.0	8	0.11
13	4.4	8	0.10	3.6	8	0.08	4.4	8	0.10
14	4.1	8	0.09	3.8	8	0.08	4.4	8	0.10
15	4.1	8	0.09	5.8	15	0.23	4.4	8	0.10
16	4.1	10	0.11	5.6	10	0.15	4.1	5	0.06
17	3.8	10	0.10	4.7	10	0.13	4.4	5	0.06
18	3.8	8	0.08	4.1	8	0.09	4.1	5	0.06
19	3.8	8	0.08	4.1	8	0.09	4.7	5	0.06
20	3.8	8	0.08	4.1	5	0.06	4.4	5	0.06
21	3.8	8	0.08	4.4	5	0.06	4.1	5	0.06
22	3.8	8	0.08	4.7	5	0.06	4.1	5	0.06
23	3.8	8	0.08	5.6	10	0.15	4.1	5	0.06
24	3.8	8	0.08	5.6	10	0.15	4.1	5	0.06
25	5.0	15	0.20	5.3	10	0.14	4.1	5	0.06
26	3.8	8	0.08	5.0	8	0.11	3.8	8	0.08
27	4.1	8	0.09	5.0	5	0.07	3.8	8	0.08
28	4.1	8	0.09	5.0	8	0.11	7.9	15	0.32
29	3.8	8	0.08	---	---	---	7.4	20	0.40
30	4.1	8	0.09	---	---	---	7.4	25	0.50
31	4.1	10	0.11	---	---	---	14	64	2.7
TOTAL	125.6	---	2.74	122.5	---	2.85	157.8	---	6.10

16272200 KAMOOALII STREAM BELOW LULUKU STREAM NEAR KANEOHE--Continued

SUSPENDED-SEDIMENT DISCHARGE (TONS/DAY), WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
		APRIL			MAY			JUNE	
1	7.7	25	0.52	6.4	10	0.17	8.1	10	0.22
2	7.0	20	0.38	6.4	10	0.17	8.1	10	0.22
3	80	218	115	6.4	8	0.14	7.7	10	0.21
4	46	83	20	6.4	8	0.14	7.4	10	0.20
5	18	15	0.73	6.4	8	0.14	11	20	0.59
6	11	8	0.24	9.2	30	0.75	11	20	0.59
7	9.2	8	0.20	7.0	15	0.28	8.9	20	0.48
8	8.1	8	0.17	7.0	15	0.28	61	726	281
9	7.4	8	0.16	14	60	2.3	15	70	2.8
10	7.0	8	0.15	11	30	0.89	11	45	1.3
11	7.6	8	0.16	11	60	1.8	9.2	30	0.75
12	6.7	5	0.09	105	628	694	8.9	25	0.60
13	6.4	5	0.09	21	45	2.6	8.8	20	0.48
14	6.4	3	0.05	23	80	5.0	9.2	20	0.50
15	6.4	3	0.05	13	15	0.53	8.8	20	0.48
16	6.4	3	0.05	11	10	0.30	8.5	18	0.41
17	6.4	3	0.05	11	10	0.30	8.5	18	0.41
18	7.7	12	0.25	10	10	0.27	8.5	15	0.34
19	16	218	19	10	10	0.27	8.5	12	0.28
20	10	50	1.4	10	12	0.32	8.5	10	0.23
21	7.7	15	0.31	10	12	0.32	8.5	10	0.23
22	7.0	10	0.19	9.6	10	0.26	8.1	10	0.22
23	7.0	10	0.19	10	15	0.41	8.1	10	0.22
24	8.4	30	0.68	8.9	15	0.36	7.7	10	0.21
25	8.5	20	0.46	8.9	15	0.36	7.7	12	0.25
26	7.0	12	0.23	8.5	15	0.34	7.7	12	0.25
27	6.7	12	0.22	8.5	15	0.34	7.7	12	0.25
28	7.0	12	0.23	9.2	15	0.37	8.4	20	0.45
29	7.4	12	0.24	8.5	10	0.23	7.0	12	0.23
30	6.7	10	0.18	8.5	10	0.23	7.0	12	0.23
31	---	---	---	8.5	10	0.23	---	---	---
TOTAL	354.8	---	161.67	404.3	---	714.10	314.5	---	294.63

DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
		JULY			AUGUST			SEPTEMBER	
1	7.0	15	0.28	6.1	10	0.16	5.3	15	0.21
2	6.7	15	0.27	6.1	10	0.16	5.6	15	0.23
3	6.4	15	0.26	5.8	10	0.16	5.6	15	0.23
4	6.7	20	0.36	5.8	10	0.16	5.6	15	0.23
5	6.4	20	0.35	7.0	20	0.38	5.3	15	0.21
6	6.1	20	0.33	6.1	15	0.25	5.3	15	0.21
7	6.4	20	0.35	5.8	20	0.31	5.0	10	0.14
8	6.2	20	0.33	5.8	15	0.23	5.3	10	0.14
9	6.4	20	0.35	5.6	15	0.23	5.8	15	0.23
10	8.0	25	0.54	5.8	15	0.23	5.3	15	0.21
11	7.7	20	0.42	5.6	12	0.18	5.0	15	0.20
12	7.7	20	0.42	8.5	30	0.69	4.7	15	0.19
13	7.0	20	0.38	6.7	15	0.27	5.0	10	0.14
14	7.0	15	0.28	6.1	12	0.20	5.0	10	0.14
15	6.7	15	0.27	6.1	10	0.16	5.0	15	0.20
16	7.0	15	0.28	6.1	10	0.16	5.0	15	0.20
17	7.4	15	0.30	6.4	12	0.21	5.0	15	0.20
18	7.4	30	0.60	6.4	12	0.21	5.0	15	0.20
19	6.7	20	0.36	6.1	20	0.33	4.7	15	0.19
20	6.7	20	0.36	5.8	20	0.31	4.7	20	0.25
21	6.7	20	0.36	6.1	20	0.33	4.5	25	0.30
22	6.4	15	0.26	5.6	20	0.30	4.7	30	0.38
23	6.4	12	0.21	5.3	25	0.36	4.8	30	0.39
24	6.1	12	0.20	5.3	25	0.36	4.9	30	0.40
25	6.1	12	0.20	5.3	25	0.36	4.7	30	0.38
26	6.1	12	0.20	5.3	25	0.36	4.9	30	0.40
27	6.1	10	0.16	5.0	25	0.34	4.9	25	0.33
28	6.7	20	0.36	5.0	20	0.27	4.8	20	0.26
29	6.4	15	0.26	5.3	20	0.29	4.8	20	0.26
30	6.4	15	0.26	5.6	20	0.30	4.7	20	0.25
31	5.8	12	0.19	5.3	15	0.21	---	---	---
TOTAL	206.8	---	9.75	182.8	---	8.47	150.9	---	7.30
YEAR	2327.5		1222.45						

16273900 KAMOOALII STREAM AT KANEOHE

LOCATION.--Lat 21°24'51", long 157°48'13", Hydrologic Unit 20060000, on right bank 500 ft (150 m) upstream from Highway 83 and 0.2 mi (0.3 km) south of Parker School in Kaneohe.

DRAINAGE AREA.--4.38 mi^2 (11.34 km^2).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--January 1959 to October 1963, November 1965 to current year.

REVISED RECORDS.--WSP 1937: Drainage area.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 38.75 ft (11.811 m) above mean sea level (levels by city and county of Honolulu). Prior to Oct. 5, 1963, at site 50 ft (15 m) downstream at datum 0.93 ft (0.283 m) lower.

REMARKS.--Records good. Recording rain gage located at station.

AVERAGE DISCHARGE.--15 years (water years 1960-63, 1967-77), 14.4 ft^3/s (0.408 m^3/s), 10,430 acre-ft/yr (12.9 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 12,000 ft^3/s (340 m^3/s) Feb. 1, 1969, gage height, 10.16 ft (3.097 m), from rating curve extended above 380 ft^3/s (10.8 m^3/s) on basis of slope-area measurements at gage heights 5.26 ft (1.603 m), 7.14 ft (2.176 m), 7.47 ft (2.277 m), and 10.16 ft (3.097 m); minimum, 3.4 ft^3/s (0.096 m^3/s) Aug. 28, 1962.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Oct. 23, 1958, reached a stage of 8.3 ft (2.53 m), from floodmarks, former site and datum, discharge, 6,610 ft^3/s (187 m^3/s), from rating curve extended above 120 ft^3/s (3.40 m^3/s) on basis of slope-area measurement at gage height 5.69 ft (1.734 m). Discharge for peaks of Feb. 4 and May 2, 1965, 6,190 ft (175 m^3/s) and 5,400 ft^3/s (153 m^3/s), respectively; results of slope-area measurements of peak flow.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 996 ft^3/s (28.2 m^3/s) May 12, gage height, 3.82 ft (1.164 m), no other peak above base of 950 ft^3/s (26.9 m^3/s); minimum, 3.6 ft^3/s (0.102 m^3/s) Feb. 10.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.6	5.2	5.5	4.5	5.4	5.5	8.8	7.2	8.9	7.5	6.3	5.8
2	6.3	6.0	5.5	4.5	4.8	6.0	7.5	6.9	9.3	7.2	6.6	6.6
3	6.3	5.8	5.5	4.5	4.8	5.8	129	7.2	8.5	6.9	6.3	6.9
4	7.8	5.5	5.5	4.5	5.0	5.2	60	7.5	8.5	7.2	6.3	6.0
5	8.9	5.2	5.8	4.5	4.2	5.0	20	6.9	13	6.9	8.1	5.8
6	9.3	5.5	6.0	4.5	4.2	5.5	12	11	14	6.6	6.6	5.5
7	7.5	5.8	6.9	4.8	4.2	5.0	9.7	7.5	9.7	6.9	6.3	5.8
8	6.9	5.5	6.0	4.5	4.2	5.2	8.9	7.6	85	6.6	6.3	6.0
9	6.0	5.5	6.0	4.8	4.0	5.2	7.8	16	16	6.9	6.3	6.6
10	5.8	5.8	5.5	4.5	3.8	5.0	7.8	12	12	8.9	6.3	6.0
11	6.0	5.5	5.8	4.5	3.8	4.5	8.5	12	11	8.1	6.0	5.5
12	13	5.5	5.5	4.5	4.0	5.9	7.8	128	10	8.1	10	5.5
13	7.6	5.2	6.6	4.8	4.0	5.0	7.5	24	10	8.1	7.5	5.5
14	7.2	6.0	6.0	4.5	4.2	4.8	7.5	25	10	7.5	6.9	5.5
15	12	5.5	6.0	4.5	6.3	5.0	7.2	14	10	7.5	6.6	5.5
16	8.5	9.3	5.5	4.5	5.8	4.5	6.6	12	9.3	7.5	6.6	5.5
17	7.5	5.8	6.0	4.5	5.0	4.8	6.9	11	9.3	7.5	6.9	6.0
18	6.9	5.5	5.5	4.2	4.5	4.5	9.1	11	9.3	7.8	6.6	5.5
19	6.6	6.3	5.2	4.5	4.2	5.3	18	11	8.9	7.5	6.3	5.5
20	6.3	6.0	5.0	4.5	4.2	5.1	12	11	9.3	7.2	6.3	5.5
21	6.6	5.8	4.8	4.2	4.8	4.8	8.1	11	8.9	7.2	6.6	5.5
22	6.3	5.5	5.0	4.2	5.0	4.8	7.5	10	8.9	6.9	6.0	5.5
23	6.3	5.5	5.0	4.2	6.3	4.8	7.5	10	8.5	6.9	6.0	5.5
24	6.0	6.0	4.8	4.0	6.0	4.2	9.4	9.3	8.1	6.6	6.0	5.5
25	5.8	6.3	4.8	5.4	5.8	4.8	9.5	9.3	8.1	6.6	6.0	5.2
26	6.0	5.5	4.8	4.4	5.2	4.0	7.5	9.3	8.1	6.6	6.0	5.5
27	5.8	5.5	4.8	5.3	5.2	4.0	7.5	9.7	8.1	6.6	5.8	5.6
28	5.8	5.5	4.8	4.5	6.3	8.4	7.8	10	10	7.5	5.8	5.2
29	5.8	6.3	4.8	4.5	---	7.8	8.1	9.3	7.5	6.9	6.0	5.2
30	5.5	5.8	4.8	5.0	---	8.2	7.2	8.9	7.5	7.2	6.6	5.2
31	5.2	---	4.5	4.8	---	18	---	9.3	---	6.3	6.0	---
TOTAL	218.1	174.1	168.2	141.1	135.2	176.6	442.7	454.9	365.7	223.7	201.9	170.4
MEAN	7.04	5.80	5.43	4.55	4.83	5.70	14.8	14.7	12.2	7.22	6.51	5.68
MAX	13	9.3	6.9	5.4	6.3	18	129	128	85	8.9	10	6.9
MIN	5.2	5.2	4.5	4.0	3.8	4.0	6.6	6.9	7.5	6.3	5.8	5.2
AC-FT	433	345	334	280	268	350	878	902	725	444	400	338

CAL YR 1976 TOTAL 2798.7 MEAN 7.65 MAX 68 MIN 4.5 AC-FT 5550
WTR YR 1977 TOTAL 2872.6 MEAN 7.87 MAX 129 MIN 3.8 AC-FT 5700

16273900 KAMOOALII STREAM AT KANEOHE--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1969-77.

REMARKS.--Miscellaneous chemical analyses published for this station for 1967-68 water years.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTAN-TANEOUS DIS-CHARGE (CFS)	COLOR (PLAT-INUM-COBALT UNITS)	TUR-BID-ITY (JTU)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	DIS-SOLVED SODIUM (NA) (MG/L)	PERCENT SODIUM
FEB										
10...	1200	4.2	8	7	60	0	9.8	8.7	16	36
MAY										
11...	1400	10	8	7	57	10	11	7.2	14	34

DATE	SODIUM AD-SORP-TION RATIO	DIS-SOLVED PO-TAS-SIUM (K) (MG/L)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DIS-SOLVED SULFATE (SO4) (MG/L)	DIS-SOLVED CHLO-RIDE (CL) (MG/L)	DIS-SOLVED FLUO-RIDE (F) (MG/L)
FEB									
10...	.9	.3	73	0	60	29	1.1	19	.1
MAY									
11...	.8	1.2	57	0	47	8.6	12	17	.0

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTI-TUENTS) (MG/L)	DIS-SOLVED SOLIDS (TONS PER AC-FT)	DIS-SOLVED SOLIDS (TONS PER DAY)	DIS-SOLVED NITRITE PLUS NITRATE (N) (MG/L)	DIS-SOLVED ORTHO. PHOS-PHORUS (P) (MG/L)	DIS-SOLVED ORTHO PHOS-PHATE (PO4) (MG/L)	DIS-SOLVED IRON (FE) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)
FEB									
10...	22	116	.14	1.32	.44	.04	.12	120	0
MAY									
11...	18	110	.15	2.97	.28	.00	.00	110	0

DATE	TIME	INSTAN-TANEOUS DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)
OCT					
13...	1115	7.2	180	7.9	25.5
NOV					
22...	1030	4.9	210	7.5	22.0
DEC					
20...	1210	5.2	190	7.5	24.0
FEB					
10...	1000	4.2	205	6.6	21.5
10...	1200	4.2	205	6.6	--
MAR					
21...	1345	4.2	200	8.6	24.0
MAY					
11...	1400	10	180	7.3	24.5
JUN					
22...	1410	8.2	195	8.1	26.0
AUG					
12...	1240	8.8	170	7.0	26.0
SEP					
20...	1520	4.8	210	7.2	27.0

16273900 KAMOOALII STREAM AT KANEOHE--Continued

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SUSPENDED SEDIMENT (MG/L)	SUSPENDED SEDIMENT DISCHARGE (T/DAY)
OCT				
13...	1330	6.5	12	.21
NOV				
13...	1515	4.6	16	.20
15...	1835	4.6	23	.29
16...	1810	5.9	17	.27
18...	1830	4.9	17	.22
22...	1030	4.9	7	.09
23...	1750	4.9	15	.20
24...	1820	5.4	20	.29
26...	1825	4.9	14	.19
28...	1815	4.9	13	.17
DEC				
01...	2120	4.9	9	.12
03...	1825	4.9	35	.46
06...	1910	5.4	40	.58
07...	1820	5.9	50	.80
20...	1110	4.4	10	.12
JAN				
03...	1800	4.2	41	.46
JAN				
17...	1600	4.3	15	.17
17...	1625	4.3	26	.30
18...	1645	4.2	38	.43
FEB				
10...	1110	4.2	19	.22
MAR				
21...	1345	4.2	13	.15
APR				
13...	1500	6.8	28	.51
MAY				
04...	1700	6.2	11	.18
11...	1400	10	10	.27
JUN				
22...	1200	8.2	5	.11
AUG				
12...	1130	8.6	24	.56
SEP				
20...	1445	4.6	44	.55

16275000 HAIKU STREAM NEAR HEEIA

LOCATION.--Lat 21°24'46", long 157°49'33", Hydrologic Unit 20060000, on left bank 1.7 mi (2.7 km) west of Kaneohe Post Office and 1.8 mi (2.9 km) southwest of Heeia.

DRAINAGE AREA.--0.97 mi^2 (2.51 km^2).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--January 1914 to October 1919, July 1939 to current year.

REVISED RECORDS (FISCAL YEARS).--WSP 935: 1940. WSP 1319: 1916-19(M). WSP 1569: Drainage area. WSP 1719: 1942-43, 1946(M), 1947, 1949, 1951, 1954(M), 1955, 1957-59. WSP 1937: 1940-45(M), 1947(M), 1948-50(P), 1951, 1952(P), 1953(M), 1955-57(P), 1958-59, 1960(M).

GAGE.--Water-stage recorder. Datum of gage is 271.9 ft (82.875 m) above mean sea level (levels by city and county of Honolulu). Prior to Apr. 28, 1914, nonrecording gage and Apr. 28, 1914, to Oct. 25, 1919, water-stage recorder, at same site at different datums.

REMARKS.--Records fair. Honolulu Board of Water Supply has diverted ground water from tunnel in drainage area since 1943.

AVERAGE DISCHARGE (since diversion from tunnel began).--34 years (water years 1944-77), 2.15 ft^3/s (0.061 m^3/s), 1,560 acre-ft/yr (1.92 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,740 ft^3/s (163 m^3/s) May 2, 1965, gage height, 7.94 ft (2.420 m), from rating curve extended above 57 ft^3/s (1.61 m^3/s) on basis of slope-area measurements at gage heights 3.87 ft (1.180 m), 3.88 ft (1.183 m), and 7.94 ft (2.420 m); minimum, 0.20 ft^3/s (0.006 m^3/s) July 20, 1957, Sept. 17, 1961.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 203 ft^3/s (5.75 m^3/s) June 8, gage height, 2.77 ft (0.844 m), from rating curve extended as explained above, no peak above base of 340 ft^3/s (9.63 m^3/s); minimum, 0.76 ft^3/s (0.022 m^3/s) several days in January, February, and March.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.2	1.1	1.1	1.1	.88	.97	1.6	1.5	1.4	1.3	1.2	1.1
2	1.1	1.1	1.1	1.1	.88	.94	1.3	1.4	1.4	1.3	1.3	1.1
3	1.0	1.0	1.1	1.0	.82	.94	17	1.4	1.3	1.2	1.3	1.1
4	1.0	.98	1.1	1.0	.88	.94	19	1.5	1.3	1.2	1.2	1.1
5	1.1	.96	1.1	1.0	.82	.94	8.7	1.5	1.8	1.2	1.5	1.1
6	1.7	.96	1.1	.98	.88	.94	3.5	1.4	3.2	1.3	1.4	1.1
7	1.7	.98	1.0	.99	.88	.94	2.1	1.5	1.9	1.3	1.5	1.1
8	1.3	.97	1.0	.98	.88	.94	1.7	1.5	18	1.3	1.2	1.2
9	1.1	.97	1.0	.98	.88	.94	1.6	1.5	6.3	1.3	1.2	1.2
10	1.1	.98	1.0	.97	.82	1.0	1.5	2.4	2.6	1.5	1.1	1.2
11	1.0	1.0	.94	.97	.82	.94	1.4	1.9	1.9	1.4	1.1	1.2
12	1.9	.99	.94	.96	.82	.94	1.4	5.7	1.7	1.3	1.7	1.1
13	2.0	.98	1.0	.99	.82	.94	1.3	4.2	1.6	1.3	1.8	1.1
14	1.5	1.0	.94	.94	.82	.88	1.3	3.7	1.6	1.3	1.4	1.1
15	2.4	1.0	.94	.94	.92	.88	1.3	2.6	1.5	1.3	1.2	1.1
16	2.1	2.3	.94	1.0	.85	.88	1.3	2.0	1.5	1.3	1.1	1.1
17	1.5	1.5	.94	1.0	.82	.88	1.3	1.8	1.5	1.3	1.1	1.0
18	1.3	1.2	.94	.94	.83	.88	1.4	1.7	1.5	1.3	1.1	1.0
19	1.2	1.3	.94	.94	.82	.88	6.9	1.6	1.4	1.2	1.1	.99
20	1.2	1.3	.96	.94	.86	1.0	3.5	1.6	1.4	1.2	1.1	.98
21	1.1	1.2	1.0	.88	.87	.94	2.1	1.6	1.4	1.3	1.2	.97
22	1.1	1.1	1.0	.88	.88	.94	1.7	1.6	1.3	1.2	1.1	.97
23	1.1	1.1	1.0	.88	.96	.88	1.6	1.5	1.3	1.1	1.1	.99
24	1.1	1.1	1.0	.88	.96	.88	3.0	1.5	1.3	1.2	1.1	.99
25	1.1	1.1	1.0	.94	.95	.88	3.0	1.5	1.3	1.3	1.1	1.0
26	1.1	1.1	1.0	.88	.94	.82	1.9	1.5	1.3	1.2	1.1	1.0
27	1.1	1.1	1.0	.82	.94	.82	1.6	1.5	1.3	1.1	1.1	1.0
28	1.1	1.1	1.0	.82	1.0	1.0	1.6	1.5	1.7	1.2	1.1	1.0
29	1.1	1.1	1.0	.82	---	.94	1.5	1.4	1.5	1.2	1.1	1.0
30	1.1	1.1	1.1	.82	---	.94	1.5	1.4	1.3	1.2	1.1	1.0
31	1.1	---	1.1	.88	---	2.4	---	1.4	---	1.2	1.1	---
TOTAL	40.5	33.67	31.28	29.22	24.50	30.03	93.6	58.8	68.5	39.0	37.8	31.89
MEAN	1.31	1.12	1.01	.94	.88	.97	3.12	1.90	2.28	1.26	1.22	1.06
MAX	2.4	2.3	1.1	1.1	1.0	2.4	17	5.7	18	1.5	1.8	1.2
MIN	1.0	.96	.94	.82	.82	.82	1.3	1.4	1.3	1.1	1.1	.97
AC-FT	80	67	62	58	49	60	186	117	136	77	75	63

CAL YR 1976 TOTAL 517.39 MEAN 1.41 MAX 12 MIN .94 AC-FT 1030
WTR YR 1977 TOTAL 518.79 MEAN 1.42 MAX 18 MIN .82 AC-FT 1030

16275000 HAIKU STREAM NEAR HEEIA--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1971-77.

REMARKS.--Miscellaneous chemical analyses published for this station for 1970 water year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	COLOR (PLATINUM-COBALT UNITS)	TURBIDITY (JTU)	HARDNESS (CA,MG) (MG/L)	NON-CARBONATE HARDNESS (MG/L)	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG) (MG/L)	DISSOLVED SODIUM (NA) (MG/L)	PERCENT SODIUM
FEB										
14...	1630	.78	5	2	45	0	8.3	5.8	12	36

DATE	SODIUM ADSORPTION RATIO	DISSOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	ALKALINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)	DISSOLVED FLUORIDE (F) (MG/L)
FEB									
14...	.8	.8	57	0	47	91	1.1	17	.0

DATE	DISSOLVED SILICA (SIO2) (MG/L)	DISSOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	DISSOLVED SOLIDS (TONS PER AC-FT)	DISSOLVED SOLIDS (TONS PER DAY)	DISSOLVED NITRITE PLUS NITRATE (N) (MG/L)	DISSOLVED ORTHO. PHOSPHORUS (P) (MG/L)	DISSOLVED ORTHO PHOSPHATE (PO4) (MG/L)	DISSOLVED IRON (FE) (UG/L)	DISSOLVED MANGANESE (MN) (UG/L)
FEB									
14...	26	99	.13	.21	.01	.04	.12	70	0

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)
NOV					
04...	1550	.94	160	7.2	19.5
DEC					
20...	1430	.97	160	7.4	19.5
FEB					
14...	1630	.78	160	6.0	21.0
MAR					
30...	0950	.88	160	7.6	20.0
MAY					
10...	1520	2.1	180	7.5	21.0
JUN					
22...	1015	1.3	150	7.0	21.0
SEP					
16...	1450	1.1	160	6.7	21.0

16283600 SOUTH FORK WAIHEE STREAM NEAR HEEIA

LOCATION.--Lat 21°26'47", long 157°52'12", Hydrologic Unit 20060000, on left bank 0.2 mi (0.3 km) upstream from confluence with North Fork, 3.0 mi (4.8 km) southwest of Waiahole School, and 4.0 mi (6.4 km) northwest of Heeia.

DRAINAGE AREA.--0.03 mi^2 (0.08 km^2).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--September 1962 to current year.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 615.74 ft (187.678 m) above mean sea level (levels by Honolulu Board of Water Supply).

REMARKS.--Records good. Honolulu Board of Water Supply diverts water from wells in drainage area.

AVERAGE DISCHARGE.--15 years, 1.89 ft^3/s (0.054 m^3/s), 1,370 acre-ft/yr (1.69 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 279 ft^3/s (7.90 m^3/s) May 2, 1965, gage height, 3.96 ft (1.207 m), from rating curve extended above 3.9 ft^3/s (0.11 m^3/s); no flow July 7, 1977.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 46 ft^3/s (1.30 m^3/s) Apr. 19, gage height, 2.11 ft (0.643 m), from rating curve extended above 3.9 ft^3/s (0.11 m^3/s), no peak above base of 47 ft^3/s (1.33 m^3/s); no flow July 8.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.6	1.8	1.8	1.5	1.4	.77	1.5	.67	1.2	1.2	1.2	.88
2	1.6	1.7	1.8	1.5	1.4	.77	1.5	.63	1.2	1.2	1.2	.88
3	1.6	1.6	1.8	1.5	1.4	.77	1.8	.81	1.2	1.2	1.2	.88
4	1.7	1.6	1.8	1.5	1.4	.72	1.9	1.2	1.2	1.2	1.2	.88
5	1.6	1.6	1.8	1.5	1.4	.72	1.7	1.2	1.7	.89	1.5	.88
6	1.8	1.5	1.8	1.5	1.4	.72	1.0	2.0	1.5	.26	1.4	.88
7	1.7	1.5	1.8	1.5	1.4	.72	.27	1.3	1.3	.01	1.4	.88
8	1.6	1.6	1.8	1.5	1.4	.72	.59	1.4	3.7	.00	1.4	.88
9	1.6	1.5	1.8	1.5	1.4	.72	.67	1.6	1.7	.11	1.3	1.0
10	1.6	1.5	1.8	1.5	1.4	.72	.67	1.5	1.3	1.0	1.3	.77
11	1.6	1.6	1.8	1.5	1.3	.82	.67	1.4	1.2	1.2	1.3	.77
12	1.7	1.7	1.8	1.5	.94	1.2	.67	1.8	1.2	1.2	1.7	.77
13	1.6	1.7	1.8	1.5	.82	1.3	.67	1.4	.85	1.2	1.3	.72
14	1.6	1.7	1.8	1.5	.82	1.3	.67	1.6	.18	1.2	1.2	.72
15	2.1	1.7	1.8	1.5	.94	1.3	.67	1.3	.20	1.2	1.2	.72
16	1.7	1.8	1.8	1.5	1.0	1.3	.67	1.3	.22	1.2	1.2	.72
17	1.6	1.7	1.8	1.5	.82	1.3	.67	1.3	.24	1.2	.94	.72
18	1.6	1.8	1.8	1.5	.77	1.3	.67	1.2	.24	1.2	.51	.72
19	1.6	1.7	1.8	1.5	.77	1.4	1.8	1.2	.24	1.2	.59	.72
20	1.6	1.7	1.8	1.5	.77	1.4	1.1	1.2	.30	1.2	.67	.72
21	1.6	1.7	1.8	1.5	.77	1.4	.72	1.2	.88	1.2	.67	.72
22	1.6	1.8	1.5	1.5	.77	1.3	.67	1.2	1.1	1.2	.67	.72
23	1.6	1.8	1.5	1.5	.82	1.3	.67	1.2	1.2	1.2	.67	.72
24	1.6	1.9	1.5	1.4	.82	1.3	1.6	1.2	1.2	1.2	.72	.72
25	1.6	1.8	1.5	1.5	.82	1.3	.93	1.2	1.2	1.2	.82	.72
26	1.6	1.8	1.5	1.4	.77	1.3	.72	1.2	1.2	1.2	.82	.72
27	1.6	1.8	1.5	1.4	.77	1.3	.67	1.2	1.4	1.2	.82	.72
28	1.6	1.8	1.5	1.3	.82	1.5	.80	1.3	1.3	1.3	.88	.72
29	1.6	1.8	1.5	1.4	---	1.3	.72	1.2	1.2	1.2	.88	.72
30	1.6	1.8	1.5	1.4	---	1.3	.67	1.2	1.2	1.2	.88	.72
31	1.6	---	1.5	1.4	---	1.6	---	1.2	---	1.2	.88	---
TOTAL	50.7	51.0	52.8	45.7	29.31	34.87	28.03	39.31	32.75	32.37	32.42	23.31
MEAN	1.64	1.70	1.70	1.47	1.05	1.12	.93	1.27	1.09	1.04	1.05	.78
MAX	2.1	1.9	1.8	1.5	1.4	1.6	1.9	2.0	3.7	1.3	1.7	1.0
MIN	1.6	1.5	1.5	1.3	.77	.72	.27	.63	.18	.00	.51	.72
AC-FT	101	101	105	91	58	69	56	78	65	64	64	46

CAL YR 1976 TOTAL 556.70 MEAN 1.52 MAX 3.2 MIN 1.3 AC-FT 1100
WTR YR 1977 TOTAL 452.57 MEAN 1.24 MAX 3.7 MIN .0 AC-FT 898

16283600 SOUTH FORK WAIHEE STREAM NEAR HEEIA--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1976-77.

REMARKS.--Miscellaneous chemical analyses published for this station for 1971 water year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTAN-TANEOUS DIS-CHARGE (CFS)	COLOR (PLAT-INUM-COBALT UNITS)	TUR-BID-ITY (JTU)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	DIS-SOLVED SODIUM (NA) (MG/L)	PERCENT SODIUM
FEB										
07...	1200	1.4	3	1	27	0	4.9	3.7	9.3	42
MAY										
19...	1000	1.2	2	1	31	0	5.9	3.9	10	41

DATE	SODIUM AD-SORP-TION RATIO	DIS-SOLVED PO-TAS-SIUM (K) (MG/L)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DIS-SOLVED SULFATE (SO4) (MG/L)	DIS-SOLVED CHLO-RIDE (CL) (MG/L)	DIS-SOLVED FLUO-RIDE (F) (MG/L)
FEB									
07...	.8	.7	34	0	28	2.7	2.1	16	.0
MAY									
19...	.8	.9	37	0	30	7.5	3.7	14	.0

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTI-TUENTS) (MG/L)	DIS-SOLVED SOLIDS (TONS PER AC-FT)	DIS-SOLVED SOLIDS (TONS PER DAY)	DIS-SOLVED NITRITE PLUS NITRATE (N) (MG/L)	DIS-SOLVED ORTHO. PHOS-PHORUS (P) (MG/L)	DIS-SOLVED ORTHO PHOS-PHATE (PO4) (MG/L)	DIS-SOLVED IRON (FE) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)
FEB									
07...	26	80	.11	.30	.13	.05	.15	10	0
MAY									
19...	26	83	.11	.27	.09	.03	.09	10	0

DATE	TIME	INSTAN-TANEOUS DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)
NOV					
09...	1135	1.5	110	6.7	19.5
DEC					
22...	1100	1.4	120	7.3	19.0
FEB					
07...	1200	1.4	115	7.3	19.5
07...	1205	1.4	115	7.3	19.5
MAR					
23...	1150	1.3	100	7.6	19.0
MAY					
06...	0930	3.3	100	6.7	19.0
19...	1000	1.2	120	6.9	20.0
19...	1030	1.2	120	6.9	20.0
JUL					
15...	1215	1.2	120	6.7	20.5
SEP					
08...	1605	.87	115	6.9	20.0

16283700 NORTH FORK WAIHEE STREAM NEAR HEEIA

LOCATION.--Lat 21°26'48", long 157°52'18", Hydrologic Unit 20060000, on left bank 0.3 mi (0.5 km) upstream from confluence with South Fork, 2.8 mi (4.5 km) southwest of Waiahole School, and 4.3 mi (6.9 km) northwest of Heeia.

DRAINAGE AREA.--0.03 mi² (0.08 km²).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--September 1962 to current year.

GAGE.--Water-stage recorder. Datum of gage is 639.00 ft (194.767 m) above mean sea level (levels by Honolulu Board of Water Supply).

REMARKS.--Records good. Honolulu Board of Water Supply diverts water from wells in South Fork which affects the flow at this station.

AVERAGE DISCHARGE.--15 years, 1.89 ft³/s (0.054 m³/s), 1,370 acre-ft/yr (1.69 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 376 ft³/s (10.6 m³/s) Feb. 4, 1965, gage height, 3.38 ft (1.030 m), from rating curve extended above 19 ft³/s (0.54 m³/s); no flow July 7, 8, 1977.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 47 ft³/s (1.33 m³/s) June 8, gage height, 1.76 ft (0.536 m), from rating curve extended above 19 ft³/s (0.54 m³/s), no other peak above base of 45 ft³/s (1.27 m³/s); no flow July 7, 8.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.6	1.5	1.4	1.5	1.5	.98	1.4	.98	1.4	1.3	1.5	1.0
2	1.6	1.5	1.4	1.6	1.5	.98	1.4	.98	1.4	1.3	1.5	1.0
3	1.6	1.5	1.4	1.5	1.5	.98	1.8	1.0	1.4	1.3	1.5	1.0
4	1.6	1.5	1.4	1.5	1.5	.98	1.9	1.4	1.4	1.3	1.5	1.0
5	1.6	1.5	1.4	1.5	1.5	.98	1.7	1.4	1.8	1.0	1.6	1.0
6	1.6	1.5	1.4	1.5	1.5	.93	1.2	2.3	1.7	.50	1.5	1.0
7	1.6	1.5	1.4	1.5	1.5	.98	.56	1.5	1.5	.00	1.5	1.0
8	1.6	1.5	1.4	1.5	1.5	.98	.78	1.6	3.9	.00	1.5	1.0
9	1.6	1.5	1.4	1.5	1.5	.98	.93	1.9	1.9	.16	1.4	1.1
10	1.6	1.5	1.4	1.5	1.5	.98	.93	1.6	1.4	1.0	1.4	1.0
11	1.6	1.6	1.4	1.5	1.3	1.0	.93	1.6	1.4	1.3	1.5	1.0
12	1.6	1.5	1.4	1.5	1.1	1.3	.93	1.9	1.4	1.3	2.0	1.0
13	1.6	1.5	1.4	1.5	1.0	1.4	.93	1.6	1.1	1.3	1.6	1.0
14	1.6	1.5	1.4	1.5	1.0	1.4	.93	1.8	.37	1.3	1.5	.98
15	2.0	1.5	1.4	1.5	1.2	1.4	.93	1.5	.40	1.3	1.5	.98
16	1.6	1.6	1.4	1.5	1.2	1.3	.93	1.4	.48	1.4	1.5	.98
17	1.6	1.5	1.4	1.5	1.0	1.3	.88	1.4	.52	1.4	1.2	.98
18	1.6	1.5	1.4	1.5	1.0	1.3	.88	1.4	.48	1.4	.88	.98
19	1.6	1.5	1.4	1.5	1.0	1.3	2.0	1.4	.48	1.4	.98	.98
20	1.6	1.5	1.4	1.5	1.0	1.4	1.3	1.4	.54	1.4	.98	.98
21	1.6	1.5	1.4	1.5	.98	1.3	.98	1.4	1.1	1.4	.98	.98
22	1.6	1.5	1.5	1.5	.98	1.3	.98	1.4	1.3	1.4	.98	.98
23	1.6	1.5	1.5	1.5	.98	1.3	.98	1.4	1.3	1.4	.98	.98
24	1.6	1.5	1.5	1.5	.98	1.3	1.5	1.4	1.3	1.4	1.0	.98
25	1.6	1.4	1.5	1.6	.98	1.3	1.3	1.4	1.3	1.4	1.1	.98
26	1.6	1.4	1.5	1.4	.98	1.3	1.1	1.4	1.3	1.4	1.1	.98
27	1.6	1.4	1.5	1.5	.98	1.3	1.0	1.4	1.6	1.5	1.1	.98
28	1.6	1.4	1.5	1.4	1.0	1.4	1.1	1.5	1.5	1.5	1.1	.98
29	1.6	1.4	1.5	1.4	---	1.4	1.0	1.4	1.3	1.5	1.1	.98
30	1.5	1.4	1.5	1.5	---	1.3	.98	1.4	1.3	1.5	1.1	.98
31	1.5	---	1.5	1.5	---	1.6	---	1.4	---	1.5	1.0	---
TOTAL	49.8	44.6	44.4	46.4	33.66	37.65	34.16	45.56	38.27	37.26	40.08	29.76
MEAN	1.61	1.49	1.43	1.50	1.20	1.21	1.14	1.47	1.28	1.20	1.29	.99
MAX	2.0	1.6	1.5	1.6	1.5	1.6	2.0	2.3	3.9	1.5	2.0	1.1
MIN	1.5	1.4	1.4	1.4	.98	.93	.56	.98	.37	.00	.88	.98
AC-FT	99	88	88	92	67	75	68	90	76	74	79	59

CAL YR 1976 TOTAL 576.00 MEAN 1.57 MAX 3.3 MIN 1.4 AC-FT 1140
WTR YR 1977 TOTAL 481.60 MEAN 1.32 MAX 3.9 MIN .0 AC-FT 955

16283700 NORTH FORK WAIHEE STREAM NEAR HEEIA--Continud

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1976-77.

REMARKS.--Miscellaneous chemical analyses published for this station for 1971 water year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTAN-TANEOUS DIS-CHARGE (CFS)	COLOR (PLAT-INUM-COBALT UNITS)	TUR-BID-ITY (JTU)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	DIS-SOLVED SODIUM (NA) (MG/L)	PERCENT SODIUM
FEB										
07...	1230	1.4	3	1	27	1	4.8	3.7	9.0	41
MAY										
19...	1110	1.3	0	0	29	1	5.5	3.6	9.5	41

DATE	SODIUM AD-SORP-TION RATIO	DIS-SOLVED PO-TAS-SIUM (K) (MG/L)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DIS-SOLVED SULFATE (SO4) (MG/L)	DIS-SOLVED CHLO-RIDE (CL) (MG/L)	DIS-SOLVED FLUO-RIDE (F) (MG/L)
FEB									
07...	.8	.5	32	0	26	4.1	1.7	16	.0
MAY									
19...	.8	.5	33	3	27	8.4	3.9	13	.0

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTI-TUENTS) (MG/L)	DIS-SOLVED SOLIDS (TONS PER AC-FT)	DIS-SOLVED SOLIDS (TONS PER DAY)	DIS-SOLVED NITRITE PLUS NITRATE (N) (MG/L)	DIS-SOLVED ORTHO. PHOS-PHORUS (P) (MG/L)	DIS-SOLVED ORTHO PHOS-PHATE (PO4) (MG/L)	DIS-SOLVED IRON (FE) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)
FEB									
07...	24	77	.10	.29	.11	.04	.12	1100	0
MAY									
19...	25	78	.11	.27	.11	.02	.06	10	0

DATE	TIME	INSTAN-TANEOUS DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)
NOV					
09...	1100	1.5	100	6.7	19.0
DEC					
22...	1320	1.5	110	7.5	19.0
FEB					
07...	1155	1.4	110	7.1	19.5
07...	1230	1.4	110	7.1	19.0
MAR					
23...	1300	1.3	110	7.6	19.0
MAY					
06...	1145	6.0	90	7.0	19.5
19...	1110	1.3	120	6.8	20.0
JUN					
23...	1530	1.3	110	6.2	20.0
JUL					
15...	1100	1.2	110	6.6	20.0
SEP					
08...	1520	1.0	110	6.8	20.0

HAWAII, ISLAND OF OAHU

16284000 WAIHEE STREAM NEAR HEEIA

LOCATION.--Lat 21°27'01", long 157°51'38", Hydrologic Unit 20060000, on left bank 120 ft (37 m) downstream from forest-reserve boundary, 3.5 mi (5.6 km) northwest of Heeia, and 4.0 mi (6.4 km) northwest of Kaneohe Post Office.

DRAINAGE AREA.--0.93 mi^2 (2.41 km^2).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--December 1935 to current year.

REVISED RECORDS (FISCAL YEARS).--WSP 1569: Drainage area. WSP 1719: 1956-57. WSP 1937: 1940-43(M), 1947(M), 1948(P), 1949-50(M), 1953(M), 1955(M), 1958(M), 1959(P). (WATER YEAR).--WRD Hawaii 1972: 1971(P).

GAGE.--Water-stage recorder and Parshall flume. Datum of gage is 193.44 ft (58.961 m) above mean sea level (levels by Honolulu Board of Water Supply).

REMARKS.--Records good. Honolulu Board of Water Supply diverts water from tunnel in drainage area and pumps water from well nearby.

AVERAGE DISCHARGE.--41 years (water years 1937-77), 8.24 ft^3/s (0.233 m^3/s), 5,970 acre-ft/yr (7.36 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,110 ft^3/s (145 m^3/s) Feb. 4, 1965, gage height, 8.72 ft (2.658 m), from floodmarks, from rating curve extended above 77 ft^3/s (2.18 m^3/s) on basis of slope-area measurements at gage heights 6.06 ft (1.847 m) and 8.72 ft (2.658 m); no flow July 8, 1977.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 158 ft^3/s (4.47 m^3/s) June 8, gage height, 3.47 ft (1.058 m), no other peak above base of 140 ft^3/s (3.96 m^3/s); no flow on July 8.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.8	2.8	2.7	2.5	2.6	1.4	2.7	1.4	2.5	2.1	1.9	1.5
2	2.7	2.7	2.7	2.6	2.5	1.4	2.4	1.4	2.4	2.1	1.9	1.5
3	2.7	2.7	2.7	2.5	2.5	1.5	5.1	1.7	2.4	2.1	1.9	1.5
4	2.6	2.7	2.7	2.5	2.5	1.3	6.4	2.4	2.4	2.1	1.9	1.6
5	2.6	2.7	2.7	2.5	2.5	1.3	5.7	2.3	4.3	1.6	2.3	1.5
6	3.2	2.7	2.8	2.5	2.4	1.3	3.1	6.6	4.4	.66	2.1	1.5
7	3.0	2.7	2.8	2.5	2.4	1.2	1.2	2.8	2.8	.02	2.0	1.5
8	2.7	2.7	2.7	2.5	2.4	1.3	1.3	3.1	16	.00	2.0	1.5
9	2.7	2.6	2.7	2.5	2.4	1.2	1.5	4.8	9.9	.02	2.0	2.0
10	2.6	2.6	2.7	2.5	2.4	1.2	1.4	3.6	4.2	1.5	1.9	1.5
11	2.6	2.8	2.7	2.5	2.2	1.4	1.5	3.3	3.1	2.1	1.9	1.3
12	2.8	2.7	2.7	2.5	1.6	2.2	1.4	6.2	2.7	2.0	3.9	1.3
13	2.7	2.6	2.7	2.5	1.4	2.3	1.3	3.9	1.9	2.0	2.7	1.3
14	2.7	2.7	2.6	2.5	1.4	2.3	1.3	5.3	.67	1.9	2.2	1.3
15	4.6	2.6	2.6	2.5	1.8	2.3	1.3	3.2	.66	1.8	2.1	1.3
16	3.3	2.8	2.6	2.5	2.0	2.2	1.3	2.8	.66	1.8	2.0	1.3
17	3.0	2.6	2.6	2.5	1.5	2.3	1.4	2.7	.74	1.8	1.6	1.4
18	2.7	2.6	2.6	2.5	1.4	2.3	1.4	2.6	.66	1.8	.81	1.3
19	2.7	2.7	2.6	2.6	1.4	2.3	8.7	2.5	.66	1.8	.95	1.3
20	2.7	2.6	2.6	2.6	1.3	2.4	4.2	2.5	.74	1.9	1.0	1.3
21	2.7	2.6	2.5	2.6	1.3	2.3	2.1	2.5	1.7	1.9	1.1	1.3
22	2.7	2.6	2.5	2.6	1.3	2.3	1.7	2.4	2.0	1.9	1.0	1.3
23	2.7	2.6	2.5	2.6	1.5	2.2	1.5	2.4	2.1	1.9	1.1	1.3
24	2.6	2.7	2.5	2.6	1.5	2.2	4.1	2.4	2.1	1.9	1.1	1.3
25	2.6	2.7	2.5	2.7	1.4	2.2	3.0	2.4	2.1	1.9	1.3	1.4
26	2.6	2.7	2.5	2.5	1.4	2.2	2.0	2.4	2.1	1.9	1.4	1.3
27	2.6	2.7	2.5	2.6	1.3	2.2	1.7	2.4	2.7	2.0	1.4	1.3
28	2.7	2.7	2.5	2.6	1.6	2.5	1.9	2.5	2.6	2.1	1.5	1.3
29	2.7	2.7	2.5	2.5	---	2.3	1.8	2.4	2.1	2.0	1.5	1.3
30	2.7	2.7	2.5	2.6	---	2.3	1.5	2.3	2.1	2.0	1.5	1.3
31	2.7	---	2.5	2.5	---	3.8	---	2.4	---	1.9	1.5	---
TOTAL	86.7	80.3	81.0	78.7	51.9	61.6	75.9	91.6	85.39	52.50	53.46	41.8
MEAN	2.80	2.68	2.61	2.54	1.85	1.99	2.53	2.95	2.85	1.69	1.72	1.39
MAX	4.6	2.8	2.8	2.7	2.6	3.8	8.7	6.6	16	2.1	3.9	2.0
MIN	2.6	2.6	2.5	2.5	1.3	1.2	1.2	1.4	.66	.00	.81	1.3
AC-FT	172	159	161	156	103	122	151	182	169	104	106	83

CAL YR 1976 TOTAL 996.80 MEAN 2.72 MAX 16 MIN 2.0 AC-FT 1980
WTR YR 1977 TOTAL 840.85 MEAN 2.30 MAX 16 MIN .0 AC-FT 1670

16284000 WAIHEE STREAM NEAR HEEIA--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1976-77.

REMARKS.--Miscellaneous chemical analyses published for this station for 1969-71 water years.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTAN-TANEOUS DIS-CHARGE (CFS)	COLOR (PLAT-INUM-COBALT UNITS)	TUR-BID-ITY (JTU)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	DIS-SOLVED SODIUM (NA) (MG/L)	PERCENT SODIUM
FEB										
07...	1430	2.7	3	3	27	0	4.8	3.6	9.0	42
MAY										
19...	1400	2.3	3	1	32	0	5.9	4.1	9.5	39

DATE	SODIUM AD-SORP-TION RATIO	DIS-SOLVED PO-TAS-SIUM (K) (MG/L)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DIS-SOLVED SULFATE (SO4) (MG/L)	DIS-SOLVED CHLO-RIDE (CL) (MG/L)	DIS-SOLVED FLUO-RIDE (F) (MG/L)
FEB									
07...	.8	.5	34	0	28	3.4	2.8	14	.0
MAY									
19...	.7	.7	40	0	33	9.1	1.5	12	.0

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTI-TUENTS) (MG/L)	DIS-SOLVED SOLIDS (TONS PER AC-FT)	DIS-SOLVED SOLIDS (TONS PER DAY)	DIS-SOLVED NITRITE PLUS NITRATE (N) (MG/L)	DIS-SOLVED ORTHO, PHOS-PHORUS (P) (MG/L)	DIS-SOLVED ORTHO PHOS-PHATE (PO4) (MG/L)	DIS-SOLVED IRON (FE) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)
FEB									
07...	25	77	.10	.56	.05	.05	.15	20	0
MAY									
19...	24	78	.11	.48	.04	.00	.00	20	0

DATE	TIME	INSTAN-TANEOUS DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)
NOV					
09...	1320	2.6	100	6.6	19.5
DEC					
16...	1350	2.6	105	7.4	20.0
FEB					
07...	1430	2.7	115	7.2	20.0
07...	1445	2.5	115	7.2	20.0
MAR					
23...	1520	2.2	100	7.4	20.0
MAY					
06...	1420	11	110	7.2	20.0
19...	1300	2.3	120	7.0	21.5
MAY					
19...	1400	2.3	120	6.9	21.5
JUN					
23...	1030	2.2	110	6.4	21.5
JUL					
15...	1335	1.8	110	6.7	22.5
AUG					
09...	1330	1.8	100	6.5	22.0
SEP					
22...	0935	1.3	130	6.5	21.5

16284200 WAIHEE STREAM NEAR KAHALUU

LOCATION.--Lat 21°27'04", long 157°51'36", Hydrologic Unit 20060000, on right bank 0.2 mi (0.3 km) downstream from forest-reserve boundary, 1.0 mi (1.6 km) south of Kahaluu School, and 1.6 mi (2.6 km) west of Ahuimanu sewage treatment plant.

DRAINAGE AREA.--0.97 mi^2 (2.51 km^2).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1974 to current year.

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 170 ft (52 m), from topographic map.

REMARKS.--Records good. Honolulu Board of Water Supply diverts water from tunnel and wells in drainage area.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 508 ft^3/s (14.4 m^3/s) Nov. 21, 1974, gage height, 5.96 ft (1.817 m) from rating curve extended above 10 ft^3/s (0.28 m^3/s); minimum, 1.1 ft^3/s (0.031 m^3/s) Apr. 7, 1977.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 150 ft^3/s (4.25 m^3/s) and maximum (*):

Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)
Apr. 19	1500	150	4.25	4.34	1.323
June 8	2200	*189	5.35	4.56	1.390

Minimum discharge, 1.1 cfs (0.031 m^3/s) Apr. 7.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.9	4.2	4.0	3.8	3.6	2.6	2.9	1.6	2.5	2.5	1.9	3.8
2	2.7	4.1	4.0	4.0	3.4	2.6	2.6	1.5	2.4	2.5	2.0	3.8
3	2.7	4.0	4.0	3.7	3.6	2.6	5.4	1.8	2.4	2.5	2.0	3.8
4	2.8	4.0	3.8	3.7	3.4	2.5	6.7	2.6	2.4	2.5	1.9	3.8
5	2.6	4.0	3.8	3.7	3.4	2.5	5.9	2.5	4.7	2.5	2.3	3.8
6	3.2	4.0	4.1	3.7	3.4	2.5	3.2	7.4	4.4	2.4	2.1	3.8
7	3.1	4.0	4.1	3.7	3.6	2.5	1.4	3.0	3.0	2.2	2.0	3.8
8	3.3	4.0	4.0	3.7	3.6	2.6	1.4	3.2	21	2.3	2.0	3.9
9	3.8	4.1	4.0	3.7	4.0	2.5	1.6	4.8	12	2.4	1.9	4.6
10	4.2	4.1	3.8	3.8	3.7	2.5	1.6	3.8	4.4	4.0	1.9	4.0
11	4.4	4.4	3.8	3.8	3.4	2.7	1.6	3.6	3.2	3.7	1.9	3.7
12	4.6	4.2	3.8	3.8	2.9	3.3	1.4	6.6	2.9	2.8	3.9	3.7
13	3.8	4.1	4.0	3.8	2.7	3.4	1.4	4.4	2.7	2.6	2.7	3.7
14	4.0	4.2	3.8	3.8	2.6	3.4	1.4	6.0	2.2	2.5	2.2	3.7
15	5.9	4.1	3.8	3.7	3.0	3.4	1.3	3.6	2.4	2.4	2.1	3.7
16	4.6	4.4	3.8	3.7	3.2	3.2	1.3	3.2	2.6	2.3	2.0	3.7
17	4.1	4.1	3.8	3.7	2.6	3.3	1.4	3.0	2.7	2.3	2.0	4.0
18	3.8	4.1	3.8	3.6	2.6	3.2	1.4	2.9	2.8	2.3	2.1	3.8
19	3.8	4.2	3.8	3.6	2.5	3.4	9.5	2.8	2.8	2.3	2.6	3.8
20	3.8	4.1	3.7	3.6	2.5	3.4	4.6	2.7	2.4	2.3	2.9	3.8
21	3.8	4.1	3.6	3.6	2.5	3.3	2.4	2.6	2.5	2.3	3.0	3.8
22	3.8	4.0	3.6	3.6	2.6	3.1	1.8	2.6	2.7	2.2	3.1	3.8
23	3.8	4.0	3.6	3.7	2.8	2.6	1.6	2.6	2.7	2.1	3.1	3.8
24	3.8	4.2	3.6	3.7	2.8	2.5	4.6	2.5	2.7	2.1	3.2	3.8
25	3.8	4.1	3.6	4.0	2.7	2.5	3.3	2.5	2.7	2.0	3.6	4.0
26	3.8	4.0	3.6	3.7	2.7	2.4	2.3	2.5	2.6	2.1	3.6	3.8
27	3.8	4.0	3.7	3.7	2.7	2.4	1.8	2.5	3.1	2.1	3.6	3.8
28	3.8	4.0	3.8	3.7	2.9	2.6	2.2	2.6	3.1	2.1	3.7	3.8
29	3.8	4.1	3.8	3.6	---	2.4	1.9	2.5	2.6	2.0	3.7	3.8
30	3.8	4.0	3.8	3.6	---	2.4	1.7	2.4	2.5	2.0	4.0	4.0
31	3.8	---	3.8	3.6	---	4.0	---	2.4	---	2.0	3.8	---
TOTAL	115.9	122.9	118.2	115.1	85.4	88.3	81.6	98.7	113.1	74.3	82.8	115.1
MEAN	3.74	4.10	3.81	3.71	3.05	2.85	2.72	3.18	3.77	2.40	2.67	3.84
MAX	5.9	4.4	4.1	4.0	4.0	4.0	9.5	7.4	21	4.0	4.0	4.6
MIN	2.6	4.0	3.6	3.6	2.5	2.4	1.3	1.5	2.2	2.0	1.9	3.7
AC-FT	230	244	234	228	169	175	162	196	224	147	164	228

CAL YR 1976 TOTAL 1459.2 MEAN 3.99 MAX 28 MIN 2.4 AC-FT 2890
WTR YR 1977 TOTAL 1211.4 MEAN 3.32 MAX 21 MIN 1.3 AC-FT 2400

HAWAII, ISLAND OF OAHU

16284200 WAIHEE STREAM NEAR KAHALUU--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1976-77.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTAN-TANEOUS DIS-CHARGE (CFS)	COLOR (PLAT-INUM-COBALT UNITS)	TUR-BID-ITY (JTU)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	DIS-SOLVED SODIUM (NA) (MG/L)	PERCENT SODIUM
FEB										
07...	1500	3.5	4	3	36	0	6.7	4.6	11	40
MAY										
19...	1530	2.6	7	1	36	1	7.2	4.4	10	37

DATE	SODIUM AD-SORP-TION RATIO	DIS-SOLVED PO-TAS-SIUM (K) (MG/L)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DIS-SOLVED SULFATE (SO4) (MG/L)	DIS-SOLVED CHLO-RIDE (CL) (MG/L)	DIS-SOLVED FLUO-RIDE (F) (MG/L)
FEB									
07...	.8	.7	45	0	37	11	.1	16	.0
MAY									
19...	.7	.7	43	0	35	8.7	3.1	13	.0

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTI-TUENTS) (MG/L)	DIS-SOLVED SOLIDS (TONS PER AC-FT)	DIS-SOLVED SOLIDS (TONS PER DAY)	DIS-SOLVED NITRITE PLUS NITRATE (N) (MG/L)	DIS-SOLVED ORTHO. PHOS-PHORUS (P) (MG/L)	DIS-SOLVED ORTHO PHOS-PHATE (PO4) (MG/L)	DIS-SOLVED IRON (FE) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)
FEB									
07...	27	89	.12	.84	.09	.05	.15	10	0
MAY									
19...	25	86	.12	.60	.23	.00	.00	30	0

DATE	TIME	INSTAN-TANEOUS DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)
NOV					
09...	1510	4.0	115	6.6	20.0
DEC					
16...	1600	3.9	110	7.5	20.0
FEB					
07...	1500	3.5	135	6.8	20.0
MAR					
23...	1630	2.6	120	7.4	20.5
MAY					
06...	1500	12	110	7.1	20.5
19...	1530	2.6	125	6.9	22.0
MAY					
19...	1555	2.6	125	7.1	22.0
JUN					
23...	0930	2.7	140	6.3	21.0
JUL					
15...	1425	2.3	130	6.7	22.0
AUG					
09...	1350	2.0	100	6.5	24.0
SEP					
22...	1040	3.9	160	6.9	21.0

16294900 WAIKANE STREAM AT ALTITUDE 75 FT (23 M), AT WAIKANE

LOCATION.--Lat 21°30'00", long 157°51'54", Hydrologic Unit 20060000, on right bank 0.3 mi (0.5 km) downstream from Waikeekee Stream, 0.7 mi (1.1 km) west of Waikane, and 1.2 mi (1.9 km) northwest of Waiahole School.

DRAINAGE AREA.--2.22 mi² (5.75 km²).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--December 1959 to current year.

REVISED RECORDS.--WSP 1937: Drainage area.

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 75 ft (23 m), from topographic map.

REMARKS.--Records fair. Waiahole tunnel diverts from two tributaries above station for irrigation in vicinity of Waipahu. Recording rain gage located at station.

AVERAGE DISCHARGE.--17 years (water years 1961-77), 8.45 ft³/s (0.239 m³/s), 6,120 acre-ft/yr (7.55 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 8,800 ft³/s (249 m³/s) Feb. 4, 1965, gage height, 10.76 ft (3.280 m), from rating curve extended above 120 ft³/s (3.40 m³/s) on basis of slope-area measurements at gage heights 4.88 ft (1.487 m), 9.46 ft (2.883 m), and 10.76 ft (3.280 m); minimum, 0.76 ft³/s (0.022 m³/s) Oct. 27, 1975.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 2,520 ft³/s (71.4 m³/s) June 8, gage height, 7.60 ft (2.316 m), from rating curve extended as explained above, no other peak above base of 700 ft³/s (19.8 m³/s); minimum, 0.79 ft³/s (0.022 m³/s) Feb. 9, 10.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.2	1.9	2.9	1.6	1.5	2.9	7.1	6.1	5.0	3.9	2.7	2.0
2	1.9	1.8	2.7	1.8	1.6	2.5	3.9	5.5	4.4	3.9	2.9	2.4
3	1.9	1.8	2.7	1.8	1.6	2.4	16	5.8	4.2	3.7	2.7	2.5
4	2.9	1.7	2.5	1.8	1.5	2.0	27	6.4	3.7	3.7	2.9	2.4
5	2.0	1.6	2.5	1.8	1.3	2.0	34	5.2	8.2	3.7	3.9	2.0
6	3.1	1.6	2.7	1.6	1.3	2.5	15	14	13	3.5	2.9	1.9
7	3.7	1.6	4.4	1.8	1.3	2.4	9.5	7.5	21	3.5	2.7	1.9
8	2.2	1.6	3.1	1.6	1.3	2.2	7.1	9.1	167	3.5	2.7	2.7
9	2.0	1.6	2.7	1.6	1.4	2.0	6.1	12	82	3.5	2.5	4.4
10	1.9	7.9	2.5	1.6	1.4	2.4	5.2	11	25	6.4	2.4	3.3
11	1.9	12	2.4	1.6	1.4	1.9	5.2	10	16	6.1	2.4	2.0
12	3.9	4.2	2.4	1.6	1.4	1.9	4.4	13	13	5.2	25	1.9
13	3.5	2.4	2.5	1.6	1.5	1.9	4.2	12	11	5.5	7.9	1.8
14	3.3	2.5	2.7	1.6	1.4	1.8	3.9	10	9.9	4.2	3.3	1.8
15	11	2.9	2.4	1.6	8.2	1.9	3.9	8.6	8.6	3.7	2.7	1.8
16	5.5	35	2.2	1.6	5.2	1.8	3.7	7.5	7.9	3.7	2.5	1.8
17	3.3	5.5	2.2	1.6	2.2	1.8	4.7	7.9	7.5	3.9	2.5	1.8
18	2.7	3.7	2.2	1.6	1.9	1.8	4.2	7.1	6.8	3.7	2.4	1.8
19	2.4	7.9	2.0	1.6	1.6	1.8	42	6.4	6.1	3.3	2.4	1.9
20	2.4	5.2	2.0	1.8	1.6	1.8	34	5.8	6.1	3.1	2.4	1.9
21	2.2	5.0	2.0	1.6	1.5	1.6	12	6.4	5.5	3.1	2.4	1.9
22	2.2	3.7	1.9	1.6	1.5	1.6	8.2	5.8	5.2	3.1	2.2	1.9
23	2.0	3.3	1.9	1.8	5.8	1.6	7.5	5.2	5.0	2.9	2.2	1.9
24	1.9	3.3	1.9	1.6	3.5	1.6	7.9	5.0	5.0	2.9	2.2	2.2
25	1.9	3.5	1.9	3.1	2.9	1.6	16	4.7	4.7	2.9	2.4	1.9
26	1.9	3.1	1.9	1.6	2.4	1.6	11	4.7	4.4	2.9	2.5	2.0
27	2.0	2.9	1.9	1.5	2.0	1.6	7.5	5.0	7.5	2.9	2.5	2.0
28	2.0	2.9	1.8	1.5	6.4	2.0	6.8	5.5	13	3.3	2.5	1.9
29	1.9	3.5	1.8	1.5	---	1.8	11	4.4	6.1	2.9	2.7	1.8
30	1.9	3.1	1.8	1.4	---	8.6	7.1	4.2	4.4	2.9	3.9	1.8
31	1.8	---	1.8	1.5	---	23	---	3.9	---	2.7	2.4	---
TOTAL	85.4	138.7	72.3	51.9	66.6	88.3	336.1	225.7	487.2	114.2	109.7	63.3
MEAN	2.75	4.62	2.33	1.67	2.38	2.85	11.2	7.28	16.2	3.68	3.54	2.11
MAX	11	35	4.4	3.1	8.2	23	42	14	167	6.4	25	4.4
MIN	1.8	1.6	1.8	1.4	1.3	1.6	3.7	3.9	3.7	2.7	2.2	1.8
AC-FT	169	275	143	103	132	175	667	448	966	227	218	126

CAL YR 1976 TOTAL 1798.2 MEAN 4.91 MAX 80 MIN 1.4 AC-FT 3570
WTR YR 1977 TOTAL 1839.4 MEAN 5.04 MAX 167 MIN 1.3 AC-FT 3650

16294900 WAIKANE STREAM AT ALTITUDE 75 FT (23 M), AT WAIKANE--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1971-77.

REMARKS.--Miscellaneous chemical analyses published for this station for 1970 water year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTAN-TANEOUS DIS-CHARGE (CFS)	COLOR (PLAT-INUM-COBALT UNITS)	TUR-BID-ITY (JTU)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	DIS-SOLVED SODIUM (NA) (MG/L)	PERCENT SODIUM
FEB										
10...	1530	1.1	6	3	49	0	8.2	7.0	15	39
MAY										
10...	1245	9.7	6	3	42	1	6.9	5.9	13	40

DATE	SODIUM AD-SORP-TION RATIO	DIS-SOLVED PO-TAS-SIUM (K) (MG/L)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DIS-SOLVED SULFATE (SO4) (MG/L)	DIS-SOLVED CHLO-RIDE (CL) (MG/L)	DIS-SOLVED FLUO-RIDE (F) (MG/L)
FEB									
10...	.9	.7	65	0	53	16	1.6	21	.0
MAY									
10...	.9	.7	50	0	41	5.0	3.3	19	.0

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTI-TUENTS) (MG/L)	DIS-SOLVED SOLIDS (TONS PER AC-FT)	DIS-SOLVED SOLIDS (TONS PER DAY)	DIS-SOLVED NITRITE PLUS NITRATE (N) (MG/L)	DIS-SOLVED ORTHO. PHOS-PHORUS (P) (MG/L)	DIS-SOLVED ORTHO PHOS-PHATE (PO4) (MG/L)	DIS-SOLVED IRON (FE) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)
FEB									
10...	28	119	.16	.39	.07	.04	.12	200	0
MAY									
10...	24	97	.13	2.59	.21	.00	.00	120	0

DATE	TIME	INSTAN-TANEOUS DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)
NOV					
03...	1200	3.6	180	7.1	22.5
08...	1500	1.6	180	7.2	21.5
DEC					
22...	1600	2.0	180	7.5	21.5
FEB					
09...	1550	1.1	190	6.8	21.0
10...	1530	1.1	190	6.8	22.0
MAR					
22...	1000	1.7	180	7.0	21.0
MAY					
10...	1245	9.7	160	7.2	22.0
12...	1215	9.7	180	7.3	22.0
JUL					
01...	1515	3.8	180	6.2	22.5
AUG					
16...	1330	2.4	190	7.0	20.0
SEP					
16...	1345	1.6	180	7.1	21.0

16296500 KAHANA STREAM AT ALTITUDE 30 FT (9.1 M), NEAR KAHANA

LOCATION.--Lat 21°32'37", long 157°53'07", Hydrologic Unit 20060000, on right bank 600 ft (183 m) upstream from Kawa Stream, 1.1 mi (1.8 km) southwest of Kahana, and 2.2 mi (3.5 km) southwest of Swanzy Beach Park in Kaaawa.

DRAINAGE AREA.--3.74 mi^2 (9.69 km^2).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--December 1958 to current year.

REVISED RECORDS (FISCAL YEARS).--WSP 1937: 1959-60.

GAGE.--Water-stage recorder and concrete-masonry control. Altitude of gage is 30 ft (9.1 m), from topographic map.

REMARKS.--Records fair. Approximately 9 ft^3/s (0.25 m^3/s) is diverted by Waiahole Water Co. at 800-ft (244-m) elevation, 2.3 mi (3.7 km) above station. Recording rain gage located at station.

AVERAGE DISCHARGE.--18 years (water years 1960-77), 35.3 ft^3/s (1.000 m^3/s), 25,570 acre-ft/yr (31.5 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,430 ft^3/s (154 m^3/s) Apr. 15, 1963, gage height, 8.10 ft (2.469 m), from rating curve extended above 530 ft^3/s (15.0 m^3/s) on basis of computation of peak flow over submerged weir; minimum, 10 ft^3/s (0.28 m^3/s) Sept. 17, 18, 20, 1961.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 1,600 ft^3/s (45.3 m^3/s) and maximum (*):

Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)
Apr. 19	1300	*3210	90.9	6.43	1.960
June 28	1500	2220	62.9	5.48	1.670

Minimum discharge, 12 ft^3/s (0.34 m^3/s) for several days in January and February.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	15	15	15	13	12	17	20	27	25	20	15	16
2	15	15	15	16	12	18	17	24	21	18	16	25
3	14	15	14	14	12	20	36	24	22	18	15	18
4	18	14	14	14	13	17	58	30	19	17	15	17
5	16	14	14	13	12	16	55	21	21	17	21	16
6	18	14	16	13	12	16	30	133	25	17	16	16
7	21	14	24	13	12	16	24	29	21	17	16	20
8	16	14	16	13	12	15	22	68	29	16	16	35
9	15	15	16	13	12	16	20	272	38	16	15	40
10	15	18	20	13	12	19	19	92	21	61	15	27
11	14	63	15	13	12	18	24	65	19	36	15	21
12	17	20	15	13	12	19	18	94	19	39	183	19
13	24	17	15	13	12	17	17	58	19	30	86	18
14	21	20	15	13	12	16	17	51	19	24	22	17
15	74	17	14	13	34	16	16	37	18	21	20	18
16	26	99	14	13	25	15	16	31	17	22	18	16
17	20	20	14	13	14	16	19	32	17	21	18	16
18	17	17	14	12	13	16	17	28	17	21	17	16
19	17	24	14	12	13	17	328	29	16	18	16	15
20	35	18	14	13	12	19	129	25	17	18	17	15
21	24	20	14	13	12	16	36	31	16	17	20	15
22	23	17	14	12	12	15	27	24	16	18	16	15
23	17	16	14	12	26	15	25	22	15	16	16	15
24	17	16	14	12	18	15	81	21	15	16	15	16
25	16	16	14	16	18	15	58	20	15	16	15	14
26	16	16	14	13	15	15	30	20	15	16	16	14
27	16	15	14	12	14	14	26	26	70	16	15	15
28	23	15	14	12	60	16	42	38	198	29	15	14
29	16	16	13	12	---	15	141	21	32	17	15	14
30	16	16	14	12	---	22	33	20	24	16	25	14
31	16	---	13	12	---	38	---	19	---	16	23	---
TOTAL	628	626	460	401	455	535	1401	1432	836	660	763	547
MEAN	20.3	20.9	14.8	12.9	16.3	17.3	46.7	46.2	27.9	21.3	24.6	18.2
MAX	74	99	24	16	60	38	328	272	198	61	183	40
MIN	14	14	13	12	12	14	16	19	15	16	15	14
AC-FT	1250	1240	912	795	902	1060	2780	2840	1660	1310	1510	1080

CAL YR 1976 TOTAL 8864 MEAN 24.2 MAX 321 MIN 13 AC-FT 17580
WTR YR 1977 TOTAL 8744 MEAN 24.0 MAX 328 MIN 12 AC-FT 17340

16296500 KAHANA STREAM AT ALTITUDE 30 FT (9.1 M), NEAR KAHANA--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1971-77.

REMARKS.--Miscellaneous chemical analyses published for this station for 1970 water year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTAN-TANEOUS DIS-CHARGE (CFS)	COLOR (PLAT-INUM-COBALT UNITS)	TUR-BID-ITY (JTU)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	DIS-SOLVED SODIUM (NA) (MG/L)	PERCENT SODIUM
FEB										
09...	1330	12	7	3	40	0	6.9	5.5	12	39
MAY										
12...	1345	77	18	100	28	3	5.6	3.3	8.3	39

DATE	SODIUM AD-SORP-TION RATIO	DIS-SOLVED PO-TAS-SIUM (K) (MG/L)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DIS-SOLVED SULFATE (SO4) (MG/L)	DIS-SOLVED CHLO-RIDE (CL) (MG/L)	DIS-SOLVED FLUO-RIDE (F) (MG/L)
FEB									
09...	.8	.6	49	0	40	20	2.5	17	.0
MAY									
12...	.7	.9	30	0	25	2.4	2.2	12	.0

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTI-TUENTS) (MG/L)	DIS-SOLVED SOLIDS (TONS PER AC-FT)	DIS-SOLVED SOLIDS (TONS PER DAY)	DIS-SOLVED NITRITE PLUS NITRATE (N) (MG/L)	DIS-SOLVED ORTHO. PHOS-PHORUS (P) (MG/L)	DIS-SOLVED ORTHO PHOS-PHATE (PO4) (MG/L)	DIS-SOLVED IRON (FE) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)
FEB									
09...	25	94	.13	3.05	.03	.04	.12	340	20
MAY									
12...	16	63	.09	13.1	.04	.00	.03	140	0

DATE	TIME	INSTAN-TANEOUS DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)
NOV					
05...	1430	14	125	6.9	20.5
DEC					
21...	1600	13	160	7.3	19.5
JAN					
17...	1040	13	150	7.0	20.5
FEB					
09...	1330	12	150	6.6	21.0
09...	1400	12	150	6.6	21.0
MAR					
24...	1500	14	140	6.7	21.0
MAY					
12...	1345	77	100	7.3	22.0
12...	1420	47	100	7.3	22.0
JUN					
29...	1610	29	105	6.3	21.0
AUG					
03...	1150	14	140	6.1	21.5
SEP					
15...	1500	16	130	6.9	22.5

16302000 PUNALUU DITCH NEAR PUNALUU

LOCATION.--Lat 21°33'41", long 157°54'10", Hydrologic Unit 20060000, on right bank 800 ft (244 m) downstream from intake, 1.5 mi (2.4 km) west of Kahana, and 1.7 mi (2.7 km) southwest of Punaluu.

PERIOD OF RECORD.--May 1953 to current year.

REVISED RECORDS (FISCAL YEARS).--WSP 1719: 1954-55.

GAGE.--Water-stage recorder. Altitude of gage is 200 ft (61 m), from topographic map.

REMARKS.--Records good. Ditch diverts from Punaluu Stream for irrigation and domestic use in Punaluu Valley. Periodic determinations of water temperature for the current year are published elsewhere in this report.

AVERAGE DISCHARGE.--24 years, 8.77 ft^3/s (0.248 m^3/s), 6,350 acre-ft/yr (7.83 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 54 ft^3/s (1.53 m^3/s) Oct. 31, 1964; no flow for several days in 1963, 1966, 1969, 1972, 1974, 1977.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.3	2.5	2.4	2.7	2.7	3.2	4.1	.06	.17	.01	.12	.04
2	2.3	2.6	2.4	2.9	2.7	3.2	4.0	.04	.17	.03	.14	.07
3	2.2	2.5	2.4	2.7	2.9	3.2	7.8	.04	.19	.03	.14	.05
4	2.3	2.4	2.4	2.7	2.8	3.2	9.0	.04	.19	.05	.12	.05
5	2.4	2.4	2.3	2.7	2.7	3.2	8.5	.04	.17	.07	.12	.05
6	2.7	2.4	2.6	2.6	2.7	3.2	6.2	.26	.07	.09	.10	.05
7	2.9	2.4	2.9	2.6	2.7	3.2	5.1	.04	.09	.09	.10	.05
8	2.4	2.4	2.4	2.6	2.7	3.2	4.7	.14	.09	.10	.10	.09
9	2.4	2.4	2.4	2.6	2.7	3.2	4.5	2.0	.09	.10	.10	.10
10	2.4	2.3	2.4	2.6	2.7	7.0	4.2	.92	.10	.19	.10	.09
11	2.3	3.0	2.3	2.6	2.7	5.0	4.4	.33	.14	.05	.09	.09
12	2.5	2.5	2.1	2.6	2.7	4.0	4.0	1.2	.15	.07	.32	.09
13	3.3	2.4	2.4	2.6	2.7	3.7	3.9	.26	.17	.09	.03	.09
14	2.9	2.6	2.4	2.6	2.7	3.5	3.9	.18	.19	.10	.04	.09
15	5.4	2.4	2.4	2.6	4.5	3.3	3.9	.14	.19	.10	.00	.10
16	3.6	4.9	2.4	2.6	3.0	3.3	3.8	.12	.19	.12	.00	.10
17	2.9	2.9	2.5	2.6	2.8	3.3	4.0	.15	.17	.14	.00	.09
18	2.7	2.7	2.5	2.6	2.8	3.3	3.8	.12	.17	.17	.00	.10
19	2.6	3.6	2.5	2.6	2.8	3.3	3.7	.14	.17	.19	.00	.23
20	3.2	2.8	2.4	2.7	2.8	5.0	.57	.15	.19	.19	.00	.21
21	3.3	2.8	2.4	2.6	2.8	3.4	.10	.13	.19	.17	.00	.21
22	3.6	2.7	2.4	2.6	2.8	3.4	.14	.10	.17	.14	.00	.21
23	2.9	2.6	2.4	2.6	4.5	3.4	.10	.12	.15	.12	.00	.23
24	2.8	2.7	2.4	2.6	3.2	3.4	.40	.12	.15	.10	.00	.26
25	2.7	2.8	2.5	3.1	3.0	3.4	.80	.14	.17	.12	.00	.21
26	2.6	2.6	2.5	2.7	3.0	3.4	.08	.15	.17	.14	.00	.19
27	2.8	2.5	2.5	2.8	3.0	3.4	.06	.21	.26	.14	.00	.19
28	3.0	2.5	2.5	2.7	5.0	3.4	.06	.21	2.2	.12	.01	.19
29	2.6	2.6	2.6	2.8	---	3.6	.70	.19	.01	.10	.01	.19
30	2.6	2.4	2.6	2.7	---	4.5	.08	.19	.01	.12	.07	.19
31	2.5	---	2.6	2.7	---	5.4	---	.15	---	.12	.07	---
TOTAL	87.1	80.3	75.9	82.7	84.1	114.2	96.59	8.08	6.54	3.37	1.78	3.90
MEAN	2.81	2.68	2.45	2.67	3.00	3.68	3.22	.26	.22	.11	.057	.13
MAX	5.4	4.9	2.9	3.1	5.0	7.0	9.0	2.0	2.2	.19	.32	.26
MIN	2.2	2.3	2.1	2.6	2.7	3.2	.06	.04	.01	.01	.00	.04
AC-FT	173	159	151	164	167	227	192	16	13	6.7	3.5	7.7

CAL YR 1976 TOTAL 1242.20 MEAN 3.39 MAX 17 MIN 2.1 AC-FT 2460
WTR YR 1977 TOTAL 644.56 MEAN 1.77 MAX 9.0 MIN .0 AC-FT 1280

NOTE.--No gage-height record Feb. 8 to Mar. 29.

16303000 PUNALUU STREAM NEAR PUNALUU

LOCATION.--Lat 21°33'33", long 157°54'06", Hydrologic Unit 20060000, on left bank at Punaluu ditch diversion dam, 1.4 mi (2.2 km) west of Kahana, and 1.8 mi (2.9 km) southwest of Punaluu.

DRAINAGE AREA.--2.78 mi^2 (7.20 km^2).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--May 1953 to current year.

REVISED RECORDS (FISCAL YEARS).--WSP 1569: Drainage area. WSP 1937: 1956(P), 1957(M), 1959(M). (WATER YEARS).--WRD Hawaii 1974: 1971-72(P), 1973(M).

GAGE.--Water-stage recorder and masonry control. Altitude of gage is 212 ft (65 m), from topographic map.

REMARKS.--Records poor. Records do not include flow of Punaluu ditch (see sta 16302000). All published peak discharges prior to Oct. 1, 1970, have been found to be in error; revised records are on file in the district office and will be published in the next water-supply paper.

AVERAGE DISCHARGE.--24 years, 16.5 ft^3/s (0.467 m^3/s), 11,950 acre-ft/yr (14.8 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,700 ft^3/s (161 m^3/s) July 17, 1974, gage hight, 7.60 ft (2.316 m), from rating curve extended above 170 ft^3/s (4.81 m^3/s) on basis of slope-area measurements at gage heights 5.77 ft (1.759 m) and 7.60 ft (2.316 m); no flow at times.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 930 ft^3/s (26.3 m^3/s) and maximum (*):

Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)
Apr. 19	1330	*1620	45.9	4.47	1.362
May 9	1930	1220	34.6	3.90	1.189
June 28	1500	1400	39.6	4.16	1.268

Minimum discharge, 6.8 ft^3/s (0.19 m^3/s) Feb. 12, 14.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	9.6	10	10	8.2	7.7	9.1	13	16	16	16	13	12
2	9.6	10	10	9.1	7.7	10	11	15	16	15	13	13
3	9.1	10	10	8.6	7.7	11	41	16	16	15	13	12
4	9.6	10	10	8.2	7.7	9.6	51	16	16	15	13	12
5	10	10	10	8.2	7.7	9.1	48	14	19	14	15	12
6	14	10	12	8.2	7.7	9.6	26	36	18	14	13	12
7	14	10	13	8.2	7.7	9.6	19	19	16	13	13	12
8	11	10	11	8.2	7.2	9.6	16	26	17	13	12	14
9	10	10	10	8.2	7.2	9.6	14	134	16	13	12	18
10	10	9.6	10	8.2	7.2	17	13	70	15	29	12	15
11	10	14	9.6	8.2	7.2	13	13	49	15	18	12	13
12	10	11	9.6	8.2	6.8	12	12	67	14	21	49	12
13	17	10	9.6	8.2	7.2	11	11	43	15	20	30	12
14	13	11	9.1	8.6	6.8	10	10	36	15	16	24	12
15	32	10	9.6	8.6	16	9.6	10	29	14	15	14	12
16	16	45	9.6	8.6	12	9.6	10	26	14	15	13	12
17	13	13	10	8.6	9.1	10	11	28	14	15	13	12
18	12	12	9.6	8.6	8.6	10	10	23	14	15	13	12
19	11	17	9.1	8.6	8.2	10	119	21	13	15	13	12
20	14	12	9.1	8.6	8.2	14	53	20	13	14	13	12
21	15	12	9.1	8.2	7.7	10	25	21	13	14	13	12
22	15	11	9.1	8.2	7.7	9.6	20	19	13	14	12	12
23	13	11	8.2	8.2	15	9.6	17	17	13	13	12	12
24	12	12	8.6	8.2	9.6	9.6	17	17	13	13	12	12
25	12	12	8.6	10	9.1	9.6	46	16	13	13	12	12
26	11	11	8.2	8.2	8.6	9.1	21	16	13	13	12	11
27	12	11	8.2	8.2	9.1	9.1	17	17	21	13	12	11
28	13	11	8.2	8.2	16	10	18	19	90	15	12	11
29	11	12	8.2	8.2	---	9.6	35	16	23	14	12	10
30	11	11	8.2	7.7	---	17	18	16	17	13	15	10
31	10	---	8.2	7.7	---	23	---	15	---	13	13	---
TOTAL	389.9	368.6	293.7	259.1	248.4	339.6	745	893	535	469	460	366
MEAN	12.6	12.3	9.47	8.36	8.87	11.0	24.8	28.8	17.8	15.1	14.8	12.2
MAX	32	45	13	10	16	23	119	134	90	29	49	18
MIN	9.1	9.6	8.2	7.7	6.8	9.1	10	14	13	13	12	10
AC-FT	773	731	583	514	493	674	1480	1770	1060	930	912	726

CAL YR 1976 TOTAL 5454.2 MEAN 14.9 MAX 157 MIN 8.2 AC-FT 10820
WTR YR 1977 TOTAL 5367.3 MEAN 14.7 MAX 134 MIN 6.8 AC-FT 10650

16303000 PUNALUU STREAM NEAR PUNALUU--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1971-77.

REMARKS.--Miscellaneous chemical analyses published for this station for 1970 water year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTAN-TANEOUS DIS-CHARGE (CFS)	COLOR (PLAT-INUM-COBALT UNITS)	TUR-BID-ITY (JTU)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	DIS-SOLVED SODIUM (NA) (MG/L)	PERCENT SODIUM
FEB										
08...	1440	7.7	6	1	36	0	6.0	5.0	11	30

DATE	SODIUM AD-SORP-TION RATIO	DIS-SOLVED PO-TAS-SIUM (K) (MG/L)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DIS-SOLVED SULFATE (SO4) (MG/L)	DIS-SOLVED CHLO-RIDE (CL) (MG/L)	DIS-SOLVED FLUO-RIDE (F) (MG/L)
FEB									
08...	.8	.8	45	0	37	5.7	1.1	15	.0

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTI-TUENTS) (MG/L)	DIS-SOLVED SOLIDS (TONS PER AC-FT)	DIS-SOLVED SOLIDS (TONS PER DAY)	DIS-SOLVED NITRITE PLUS NITRATE (N) (MG/L)	DIS-SOLVED ORTHO. PHOS-PHORUS (P) (MG/L)	DIS-SOLVED ORTHO PHOS-PHATE (PO4) (MG/L)	DIS-SOLVED IRON (FE) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)
FEB									
08...	29	91	.12	1.89	.04	.05	.15	170	0

DATE	TIME	INSTAN-TANEOUS DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)
NOV					
08...	1200	10	115	6.7	20.0
DEC					
17...	1400	9.8	120	6.7	20.5
FEB					
08...	1425	7.8	130	7.1	20.0
08...	1440	7.7	130	7.1	20.0
MAR					
29...	1420	8.9	120	7.6	20.0
JUN					
28...	1400	28	100	5.9	21.5
SEP					
20...	1120	12	140	6.7	21.0

16304200 KALUANUI STREAM NEAR PUNALUU

LOCATION.--Lat 21°35'22", long 157°54'38", Hydrologic Unit 20060000, on right bank 0.8 mi (1.3 km) downstream from Sacred Falls, 1.6 mi (2.6 km) west of Punaluu Beach Park, and 1.7 mi (2.7 km) south of cemetery in Hauula.

DRAINAGE AREA.--1.11 mi² (2.87 km²).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--May 1967 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 110 ft (34 m), from topographic map.

REMARKS.--Records fair. No diversion above station.

AVERAGE DISCHARGE.--10 years, 3.76 ft³/s (0.106 m³/s), 2,720 acre-ft/yr (3.35 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,010 ft³/s (56.9 m³/s) Feb. 1, 1969, gage height, 10.0 ft (3.05 m), from rating curve extended above 14 ft³/s (0.40 m³/s) on basis of slope-area measurements at gage heights 8.85 ft (2.697 m) and 10.0 ft (3.05 m); maximum gage height, 10.84 ft (3.304 m) July 17, 1974; no flow for several days in July and August 1971, Sept. 14, 27, 1975, many days in January and February 1977.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 530 ft³/s (15.0 m³/s) May 9, gage height, 8.53 ft (2.600 m), from rating cnrve extended as explained above, no other peak above base of 500 ft³/s (14.2 m³/s); no flow for many days in January and February.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.76	.62	.58	.07	.01	1.2	1.3	1.4	4.9	.93	.53	1.3
2	.58	1.4	.45	1.7	.00	3.0	1.1	1.2	2.5	.77	1.4	6.5
3	.60	1.5	.35	.37	.00	3.9	65	3.1	2.3	.62	.63	2.4
4	1.0	.38	.33	.16	1.0	1.7	42	8.7	1.2	.61	2.7	1.3
5	.94	.29	.30	.08	.36	1.1	26	2.2	11	.58	13	1.1
6	12	.40	.29	.05	.13	2.0	6.1	19	7.7	.62	2.9	.66
7	5.5	.60	2.8	.02	.04	1.3	3.4	2.9	7.2	.73	2.6	2.0
8	.79	1.1	2.2	.02	.00	1.5	2.5	9.5	2.0	.52	1.9	4.9
9	.58	.54	1.2	.02	.00	2.8	1.8	46	1.7	.46	1.0	14
10	.46	.35	.78	.01	.03	4.1	1.5	14	1.2	16	.82	3.5
11	.39	14	.50	.01	.00	3.7	4.7	7.1	.94	7.3	.66	1.3
12	4.9	1.7	.35	.00	.00	3.0	1.5	18	.87	5.6	41	.91
13	12	.61	.24	.00	.00	2.8	1.2	4.4	1.3	7.2	7.2	.85
14	8.9	5.4	1.0	.00	.00	4.3	1.3	8.0	2.1	1.8	1.8	.79
15	29	3.5	.90	.00	14	3.0	1.0	2.8	1.1	1.6	1.3	.79
16	3.2	40	.60	.00	7.7	1.5	1.1	1.9	.81	3.0	1.0	.59
17	1.7	1.7	.35	.00	.91	2.0	2.3	2.2	1.2	4.3	.95	.54
18	1.2	.99	.25	.00	.39	1.9	1.3	1.5	1.9	2.4	.75	.49
19	.98	10	.14	.00	.23	2.9	49	1.2	.83	1.4	.62	.69
20	4.4	2.9	.17	.00	.15	9.2	5.6	1.0	1.9	1.0	.61	.54
21	2.4	5.1	.20	.00	.10	1.6	2.3	3.8	1.2	.90	1.5	.42
22	2.2	1.4	.12	.00	.07	1.4	1.6	1.9	.75	1.5	.66	.34
23	.89	.96	.09	.00	12	1.4	1.4	1.0	.82	.85	.45	.52
24	.66	1.2	.08	.00	3.8	.98	1.6	.80	.67	.64	.38	2.3
25	.62	3.3	.07	5.7	3.2	1.9	16	.74	.88	.60	.35	.86
26	.53	.86	.06	.53	2.5	.93	3.0	.71	.65	.52	1.5	.70
27	2.9	.64	.05	.17	3.0	.69	1.9	4.3	1.1	.47	.48	.49
28	2.3	.55	.04	.11	7.9	1.3	2.2	7.2	31	5.5	.67	.30
29	.66	4.5	.05	.12	---	1.1	10	1.4	3.3	1.2	.90	.26
30	1.2	1.3	.12	.15	---	3.3	2.2	2.0	1.2	2.6	12	.23
31	.47	---	.22	.04	---	4.9	---	1.4	---	.78	4.8	---
TOTAL	104.71	107.79	14.88	9.33	57.52	76.40	261.9	181.35	96.22	73.00	107.06	51.57
MEAN	3.38	3.59	.48	.30	2.05	2.46	8.73	5.85	3.21	2.35	3.45	1.72
MAX	29	40	2.8	5.7	14	9.2	65	46	31	16	41	14
MIN	.39	.29	.04	.00	.00	.69	1.0	.71	.65	.46	.35	.23
AC-FT	208	214	30	19	114	152	519	360	191	145	212	102

CAL YR 1976 TOTAL 1151.07 MEAN 3.15 MAX 59 MIN .04 AC-FT 2280
WTR YR 1977 TOTAL 1141.73 MEAN 3.13 MAX 65 MIN .00 AC-FT 2260

16304200 KALUANUI STREAM NEAR PUNALUU--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1971-77.

REMARKS.--Miscellaneous chemical analyses published for this station for 1970 water year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	COLOR (PLATINUM-COBALT UNITS)	TURBIDITY (JTU)	HARDNESS (CA,MG) (MG/L)	NONCARBONATE HARDNESS (MG/L)	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG) (MG/L)	DISSOLVED SODIUM (NA) (MG/L)	PERCENT SODIUM
MAY 12...	0950	7.1	50	8	7	2	1.1	1.1	5.2	59

DATE	SODIUM ADSORPTION RATIO	DISSOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	ALKALINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)	DISSOLVED FLUORIDE (F) (MG/L)
MAY 12...	.8	.5	7	0	6	.9	2.8	9.5	.0

DATE	DISSOLVED SILICA (SIO2) (MG/L)	DISSOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	DISSOLVED SOLIDS (TONS PER AC-FT)	DISSOLVED SOLIDS (TONS PER DAY)	DISSOLVED NITRITE PLUS NITRATE (N) (MG/L)	DISSOLVED ORTHO. PHOSPHORUS (P) (MG/L)	DISSOLVED ORTHO PHOSPHATE (PO4) (MG/L)	DISSOLVED IRON (FE) (UG/L)	DISSOLVED MANGANESE (MN) (UG/L)
MAY 12...	3.8	28	.04	.54	.05	.00	.00	70	4

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)
NOV 05...	1000	.31	60	6.7	20.0
DEC 28...	1450	.04	80	6.9	21.0
MAR 24...	1000	.93	80	6.6	19.0
MAY 12...	0950	7.1	55	7.1	20.0
JUN 29...	1000	2.3	60	6.3	22.0
SEP 21...	1120	.42	70	7.0	23.5

16325000 KAMANANUI STREAM AT PUPUKEA MILITARY ROAD, NEAR MAUNAWAI

LOCATION.--Lat 21°37'25", long 158°01'04", Hydrologic Unit 20060000, on right bank 75 ft (23 m) upstream from Pupukea Military Road and 3.5 mi (5.6 km) southeast of Maunawai.

DRAINAGE AREA.--3.13 mi² (8.11 km²).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--Occasional low-flow measurements, water years 1961, 1963, June 1963 to current year.

GAGE.--Water-stage recorder and combination pipe culverts and paved road control. Altitude of gage is 590 ft (180 m), from topographic map.

REMARKS.--Records fair. No diversion above station.

AVERAGE DISCHARGE.--14 years, 11.0 ft³/s (0.312 m³/s), 7,970 acre-ft/yr (9.83 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,390 ft³/s (96.0 m³/s) Jan. 30, 1975, gage height, 10.06 ft (3.066 m), from rating curve extended above 42 ft³/s (1.19 m³/s) on basis of slope-area measurement at gage height 10.06 ft (3.066 m); no flow Aug. 26 to Sept. 1, Sept. 23, Oct. 15-25, 1971, many days in September 1975.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,300 ft³/s (36.8 m³/s) Apr. 19, gage height, 7.90 ft (2.408 m), from rating curve extended as explained above, no other peak above base of 950 ft³/s (26.9 m³/s); minimum, 0.03 ft³/s (0.001 m³/s), Feb. 14, 15.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.1	.97	1.6	.62	.20	18	5.0	4.4	6.5	1.4	1.5	2.3
2	.76	.69	1.1	2.4	.14	12	3.5	3.6	9.3	1.1	1.4	6.1
3	.62	2.0	.97	2.6	.12	9.1	45	3.9	4.4	1.0	1.4	5.7
4	.55	1.6	.90	.92	.10	5.0	49	19	3.8	1.0	1.4	1.9
5	.55	.69	.97	.55	.41	3.2	45	7.6	6.0	1.0	10	1.2
6	.62	.62	1.2	.35	.76	3.2	14	46	14	1.2	5.5	.97
7	13	.69	3.0	.26	.48	3.8	9.5	14	4.7	1.4	3.2	.90
8	2.9	.76	3.6	.20	.41	2.9	6.3	22	4.1	1.4	2.3	3.1
9	1.1	.97	1.6	.20	.26	5.4	4.8	58	3.2	1.2	1.7	5.7
10	.76	.90	.97	.18	.18	3.2	4.2	32	2.9	18	1.4	12
11	.55	7.7	.83	.16	.12	4.4	11	16	2.6	13	1.3	2.4
12	2.8	6.8	.69	.16	.08	15	5.1	25	2.8	22	20	1.3
13	22	1.8	.76	.16	.06	8.9	3.5	19	2.5	13	14	1.0
14	10	6.2	1.0	.14	.03	7.8	3.1	14	2.8	4.7	2.8	.90
15	35	3.9	1.1	.16	13	5.8	2.9	10	3.4	2.8	1.5	.83
16	8.8	77	.76	.16	11	4.7	2.9	6.9	2.6	2.2	1.1	.83
17	3.6	5.7	.62	.16	2.9	2.6	5.5	6.7	2.8	4.8	.97	.83
18	2.3	2.9	.62	.14	1.1	2.2	4.2	5.8	2.9	5.5	.90	.83
19	1.8	8.9	.55	.14	.62	3.7	132	5.5	3.4	6.5	.90	.76
20	4.6	7.4	.55	.16	.35	13	22	4.5	2.5	2.3	.90	.76
21	8.7	5.2	.48	.30	.23	5.0	9.5	5.3	3.0	1.7	1.0	.76
22	2.4	3.8	.48	.35	.20	3.8	6.3	6.1	2.6	1.5	1.4	.76
23	1.4	2.2	.48	.26	18	2.5	5.1	4.2	2.3	1.5	1.3	.76
24	1.1	1.7	.48	.20	6.8	2.2	5.1	3.8	2.0	1.4	.97	.97
25	1.1	3.6	.48	2.9	8.0	8.1	9.5	3.8	2.1	1.6	1.0	2.0
26	.97	2.9	.48	2.5	6.0	2.6	9.7	3.8	2.1	2.1	1.1	1.8
27	1.2	1.5	.41	.97	8.0	1.8	4.7	6.6	2.5	1.4	1.4	.83
28	9.0	1.3	.35	.62	50	1.6	4.2	20	15	4.5	1.3	.69
29	2.4	1.1	.30	.48	---	3.5	23	6.3	9.9	4.4	1.3	.55
30	1.4	2.4	.35	.41	---	4.2	7.8	4.7	2.2	1.9	12	.41
31	1.4	---	.48	.26	---	6.9	---	4.4	---	1.7	12	---
TOTAL	144.48	163.89	28.16	19.07	129.55	176.1	463.4	392.9	130.9	129.2	108.94	59.84
MEAN	4.66	5.46	.91	.62	4.63	5.68	15.4	12.7	4.36	4.17	3.51	1.99
MAX	35	77	3.6	2.9	50	18	132	58	15	22	20	12
MIN	.55	.62	.30	.14	.03	1.6	2.9	3.6	2.0	1.0	.90	.41
AC-FT	287	325	56	38	257	349	919	779	260	256	216	119

CAL YR 1976 TOTAL 2137.69 MEAN 5.84 MAX 77 MIN .30 AC-FT 4240
WTR YR 1977 TOTAL 1946.43 MEAN 5.33 MAX 132 MIN .03 AC-FT 3860

16325000 KAMANANUI STREAM AT PUPUKEA MILITARY ROAD, NEAR MAUNAWAI--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1976-77.

REMARKS.--Miscellaneous chemical analyses published for this station for 1970, 1973 water years.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTAN-TANEOUS DIS-CHARGE (CFS)	COLOR (PLAT-INUM-COBALT UNITS)	TUR-BID-ITY (JTU)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	DIS-SOLVED SODIUM (NA) (MG/L)	PERCENT SODIUM
MAR										
02...	1300	23	110	30	9	6	.9	1.6	8.0	64

DATE	SODIUM AD-SORP-TION RATIO	DIS-SOLVED PO-TAS-SIUM (K) (MG/L)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DIS-SOLVED SULFATE (SO4) (MG/L)	DIS-SOLVED CHLO-RIDE (CL) (MG/L)	DIS-SOLVED FLUO-RIDE (F) (MG/L)
MAR									
02...	1.2	.8	3	0	2	4.8	4.5	15	.0

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTI-TUENTS) (MG/L)	DIS-SOLVED SOLIDS (TONS PER AC-FT)	DIS-SOLVED SOLIDS (TONS PER DAY)	DIS-SOLVED NITRITE PLUS NITRATE (N) (MG/L)	DIS-SOLVED ORTHO. PHOS-PHORUS (P) (MG/L)	DIS-SOLVED ORTHO PHOS-PHATE (PO4) (MG/L)	DIS-SOLVED IRON (FE) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)
MAR									
02...	3.0	36	.05	1.94	.01	.03	.09	190	10

DATE	TIME	INSTAN-TANEOUS DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)
OCT					
01...	1100	1.1	56	6.0	24.0
NOV					
17...	1230	5.5	65	5.9	19.0
JAN					
04...	1150	.92	82	6.5	19.5
MAR					
02...	1300	20	70	6.0	21.5
02...	1345	18	70	6.0	21.5
APR					
13...	1430	3.3	80	6.5	24.0
MAY					
26...	1230	3.5	90	6.8	23.0
JUL					
07...	1045	1.4	68	6.6	24.0
AUG					
16...	1045	1.2	60	7.1	24.0

16330000 KAMANANUI STREAM AT MAUNAWAI

LOCATION.--Lat 21°38'20", long 158°03'27", Hydrologic Unit 20060000, on right bank at Maunawai, 25 ft (7.6 m) upstream from Elehaha Stream, 4.9 mi (7.9 km) northeast of Waialua School, and 7.3 mi (11.7 km) southwest of Kahuku School.

DRAINAGE AREA.--9.79 mi² (25.4 km²).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--February 1958 to current year.

REVISED RECORDS (FISCAL YEARS).--WSP 1937: 1958-60. (WATER YEARS).--WRD Hawaii 1974: 1971(P), 1972-73(M).

GAGE.--Water-stage recorder. Altitude of gage is 20 ft (6.1 m), from topographic map. Prior to May 13, 1965, at datum 2.00 ft (0.610 m) higher and May 13, 1965, to May 17, 1966, at datum 1.00 ft (0.305 m) higher.

REMARKS.--Records good. No diversion above station.

AVERAGE DISCHARGE.--19 years, 15.9 ft³/s (0.450 m³/s), 11,520 acre-ft/yr (14.1 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,610 ft³/s (159 m³/s) Apr. 19, 1974, gage height, 10.43 ft (3.179 m), from rating curve extended above 150 ft³/s (4.25 m³/s) on basis of slope-area measurements at gage heights 6.25 ft (1.905 m), 8.13 ft (2.478 m), 10.14 ft (3.091 m), and 10.43 ft (3.179 m); no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 2,070 ft³/s (58.6 m³/s) Apr. 19, gage height, 7.01 ft (2.137 m) from rating curve extended as explained above, no other peak above base of 1,300 ft³/s (36.8 m³/s); minimum, 0.02 ft³/s (0.001 m³/s) for several days in January and February.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.6	.98	2.6	.04	.13	10	5.6	5.6	4.5	2.0	1.0	4.4
2	.87	.68	1.3	.10	.05	9.0	3.3	3.9	12	1.3	.70	2.6
3	.48	.52	.83	2.5	.04	13	149	3.5	5.4	.95	.48	8.5
4	.45	1.5	.64	1.0	.03	9.4	171	23	4.0	.81	.40	3.3
5	.40	.78	.54	.52	.03	4.4	183	13	3.8	.77	4.2	1.5
6	.25	.48	.66	.39	.03	3.8	30	170	15	.74	6.8	.81
7	9.8	.34	1.4	.27	.03	4.0	16	45	6.1	.76	3.5	.50
8	4.1	.31	4.2	.18	.03	3.3	9.4	47	4.2	.82	2.1	.52
9	1.6	.34	2.2	.12	.04	5.0	6.4	112	3.4	.75	1.4	4.6
10	.71	.41	1.1	.09	.06	4.4	5.2	126	2.8	26	.79	20
11	.38	14	.65	.05	.08	4.1	10	36	2.6	25	.49	4.3
12	.28	15	.49	.04	.12	22	8.8	71	2.4	23	23	1.9
13	34	3.3	.43	.05	.06	13	4.6	60	2.2	16	39	.96
14	9.9	3.5	.42	.06	.03	12	3.7	38	2.2	7.6	5.0	.59
15	67	6.1	.67	.05	4.8	7.8	3.2	26	2.4	3.7	2.3	.35
16	18	216	.62	.04	15	7.8	3.1	13	2.0	2.7	1.3	.22
17	5.1	6.7	.44	.04	5.0	4.1	4.5	11	2.0	3.1	.84	.15
18	2.8	4.5	.32	.04	1.9	3.0	6.4	9.8	2.0	5.7	.56	.10
19	1.8	6.8	.25	.04	.77	2.8	352	7.4	2.3	7.0	.36	.08
20	2.3	10	.21	.06	.33	21	62	6.4	1.9	2.9	.24	.06
21	8.4	5.7	.18	.06	.14	11	16	6.2	1.8	1.8	.16	.04
22	3.8	5.0	.15	.03	.06	5.4	8.3	8.0	2.0	1.3	.15	.03
23	1.8	3.0	.08	.04	17	3.8	5.8	5.7	1.5	1.1	.47	.05
24	1.1	2.1	.06	.07	16	2.6	5.4	4.7	1.3	.88	.42	.05
25	.92	2.8	.05	.04	10	8.6	7.7	4.3	1.2	.80	.21	.05
26	.71	4.1	.04	1.2	6.3	4.6	16	4.0	1.1	1.3	.20	1.6
27	.63	2.2	.04	1.1	8.2	2.5	5.7	5.9	1.1	1.1	.27	.77
28	8.2	1.4	.07	.56	87	1.8	4.2	28	9.7	.83	.38	.32
29	4.0	1.0	.07	.29	---	2.6	34	10	12	6.6	.36	.16
30	1.7	1.3	.06	.22	---	4.8	14	5.4	3.9	2.6	11	.11
31	.99	---	.04	.16	---	5.4	---	4.8	---	1.4	23	---
TOTAL	194.07	320.84	20.81	9.45	173.26	217.0	1154.3	914.6	118.8	151.31	131.08	58.62
MEAN	6.26	10.7	.67	.30	6.19	7.00	38.5	29.5	3.96	4.88	4.23	1.95
MAX	67	216	4.2	2.5	87	22	352	170	15	26	39	20
MIN	.25	.31	.04	.03	.03	1.8	3.1	3.5	1.1	.74	.15	.03
AC-FT	385	636	41	19	344	430	2290	1810	236	300	260	116

CAL YR 1976 TOTAL 4550.15 MEAN 12.4 MAX 388 MIN .04 AC-FT 9030
WTR YR 1977 TOTAL 3464.14 MEAN 9.49 MAX 352 MIN .03 AC-FT 6870

16330000 KAMANANUI STREAM AT MAUNAWAI--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1971-77.

REMARKS.--Miscellaneous chemical analyses published for this station for 1968, 1970 water years.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTAN-TANEOUS DIS-CHARGE (CFS)	COLOR (PLAT-INUM-COBALT UNITS)	TUR-BID-ITY (JTU)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	DIS-SOLVED SODIUM (NA) (MG/L)	PERCENT SODIUM
FEB 24...	0950	14	180	40	12	6	1.6	2.0	8.4	58

DATE	SODIUM AD-SORP-TION RATIO	DIS-SOLVED PO-TAS-SIUM (K) (MG/L)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DIS-SOLVED SULFATE (SO4) (MG/L)	DIS-SOLVED CHLO-RIDE (CL) (MG/L)	DIS-SOLVED FLUO-RIDE (F) (MG/L)
FEB 24...	1.0	.8	7	0	6	8.9	9.5	15	.0

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTI-TUENTS) (MG/L)	DIS-SOLVED SOLIDS (TONS PER AC-FT)	DIS-SOLVED SOLIDS (TONS PER DAY)	DIS-SOLVED NITRITE PLUS NITRATE (N) (MG/L)	DIS-SOLVED ORTHO. PHOS-PHORUS (P) (MG/L)	DIS-SOLVED ORTHO PHOS-PHATE (PO4) (MG/L)	DIS-SOLVED IRON (FE) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)
FEB 24...	4.0	95	.06	1.70	.01	.07	.21	350	10

DATE	TIME	INSTAN-TANEOUS DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)
OCT 01...	1500	1.3	78	6.0	25.0
NOV 17...	1600	8.1	73	6.0	19.5
JAN 09...	1515	.85	105	6.3	21.0
FEB 24...	0950	14	76	6.1	20.0
24...	1010	14	76	6.1	20.0
APR 08...	1045	11	96	6.5	22.0
MAY 26...	1650	4.0	90	6.8	23.5
JUL 06...	1540	.67	92	6.5	26.5
AUG 16...	1315	1.2	81	7.0	24.0

16343000 HELEMANO STREAM AT HALEIWA

LOCATION.--Lat 21°34'40", long 158°06'12", Hydrologic Unit 20060000, on left bank at upstream side of private road bridge, 0.3 mi (0.5 km) east of Weed Circle, and 1.1 mi (1.8 km) southeast of Waialua School at Haleiwa.

DRAINAGE AREA.--14.2 mi² (36.8 km²).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--November 1967 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1.57 ft (0.479 m) above mean sea level.

REMARKS.--Records fair except those below 1.0 ft³/s (0.03 m³/s), which are poor. Minor regulation by reservoir on upstream tributary. Diversions into basin for irrigation of sugarcane; low flow affected by irrigation return flow and releases.

AVERAGE DISCHARGE.--9 years (1968-77), 12.3 ft³/s (0.348 m³/s), 8,910 acre-ft/yr (11.0 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 18,200 ft³/s (515 m³/s) Apr. 19, 1974, gage height, 22.5 ft (6.86 m), from floodmark, from rating curve extended above 300 ft³/s (8.50 m³/s) on basis of slope-area measurements at gage heights 10.54 ft (3.213 m), 14.2 ft (4.328 m), 15.34 ft (4.676 m), 17.63 ft (5.374 m), and 22.5 ft (6.86 m); no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 975 ft³/s (27.6 m³/s) Apr. 20, gage height, 8.45 ft (2.576 m), from rating curve extended as explained above, no peak above base of 1,200 ft³/s (34.0 m³/s); no flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.02	.00	.00	.00	.00	.00	.18	1.7	.25	.20	.02	.03
2	.00	.00	.00	.00	.00	.00	.14	.46	.30	.08	.02	.03
3	.01	.00	.00	.00	.00	.00	.12	.23	.25	.04	.01	.03
4	.01	.00	.01	.00	.00	.00	.14	.23	.20	.02	.01	.03
5	.01	.00	.00	.00	.00	.00	.14	.23	.15	.02	.01	.03
6	.02	.00	.00	.00	.00	.00	.14	4.8	.33	.02	.01	.04
7	.01	.00	.00	.00	.00	.00	.14	18	.25	.02	.01	.03
8	.01	.01	.02	.00	.00	.00	.12	3.0	.22	.02	.01	.03
9	.02	.17	.01	.00	.00	.00	.10	1.6	.15	.02	.01	.03
10	.00	.01	.02	.00	.00	.00	.07	48	.10	.02	.01	.03
11	.02	.06	.01	.00	.00	.00	.08	8.9	.08	.03	.01	.03
12	.04	.48	.00	.00	.00	.36	.07	13	.06	.03	.01	.03
13	.11	.02	.01	.00	.00	14	.05	35	.04	.03	.01	.03
14	.00	.01	.04	.00	.00	15	.08	6.7	.06	.02	.02	.03
15	.00	.01	.15	.00	.00	2.9	.12	18	.08	.02	.01	.03
16	.00	.01	.00	.00	.00	2.0	.14	5.3	.06	.01	.01	.08
17	.00	.00	.00	.00	.00	.74	.14	2.6	.04	.01	.01	.02
18	.00	.00	.00	.00	.00	.14	.10	1.3	.02	.02	.01	.02
19	.01	.00	.00	.00	.00	.09	.12	.77	.02	.02	.01	.02
20	.02	.05	.14	.00	.00	25	190	.59	.02	.03	.01	.02
21	.01	.01	.00	.00	.00	25	20	.59	.02	.04	.01	.02
22	.00	.12	.00	.00	.00	6.4	4.3	.50	.02	.03	.01	.03
23	.00	.05	.00	.00	.00	2.2	1.3	.46	.02	.03	.02	.03
24	.00	.02	.00	.00	.00	.54	.26	.38	.02	.03	.02	.03
25	.03	.03	.00	.00	.00	.18	.14	.35	.01	.02	.02	.03
26	.12	.01	.00	.00	.00	.12	.14	.33	.01	.02	.02	.03
27	.14	.00	.00	.00	.00	.08	.14	.35	.00	.02	.02	.02
28	.00	.00	.00	.00	.00	.09	.16	.60	.30	.02	.02	.02
29	.00	.08	.00	.00	---	.09	.16	.45	.80	.02	.02	.20
30	.02	.01	.00	.00	---	.58	3.2	.30	.30	.02	.03	.01
31	.00	---	.00	.00	---	.26	---	.20	---	.02	.03	---
TOTAL	.63	1.16	.41	.00	.00	95.77	221.99	174.92	4.18	.95	.45	1.04
MEAN	.020	.039	.013	.000	.000	3.09	7.40	5.64	.14	.031	.015	.035
MAX	.14	.48	.15	.00	.00	25	190	48	.80	.20	.03	.20
MIN	.00	.00	.00	.00	.00	.00	.05	.20	.00	.01	.01	.01
AC-FT	1.2	2.3	.8	.00	.00	190	440	347	8.3	1.9	.9	2.1

CAL YR 1976 TOTAL 1055.97 MEAN 2.89 MAX 207 MIN .00 AC-FT 2090
WTR YR 1977 TOTAL 501.50 MEAN 1.37 MAX 190 MIN .00 AC-FT 995

NOTE.--No gage-height record May 26 to July 5.

HAWAII, ISLAND OF OAHU

16343000 HELEMANO STREAM AT HALEIWA--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1971-77.

REMARKS.--Miscellaneous chemical analyses published for this station for 1968, 1970 water years.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	COLOR (PLATINUM-COBALT UNITS)	TURBIDITY (JTU)	HARDNESS (CA,MG) (MG/L)	NON-CARBONATE HARDNESS (MG/L)	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG) (MG/L)	DISSOLVED SODIUM (NA) (MG/L)	PERCENT SODIUM
APR 20...	1045	700	200	550	10	3	1.8	1.3	6.3	54

DATE	SODIUM ADSORPTION RATIO	DISSOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	ALKALINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)	DISSOLVED FLUORIDE (F) (MG/L)
APR 20...	.9	1.4	8	0	7	4.0	6.4	11	.1

DATE	DISSOLVED SILICA (SIO2) (MG/L)	DISSOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	DISSOLVED SOLIDS (TONS PER AC-FT)	DISSOLVED SOLIDS (TONS PER DAY)	DISSOLVED NITRITE PLUS NITRATE (N) (MG/L)	DISSOLVED ORTHO. PHOSPHORUS (P) (MG/L)	DISSOLVED ORTHO PHOSPHATE (PO4) (MG/L)	DISSOLVED IRON (FE) (UG/L)	DISSOLVED MANGANESE (MN) (UG/L)
APR 20...	2.7	36	.05	68.0	.23	.01	.03	180	10

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)
APR 13...	1000	.04	450	6.7	22.5
20...	1045	700	52	6.5	21.5
21...	1045	20	52	6.5	21.5
MAY 17...	1645	2.5	105	6.3	27.5
JUL 05...	1630	.02	680	6.6	24.5
AUG 16...	1520	.02	700	6.9	24.5

16345000 OPAEULA STREAM NEAR WAHIAWA

LOCATION.--Lat 21°33'55", long 158°00'10", Hydrologic Unit 20060000, on left bank 4.3 mi (6.9 km) northeast of Leilehua High Shool in Wahiawa and 8.1 mi (13.0 km) east of Waialua School.

DRAINAGE AREA.--2.98 mi² (7.72 km²).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--August 1959 to current year.

REVISEU RECORDS (FISCAL YEAR).--WSP 1937: 1960.

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 1,120 ft (341 m), from topographic map.

REMARKS.--Records fair. No diversion above station.

AVERAGE DISCHARGE.--18 years, 13.6 ft³/s (0.385 m³/s), 9,850 acre-ft/yr (12.1 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,540 ft³/s (157 m³/s) July 17, 1974, gage height, 11.94 ft (3.639 m), from rating curve extended above 110 ft³/s (3.12 m³/s) on basis of slope-area measurements at gage heights 6.74 ft (2.054 m) and 10.12 ft (3.085 m); minimum, no flow Jan. 24, 25, 1977.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,080 ft³/s (30.6 m³/s) May 9, gage height, 6.13 ft (1.868 m), from rating curve extended as explained above, no peak above base of 1,200 ft³/s (34.0 m³/s); no flow Jan. 24, 25.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.1	.93	2.3	.20	.19	6.6	9.8	5.5	5.2	2.3	1.8	4.1
2	1.5	.84	1.3	.40	.14	6.5	4.6	4.0	16	1.7	1.3	12
3	1.3	3.3	1.0	2.1	.11	14	17	3.6	8.4	1.6	2.9	12
4	3.5	2.9	.90	1.5	.08	11	28	22	6.7	1.5	1.6	3.9
5	3.0	1.4	.86	.89	.05	4.6	62	10	4.0	1.6	23	3.8
6	2.8	1.2	.92	.62	.09	7.2	20	67	24	1.7	12	2.6
7	22	1.5	7.1	.44	.03	8.6	17	16	5.9	1.6	7.1	3.6
8	4.2	1.6	6.7	.33	.17	6.5	9.9	23	5.2	1.8	5.8	10
9	1.8	2.1	2.9	.25	.27	8.3	6.5	88	4.1	1.6	3.1	12
10	1.2	1.7	1.5	.19	.19	12	4.8	45	3.6	43	1.9	19
11	.88	.96	1.0	.14	.12	21	12	16	2.8	26	1.5	4.3
12	1.2	4.8	.78	.11	.09	25	6.7	49	2.5	26	24	2.3
13	26	2.4	.69	.09	.06	14	4.3	21	2.4	20	37	1.8
14	10	3.7	2.1	.06	.05	14	3.8	26	4.6	7.7	5.5	1.5
15	89	5.7	2.1	.05	56	19	3.6	20	5.7	4.4	2.8	1.3
16	15	129	1.1	.03	45	9.5	3.5	7.5	3.3	3.6	2.1	1.2
17	5.0	10	.82	.03	6.4	5.4	5.0	6.3	2.3	12	1.7	1.2
18	3.0	3.6	.66	.03	2.3	11	7.5	6.2	2.8	7.5	1.5	1.0
19	2.2	35	.55	.03	1.2	13	51	4.6	4.1	7.3	1.4	1.0
20	4.8	18	.79	.03	.75	52	53	3.9	2.2	3.1	1.2	.91
21	9.9	9.4	.82	.03	.50	10	11	8.6	2.8	2.4	1.2	1.1
22	3.7	6.6	.57	.02	.38	9.2	5.9	12	2.6	2.1	2.1	.89
23	3.2	3.4	.44	.01	61	6.7	4.2	5.0	1.8	3.1	1.5	.77
24	1.9	2.4	.37	.00	18	5.1	4.9	3.4	1.9	2.0	1.0	2.3
25	1.5	7.9	.32	.00	19	5.5	21	2.9	1.6	1.6	.93	5.4
26	1.4	4.8	.28	.08	6.6	5.5	15	2.8	1.7	1.6	.96	2.1
27	1.4	2.2	.27	1.6	10	3.2	5.3	7.7	1.7	1.7	2.8	1.2
28	9.6	1.6	.26	.94	26	3.4	4.7	28	52	9.5	1.4	.95
29	4.0	1.3	.24	.54	---	6.0	37	7.3	14	6.9	.97	.76
30	1.7	1.6	.23	.35	---	4.2	14	4.8	4.1	3.1	11	.61
31	1.1	---	.22	.24	---	18	---	4.9	---	4.4	21	---
TOTAL	239.88	271.83	40.09	11.33	254.72	346.0	453.0	532.0	200.0	214.4	184.06	115.59
MEAN	7.74	9.06	1.29	.37	9.10	11.2	15.1	17.2	6.67	6.92	5.94	3.85
MAX	89	129	7.1	2.1	61	52	62	88	52	43	37	19
MIN	.88	.84	.22	.00	.03	3.2	3.5	2.8	1.6	1.5	.93	.61
AC-FT	476	539	80	22	505	686	899	1060	397	425	365	229

CAL YR 1976 TOTAL 3665.91 MEAN 10.0 MAX 222 MIN .22 AC-FT 7270
WTR YR 1977 TOTAL 2862.90 MEAN 7.84 MAX 129 MIN .00 AC-FT 5680

HAWAII, ISLAND OF OAHU

16345000 OPAEULA STREAM NEAR WAHIAWA

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1971-72, 1975-77.

REMARKS.--Miscellaneous chemical analyses published for this station for 1968, 1970, 1973-74 water years.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	COLOR (PLATINUM-COBALT UNITS)	TURBIDITY (JTU)	HARDNESS (CA,MG) (MG/L)	NONCARBONATE HARDNESS (MG/L)	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG) (MG/L)	DISSOLVED SODIUM (NA) (MG/L)	PERCENT SODIUM
APR 05...	1035	55	93	9	6	4	.8	1.0	5.0	62

DATE	SODIUM ADSORPTION RATIO	DISSOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	ALKALINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)	DISSOLVED FLUORIDE (F) (MG/L)
APR 05...	.9	.4	2	0	2	2.0	8.1	9.0	.1

DATE	DISSOLVED SILICA (SIO2) (MG/L)	DISSOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	DISSOLVED SOLIDS (TONS PER AC-FT)	DISSOLVED SOLIDS (TONS PER DAY)	DISSOLVED NITRITE PLUS NITRATE (N) (MG/L)	DISSOLVED ORTHO, PHOSPHOPHOPUS (P) (MG/L)	DISSOLVED ORTHO PHOSPHATE (PO4) (MG/L)	DISSOLVED IRON (FE) (UG/L)	DISSOLVED MANGANESE (MN) (UG/L)
APR 05...	1.5	28	.04	4.16	.25	.01	.03	170	0

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)
OCT 04...	1100	2.4	41	6.2	23.0
NOV 16...	1400	78	36	5.2	19.0
JAN 06...	1055	.65	55	5.6	18.5
FEB 25...	0940	20	55	5.4	19.0
APR 05...	1035	55	39	6.2	21.5
APR 08...	1415	9.4	67	6.4	22.0
MAY 17...	1100	5.8	34	6.1	23.5
JUL 05...	1345	1.5	31	7.0	23.5
AUG 24...	1200	1.1	46	7.3	26.0

16400000 HALAWA STREAM NEAR HALAWA
(National stream-quality accounting network station)

LOCATION.--Lat 21°09'31", long 156°45'53", Hydrologic Unit 20050000, on right bank 600 ft (183 m) downstream from Hipuapua Stream and 1.5 mi (2.4 km) west of Halawa.

DRAINAGE AREA.--4.62 mi² (11.97 km²).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--July 1917 to July 1932, November 1937 to current year.

REVISED RECORDS (FISCAL YEARS).--WSP 1319: 1928, 1929(M), 1930-31, 1938-50(M), drainage area. WSP 1719: 1954.

GAGE.--Water-stage recorder. Altitude of gage is 210 ft (64 m), from topographic map. Prior to June 25, 1923, at site 350 ft (107 m) upstream at different datum. June 25, 1923, to July 18, 1932, and Nov. 17, 1937, to Feb. 3, 1965, at present site at datum 2.00 ft (0.610 m) higher.

REMARKS.--Records good. No diversion above station.

AVERAGE DISCHARGE.--53 years (water years, 1918-31, 1939-77), 29.1 ft³/s (0.824 m³/s), 21,080 acre-ft/yr (26.0 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 26,900 ft³/s (762 m³/s) Feb. 4, 1965, gage height, 19.91 ft (6.069 m), from floodmarks, from rating curve extended above 86 ft³/s (2.44 m³/s) on basis of slope-area measurement of peak flow; minimum, 0.76 ft³/s (0.022 m³/s) about Nov. 23, 1962.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,470 ft³/s (41.6 m³/s) Nov. 16, gage height, 7.87 ft (2.399 m), from rating curve extended as explained above, no peak above base of 1,900 ft³/s (53.8 m³/s); minimum, 2.1 ft³/s (0.059 m³/s) Feb. 14, 15.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	13	12	9.8	3.3	5.1	10	68	14	30	10	8.4	17
2	8.1	58	7.5	11	27	9.8	131	12	15	8.1	7.3	15
3	6.6	52	6.6	4.8	11	10	206	12	15	9.8	12	26
4	6.1	8.5	6.0	3.5	6.3	9.7	497	19	9.0	8.6	7.7	14
5	6.1	17	5.7	5.1	5.2	8.8	289	18	24	26	83	8.0
6	23	18	6.0	3.7	9.0	16	144	98	76	17	15	37
7	55	7.9	25	3.1	5.5	14	60	23	16	25	10	177
8	7.8	13	9.1	2.9	4.4	10	38	42	21	9.2	7.5	29
9	5.9	14	16	3.0	3.3	15	23	93	9.6	8.2	6.3	71
10	5.2	24	14	3.4	2.8	8.4	18	22	7.8	67	5.7	24
11	4.9	21	7.2	2.8	2.5	7.6	50	33	7.2	57	5.6	13
12	143	11	5.6	2.6	2.4	27	21	16	6.7	142	116	9.7
13	24	7.3	31	2.6	2.3	45	18	38	6.1	48	18	10
14	13	79	8.4	3.0	2.2	18	24	41	7.2	29	9.1	11
15	110	48	6.0	2.5	98	16	14	19	14	17	7.0	7.7
16	33	364	5.4	2.4	41	9.0	11	12	8.0	21	6.2	6.8
17	13	67	9.3	2.3	13	6.7	13	27	12	49	5.6	14
18	9.6	21	5.7	2.3	6.3	5.8	14	14	9.7	35	5.1	14
19	7.9	41	4.7	2.2	4.4	6.3	23	10	9.8	15	4.7	6.9
20	17	54	4.3	30	3.7	10	55	8.7	11	10	21	5.9
21	11	20	26	30	3.3	9.6	29	20	8.2	8.9	11	5.2
22	14	13	9.4	4.7	23	51	15	12	26	8.4	6.8	4.9
23	8.0	11	5.3	3.2	113	22	10	19	12	7.1	5.9	5.9
24	6.5	9.7	5.3	2.8	92	9.6	47	11	14	6.3	5.0	9.2
25	6.8	20	4.5	2.7	23	8.7	76	8.8	11	6.1	6.8	5.5
26	6.0	8.7	4.0	2.6	16	6.1	28	8.4	7.3	5.5	6.0	11
27	14	21	3.8	2.4	33	5.3	22	30	33	10	4.9	5.8
28	21	9.5	3.7	2.9	25	12	64	55	33	64	19	4.4
29	8.5	10	3.5	3.5	---	25	117	16	17	11	12	4.0
30	6.3	46	3.4	9.6	---	65	21	12	28	9.1	39	3.7
31	9.7	---	3.2	3.6	---	54	---	12	---	21	24	---
TOTAL	624.0	1106.6	265.4	164.5	583.7	531.4	2146	775.9	504.6	769.3	501.6	576.6
MEAN	20.1	36.9	8.56	5.31	20.8	17.1	71.5	25.0	16.8	24.8	16.2	19.2
MAX	143	364	31	30	113	65	497	98	76	142	116	177
MIN	4.9	7.3	3.2	2.2	2.2	5.3	10	8.4	6.1	5.5	4.7	3.7
AC-FT	1240	2190	526	326	1160	1050	4260	1540	1000	1530	995	1140

CAL YR 1976 TOTAL 8908.7 MEAN 24.3 MAX 436 MIN 3.0 AC-FT 17670
WTR YR 1977 TOTAL 8549.6 MEAN 23.4 MAX 497 MIN 2.2 AC-FT 16960

16400000 HALAWA STREAM NEAR HALAWA--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1969-74, 1975 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTAN-TANEOUS DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)	TUR-BID-ITY (JTU)	FECAL COLI-FORM .7UM-MF (COL./ 100 ML)	STREP-TOCOCCI (COL-ONIES PER 100 ML)	FECAL STREP-TOCOCCI KF AGAR (COL. PER 100 ML)	HARD-NESS (CA,MG) (MG/L)
OCT										
19...	1315	7.9	54	6.4	20.0	2	B18	200	--	8
NOV										
16...	0930	330	37	5.7	18.0	20	490	800	--	9
DEC										
14...	1330	7.7	49	6.7	19.5	9	470	210	--	9
JAN										
11...	1215	2.8	65	6.9	19.0	2	10	--	500	10
FEB										
08...	1330	4.2	58	6.8	19.5	4	11	--	790	9
MAR										
09...	1200	9.0	63	6.3	18.0	3	15	--	650	9
APR										
06...	1145	175	49	6.2	17.0	7	150	--	820	8
MAY										
03...	1230	12	54	7.0	20.0	2	9	--	650	7
31...	1330	13	53	7.2	19.5	3	8	--	390	8
JUL										
11...	1300	53	49	6.5	20.5	10	510	--	1600	6
AUG										
15...	1400	6.9	54	6.8	22.5	4	47	--	2700	9
SEP										
12...	1445	9.8	52	7.1	23.0	2	10	--	720	7

DATE	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	DIS-SOLVED SODIUM (NA) (MG/L)	PERCENT SODIUM	SODIUM AD-SORP-TION RATIO	DIS-SOLVED PO-TAS-SIUM (K) (MG/L)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)
OCT									
19...	0	1.1	1.2	6.6	63	1.0	.6	9	0
NOV									
16...	5	2.3	.9	4.6	50	.7	.6	5	0
DEC									
14...	6	1.2	1.5	6.3	58	.9	.6	4	0
JAN									
11...	0	1.3	1.6	8.0	62	1.1	.6	15	0
FEB									
08...	2	1.3	1.3	7.2	63	1.1	.6	8	0
MAR									
08...	3	1.2	1.4	7.6	63	1.1	.6	7	0
APR									
06...	7	1.8	.9	5.8	58	.9	.6	2	0
MAY									
03...	3	1.0	1.0	6.8	67	1.2	.5	4	0
31...	3	1.6	.9	6.6	63	1.0	.5	6	0
JUL									
11...	4	1.0	.8	5.9	67	1.1	.5	2	0
AUG									
15...	3	2.0	1.0	6.8	60	1.0	.6	8	0
SEP									
12...	2	1.3	1.9	6.0	62	1.0	.6	6	0

B Results based on colony count outside the acceptable range (non-ideal colony count).

16400000 HALAWA STREAM NEAR HALAWA--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DIS-SOLVED SULFATE (SO4) (MG/L)	DIS-SOLVED CHLO-RIDE (CL) (MG/L)	DIS-SOLVED FLUO-RIDE (F) (MG/L)	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED SOLIDS (RESI-DUE AT 180 C) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTI-TUENTS) (MG/L)	DIS-SOLVED SOLIDS (TONS PER AC-FT)
OCT									
19...	7	5.7	4.9	10	.1	7.3	31	36	.04
NOV									
16...	4	16	5.4	8.0	.0	1.5	42	26	.06
DEC									
14...	3	1.3	6.0	9.9	.0	5.2	46	33	.06
JAN									
11...	12	3.0	3.6	12	.1	9.5	50	44	.07
FEB									
08...	7	2.0	3.6	13	.1	7.5	40	39	.05
MAR									
08...	6	5.6	3.3	13	.1	5.2	45	36	.06
APR									
06...	2	2.0	3.6	10	.1	2.7	37	27	.05
MAY									
03...	3	.6	7.5	11	.0	7.9	31	38	.04
31...	5	.6	5.2	12	.2	9.6	34	40	.05
JUL									
11...	2	1.0	4.1	9.9	.0	3.5	43	27	.06
AUG									
15...	7	2.0	3.7	9.9	.0	7.2	28	35	.04
SEP									
12...	5	.8	2.8	9.9	.0	7.4	33	32	.04

DATE	DIS-SOLVED SOLIDS (TONS PER DAY)	TOTAL NITRITE PLUS NITRATE (N) (MG/L)	TOTAL AMMONIA NITRO-GEN (N) (MG/L)	TOTAL ORGANIC NITRO-GEN (N) (MG/L)	TOTAL KJEL-DAHL NITRO-GEN (N) (MG/L)	TOTAL NITRO-GEN (N) (MG/L)	TOTAL NITRO-GEN (NO3) (MG/L)	TOTAL PHOS-PHORUS (P) (MG/L)	DIS-SOL-VED-PHOS-PHORUS (P) (MG/L)
OCT									
19...	.66	.01	--	--	.21	.22	.97	.02	--
NOV									
16...	37.4	.04	--	--	.39	.43	1.9	.14	--
DEC									
14...	.96	.03	--	--	.32	.35	1.6	.08	--
JAN									
11...	.38	.12	--	--	.17	.29	1.3	.04	--
FEB									
08...	.45	.08	--	--	.17	.25	1.1	.03	--
MAR									
08...	1.09	.01	--	--	.21	.22	.97	.01	--
APR									
06...	17.5	.03	--	--	.17	.20	.89	.02	--
MAY									
03...	1.00	.02	--	--	.00	.02	.10	.01	--
31...	1.19	.01	--	--	.41	.42	1.9	.03	--
JUL									
11...	6.15	.01	--	--	.37	.38	1.7	.08	--
AUG									
15...	.52	.01	--	--	.06	.07	.31	.06	--
SEP									
12...	.87	.02	.01	.06	.07	.09	.40	.02	.01

DATE	TIME	TOTAL ARSENIC (AS) (UG/L)	SUS-PENDED ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)	SUS-PENDED CAD-MIUM (CD) (UG/L)	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	SUS-PENDED CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	SUS-PENDED COBALT (CO) (UG/L)
OCT												
19...	1315	1	1	0	<10	<9	1	0	0	0	<50	<50
FEB												
08...	1330	0	0	0	<10	<9	1	0	0	0	<50	<49
APR												
06...	1145	0	0	0	<10	<9	1	0	0	0	<50	<50
JUL												
11...	1300	0	0	0	<10	<10	0	0	0	0	<50	<50

< Actual value is known to be less than the value shown

16400000 HALAWA STREAM NEAR HALAWA--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	SUS-PENDED COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)	TOTAL LEAD (PB) (UG/L)	SUS-PENDED LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	SUS-PENDED MAN-GANESE (MN) (UG/L)
OCT											
19...	0	<10	<8	2	150	50	<100	<90	10	10	0
FEB											
08...	1	<10	<10	0	320	70	<100	<95	5	10	0
APR											
06...	0	<10	<10	0	370	110	<100	<95	5	10	0
JUL											
11...	0	<10	<9	1	870	220	<100	<99	1	10	--

DATE	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	SUS-PENDED MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	SUS-PENDED SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL ZINC (ZN) (UG/L)	SUS-PENDED ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)
OCT											
19...	10	.0	.0	.0	0	0	0	0	0	0	2.3
FEB											
08...	10	.0	.0	.0	0	0	0	0	0	0	2.6
APR											
06...	10	.0	--	.0	0	0	0	20	20	0	3.2
JUL											
11...	0	.1	.1	.0	0	0	0	0	0	0	7.3

DATE	TIME	TOTAL PHYTO-PLANK-TON (CELLS PER ML)	CHLOR-A PERI-PHYTON CHROMO-SPECT-METRIC (MG/M2)	CHLOR-A PERI-PHYTON CHROMO-GRAPHIC FLUOROM (MG/M2)	CHLOR-B PERI-PHYTON CHROMO-SPECT-METRIC (MG/M2)	CHLOR-B PERI-PHYTON CHROMO-GRAPHIC FLUOROM (MG/M2)	BIOMASS CHLORO-PHYLL RATIO PERI-PHYTON (UNITS)	LENGTH OF EXPO-SURE (DAYS)
OCT								
19...	1315	34	1.75	--	.665	--	243	35
NOV								
16...	0930	230	--	--	--	--	--	--
DEC								
14...	1330	260	--	--	--	--	--	--
JAN								
11...	1215	88	--	--	--	--	--	--
FEB								
08...	1330	43	--	--	--	--	--	--
MAR								
08...	1200	21	--	--	--	--	--	--
APR								
06...	1145	190	--	--	--	--	--	--
MAY								
03...	1230	110	--	--	--	--	--	--
31...	1330	8	--	.481	--	.033	.09	35
JUL								
11...	1300	200	--	1.67	--	1.82	593	41
AUG								
15...	1400	89	--	--	--	--	--	--
SEP								
12...	1445	7	--	--	--	--	--	--

DATE	TIME	INSTAN-TANEOUS DIS-CHARGE (CFS)	SUS-PENDED SEDI-MENT (MG/L)	SUS-PENDED SEDI-MENT DIS-CHARGE (T/DAY)	SUS. SED. SIEVE DIAM. % FINER THAN .062 MM
OCT					
19...	1315	7.9	3	.06	100
NOV					
16...	0930	330	46	41	100
DEC					
14...	1330	7.7	9	.19	100
JAN					
11...	1215	2.8	2	.02	100
FEB					
08...	1330	4.2	5	.06	100
MAR					
08...	1200	9.0	2	.05	100
APR					
06...	1145	175	4	1.9	100
MAY					
03...	1230	12	3	.10	100
31...	1330	13	5	.18	100
JUL					
11...	1300	53	21	3.0	100
AUG					
15...	1400	6.9	5	.09	100
SEP					
12...	1445	9.8	4	.11	100

16400000 HALAWA STREAM NEAR HALAWA--Continued

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

PHYTOPLANKTON

DATE	OCT 19,76	NOV 16,76	DEC 14,76	JAN 11,77	FEB 8,77	MAR 8,77
TIME	1315	0930	1330	1215	1330	1200
TOTAL CELLS/ML	34	230	260	88	48	21
DIVERSITY: DIVISION	0.0	1.5	0.5	1.0	0.3	0.0
.CLASS	0.0	1.5	0.5	1.0	0.3	0.0
..ORDER	0.0	2.2	0.5	1.0	0.3	0.0
...FAMILY	1.8	3.0	0.6	2.1	2.2	1.9
....GENUS	1.8	3.2	1.5	2.2	2.2	1.9

ORGANISM	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT
CHLOROPHYTA (GREEN ALGAE)												
.CHLOROPHYCEAE												
..CHLOROCOCCALES												
...OOCYSTACEAE												
....ANKISTRODESMUS	--	-	--	-	--	-	--	-	3	6	--	-
....DICTYOSPHAERIUM	--	-	--	-	--	-	--	-	--	-	--	-
....TETRAEDRON	--	-	--	-	--	-	--	-	--	-	--	-
...SCENEDESMACEAE												
....SCENEDESMUS	--	-	22	10	--	-	--	-	--	-	--	-
..TETRASPORALES												
...PALMELLACEAE												
....GLOEOCYSTIS	--	-	6	2	--	-	--	-	--	-	--	-
..VOLVOCALES												
...CHLAMYDOMONADACEAE	--	-	--	-	--	-	--	-	--	-	--	-
....CHLAMYDOMONAS	--	-	11	5	--	-	--	-	--	-	--	-
CHRYSOPHYTA												
.BACILLARIOPHYCEAE												
..CENTRALES												
...BIDDULPHIACEAE												
....BIDDULPHIA	--	-	--	-	--	-	--	-	*	0	--	-
..PENNALES												
...ACHNANTHACEAE												
....ACHNANTHES	6#	17	17	7	--	-	5	6	9#	19	7#	33
....COCCONEIS	--	-	6	2	--	-	2	3	--	-	--	-
....RHOICOSPHENIA	--	-	--	-	--	-	--	-	--	-	--	-
...CYMBELLACEAE												
....CYMBELLA	--	-	--	-	--	-	5	6	3	6	3#	17
....RHOPALODIA	--	-	--	-	--	-	--	-	--	-	--	-
...DIATOMACEAE												
....DIATOMA	--	-	--	-	--	-	--	-	--	-	--	-
...EUNOTIACEAE												
....EUNOTIA	--	-	11	5	--	-	--	-	--	-	--	-
...FRAGILARIACEAE												
....SYNEDRA	6#	17	6	2	2	1	7	8	18#	38	--	-
...GOMPHONEMATACEAE												
....GOMPHONEIS	--	-	--	-	--	-	--	-	--	-	3#	17
....GOMPHONEMA	17#	50	6	2	22	9	27#	31	3	6	--	-
...NAVICULACEAE												
....FRUSTULIA	--	-	6	2	--	-	--	-	--	-	--	-
....NAVICULA	--	-	33	15	--	-	5	6	12#	25	7#	33
...NITZSCHIACEAE												
....NITZSCHIA	6#	17	6	2	2	1	--	-	--	-	--	-
CYANOPHYTA (BLUE-GREEN ALGAE)												
.CYANOPHYCEAE												
..CHROOCOCCALES												
...CHROOCOCCACEAE												
....ANACYSTIS	--	-	45#	20	--	-	--	-	--	-	--	-
..HORMOGONALES												
...NOSTOCACEAE												
....ANABAENA	--	-	56#	24	--	-	--	-	--	-	--	-
...OSCILLATORIACEAE	--	-	--	-	--	-	--	-	--	-	--	-
....LYNGBYA	--	-	--	-	110#	43	37#	42	--	-	--	-
....OSCILLATORIA	--	-	--	-	120#	47	--	-	--	-	--	-

NOTE: # - DOMINANT ORGANISM; EQUAL TO OR GREATER THAN 15%
* - OBSERVED ORGANISM; MAY NOT HAVE BEEN COUNTED; LESS THAN 1/24

16400000 HALAWA STREAM NEAR HALAWA--Continued

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

PHYTOPLANKTON

DATE	APR 6,77		MAY 3,77		MAY 31,77		JUL 11,77		AUG 15,77		SEP 12,77	
TIME	1145		1230		1330		1300		1400		1445	
TOTAL CELLS/ML	190		110		8		200		89		7	
DIVERSITY: DIVISION	0.6		0.9		0.0		1.4		1.2		0.0	
.CLASS	0.6		0.9		0.0		1.4		1.2		0.0	
..ORDER	0.6		0.9		0.0		1.4		1.2		0.0	
...FAMILY	0.8		1.3		0.0		1.7		2.1		0.0	
....GENUS	0.0		1.3		0.0		1.7		2.1		0.0	
ORGANISM	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT
CHLOROPHYTA (GREEN ALGAE)												
.CHLOROPHYCEAE												
..CHLOROCOCCALES												
...OOCYSTACEAE												
....ANKISTRODESMUS	--	-	--	-	--	-	--	-	--	-	7#	100
....DICTYOSPHAERIUM	--	-	--	-	*	0	--	-	--	-	--	-
....TETRAEDRON	--	-	--	-	--	-	--	-	6	7	--	-
...SCENEDESMACEAE												
....SCENEDESMUS	--	-	--	-	--	-	33#	16	--	-	--	-
..TETRASPORALES												
...PALMELLACEAE												
....GLOEOCYSTIS	--	-	--	-	--	-	--	-	--	-	--	-
..VOLVOCALES												
...CHLAMYDOMONADACEAE	3	2	--	-	--	-	--	-	--	-	--	-
....CHLAMYDOMONAS	--	-	--	-	--	-	--	-	--	-	--	-
CHRYSOPHYTA												
.BACILLARIOPHYCEAE												
..CENTRALES												
...BIDDULPHIACEAE												
....BIDDULPHIA	--	-	--	-	--	-	--	-	--	-	--	-
..PENNALES												
...ACHNANTHACEAE												
....ACHNANTHES	--	-	3	3	*	0	--	-	--	-	--	-
....COCCONEIS	--	-	--	-	*	0	--	-	--	-	--	-
....RHOICOSPHENIA	--	-	--	-	--	-	8	4	--	-	--	-
...CYMBELLACEAE												
....CYMBELLA	3	2	--	-	*	0	--	-	6	7	--	-
....RHOPALODIA	--	-	--	-	*	0	--	-	--	-	--	-
...DIATOMACEAE												
....DIATOMA	--	-	--	-	--	-	16	8	--	-	--	-
...EUNOTIACEAE												
....EUNOTIA	--	-	--	-	--	-	--	-	--	-	--	-
...FRAGILARIACEAE												
....SYNEDRA	3	2	--	-	--	-	--	-	6	7	--	-
...GOMPHONEMATACEAE												
....GOMPHONEIS	--	-	--	-	--	-	--	-	--	-	--	-
....GOMPHONEMA	6	3	18#	15	8#	100	--	-	6	7	--	-
...NAVICULACEAE												
....FRUSTULIA	--	-	--	-	--	-	--	-	--	-	--	-
....NAVICULA	6	3	15	13	*	0	25	12	38#	43	--	-
...NITZSCHIACEAE												
....NITZSCHIA	--	-	--	-	--	-	--	-	--	-	--	-
CYANOPHYTA (BLUE-GREEN ALGAE)												
.CYANOPHYCEAE												
..CHROOCOCCALES												
...CHROOCOCCACEAE												
....ANACYSTIS	--	-	--	-	--	-	--	-	--	-	--	-
..HORMOGONALES												
...NOSTOCACEAE												
....ANABAENA	--	-	--	-	--	-	--	-	--	-	--	-
...OSCILLATORIACEAE	16	8	--	-	--	-	--	-	--	-	--	-
....LYNGBYA	160#	81	--	-	--	-	--	-	--	-	--	-
....OSCILLATORIA	--	-	79#	69	--	-	120#	60	25#	29	--	-

NOTE: # - DOMINANT ORGANISM; EQUAL TO OR GREATER THAN 15%
* - OBSERVED ORGANISM, MAY NOT HAVE BEEN COUNTED; LESS THAN 1/2%

16403900 KAWAINUI STREAM NEAR PELEKUNU

LOCATION.--Lat 21°07'59", long 156°52'38", Hydrologic Unit 20050000, on right bank 900 ft (274 m) upstream from confluence with Kapuhi Stream, 2.1 mi (3.4 km) south of former village of Pelekunu, and 5.7 mi (9.2 km) north of Kamalo.

DRAINAGE AREA.--1.17 mi^2 (3.03 km^2).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--August 1968 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 770 ft (235 m), from topographic map.

REMARKS.--Records good except those above 90 ft^3/s (2.55 m^3/s), which are poor. No diversion above station.

AVERAGE DISCHARGE.--9 years, 8.16 ft^3/s (0.231 m^3/s), 5,910 acre-ft/yr (7.29 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,630 ft^3/s (46.2 m^3/s) Jan. 8, 1969, gage height, 7.36 ft (2.243 m), from rating curve extended above 43 ft^3/s (1.22 m^3/s); minimum, 0.70 ft^3/s (0.020 m^3/s) Sept. 22, 1968.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 172 ft^3/s (4.87 m^3/s) May 14, gage height, 3.61 ft (1.100 m), from rating curve extended above 43 ft^3/s (1.22 m^3/s), no peak above base of 300 ft^3/s (8.50 m^3/s); minimum, 1.2 ft^3/s (0.034 m^3/s) Feb. 13-15.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	7.9	2.2	4.7	1.9	1.7	10	17	7.4	12	2.3	3.4	3.0
2	5.9	5.0	4.3	5.4	4.0	9.8	28	6.6	9.4	2.1	3.4	4.8
3	4.7	5.5	4.0	2.2	2.8	12	27	6.2	7.7	2.4	3.2	4.7
4	4.1	3.0	3.7	1.9	1.8	8.9	59	7.2	6.6	2.9	2.9	3.5
5	3.6	4.8	3.6	2.0	1.7	8.7	57	7.9	7.7	5.4	7.7	2.6
6	6.0	6.1	3.9	1.8	1.8	12	30	30	12	4.7	5.8	2.9
7	8.5	4.3	8.8	1.7	1.6	11	24	14	7.6	4.8	6.5	5.2
8	4.9	4.6	4.8	1.8	1.6	9.9	19	13	6.6	3.0	4.2	4.1
9	4.1	3.6	4.0	3.6	1.4	9.5	13	14	5.8	3.0	3.6	4.6
10	3.7	3.1	3.8	2.2	1.3	7.7	11	10	5.2	8.6	3.3	3.8
11	3.6	2.7	3.4	1.7	1.3	7.2	16	8.7	4.8	9.9	3.2	3.0
12	10	2.6	3.2	1.6	1.3	11	11	7.7	4.5	17	17	2.6
13	5.9	2.4	4.7	1.6	1.2	13	10	15	4.2	11	7.9	2.6
14	5.1	4.9	3.3	1.6	1.2	11	9.3	55	4.8	8.4	5.9	2.4
15	8.1	5.2	3.5	1.5	15	14	7.7	20	4.8	6.7	5.0	2.2
16	5.4	38	3.0	1.5	12	9.6	7.2	13	4.0	8.1	4.4	2.1
17	4.5	25	2.8	1.5	6.3	8.1	7.2	10	5.6	12	4.0	3.6
18	4.0	12	2.6	1.4	4.2	7.6	7.6	8.5	4.0	11	3.6	2.7
19	3.6	12	2.5	1.4	3.4	8.7	13	7.3	3.9	8.7	3.4	2.1
20	3.7	15	2.4	1.5	3.0	10	20	6.5	4.0	7.2	3.5	1.9
21	3.3	11	2.8	4.0	2.6	11	16	8.0	3.3	6.3	3.2	1.8
22	3.0	8.5	2.4	1.7	5.7	15	13	7.5	3.2	5.3	3.0	1.9
23	2.7	7.1	2.2	1.5	13	13	10	6.1	2.9	4.6	2.7	2.7
24	2.9	9.7	2.3	1.4	28	10	8.5	5.7	3.1	4.2	2.7	3.4
25	2.7	12	2.1	1.5	14	8.6	8.2	4.9	3.2	3.8	3.7	2.1
26	2.8	7.8	2.0	1.4	11	7.3	6.8	5.6	2.6	3.6	3.2	1.9
27	4.4	6.7	2.4	1.3	16	6.7	6.3	9.6	2.7	3.6	2.3	1.9
28	3.5	6.0	2.1	2.7	15	14	7.5	15	2.5	9.6	2.9	1.8
29	2.5	5.7	2.0	1.7	---	16	16	9.1	2.4	4.4	2.7	1.7
30	2.3	6.0	1.9	1.5	---	19	8.9	7.5	2.4	3.8	4.4	1.6
31	2.2	---	1.8	1.4	---	26	---	7.9	---	4.6	4.7	---
TOTAL	139.6	242.5	101.0	59.9	173.9	346.3	495.2	354.9	153.5	193.0	137.4	85.2
MEAN	4.50	8.08	3.26	1.93	6.21	11.2	16.5	11.4	5.12	6.23	4.43	2.84
MAX	10	38	8.8	5.4	28	26	59	55	12	17	17	5.2
MIN	2.2	2.2	1.8	1.3	1.2	6.7	6.3	4.9	2.4	2.1	2.3	1.6
AC-FT	277	481	200	119	345	687	982	704	304	383	273	169

CAL YR 1976 TOTAL 2826.2 MEAN 7.72 MAX 89 MIN 1.6 AC-FT 5610
WTR YR 1977 TOTAL 2482.4 MEAN 6.80 MAX 59 MIN 1.2 AC-FT 4920

HAWAII, ISLAND OF MOLOKAI

16403900 KAWAINUI STREAM NEAR PELEKUNU--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1976-77.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	COLOR (PLATINUM-COBALT UNITS)	TURBIDITY (JTU)	HARDNESS (CA,MG) (MG/L)	NON-CARBONATE HARDNESS (MG/L)	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG) (MG/L)	DISSOLVED SODIUM (NA) (MG/L)	PERCENT SODIUM
OCT 28...	1500	3.2	4	1	46	24	13	3.3	7.9	27
MAR 23...	1200	13	5	1	37	12	9.9	3.0	7.7	31

DATE	SODIUM ADSORPTION RATIO	DISSOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	ALKALINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)	DISSOLVED FLUORIDE (F) (MG/L)
OCT 28...	.5	.4	27	0	22	2.2	23	9.3	.1
MAR 23...	.6	.4	30	0	25	2.4	13	14	.1

DATE	DISSOLVED SILICA (SIO2) (MG/L)	DISSOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	DISSOLVED SOLIDS (TONS PER AC-FT)	DISSOLVED SOLIDS (TONS PER DAY)	DISSOLVED NITRITE PLUS NITRATE (N) (MG/L)	DISSOLVED ORTHO, PHOSPHORUS (P) (MG/L)	DISSOLVED ORTHO PHOSPHATE (PO4) (MG/L)	DISSOLVED IRON (FE) (UG/L)	DISSOLVED MANGANESE (MN) (UG/L)
OCT 28...	17	85	.12	.73	.04	.01	.03	20	0
MAR 23...	16	79	.11	2.77	.06	.00	.00	20	0

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)
OCT 28...	1500	3.2	136	7.3	20.0
JAN 18...	1300	1.3	154	7.4	17.5
MAR 23...	1200	13	122	7.3	17.5
MAY 26...	1130	4.8	136	7.6	19.5
AUG 04...	1200	2.8	142	7.6	21.0

16404000 PELEKUNU STREAM NEAR PELEKUNU

LOCATION.--Lat 21°08'11", long 156°52'43", Hydrologic Unit 20050000, on left bank (revised), 0.4 mi (0.6 km) upstream from Pilipililau Stream, 1.9 mi (3.1 km) south of former village of Pelekunu, and 5.8 mi (9.3 km) north of Kamalo.

DRAINAGE AREA.--2.59 mi² (6.71 km²).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--December 1919 to January 1929, September 1937 to November 1947, June 1948 to August 1957, August 1971 to current year. Occasional low-flow measurements and annual maximum, water years 1968-71.

REVISED RECORDS (FISCAL YEAR).--WSP 1569: 1940(M).

GAGE.--Water-stage recorder. Altitude of gage is 552 ft (168.250 m) above mean sea level (levels by Bureau of Reclamation). Prior to Aug. 25, 1957, at site 300 ft (91 m) downstream at different datum.

REMARKS.--Records good. No diversion above station.

AVERAGE DISCHARGE.--32 years (water years, 1921-28, 1938-47, 1949-56, 1972-77), 16.4 ft³/s (0.464 m³/s), 11,880 acre-ft/yr (14.6 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,120 ft³/s (117 m³/s) Nov. 20, 1940, gage height, 6.81 ft (2.076 m), from rating curve extended above 39 ft³/s (1.10 m³/s) by test on model of station site; minimum, 2.2 ft³/s (0.062 m³/s) Sept. 29, Oct. 3, 4, 6, 12-18, 1974.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of undetermined magnitude destroyed station on Jan. 26, 1948.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 338 ft³/s (9.57 m³/s) May 14, gage height, 3.23 ft (0.985 m), no peak above base of 460 ft³/s (13.0 m³/s); minimum, 2.9 ft³/s (0.082 m³/s) Feb. 12-15.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	12	4.0	8.3	4.0	3.8	18	38	13	24	5.5	6.1	5.5
2	8.3	12	7.9	11	8.3	19	73	12	17	5.2	6.1	8.6
3	7.1	10	7.5	4.3	5.5	25	70	12	13	5.5	5.8	8.0
4	6.4	5.2	7.1	4.0	4.0	16	109	13	11	5.8	5.5	5.8
5	5.8	10	6.8	4.0	3.8	16	100	15	15	10	13	4.9
6	12	10	7.1	4.0	3.8	29	74	77	27	8.9	9.6	5.3
7	16	6.8	17	3.8	3.5	22	61	28	13	9.1	11	9.0
8	7.5	7.1	8.3	4.0	3.5	20	48	27	11	6.1	6.8	6.8
9	6.4	6.1	7.1	6.8	3.3	19	29	27	9.6	6.1	6.1	7.1
10	6.1	5.5	6.8	4.9	3.3	14	24	19	8.7	18	5.8	6.4
11	6.1	5.2	6.1	4.3	3.1	13	38	15	8.3	17	5.8	5.5
12	22	4.9	5.8	4.0	3.1	28	24	14	7.9	35	37	4.9
13	9.1	4.6	8.0	3.8	2.9	32	21	40	7.5	19	12	4.9
14	7.9	7.9	5.8	3.8	2.9	22	19	131	8.3	13	8.7	4.6
15	13	9.8	10	3.5	48	34	15	43	8.3	10	7.5	4.6
16	8.3	88	5.8	3.5	27	18	14	25	7.5	13	7.1	4.6
17	7.1	54	5.5	3.3	10	14	15	20	9.6	22	6.4	6.1
18	6.4	21	5.2	3.3	7.1	14	17	16	7.5	20	6.1	5.2
19	6.1	24	4.9	3.3	6.1	18	22	14	7.5	13	6.1	4.3
20	6.1	32	4.9	3.8	5.5	20	42	12	7.9	11	6.1	4.0
21	5.5	19	5.8	8.5	5.2	25	33	16	6.8	9.6	5.8	4.0
22	5.2	14	4.9	4.0	14	34	25	14	6.8	8.3	5.5	4.3
23	4.9	12	4.9	3.5	36	27	19	12	6.4	7.5	5.2	4.9
24	5.2	18	4.9	3.3	70	20	16	11	6.8	6.8	5.2	6.1
25	4.9	26	4.6	3.5	29	16	16	9.1	7.1	6.4	6.1	4.3
26	5.2	13	4.6	3.5	23	13	13	11	6.1	6.1	5.5	4.0
27	6.8	11	5.2	3.3	37	13	13	19	6.4	6.8	4.6	3.8
28	6.1	10	4.6	5.5	32	33	15	31	5.8	17	5.2	3.8
29	4.4	9.6	4.3	3.8	---	34	36	15	5.5	7.1	5.2	3.5
30	4.3	11	4.0	3.5	---	46	17	13	5.5	6.8	7.5	3.3
31	4.0	---	4.0	3.3	---	64	---	14	---	7.1	7.7	---
TOTAL	236.2	471.7	197.7	133.1	404.7	736	1056	738.1	292.8	342.7	242.1	158.1
MEAN	7.62	15.7	6.38	4.29	14.5	23.7	35.2	23.8	9.76	11.1	7.81	5.27
MAX	22	88	17	11	70	64	109	131	27	35	37	9.0
MIN	4.0	4.0	4.0	3.3	2.9	13	13	9.1	5.5	5.2	4.6	3.3
AC-FT	469	936	392	264	803	1460	2090	1460	581	680	480	314

CAL YR 1976 TOTAL 5069.2 MEAN 13.9 MAX 119 MIN 3.3 AC-FT 10050
WTR YR 1977 TOTAL 5009.2 MEAN 13.7 MAX 131 MIN 2.9 AC-FT 9940

16404000 PELEKUNU STREAM NEAR PELEKUNU--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1971-77.

REMARKS.--Miscellaneous chemical analyses published for this station for 1969-70 water years.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTAN-TANEOUS DIS-CHARGE (CFS)	COLOR (PLAT-INUM-COBALT UNITS)	TUR-BID-ITY (JTU)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	DIS-SOLVED SODIUM (NA) (MG/L)	PERCENT SODIUM
OCT										
29...	1030	4.6	2	1	44	7	12	3.5	9.0	30
MAR										
24...	1145	18	3	1	39	9	10	3.5	8.8	32

DATE	SODIUM AD-SORP-TION RATIO	DIS-SOLVED PO-TAS-SIUM (K) (MG/L)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DIS-SOLVED SULFATE (SO4) (MG/L)	DIS-SOLVED CHLO-RIDE (CL) (MG/L)	DIS-SOLVED FLUO-RIDE (F) (MG/L)
OCT									
29...	.6	.8	46	0	38	7.4	13	12	.1
MAR									
24...	.6	.6	37	0	30	.9	11	14	.1

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTI-TUENTS) (MG/L)	DIS-SOLVED SOLIDS (TONS PER AC-FT)	DIS-SOLVED SOLIDS (TONS PER DAY)	DIS-SOLVED NITRITE PLUS NITRATE (N) (MG/L)	DIS-SOLVED ORTHO. PHOS-PHORUS (P) (MG/L)	DIS-SOLVED ORTHO PHOS-PHATE (PO4) (MG/L)	DIS-SOLVED IRON (FE) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)
OCT									
29...	22	96	.13	1.19	.10	.01	.03	10	0
MAR									
24...	20	87	.12	4.23	.09	.01	.03	10	0

DATE	TIME	INSTAN-TANEOUS DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)
OCT					
29...	1030	4.6	136	7.0	20.0
JAN					
18...	1545	3.3	144	7.3	18.0
MAR					
24...	1145	18	134	7.8	18.0
MAY					
27...	1010	13	116	7.6	20.0
AUG					
04...	1630	5.2	138	7.8	22.0

16404200 PILIPILILAU STREAM NEAR PELEKUNU

LOCATION.--Lat 21°08'08", long 156°53'09", Hydrologic Unit 20050000, on right bank 500 ft (152 m) downstream from left-bank tributary, 1.9 mi (3.1 km) south of former village of Pelekunu, and 5.8 mi (9.3 km) north of Kamalo.

DRAINAGE AREA.--0.49 mi² (1.27 km²)

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--August 1968 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 1,000 ft (305 m), from topographic map.

REMARKS.--Records good except those above 8 ft³/s (0.23 m³/s), which are poor. No diversion above station.

AVERAGE DISCHARGE.--9 years, 1.34 ft³/s (0.038 m³/s), 971 acre-ft/yr (1.20 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 274 ft³/s (7.76 m³/s) Dec. 8, 1973, gage height, 3.78 ft (1.152 m), from rating curve extended above 3.8 ft³/s (0.11 m³/s); minimum, 0.50 ft³/s (0.014 m³/s) Sept. 2-8, 21-29, 1975.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 87 ft³/s (2.46 m³/s) May 14, gage height, 2.98 ft (0.908 m), from rating curve extended above 3.8 ft³/s (0.11 m³/s), no other peak above base of 80 ft³/s (2.27 m³/s); minimum, 0.56 ft³/s (0.016 m³/s) on several days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.69	.58	.67	.62	.63	.95	1.9	1.2	1.0	.65	.68	.59
2	.63	1.3	.66	.75	.81	1.2	3.8	1.2	.98	.65	.68	.62
3	.62	1.3	.70	.64	.69	1.6	3.6	1.2	.94	.68	.68	.65
4	.63	.63	.74	.63	.61	1.0	5.2	1.1	.90	.68	.68	.59
5	.62	.80	.71	.62	.60	1.1	4.1	1.2	1.2	.74	.90	.59
6	1.0	.80	.72	.63	.60	1.5	3.4	2.7	2.3	.71	.78	.65
7	1.1	.71	.97	.62	.59	1.3	3.0	1.3	.74	.68	.74	.71
8	.66	.70	.73	.64	.59	1.1	2.7	1.3	.71	.62	.71	.65
9	.63	.66	.68	.69	.59	1.1	2.0	1.2	.68	.62	.68	.65
10	.62	.65	.66	.64	.59	.94	1.9	1.1	.68	.74	.65	.62
11	.64	.64	.64	.62	.59	.93	2.1	1.1	.68	.68	.65	.62
12	1.2	.63	.66	.62	.58	2.5	1.6	1.2	.68	.78	1.1	.59
13	.69	.63	.71	.62	.57	2.3	1.5	2.1	.68	.71	.65	.59
14	.65	.69	.68	.63	.57	1.4	1.4	12	.71	.62	.62	.59
15	.81	1.4	.71	.60	3.0	2.1	1.3	1.6	.68	.65	.62	.59
16	.67	13	.69	.63	1.7	1.2	1.3	1.3	.68	.68	.62	.59
17	.63	3.2	.68	.63	.79	1.1	1.4	1.2	.71	.78	.62	.62
18	.62	1.1	.64	.60	.70	1.1	1.5	1.2	.65	.74	.62	.56
19	.61	1.2	.63	.59	.66	1.3	1.5	1.2	.71	.71	.65	.56
20	.63	1.7	.63	.64	.65	1.2	1.7	1.1	.68	.68	.65	.56
21	.62	.93	.71	.99	.64	1.5	1.9	1.1	.65	.71	.62	.56
22	.60	.79	.65	.60	1.1	1.7	1.6	1.1	.65	.68	.62	.56
23	.60	.77	.65	.59	2.2	1.3	1.4	1.1	.65	.65	.62	.59
24	.61	1.3	.65	.60	3.8	1.1	1.3	1.1	.65	.68	.62	.59
25	.60	2.0	.64	.62	1.5	.98	1.4	1.1	.65	.68	.65	.59
26	.62	.93	.64	.59	1.1	.94	1.2	1.1	.65	.68	.62	.59
27	.65	.84	.67	.60	1.4	.94	1.3	1.3	.65	.68	.59	.59
28	.61	.80	.65	.70	1.4	1.7	1.3	1.2	.65	.78	.62	.59
29	.59	.80	.64	.60	---	1.7	1.9	1.1	.65	.65	.59	.59
30	.58	.74	.64	.59	---	2.3	1.3	.98	.65	.68	.65	.59
31	.58	---	.60	.60	---	3.6	---	.98	---	.68	.62	---
TOTAL	21.01	42.22	21.05	19.74	29.25	44.68	61.5	49.66	23.49	21.35	20.80	18.03
MEAN	.68	1.41	.68	.64	1.04	1.44	2.05	1.60	.78	.69	.67	.60
MAX	1.2	13	.97	.99	3.8	3.6	5.2	12	2.3	.78	1.1	.71
MIN	.58	.58	.60	.59	.57	.93	1.2	.98	.65	.62	.59	.56
AC-FT	42	84	42	39	58	89	122	99	47	42	41	36

CAL YR 1976 TOTAL 364.92 MEAN 1.00 MAX 13 MIN .54 AC-FT 724
WTR YR 1977 TOTAL 372.78 MEAN 1.02 MAX 13 MIN .56 AC-FT 739

HAWAII, ISLAND OF MOLOKAI

16404200 PILIPILILAU STREAM NEAR PELEKUNU--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1976-77.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTAN-TANEOUS DIS-CHARGE (CFS)	COLOR (PLAT-INUM-COBALT UNITS)	TUR-BID-ITY (JTU)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	DIS-SOLVED SODIUM (NA) (MG/L)	PERCENT SODIUM
OCT 28...	1515	.59	4	5	48	4	11	5.0	12	34
MAR 23...	1030	1.3	4	3	47	0	10	5.4	12	34

DATE	SODIUM AD-SORP-TION RATIO	DIS-SOLVED PO-TAS-SIUM (K) (MG/L)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DIS-SOLVED SULFATE (SO4) (MG/L)	DIS-SOLVED CHLO-RIDE (CL) (MG/L)	DIS-SOLVED FLUO-RIDE (F) (MG/L)
OCT 28...	.8	2.2	54	0	44	5.5	3.7	16	.1
MAR 23...	.8	1.9	59	0	48	1.9	2.5	17	.1

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTI-TUENTS) (MG/L)	DIS-SOLVED SOLIDS (TONS PER AC-FT)	DIS-SOLVED SOLIDS (TONS PER DAY)	DIS-SOLVED NITRITE PLUS NITRATE (N) (MG/L)	DIS-SOLVED ORTHO. PHOS-PHORUS (P) (MG/L)	DIS-SOLVED ORTHO PHOS-PHATE (PO4) (MG/L)	DIS-SOLVED IRON (FE) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)
OCT 28...	41	119	.16	.19	.29	.06	.18	20	10
MAR 23...	37	116	.15	.41	.23	.04	.12	30	0

DATE	TIME	INSTAN-TANEOUS DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)
OCT 28...	1515	.59	157	7.2	20.5
JAN 18...	1330	.59	157	7.6	18.0
MAR 23...	1030	1.3	158	7.7	19.0
MAY 26...	1230	1.1	155	7.7	21.0

16405100 MOLOKAI TUNNEL AT EAST PORTAL

LOCATION.--Lat 21°08'38", long 156°55'16", Hydrologic Unit 20050000, on left bank 100 ft (30 m) downstream from the east portal, 5.3 mi (8.5 km) southeast of Kalaupapa, and 7.5 mi (12.1 km) northeast of Kaunakakai.

PERIOD OF RECORD.--July 1966 to current year.

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 989 ft (301.4 m), from tunnel plans.

REMARKS.--Records good. Tunnel diverts from Waikolu Stream and two tributaries; diversion is augmented by water pumped from two wells and from the stream at elevation 728 ft (221.9 m) in Waikolu Valley near the east portal. Periodic determinations of water temperature for the current year are published elsewhere in this report.

AVERAGE DISCHARGE.--11 years, 2.93 ft^3/s (0.083 m^3/s), 2,120 acre-ft/yr (2.61 hm^3/yr).

EXTREMES FOR THE PERIOD OF RECORD.--Maximum daily discharge, 29 ft^3/s (0.82 m^3/s) Jan. 27, May 18, 1973; no flow at times.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.9	.95	2.0	.90	1.6	3.2	6.6	2.4	6.3	1.4	2.2	2.1
2	2.0	3.9	1.7	3.6	4.0	9.4	15	2.1	4.4	1.4	1.4	3.5
3	1.4	8.0	1.4	1.8	4.1	9.1	14	2.3	2.6	1.4	1.4	4.4
4	1.2	2.1	1.3	1.1	2.3	4.0	26	2.6	2.0	1.5	1.4	2.7
5	1.1	3.5	1.3	1.1	1.5	4.0	21	4.6	3.4	4.6	4.2	1.6
6	3.6	6.2	1.4	.99	1.3	11	14	17	12	5.6	5.3	1.6
7	9.1	3.8	5.6	.90	1.1	7.0	13	4.6	3.4	6.0	5.0	3.4
8	2.9	3.1	2.7	.90	1.1	5.9	8.4	4.0	2.4	2.6	2.7	3.6
9	1.6	2.8	2.0	1.3	1.1	6.4	3.6	5.3	1.9	2.6	1.5	2.1
10	1.3	1.6	1.4	1.9	.99	3.4	4.0	3.1	1.7	5.2	2.0	2.6
11	1.2	1.2	1.3	1.3	.99	3.1	9.6	2.3	1.6	6.4	2.7	1.6
12	5.5	1.1	1.1	1.1	.90	12	5.3	2.1	1.5	10	10	2.1
13	3.4	.90	1.4	.99	.90	12	4.0	5.5	1.5	5.3	5.0	1.3
14	2.1	1.4	1.2	.90	1.0	4.6	4.4	21	1.6	3.6	3.4	1.3
15	5.1	6.2	1.5	.90	14	9.8	3.4	4.6	2.0	2.4	3.2	1.3
16	3.5	23	1.7	.90	11	3.2	3.2	3.1	1.7	2.1	1.9	1.2
17	1.9	11	1.3	.94	3.1	2.6	3.2	2.2	2.7	6.2	1.3	1.3
18	1.5	2.7	1.1	.90	1.9	2.9	4.6	2.0	2.9	6.3	1.2	1.6
19	1.1	7.2	1.1	.90	1.4	5.5	3.6	2.0	2.4	3.8	1.2	1.5
20	.99	13	.99	1.1	1.2	5.3	5.3	1.9	2.3	2.1	1.2	1.3
21	.99	3.4	1.2	3.0	1.1	6.8	8.4	2.0	2.3	1.6	1.2	1.2
22	.90	2.5	1.2	1.7	8.3	9.5	4.4	2.3	1.9	1.5	1.2	1.2
23	.90	1.9	1.1	1.2	12	5.4	3.2	2.5	1.7	1.4	1.2	1.3
24	.90	2.5	.99	1.1	21	4.0	2.7	2.3	1.6	1.3	1.2	1.6
25	1.1	11	.99	1.3	5.3	5.4	2.9	2.0	1.6	1.9	1.2	1.5
26	.99	3.1	.90	1.1	4.4	4.3	3.2	2.0	1.5	3.1	1.2	1.5
27	1.5	2.1	1.0	.99	8.3	3.7	2.4	5.4	1.6	3.1	1.2	1.3
28	2.9	1.7	.99	2.1	7.2	9.6	2.7	9.2	1.4	6.2	1.2	1.2
29	1.5	1.7	.90	1.9	---	10	7.9	4.0	1.4	4.1	1.3	1.2
30	1.1	2.9	.90	1.3	---	13	3.4	2.9	1.4	3.3	2.0	1.2
31	.99	---	.90	1.2	---	16	---	3.3	---	3.3	3.6	---
TOTAL	68.16	136.45	44.56	41.31	123.08	212.1	213.4	132.6	76.7	111.3	74.7	55.3
MEAN	2.20	4.55	1.44	1.33	4.40	6.84	7.11	4.28	2.56	3.59	2.41	1.84
MAX	9.1	23	5.6	3.6	21	16	26	21	12	10	10	4.4
MIN	.90	.90	.90	.90	.90	2.6	2.4	1.9	1.4	1.3	1.2	1.2
AC-FT	135	271	88	82	244	421	423	263	152	221	148	110

CAL YR 1976 TOTAL 1149.30 MEAN 3.14 MAX 23 MIN .00 AC-FT 2280
WTR YR 1977 TOTAL 1289.66 MEAN 3.53 MAX 26 MIN .90 AC-FT 2560

HAWAII, ISLAND OF MOLOKAI

16405300 MOLOKAI TUNNEL AT WEST PORTAL

LOCATION.--Lat 21°07'27", long 156°59'50", Hydrologic Unit 20050000, on left bank 50 ft (15 m) upstream from the west portal, 2.5 mi (4.0 km) northeast of Kaunakakai, and 4.7 mi (7.6 km) south of Kalaupapa.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--July 1965 to current year.

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 970 ft (295.7 m), from tunnel plans.

REMARKS.--Records excellent. Tunnel diverts from Waikolu Stream and two tributaries; diversion is augmented by water pumped from two wells and from the stream at elevation 728 ft (221.9 m) in Waikolu Valley near east portal and one well in the tunnel near east portal. Water is used for irrigation in west-central Molokai.

AVERAGE DISCHARGE.--12 years, 5.18 ft^3/s (0.147 m^3/s), 3,750 acre-ft/yr (4.62 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 34 ft^3/s (0.96 m^3/s) Feb. 5, 1972; minimum daily, 1.8 ft^3/s (0.051 m^3/s) Oct. 15, 1967.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.0	3.0	3.9	2.6	3.1	5.3	8.8	4.5	8.3	3.5	4.5	4.5
2	3.9	3.6	3.7	5.0	5.3	10	16	4.5	7.3	3.5	3.5	4.5
3	3.1	12	3.5	3.4	6.3	11	14	4.3	5.0	3.3	3.5	6.8
4	3.1	4.3	3.1	3.0	4.1	5.8	26	4.5	4.5	3.5	3.7	5.3
5	3.0	4.4	3.1	2.8	3.1	5.5	24	6.5	4.9	6.2	6.2	4.1
6	3.0	9.3	3.2	2.8	3.0	13	16	18	14	7.5	7.2	3.8
7	12	6.0	7.3	2.8	3.1	9.5	14	7.0	5.8	8.3	7.8	5.3
8	4.8	5.1	5.0	2.8	3.0	6.7	11	6.5	4.5	5.0	5.0	6.3
9	3.5	4.8	4.1	3.1	3.0	8.6	5.5	7.8	4.1	4.5	3.9	4.5
10	3.1	3.7	3.5	3.7	2.8	5.3	6.3	5.5	3.7	7.0	4.2	4.8
11	3.0	3.1	3.3	3.1	2.8	4.8	12	4.8	3.7	8.7	4.7	4.1
12	7.1	3.0	3.1	3.0	2.8	14	7.8	4.3	3.7	12	12	3.9
13	5.3	2.8	3.3	2.8	2.8	14	6.3	6.1	3.7	7.7	7.6	3.3
14	3.9	3.1	3.4	2.8	2.9	6.8	6.8	22	3.7	6.0	6.0	3.3
15	6.3	7.8	3.5	2.8	13	12	5.8	7.5	4.2	4.5	5.5	3.3
16	5.5	23	3.5	2.8	14	5.3	5.5	5.5	3.9	4.3	4.1	3.3
17	3.7	12	3.1	2.7	5.0	4.3	5.3	4.5	4.8	8.2	3.5	3.3
18	3.2	4.5	3.0	2.6	3.9	4.5	6.8	4.5	5.0	8.2	3.5	3.5
19	3.0	8.4	3.0	2.6	3.3	7.5	6.3	4.3	4.8	6.5	3.5	3.5
20	2.8	15	2.8	2.6	3.1	7.0	7.8	4.1	4.3	4.3	3.5	3.3
21	2.8	5.5	3.0	4.2	3.0	7.7	11	4.1	4.5	3.7	3.5	3.1
22	2.8	4.6	3.0	3.3	9.0	11	7.3	4.5	4.1	3.7	3.5	3.1
23	2.8	3.9	2.8	2.8	13	8.3	5.5	4.8	3.7	3.5	3.5	3.1
24	2.8	3.9	2.8	2.7	23	5.6	4.8	4.5	3.7	3.5	3.5	3.3
25	3.2	13	2.8	3.0	7.8	7.5	5.3	4.3	3.7	4.0	3.5	3.5
26	2.8	5.3	2.8	2.8	5.8	6.4	5.5	4.1	3.7	5.0	3.5	3.3
27	3.0	4.3	2.9	2.8	10	5.6	4.8	7.8	3.9	5.0	3.5	3.1
28	4.5	3.9	2.8	3.3	9.1	11	4.8	11	3.5	7.7	3.5	3.1
29	3.3	3.8	2.8	3.7	---	12	9.9	6.5	3.5	6.5	3.7	3.1
30	3.0	5.4	2.6	3.0	---	15	5.8	5.3	3.5	5.7	4.1	3.1
31	2.8	---	2.6	3.1	---	17	---	5.8	---	5.5	6.2	---
TOTAL	123.1	192.5	103.3	94.5	171.1	268.0	276.7	199.4	141.7	176.5	145.4	116.5
MEAN	3.97	6.42	3.33	3.05	6.11	8.65	9.22	6.43	4.72	5.69	4.69	3.88
MAX	12	23	7.3	5.0	23	17	26	22	14	12	12	6.8
MIN	2.8	2.8	2.6	2.6	2.8	4.3	4.8	4.1	3.5	3.3	3.5	3.1
AC-FT	244	382	205	187	339	532	549	396	281	350	288	231

CAL YR 1976 TOTAL 1808.3 MEAN 4.94 MAX 23 MIN 1.9 AC-FT 3590
WTR YR 1977 TOTAL 2008.7 MEAN 5.50 MAX 26 MIN 2.6 AC-FT 3980

HAWAII, ISLAND OF MOLOKAI

16405300 MOLOKAI TUNNEL AT WEST PORTAL--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1976-77.

REMARKS.--Miscellaneous chemical analyses published for this station for 1969-71 water years.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTAN-TANEOUS DIS-CHARGE (CFS)	COLOR (PLAT-INUM-COBALT UNITS)	TUR-BID-ITY (JTU)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	DIS-SOLVED SODIUM (NA) (MG/L)	PERCENT SODIUM
OCT										
21...	1500	2.8	3	1	29	0	6.4	3.2	9.8	41
APR										
09...	1020	14	55	1	10	3	2.1	1.2	5.7	53

DATE	SODIUM AD-SORP-TION RATIO	DIS-SOLVED PO-TAS-SIUM (K) (MG/L)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DIS-SOLVED SULFATE (SO4) (MG/L)	DIS-SOLVED CHLO-RIDE (CL) (MG/L)	DIS-SOLVED FLUO-RIDE (F) (MG/L)
OCT									
21...	.9	1.5	43	0	35	2.2	3.1	11	.6
APR									
09...	.8	.6	9	0	7	1.8	8.4	9.2	.0

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTI-TUENTS) (MG/L)	DIS-SOLVED SOLIDS (TONS PER AC-FT)	DIS-SOLVED SOLIDS (TONS PER DAY)	DIS-SOLVED NITRITE PLUS NITRATE (N) (MG/L)	DIS-SOLVED ORTHO. PHOS-PHORUS (P) (MG/L)	DIS-SOLVED ORTHO PHOS-PHATE (PO4) (MG/L)	DIS-SOLVED IRON (FE) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)
OCT									
21...	31	90	.12	.68	.38	.06	.18	40	0
APR									
09...	9.0	41	.06	1.55	.08	.01	.03	230	10

DATE	TIME	INSTAN-TANEOUS DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)
OCT					
21...	1500	2.8	114	7.5	18.0
DEC					
16...	1500	3.5	104	7.4	17.5
FEB					
09...	0800	3.0	112	7.7	18.0
APR					
08...	1020	14	50	7.0	17.0
JUN					
02...	1515	6.3	73	7.3	18.0
JUL					
13...	1500	8.0	71	7.4	19.0
SEP					
13...	1445	3.3	110	7.4	20.0

16405500 WAIKOLU STREAM AT ALTITUDE 900 FT (274 M), NEAR KALAUPAPA

LOCATION.--Lat 21°08'43", long 156°55'18", Hydrologic Unit 20050000, on right bank 1.8 mi (2.9 km) southwest of Haupu Bay, 2.3 mi (3.7 km) upstream from mouth, and 5.2 mi (8.4 km) southeast of Kalaupapa.

DRAINAGE AREA.--1.99 mi^2 (5.15 km^2).

PERIOD OF RECORD.--May 1956 to October 1961, July 1962 to current year.

REVISED RECORDS (FISCAL YEAR).--WSP 1719: 1959. (WATER YEARS).--WSP 2137: 1963(P), 1964(M), 1965(P).

GAGE.--Water-stage recorder. Altitude of gage is 900 ft (274 m), from topographic map. Prior to July 1, 1962, at site 200 ft (61 m) upstream at datum 6.14 ft (1.871 m) higher.

REMARKS.--Records fair except those above 90 ft^3/s (2.55 m^3/s), which are poor. Since Nov. 16, 1960, water diverted above station at times, either into or from Molokai tunnel. Periodic determinations of water temperatures for the current year are published elsewhere in this report.

AVERAGE DISCHARGE (since Molokai tunnel diversion began).--16 years (water years, 1961, 1963-77), 7.30 ft^3/s (0.207 m^3/s), 5,290 acre-ft/yr (6.52 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,080 ft^3/s (58.9 m^3/s) Apr. 13, 1965, gage height, 6.12 ft (1.865 m), from rating curve extended above 43 ft^3/s (1.22 m^3/s); minimum, 0.06 ft^3/s (0.002 m^3/s) Sept. 9, 1975.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Oct. 31, 1961, reached a stage of 13.62 ft (4.151 m), from flood-marks, former site and datum, discharge, 6,220 ft^3/s (176 m^3/s), by slope-area measurement.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 860 ft^3/s (24.4 m^3/s) Nov. 16, gage height, 4.40 ft (1.341 m), from rating curve extended above 43 ft^3/s (1.22 m^3/s), no other peak above base of 590 ft^3/s (16.7 m^3/s); minimum, 0.28 ft^3/s (0.008 m^3/s) Mar. 27, 28.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.9	.59	.74	.92	1.1	1.4	3.4	1.4	4.6	1.4	.74	.92
2	.59	15	.74	1.1	3.0	8.3	13	1.4	3.3	1.4	.74	.92
3	.59	8.2	.74	.92	3.3	9.3	26	1.4	1.4	1.4	.74	1.1
4	.59	.59	.74	.92	1.1	2.4	55	1.6	1.4	1.4	.92	.92
5	.59	3.4	.74	.92	1.1	1.9	41	2.4	4.8	2.1	5.4	.92
6	7.3	5.8	.74	.92	.92	14	19	21	27	2.7	2.0	.92
7	14	1.1	5.9	.92	.92	5.6	17	2.4	1.9	2.7	3.0	1.1
8	.92	.59	1.1	.92	.92	4.5	16	1.9	1.4	1.4	1.1	.92
9	.59	.74	.74	.92	.92	5.2	3.0	3.6	1.4	1.4	.92	.74
10	.59	.46	.74	.92	.74	1.6	1.6	1.9	1.4	4.3	.92	.74
11	.59	.46	.74	1.1	.74	1.1	8.0	1.9	1.4	4.2	.92	.74
12	9.8	.46	.74	1.1	.74	16	3.9	1.9	1.4	11	10	.74
13	.92	.46	.74	1.1	.74	14	1.6	7.6	1.6	3.7	3.0	.74
14	.74	.46	1.1	1.1	.59	3.3	2.1	78	1.6	1.6	1.3	.74
15	5.7	4.9	.92	1.1	52	14	1.4	3.7	1.9	1.1	1.1	.74
16	1.4	157	.92	1.1	16	1.1	1.1	1.6	1.9	1.1	.92	.74
17	.59	25	.92	1.1	1.4	.74	.92	2.1	1.9	4.6	.92	.74
18	.59	2.7	.92	1.1	.74	1.1	3.6	1.6	1.6	3.2	.92	.74
19	.59	16	.92	.92	.74	4.5	2.4	1.4	1.6	1.6	.92	.74
20	.59	23	.92	.92	.74	3.6	3.9	1.4	1.6	1.1	.92	.74
21	.59	2.4	.92	2.2	.59	6.4	18	1.4	1.6	1.0	.92	.74
22	.59	1.1	.92	.92	13	10	3.6	1.4	1.6	.92	.92	.74
23	.59	.92	.92	.92	25	4.6	.92	1.4	1.4	.92	.92	.74
24	.59	2.5	.92	.92	31	1.4	.92	1.6	1.4	.92	.92	.74
25	.59	13	.92	.92	3.9	1.1	1.1	1.9	1.4	.92	.92	.74
26	.59	1.4	.92	.92	1.8	.36	1.4	1.9	1.4	.92	.92	.74
27	.59	.74	.92	.92	8.7	.36	1.1	2.7	1.4	.92	.92	.74
28	.59	.74	.92	.92	6.6	4.9	1.1	6.7	1.4	1.1	.92	.74
29	.59	.92	.92	.92	---	4.6	9.9	1.9	1.4	.92	.92	.74
30	.59	2.1	.92	.92	---	10	1.6	1.9	1.4	.74	1.1	.74
31	.59	---	.92	.92	---	24	---	1.6	---	.74	.92	---
TOTAL	55.66	292.73	31.88	31.42	179.04	181.36	263.56	164.6	79.5	63.42	47.70	24.00
MEAN	1.80	9.76	1.03	1.01	6.39	5.85	8.79	5.31	2.65	2.05	1.54	.80
MAX	14	157	5.9	2.2	52	24	55	78	27	11	10	1.1
MIN	.59	.46	.74	.92	.59	.36	.92	1.4	1.4	.74	.74	.74
AC-FT	110	581	63	62	355	360	523	326	158	126	95	48

CAL YR 1976 TOTAL 1580.87 MEAN 4.32 MAX 157 MIN .11 AC-FT 3140
WTR YR 1977 TOTAL 1414.87 MEAN 3.88 MAX 157 MIN .36 AC-FT 2810

16408000 WAIKOLU STREAM BELOW PIPELINE CROSSING, NEAR KALAUPAPA

LOCATION.--Lat 21°09'45", long 156°55'54", Hydrologic Unit 20050000, on left bank 0.7 mi (1.1 km) upstream from mouth and 4.4 mi (7.1 km) southeast of Molokai Lighthouse near Kalaupapa.

DRAINAGE AREA.--3.68 mi^2 (9.53 km^2).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--July 1919 to November 1930, August 1931 to July 1932, September 1937 to January 1948, July 1948 to current year. Prior to August 1931, published as "at pipeline crossing, near Kalaupapa."

REVISED RECORDS (FISCAL YEARS).--WSP 1155: 1932(M), 1938-44(M), 1946-48(M). WSP 1319: 1923(M), 1930(M), 1932, 1938-40, 1945(M), drainage area.

GAGE.--Water-stage recorder. Datum of gage is 252 ft (76.810 m) above mean sea level (hand levels by Bureau of Reclamation). Prior to Nov. 19, 1930, at site 500 ft (152 m) upstream at different datums. Aug. 14, 1931, to July 20, 1932, and Sept. 20, 1937, to Jan. 26, 1948, at present site at datum 1.49 ft (0.454 m) higher, and July 30, 1948, to June 30, 1962, at present site at datum 1.00 ft (0.305 m) higher.

REMARKS.--Records good except those above 80 ft^3/s (2.27 m^3/s), which are poor. Diversion above station for domestic use in Kalaupapa, and since Nov. 16, 1960, water has been diverted above station both to and from Molokai tunnel.

AVERAGE DISCHARGE (since Molokai tunnel diversion began).--17 years (water years 1961-77), 14.9 ft^3/s (0.422 m^3/s), 10,800 acre-ft/yr (13.3 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,600 ft^3/s (187 m^3/s) Oct. 31, 1961, gage height, 13.75 ft (4.191 m), present datum, from floodmarks, from rating curve extended above 39 ft^3/s (1.10 m^3/s) on basis of slope-area measurement of peak flow; minimum, 2.0 ft^3/s (0.057 m^3/s) Nov. 1, 2, 1925, June 5, 1926.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 833 ft^3/s (23.6 m^3/s) Nov. 16, gage height, 5.05 ft (1.539 m), from rating curve extended as explained above; minimum, 4.9 ft^3/s (0.14 m^3/s) Jan. 31.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.6	5.3	6.9	6.0	6.0	7.8	9.6	9.1	11	8.2	7.4	7.1
2	5.3	28	6.8	6.1	8.0	14	24	8.8	11	8.2	7.5	7.1
3	5.2	19	6.6	6.0	9.1	16	63	9.3	8.8	8.4	7.5	7.5
4	5.0	5.7	6.6	6.0	6.0	8.2	124	9.1	8.6	8.8	7.7	7.2
5	5.0	8.5	6.6	6.0	6.0	7.6	81	9.3	12	9.3	14	7.1
6	7.8	13	6.6	6.0	5.8	22	51	30	48	10	11	7.3
7	31	6.3	14	6.0	5.8	13	40	11	10	9.8	12	7.3
8	5.7	5.7	7.5	6.0	5.8	9.3	30	9.1	9.1	8.2	7.8	7.8
9	5.3	5.7	6.8	6.0	5.8	12	13	10	8.8	8.2	7.7	7.4
10	5.3	5.5	6.6	6.0	5.8	7.8	10	8.6	8.8	11	7.6	7.2
11	5.3	5.5	6.6	6.0	5.7	7.0	17	8.4	8.6	12	7.6	7.1
12	19	5.3	6.4	5.8	5.7	28	12	8.8	8.6	20	17	7.0
13	6.1	5.3	6.3	5.8	5.7	22	9.3	17	8.6	10	8.1	7.1
14	5.7	5.7	6.4	5.8	5.7	9.3	9.6	102	8.8	8.6	7.4	7.0
15	17	9.2	6.3	5.8	88	22	8.8	14	8.6	8.2	7.3	7.0
16	6.8	193	6.3	5.8	28	7.4	8.6	10	8.6	8.4	7.2	7.0
17	6.1	51	6.3	5.8	8.4	6.6	8.6	9.8	8.6	13	7.2	7.1
18	5.7	11	6.3	5.8	6.8	6.8	11	9.3	8.4	10	7.2	6.9
19	5.5	26	6.3	5.8	6.3	9.6	9.8	9.3	8.6	8.9	7.2	6.9
20	5.5	39	6.1	6.1	6.1	9.1	11	9.1	8.4	8.3	7.3	6.9
21	5.3	10	6.3	6.6	6.1	11	30	9.1	8.4	8.2	7.3	6.9
22	5.3	7.7	6.1	5.8	26	16	13	9.1	8.4	8.1	7.2	6.9
23	5.3	7.1	6.1	5.8	48	11	9.1	8.8	8.4	8.0	7.3	7.1
24	5.3	7.7	6.1	5.8	63	7.2	8.8	8.8	8.4	8.0	7.3	6.9
25	5.2	22	6.1	5.8	16	6.8	8.8	8.8	8.4	7.9	7.4	6.9
26	5.5	7.7	6.1	5.8	9.6	6.3	8.8	8.8	8.4	7.8	7.2	6.8
27	5.5	6.9	6.1	5.8	16	6.1	8.8	9.6	8.4	7.8	7.2	6.8
28	5.3	6.8	6.1	6.0	14	13	8.8	14	8.4	8.2	7.3	6.8
29	5.3	7.6	6.0	5.8	---	12	23	9.1	8.4	7.6	7.1	6.8
30	5.3	8.6	6.0	5.8	---	20	10	8.8	8.4	7.6	7.6	6.8
31	5.3	---	6.0	5.7	---	37	---	8.8	---	7.5	7.2	---
TOTAL	223.5	545.8	205.3	183.3	429.2	391.9	680.4	415.7	305.9	284.2	253.8	211.7
MEAN	7.21	18.2	6.62	5.91	15.3	12.6	22.7	13.4	10.2	9.17	8.19	7.06
MAX	31	193	14	6.6	88	37	124	102	48	20	17	7.8
MIN	5.0	5.3	6.0	5.7	5.7	6.1	8.6	8.4	8.4	7.5	7.1	6.8
AC-FT	443	1080	407	364	851	777	1350	825	607	564	503	420

CAL YR 1976 TOTAL 3712.8 MEAN 10.1 MAX 193 MIN 2.8 AC-FT 7360
WTR YR 1977 TOTAL 4130.7 MEAN 11.3 MAX 193 MIN 5.0 AC-FT 8190

16408000 WAIKOLU STREAM BELOW PIPELINE CROSSING, NEAR KALAUPAPA--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1976-77.

REMARKS.--Miscellaneous chemical analyses published for this station for 1969, 1971 water years.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	COLOR (PLATINUM-COBALT UNITS)	TURBIDITY (JTU)	HARDNESS (CA,MG) (MG/L)	NONCARBONATE HARDNESS (MG/L)	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG) (MG/L)	DISSOLVED SODIUM (NA) (MG/L)	PERCENT SODIUM
OCT 21...	1115	5.3	2	1	34	2	7.2	3.9	9.9	37
APR 26...	1415	8.9	3	1	30	0	6.2	3.6	9.2	38

DATE	SODIUM ADSORPTION RATIO	DISSOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	ALKALINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)	DISSOLVED FLUORIDE (F) (MG/L)
OCT 21...	.7	1.5	39	0	32	2.5	5.4	12	.1
APR 26...	.7	1.5	33	0	31	2.4	3.1	13	.1

DATE	DISSOLVED SILICA (SIO2) (MG/L)	DISSOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	DISSOLVED SOLIDS (TONS PER AC-FT)	DISSOLVED SOLIDS (TONS PER DAY)	DISSOLVED NITRITE PLUS NITRATE (N) (MG/L)	DISSOLVED ORTHO. PHOSPHORUS (P) (MG/L)	DISSOLVED ORTHO PHOSPHATE (PO4) (MG/L)	DISSOLVED IRON (FE) (UG/L)	DISSOLVED MANGANESE (MN) (UG/L)
OCT 21...	32	92	.13	1.32	.11	.04	.12	30	0
APR 26...	31	97	.12	2.09	.17	.02	.06	20	0

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)
OCT 21...	1115	5.3	122	7.4	20.0
DEC 16...	1215	6.3	116	7.7	19.5
FEB 10...	1130	5.9	116	7.8	19.0
APR 26...	1415	8.9	107	7.4	22.5
JUN 02...	1230	9.6	108	7.7	21.0
JUL 13...	1200	12	104	7.6	20.5
SEP 13...	1140	6.7	118	7.5	21.0

16414000 KAUNAKAKAI GULCH AT KAUNAKAKAI

LOCATION.--Lat 21°06'21", long 157°00'34", Hydrologic Unit 20050000, on left bank 0.6 mi (1.0 km) upstream from Molokai Ranch pipeline crossing, 1.3 mi (2.1 km) northeast of Kaunakakai Post Office, and 1.7 mi (2.7 km) upstream from mouth.

DRAINAGE AREA.--6.57 mi^2 (17.02 km^2).

PERIOD OF RECORD.--December 1949 to current year. Prior to July 1958, published as Kaunakakai Stream at Kaunakakai.

REVISED RECORDS (FISCAL YEARS).--WSP 1289: 1950-51. WSP 1569: Drainage area.

GAGE.--Water-stage recorder. Altitude of gage is 240 ft (73 m), from topographic map.

REMARKS.--Records fair. Flow has been augmented by occasional spillage from Molokai tunnel since May 1965.

AVERAGE DISCHARGE.--27 years (water years 1951-77), 1.47 ft^3/s (0.042 m^3/s), 1,070 acre-ft/yr (1.32 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,060 ft^3/s (86.7 m^3/s) Oct. 31, 1961, gage height, 9.30 ft (2.835 m), from rating curve extended above 620 ft^3/s (17.6 m^3/s) on basis of slope-area measurement of peak flow; no flow at times each year.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 344 ft^3/s (9.74 m^3/s) May 14, gage height, 5.08 ft (1.548 m), from rating curve extended as explained above, no other peak above base of 280 ft^3/s (7.93 m^3/s); no flow most of time.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.00	.00	5.3	.00	.00	.00	.00	.00
2	.00	.00	.00	.00	.00	.00	4.5	.00	.00	.00	.00	.00
3	.00	.00	.00	.00	.00	.00	1.9	.00	.00	.00	.00	.00
4	.00	.00	.00	.00	.00	.00	16	.00	.00	.00	.00	.00
5	.00	.00	.00	.00	.00	.00	20	.00	.00	.00	.00	.00
6	.00	.00	.00	.00	.00	.00	7.9	.00	.00	.00	.00	.00
7	.00	.00	.00	.00	.00	.00	4.5	.00	.00	.00	.00	.00
8	.00	.00	.00	.00	.00	.00	2.0	.00	.00	.00	.00	.00
9	.00	.00	.00	.00	.00	.00	.07	.00	.00	.00	.00	.00
10	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
11	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
12	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
13	.00	.00	.00	.00	.00	.01	.00	.00	.00	.00	.00	.00
14	.00	.00	.00	.00	.00	.00	.00	51	.00	.00	.00	.00
15	.00	.00	.00	.00	.00	.00	.00	4.0	.00	.00	.00	.00
16	.00	30	.00	.00	.54	.00	.00	.00	.00	.00	.00	.00
17	.00	11	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
18	.00	.25	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
19	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
20	.00	.32	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
21	.00	.17	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
22	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
23	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
24	.00	.00	.00	.00	2.0	.00	.00	.00	.00	.00	.00	.00
25	.00	.00	.00	.00	.69	.00	.00	.00	.00	.00	.00	.00
26	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
27	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
28	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
29	.00	.00	.00	.00	---	.00	.00	.00	.00	.00	.00	.00
30	.00	.00	.00	.00	---	1.3	.00	.00	.00	.00	.00	.00
31	.00	---	.00	.00	---	7.4	---	.00	---	.00	.00	---
TOTAL	.00	41.74	.00	.00	3.23	8.71	62.17	55.00	.00	.00	.00	.00
MEAN	.000	1.39	.000	.000	.12	.28	2.07	1.77	.000	.000	.000	.000
MAX	.00	30	.00	.00	2.0	7.4	20	51	.00	.00	.00	.00
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	.00	83	.00	.00	6.4	17	123	109	.00	.00	.00	.00

CAL YR 1976 TOTAL 178.66 MEAN .49 MAX 50 MIN .00 AC-FT 354
WTR YR 1977 TOTAL 170.85 MEAN .47 MAX 51 MIN .00 AC-FT 339

16419500 PAPIO GULCH AT HALAWA

LOCATION.--Lat 21°08'55", long 156°44'16", Hydrologic Unit 20050000, on left bank 200 ft (61 m) downstream from wooden bridge on Highway 45 and 0.8 mi (1.3 km) south of Halawa.

DRAINAGE AREA.--0.94 mi^2 (2.43 km^2).

PERIOD OF RECORD.--July 1963 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 640 ft (195 m), from topographic map.

REMARKS.--Records good. Diversion above station for domestic use at Puu O Hoku Ranch. Periodic determinations of water temperature for the current year are published elsewhere in this report.

AVERAGE DISCHARGE.--14 years, 0.796 ft^3/s (0.023 m^3/s), 577 acre-ft/yr (711,000 m^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,720 ft^3/s (77.0 m^3/s) Apr. 13, 1965, gage height, 11.25 ft (3.429 m), from rating curve extended above 37 ft^3/s (1.05 m^3/s) on basis of slope-area measurements at gage heights 4.60 ft (1.402 m), 7.15 ft (2.179 m), and 11.25 ft (3.429 m); no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 78 ft^3/s (2.21 m^3/s) Apr. 4, gage height, 2.91 ft (0.887 m), no peak above base of 210 ft^3/s (5.95 m^3/s); no flow most of time.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.12	.00	.00	.00	.83	.07	.06	.00	.00	.00
2	.00	.00	.03	.00	.00	.00	9.9	.06	.12	.00	.00	.00
3	.00	.31	.01	.00	.00	.00	9.5	.06	.12	.00	.00	.00
4	.00	.01	.00	.00	.00	.00	41	.06	.12	.00	.00	.00
5	.00	.00	.00	.00	.00	.00	27	.06	.09	.00	.00	.00
6	.00	.00	.00	.00	.00	.00	7.3	.96	2.0	.00	.07	.00
7	.00	.00	.00	.00	.00	.00	2.6	.38	.27	.00	.02	.00
8	.00	.00	.00	.00	.00	.00	1.5	.15	.09	.00	.00	.00
9	.00	.00	.00	.00	.00	.00	1.0	1.2	.06	.00	.00	.00
10	.00	.00	.00	.00	.00	.00	.83	.27	.05	.68	.00	.01
11	.00	.00	.00	.00	.00	.00	1.2	.12	.04	.65	.00	.00
12	1.5	.00	.00	.00	.00	.00	.58	.09	.04	2.5	.00	.00
13	.23	.00	.00	.00	.00	.00	.42	4.3	.04	.38	.00	.00
14	.03	.00	.00	.00	.00	.00	.38	.84	.03	.12	.00	.00
15	1.0	.00	.00	.00	.00	.00	.30	.50	.01	.05	.00	.00
16	.80	5.7	.00	.00	.00	.00	.27	.18	.00	.03	.00	.00
17	.05	1.2	.00	.00	.00	.00	.24	.12	.00	.02	.00	.00
18	.00	.15	.00	.00	.00	.00	.34	.15	.00	.05	.00	.00
19	.00	.04	.00	.00	.00	.00	.27	.09	.00	.06	.00	.00
20	.00	.23	.00	.00	.00	.00	.43	.07	.00	.03	.00	.00
21	.00	.12	.00	.00	.00	.00	.30	.06	.00	.01	.00	.00
22	.00	.04	.00	.00	.00	.00	.18	.07	.00	.00	.00	.00
23	.00	.01	.00	.00	.48	.00	.12	.09	.00	.00	.00	.00
24	.00	.00	.00	.00	.90	.00	.12	.06	.00	.00	.00	.00
25	.00	.00	.00	.00	.37	.00	.12	.05	.00	.00	.00	.00
26	.00	.00	.00	.00	.01	.00	.09	.06	.00	.00	.00	.00
27	.00	.10	.00	.00	.00	.00	.12	.07	.00	.00	.00	.00
28	.00	.12	.00	.00	.00	.00	.07	.42	.00	.00	.00	.00
29	.00	.03	.00	.00	---	.00	1.4	.18	.00	.00	.00	.00
30	.00	.57	.00	.00	---	1.3	.21	.07	.00	.00	.00	.00
31	.00	---	.00	.00	---	1.4	---	.05	---	.00	.00	---
TOTAL	3.61	8.63	.16	.00	1.76	2.70	108.62	10.91	3.14	4.58	.09	.01
MEAN	.12	.29	.005	.000	.063	.087	3.62	.35	.10	.15	.003	.000
MAX	1.5	5.7	.12	.00	.90	1.4	41	4.3	2.0	2.5	.07	.01
MIN	.00	.00	.00	.00	.00	.00	.07	.05	.00	.00	.00	.00
AC-FT	7.2	17	.3	.00	3.5	5.4	215	22	6.2	9.1	.2	.02

CAL YR 1976 TOTAL 97.58 MEAN .27 MAX 19 MIN .00 AC-FT 194
WTR YR 1977 TOTAL 144.21 MEAN .40 MAX 41 MIN .00 AC-FT 286

16501000 PALIKEA STREAM BELOW DIVERSION DAM, NEAR KIPAHULU

LOCATION.--Lat 20°41'03", long 156°04'10", Hydrologic Unit 20020000, on left bank 50 ft (15 m) downstream from old diversion dam, 2 mi (3 km) northwest of Kipahulu, and 2.1 mi (3.4 km) upstream from mouth.

DRAINAGE AREA.--6.29 mi² (16.29 km²).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--February 1927 to September 1929, December 1931 to September 1935, December 1935 to February 1938, May to October, December 1938, January 1939, August 1939 to current year. Published as Oheo Stream at elevation 1,550 ft (472 m) near Kipahulu 1927-29 and as Oheo Stream below diversion dam, near Kipahulu 1930-56.

REVISED RECORDS (FISCAL YEARS).--WSP 1155: 1939(M). WSP 1569: Drainage area. WSP 1719: 1932-34, 1937-40, 1948, 1949-50(P), 1951, 1952-54(P), 1956-58(P). WSP 1937: 1932-38(M), 1940-47(M), 1948-49(P), 1950(M), 1951-53(P), 1956(P), 1957(M), 1958-59(P), 1960(M).

GAGE.--Water-stage recorder. Datum of gage is 1,546 ft (471 m) above mean sea level (by vertical angles). Prior to Sept. 6, 1929, at site 100 ft (30 m) upstream at different datum.

REMARKS.--Records good. No diversion above station.

AVERAGE DISCHARGE.--42 years (water years, 1928, 1933-34, 1937, 1940-77), 57.7 ft³/s (1.634 m³/s), 41,800 acre-ft/yr (51.5 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 16,100 ft³/s (456 m³/s) Jan. 23, 1965, gage height, 18.3 ft (5.58 m), from floodmarks, from rating curve extended above 3,300 ft³/s (93.5 m³/s) on basis of computations of peak flow over dam at gage heights 12.68 ft (3.865 m) and 17.5 ft (5.33 m); no flow at times.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 3,700 ft³/s (105 m³/s) and maximum (*):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Apr. 1	2200	3880	110	9.47	2.886
Apr. 18	2200	3880	110	9.47	2.886
Aug. 12	1330	*4000	113	9.50	2.896

Minimum discharge, 0.01 ft³/s (<0.001 m³/s) for several days in December and January.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.03	8.7	.02	.03	.02	169	284	3.2	33	.07	.56	1.4
2	.03	.72	.02	61	.02	318	169	1.8	5.8	.05	.35	6.8
3	.03	.29	.02	.61	.02	785	5.8	1.1	.91	.05	.24	34
4	.49	.05	.02	.03	.02	87	73	1.4	.56	.05	.07	17
5	7.6	.03	.02	.24	.03	29	31	143	.29	20	22	1.6
6	.03	2.8	.02	.03	.03	79	9.9	523	.19	25	227	16
7	.03	1.6	92	.02	.03	66	121	108	.12	33	91	6.1
8	.03	.07	35	.02	.97	157	120	163	.19	.64	3.2	.72
9	.03	5.0	28	.02	.37	113	54	120	.09	16	.81	13
10	.03	26	18	.02	.03	15	151	175	.15	192	.29	3.5
11	.05	6.8	.41	.01	.02	181	260	356	.09	128	.12	.29
12	75	1.4	.05	.02	.02	276	66	263	.05	226	949	.12
13	1.7	.48	18	.02	1.2	805	55	251	.05	36	49	45
14	.15	8.1	2.2	.01	1.3	360	65	356	.05	11	3.3	.48
15	1.5	3.0	.15	.01	.81	269	47	18	2.6	2.6	1.4	.12
16	.30	9.9	.03	.01	.64	30	40	4.9	.19	32	.81	.24
17	.05	.41	1.0	.01	.04	101	6.5	39	.09	108	.56	21
18	.03	.05	4.9	.02	.02	141	342	81	.24	121	2.7	13
19	.03	.03	.15	.02	.02	257	326	8.6	.15	13	.35	.24
20	.19	.03	.03	.02	.02	319	271	3.3	14	2.5	12	.09
21	18	.02	.15	.02	.02	183	65	128	1.1	1.8	4.0	.07
22	8.9	.02	.03	.02	.02	398	20	65	.05	.64	8.3	.15
23	.41	.40	.02	.02	.03	130	3.9	52	.03	.35	1.0	.12
24	.12	.19	.03	.02	259	80	2.4	7.2	.03	.24	14	.79
25	.09	9.9	.02	.02	35	36	2.8	1.8	.03	2.6	22	2.5
26	.03	.35	.02	.02	84	7.1	11	1.4	.03	.56	.41	.15
27	14	.07	.02	.02	434	3.3	34	25	3.2	23	.15	.09
28	17	.03	.02	.02	492	2.5	60	55	.24	255	.12	.07
29	.47	.03	.01	.02	---	3.0	237	12	.12	5.2	.24	.03
30	41	.02	.02	.02	---	2.1	16	2.4	.24	1.2	8.3	.05
31	1.1	---	.05	.02	---	2.0	---	1.9	---	1.1	19	---
TOTAL	188.45	86.49	200.43	62.39	1309.70	5404.0	2949.3	2972.0	63.88	1258.65	1442.28	184.72
MEAN	6.08	2.88	6.47	2.01	46.8	174	98.3	95.9	2.13	40.6	46.5	6.16
MAX	75	26	92	61	492	805	342	523	33	255	949	45
MIN	.03	.02	.01	.01	.02	2.0	2.4	1.1	.03	.05	.07	.03
AC-FT	374	172	398	124	2600	10720	5850	5890	127	2500	2860	366

CAL YR 1976 TOTAL 12401.84 MEAN 33.9 MAX 760 MIN .01 AC-FT 24600
WTR YR 1977 TOTAL 16122.29 MEAN 44.2 MAX 949 MIN .01 AC-FT 31980

16501000 PALIKEA STREAM BELOW DIVERSION DAM, NEAR KIPAHULU--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1972-77.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	COLOR (PLATINUM-COBALT UNITS)	TURBIDITY (JTU)	HARDNESS (CA,MG) (MG/L)	NONCARBONATE HARDNESS (MG/L)	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG) (MG/L)	DISSOLVED SODIUM (NA) (MG/L)	PERCENT SODIUM
OCT										
06...	1015	.03	7	8	8	0	1.4	1.0	3.3	47
MAR										
02...	1015	340	22	3	3	2	.5	.5	2.5	60

DATE	SODIUM ADSORPTION RATIO	DISSOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	ALKALINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)	DISSOLVED FLUORIDE (F) (MG/L)
OCT									
06...	.5	.5	14	0	11	56	2.0	4.1	.0
MAR									
02...	.6	.3	2	0	2	5.1	3.1	5.2	.1

DATE	DISSOLVED SILICA (SIO2) (MG/L)	DISSOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	DISSOLVED SOLIDS (TONS PER AC-FT)	DISSOLVED SOLIDS (TONS PER DAY)	DISSOLVED NITRITE PLUS NITRATE (N) (MG/L)	DISSOLVED ORTHO. PHOSPHORUS (P) (MG/L)	DISSOLVED ORTHO PHOSPHATE (PO4) (MG/L)	DISSOLVED IRON (FE) (UG/L)	DISSOLVED MANGANESE (MN) (UG/L)
OCT									
06...	4.1	25	.03	.09	.32	.02	.06	80	10
MAR									
02...	1.5	15	.02	13.8	.08	.02	.06	80	10

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)
OCT					
06...	1015	.03	35	5.6	21.5
NOV					
23...	1115	1.9	35	6.4	19.5
JAN					
13...	1000	.02	49	7.2	18.0
MAR					
02...	1015	340	28	5.8	15.5
APR					
21...	1015	58	29	6.6	17.0
JUN					
16...	1000	.29	41	7.4	21.0
AUG					
10...	1020	.29	44	7.1	21.5

16508000 HANAWI STREAM NEAR NAHIKU

LOCATION.--Lat 20°48'37", long 156°07'00", Hydrologic Unit 20020000, on left bank 200 ft (61 m) upstream from Koolau ditch intake and trail, 1.9 mi (3.1 km) southwest of Nahiku, and 4.5 mi (7.2 km) southeast of Keanae.

DRAINAGE AREA.--3.49 mi^2 (9.04 km^2).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--January 1914 to January 1916, November 1921 to current year. Monthly discharge only April to June 1915, published in WSP 1319.

REVISED RECORDS (FISCAL YEARS).--WSP 1045: 1922-43(M). WSP 1569: Drainage area. WSP 1719: 1915(M), 1922, 1924-25, 1927, 1930-35, 1937, 1939-40, 1942-43.

GAGE.--Water-stage recorder. Datum of gage is 1,318 ft (401.7 m) above mean sea level (by vertical angles). Prior to Nov. 1, 1921, at site 50 ft (15 m) downstream at datum 0.12 ft (0.037 m) lower.

REMARKS.--Records good. No diversion above station.

AVERAGE DISCHARGE.--55 years (water years 1923-77), 22.6 ft^3/s (0.640 m^3/s), 16,370 acre-ft/yr (20.2 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, about 5,570 ft^3/s (158 m^3/s) Jan. 18, 1916, gage height, 11.6 ft (3.54 m), present site and datum, from rating curve extended above 814 ft^3/s (23.1 m^3/s) by test model of station site; minimum, 1.2 ft^3/s (0.034 m^3/s) Oct. 17, 1974.

EXTREMES FOR CURRENT YEAR.--Maximum discharge 1,870 ft^3/s (53.0 m^3/s) Feb. 28, gage height, 6.76 ft (2.060 m), no other peak above base of 1,700 ft^3/s (48.1 m^3/s); minimum, 1.4 ft^3/s (0.040 m^3/s) several days in February.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.3	2.8	2.8	2.3	1.6	32	11	10	4.8	2.9	4.6	4.8
2	2.2	5.7	2.8	2.5	2.1	151	12	8.8	4.3	2.8	6.0	4.6
3	2.1	24	2.7	2.3	2.2	203	17	8.0	4.1	2.8	9.5	7.6
4	2.0	4.0	2.7	2.2	1.7	33	375	7.9	4.0	2.9	6.3	6.9
5	2.0	3.3	2.8	2.2	1.7	24	204	9.0	3.9	6.8	48	5.0
6	3.6	18	3.5	2.1	1.7	79	138	44	8.9	8.7	176	7.0
7	45	8.9	7.9	2.1	1.7	73	157	18	4.8	10	47	6.1
8	3.8	29	15	2.0	1.6	32	104	17	4.0	5.5	9.8	5.2
9	5.8	22	4.4	2.0	1.5	12	53	14	3.7	8.1	7.2	4.6
10	8.4	15	6.3	2.0	1.5	5.2	38	8.9	3.6	18	5.4	4.3
11	3.3	7.3	4.7	1.9	1.5	44	36	7.7	3.5	19	16	4.0
12	15	5.3	3.8	1.9	1.5	114	21	6.8	3.5	40	257	3.8
13	4.8	4.3	3.9	1.9	1.4	183	20	8.7	3.4	25	10	3.7
14	4.0	3.9	3.4	1.8	1.4	56	17	26	3.7	10	6.9	3.6
15	17	3.5	3.2	1.8	1.6	81	19	8.1	11	6.7	5.7	3.5
16	5.7	103	3.2	1.8	2.1	13	26	6.1	5.0	7.0	5.2	3.5
17	4.1	50	3.1	1.7	1.5	16	13	5.6	3.9	41	4.6	31
18	3.3	8.8	3.0	1.7	1.5	91	13	5.2	3.7	18	4.4	10
19	3.2	5.3	2.9	1.7	1.4	95	29	4.8	3.6	9.8	4.3	4.5
20	3.7	4.5	2.8	1.7	1.4	138	81	4.7	4.2	6.6	4.3	3.9
21	3.0	3.9	2.8	1.7	1.4	78	82	15	3.7	9.5	4.0	3.6
22	2.8	3.6	2.7	1.7	1.5	187	22	16	3.5	5.9	6.1	3.5
23	2.6	3.8	2.6	1.7	2.9	99	12	7.8	3.4	4.8	4.6	3.4
24	2.6	3.2	2.6	1.7	112	66	10	5.8	3.5	4.4	4.5	3.4
25	2.6	3.1	2.5	1.6	6.2	22	9.1	4.9	3.3	4.1	6.9	3.4
26	2.9	3.0	2.5	1.6	6.9	13	8.3	4.7	3.1	4.2	4.6	3.2
27	8.4	3.2	2.5	1.6	130	12	8.2	4.7	3.1	16	4.3	3.1
28	5.3	3.0	2.5	1.6	176	12	12	6.2	3.0	35	4.6	3.0
29	3.2	3.0	2.5	2.0	---	12	68	5.0	2.9	6.3	4.3	2.9
30	3.5	3.0	2.4	1.7	---	12	17	4.9	3.1	4.9	7.2	2.8
31	3.3	---	2.3	1.6	---	12	---	4.7	---	5.0	6.3	---
TOTAL	181.5	361.4	112.8	58.1	469.5	2000.2	1632.6	309.0	124.2	351.7	695.6	159.9
MEAN	5.85	12.0	3.64	1.87	16.8	64.5	54.4	9.97	4.14	11.3	22.4	5.33
MAX	45	103	15	2.5	176	203	375	44	11	41	257	31
MIN	2.0	2.8	2.3	1.6	1.4	5.2	8.2	4.7	2.9	2.8	4.0	2.8
AC-FT	360	717	224	115	931	3970	3240	613	246	698	1380	317

CAL YR 1976 TOTAL 5742.4 MEAN 15.7 MAX 711 MIN 2.0 AC-FT 11390
WTR YR 1977 TOTAL 6456.5 MEAN 17.7 MAX 375 MIN 1.4 AC-FT 12810

HAWAII, ISLAND OF MAUI

16508000 HANAWI STREAM NEAR NAHIKU--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1972-77.

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	COLOR (PLATINUM-COBALT UNITS)	TURBIDITY (JTU)	HARDNESS (CA,MG) (MG/L)	NONCARBONATE HARDNESS (MG/L)	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG) (MG/L)	DISSOLVED SODIUM (NA) (MG/L)	PERCENT SODIUM
OCT 07...	0920	39	12	6	8	5	2.4	.5	2.9	42
MAR 03...	0920	272	18	3	3	2	.5	.5	2.8	62

DATE	SODIUM ADSORPTION RATIO	DISSOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	ALKALINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)	DISSOLVED FLUORIDE (F) (MG/L)
OCT 07...	.4	.5	4	0	3	6.4	2.8	4.4	.0
MAR 03...	.7	.3	2	0	2	3.2	3.3	5.7	.0

DATE	DISSOLVED SILICA (SIO2) (MG/L)	DISSOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	DISSOLVED SOLIDS (TONS PER AC-FT)	DISSOLVED SOLIDS (TONS PER DAY)	DISSOLVED NITRITE PLUS NITRATE (N) (MG/L)	DISSOLVED ORTHO. PHOSPHORUS (P) (MG/L)	DISSOLVED ORTHO PHOSPHATE (PO4) (MG/L)	DISSOLVED IRON (FE) (UG/L)	DISSOLVED MANGANESE (MN) (UG/L)
OCT 07...	2.5	27	.04	2.84	2.0	.00	.00	140	10
MAR 03...	1.3	16	.02	11.8	.03	.01	.03	50	10

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)
OCT 07...	0920	39	22	6.0	19.0
NOV 22...	1545	3.6	42	7.2	18.0
JAN 14...	1010	1.8	49	7.1	16.5
MAR 03...	0920	272	24	6.0	15.5
APR 22...	1200	19	27	6.9	17.0
JUN 15...	1430	6.7	43	7.8	20.0
AUG 09...	1440	6.6	37	7.1	20.5

16512000 KOOLAU DITCH AT NAHIKU WEIR, NEAR NAHIKU

LOCATION.--Lat 20°48'56", long 156°07'15", Hydrologic Unit 20020000, on right bank between Kapaula and Waiohue Gulches, 1.8 mi (2.9 km) southwest of Nahiku, and 3.8 mi (6.1 km) southeast of Keanae.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--February 1919 to current year.

GAGE.--Water-stage recorder and sharp-crested weir. Datum of gage is 1,289.14 ft (392.930 m) above mean sea level. Prior to Apr. 28, 1922, nonrecording gage at same site and datum.

REMARKS.--Records excellent. Ditch diverts water from nearly all streams from the Makapipi west to the Alo for power, domestic use, and irrigation in central Maui.

AVERAGE DISCHARGE.--58 years, 34.0 ft^3/s (0.963 m^3/s), 24,630 acre-ft/yr (30.4 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 99 ft^3/s (2.80 m^3/s) Apr. 27, May 11, 1963, May 25, 1964; no flow at times.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	11	15	14	9.2	5.6	71	37	49	22	12	23	21
2	9.4	22	14	9.8	6.2	84	40	42	21	12	28	20
3	8.9	57	13	9.1	7.3	90	49	38	19	12	42	26
4	8.5	23	13	8.8	6.1	69	91	36	18	12	30	29
5	8.3	20	13	8.5	6.2	60	92	40	18	21	82	21
6	13	51	15	8.4	6.3	82	92	86	31	27	81	28
7	62	33	28	8.1	5.9	86	91	71	21	32	78	30
8	18	52	43	8.0	5.6	69	89	72	18	21	48	23
9	20	69	21	7.7	5.4	50	87	62	17	27	40	21
10	29	64	27	7.7	5.3	34	86	45	17	50	33	19
11	15	43	21	7.6	5.0	56	87	39	16	59	31	17
12	52	34	18	7.3	5.0	84	78	34	16	85	89	17
13	24	28	19	7.0	5.0	92	75	37	15	78	53	15
14	20	25	16	7.0	5.0	86	71	55	16	49	36	15
15	58	22	15	7.0	5.4	87	67	37	34	38	31	14
16	29	72	15	6.8	8.0	54	74	31	21	38	29	14
17	22	77	14	6.7	5.8	53	54	28	17	77	26	54
18	19	30	14	6.7	5.2	88	52	26	16	70	23	43
19	18	32	13	6.5	5.0	88	72	24	16	47	22	23
20	20	29	13	6.3	4.8	89	82	23	18	36	21	18
21	16	25	12	6.3	4.9	87	92	41	16	45	19	17
22	15	23	12	6.2	5.2	91	75	50	15	32	24	16
23	14	24	12	6.0	14	89	55	33	15	27	20	16
24	14	19	12	6.0	81	86	48	27	15	24	19	15
25	14	18	11	5.7	30	69	43	23	15	22	26	14
26	14	17	10	6.0	27	51	39	22	14	22	19	13
27	28	18	10	6.1	83	46	39	22	13	36	17	13
28	22	16	10	5.9	83	43	53	28	13	68	20	12
29	16	16	10	6.6	---	43	91	24	13	33	18	12
30	18	16	9.8	5.6	---	40	72	23	14	27	24	11
31	17	---	9.5	5.6	---	39	---	22	---	26	28	---
TOTAL	653.1	990	477.3	220.2	442.2	2156	2073	1190	530	1165	1080	607
MEAN	21.1	33.0	15.4	7.10	15.8	69.5	69.1	38.4	17.7	37.6	34.8	20.2
MAX	62	77	43	9.8	83	92	92	86	34	85	89	54
MIN	8.3	15	9.5	5.6	4.8	34	37	22	13	12	17	11
AC-FT	1300	1960	947	437	877	4280	4110	2360	1050	2310	2140	1200

CAL YR 1976 TOTAL 11834.9 MEAN 32.3 MAX 93 MIN 8.3 AC-FT 23470
WTR YR 1977 TOTAL 11583.8 MEAN 31.7 MAX 92 MIN 4.8 AC-FT 22980

16512000 KOOLAU DITCH AT NAHIKU WEIR, NEAR NAHIKU--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1976-77.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	COLOR (PLATINUM-COBALT UNITS)	TURBIDITY (JTU)	HARDNESS (CA,MG) (MG/L)	NON-CARBONATE HARDNESS (MG/L)	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG) (MG/L)	DISSOLVED SODIUM (NA) (MG/L)	PERCENT SODIUM
OCT										
05...	1540	8.4	2	1	11	0	2.5	1.2	5.1	48
MAR										
01...	1505	59	11	1	5	0	1.2	.5	3.8	60

DATE	SODIUM ADSORPTION RATIO	DISSOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	ALKALINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)	DISSOLVED FLUORIDE (F) (MG/L)
OCT									
05...	.7	.7	20	0	16	2.5	1.4	4.9	.0
MAR									
01...	.7	.4	7	0	6	2.2	2.9	5.7	.0

DATE	DISSOLVED SILICA (SIO2) (MG/L)	DISSOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	DISSOLVED SOLIDS (TONS PER AC-FT)	DISSOLVED SOLIDS (TONS PER DAY)	DISSOLVED NITRITE PLUS NITRATE (N) (MG/L)	DISSOLVED ORTHO, PHOSPHORUS (P) (MG/L)	DISSOLVED ORTHO PHOSPHATE (PO4) (MG/L)	DISSOLVED IRON (FE) (UG/L)	DISSOLVED MANGANESE (MN) (UG/L)
OCT									
05...	11	37	.05	.84	.06	.01	.03	20	0
MAR									
01...	4.7	23	.03	3.66	.03	.02	.06	50	0

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)
OCT					
05...	1540	8.4	51	7.1	20.0
NOV					
22...	1415	22	46	7.2	17.5
JAN					
12...	1600	7.4	51	7.1	19.0
MAR					
01...	1505	59	34	6.7	18.0
APR					
20...	1430	76	41	7.4	18.0
JUN					
15...	1300	27	43	7.6	20.5
AUG					
09...	1315	40	47	7.3	20.5

16518000 WEST WAILUAIKI STREAM NEAR KEANAE

LOCATION.--Lat 20°49'16", long 156°08'37", Hydrologic Unit 20020000, on left bank 500 ft (152 m) upstream from Koolau ditch crossing and trail bridge and 2.8 mi (4.5 km) south of Keanae Post Office.

DRAINAGE AREA.--3.66 mi² (9.48 km²).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--January 1914 to December 1915, May 1916 to October 1917, November 1921 to current year. Monthly discharge only for some periods, published in WSP 1319.

REVISED RECORDS (FISCAL YEARS).--WSP 1569. Drainage area. WSP 2137: 1915-16(M), 1923-25(M), 1929-31(M), 1934-35(M), 1937-39(M), 1941-43(M), 1946-47(M), 1948(P), 1949(M), 1952-53(M), 1955-56(M), 1959-60(M). (WATER YEARS).--WSP 2137: 1960(P), 1961(M), 1963(M).

GAGE.--Water-stage recorder. Datum of gage is 1,343.1 ft (409.38 m) above mean sea level (by vertical angles). Prior to Oct. 3, 1974, at present site at datum 0.50 ft (0.15 m) higher.

REMARKS.--Records good. No diversion above station. Water is diverted by Koolau ditch, 500 ft (152 m) below station, for domestic supply and irrigation of sugarcane in central Maui.

AVERAGE DISCHARGE.--57 years (water years, 1915, 1917, 1923-77), 35.0 ft³/s (0.991 m³/s), 25,360 acre-ft/yr (31.3 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 9,900 ft³/s (280 m³/s) Jan. 14, 1923, gage height, 13.5 ft (4.11 m), from floodmarks, from rating curve extended above 650 ft³/s (18.4 m³/s); minimum, 0.5 ft³/s (0.014 m³/s) July 26, 1922.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 2,990 ft³/s (84.7 m³/s) Feb. 28, gage height, 9.02 ft (2.749 m), from rating curve extended above 650 ft³/s (18.4 m³/s), no other peak above base of 1,900 ft³/s (53.9 m³/s); minimum, 1.0 ft³/s (0.028 m³/s) Feb. 14.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.7	4.3	4.5	2.8	1.4	28	8.9	15	5.9	3.7	8.0	5.7
2	3.8	12	4.2	3.2	2.5	155	15	11	5.1	3.3	10	5.9
3	5.5	57	4.1	2.5	4.1	158	46	10	4.9	3.3	14	12
4	5.0	8.2	3.9	2.4	2.0	52	547	9.6	4.5	5.5	12	12
5	3.2	11	4.2	3.2	1.9	71	285	10	5.2	16	107	6.6
6	13	73	5.3	2.4	2.9	134	188	40	21	16	276	7.5
7	120	26	33	2.2	2.2	116	193	19	7.8	17	79	8.2
8	12	64	29	2.1	1.6	54	130	19	7.4	11	19	6.7
9	18	50	7.6	2.0	1.4	23	68	14	6.6	14	12	5.7
10	18	30	11	2.0	1.3	14	43	9.8	5.1	30	9.8	5.1
11	7.6	16	7.1	2.0	1.2	36	40	8.9	4.7	35	10	4.7
12	46	13	5.7	1.9	1.2	95	25	7.8	5.1	71	284	4.4
13	12	9.3	5.9	1.9	1.2	136	24	15	4.5	41	25	4.1
14	9.1	8.2	4.7	1.8	1.6	57	21	66	5.6	16	13	3.9
15	36	8.0	4.5	1.8	3.7	71	26	14	19	11	9.9	3.7
16	14	185	5.0	1.7	19	22	34	9.3	6.9	12	8.5	3.9
17	8.5	96	4.3	1.7	3.2	21	15	8.2	5.2	79	7.5	76
18	6.8	22	3.9	1.6	2.0	104	13	7.4	5.1	30	6.8	20
19	6.2	12	3.5	1.7	1.6	111	18	6.8	6.0	15	6.2	6.9
20	6.3	10	3.3	1.6	1.5	181	107	6.6	6.0	11	6.3	5.3
21	5.5	8.3	3.3	1.6	1.4	140	116	38	4.6	14	5.6	4.6
22	4.9	7.6	3.1	1.5	1.5	291	34	27	4.2	8.9	12	4.4
23	4.4	7.2	3.0	1.4	21	144	18	19	4.2	7.4	6.4	4.5
24	4.4	6.2	3.0	1.4	211	97	14	11	4.2	6.8	6.4	7.7
25	4.7	5.7	2.8	1.4	15	37	18	8.2	4.0	6.3	16	5.3
26	6.9	5.6	2.7	1.3	13	21	15	7.2	3.5	7.2	6.5	4.1
27	18	7.1	2.9	1.3	162	16	11	7.1	6.3	37	6.3	4.0
28	9.1	6.3	4.3	1.4	214	15	16	8.5	4.7	68	6.0	3.4
29	5.3	5.5	4.4	4.5	---	19	131	6.5	3.6	11	5.0	3.2
30	5.5	5.6	3.8	2.3	---	13	29	6.2	5.3	8.3	8.7	3.0
31	5.0	---	2.9	1.6	---	11	---	5.7	---	9.8	8.2	---
TOTAL	431.4	780.1	190.9	62.2	696.4	2443	2249.9	451.8	186.2	625.5	1011.1	252.5
MEAN	13.9	26.0	6.16	2.01	24.9	78.8	75.0	14.6	6.21	20.2	32.6	8.42
MAX	120	185	33	4.5	214	291	547	66	21	79	284	76
MIN	3.2	4.3	2.7	1.3	1.2	11	8.9	5.7	3.5	3.3	5.0	3.0
AC-FT	856	1550	379	123	1380	4850	4460	896	369	1240	2010	501

CAL YR 1976 TOTAL 8175.9 MEAN 22.3 MAX 1100 MIN 2.2 AC-FT 16220
WTR YR 1977 TOTAL 9380.0 MEAN 25.7 MAX 547 MIN 1.2 AC-FT 18610

HAWAII, ISLAND OF MAUI

16518000 WEST WAILUAIKI STREAM NEAR KEANAE--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1972-77.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	COLOR (PLATINUM-COBALT UNITS)	TURBIDITY (JTU)	HARDNESS (CA,MG) (MG/L)	NONCARBONATE HARDNESS (MG/L)	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG) (MG/L)	DISSOLVED SODIUM (NA) (MG/L)	PERCENT SODIUM
OCT 05...	1400	3.5	35	10	23	17	6.9	1.3	3.3	24
MAR 01...	1300	23	35	6	5	1	1.2	.5	2.8	53

DATE	SODIUM ADSORPTION RATIO	DISSOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	ALKALINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)	DISSOLVED FLUORIDE (F) (MG/L)
OCT 05...	.3	.6	7	0	6	1.8	5.3	4.0	.0
MAR 01...	.5	.3	5	0	4	4.0	3.7	4.8	.0

DATE	DISSOLVED SILICA (SIO2) (MG/L)	DISSOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	DISSOLVED SOLIDS (TONS PER AC-FT)	DISSOLVED SOLIDS (TONS PER DAY)	DISSOLVED NITRITE PLUS NITRATE (N) (MG/L)	DISSOLVED ORTHO. PHOSPHORUS (P) (MG/L)	DISSOLVED ORTHO PHOSPHATE (PO4) (MG/L)	DISSOLVED IRON (FE) (UG/L)	DISSOLVED MANGANESE (MN) (UG/L)
OCT 05...	7.6	50	.07	.47	3.9	.03	.09	140	10
MAR 01...	4.0	20	.03	1.24	.06	.01	.03	90	0

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)
OCT 05...	1400	3.5	35	6.8	20.5
NOV 22...	1230	6.9	37	7.1	16.5
JAN 12...	1400	1.8	54	7.1	17.0
MAR 01...	1300	23	28	6.3	18.0
APR 20...	1310	19	38	7.3	18.0
JUN 15...	1110	16	40	7.5	18.0
AUG 09...	1130	12	32	7.1	19.5

16523000 KOOLAU DITCH NEAR KEANAE

LOCATION (REVISED).--Lat 20°49'53", long 156°10'30", Hydrologic Unit 20020000, on right bank on west side of Keanae Valley, 2.7 mi (4.3 km) southwest of Keanae School, and 5.1 mi (8.2 km) southeast to Kailua.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--January 1910 to December 1912, November 1917 to February 1918, April 1918 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,237.7 ft (377.25 m) above mean sea level (by plane-table traverse). Jan. 1, 1910, to Dec. 31, 1912, nonrecording gage at same site and datum.

REMARKS.--Records good. Ditch diverts at altitude 1,260 ft (384 m) from nearly all streams from the Makapipi west to the Alo for power, domestic use, and irrigation in central Maui.

AVERAGE DISCHARGE.--61 years (water years, 1911-12, 1918-77), 101 ft^3/s (2.860 m^3/s), 73,170 acre-ft/yr (90.2 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 266 ft^3/s (7.53 m^3/s) Apr. 19, 1935; no flow at times.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	51	46	46	30	16	202	90	142	65	40	76	62
2	36	58	44	32	25	212	111	113	57	38	102	62
3	38	170	42	28	37	222	158	100	54	38	155	95
4	36	71	41	29	21	212	217	96	51	50	93	104
5	31	69	41	29	21	217	218	106	54	109	221	65
6	44	210	55	26	29	221	220	209	130	113	217	83
7	202	149	163	25	22	221	220	181	68	131	218	100
8	77	164	148	24	18	215	216	190	58	86	163	69
9	103	213	73	24	16	177	214	162	53	117	121	61
10	132	201	111	23	16	114	206	112	49	157	98	54
11	59	148	72	22	15	173	212	96	47	191	95	50
12	192	115	57	22	15	216	203	85	48	222	219	47
13	91	87	62	21	15	220	198	109	45	219	185	45
14	73	79	50	21	18	221	193	170	52	160	120	42
15	205	74	47	20	25	220	187	113	124	112	96	41
16	109	189	49	20	71	178	198	83	66	126	84	42
17	74	220	45	19	23	173	149	76	53	217	76	189
18	62	150	41	19	18	222	131	72	50	209	69	148
19	57	109	39	19	16	221	167	65	54	155	64	67
20	64	93	38	19	15	220	204	64	60	113	63	55
21	52	78	37	18	15	222	219	152	49	152	57	49
22	47	72	35	18	16	220	203	167	46	89	95	47
23	43	79	35	17	50	222	156	124	45	80	63	46
24	43	61	34	17	217	222	129	87	45	72	63	55
25	45	58	33	16	116	214	129	70	44	67	101	48
26	60	55	32	16	93	170	116	65	41	71	60	41
27	125	63	32	16	220	139	106	65	60	128	59	40
28	85	56	37	17	217	124	146	88	43	193	63	38
29	52	52	36	32	---	140	223	69	39	103	54	36
30	59	52	34	20	---	112	202	66	53	81	83	34
31	54	---	31	17	---	102	---	63	---	86	93	---
TOTAL	2401	3241	1640	676	1396	5964	5341	3360	1703	3725	3326	1915
MEAN	77.5	108	52.9	21.8	49.9	192	178	108	56.8	120	107	63.8
MAX	205	220	163	32	220	222	223	209	130	222	221	189
MIN	31	46	31	16	15	102	90	63	39	38	54	34
AC-FT	4760	6430	3250	1340	2770	11830	10590	6660	3380	7390	6600	3800

CAL YR 1976 TOTAL 35785 MEAN 97.8 MAX 222 MIN 30 AC-FT 70980
WTR YR 1977 TOTAL 34688 MEAN 95.0 MAX 223 MIN 15 AC-FT 68800

HAWAII, ISLAND OF MAUI

16523000 KOOLAU DITCH NEAR KEANAE--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1976-77.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	COLOR (PLATINUM-COBALT UNITS)	TURBIDITY (JTU)	HARDNESS (CA,MG) (MG/L)	NON-CARBONATE HARDNESS (MG/L)	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG) (MG/L)	DISSOLVED SODIUM (NA) (MG/L)	PERCENT SODIUM
OCT 05...	1130	30	6	2	12	0	2.4	1.5	4.3	42
MAR 01...	1035	215	28	5	5	0	.8	.7	3.2	57

DATE	SODIUM ADSORPTION RATIO	DISSOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	ALKALINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)	DISSOLVED FLUORIDE (F) (MG/L)
OCT 05...	.5	.5	20	0	16	1.6	1.7	4.6	.0
MAR 01...	.6	.3	6	0	5	3.8	3.6	5.4	.0

DATE	DISSOLVED SILICA (SIO2) (MG/L)	DISSOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	DISSOLVED SOLIDS (TONS PER AC-FT)	DISSOLVED SOLIDS (TONS PER DAY)	DISSOLVED NITRITE PLUS NITRATE (N) (MG/L)	DISSOLVED ORTHO. PHOSPHORUS (P) (MG/L)	DISSOLVED ORTHO PHOSPHATE (PO4) (MG/L)	DISSOLVED IRON (FE) (UG/L)	DISSOLVED MANGANESE (MN) (UG/L)
OCT 05...	10	35	.05	2.83	.11	.02	.06	60	0
MAR 01...	4.0	21	.03	12.2	.07	.01	.03	70	0

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)
OCT 05...	1130	30	47	7.3	19.5
NOV 22...	1000	71	45	7.1	17.0
JAN 12...	1145	22	56	7.5	16.5
MAR 01...	1035	215	29	6.8	17.5
APR 20...	1015	178	42	7.3	18.0
JUN 15...	0945	154	42	7.3	19.5
AUG 09...	0945	125	42	7.3	19.0

16531000 KULA DIVERSION FROM HAIPUAENA STREAM NEAR OLINDA

LOCATION.--Lat 20°28'24", long 156°13'27", Hydrologic Unit 20020000, on left bank of Haipuaena Stream, 3.4 mi (5.5 km) east of Olinda, and 6.2 mi (10.0 km) south of Kailua.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--July 1945 to current year.

GAGE.--Water-stage recorder and V-notch sharp-crested weir since Apr. 2, 1975. Altitude of gage is 4,320 ft (1,317 m), from topographic map.

REMARKS.--Records good except those above 6.6 ft^3/s (0.19 m^3/s) which are fair. Water is diverted from Haipuaena Stream at station for domestic use and irrigation of truck crops in the Olinda and Kula areas.

AVERAGE DISCHARGE.--32 years, 0.665 ft^3/s (0.019 m^3/s), 482 acre-ft/yr (594,000 m^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 10 ft^3/s (0.28 m^3/s) Nov. 6, 1976; no flow Nov. 4, 1964, Dec. 3, 5, 1970, Mar. 27 to Apr. 1, Apr. 10-14, 1975.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.31	.10	.05	.02	.04	1.0	.19	.84	.07	.14	.14	.28
2	.16	.49	.03	.01	.03	7.0	.16	.54	.05	.10	.28	.16
3	.12	5.3	.03	.01	.05	7.2	3.3	.48	.04	.08	.66	.46
4	.09	.70	.03	.01	.10	3.1	9.2	.48	.03	.06	.32	.84
5	.07	3.2	.03	.01	.07	6.8	8.0	.36	.05	.09	6.2	.32
6	.27	10	.04	.01	.04	9.0	9.2	2.2	.32	.25	4.0	.25
7	6.0	2.4	2.7	.01	.03	8.4	8.3	.97	.22	.91	1.2	.84
8	.77	4.5	.84	.01	.02	2.9	5.8	.66	.14	.22	.84	1.2
9	.38	3.5	.36	.01	.02	.97	1.5	.91	.12	.14	.44	1.6
10	.38	4.2	.25	.01	.01	.48	1.1	.44	.10	.57	.25	.91
11	.18	1.4	.16	.01	.01	.40	1.6	.28	.07	2.5	1.1	.40
12	7.4	.84	.12	.01	.01	2.7	1.1	.25	.06	5.2	3.0	.25
13	.91	.44	.09	.01	.01	4.9	.91	.19	.04	1.6	.09	.22
14	.38	.28	.07	.01	.01	2.5	.78	.19	.03	1.3	.19	.28
15	2.5	.22	.05	.01	.02	2.4	1.0	.25	.40	.72	.28	.16
16	.70	5.5	.03	.01	1.5	.91	1.8	.16	.19	.32	.22	.14
17	.30	5.9	.03	.01	.28	.56	.60	.14	.12	4.5	.19	4.2
18	.18	1.5	.02	.01	.12	6.6	.54	.12	.09	1.4	.14	1.3
19	.18	.60	.02	.01	.06	8.0	3.3	.10	.08	1.1	.12	.44
20	.34	.36	.01	.01	.03	6.3	6.3	.08	.07	.40	.32	.25
21	.76	.25	.01	.01	.02	6.9	6.5	2.8	.07	.36	.44	.19
22	.53	.16	.01	.01	.02	6.8	2.0	2.1	.06	.36	1.0	.14
23	.20	.12	.01	.01	1.3	4.9	.84	1.4	.08	.16	.44	.16
24	.16	.10	.02	.01	6.1	3.3	.54	.66	.07	.12	.32	.48
25	.14	.09	.02	.01	1.2	1.5	3.3	.32	.07	.10	1.4	.36
26	.12	.09	.02	.01	.59	.72	1.9	.22	.06	.10	.54	.22
27	.56	.09	.01	.01	5.5	.40	1.8	.16	.08	.97	.28	.16
28	.53	.09	.02	.01	1.8	.40	3.6	.14	.09	2.7	.22	.14
29	.18	.07	.03	.15	---	.40	9.0	.14	.09	.66	.22	.10
30	.14	.06	.03	.25	---	.36	1.8	.12	.10	.32	.40	.09
31	.12	---	.02	.09	---	.25	---	.08	---	.19	.48	---
TOTAL	25.06	52.55	5.16	.78	18.99	108.05	95.96	17.78	3.06	27.64	25.72	16.54
MEAN	.81	1.75	.17	.025	.68	3.49	3.20	.57	.10	.89	.83	.55
MAX	7.4	10	2.7	.25	6.1	9.0	9.2	2.8	.40	5.2	6.2	4.2
MIN	.07	.06	.01	.01	.01	.25	.16	.08	.03	.06	.09	.09
AC-FT	50	104	10	1.5	38	214	190	35	6.1	55	51	33

CAL YR 1976 TOTAL 414.25 MEAN 1.13 MAX 10 MIN .01 AC-FT 822
WTR YR 1977 TOTAL 397.29 MEAN 1.09 MAX 10 MIN .01 AC-FT 788

16531000 KULA DIVERSION FROM HAIPUAENA STREAM NEAR OLINDA--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1976-77.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTAN-TANEOUS DIS-CHARGE (CFS)	COLOR (PLAT-INUM-COBALT UNITS)	TUR-BID-ITY (JTU)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	TOTAL ACIDITY AS H+ (MG/L)	TOTAL ACIDITY AS CACO3 (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)
NOV										
06...	1030	8.8	100	2	4	4	.1	5.0	.9	.4
FEB										
02...	1200	.02	38	1	5	0	--	--	1.0	.6

DATE	DIS-SOLVED SODIUM (NA) (MG/L)	PERCENT SODIUM	SODIUM AD-SORP-TION RATIO	DIS-SOLVED PO-TAS-SIUM (K) (MG/L)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DIS-SOLVED SULFATE (SO4) (MG/L)	DIS-SOLVED CHLO-RIDE (CL) (MG/L)
NOV										
06...	1.7	47	.4	.2	0	0	0	.0	6.3	3.5
FEB										
02...	1.8	43	.4	.2	6	0	5	12	2.[illegible]	3.3

DATE	DIS-SOLVED FLUO-RIDE (F) (MG/L)	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTI-TUENTS) (MG/L)	DIS-SOLVED SOLIDS (TONS PER AC-FT)	DIS-SOLVED SOLIDS (TONS PER DAY)	DIS-SOLVED NITRITE PLUS NITRATE (N) (MG/L)	DIS-SOLVED ORTHO. PHOS-PHORUS (P) (MG/L)	DIS-SOLVED ORTHO PHOS-PHATE (PO4) (MG/L)	DIS-SOLVED IRON (FE) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)
NOV										
06...	.0	.6	15	.02	.36	.10	.00	.00	840	20
FEB										
02...	.0	4.2	17	.02	.00	.12	.01	.03	370	20

DATE	TIME	INSTAN-TANEOUS DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)
OCT					
01...	1100	.30	16	6.1	14.5
NOV					
06...	1030	8.8	23	4.2	12.0
29...	1030	.07	15	5.6	11.0
JAN					
19...	1000	.01	21	6.1	12.0
FEB					
02...	1200	.02	19	5.9	13.0
MAR					
10...	1100	6.50	16	4.8	12.5
18...	1310	9.3	22	4.1	11.0
APR					
28...	1330	1.3	14	4.8	14.0
JUN					
22...	1100	.05	17	5.7	15.0
AUG					
16...	1000	.20	13	5.7	15.0

16538000 SPRECKELS DITCH AT HAIPUAENA WEIR, NEAR HUELO

LOCATION.--Lat 20°51'15", long 156°11'25", Hydrologic Unit 20020000, on right bank near Spreckels ditch trail between Haipuaena and Puohokamoa Streams, 2.7 mi (4.3 km) west of Keanae, and 4.5 mi (7.2 km) southeast of Huelo.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--April 1922 to current year. Published as "at Haipuaena, near Huelo" 1930-35.

REVISED RECORDS (FISCAL YEARS).--WSP 770: 1932-33.

GAGE.--Water-stage recorder and sharp-crested weir. Datum of gage is 1,470.96 ft (448.349 m) above mean sea level (East Maui Irrigation Co. bench mark). Apr. 29, 1922, to Feb. 19, 1930, at same site at different datum. Feb. 20, 1930, to Oct. 25, 1935, at site 100 ft (30 m) upstream at different datum.

REMARKS.--Records excellent. Spreckels ditch diverts from all streams between the Nuaailua and the Kailua above Koolau ditch east of the Puohokamoa, and below Koolau ditch west of the Puohokamoa. About 6 ft^3/s (0.17 m^3/s) was diverted above station to East Maui Irrigation Co. powerplant at Kolea Gulch prior to June 30, 1961, when the plant was abandoned. Water used for domestic supply and irrigation in central Maui.

AVERAGE DISCHARGE (since termination of powerplant diversion).--16 years (water years 1962-77), 29.2 ft^3/s (0.827 m^3/s), 21,160 acre-ft/yr (26.1 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 150 ft^3/s (4.25 m^3/s) Feb. 10, 1955, Feb. 18, 1956; no flow at times.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	17	9.7	8.2	5.1	3.0	49	12	29	12	9.9	17	13
2	9.7	15	7.5	5.1	3.3	101	20	22	9.4	8.0	35	13
3	8.2	64	7.1	4.7	8.5	107	35	18	8.5	7.1	49	27
4	8.3	14	6.9	6.3	5.2	60	126	17	7.9	16	29	23
5	6.6	19	7.7	6.6	4.2	74	116	21	10	39	104	13
6	21	95	11	4.6	7.5	97	114	70	41	37	100	25
7	92	36	65	4.3	4.9	101	114	38	21	46	83	30
8	19	71	53	4.0	3.5	66	102	51	12	28	33	19
9	41	78	19	3.8	3.0	36	87	36	9.8	37	23	21
10	38	73	42	3.8	2.8	23	69	20	8.2	63	19	14
11	16	49	17	3.6	2.7	43	74	17	7.6	69	23	11
12	90	34	12	3.5	2.5	77	48	16	7.7	104	101	9.0
13	23	21	15	3.5	2.4	97	44	15	7.2	86	36	8.7
14	21	18	10	3.3	3.6	77	39	26	9.8	46	23	8.1
15	95	20	8.9	3.3	11	77	45	15	38	27	17	7.8
16	32	96	11	3.2	29	35	51	12	12	40	13	8.1
17	19	97	8.9	3.1	5.1	38	26	12	8.4	91	12	74
18	15	35	7.6	3.0	3.5	95	24	11	7.9	73	11	30
19	13	22	7.0	3.0	3.0	98	47	9.7	11	37	10	13
20	13	19	6.6	3.0	2.8	103	87	6.1	13	26	11	9.8
21	12	15	6.5	3.0	2.8	104	98	34	9.4	41	9.8	9.0
22	10	16	6.0	2.8	3.4	122	51	22	7.8	23	35	8.7
23	9.0	24	5.9	2.7	27	107	27	11	9.3	17	14	8.7
24	8.4	12	7.1	2.7	109	93	22	12	8.3	15	14	17
25	10	11	5.7	2.6	26	55	31	12	7.9	14	33	11
26	18	11	5.2	2.6	28	32	26	11	6.8	19	11	7.8
27	50	13	5.5	2.5	100	24	27	11	17	53	12	7.5
28	24	12	11	2.6	87	21	58	22	11	78	13	6.6
29	12	11	9.4	20	---	18	111	13	8.8	25	10	6.1
30	17	11	6.7	8.5	---	14	61	12	17	19	23	5.6
31	12	---	5.4	3.6	---	13	---	11	---	22	28	---
TOTAL	780.2	1021.7	405.8	134.4	494.7	2057	1792	632.8	365.7	1216.0	951.8	465.5
MEAN	25.2	34.1	13.1	4.34	17.7	66.4	59.7	20.4	12.2	39.2	30.7	15.5
MAX	95	97	65	20	109	122	126	70	41	104	104	74
MIN	6.6	9.7	5.2	2.5	2.4	13	12	6.1	6.8	7.1	9.8	5.6
AC-FT	1550	2030	805	267	981	4080	3550	1260	725	2410	1890	923

CAL YR 1976 TOTAL 10226.9 MEAN 27.9 MAX 122 MIN 5.0 AC-FT 20290
WTR YR 1977 TOTAL 10317.6 MEAN 28.3 MAX 126 MIN 2.4 AC-FT 20460

16538000 SPRECKELS DITCH AT HAIPUAENA WEIR, NEAR HUELO--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1976-77.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	COLOR (PLATINUM-COBALT UNITS)	TURBIDITY (JTU)	HARDNESS (CA,MG) (MG/L)	NON-CARBONATE HARDNESS (MG/L)	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG) (MG/L)	DISSOLVED SODIUM (NA) (MG/L)	PERCENT SODIUM
OCT 14...	1535	16	18	3	7	2	1.3	1.0	3.7	51
MAR 09...	1130	41	12	4	5	2	.8	.7	3.8	61

DATE	SODIUM ADSORPTION RATIO	DISSOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	ALKALINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)	DISSOLVED FLUORIDE (F) (MG/L)
OCT 14...	.6	.3	6	0	5	1.9	4.1	5.1	.0
MAR 09...	.7	.3	4	0	3	2.5	1.3	6.9	.0

DATE	DISSOLVED SILICA (SIO2) (MG/L)	DISSOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	DISSOLVED SOLIDS (TONS PER AC-FT)	DISSOLVED SOLIDS (TONS PER DAY)	DISSOLVED NITRITE PLUS NITRATE (N) (MG/L)	DISSOLVED ORTHO. PHOSPHORUS (P) (MG/L)	DISSOLVED ORTHO PHOSPHATE (PO4) (MG/L)	DISSOLVED IRON (FE) (UG/L)	DISSOLVED MANGANESE (MN) (UG/L)
OCT 14...	7.6	26	.04	1.12	.01	.04	.12	90	0
MAR 09...	4.7	21	.03	2.32	.01	.01	.03	90	0

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)
OCT 14...	1535	16	35	6.7	20.5
DEC 01...	1130	8.1	40	7.1	17.5
JAN 20...	1200	3.1	48	7.5	18.5
MAR 09...	1130	41	33	6.4	18.5
APR 27...	1035	16	32	7.0	19.0
JUN 20...	1520	17	39	6.9	20.5
AUG 12...	1335	112	37	5.9	20.5

16541000 KOOLAU DITCH AT HAIPUAENA, NEAR HUELO

LOCATION.--Lat 20°51'17", long 156°11'19", Hydrologic Unit 20020000, on right bank at Haipuaena Stream, 1,000 ft (305 m) upstream from intake at Puohokamoa Stream, 3.3 mi (5.3 km) southeast of Kailua, and 4.5 mi (7.2 km) southeast of Huelo.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--April 1932 to current year.

GAGE.--Water-stage recorder and Parshall flume. Altitude of gage is 1,240 ft (378 m), from topographic map. Prior to Mar. 21, 1933, at datum 1.94 ft (0.591 m) lower, and Mar. 21, 1933, to Mar. 20, 1935, at datum 0.25 ft (0.076 m) lower, than present datum.

REMARKS.--Records excellent. Ditch is extension of Wailoa ditch east of Alo Stream; it receives water from Makapipi ditch at Hanawi Stream and diverts from nearly all streams from there west to the Alo. Water is used for power, domestic supply, and irrigation in central Maui.

AVERAGE DISCHARGE.--45 years, 116 ft^3/s (3.285 m^3/s), 84,040 acre-ft/yr (104 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 300 ft^3/s (8.50 m^3/s) July 1, 17, 1963; no flow at times.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	54	47	47	29	16	209	93	144	66	38	79	64
2	36	59	44	31	23	254	110	117	58	35	100	63
3	38	191	43	28	38	275	162	105	54	35	158	91
4	36	74	40	28	21	227	277	101	51	48	98	106
5	30	70	41	28	21	232	243	109	52	106	263	66
6	45	238	54	25	29	260	282	224	134	118	257	80
7	233	151	163	25	22	265	294	179	71	137	244	102
8	82	186	162	24	18	231	271	190	60	86	164	71
9	105	230	75	23	17	180	248	163	54	115	124	62
10	134	223	112	23	16	118	225	116	49	172	102	55
11	61	153	74	22	15	175	238	101	47	204	98	50
12	219	121	58	22	15	245	211	89	48	264	268	47
13	96	92	63	21	15	265	204	108	44	239	188	44
14	75	83	51	21	18	246	197	166	51	156	123	42
15	244	76	47	20	24	248	192	114	130	113	101	40
16	113	229	48	20	71	182	208	86	66	129	89	41
17	78	253	46	20	23	174	150	78	53	252	80	208
18	65	155	42	19	18	262	132	73	50	221	72	150
19	59	112	39	19	16	262	174	67	54	153	67	69
20	66	97	38	19	15	268	238	68	60	114	65	56
21	53	82	37	18	15	266	263	180	49	149	59	50
22	48	75	35	18	17	289	211	192	44	99	100	47
23	44	86	34	17	60	270	157	141	44	83	66	46
24	43	64	34	17	272	257	130	95	44	74	65	55
25	45	60	32	17	121	223	134	72	43	69	102	48
26	61	57	31	16	96	173	123	66	39	74	62	40
27	132	64	31	16	261	140	111	66	58	135	60	39
28	88	58	36	17	252	126	159	90	42	222	65	36
29	54	52	36	32	---	140	273	71	37	106	55	35
30	62	54	33	21	---	115	212	68	52	84	82	33
31	55	---	30	17	---	105	---	64	---	88	94	---
TOTAL	2554	3492	1656	673	1545	6682	5922	3503	1704	3918	3550	1936
MEAN	82.4	116	53.4	21.7	55.2	216	197	113	56.8	126	115	64.5
MAX	244	253	163	32	272	289	294	224	134	264	268	208
MIN	30	47	30	16	15	105	93	64	37	35	55	33
AC-FT	5070	6930	3280	1330	3060	13250	11750	6950	3380	7770	7040	3840

CAL YR 1976 TOTAL 37886 MEAN 104 MAX 288 MIN 29 AC-FT 75150
WTR YR 1977 TOTAL 37135 MEAN 102 MAX 294 MIN 15 AC-FT 73660

16541000 KOOLAU DITCH AT HAIPUAENA, NEAR HUELO--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1976-77.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTAN-TANEOUS DIS-CHARGE (CFS)	COLOR (PLAT-INUM-COBALT UNITS)	TUR-BID-ITY (JTU)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	DIS-SOLVED SODIUM (NA) (MG/L)	PERCENT SODIUM
OCT 14...	1315	72	18	3	9	0	1.9	1.1	3.9	46
MAR 09...	1330	172	9	3	6	0	1.1	.9	4.3	56

DATE	SODIUM AD-SORP-TION RATIO	DIS-SOLVED PO-TAS-SIUM (K) (MG/L)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DIS-SOLVED SULFATE (SO4) (MG/L)	DIS-SOLVED CHLO-RIDE (CL) (MG/L)	DIS-SOLVED FLUO-RIDE (F) (MG/L)
OCT 14...	.6	.5	11	0	9	2.8	4.9	5.1	.0
MAR 09...	.7	.6	3	0	7	3.2	1.7	6.8	.0

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTI-TUENTS) (MG/L)	DIS-SOLVED SOLIDS (TONS PER AC-FT)	DIS-SOLVED SOLIDS (TONS PER DAY)	DIS-SOLVED NITRITE PLUS NITRATE (N) (MG/L)	DIS-SOLVED ORTHO. PHOS-PHORUS (P) (MG/L)	DIS-SOLVED ORTHO PHOS-PHATE (PO4) (MG/L)	DIS-SOLVED IRON (FE) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)
OCT 14...	8.8	32	.04	6.22	.03	.05	.15	70	0
MAR 09...	5.8	26	.04	12.1	.08	.01	.03	40	10

DATE	TIME	INSTAN-TANEOUS DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)
OCT 14...	1315	72	40	6.8	19.0
DEC 01...	1400	46	54	6.9	17.5
JAN 20...	1200	19	58	7.3	17.0
MAR 09...	1330	172	42	6.6	18.5
APR 27...	1350	111	44	7.1	19.0
JUN 20...	1055	66	48	7.1	20.0
AUG 15...	1200	102	42	7.2	19.5

16541500 MANUEL LUIS DITCH AT PUOHOKAMOA GULCH, NEAR HUELO

LOCATION.--Lat 20°51'48", long 156°10'49", Hydrologic Unit 20020000, on right bank at lower portal of tunnel between Haipuaena and Puohokamoa Streams, 2.2 mi (3.5 km) west of Keanae, and 4.4 mi (7.1 km) southeast of Huelo.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--December 1917 to November 1924, January 1925 to current year.

REVISED RECORDS (FISCAL YEARS).--WSP 1719: 1918-30.

GAGE.--Water-stage recorder and sharp-crested weir. Altitude of gage is 920 ft (280 m), from topographic map.

REMARKS.--Records good. Ditch is extension of Center ditch and picks up water from streams between the Kolea and the Waikamoi for irrigation in central Maui.

AVERAGE DISCHARGE.--58 years (water years, 1919-24, 1926-77), 8.20 ft^3/s (0.232 m^3/s), 5,940 acre-ft/yr (7.32 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 142 ft^3/s (4.02 m^3/s) Jan. 3, 1927; no flow at times.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.64	.73	1.0	.28	.08	2.2	.75	4.2	.72	.25	1.1	.51
2	.28	2.2	.91	.28	.07	19	.85	2.8	.59	.19	1.2	.46
3	.16	19	.82	.28	.07	31	2.6	2.0	.49	.17	3.8	.73
4	.16	1.1	.73	.28	.07	4.2	100	1.8	.47	.19	4.2	1.0
5	.16	1.0	.73	.28	.08	2.4	83	1.8	.42	.91	50	.55
6	2.6	4.8	.64	.28	.11	8.7	60	6.4	1.5	.61	62	.82
7	25	1.2	1.1	.22	.09	6.3	53	3.3	.49	1.2	25	1.2
8	.73	15	6.6	.22	.07	6.4	30	5.6	.38	.31	3.7	.57
9	.41	10	1.1	.22	.07	1.7	6.8	4.7	.34	.49	2.3	.50
10	.73	19	1.8	.22	.07	1.1	3.7	2.6	.30	7.6	1.8	.48
11	.51	6.2	.91	.16	.07	1.4	11	2.0	.27	8.5	1.9	.41
12	17	4.5	.73	.16	.06	8.2	5.3	1.7	.28	19	60	.41
13	1.4	2.6	.82	.16	.04	23	3.3	1.5	.28	12	4.2	.36
14	1.0	2.2	.64	.11	.04	7.1	2.7	1.5	.29	2.6	2.7	.34
15	21	2.2	.56	.11	.10	5.8	2.3	1.2	1.1	1.5	2.0	.33
16	2.4	50	.48	.11	.22	2.5	2.3	.99	.31	1.9	1.6	.35
17	1.3	33	.64	.11	.16	2.3	1.5	.89	.28	36	1.3	6.7
18	1.0	5.3	.73	.08	.11	3.0	1.3	.79	.26	5.2	1.2	.91
19	.91	3.5	.48	.09	.11	5.5	2.2	.70	.28	2.7	1.0	.31
20	.91	2.8	.48	.08	.07	17	24	.64	.32	1.8	1.0	.27
21	.82	2.1	.48	.07	.07	6.3	8.9	4.9	.29	2.7	.79	.22
22	.73	3.5	.41	.07	.11	49	2.4	2.5	.22	1.5	1.1	.22
23	.64	11	.41	.07	5.2	19	1.3	.77	.22	1.1	.70	.22
24	.56	3.1	.34	.07	57	10	1.1	.60	.25	.96	.68	.26
25	.56	2.2	.34	.07	1.4	2.8	1.0	.50	.28	.89	1.0	.24
26	1.0	1.9	.34	.07	.80	1.7	.98	.45	.23	.85	.55	.22
27	2.2	1.6	.34	.07	25	1.3	.88	.55	.22	16	.48	.21
28	1.1	1.4	.34	.07	21	1.1	11	1.1	.23	28	.64	.16
29	.73	1.2	.34	.10	---	1.0	72	.60	.20	1.7	.50	.16
30	1.1	1.1	.34	.11	---	.87	9.0	.58	.44	1.3	.64	.16
31	.82	---	.28	.11	---	.77	---	.59	---	1.3	.93	---
TOTAL	88.56	210.43	25.86	4.61	112.34	252.64	505.16	60.25	11.95	159.42	240.01	19.28
MEAN	2.86	7.01	.83	.15	4.01	8.15	16.8	1.94	.40	5.14	7.74	.64
MAX	25	50	6.6	.28	57	49	100	6.4	1.5	36	62	6.7
MIN	.16	.73	.28	.07	.04	.77	.75	.45	.20	.17	.48	.16
AC-FT	176	417	51	9.1	223	501	1000	120	24	316	476	38

CAL YR 1976 TOTAL 989.23 MEAN 2.70 MAX 51 MIN .12 AC-FT 1960
WTR YR 1977 TOTAL 1690.51 MEAN 4.63 MAX 100 MIN .04 AC-FT 3350

16541500 MANUEL LUIS DITCH AT PUOHOKAMOA GULCH, NEAR HUELO--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1976-77.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	COLOR (PLATINUM-COBALT UNITS)	TURBIDITY (JTU)	HARDNESS (CA,MG) (MG/L)	NON-CARBONATE HARDNESS (MG/L)	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG) (MG/L)	DISSOLVED SODIUM (NA) (MG/L)	PERCENT SODIUM
OCT										
07...	1100	5.7	65	10	5	0	.8	.7	3.1	53
MAR										
03...	1330	86	35	8	5	3	.7	.9	4.2	61

DATE	SODIUM ADSORPTION RATIO	DISSOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	ALKALINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)	DISSOLVED FLUORIDE (F) (MG/L)
OCT									
07...	.6	.8	7	0	6	18	3.8	4.6	.0
MAR									
03...	.8	.4	3	0	2	12	5.6	8.2	.0

DATE	DISSOLVED SILICA (SIO2) (MG/L)	DISSOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	DISSOLVED SOLIDS (TONS PER AC-FT)	DISSOLVED SOLIDS (TONS PER DAY)	DISSOLVED NITRITE PLUS NITRATE (N) (MG/L)	DISSOLVED ORTHO. PHOSPHORUS (P) (MG/L)	DISSOLVED ORTHO PHOSPHATE (PO4) (MG/L)	DISSOLVED IRON (FE) (UG/L)	DISSOLVED MANGANESE (MN) (UG/L)
OCT									
07...	2.8	20	.03	.31	.03	.02	.06	200	0
MAR									
03...	2.0	24	.03	5.57	.04	.01	.03	80	10

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)
OCT					
07...	1100	5.7	27	5.8	20.5
NOV					
24...	1030	2.7	54	6.5	19.5
JAN					
14...	1440	.11	70	6.6	17.5
MAR					
03...	1330	86	45	5.6	18.0
APR					
22...	1840	1.9	51	6.7	19.5
JUN					
17...	0930	.28	64	7.2	21.0
AUG					
11...	1045	1.4	79	7.2	21.0

16587000 HONOPOU STREAM NEAR HUELO

LOCATION.--Lat 20°53'20", long 156°15'20", Hydrologic Unit 20020000, on left bank 75 ft (23 m) upstream from Wailoa ditch intake, 2.2 mi (3.5 km) southwest of Huelo, and 2.5 mi (4.0 km) west of Kailua.

DRAINAGE AREA.--0.64 mi^2 (1.66 km^2).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--December 1910 to current year. Monthly discharge only for some periods, published in WSP 1319.

REVISED RECORDS (FISCAL YEARS).--WSP 1219: 1914(M), 1916-50(M). WSP 1249: 1948-50(P). WSP 1569: Drainage area.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 1,208 ft (368 m) above mean sea level (by vertical angles). Prior to June 19, 1914, nonrecording gage at same site and datum.

REMARKS.--Records excellent. No diversion above station.

AVERAGE DISCHARGE.--66 years (water years 1912-77), 4.65 ft^3/s (0.132 m^3/s), 3,370 acre-ft/yr (4.16 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,710 ft^3/s (162 m^3/s) Nov. 18, 1930, gage height, 7.28 ft (2.219 m), from rating curve extended above 110 ft^3/s (3.12 m^3/s) by test of model of station site; minimum, 0.02 ft^3/s (0.001 m^3/s) several days in 1933, 1934.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 155 ft^3/s (4.39 m^3/s) Apr. 4, gage height, 2.73 ft (0.832 m), no peak above base of 270 ft^3/s (7.65 m^3/s); minimum, 0.38 ft^3/s (0.011 m^3/s) on many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.74	.84	1.9	.84	.38	3.0	3.5	4.7	1.6	.64	2.7	1.7
2	.54	1.4	1.7	.84	.38	8.4	3.2	4.3	1.5	.64	2.7	1.6
3	.46	2.7	1.6	.74	.38	13	5.3	4.1	1.3	.64	3.0	1.7
4	.46	1.1	1.5	.96	.38	5.8	55	3.9	1.3	.64	2.9	1.7
5	.46	1.1	1.5	.84	.46	4.3	63	4.1	1.2	1.1	15	1.5
6	.54	2.5	1.5	.74	.46	5.7	53	7.2	1.5	1.5	22	1.5
7	2.3	1.6	2.1	.74	.38	6.0	51	4.3	1.2	1.9	11	1.3
8	.84	4.7	6.2	.74	.38	5.6	36	5.4	1.1	1.2	7.1	1.2
9	1.1	3.9	1.9	.74	.38	4.7	27	4.3	1.1	1.5	5.8	1.2
10	1.2	3.8	2.4	.74	.38	3.9	21	3.5	.96	4.3	5.1	1.1
11	.96	2.5	1.7	.64	.38	4.9	21	3.3	.96	3.1	4.7	1.1
12	4.4	2.4	1.6	.64	.38	6.4	15	3.2	.96	6.1	19	.96
13	1.3	2.1	1.7	.54	.38	15	12	3.0	.84	6.3	6.2	.96
14	1.1	2.1	1.5	.54	.38	9.8	10	2.8	.84	3.0	5.1	.84
15	8.3	2.0	1.5	.54	.54	9.5	9.5	2.7	1.5	2.4	4.5	.84
16	2.1	23	1.6	.54	.64	6.9	8.0	2.5	.96	2.8	4.1	.84
17	1.6	12	1.3	.54	.38	6.7	7.5	2.4	.84	9.4	3.7	1.5
18	1.5	5.8	1.2	.46	.38	6.9	6.7	2.3	.84	4.7	3.3	1.1
19	1.5	4.7	1.2	.46	.38	7.1	5.8	2.1	.84	3.5	3.2	.84
20	1.5	4.3	1.1	.46	.38	8.1	7.7	2.0	.96	3.2	3.0	.84
21	1.3	3.7	1.1	.46	.38	7.1	7.3	3.0	.84	3.3	2.8	.74
22	1.2	3.4	1.1	.46	.46	16	5.6	3.2	.84	2.7	3.2	.74
23	1.1	3.3	1.1	.46	1.4	12	4.9	2.1	.84	2.5	2.5	.74
24	.96	2.8	1.1	.46	8.9	11	4.5	1.9	.84	2.3	2.4	.74
25	.96	3.0	.96	.46	1.6	8.5	4.1	1.9	.74	2.1	2.3	.64
26	1.6	2.5	.96	.38	1.9	7.3	3.9	1.9	.64	2.3	2.1	.64
27	2.5	2.4	.96	.38	5.9	6.5	3.7	1.9	.64	7.7	2.0	.64
28	1.6	2.3	.96	.46	16	5.4	3.9	2.3	.64	7.7	2.0	.64
29	1.1	2.1	.84	.96	---	5.1	16	1.9	.64	3.2	1.7	.54
30	1.1	2.0	.84	.64	---	4.3	6.3	1.7	.64	2.8	2.6	.54
31	.96	---	.84	.46	---	3.7	---	1.6	---	3.0	2.4	---
TOTAL	47.28	112.04	47.46	18.86	44.72	228.6	481.4	95.5	29.60	98.16	160.1	30.92
MEAN	1.53	3.73	1.53	.61	1.60	7.37	16.0	3.08	.99	3.17	5.16	1.03
MAX	8.3	23	6.2	.96	16	16	63	7.2	1.6	9.4	22	1.7
MIN	.46	.84	.84	.38	.38	3.0	3.2	1.6	.64	.64	1.7	.54
AC-FT	94	222	94	37	89	453	955	189	59	195	318	61

CAL YR 1976 TOTAL 1008.64 MEAN 2.76 MAX 36 MIN .46 AC-FT 2000
WTR YR 1977 TOTAL 1394.64 MEAN 3.82 MAX 63 MIN .38 AC-FT 2770

HAWAII, ISLAND OF MAUI

16587000 HONOPOU STREAM NEAR HUELO--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1976-77.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	COLOR (PLATINUM-COBALT UNITS)	TURBIDITY (JTU)	HARDNESS (CA,MG) (MG/L)	NON-CARBONATE HARDNESS (MG/L)	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG) (MG/L)	DISSOLVED SODIUM (NA) (MG/L)	PERCENT SODIUM
OCT 04...	1045	.46	7	1	10	3	1.5	1.6	5.9	54
MAR 04...	1130	5.8	22	8	7	2	1.1	1.1	5.6	60

DATE	SODIUM ADSORPTION RATIO	DISSOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	ALKALINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)	DISSOLVED FLUORIDE (F) (MG/L)
OCT 04...	.8	.5	9	0	7	2.9	2.4	8.8	.1
MAR 04...	.9	.6	6	0	5	1.9	3.5	9.8	.0

DATE	DISSOLVED SILICA (SIO2) (MG/L)	DISSOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	DISSOLVED SOLIDS (TONS PER AC-FT)	DISSOLVED SOLIDS (TONS PER DAY)	DISSOLVED NITRITE PLUS NITRATE (N) (MG/L)	DISSOLVED ORTHO. PHOSPHORUS (P) (MG/L)	DISSOLVED ORTHO PHOSPHATE (PO4) (MG/L)	DISSOLVED IRON (FE) (UG/L)	DISSOLVED MANGANESE (MN) (UG/L)
OCT 04...	6.0	32	.04	.04	.14	.00	.00	100	10
MAR 04...	4.9	30	.04	.47	.17	.01	.03	130	10

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)
OCT 04...	1045	.46	56	6.7	21.0
NOV 30...	1200	2.0	48	6.9	19.0
JAN 24...	1000	.46	56	6.9	16.0
MAR 04...	1130	5.8	49	6.7	18.5
APR 25...	1200	4.0	55	7.1	19.5
JUN 21...	1445	.84	59	7.3	22.0
AUG 15...	1600	4.5	52	7.1	21.0

16588000 WAILOA DITCH AT HONOPOU, NEAR HUELO

LOCATION.--Lat 20°53'20", long 156°15'19", Hydrologic Unit, 20020000, on right bank 100 ft (30 m) downstream from intake at Honopou Stream, 0.5 mi (0.8 km) west of Lupi, and 2.2 mi (3.5 km) southwest of Huelo.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--November 1922 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,208 ft (368.2 m) above mean sea level (by vertical angles).

REMARKS.--Records excellent. Wailoa ditch receives water from Koolau ditch at Alo Stream and from all streams from there west to Halehaku Gulch at altitude of about 1,200 ft (366 m). Water is used for domestic supply, power, and irrigation in Central Maui.

AVERAGE DISCHARGE.--54 years (water years 1924-77), 171 ft^3/s (4.843 m^3/s), 123,900 acre-ft/yr (153 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 326 ft^3/s (9.23 m^3/s) Apr. 1, 1967; no flow Jan. 24-27, 1923.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	129	87	90	53	30	285	162	277	127	73	162	127
2	72	98	85	56	33	292	175	229	107	64	199	120
3	68	258	80	50	67	296	222	202	97	63	266	169
4	67	134	77	55	40	291	227	197	91	97	180	202
5	55	123	79	57	38	287	158	223	91	147	299	129
6	66	286	89	47	53	291	159	289	229	206	296	139
7	263	242	260	44	40	293	164	284	141	224	298	192
8	148	251	257	43	33	292	168	287	109	167	285	141
9	165	289	155	42	29	280	212	281	95	194	247	130
10	220	286	233	41	27	219	223	230	87	225	205	119
11	121	272	144	39	26	273	242	201	81	257	191	97
12	274	237	112	38	25	295	244	176	83	284	299	88
13	191	184	128	37	25	297	244	188	77	283	287	83
14	141	169	98	36	29	296	244	246	87	277	242	79
15	283	162	90	35	56	296	244	196	206	229	198	74
16	213	286	98	34	122	286	244	150	115	225	170	76
17	156	302	92	34	43	277	252	141	90	287	151	244
18	127	275	82	33	32	293	260	131	83	282	137	229
19	115	228	74	33	28	295	279	117	94	268	129	117
20	122	201	71	32	26	297	291	112	115	232	128	95
21	101	164	69	33	26	296	293	236	91	258	115	85
22	91	157	65	31	37	299	288	268	77	206	205	81
23	82	200	64	30	56	297	271	239	79	166	141	79
24	79	135	69	29	275	296	232	175	79	148	131	103
25	85	127	60	28	208	293	228	132	79	137	211	91
26	141	119	58	27	163	287	232	122	68	146	123	71
27	208	122	59	27	287	249	218	124	104	240	118	68
28	186	116	74	29	294	226	276	199	83	289	128	64
29	103	103	76	97	---	232	301	137	68	225	106	61
30	138	106	64	63	---	197	289	124	107	175	172	58
31	104	---	56	34	---	175	---	119	---	189	210	---
TOTAL	4314	5719	3108	1267	2148	8578	7042	6032	3040	6263	6029	3411
MEAN	139	191	100	40.9	76.7	277	235	195	101	202	194	114
MAX	283	302	260	97	294	299	301	289	229	289	299	244
MIN	55	87	56	27	25	175	158	112	68	63	106	58
AC-FT	8560	11340	6160	2510	4260	17010	13970	11960	6030	12420	11960	6770

CAL YR 1976 TOTAL 58169 MEAN 159 MAX 311 MIN 47 AC-FT 115400
WTR YR 1977 TOTAL 56951 MEAN 156 MAX 302 MIN 25 AC-FT 113000

16588000 WAILOA DITCH AT HONOPOU, NEAR HUELO--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1972-77.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	COLOR (PLATINUM-COBALT UNITS)	TURBIDITY (JTU)	HARDNESS (CA,MG) (MG/L)	NON-CARBONATE HARDNESS (MG/L)	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG) (MG/L)	DISSOLVED SODIUM (NA) (MG/L)	PERCENT SODIUM
OCT										
04...	1015	67	18	5	10	0	1.9	1.2	4.4	48
MAR										
04...	1340	291	22	4	5	3	1.1	.6	3.8	59

DATE	SODIUM ADSORPTION RATIO	DISSOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	ALKALINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)	DISSOLVED FLUORIDE (F) (MG/L)
OCT									
04...	.6	.5	17	0	14	3.4	1.8	5.1	.1
MAR									
04...	.7	.4	3	0	2	1.9	3.1	6.4	.0

DATE	DISSOLVED SILICA (SIO2) (MG/L)	DISSOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	DISSOLVED SOLIDS (TONS PER AC-FT)	DISSOLVED SOLIDS (TONS PER DAY)	DISSOLVED NITRITE PLUS NITRATE (N) (MG/L)	DISSOLVED ORTHO. PHOSPHORUS (P) (MG/L)	DISSOLVED ORTHO PHOSPHATE (PO4) (MG/L)	DISSOLVED IRON (FE) (UG/L)	DISSOLVED MANGANESE (MN) (UG/L)
OCT									
04...	.9	25	.03	4.52	.07	.00	.00	100	0
MAR									
04...	4.0	21	.03	16.5	.07	.01	.03	70	0

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)
OCT					
04...	1015	67	47	6.9	19.0
NOV					
30...	1450	102	55	7.1	18.5
JAN					
24...	1230	29	56	7.0	18.0
MAR					
04...	1340	291	33	6.4	18.0
APR					
25...	1400	220	42	7.1	18.5
JUN					
21...	1350	88	49	7.1	20.0
AUG					
15...	1400	197	41	7.1	20.0

16589000 NEW HAMAKUA DITCH AT HONOPOU, NEAR HUELO

LOCATION.--Lat 20°53'28", long 156°15'22", Hydrologic Unit 20020000, on right bank 15 ft (4.6 m) upstream from tunnel portal, 600 ft (183 m) downstream from Honopou Stream crossing, and 2.1 mi (3.4 km) southwest of Huelo.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--January 1918 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,170 ft (356.6 m) above mean sea level (by vertical angles). Prior to May 14, 1921, at site 300 ft (91 m) upstream at different datum. May 14, 1921, to Mar. 18, 1962, at present site at datum 1.00 ft (0.305 m) higher.

REMARKS.--Records excellent. Ditch diverts from streams between Waikanoi Stream and Halehaku Gulch above Center and Lowrie ditches for irrigation in central Maui.

AVERAGE DISCHARGE.--59 years, 36.4 ft^3/s (1.031 m^3/s), 26,370 acre-ft/yr (32.5 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 182 ft^3/s (5.15 m^3/s) Nov. 2, 1967; no flow at times.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	11	.75	2.0	.56	.16	116	1.9	29	1.4	.40	1.8	1.4
2	.62	1.5	1.9	.59	.14	134	2.4	4.8	1.1	.32	13	1.2
3	.43	100	1.7	.53	.16	163	30	3.9	.99	.31	82	3.8
4	.38	1.4	1.6	.64	.14	142	170	3.7	.92	.32	3.4	16
5	.32	.96	1.5	.65	.16	125	169	4.0	.87	35	162	1.3
6	1.7	135	1.5	.51	.16	155	169	145	41	63	162	1.1
7	141	68	88	.47	.16	160	167	88	1.2	85	164	10
8	5.6	70	90	.46	.13	153	166	124	.93	12	77	1.2
9	27	150	2.1	.43	.11	78	165	92	.81	65	8.9	1.0
10	62	118	32	.41	.11	5.4	164	5.3	.74	88	3.5	.97
11	.75	69	1.7	.40	.11	55	164	4.4	.68	133	3.1	.85
12	140	43	1.4	.36	.11	150	163	3.8	.68	163	157	.79
13	15	2.6	1.4	.36	.11	154	160	3.7	.62	161	100	.74
14	1.2	2.6	1.2	.31	.11	163	148	19	.62	86	11	.68
15	146	2.4	1.2	.31	.52	163	114	5.5	44	16	4.6	.63
16	51	122	1.1	.30	26	88	152	2.6	1.0	25	3.9	.62
17	1.7	164	1.1	.27	.32	59	56	2.4	.63	162	3.4	79
18	1.3	77	1.3	.25	.15	158	19	2.2	.65	143	3.0	43
19	1.1	6.7	.97	.23	.11	162	50	1.9	.64	79	2.6	1.0
20	1.3	5.4	.90	.23	.10	163	155	1.8	.87	7.7	2.6	.75
21	1.0	4.2	.87	.23	.11	162	162	43	.72	63	2.3	.64
22	.91	4.5	.85	.20	.23	165	139	97	.55	4.6	40	.62
23	.82	48	.81	.17	19	164	35	7.8	.51	2.3	2.3	.58
24	.79	4.6	.84	.16	161	164	13	2.4	.53	2.0	2.0	.56
25	.79	3.9	.74	.16	31	156	8.5	1.5	.50	1.9	28	.56
26	3.7	3.4	.68	.16	11	63	16	1.4	.44	1.8	1.8	.48
27	68	3.0	.68	.13	158	17	15	1.4	1.9	58	1.6	.44
28	26	2.7	.68	.14	159	2.9	38	4.8	.40	142	1.6	.41
29	1.0	2.4	.71	.43	---	2.6	165	1.5	.34	5.3	1.4	.37
30	1.7	2.3	.64	.43	---	2.3	151	1.3	.52	2.2	4.1	.36
31	.85	---	.61	.19	---	2.0	---	1.2	---	2.1	26	---
TOTAL	714.96	1219.31	242.68	10.67	568.41	3447.2	3127.8	710.3	106.76	1610.25	1079.9	171.05
MEAN	23.1	40.6	7.83	.34	20.3	111	104	22.9	3.56	51.9	34.8	5.70
MAX	146	164	90	.65	161	165	170	145	44	163	164	79
MIN	.32	.75	.61	.13	.10	2.0	1.9	1.2	.34	.31	1.4	.36
AC-FT	1420	2420	481	21	1130	6840	6200	1410	212	3190	2140	339

CAL YR 1976 TOTAL 12543.04 MEAN 34.3 MAX 168 MIN .25 AC-FT 24880
WTR YR 1977 TOTAL 13009.29 MEAN 35.6 MAX 170 MIN .10 AC-FT 25800

HAWAII, ISLAND OF MAUI

16589000 NEW HAMAKUA DITCH AT HONOPOU, NEAR HUELO--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1976-77.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	COLOR (PLATINUM-COBALT UNITS)	TURBIDITY (JTU)	HARDNESS (CA,MG) (MG/L)	NONCARBONATE HARDNESS (MG/L)	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG) (MG/L)	DISSOLVED SODIUM (NA) (MG/L)	PERCENT SODIUM
OCT 04...	1245	.31	22	6	11	3	2.0	1.4	6.0	53
MAR 04...	1110	157	32	8	4	1	.8	.6	3.9	63

DATE	SODIUM ADSORPTION RATIO	DISSOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	ALKALINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)	DISSOLVED FLUORIDE (F) (MG/L)
OCT 04...	.8	.6	9	0	7	1.8	1.8	8.2	.0
MAR 04...	.8	.4	4	0	3	3.2	3.5	6.8	.0

DATE	DISSOLVED SILICA (SIO2) (MG/L)	DISSOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	DISSOLVED SOLIDS (TONS PER AC-FT)	DISSOLVED SOLIDS (TONS PER DAY)	DISSOLVED NITRITE PLUS NITRATE (N) (MG/L)	DISSOLVED ORTHO. PHOSPHORUS (P) (MG/L)	DISSOLVED ORTHO PHOSPHATE (PO4) (MG/L)	DISSOLVED IRON (FE) (UG/L)	DISSOLVED MANGANESE (MN) (UG/L)
OCT 04...	6.9	32	.04	.03	.04	.00	.00	130	0
MAR 04...	3.4	22	.03	9.33	.05	.01	.03	110	0

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)
OCT 04...	1245	.31	56	6.9	25.5
NOV 30...	1050	2.2	61	7.0	19.0
JAN 24...	1400	.16	67	7.0	20.5
MAR 04...	1110	157	33	6.3	18.0
APR 25...	1030	8.8	46	6.7	18.5
JUN 21...	1125	.68	62	7.3	22.0
AUG 15...	1330	4.4	58	6.9	20.5

16592000 LOWRIE DITCH AT HONOPOU GULCH, NEAR HUELO

LOCATION.--Lat 20°54'57", long 156°15'08", Hydrologic Unit 20020000, on left bank 0.2 mi (0.3 km) downstream from siphon across Honopou Stream, 1.6 mi (2.6 km) west of Huelo, and 2.7 mi (4.3 km) northwest of Kailua.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--January 1910 to March 1927, February 1930 to current year. Published as "at Opana weir, near Huelo" 1910-27.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 598.0 ft (182.27 m) above mean sea level. Jan. 1, 1910, to Mar. 31, 1927, at site 1.5 mi (2.4 km) downstream at different datum.

REMARKS.--Records good. Lowrie ditch receives water from Center ditch at Nailiilihaele Stream and diverts from additional streams westward to Maliko Gulch for irrigation in central Maui.

AVERAGE DISCHARGE.--63 years (water years, 1911-26, 1931-77), 37.7 ft^3/s (1.068 m^3/s), 27,310 acre-ft/yr (33.7 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 116 ft^3/s (3.29 m^3/s) Oct. 31, 1921; no flow at times.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	18	12	24	5.8	3.3	42	22	47	21	5.5	24	10
2	13	13	24	6.1	3.1	76	19	35	18	4.9	20	9.4
3	12	53	23	5.7	3.1	102	19	31	18	4.8	30	10
4	11	27	12	6.1	3.1	71	109	29	9.3	5.0	21	15
5	9.8	24	11	6.4	3.1	55	111	28	9.0	7.3	86	11
6	9.4	58	19	5.4	4.2	78	100	79	19	25	87	9.7
7	55	39	19	5.1	3.3	82	95	52	9.3	34	91	13
8	18	45	55	5.0	3.0	75	75	42	20	24	43	9.6
9	19	75	28	4.8	2.8	51	57	65	9.4	22	33	9.3
10	22	61	35	4.7	2.7	40	50	35	8.0	47	34	8.5
11	19	48	17	4.5	2.5	42	56	30	7.7	52	35	7.8
12	79	41	12	4.3	2.4	76	71	28	7.7	88	90	7.4
13	27	20	27	4.2	2.2	84	82	27	7.4	84	55	7.1
14	27	20	16	4.1	2.2	93	59	26	7.8	38	31	6.8
15	79	23	12	4.0	2.7	90	48	22	26	28	33	6.5
16	32	89	10	4.0	5.0	52	81	22	20	30	32	6.5
17	15	101	9.4	3.9	3.1	47	34	39	7.5	87	23	25
18	27	70	10	3.7	2.5	74	41	33	6.8	63	32	23
19	29	44	8.4	3.5	2.4	91	38	28	6.7	47	23	24
20	29	34	7.9	3.3	2.2	88	82	24	5.7	33	23	24
21	22	27	7.7	3.3	2.2	87	92	24	5.8	33	20	23
22	11	27	7.3	3.1	3.7	90	68	58	6.6	33	27	12
23	8.4	69	7.3	3.0	4.2	89	30	26	6.1	34	26	5.7
24	7.3	37	8.0	3.0	100	89	26	24	6.6	23	20	5.9
25	7.5	30	6.9	3.0	40	71	36	25	6.6	14	14	5.8
26	8.0	26	6.5	3.0	32	29	35	24	6.0	12	14	5.3
27	18	22	6.5	2.8	86	24	32	18	5.8	27	11	5.0
28	20	22	6.8	3.1	94	28	22	15	5.4	82	11	4.7
29	15	32	7.2	4.0	---	32	97	11	5.0	24	10	4.5
30	14	29	6.6	4.2	---	34	75	23	7.3	22	12	4.4
31	12	---	6.1	3.1	---	33	---	18	---	22	16	---
TOTAL	693.4	1218	456.6	130.2	421.0	2015	1762	1008	297.5	1055.5	1027	319.9
MEAN	22.4	40.6	14.7	4.20	15.0	65.0	58.7	32.5	9.92	34.0	33.1	10.7
MAX	79	101	55	6.4	100	102	111	79	26	88	91	25
MIN	7.3	12	6.1	2.8	2.2	24	19	11	5.0	4.8	10	4.4
AC-FT	1380	2420	906	258	835	4000	3490	2000	590	2090	2040	635

CAL YR 1976 TOTAL 9380.1 MEAN 25.6 MAX 101 MIN 2.8 AC-FT 18610
WTR YR 1977 TOTAL 10404.1 MEAN 28.5 MAX 111 MIN 2.2 AC-FT 20640

16592000 LOWRIE DITCH AT HONOPOU GULCH, NEAR HUELO--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1976-77.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTAN-TANEOUS DIS-CHARGE (CFS)	COLOR (PLAT-INUM-COBALT UNITS)	TUR-BID-ITY (JTU)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	DIS-SOLVED SODIUM (NA) (MG/L)	PERCENT SODIUM
OCT										
04...	1430	10	70	20	7	0	1.0	1.0	4.7	58
FEB										
28...	1110	97	90	30	5	2	1.0	.6	4.2	61

DATE	SODIUM AD-SORP-TION RATIO	DIS-SOLVED PO-TAS-SIUM (K) (MG/L)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DIS-SOLVED SULFATE (SO4) (MG/L)	DIS-SOLVED CHLO-RIDE (CL) (MG/L)	DIS-SOLVED FLUO-RIDE (F) (MG/L)
OCT									
04...	.8	.7	15	0	12	4.8	2.5	5.7	.0
FEB									
28...	.8	.6	4	0	3	5.1	4.4	6.2	.0

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTI-TUENTS) (MG/L)	DIS-SOLVED SOLIDS (TONS PER AC-FT)	DIS-SOLVED SOLIDS (TONS PER DAY)	DIS-SOLVED NITRITE PLUS NITRATE (N) (MG/L)	DIS-SOLVED ORTHO, PHOS-PHORUS (P) (MG/L)	DIS-SOLVED ORTHO PHOS-PHATE (PO4) (MG/L)	DIS-SOLVED IRON (FE) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)
OCT									
04...	5.5	29	.04	.83	.01	.00	.00	80	0
FEB									
28...	2.4	22	.03	5.76	.08	.01	.03	210	0

DATE	TIME	INSTAN-TANEOUS DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)
OCT					
04...	1430	10	43	6.7	23.0
04...	1435	11	43	6.7	23.0
NOV					
24...	1600	35	64	6.7	20.5
JAN					
18...	1100	3.5	83	7.4	21.0
FEB					
28...	1110	97	32	6.1	18.5
MAR					
07...	1130	81	41	6.2	18.0
APR					
26...	1350	36	53	6.9	21.0
JUN					
27...	1300	5.9	81	7.7	22.5
AUG					
11...	1450	35	46	7.2	22.5

HAWAII, ISLAND OF MAUI

16594000 HAIKU DITCH AT HONOPOU GULCH, NEAR KAILUA

LOCATION.--Lat 20°55'07", long 156°14'58", Hydrologic Unit 20020000, on right bank on west side of Honopou Gulch, 160 ft (49 m) below new Government Road, 2.5 mi (4.0 km) northwest of Kailua, and 5.0 mi (8.0) east of Haiku.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--January 1910 to December 1928, February 1930 to current year. Published as "at Peahi weir, near Huelo" prior to July 1919, as "at Manawai Gulch, near Peahi" July 1919 to December 1928, and as "at Kapalalaea Gulch, near Huelo" February 1930 to January 1940. Monthly discharge only for some periods, published in WSP 1319.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 421.54 ft (128.485 m) above mean sea level. Prior to Oct. 7, 1914, at site at Peahi weir on old Haiku ditch at different datum. Oct. 7, 1914, to Dec. 31, 1928, at site 2.9 mi (4.7 km) downstream at different datum. Feb. 19, 1930, to Feb. 20, 1940, at site 0.9 mi (1.4 km) downstream at different datum.

REMARKS.--Records excellent. Ditch diverts from all streams between Nailiilihaele Stream and Maliko Gulch for irrigation in central Maui.

AVERAGE DISCHARGE.--62 years (water years, 1911, 1914, 1916-28, 1931-77), 25.3 ft^3/s (0.716 m^3/s), 18,330 acre-ft/yr (22.6 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 209 ft^3/s (5.92 m^3/s) Nov. 13, 1934, Jan. 8, 9, Feb. 25-27, 1935, Jan. 27, 1938; no flow at times.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.1	.25	1.3	.48	.26	3.0	1.7	6.0	1.9	.96	1.3	1.1
2	2.1	.26	1.2	.50	.26	63	1.9	5.7	1.6	.92	1.2	1.1
3	1.7	37	1.2	.48	.09	109	4.7	4.1	1.6	.84	1.3	1.1
4	1.2	.69	1.1	.62	.02	55	99	3.9	1.5	.86	1.2	1.1
5	.36	.52	1.0	.54	.11	16	92	4.0	1.6	3.8	98	1.1
6	.18	51	1.1	.48	.27	62	87	75	1.7	7.6	84	1.1
7	67	7.7	1.1	.47	.36	92	85	6.4	1.6	2.1	60	1.1
8	2.2	29	40	.44	.36	59	78	13	1.5	.96	3.7	1.1
9	2.3	62	1.8	.45	.36	2.3	43	21	1.4	.86	1.7	1.1
10	1.7	48	1.6	.43	.36	2.0	63	4.2	1.2	43	1.5	1.0
11	.59	20	1.2	.40	.36	1.6	97	3.9	1.2	45	1.4	.90
12	76	11	.89	.36	.34	63	63	3.6	1.2	103	83	.89
13	3.6	1.6	1.0	.36	.33	67	9.2	3.6	1.2	93	15	.90
14	1.6	1.7	.85	.34	.33	80	4.8	3.4	1.3	5.1	2.1	.74
15	87	1.5	.79	.32	.43	91	4.7	2.8	1.9	1.7	1.9	.74
16	7.0	75	.74	.32	.52	4.5	45	2.7	1.3	1.7	1.7	.74
17	1.7	102	.71	.32	.38	2.2	4.8	2.7	1.2	77	1.6	3.9
18	1.4	19	.65	.28	.36	71	4.7	2.5	1.2	48	1.5	4.0
19	1.2	4.0	.63	.26	.36	103	4.5	2.4	1.3	15	1.4	.92
20	1.6	3.3	.61	.25	.36	85	57	2.2	4.2	1.7	1.5	.80
21	.74	2.5	.59	.26	.28	73	69	5.8	2.6	1.7	1.3	.74
22	.56	2.0	.58	.28	.25	62	29	38	1.2	1.6	1.3	.68
23	.51	22	.64	.29	.42	34	4.5	2.6	1.2	1.4	1.2	.68
24	.45	2.4	.69	.30	101	41	4.1	2.3	1.0	1.3	1.3	.68
25	.42	2.0	.59	.29	6.1	20	3.8	2.0	1.1	1.3	1.3	.68
26	.42	1.8	.58	.22	1.0	3.1	3.4	1.9	.97	1.2	1.2	.68
27	.56	1.6	.64	.18	80	2.5	3.1	2.0	1.0	6.6	1.2	.68
28	.64	1.5	.61	.27	87	2.2	3.6	2.3	.97	80	1.3	.72
29	.47	1.4	.65	.31	---	2.1	90	1.8	.97	1.9	1.3	.74
30	.44	1.4	.57	.31	---	2.0	47	1.8	1.1	1.5	1.4	.77
31	.30	---	.52	.27	---	1.8	---	1.7	---	1.4	1.3	---
TOTAL	270.04	514.12	66.13	11.08	282.27	1275.3	1107.5	235.3	43.71	553.00	379.1	32.48
MEAN	8.71	17.1	2.13	.36	10.1	41.1	36.9	7.59	1.46	17.8	12.2	1.08
MAX	87	102	40	.62	101	109	99	75	4.2	103	98	4.0
MIN	.18	.25	.52	.18	.02	1.6	1.7	1.7	.97	.84	1.2	.68
AC-FT	536	1020	131	22	560	2530	2200	467	87	1100	752	64

CAL YR 1976 TOTAL 4204.48 MEAN 11.5 MAX 104 MIN .15 AC-FT 8340
WTR YR 1977 TOTAL 4770.03 MEAN 13.1 MAX 109 MIN .02 AC-FT 9460

HAWAII, ISLAND OF MAUI

16594000 HAIKU DITCH AT HONOPOU GULCH, NEAR KAILUA--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1976-77.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTAN-TANEOUS DIS-CHARGE (CFS)	COLOR (PLAT-INUM-COBALT UNITS)	TUR-BID-ITY (JTU)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	DIS-SOLVED SODIUM (NA) (MG/L)	PERCENT SODIUM
OCT 07...	1405	109	70	20	12	7	3.6	.7	3.3	36
MAR 07...	1000	26	25	6	8	5	1.5	1.0	4.9	56

DATE	SODIUM AD-SORP-TION RATIO	DIS-SOLVED PO-TAS-SIUM (K) (MG/L)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DIS-SOLVED SULFATE (SO4) (MG/L)	DIS-SOLVED CHLO-RIDE (CL) (MG/L)	DIS-SOLVED FLUO-RIDE (F) (MG/L)
OCT 07...	.4	.6	6	0	5	6.1	3.4	4.3	.0
MAR 07...	.8	.4	4	0	3	3.2	3.4	8.6	.0

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTI-TUENTS) (MG/L)	DIS-SOLVED SOLIDS (TONS PER AC-FT)	DIS-SOLVED SOLIDS (TONS PER DAY)	DIS-SOLVED NITRITE PLUS NITRATE (N) (MG/L)	DIS-SOLVED ORTHO. PHOS-PHORUS (P) (MG/L)	DIS-SOLVED ORTHO PHOS-PHATE (PO4) (MG/L)	DIS-SOLVED IRON (FE) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)
OCT 07...	3.0	23	.03	6.77	.09	.02	.06	200	10
MAR 07...	4.1	26	.04	1.83	.04	.00	.00	390	0

DATE	TIME	INSTAN-TANEOUS DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)
OCT 07...	1405	109	27	6.2	20.5
NOV 24...	1400	2.1	89	6.6	21.5
JAN 18...	1500	.25	112	7.9	21.5
MAR 07...	1000	26	44	6.3	17.5
APR 26...	1040	3.2	98	7.1	21.0
JUN 27...	1100	1.1	112	7.1	23.0
AUG 11...	1325	1.4	97	7.1	23.5

16599500 OPANA TUNNEL AT KAILIILI

LOCATION.--Lat 20°51'04", long 156°16'17", Hydrologic Unit 20020000, on left bank at tunnel outlet, 0.3 mi (0.5 km) north of Kailiili, and 2.7 mi (4.3 km) east of Makawao.

PERIOD OF RECORD.--May 1965 to current year.

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 2,340 ft (713 m), from topographic map.

REMARKS.--Records good. Tunnel diverts from Opana Gulch for domestic use in the Kokomo, Makawao and Pukalani areas. Periodic determinations of water temperature for the current year are published elsewhere in this report.

AVERAGE DISCHARGE.--12 years, 3.10 ft^3/s (0.088 m^3/s), 2,250 acre-ft/yr (2.77 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 13 ft^3/s (0.37 m^3/s) Apr. 1, 1969, Apr. 9, 10, 1972, Nov. 12, 1973; minimum daily, 0.11 ft^3/s (0.003 m^3/s) Nov. 5-10, 1973, Oct. 5, 6, 25, 26, 1974.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.5	.22	.80	.28	.17	4.0	3.9	5.7	1.4	.50	1.1	1.4
2	.53	.29	.71	.28	.17	7.7	3.6	4.8	1.4	.46	1.0	1.3
3	.33	3.3	.67	.28	.17	9.9	5.0	4.1	1.3	.46	1.0	1.3
4	.25	1.2	.65	.29	.16	6.8	12	3.8	1.2	.53	.93	1.4
5	.21	.86	.66	.28	.15	8.3	11	3.6	1.2	.74	7.5	1.2
6	.26	8.1	.65	.27	.15	10	11	4.5	1.6	.75	8.6	1.1
7	7.8	5.3	2.3	.24	.15	10	11	3.7	1.3	.97	9.1	1.1
8	2.3	4.9	2.1	.24	.15	8.2	11	3.5	1.1	.74	4.7	1.0
9	1.2	6.7	1.2	.24	.14	4.5	9.3	3.3	1.1	.65	3.1	1.0
10	1.1	3.1	.96	.24	.14	3.1	8.7	3.2	1.0	1.1	2.5	1.0
11	.67	2.3	.81	.23	.14	3.2	8.3	3.2	.98	1.6	2.3	.91
12	5.2	1.6	.70	.20	.14	8.5	7.7	2.9	.95	5.5	9.6	.84
13	2.5	1.2	.67	.20	.14	8.2	7.0	2.7	.86	3.4	6.6	.80
14	1.2	1.0	.61	.20	.14	7.8	6.4	3.2	.95	1.8	3.9	.77
15	2.0	.87	.57	.20	.14	7.2	6.1	2.7	1.5	1.2	3.2	.71
16	1.5	7.2	.54	.20	.23	4.8	6.4	2.4	1.1	1.0	2.8	.70
17	.96	10	.49	.20	.15	3.9	5.8	2.3	.90	6.1	2.6	1.1
18	.69	5.5	.46	.17	.15	7.9	6.4	2.1	.83	3.3	2.3	1.3
19	.54	2.8	.41	.17	.14	9.7	7.1	2.0	.86	2.4	2.2	.85
20	.47	2.0	.40	.17	.14	11	9.1	1.9	.81	1.6	2.1	.68
21	.44	1.6	.36	.20	.14	10	9.6	3.6	.74	1.3	2.0	.62
22	.37	1.4	.36	.17	.14	12	8.3	5.8	.70	1.1	2.3	.58
23	.31	1.2	.36	.17	.21	11	6.5	4.0	.64	.96	1.9	.58
24	.27	1.1	.38	.17	8.3	10	5.5	3.2	.63	.83	1.8	.74
25	.24	1.5	.32	.16	3.0	8.8	5.4	2.4	.60	.76	2.7	.63
26	.33	1.2	.32	.15	1.2	7.9	6.2	2.1	.58	.73	1.9	.55
27	.78	1.0	.32	.15	8.1	6.9	4.9	1.9	.56	1.1	1.7	.52
28	.92	.93	.36	.19	9.1	6.0	4.5	2.0	.52	8.1	1.6	.49
29	.45	.87	.35	.37	---	5.3	9.5	1.7	.52	2.7	1.5	.46
30	.30	.89	.32	.28	---	4.7	7.9	1.6	.52	1.6	1.7	.45
31	.24	---	.30	.21	---	4.2	---	1.5	---	1.4	1.8	---
TOTAL	35.86	80.13	20.11	6.80	33.25	231.5	225.1	95.4	28.35	55.38	98.03	26.08
MEAN	1.16	2.67	.65	.22	1.19	7.47	7.50	3.08	.95	1.79	3.16	.87
MAX	7.8	10	2.3	.37	9.1	12	12	5.8	1.6	8.1	9.6	1.4
MIN	.21	.22	.30	.15	.14	3.1	3.6	1.5	.52	.46	.93	.45
AC-FT	71	159	40	13	66	459	446	189	56	110	194	52

CAL YR 1976 TOTAL 920.78 MEAN 2.52 MAX 12 MIN .15 AC-FT 1830
WTR YR 1977 TOTAL 935.99 MEAN 2.56 MAX 12 MIN .14 AC-FT 1860

16618000 KAHAKULOA STREAM NEAR HONOKOHAU
(National stream-quality accounting network station)

LOCATION.--Lat 20°58'54", long 156°33'26", Hydrologic Unit 20020000, on right bank 0.5 mi (0.8 km) downstream from Kapuna Stream, 1.3 mi (2.1 km) south of Kahakuloa, 2.0 mi (3.2 km) west of Puu Makawana, and 4.3 mi (6.9 km) southeast of Honokohau.

DRAINAGE AREA.--3.47 mi² (8.99 km²).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--July 1939 to August 1943, September 1947 to November 1970, December 1974 to current year. Records for January 1913 to December 1914 (fragmentary) at site 1.0 mi (1.6 km) upstream not equivalent owing to difference in drainage areas.

REVISED RECORDS (FISCAL YEARS).--WSP 1319: 1948, 1949(M). WSP 1569: Drainage area.

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 330 ft (101 m), from topographic map.

REMARKS.--Records good. No diversion above station.

AVERAGE DISCHARGE.--28 years (1940-42, 1948-70, 1976-77), 16.6 ft³/s (0.470 m³/s) 12,030 acre-ft/yr (14.8 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,800 ft³/s (108 m³/s) Nov. 25, 1970, gage height, 10.57 ft (3.222 m), from floodmarks, from rating curve extended above 510 ft³/s (14.4 m³/s) on basis of slope-area measurements at gage heights 6.70 ft (2.042 m), 8.48 ft (2.585 m), and 10.57 ft (3.222 m); minimum, 3.0 ft³/s (0.085 m³/s) Feb. 9-11, 1954.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 500 ft³/s (14.2 m³/s) and maximum (*):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Nov. 16	0730	512	14.5	5.16	1.573
Apr. 4	0430	767	21.7	5.61	1.710
July 27	2330	*1260	35.7	6.23	1.899

Minimum discharge, 3.7 ft³/s (0.10 m³/s) Feb. 12-15.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	7.0	6.0	5.5	4.7	4.4	7.3	4.9	11	8.5	6.6	7.5	6.9
2	5.1	21	5.5	4.7	4.2	18	58	8.7	6.8	6.1	17	6.2
3	4.7	37	5.3	4.5	5.7	8.3	91	8.6	6.0	6.6	22	9.3
4	4.5	6.7	5.3	4.6	5.4	6.9	352	9.0	5.8	7.0	8.3	6.8
5	4.3	5.7	5.3	5.7	4.7	5.5	257	8.3	7.4	6.4	140	5.9
6	4.8	17	5.8	4.3	5.1	14	189	14	35	6.1	39	35
7	46	7.5	7.3	4.1	5.5	15	53	8.7	8.6	8.9	25	22
8	6.4	17	38	4.1	4.7	11	36	8.9	7.2	6.0	9.5	19
9	5.2	27	11	4.0	4.2	6.3	46	16	6.1	5.7	7.8	26
10	5.0	71	15	4.1	4.0	5.4	18	7.6	5.7	48	7.0	11
11	4.9	23	6.5	4.0	3.9	5.2	19	6.6	5.7	18	7.8	7.3
12	133	14	5.6	4.0	3.9	5.4	17	6.3	5.5	108	100	6.5
13	10	7.6	11	4.0	3.8	15	14	6.4	5.4	35	12	6.3
14	7.1	28	6.0	4.0	3.7	7.0	10	27	6.4	13	8.4	6.1
15	109	16	5.7	4.0	15	5.7	8.7	9.7	7.6	8.5	7.1	5.8
16	14	181	5.3	4.0	37	5.1	8.3	6.8	8.0	8.4	6.6	5.6
17	7.6	97	5.4	4.0	5.8	4.7	14	7.1	6.7	57	6.3	15
18	6.2	14	16	4.0	4.6	5.3	79	6.4	5.8	8.9	6.1	12
19	5.6	18	5.8	4.0	4.4	7.0	30	6.0	6.2	7.3	5.9	6.4
20	5.6	17	5.2	4.1	4.2	9.3	23	5.9	7.9	6.5	8.8	5.7
21	7.9	9.6	5.2	5.5	4.2	6.8	25	6.2	7.1	14	6.8	5.5
22	6.3	7.8	5.0	4.3	9.7	18	12	6.0	11	11	17	5.3
23	5.1	11	5.1	4.0	29	12	8.5	6.0	8.0	6.8	7.1	5.4
24	4.8	7.1	8.0	4.0	56	13	20	6.0	9.1	6.1	6.5	5.5
25	4.8	29	5.3	3.9	9.3	6.2	31	7.1	7.1	5.9	9.2	5.3
26	5.4	7.5	4.9	3.9	6.1	5.2	14	6.0	6.0	5.7	6.2	5.2
27	37	6.5	4.7	3.9	24	4.9	21	6.4	7.0	80	6.0	5.2
28	14	6.2	4.9	4.0	33	4.7	35	16	8.7	64	12	5.0
29	5.7	5.8	5.2	17	---	5.1	112	7.1	6.1	9.8	7.1	5.0
30	7.1	5.8	4.8	9.3	---	4.8	20	8.0	14	7.2	20	5.0
31	14	---	4.6	4.6	---	4.6	---	6.9	---	8.3	14	---
TOTAL	508.1	727.8	234.2	149.3	305.5	252.7	1626.4	270.7	246.4	596.8	564.0	277.2
MEAN	16.4	24.3	7.55	4.82	10.9	8.15	54.2	8.73	8.21	19.3	18.2	9.24
MAX	133	181	38	17	56	18	352	27	35	108	140	35
MIN	4.3	5.7	4.6	3.9	3.7	4.6	4.9	5.9	5.4	5.7	5.9	5.0
AC-FT	1010	1440	465	296	606	501	3230	537	489	1180	1120	550

CAL YR 1976 TOTAL 4620.8 MEAN 12.6 MAX 227 MIN 3.7 AC-FT 9170
WTR YR 1977 TOTAL 5759.1 MEAN 15.8 MAX 352 MIN 3.7 AC-FT 11420

WATER-QUALITY RECORDS

PERIOD OF RECORD.--December 1974 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	TURBIDITY (JTU)	FECAL COLIFORM .7UM-MF (COL./100 ML)	STREPTOCOCCI (COLONIES PER 100 ML)	FECAL STREPTOCOCCI KF AGAR (COL. PER 100 ML)	HARDNESS (CA,MG) (MG/L)	NON-CARBONATE HARDNESS (MG/L)	DISSOLVED CALCIUM (CA) (MG/L)
OCT												
12...	1300	198	29	6.3	20.0	20	490	1200	--	4	3	.6
NOV												
09...	1220	11	63	7.1	19.0	1	830	370	--	13	0	2.5
DEC												
06...	1200	5.7	78	6.9	19.5	1	30	310	--	20	2	3.4
JAN												
04...	1130	4.4	86	7.6	20.0	1	20	--	620	21	5	3.8
FEB												
01...	1145	4.4	83	7.7	19.5	1	17	--	590	21	0	3.8
MAR												
08...	1000	10	75	7.1	18.5	1	24	--	1100	16	3	3.1
APR												
11...	1130	31	62	7.1	18.5	2	65	--	1100	10	2	1.7
MAY												
09...	1115	13	57	7.3	20.0	5	64	--	1100	12	1	2.2
JUN												
06...	1300	52	49	7.3	20.0	10	360	--	2200	14	6	4.3
JUL												
05...	1000	6.0	80	7.6	20.0	1	26	--	2700	20	1	4.0
AUG												
02...	1200	8.3	70	7.3	20.0	1	45	--	1500	17	1	3.6
30...	1030	51	48	7.1	20.0	10	840	--	3100	10	2	1.9

DATE	DISSOLVED MAGNESIUM (MG) (MG/L)	DISSOLVED SODIUM (NA) (MG/L)	PERCENT SODIUM	SODIUM ADSORPTION RATIO	DISSOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	ALKALINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)
OCT											
12...	.5	3.6	65	.8	.5	1	0	1	.8	7.0	4.9
NOV											
09...	1.7	6.3	49	.8	.7	21	0	17	2.7	2.5	9.0
DEC											
06...	2.7	7.3	44	.7	.8	21	0	17	4.2	4.6	9.3
JAN											
04...	2.7	7.8	44	.7	.8	19	0	16	.8	3.9	10
FEB											
01...	2.8	7.6	43	.7	.8	29	0	24	.9	2.8	10
MAR											
08...	2.1	7.9	48	.8	.8	16	0	13	2.0	2.5	13
APR											
11...	1.4	6.3	55	.9	.8	10	0	8	1.3	3.4	10
MAY											
09...	1.6	5.6	49	.7	.5	13	0	11	1.0	6.4	8.4
JUN											
06...	.8	5.6	45	.7	.7	8	0	8	.8	5.4	8.9
JUL											
05...	2.5	7.5	43	.7	.8	23	0	19	.9	3.5	12
AUG											
02...	1.9	6.8	45	.7	.9	19	0	16	1.5	5.1	8.9
30...	1.2	5.0	51	.7	.7	9	0	7	1.1	3.1	8.5

B Results based on colony count outside the acceptable range (non-ideal colony count).

16618000 KAHAKULOA STREAM NEAR HONOKOHAU--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	DIS-SOLVED FLUO-RIDE (F) (MG/L)	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED SOLIDS (RESI-DUE AT 180 C) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTI-TUENTS) (MG/L)	DIS-SOLVED SOLIDS (TONS PER AC-FT)	DIS-SOLVED SOLIDS (TONS PER DAY)	TOTAL NITRITE PLUS NITRATE (N) (MG/L)	TOTAL KJEL-DAHL NITRO-GEN (N) (MG/L)	TOTAL NITRO-GEN (N) (MG/L)	TOTAL NITRO-GEN (NO3) (MG/L)	TOTAL PHOS-PHORUS (P) (MG/L)
OCT											
12...	.2	3.1	23	21	.03	12.3	.08	.46	.54	2.4	.06
NOV											
08...	.1	14	49	47	.07	1.46	.33	.03	.36	1.6	.03
DEC											
06...	.1	19	51	58	.07	.78	.14	.00	.14	.62	.02
JAN											
04...	.1	22	49	60	.07	.58	.15	.00	.15	.66	.04
FEB											
01...	.0	21	61	63	.08	.72	.20	.10	.30	1.3	.03
MAR											
08...	.1	12	57	49	.08	1.54	.05	.05	.10	.44	.02
APR											
11...	.1	10	47	39	.06	3.93	.12	.00	.12	.53	.02
MAY											
09...	.0	11	40	42	.05	1.40	.04	.00	.04	.18	.00
JUN											
06...	.1	6.6	36	37	.05	5.05	.05	.12	.17	.75	.04
JUL											
05...	.0	18	58	60	.08	.94	.06	.00	.06	.27	.03
AUG											
02...	.0	15	48	52	.07	1.08	.08	.17	.25	1.1	.02
30...	.0	9.6	36	34	.05	4.96	.09	.15	.24	1.1	.03

DATE	TIME	TOTAL ARSENIC (AS) (UG/L)	SUS-PENDED ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)	SUS-PENDED CAD-MIUM (CD) (UG/L)	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	SUS-PENDED CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	SUS-PENDED COBALT (CO) (UG/L)
OCT												
12...	1300	1	0	1	<10	<10	0	10	10	0	<50	<48
FEB												
01...	1145	0	0	0	<10	<9	1	0	0	0	<50	<50
APR												
11...	1130	1	--	0	<10	--	2	0	--	0	<50	--
JUL												
05...	1000	0	--	0	<10	<9	1	0	--	0	<50	--

DATE	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	SUS-PENDED COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)	TOTAL LEAD (PB) (UG/L)	SUS-PENDED LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	SUS-PENDED MAN-GANESE (MN) (UG/L)
OCT											
12...	2	<10	<7	3	1700	110	<100	<96	4	30	30
FEB											
01...	0	<10	<10	0	320	10	<100	<94	6	0	0
APR											
11...	0	<10	--	0	110	30	<100	--	10	0	--
JUL											
05...	1	<10	--	0	50	30	<100	<91	9	4	--

< Actual value is known to be less than the value shown

HAWAII, ISLAND OF MAUI

16618000 KAHAKULOA STREAM NEAR HONOKOHAU--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	SUS-PENDED MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	SUS-PENDED SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL ZINC (ZN) (UG/L)	SUS-PENDED ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)
OCT											
12...	0	.0	.0	.0	0	0	0	10	0	10	8.6
FEB											
01...	0	.1	.0	.1	0	0	0	0	0	0	1.2
APR											
11...	0	.0	--	.0	0	0	0	0	--	0	1.0
JUL											
05...	4	.0	--	.0	0	--	0	0	--	0	.7

DATE	TIME	TOTAL PHYTO-PLANK-TON (CELLS PER ML)	CHLOR-A PERI-PHYTON CHROMO-SPECT-METRIC (MG/M2)	CHLOR-A PERI-PHYTON CHROMO-GRAPHIC FLUOROM (MG/M2)	CHLOR-B PERI-PHYTON CHROMO-SPECT-METRIC (MG/M2)	CHLOR-B PERI-PHYTON CHROMO-GRAPHIC FLUOROM (MG/M2)	BIOMASS CHLORO-PHYLL RATIO PERI-PHYTON (UNITS)	LENGTH OF EXPO-SURE (DAYS)
OCT								
12...	1300	5300	.441	--	.159	--	175	35
NOV								
08...	1220	57	--	--	--	--	--	--
DEC								
06...	1200	53	--	--	--	--	--	--
JAN								
04...	1130	250	--	--	--	--	--	--
FEB								
01...	1145	120	--	--	--	--	--	--
MAR								
08...	1000	91	--	--	--	--	--	--
APR								
11...	1130	9	--	--	--	--	--	--
MAY								
09...	1115	540	--	--	--	--	--	--
JUN								
06...	1300	730	--	--	--	--	--	--
JUL								
05...	1000	600	--	.245	--	.269	1792	29
AUG								
02...	1200	16	--	--	--	--	--	--
30...	1030	130	--	--	--	--	--	--

DATE	TIME	INSTAN-TANEOUS DIS-CHARGE (CFS)	SUS-PENDED SEDI-MENT (MG/L)	SUS-PENDED SEDI-MENT DIS-CHARGE (T/DAY)	SUS. SED. SIEVE DIAM. % FINER THAN .062 MM
OCT					
12...	1300	198	49	26	100
NOV					
08...	1220	11	2	.06	100
DEC					
06...	1200	5.7	1	.02	100
JAN					
04...	1130	4.4	0	.00	100
FEB					
01...	1145	4.4	2	.02	100
MAR					
08...	1000	10	1	.03	100
APR					
11...	1130	31	2	.17	100
MAY					
09...	1115	13	4	.14	100
JUN					
06...	1300	52	12	1.7	100
JUL					
05...	1000	6.0	1	.02	100
AUG					
02...	1200	8.3	1	.02	100
30...	1030	51	14	1.9	100

16618000 KAHAKULOA STREAM NEAR HONOKOHAU--Continued

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

PHYTOPLANKTON

DATE	OCT 12,76		NOV 8,76		DEC 6,76		JAN 4,77		FEB 1,77		MAR 9,77	
TIME	1300		1220		1200		1130		1145		1000	
TOTAL CELLS/ML	5300		57		53		250		120		91	
DIVERSITY: DIVISION	0.7		1.2		1.0		0.9		1.4		1.0	
.CLASS	0.7		1.2		1.0		0.9		1.4		1.0	
..ORDER	1.6		1.5		1.0		1.0		1.4		1.0	
...FAMILY	1.7		2.3		1.7		2.2		2.3		1.7	
....GENUS	1.7		2.3		1.7		2.6		2.3		1.7	
ORGANISM	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT
CHLOROPHYTA (GREEN ALGAE)												
.CHLOROPHYCEAE												
..CHLOROCOCCALES												
...OOCYSTACEAE												
....SELENASTRUM	120	2	--	-	--	-	--	-	--	-	--	-
..VOLVOCALES												
...CHLAMYDOMONADACEAE												
....CHLAMYDOMONAS	--	-	3	6	--	-	--	-	17	14	--	-
CHRYSOPHYTA												
.BACILLARIOPHYCEAE												
..CENTRALES												
...COSCINODISCACEAE												
....CYCLOTELLA	--	-	3	6	--	-	6	3	--	-	--	-
....MELOSIRA	240	5	--	-	--	-	--	-	--	-	--	-
..PENNALES												
...ACHNANTHACEAE												
....ACHNANTHES	--	-	--	-	--	-	38#	15	--	-	--	-
....COCCONEIS	--	-	--	-	--	-	--	-	--	-	--	-
....RHOICOSPHENIA	30	1	13#	24	6	11	32	13	40#	33	42#	46
...CYMBELLACEAE												
....CYMBELLA	--	-	--	-	--	-	--	-	--	-	--	-
....RHOPALODIA	--	-	--	-	--	-	--	-	--	-	--	-
...DIATOMACEAE												
....DIATOMA	--	-	--	-	--	-	3	1	3	2	--	-
...FRAGILARIACEAE												
....SYNEDRA	--	-	--	-	--	-	3	1	--	-	7	8
...GOMPHONEMATACEAE												
....GOMPHONEMA	210	4	--	-	6	11	35	14	--	-	--	-
...NAVICULACEAE	--	-	--	-	--	-	--	-	--	-	--	-
....NAVICULA	30	1	3	6	14#	26	51#	21	20#	16	4	4
....PINNULARIA	--	-	--	-	--	-	3	1	--	-	--	-
...NITZSCHIACEAE												
....NITZSCHIA	--	-	--	-	--	-	--	-	9	7	4	4
CYANOPHYT(BLUE-GREEN ALGAE)												
.CYANOPHYCEAE												
..HORMOGONALES												
...OSCILLATORIACEAE												
....SYMPLOCA	--	-	--	-	--	-	--	-	--	-	--	-
..CHROCOCCALES												
...CHROCOCCACEAE												
....AGMENELLUM	1900#	36	--	-	--	-	--	-	--	-	--	-
....ANACYSTIS	--	-	--	-	--	-	--	-	34#	28	--	-
..HORMOGONALES												
...OSCILLATORIACEAE												
....LYNGBYA	--	-	17#	29	--	-	--	-	--	-	--	-
....OSCILLATORIA	2700#	51	--	-	28#	53	76#	31	--	-	35#	38
...RIVULARIACEAE												
....RAPHIDIOPSIS	--	-	17#	29	--	-	--	-	--	-	--	-
.CYANOPHYCEAE	--	-	--	-	--	-	--	-	--	-	--	-
EUGLENOPHYTA (EUGLENOIDS)												
.EUGLENOPHYCEAE												
..EUGLENALES												
...EUGLENACEAE												
....TRACHELOMONAS	30	1	--	-	--	-	--	-	--	-	--	-

NOTE: # - DOMINANT ORGANISM; EQUAL TO OR GREATER THAN 15%
* - OBSERVED ORGANISM, MAY NOT HAVE BEEN COUNTED; LESS THAN 1/2%

16618000 KAHAKULOA STREAM NEAR HONOKOHAU--Continued

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

PHYTOPLANKTON

DATE	APR 11,77		MAY 9,77		JUN 6,77		JUL 5,77		AUG 2,77		AUG 30,77	
TIME	1130		1115		1300		1000		1200		1030	
TOTAL CELLS/ML	9		540		730		600		16		130	
DIVERSITY: DIVISION	0.0		0.4		1.0		0.8		0.9		0.0	
.CLASS	0.0		0.4		1.0		0.8		0.9		0.0	
..ORDER	0.0		0.4		1.6		1.7		0.0		0.0	
...FAMILY	0.9		0.5		2.6		2.2		0.0		2.0	
....GENUS	0.9		0.5		2.8		2.2		0.0		2.2	
ORGANISM	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT
CHLOROPHYTA (GREEN ALGAE)												
.CHLOROPHYCEAE												
..CHLOROCOCCALES												
...OOCYSTACEAE												
....SELENASTRUM	--	-	--	-	--	-	--	-	--	-	--	-
..VOLVOCALES												
...CHLAMYDOMONADACEAE												
....CHLAMYDOMONAS	--	-	--	-	--	-	--	-	--	-	--	-
CHRYSOPHYTA												
.BACILLARIOPHYCEAE												
..CENTRALES												
...COSCINODISCACEAE												
....CYCLOTELLA	--	-	--	-	65	9	--	-	--	-	--	-
....MELOSIRA	--	-	--	-	--	-	27	4	--	-	--	-
..PENNALES												
...ACHNANTHACEAE												
....ACHNANTHES	--	-	*	0	36	5	--	-	--	-	13	10
....COCCONEIS	--	-	--	-	--	-	--	-	--	-	4	3
....RHOICOSPHENIA	--	-	7	1	160#	22	61	10	5#	33	--	-
...CYMBELLACEAE												
....CYMBELLA	--	-	*	0	7	1	--	-	--	-	4	3
....RHOPALODIA	--	-	--	-	--	-	--	-	--	-	4	3
...DIATOMACEAE												
....DIATOMA	--	-	--	-	29	4	--	-	--	-	--	-
...FRAGILARIACEAE												
....SYNEDRA	6#	67	*	0	--	-	12	2	--	-	--	-
...GOMPHONEMATACEAE												
....GOMPHONEMA	3#	33	14	3	170#	24	19	3	--	-	62#	48
...NAVICULACEAE	--	-	--	-	--	-	--	-	5#	33	--	-
....NAVICULA	--	-	7	1	29	4	31	5	--	-	13	10
....PINNULARIA	--	-	--	-	--	-	--	-	--	-	--	-
...NITZSCHIACEAE												
....NITZSCHIA	--	-	*	0	--	-	15	3	--	-	27#	21
CYANOPHYT(BLUE-GREEN ALGAE)												
.CYANOPHYCEAE												
..HORMOGONALES												
...OSCILLATORIACEAE												
....SYMPLOCA	--	-	500#	93	--	-	--	-	--	-	--	-
..CHROOCOCCALES												
...CHROOCOCCACEAE												
....AGMENELLUM	--	-	--	-	--	-	--	-	--	-	--	-
....ANACYSTIS	--	-	--	-	150#	21	270#	45	--	-	--	-
..HORMOGONALES												
...OSCILLATORIACEAE												
....LYNGBYA	--	-	--	-	--	-	--	-	--	-	--	-
....OSCILLATORIA	--	-	--	-	72	10	170#	28	--	-	--	-
...RIVULARIACEAE												
....RAPHIDIOPSIS	--	-	--	-	--	-	--	-	--	-	--	-
.CYANOPHYCEAE	--	-	--	-	--	-	--	-	5#	33	--	-
EUGLENOPHYTA (EUGLENOIDS)												
.EUGLENOPHYCEAE												
..EUGLENALES												
...EUGLENACEAE												
....TRACHELOMONAS	--	-	--	-	7	1	--	-	--	-	--	-

NOTE: # - DOMINANT ORGANISM; EQUAL TO OR GREATER THAN 15%
* - OBSERVED ORGANISM, MAY NOT HAVE BEEN COUNTED; LESS THAN 1/2%

16620000 HONOKOHAU STREAM NEAR HONOKOHAU

LOCATION.--Lat 20°57'48", long 156°35'22", Hydrologic Unit 20020000, on right bank 1,000 ft (305 m) upstream from intake of Honokohau ditch and 4.1 mi (6.6 km) southeast of Honokohau.

DRAINAGE AREA.--4.11 mi^2 (10.64 km^2).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--September, November and December 1911 (combined flow of stream and ditch below point of diversion), March 1913 to September 1920, May 1922 to current year. Monthly discharge only for some periods, published in WSP 1319.

REVISED RECORDS.--WSP 1937: Drainage area.

GAGE.--Water-stage recorder and masonry control. Altitude of gage is 870 ft (265 m), from topographic map. Prior to Mar. 7, 1913, nonrecording gage at site just below Honokohau ditch intake at different datum.

REMARKS.--Records good. No diversion above station. All medium and low flow, together with the inflow from two development tunnels below station, is diverted into Honokohau ditch.

AVERAGE DISCHARGE.--61 years (water years, 1914-19, 1923-77), 39.1 ft^3/s (1.107 m^3/s), 28,330 acre-ft/yr (34.9 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,740 ft^3/s (106 m^3/s) Dec. 14, 1942, Aug. 30, 1957, gage height, 8.40 ft (2.560 m), from rating curve extended above 547 ft^3/s (15.5 m^3/s); minimum, 8.4 ft^3/s (0.24 m^3/s) May 1, 1945, Jan. 5, 1946.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,030 ft^3/s (29.2 m^3/s) July 27, gage height, 5.26 ft (1.603 m), from rating curve extended above 547 ft^3/s (15.5 m^3/s), no peak above base of 1,100 ft^3/s (31.2 m^3/s); minimum, 11 ft^3/s (0.31 m^3/s) on Jan. 22-27, Feb. 10-15, 18-21.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	13	13	13	14	12	18	12	21	43	16	19	20
2	12	20	13	16	11	47	105	18	21	15	23	18
3	12	49	13	13	13	27	50	30	17	16	25	24
4	12	15	13	13	12	19	282	32	17	20	38	19
5	12	26	13	13	12	16	134	22	19	28	225	17
6	13	51	13	12	14	68	160	77	40	23	109	45
7	49	19	27	12	18	60	127	23	18	33	49	25
8	14	47	69	12	14	26	69	79	16	18	20	20
9	13	39	17	13	12	19	72	75	16	17	18	44
10	14	40	40	13	11	15	56	20	16	114	17	21
11	13	21	15	12	11	25	80	18	16	102	18	17
12	152	16	14	12	11	35	31	17	16	205	247	17
13	17	14	21	12	11	46	27	17	16	87	23	17
14	22	25	14	12	11	18	20	34	18	39	19	17
15	116	19	14	12	30	21	18	20	34	21	18	16
16	19	153	14	12	46	13	22	16	22	78	17	16
17	15	94	15	12	13	13	40	17	21	193	17	68
18	14	20	18	12	12	26	65	17	17	46	17	26
19	16	20	13	12	11	22	42	17	21	21	17	17
20	17	39	13	12	11	60	148	16	25	18	23	16
21	19	17	13	12	12	39	86	20	20	26	19	16
22	14	15	12	11	17	90	29	22	20	19	43	16
23	13	15	13	11	87	32	20	19	18	16	19	16
24	13	16	18	11	136	36	20	17	21	16	21	18
25	13	74	15	11	21	15	22	17	21	16	26	16
26	16	16	13	11	24	13	21	17	16	16	18	15
27	91	14	13	11	78	12	85	32	16	113	18	15
28	23	14	15	12	80	14	98	67	17	118	37	15
29	14	14	14	20	---	19	303	27	16	20	20	15
30	23	14	13	16	---	15	43	23	22	17	61	15
31	15	---	13	12	---	12	---	27	---	23	44	---
TOTAL	819	949	534	389	751	891	2287	874	616	1510	1285	637
MEAN	26.4	31.6	17.2	12.5	26.8	28.7	76.2	28.2	20.5	48.7	41.5	21.2
MAX	152	153	69	20	136	90	303	79	43	205	247	68
MIN	12	13	12	11	11	12	12	16	16	15	17	15
AC-FT	1620	1880	1060	772	1490	1770	4540	1730	1220	3000	2550	1260

CAL YR 1976 TOTAL 9678 MEAN 26.4 MAX 234 MIN 11 AC-FT 19200
WTR YR 1977 TOTAL 11542 MEAN 31.6 MAX 303 MIN 11 AC-FT 22890

16620000 HONOKOHAU STREAM NEAR HONOKOHAU--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1972-77.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	COLOR (PLATINUM-COBALT UNITS)	TURBIDITY (JTU)	HARDNESS (CA,MG) (MG/L)	NONCARBONATE HARDNESS (MG/L)	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG) (MG/L)	DISSOLVED SODIUM (NA) (MG/L)	PERCENT SODIUM
OCT										
15...	1435	123	45	3	8	1	1.7	.9	2.5	40
DEC										
02...	1230	13	4	1	22	1	5.0	2.3	4.8	31

DATE	SODIUM ADSORPTION RATIO	DISSOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	ALKALINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)	DISSOLVED FLUORIDE (F) (MG/L)
OCT									
15...	.4	.3	8	0	7	4.0	1.6	3.0	.2
DEC									
02...	.4	.7	26	0	21	1.3	2.5	5.2	.0

DATE	DISSOLVED SILICA (SIO2) (MG/L)	DISSOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	DISSOLVED SOLIDS (TONS PER AC-FT)	DISSOLVED SOLIDS (TONS PER DAY)	DISSOLVED NITRITE PLUS NITRATE (N) (MG/L)	DISSOLVED ORTHO. PHOSPHORUS (P) (MG/L)	DISSOLVED ORTHO PHOSPHATE (PO4) (MG/L)	DISSOLVED IRON (FE) (UG/L)	DISSOLVED MANGANESE (MN) (UG/L)
OCT									
15...	5.8	20	.03	6.64	.02	.04	.12	50	0
DEC									
02...	24	58	.08	2.94	.09	.01	.03	10	10

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)
OCT					
15...	1435	123	26	6.5	19.5
DEC					
02...	1230	13	69	7.5	18.0
JAN					
21...	1230	12	72	8.2	18.5
MAR					
11...	1310	14	63	7.3	17.5
APR					
29...	1200	500	20	6.8	17.5
JUN					
23...	1230	17	63	7.9	19.0
AUG					
18...	1115	17	68	7.9	20.0

16638500 KAHOMA STREAM AT LAHAINA

LOCATION.--Lat 20°53'10", long 156°40'36", Hydrologic Unit 20020000, on right bank 0.2 mi (0.3 km) west of Kelawea, 0.6 mi (1.0 km) northeast of Lahaina, 0.6 mi (1.0 km) downstream from Kanaha Stream, and 0.9 mi (1.4 km) upstream from mouth.

DRAINAGE AREA.--5.22 mi^2 (13.52 km^2).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1962 to current year.

REVISED RECORDS (WATER YEARS).--WSP 2137: 1963-65(P).

GAGE.--Water-stage recorder. Altitude of gage is 90 ft (27 m), from topographic map.

REMARKS.--Records fair except those below 10 ft^3/s (0.28 m^3/s), which are poor. Diversion above station by Pioneer Mill Co. for irrigation of sugarcane. Diversion from Kanaha Stream above station by Maui County Board of Water Supply for domestic use. Recording rain gage located at station.

AVERAGE DISCHARGE.--14 years (water years 1964-77), 3.52 ft^3/s (0.100 m^3/s), 2,550 acre-ft/yr (3.14 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,490 ft^3/s (70.5 m^3/s) July 11, 1965, gage height, 11.03 ft (3.362 m), from rating curve extended above 206 ft^3/s (5.83 m^3/s) on basis of slope-area measurements at gage heights 7.58 ft (2.310 m), 8.07 ft (2.460 m), and 11.03 ft (3.362 m); no flow many days each year.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum discharge of flood of May 13, 1960, 7,750 ft^3/s (219 m^3/s), by slope-area measurement at site 0.5 mi (0.8 km) upstream.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 301 ft^3/s (8.52 m^3/s) Mar. 22, gage height, 6.64 ft (2.024 m), no peak above base of 590 ft^3/s (16.7 m^3/s); no flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.00	.00	.03	.00	.00	.00	.00	.00
2	.00	.00	.00	.00	.00	.03	37	.00	.00	.00	.00	.00
3	.00	.00	.00	.00	.00	1.9	.02	.00	.00	.00	.00	.00
4	.00	.00	.00	.00	.00	.72	10	.00	.00	.00	.00	.00
5	.00	.00	.00	.00	.00	.00	.00	.90	.00	1.0	.01	.00
6	.00	.01	.00	.00	.00	11	.00	8.3	.00	.20	1.6	.00
7	.00	.00	.00	.00	.00	2.4	10	.00	.21	.00	1.5	.00
8	.00	.00	.00	.00	.00	.16	11	.00	.00	.00	.00	.00
9	.00	.00	.00	.00	.00	.00	7.3	1.2	.00	.00	.00	.00
10	.00	.00	.00	.00	.00	.00	4.2	.00	.00	1.4	.00	.00
11	.00	.00	.00	.00	.00	.00	5.3	.00	.00	.39	.00	.00
12	.00	.00	.00	.00	.00	.01	.25	.00	.00	.00	.00	.00
13	.00	.00	.00	.00	.00	.02	.64	.00	.00	.00	.00	.00
14	.00	.00	.00	.00	.00	.22	.00	.00	.00	.00	.00	.00
15	.00	.00	.00	.00	.00	2.3	1.1	.00	.96	.00	.00	.00
16	.00	.00	.00	.00	.00	.00	.65	.00	.16	.00	.00	.00
17	.00	.00	.00	.00	.00	.00	.00	.00	.00	1.2	.00	.00
18	.03	.00	.00	.00	.00	.00	1.9	.06	.00	.00	.00	.00
19	.00	.00	.00	.00	.00	.00	.46	.00	.00	.00	.00	.00
20	.00	.00	.00	.00	.00	16	17	.07	.00	.00	.00	.00
21	.00	.00	.00	.00	.00	.83	4.8	.00	.00	.00	.00	.00
22	.00	.00	.00	.00	.00	52	.70	.01	.00	.00	.00	.00
23	.00	.00	.00	.00	.00	5.2	.00	.67	.01	.00	.00	.00
24	.00	.00	.00	.00	.26	.00	.00	.00	.00	.00	.00	.00
25	.00	.26	.00	.00	.00	.00	.65	.00	.00	.00	.00	.00
26	.00	.00	.00	.00	.00	.00	.16	.00	.00	.00	.00	.00
27	.00	.00	.00	.00	.43	.00	.00	.00	.00	.00	.00	.00
28	.00	.00	.00	.00	.21	.00	.00	.64	.00	.00	.00	.00
29	.00	.00	.00	.00	---	.00	32	.00	.00	.00	.00	.00
30	.00	.00	.00	.00	---	.00	.00	.00	.00	.00	.00	.00
31	.00	---	.00	.00	---	.00	---	.39	---	.00	.00	---
TOTAL	.03	.27	.00	.00	.90	92.79	145.16	12.24	1.34	4.19	3.11	.00
MEAN	.001	.009	.000	.000	.032	2.99	4.84	.39	.045	.14	.10	.000
MAX	.03	.26	.00	.00	.43	52	37	8.3	.96	1.4	1.6	.00
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	.06	.5	.00	.00	1.8	184	288	24	2.7	8.3	6.2	.00

CAL YR 1976 TOTAL 142.79 MEAN .39 MAX 64 MIN .00 AC-FT 283
WTR YR 1977 TOTAL 260.03 MEAN .71 MAX 52 MIN .00 AC-FT 516

HAWAII, ISLAND OF MAUI

16638500 KAHOMA STREAM AT LAHAINA--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1976-77.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTAN-TANEOUS DIS-CHARGE (CFS)	COLOR (PLAT-INUM-COBALT UNITS)	TUR-BID-ITY (JTU)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	DIS-SOLVED SODIUM (NA) (MG/L)	PERCENT SODIUM
APR										
04...	1110	58	250	120	10	0	1.9	1.2	3.4	41
16...	0930	2.0	23	4	26	1	5.1	3.1	9.7	44

DATE	SODIUM AD-SORP-TION RATIO	DIS-SOLVED PO-TAS-SIUM (K) (MG/L)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DIS-SOLVED SULFATE (SO4) (MG/L)	DIS-SOLVED CHLO-RIDE (CL) (MG/L)	DIS-SOLVED FLUO-RIDE (F) (MG/L)
APR									
04...	.5	.8	12	0	10	1.5	4.7	4.8	.1
16...	.8	1.3	30	0	25	1.5	4.6	15	.1

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTI-TUENTS) (MG/L)	DIS-SOLVED SOLIDS (TONS PER AC-FT)	DIS-SOLVED SOLIDS (TONS PER DAY)	DIS-SOLVED NITRITE PLUS NITRATE (N) (MG/L)	DIS-SOLVED ORTHO. PHOS-PHORUS (P) (MG/L)	DIS-SOLVED ORTHO PHOS-PHATE (PO4) (MG/L)	DIS-SOLVED IRON (FE) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)
APR									
04...	9.2	33	.04	5.17	.16	.06	.18	110	10
16...	18	72	.10	.39	.13	.02	.06	40	0

DATE	TIME	INSTAN-TANEOUS DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)
APR					
04...	1110	58	37	7.1	20.0
12...	1230	1.1	120	7.8	26.0
16...	0930	2.0	112	7.5	23.0

16700000 WAIAKEA STREAM NEAR MOUNTAIN VIEW

LOCATION.--Lat 19°38'30", long 155°10'28", Hydrologic Unit 20010000, on left bank 200 ft (61 m) upstream from Olaa Flume Road, 7.3 mi (11.7 km) northwest of Mountain View, and 8.0 mi (12.9 km) southwest of Hilo Post Office.

DRAINAGE AREA.--17.4 mi^2 (45.1 km^2).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--September 1930 to current year. Prior to July 1960, published as "at middle flume house, near Mountain View."

REVISED RECORDS (FISCAL YEARS).--WSP 2137: 1939(M), 1942(M), 1944-45(M), 1947(M), 1949(P), 1950-51(M), 1952-53(P), 1955(P), 1956(M), 1957-58(P), 1960(M).

GAGE.--Water-stage recorder and combined Parshall flume and concrete-weir control. Datum of gage is 1,934 ft (589 m) above mean sea level (by stadia survey). Prior to Jan. 21, 1938, at datum 0.23 ft (0.070 m) lower.

REMARKS.--Records good. No diversion above station. Large part of flow comes from 3 tunnels.

AVERAGE DISCHARGE.--47 years, 11.9 ft^3/s (0.337 m^3/s), 8,620 acre-ft/yr (10.6 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 565 ft^3/s (16.0 m^3/s) Mar. 14, 1942, Aug. 26, 1970, from rating curve extended above 160 ft^3/s (4.53 m^3/s); maximum gage height, 4.45 ft (1.356 m) Aug. 26, 1970; no flow at times.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 100 ft^3/s (2.83 m^3/s) and maximum (*):

Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)
Mar. 3	1100	*124	3.51	3.57	1.088
Mar. 14	0430	116	3.29	3.53	1.076

Minimum discharge, 0.18 ft^3/s (0.005 m^3/s) Feb. 23.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.8	4.8	5.1	5.2	.56	18	19	31	6.3	.65	12	9.8
2	3.5	4.7	4.9	5.4	.52	27	18	29	5.8	.52	12	9.3
3	3.2	4.7	4.7	5.1	.65	50	17	28	5.5	.56	14	8.7
4	3.0	4.2	4.4	4.9	.52	54	15	26	5.2	.75	13	8.1
5	2.9	4.0	4.1	4.7	.48	53	14	22	5.0	.56	13	7.7
6	2.7	3.9	6.4	4.5	.75	50	24	21	4.8	.70	20	7.2
7	2.5	4.0	10	4.2	.48	43	26	20	4.7	.90	22	7.1
8	2.4	7.2	11	4.0	.48	37	29	19	4.3	1.9	24	6.5
9	2.3	17	14	4.0	.44	31	33	18	4.1	2.5	24	6.2
10	3.4	26	13	3.8	.40	29	38	17	3.9	3.8	23	5.8
11	2.5	21	12	3.5	.40	28	39	16	3.7	4.9	25	5.5
12	2.9	19	11	3.3	.40	26	39	14	3.5	6.0	41	5.2
13	2.4	19	11	3.0	.36	37	36	13	3.3	6.4	38	5.0
14	2.3	18	10	2.9	.36	62	32	12	3.0	6.2	37	5.0
15	2.1	17	9.6	2.7	.40	60	28	11	2.8	5.8	33	4.7
16	2.4	16	9.8	2.4	.36	54	28	10	2.5	5.7	28	4.9
17	2.4	15	9.6	2.3	.36	52	27	9.7	2.4	8.9	26	9.5
18	2.1	13	9.2	2.1	.36	47	27	9.7	2.1	11	22	7.8
19	2.1	12	8.5	2.0	.32	47	23	8.8	2.0	11	19	6.6
20	2.4	11	7.9	1.9	.28	55	24	8.1	1.8	11	17	6.2
21	7.6	10	7.5	1.7	.24	52	26	10	1.7	11	16	5.7
22	13	9.8	7.1	1.7	.20	56	24	12	1.5	11	17	4.8
23	8.3	9.4	6.7	1.4	.20	54	22	11	1.4	10	16	5.2
24	6.9	8.5	6.4	1.4	.28	52	20	9.9	1.3	9.6	16	5.0
25	6.2	7.9	6.4	1.3	1.9	45	18	9.4	1.2	8.9	15	4.8
26	5.8	7.2	6.0	1.1	1.2	39	17	9.0	1.0	8.7	13	4.6
27	5.8	6.6	5.8	1.0	17	34	16	8.7	1.0	9.1	12	4.6
28	5.5	6.2	6.1	.95	19	31	16	8.1	.85	16	12	4.3
29	5.2	5.7	6.2	.95	---	30	30	7.5	.80	13	12	4.1
30	5.2	5.3	5.7	.75	---	26	34	7.0	.75	13	11	4.0
31	5.0	---	5.5	.65	---	22	---	6.6	---	12	11	---
TOTAL	127.8	318.1	245.6	84.80	48.90	1301	759	442.5	88.20	212.04	614	183.9
MEAN	4.12	10.6	7.92	2.74	1.75	42.0	25.3	14.3	2.94	6.84	19.8	6.13
MAX	13	26	14	5.4	19	62	39	31	6.3	16	41	9.8
MIN	2.1	3.9	4.1	.65	.20	18	14	6.6	.75	.52	11	4.0
AC-FT	253	631	487	168	97	2580	1510	878	175	421	1220	365

CAL YR 1976 TOTAL 4843.10 MEAN 13.2 MAX 68 MIN 1.7 AC-FT 9610
WTR YR 1977 TOTAL 4425.84 MEAN 12.1 MAX 62 MIN .20 AC-FT 8780

16700000 WAIAKEA STREAM NEAR MOUNTAIN VIEW--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1973-77.

REMARKS.--Miscellaneous chemical analyses published for this station for 1972 water year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTAN-TANEOUS DIS-CHARGE (CFS)	COLOR (PLAT-INUM-COBALT UNITS)	TUR-BID-ITY (JTU)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	DIS-SOLVED SODIUM (NA) (MG/L)	PERCENT SODIUM
NOV										
22...	0945	9.7	5	1	11	0	3.2	.8	3.5	38
JUN										
24...	0930	1.3	4	0	11	0	3.0	.8	3.8	41

DATE	SODIUM AD-SORP-TION RATIO	DIS-SOLVED PO-TAS-SIUM (K) (MG/L)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DIS-SOLVED SULFATE (SO4) (MG/L)	DIS-SOLVED CHLO-RIDE (CL) (MG/L)	DIS-SOLVED FLUO-RIDE (F) (MG/L)
NOV									
22...	.5	1.1	19	0	16	7.6	2.9	2.5	.0
JUN									
24...	.5	.9	16	0	13	.4	1.4	2.6	.0

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTI-TUENTS) (MG/L)	DIS-SOLVED SOLIDS (TONS PER AC-FT)	DIS-SOLVED SOLIDS (TONS PER DAY)	DIS-SOLVED NITRITE PLUS NITRATE (N) (MG/L)	DIS-SOLVED ORTHO. PHOS-PHORUS (P) (MG/L)	DIS-SOLVED ORTHO PHOS-PHATE (PO4) (MG/L)	DIS-SOLVED IRON (FE) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)
NOV									
22...	17	41	.06	1.07	.23	.01	.03	60	10
JUN									
24...	17	37	.05	.13	--	--	--	20	0

DATE	TIME	INSTAN-TANEOUS DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)
OCT					
26...	1040	5.7	38	6.7	18.0
NOV					
22...	0945	9.7	41	6.6	16.0
JAN					
26...	0830	1.1	42	7.8	16.0
FEB					
23...	1315	.18	40	7.9	17.0
APR					
25...	1020	18	44	6.7	15.0
MAY					
23...	1045	11	40	6.9	16.0
JUN					
24...	0930	1.3	42	7.8	17.0
JUL					
25...	1100	8.8	40	6.3	17.5
SEP					
26...	0940	4.6	40	7.7	18.0

16700900 OLAA FLUME SPRING NEAR KAUMANA

LOCATION.--Lat 19°41'59", long 155°11'13", Hydrologic Unit 20010000, on left bank 58 ft (18 m) downstream from tunnel entrance, 3.3 mi (5.3 km) northwest of Kaumana School, and 6.5 mi (10.5 km) southwest of Hilo Post Office.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1974 to current year.

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 1,970 ft (600 m), from topographic map.

REMARKS.--Records good. No diversion above station.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 43 ft^3/s (1.22 m^3/s) Jan. 8, 1975; minimum daily, 1.2 ft^3/s (0.034 m^3/s) Oct. 10, 1974.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.7	10	6.2	10	2.4	26	23	30	12	3.2	18	14
2	5.2	10	5.7	10	2.3	27	24	27	11	3.0	17	14
3	5.1	10	5.5	10	2.4	29	26	26	11	3.0	18	13
4	4.7	9.6	5.4	9.6	2.6	30	26	25	10	3.5	20	12
5	4.6	9.2	4.9	9.2	2.9	30	26	24	9.8	4.6	18	12
6	4.6	8.6	5.2	9.0	3.0	28	27	23	9.6	5.7	17	11
7	4.6	8.2	7.8	8.6	4.0	26	29	24	9.2	7.8	22	10
8	4.7	8.4	20	8.2	4.1	25	30	25	9.0	9.8	23	10
9	4.7	15	24	7.6	4.0	25	30	24	8.6	14	22	10
10	5.2	26	22	7.2	3.5	24	30	22	8.4	16	20	10
11	7.1	27	19	6.7	3.2	23	30	21	8.0	20	18	10
12	7.8	26	16	6.4	3.0	24	30	20	7.6	22	24	9.6
13	8.8	24	15	5.9	2.9	26	28	20	7.2	22	26	9.4
14	9.0	21	14	5.5	2.6	30	27	18	6.9	21	24	9.2
15	8.4	18	13	5.2	2.8	31	26	18	6.6	19	23	9.0
16	8.0	16	12	4.9	3.0	30	29	17	6.2	17	22	9.0
17	7.4	14	15	4.6	2.8	29	26	16	6.0	18	20	10
18	7.2	14	15	4.3	2.6	28	25	16	5.5	23	19	19
19	6.9	12	14	4.0	2.5	28	24	16	5.4	24	18	18
20	7.1	11	13	3.8	2.4	29	26	15	5.4	23	16	16
21	9.2	10	12	3.5	2.3	31	27	15	5.2	21	16	14
22	19	10	12	3.4	2.2	31	27	20	4.9	19	17	13
23	23	9.6	11	3.2	2.1	30	26	22	4.6	17	20	12
24	19	9.4	10	3.0	2.2	30	25	20	4.6	16	20	11
25	16	9.0	10	2.9	4.1	29	23	18	4.3	15	20	11
26	15	8.6	9.6	2.6	7.1	27	22	16	4.0	15	18	10
27	14	8.0	9.6	2.5	16	26	22	16	3.8	15	17	10
28	14	7.4	10	2.4	26	25	22	15	3.5	21	16	10
29	12	7.1	10	2.4	---	24	25	14	3.4	24	15	9.6
30	11	6.6	11	2.4	---	24	30	13	3.4	23	15	9.2
31	11	---	10	2.4	---	23	---	12	---	20	15	---
TOTAL	290.0	383.7	367.9	171.4	121.0	848	791	608	205.1	485.6	594	345.0
MEAN	9.35	12.8	11.9	5.53	4.32	27.4	26.4	19.6	6.84	15.7	19.2	11.5
MAX	23	27	24	10	26	31	30	30	12	24	26	19
MIN	4.6	6.6	4.9	2.4	2.1	23	22	12	3.4	3.0	15	9.0
AC-FT	575	761	730	340	240	1680	1570	1210	407	963	1180	684

CAL YR 1976 TOTAL 5918.5 MEAN 16.2 MAX 36 MIN 4.6 AC-FT 11740
WTR YR 1977 TOTAL 5210.7 MEAN 14.3 MAX 31 MIN 2.1 AC-FT 10340

16700900 OLAA FLUME SPRING, NEAR KAUMANA--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1976-77.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	COLOR (PLATINUM-COBALT UNITS)	TURBIDITY (JTU)	HARDNESS (CA,MG) (MG/L)	NON-CARBONATE HARDNESS (MG/L)	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG) (MG/L)	DISSOLVED SODIUM (NA) (MG/L)	PERCENT SODIUM
NOV										
11...	0930	27	12	1	11	1	2.7	1.0	2.7	34
SEP										
01...	1425	14	4	0	10	0	2.7	.9	2.3	31

DATE	SODIUM ADSORPTION RATIO	DISSOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	ALKALINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)	DISSOLVED FLUORIDE (F) (MG/L)
NOV									
11...	.4	.6	12	0	10	4.8	2.8	2.1	.1
SEP									
01...	.3	.5	13	0	11	4.2	1.9	2.0	.0

DATE	DISSOLVED SILICA (SIO2) (MG/L)	DISSOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	DISSOLVED SOLIDS (TONS PER AC-FT)	DISSOLVED SOLIDS (TONS PER DAY)	DISSOLVED NITRITE PLUS NITRATE (N) (MG/L)	DISSOLVED ORTHO. PHOSPHORUS (P) (MG/L)	DISSOLVED ORTHO PHOSPHATE (PO4) (MG/L)	DISSOLVED IRON (FE) (UG/L)	DISSOLVED MANGANESE (MN) (UG/L)
NOV									
11...	11	30	.04	2.19	.14	.00	.00	60	0
SEP									
01...	13	30	.04	1.13	--	--	--	40	10

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)
OCT					
05...	1400	4.6	40	6.4	17.0
NOV					
11...	0930	27	38	6.6	17.0
DEC					
14...	1125	16	39	6.5	17.0
MAR					
09...	1035	25	33	6.9	17.0
APR					
19...	1055	24	32	7.0	16.0
JUN					
01...	1345	12	35	6.3	17.0
AUG					
03...	1045	17	34	6.1	17.0
SEP					
01...	1425	14	34	6.7	17.0

16701750 WAILUKU RIVER NEAR HUMUULA

LOCATION.--Lat 19°42'55", long 155°18'36", Hydrologic Unit 20010000, on right bank 300 ft (91 m) upstream from trail terminus, 10 mi (16 km) east of Humuula, and 14 mi (22 km) west of Hilo.

DRAINAGE AREA.--34.8 mi^2 (90.1 km^2).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--February 1965 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 4,250 ft (1,295 m), from topographic map.

REMARKS.--Records good except those for periods of no gage-height record Feb. 27 to Apr. 1, July 12 to Sept. 30, and those above 40 ft^3/s (1.13 m^3/s), which are fair. No diversion above station.

AVERAGE DISCHARGE.--12 years, 3.08 ft^3/s (0.087 m^3/s), 2,230 acre-ft/yr (2.75 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,180 ft^3/s (90.1 m^3/s) Nov. 20, 1973, gage height, 11.00 ft (3.353 m), from rating curve extended above 18 ft^3/s (0.51 m^3/s); no flow at times in 1965, 1969-77.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 916 ft^3/s (25.9 m^3/s) Aug. 12, gage height, 7.44 ft (2.268 m), from rating curve extended above 18 ft^3/s (0.51 m^3/s), no other peak above base of 310 ft^3/s (8.78 m^3/s); no flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.02	.02	.10	.00	35	1.0	1.8	.57	.04	.50	.50
2	.00	.01	.03	.06	.00	50	2.7	1.4	.57	.02	.45	.40
3	.00	.00	.03	.04	.00	100	4.1	1.2	.57	.02	.80	.45
4	.00	.00	.02	.04	.00	40	2.5	1.2	.52	.08	.40	.50
5	.10	.00	.30	.03	.00	10	2.7	1.2	.48	.08	.35	.40
6	.30	.00	1.9	.03	.00	5.0	2.3	1.2	.48	.17	40	.35
7	.05	.13	1.3	.02	.00	4.0	4.2	1.2	.48	.17	20	.35
8	.00	.80	.34	.03	.00	3.5	7.7	1.1	.48	.44	3.0	.30
9	.00	3.4	.17	.02	.00	1.5	6.1	1.0	.44	.44	1.0	.25
10	.00	1.2	.10	.02	.00	3.0	8.3	1.0	.39	.90	.80	.30
11	.00	.44	.08	.02	.00	5.0	7.3	1.2	.39	.48	.60	.25
12	.50	.21	.10	.02	.00	40	4.0	1.1	.39	.40	150	.20
13	.05	.12	.08	.02	.00	55	3.1	1.0	.34	.30	25	.15
14	.00	.10	.06	.01	.00	60	2.7	.95	.34	.25	5.0	.15
15	.00	.08	.21	.01	.00	10	2.2	.95	.25	.25	3.0	.10
16	.00	.08	.17	.01	.00	5.0	1.8	.85	.21	.15	2.5	.10
17	.00	.08	.17	.01	.00	7.0	1.4	.80	.21	1.0	2.0	2.5
18	.00	.06	.08	.01	.00	15	1.4	.90	.30	.90	1.5	1.0
19	.00	.06	.12	.01	.00	85	1.4	.85	.17	.95	1.0	.50
20	.17	.06	.39	.01	.00	30	1.4	.80	.17	.50	.90	.40
21	2.6	.04	.12	.00	.00	8.0	1.7	1.2	.17	.45	.90	.30
22	.21	.06	.08	.00	.00	7.0	1.2	1.4	.12	.40	2.0	.30
23	.08	.04	.08	.00	.00	6.5	1.2	1.0	.10	.25	1.0	.35
24	.06	.03	.06	.00	.00	6.0	1.1	.80	.10	.20	2.5	.35
25	.10	.03	.04	.00	.00	3.5	3.0	.75	.10	.30	1.0	.30
26	.06	.03	.21	.00	.00	2.5	1.6	.75	.10	.30	.90	.20
27	.03	.03	.10	.00	60	1.0	1.2	.70	.10	.75	.80	.15
28	.02	.02	.21	.00	20	1.0	1.4	.70	.10	10	.75	.15
29	.02	.02	.14	.00	---	1.0	8.2	.66	.10	2.5	.75	.10
30	.02	.02	.08	.00	---	2.0	9.3	.62	.10	.80	.70	.05
31	.02	---	.08	.00	---	1.5	---	.62	---	.60	.65	---
TOTAL	4.39	7.17	6.87	.52	80.00	604.0	98.2	30.90	8.84	24.09	270.75	11.40
MEAN	.14	.24	.22	.017	2.86	19.5	3.27	1.00	.29	.78	8.73	.38
MAX	2.6	3.4	1.9	.10	60	100	9.3	1.8	.57	10	150	2.5
MIN	.00	.00	.02	.00	.00	1.0	1.0	.62	.10	.02	.35	.05
AC-FT	8.7	14	14	1.0	159	1200	195	61	18	48	537	23

CAL YR 1976 TOTAL 615.20 MEAN 1.68 MAX 85 MIN .00 AC-FT 1220
WTR YR 1977 TOTAL 1147.13 MEAN 3.14 MAX 150 MIN .00 AC-FT 2280

16701800 WAILUKU RIVER NEAR KAUMANA

LOCATION.--Lat 19°43'15", long 155°16'08", Hydrologic Unit 20010000, on right bank 0.2 mi (0.3 km) upstream from Waipahoehoe Gulch and 8.4 mi (13.5 km) west of Kaumana.

DRAINAGE AREA.--43.4 mi² (112.4 km²).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1966 to current year.

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 3,520 ft (1,073 m), from topographic map.

REMARKS.--Records good except those for period of no gage-height record May 27 to June 28, which are fair. No diversion above station. Recording rain gage located at station.

AVERAGE DISCHARGE.--11 years, 29.9 ft³/s (0.847 m³/s), 21,660 acre-ft/yr (26.7 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 9,580 ft³/s (271 m³/s) Aug. 8, 1967, gage height, 13.35 ft (4.069 m), from rating curve exteuded above 2,200 ft³/s (62.3 m³/s); no flow Mar. 13, 14, 1970.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 1,500 ft³/s (42.5 m³/s) and maximum (*):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Mar. 3	0030	1510	42.8	6.25	1.905
Apr. 2	1530	1730	49.0	6.59	2.010
Aug. 12	0800	*3460	98.0	8.66	2.640

Minimum discharge, 0.04 ft³/s (0.001 m³/s) July 3.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.40	1.0	.64	1.4	.25	200	16	25	4.0	.11	4.9	2.2
2	.28	.97	.64	1.4	.22	294	189	18	4.0	.06	4.1	1.7
3	1.5	.85	.67	1.2	.43	944	65	14	4.0	.04	7.6	1.9
4	1.7	.76	.58	1.2	.61	242	49	12	3.5	.22	4.1	2.3
5	2.5	.73	.52	1.3	.34	85	44	11	3.0	.43	3.1	1.7
6	4.4	.70	2.5	1.0	.34	35	55	14	3.0	.82	311	1.4
7	.88	.70	40	.97	.37	22	127	15	3.0	.67	197	1.6
8	.58	9.0	64	.91	.40	18	205	10	2.5	2.2	16	1.4
9	.49	22	4.7	.88	.31	12	178	6.8	2.0	3.1	9.4	1.2
10	.88	134	2.7	.82	.19	9.7	210	7.0	2.0	11	7.2	1.6
11	.82	27	1.8	.76	.15	18	166	14	2.0	9.1	6.3	1.2
12	4.6	7.4	1.4	.73	.13	45	53	9.9	1.5	4.3	948	1.0
13	1.7	4.6	1.7	.70	.13	249	30	7.2	1.5	4.1	234	.97
14	.76	3.3	1.6	.67	.13	315	25	6.5	1.5	2.4	36	.97
15	.58	2.5	1.2	.61	.37	328	20	5.7	1.0	2.3	21	.94
16	.58	2.2	2.7	.58	.28	92	15	4.6	.90	1.7	16	.94
17	.58	1.8	3.1	.52	.13	55	12	6.5	.90	7.6	12	16
18	.49	1.5	3.0	.52	.11	85	11	10	1.0	5.7	9.4	8.3
19	.46	1.3	1.6	.55	.09	114	12	5.5	.80	6.6	7.0	2.1
20	.85	1.2	1.6	.52	.06	755	26	4.1	.80	3.7	5.5	1.5
21	2.2	1.1	8.0	.46	.06	285	22	21	.75	3.1	5.2	1.0
22	127	1.0	2.2	.43	.06	130	11	26	.60	2.7	12	1.2
23	4.7	1.2	1.4	.37	.06	92	8.5	7.6	.50	1.9	7.6	1.4
24	1.8	1.0	1.4	.34	.26	90	6.8	5.4	.45	1.8	13	1.4
25	1.8	.91	1.2	.31	5.8	37	65	4.6	.40	2.4	6.3	1.4
26	2.2	.85	1.2	.28	2.3	22	23	3.8	.30	2.5	4.6	1.1
27	1.5	.82	3.7	.28	335	17	16	6.5	.25	7.0	3.8	1.0
28	1.2	.73	1.8	.25	142	18	16	6.0	.20	168	3.5	1.0
29	1.0	.70	5.3	.40	---	17	159	5.5	.15	12	3.4	.97
30	1.1	.67	3.1	.70	---	19	205	5.0	.11	6.8	3.0	.91
31	1.2	---	1.7	.37	---	33	---	5.0	---	5.2	2.7	---
TOTAL	170.73	232.49	167.65	21.43	490.58	4677.7	2040.3	303.2	46.61	279.55	1924.7	62.30
MEAN	5.51	7.75	5.41	.69	17.5	151	68.0	9.78	1.55	9.02	62.1	2.08
MAX	127	134	64	1.4	335	944	210	26	4.0	168	948	16
MIN	.28	.67	.52	.25	.06	9.7	6.8	3.8	.11	.04	2.7	.91
AC-FT	339	461	333	43	973	9280	4050	601	92	554	3820	124

CAL YR 1976 TOTAL 8270.69 MEAN 22.6 MAX 755 MIN .22 AC-FT 16400
WTR YR 1977 TOTAL 10417.24 MEAN 28.5 MAX 948 MIN .04 AC-FT 20660

16701800 WAILUKU RIVER NEAR KAUMANA--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1976-77.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)
OCT					
13...	1005	1.5	25	6.5	17.0
NOV					
18...	1050	1.5	26	6.6	16.0
JAN					
05...	1330	1.2	25	7.7	15.5
MAR					
10...	1425	9.4	28	5.8	16.0
MAY					
09...	1125	7.0	25	7.5	15.0
JUN					
28...	1300	.17	32	7.0	20.0
AUG					
11...	1000	5.7	25	6.9	17.5

16704000 WAILUKU RIVER AT PIIHONUA
(National stream-quality accounting network station)

LOCATION.--Lat 19°42'58", long 155°09'13", Hydrologic Unit 20010000, on left bank 0.2 mi (0.3 km) downstream from Hookelekele Stream, 0.9 mi (1.4 km) west of Piihonua, and 4.1 mi (6.6 km) west of Hilo Post Office.

DRAINAGE AREA.--230 mi² (596 km²), revised, of which 81 mi² (210 km²) probably is noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--July 1928 to July 1940, October 1940 to December 1947, April 1948 to current year. Monthly discharge only July 1928, published in WSP 1319. Prior to July 1960, published as "above Hilo Boarding School ditch intake, near Hilo."

REVISED RECORDS (FISCAL YEARS).--WSP 865: 1929-36(M). WSP 965: 1941.

GAGE.--Water-stage recorder. Altitude of gage is 1,070 ft (326 m), from topographic map.

REMARKS.--Records good. Hawaii County Board of Water Supply diverts about 6 ft³/s (0.17 m³/s) above station for domestic supply. Kapehu ditch diverted from Kapehu Stream into Wailuku River above station 1938-63.

AVERAGE DISCHARGE.--46 years (water years, 1929-39, 1942-47, 1949-77), 287 ft³/s (8.128 m³/s), 207,900 acre-ft/yr (256 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 63,400 ft³/s (1,800 m³/s) Aug. 11, 1940, gage height, 28.6 ft (8.72 m), from floodmarks, from rating curve extended above 11,000 ft³/s (312 m³/s); minimum, 0.25 ft³/s (0.007 m³/s) Mar. 9, 1941.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 8,700 ft³/s (246 m³/s) and maximum (*):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Feb. 27	0945	10800	306	15.70	4.785	Apr. 2	1645	9870	280	15.39	4.691
Mar. 3	0130	11600	328	15.95	4.862	29	2245	9930	281	15.41	4.697
20	0745	10000	283	15.45	4.709	Aug. 12	0845	*15900	450	17.33	5.282

Minimum discharge, 1.8 ft³/s (0.005 m³/s) Feb. 23, 24.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.9	55	14	43	4.1	1730	396	599	39	7.3	99	92
2	6.2	42	13	44	3.5	1990	1290	345	35	6.7	83	70
3	5.5	43	12	36	9.4	5400	487	291	31	8.5	369	63
4	30	31	8.9	31	11	2020	399	230	28	21	146	58
5	34	27	9.5	45	7.5	935	446	197	25	23	98	55
6	80	26	77	28	18	557	847	221	24	59	1720	47
7	21	27	586	23	13	385	1560	328	23	57	1300	50
8	14	289	647	20	7.9	368	1990	267	22	147	331	44
9	11	982	263	17	7.7	272	1730	125	20	185	206	51
10	81	2050	168	15	5.7	211	1960	62	19	447	141	60
11	32	780	105	14	4.2	330	1790	164	18	372	306	45
12	102	335	73	14	3.0	613	738	152	17	218	5180	35
13	53	200	106	13	2.9	2720	518	68	16	245	844	32
14	26	139	73	10	2.7	3610	314	95	16	158	456	43
15	20	103	53	11	7.5	2690	324	115	14	137	275	32
16	25	81	144	8.5	6.4	1120	334	89	11	96	220	52
17	24	79	111	6.3	4.7	791	261	168	9.5	346	176	448
18	20	60	105	7.9	3.4	1180	281	249	9.8	355	165	251
19	15	48	66	10	2.9	1400	289	90	10	350	124	114
20	56	42	53	9.9	2.2	4890	1160	100	11	199	114	83
21	325	40	165	8.5	2.2	2280	931	229	9.8	161	109	63
22	1490	34	69	6.7	2.1	1310	392	491	7.8	133	336	59
23	200	47	47	5.6	2.0	1160	318	103	7.9	95	257	59
24	105	32	41	4.6	6.4	1130	238	93	7.3	76	299	56
25	86	27	40	4.3	33	654	294	103	6.5	95	182	56
26	93	23	37	4.0	54	320	258	85	5.3	101	132	43
27	106	22	162	3.7	2440	337	216	75	7.0	98	104	37
28	67	19	68	3.2	1220	275	228	68	8.1	1330	124	32
29	49	18	131	4.2	---	274	1900	63	7.2	226	116	30
30	62	15	79	5.6	---	145	2720	51	7.8	141	104	27
31	56	---	48	5.2	---	292	---	45	---	98	116	---
TOTAL	3301.6	5716	3574.4	462.2	3887.4	41389	24609	5361	473.0	5991.5	14232	2187
MEAN	107	191	115	14.9	139	1335	820	173	15.8	193	459	72.9
MAX	1490	2050	647	45	2440	5400	2720	599	39	1330	5180	448
MIN	5.5	15	8.9	3.2	2.0	145	216	45	5.3	6.7	83	27
AC-FT	6550	11340	7090	917	7710	82100	48810	10630	938	11880	28230	4340

CAL YR 1976 TOTAL 123918.2 MEAN 339 MAX 9570 MIN 5.5 AC-FT 245800
WTR YR 1977 TOTAL 111184.1 MEAN 305 MAX 5400 MIN 2.0 AC-FT 220500

16704000 WAILUKU RIVER AT PIIHONUA--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1972-74, 1975 to current year.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: May 1975 to current year.
WATER TEMPERATURES: May 1975 to current year.

INSTRUMENTATION.--Water-quality monitor since May 1975.

REMARKS.--Interruptions in the daily records were due to malfunctions of the instrument. No record Oct. 1-21, Dec. 1 to Jan. 25, July 20 to Sept. 30. In addition to the water-quality monitor record, samples were collected once a month.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: Maximum recorded, 59 micromhos/cm June 15, 1977; minimum recorded, 15 micromhos/cm Oct. 22, Nov. 10, 1976, and Mar. 3, 13, 20, Apr. 2, 1977.
WATER TEMPERATURE: Maximum recorded, 24.5°C Feb. 23, 1977; minimum recorded, 14.5°C Mar. 20, 21, 1977.

DATE	TIME	INSTAN-TANEOUS DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)	TUR-BID-ITY (JTU)	FECAL COLI-FORM .7UM-MF (COL./100 ML)	STREP-TOCOCCI (COL-ONIES PER 100 ML)	FECAL STREP-TOCOCCI KF AGAR (COL. PER 100 ML)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)
OCT												
27...	0925	126	31	6.2	19.0	5	160	110	--	11	0	2.4
NOV												
30...	1005	17	45	7.9	18.5	1	45	200	--	15	3	3.5
DEC												
28...	1030	40	35	7.4	17.5	2	42	80	--	12	0	2.5
JAN												
26...	--	3.7	49	7.9	15.5	--	--	--	--	--	--	--
26...	0945	3.7	49	7.9	15.5	1	82	--	27	16	0	3.6
FEB												
23...	1445	2.2	44	7.9	19.0	1	<1	--	70	16	0	3.8
MAR												
29...	0845	275	34	7.4	16.0	0	6	--	120	10	1	2.2
APR												
20...	0830	305	34	7.5	16.5	0	30	--	180	10	0	2.2
MAY												
24...	0900	136	35	7.7	18.0	0	50	--	940	11	0	2.8
JUN												
21...	1030	10	50	7.7	20.0	1	22	--	110	19	1	5.3
JUL												
18...	0845	298	34	7.5	17.0	2	68	--	640	14	4	4.0
AUG												
24...	0930	320	33	7.2	18.0	1	18	--	1100	10	0	3.1
SEP												
07...	1200	53	40	7.2	21.0	--	--	--	--	--	--	--
26...	0900	41	75	6.6	17.0	0	12	--	B12D0	12	0	3.1

DATE	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	DIS-SOLVED SODIUM (NA) (MG/L)	PERCENT SODIUM	SODIUM AD-SORP-TION RATIO	DIS-SOLVED PO-TAS-SIUM (K) (MG/L)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DIS-SOLVED SULFATE (SO4) (MG/L)	DIS-SOLVED CHLO-RIDE (CL) (MG/L)	DIS-SOLVED FLUO-RIDE (F) (MG/L)
OCT												
27...	1.1	2.4	32	.3	.5	14	0	11	14	3.9	2.3	.0
NOV												
30...	1.5	2.7	27	.3	.6	15	0	12	.3	.8	2.4	.0
DEC												
28...	1.5	2.7	31	.3	.4	18	0	15	1.1	1.5	2.5	.1
JAN												
26...	--	--	--	--	--	--	--	--	--	--	--	--
26...	1.8	3.2	29	.3	.6	26	0	21	.5	3.5	2.5	.1
FEB												
23...	1.7	3.0	27	.3	.6	23	0	19	.5	4.9	2.8	.0
MAR												
29...	1.0	2.7	36	.4	.5	10	0	8	.6	5.3	2.7	.1
APR												
20...	1.0	2.6	36	.4	.5	16	0	13	.8	3.5	2.5	.1
MAY												
24...	1.0	2.4	31	.3	.5	14	0	11	.4	2.0	2.3	.0
JUN												
21...	1.4	3.6	28	.4	.8	22	0	18	.7	2.4	2.8	.1
JUL												
18...	.9	2.8	30	.3	.4	12	0	10	.6	2.7	3.0	.1
AUG												
24...	.6	2.6	34	.4	.5	13	0	11	1.3	2.3	2.3	.1
SEP												
07...	--	--	--	--	--	--	--	--	--	--	--	--
26...	1.1	2.8	32	.3	.6	16	0	13	6.4	1.9	2.9	.1

< Actual value is known to be less than the value shown.
B Results based on colony count outside the acceptable range (non-ideal colony count).

HAWAII, ISLAND OF HAWAII

16704000 WAILUKU RIVER AT PIIHONUA--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED SOLIDS (RESI-DUE AT 180 C) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTI-TUENTS) (MG/L)	DIS-SOLVED SOLIDS (TONS PER AC-FT)	DIS-SOLVED SOLIDS (TONS PER DAY)	TOTAL NITRITE PLUS NITRATE (N) (MG/L)	TOTAL AMMONIA NITRO-GEN (N) (MG/L)	TOTAL KJEL-DAHL NITRO-GEN (N) (MG/L)	TOTAL NITRO-GEN (N) (MG/L)	TOTAL NITRO-GEN (NO3) (MG/L)	TOTAL PHOS-PHORUS (P) (MG/L)	DIS-SOL-VED-PHOS-PHORUS (P) (MG/L)
OCT												
27...	8.3	33	28	.04	11.2	.13	--	.14	.27	1.2	.01	--
NOV												
30...	13	38	32	.05	1.74	.10	--	.03	.13	.58	.00	--
DEC												
28...	10	36	30	.05	3.89	.29	--	.27	.56	2.5	.01	--
JAN												
26...	--	--	--	--	--	--	--	--	--	--	--	--
26...	16	51	44	.07	.51	.10	--	.03	.13	.58	.00	--
FEB												
23...	17	43	45	.06	.26	.11	--	.11	.22	.97	.01	--
MAR												
29...	13	32	33	.04	23.8	.09	--	.04	.13	.58	.04	--
APR												
20...	11	34	31	.05	28.0	.08	--	.00	.08	.35	.00	--
MAY												
24...	14	34	32	.05	12.5	.07	--	.00	.07	.31	.00	--
JUN												
21...	21	40	48	.05	1.08	.04	--	.23	.27	1.2	.00	--
JUL												
18...	10	31	30	.04	24.9	.08	--	.08	.16	.71	.02	--
AUG												
24...	12	34	30	.05	29.4	.07	--	.00	.07	.31	.01	--
SEP												
07...	--	--	--	--	--	--	--	--	--	--	--	--
26...	15	33	36	.04	3.65	.09	.00	--	--	--	.00	.00

DATE	TIME	TOTAL ARSENIC (AS) (UG/L)	SUS-PENDED ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL BARIUM (BA) (UG/L)	SUS-PENDED BARIUM (BA) (UG/L)	DIS-SOLVED BARIUM (BA) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)	SUS-PENDED CAD-MIUM (CD) (UG/L)	DIS-SOLVED CAD-MIUM (CD) (UG/L)
DEC										
28...	1030	0	0	0	--	--	--	<10	<9	1
MAR										
29...	0845	0	--	0	--	--	--	<10	<10	0
JUN										
21...	1030	3	--	0	--	--	--	<10	<9	1
SEP										
26...	0900	0	0	0	100	0	100	<10	<10	0

DATE	TOTAL CHRO-MIUM (CR) (UG/L)	SUS-PENDED CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	SUS-PENDED COBALT (CO) (UG/L)	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	SUS-PENDED COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)
DEC										
28...	0	0	0	<50	<49	1	20	19	1	250
MAR										
29...	0	0	0	<50	<50	0	<10	<10	0	250
JUN										
21...	0	0	0	<50	<50	0	<10	<10	0	50
SEP										
26...	40	0	40	<50	<50	0	<10	<7	3	70

DATE	DIS-SOLVED IRON (FE) (UG/L)	TOTAL LEAD (PB) (UG/L)	SUS-PENDED LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	SUS-PENDED MAN-GANESE (MN) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	SUS-PENDED MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)
DEC										
28...	80	<100	<89	11	20	10	10	.5	.5	.0
MAR										
29...	70	<100	<95	5	0	0	0	.1	--	.0
JUN										
21...	50	<100	<88	12	4	--	0	.0	.0	.0
SEP										
26...	20	<100	<94	6	10	10	0	.0	.0	.0

< Actual value is known to be less than the value shown.

16704000 WAILUKU RIVER AT PIIHONUA--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TOTAL SELE-NIUM (SE) (UG/L)	SUS-PENDED SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL SILVER (AG) (UG/L)	SUS-PENDED SILVER (AG) (UG/L)	DIS-SOLVED SILVER (AG) (UG/L)	TOTAL ZINC (ZN) (UG/L)	SUS-PENDED ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)
DEC										
28...	0	0	0	--	--	--	10	0	10	2.1
MAR										
29...	1	0	1	--	--	--	0	0	0	.7
JUN										
21...	0	0	0	--	--	--	0	0	0	1.3
SEP										
26...	0	0	0	<10	<10	0	10	10	0	1.1

DATE	TIME	TOTAL PHYTO-PLANK-TON (CELLS PER ML)	CHLOR-A PERI-PHYTON CHROMO-SPECT-METRIC (MG/M2)	CHLOR-A PERI-PHYTON CHROMO-GRAPHIC FLUOROM (MG/M2)	CHLOR-B PERI-PHYTON CHROMO-SPECT-METRIC (MG/M2)	CHLOR-B PERI-PHYTON CHROMO-GRAPHIC FLUOROM (MG/M2)	BIOMASS CHLORO-PHYLL RATIO PERI-PHYTON (UNITS)	LENGTH OF EXPO-SURE (DAYS)
OCT								
27...	0925	230	--	--	--	--	--	--
NOV								
30...	1005	15	--	--	--	--	--	--
DEC								
28...	1030	170	--	--	--	--	--	--
JAN								
26...	0945	150	2.57	--	1.91	--	269	35
FEB								
23...	1445	33	--	--	--	--	--	--
MAR								
29...	0845	270	--	--	--	--	--	--
MAY								
24...	0900	27	--	--	--	--	--	--
JUN								
21...	1030	48	--	.353	--	.431	3926	45
JUL								
18...	0845	42	--	--	--	--	--	--
AUG								
24...	0930	110	--	--	--	--	--	--
SEP								
07...	1200	--	--	.136	--	.158	1735	37
26...	0900	0	--	.174	--	.203	2264	35

DATE	TIME	INSTAN-TANEOUS DIS-CHARGE (CFS)	SUS-PENDED SEDI-MENT (MG/L)	SUS-PENDED SEDI-MENT DIS-CHARGE (T/DAY)	SUS. SED. SIEVE DIAM. % FINER THAN .062 MM
OCT					
27...	0925	126	3	1.0	100
NOV					
30...	1005	17	4	.18	100
DEC					
28...	1030	40	1	.11	100
JAN					
26...	--	3.7	--	--	--
26...	0945	3.7	1	.01	100
FEB					
23...	1445	2.2	1	.01	100
MAR					
29...	0845	275	1	.74	100
APR					
20...	0830	305	1	.82	100
MAY					
24...	0900	136	2	.73	100
JUN					
21...	1030	10	3	.08	100
JUL					
18...	0845	298	1	.80	100
AUG					
24...	0930	320	2	1.7	100
SEP					
07...	1200	53	--	--	--
26...	0900	41	0	.00	100

16704000 WAILUKU RIVER AT PIIHONUA--Continued

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

PHYTOPLANKTON

DATE	OCT 27,76	NOV 30,76	DEC 28,76	JAN 26,77	FEB 23,77	MAR 29,77
TIME	0925	1005	1030	0945	1445	0845
TOTAL CELLS/ML	230	15	170	150	33	270
DIVERSITY: DIVISION	1.5	0.9	0.8	1.0	0.9	0.0
.CLASS	1.5	0.9	0.8	1.0	0.9	0.0
..ORDER	1.6	0.9	0.9	1.5	0.9	0.0
...FAMILY	2.3	1.9	2.7	2.5	2.5	0.3
....GENUS	2.3	1.9	2.7	2.7	2.7	0.3

ORGANISM	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT
CHLOROPHYTA (GREEN ALGAE)												
.CHLOROPHYCEAE												
..CHLOROCOCCALES												
...OOCYSTACEAE												
....ANKISTRODESMUS	--	-	--	-	3	2	43#	29	3	8	--	-
....KIRCHNERIELLA	--	-	--	-	--	-	--	-	3	8	--	-
....SELENASTRUM	--	-	--	-	--	-	11	7	--	-	--	-
....TETRAEDRON	4	2	--	-	--	-	--	-	--	-	--	-
...SCENEDESMACEAE												
....CRUCIGENIA	8	4	--	-	--	-	--	-	--	-	--	-
....SCENEDESMUS	--	-	--	-	--	-	11	7	6#	17	--	-
..VOLVOCALES												
...CHLAMYDOMONADACEAE												
....CHLAMYDOMONAS	--	-	5#	33	--	-	13	9	--	-	--	-
..ZYGNEMATALES												
...DESMIDIACEAE												
....COSMARIUM	8	4	--	-	--	-	--	-	--	-	--	-
CHRYSOPHYTA												
.BACILLARIOPHYCEAE												
..CENTRALES												
...COSCINODISCACEAE												
....CYCLOTELLA	--	-	--	-	3	2	5	4	--	-	--	-
..PENNALES												
...ACHNANTHACEAE												
....ACHNANTHES	--	-	--	-	10	6	21	15	6#	17	--	-
....COCCONEIS	--	-	--	-	--	-	--	-	--	-	*	0
...CYMBELLACEAE												
....CYMBELLA	--	-	--	-	--	-	--	-	--	-	*	0
...DIATOMACEAE												
....DIATOMA	8	4	3#	17	--	-	--	-	--	-	--	-
...FRAGILARIACEAE												
....FRAGILARIA	8	4	--	-	--	-	--	-	--	-	--	-
....SYNEDRA	--	-	--	-	28#	17	4	0	3	8	260#	96
...GOMPHONEMATACEAE												
....GOMPHONEMA	21	9	3#	17	38#	23	11	7	6#	17	7	3
...NAVICULACEAE												
....FRUSTULIA	--	-	--	-	--	-	--	-	--	-	--	-
....NAVICULA	37#	16	5#	33	41#	25	32#	22	8#	25	2	1
...NITZSCHIACEAE												
....NITZSCHIA	--	-	--	-	5	3	--	-	--	-	--	-
...SURIRELLACEAE												
....SURIRELLA	4	2	--	-	--	-	--	-	--	-	--	-
...TABELLARIACEAE												
....TABELLARIA	--	-	--	-	8	5	--	-	--	-	*	0
CYANOPHYTA (BLUE-GREEN ALGAE)												
.CYANOPHYCEAE												
..HORMOGONALES												
...OSCILLATORIACEAE												
....OSCILLATORIA	120#	54	--	-	31#	18	--	-	--	-	--	-
EUGLENOPHYTA (EUGLENOIDS)												
.EUGLENOPHYCEAE												
..EUGLENALES												
...EUGLENACEAE												
....TRACHELOMONAS	4	2	--	-	--	-	--	-	--	-	--	-
PYRRHOPHYTA (FIRE ALGAE)												
.DINOPHYCEAE												
..PERIDINIALES												
...PERIDINIACEAE												
....PERIDINIUM	4	2	--	-	--	-	--	-	--	-	--	-

NOTE: # - DOMINANT ORGANISM; EQUAL TO OR GREATER THAN 15%
* - OBSERVED ORGANISM; MAY NOT HAVE BEEN COUNTED; LESS THAN 1/2%

I6704000 WAILUKU RIVER AT PIIHONUA--Continued

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1977

PHYTOPLANKTON

DATE	APR 20,77	MAY 24,77	JUN 21,77	JUL 18,77	AUG 24,77	SEP 26,77
TIME	0830	0900	1030	0845	0930	0900
TOTAL CELLS/ML	100	27	48	42	110	0
DIVERSITY: DIVISION	0.6	0.0	0.0	0.0	0.0	0.0
.CLASS	0.6	0.0	0.0	0.0	0.0	0.0
..ORDER	0.6	0.0	0.0	0.0	0.0	0.0
...FAMILY	1.5	0.4	1.1	1.4	2.3	0.0
....GENUS	1.5	0.4	1.2	1.9	2.3	0.0

ORGANISM	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT
CHLOROPHYTA (GREEN ALGAE)												
.CHLOROPHYCEAE												
..CHLOROCOCCALES												
...OOCYSTACEAE												
....ANKISTRODESMUS	--	-	--	-	--	-	--	-	--	-	--	-
....KIRCHNERIELLA	--	-	--	-	--	-	--	-	--	-	--	-
....SELENASTRUM	--	-	--	-	--	-	--	-	--	-	--	-
....TETRAEDRON	--	-	--	-	--	-	--	-	--	-	--	-
...SCENEDESMACEAE												
....CRUCIGENIA	--	-	--	-	--	-	--	-	--	-	--	-
....SCENEDESMUS	--	-	--	-	--	-	--	-	--	-	--	-
..VOLVOCALES												
...CHLAMYDOMONADACEAE												
....CHLAMYDOMONAS	--	-	--	-	--	-	--	-	--	-	--	-
..ZYGNEMATALES												
...DESMIDIACEAE												
....COSMARIUM	--	-	--	-	--	-	--	-	--	-	--	-
CHRYSOPHYTA												
.BACILLARIOPHYCEAE												
..CENTRALES												
...COSCINODISCACEAE												
....CYCLOTELLA	--	-	--	-	--	-	--	-	--	-	--	-
..PENNALES												
...ACHNANTHACEAE												
....ACHNANTHES	6	5	*	0	3	7	11#	25	5	4	--	-
....COCCONEIS	--	-	2	9	6	13	11#	25	--	-	--	-
...CYMBELLACEAE												
....CYMBELLA	--	-	*	0	--	-	--	-	--	-	--	-
...DIATOMACEAE												
....DIATOMA	--	-	--	-	--	-	--	-	--	-	--	-
...FRAGILARIACEAE												
....FRAGILARIA	--	-	--	-	--	-	--	-	--	-	--	-
....SYNEDRA	69#	68	*	0	--	-	--	-	19#	17	*	0
...GOMPHONEMATACEAE												
....GOMPHONEMA	6	5	25#	91	3	7	5	13	24#	22	--	-
...NAVICULACEAE												
....FRUSTULIA	--	-	--	-	--	-	--	-	--	-	*	0
....NAVICULA	6	5	*	0	36#	73	16#	38	29#	26	*	0
...NITZSCHIACEAE												
....NITZSCHIA	--	-	--	-	--	-	--	-	5	4	--	-
...SURIRELLACEAE												
....SURIRELLA	--	-	--	-	--	-	--	-	--	-	--	-
...TABELLARIACEAE												
....TABELLARIA	--	-	--	-	--	-	--	-	29#	26	--	-
CYANOPHYTA (BLUE-GREEN ALGAE)												
.CYANOPHYCEAE												
..HORMOGONALES												
...OSCILLATORIACEAE												
....OSCILLATORIA	17#	16	--	-	--	-	--	-	--	-	--	-
EUGLENOPHYTA (EUGLENOIDS)												
.EUGLENOPHYCEAE												
..EUGLENALES												
...EUGLENACEAE												
....TRACHELOMONAS	--	-	--	-	--	-	--	-	--	-	--	-
PYRRHOPHYTA (FIRE ALGAE)												
.DINOPHYCEAE												
..PERIDINIALES												
...PERIDINIACEAE												
....PERIDINIUM	--	-	--	-	--	-	--	-	--	-	--	-

NOTE: # - DOMINANT ORGANISM; EQUAL TO OR GREATER THAN 15%
* - OBSERVED ORGANISM, MAY NOT HAVE BEEN COUNTED; LESS THAN 1/2%

HAWAII, ISLAND OF HAWAII

16704000 WAILUKU RIVER AT PIIHONUA--Continued

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	---	---	---	35	30	33			---	---	---	---
2	---	---	---	36	30	34			---	---	---	---
3	---	---	---	36	30	34			---	---	---	---
4	---	---	---	37	34	36			---	---	---	---
5	---	---	---	39	36	38			---	---	---	---
6	---	---	---	40	35	39			---	---	---	---
7	---	---	---	42	35	40			---	---	---	---
8	---	---	---	58	25	39			---	---	---	---
9	---	---	---	29	20	23			---	---	---	---
10	---	---	---	20	15	18			---	---	---	---
11	---	---	---	29	20	24			---	---	---	---
12	---	---	---	32	25	29			---	---	---	---
13	---	---	---	34	30	32			---	---	---	---
14	---	---	---	36	30	33			---	---	---	---
15	---	---	---	37	30	35			---	---	---	---
16	---	---	---	38	35	37			---	---	---	---
17	---	---	---	39	35	38			---	---	---	---
18	---	---	---	40	35	38			---	---	---	---
19	---	---	---	40	35	38			---	---	---	---
20	---	---	---	42	35	40			---	---	---	---
21	---	---	---	43	40	41			---	---	---	---
22	22	15	18	43	40	42			---	---	---	---
23	27	20	25	41	35	38			---	---	---	---
24	29	25	27	40	35	37			---	---	---	---
25	31	25	29	37	30	36			---	---	---	---
26	31	25	30	38	36	37			---	52	45	51
27	31	30	31	39	35	38			---	53	45	51
28	32	30	31	39	35	199			---	53	50	52
29	34	30	33	39	35	38			---	53	52	53
30	34	30	33	41	35	39			---	55	50	53
31	34	30	33	---	---	---			---	55	52	54
MONTH	34	15	29	58	15	41			---	55	45	52

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	56	52	54	25	20	22	37	22	29	32	25	29
2	56	50	54	32	20	24	30	15	25	34	31	33
3	55	50	53	22	15	20	30	20	25	35	30	32
4	54	50	52	28	20	24	30	25	27	36	30	35
5	54	50	52	31	25	28	30	25	27	36	30	35
6	53	50	52	33	30	31	30	20	27	37	32	35
7	52	50	52	34	30	33	25	20	24	31	25	29
8	52	45	50	34	32	33	26	20	23	33	30	32
9	55	45	50	35	30	33	26	20	24	35	30	33
10	52	45	49	36	35	35	26	20	24	36	35	35
11	51	45	49	36	30	33	27	20	24	36	30	33
12	50	45	49	32	25	29	31	25	29	33	30	32
13	50	45	49	33	15	25	33	31	32	34	30	33
14	50	45	49	26	20	23	35	32	33	36	30	33
15	51	45	49	28	20	24	35	30	33	37	30	35
16	51	45	49	33	25	30	35	30	34	38	36	37
17	52	45	50	33	30	32	37	30	35	39	27	36
18	51	45	50	33	25	29	38	36	37	32	27	30
19	51	45	49	31	25	27	36	30	33	34	31	33
20	55	47	50	25	15	21	35	21	29	36	30	33
21	51	45	50	28	20	25	30	23	26	36	30	35
22	52	45	50	30	25	28	33	30	31	29	25	27
23	52	45	50	31	25	29	37	30	34	32	25	30
24	52	50	51	31	25	28	36	30	35	35	30	33
25	52	50	51	36	30	32	37	30	35	37	30	35
26	50	40	47	35	30	33	34	28	31	39	36	37
27	46	15	25	38	35	36	33	32	33	40	35	38
28	26	20	23	38	35	37	34	32	33	41	35	39
29	---	---	---	36	30	34	32	17	25	45	40	41
30	---	---	---	37	35	36	28	17	21	44	41	42
31	---	---	---	34	30	33	---	---	---	45	42	43
MONTH	56	15	49	38	15	29	38	15	29	45	25	34

HAWAII, ISLAND OF HAWAII

16704000 WAILUKU RIVER AT PIIHONUA--Continued

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	46	40	43	56	50	54						
2	46	40	44	56	50	54						
3	47	45	46	56	50	55						
4	50	46	47	55	50	53						
5	55	45	48	53	50	52						
6	52	45	49	53	45	49						
7	50	45	48	47	40	45						
8	52	45	49	45	35	38						
9	52	45	50	35	30	33						
10	53	50	51	35	25	31						
11	51	50	50	29	25	26						
12	53	50	51	31	25	29						
13	55	50	52	32	30	30						
14	53	50	51	34	31	32						
15	59	50	52	38	30	33						
16	52	50	51	36	30	33						
17	53	50	51	35	27	32						
18	52	50	51	30	25	28						
19	52	50	51	29	25	28						
20	55	50	53	---	---	---						
21	56	50	55	---	---	---						
22	58	50	54	---	---	---						
23	56	50	54	---	---	---						
24	55	50	54	---	---	---						
25	56	50	55	---	---	---						
26	56	50	54	---	---	---						
27	57	52	55	---	---	---						
28	55	50	54	---	---	---						
29	56	52	54	---	---	---						
30	56	50	54	---	---	---						
31	---	---	---	---	---	---						
MONTH	59	40	51	56	25	39						
YEAR	59	15	39									

NOTE: NUMBER OF MISSING DAYS OF RECORD EXCEEDED 20% OF YEAR

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	---	---	---	19.5	19.0	19.5				---	---	---
2	---	---	---	20.0	19.0	19.5				---	---	---
3	---	---	---	20.0	19.0	19.5				---	---	---
4	---	---	---	20.0	---	---				---	---	---
5	---	---	---	19.5	19.0	19.0				---	---	---
6	---	---	---	19.0	19.5	19.0				---	---	---
7	---	---	---	19.5	18.0	19.0				---	---	---
8	---	---	---	19.0	18.0	18.5				---	---	---
9	---	---	---	18.5	17.0	18.0				---	---	---
10	---	---	---	18.5	17.5	19.0				---	---	---
11	---	---	---	18.5	18.0	18.0				---	---	---
12	---	---	---	18.5	17.5	18.0				---	---	---
13	---	---	---	18.5	17.5	18.0				---	---	---
14	---	---	---	18.5	17.5	18.0				---	---	---
15	---	---	---	18.5	17.5	18.0				---	---	---
16	---	---	---	18.5	18.0	18.5				---	---	---
17	---	---	---	19.0	17.5	18.5				---	---	---
18	---	---	---	18.5	17.0	18.0				---	---	---
19	---	---	---	18.0	16.5	18.0				---	---	---
20	---	---	---	18.5	17.5	18.0				---	---	---
21	---	---	---	19.0	18.0	18.5				---	---	---
22	19.0	18.5	19.0	18.5	18.0	18.5				---	---	---
23	19.5	18.5	19.0	19.0	18.0	19.0				---	---	---
24	19.0	18.0	18.5	19.5	18.0	19.0				---	---	---
25	19.5	18.0	19.0	19.0	18.0	18.5				---	---	---
26	19.5	18.5	19.0	19.0	18.5	19.0				20.5	18.0	18.5
27	19.5	18.5	19.0	19.5	18.5	19.0				21.5	17.0	18.5
28	20.0	19.0	19.5	20.5	19.0	20.0				19.5	17.0	18.5
29	19.5	19.0	19.5	20.5	19.0	19.5				19.0	17.5	18.0
30	19.5	19.0	19.5	19.5	19.0	19.5				20.5	17.0	18.0
31	19.5	19.0	19.5	---	---	---				20.5	17.0	18.5
MONTH	20.0	19.0	19.0	20.5	16.5	18.5				21.5	17.0	18.5

HAWAII, ISLAND OF HAWAII

16704000 WAILUKU RIVER AT PIIHONUA--Continued

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	20.5	17.5	18.5	17.0	16.0	16.5	18.0	16.5	17.5	17.0	16.0	16.5
2	20.0	17.5	19.0	17.0	16.0	16.5	18.0	17.0	17.5	17.0	16.0	16.5
3	19.5	18.0	18.5	16.0	15.0	15.5	18.0	17.0	17.5	18.0	16.0	17.0
4	18.5	17.0	18.0	16.5	15.0	16.0	18.0	16.0	17.5	18.5	17.0	18.0
5	19.0	18.0	18.5	17.0	16.0	16.5	17.5	17.0	17.5	18.5	17.0	18.0
6	19.0	18.5	18.5	17.0	16.0	16.5	17.5	17.0	17.5	18.5	17.5	18.0
7	19.0	18.0	18.5	17.0	16.0	16.5	17.5	16.5	17.0	18.0	17.0	18.0
8	20.0	17.5	18.5	17.5	16.5	17.0	17.0	16.0	17.0	18.5	17.0	18.0
9	19.5	18.0	19.0	17.5	16.5	17.0	17.0	16.0	16.5	18.5	17.5	18.0
10	20.0	18.5	19.0	17.5	16.5	17.0	17.0	16.0	16.5	18.5	17.5	18.0
11	19.5	18.0	19.0	17.5	17.0	17.5	17.5	16.5	17.0	18.0	17.5	18.0
12	22.0	18.0	19.5	17.5	16.5	16.5	17.5	16.5	17.0	18.0	16.5	17.5
13	22.5	18.5	20.0	16.5	15.5	16.0	18.0	16.5	17.5	18.5	17.5	18.0
14	21.0	18.5	19.5	16.5	15.0	16.0	17.5	16.5	17.5	18.5	17.5	18.5
15	20.0	19.0	19.5	16.5	15.0	16.0	17.5	16.5	17.0	19.0	17.5	18.5
16	20.5	18.5	19.5	16.5	15.0	16.0	17.5	16.5	17.0	19.0	17.5	18.5
17	20.5	18.5	19.5	16.5	16.0	16.5	18.0	16.5	17.5	19.5	18.5	19.0
18	22.0	18.5	20.0	16.5	16.0	16.5	18.0	17.0	17.5	19.0	18.5	19.0
19	23.0	18.5	20.0	16.5	15.5	16.0	18.0	17.0	17.5	18.5	18.0	18.5
20	22.0	18.0	20.0	16.0	14.5	15.0	18.0	17.0	17.5	18.5	18.0	18.0
21	22.5	18.5	20.0	16.5	14.5	15.5	17.5	16.5	17.0	18.5	17.5	18.0
22	23.0	19.0	20.5	16.5	15.5	16.0	17.5	16.5	17.0	18.0	17.0	17.5
23	24.5	19.5	21.0	16.5	15.5	16.0	18.0	16.5	17.5	18.0	17.0	17.5
24	21.5	19.5	20.5	16.5	15.5	16.5	17.5	16.5	17.5	18.5	17.5	18.0
25	19.5	18.5	19.0	17.0	15.5	16.5	18.0	17.0	17.5	18.5	17.5	18.0
26	19.0	18.0	18.5	17.5	15.5	16.5	18.0	17.0	17.5	19.0	17.5	18.5
27	18.5	15.5	16.5	18.0	16.0	17.0	18.5	17.5	18.0	19.5	18.0	19.0
28	17.0	16.0	16.5	18.0	17.0	17.5	18.0	17.5	18.0	19.5	19.0	19.5
29	---	---	---	18.0	17.0	17.5	18.0	17.0	17.5	20.0	18.5	19.5
30	---	---	---	18.0	17.5	17.5	17.0	16.5	17.0	20.0	19.0	19.5
31	---	---	---	17.5	17.0	17.5	---	---	---	20.0	19.0	19.5
MONTH	24.5	15.5	19.0	18.0	14.5	16.5	18.5	16.0	17.5	20.0	16.0	18.0

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	20.5	19.0	20.0	22.0	20.5	21.0						
2	20.5	19.5	20.0	22.5	20.5	21.0						
3	20.0	19.0	20.0	22.0	20.5	21.0						
4	20.5	19.0	20.0	21.0	20.0	20.5						
5	20.5	19.0	20.0	20.5	19.5	20.0						
6	20.5	19.5	20.0	20.5	19.5	20.0						
7	20.5	19.5	20.0	20.5	20.0	20.0						
8	21.0	19.5	20.0	20.5	19.5	20.0						
9	21.0	19.5	20.5	20.0	19.0	19.5						
10	20.5	19.5	20.0	19.5	18.5	19.0						
11	21.5	20.0	20.5	19.0	18.0	19.0						
12	21.0	20.5	20.5	19.5	18.5	19.0						
13	21.0	19.5	20.5	19.5	18.5	19.0						
14	22.0	20.0	21.0	19.0	18.0	19.0						
15	22.0	20.5	21.5	19.5	18.5	19.0						
16	22.5	20.5	21.5	19.5	19.0	19.5						
17	22.5	20.5	21.5	19.5	19.0	19.5						
18	22.0	20.5	21.5	19.5	18.5	19.0						
19	21.0	20.5	21.0	19.0	18.5	19.0						
20	21.5	20.0	20.5	---	---	---						
21	21.0	20.0	20.5	---	---	---						
22	22.5	20.0	21.0	---	---	---						
23	21.5	20.5	21.0	---	---	---						
24	22.0	20.0	21.0	---	---	---						
25	22.0	20.0	21.0	---	---	---						
26	23.0	20.0	21.5	---	---	---						
27	23.0	20.5	21.5	---	---	---						
28	21.0	20.5	20.5	---	---	---						
29	21.5	20.0	21.0	---	---	---						
30	21.5	20.5	21.0	---	---	---						
31	---	---	---	---	---	---						
MONTH	23.0	19.0	20.5	22.5	18.0	19.5						
YEAR	24.5	14.5	18.5									

NOTE: NUMBER OF MISSING DAYS OF RECORD EXCEEDED 20% OF YEAR

HAWAII, ISLAND OF HAWAII

16713000 WAILUKU RIVER AT HILO

LOCATION.--Lat 19°43'43", long 155°05'40", Hydrologic Unit 20010000, on right bank 500 ft (152 m) upstream from Wailuku bridge and 0.2 mi (0.3 km) west of Hilo Post Office.

DRAINAGE AREA.--256 mi² (663 km²), of which 81 mi² (210 km²) probably is noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--March to September 1977.

GAGE.--Water-stage recorder. Altitude of gage is 80 ft (24 m), from topographic map.

REMARKS.--Records good. Hilo Electric Light Co. diverts above station for Hydro-plant use.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge during period March to September, 15,700 ft³/s (445 m³/s) Aug. 12, 1977, gage height 15.45 ft (4.710 m), from rating curve extended above 6,840 ft³/s (194 m³/s); minimum, 9.0 ft³/s (0.25 m³/s) on July 3, 1977.

EXTREMES FOR CURRENT YEAR.--Peak discharges for period March to September, above base of 9,500 ft³/s (269 m³/s) and maximum (*):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Mar. 20	0700	11500	326	13.54	4.127	Apr. 29	2330	11800	334	13.67	4.167
Apr. 2	1800	11000	312	13.30	4.054	Aug. 12	0900	*15700	445	15.45	4.710

Minimum discharge, 9.0 ft³/s (0.25 m³/s) July 3.

DISCHARGE, IN CUBIC FEET PER SECOND, MARCH TO SEPTEMBER 1977

MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1						2400	694	1060	52	12	171	133
2						2700	1320	735	44	10	139	87
3						6400	870	584	35	9.8	742	70
4						2500	735	418	28	16	280	66
5						1500	900	397	30	42	177	57
6						980	1560	442	25	36	2140	41
7						670	2300	745	23	99	1710	35
8						576	2730	442	23	316	560	43
9						432	2380	319	26	385	355	33
10						376	2610	252	44	675	240	70
11						636	2640	397	38	657	332	32
12						1190	1340	397	37	391	6340	23
13						3300	985	337	35	407	1280	30
14						4460	955	208	37	235	725	75
15						3180	745	184	31	190	505	74
16						1580	576	127	25	106	364	83
17						1140	446	429	20	540	280	739
18						1680	446	690	21	690	255	465
19						1890	502	255	22	620	180	188
20						5540	1470	208	25	322	151	128
21						3430	1460	364	23	255	144	93
22						3220	875	825	18	190	564	81
23						3270	576	343	15	140	468	87
24						2290	435	218	12	110	500	76
25						1070	435	159	12	140	280	87
26						800	477	134	19	160	190	53
27						612	367	133	15	130	139	40
28						505	433	116	18	1800	177	32
29						508	2410	105	10	370	186	26
30						397	4260	85	10	242	144	21
31						502	---	74	---	157	230	---
TOTAL						59734	37832	11142	773	9362.8	19948	3078
MEAN						1927	1261	359	25.3	302	643	103
MAX						6400	4260	1060	52	1800	6340	739
MIN						376	367	74	10	9.8	139	21
AC-FT						118500	75040	22100	1530	18570	39570	6110

WATER-QUALITY RECORDS

PERIOD OF RECORD.--March 1977 to current year.

PERIOD OF DAILY RECORD.--
SUSPENDED SEDIMENT DISCHARGE: March 1977 to current year.

INSTRUMENTATION.--Automatic pumping sediment sampler since March 1977.

REMARKS.--In addition to the sediment sampler record, samples were collected at this station.

EXTREMES FOR CURRENT YEAR.--
SEDIMENT CONCENTRATIONS: Maximum daily mean, 126 mg/L Aug. 12; minimum daily mean, 1 mg/L on several days in May and August.
SEDIMENT DISCHARGE: Maximum daily, 2,860 tons (2,590 tonnes) Aug. 12, minimum daily, 0.08 ton (0.07 tonne) June 29, 30, July 2, 3.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	TURBIDITY (JTU)	DISSOLVED OXYGEN (MG/L)	FECAL COLIFORM .7UM-MF (COL./100 ML)	FECAL STREPTOCOCCI KF AGAR (COL. PER 100 ML)
FEB									
22...	1430	20	77	8.5	22.0	1	9.7	11	274
MAR									
29...	1330	300	46	7.6	19.0	1	9.5	36	580
APR									
20...	1015	350	47	7.6	17.0	1	9.4	110	430
MAY									
24...	1100	175	46	7.7	20.0	2	9.0	73	800
JUN									
21...	1330	22	78	7.3	22.0	1	9.6	32	120
JUL									
18...	0945	350	32	7.2	20.0	4	9.2	240	2900
AUG									
24...	1015	360	36	7.5	20.0	2	9.0	84	6100
SEP									
26...	1045	50	63	6.4	20.0	1	9.0	26	250

DATE	TOTAL NITRITE PLUS NITRATE (N) (MG/L)	TOTAL AMMONIA NITROGEN (N) (MG/L)	TOTAL ORGANIC NITROGEN (N) (MG/L)	TOTAL KJELDAHL NITROGEN (N) (MG/L)	TOTAL NITROGEN (N) (MG/L)	TOTAL NITROGEN (NO3) (MG/L)	TOTAL PHOSPHORUS (P) (MG/L)	TOTAL ORTHO PHOSPHORUS (P) (MG/L)
FEB								
22...	.15	.00	.02	.02	.17	.75	.02	.02
MAR								
29...	.15	.00	.09	.09	.24	1.1	.01	.00
APR								
20...	.10	.04	.00	.04	.14	.60	.03	.03
MAY								
24...	.10	.01	.14	.15	.25	1.1	.01	.01
JUN								
21...	.04	.04	.11	.15	.19	.84	.00	.00
JUL								
18...	.03	.01	.19	.19	.22	.97	.03	.03
AUG								
24...	.06	.00	.00	.00	.06	.27	.02	.00
SEP								
26...	.09	.00	.02	.02	.11	.49	.01	.00

16713000 WAILUKU RIVER AT HILO--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	TOTAL ARSENIC (AS) (UG/L)	SUS-PENDED ARSENIC (AS) (UG/L)	DIS-SOLVED ARSENIC (AS) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)	SUS-PENDED CAD-MIUM (CD) (UG/L)	DIS-SOLVED CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	SUS-PENDED CHRO-MIUM (CR) (UG/L)	DIS-SOLVED CHRO-MIUM (CR) (UG/L)	TOTAL COBALT (CO) (UG/L)	SUS-PENDED COBALT (CO) (UG/L)
FEB												
22...	1430	--	--	--	--	--	--	--	--	--	--	--
MAR												
29...	1330	0	0	0	<10	<7	3	0	0	0	<50	<50
APR												
20...	1015	--	--	--	--	--	--	--	--	--	--	--
MAY												
24...	1100	--	--	--	--	--	--	--	--	--	--	--
JUN												
21...	1330	1	--	0	<10	<9	1	10	10	0	<50	<50
JUL												
18...	0945	--	--	--	--	--	--	--	--	--	--	--
AUG												
24...	1015	--	--	--	--	--	--	--	--	--	--	--
SEP												
26...	1045	0	0	0	<10	<8	2	0	0	0	<50	<50

DATE	DIS-SOLVED COBALT (CO) (UG/L)	TOTAL COPPER (CU) (UG/L)	SUS-PENDED COPPER (CU) (UG/L)	DIS-SOLVED COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED IRON (FE) (UG/L)	TOTAL LEAD (PB) (UG/L)	SUS-PENDED LEAD (PB) (UG/L)	DIS-SOLVED LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	SUS-PENDED MAN-GANESE (MN) (UG/L)
FEB											
22...	--	--	--	--	--	--	--	--	--	--	--
MAR											
29...	0	<10	<10	0	450	40	<100	<81	19	0	0
APR											
20...	--	--	--	--	--	--	--	--	--	--	--
MAY											
24...	--	--	--	--	--	--	--	--	--	--	--
JUN											
21...	0	<10	<9	1	80	50	<100	<91	9	0	--
JUL											
18...	--	--	--	--	--	--	--	--	--	--	--
AUG											
24...	--	--	--	--	--	--	--	--	--	--	--
SEP											
26...	0	<10	<9	1	230	0	<100	<82	18	10	10

DATE	DIS-SOLVED MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	SUS-PENDED MERCURY (HG) (UG/L)	DIS-SOLVED MERCURY (HG) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	SUS-PENDED SELE-NIUM (SE) (UG/L)	DIS-SOLVED SELE-NIUM (SE) (UG/L)	TOTAL ZINC (ZN) (UG/L)	SUS-PENDED ZINC (ZN) (UG/L)	DIS-SOLVED ZINC (ZN) (UG/L)	TOTAL ORGANIC CARBON (C) (MG/L)
FEB											
22...	--	--	--	--	--	--	--	--	--	--	3.3
MAR											
29...	0	.0	--	.0	0	0	0	80	80	0	.9
APR											
20...	--	--	--	--	--	--	--	--	--	--	1.6
MAY											
24...	--	--	--	--	--	--	--	--	--	--	3.3
JUN											
21...	0	.0	.0	.0	0	0	0	0	0	0	.6
JUL											
18...	--	--	--	--	--	--	--	--	--	--	4.4
AUG											
24...	--	--	--	--	--	--	--	--	--	--	3.1
SEP											
26...	0	.0	.0	.0	0	0	0	10	10	0	1.2

< Actual value is known to be less than the value shown

16713000 WAILUKU RIVER AT HILO--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTAN-TANEOUS DIS-CHARGE (CFS)	SUS-PENDED SEDI-MENT (MG/L)	SUS-PENDED SEDI-MENT DIS-CHARGE (T/DAY)
FEB				
22...	1430	20	1	.05
MAR				
29...	1330	300	1	.81
APR				
20...	1015	350	1	.94
MAY				
24...	1100	175	3	1.4
JUN				
21...	1330	22	2	.12
JUL				
18...	0945	350	4	3.8
AUG				
24...	1015	360	5	4.9
SEP				
26...	1045	50	0	.00

SUSPENDED-SEDIMENT DISCHARGE (TONS/DAY), WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
		JANUARY			FEBRUARY			MARCH	
1							2400	---	---
2							2700	---	---
3							6400	---	---
4							2500	---	---
5							1500	---	---
6							980	---	---
7							670	---	---
8							576	5	7.8
9							432	4	4.7
10							376	3	3.0
11							636	8	14
12							1190	12	39
13							3300	26	359
14							4460	25	383
15							3180	17	182
16							1580	7	30
17							1140	7	22
18							1680	11	50
19							1890	15	77
20							5540	56	880
21							3430	25	232
22							3220	10	87
23							3270	6	53
24							2290	12	79
25							1070	4	12
26							800	3	6.5
27							612	2	3.3
28							505	2	2.7
29							508	2	2.7
30							397	3	3.2
31							502	4	5.4
TOTAL							59734	---	2533.3

16713000 WAILUKU RIVER AT HILO--Continued

SUSPENDED-SEDIMENT DISCHARGE (TONS/DAY), WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
		APRIL			MAY			JUNE	
1	694	43	138	1060	3	8.6	52	2	0.28
2	1320	68	430	735	2	4.0	44	2	0.24
3	870	23	63	544	1	1.5	35	2	0.19
4	735	7	14	418	1	1.1	28	2	0.15
5	900	6	15	397	1	1.1	30	2	0.16
6	1560	17	72	442	2	2.4	25	2	0.14
7	2300	11	68	745	3	6.0	23	3	0.19
8	2730	19	171	442	3	3.6	23	5	0.31
9	2380	8	51	319	2	1.7	26	6	0.42
10	2610	8	56	252	1	0.68	44	3	0.36
11	2640	6	43	397	2	2.1	38	3	0.31
12	1340	5	18	397	3	3.2	37	3	0.30
13	985	5	13	337	2	1.8	35	3	0.28
14	855	4	9.2	208	1	0.56	37	6	0.60
15	745	3	6.0	184	1	0.50	31	10	0.84
16	576	3	4.7	127	2	0.69	25	5	0.34
17	446	3	3.6	429	10	12	20	3	0.16
18	446	4	4.8	690	12	22	21	3	0.17
19	502	4	5.4	255	3	2.1	22	5	0.30
20	1470	36	327	208	2	1.1	25	3	0.20
21	1460	15	59	364	5	4.9	23	3	0.19
22	875	4	9.5	825	6	13	18	4	0.19
23	576	3	4.7	343	3	2.8	15	3	0.12
24	435	3	3.5	218	2	1.2	12	3	0.10
25	435	4	4.7	159	2	0.86	12	3	0.10
26	477	3	3.9	134	2	0.72	19	4	0.21
27	367	2	2.0	133	2	0.72	15	5	0.20
28	433	3	3.5	116	2	0.63	18	5	0.24
29	2410	30	407	105	2	0.57	10	3	0.08
30	4260	39	779	85	3	0.69	10	3	0.08
31	---	---	---	74	3	0.60	---	---	---
TOTAL	37832	---	2789.5	11142	---	103.42	773	---	7.45

DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
		JULY			AUGUST			SEPTEMBER	
1	12	4	0.13	171	2	0.92	133	4	1.4
2	10	3	0.08	139	3	1.1	97	3	0.70
3	9.8	3	0.08	742	30	60	70	2	0.38
4	16	5	0.22	280	7	5.3	66	2	0.36
5	42	12	1.4	177	2	0.96	57	2	0.31
6	36	8	0.78	2140	29	446	41	2	0.22
7	99	6	1.6	1710	17	105	45	4	0.49
8	316	8	6.8	560	3	4.5	43	4	0.46
9	385	8	8.3	355	2	1.9	33	5	0.45
10	675	25	46	240	2	1.3	70	5	0.94
11	657	10	18	332	3	2.7	32	5	0.43
12	391	6	6.3	6340	126	2860	23	5	0.31
13	407	8	8.8	1280	12	41	30	5	0.41
14	235	7	4.4	725	3	5.9	75	4	0.81
15	190	5	2.6	505	2	2.7	74	3	0.60
16	106	4	1.1	364	1	0.98	83	6	1.3
17	540	8	12	280	1	0.76	739	20	60
18	600	6	7.7	255	2	1.4	465	15	19
19	620	8	13	180	2	0.97	188	6	3.0
20	322	4	3.5	151	1	0.41	128	4	1.4
21	255	4	2.0	144	1	0.39	93	3	0.75
22	190	3	1.5	564	6	9.1	81	2	0.44
23	140	3	1.1	468	8	10	87	2	0.47
24	110	3	0.89	500	5	6.8	76	2	0.41
25	140	4	1.5	280	3	2.3	87	3	0.70
26	160	2	0.86	190	3	1.5	53	5	0.72
27	130	20	7.0	139	5	1.9	40	5	0.54
28	1800	30	146	177	3	1.4	32	6	0.52
29	370	4	4.0	186	4	2.0	26	7	0.49
30	242	3	2.0	144	4	1.6	21	5	0.28
31	157	2	0.85	230	5	3.1	---	---	---
TOTAL	9362.8	---	313.29	19948	---	3583.89	3078	---	98.29
YEAR	141869.8		9429.14						

NOTE: NUMBER OF MISSING DAYS OF RECORD EXCEEDED 20% OF YEAR

HAWAII, ISLAND OF HAWAII

16717000 HONOLII STREAM NEAR PAPAIKOU
(Hydrologic bench-mark station)

LOCATION.--Lat 19°46'00", long 155°09'16", Hydrologic Unit 20010000, on left bank 0.7 mi (1.1 km) downstream from Pohakupaa Stream, 4.1 mi (6.6 km) west of Papaikou, and 4.8 mi (7.7 km) northwest of Hilo Post Office.

DRAINAGE AREA.--11.6 mi² (30.0 km²).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--June 1911 to March 1913 (published as "at Kaiwiki, near Hilo"), February 1967 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 1,540 ft (469 m), from topographic map. Prior to Aug. 27, 1911, nonrecording gage and Aug. 27, 1911, to Mar. 24, 1913, water-stage recorder, at site 0.5 mi (0.8 km) upstream at different datum.

REMARKS.--Records good. No diversion above station. During period 1911-13, Honolii ditch diverted an average of about 3.2 ft³/s (0.091 m³/s) above station for fluming cane and domestic use.

AVERAGE DISCHARGE.--11 years, 128 ft³/s (3.625 m³/s), 92,740 acre-ft/yr (114 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 9,450 ft³/s (268 m³/s) Aug. 3, 1967, gage height, 16.95 ft (5.166 m); minimum, 0.8 ft³/s (0.023 m³/s) Jan. 31, 1912.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 4,400 ft³/s (125 m³/s) and maximum (*):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Oct. 21	2400	*5510	156	13.01	3.965	Apr. 2	1600	4740	134	12.16	3.706
Feb. 27	0445	4740	134	12.15	3.703	Aug. 12	0800	4640	131	12.04	3.060
Mar. 20	0615	4450	126	11.81	3.600						

Minimum discharge, 3.5 ft³/s (0.10 m³/s) Feb. 22, 23.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	17	42	14	30	6.1	703	238	83	22	7.9	64	37
2	13	31	13	32	5.4	950	463	55	20	7.4	52	28
3	11	50	12	25	13	2350	148	46	19	11	293	27
4	23	28	11	24	15	674	118	40	17	23	57	28
5	89	25	11	31	10	283	137	44	16	47	39	29
6	67	29	51	20	23	110	554	83	15	66	1010	25
7	32	41	375	17	15	102	866	153	15	53	500	32
8	24	341	326	16	18	114	840	59	15	166	64	26
9	21	701	74	14	12	67	796	43	14	120	43	27
10	88	862	61	13	8.7	52	771	44	13	264	34	30
11	39	214	44	12	6.5	182	710	85	12	170	255	25
12	98	64	28	11	5.0	290	180	137	13	116	2060	22
13	45	43	54	11	4.4	1540	104	81	13	117	168	20
14	26	38	31	9.7	4.4	1590	104	44	15	71	64	26
15	21	31	22	8.9	16	929	98	39	13	55	46	21
16	31	29	99	7.8	10	273	63	32	12	44	37	41
17	29	66	56	8.0	7.1	140	45	400	11	228	33	277
18	28	33	50	7.7	7.0	485	67	255	13	147	32	80
19	55	26	30	7.9	6.0	609	89	60	17	123	28	35
20	73	24	37	8.4	4.7	1970	433	48	20	59	31	29
21	393	26	84	8.1	4.1	581	291	149	16	62	35	24
22	564	22	36	7.1	3.5	462	124	242	13	50	141	28
23	65	35	25	5.6	3.5	408	60	59	12	36	108	33
24	39	23	23	5.9	5.0	403	50	45	12	34	98	41
25	42	18	25	5.5	20	102	45	36	10	50	51	43
26	54	17	31	5.1	41	59	52	32	8.9	53	35	26
27	122	16	127	5.0	1230	47	57	31	8.6	97	30	23
28	47	15	42	4.7	647	48	100	33	8.4	897	50	21
29	33	14	82	6.5	---	57	919	34	7.9	65	43	19
30	57	15	42	10	---	70	919	25	7.9	46	45	17
31	48	---	31	8.8	---	90	---	24	---	36	60	---
TOTAL	2294	2919	1947	386.7	2151.4	15740	9441	2541	409.7	3321.3	5606	1140
MEAN	74.0	97.3	62.8	12.5	76.8	508	315	82.0	13.7	107	181	38.0
MAX	564	862	375	32	1230	2350	919	400	22	897	2060	277
MIN	11	14	11	4.7	3.5	47	45	24	7.9	7.4	28	17
AC-FT	4550	5790	3860	767	4270	31220	18730	5040	813	6590	11120	2260

CAL YR 1976 TOTAL 49122.0 MEAN 134 MAX 3540 MIN 11 AC-FT 97430
WTR YR 1977 TOTAL 47897.1 MEAN 131 MAX 2350 MIN 3.5 AC-FT 95000

16717000 HONOLII STREAM NEAR PAPAIKOU--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--September 1969 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTAN-TANEOUS DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)	DIS-SOLVED OXYGEN (MG/L)	IMME-DIATE COLI-FORM (COL. PER 100 ML)	FECAL COLI-FORM .7UM-MF (COL./ 100 ML)	STREP-TOCOCCI (COL-ONIES PER 100 ML)	FECAL STREP-TOCOCCI KF AGAR (COL. PER 100 ML)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)
OCT 28...	0930	48	29	6.4	18.5	9.4	200	88	170	--	11	6
NOV 30...	1330	14	75	7.9	18.5	10.2	38	B6	33	--	31	4
DEC 29...	0930	41	39	7.6	16.0	9.9	140	54	B650	--	16	4
JAN 26...	1300	5.5	98	8.2	16.0	11.0	2	1	--	92	41	0
FEB 23...	0915	3.5	100	8.0	18.5	9.8	54	1	--	89	42	0
MAR 28...	0930	39	39	7.3	16.0	9.4	110	5	--	92	13	0
APR 19...	1415	68	29	7.3	17.0	9.8	110	--	--	58	8	0
MAY 25...	0900	36	45	6.9	17.5	9.0	46	13	--	52	15	0
JUN 22...	0900	13	77	7.4	18.0	9.8	130	4	--	180	37	5
JUL 19...	1000	144	24	7.5	18.0	8.8	220	93	--	1100	6	2
AUG 24...	1330	76	26	7.2	19.0	8.6	360	88	--	660	8	3
SEP 27...	0915	23	54	6.2	18.5	9.0	220	30	--	61	22	1

DATE	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	DIS-SOLVED SODIUM (NA) (MG/L)	PERCENT SODIUM	SODIUM AD-SORP-TION RATIO	DIS-SOLVED PO-TAS-SIUM (K) (MG/L)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DIS-SOLVED SULFATE (SO4) (MG/L)
OCT 28...	2.2	1.4	1.9	26	.2	.2	6	0	5	3.8	4.1
NOV 30...	6.5	3.5	3.5	20	.3	.3	32	0	26	.6	1.8
DEC 29...	3.0	2.0	2.4	25	.3	.3	14	0	11	.6	4.9
JAN 26...	8.8	4.7	4.4	19	.3	.3	57	0	47	.6	3.5
FEB 23...	9.1	4.8	4.3	18	.3	.3	58	0	48	.9	4.5
MAR 28...	2.5	1.7	2.3	27	.3	.2	16	0	13	1.3	4.7
APR 19...	1.6	1.0	1.8	32	.3	.1	10	0	8	.8	4.5
MAY 25...	3.1	1.7	2.4	26	.3	.2	19	0	16	3.8	2.4
JUN 22...	8.8	3.7	3.7	18	.3	.3	39	0	32	2.5	2.9
JUL 19...	1.3	.6	1.9	41	.3	.2	4	0	3	.2	2.4
AUG 24...	1.9	.9	1.7	30	.3	.2	7	0	6	.7	5.3
SEP 27...	4.6	2.6	2.8	21	.3	.3	26	0	21	26	2.3

B Results based on colony count outside the acceptable range (non-ideal colony count).

16717000 HONOLII STREAM NEAR PAPAIKOU--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	DIS-SOLVED CHLO-RIDE (CL) (MG/L)	DIS-SOLVED FLUO-RIDE (F) (MG/L)	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED SOLIDS (RESI-DUE AT 180 C) (MG/L)	TOTAL FILT-RABLE RESIDUE (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTI-TUENTS) (MG/L)	DIS-SOLVED SOLIDS (TONS PER AC-FT)	DIS-SOLVED SOLIDS (TONS PER DAY)	TOTAL NON-FILT-RABLE RESIDUE (MG/L)	TOTAL NITRITE PLUS NITRATE (N) (MG/L)	TOTAL PHOS-PHORUS (P) (MG/L)
OCT											
28...	2.8	.1	5.4	25	28	21	.03	3.24	<1	--	.01
NOV											
30...	3.2	.1	16	54	--	51	.07	2.04	--	.00	.01
DEC											
29...	3.1	.0	7.5	36	--	30	.05	3.99	--	.06	.01
JAN											
26...	3.4	.1	24	79	--	77	.11	1.17	--	.04	.01
FEB											
23...	3.5	.0	24	78	--	79	.11	.74	--	.06	.02
MAR											
28...	3.3	.0	9.7	34	--	32	.05	3.58	--	.04	--
APR											
19...	2.9	.0	6.3	24	--	23	.03	4.41	--	.02	.00
MAY											
25...	2.7	.0	9.0	31	--	31	.04	3.01	--	--	.00
JUN											
22...	3.3	.0	21	54	--	63	.07	1.90	--	--	.01
JUL											
19...	2.8	.0	3.1	19	--	14	.03	7.39	--	--	.02
AUG											
24...	3.9	.0	4.9	12	--	22	.02	2.46	--	--	.00
SEP											
27...	3.4	.0	13	41	--	42	.06	2.55	--	--	.01

DATE	TIME	TOTAL ARSENIC (AS) (UG/L)	TOTAL BARIUM (BA) (UG/L)	TOTAL CAD-MIUM (CD) (UG/L)	TOTAL CHRO-MIUM (CR) (UG/L)	TOTAL COPPER (CU) (UG/L)	TOTAL IRON (FE) (UG/L)
OCT							
28...	0930	0	0	<10	0	<10	820
MAY							
25...	0900	0	0	<10	0	<10	500

DATE	TOTAL LEAD (PB) (UG/L)	TOTAL MAN-GANESE (MN) (UG/L)	TOTAL MERCURY (HG) (UG/L)	TOTAL SILVER (AG) (UG/L)	TOTAL SELE-NIUM (SE) (UG/L)	TOTAL ZINC (ZN) (UG/L)
OCT						
28...	<100	10	.1	<10	0	0
MAY						
25...	<100	0	.1	<10	0	10

DATE	TIME	DIS-SOLVED GROSS ALPHA AS U-NAT. (UG/L)	SUS-PENDED GROSS ALPHA AS U-NAT. (UG/L)	DIS-SOLVED GROSS BETA AS CS-137 (PC/L)	SUS-PENDED GROSS BETA AS CS-137 (PC/L)	DIS-SOLVED GROSS BETA AS SR90 /Y90 (PC/L)	SUS-PENDED GROSS BETA AS SR90 /Y90 (PC/L)	DIS-SOLVED RA-226 (RADON METHOD) (PC/L)	DIS-SOLVED URANIUM (U) (UG/L)
OCT									
28...	0930	<.4	<.4	1.8	1.0	1.5	.9	.09	.04

< Actual value is known to be less than the value shown.

HAWAII, ISLAND OF HAWAII

16717000 HONOLII STREAM NEAR PAPAIKOU--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	TOTAL PCB (UG/L)	PCB IN BOTTOM MATERIAL (UG/KG)	POLYCHLORINATED NAPHTHALENES (UG/L)	TOTAL ALDRIN (UG/L)	ALDRIN IN BOTTOM MATERIAL (UG/KG)	TOTAL CHLORDANE (UG/L)	CHLORDANE IN BOTTOM MATERIAL (UG/KG)	TOTAL DDD (UG/L)	DDD IN BOTTOM MATERIAL (UG/KG)	TOTAL DDE (UG/L)	DDE IN BOTTOM MATERIAL (UG/KG)
OCT 28...	0930	.0	0	.00	.00	.0	.0	0	.00	.0	.00	.0

DATE	TOTAL DDT (UG/L)	DDT IN BOTTOM MATERIAL (UG/KG)	TOTAL DIAZINON (UG/L)	TOTAL DIELDRIN (UG/L)	DIELDRIN IN BOTTOM MATERIAL (UG/KG)	TOTAL ENDRIN (UG/L)	ENDRIN IN BOTTOM MATERIAL (UG/KG)	TOTAL ETHION (UG/L)	TOTAL HEPTACHLOR (UG/L)	HEPTACHLOR IN BOTTOM MATERIAL (UG/KG)	TOTAL HEPTACHLOR EPOXIDE (UG/L)	HEPTACHLOR EPOXIDE IN BOTTOM MATERIAL (UG/KG)
OCT 28...	.00	.0	.00	.00	.0	.00	.0	.00	.00	.0	.00	.0

DATE	TOTAL LINDANE (UG/L)	LINDANE IN BOTTOM MATERIAL (UG/KG)	TOTAL MALATHION (UG/L)	TOTAL METHYL PARATHION (UG/L)	TOTAL METHYL TRITHION (UG/L)	TOTAL PARATHION (UG/L)	TOTAL TOXAPHENE (UG/L)	TOXAPHENE IN BOTTOM MATERIAL (UG/KG)	TOTAL TRITHION (UG/L)	TOTAL 2,4-D (UG/L)	TOTAL 2,4,5-T (UG/L)	TOTAL SILVEX (UG/L)
OCT 28...	.00	.0	.00	.00	.00	.00	0	0	.00	.00	.00	.00

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SUSPENDED SEDIMENT (MG/L)	SUSPENDED SEDIMENT DISCHARGE (T/DAY)
OCT 28...	0930	48	4	.52
NOV 30...	1330	14	0	.00
DEC 29...	0930	41	2	.22
JAN 26...	1300	5.5	1	.01
FEB 23...	0915	3.5	1	.01
MAR 28...	0930	39	1	.11
APR 19...	1815	68	1	.18
MAY 25...	0900	36	2	.19
JUN 22...	0900	13	2	.07
JUL 19...	1000	144	4	1.6
AUG 24...	1330	76	2	.41
SEP 27...	0915	23	1	.06

16717800 POHAKUPUKA STREAM NEAR PAPAALOA

LOCATION.--Lat 19°57'20", long 155°11'20", Hydrologic Unit 20010000, on right bank 200 ft (61 m) downstream from Highway 19, 2.8 mi (4.5 km) northwest of Honohina, and 3.0 mi (4.8 km) southeast of Papaaloa.

DRAINAGE AREA.--2.76 mi² (7.15 km²).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--April 1962 to current year.

GAGE.--Water-stage recorder. Datum of gage is 250 ft (76.2 m) above mean sea level (by stadia survey).

REMARKS.--Records good.

AVERAGE DISCHARGE.--15 years, 27.4 ft³/s (0.776 m³/s), 19,850 acre-ft/yr (24.5 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,340 ft³/s (151 m³/s) Nov. 26, 1967, gage height, 13.37 ft (4.075 m), from rating curve extended above 1,100 ft³/s (31.2 m³/s); minimum, 0.28 ft³/s (0.008 m³/s) Nov. 9, 1962.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 1,400 ft³/s (39.6 m³/s) and maximum (*):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Oct. 21	2400	1530	43.3	7.92	2.414
Feb. 27	0515	*2190	62.0	9.10	2.774
Apr. 1	1445	1520	43.0	7.89	2.405

Minimum discharge, 1.1 ft³/s (0.031 m³/s) Oct. 5.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.2	4.7	6.4	5.4	2.0	110	123	22	5.7	2.9	15	9.2
2	1.7	3.9	5.9	4.9	2.0	154	29	16	5.5	2.7	36	7.5
3	1.4	123	5.8	4.6	17	343	20	14	5.3	2.5	166	7.7
4	1.2	11	5.8	4.2	3.7	122	18	13	5.1	7.4	13	7.7
5	1.2	7.1	6.7	3.9	2.5	57	56	12	5.0	5.5	9.2	10
6	8.0	15	8.5	3.7	5.1	28	323	11	6.5	39	236	7.3
7	48	30	105	3.6	3.3	40	270	25	5.5	12	96	10
8	12	153	75	3.6	2.4	28	203	13	5.1	50	14	7.4
9	9.4	186	18	3.4	2.0	12	158	10	4.6	30	9.4	6.4
10	62	238	33	3.3	1.8	8.2	143	9.5	4.3	60	7.4	6.0
11	12	34	27	3.2	1.7	17	118	9.1	4.0	20	81	6.2
12	16	19	10	3.1	1.7	50	43	8.9	3.9	25	330	5.9
13	7.7	10	9.5	3.0	1.6	352	27	8.5	3.8	42	28	5.5
14	3.8	8.2	7.6	2.9	1.6	185	24	8.2	3.8	17	14	5.2
15	3.7	6.7	6.4	2.8	1.6	151	21	7.8	3.6	12	11	5.1
16	12	59	73	2.8	1.6	41	20	7.4	3.4	6.7	9.3	21
17	9.0	148	14	2.6	1.5	22	17	58	3.3	73	8.4	78
18	8.2	21	8.4	2.6	1.5	109	16	50	3.2	30	8.0	18
19	8.3	12	6.9	2.6	1.4	92	16	11	3.2	26	7.3	8.2
20	17	9.6	6.2	2.5	1.4	277	38	8.7	3.1	15	7.4	6.7
21	45	16	5.9	2.5	1.4	119	69	21	3.3	25	6.9	5.9
22	89	12	5.6	2.4	1.4	99	39	48	3.0	13	26	5.8
23	7.9	12	5.2	2.4	1.4	89	18	13	2.9	7.2	22	7.5
24	4.7	7.8	4.9	2.3	1.5	91	16	10	3.2	6.0	16	8.6
25	4.9	6.9	7.3	2.2	1.5	22	15	8.3	2.9	12	12	10
26	8.3	6.7	15	2.2	1.6	15	15	7.6	2.6	22	8.4	5.9
27	26	6.9	45	2.2	307	12	15	7.1	3.3	28	7.7	5.3
28	8.7	7.9	8.5	2.1	107	12	20	7.0	9.7	142	13	4.9
29	4.4	6.4	18	3.3	---	13	295	6.7	3.7	12	11	4.5
30	4.3	6.5	8.5	3.2	---	12	166	6.3	3.0	8.5	10	4.2
31	4.9	---	5.6	2.3	---	13	---	6.0	---	6.3	14	---
TOTAL	453.9	1188.3	568.6	95.8	480.2	2695.2	2351	464.1	125.5	760.7	1253.4	301.6
MEAN	14.6	39.6	18.3	3.09	17.2	86.9	78.4	15.0	4.18	24.5	40.4	10.1
MAX	89	238	105	5.4	307	352	323	58	9.7	142	330	78
MIN	1.2	3.9	4.9	2.1	1.4	8.2	15	6.0	2.6	2.5	6.9	4.2
AC-FT	900	2360	1130	190	952	5350	4660	921	249	1510	2490	598

CAL YR 1976 TOTAL 11971.17 MEAN 32.7 MAX 388 MIN .89 AC-FT 23740
WTR YR 1977 TOTAL 10738.30 MEAN 29.4 MAX 352 MIN 1.2 AC-FT 21300

16717800 POHAKUPUKA STREAM NEAR PAPAALOA--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1973-77.

REMARKS.--Miscellaneous chemical analyses published for this station for 1972 water year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	COLOR (PLATINUM-COBALT UNITS)	TURBIDITY (JTU)	HARDNESS (CA,MG) (MG/L)	NON-CARBONATE HARDNESS (MG/L)	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG) (MG/L)	DISSOLVED SODIUM (NA) (MG/L)	PERCENT SODIUM
NOV 12...	1050	17	45	10	14	1	3.1	1.6	3.4	33
JUL 11...	1335	18	90	6	11	4	2.3	1.2	2.9	33

DATE	SODIUM ADSORPTION RATIO	DISSOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	ALKALINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)	DISSOLVED FLUORIDE (F) (MG/L)
NOV 12...	.4	.7	16	0	13	2.0	3.5	5.2	.0
JUL 11...	.4	1.5	8	0	7	1.0	2.7	5.0	.0

DATE	DISSOLVED SILICA (SIO2) (MG/L)	DISSOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	DISSOLVED SOLIDS (TONS PER AC-FT)	DISSOLVED SOLIDS (TONS PER DAY)	DISSOLVED NITRITE PLUS NITRATE (N) (MG/L)	DISSOLVED ORTHO. PHOSPHORUS (P) (MG/L)	DISSOLVED ORTHO PHOSPHATE (PO4) (MG/L)	DISSOLVED IRON (FE) (UG/L)	DISSOLVED MANGANESE (MN) (UG/L)
NOV 12...	8.0	34	.05	1.56	.09	.00	.00	210	0
JUL 11...	4.5	24	.03	1.17	--	--	--	330	0

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)
OCT 05...	1005	1.1	130	7.3	21.5
NOV 12...	1050	17	46	7.1	20.0
DEC 15...	1350	6.4	103	6.9	20.5
MAR 08...	1310	22	33	6.9	19.0
MAY 05...	1500	12	85	7.2	20.0
JUL 11...	1335	18	32	7.1	17.0

16720000 KAWAINUI STREAM NEAR KAMUELA

LOCATION.--Lat 20°05'18", long 155°40'58", Hydrologic Unit 20010000, on left bank 250 ft (76 m) upstream from Upper Hamakua ditch intake and 4.5 mi (7.2 km) north of Kamuela.

DRAINAGE AREA.--1.58 mi² (4.09 km²).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--January 1964 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 4,060 ft (1,237 m), from topographic map.

REMARKS.--Records good. No diversion above station.

AVERAGE DISCHARGE.--13 years, 13.6 ft³/s (0.385 m³/s), 9,850 acre-ft/yr (12.1 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,400 ft³/s (68.0 m³/s) Jan. 11, 1967, gage height, 9.15 ft (2.789 m), from rating curve extended above 53 ft³/s (1.50 m³/s) on basis of computation of peak flow over dam; minimum, 0.01 ft³/s (<0.001 m³/s) Jan. 20, 21, 24-28, Feb. 20-22, 1977.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 435 ft³/s (12.3 m³/s) Aug. 11, gage height, 4.98 ft (1.518 m), from rating curve extended as explained above, no peak above base of 440 ft³/s (12.5 m³/s); minimum, 0.01 ft³/s (<0.001 m³/s) Jan. 20, 21, 24-28, Feb. 20-22.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.0	3.1	.64	1.1	1.5	15	2.9	6.9	7.2	8.1	15	9.1
2	1.3	1.7	.50	1.1	1.1	17	1.9	3.8	16	33	40	4.3
3	1.0	46	.45	.91	17	37	6.6	2.9	14	37	9.3	12
4	.67	15	.35	.65	5.3	63	23	2.8	9.6	40	31	12
5	.46	12	1.6	.49	2.5	56	104	3.6	4.2	55	111	6.6
6	.31	42	1.1	.34	3.8	58	174	6.6	6.3	99	154	3.2
7	13	39	24	.24	6.0	85	206	20	3.4	36	15	6.0
8	7.6	80	30	.15	5.4	30	156	12	2.0	51	5.9	3.4
9	7.7	42	15	.09	2.2	7.3	102	6.0	1.4	33	4.2	3.0
10	25	89	23	.08	1.4	3.6	93	3.0	1.1	56	2.4	2.8
11	8.7	18	13	.07	.93	3.4	73	2.1	.97	61	26	3.0
12	18	4.6	7.0	.06	.62	2.8	24	1.6	2.1	18	61	2.1
13	4.0	2.5	15	.05	.40	16	13	1.2	3.2	21	4.8	2.0
14	2.0	2.7	3.3	.04	.23	21	13	1.1	16	17	2.8	2.4
15	2.3	1.9	1.9	.03	.10	33	7.5	.89	6.0	84	1.9	1.8
16	5.8	81	107	.03	.07	5.9	16	.77	3.4	50	1.4	3.7
17	2.3	92	13	.02	.06	2.9	4.5	1.1	2.7	38	1.2	22
18	1.4	20	3.6	.02	.04	53	2.6	.73	3.8	14	1.0	8.6
19	5.9	11	1.9	.03	.02	16	1.8	.57	15	8.5	1.0	2.9
20	21	22	1.3	.02	.01	66	62	.52	39	14	7.0	2.0
21	6.6	15	.94	.02	.01	74	29	4.4	60	6.1	34	1.5
22	12	3.9	.68	.03	.02	101	14	19	16	3.1	41	1.4
23	4.6	4.7	.51	.01	.04	76	5.1	6.1	19	2.1	28	5.3
24	2.1	2.2	.68	.01	3.1	82	2.8	7.3	9.0	1.9	12	5.7
25	6.1	14	19	.01	11	7.6	17	38	4.6	5.1	15	2.5
26	13	6.4	7.2	.01	24	3.3	9.4	17	2.6	61	3.9	1.7
27	54	2.3	25	.01	90	2.1	7.9	25	1.7	35	3.1	1.3
28	12	1.5	4.3	.01	13	4.5	12	41	1.3	9.0	35	1.1
29	2.9	1.2	2.5	24	---	9.5	66	15	1.2	13	22	.89
30	9.6	.88	2.0	8.5	---	11	36	29	1.2	16	56	.76
31	9.7	---	1.3	2.6	---	8.5	---	18	---	36	42	---
TOTAL	263.04	677.58	327.75	40.73	189.85	971.4	1286.0	297.98	273.97	961.9	787.9	135.05
MEAN	8.49	22.6	10.6	1.31	6.78	31.3	42.9	9.61	9.13	31.0	25.4	4.50
MAX	54	92	107	24	90	101	206	41	60	99	154	22
MIN	.31	.88	.35	.01	.01	2.1	1.8	.52	.97	1.9	1.0	.76
AC-FT	522	1340	650	81	377	1930	2550	591	543	1910	1560	268

CAL YR 1976 TOTAL 5315.40 MEAN 14.5 MAX 195 MIN .05 AC-FT 10540
WTR YR 1977 TOTAL 6213.15 MEAN 17.0 MAX 206 MIN .01 AC-FT 12320

HAWAII, ISLAND OF HAWAII

16720000 KAWAINUI STREAM NEAR KAMBULA--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1976-77.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTAN-TANEOUS DIS-CHARGE (CFS)	COLOR (PLAT-INUM-COBALT UNITS)	TUR-BID-ITY (JTU)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	DIS-SOLVED SODIUM (NA) (MG/L)	PERCENT SODIUM
DEC 03...	1000	.48	85	2	5	0	1.3	.4	2.7	53
AUG 10...	1130	2.4	90	1	7	7	1.9	.5	2.3	42

DATE	SODIUM AD-SORP-TION RATIO	DIS-SOLVED PO-TAS-SIUM (K) (MG/L)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DIS-SOLVED SULFATE (SO4) (MG/L)	DIS-SOLVED CHLO-RIDE (CL) (MG/L)	DIS-SOLVED FLUO-RIDE (F) (MG/L)
DEC 03...	.5	.3	8	0	7	16	2.8	3.6	.0
AUG 10...	.4	.1	0	0	0	.0	3.1	3.5	.0

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTI-TUENTS) (MG/L)	DIS-SOLVED SOLIDS (TONS PER AC-FT)	DIS-SOLVED SOLIDS (TONS PER DAY)	DIS-SOLVED NITRITE PLUS NITRATE (N) (MG/L)	DIS-SOLVED ORTHO. PHOS-PHORUS (P) (MG/L)	DIS-SOLVED ORTHO PHOS-PHATE (PO4) (MG/L)	DIS-SOLVED IRON (FE) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)
DEC 03...	9.6	25	.03	.03	.02	.00	.00	360	0
AUG 10...	3.4	15	.02	.10	--	--	--	430	10

DATE	TIME	INSTAN-TANEOUS DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)
OCT 29...	1100	2.7	25	5.3	14.0
DEC 03...	1000	.48	22	5.9	13.0
JAN 06...	1005	.32	23	6.7	11.0
APR 12...	1230	39	18	5.2	12.0
JUN 28...	1010	1.2	25	5.7	15.0
AUG 10...	1130	2.4	19	5.8	18.5

HAWAII, ISLAND OF HAWAII

16720300 KAWAIKI STREAM NEAR KAMUELA

LOCATION.--Lat 20°05'13", long 155°40'59", Hydrologic Unit 20010000, on right bank 0.2 mi (0.3 km) upstream from Upper Hanakua ditch intake and 4.4 mi (7.1 km) north of Kamuela.

DRAINAGE AREA.--0.45 mi² (1.17 km²).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--June 1968 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 4,090 ft (1,247 m), from topographic map.

REMARKS.--Records good. No diversion above station.

AVERAGE DISCHARGE.--9 years, 3.82 ft³/s (0.108 m³/s), 2,770 acre-ft/yr (3.42 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 595 ft³/s (16.9 m³/s) Oct. 20, 1974, gage height, 5.65 ft (1.722 m), from rating curve extended above 33 ft³/s (0.94 m³/s); minimum, 0.03 ft³/s (0.001 m³/s) Nov. 12-15, 1968.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 100 ft³/s (2.83 m³/s) and maximum (*):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Apr. 20	1830	*145	4.11	3.45	1.052
Aug. 6	1400	106	3.00	2.97	.905
Aug. 11	2400	107	3.03	2.99	.911

Minimum discharge, 0.15 ft³/s (0.004 m³/s) Feb. 21, 22.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.1	1.7	.77	.86	.69	4.3	1.2	2.8	3.0	1.2	12	2.4
2	.84	1.1	.70	.85	.56	3.9	.92	2.1	5.8	1.4	6.8	1.2
3	.77	13	.69	.76	5.8	7.7	4.3	1.8	5.0	4.9	12	3.2
4	.59	4.7	.69	.69	2.1	14	12	1.8	4.2	10	4.9	2.9
5	.52	4.1	1.5	.69	1.2	14	29	2.4	2.2	8.8	12	2.0
6	.47	11	1.2	.50	2.0	14	43	3.8	3.3	9.6	44	1.1
7	4.6	11	11	.37	2.5	20	48	6.2	2.1	15	15	2.5
8	3.1	20	8.0	.37	2.0	6.5	32	4.2	1.4	23	4.4	1.3
9	3.4	12	5.3	.36	.97	2.2	23	2.6	1.1	9.4	2.3	1.2
10	8.0	25	8.1	.32	.64	1.4	21	1.7	.93	16	1.3	1.2
11	3.5	5.1	4.7	.32	.47	1.5	18	1.3	.97	9.4	7.4	1.4
12	4.9	2.2	3.2	.32	.38	1.2	6.3	1.1	1.6	16	14	.94
13	1.7	1.5	4.8	.28	.32	3.7	4.2	1.0	2.5	15	1.3	1.0
14	1.1	1.7	1.7	.28	.28	4.5	3.8	.93	4.8	8.4	.91	1.2
15	1.6	1.2	1.2	.28	.25	6.0	2.7	.86	2.9	4.5	.70	.83
16	3.0	18	26	.28	.24	1.9	4.3	.90	2.0	9.6	.59	1.9
17	1.5	22	3.8	.24	.21	1.2	1.9	.99	1.6	25	.54	7.4
18	.96	6.1	1.9	.25	.21	12	1.4	.86	1.9	11	.51	2.5
19	2.5	4.2	1.3	.24	.18	4.4	1.2	.83	4.9	8.3	.59	.99
20	5.7	8.3	1.0	.24	.18	15	21	.80	11	3.8	3.3	.75
21	2.9	5.5	.86	.23	.16	19	8.2	1.5	17	5.8	10	.61
22	4.3	1.9	.78	.21	.17	24	4.6	4.0	5.9	4.1	9.6	.61
23	2.3	2.4	.77	.21	.18	18	2.3	2.4	6.9	2.2	7.4	1.8
24	3.5	1.4	.80	.21	1.8	17	1.6	2.9	4.0	1.8	3.2	1.7
25	2.3	3.8	5.6	.20	4.1	2.4	6.5	11	2.4	1.8	3.2	.89
26	4.3	2.2	3.3	.18	6.9	1.4	3.7	5.4	1.7	2.9	1.0	.67
27	[illegible]	1.4	8.5	.18	19	1.0	3.8	6.7	1.3	12	1.1	.58
28	3.[illegible]	1.1	2.1	.19	3.8	1.9	4.9	12	1.2	11	11	.52
29	1.4	.93	1.4	8.3	---	2.4	19	4.9	1.1	4.1	5.6	.48
30	4.0	.86	1.1	2.8	---	2.6	10	9.1	1.2	5.6	14	.48
31	4.2	---	.90	1.1	---	2.1	---	6.2	---	6.6	11	---
TOTAL	93.25	195.39	113.66	22.31	57.29	231.2	343.82	105.07	105.90	268.2	221.64	46.25
MEAN	3.01	6.51	3.67	.72	2.05	7.46	11.5	3.39	3.53	8.65	7.15	1.54
MAX	13	25	26	8.3	19	24	48	12	17	25	44	7.4
MIN	.47	.86	.69	.18	.16	1.0	.92	.80	.93	1.2	.51	.48
AC-FT	185	388	225	44	114	459	682	208	210	532	440	92

CAL YR 1976 TOTAL 1589.74 MEAN 4.34 MAX 40 MIN .24 AC-FT 3150
WTR YR 1977 TOTAL 1803.98 MEAN 4.94 MAX 48 MIN .16 AC-FT 3580

HAWAII, ISLAND OF HAWAII

16720300 KAWAIKI STREAM NEAR KAMUELA--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1976-77.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	COLOR (PLATINUM-COBALT UNITS)	TURBIDITY (JTU)	HARDNESS (CA,MG) (MG/L)	NONCARBONATE HARDNESS (MG/L)	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG) (MG/L)	DISSOLVED SODIUM (NA) (MG/L)	PERCENT SODIUM
DEC 03...	0920	.68	90	7	7	0	.8	1.1	4.0	56
AUG 10...	1220	1.5	95	1	11	8	1.6	1.3	2.8	34

DATE	SODIUM ADSORPTION RATIO	DISSOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	ALKALINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)	DISSOLVED FLUORIDE (F) (MG/L)
DEC 03...	.7	.3	12	0	10	38	3.0	4.5	.0
AUG 10...	.4	.2	4	0	3	10	5.4	3.8	.0

DATE	DISSOLVED SILICA (SIO2) (MG/L)	DISSOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	DISSOLVED SOLIDS (TONS PER AC-FT)	DISSOLVED SOLIDS (TONS PER DAY)	DISSOLVED NITRITE PLUS NITRATE (N) (MG/L)	DISSOLVED ORTHO. PHOSPHORUS (P) (MG/L)	DISSOLVED ORTHO PHOSPHATE (PO4) (MG/L)	DISSOLVED IRON (FE) (UG/L)	DISSOLVED MANGANESE (MN) (UG/L)
DEC 03...	5.3	26	.04	.05	.03	.00	.00	480	20
AUG 10...	4.8	23	.03	.09	--	--	--	380	20

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)
OCT 29...	1000	1.5	26	5.4	14.0
DEC 03...	0920	.68	32	5.7	13.0
JAN 06...	0920	.61	34	6.2	15.0
APR 12...	1140	10	22	5.1	12.0
JUN 28...	0930	1.2	32	5.7	15.0
AUG 10...	1220	1.5	22	5.8	18.0

16720500 UPPER HAMAKUA DITCH BELOW KAWAIKI STREAM, NEAR KAMUELA

LOCATION.--Lat 20°05'15", long 155°40'42", Hydrologic Unit 20010000, on right bank 800 ft (244 m) downstream from Kawaiki Stream intake and 4.4 mi (7.1 km) north of Kamuela.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--January 1964 to current year.

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 4,020 ft (1,225 m), from topographic map.

REMARKS.--Records good. Ditch diverts from Kawainui and Kawaiki Streams for irrigation in vicinity of Kamuela. Recording rain gage located at station.

AVERAGE DISCHARGE.--13 years, 8.16 ft^3/s (0.231 m^3/s), 5,910 acre-ft/yr (7.29 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 49 ft^3/s (1.39 m^3/s) Nov. 2, 1967; minimum daily, 0.05 ft^3/s (0.001 m^3/s) Oct. 4-6, 1965.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.5	4.1	1.1	1.3	1.6	7.8	3.5	7.1	8.0	1.9	12	7.4
2	1.7	2.1	1.0	1.3	1.2	8.2	2.0	5.0	9.0	1.9	11	4.8
3	1.4	14	.89	1.1	11	8.6	7.0	4.0	9.3	9.4	12	6.5
4	1.0	13	.78	.89	6.2	9.5	9.0	3.8	9.0	12	9.3	8.3
5	.89	12	2.3	.78	2.9	9.3	10	4.5	5.2	12	11	6.6
6	.72	14	1.5	.67	4.6	9.5	12	7.0	7.4	13	13	3.5
7	9.5	14	7.3	.56	6.3	9.7	14	7.8	4.4	13	9.6	6.6
8	8.7	12	13	.45	5.9	8.6	14	7.7	2.7	14	8.0	3.8
9	7.0	14	13	.42	2.5	7.1	12	6.5	1.9	13	5.3	3.5
10	13	15	13	.38	1.4	4.1	12	3.6	1.5	13	2.9	3.4
11	7.1	12	12	.38	.94	3.9	10	2.5	1.6	13	4.7	3.5
12	12	5.9	7.3	.34	.78	3.5	9.0	2.0	3.1	14	8.9	2.3
13	4.7	3.5	11	.31	.62	4.8	8.6	1.6	4.4	14	5.2	2.3
14	2.5	3.8	4.0	.28	.45	8.2	8.6	1.4	9.3	13	3.2	2.7
15	3.2	2.5	2.3	.28	.38	8.4	7.6	1.3	7.4	12	2.3	1.9
16	7.1	10	14	.24	.34	5.9	8.6	1.2	4.4	12	1.7	3.8
17	3.1	15	10	.20	.31	3.5	5.6	1.4	3.6	14	1.4	8.6
18	1.7	12	4.4	.20	.24	8.9	3.5	1.1	4.7	13	1.3	7.4
19	3.7	12	2.4	.24	.20	8.3	2.5	.94	6.1	13	1.4	3.5
20	12	13	1.7	.20	.20	9.3	7.1	.89	10	12	6.0	2.3
21	7.8	12	1.3	.20	.17	8.6	8.2	2.0	12	12	8.2	1.6
22	11	5.2	1.0	.20	.20	9.0	7.8	8.2	11	11	9.3	1.4
23	5.8	13	.89	.17	.24	8.0	5.9	6.8	12	5.2	9.2	3.3
24	2.7	10	1.1	.14	3.9	8.5	3.8	7.7	10	3.4	8.4	5.6
25	6.9	6.9	12	.14	4.1	8.0	4.8	8.9	8.0	2.9	8.2	2.7
26	9.6	7.1	6.0	.10	9.9	4.0	7.8	8.4	6.0	5.0	4.1	1.7
27	14	3.1	13	.10	10	2.5	7.4	8.4	4.0	9.3	3.6	1.4
28	9.8	2.0	5.0	.14	7.8	5.0	7.8	8.9	2.0	11	9.5	1.0
29	3.8	1.5	3.0	10	---	6.0	9.2	8.6	1.8	9.6	8.9	.89
30	10	1.3	2.3	8.8	---	7.5	8.4	9.0	1.9	10	9.6	.72
31	3.2	---	1.5	3.0	---	7.0	---	8.9	---	10	9.5	---
TOTAL	188.11	266.0	170.06	33.51	84.37	221.2	237.7	157.13	181.7	322.6	218.7	113.01
MEAN	6.07	8.87	5.49	1.08	3.01	7.14	7.92	5.07	6.06	10.4	7.05	3.77
MAX	14	15	14	10	11	9.7	14	9.0	12	14	13	8.6
MIN	.72	1.3	.78	.10	.17	2.5	2.0	.89	1.5	1.9	1.3	.72
AC-FT	373	528	337	66	167	439	471	312	360	640	434	224

CAL YR 1976 TOTAL 2569.29 MEAN 7.02 MAX 15 MIN .38 AC-FT 5100
WTR YR 1977 TOTAL 2194.09 MEAN 6.01 MAX 15 MIN .10 AC-FT 4350

HAWAII, ISLAND OF HAWAII

16720500 UPPER HAMAKUA DITCH BELOW KAWAIKI STREAM, NEAR KAMUELA--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1976-77.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)
OCT 29...	0930	3.8	28	5.4	15.0
DEC 03...	0840	.89	26	5.8	13.0
JAN 06...	1050	.67	20	7.1	11.0
APR 12...	1110	9.0	21	5.2	12.0
JUN 28...	0905	1.8	26	5.6	15.0
AUG 10...	1335	3.0	22	5.8	19.0

16724800 UPPER HAMAKUA DITCH ABOVE ALAKAHI STREAM, NEAR KAMUELA

LOCATION.--Lat 20°04'31", long 155°40'26", Hydrologic Unit 20010000, on right bank 0.1 mi (0.2 km) upstream from Alakahi Stream and 3.6 mi (5.8 km) north of Kamuela.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--April 1968 to current year.

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 3,890 ft (1,186 m), from topographic map.

REMARKS.--Records good. Ditch diverts from Kawainui and Kawaiki Streams for irrigation in vicinity of Kamuela.

AVERAGE DISCHARGE.--9 years, 5.89 ft^3/s (0.167 m^3/s), 4,270 acre-ft/yr (5.26 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 41 ft^3/s (1.16 m^3/s) Aug. 18, 1972; no flow at times each year.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.54	1.4	.00	.00	.02	3.7	1.4	5.2	4.1	.31	11	5.1
2	.09	.30	.00	.00	.00	4.0	.65	3.5	4.6	.28	10	3.1
3	.00	7.9	.00	.00	4.7	4.1	1.6	2.6	4.8	3.3	12	4.1
4	.00	7.0	.00	.00	2.7	5.8	5.1	2.4	4.5	5.9	7.9	5.5
5	.00	6.6	.00	.00	.67	6.1	9.6	2.4	2.6	6.3	11	4.2
6	.00	8.4	.00	.00	1.1	6.3	15	4.1	3.4	7.7	19	2.0
7	3.5	9.3	.00	.00	1.7	7.4	17	4.8	2.0	8.4	12	3.9
8	3.8	9.2	.00	.00	2.4	5.7	14	4.9	.91	11	7.5	2.1
9	2.5	9.8	.00	.00	.41	4.1	11	4.0	.43	8.6	4.3	1.6
10	5.7	12	.00	.00	.00	2.0	11	2.0	.19	9.4	2.4	1.5
11	2.5	8.0	.00	.00	.00	1.5	11	1.1	.12	8.6	3.4	1.8
12	5.0	3.3	.00	.00	.00	1.2	7.8	.78	.60	10	10	.99
13	1.4	1.4	.00	.00	.00	1.7	6.6	.51	.89	10	3.2	.81
14	.30	1.4	.00	.00	.00	3.7	6.1	.34	3.4	8.8	1.9	1.1
15	.26	.68	.00	.00	.00	4.0	5.0	.19	2.9	7.3	1.2	.72
16	2.2	7.1	.00	.00	.00	3.1	5.6	.15	1.5	8.0	.83	.77
17	.41	12	.00	.00	.00	1.3	3.6	.28	1.1	12	.60	4.4
18	.01	8.1	.00	.00	.00	4.5	1.9	.11	1.5	9.8	.48	5.3
19	.42	7.0	.00	.00	.00	4.3	1.2	.02	1.8	9.3	1.1	2.1
20	4.7	8.1	.00	.00	.00	5.5	9.2	.01	4.9	7.5	4.6	1.0
21	2.6	7.3	.00	.00	.00	7.0	7.7	.15	7.6	7.8	8.2	.57
22	4.2	2.6	.00	.00	.00	8.2	6.2	3.3	6.3	6.8	7.4	.37
23	1.7	3.0	.00	.00	.00	8.1	4.5	3.1	6.7	2.9	6.6	.36
24	.30	1.1	.00	.00	.48	8.4	2.4	3.5	5.5	1.6	6.1	2.9
25	1.1	2.6	.00	.00	.66	4.9	3.6	4.6	3.1	1.5	4.7	1.6
26	3.5	3.9	.00	.00	4.3	2.2	5.1	4.6	1.4	3.0	2.1	.74
27	7.0	1.1	.00	.00	7.1	1.1	4.9	4.7	.74	8.8	3.5	.41
28	5.0	.50	.00	.00	4.5	1.2	5.2	5.6	.46	12	7.4	.11
29	1.1	.15	.00	3.1	---	3.9	9.0	4.8	.53	8.5	5.9	.01
30	4.5	.01	.00	4.3	---	3.0	7.5	5.5	.36	8.8	9.9	.00
31	5.4	---	.00	.63	---	3.5	---	4.9	---	8.5	7.7	---
TOTAL	69.73	151.24	.00	8.03	30.74	131.5	200.45	84.14	78.93	222.69	193.91	59.16
MEAN	2.25	5.04	.000	.26	1.10	4.24	6.68	2.71	2.63	7.18	6.26	1.97
MAX	7.0	12	.00	4.3	7.1	8.4	17	5.6	7.6	12	19	5.5
MIN	.00	.01	.00	.00	.00	1.1	.65	.01	.12	.28	.48	.00
AC-FT	138	300	.00	16	61	261	398	167	157	442	385	117

CAL YR 1976 TOTAL 1421.35 MEAN 3.88 MAX 14 MIN .00 AC-FT 2820
WTR YR 1977 TOTAL 1230.52 MEAN 3.37 MAX 19 MIN .00 AC-FT 2440

16724800 UPPER HAMAKUA DITCH ABOVE ALAKAHI STREAM, NEAR KAMUELA--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1974-77.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTAN-TANEOUS DIS-CHARGE (CFS)	COLOR (PLAT-INUM-COBALT UNITS)	TUR-BID-ITY (JTU)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	DIS-SOLVED SODIUM (NA) (MG/L)	PERCENT SODIUM
APR										
12...	1015	8.0	75	1	5	3	.5	.9	2.2	44
AUG										
10...	1445	2.1	75	1	7	6	1.8	.7	2.8	44

DATE	SODIUM AD-SORP-TION RATIO	DIS-SOLVED PO-TAS-SIUM (K) (MG/L)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DIS-SOLVED SULFATE (SO4) (MG/L)	DIS-SOLVED CHLO-RIDE (CL) (MG/L)	DIS-SOLVED FLUO-RIDE (F) (MG/L)
APR									
12...	.4	.9	2	0	2	16	6.1	3.9	.0
AUG									
10...	.4	.2	2	0	2	3.2	3.3	3.7	.0

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTI-TUENTS) (MG/L)	DIS-SOLVED SOLIDS (TONS PER AC-FT)	DIS-SOLVED SOLIDS (TONS PER DAY)	DIS-SOLVED NITRITE PLUS NITRATE (N) (MG/L)	DIS-SOLVED ORTHO. PHOS-PHORUS (P) (MG/L)	DIS-SOLVED ORTHO PHOS-PHATE (PO4) (MG/L)	DIS-SOLVED IRON (FE) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)
APR									
12...	3.6	20	.03	.43	.12	.01	.03	190	0
AUG									
10...	5.6	19	.03	.11	--	--	--	250	0

DATE	TIME	INSTAN-TANEOUS DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)
OCT					
29...	1040	1.3	34	5.4	15.0
APR					
12...	1015	8.0	18	5.3	12.0
JUN					
28...	0810	.45	26	5.6	15.0
AUG					
10...	1445	2.1	22	6.0	18.0

16725000 ALAKAHI STREAM NEAR KAMUELA

LOCATION.--Lat 20°04'27", long 155°40'25", Hydrologic Unit 20010000, on right bank 25 ft (8 m) upstream from Upper Hamakua ditch intake and 3.5 mi (5.6 km) north of Kamuela.

DRAINAGE AREA.--0.87 mi² (2.25 km²).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--January 1964 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 3,900 ft (1,189 m), from topographic map.

REMARKS.--Records good. Parker Ranch pipeline diverts from tributary 0.4 mi (0.6 km) above station for ranch use in Kamuela area.

AVERAGE DISCHARGE.--13 years, 6.29 ft³/s (0.178 m³/s), 4,560 acre-ft/yr (5.62 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,420 ft³/s (40.2 m³/s) Jan. 11, 1967, gage height, 8.65 ft (2.637 m), from rating curve extended above 28 ft³/s (0.79 m³/s) on basis of computation of peak flow over dam; minimum, 0.03 ft³/s (0.001 m³/s) on several days in 1965.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 104 ft³/s (2.95 m³/s) Apr. 20, gage height, 4.22 ft (1.286 m), from rating curve extended as explained above, no peak above base of 120 ft³/s (3.40 m³/s); minimum, 0.18 ft³/s (0.005 m³/s) Feb. 19-22.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.99	2.2	.64	.52	.75	5.0	1.5	4.1	3.8	1.3	14	4.7
2	.65	1.0	.52	.44	.86	4.6	1.0	2.9	5.3	1.5	6.5	2.9
3	.57	16	.44	.39	6.5	9.7	5.0	2.4	5.5	4.3	15	4.0
4	.44	6.0	.39	.36	3.0	18	10	2.3	4.8	13	4.4	4.6
5	.38	5.0	.60	.35	1.4	20	30	2.0	2.9	10	13	3.5
6	.36	14	.69	.39	1.6	21	35	2.9	3.0	14	39	2.3
7	3.6	16	13	.28	2.0	29	35	5.6	2.7	19	19	3.5
8	3.5	25	12	.27	2.2	7.2	25	4.4	1.7	32	4.7	2.6
9	20	19	6.3	.28	1.0	3.5	20	2.8	1.2	12	2.7	2.0
10	8.0	38	10	.27	.60	2.4	20	1.9	.96	20	2.3	2.0
11	15	7.3	6.2	.29	.80	1.8	15	1.3	.85	11	6.9	2.3
12	5.0	3.9	3.7	.28	.32	1.4	10	1.1	.98	23	20	1.8
13	2.3	2.5	6.2	.29	.26	2.6	5.7	.91	1.4	21	3.7	1.6
14	1.1	2.0	2.5	.29	.26	3.8	5.0	.80	4.8	11	2.7	1.7
15	1.9	1.5	1.4	.25	.26	4.9	3.6	.69	3.0	5.8	2.1	1.4
16	3.3	24	35	.27	.26	2.2	4.5	.70	2.0	10	1.7	2.0
17	1.5	30	6.4	.22	.26	1.7	3.0	.93	1.5	30	1.4	9.6
18	.85	8.2	3.4	.26	.22	14	2.2	.80	1.3	14	1.3	4.6
19	1.0	5.3	2.0	.26	.18	5.0	1.8	.64	3.8	11	1.3	2.3
20	9.0	12	1.3	.26	.18	27	25	.57	12	4.1	4.4	1.6
21	6.0	7.5	.98	.26	.18	22	12	.51	24	5.9	13	1.2
22	7.5	3.5	.79	.26	.22	32	6.1	2.7	7.7	4.5	15	1.1
23	2.7	2.9	.65	.26	.18	29	3.3	1.7	9.5	2.7	12	1.4
24	1.2	2.0	.52	.26	.26	18	2.2	1.7	4.6	2.0	4.9	2.9
25	1.4	3.4	5.0	.26	1.9	3.8	5.8	9.8	3.2	1.9	5.2	1.6
26	8.0	3.3	2.7	.26	8.9	3.5	4.7	6.6	2.1	2.1	2.8	1.1
27	15	1.7	11	.26	21	2.0	4.1	6.6	1.4	11	2.3	.97
28	10	1.2	3.0	.26	5.0	2.5	5.7	14	1.3	13	17	.86
29	6.5	.91	1.5	9.5	---	8.0	25	6.3	1.3	3.9	9.0	.74
30	3.4	.75	.94	4.0	---	3.0	17	12	1.3	5.0	19	.68
31	4.9	---	.67	1.5	---	4.0	---	7.0	---	5.5	18	---
TOTAL	146.04	266.06	140.43	23.21	60.15	312.6	344.2	108.65	119.89	325.5	284.3	73.55
MEAN	4.71	8.87	4.53	.75	2.15	10.1	11.5	3.50	4.00	10.5	9.17	2.45
MAX	20	38	35	9.5	21	32	35	14	24	32	39	9.6
MIN	.36	.75	.39	.22	.18	1.4	1.0	.51	.85	1.3	1.3	.68
AC-FT	290	528	279	46	119	620	683	216	238	646	564	146

CAL YR 1976 TOTAL 2601.61 MEAN 7.11 MAX 48 MIN .36 AC-FT 5160
WTR YR 1977 TOTAL 2204.58 MEAN 6.04 MAX 39 MIN .18 AC-FT 4370

16725000 ALAKAHI STREAM NEAR KAMUELA--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1974-77.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	COLOR (PLATINUM-COBALT UNITS)	TURBIDITY (JTU)	HARDNESS (CA,MG) (MG/L)	NONCARBONATE HARDNESS (MG/L)	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG) (MG/L)	DISSOLVED SODIUM (NA) (MG/L)	PERCENT SODIUM
DEC										
03...	0830	.43	65	2	12	2	1.8	1.9	3.7	39
AUG										
10...	1515	3.1	100	1	6	5	1.2	.7	2.5	47

DATE	SODIUM ADSORPTION RATIO	DISSOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	ALKALINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)	DISSOLVED FLUORIDE (F) (MG/L)
DEC									
03...	.5	.4	12	0	10	3.0	3.8	4.2	.0
AUG									
10...	.4	.2	1	0	1	25	3.5	3.9	.0

DATE	DISSOLVED SILICA (SIO2) (MG/L)	DISSOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	DISSOLVED SOLIDS (TONS PER AC-FT)	DISSOLVED SOLIDS (TONS PER DAY)	DISSOLVED NITRITE PLUS NITRATE (N) (MG/L)	DISSOLVED ORTHO. PHOSPHORUS (P) (MG/L)	DISSOLVED ORTHO PHOSPHATE (PO4) (MG/L)	DISSOLVED IRON (FE) (UG/L)	DISSOLVED MANGANESE (MN) (UG/L)
DEC									
03...	8.1	30	.04	.03	.02	.01	.03	320	30
AUG									
10...	3.5	16	.02	.13	--	--	--	390	20

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)
OCT					
29...	1115	1.8	50	5.5	15.0
DEC					
03...	0830	.43	37	6.8	13.0
JAN					
06...	1215	.31	44	7.0	12.0
APR					
12...	0945	9.2	21	5.0	12.0
JUN					
28...	0740	1.4	30	5.7	15.0

16726000 UPPER HAMAKUA DITCH ABOVE WAIMEA RESERVOIR DIVERSION, NEAR KAMUELA

LOCATION.--Lat 20°03'31", long 155°37'40", Hydrologic Unit 20010000, on left bank 120 ft (37 m) upstream from diversion intake leading to Waimea Reservoir and 3.7 mi (6.0 km) northeast of Kamuela Post Office.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1974 to current year.

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 3,020 ft (920 m), from topographic map.

REMARKS.--Records good except those for period of no gage-height record, Jan. 22 to Mar. 16, which are fair. Ditch diverts from Kawainui, Kawaiki, and Alakahi Streams for use in vicinity of Kamuela.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 48 ft^3/s (1.36 m^3/s) Apr. 6, 1977; no flow Oct. 1-21, 1974.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.0	4.9	1.4	.75	.80	8.0	4.3	19	12	1.9	31	18
2	1.4	3.4	1.2	.75	.50	7.0	2.6	11	13	4.2	26	10
3	1.1	36	.92	.70	10	15	10	7.3	16	14	36	8.3
4	.78	19	.80	.60	5.0	25	22	6.8	16	25	22	16
5	.63	15	1.1	.50	2.0	30	43	6.2	8.4	22	33	15
6	9.5	29	1.0	.45	2.5	30	48	9.4	10	30	39	8.7
7	12	30	13	.41	3.0	40	47	15	8.0	30	33	10
8	7.9	28	26	.37	3.5	10	41	15	4.4	36	25	10
9	27	35	20	.34	1.5	6.0	35	10	2.3	29	14	5.5
10	13	41	26	.32	.80	4.0	35	6.0	1.6	30	8.5	5.7
11	19	27	21	.29	1.0	3.0	35	3.9	1.3	28	14	6.8
12	6.4	12	11	.26	.50	2.5	26	2.9	1.5	37	28	5.1
13	2.7	6.3	20	.23	.30	3.5	19	2.2	1.8	37	14	3.5
14	2.3	5.4	6.8	.21	.30	4.5	17	1.7	11	29	9.8	3.5
15	4.6	3.8	3.2	.19	.20	6.0	13	1.5	7.1	22	6.5	2.6
16	6.3	25	32	.15	.20	3.5	13	1.5	3.6	26	4.5	4.8
17	1.7	42	20	.12	.15	2.8	6.7	2.1	2.6	37	3.6	17
18	1.0	26	7.6	.10	.10	20	9.8	1.6	2.4	31	3.0	14
19	2.0	20	4.0	.12	.10	13	36	1.3	6.0	29	2.8	6.1
20	15	26	2.5	.07	.05	25	25	1.1	24	20	11	3.5
21	8.0	24	1.7	.06	.05	31	15	.95	35	24	18	2.1
22	10	10	1.4	.05	.10	35	8.6	6.9	26	20	27	1.7
23	3.5	9.3	1.2	.05	.05	33	8.3	5.9	25	9.9	27	2.8
24	2.0	5.2	1.1	.05	.15	33	22	5.5	16	6.9	19	9.7
25	2.5	8.1	12	.05	2.5	16	12	18	9.1	6.8	17	4.5
26	10	13	7.0	.05	15	8.3	10	19	5.2	10	8.8	2.0
27	20	6.9	15	.05	30	5.2	8.0	16	3.1	26	6.2	1.3
28	15	4.9	5.0	.05	8.0	6.6	12	28	2.2	31	29	1.0
29	4.6	3.4	2.0	15	---	14	34	22	2.0	16	25	.78
30	7.8	1.9	.90	7.0	---	7.6	33	27	1.8	21	23	.65
31	12	---	.80	2.0	---	9.2	---	20	---	21	32	---
TOTAL	231.71	521.5	267.62	31.34	88.35	457.7	651.3	299.75	278.4	710.7	596.7	200.63
MEAN	7.47	17.4	8.63	1.01	3.16	14.8	21.7	9.51	9.28	22.9	19.2	6.69
MAX	27	42	32	15	30	40	48	28	35	37	39	18
MIN	.63	1.9	.80	.05	.05	2.5	2.6	.95	1.3	1.9	2.8	.65
AC-FT	460	1030	531	62	175	908	1290	585	552	1410	1180	398

CAL YR 1976 TOTAL 4066.80 MEAN 11.1 MAX 42 MIN .14 AC-FT 8070
WTR YR 1977 TOTAL 4330.70 MEAN 11.9 MAX 48 MIN .05 AC-FT 8590

16726000 UPPER HAMAKUA DITCH ABOVE WAIMEA RESERVOIR DIVERSION, NEAR KAMUELA--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1976-77.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTAN-TANEOUS DIS-CHARGE (CFS)	COLOR (PLAT-INUM-COBALT UNITS)	TUR-BID-ITY (JTU)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	DIS-SOLVED SODIUM (NA) (MG/L)	PERCENT SODIUM
DEC										
02...	1330	1.0	45	2	5	0	.8	.7	3.6	60
AUG										
15...	1425	6.6	80	1	7	6	1.3	.8	2.9	49

DATE	SODIUM AD-SORP-TION RATIO	DIS-SOLVED PO-TAS-SIUM (K) (MG/L)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DIS-SOLVED SULFATE (SO4) (MG/L)	DIS-SOLVED CHLO-RIDE (CL) (MG/L)	DIS-SOLVED FLUO-RIDE (F) (MG/L)
DEC									
02...	.7	.3	8	0	7	3.2	2.8	4.7	.0
AUG									
15...	.5	.1	1	0	1	.4	4.0	3.9	.0

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTI-TUENTS) (MG/L)	DIS-SOLVED SOLIDS (TONS PER AC-FT)	DIS-SOLVED SOLIDS (TONS PER DAY)	DIS-SOLVED NITRITE PLUS NITRATE (N) (MG/L)	DIS-SOLVED ORTHO. PHOS-PHORUS (P) (MG/L)	DIS-SOLVED ORTHO PHOS-PHATE (PO4) (MG/L)	DIS-SOLVED IRON (FE) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)
DEC									
02...	8.2	25	.03	.07	.01	.00	.00	180	0
AUG									
15...	5.4	19	.03	.34	--	--	--	260	10

DATE	TIME	INSTAN-TANEOUS DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)
OCT					
28...	1345	1.3	20	6.0	16.0
DEC					
02...	1330	1.0	28	6.6	15.5
JAN					
06...	1445	.46	34	6.8	16.0
MAR					
16...	1230	5.7	33	6.6	15.0
APR					
28...	1255	14	25	6.6	16.0
JUN					
08...	1250	4.4	28	6.3	17.0
AUG					
15...	1425	6.6	22	6.6	18.0
SEP					
13...	1345	3.3	26	6.4	16.0

16756000 KOHAKOHAU STREAM NEAR KAMUELA

LOCATION.--Lat 20°02'38", long 155°41'10", Hydrologic Unit 20010000, on left bank 0.6 mi (1.0 km) upstream from Oolamakapehu Gulch and 1.7 mi (2.7 km) northwest of Kamuela.

DRAINAGE AREA.--2.51 mi^2 (6.50 km^2).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--March 1956 to current year.

GAGE.--Water-stage recorder. Datum of gage is 3,273 ft (997.6 m) above mean sea level (by stadia survey by State Department of Land and Natural Resources). Prior to Jan. 11, 1967, at site 0.5 mi (0.8 km) upstream at different datums.

REMARKS.--Records good. Parker Ranch pipeline diverts above station at altitude 4,250 ft (1,295 m). Hawaii Division of Water and Land Development diverts by pipeline 0.3 mi (0.5 km) above station at altitude 3,400 ft (1,036 m) for domestic use in the Kamuela and Kawaihae areas since Aug. 20, 1973.

AVERAGE DISCHARGE.--21 years, 8.37 ft^3/s (0.237 m^3/s), 6,060 acre-ft/yr (7.47 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,880 ft^3/s (110 m^3/s) Aug. 7, 1958, gage height, 10.76 ft (3.280 m), site and datum then in use, from rating curve extended above 70 ft^3/s (1.98 m^3/s), by test of model of station site; no flow at times in 1968, 1971-77.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 217 ft^3/s (6.15 m^3/s) Aug. 6, gage height, 4.12 ft (1.256 m), from rating curve extended above 46 ft^3/s (1.30 m^3/s) on basis of computation of flow over dam at gage height 6.20 ft (1.890 m), no peak above base of 310 ft^3/s (8.78 m^3/s); no flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.95	.71	.10	.00	.00	2.1	6.7	3.9	.00	25	5.6
2	.00	.58	.67	.00	.00	.00	1.5	3.7	4.0	.00	9.7	3.1
3	.00	13	.63	.00	.00	1.0	4.3	2.7	7.5	.00	27	3.5
4	.00	4.5	.31	.00	.00	26	12	2.3	5.5	9.8	6.7	3.3
5	.00	2.9	.00	.00	.00	25	54	2.0	2.7	11	23	2.8
6	.00	20	.00	.00	.00	26	103	.32	2.1	26	107	1.9
7	.00	28	6.1	.00	.00	43	119	3.5	1.6	27	47	2.2
8	.00	38	15	.00	.00	25	90	4.2	1.2	56	10	1.6
9	.00	32	4.3	.00	.00	3.6	61	2.4	.90	23	4.8	1.4
10	5.8	55	8.7	.00	.00	1.8	54	1.8	.73	35	.59	1.3
11	1.9	18	6.7	.00	.00	1.2	52	1.5	.65	23	8.1	1.2
12	3.6	3.8	2.8	.00	.00	.95	17	1.3	.11	44	39	1.1
13	1.1	2.3	5.8	.00	.00	.80	5.6	1.1	.00	41	4.4	1.1
14	.44	1.7	1.9	.00	.00	2.4	8.1	1.0	.00	15	2.6	.95
15	.30	1.3	1.1	.00	.00	6.6	.47	.88	.00	9.7	1.8	.88
16	.45	22	42	.00	.00	.01	5.3	.78	.00	14	.00	.12
17	.27	54	12	.00	.00	.00	3.1	.47	.00	53	.00	3.6
18	.13	16	2.6	.00	.00	18	2.2	.00	.00	26	.00	1.6
19	.09	5.0	1.4	.00	.00	5.5	1.7	.00	.00	22	.00	1.2
20	1.7	10	1.0	.00	.00	27	45	.00	7.6	6.0	5.0	.95
21	.67	12	.89	.00	.00	41	27	.00	37	7.9	10	.60
22	1.3	3.1	.78	.00	.00	64	7.8	.00	11	5.4	15	.00
23	1.1	2.2	.66	.00	.00	50	4.7	.00	12	2.8	10	.00
24	.46	1.5	.14	.00	.00	48	2.3	.00	4.1	1.9	5.0	.00
25	.30	11	.00	.00	.00	6.5	2.9	4.7	2.2	1.6	6.0	.00
26	.21	5.3	.00	.00	.00	2.8	6.0	7.8	1.4	1.5	2.0	.00
27	14	1.6	4.8	.00	22	1.8	3.0	10	.95	11	1.5	.00
28	6.2	1.2	1.9	.00	1.2	3.0	3.2	24	.79	27	20	.00
29	1.1	.89	.89	.00	---	11	35	11	.67	5.0	12	.00
30	1.1	.89	.69	.00	---	3.6	35	18	.33	5.1	31	.00
31	1.8	---	.57	.00	---	6.4	---	10	---	5.0	30	---
TOTAL	44.02	368.71	125.04	.10	23.20	451.96	768.27	122.15	108.93	515.70	464.19	40.00
MEAN	1.42	12.3	4.03	.003	.83	14.6	25.6	3.94	3.63	16.6	15.0	1.33
MAX	14	55	42	.10	22	64	119	24	37	56	107	5.6
MIN	.00	.58	.00	.00	.00	.00	.47	.00	.00	.00	.00	.00
AC-FT	87	731	248	.2	46	896	1520	242	216	1020	921	79

CAL YR 1976 TOTAL 2817.80 MEAN 7.70 MAX 100 MIN .00 AC-FT 5590
WTR YR 1977 TOTAL 3032.27 MEAN 8.31 MAX 119 MIN .00 AC-FT 6010

16756000 KOHAKOHAU STREAM NEAR KAMUELA--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1972-77.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	COLOR (PLATINUM-COBALT UNITS)	TURBIDITY (JTU)	HARDNESS (CA,MG) (MG/L)	NON-CARBONATE HARDNESS (MG/L)	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG) (MG/L)	DISSOLVED SODIUM (NA) (MG/L)	PERCENT SODIUM
DEC										
03...	0950	.60	90	7	5	4	.8	.7	3.3	57
AUG										
29...	1230	12	140	2	4	3	1.0	.4	2.7	57

DATE	SODIUM ADSORPTION RATIO	DISSOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	ALKALINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)	DISSOLVED FLUORIDE (F) (MG/L)
DEC									
03...	.7	.4	1	0	1	1.0	4.4	5.0	.0
AUG									
29...	.6	.2	1	0	1	1.3	5.5	5.0	.0

DATE	DISSOLVED SILICA (SIO2) (MG/L)	DISSOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	DISSOLVED SOLIDS (TONS PER AC-FT)	DISSOLVED SOLIDS (TONS PER DAY)	DISSOLVED NITRITE PLUS NITRATE (N) (MG/L)	DISSOLVED ORTHO. PHOSPHORUS (P) (MG/L)	DISSOLVED ORTHO PHOSPHATE (PO4) (MG/L)	DISSOLVED IRON (FE) (UG/L)	DISSOLVED MANGANESE (MN) (UG/L)
DEC									
03...	4.7	20	.03	.03	.02	.00	.00	240	10
AUG									
29...	2.4	18	.02	.58	--	--	--	450	20

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)
OCT					
28...	1035	9.1	31	6.0	15.0
DEC					
03...	0950	.60	27	6.2	13.0
APR					
29...	1015	7.0	25	6.3	15.0
JUN					
09...	1100	.81	33	6.5	18.0
AUG					
29...	1230	12	25	6.1	15.0

16758000 WAIKOLOA STREAM AT MARINE DAM, NEAR KAMUELA

LOCATION.--Lat 20°02'48", long 155°39'58", Hydrologic Unit 20010000, on right bank 160 ft (49 m) upstream from Marine Dam, 0.4 mi (0.6 km) east of Puu Ohu, and 1.6 mi (2.6 km) north of Kamuela.

DRAINAGE AREA.--1.18 mi² (3.06 km²).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--May 1947 to current year.

REVISED RECORDS (FISCAL YEARS).--WSP 1569: Drainage area. WSP 1937: 1948(M), 1949-51(P), 1952(M), 1954(M), 1955, 1956-57(P), 1958-60.

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 3,460 ft (1,055 m), from topographic map.

REMARKS.--Records good. Diversion above station for livestock and domestic use.

AVERAGE DISCHARGE.--30 years, 8.59 ft³/s (0.243 m³/s), 6,220 acre-ft/yr (7.67 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,390 ft³/s (96.0 m³/s) Oct. 23, 1957, gage height, 6.99 ft (2.131 m), from rating curve extended above 120 ft³/s (3.40 m³/s) on basis of computations of flow over dam at gage heights 5.46 ft (1.664 m) and 5.96 ft (1.817 m); minimum, 0.59 ft³/s (0.017 m³/s) Oct. 3-6, 1965.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 182 ft³/s (5.15 m³/s) Apr. 20, gage height, 3.31 ft (1.010 m), from rating curve extended as explained above, no other peak above base of 180 ft³/s (5.10 m³/s); minimum, 1.4 ft³/s (0.048 m³/s) Feb. 18-25.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.5	3.2	2.7	2.5	2.4	3.8	3.3	8.6	5.1	2.4	20	8.9
2	3.3	2.6	2.6	2.4	2.2	3.9	2.8	6.4	4.8	2.8	16	5.4
3	3.1	21	2.5	2.3	10	4.3	11	5.3	5.8	4.7	32	5.1
4	2.9	7.5	2.4	2.3	4.9	11	14	4.4	6.9	13	14	5.7
5	2.8	5.2	2.7	2.3	3.0	14	65	4.4	4.3	12	26	5.2
6	2.7	19	2.5	2.2	2.8	14	102	4.6	4.6	15	85	4.1
7	7.4	22	16	2.0	2.8	23	114	5.8	3.8	17	26	5.4
8	6.8	34	16	1.9	2.8	11	72	5.8	3.2	33	13	4.3
9	5.9	27	8.2	1.9	2.3	5.5	45	4.6	3.0	15	7.5	3.8
10	22	58	15	1.9	2.0	5.0	43	3.8	2.2	25	7.0	3.8
11	7.3	16	11	1.8	1.9	4.5	41	3.5	2.1	17	25	4.0
12	8.6	5.9	6.1	1.8	1.8	4.0	15	3.2	2.1	32	40	3.5
13	4.6	4.3	10	1.8	1.6	3.5	9.8	3.0	2.2	33	10	3.3
14	3.6	3.8	4.2	1.8	1.6	3.0	7.6	2.9	3.1	17	7.0	3.2
15	3.5	3.3	3.3	1.8	1.6	3.0	5.9	2.8	2.8	11	5.0	3.0
16	4.4	29	44	1.7	1.5	2.5	5.4	2.8	2.4	17	4.5	3.7
17	2.8	63	11	1.7	1.5	2.5	4.4	2.8	2.2	36	4.0	8.2
18	3.0	17	4.7	1.7	1.5	9.7	3.9	2.6	2.1	22	3.5	5.9
19	3.5	9.8	3.5	1.7	1.4	4.7	3.6	2.5	3.6	17	3.5	3.6
20	6.9	16	3.1	1.6	1.4	12	44	2.4	11	8.8	10	3.1
21	4.7	13	2.9	1.6	1.4	20	24	2.4	27	13	20	2.9
22	7.8	5.3	2.7	1.6	1.5	33	13	2.5	13	8.9	25	2.8
23	5.7	4.6	2.6	1.6	1.4	23	6.9	2.4	14	5.3	15	3.1
24	3.7	3.7	2.6	1.6	1.5	27	4.8	2.4	6.5	4.4	10	3.5
25	3.4	5.5	3.3	1.5	1.6	6.3	9.0	7.4	4.2	4.2	12	3.0
26	3.3	5.2	2.9	1.5	2.1	3.8	9.1	7.2	3.2	4.6	7.0	2.7
27	9.4	3.6	8.0	1.5	14	3.1	6.1	4.6	2.7	21	7.0	2.6
28	6.5	3.2	3.9	1.6	5.2	5.1	6.8	16	2.5	17	30	2.5
29	3.1	3.0	3.0	14	---	8.4	44	9.8	2.4	6.9	15	2.4
30	3.3	2.9	2.7	6.2	---	4.5	28	14	2.4	7.4	28	2.4
31	4.2	---	2.5	3.1	---	4.4	---	8.6	---	7.8	29	---
TOTAL	163.7	417.6	208.6	74.9	79.7	283.5	764.4	159.5	155.2	451.2	557.0	121.1
MEAN	5.28	13.9	6.73	2.42	2.85	9.15	25.5	5.15	5.17	14.6	18.0	4.04
MAX	22	63	44	14	14	33	114	16	27	36	85	8.9
MIN	2.7	2.6	2.4	1.5	1.4	2.5	2.8	2.4	2.1	2.4	3.5	2.4
AC-FT	325	828	414	149	158	562	1520	316	308	895	1100	240

CAL YR 1976 TOTAL 2952.7 MEAN 8.07 MAX 76 MIN 1.7 AC-FT 5860
WTR YR 1977 TOTAL 3436.4 MEAN 9.41 MAX 114 MIN 1.4 AC-FT 6820

16758000 WAIKOLOA STREAM AT MARINE DAM, NEAR KAMUELA--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1972-77.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	COLOR (PLATINUM-COBALT UNITS)	TURBIDITY (JTU)	HARDNESS (CA,MG) (MG/L)	NONCARBONATE HARDNESS (MG/L)	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG) (MG/L)	DISSOLVED SODIUM (NA) (MG/L)	PERCENT SODIUM
DEC 03...	1030	2.6	50	4	14	0	1.7	2.3	4.4	40
AUG 29...	1100	12	140	1	8	6	1.9	.8	2.8	42

DATE	SODIUM ADSORPTION RATIO	DISSOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	ALKALINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)	DISSOLVED FLUORIDE (F) (MG/L)
DEC 03...	.5	.5	21	0	17	21	2.8	4.8	.1
AUG 29...	.4	.2	3	0	2	2.4	6.7	4.7	.0

DATE	DISSOLVED SILICA (SIO2) (MG/L)	DISSOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	DISSOLVED SOLIDS (TONS PER AC-FT)	DISSOLVED SOLIDS (TONS PER DAY)	DISSOLVED NITRITE PLUS NITRATE (N) (MG/L)	DISSOLVED ORTHO. PHOSPHORUS (P) (MG/L)	DISSOLVED ORTHO PHOSPHATE (PO4) (MG/L)	DISSOLVED IRON (FE) (UG/L)	DISSOLVED MANGANESE (MN) (UG/L)
DEC 03...	12	40	.95	.28	.02	.00	.00	530	10
AUG 29...	3.4	23	.03	.75	--	--	--	540	20

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)
OCT 28...	0935	6.2	36	6.4	14.5
DEC 03...	1030	2.6	48	6.2	15.0
JAN 07...	0955	1.9	38	6.8	13.0
MAR 17...	0930	2.4	51	6.9	15.0
APR 29...	0940	12	31	6.4	15.0
JUN 09...	0850	2.9	44	6.5	17.0
AUG 29...	1100	12	22	6.3	15.0

16759000 HAUANI GULCH NEAR KAMUELA

LOCATION--Lat 20°02'28", long 155°39'05", Hydrologic Unit 20010000, on left bank 800 ft (244 m) downstream from small tributary and 1.8 mi (2.9 km) northeast of Kamuela.

DRAINAGE AREA.--0.47 mi^2 (1.22 km^2).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--March 1956 to current year. Prior to July 1960, published as Hauani Stream near Kamuela.

GAGE.--Water-stage recorder. Concrete control since Feb. 27, 1963. Datum of gage is 3,117.42 ft (950.190 m) above mean sea level (Hawaii County Board of Water Supply bench mark).

REMARKS.--Records good. Diversion above station for livestock and domestic use.

AVERAGE DISCHARGE.--21 years, 1.46 ft^3/s (0.041 m^3/s), 1,060 acre-ft/yr (1.31 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 590 ft^3/s (16.7 m^3/s) Oct. 20, 1974, gage height, 4.18 ft (1.274 m), from rating curve extended above 11 ft^3/s (0.31 m^3/s) on basis of slope-conveyance study; maximum gage height, 4.65 ft (1.417 m) Oct. 23, 1957; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 78 ft^3/s (2.21 m^3/s) Apr. 6, gage height, 2.58 ft (0.786 m), from rating curve extended above 54 ft^3/s (1.53 m^3/s), no other peak above base of 78 ft^3/s (2.21 m^3/s); minimum, 0.01 ft^3/s (<0.001 m^3/s) Feb. 21, 22.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.12	.10	.25	.20	.11	.16	4.1	1.2	.78	.24	3.0	1.1
2	.10	.08	.22	.20	.10	.25	3.8	.78	.78	.34	1.9	.72
3	.09	4.7	.19	.19	1.1	.18	5.4	.62	.78	.70	6.3	.79
4	.07	.68	.19	.18	.38	1.3	2.6	.49	.89	1.7	1.8	.82
5	.08	.41	.22	.18	.17	2.8	18	.47	.56	1.6	4.8	.94
6	.07	2.0	.20	.16	.15	2.5	38	.50	.67	2.0	28	.44
7	1.5	2.6	3.6	.14	.14	5.5	42	.57	.45	3.6	8.9	.45
8	.55	8.9	1.9	.13	.12	2.3	17	.66	.24	7.7	2.1	.38
9	.53	4.7	.76	.12	.09	.57	9.5	.48	.22	3.0	1.1	.35
10	2.8	15	2.0	.12	.08	.30	9.4	.36	.19	3.8	.83	.36
11	.74	2.5	1.4	.12	.07	.22	7.5	.35	.19	3.2	4.5	.36
12	.71	.79	.72	.12	.06	.17	2.2	.31	.19	9.0	11	.30
13	.27	.50	1.6	.11	.06	.14	1.2	.28	.21	9.2	1.0	.30
14	.18	.38	.47	.10	.05	.14	.89	.28	.23	3.9	.80	.29
15	.16	.30	.34	.11	.04	.14	.68	.28	.21	1.9	.65	.27
16	.18	7.5	14	.10	.04	.11	.99	.28	.19	2.8	.54	.32
17	.14	18	1.7	.10	.04	.08	1.9	.30	.17	10	.48	.79
18	.11	2.5	.60	.10	.04	1.1	1.7	.28	.15	4.6	.44	.48
19	.13	1.3	.41	.11	.03	.31	1.6	.28	.36	3.4	.49	.28
20	.45	3.3	.33	.10	.02	1.1	6.4	.28	1.5	1.4	1.3	.25
21	.20	2.2	.29	.09	.02	2.6	3.4	.28	5.5	1.6	1.7	.23
22	.41	.74	.26	.09	.03	7.6	1.4	.28	2.4	1.3	2.5	.22
23	.29	.60	.24	.08	.04	4.5	.71	.28	2.5	.84	2.5	.27
24	.13	.43	.28	.08	.03	5.3	.47	.28	1.1	.71	.99	.35
25	.10	.64	.55	.08	.04	3.2	4.1	1.3	.59	.64	1.1	.21
26	.09	.57	.30	.08	.07	5.9	1.3	.89	.40	.65	.62	.18
27	.47	.37	.97	.07	1.3	5.1	.74	.72	.32	3.9	.70	.17
28	.39	.32	.34	.07	.32	7.2	.82	3.1	.28	2.8	6.0	.15
29	.11	.29	.26	2.0	---	7.5	9.6	1.6	.26	.88	2.0	.14
30	.10	.26	.23	.53	---	5.2	5.2	2.2	.25	.88	7.6	.14
31	.15	---	.20	.16	---	4.9	---	1.4	---	.80	5.1	---
TOTAL	11.42	82.66	35.02	6.02	4.74	78.37	202.60	21.38	22.56	89.08	110.74	12.05
MEAN	.37	2.76	1.13	.19	.17	2.53	6.75	.69	.75	2.87	3.57	.40
MAX	2.8	18	14	2.0	1.3	7.6	42	3.1	5.5	10	28	1.1
MIN	.07	.08	.19	.07	.02	.08	.47	.28	.15	.24	.44	.14
AC-FT	23	164	69	12	9.4	155	402	42	45	177	220	24

CAL YR 1976 TOTAL 459.67 MEAN 1.26 MAX 26 MIN .06 AC-FT 912
WTR YR 1977 TOTAL 676.64 MEAN 1.85 MAX 42 MIN .02 AC-FT 1340

16759000 HAUANI GULCH NEAR KAMUELA--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1976-77.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	COLOR (PLATINUM-COBALT UNITS)	TURBIDITY (JTU)	HARDNESS (CA,MG) (MG/L)	NONCARBONATE HARDNESS (MG/L)	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG) (MG/L)	DISSOLVED SODIUM (NA) (MG/L)	PERCENT SODIUM
DEC 02...	1240	.22	25	1	5	4	.7	.8	3.6	59
AUG 29...	1415	1.4	90	1	10	9	3.6	.3	2.8	35

DATE	SODIUM ADSORPTION RATIO	DISSOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	ALKALINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)	DISSOLVED FLUORIDE (F) (MG/L)
DEC 02...	.7	.3	1	0	1	.5	2.8	5.7	.0
AUG 29...	.4	1.0	1	0	1	1.0	4.3	6.0	.0

DATE	DISSOLVED SILICA (SIO2) (MG/L)	DISSOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	DISSOLVED SOLIDS (TONS PER AC-FT)	DISSOLVED SOLIDS (TONS PER DAY)	DISSOLVED NITRITE PLUS NITRATE (N) (MG/L)	DISSOLVED ORTHO. PHOSPHORUS (P) (MG/L)	DISSOLVED ORTHO PHOSPHATE (PO4) (MG/L)	DISSOLVED IRON (FE) (UG/L)	DISSOLVED MANGANESE (MN) (UG/L)
DEC 02...	5.3	20	.03	.01	.01	.00	.00	100	10
AUG 29...	2.7	22	.03	.08	--	--	--	350	20

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)
OCT 28...	1245	.28	28	6.2	18.0
DEC 02...	1240	.22	30	6.5	16.0
JAN 06...	1245	.18	31	6.4	16.0
MAR 17...	1210	.08	33	6.9	16.0
APR 29...	1130	14	20	6.0	15.0
JUN 08...	1450	.25	30	6.4	18.0
AUG 29...	1415	1.4	26	6.2	15.0

16759200 RIGHT BRANCH WAIAHA STREAM NEAR HOLUALOA

LOCATION.--Lat 19°38'41", long 155°54'55", Hydrologic Unit 20010000, on right bank 1,000 ft (305 m) upstream from reservoir, 1.0 mi (1.6 km) northeast of Holualoa Makai Camp, and 2.9 mi (4.7 km) northeast of Holualoa School.

DRAINAGE AREA.--1.89 mi^2 (4.90 km^2).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--April 1960 to current year.

REVISED RECORDS (WATER YEARS).--WSP 2137: 1963-65(M).

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 3,280 ft (1,000 m), from topographic map.

REMARKS.--Records good. No diversion above station. Recording rain gage located at station.

AVERAGE DISCHARGE.--17 years, 0.336 ft^3/s (0.010 m^3/s), 243 acre-ft/yr (300,000 m^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,630 ft^3/s (46.2 m^3/s) Oct. 3, 1968, gage height, 5.78 ft (1.762 m), from rating curve extended above 9.1 ft^3/s (0.26 m^3/s) on basis of slope-area measurements at gage heights 4.07 ft (1.241 m) and 5.78 ft (1.762 m); no flow at times each year.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 74 ft^3/s (2.10 m^3/s) Oct. 4, gage height, 3.28 ft (1.000 m), from rating curve extended as explained above, no peak above base of 115 ft^3/s (3.26 m^3/s); no flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.25	.00	.00	.00	.00	.00	.08	.19	.00	.00	.03	.01
2	.09	.00	.00	.00	.00	.00	.04	.08	.00	.00	.02	.01
3	.04	.00	.00	.00	.00	.00	.06	.06	.00	.01	.01	.01
4	8.9	.00	.00	.00	.00	.00	.09	.05	.00	.06	.01	.01
5	3.7	.00	.00	.00	.00	.00	.05	.06	.00	.10	.01	.00
6	.55	.00	.00	.00	.00	.00	.07	.04	.00	.06	.04	.00
7	.16	.00	.00	.00	.00	.00	.08	.03	.01	.04	.03	.00
8	.07	.00	.00	.00	.00	.00	.12	1.2	.06	.03	.04	.00
9	.04	.00	.00	.00	.00	.00	.09	.39	.01	.04	.06	.00
10	.02	.00	.00	.00	.00	.00	.09	.11	.01	.02	.03	.00
11	.01	.00	.00	.00	.00	.00	.08	.06	.01	.05	.01	.00
12	.01	.00	.00	.00	.00	.00	.05	.04	.01	.07	.01	.00
13	.01	.00	.00	.00	.00	.00	.04	.02	.00	.08	.04	.00
14	.00	.00	.00	.00	.00	.00	.03	.02	.00	.06	.06	.00
15	.00	.00	.00	.00	.00	.01	.02	.02	.00	.02	.06	.00
16	.00	.00	.00	.00	.00	.21	.01	.07	.00	.02	.04	.00
17	.00	.00	.00	.00	.00	.09	.01	.04	.01	.02	.05	.82
18	.00	.00	.00	.00	.00	.03	.01	.02	.04	.02	.06	.11
19	.00	.00	.00	.00	.00	.01	.70	.02	.07	.06	.05	.04
20	.00	.00	.00	.00	.00	.01	1.4	.01	.06	.45	.09	.01
21	.00	.00	.00	.00	.00	.01	.39	.01	.02	.39	.08	.01
22	.00	.00	.00	.00	.00	.01	.11	.01	.01	.17	.05	.01
23	.00	.00	.00	.00	.00	.00	.07	.01	.01	.12	.05	.00
24	.00	.00	.00	.00	.00	.02	.04	.00	.01	.05	.04	.00
25	.00	.00	.00	.00	.00	.03	.31	.00	.01	.02	.03	.00
26	.00	.00	.00	.00	.00	.01	.42	.00	.01	.02	.02	.00
27	.00	.00	.00	.00	.00	.01	.09	.00	.01	.02	.01	.00
28	.00	.00	.00	.00	.00	.30	.06	.00	.01	.01	.01	.00
29	.00	.00	.00	.00	---	.23	.05	.00	.01	.02	.01	.00
30	.00	.00	.00	.00	---	.33	.45	.00	.00	.02	.02	.00
31	.00	---	.00	.00	---	.25	---	.00	---	.03	.01	---
TOTAL	13.85	.00	.00	.00	.00	1.56	5.11	2.56	.39	2.08	1.08	1.04
MEAN	.45	.000	.000	.000	.000	.050	.17	.083	.013	.067	.035	.035
MAX	8.9	.00	.00	.00	.00	.33	1.4	1.2	.07	.45	.09	.82
MIN	.00	.00	.00	.00	.00	.00	.01	.00	.00	.00	.01	.00
AC-FT	27	.00	.00	.00	.00	3.1	10	5.1	.8	4.1	2.1	2.1

CAL YR 1976 TOTAL 70.04 MEAN .19 MAX 13 MIN .00 AC-FT 139
WTR YR 1977 TOTAL 27.67 MEAN .076 MAX 8.9 MIN .00 AC-FT 55

16759200 RIGHT BRANCH WAIAHA STREAM NEAR HOLUALOA--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1972-77.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTAN-TANEOUS DIS-CHARGE (CFS)	COLOR (PLAT-INUM-COBALT UNITS)	TUR-BID-ITY (JTU)	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	DIS-SOLVED SODIUM (NA) (MG/L)	PERCENT SODIUM
MAR										
16...	0830	.01	26	6	18	14	2.9	2.5	4.8	34
AUG										
23...	0750	.04	23	1	14	8	2.5	1.9	2.8	39

DATE	SODIUM AD-SORP-TION RATIO	DIS-SOLVED PO-TAS-SIUM (K) (MG/L)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DIS-SOLVED SULFATE (SO4) (MG/L)	DIS-SOLVED CHLO-RIDE (CL) (MG/L)	DIS-SOLVED FLUO-RIDE (F) (MG/L)
MAR									
16...	.5	1.9	4	0	3	1.6	11	9.3	.0
AUG									
23...	.3	.3	8	0	7	4.0	3.8	5.0	.0

DATE	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTI-TUENTS) (MG/L)	DIS-SOLVED SOLIDS (TONS PER AC-FT)	DIS-SOLVED SOLIDS (TONS PER DAY)	DIS-SOLVED NITRITE PLUS NITRATE (N) (MG/L)	DIS-SOLVED ORTHO. PHOS-PHORUS (P) (MG/L)	DIS-SOLVED ORTHO PHOS-PHATE (PO4) (MG/L)	DIS-SOLVED IRON (FE) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)
MAR									
16...	4.8	39	.05	.00	.01	.03	.09	70	0
AUG									
23...	5.1	26	.04	.00	--	--	--	170	0

DATE	TIME	INSTAN-TANEOUS DIS-CHARGE (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)
MAR					
16...	0830	.01	68	6.6	19.0
APR					
28...	0840	.06	23	6.3	16.0
JUN					
08...	0800	.05	35	6.0	20.0
AUG					
23...	0750	.04	45	6.5	18.0

16759800 KIILAE STREAM NEAR HONAUNAU

LOCATION.--Lat 19°24'52", long 155°50'56", Hydrologic Unit 20010000, on right bank 2.4 mi (3.9 km) northeast of Kealia and 3.0 mi (4.8 km) southeast of Honaunau Post Office.

DRAINAGE AREA.--0.67 mi^2 (1.74 km^2).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--April 1958 to current year.

GAGE.--Water-stage recorder. Datum of gage is 2,898 ft (883.3 m) above mean sea level (by stadia traverse).

REMARKS.--Records good. No diversion above station. Banks overflow at high stage and part of overflow is lost in lava. Recording rain gage located at station.

AVERAGE DISCHARGE.--19 years, 0.204 ft^3/s (0.006 m^3/s), 142 acre-ft/yr (182,000 m^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 104 ft^3/s (2.95 m^3/s) Jan. 13, 1959, gage height, 2.32 ft (0.707 m), from rating curve extended above 5.7 ft^3/s (0.161 m^3/s); no flow at times each year.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 21 ft^3/s (0.59 m^3/s) Mar. 2, gage height, 1.53 ft (0.466 m), from rating curve extended above 5.7 ft^3/s (0.161 m^3/s), no peak above base of 25 ft^3/s (0.71 m^3/s); no flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.06	.00	.00	.00	.00	.04	.00	.30	.00	.00	.00	.00
2	.06	.00	.00	.00	.00	1.4	.81	.10	.00	.00	.00	.00
3	.09	.00	.00	.00	.00	.16	.92	.10	.00	.00	.00	.03
4	.04	.00	.00	.00	.00	.54	.42	.05	.00	.28	.00	.03
5	.01	.00	.00	.00	.00	.10	.20	.05	.00	.10	.00	.00
6	.02	.00	.00	.00	.00	.01	.78	.05	.00	.01	.00	.00
7	.01	.00	.00	.00	.00	.00	.06	.05	.03	.00	.00	.00
8	.01	.00	.00	.00	.00	.00	.13	1.0	.59	.00	.00	.00
9	.02	.00	.00	.00	.00	.00	.04	.50	.12	.00	.15	.00
10	.00	.00	.00	.00	.00	.00	.06	.20	.04	.00	.10	.00
11	.00	.00	.00	.00	.00	.00	.04	.15	.02	.00	.05	.00
12	.00	.00	.00	.00	.00	.05	.03	.10	.00	.00	.05	.00
13	.00	.00	.00	.00	.00	.10	.02	.05	.00	.00	.00	.00
14	.00	.00	.00	.00	.00	.50	.04	.00	.00	.00	.00	.00
15	.00	.00	.00	.00	.00	.15	.09	.00	.02	.00	.00	.00
16	.00	.00	.00	.00	.00	.05	.02	.15	.06	.00	.05	.00
17	.00	.00	.00	.00	.00	.01	.02	.10	.11	.00	.05	.00
18	.00	.00	.00	.00	.00	.14	.00	.10	.11	.00	.10	.96
19	.00	.00	.00	.00	.00	.09	.01	.05	.07	.00	.15	.05
20	.00	.00	.00	.00	.00	.21	.63	.12	.01	.09	.20	.00
21	.00	.00	.00	.00	.00	.06	.34	.14	.00	.04	.05	.00
22	.00	.00	.00	.00	.00	.03	.10	.02	.00	.04	.02	.00
23	.00	.00	.00	.00	.00	.91	.03	.04	.00	.02	.28	.00
24	.00	.00	.00	.00	.00	.11	.03	.04	.00	.00	.08	.29
25	.00	.00	.00	.00	.00	.04	1.0	.04	.00	.00	.05	.03
26	.00	.00	.00	.00	.00	.01	.34	.00	.00	.00	.00	.02
27	.00	.00	.00	.00	.00	.00	.07	.06	.00	.00	.00	.00
28	.00	.00	.00	.00	.34	.00	.02	.04	.00	.00	.00	.00
29	.00	.00	.00	.00	---	.00	.05	.00	.00	.00	.52	.00
30	.00	.00	.00	.00	---	.10	.10	.00	.00	.00	.10	.00
31	.00	---	.00	.00	---	.05	---	.00	---	.00	.00	---
TOTAL	.32	.00	.00	.00	.34	4.86	6.40	3.60	1.18	.58	2.00	1.41
MEAN	.010	.000	.000	.000	.012	.16	.21	.12	.039	.019	.065	.047
MAX	.09	.00	.00	.00	.34	1.4	1.0	1.0	.59	.28	.52	.96
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	.6	.00	.00	.00	.7	9.6	13	7.1	2.3	1.2	4.0	2.8

CAL YR 1976 TOTAL 63.90 MEAN .17 MAX 4.1 MIN .00 AC-FT 127
WTR YR 1977 TOTAL 20.69 MEAN .057 MAX 1.4 MIN .00 AC-FT 41

16759800 KIILAE STREAM NEAR HONAUNAU--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1974-77.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	COLOR (PLATINUM-COBALT UNITS)	TURBIDITY (JTU)	HARDNESS (CA,MG) (MG/L)	NONCARBONATE HARDNESS (MG/L)	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG) (MG/L)	DISSOLVED SODIUM (NA) (MG/L)	PERCENT SODIUM
MAR										
15...	1440	.07	8	2	11	9	2.1	1.4	2.6	32
AUG										
22...	1430	.02	32	1	9	8	2.0	1.0	2.0	32

DATE	SODIUM ADSORPTION RATIO	DISSOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	ALKALINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)	DISSOLVED FLUORIDE (F) (MG/L)
MAR									
15...	.3	.7	2	0	2	2.5	8.7	5.4	.0
AUG									
22...	.3	.0	1	0	1	.5	4.3	3.2	.0

DATE	DISSOLVED SILICA (SIO2) (MG/L)	DISSOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	DISSOLVED SOLIDS (TONS PER AC-FT)	DISSOLVED SOLIDS (TONS PER DAY)	DISSOLVED NITRITE PLUS NITRATE (N) (MG/L)	DISSOLVED ORTHO. PHOSPHORUS (P) (MG/L)	DISSOLVED ORTHO PHOSPHATE (PO4) (MG/L)	DISSOLVED IRON (FE) (UG/L)	DISSOLVED MANGANESE (MN) (UG/L)
MAR									
15...	4.9	27	.04	.01	.00	.03	.09	80	10
AUG									
22...	4.6	18	.02	.00	--	--	--	130	0

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)
MAR					
15...	1440	.07	41	6.1	19.0
APR					
27...	1430	.05	24	6.1	17.0
AUG					
22...	1430	.02	25	6.5	20.0

16764000 HILEA GULCH TRIBUTARY NEAR HONUAPO

LOCATION.--Lat 19°10'27", long 155°35'58", Hydrologic Unit 20010000, on right bank 0.5 mi (0.8 km) upstream from mouth, 6.6 mi (10.6 km) northwest of Honuapo, and 6.7 mi (10.8 km) west of Punaluu.

DRAINAGE AREA.--9.17 mi^2 (23.75 km^2).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--February 1966 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 2,940 ft (896 m), from topographic map.

REMARKS.--Records good. No diversion above station. Recording rain gage located at station.

AVERAGE DISCHARGE.--11 years, 8.44 ft^3/s (0.239 m^3/s), 6,110 acre-ft/yr (7.53 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,220 ft^3/s (34.6 m^3/s) Dec. 30, 1966, gage height, 6.35 ft (1.935 m), from rating curve extended above 75 ft^3/s (2.12 m^3/s); no flow at times each year.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 718 ft^3/s (20.3 m^3/s) Aug. 12, gage height, 5.27 ft (1.606 m), from rating curve extended as explained above, no other peak above base of 600 ft^3/s (17.0 m^3/s); no flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.12	4.8	.16	.03	.00	11	.27	6.5	1.1	.52	.40	.63
2	.11	1.3	.19	.02	.00	1.6	.59	3.2	.85	.39	.38	.41
3	.27	.33	.09	.02	22	45	5.9	2.3	.34	4.3	.35	.35
4	1.1	.23	.07	.19	.82	4.3	1.3	5.5	.31	24	.28	1.2
5	.27	.18	.09	.10	.10	.37	19	7.1	.27	17	.28	1.0
6	.54	.16	22	.03	.28	.18	6.7	23	2.7	2.8	75	2.5
7	.51	.13	13	.02	5.5	.13	1.1	12	2.9	.38	22	1.6
8	.16	.41	2.4	.02	1.3	.10	.27	14	1.3	1.2	1.4	.43
9	.08	59	1.4	.01	.20	.08	.18	3.6	33	3.3	1.5	3.9
10	.49	81	.36	.01	.09	.07	9.5	8.0	9.2	45	.72	1.2
11	.19	5.2	.20	.01	.08	.41	12	5.7	2.6	13	.48	.56
12	4.2	.72	.15	.00	.38	2.3	1.3	2.6	.45	20	186	.46
13	.39	.35	15	.00	.36	21	.24	1.0	.33	3.4	9.9	.31
14	.12	.65	1.8	.00	1.3	26	.19	1.1	.28	16	4.3	.27
15	.10	1.5	.29	.00	1.3	6.2	.15	2.3	.23	4.2	1.2	.25
16	.48	1.3	.16	.00	.35	2.0	.12	1.2	.19	28	1.5	1.5
17	12	.28	.16	.00	.11	1.3	.11	.66	.22	44	9.6	38
18	4.4	.23	.16	.00	.06	.19	.10	36	.19	22	17	2.5
19	5.6	.18	.13	.00	.03	.14	1.6	22	.17	9.4	31	.61
20	1.5	.16	4.0	.00	.02	1.7	4.9	13	2.8	8.8	31	.45
21	22	.15	4.0	.00	.01	.54	29	7.2	.74	3.5	21	.38
22	61	.13	.23	.00	.01	.13	7.2	3.4	.20	1.8	9.6	.32
23	3.6	.23	.74	.00	.00	.11	4.0	.51	.16	.51	28	.29
24	.46	.16	1.0	.00	.00	.09	1.0	.37	.17	2.0	6.7	.26
25	.25	.11	.14	.00	.14	.07	3.3	1.0	.17	10	1.1	.26
26	.18	.08	.12	.00	7.8	.06	1.0	.73	.14	12	.68	.21
27	1.8	.07	.12	.00	70	.06	7.4	.43	.33	22	.57	.18
28	.40	.03	.10	.00	41	14	8.9	.36	.38	5.3	2.2	.15
29	.28	.03	.08	.00	---	3.6	63	.31	1.5	2.2	1.8	.15
30	11	.13	.07	.00	---	11	15	.38	.97	1.2	.68	.14
31	4.5	---	.05	.00	---	1.6	---	.58	---	.52	1.4	---
TOTAL	138.10	159.23	68.46	.46	153.24	155.33	205.32	186.03	64.19	328.72	468.02	60.47
MEAN	4.45	5.31	2.21	.015	5.47	5.01	6.84	6.00	2.14	10.6	15.1	2.02
MAX	61	81	22	.19	70	45	63	36	33	45	186	38
MIN	.08	.03	.05	.00	.00	.06	.10	.31	.14	.38	.28	.14
AC-FT	274	316	136	.9	304	308	407	369	127	652	928	120

CAL YR 1976 TOTAL 3565.61 MEAN 9.74 MAX 303 MIN .03 AC-FT 7070
WTR YR 1977 TOTAL 1987.57 MEAN 5.45 MAX 186 MIN .00 AC-FT 3940

HAWAII, ISLAND OF HAWAII

16764000 HILEA GULCH TRIBUTARY NEAR HONUAPO--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1972-77.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	COLOR (PLATINUM-COBALT UNITS)	TURBIDITY (JTU)	HARDNESS (CA,MG) (MG/L)	NON-CARBONATE HARDNESS (MG/L)	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG) (MG/L)	DISSOLVED SODIUM (NA) (MG/L)	PERCENT SODIUM
DEC 01...	0940	.10	8	2	18	2	3.9	2.0	3.2	26
AUG 17...	1050	2.4	13	1	11	6	2.0	1.4	2.3	31

DATE	SODIUM ADSORPTION RATIO	DISSOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	ALKALINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)	DISSOLVED FLUORIDE (F) (MG/L)
DEC 01...	.3	1.4	19	0	16	3.0	6.2	4.6	.1
AUG 17...	.3	.3	6	0	5	1.9	4.0	2.7	.1

DATE	DISSOLVED SILICA (SIO2) (MG/L)	DISSOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	DISSOLVED SOLIDS (TONS PER AC-FT)	DISSOLVED SOLIDS (TONS PER DAY)	DISSOLVED NITRITE PLUS NITRATE (N) (MG/L)	DISSOLVED ORTHO. PHOSPHORUS (P) (MG/L)	DISSOLVED ORTHO PHOSPHATE (PO4) (MG/L)	DISSOLVED IRON (FE) (UG/L)	DISSOLVED MANGANESE (MN) (UG/L)
DEC 01...	13	44	.06	.01	.02	.00	.00	50	0
AUG 17...	9.2	25	.03	.16	--	--	--	150	0

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)
OCT 26...	1010	.18	53	6.5	17.0
DEC 01...	0940	.10	53	7.0	17.0
JAN 05...	0930	.10	57	6.9	14.0
MAR 15...	0920	11	30	7.1	14.0
APR 27...	0900	1.4	29	6.6	16.0
JUN 07...	0900	1.2	34	6.8	16.0
AUG 17...	1050	2.4	33	6.7	17.5

16765000 HILEA GULCH TRIBUTARY NO. 2 NEAR HONUAPO

LOCATION.--Lat 19°10'17", long 155°36'05", Hydrologic Unit 20010000, on right bank 0.5 mi (0.8 km) upstream from mouth, 6.3 mi (10.1 km) northwest of Honuapo, and 6.6 mi (10.6 km) west of Punaluu.

DRAINAGE AREA.--1.86 mi² (4.82 km²).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--February 1966 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 2,880 ft (878 m), from topographic map.

REMARKS.--Records good. No diversion above station.

AVERAGE DISCHARGE.--11 years, 3.10 ft³/s (0.088 m³/s), 2,250 acre-ft/yr (2.77 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 523 ft³/s (14.8 m³/s) Dec. 30, 1966, gage height, 7.16 ft (2.182 m), from rating curve extended above 41 ft³/s (1.16 m³/s); no flow many days each year.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 222 ft³/s (6.29 m³/s) Aug. 12, gage height, 5.31 ft (1.618 m), from rating curve extended above 41 ft³/s (1.16 m³/s), no peak above base of 310 ft³/s (8.78 m³/s); no flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.00	2.6	.00	.27	.00	.00	.00	.00
2	.00	.00	.00	.00	.00	.06	.00	.04	.00	.00	.00	.00
3	.00	.00	.00	.00	4.2	10	.00	.00	.00	.00	.00	.00
4	.00	.00	.00	.00	.00	.51	.00	.11	.00	1.4	.00	.00
5	.00	.00	.00	.00	.00	.00	1.9	1.2	.00	.57	.00	.00
6	.00	.00	8.6	.00	.00	.00	3.9	6.8	.00	.05	10	.00
7	.00	.00	8.3	.00	.54	.00	.09	1.4	.02	.00	1.0	.00
8	.00	.00	.40	.00	.01	.00	.00	3.1	.00	.00	.00	.00
9	.00	.01	.00	.00	.00	.00	.00	.35	6.5	.00	.00	.00
10	.00	.01	.00	.00	.00	.00	3.8	1.1	.99	8.8	.00	.00
11	.00	.00	.00	.00	.00	.00	2.3	.20	.15	.10	.00	.00
12	.00	.00	.00	.00	.00	.00	.09	.03	.00	1.4	50	.00
13	.00	.00	1.8	.00	.00	7.0	.00	.00	.00	.01	1.0	.00
14	.00	.00	.05	.00	.00	7.8	.00	.00	.00	.66	.50	.00
15	.00	.00	.00	.00	.00	1.1	.00	.00	.00	.09	.00	.00
16	.00	.00	.00	.00	.00	.00	.00	.00	.00	4.1	.00	.00
17	.74	.00	.00	.00	.00	.00	.00	.00	.00	6.0	.39	5.9
18	.53	.00	.00	.00	.00	.00	.00	5.2	.00	2.3	3.4	.10
19	.61	.00	.00	.00	.00	.00	.00	14	.00	.87	8.8	.00
20	.08	.00	.02	.00	.00	.00	.15	2.0	.00	.57	9.5	.00
21	4.9	.00	.08	.00	.00	.00	6.4	3.2	.00	.15	7.4	.00
22	9.2	.00	.00	.00	.00	.00	.76	.67	.00	.00	2.1	.00
23	.30	.00	.00	.00	.00	.00	.32	.00	.00	.00	8.7	.00
24	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	1.4	.00
25	.00	.00	.00	.00	.00	.00	.00	.00	.00	.10	.00	.00
26	.00	.00	.00	.00	.73	.00	.00	.00	.00	.06	.00	.00
27	.00	.00	.00	.00	16	.00	.03	.00	.00	1.6	.00	.00
28	.00	.00	.00	.00	16	4.0	.42	.00	.00	.75	.00	.00
29	.00	.00	.00	.00	---	.31	16	.00	.00	.00	.00	.00
30	.00	.00	.00	.00	---	2.3	3.1	.00	.00	.00	.00	.00
31	.00	---	.00	.00	---	.08	---	.00	---	.00	.00	---
TOTAL	16.36	.02	19.25	.00	37.48	35.76	39.21	39.69	7.66	29.58	104.19	6.00
MEAN	.53	.001	.62	.000	1.34	1.15	1.31	1.28	.26	.95	3.36	.20
MAX	9.2	.01	8.6	.00	16	10	16	14	6.5	8.8	50	5.9
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	32	.04	38	.00	74	71	78	79	15	59	207	12

CAL YR 1976 TOTAL 1001.95 MEAN 2.74 MAX 142 MIN .00 AC-FT 1990
WTR YR 1977 TOTAL 335.20 MEAN .92 MAX 50 MIN .00 AC-FT 665

NOTE.--No gage-height record Aug. 2-17.

HAWAII, ISLAND OF HAWAII

16767000 NINOLE GULCH NEAR PUNALUU

LOCATION.--Lat 19°10'44", long 155°33'46", Hydrologic Unit 20010000, on right bank 300 ft (91 m) downstream from forest-reserve boundary, 4.6 mi (7.4 km) northwest of Punaluu, and 6.0 mi (9.6 km) north of Honuapo.

DRAINAGE AREA.--15.5 mi² (40.1 km²).

PERIOD OF RECORD.--March 1966 to current year.

GAGE.--Water-stage recorder and sharp-crested weir. Altitude of gage is 2,080 ft (634 m), from topographic map.

REMARKS.--Records good except those above 60 cfs, which are fair. No diversion above station.

AVERAGE DISCHARGE.--11 years, 3.82 ft³/s (0.108 m³/s), 2,770 acre-ft/yr (3.41 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,430 ft³/s (68.8 m³/s) Apr. 11, 1970, gage height, 6.62 ft (2.018 m), from rating curve extended above 30 ft³/s (0.85 m³/s); no flow for many days each year.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 528 ft³/s (15.0 m³/s) Nov. 9, gage height, 4.93 ft (1.503 m), from rating curve extended above 30 ft³/s (0.85 m³/s), no peak above base of 1,000 ft³/s (28.3 m³/s); no flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.00	.00	.00	.13	.00	.00	.00	.00
2	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
3	.00	.00	.00	.00	.00	9.2	.00	.00	.00	.00	.00	.00
4	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
5	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
6	.00	.00	23	.00	.00	.00	.00	.52	.00	.00	33	.00
7	.00	.00	4.3	.00	.00	.00	.00	1.1	.00	.00	6.0	.00
8	.00	.00	.04	.00	.00	.00	.00	.93	.00	.00	.00	.00
9	.00	66	.00	.00	.00	.00	.00	.04	14	.00	.00	.00
10	.00	53	.00	.00	.00	.00	.00	.00	.30	.47	.00	.00
11	.00	.63	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
12	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	94	.00
13	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	1.6	.00
14	.00	.00	.00	.00	.00	.00	.00	.00	.00	.02	.05	.00
15	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
16	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
17	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	7.3
18	.00	.00	.00	.00	.00	.00	.00	3.2	.00	.00	.65	.00
19	.00	.00	.00	.00	.00	.00	.00	.17	.00	.00	9.0	.00
20	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	7.1	.00
21	.27	.00	.00	.00	.00	.00	2.4	.00	.00	.00	.51	.00
22	38	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
23	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	3.9	.00
24	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.02	.00
25	.00	.00	.00	.00	.00	.00	.30	.00	.00	.00	.00	.00
26	.00	.00	.00	.00	.00	.00	.00	.00	.00	.10	.00	.00
27	.00	.00	.00	.00	14	.00	.00	.00	.00	.71	.00	.00
28	.00	.00	.00	.00	.37	.00	.13	.00	.00	.00	.00	.00
29	.00	.00	.00	.00	---	.00	65	.00	.00	.00	.00	.00
30	.55	.00	.00	.00	---	.00	1.7	.00	.00	.00	.00	.00
31	.00	---	.00	.00	---	.00	---	.00	---	.00	.00	---
TOTAL	38.82	119.63	27.34	.00	14.37	9.20	69.53	6.09	14.30	1.30	155.83	7.30
MEAN	1.25	3.99	.88	.000	.51	.30	2.32	.20	.48	.042	5.03	.24
MAX	38	66	23	.00	14	9.2	65	3.2	14	.71	94	7.3
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	77	237	54	.00	29	18	138	12	28	2.6	309	14

CAL YR 1976 TOTAL 1441.98 MEAN 3.94 MAX 351 MIN .00 AC-FT 2860
WTR YR 1977 TOTAL 463.71 MEAN 1.27 MAX 94 MIN .00 AC-FT 920

HAWAII, ISLAND OF HAWAII

16770500 PAAUAU GULCH AT PAHALA

LOCATION.--Lat 19°12'39", long 155°28'48", Hydrologic Unit 20010000, on right bank 100 ft (30 m) downstream from bridge on Wood Valley Road and 0.7 mi (1.1 km) north of Pahala.

DRAINAGE AREA.--1.74 mi² (4.51 km²).

PERIOD OF RECORD.--May 1962 to current year.

GAGE.--Water-stage recorder. Datum of gage is 972 ft (296.3 m) above mean sea level (by stadia survey).

REMARKS.--Records good. No diversion above station.

AVERAGE DISCHARGE.--15 years, 0.797 ft³/s (0.023 m³/s), 577 acre-ft/yr (711,000 m³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,600 ft³/s (102 m³/s) Jan. 5, 1969, Jan. 8, 1975, gage height, 5.90 ft (1.798 m), from rating curve extended above 360 ft³/s (10.2 m³/s) on basis of slope-area measurement at gage height 4.40 ft (1.341 m); no flow most of time.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 990 ft³/s (28.0 m³/s) Aug. 12, gage height, 4.69 ft (1.430 m), from rating curve extended as explained above, no other peak above base of 180 ft³/s (5.10 m³/s); no flow most of time.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
2	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
3	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
4	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
5	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
6	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
7	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
8	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
9	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
10	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
11	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
12	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	55	.00
13	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	1.0	.00
14	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
15	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
16	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
17	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
18	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
19	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
20	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
21	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
22	1.8	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
23	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
24	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
25	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
26	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
27	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
28	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
29	.00	.00	.00	.00	---	.00	.00	.00	.00	.00	.00	.00
30	.00	.00	.00	.00	---	.00	.00	.00	.00	.00	.00	.00
31	.00	---	.00	.00	---	.00	---	.00	---	.00	.00	---
TOTAL	1.80	.00	.00	.00	.00	.00	.00	.00	.00	.00	56.00	.00
MEAN	.058	.000	.000	.000	.000	.000	.000	.000	.000	.000	1.81	.000
MAX	1.8	.00	.00	.00	.00	.00	.00	.00	.00	.00	55	.00
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	3.6	.00	.00	.00	.00	.00	.00	.00	.00	.00	111	.00

CAL YR 1976 TOTAL 763.22 MEAN 2.09 MAX 387 MIN .00 AC-FT 1510
WTR YR 1977 TOTAL 57.80 MEAN .16 MAX 55 MIN .00 AC-FT 115

As the number of streams on which streamflow information is likely to be desired far exceeds the number of stream-gaging stations feasible to operate at one time, the Geological Survey collects limited streamflow data at sites other than stream-gaging stations. When limited streamflow data are collected on a systematic basis over a period of years for use in hydrologic analyses, the site at which the data are collected is called a partial-record station. Data collected at these partial-record stations are usable in low-flow or floodflow analyses, depending on the type of data collected. In addition, discharge measurements are made at other sites not included in the partial-record program. These measurements are generally made in times of drought or flood to give better areal coverage to those events. Those measurements and others collected for some special reason are called measurements at miscellaneous sites.

Records collected at partial-record stations are presented in two tables. The first is a table of discharge measurements at low-flow partial-record stations, and the second is a table of annual maximum stage and discharge at crest-stage stations. Discharge measurements made at miscellaneous sites for both low flow and high flow are given in a third table.

Low-flow partial-record stations

Measurements of streamflow in the area covered by this report made at low-flow partial-record stations are given in the following table. Most of these measurements were made during periods of base flow when streamflow is primarily from ground-water storage. These measurements, when correlated with the simultaneous discharge of a nearby stream where continuous records are available, will give a picture of the low-flow potentiality of the stream. The column headed "Period of record" shows the water years in which measurements were made at the same, or practically the same, site.

Discharge measurements made at low-flow partial-record statinns during water year 1977

Station No.	Station name	Location	Drainage area mi^2 (km^2)	Period of record	Measurements: Date	Measurements: Discharge (ft^3/s)
		Hawaii, Island of Kauai				
16011000	Waiakoali Stream near Waimea	Lat 22°07'42", long 159°37'27", 0.3 mi (0.5 km) upstream from mouth and 12 mi (19 km) northeast of Waimea.	1.58 (4.09)	1909-13≠, 1914-17, 1919-25≠, 1961-62, 1964, 1966-70, 1972-77	12-13-76 6-15-77 8- 3-77	1.1 2.8 1.4
16012000	Kawaikinana Stream near Waimea	Lat 22°08'12", long 159°37'58", 0.6 mi (1.0 km) upstream from mouth and 12 mi (19 km) northeast of Waimea.	.84 (2.18)	1911-13, 1915-17, 1919-25≠, 1961-62, 1964, 1966-77	12-13-76 6-15-77 8- 3-77	.39 .82 .60
16025500	Mokihana Stream near Waimea	Lat 21°59'38", long 159°40'07", 500 ft (152 m) upstream from mouth and 2.5 mi (4.0 km) north of Waimea.	4.83 (12.51)	1962, 1964-77	2- 7-77 5- 2-77 8- 1-77	.04 .72 .17
16058500	South Fork Wailua River near rock Quarry	Lat 22°01'44", long 159°25'03", 7.5 mi (12.1 km) upstream from mouth and 4.6 mi (7.4 km) northwest of Lihue.	20.2 (52.3)	1974-77	1-21-77 3-25-77 7-25-77	1.7 2.9 2.5
16102000	China ditch near Hanalei	Lat 22°11'10", long 159°28'00", on left bank just below intake and 3.0 mi (4.8 km) southeast of Hanalei.	-	1913-19≠, 1977	8-25-77	16
		Hawaii, Island of Oahu				
16201000	Right Branch of North Fork Kaukonahua Stream near Wahiawa	Lat 21°31'11", long 157°56'53", 200 ft (61 m) above confluence with Left Branch and 4.5 mi (7.2 km) east of Leilehua High School in Wahiawa.	1.17 (3.03)	1913-53≠, 1960-62, 1966, 1968-77	11-24-76 1- 5-77 8-15-77	.95 .43 2.4
16214000	Pearl Harbor Springs at Waiawa, near Pearl City	Lat 21°23'36", long 157°59'11", 0.7 mi (1.1 km) west of Pearl City and 1.5 mi (2.4 km) east of Waipahu Post Office.	-	1931-34≠, 1937-64≠, 1967-68, 1970-77	1-11-77 4- 6-77	12 11
16224000	Pearl Harbor Springs at Kalauao, near Aiea	Lat 21°23'05", long 157°56'46", 300 ft (91 m) downstream from Highway 90 and 0.8 mi (1.3 km) west of Aiea Post Office.	-	1931-62≠, 1964-65≠, 1966-68, 1970-77	1-12-77 4- 7-77	15 12
16264100	Kahanaiki Stream at Highway 61, near Kailua	Lat 21°22'49", long 157°46'06", at bridge on Highway 61 and 1.9 mi (3.1 km) southwest of Kailua Post Office.	1.45 (3.76)	1960-63, 1965-66, 1971-77	12-23-76 9-19-77	.74 .57
*16274499	Keaahala Stream at Kamehameha Highway, at Kaneohe	Lat 21°25'13", long 157°48'16", 36 ft (11 m) upstream from bridge at Kamehameha Highway in Kaneohe.	.62 (1.61)	1961-63, 1965-66, 1971-75, 1977	3- 7-77c	4.3

* Also a crest-stage partial-record station.
≠ Operated as a continuous-record gaging station.
c Not previously published.

Discharge measurements made at low-flow partial-record stations during water year 1977--Continued

Station No.	Station name	Location	Drainage area mi² (km²)	Period of record	Measurements Date	Measurements Discharge (ft³/s)
		Hawaii, Island of Oahu--Continued				
16283400	Kahaluu Stream near Kahaluu	Lat 21°27'14", long 157°50'17", 600 ft (183 m) above Ahuimanu Stream and 0.6 mi (1.0 km) south of Kahaluu.	1.29 (3.34)	1962-63, 1966, 1972-77	12-20-76 9-22-77	1.7 2.2
*16283480	Ahuimanu Stream near Kahaluu	Lat 21°27'06", long 157°50'13", at bridge on Ahuimanu Road and 0.8 mi (1.3 km) south of Kahaluu.	2.31 (5.98)	1962-63, 1965-66, 1968, 1972-77	12-20-76	.51
16295995	Kahana Stream at Mauka trail crossing, near Kahana	Lat 21°32'17", long 157°53'29", 1.8 mi (2.9 km) upstream from main bridge on Kamehameha Highway and 2.8 mi (4.5 km) southwest of Kaaawa School.	3.18 (8.24)	1960-62, 1966, 1971-72, 1974-77	12-21-76 9-15-77	12 16
16297000	Kawa Stream near Kahana	Lat 21°32'33", long 157°53'00", 0.1 mi (0.2 km) above confluence with Kahana Stream and 1.0 mi (1.6 km) south of Kahana.	2.09 (5.41)	1914-17≠, 1958b, 1961-62, 1966, 1971-72, 1974-77	9-16-77	1.7
		Hawaii, Island of Molokai				
16403400	Kapuhi Stream at altitude 1,000 ft (305 m) near Pelekunu	Lat 21°07'50", long 156°53'02", 500 ft (152 m) upstream from Kawailena Stream, 2.2 mi (3.5 km) south of former village of Pelekunu, and 5.4 mi (8.7 km) north of Kamalo.	.51 (1.32)	1968-77	10-28-76 1-18-77 5-26-77 8- 4-77	1.0 .70 1.6 .84
16403500	Kawailena Stream near Pelekunu	Lat 20°07'52", long 156°53'05", 800 ft (244 m) upstream from mouth, 2.2 mi (3.5 km) south of former village of Pelekunu, and 5.5 mi (8.8 km) north of Kamalo.	.65 (1.68)	1968-77	10-28-76 1-18-77 5-26-77 8- 4-77	1.4 1.2 2.3 1.5
16403600	Kapuhi Stream near Pelekunu	Lat 21°07'57", long 156°52'56", on left bank 400 ft (122 m) downstream from Kawailena Stream, 2.1 mi (3.4 km) south of former village of Pelekunu, and 5.6 mi (9.0 km) north of Kamalo.	1.20 (3.11)	1968-70≠, 1974-77	10-28-76 1-18-77 5-26-77 8- 4-77	2.4 1.8 3.7 2.3
16403700	Kawainui Stream at altitude 1,000 ft (305 m) near Pelekunu	Lat 20°07'46", long 156°52'31", 400 ft (122 m) upstream from Kawaipoko Stream, 2.4 mi (3.9 km) south of former village of Pelekunu, and 5.4 mi (8.7 km) north of Kamalo.	.79 (2.05)	1968-77	10-28-76 1-18-77 5-26-77 8- 4-77	2.3 1.2 .70 .54
16403800	Kawaipoko Stream near Pelekunu	Lat 21°07'48", long 156°52'30", 300 ft (91 m) upstream from mouth, 2.4 mi (3.9 km) south of former village of Pelekunu, and 5.4 mi (8.7 km) north of Kamalo.	.26 (.67)	1968-77	10-28-76 1-18-77 5-26-77 8- 4-77	.63 .15 2.9 1.8
		Hawaii, Island of Maui				
*16502000	Hahalawe Gulch near Kipahulu	Lat 20°40'54", long 156°02'50", at old ditch intake, 0.7 mi (1.1 km) upstream from mouth, and 1 8 mi (2.9 km) northeast of Kipahulu Church.	.43 (1.11)	1927-69≠, 1970-77	10- 6-76 11-23-76 1-13-77 6-16-77 8-10-77	.93 2.8 .74 1.8 1.7

* Also a creat-stage partial-record station.
≠ Operated as a continuous-record gaging station.
b Previously published with discharge measurements at miscellaneous sites.

Crest-stage partial-record stations

Prior to 1973, crest-stage partial-record station records for the State of Hawaii were published in an annual progress report entitled "An Investigation of Floods in Hawaii." The following table contains annual maximum discharge for crest-stage stations. A crest-stage gage is a device which will register the peak stage occurring between inspections of the gage. A stage-discharge relation for each gage is developed from discharge measurements made by indirect measurements of peak flow or by current meter. The date of the maximum discharge is not always certain but is usually determined by comparison with nearby continuous-record stations, weather records, or local inquiry. Only the maximum discharge for each water year is given. Information on some lower floods may have been made for purposes of establishing the stage-discharge relation, but these are not published herein. The years given in the period of record represent water years for which the annual maximum has been determined.

Annual maximum discharge at crest-stage partial-record stations during water year 1977

Station No.	Station name	Location	Drainage area mi² (km²)	Period of record	Annual maximum Date	Gage height (feet)	Discharge (ft³/s)
		Hawaii, Island of Kauai					
16038000	Waimea River at Waimea	Lat 21°57'23", long 159°39'59", 150 ft (46 m) upstream from highway bridge at Waimea and 0.2 mi (0.3 km) upstream from mouth.	86.5 (224.0)	1944-77d	-	-	-
16052000	Hanapepe River at Hanapepe	Lat 21°54'47", long 159°35'33", 400 ft (122 m) upstream from bridge on Highway 50 and 0.5 mi (0.8 km) upstream from mouth.	26.6 (68.9)	1950-77d	6-28-77	3.26	-
16052500	Lawai Stream near Koloa	Lat 21°54'11", long 159°30'21", on right bank at private road bridge, 0.9 mi)1.4 km) upstream from mouth and 2.4 mi (3.9 km) southwest of Koloa.	6.62 (17.15)	1962-63, 1964-72≠, 1973-77	5-12-77	-	e100
16055000	Huleia Stream near Lihue	Lat 21°57'20", long 159°25'23", at highway bridge, 3.7 mi (6.0 km) southwest of Lihue, and 4.5 mi (7.2 km) upstream from mouth.	17.6 (45.6)	1912-15≠, 1962-67, 1968-70≠, 1971-77	5-10-77	10.78	3,400
16071800	Wailua River near Kapaa	Lat 22°03'00", long 159°20'26", at State Park 600 ft (183 m) upstream from highway bridge, 850 ft (259 m) upstream from mouth, and 2.5 mi (4.0 km) southwest of Kapaa.	52.6 (136.2)	1962-77d	-	-	-
16073500	Konohiki Stream near Kapaa	Lat 22°04'01", long 159°20'21", at culvert on private road, 1.8 mi (2.9 km) upstream from mouth and 2.4 mi (3.9 km) southwest of Kapaa High School.	3.38 (8.75)	1964-67, 1970-77	5-10-77	4.53	142
16081200	Akulikuli Stream near Kapaa	Lat 22°06'25", long 159°22'07", at Kahuna road crossing, 800 ft (244 m) upstream from mouth and 3.5 mi (5.6 km) northwest of Kapaa armory.	.40 (1.04)	1964-77	5- 9-77	3.92	245
16084500	Kapaa Stream at old highway crossing, near Kealia	Lat 22°06'28", long 159°19'52", at abutment of old highway bridge, 100 ft (30 m) upstream from road crossing, 1.4 mi (2.2 km) northwest of Kealia and 2.1 mi (3.4 km) upstream from mouth.	14.0 (36.3)	1962-77	5- 9-77	8.15	1,400
16085000	Homaikawaa Stream near Kealia	Lat 22°07'23", long 159°18'12", at culvert on Highway 56, 1.6 mi (2.6 km) southeast of Anahola School and 1.6 mi (2.6 km) north of Kealia.	.85 (2.20)	1964-77	-	-	No flow
16097900	Puukumu Stream near Kilauea	Lat 22°13'02", long 159°25'18", at culvert on Highway 56, 0.8 mi (1.3 km) northwest of Kilauea School and 0.9 mi (1.4 km) upstream from mouth.	.91 (2.36)	1964-68, 1971-77	-	-	No flow

≠ Operated as a continuous-record gaging station.
d Gage height only.
e Estimated.

Annual maximum discharge at crest-stage partial-record stations during water year 1977--Continued

Station No.	Station name	Location	Drainage area mi² (km²)	Period of record	Annual maximum Date	Gage height (feet)	Discharge (ft³/s)
		Hawaii, Island of Kauai--Continued					
16104200	Hanalei River at Highway 56 Bridge near Hanalei	Lat 22°12'50", long 159°28'43", at highway bridge, 1.6 mi (2.6 km) northeast of Hanalei and 2.4 mi (3.9 km) upstream from mouth.	21.0 (54.4)	1963-77d	-	-	-
16130000	Nahonalu Valley near Mana	Lat 22°02'41", long 159°45'17", on left bank 1.1 mi (1.8 km) northeast of Mana and 5.3 mi (8.5 km) northwest of Kekaha School.	3.81 (9.87)	1962-63, 1964-71≠, 1972-77	5-12-77	-	e100
		Hawaii, Island of Oahu					
16210500	Kaukonahua Stream at Waialua	Lat 21°33'56", long 158°07'26", 0.2 mi (0.3 km) upstream from Highway 99, 0.4 mi (0.6 km) southeast of Waialua High School and 1.3 mi (2.1 km) southwest of Weed Circle.	38.7 (100.2)	1963, 1968-77	4-20-77	-	e610
16211200	Poamoho Stream at Waialua	Lat 21°34'00", long 158°06'40", at culvert crossing of Kaheaka Road, 0.2 mi (0.3 km) upstream from Highway 83 and 1.1 mi (1.8 km) east of Waialua High School.	10.9 (28.2)	1967-77	4-20-77	16.39	e1,600
16211300	Makaleha Stream near Waialua	Lat 21°33'49", long 158°09'21", 1.0 mi (1.6 km) southwest of Dillingham Ranch and 1.9 mi (3.1 km) southwest of sugar mill at Waialua.	4.15 (10.75)	1958-63, 1964-65≠, 1966-77	3-31-77	4.64	172
16211400	Manini Gulch at Kaena	Lat 21°34'50", long 158°15'12", 180 ft (55m) upstream from Highway 99, 1.7 mi (2.7 km) west of Camp Erdman and 2.0 mi (3.2 km) east of Kaena Point.	1.08 (2.80)	1974-77	-	-	e15
16211500	Makua Stream at Makua	Lat 21°31'59", long 158°13'49", on left bank, 20 ft (6 m) upstream from old concrete highway ford, 140 ft (43 m) downstream from Farrington Highway box culvert, 0.1 mi (0.2 km) north of Makua cemetery, and 4.5 mi (7.2 km) southeast of Kaena Point lighthouse.	4.28 (11.09)	1958-77	-	-	e50
16211700	Makaha Stream at Makaha	Lat 21°28'47", long 158°12'31", 0.9 mi (1.4 km) upstream from Farrington Highway and 1.1 mi (1.8 km) north of junction of Farrington Highway and Makaha Valley Road.	5.25 (13.60)	1966-77	-	-	e120
16211800	Kaupuni Stream at altitude 372 ft (144 m), near Waianae	Lat 21°28'20", long 158°09'26", at abandoned diversion dam, 2.6 mi (4.2 km) northeast of Waianae cemetery and 2.8 mi (4.5 km) northeast of junction of Waianae Valley Road and Farrington Highway.	3.58 (9.27)	1961-72≠, 1973-77	5-10-77	4.01	140
16212200	Mailiilii Stream near Waianae	Lat 21°27'34", long 158°08'05", at bridge at Lualualei Naval Reservation and 3.4 mi (5.5 km) east of cemetery near Waianae.	1.51 (3.91)	1958-77	-	-	e100
16212300	Nanakuli Stream at Nanakuli	Lat 21°23'08", long 158°08'11", 0.7 mi (1.1 km) upstream from Highway 90 and 0.6 mi (1.0 km) northeast of Nanakuli Post Office.	3.98 (10.31)	1968-77	-	-	e300

≠ Operated as a continuous-record gaging station.
d Gage height only.
e Estimated.

Annual maximum discharge at crest-stage partial-record stations during water year 1977--Continued

Station No.	Station name	Location	Drainage area mi² (km²)	Period of record	Annual maximum Date	Gage height (feet)	Discharge (ft³/s)
		Hawaii, Island of Oahu--Continued					
16212450	Kaloi Gulch tributary near Honouliuli	Lat 21°22'41", long 158°03'45", at culvert on private road, 1.8 mi (2.9 km) west of Honouliuli and 2.8 mi (4.5 km) northwest of Ewa Post Office.	1.70 (4.40)	1968-77	4-19-77	4.48	255
16212500	Honouliuli Stream near Waipahu	Lat 21°22'40", long 158°02'10", at bridge on Farrington Highway and 1.8 mi (2.9 km) west of Waipahu Post Office.	11.0 (28.5)	1956-77	4-19-77	1.90	207
16212601	Waikele Stream at Wheeler Field	Lat 21°28'44", long 158°03'07", at culvert 0.3 mi (0.5 km) west of east-west runway at Wheeler Field, and 1.9 mi (3.1 km) southwest of Wahiawa Post Office.	6.35 (16.45)	1958, 1960-77	4-19-77	4.34	140
16212700	Waikakalaua Stream near Wahiawa	Lat 21°27'50", long 158°01'38", 0.2 mi (0.3 km) downstream from Kamehameha Highway and 2.4 mi (3.9 km) south of Wahiawa Post Office.	7.49 (19.40)	1958-77	4-19-77	4.58	482
16212750	Huliwai Gulch near Kunia Camp	Lat 21°26'43", long 158°03'47", 200 ft (61 m) upstream from Highway 75 and 1.2 mi (1.9 km) south of Kunia Camp.	.84 (2.18)	1974-77	4-19-77	6.44	35
16223000	Waimalu Stream near Aiea	Lat 21°23'48", long 157°56'56", 1,300 ft (400 m) upstream from bridge on Moanalua Road and 1.2 mi (1.9 km) northwest of Aiea High School.	5.97 (15.46)	1952-70≠, 1973-77	6-8-77	2.65	1,010
16227000	Halawa Stream at Aiea	Lat 21°22'26", long 157°55'42", 0.7 mi (1.1 km) southeast of Aiea Post Office and 6.2 mi (10.0 km) northwest of Honolulu Post Office.	8.78 (22.74)	1954-62, 1966-72, 1977	6-8-77	4.52	1,900
**16228200	Moanalua Stream near Aiea	Lat 21°22'37", long 157°53'03", on right bank 1.1 mi (1.8 km) northeast of Tripler Hospital and 2.9 mi (4.7 km) east of Aiea sugar refinery.	3.34 (8.65)	1969-77	4-19-77	4.46	892
**16228600	Moanalua Stream at Tripler Hospital	Lat 21°21'52", long 157°54'05", on right bank 0.5 mi (0.8 km) west of Tripler Hospital and 1.6 mi (2.6 km) northeast of Aliamanu School.	4.44 (11.50)	1971-77	4-19-77	14.45	e1,200
16228900	Kalihi Stream near Kaneohe	Lat 21°22'35", long 157°49'32", on right bank 800 ft (244 m) downstream from Likelike Highway, and 2.8 mi (4.5 km) southwest of Castle High School in Kaneohe.	.60 (1.55)	1967-71≠, 1972-77	4-19-77	3.28	384
16235400	Waolani Stream at Honolulu	Lat 21°20'00", long 157°51'04", at Wyllie Street bridge and 1.8 mi (2.9 km) northeast of Honolulu Post Office.	1.28 (3.32)	1958-77	5-12-77	3.47	985
16237500	Pauoa Stream at Honolulu	Lat 21°19'18", long 157°51'03", at Lusitana Street bridge and 1.1 mi (1.8 km) northeast of Honolulu Post Office.	1.43 (3.70)	1958-77	5-12-77	1.21	677
16247100	Manoa-Palolo Drainage Canal at Moiliili	Lat 21°17'24", long 157°49'17", on left bank at Kainuki High School, 0.3 mi (0.5 km) downstream from confluence of Manoa and Palolo Stream and 0.6 mi (1.0 km) upstream from point of discharge into Ala Wai Canal.	9.35 (24.22)	1968-77	5-12-77	8.68	4,420

** Also a water-quality partial-record station.
≠ Operated as a continuous-record gaging station.
e Estimated.

Annual maximum discharge at crest-stage partial-record stations during water year 1977--Continued

Station No.	Station name	Location	Drainage area mi² (km²)	Period of record	Annual maximum Date	Gage height (feet)	Discharge (ft³/s)
		Hawaii, Island of Oahu--Continued					
16247500	Wailupe Gulch at Aina Haina	Lat 21°17'46", long 157°45'29", at Ani Street bridge and 1.0 mi (1.6 km) upstream from Kalanianaole Highway in Aina Haina.	2.35 (6.09)	1958-77	-	-	e150
16247900	Kuliouou Valley at Kuliouou	Lat 21°17'50", long 157°43'35", at Kuliouou, 300 ft (91 m) downstream of single-lane wooden bridge and 0.6 mi (1.0 km) upstream from Highway 72.	1.18 (3.06)	1958-59, 1970-77	5-12-77	-	e200
16248800	Inoaole Stream at Waimanalo	Lat 21°29'31", long 157°42'40", 30 ft (9 m) upstream from culvert on Hihimanu Street and 0.8 mi (1.3 km) northwest of Wainanalo Post Office.	1.21 (3.13)	1958-77	5-12-77	4.81	363
16249000	Waimanalo Stream at Waimanalo	Lat 21°21'12", long 157°43'52", on right bank 40 ft (12 m) upstream from Highway 72 and 2.3 mi (3.7 km) northwest of Waimanalo Post Office.	2.16 (5.59)	1967-70≠, 1971-77	5-12-77	10.00	e3,500
16249100	Kaelepulu Stream tributary at Kailua	Lat 21°21'44", long 157°44'22", 30 ft (9 m) upstream from Kalanianaole Highway, 1.6 mi (2.6 km) northwest of Waimanalo School and 2.4 mi (3.9 km) south of Kailua Post Office.	.16 (.41)	1963-77	5-12-77	5.57	286
16260500	Maunawili Stream at Highway 61, near Kailua	Lat 21°22'51", long 157°45'48", on right bank at downstream side of bridge on Highway 61, 0.6 mi (1.0 km) west of Maunawili School and 1.6 mi (2.6 km) southwest of Kailua Post Office.	5.34 (13.83)	1958-67, 1968-71≠, 1972-77	5-12-77	12.83	4,630
16264800	Kawainui Canal at Kailua	Lat 21°24'15", long 157°45'28", at head of canal and 1.2 mi (1.9 km) northwest of Kailua Post office.	11.0 (28.5)	1957-60, 1963-64, 1967-77d	6-30-77	4.10	-
16265000	Kawa Stream at Kaneohe	Lat 21°24'32", long 157°47'36", 50 ft (15 m) upstream from bridge on Kaneohe Bay Drive at Kaneohe, 0.2 mi (0.3 km) northeast of Castle High School, and 0.6 mi (1.0 km) upstream from mouth.	1.19 (3.08)	1965, 1968-74, 1977	5-12-77	6.29	557
16270900	Luluku Stream at altitude 220 ft (67 m), near Kaneohe	Lat 21°23'42", long 157°48'46", on left bank 0.5 mi (0.8 km) upstream from mouth, 1.4 mi (2.2 km) southwest of Castle High School, and 1.9 mi (3.1 km) south of Kaneohe Post Office.	.44 (1.14)	1967-71≠, 1972-75, 1977	5-12-77	3.56	96
*16274499	Keaahala Stream at Kamehameha Highway, at Kaneohe	Lat 21°25'12", long 157°48'15", 35 ft (11 m) upstream from bridge on Kamehameha Highway in Kaneohe.	.62 (1.61)	1959-77	-	-	e300
16279500	Heeia Stream at Kaneohe	Lat 21°25'17", long 157°49'01", 60 ft (18 m) downstream from culvert on Kahekili Highway, 0.7 mi (1.1 km) west of Kaneohe Post Office and 0.8 mi (1.3 km) southwest of Heeia.	1.80 (4.66)	1965-66, 1968-77	5-12-77	5.21	e680
*16283480	Ahuimanu Stream near Kahaluu	Lat 21°27'04", long 157°50'13", at bridge on Ahuimanu Road and 0.8 mi (1.3 km) south of Kahaluu.	2.31 (5.98)	1963-77	5-12-77	5.35	e600

* Also a low-flow partial-record station.
≠ Operated as a continuous-record gaging station.
d Gage height only.
e Estimated.

Annual maximum discharge at crest-stage partial-record stations during water year 1977--Continued

Station No.	Station name	Location	Drainage area mi² (km²)	Period of record	Annual maximum Date	Gage height (feet)	Discharge (ft³/s)
		Hawaii, Island of Oahu--Continued					
16304500	Kaluanui Stream at Hauula	Lat 21°35'57", long 157°54'24", on left downstream wingwall of concrete bridge, 1.2 mi (1.9 km) southeast of cemetery in Hauula and 1.4 mi (2.2 km) northeast of Sacred Falls.	2.12 (5.49)	1958-77	5- 9-77	2.57	e650
16310501	Malaekahana Stream at altitude 30 ft (9 m), near Kahuku	Lat 21°39'47", long 157°57'11", at abandoned plantation railroad bridge, 1.1 mi (1.8 km) southwest of junction of planation road and Highway 83, and 1.2 mi (1.9 km) south of Kahuku Hospital.	4.05 (10.49)	1959-77	4-19-77	3.51	e100
16311000	Oio Stream near Kahuku	Lat 21°41'32", long 157°59'48", 0.6 mi (1.0 km) southwest of junction of Pla tation Road and Highway 83 and 2.7 mi (4.3 km) west of Kahuku Hospital.	2.13 (5.52)	1958-77	4-19-77	5.40	e50
16317800	Kaunala Gulch near Sunset Beach	Lat 21°40'59", long 158°02'12", on downstream left bank wingwall of road bridge on Highway 83 near Sunset Beach and 2.9 mi (4.7 km) northeast of Waimea.	1.98 (5.13)	1973-77	2-28-77	2.93	e250
16318000	Paumalu Gulch at Sunset Beach	Lat 21°40'19", long 158°02'28", 0.4 mi (0.6 km) upstream from Highway 83 at Sunset Beach and 2.2 mi (3.5 km) northeast of Waimea.	2.59 (6.71)	1968-77	4-19-77	2.03	e20
16331000	Waimea Gulch near Kawailoa Camp	Lat 21°37'29", long 158°04'58", at culvert on Ashley Road, 0.1 mi (0.2 km) upstream from Highway 83 and 1.1 mi (1.8 km) north of Kawailoa Camp.	2.23 (5.78)	1968-77	4-19-77	-	e10
16340000	Anahulu River near Haleiwa	Lat 21°35'28", long 158°04'45", 1.7 mi (2.7 km) southeast of junction of Emerson Road and Kamehameha Highway and 2.5 mi (4.0 km) east of Waialua School at Haleiwa.	13.5 (35.0)	1958-77	5- 9-77	3.59	737
16350000	Opaeula Stream near Haleiwa	Lat 21°35'09", long 158°06'01", 0.6 mi (1.0 km) upstream from Kamehameha Highway and 2.1 mi (3.4 km) northeast of Waialua.	5.96 (15.44)	1956-77	5- 9-77	9.79	328
		Hawaii, Island of Molokai					
16411300	Kakaako Gulch Highway 46, near Mauna Loa	Lat 21°08'49", long 157°11'36", at Highway 46, 1.6 mi (2.6 km) northeast of Mauna Loa, and 1.8 mi (2.9 km) upstream from Kamakahi Gulch.	.55 (1.42)	1964-77	4-18-77	-	e1
16411320	Kakaako Gulch above Kamakahi Gulch, near Mauna Loa	Lat 21°10'11", long 157°11'56", 0.1 mi (0.2 km) upstream from Kamakahi Gulch, 1.7 mi (2.7 km) downstream form Highway 46, and 2.5 mi (4.0 km) northeast of Mauna Loa.	1.40 (3.63)	1964-77	4-18-77	-	e5
16411400	Kakaako Gulch near Mauna Loa	Lat 21°10'39", long 157°12'31", on left bank 1.0 mi (2.0 km) downstream from Kamakahi Gulch and 3.0 mi (4.8 km) north of Mauna Loa School.	5.34 (13.83)	1963-72≠, 1973-77	4-18-77	2.54	502
16411600	Kaunala Gulch near Mauna Loa	Lat 21°07'01", long 157°15'43", at Sand Haul Road, 3.2 mi (5.2 km) east of Laau Point lighthouse, and 3.3 mi (5.3 km) southwest of Mauna Loa.	.28 (.73)	1964-77	4-18-77	1.24	e18

≠ Operated as a continuous-record gaging station.
e Estimated.

Annual maximum discharge at crest-stage partial-record stations during water year 1977--Continued

Station No.	Station name	Location	Drainage area mi² (km²)	Period of record	Annual maximum Date	Gage height (feet)	Discharge (ft³/s)
		Hawaii, Island of Molokai--Continued					
16411640	Halena Gulch near Mauna Loa	Lat 21°05'53", long 157°13'47", 2.7 mi (4.3 km) southwest of Mauna Loa and 5.5 mi (8.8 km) east of Laau Point.	2.07 (5.36)	1965-77	4-18-77	2.91	403
16411800	Kaluapeelua Gulch at Hoolehua	Lat 21°09'55", long 157°04'22", 0.4 mi (0.6 km) south of Hoolehua and 2.1 mi (3.4 km) west of Kualapuu.	1.46 (3.78)	1964-77	3-31-77	.83	11
16411900	Kaluapeelua Gulch tributary near Molokai Airport	Lat 21°08'57", long 157°07'12", 1.7 mi (2.7 km) southwest of Molokai Airport and 5.1 mi (8.2 km) west of Kualapuu.	1.56 (4.04)	1964-77	5-14-77	1.70	43
16413500	Manawainui Gulch near Kualapuu	Lat 21°07'42", long 157°03'25", at bridge on Highway 46, 0.5 mi (0.8 km) south of Holomua School and 2.3 mi (3.7 km) southwest of Kualapuu.	10.4 (26.9)	1965-77	11-16-76	5.94	269
16414100	Unnamed gulch at Kaunakakai	Lat 21°05'14", long 157°00'45", at bridge on Highway 45, 0.6 mi (1.0 km) southeast of Kaunakakai and 0.8 mi (1.3 km) northwest of Kamiloloa.	1.19 (3.08)	1965-77	-	-	No flow
16415400	Wawaia Gulch at Kamalo	Lat 21°03'25", long 156°52'20", at Highway 45, 0.3 mi (0.5 km) upstream from mouth, and 0.5 mi (0.8 km) northeast of Kamalo.	2.12 (5.49)	1964-77	4- 4-77	-	e10
16419000	Pohakupili Gulch near Halawa	Lat 21°07'59", long 156°44'15", at Highway 45, 0.5 mi (0.8 km) upstream from mouth and 1.9 mi (3.1 km) south of Halawa.	.48 (1.24)	1964-77	4- 4-77	4.89	48
		Hawaii, Island of Maui					
16500100	Kepuni Gulch near Kahikinui House	Lat 20°37'21", long 156°15'16", on right bank 120 ft (37 m) upstream from bridge on Highway 31, 400 ft (122 m) upstream from Kamole Gulch, 1.1 mi (1.8 km) east of Kahikinui House, and 8.5 mi (13.7 km) west of Kaupo.	1.19 (4.95)	1963-72≠, 1973-77	8-12-77	4.48	192
16500300	Hawelewele Gulch near Kaupo	Lat 20°38'01", long 156°11'08", 700 ft (213 m) upstream from Piilani Highway 31 and 3.9 mi (6.3 km) west of Kaupo.	11.3 (29.3)	1967-77	5-12-77	9.71	7,660
16500800	Kukuiula Gulch near Kipahulu	Lat 20°39'18", long 156°04'44", at Highway 31, 1.3 mi (2.1 km) west of Kipahulu and 3.2 mi (5.2 km) east of Kaupo.	.76 (1.97)	1963-68≠, 1969-77	5-12-77	1.99	198
*16502000	Hahalawe Gulch near Kipahulu	Lat 20°40'54", long 156°02'50", on left bank at old ditch intake, 0.7 mi (1.1 km) upstream from mouth, and 1.8 mi (2.9 km) northeast of Kipahulu Church.	.43 (1.11)	1927-69≠, 1970-77	4- 1-77	3.43	515
16502400	Pukuilua Gulch near Hana	Lat 20°42'00", long 156°00'14", at Highway 31, 0.4 mi (0.6 km) southwest of Puuiki, and 4.0 mi (6.4 km) south of Hana.	.48 (1.24)	1963-77	4-18-77	3.62	172
16502800	Moomoonui Gulch at Hana	Lat 20°44'37", long 155°59'18", at Highway 31 just downstream from Moomooiki Gulch and 1.0 mi (1.6 km) south of Hana.	.90 (2.33)	1963-77	4-18-77	11.03	653

* Also a low-flow partial-record station.
≠ Operated as a continuous-record gaging station.
e Estimated.

Annual maximum discharge at crest-stage partial-record stations during water year 1977--Continued

Station No.	Station name	Location	Drainage area mi² (km²)	Period of record	Annual maximum Date	Gage height (feet)	Discharge (ft³/s)
		Hawaii, Island of Maui--Continued					
16502900	Kawaipapa Gulch at Hana	Lat 20°46'08", long 156°00'04", 1,000 ft (305 m) upstream from Highway 36 and 0.3 mi (0.5 km) northwest of Hana Hospital.	5.83 (15.10)	1965-77	4-18-77	7.18	3,600
16603300	Unnamed gulch at Maliko Bay	Lat 20°56'26", long 156°21'04", at Hana Highway, 0.5 mi (0.8 km) west of Maliko Bay, and 1.3 mi (2.1 km) north of Hanakuapoko.	.43 (1.11)	1963-77	-	-	No flow
16603700	Kalialinui Gulch tributary near Pukalani	Lat 20°49'02", long 156°19'44", at Lower Kula Road and 1.4 mi (2.3 km) south of Pukalani.	1.17 (3.03)	1967-77	1-16-76 8-12-77	7.34 3.26	c412 76
16603800	Kaluapulani Gulch tributary near Pukalani	Lat 20°48'52", long 156°18'32", at Haleakala Highway, 1.5 mi (2.4 km) west of Olinda Prison Camp, and 2.3 mi (3.7 km) southeast of Pukalani.	.45 (1.17)	1963-77	8-12-77	4.11	134
16603850	Kalialinui Gulch near Kahului	Lat 20°52'47", long 156°26'06", 600 ft (183 m) upstream from Hansen Road, 0.5 mi (0.8 km) northeast of Puunene Hospital, and 2.5 mi (4.0 km) southeast of Kahului Post Office.	17.9 (46.4)	1967-77	-	-	No flow
**16607000	Iao Stream at Wailuku	Lat 20°53'38", long 156°30'27", 560 ft (171 m) upstream from Market Street bridge at Wailuku and 1.9 mi (3.1 km) upstream from mouth.	8.24 (21.4)	1951≠, 1952-77	11-25-76	3.43	1,930
16616500	Unnamed gulch at Maluhia Camp	Lat 20°57'26", long 156°31'41", at Kahekili Highway, 0.6 mi (1.0 km) east of Maluhia Camp and 1.8 mi (2.9 km) northwest of Waihee.	.12 (.31)	1964-77	-	-	No flow
16619700	Poelua Gulch near Kahakuloa	Lat 21°00'58", long 156°34'58", at Highway 30 (bypass), 1.3 mi (2.1 km) southeast of Nakalele Point lighthouse, and 2.2 mi (3.5 km) northwest of Kahakuloa.	1.18 (3.06)	1965-77	4- 4-77	5.75	117
16623400	Honokeana Gulch near Honokahua	Lat 20°59'39", long 156°40'13", at Honoapiilani Highway, 1.1 mi (1.8 km) southwest of Honokahua and 1.1 mi (1.8 km) south of Hawea Point.	.59 (1.53)	1964-77	4- 4-77	3.75	72
16630200	Honokowai Stream at Honokowai	Lat 20°56'58", long 156°41'07", 0.5 mi (0.8 km) southeast of Honokowai and 1.1 mi (1.8 km) northwest of Puukolii.	5.59 (14.48)	1962-63, 1965-77	7-10-77	3.35	320
16643300	Kauaula Stream near mouth, near Lahaina	Lat 20°52'09", long 156°39 43", 0.7 mi (1.1 km) upstream from Honoapiilani Highway (bypass) and 1.3 mi (2.1 km) southeast of Lahaina lighthouse.	4.12 (10.67)	1960, 1962, 1964-77	3-22-77	-	e30
16646200	Olowalu Stream at Olowalu	Lat 20°49'23", long 156°37'15", on downstream side of center pier of plantation road bridge, 0.6 mi (1.0 km) northeast of Olowalu, and 5.5 mi (8.8 km) southeast of Lahaina.	4.08 (10.57)	1962-72≠, 1973-77	7-17-77	2.60	171
16647500	Malalowaiaole Gulch near Maalaea	Lat 20°46'56", long 156°31'32", at Honoapiilani Highway, 200 ft (61 m) upstream from mouth, 0.2 mi (0.3 km) north of McGregor Point, and 1.2 mi (1.9 km) southwest of Maalaea.	.64 (1.66)	1964-77	-	-	No flow

** Also a water-quality partial-record station.
≠ Operated as a continuous-record gaging station.
c Correction.
e Estimated.

Annual maximum discharge at crest-stage partial-record stations during water year 1977--Continued

Station No.	Station name	Location	Drainage area mi² (km²)	Period of record	Annual maximum Date	Gage height (feet)	Discharge (ft³/s)
		Hawaii, Island of Maui--Continued					
16650500	Waikapu Stream near Kihei	Lat 20°49'02", long 156°29'00", at railroad bridge beside Lower Maalaea Road, 2.5 mi (4.0 km) northeast of Maalaea, and 2.5 mi (4.0 km) northwest of Kihei.	6.97 (18.05)	1963-77	4- 4-77	2.83	288
16658500	Waiakoa Gulch tributary near Waiakoa	Lat 20°44'56", long 156°19'22", at Upper Kula Road, 1.0 mi (1.6 km) southeast of Waiakoa and 1.0 mi (1.6 km) northeast of junction of Lower and Upper Kula Roads.	.98 (2.54)	1964-77	8-12-77	-	e2
16659000	Waiakoa Gulch at Kihei	Lat 20°47'14", long 156°27'41", 0.3 mi (0.5 km) northeast of Kihei and 0.4 mi (0.6 km) upstream from mouth.	10.1 (26.2)	1963-77	-	-	No flow
16660000	Kulanihakoi Gulch near Kihei	Lat 20°46'06", long 156°27'03", on right bank 0.5 mi (0.8 km) northeast of Lihue Cemetery, 0.8 mi (1.3 km) upstream from mouth and 1.3 mi (2.1 km) southeast of Kihei.	14.4 (37.3)	1963-70≠, 1971-77	-	-	No flow
16663500	Kamaole Gulch at Kamaole	Lat 20°43'36", long 156°27'02", at Kihei Road, 350 ft (107 m) upstream from mouth, and 0.2 mi (0.3 km) south of Kamaole.	4.28 (11.09)	1972-77	-	-	No flow
16664000	Liilioholo Gulch at Kamaole	Lat 20°43'04", long 156°26'55", on upstream side of Kihei Road, 300 ft (91 m) upstream from mouth, and 0.8 mi (1.3 km) south of Kamaole.	4.12 (10.67)	1972-77	-	-	No flow
		Hawaii, Island of Hawaii					
16701300	Waiakea Stream at Hilo	Lat 19°42'38", long 155°05'02", 0.3 mi (0.5 km) upstream from Kinoole Street bridge and 1.3 mi (2.1 km) southeast of Hilo Post Office.	35.8 (92.7)	1968-77	8-12-77	3.90	505
16701400	Palai Stream at Hilo	Lat 19°40'56", long 155°04'04", at Highway 11, 300 ft (91 m) south of Palai Street intersection and 3.5 mi (5.6 km) southeast of Hilo Post Office.	5.08 (13.16)	1965-77	8-12-77	4.27	345
16717400	Kalaoa Mauka Stream near Hilo	Lat 19°48'07", long 155°06'03", at culvert on Highway 19, 1.0 mi (1.6 km) north of Papikou and 5.1 mi (8.2 km) north of Hilo Post Office.	.24 (.62)	1963-77	8-12-77	3.91	54
16717600	Alia Stream near Hilo	Lat 19°50'38", long 155°06'21", on left bank 10 ft (3.0 m) downstream from culvert on Highway 19 at Pepeekeo, 2.0 mi (3.2 km) south of Honomu, and 8.0 mi (12.9 km) north of Hilo.	.58 (1.50)	1962-72≠, 1973-77	2-27-77	4.41	504
16717650	Kapehu Stream near Pepeekeo	Lat 19°51'52", long 155°06'11", at culvert on Highway 19, 1.0 mi (1.6 km) southeast of Honomu, 2.2 mi (3.5 km) north of Pepeekeo, and 9.4 mi (15.1 km) north of Hilo.	1.09 (2.82)	1963-77	2-27-77	5.55	393
16717850	Keehia Gulch near Ookala	Lat 20°01'08", long 155°18'45", at culvert on Highway 19, 1.7 mi (2.7 km) west of Ookala, and 4.1 mi (6.6 km) southeast of Paauilo.	.62 (1.61)	1963-77	4-12-77	2.28	45

≠ Operated as a continuous-record gaging station.
e Estimated.

Annual maximum discharge at crest-stage partial-record stations during water year 1977--Continued

Station No.	Station name	Location	Drainage area mi² (km²)	Period of record	Annual maximum Date	Gage height (feet)	Discharge (ft³/s)
		Hawaii, Island of Hawaii--Continued					
16717920	Ahualoa Gulch at Honokaa	Lat 20°05'12", long 155°29'17", at Highway 24, 1.1 mi (1.8 km) northwest of Honokaa Hospital, and 1.5 mi (2.4 km) upstream from mouth.	2.27 (5.88)	1963-77	-	-	No flow
16717950	Honokaia Gulch tributary near Honokaa	Lat 20°02'58", long 155°32'19", at culvert, 4.8 mi (7.7 km) southwest of Honokaa Hospital, and 5.5 mi (8.8 km) southeast of Kukuihaele.	2.42 (6.27)	1963-77	-	-	No flow
16752600	Hapahapai Gulch at Kapaau	Lat 20°14'00", long 155°48'00", at Highway 27, 300 ft (91 m) east of Kapaau Post Office.	1.52 (3.94)	1963-77	2-27-77	4.09	23
16755800	Luahine Gulch near Waimea	Lat 20°03'11", long 155°44'35", at culvert 5.1 mi (8.2 km) northwest of Waimea and 5.7 mi (9.2 km) east of Kawaihae.	.32 (.83)	1963-77	4-20-77	2.34	56
16756500	Keanuiomano Stream near Kamuela	Lat 20°01'48", long 155°42'05", on left bank 150 ft (46 m) upstream from Highway 25 at Waiaka and 2.0 mi (3.2 km) west of Kamuela.	4.30 (11.14)	1964-72≠, 1973-77	8-12-77	5.00	490
16759040	Paiakuli Reservoir tributary near Waimea	Lat 20°02'16", long 155°38'08", at Highway 19, 2.1 mi (3.4 km) west of Puukapu Reservoir, and 2.6 mi (4.2 km) northeast of Waimea.	0.27 (.70)	1963-77	2-27-77	2.00	43
16759060	Kamakoa Gulch near Waimea	Lat 19°57'32", long 155°41'02", at bridge, 1.4 mi (2.2km) north of Saddle Road Junction and 4.5 mi (7.2 km) south of Waimea.	50.6 (131.1)	1963-77	11- 9-76	4.02	179
16759080	Popoo Gulch near Waikii	Lat 19°52'11", long 155°43'51", at bridge on Highway19, 2.0 mi (3.2 km) north of Keamuku and 5.2 mi (8.4 km) west of Waikii.	33.1 (85.7)	1963-77	11- 9-76	-	e100
16759180	Keopu Stream near Kailua	Lat 19°38'54", long 155°58'15", at county road bridge, 1.9 mi (3.1 km) east of Kailua, and 2.3 mi (3.7 km) northwest of Holualoa Post Office.	2.61 (6.76)	1962, 1965-77	-	-	No flow
16759300	Waiaha Stream at Luawai, near Holualoa	Lat 19°38'12", long 155°55'45", on right bank at LUawai, 1.8 mi (2.9 km) northeast of Holualoa School, and 4.2 mi (6.8 km) southeast of Honokohau School.	8.74 (22.64)	1961-77	4-20-77	2.12	15
16762000	Alapai Gulch at Naalehu	Lat 19°04'00", long 155°35"19", at debris catchment outlet of Naalehu Watershed Protection Project and 0.2 mi (0.3 km) upstream from Highway 11 at Naalehu.	2.87 (7.43)	1963-77	10-22-76	4.96	679
16770000	Hionamoa Gulch at Pahala	Lat 19°11'45", long 155°29'11", at bridge, 0.6 mi (1.0 km) southwest of Pahala, and 4.1 mi (6.6 km) north of Punaluu.	9.41 (24.37)	1963-77	10-22-76	8.82	1,590

DISCHARGE MEASUREMENTS MADE AT MISCELLANEOUS SITES DURING WATER YEAR 1977

Stream	Tributary to	Location	Drainage area mi^2 (km^2)	Measured previously (water years)	Measurements Date	Measurements Discharge (ft^3/s)
		Hawaii, Island of Kauai				
Kuna ditch	Hanalei River	Lat 22°11'37", long 159°27'59", at diversion and 2.6 mi (4.2 km) southeast of Hanalei School.			2-14-77 5-25-77 8-25-77	8.3 8.8 8.7
Kuna ditch Site No. 1	Hanalei River	Lat 22°12'28", long 159°28'22", 0.6 mi (1.0 km) southeast of bridge crossing Hanalei River on Highway 56 and 2.1 mi (3.4 km) northeast of Hanalei School.			2-14-77	5.5
Kuna ditch Site No. 2	Hanalei River	Lat 22°13'30", long 159°28'29", 0.5 mi (0.8 km) southeast of bridge crossing Hanalei River on Highway 56 and 2.0 mi (3.2 km) northeast of Hanalei School.			2-14-77	1.5
Kuna ditch Site No. 3	Hanalei River	Lat 22°12'36", long 159°28'34", 0.3 mi (0.6 km) southeast of bridge crossing Hanalei River on Highway 56 and 1.9 mi (3.1 km) northeast of Hanalei School.			2-14-77	1.5
		Hawaii, Island of Oahu				
*Luluku Stream at altitude 220 ft near Kaneohe	Kamooalii Stream	Lat 21°23'42", long 157°48'46", on left bank 0.5 mi (0.8 km) upstream from mouth, 1.4 mi (2.2 km) southwest of Castle High School, and 1.9 mi (3.1 km) south of Kaneohe Post Office.	.44 (1.14)	1967-71≠, 1972-77	11- 4-76	.84
Luluku Stream near Kaneohe	Kamooalii Stream	Lat 21°23'47", long 157°48'30", 300 ft (91 m) above confluence with Kamooalii Stream and 1.0 mi (1.6 km) southwest of Castle High School.	.46 (1.19)	1914-16, 1977	11- 4-76	.90

* Also a crest-stage partial-record station.
≠ Operated as a continuous-record gaging station.

Water-quality partial-record stations are particular sites where chemical-quality, biological and or sediment data are collected systematically over a period of years for use in hydrologic analyses. The data are collected usually less than quarterly.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

HAWAII, ISLAND OF OAHU

16227700 MOANALUA STREAM TRIBUTARY NEAR KANEOHE (LAT 21°23'27" LONG 157°50'53")

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)
APR					
04...	1000	4.0	50	6.8	19.0

16228000 MOANALUA STREAM NEAR HONOLULU (LAT 21°22'53" LONG 157°52'22")

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)
APR				
04...	0945	3.0	125	6.9

16228200 MOANALUA STREAM NEAR AIEA (LAT 21°22'37" LONG 157°52'58")

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	TURBIDITY (JTU)	HARDNESS (CA,MG) (MG/L)	NONCARBONATE HARDNESS (MG/L)	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG) (MG/L)	DISSOLVED SODIUM (NA) (MG/L)	PERCENT SODIUM	SODIUM ADSORPTION RATIO	DISSOLVED POTASSIUM (K) (MG/L)
APR											
04...	0900	4.0	5	30	11	4.7	4.4	13	47	1.0	1.2
20...	1105	94	40	35	17	5.8	5.1	17	49	1.2	1.8

DATE	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	ALKALINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)	DISSOLVED FLUORIDE (F) (MG/L)	DISSOLVED SILICA (SIO2) (MG/L)	DISSOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	DISSOLVED SOLIDS (TONS PER AC-FT)	DISSOLVED SOLIDS (TONS PER DAY)
APR											
04...	23	0	19	2.9	6.0	23	.0	15	79	.13	.99
20...	22	0	18	14	7.6	30	.1	16	94	.15	27.4

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)
APR					
04...	0900	4.0	140	7.1	21.0

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)
APR					
20...	1105	94	154	6.4	--

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SUSPENDED SEDIMENT (MG/L)	SUSPENDED SEDIMENT DISCHARGE (T/DAY)
APR				
19...	1425	850	1960	4500
19...	1530	380	692	710
19...	1630	212	213	122
20...	1115	89	87	21
MAY				
12...	2005	212	210	120
12...	2100	220	610	362
12...	2200	176	550	261
14...	0600	160	500	216
14...	0700	156	160	67

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SUSPENDED SEDIMENT (MG/L)	SUSPENDED SEDIMENT DISCHARGE (T/DAY)
MAY				
14...	0800	166	130	58
JUN				
08...	1900	492	916	1220
08...	2000	380	602	618
08...	2050	231	467	291
08...	2150	187	287	145
08...	2250	223	398	234
08...	2350	176	318	151

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

HAWAII, ISLAND OF OAHU--Continued

16228600 MOANALUA STREAM AT TRIPLER HOSPITAL (LAT 21°21'48" LONG 157°54'05")

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TURBIDITY (JTU)	FECAL COLIFORM .7UM-MF (COL./100 ML)	FECAL STREPTOCOCCI KF AGAR (COL. PER 100 ML)	HARDNESS (CA,MG) (MG/L)	NONCARBONATE HARDNESS (MG/L)	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG) (MG/L)
APR 20...	1145	120	183	6.5	45	1200	9200	42	20	7.2	5.9

DATE	DISSOLVED SODIUM (NA) (MG/L)	PERCENT SODIUM	SODIUM ADSORPTION RATIO	DISSOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	ALKALINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)	DISSOLVED FLUORIDE (F) (MG/L)
APR 20...	19	48	1.3	1.8	27	0	22	14	11	33	.0

DATE	DISSOLVED SILICA (SIO2) (MG/L)	DISSOLVED SOLIDS (RESIDUE AT 180 C) (MG/L)	DISSOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	DISSOLVED SOLIDS (TONS PER AC-FT)	DISSOLVED SOLIDS (TONS PER DAY)	TOTAL NITRITE PLUS NITRATE (N) (MG/L)	TOTAL KJELDAHL NITROGEN (N) (MG/L)	TOTAL NITROGEN (N) (MG/L)	TOTAL NITROGEN (NO3) (MG/L)	TOTAL PHOSPHORUS (P) (MG/L)	TOTAL ORGANIC CARBON (C) (MG/L)
APR 20...	17	121	108	.16	39.2	.50	.60	1.1	4.9	.03	5.5

16284500 WAIHEE STREAM AT KAHALUU (LAT 21°27'32" LONG 157°50'26")

DATE	TIME	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	TURBIDITY (JTU)	TOTAL NITRITE PLUS NITRATE (N) (MG/L)	TOTAL AMMONIA NITROGEN (N) (MG/L)
OCT 21...	0945	214	6.7	22.5	10	.04	3.6

DATE	TOTAL ORGANIC NITROGEN (N) (MG/L)	TOTAL KJELDAHL NITROGEN (N) (MG/L)	TOTAL NITROGEN (N) (MG/L)	TOTAL NITROGEN (NO3) (MG/L)	TOTAL PHOSPHORUS (P) (MG/L)	SUSPENDED SEDIMENT (MG/L)
OCT 21...	.50	4.1	4.1	18	.90	34

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

HAWAII, ISLAND OF MAUI

16607000 IAO STREAM AT WAILUKU (LAT 20°53'38" LONG 156°30'27")

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	COLOR (PLATINUM-COBALT UNITS)	TURBIDITY (JTU)	HARDNESS (CA,MG) (MG/L)	NONCARBONATE HARDNESS (MG/L)	DISSOLVED CALCIUM (CA) (MG/L)	DISSOLVED MAGNESIUM (MG) (MG/L)	DISSOLVED SODIUM (NA) (MG/L)	PERCENT SODIUM
OCT										
15...	1400	100	18	3	21	4	4.9	2.2	4.6	31
APR										
04...	0850	1000	--	--	18	3	--	--	--	36

DATE	SODIUM ADSORPTION RATIO	DISSOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO3) (MG/L)	CARBONATE (CO3) (MG/L)	ALKALINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)	DISSOLVED SULFATE (SO4) (MG/L)	DISSOLVED CHLORIDE (CL) (MG/L)	DISSOLVED FLUORIDE (F) (MG/L)
OCT									
15...	.4	.5	21	0	17	2.7	3.3	7.2	.1
APR									
04...	.5	--	18	--	15	1.4	--	--	--

DATE	DISSOLVED SILICA (SIO2) (MG/L)	DISSOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	DISSOLVED SOLIDS (TONS PER AC-FT)	DISSOLVED SOLIDS (TONS PER DAY)	DISSOLVED NITRITE PLUS NITRATE (N) (MG/L)	DISSOLVED ORTHO. PHOSPHORUS (P) (MG/L)	DISSOLVED ORTHO PHOSPHATE (PO4) (MG/L)	DISSOLVED IRON (FE) (UG/L)	DISSOLVED MANGANESE (MN) (UG/L)
OCT									
15...	15	49	.07	13.2	.08	.06	.18	30	0
APR									
04...	--	46	.06	124	--	--	.06	--	--

HAWAII, ISLAND OF HAWAII

16701750 WAILUKU RIVER NEAR HUMUULA (LAT 19°42'55" LONG 155°18'36")

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)
OCT						APR					
18...	1210	.01	39	6.4	17.5	01...	1130	1.2	28	7.0	14.5

16765000 HILEA GULCH TRIBUTARY NO.2 NEAR HONUAPO (LAT 19°10'17" LONG 155°36'05")

DATE	TIME	INSTANTANEOUS DISCHARGE (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)
MAR					
15...	1020	2.1	29	7.2	15.0

Samples are collected at sites other than gaging stations and partial-record stations to give better areal coverage in a river basin. Such sites are referred to as miscellaneous sites.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

HAWAII, ISLAND OF OAHU

16227900 MOANALUA STREAM TRIBUTARY NEAR AIEA (LAT 21°23'07" LONG 157°51'42")

DATE	TIME	INSTAN-TANEOUS DIS-CHARGE (CFS)	SUS-PENDED SEDI-MENT (MG/L)	SUS-PENDED SEDI-MENT DIS-CHARGE (T/DAY)
APR 19...	1315	5.0	1680	22

212732157502200 KAHALUU STREAM AT ALTITUDE 10 FT AT KAHALUU (LAT 21°27'32" LONG 157°50'22")

DATE	TIME	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)	TUR-BID-ITY (JTU)	TOTAL NITRITE PLUS NITRATE (N) (MG/L)	TOTAL AMMONIA NITRO-GEN (N) (MG/L)
OCT 21...	0925	301	6.8	23.0	3	.57	.77

DATE	TOTAL ORGANIC NITRO-GEN (N) (MG/L)	TOTAL KJEL-DAHL NITRO-GEN (N) (MG/L)	TOTAL NITRO-GEN (N) (MG/L)	TOTAL NITRO-GEN (NO3) (MG/L)	TOTAL PHOS-PHORUS (P) (MG/L)	SUS-PENDED SEDI-MENT (MG/L)
OCT 21...	.13	.90	1.5	6.5	.29	3

212742157503200 KAHALUU STREAM AT HWY 83 AT KAHALUU (LAT 21°27'42" LONG 157°50'32")

DATE	TIME	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)	TUR-BID-ITY (JTU)	TOTAL NITRITE PLUS NITRATE (N) (MG/L)	TOTAL AMMONIA NITRO-GEN (N) (MG/L)
OCT 21...	0840	50000	7.8	26.0	8	.10	.12

DATE	TOTAL ORGANIC NITRO-GEN (N) (MG/L)	TOTAL KJEL-DAHL NITRO-GEN (N) (MG/L)	TOTAL NITRO-GEN (N) (MG/L)	TOTAL NITRO-GEN (NO3) (MG/L)	TOTAL PHOS-PHORUS (P) (MG/L)	SUS-PENDED SEDI-MENT (MG/L)
OCT 21...	.21	.33	.43	1.9	.07	15

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

HAWAII, ISLAND OF OAHU

16210900 - POAMOHO TUNNEL NR WAHIAWA, OAHU, HI (LAT 21 31 12 LONG 157 58 51)

DATE	TIME	INSTAN-TANEOUS DIS-CHARGE (CFS)	AIR TEMPER-ATURE (DEG C)	TEMPER-ATURE (DEG C)
OCT , 1976				
08...	1115	.78	21.5	21.0
NOV				
23...	1635	.53	21.5	19.0
JAN , 1977				
07...	1115	.08	19.5	18.0
APR				
19...	1245	1.9	20.5	20.0
JUN , 1977				
01...	1605	3.2	22.5	22.5
JUL				
07...	1600	1.2	22.0	22.0
AUG				
26...	1300	.37	--	24.0

HAWAII, ISLAND OF MOLOKAI

16405100 - MOLOKAI TUNNEL AT EAST PORTAL, MOLOKAI, HI (LAT 21 08 38 LONG 156 55 17)

DATE	TIME	INSTAN-TANEOUS DIS-CHARGE (CFS)	AIR TEMPER-ATURE (DEG C)	TEMPER-ATURE (DEG C)
OCT , 1976				
21...	1115	.95	23.5	18.5
DEC				
16...	1100	1.6	--	17.5
16...	1140	1.6	19.5	17.5
FEB , 1977				
10...	1430	.99	--	19.0
APR				
26...	1350	3.1	19.5	19.0
JUN , 1977				
02...	1200	3.9	22.0	18.5
JUL				
13...	1235	6.0	23.0	19.5
SEP				
13...	1200	1.2	--	20.0
13...	1205	1.2	23.0	20.0

16405500 - WAIKOLU STR AT ALT 900 FT NR KALAUPAPA, MOLO,HI (LAT 21 08 45 LONG 156 55 18)

DATE	TIME	INSTAN-TANEOUS DIS-CHARGE (CFS)	AIR TEMPER-ATURE (DEG C)	TEMPER-ATURE (DEG C)
OCT , 1976				
21...	0859	.62	21.5	19.0
DEC				
16...	1000	.87	20.0	18.0
FEB , 1977				
10...	1405	.76	24.5	18.5
APR				
26...	1250	1.2	24.5	20.0
JUN , 1977				
02...	1015	1.9	24.0	19.0
JUL				
13...	1035	5.3	23.0	19.5
SEP				
13...	1025	.62	26.0	20.0

16414000 - KAUNAKAKAI GULCH AT KAUNAKAKAI, MOLOKAI, HI (LAT 21 06 22 LONG 157 00 34)

DATE	TIME	INSTAN-TANEOUS DIS-CHARGE (CFS)	AIR TEMPER-ATURE (DEG C)	TEMPER-ATURE (DEG C)
APR , 1977				
06...	0720	7.7	21.0	18.5
07...	0850	7.1	22.5	19.0
APR , 1977				
08...	0805	.42	22.5	21.0

HAWAII, ISLAND OF MAUI

16599500 - OPANA TUNNEL NR KAILIILI, MAUI, HI (LAT 20 51 04 LONG 156 16 17)

DATE	TIME	INSTAN-TANEOUS DIS-CHARGE (CFS)	AIR TEMPER-ATURE (DEG C)	TEMPER-ATURE (DEG C)
OCT , 1976				
01...	1430	1.1	22.0	19.0
NOV				
29...	1425	.82	22.0	16.5
JAN , 1977				
19...	1305	.20	19.0	17.5
APR , 1977				
28...	1115	9.3	20.0	18.0
AUG				
16...	1355	2.7	25.0	19.5

ISLAND OF KAUAI

220354159205601. Local number, 2-0320-01.
LOCATION.--Lat 22°03'54", long 159°20'56", Hydrologic Unit 20070000, in Wailua Houselots, Wailua. Owner: Kauai County, Department of Water.
AQUIFER.--Koloa Volcanic Series, Pleistocene (?) age.
WELL CHARACTERISTICS.--Drilled basal water-table well, diameter 8 in (0.2 m), depth 240 ft (73.2 m), cased to 193 ft (58.8 m), open end.
DATUM.--Land-surface datum is 155 ft (47.2 m) above mean sea level. Measuring point: Top edge of steel pumpbase at breather hole, 155.98 ft (47.543 m) above mean sea level.
REMARKS.--Water-quality records for 1960, 1966, 1972-76 are available in files of district office; those for 1977 are published elsewhere in this report. Water from this well is used for domestic supply.
PERIOD OF RECORD.--February 1960, June 1973 to September 1975 records available in files of district office; November 1975 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 20.04 ft (6.108 m) above mean sea level, Feb. 17, 1960; lowest measured, 3.31 ft (1.009 m) below mean sea level, May 27, 1977.

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 14	10.89	JAN 14	8.44	APR 13	8.48	MAY 27	a-3.31	JUL 14	9.59	SEP 22	4.13
DEC 8	a1.06	FEB 28	8.90								

a Well being pumped.

HAWAII, ISLAND OF OAHU

211718157491001 (Formerly 211718157490801). Local number, 3-1749-07 tube B.
LOCATION.--Lat 21°17'18", long 157°49'08", Hydrologic Unit 20060000, at Kaimuki High School grounds near Olokele Street, Honolulu. Owner: State of Hawaii.
AQUIFER.--Basalt of Koolau Volcanic Series, Pliocene (?) age.
WELL CHARACTERISTICS.--Drilled observation artesian basal water-table well, diameter 0.5 in (0.01 m), depth 378 ft (115 m), cased to 378 ft (115 m), open end.
DATUM.--Land-surface datum is 14 ft (4.3 m) above mean sea level. Measuring point: Top of iron cover 0.5 ft (0.2 m) above ground, 14.85 ft (4.526 m) above mean sea level.
REMARKS.--Tube B is one of five sampling tubes installed on Sept. 7, 1951 in existing 8 in (0.2 m) well. The bottom of each tube is at different depths to obtain water samples for determining vertical distribution of the chloride concentration. Water-quality records for 1951-76 are available in files of district office; those for 1977 are published elsewhere in this report.
PERIOD OF RECORD.--July 1951, October 1955 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 28.88 ft (8.803 m) above mean sea level, Feb. 6, 1957; lowest measured, 19.51 ft (5.947 m) Aug. 31, 1962.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 19	23.21	JAN 26	22.84	APR 26	23.71	JUN 7	23.71	JUL 19	22.45	AUG 30	22.03
DEC 6	23.03	MAR 10	23.51								

212154158015201. Local number, 3-2101-03.
LOCATION.--Lat 21°21'54", long 158°01'52", Hydrologic Unit 20060000, in Honouliuli. Owner: Hawaii Meat Co.
AQUIFER.--Basalt of Koolau Volcanic Series, Pliocene (?) age.
WELL CHARACTERISTICS.--Drilled observation artesian basal water-table well, diameter 10 in (0.25 m), depth 355 ft (108 m), cased to 165 ft (50.3 m), open hole.
DATUM.--Land-surface datum is 11 ft (3.4 m) above mean sea level. Measuring point; Top of lowest horizontal flange, 11.16 ft (3.402 m) above mean sea level.
REMARKS.--Water-quality records for 1910-16, 1920-21, 1923-75 are available in files of district office.
PERIOD OF RECORD.--April 1910 to June 1921, September 1923 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 29.16 ft (8.888 m) above mean sea level, April 1918; lowest measured, less than 11.16 ft (3.402 m) above mean sea level, Sept. 2, 1977.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 27	12.69	JAN 26	14.72	APR 28	11.97	JUN 13	12.61	JUL 26	11.60	SEP 2	<11.16
DEC 7	13.34	MAR 14	12.01								

HAWAII, ISLAND OF OAHU--Continued

212238157561101. Local number, 3-2256-10.
LOCATION.--Lat 21°22'38", long 157°56'11", Hyudrologic Unit 20060000, in Pearl Harbor Navy Reservation near Kamehameha Highway, Aiea. Owner: U.S. Navy.
AQUIFER.--Basalt of Koolau Volcanic Series, Pliocene (?) age.
WELL CHARACTERISTICS.--Drilled industrial artesian basal water-table well, diameter 12 in (0.30 m), depth 173 ft (52.7 m), cased to 143 ft (43.0 m), open hole.
DATUM.--Land-surface datum is 10 ft (3.0 m) above mean sea level. Measuring point: Top of 10 in (0.25 m) stilling pipe for water-level recorder, 26.15 ft (7.971 m) above mean sea level (since Sept. 9, 1968).
REMARKS.--Recording gage installed Sept. 9, 1968. Water-quality records for 1923, 1928-30, 1934-68, 1972, 1974-75 are available in files of district office.
PERIOD OF RECORD.--January 1928 to February 1931, September 1934 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 25.90 ft (7.894 m) above mean sea level, Jan. 16, 1928; lowest, 13.35 ft (4.069 m) above mean sea level, Aug. 31, 1977.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	14.77	14.58	15.04	15.17	*	*	14.33	14.15	14.55	*	13.58	13.57
10	14.85	14.58	14.89	15.23	*	14.32	14.43	14.14	14.38	*	13.58	13.56
15	14.80	14.65	14.91	15.22	*	14.31	14.24	14.68	14.28	*	13.62	13.45
20	14.76	14.67	14.92	15.13	*	14.32	14.25	14.74	*	13.78	13.56	13.45
25	14.78	14.84	14.93	15.17	*	14.19	14.25	14.66	*	13.77	13.46	13.55
EOM	14.73	15.07	15.10	*	*	14.30	14.14	14.65	*	13.73	13.43	13.49

WTR YEAR 1977 MAX 15.30 JAN 10, 1977 MIN 13.35 AUG 31, 1977

* No record.

212927158014807. Local number, 3-2901-07.
LOCATION.--Lat 21°29'27", long 158°01'48", Hydrologic Unit 20060000, at Kamehameha Highway and Wilikina Drive, Wahiawa. Owner: U.S. Army.
AQUIFER.--Basalt of Koolau Volcanic Series, Pliocene (?) age.
WELL CHARACTERISTICS.--Dug domestic high-level water-table well, size 8 x 8 ft (2 x 2 m), length of 30-degree inclined shaft 1,148 ft (349.9 m).
DATUM.--Land-surface datum is 850 ft (259 m) above mean sea level. Measuring point: Top of pump chamber floor at recorder, 287.00 ft (87.478 m) above mean sea level.
REMARKS.--Recorder is located on the pump chamber floor at the bottom of shaft. Recording gage installed November 1938. Water-quality records for 1966-72, 1975-76 are available in files of district office; those for 1977 are published elsewhere in this report. Water pumped continually for domestic supply.
PERIOD OF RECORD.--August 1936 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 284.40 ft (86.685 m) above mean sea level, May 12, 1969; lowest, 273.12 ft (83.247 m) above mean sea level, Sept. 10 to 12, 1977.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977
MAXIMUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	278.28	278.07	277.60	276.95	276.28	275.64	*	274.74	274.52	274.20	273.86	273.69
10	278.21	277.82	277.42	276.11	276.19	275.65	*	274.75	274.41	274.28	273.39	273.61
15	278.37	277.79	277.30	276.02	276.01	*	*	274.68	274.40	274.04	273.76	273.60
20	278.03	277.02	277.25	275.79	275.92	*	274.98	274.60	274.36	273.84	273.44	273.54
25	277.40	277.96	277.15	275.62	275.86	*	274.97	274.59	274.31	274.15	273.66	273.52
EOM	278.00	277.65	276.98	276.51	275.83	*	274.86	274.50	274.29	274.05	273.68	273.43

Note: Well being pumped throughout the year.

* No record.

213327157524401. Local number, 3-3352-01.
LOCATION.--Lat 21°33'27", long 157°52'44", Hydrologic Unit 20060000, at mouth of Kahana Valley and 700 ft (180 m) southwest of Kamehameha Highway (Highway 83), Kahana. Owner: Mary E. Foster Estate.
AQUIFER.--Basalt of Koolau Volcanic Series, Pliocene (?) age.
WELL CHARACTERISTICS.--Drilled artesian basal water-table well, diameter 10 in (0.25 m), depth 441 ft (134 m), cased to 177 ft (53.9 m), open hole.
DATUM.--Land-surface datum is 6 ft (2 m) above mean sea level. Measuring point: Top of blind flange, 5.76 ft (1.756 m) above mean sea level.
REMARKS.--Water-quality records for 1935-76 are available in files of district office; those for 1977 are published elsewhere in this report.
PERIOD OF RECORD.--April 1935 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 21.3 ft (6.49 m) above mean sea level, Mar. 29, 1966; lowest measured, 14.39 ft (4.386 m) above mean sea level, Sept. 9, 1977.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 10	14.90	MAR 25	14.48	MAY 16	15.16	JUL 1	14.91	AUG 3	15.09	SEP 9	14.39

HAWAII, ISLAND OF OAHU--Continued

213455158065301. Local number, 3-3406-01.
LOCATION.--Lat 21°34'55", long 158°06'53", Hydrologic Unit 20060000, near Weed Circle, Waialua. Owner: Waialua Sugar Co., Inc.
AQUIFER.--Basalt of Koolau Volcanic Series, Pliocene (?) age.
WELL CHARACTERISTICS.--Drilled irrigation artesian basal water-table well, diameter 6 in (0.2 m), depth 201 ft (61.3 m), cased to 114 ft (34.7 m), open hole.
DATUM.--Land-surface datum is 5 ft (2 m) above mean sea level. Measuring point: Top of blind flange on well, 4.69 ft (1.430 m) above mean sea level.
REMARKS.--Water-quality records for 1912-16, 1924-74 are available in files of district office.
PERIOD OF RECORD.--March 1911 to April 1921, February 1924 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 13.35 ft (4.069 m) above mean sea level, December 1914; lowest measured, 9.19 ft (2.801 m) above mean sea level, Apr. 24, 1946.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 12	11.85	JAN 13	11.15	FEB 25	10.18	JUN 1	10.52	AUG 19	10.40	SEP 29	10.25
NOV 30	11.07	FEB 24	10.15	APR 14	10.65	JUL 14	10.37				

213446158104901. Local number, 3-3410-08.
LOCATION.--Lat 21°34'46", long 158°10'49", Hydrologic Unit 20060000, near Dillingham Air Force Base south of Farrington Highway, Mokuleia. Owner: Waialua Sugar Co., Inc.
AQUIFER.--Basalt of Waianae Volcanic Series, Pliocene (?) age.
WELL CHARACTERISTICS.--Drilled observation artesian basal water-table well, diameter 1.0 in (0.03 m), depth 447 ft (136 m), cased to 447 ft (136 m), perforated 410 to 447 ft (125 to 136 m).
DATUM.--Land-surface datum is 16 ft (4.9 m) above mean sea level. Measuring point: Top of 12 in (0.30 m) stilling well 20.53 ft (6.258 m) above mean sea level.
REMARKS.--Recording gage was operated January 1963 to February 1972. Present one-inch galvanized pipe was installed inside of existing 6-inch well and space between the two casings grouted on Sept. 13, 1948. Water-quality records for 1929-76 are available in files of district office; those for 1977 are published elsewhere in this report.
PERIOD OF RECORD.--January 1929 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 19.98 ft (6.090 m) above mean sea level, Jan. 5, 1969; lowest measured, 16.08 ft (4.901 m) above mean sea level, Aug. 6, 1929.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 15	18.06	JAN 13	17.97	APR 14	18.35	JUL 14	17.95	AUG 19	18.17	SEP 29	18.42
DEC 1	18.15	FEB 24	17.99	JUN 1	17.75						

213722157551701. Local number, 3-3755-05.
LOCATION.--Lat 21°37'22", long 157°55'17", Hydrologic Unit 20060000, at mouth of Kaipapau Valley, Hauula. Owner: Consolidated Amusement Co., Ltd.
AQUIFER.--Basalt of Koolau Volcanic Series, Pliocene (?) age.
WELL CHARACTERISTICS.--Drilled observation artesian basal water-table well, diameter 12 in (0.30 m), depth 192 ft (58.5 m), cased to 92 ft (28 m), open end.
DATUM.--Land-surface datum is 16 ft (4.9 m) above mean sea level. Measuring point: Top of PVC stilling well for water-level recorder, 23.22 ft (7.077 m) above mean sea level.
REMARKS.--Water-quality records for 1929-34, 1937-54, 1956-64 are available in files of district office. Recording gage was operated July 8, 1968 to June 15, 1977.
PERIOD OF RECORD.--July 1956 to December 1964, July 1968 to September 1975 records available in files of district office; October 1975 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 21.77 ft (6.635 m) above mean sea level, Feb. 24, 1969; lowest 16.65 ft (5.075 m) above mean sea level, Oct. 4, 1962.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	17.50	17.30	17.41	17.09	16.93	*	16.93	17.26	17.21	*	*	*
10	17.54	17.24	17.38	17.08	16.87	*	17.06	17.32	17.21	*	*	*
15	17.56	17.22	17.34	17.06	*	*	17.05	*	*	*	*	*
20	17.54	17.27	17.32	17.01	*	*	17.05	17.42	*	*	*	*
25	17.50	17.38	17.25	16.93	*	*	17.14	17.35	*	*	*	*
EOM	17.40	17.40	17.12	16.96	*	16.81	17.24	17.26	*	*	*	*

* No record.

HAWAII, ISLAND OF OAHU--Continued

214125158013401. Local number, 3-4101-03.
LOCATION.--Lat 21°41'25", long 158°01'34", Hydrologic Unit 20060000, on Kamehameha Highway at Waialee. Owner: State of Hawaii.
AQUIFER.--Basalt of Koolau Volcanic Series, Pliocene (?) age.
WELL CHARACTERISTICS.--Drilled observation artesian basal water-table well, diameter 8 in (0.2 m), depth 61 ft (19 m), cased to 36 ft (11 m), open hole.
DATUM.--Land-surface datum is 22 ft (6.7 m) above mean sea level. Measuring point: Top of 4-inch (0.1 m) pipe, 21.89 ft (6.672 m) above mean sea level.
REMARKS.--Water-quality records for 1929-74 are available in files of district office.
PERIOD OF RECORD.--February 1929 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 15.60 ft (4.755 m) above mean sea level, Nov. 14, 1932; lowest measured, 10.97 ft (3.344 m) above mean sea level, July 1, 1977.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 10	13.11	FEB 11	12.91	MAY 16	12.69	JUL 1	11.97	AUG 11	12.61	SEP 9	12.73
DEC 28	13.13	MAR 25	12.68								

HAWAII, ISLAND OF MOLOKAI

210425156483001. Local number, 4-0448-02.
LOCATION.--Lat 21°04'25", long 156°48'30", Hydrologic Unit 20050000, 100 ft (30 m) north of Highway 45, and 0.8 mi (1 km) west of Pukoo. Owner: P. Friel.
AQUIFER.--East Molokai Volcanic Series, Pliocene (?) age.
WELL CHARACTERISTICS.--Dug observation basal water-table well, 4 x 6 ft (1 x 2 m), depth 22 ft (6.7 m).
DATUM.--Land-surface datum is 19 ft (5.8 m) above mean sea level. Measuring point: Top of 2 x 2 in (0.05 x 0.05 m) steel plate bolted to top of concrete well wall, 21.23 ft (6.471 m) above mean sea level.
REMARKS.--Recording gage was operated Aug. 8, 1970 to Jan. 22, 1973. Water-quality records for 1970 to 1973 are available in files of district office.
PERIOD OF RECORD.--August 1970 to September 1975 records available in files of district office; November 1975 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 6.11 ft (1.862 m) above mean sea level, Nov. 26, 1970; lowest measured, 3.67 ft (1.119 m) above mean sea level, Feb. 8, 1977.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 19	4.08	FEB 8	3.67	APR 6	4.39	MAY 31	3.99	JUL 11	3.98	SEP 12	4.07
DEC 14	4.04										

210605157012001. Local number, 4-0601-01.
LOCATION.--Lat 21°06'05", long 157°01'20", Hydrologic Unit 20050000, in Kaunakakai Gulch, Kaunakakai. Owner: State of Hawaii.
AQUIFER.--Basalt of East Molokai Volcanic Series, Pliocene (?) age.
WELL CHARACTERISTICS.--Drilled observation basal water-table well, diameter 12 in (0.30 m), depth 59 ft (18 m), cased to 20 ft (6.1 m), open hole.
DATUM.--Land-surface datum is 51 ft (16 m) above mean sea level. Measuring point: Top of 15 in (0.38 m) surface casing 51.95 ft (15.834 m) above mean sea level.
REMARKS.--Water-quality records for 1954-76 are available in files of district office; those for 1977 are published elsewhere in this report.
PERIOD OF RECORD.--May 1954 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 3.30 ft (1.006 m) above mean sea level, Jan. 20, 1969; lowest measured, 1.6 ft 0.49 m) above mean sea level, Dec. 5, 1964.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 22	2.67	FEB 11	2.43	APR 8	2.44	JUN 3	2.38	JUL 14	2.49	SEP 14	2.65
DEC 17	2.63										

HAWAII, ISLAND OF MAUI

203912156255901. Local number, 6-3925-01.
LOCATION.--Lat 20°39'12", long 156°25'59", Hydrologic Unit 20020000, 0.75 mi (1.2 km) east of Makena. Owner: State of Hawaii.
AQUIFER.--Hana Volcanic Series, Pleistocene (?) age.
WELL CHARACTERISTICS.--Drilled observation basal water-table well, diameter 8 in (0.2 m), depth 382 ft (116 m), cased to 363 ft (111 m), open hole.
DATUM.--Land-surface datum is 352 ft (107 m) above mean sea level. Measuring point: Top of 2 in (0.05 m) pipe attached to the casing cover, 352.29 ft (107.378 m) above mean sea level.
REMARKS.--Water-quality records for 1964 are available in files of district office.
PERIOD OF RECORD.--August 1964, June 1972 to September 1975 records available in files of district office; October 1975 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 0.47 ft (0.143 m) above mean sea level, Aug. 24, 1964; lowest measured, 0.41 ft (0.125 m) below mean sea level, May 4, 1977.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 18	-0.06	JAN 25	-0.21	MAR 15	-0.35	MAY 4	-0.41	JUN 24	-0.36	AUG 19	0.01
DEC 3	.04										

204827156242201. Local number, 6-4824-01.
LOCATION.--Lat 20°48'27", long 156°24'22", Hydrologic Unit 20020000, on Waiakoa Road 1,000 ft (305 m) south of intersection with Kalaloa Gulch, and 4 mi (6 km) east of Kihei, Owner: State of Hawaii.
AQUIFER.--Kula Volcanic Series, Pleistocene (?) age.
WELL CHARACTERISTICS.--Drilled observation basal water-table well, diameter 12 in (0.30 m), depth 647 ft (197 m), cased to 598 ft (182 m), screened 598 to 638 ft (182 to 194 m), open hole.
DATUM.--Land-surface datum is 593 ft (181 m) above mean sea level. Measuring point: Top of 3 in (0.08 m) pipe attached to the steel casing cover, 594.75 ft (181.280 m) above mean sea level.
REMARKS.--Water-quality records for 1971, 1973 are available in files of district office.
PERIOD OF RECORD.--March 1971, May 1972 to September 1975 records available in files of district office; October 1975 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 5.20 ft (1.585 m) above mean sea level, Jan. 17, 1974; lowest measured, 3.65 ft (1.113 m) above mean sea level, Jan. 27, 1977.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 26	3.95	JAN 27	3.65	MAR 16	3.98	MAY 5	4.44	JUN 30	4.18	AUG 23	4.45
DEC 7	4.13										

204818156310301. Local number, 6-4831-01.
LOCATION.--Lat 20°48'18", long 156°31'03", Hydrologic Unit 20020000, on sugar plantation road 0.7 mi (1.1 km) north of Maalaea and 0.9 mi (1.4 km) southwest of intersection of Honoapiilani Highway and Kihei Road. Owner: State of Hawaii.
AQUIFER.--Wailuku Volcanic Series, Pliocene (?) age.
WELL CHARACTERISTICS.--Drilled observation basal water-table well, diameter 8 in (0.2 m), depth 219 ft (66.8 m), cased to 187 ft (57.0 m), open hole.
DATUM.--Land-surface datum is 166 ft (50.6 m) above mean sea level. Measuring point: Top of 8 in (0.2 m) casing, 166.60 ft (50.780 m) above mean sea level.
REMARKS.--Water-quality records for 1965-67 are available in files of district office. Recording gage was operated January to July 1974.
PERIOD OF RECORD.--September 1972 to September 1975 records available in files of district office; October 1975 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 5.57 ft (1.698 m) above mean sea level, Jan. 16, 1974; lowest measured, 4.74 ft (1.445 m) above mean sea level, Mar. 16, 1977.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
DEC 7	5.16	JAN 27	4.86	MAR 16	4.74	MAY 5	4.97	JUN 30	4.89	AUG 23	5.13

204909156281401. Local number, 6-4928-02.
LOCATION.--Lat 20°48'27", long 156°28'14", Hydrologic Unit 20020000, at Puunene Airport on Mokulele Highway 2.5 mi (4.0 km) north of intersection with Kihei Road, Kihei. Owner: Hawaiian Commercial and Sugar Co.
AQUIFER.--Honomanu Volcanic Series.
WELL CHARACTERISTICS.--Dug basal water-table well, 6 x 9 ft (2 x 3 m) vertical shaft, depth 53 ft (16 m).
DATUM.--Land-surface datum is 50 ft (15 m) above mean sea level. Measuring point: Top of angle iron at well, 50.08 ft (15.264 m) above mean sea level.
REMARKS.--Recording gage installed Mar. 22, 1972. Water-quality records for 1973 are available in files of district office.
PERIOD OF RECORD.--March 1972 to September 1975 records available in files of district office; October 1975 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 4.24 ft (1.292 m) above mean sea level, Feb. 9, 10, 1974; lowest, 3.05 ft (0.930 m) above mean sea level, Mar. 5, 6, 1977.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	3.55	3.41	3.67	3.57	3.23	3.08	3.68	3.60	3.36	3.35	3.53	3.56
10	3.48	3.40	3.64	3.48	3.19	3.16	3.57	3.69	3.37	3.33	3.56	3.58
15	3.49	3.50	3.61	3.43	3.16	3.20	3.60	3.53	3.34	3.35	3.68	3.59
20	3.45	3.58	3.60	3.37	3.13	3.27	3.68	3.41	3.34	3.38	3.68	3.54
25	3.46	3.73	3.59	3.27	3.13	3.31	3.65	3.36	3.33	3.44	3.64	3.52
EOM	3.44	3.73	3.54	3.25	3.14	3.55	3.53	3.39	3.36	3.55	3.63	3.51

WTR YEAR 1977 MAX 3.79 NOV 26, 1976 MIN 3.05 MAR 5, 6, 1977

205552156193101. Local number, 6-5519-01.
LOCATION.--Lat 20°55'52", long 156°19'31", Hydrologic Unit 20020000, at Haiku School 1.0 mi (1.6 km) north of Haiku and 2.7 mi (4.3 km) northeast of Paia. Owner: State of Hawaii.
AQUIFER.--Kula Volcanic Series, Pleistocene (?) age.
WELL CHARACTERISTICS.--Drilled observation basal water-table well, diameter 8 in (0.2 m), depth 400 ft (122 m), cased to 363 ft (111 m), perforated 363 to 383 ft (111 to 117 m).
DATUM.--Land-surface datum is 365 ft (111 m) above mean sea level. Measuring point: Top of 2.5 in (0.06 m) coupling pipe attached to the casing cover, 366.26 ft (111.636 m) above mean sea level.
REMARKS.--Water-quality records for 1967 are available in files of district office.
PERIOD OF RECORD.--May 1967, December 1970, May 1972 to September 1975 records available in files of district office; October 1975 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 5.75 ft (1.753 m) above mean sea level, Dec. 10, 1973; lowest measured, 4.75 ft (1.448 m) above mean sea level, Mar. 7, 1977.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 26	5.24	JAN 24	5.02	MAR 7	4.75	APR 26	5.06	JUN 27	5.05	AUG 23	5.05
DEC 1	5.36										

205856156400101. Local number, 6-5840-01.
LOCATION.--Lat 20°58'56", long 156°40'01", Hydrologic Unit 20020000, on sugar plantation road 0.9 mi (1.4 km) east of Kahana and 1.5 mi (2.4 km) southwest of Honokahua. Owner: State of Hawaii.
AQUIFER.--Honolua Volcanic Series, Pliocene (?) age.
WELL CHARACTERISTICS.--Drilled observation basal water-table well, diameter 8 in (0.2 m), depth 274 ft (83.5 m), cased to 274 ft (83.5 m), perforated 264 to 274 ft (80.5 to 83.5 m). Hole was drilled to depth of 284 ft (86.6 m) but plugged back 10 ft (3.0 m) with cement.
DATUM.--Land-surface datum is 257 ft (78.3 m) above mean sea level. Measuring point: Top of 2.2 in (0.06 m) coupling pipe attached to casing cover 257.46 ft (78.474 m) above mean sea level.
REMARKS.--Recording gage installed Aug. 6, 1975. Water-quality records for 1964 are available in files of district office.
PERIOD OF RECORD.--June 1964 to July 1964, March 1972 to September 1975 records available in files of district office; October 1975 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 3.36 ft (1.024 m) above mean sea level, Jan. 15, 1974; lowest, 2.43 ft (0.741 m) above mean sea level Mar. 25, 1977.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	3.06	2.90	2.99	2.81	2.75	2.59	2.85	2.71	2.72	2.87	2.99	2.95
10	3.00	2.92	2.96	2.89	2.70	2.64	2.83	2.75	2.75	2.88	3.02	3.00
15	2.97	3.00	2.98	2.87	2.70	2.61	2.84	2.71	2.72	2.93	3.09	3.02
20	2.95	2.90	2.95	2.84	2.67	2.53	2.80	2.60	2.78	2.92	3.00	2.98
25	2.95	3.10	2.90	2.72	2.65	2.52	2.74	2.58	2.81	2.99	2.94	2.98
EOM	2.93	2.99	2.80	2.77	2.69	2.90	2.66	2.71	2.87	3.03	2.96	2.97

WTR YEAR 1977 MAX 3.25 OCT 1, 1976 MIN 2.43 MAR 25, 1977

HAWAII, ISLAND OF HAWAII

193017154502101. Local number, 8-3080-02.
LOCATION.--Lat 19°30'17", long 154°50'21", Hydrologic Unit 20010000, 0.5 mi (0.8 km) south of intersection of Highway 132 and Highway 137 near Pahoa. Owner: County of Hawaii.
AQUIFER.--Puna Volcanic Series, Holocene age.
WELL CHARACTERISTICS.--Dug basal water-table well, diameter 66 in (1.7 m), depth 46 ft (14 m), with two horizontal infiltration tunnels 2 x 50 ft (0.6 x 15 m) extending in opposite directions from 3 ft (0.9 m) above bottom of well.
DATUM.--Land-surface datum is 39 ft (12 m) above mean sea level. Measuring point: Top of steel manhole cover at 1-inch (0.03 m) hole, 39.50 ft (12.040 m) above mean sea level.
REMARKS.--Water-quality records for 1972-76 are available in files of district office; those for 1977 are published elsewhere in this report. Water from the shaft is pumped frequently for domestic use.
PERIOD OF RECORD.--March 1972 to August 1975 records available in files of district office; November 1975 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 3.66 ft (1.116 m) above mean sea level, Sept. 21, 1976; lowest measured, 1.71 ft (0.521 m) above mean sea level, July 11, 1977.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 1	3.59	DEC 30	3.62	MAR 23	3.06	MAY 10	3.20	JUL 11	a1.71	SEP 14	a2.58

a Well being pumped.

193339154594801. Local number, 8-3389-01.
LOCATION.--Lat 19°33'39", long 154°59'48", Hydrologic Unit 20010000, 4.9 mi (7.9 km) southeast of Keaau on Orchid Land Estate subdivision. Owner: County of Hawaii.
AQUIFER.--Puna Volcanic Series, Holocene age.
WELL CHARACTERISTICS.--Drilled observation basal water-table well, diameter 8 in (0.2 m), depth 475 ft (145 m), cased to 403 ft (123 m), perforated 403 to 475 ft (123 to 145 m).
DATUM.--Land-surface datum is 427 ft (130 m) above mean sea level. Measuring point: Top of casing, 428.14 ft (130.497 m) above mean sea level.
REMARKS.--Water-quality records for 1961 are available in files of district office.
PERIOD OF RECORD.--September 1974 to September 1975 records available in files of district office; November 1975 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 20.37 ft (6.209 m) above mean sea level, Feb. 14, 1975; lowest measured, 16.35 ft (4.983 m) above mean sea level, Nov. 5, 1975.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1976 TOSEPTEMBER 1977

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 1	17.58	NOV 12	17.02	MAR 23	16.96	MAY 11	18.83	JUL 11	17.88	SEP 14	17.12

194134155005601. Local number, 8-4100-01.
LOCATION.--Lat 19°41'34", long 155°00'56", Hydrologic Unit 20010000, 5.5 mi (8.9 km) southeast of Hilo Post Office and 5.0 mi (8.0 km) northeast of Keaau. Owner: Hawaiian Paradise Corporation.
AQUIFER.--Kau Volcanic Series, Holocene age.
WELL CHARACTERISTICS.--Drilled observation basal water-table well, diameter 10 in (0.25 m), depth 55 ft (17 m), cased to 39 ft (12 m), perforated 39 to 55 ft (12 to 17 m).
DATUM.--Land-surface datum is 45 ft (14 m) above mean sea level. Measuring point: Top of casing, 46.84 ft (14.277 m) above mean sea level.
REMARKS.--Water-quality records for 1971, 1973-76 are available in files of district office; those for 1977 are published elsewhere in this report.
PERIOD OF RECORD.--November 1971 to August 1975 records available in files of district office; November 1975 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 5.34 ft (1.628 m) above mean sea level, Nov. 15, 1973; lowest measured, 2.24 ft (0.683 m) above mean sea level, Mar. 9, 1972.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 13	4.72	DEC 8	4.69	APR 8	4.38	JUN 1	3.76	AUG 1	4.09

194819155582301. Local number, 8-4858-01.
LOCATION.--Lat 19°48'19", long 155°58'23", Hydrologic Unit 20010000, 3.4 mi (5.5 km) north of Huehue Ranch and 2.3 mi (3.7 km) southeast of Kaupulehu. Owner: Kona Village Resort.
AQUIFER.--Hualalai Volcanic Series, Holocene age.
WELL CHARACTERISTICS.--Drilled basal water-table well, diameter 4 in (0.1 m), depth 528 ft (161 m).
DATUM.--Land-surface datum is 498 ft (152 m) above mean sea level. Measuring point: Top of concrete block at well opening, 498.05 ft (151.806 m) above mean sea level.
REMARKS.--Water-quality records for 1960-61, 1965, 1972 are available in files of district office. Water level affected by pumping from two wells located within 100 ft (30.5 m).
PERIOD OF RECORD.--April 1974 to August 1975 records available in files of district office; October 1975 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 2.16 ft (0.658 m) above mean sea level, Aug. 26, 1975; lowest measured, 0.63 ft (0.192 m) above mean sea level, July 9, 1975.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OTOBER 1976 TO SEPTEMBER 1977

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 16	c1.40	MAR 17	c0.82	JUN 22	c0.95	AUG 4	c1.03

c Nearby well being pumped.

195947155485801. Local number, 8-5948-01.
LOCATION.--Lat 19°59'47", long 155°48'58", Hydrologic Unit 20010000, 0.7 mi (1.1 km) east of Hapuna Beach Park and 3.1 mi (5.0 km) southeast of Kawaihae. Owner: State of Hawaii.
AQUIFER.--Hamakua Volcanic Series, Pleistocene age.
WELL CHARACTERISTICS.--Drilled observation basal water-table well, diameter 10 in (0.25 m), depth 268 ft (81.7 m), cased to 246 ft (75.0 m), screened 246 to 266 ft (75.0 to 81.1 m).
DATUM.--Land-surface datum is 244 ft (74.4 m) above mean sea level. Measuring point: Hole in pumpbase, 245.0 ft (74.7 m) above mean sea level.
REMARKS.--Water-quality records for 1970, 1973-76 are available in files of district office; those for 1977 are published elsewhere in this report.
PERIOD OF RECORD.--April 1970, March 1973 to August 1975 records available in files of district office; October 1975 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 2.2 ft (0.67 m) above mean sea level, Sept. 20, 1976; lowest measured, 1.4 ft (0.43 m) above mean sea level, June 22, 1973, June 3, 1974.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 10	2.2	MAR 15	2.0	MAY 2	1.8	JUN 14	1.8	AUG 8	2.4

200132155471001. Local number, 8-6147-01.
LOCATION.--Lat 20°01'32", long 155°47'10", Hydrologic Unit 20010000, on Highway 26, 3.1 mi (5.0 km) east of Kawaihae and 2.8 mi (4.5 km) northeast of Hapuna Beach Park. Owner: State of Hawaii.
AQUIFER.--Pololu Volcanic Series, Pleistocene age.
WELL CHARACTERISTICS.--Drilled observation basal water-table well, diameter 8 in (0.2 m), depth 1,008 ft (307.2 m), cased to 997 ft (304 m), perforated 997 to 1,008 ft (304 to 307.2 m). Hole was drilled to 1,040 ft (317.0 m) but was finally plugged back to 1,008 ft (307.2 m).
DATUM.--Land-surface datum is 982 ft (299 m) above mean sea level. Measuring point: Top of pipe coupling on casing cover 983.1 ft (299.6 m) revised.
REMARKS.--Water-quality records for 1963-64 are available in files of district office.
PERIOD OF RECORD.--June to July 1963, June 1973 to August 1975 records available in files of district office; October 1975 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 5.9 ft (1.8 m) revised, above mean sea level, Aug. 25, 1975, 5.9 ft (1.8 m) above mean sea level, Nov. 10, 1976; lowest measured, 4.4 ft (1.3 m) above mean sea level Sept. 20, 1976.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 10	5.9	MAR 15	5.7	MAY 2	5.6	JUN 14	5.5	AUG 8	5.8

HAWAII, ISLAND OF HAWAII--Continued

201603155521801. Local number, 8-7652-01.
LOCATION.--Lat 20°16'03", long 155°52'18", Hydrologic Unit 20010000, 0.3 mi (0.5 km) west of Upolu Point Airfield, 3.1 mi (5.0 km) northwest of Hawi, and 1.9 mi (3.1 km) west of Hoea Camp. Owner: Kohala Corporation.
AQUIFER.--Pololu Volcanic Series, Pleistocene age.
WELL CHARACTERISTICS.--Dug observation basal water-table well.
DATUM.--Land-surface datum is 7.43 ft (2.265 m) above mean sea level. Measuring point: Top of 4 in (0.1 m) steel I-beam placed across sump, 7.75 ft (2.362 m) above mean sea level.
REMARKS.--Water-quality records for 1973-76 are available in files of district office; those for 1977 are published elsewhere in this report.
PERIOD OF RECORD.--March 1973 to August 1975 records available in files of district office; October 1975 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 3.09 ft (0.942 m) above mean sea level, Aug. 22, 1974; lowest measured, 1.45 ft (0.442 m) above mean sea level, July 9, 1975.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 16	2.25	APR 22	1.67	JUNE 16	1.63	AUG 15	2.00

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

STATION NUMBER	LOCAL IDENT-I-FIER	LAT-I-TUDE	LONG-I-TUDE	SEQ. NO.	DATE OF SAMPLE	TIME	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	TEMPER-ATURE (DEG C)	DIS-SOLVED CHLO-RIDE (CL) (MG/L)
		HAWAII, ISLAND OF KAUAI							
220008159444202	2-0044-03 W32B KSC	22 00 08	159 44 42	02	77-05-03	1105	10600	23.5	3500
220018159444701	2-0044-10 W33 KSC	22 00 18	159 44 47	01	76-10-13	1045	5100	22.0	2000
					76-12-02	1115	5600	20.5	2300
					77-01-26	1100	7500	23.0	3400
					77-03-08	1115	5000	22.5	2000
					77-05-10	1210	5200	22.5	2200
					77-06-07	1300	3900	23.0	1100
					77-06-07	1430	4100	23.5	1200
					77-06-13	1100	1200	31.0	310
					77-07-26	1100	660	33.0	130
220005159444501	2-0044-12 W30 KSC	22 00 05	159 44 45	01	77-08-04	1045	6300	22.5	2000
220019159444801	2-0044-14 W35 KSC	22 00 19	159 44 48	01	77-06-08	1000	770	23.0	150
					77-08-02	1300	1200	28.0	290
					77-08-02	1415	1000	23.0	270
220016159442701	2-0044-15 S14 KSC	22 00 16	159 44 27	01	76-10-13	1030	5300	22.5	2200
					76-12-02	1100	4200	21.5	1800
					77-01-26	1115	1350	23.5	340
					77-03-08	1100	4200	23.0	1800
					77-05-10	1240	2190	22.5	640
					77-06-13	1045	3750	22.5	1500
					77-07-26	1045	4700	23.5	2000
					77-09-23	1045	6800	23.0	2300
220136159205501	2-0120-01 W7 STATE	22 01 36	159 20 55	01	76-10-14	0845	820	24.5	150
					76-12-08	1530	830	24.0	150
					77-01-14	1530	800	26.0	150
					77-03-02	1530	800	26.0	150
					77-04-13	1500	850	24.5	190
					77-06-02	1500	790	26.5	150
					77-07-15	1510	850	25.5	160
					77-09-26	1220	860	25.5	160
220148159453501	2-0145-10 W45F KSC	22 01 48	159 45 35	01	76-10-13	1115	2800	21.5	850
					76-12-02	1125	3200	20.5	1000
					77-01-26	1045	3100	22.5	1200
					77-03-08	1125	3600	22.0	1300
					77-05-06	1430	2750	21.5	850
					77-06-13	1130	1900	22.0	560
					77-07-26	1115	2150	22.5	620
220354159205601	2-0320-01 W9-1A WAILUA	22 03 54	159 20 56	01	76-12-08	1345	400	22.5	43
					77-05-27	1230	390	23.5	44
					77-09-22	1510	390	23.0	45
220354159205602	2-0320-03 W9-1E CNTY	22 03 54	159 20 56	02	77-01-14	1430	360	25.5	53
					77-04-13	1355	350	24.5	47
220341159453901	2-0345-04 S16 KSC	22 03 41	159 45 39	01	76-10-13	1330	1750	22.0	450
					76-12-02	1200	1750	21.0	440
					77-01-26	1000	1600	23.5	450
					77-03-08	1300	1750	22.5	460
					77-05-06	1345	1690	22.5	430
					77-06-13	1330	1620	22.0	420
					77-07-26	1200	1650	23.0	440
					77-09-23	1200	1750	23.0	460

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

HAWAII, ISLAND OF KAUAI--Continued

STATION NUMBER	LOCAL IDENT-I-FIER	LAT-I-TUDE	LONG-I-TUDE	SEQ. NO.	DATE OF SAMPLE	TIME	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	TEMPER-ATURE (DEG C)	DIS-SOLVED CHLO-RIDE (CL) (MG/L)
220530159450401	2-0545-01 W59 SAKIMANA	22 05 30	159 45 04	01	76-10-13	1315	850	23.5	160
					76-12-02	1300	880	22.0	160
					77-01-26	0945	795	24.0	160
					77-03-08	1200	810	24.5	160
					77-05-06	1315	810	23.0	160
					77-06-13	1300	825	23.5	160
					77-07-26	1300	800	25.0	150
					77-09-23	1315	810	25.0	170
220827159185401	2-0818-01 W90A ANAHOLA	22 08 27	159 18 54	01	76-10-12	0910	270	22.0	24
					77-07-14	1445	240	23.5	23
220826159185401	2-0818-02 W90B CNTY	22 08 26	159 18 54	01	76-12-07	1345	280	23.0	21
					77-01-13	1415	270	23.0	21
					77-09-26	1105	282	23.5	24
221038159203801	2-1020-03 W78 LPC	22 10 38	159 20 38	01	77-05-27	1045	205	23.0	21
					77-07-14	1400	210	22.0	15
221141159252502	2-1125-02 CNTY	22 11 41	159 25 25	02	77-05-27	0945	150	23.5	14
221201159293401	2-1229-03 W73 HANALEI	22 12 01	159 29 34	01	76-10-12	1000	220	21.5	20
					76-12-03	1100	220	22.0	22
					77-01-12	1045	200	24.0	22
					77-03-01	1100	200	23.5	22
					77-05-26	1015	210	24.0	21
					77-07-13	1445	210	23.5	20
					77-09-22	1100	220	24.0	22
221247159324801	2-1232-01 W67 CNTY	22 12 47	159 32 48	01	76-12-03	1130	150	21.5	20
					77-01-12	1125	111	23.5	20
					77-03-01	1130	130	23.5	19
					77-05-25	1435	140	23.5	20
					77-09-22	1250	138	23.5	19
221318159335901	2-1333-01 W66 HAENA	22 13 18	159 33 59	01	76-10-12	1100	210	22.0	18
					76-12-03	1200	210	22.0	20
					77-01-12	1300	205	23.0	18
					77-03-01	1200	200	22.5	20
					77-04-11	1345	210	22.5	20
					77-07-13	1400	210	23.5	20
					77-09-22	1230	200	23.0	19
215418159260401	2-5426-04 STATE, KOLOA	21 54 18	159 26 04	01	77-02-18	0955	366	--	55
215454159274201	2-5427-01 W16A KOLOA	21 54 54	159 27 42	01	76-10-14	1330	240	23.0	25
					76-12-09	1330	240	21.5	26
					77-01-27	1345	230	24.0	25
					77-06-22	1500	230	24.0	27
					77-09-28	1415	240	23.0	26
215536159263501	2-5526-01 GRV FRM, KOLOA	21 55 36	159 26 35	01	77-09-28	1500	230	23.0	20
215528159303001	2-5530-02 W23 MSCO	21 55 28	159 30 30	01	76-10-14	1145	245	22.5	25
					76-12-09	1100	250	22.0	29
					77-01-27	1245	220	23.5	26
					77-04-14	1015	255	22.0	27
					77-06-22	1230	240	24.0	25
					77-07-27	1130	240	24.0	26
					77-09-28	1100	241	22.5	27
215535159302601	2-5530-03 W22 LAWAI	21 55 35	159 30 26	01	76-10-14	1200	215	23.0	22
					76-12-09	1115	220	21.5	22
					77-03-11	1530	210	24.0	23
					77-04-14	1000	220	22.0	23
					77-06-22	1215	215	24.5	24
					77-07-27	1115	210	24.0	22
					77-09-28	1050	220	22.5	24

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

HAWAII, ISLAND OF KAUAI--Continued

STATION NUMBER	LOCAL IDENT-I-FIER	LAT-I-TUDE	LONG-I-TUDE	SEQ. NO.	DATE OF SAMPLE	TIME	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	TEMPER-ATURE (DEG C)	DIS-SOLVED CHLO-RIDE (CL) (MG/L)
215522159342601	2-5534-03 W25-1 MCBRYDE	21 55 22	159 34 26	01	76-10-14	1030	475	23.5	40
					76-12-09	1000	490	23.0	42
					77-03-11	1455	460	24.0	42
					77-07-27	1030	450	24.0	36
					77-09-28	1015	465	22.5	37
215635159355001	2-5635-01 S7 KAUMAKANI	21 56 35	159 35 50	01	76-10-14	0930	730	23.5	140
					76-12-09	0900	750	23.0	150
					77-01-27	1100	650	23.5	140
					77-03-11	1400	720	24.0	140
					77-04-27	1420	700	24.0	140
					77-06-22	1115	700	24.0	140
					77-07-27	1015	710	23.0	140
					77-09-28	0930	725	22.5	140
215747159253401	2-5725-01 TU9 CNTY	21 57 47	159 25 34	01	76-11-18	--	260	21.5	24
215845159232101	2-5823-01 TU8 CNTY	21 58 45	159 23 21	01	77-03-21	0910	181	--	22
215825159240801	2-5824-01 CNTY, PUHI	21 58 25	159 24 08	01	76-11-18	--	280	22.5	18
215803159401201	2-5840-02 W26 WAIMEA	21 58 03	159 40 12	01	76-10-13	1430	600	25.5	99
					76-12-02	1415	600	23.5	110
					77-01-26	1415	560	25.5	110
					77-03-08	1420	600	25.5	110
					77-04-27	1245	580	25.0	100
					77-06-13	1400	580	26.0	110
					77-07-26	1400	600	25.0	120
					77-09-23	1400	650	24.5	120
215854159424601	2-5842-02 S11 KSC	21 58 54	159 42 46	01	76-10-13	0945	700	24.5	120
					76-12-02	1015	690	23.0	120
					77-01-26	1300	690	24.0	110
					77-03-08	1000	700	24.5	120
					77-05-10	1330	720	24.5	120
					77-06-13	1000	710	24.5	120
					77-07-26	1000	720	25.0	120
					77-09-23	1000	750	24.5	140
215843159422901	2-5842-03 S10 KSC	21 58 43	159 42 29	01	76-10-13	0915	1100	24.5	250
					76-12-02	0930	1080	23.0	240
					77-01-26	1330	1100	25.0	260
					77-03-08	0920	1300	24.5	330
					77-04-27	1330	1250	24.5	210
					77-07-11	1130	1450	25.0	410
					77-07-26	0920	1300	24.5	330
					77-09-23	0900	1250	25.0	310
215901159235301	2-5923-01 STATE	21 59 01	159 23 53	00	76-10-14	1445	295	24.5	18
215901159235302	2-5923-02 STATE	21 59 01	159 23 53	02	77-03-21	1000	190	--	--
					77-03-21	1055	190	--	--
215906159395601	2-5939-01 S9 CNTY	21 59 06	159 39 56	01	76-10-13	1500	520	22.5	86
					76-12-06	1200	530	23.0	72
					77-01-26	1430	370	24.5	49
					77-03-08	1445	430	24.0	59
					77-04-27	1205	450	24.0	58
					77-06-13	1415	390	24.5	48
					77-07-26	1430	400	24.0	54
					77-09-23	1440	480	24.5	74

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

STATION NUMBER	LOCAL IDENT-I-FIER	LAT-I-TUDE	LONG-I-TUDE	SEQ. NO.	DATE OF SAMPLE	TIME	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	TEMPER-ATURE (DEG C)	DIS-SOLVED CHLO-RIDE (CL) (MG/L)
			HAWAII, ISLAND OF KAUAI--Continued						
215937159434201	2-5943-01 S13 WAIAWA	21 59 37	159 43 42	01	76-10-13	1000	1200	23.5	280
					76-12-02	1030	1160	23.5	290
					77-01-26	1245	1100	24.0	300
					77-03-08	1030	1170	24.5	260
					77-05-10	1300	1100	24.0	320
					77-06-13	1030	1140	24.0	300
					77-07-26	1015	1130	24.5	330
					77-09-23	1015	1150	24.5	340
			HAWAII, ISLAND OF OAHU						
211646157465201	3-1646-01 W1B WAIALAE GC	21 16 46	157 46 52	01	76-10-22	0900	825	23.5	230
					76-12-07	1345	850	23.0	200
					77-01-21	1400	750	23.5	170
					77-03-10	1435	850	23.0	200
					77-04-26	0920	800	23.0	200
					77-06-10	0850	800	23.5	200
					77-07-26	0900	950	22.5	250
					77-08-31	0810	1050	22.0	260
211718157491002	3-1749-07 W25 TUBE D	21 17 18	157 49 08	02	76-10-19	1515	1225	23.0	390
					76-10-29	1340	--	--	410
					76-11-26	1400	--	--	360
					76-12-06	1505	1500	23.0	420
					76-12-29	1400	--	--	430
					77-01-17	1055	--	--	420
					77-01-26	0840	1425	23.0	400
					77-02-24	1415	--	--	390
					77-03-10	1550	1375	23.0	330
					77-03-22	1025	--	--	390
					77-04-19	1115	--	--	400
					77-04-26	1035	1250	23.0	380
					77-05-19	1105	--	--	400
					77-06-07	1540	1400	23.0	400
					77-06-20	1140	--	--	420
					77-07-19	1525	1500	23.0	430
					77-07-25	1130	--	--	430
					77-08-29	1135	--	--	430
					77-08-30	1500	1550	23.0	430
					77-09-14	1135	--	--	420
211718157491001	3-1749-07 W25 TUBE E	21 17 18	157 49 08	01	76-10-19	1520	650	23.0	160
					76-10-29	1350	--	--	160
					76-11-26	1410	--	--	160
					76-12-06	1515	760	22.5	180
					76-12-29	1405	--	--	180
					77-01-17	1105	--	--	190
					77-01-26	0845	800	23.0	190
					77-02-24	1420	--	--	200
					77-03-10	1445	790	23.0	190
					77-03-22	1035	--	--	200
					77-04-19	1125	--	--	200
					77-04-26	1040	750	23.0	190
					77-05-19	1110	--	--	190
					77-06-07	1550	750	23.0	190
					77-06-20	1145	--	--	190
					77-07-19	1530	850	23.0	210
					77-07-25	1135	--	--	210
					77-08-29	1150	--	--	220
					77-08-30	1510	900	23.0	220
					77-09-14	1140	--	--	230

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

STATION NUMBER	LOCAL IDENT-I-FIER	LAT-I-TUDE	LONG-I-TUDE	SEQ. NO.	DATE OF SAMPLE	TIME	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	TEMPER-ATURE (DEG C)	DIS-SOLVED CHLO-RIDE (CL) (MG/L)
					HAWAII, ISLAND OF OAHU--Continued				
211832157515501	3-1851-19 W102 TUBE A	21 18 32	157 51 55	01	76-10-22	1500	17500	24.0	7400
					76-12-06	1430	16000	23.5	7200
					77-01-25	1430	17000	23.5	7200
					77-03-11	1510	20000	23.5	7400
					77-04-26	1510	15000	23.5	7200
					77-06-10	1540	17000	23.5	7400
					77-07-22	1520	18000	24.0	7800
					77-09-06	1220	15000	24.0	7500
211832157515502	3-1851-19 W102 TUBE B	21 18 32	157 51 55	02	76-10-22	1515	1050	24.0	320
					76-12-06	1420	1200	23.5	320
					77-01-25	1420	1175	24.0	350
					77-03-11	1515	1200	23.5	340
					77-04-26	1515	1125	23.5	340
					77-06-10	1530	1250	23.5	350
					77-07-22	1530	1300	24.0	360
					77-09-06	1230	1300	23.5	370
212038157422501	3-2042-13 W420-1A PAC CO	21 20 02	157 42 07	01	77-05-11	1110	5000	25.5	1600
					77-09-19	1010	4900	25.0	1500
212133158035501	3-2103-03 S14 NAVY	21 21 33	158 03 55	01	76-12-07	0900	1075	23.0	220
					77-01-26	1050	1025	23.5	220
					77-03-14	0920	1000	23.5	220
					77-04-27	0900	950	23.5	220
					77-06-13	0915	1025	23.0	220
					77-07-26	1315	1100	23.0	230
					77-09-02	0915	1050	23.0	220
212106157533701	3-2153-02 W153 DAMON EST	21 21 06	157 53 37	01	76-10-22	0955	380	22.0	74
					76-12-06	0920	410	22.0	75
					77-01-25	0850	405	22.0	76
					77-03-11	0855	400	21.5	75
					77-04-26	1225	395	22.0	75
					77-06-10	1140	400	22.0	74
					77-07-22	0945	400	22.0	73
					77-09-06	0900	400	21.5	74
212155157551001	3-2155-04 W160 ARMY	21 21 55	157 55 10	01	76-10-22	1345	580	23.0	150
					76-12-06	1330	640	22.5	160
					77-01-25	1320	625	22.5	150
					77-03-11	1355	650	23.0	160
					77-04-26	1405	600	23.0	150
212237158002001	3-2200-03 W234 NAVY	21 22 37	158 00 20	01	77-01-26	0945	8000	22.5	2800
212259157554201	3-2255-35 W189-3A C&H SG	21 22 59	157 55 42	01	76-10-22	1020	760	22.5	220
					76-12-06	0945	825	22.5	190
					77-01-25	0915	850	22.5	200
					77-03-11	0935	850	22.5	200
					77-04-26	1345	800	22.5	210
					77-07-22	1015	900	22.0	230
					77-09-06	0920	900	22.0	220
212238157561102	3-2256-12 W187C NAVY	21 22 38	157 56 11	02	76-10-22	1250	550	26.0	150
					76-12-06	1300	600	24.0	160
					77-01-25	1010	600	24.0	150
					77-03-07	1010	560	24.5	160
					77-06-10	1340	590	27.0	160
212300158004801	3-2300-06 W253 CITY	21 23 00	158 00 48	01	77-05-16	1355	650	21.7	160
					77-06-21	1309	640	21.3	150

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

STATION NUMBER	LOCAL IDENTI-FIER	LAT-I-TUDE	LONG-I-TUDE	SEQ. NO.	DATE OF SAMPLE	TIME	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	TEMPER-ATURE (DEG C)	DIS-SOLVED CHLO-RIDE (CL) (MG/L)
			HAWAII, ISLAND OF OAHU--Continued						
212343158001001	3-2300-11 W238 WATANABE	21 23 43	158 00 10	01	76-10-27	1310	700	22.5	170
					76-12-07	1300	800	21.5	180
					77-01-26	0925	760	23.0	170
					77-03-14	1215	790	22.5	180
					77-04-28	1415	700	23.0	180
					77-06-13	1335	775	22.5	180
					77-07-22	1040	800	23.0	180
					77-09-02	1335	800	22.5	180
212358158010901	3-2301-09, 10 W247J,I	21 23 58	158 01 09	01	76-10-27	1245	400	23.5	65
					76-12-07	1230	440	23.0	72
					77-01-26	1010	430	22.0	72
					77-03-14	1200	380	23.5	59
					77-04-28	1400	380	25.0	60
					77-06-13	1315	430	23.5	73
					77-07-22	1110	400	23.5	64
					77-09-02	1315	400	24.0	64
212327157573901	3-2357-21 W198-3 SUYETANI	21 23 27	157 57 39	01	77-03-11	1330	500	23.0	110
212332157582201	3-2358-02 W201 NAVY	21 23 32	157 58 22	01	76-10-22	1110	1250	20.5	410
					76-12-06	1035	1550	20.5	430
					77-01-25	1145	1475	20.5	420
					77-03-11	1225	1200	20.5	330
					77-04-26	1325	1100	20.5	340
					77-06-10	1245	1100	20.0	310
					77-07-22	1210	900	20.5	240
					77-09-02	1430	825	20.5	210
212318157583401	3-2358-19 W205-1 NAVY	21 23 18	157 58 34	01	76-10-22	1055	700	25.5	180
					76-12-06	1020	1200	24.0	340
					77-01-25	1050	1175	21.5	340
					77-06-10	1230	1175	24.5	320
212342157584301	3-2358-22 W204-4	21 23 42	157 58 43	01	76-10-27	1325	500	21.0	130
					76-12-06	1105	590	20.5	130
					77-01-25	1220	600	21.0	140
					77-03-11	1300	540	21.0	120
					77-04-28	1435	495	21.0	120
					77-06-13	1350	540	20.5	130
					77-07-22	1300	520	21.0	110
					77-09-02	1345	540	20.5	130
212343157584701	3-2358-29 W204-9	21 23 43	157 58 47	01	76-10-27	1335	650	20.5	180
					76-12-06	1115	790	20.0	200
					77-01-25	1230	850	20.5	220
					77-03-11	1310	660	20.5	160
					77-04-28	1440	600	21.0	160
					77-06-13	1400	700	20.5	180
					77-07-22	1310	625	20.5	150
					77-09-02	1355	625	20.5	150
212336157591801	3-2359-05 W204-11 OSHITA	21 23 36	157 59 18	01	76-10-27	1350	1200	22.0	370
					76-12-06	1130	1400	22.0	370
					77-01-25	1205	1400	22.5	390
					77-06-13	1415	1200	22.5	340
212422157485601	3-2448-01 W416 STATE	21 24 22	157 48 56	01	76-12-27	1505	200	21.0	20
					77-03-30	1010	180	21.0	20
					77-05-17	0800	180	21.0	20
					77-09-23	1045	195	21.0	20
212501158080701	3-2508-02 SP CATY	21 25 01	158 08 07	01	76-10-12	1435	450	28.5	280
					76-11-26	1515	1300	28.5	290
					77-01-19	1145	1340	28.5	270
					77-03-07	1115	1400	28.5	290
					77-04-18	1030	1350	28.5	280
					77-07-12	0915	1350	28.5	280
					77-09-29	0940	1450	27.5	280

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

STATION NUMBER	LOCAL IDENT-I-FIER	LAT-I-TUDE	LONG-I-TUDE	SEQ. NO.	DATE OF SAMPLE	TIME	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	TEMPER-ATURE (DEG C)	DIS-SOLVED CHLO-RIDE (CL) (MG/L)
HAWAII, ISLAND OF OAHU--Continued									
212556157500301	3-2550-01 W407-16	21 25 56	157 50 03	01	76-12-27	1530	145	23.0	19
					77-02-11	1540	160	23.0	18
					77-03-25	1430	145	23.0	19
					77-05-17	0700	140	23.5	19
					77-09-23	1030	145	23.0	18
212506157582301	3-2558-10 S16 NAVY	21 25 06	157 58 23	01	76-10-27	0920	700	22.5	180
					77-01-20	1230	700	22.0	180
					77-03-11	1200	710	22.0	180
					77-06-10	1210	790	21.5	200
					77-07-20	1210	740	22.0	180
					77-09-01	1210	750	22.0	160
212617158033801	3-2603-01 W330-8 HAW CC	21 26 17	158 03 38	01	76-12-07	1150	365	22.0	49
					77-06-13	1215	340	22.0	50
					77-07-26	1355	360	22.0	46
212656158071801	3-2607-01 W277-97 NAVY	21 26 56	158 07 18	01	77-01-14	0940	345	24.5	44
					77-03-08	0815	370	24.5	43
					77-04-18	0830	340	24.5	46
					77-07-12	0745	340	24.5	46
					77-09-29	0800	370	24.0	46
212803158000701	3-2800-01 W250-4A CNTY	21 28 03	158 00 07	01	76-11-29	1340	155	22.0	16
					77-01-14	1345	160	22.0	18
212813158080201	3-2808-01 W277-92 NAVY	21 28 13	158 08 02	01	76-10-12	1335	1400	27.0	160
					76-11-30	1320	1280	27.0	160
					77-01-14	1010	1300	26.5	160
					77-03-08	0900	1350	26.5	160
					77-04-18	0925	1250	27.0	160
					77-07-12	0810	1240	27.0	160
					77-09-29	0820	1350	26.0	160
212828158092001	3-2809-06 CNTY, WAIANAE	21 28 28	158 09 20	01	76-10-06	0945	410	23.5	31
					76-11-26	1415	440	23.0	34
					77-01-10	0930	430	23.5	34
					77-02-23	0900	450	23.0	33
					77-04-15	1100	420	23.5	34
					77-05-27	1015	420	23.0	32
					77-07-11	1015	395	23.5	34
					77-08-25	1350	420	23.0	32
212859158124301	3-2812-01 S1 CNTY, MAKAHA	21 28 59	158 12 43	01	76-10-06	1505	480	25.5	82
					76-11-30	1120	380	23.5	58
					77-01-10	1120	450	23.5	76
					77-02-23	1030	580	25.5	90
					77-04-18	1210	240	24.5	30
					77-05-27	1610	580	24.0	94
					77-07-11	1200	560	25.0	96
					77-08-25	0940	560	26.5	93
212927158014801	3-2901-07 S4 ARMY	21 29 27	158 01 48	01	76-10-15	0815	165	22.0	16
					76-12-01	0830	168	22.5	18
					77-01-14	1430	170	22.0	18
					77-03-07	0830	180	22.5	19
					77-04-19	0755	170	22.5	20
					77-07-08	0830	175	22.5	18
					77-08-24	0920	190	23.0	19

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

STATION NUMBER	LOCAL IDENT-I-FIER	LAT-I-TUDE	LONG-I-TUDE	SEQ. NO.	DATE OF SAMPLE	TIME	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	TEMPER-ATURE (DEG C)	DIS-SOLVED CHLO-RIDE (CL) (MG/L)
HAWAII, ISLAND OF OAHU--Continued									
212945158014301	3-2901-09 W330-6 CNTY	21 29 45	158 01 43	01	76-10-08	1615	180	22.5	19
					76-11-24	1540	180	22.0	20
					77-01-04	1625	185	22.0	20
					77-02-25	1420	195	22.5	21
					77-04-12	1650	185	22.0	22
					77-05-31	0845	190	21.5	20
					77-07-08	1645	190	22.0	20
					77-08-19	1600	195	22.5	20
					77-09-27	1600	200	21.5	21
212939158112301	3-2911-02 WDCO, MAKAHA	21 29 39	158 11 23	01	76-10-06	1310	250	22.0	26
					76-11-26	1300	255	21.5	26
					77-01-10	1350	260	21.5	26
					77-02-23	1050	280	21.5	25
					77-04-15	1510	260	22.0	28
					77-05-27	1430	275	21.0	26
					77-07-11	1600	265	21.5	26
					77-08-25	1315	570	21.0	24
213224158135901	3-3213-06 W277-101 PAGE	21 32 24	158 13 59	01	76-10-06	1420	875	25.5	210
					76-11-30	1045	875	24.5	200
					77-01-10	1035	880	24.5	210
					77-02-23	1000	900	24.5	200
					77-04-18	1310	880	25.0	210
					77-05-27	1530	890	24.5	210
					77-07-11	1115	890	25.0	200
					77-08-25	1000	875	26.5	210
213243157510001	3-3251-01 W406 SWANZY	21 32 43	157 51 00	01	76-11-10	1545	950	22.0	230
					77-02-11	1430	950	22.5	240
					77-03-25	1400	950	22.5	240
					77-05-16	1500	900	23.0	240
					77-07-01	1305	900	23.0	240
					77-08-11	1300	900	23.0	340
					77-09-09	1330	950	23.0	260
213327157524401	3-3352-01 W405 FOSTER	21 33 27	157 52 44	01	76-11-10	1510	270	22.0	37
					77-02-11	1350	280	22.0	36
					77-03-25	1320	260	22.0	27
					77-05-16	1420	260	23.0	37
					77-07-01	1230	260	22.5	37
					77-08-03	1225	160	22.0	18
					77-09-09	1320	270	22.0	38
213427158055501	3-3405-02 W323-2 CNTY	21 34 27	158 05 55	01	76-10-08	1550	550	23.0	110
					77-01-04	1600	570	23.0	120
					77-02-25	1400	580	24.5	110
					77-04-13	0820	580	23.0	110
					77-05-25	1740	565	22.5	110
					77-08-19	0915	595	23.0	120
213411158074501	3-3407-25 W320 CNTY	21 34 11	158 07 45	01	76-10-13	0740	1950	23.5	540
					76-12-01	0935	1900	23.5	540
					77-01-13	0900	1950	23.0	530
					77-03-08	1045	2000	23.5	540
					77-04-19	0930	1900	23.5	520
					77-06-01	0805	2200	22.5	610
					77-07-14	0840	2200	23.0	620
213444158075501	3-3407-30 W318-2 WSCO	21 34 44	158 07 55	01	76-10-12	1550	3800	25.5	1000
					76-11-30	1530	3500	25.0	1000
					77-04-14	1100	3100	25.5	700
					77-06-01	1125	3100	24.5	740
					77-07-14	1135	3800	25.5	1000
					77-08-19	1205	4700	25.5	1200
					77-09-29	1515	5300	24.5	1400

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

STATION NUMBER	LOCAL IDENT-I-FIER	LAT-I-TUDE	LONG-I-TUDE	SEQ. NO.	DATE OF SAMPLE	TIME	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	TEMPER-ATURE (DEG C)	DIS-SOLVED CHLO-RIDE (CL) (MG/L)
			HAWAII, ISLAND OF OAHU--Continued						
213438158091101	3-3409-16 W308 MENOONCA	21 34 38	158 09 11	01	76-10-15	1020	800	22.5	160
					76-11-30	1500	800	22.5	170
					77-01-13	1000	800	22.0	170
					77-02-24	1400	800	22.5	170
					77-04-14	1230	800	23.0	180
					77-06-01	0840	800	22.0	180
					77-07-14	0915	840	22.5	180
					77-08-19	1235	830	22.5	180
213446158104901	3-3410-08 W286 WSCO	21 34 46	158 10 49	01	76-10-15	1100	800	23.0	240
					76-12-01	1000	890	21.5	240
					77-01-13	1045	930	21.5	260
					77-02-24	1425	900	22.0	250
					77-04-19	1305	875	23.0	250
					77-06-01	0925	890	22.0	240
					77-07-14	0945	930	23.0	250
					77-08-19	1315	950	24.0	240
					77-09-29	1625	975	23.5	260
213512158061601	3-3506-03,04 W329A,B WSCO	21 35 12	158 06 16	01	76-10-04	1215	475	22.0	88
					77-01-06	1200	490	22.0	86
					77-02-25	1235	490	22.0	87
					77-04-14	0920	470	22.5	88
					77-05-17	1230	490	22.5	88
					77-07-05	1510	500	22.5	92
					77-08-19	0930	520	23.0	96
					77-09-29	1315	540	21.5	98
213513157534701	3-3553-07 W402-2D CNTY	21 35 13	157 53 47	01	77-02-11	1330	380	21.0	100
					77-03-25	1300	420	21.0	95
					77-07-01	1215	440	21.0	100
					77-08-11	1220	440	21.0	100
					77-09-09	1250	460	21.0	110
213636158053701	3-3605-03 W334C WSCO	21 36 36	158 05 37	01	76-10-08	1520	2300	22.0	630
					76-12-01	1330	1900	21.5	540
					77-01-13	1300	1550	21.5	420
					77-02-24	1120	2100	22.0	560
					77-04-14	0935	2200	22.0	520
					77-05-25	1650	1900	21.5	530
					77-07-07	1320	2000	22.0	560
					77-08-19	1050	2100	22.0	580
					77-09-27	1510	2400	21.0	590
213636158053702	3-3605-21 W334U WSCO	21 36 36	158 05 37	02	76-10-08	1500	1400	22.0	330
					76-12-01	1340	1360	22.0	360
					77-01-13	1245	1350	21.5	350
					77-02-24	1105	1350	21.5	360
					77-04-14	0955	1300	22.0	360
					77-05-25	1715	1360	21.5	370
					77-07-07	1300	1400	22.0	380
					77-08-19	1035	1450	22.5	390
					77-09-27	1450	1650	21.5	390
213656157550401	3-3655-01 W394 CNTY	21 36 56	157 55 04	01	76-11-10	1445	240	21.0	32
					76-12-28	1315	250	21.0	34
					77-02-11	1230	240	21.5	34
					77-03-25	1235	240	21.5	34
					77-05-16	1400	230	22.0	34
					77-07-01	1135	230	21.5	34
					77-08-11	1200	225	21.5	34
					77-09-09	1230	240	21.5	34

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

STATION NUMBER	LOCAL IDENT-I-FIER	LAT-I-TUDE	LONG-I-TUDE	SEQ. NO.	DATE OF SAMPLE	TIME	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	TEMPER-ATURE (DEG C)	DIS-SOLVED CHLO-RIDE (CL) (MG/L)
			HAWAII, ISLAND OF OAHU--Continued						
213902157561601	3-3956-04 W366 KAHAWAI	21 39 02	157 56 16	01	76-11-10	1315	550	21.0	130
					76-12-28	1215	600	21.5	140
					77-02-11	1140	600	21.5	140
					77-05-16	1300	580	22.0	140
					77-07-01	1105	600	21.5	150
					77-08-11	1100	600	21.0	150
					77-09-09	1100	625	21.5	150
214050157573301	3-4057-01 W353A KAHUKU	21 40 50	157 57 33	01	76-11-10	0800	470	21.5	98
					76-12-28	0800	470	21.5	98
					77-02-11	1000	540	21.5	110
					77-03-25	0800	500	21.5	110
					77-05-16	1115	460	22.0	88
					77-07-01	0810	440	21.5	99
					77-08-11	0830	500	21.5	140
					77-09-09	0830	600	22.0	110
214029157570101	3-4057-06 W357 CMPBL EST	21 40 29	157 57 01	01	77-02-11	1100	1400	22.0	910
					77-07-01	1045	1350	21.5	400
214157158000101	3-4100-01 W338 DEL WEBB	21 41 57	158 00 01	01	76-11-10	1000	850	20.5	210
					76-12-28	0900	5500	20.0	1600
214131158011601	3-4101-08 W337-6 CNTY	21 41 31	158 01 16	01	76-11-10	1115	230	20.0	32
					76-12-28	1100	240	20.0	34
					77-02-11	0910	240	21.0	34
					77-03-25	1040	230	20.5	34
					77-05-16	1000	230	21.0	32
					77-07-01	0955	220	20.5	36
					77-08-11	0955	210	20.5	35
					77-09-09	1015	230	20.5	34
214159157591001	3-4159-01 W341-A CMPBL	21 41 59	157 59 10	01	76-11-10	0915	1050	24.0	270
					76-12-28	0840	1100	22.5	260
214233157583501	3-4258-04 W345 RCA	21 42 33	157 58 35	01	76-11-10	0845	1700	23.5	520
					76-12-28	0820	1800	22.5	520
					77-02-11	0745	1800	21.5	550
					77-03-25	0820	1650	22.0	530
					77-05-16	0815	1600	24.0	530
					77-07-01	0840	1800	23.5	520
					77-08-11	0840	1800	23.5	530
					77-09-09	0910	1700	24.0	530
			HAWAII, ISLAND OF MOLOKAI						
210402156495801	4-0449-01 S6 CNTY	21 04 02	156 49 58	01	76-10-19	1600	330	22.0	61
					77-02-08	1630	350	20.0	60
					77-05-31	1710	370	21.0	66
					77-09-12	1720	360	20.0	65
210419156570501	4-0457-01 S4 CNTY	21 04 19	156 57 05	01	76-10-19	1630	260	23.0	52
					77-02-08	1715	320	22.0	68
					77-05-31	1800	280	22.0	54
					77-09-12	1755	280	22.5	58
210605157012001	4-0601-01 W11 MO RANCH	21 06 05	157 01 20	01	76-10-22	0815	290	23.0	28
					76-12-17	0715	298	23.0	34
					77-02-11	1305	300	23.0	38
					77-04-08	1710	310	23.0	42
					77-06-03	0800	310	23.0	44
					77-07-14	0820	340	23.0	49
					77-09-14	0820	400	23.5	58

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

STATION NUMBER	LOCAL IDENT-I-FIER	LAT-I-TUDE	LONG-I-TUDE	SEQ. NO.	DATE OF SAMPLE	TIME	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	TEMPER-ATURE (DEG C)	DIS-SOLVED CHLO-RIDE (CL) (MG/L)
HAWAII, ISLAND OF MOLOKAI--Continued									
210638157032601	4-0603-01 D414 MO RANCH	21 06 38	157 03 26	01	76-10-22	0900	2600	23.0	700
					77-02-11	1130	2700	22.0	720
					77-06-03	0915	2600	23.0	650
					77-09-15	1235	2850	24.5	750
210856157011201	4-0801-01 W16 HHC	21 08 56	157 01 12	01	76-12-14	0830	301	--	62
					77-04-05	0850	396	--	88
					77-07-12	0745	310	--	62
210903157013001	4-0901-01 W17 DEL MONTE	21 09 03	157 01 30	01	76-10-20	0900	370	20.0	--
					76-12-15	0900	310	20.0	66
					77-02-09	1025	390	20.0	60
					77-06-01	1520	300	20.5	57
					77-07-13	1625	310	20.5	58
					77-09-14	0930	290	19.5	56
HAWAII, ISLAND OF MAUI									
203835156065001	6-3806-01 PUNAHOA SPRINGS	20 38 35	156 06 50	01	77-07-20	0840	92	--	11
204126156262101	6-4126-02 478-1 A&B INC	20 41 26	156 26 21	01	76-10-18	1130	1900	21.0	460
					76-12-03	1010	1900	20.0	450
					77-01-25	0845	2000	18.0	480
					77-03-15	0935	1800	19.5	480
					77-05-04	1015	2000	19.0	460
					77-06-29	1125	2000	20.0	500
					77-08-19	1345	2000	19.0	510
204601156001501	6-4600-01 W55 HANA RANCH	20 46 01	156 00 15	01	76-10-05	1745	550	20.5	100
					76-11-22	1645	540	20.5	100
					77-01-12	1715	540	21.0	100
					77-03-01	1700	590	20.0	110
					77-04-20	1745	590	20.5	110
					77-06-15	1605	520	21.0	99
					77-08-09	1600	600	20.5	110
204636156002601	6-4600-02 STATE	20 46 36	156 00 26	01	77-01-13	1515	1880	18.5	500
					77-09-01	1500	727	19.0	190
204633156003201	6-4600-03 STATE WELL B	20 46 33	156 00 32	01	76-12-16	1145	676	--	180
					77-06-15	1630	340	19.5	70
					77-08-31	1618	329	19.0	70
204634156271101	6-4627-08 W225 HASHIMOTO	20 46 34	156 27 11	01	76-12-03	1350	1750	23.0	330
					77-03-15	1230	1700	23.0	320
					77-06-29	1400	1750	23.0	390
204635156270101	6-4627-14 W226 HASHIMOTO	20 46 35	156 27 01	01	76-10-18	1400	1440	23.0	280
					77-01-25	1135	1440	23.0	290
					77-05-04	1220	1420	23.0	290
					77-08-19	1115	1440	22.5	280
204845156255001	6-4825-01 S15 HC&S	20 48 45	156 25 50	01	76-10-07	1030	1590	--	340
					76-12-07	0800	1620	--	340
					77-01-10	0730	1610	--	340
					77-02-08	0800	1590	--	340
					77-05-24	0800	1630	--	350
					77-06-18	0800	1620	--	350
					77-07-16	--	1620	--	360
					77-08-26	--	1620	--	340

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

STATION NUMBER	LOCAL IDENT-I-FIER	LAT-I-TUDE	LONG-I-TUDE	SEQ. NO.	DATE OF SAMPLE	TIME	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	TEMPER-ATURE (DEG C)	DIS-SOLVED CHLO-RIDE (CL) (MG/L)
			HAWAII, ISLAND OF MAUI--Continued						
204931156371201	6-4937-01 S10 PNR MILL	20 49 31	156 37 12	01	76-10-01	1300	4500	--	1400
					76-10-29	0830	4580	--	1400
					76-12-02	1420	4660	--	1500
					76-12-24	--	5530	--	1800
					77-01-28	1400	5420	--	1800
					77-02-25	1000	3680	--	1100
					77-04-28	0820	4090	--	1300
					77-06-02	1420	4290	--	1300
					77-07-01	1010	4520	--	1400
					77-08-03	1020	4300	--	1400
					77-09-02	1350	4670	--	1400
205014156212701	6-5021-01 LANDCO	20 50 14	156 21 27	01	77-09-26	0845	1850	21.0	480
205102156282501	6-5128-02 S16 HC&S	20 51 02	156 28 25	01	76-10-07	0740	2090	--	450
					76-12-07	0730	2130	--	480
					77-01-10	--	1950	--	430
					77-02-08	0815	2000	--	450
					77-05-24	0630	1920	--	420
					77-06-18	0515	1910	--	420
					77-07-16	0725	1900	--	420
					77-08-26	--	1880	--	410
205243156243201	6-5224-02 S22 HC&S	20 52 43	156 24 32	01	76-10-07	0800	1510	--	360
					76-12-07	0900	1530	--	360
					77-01-10	0820	1530	--	360
					77-02-08	0600	1540	--	370
					77-05-24	0540	1540	--	370
					77-06-18	0830	1580	--	330
					77-07-16	--	1580	--	380
					77-08-26	--	1600	--	390
205305156304401	6-5330-05 S73 WSCO	20 53 05	156 30 44	01	76-12-07	1230	340	20.5	53
					77-01-27	1230	350	22.0	44
					77-03-15	1445	370	21.0	56
					77-06-30	1315	350	21.0	53
					77-08-23	1315	340	20.5	51
205329156305502	6-5330-09 W15A CNTY	20 53 29	156 30 55	02	76-12-07	1030	470	23.0	85
205329156305501	6-5330-10 W15B CNTY	20 53 29	156 30 55	01	77-01-27	1050	430	23.0	72
					77-06-30	1100	400	22.0	74
205330156305401	6-5330-11 W15F CNTY	20 53 30	156 30 54	01	76-10-18	1310	330	23.0	36
					77-03-15	1430	310	23.0	40
					77-08-23	1445	350	22.0	43
205322156394501	6-5339-01 W291 CNTY	20 53 22	156 39 45	01	76-11-26	1520	1060	--	290
					77-06-28	1225	1290	21.5	290
205320156394501	6-5339-02 W292 CNTY	20 53 20	156 39 45	01	77-01-26	1345	1300	20.0	300
					77-05-02	0950	1118	20.5	260
					77-08-17	1145	960	20.0	200
205344156393001	6-5339-03 STATE	20 53 44	156 39 30	01	77-01-28	0945	960	--	260
205343156401101	6-5340-02 S5 PNR MILL	20 53 43	156 40 11	01	76-10-01	1040	4260	--	1300
					76-10-29	1000	4530	--	1400
					76-12-02	1230	3790	--	1100
					76-12-24	0800	4700	--	1500
					77-01-28	0930	4620	--	1400
					77-02-25	0815	1950	--	540
					77-04-28	0930	2340	--	670
					77-06-02	1320	2790	--	800
					77-07-01	0800	3340	--	1000
					77-07-29	0750	3400	--	1000
					77-09-02	1219	3770	--	1100

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

STATION NUMBER	LOCAL IDENT-I-FIER	LAT-I-TUDE	LONG-I-TUDE	SEQ. NO.	DATE OF SAMPLE	TIME	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	TEMPER-ATURE (DEG C)	DIS-SOLVED CHLO-RIDE (CL) (MG/L)
			HAWAII, ISLAND OF MAUI--Continued						
205416156244301	6-5424-01 S24 HCRS	20 54 16	156 24 43	01	76-10-07	1000	2220	--	580
					77-01-10	0845	2310	--	630
					77-02-08	0900	2330	--	630
					77-05-24	0615	2300	--	620
					77-06-18	0545	2360	--	650
					77-07-16	--	2370	--	640
					77-08-26	--	2270	--	640
205511156222101	6-5522-01 S31 HCRS	20 55 11	156 22 21	01	76-10-07	0930	1270	--	410
					76-12-07	0930	1230	--	290
					77-01-11	0800	1200	--	290
					77-02-08	--	1170	--	280
					77-05-24	0900	1160	--	280
					77-06-18	0900	1210	--	290
					77-07-16	--	1250	--	300
					77-08-26	--	1250	--	310
205651156401001	6-5640-01 S36 PNR MILL	20 56 51	156 40 10	01	76-10-01	1010	1430	--	380
					76-10-29	1015	1750	--	480
					76-12-02	1330	1670	--	460
					76-12-24	0900	1790	--	490
					77-01-28	0850	1470	--	400
					77-02-25	0925	750	--	180
					77-04-28	1015	794	--	200
					77-06-02	1240	850	--	210
					77-07-01	0910	930	--	240
					77-07-29	0835	830	--	220
					77-09-02	1305	969	--	250
205837156384601	6-5838-01 STATE	20 58 37	156 38 46	01	76-11-26	1025	710	20.5	170
					77-01-26	1105	660	20.0	150
					77-03-14	1410	640	20.5	150
					77-05-02	1115	670	20.5	150
					77-06-28	1415	670	20.5	150
					77-08-17	1345	670	21.0	150
			HAWAII, ISLAND OF HAWAII						
190347155354301	8-0335-01 STATE	19 03 47	155 35 43	01	77-05-05	1300	130	19.0	10
					77-06-21	1140	130	19.0	10
190832155310801	8-0031-01 HWN INVEST CO	19 08 32	155 31 08	01	77-06-21	1025	530	18.0	120
190832155310901	8-0831-02 HWN INVEST CO	19 08 32	155 31 09	01	76-11-05	0940	570	18.0	150
					77-03-11	1140	530	18.0	150
191114155294801	8-1129-01 DRWR ORCHARDS	19 11 14	155 29 48	01	77-03-11	1105	90	18.0	--
191219155291601	8-1229-01 CNTY	19 12 19	155 29 16	01	77-05-05	1110	92	17.0	4.0
192108155021201	8-2102-01 W9-10 STATE	19 21 08	155 02 12	01	76-11-12	1340	940	26.0	230
					77-03-24	1320	1000	25.5	250
					77-05-10	1420	1000	25.5	260
					77-07-11	1345	1075	25.5	280
					77-09-20	1225	1050	25.5	280
192457154571801	8-2487-02 CNTY	19 24 57	154 57 18	01	77-09-14	1035	630	24.0	160
192738155534201	8-2753-01 W12-4 CNTY	19 27 38	155 53 42	01	77-03-18	0830	550	19.0	130
192731155534101	8-2753-02 W12-8 CNTY	19 27 31	155 53 41	01	76-11-17	0815	660	19.0	160
					77-05-05	1445	690	19.0	170
					77-06-21	1420	750	19.5	180
					77-08-04	1525	750	19.5	180

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

STATION NUMBER	LOCAL IDENT-I-FIER	LAT-I-TUDE	LONG-I-TUDE	SEQ. NO.	DATE OF SAMPLE	TIME	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	TEMPER-ATURE (DEG C)	DIS-SOLVED CHLO-RIDE (CL) (MG/L)
HAWAII, ISLAND OF HAWAII--Continued									
192728154530101	8-2783-01 W9-9 STATE	19 27 28	154 53 01	01	76-10-01	1015	16500	55.0	5900
					76-11-01	1135	15000	54.5	5800
					76-12-30	1100	15000	55.0	5800
					77-03-24	1115	14800	55.0	5900
					77-05-11	1340	6600	52.0	2500
					77-07-11	1140	12000	54.0	5000
					77-09-20	1400	13000	53.0	5000
192924154564701	8-2986-01 W9-5B CNTY	19 29 24	154 56 47	01	76-12-30	0950	123	22.5	5.0
					77-09-14	1205	125	22.5	5.5
193017154502101	8-3080-02 S9 CNTY	19 30 17	154 50 21	01	77-07-11	1000	825	25.0	150
					77-09-14	1300	1060	25.0	170
193113154555801	8-3185-01 W9-11 HAW BCH	19 31 13	154 55 58	01	76-11-12	1000	120	21.5	15
					77-03-23	1120	125	21.5	16
					77-05-11	1530	122	21.5	14
193510155570801	8-3557-01 W12-5 CNTY	19 35 10	155 57 08	01	76-11-17	1030	170	20.0	19
					77-03-18	1010	155	20.0	15
					77-05-06	0935	145	20.0	12
					77-06-22	0920	150	20.0	13
					77-08-05	0905	170	20.0	14
193505155570801	8-3557-02 W12-6 CNTY	19 35 05	155 57 08	01	76-11-17	1000	370	20.0	72
					77-03-18	1000	390	20.0	--
					77-05-06	0835	380	20.0	--
					77-06-22	0830	370	20.0	--
					77-08-05	0845	400	20.0	--
193508155570701	8-3557-03 CNTY	19 35 08	155 57 07	01	76-11-17	1045	160	20.0	16
					77-03-18	1025	157	20.0	--
					77-08-05	0920	170	20.0	--
193505155570701	8-3557-04 CNTY	19 35 05	155 57 07	01	76-11-17	1015	250	20.0	38
					77-03-18	0940	250	20.0	--
					77-05-06	0815	250	20.0	--
					77-08-05	0830	255	20.0	--
193805155020201	8-3802-03 PUNA SGR CO	19 38 05	155 02 02	01	76-10-13	1430	76	19.0	4.5
					76-12-06	1420	78	19.0	4.5
					77-03-23	0955	75	19.0	5.0
					77-05-04	1145	80	19.0	5.0
					77-07-08	1045	82	18.5	5.0
193937155004301	8-3900-01 W9-2 RYL HWN	19 39 37	155 00 43	01	76-10-13	1345	320	18.5	64
194037155035301	8-4003-01 W8-3 CNTY	19 40 37	155 03 53	01	76-10-22	0930	85	20.0	5.0
					76-12-06	1510	83	20.0	4.0
					77-07-27	0940	93	20.0	4.0
194040155035201	8-4003-02 CNTY	19 40 40	155 03 52	01	77-03-09	1540	80	19.5	4.5
					77-04-27	1030	80	20.0	5.0
					77-06-13	1125	88	20.0	4.0
194134155005601	8-4190-01 HAW PROSE PARK	19 41 34	155 00 56	01	76-10-13	1035	1250	18.5	350
					76-12-08	1010	1200	18.5	360
					77-04-08	0940	1300	18.0	390
					77-06-01	1040	1500	18.5	380
					77-08-01	1005	1280	19.0	360
194222155034801	8-4203-06 W8-2B HELCO	19 42 22	155 03 48	01	76-10-22	0900	115	24.0	16
					76-12-08	1355	130	24.5	20
					77-03-10	0950	140	23.5	22
					77-04-28	1155	118	23.5	16
					77-07-26	0855	130	21.0	18

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

STATION NUMBER	LOCAL IDENT-I-FIER	LAT-I-TUDE	LONG-I-TUDE	SEQ. NO.	DATE OF SAMPLE	TIME	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	TEMPER-ATURE (DEG C)	DIS-SOLVED CHLO-RIDE (CL) (MG/L)
HAWAII, ISLAND OF HAWAII--Continued									
194337155041801	8-4304-01 HELCO	19 43 37	155 04 18	01	76-10-22	1015	7500	20.5	2400
					76-12-08	1320	11000	20.5	4400
					77-03-09	1445	10500	20.5	3400
					77-04-28	1120	--	21.0	4300
					77-06-13	0850	6800	20.5	3100
					77-07-27	1025	23000	20.5	16000
194820155582401	8-4858-03 ISL COPRA TRADE	19 48 20	155 58 24	01	76-11-16	1520	2400	20.5	550
					77-03-17	1555	2300	20.5	540
					77-05-06	1140	2400	20.5	540
					77-06-22	1230	2300	21.0	520
					77-08-04	1325	2550	20.0	580
195035155054501	8-5005-01 HILO CST PROC	19 50 35	155 05 45	01	77-01-04	1130	162	21.0	--
195043155053801	8-5005-02 PEPEEKEO SGR	19 50 43	155 05 38	01	76-11-03	1030	195	22.0	20
					77-01-04	1110	185	22.5	14
					77-03-10	1235	200	22.0	20
					77-05-04	1100	180	22.0	15
					77-07-07	0920	180	22.0	16
195049155051601	8-5005-04 HILO CST PROC	19 50 49	155 05 16	01	76-11-03	1110	14000	--	5200
					77-01-04	1045	13500	--	5400
					77-07-07	1020	10500	18.0	6000
195546155480301	8-5548-01 BOISE CASCADE	19 55 46	155 48 03	01	77-05-31	1300	2075	27.0	560
					77-07-20	1000	2050	--	540
					77-08-04	1205	2000	28.0	520
195724155455301	8-5745-01 BOISE CASCADE	19 57 24	155 45 53	01	77-04-14	1400	280	26.0	26
195722155455201	8-5745-02 BOISE CASCADE	19 57 22	155 45 52	01	76-11-24	1110	280	26.5	26
					77-04-14	1405	280	26.5	26
					77-07-20	1020	278	--	27
					77-08-04	1050	280	26.5	27
195929155462501	8-5946-01 STATE	19 59 29	155 46 25	01	77-07-19	1400	436	--	76
					77-07-23	0700	449	--	78
195947155485801	8-5948-01 STATE	19 59 47	155 48 58	01	76-11-10	1345	1550	25.5	420
					77-03-15	1355	1550	25.5	440
					77-05-02	1405	1500	26.0	430
					77-06-14	1045	1625	25.5	440
					77-08-08	1305	1600	25.0	440
200039155494001	8-6049-03 MAUNAKEA HTL	20 00 39	155 49 40	01	77-03-15	1300	10000	25.5	3600
					77-05-02	1315	6500	25.0	2500
					77-06-14	1130	9500	25.0	3600
200122155480901	8-6148-01 W14 CNTY	20 01 22	155 48 09	01	76-11-10	1215	1280	27.0	360
					77-03-15	1205	1280	27.0	360
					77-06-14	1155	1400	27.0	360
					77-08-08	1145	1350	27.0	360
201603155521801	8-7652-01 S1 KOHALA SGR	20 16 03	155 52 18	01	76-11-16	1145	1500	22.0	400
					77-04-22	1310	1900	22.0	550
					77-06-16	1135	1650	21.0	560
					77-08-15	1130	2000	22.0	560

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

STATION NUMBER	LOCAL IDENT-I-FIER	LAT-I-TUDE	LONG-I-TUDE	SEQ. NO.	DATE OF SAMPLE	TIME	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)
			HAWAII, ISLAND OF KAUAI						
220008159444202	2-0044-03 W32B KSC	22 00 08	159 44 42	02	77-05-03	1105	10600	7.2	23.5
220018159444701	2-0044-10 W33 KSC	22 00 18	159 44 47	01	77-06-07	1300	3990	7.0	23.0
					77-06-07	1430	4100	7.1	23.5
220005159444501	2-0044-12 W30 KSC	22 00 05	159 44 45	01	77-08-04	1045	6300	7.5	22.5
220019159444801	2-0044-14 W35 KSC	22 00 19	159 44 48	01	77-06-08	1000	730	7.4	23.0
					77-08-02	1300	1200	7.2	28.0
					77-08-02	1415	1000	7.2	23.0
215418159260401	2-5426-04 STATE	21 54 18	159 26 04	01	77-02-18	0955	366	7.0	--
215845159232101	2-5823-01 TUB CNTY	21 58 45	159 23 21	01	77-03-21	0910	191	6.8	--
215901159235302	2-5923-02 STATE	21 59 01	159 23 53	02	77-03-21	1000	190	6.7	23.5
					77-03-21	1055	190	6.8	23.3

DATE OF SAMPLE	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	DIS-SOLVED SODIUM (NA) (MG/L)	PERCENT SODIUM	SODIUM AD-SORP-TION RATIO	DIS-SOLVED PO-TAS-SIUM (K) (MG/L)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)
				HAWAII, ISLAND OF KAUAI								
77-05-03	3500	3400	400	610	910	36	6.7	14	140	0	115	14
77-06-07	1200	1100	160	200	290	34	3.6	4.2	120	0	98	19
77-06-07	1300	1200	170	220	320	34	3.8	4.5	130	0	110	17
77-08-04	2100	1900	240	360	600	38	5.7	10	180	0	150	9.1
77-06-08	270	150	29	47	41	25	1.1	1.8	140	0	110	8.9
77-08-02	390	290	46	66	79	31	1.7	2.1	120	0	98	12
77-08-02	360	260	42	63	71	30	1.6	2.0	130	0	110	13
77-02-18	100	11	13	17	36	43	1.5	1.4	111	0	91	18
77-03-21	52	2	6.7	8.6	16	39	1.0	1.2	61	0	50	15
77-03-21	55	0	7.2	9.0	17	40	1.0	1.1	67	0	55	21
77-03-21	57	3	7.4	9.3	18	40	1.0	1.3	66	0	54	17

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE OF SAMPLE	DIS-SOLVED SULFATE (SO4) (MG/L)	DIS-SOLVED CHLO-RIDE (CL) (MG/L)	DIS-SOLVED FLUO-RIDE (F) (MG/L)	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTI-TUENTS) (MG/L)	DIS-SOLVED NITRITE PLUS NITRATE (N) (MG/L)	DIS-SOLVED ORTHO. PHOS-PHORUS (P) (MG/L)	DIS-SOLVED IRON (FE) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)
HAWAII, ISLAND OF KAUAI									
77-05-03	380	3500	.0	65	5950	1.0	.13	60	20
77-06-07	140	1100	.1	47	2000	--	--	10	140
77-06-07	140	1200	.1	50	2170	--	--	20	250
77-08-04	280	2000	.0	72	3650	--	--	40	100
77-06-08	28	150	.1	67	433	--	--	20	0
77-08-02	38	290	.1	25	606	--	--	20	230
77-08-02	36	270	.1	27	575	--	--	20	210
77-02-18	12	55	.1	58	252	1.0	.13	20	10
77-03-21	11	22	.1	32	132	.88	.08	10	10
77-03-21	5.3	22	.1	33	132	.84	.18	70	0
77-03-21	6.6	24	.1	33	136	.72	.08	20	0

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

STATION NUMBER	LOCAL IDENT-I-FIER	LAT-I-TUDE	LONG-I-TUDE	SEQ. NO.	DATE OF SAMPLE	TIME	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)
HAWAII, ISLAND OF MAUI									
204636156002601	6-4600-02 STATE	20 46 36	156 00 26	01	77-09-01	1500	727	7.8	19.0
204633156003201	6-4600-03 STATE WELL 8	20 46 33	156 00 32	01	76-12-16	1145	676	6.8	--
					77-08-31	1618	320	8.0	19.0
205344156393001	6-5339-03 STATE, LAHAINA	20 53 44	156 39 30	01	77-01-28	0945	960	6.2	--
HAWAII, ISLAND OF HAWAII									
195546155480301	8-5548-01 BOISE CASCADE	19 55 46	155 48 03	01	77-07-20	1000	2050	7.5	--
195722155455201	8-5745-02 BOISE CASCADE	19 57 22	155 45 52	01	77-07-20	1020	278	7.4	--
195929155462501	8-5946-01 STATE, KOHALA	19 59 29	155 46 25	01	77-07-19	1400	436	--	--
					77-07-23	0700	449	--	--

DATE OF SAMPLE	HARD-NESS (CA,MG) (MG/L)	NON-CAR-BONATE HARD-NESS (MG/L)	DIS-SOLVED CAL-CIUM (CA) (MG/L)	DIS-SOLVED MAG-NE-SIUM (MG) (MG/L)	DIS-SOLVED SODIUM (NA) (MG/L)	PERCENT SODIUM	SODIUM AD-SORP-TION RATIO	DIS-SOLVED PO-TAS-SIUM (K) (MG/L)	BICAR-BONATE (HCO3) (MG/L)	CAR-BONATE (CO3) (MG/L)	ALKA-LINITY AS CACO3 (MG/L)	CARBON DIOXIDE (CO2) (MG/L)
HAWAII, ISLAND OF MAUI												
77-09-01	69	35	7.8	12	110	76	5.8	5.5	41	0	34	1.0
76-12-16	81	57	9.2	14	100	71	4.8	5.4	29	0	24	7.4
77-08-31	22	0	2.7	3.3	55	82	5.1	2.9	41	0	34	.7
77-01-28	140	94	26	19	130	65	4.7	6.3	60	0	49	61
HAWAII, ISLAND OF HAWAII												
77-07-20	270	150	29	47	320	70	8.5	22	140	0	110	7.1
77-07-20	63	0	9.0	9.9	34	52	1.9	4.8	100	0	82	6.4
77-07-19	85	6	11	14	56	57	2.6	5.8	96	--	79	--
77-07-23	89	16	11	15	61	58	2.8	5.9	89	--	73	--

QUALITY OF GROUND WATER

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE OF SAMPLE	DIS-SOLVED SULFATE (SO4) (MG/L)	DIS-SOLVED CHLO-RIDE (CL) (MG/L)	DIS-SOLVED FLUO-RIDE (F) (MG/L)	DIS-SOLVED SILICA (SIO2) (MG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTI-TUENTS) (MG/L)	DIS-SOLVED NITRITE PLUS NITRATE (N) (MG/L)	DIS-SOLVED ORTHO. PHOS-PHORUS (P) (MG/L)	DIS-SOLVED IRON (FE) (UG/L)	DIS-SOLVED MAN-GANESE (MN) (UG/L)
HAWAII, ISLAND OF MAUI									
77-09-01	26	190	.1	20	392	--	--	10	0
76-12-16	27	189	.1	21	372	.17	.06	10	10
77-08-31	7.5	70	.1	20	182	--	--	10	0
77-01-28	34	260	.1	42	547	.01	.07	20	10
HAWAII, ISLAND OF HAWAII									
77-07-20	99	580	.5	56	1130	--	--	20	10
77-07-20	16	27	.3	57	207	--	--	20	0
77-07-19	20	76	.3	55	295	--	--	50	8
77-07-23	21	78	.3	55	291	--	--	40	20

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