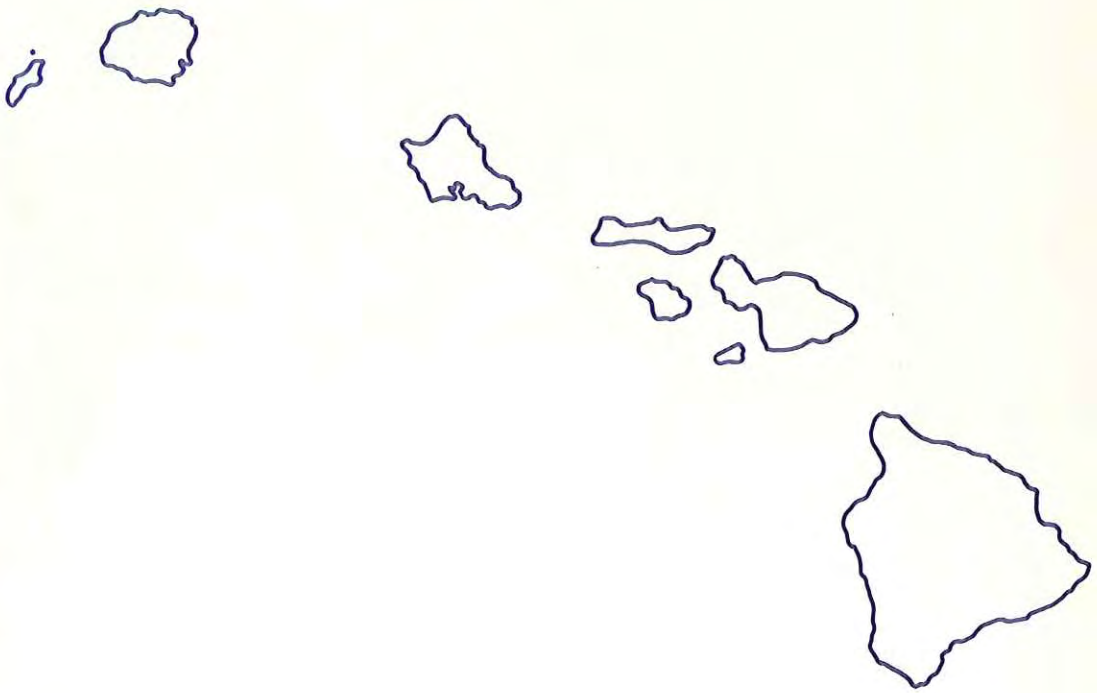
Water Resources Data Hawaii Water Year 1981

Volume 1. Hawaii



U.S. GEOLOGICAL SURVEY WATER-DATA REPORT HI-81-1

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

CALENDAR FOR WATER YEAR 1981

1980

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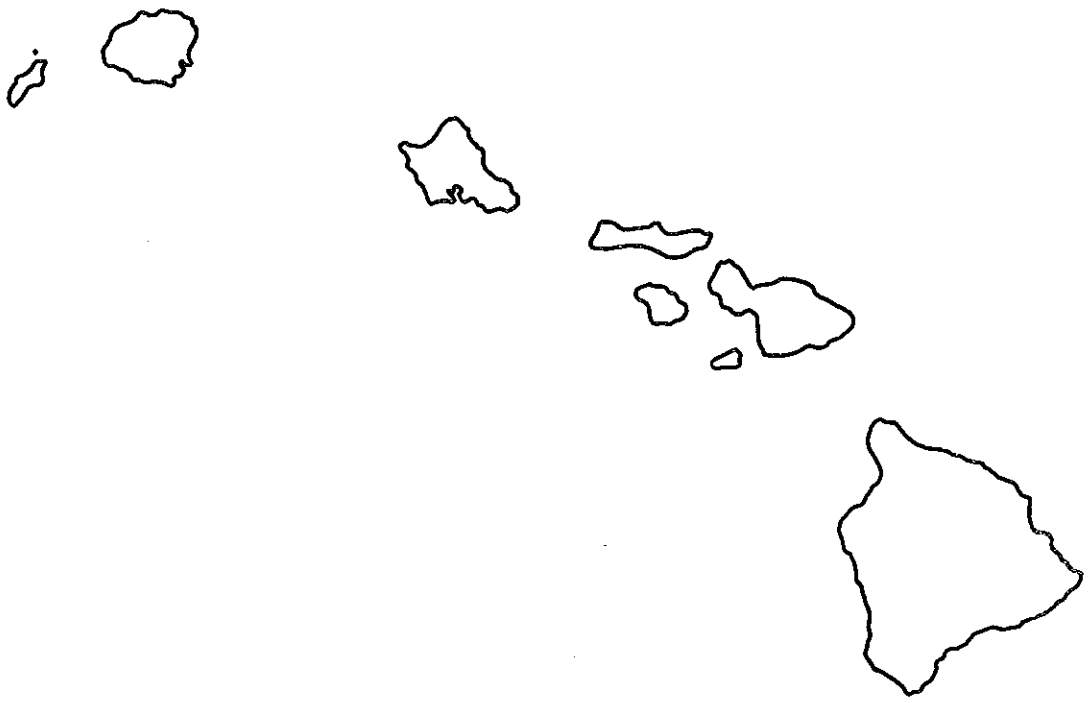
Pat Lade

Water Resources Data Hawaii Water Year 1981

Volume 1. Hawaii



U.S. GEOLOGICAL SURVEY WATER-DATA REPORT HI-81-1
Prepared in cooperation with the State of Hawaii
and with other agencies

UNITED STATES DEPARTMENT OF THE INTERIOR

JAMES G. WATT, Secretary

GEOLOGICAL SURVEY

Dallas L. Peck, Director

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and other Pacific Areas write to
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Honolulu, Hawaii 96850

1982

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 Benjamin L. Jones, District Chief, and J. D. Bredehoeft, 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 Philip Cohen, Chief Hydrologist, U.S. Geological Survey, and R. J. Dingman, Assistant Chief Hydrologist for Scientific Publications and Data Management.

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

Volume 1. Hawaii

Volume 2. Guam, Northern Mariana Islands, Federated States of Micronesia, Palau Islands, and American Samoa

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Volume 1 of water resources data for the 1981 water year for Hawaii and other Pacific Areas consists 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 106 gaging stations; water quality for 11 gaging stations, 103 partial-record flow stations, and 150 wells; and water levels for 21 observation wells. Also included are 106 crest-stage partial-record stations and 19 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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b. Identifiers/Open-Ended Terms

c. COSATI Field/Group

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Department of Commerce

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SURFACE-WATER AND WATER-QUALITY STATIONS,
IN DOWNSTREAM ORDER, FOR WHICH RECORDS ARE PUBLISHED

Letters after station name designate type of data:
(d), discharge; (c), chemical; (b), biological; (m), microbiological;
(t) water temperature; (s), sediment

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WATER RESOURCES DATA FOR HAWAII AND OTHER PACIFIC AREAS, 1981

Volume 1

INTRODUCTION

Water resources data for the 1981 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 106 gaging stations; water quality for 11 gaging stations, 103 partial-record flow stations, and 150 wells; and water levels for 21 observation wells. Also included are data for 106 crest-stage partial-record stations and 19 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, 1200 South Eads Street, Arlington, VA 22202.

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. 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.

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-81-1." For archiving and general distribution, the reports for water years 1971-74 are also identified as water-data reports. These water-data reports are for sale, in paper copy or in microfiche by the National Technical Information Service, U.S. Department of Commerce, Springfield, VA 22161.

Additional information including current prices, for ordering specific reports may be obtained from the district chief at the address given on the back of the title page or by telephone (808) 546-8331.

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.
City and County of Honolulu, Board of Water Supply, Kazuyoshi Hayashida, manager and chief engineer.
City and County of Honolulu, Division of Engineering, Michael Chun, 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 9 gaging stations, 9 water-quality stations and 5 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.

SUMMARY OF HYDROLOGIC CONDITIONS

Runoff during the 1981 year was below normal (in the lower 25 percent of record) at the index stations on the islands of Kauai, Oahu, Maui, and Hawaii. The relation to the median of yearly mean discharges for the period 1941-70 for the four index stations ranged between 37 and 71 percent of the annual median. Monthly mean flow at all the index stations was in the deficient range during February and March. Record lows for monthly means were set at the islands of Kauai for January, Maui for July, and Hawaii for January, June, and July. Deficient flow at the index stations occurred randomly throughout the year but mostly during the first 7 months of the calendar year.

At Kauai, streamflow was deficient for January, February, and March and excessive for the month of August. Annual mean discharge was deficient and was 71 percent of the annual median. Streamflow at Kalihi Stream near Honolulu, Oahu, was deficient for 6 months and excessive for the month of March. Yearly mean discharge was deficient and 53 percent of the annual median. Monthly mean flow at Honopou Stream near Huelo, Maui, was in the normal range for 6 months and deficient for the other 6 months of 1981. Annual mean discharge was in the deficient range at 37 percent of the annual median. Monthly mean flows at the index station, Waiakea Stream near Mountain View, Hawaii, were deficient for 9 months and excessive for the month of October and annual mean discharge was in the deficient range at 41 percent of the annual median.

Monthly and annual mean discharge is compared with medians at the four index stations in figure 1.

On Feb. 6, 1981, after 2 1/2 months of drought, the areas of Hamakua and South Kohala of the island of Hawaii were declared as disaster areas by the governor of the state. Drought conditions were eased in August with some rain but did not end water restriction.

Records at the two continuous recorder sites on Oahu showed that while remaining in the normal range the water level rose until January after which it started and continued to steadily decline to the end of the year. Two continuous recorder sites on Maui showed a normal groundwater level for the year.

Analyses of water samples taken at more than 150 basal water-table wells did not in general show significant changes in the chloride contents.

DEFINITION OF 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 level 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 microscopic 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 as 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.

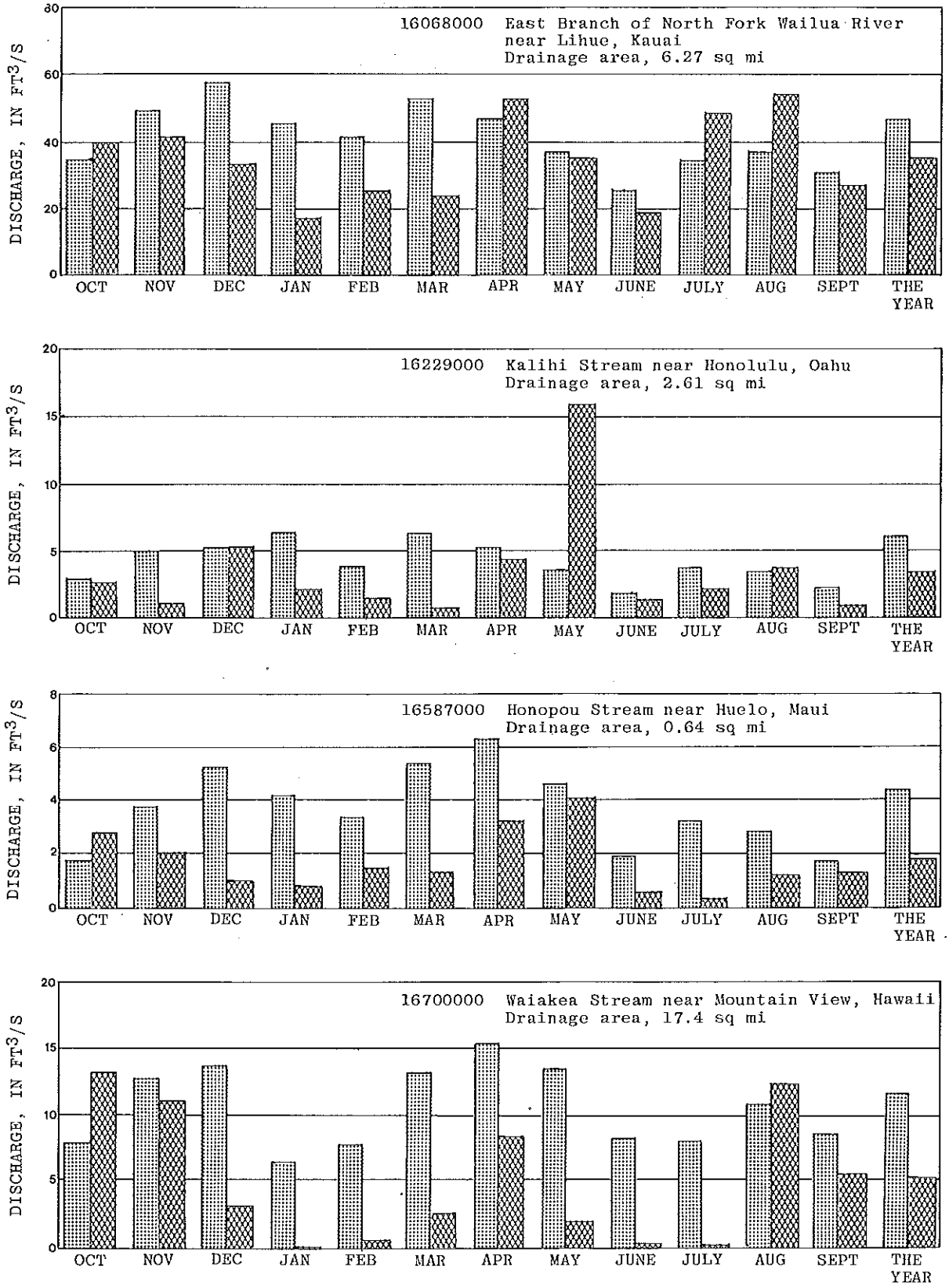

FIGURE 1.--DISCHARGE DURING 1981 WATER YEAR COMPARED WITH MEDIAN DISCHARGE FOR PERIOD 1941-70 FOR FOUR REPRESENTATIVE GAGING STATIONS.

Fecal streptococcal bacteria are bacteria found also in the intestine of warm-blooded 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 is that material in a representative water sample which passes through a 0.45 micrometer membrane filter. This is a convenient operational definition used by Federal agencies that collect water data. Determinations of "dissolved" constituents are made on subsamples of the filtrate. It is recognized that certain kinds of samples cannot be filtered; to provide for this, procedures that are considered equivalent to filtering through a 0.45 micrometer membrane filter will be identified and announced at a later date.

Suspended recoverable is the amount of a given constituent that is in solution after the part of a representative water-suspended sediment sample that is retained on a 0.45 micrometer membrane filter has been digested by a method (usually using a dilute acid solution) that results in dissolution of only readily soluble substances. Complete dissolution of all the particulate matter is not achieved by the digestion treatment and thus the determination represents something less than the "total" amount (that is, less than 95 percent) of the constituent present in the sample. To achieve comparability of analytical data, equivalent digestion procedures would be required of all laboratories performing such analyses because different digestion procedures are likely to produce different analytical results.

Determinations of "suspended, recoverable constituents are made either by analyzing portions of the material collected on the filter or, more commonly, by difference, based on determinations of (1) dissolved and (2) total recoverable concentrations of the constituent.

Suspended, total is the total amount of a given constituent in the part of a representative water-suspended sediment sample that is retained on a 0.45 micrometer membrane filter. This term is used only when the analytical procedure assures measurement of at least 95 percent of the constituent determined. A knowledge of the expected form of the constituent in the sample, as well as the analytical methodology used, is required to determine when the results should be reported as "suspended, total."

Determinations of "suspended, total" constituents are made either by analyzing portions of the material collected on the filter or, more commonly, by difference, based on determinations of (1) dissolved and (2) total concentrations of the constituent.

Total, recoverable is the amount of a given constituent that is in solution after a representative water-suspended sediment sample has been digested by a method (usually using a dilute acid solution) that results in dissolution of only readily soluble substances. Complete dissolution of all particulate matter is not achieved by the digestion treatment, and thus the determination represents something less than the "total" amount (that is, less than 95 percent) of the constituent present in the dissolved and suspended phases of the sample. To achieve comparability of analytical data, equivalent digestion procedures would be required of all laboratories performing such analyses because different digestion procedures are likely to produce different analytical results.

Total is the total amount of a given constituent in a representative water-suspended sediment sample, regardless of the constituent's physical or chemical form. This term is used only when the analytical procedure assures measurement of at least 95 percent of the constituent present in both the dissolved and suspended phases of the sample. A knowledge of the expected form of the constituent in the sample, as well as the analytical methodology used, is required to judge when the results should be reported as "total". (Note that the word "total" does double duty here, indicating both that the sample consists of a water-suspended sediment mixture and that the analytical method determines all of the constituent in the sample.)

Recoverable from bottom material is the amount of a given constituent that is in solution after a representative sample of bottom material has been digested by a method (usually using an acid or mixture of acids) that results in dissolution of only readily soluble substances. Complete dissolution of all bottom material is not achieved by the digestion treatment and thus the determination represents less than the total amount (that is, less than 95 percent) of the constituent in the sample. To achieve comparability of analytical data, equivalent digestion procedures would be required of all laboratories performing such analyses because different digestion procedures are likely to produce different analytical results.

Total in bottom material is the total amount of a given constituent in a representative sample of bottom material. This term is used only when the analytical procedure assures measurement of at least 95 percent of the constituent determined. A knowledge of the expected form of the constituent in the sample, as well as the analytical methodology used, is required to judge when the results should be reported as "total in bottom material".

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

$$\bar{d} = \sum_{i=1}^{s} \frac{n_i}{n} \log_2 \frac{n_i}{n}$$

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 radio-activity 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 addition 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 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·time) for periphyton and macrophytes and mg C/(m^3·time)] for phytoplankton are units 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·time for periphyton and macrophytes and mg O_2/(m^3 · 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.

Substrate 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 plexi-glass 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 hierorgan archical 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 taxonomy 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 main-stream stations are listed before the first main-stream 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. Locations of the stations are shown in figures 2, 4, 6, 8, and 10.

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 or 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 grids 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 few 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.

Well locations on the islands of Kauai, Oahu, Molokai, Maui and Hawaii are shown in figures 3, 5, 7, 9, and 11, respectively.

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.

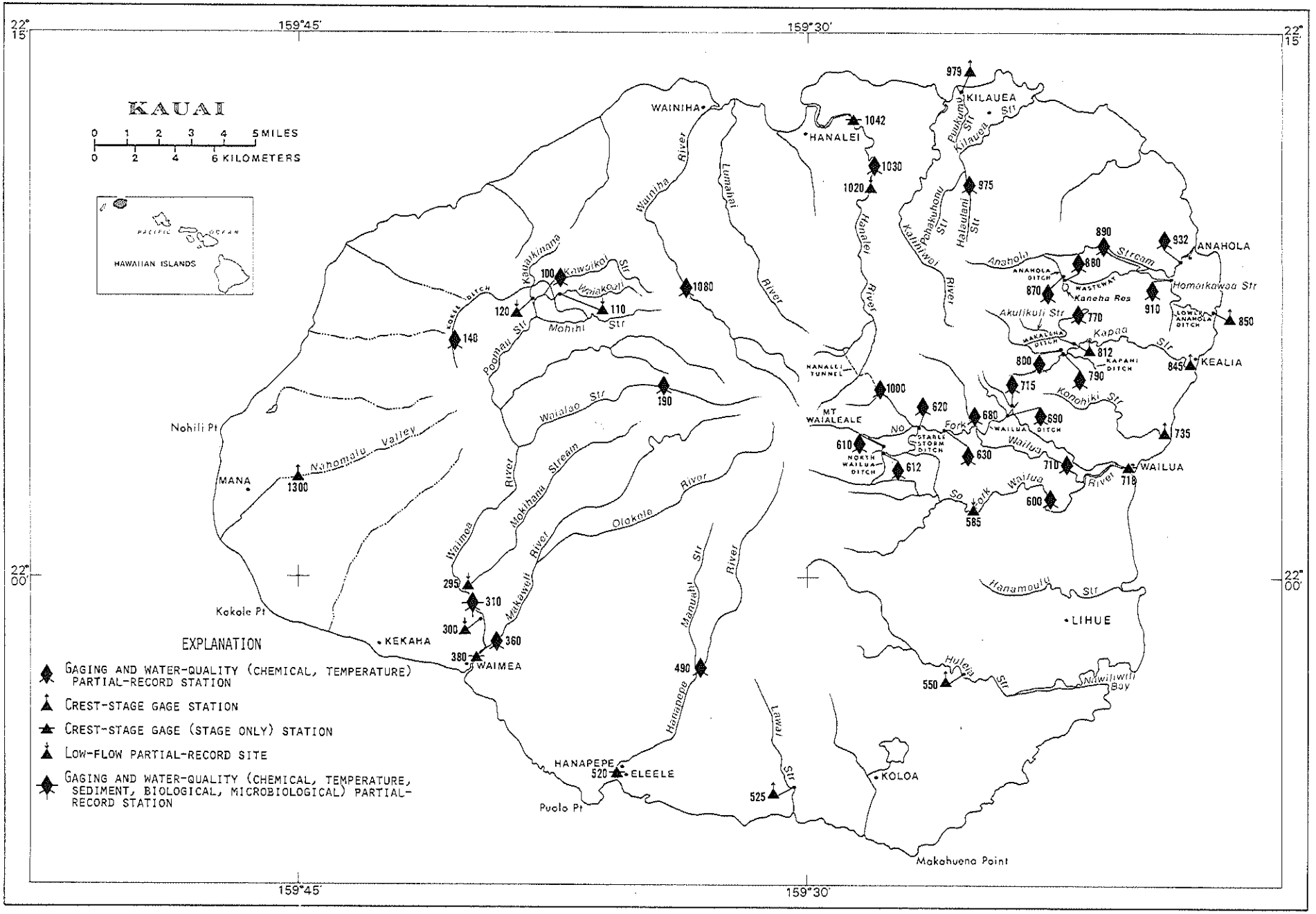

FIGURE 2.--LOCATIONS OF GAGING, WATER-QUALITY, AND PARTIAL-RECORD STATIONS ON KAUAI.

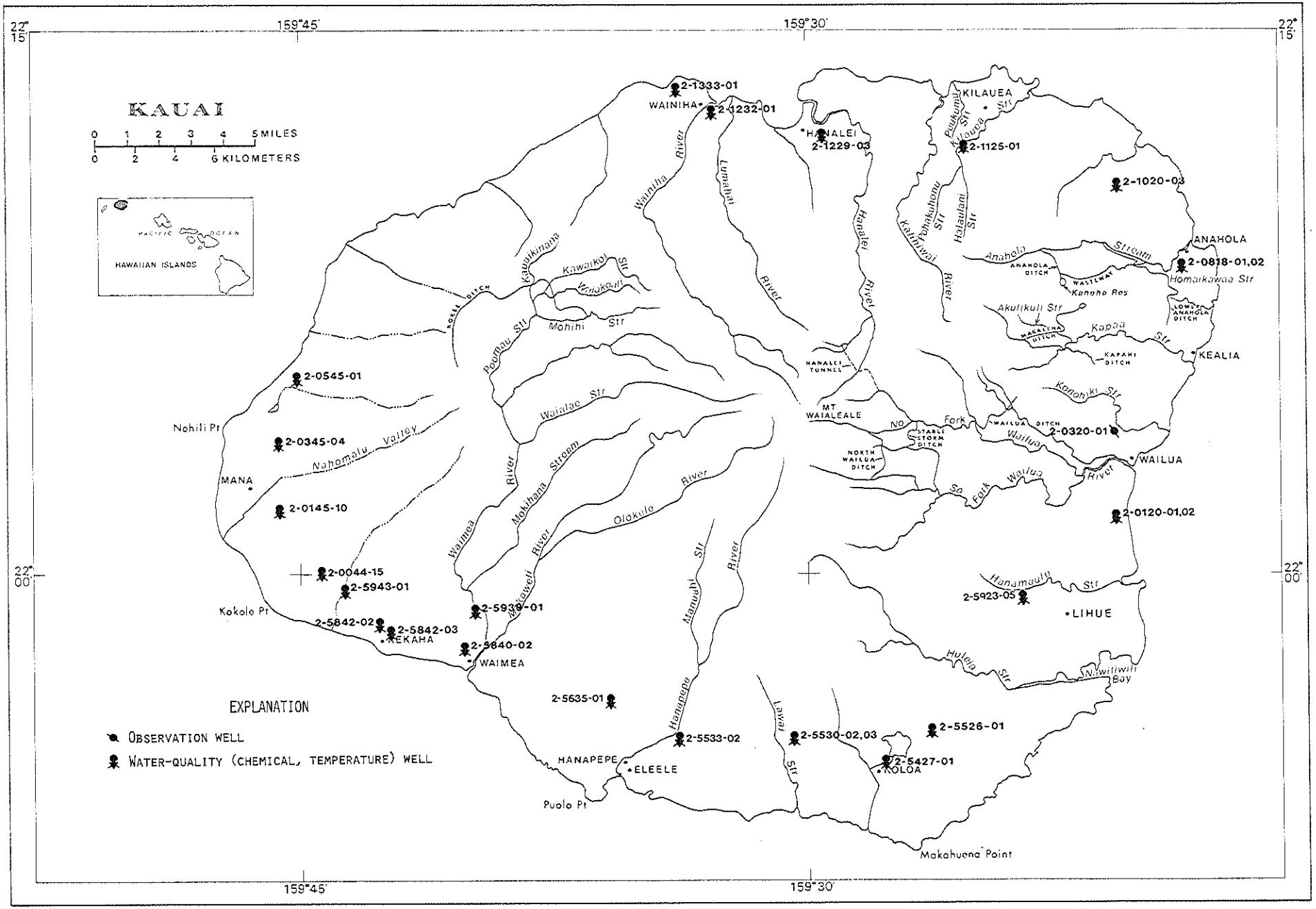

FIGURE 3.--LOCATIONS OF OBSERVATION WELLS AND GROUND-WATER QUALITY SAMPLING SITES ON KAUAI.

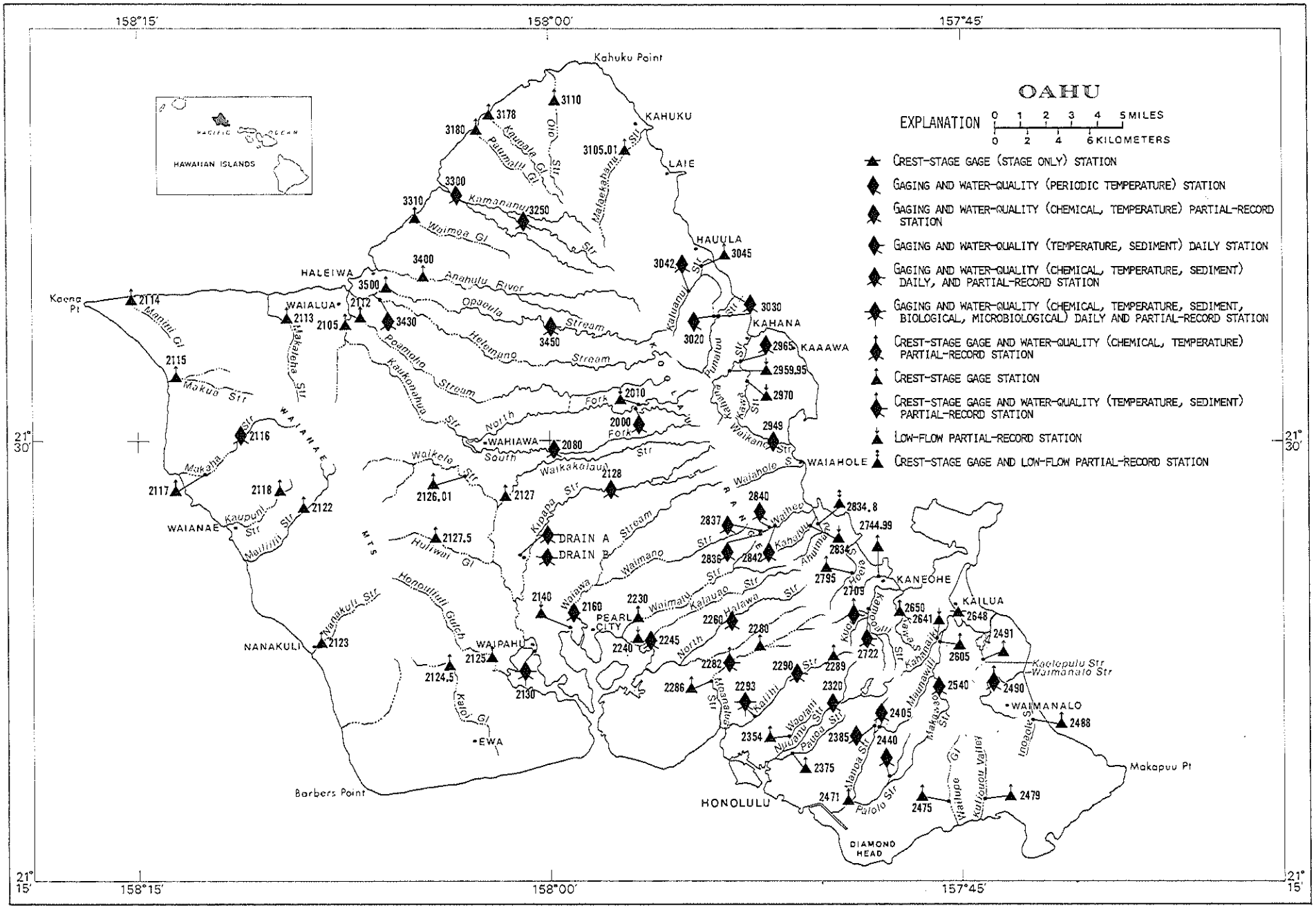

FIGURE 4.--LOCATIONS OF GAGING, WATER-QUALITY, AND PARTIAL-RECORD STATIONS ON OAHU.

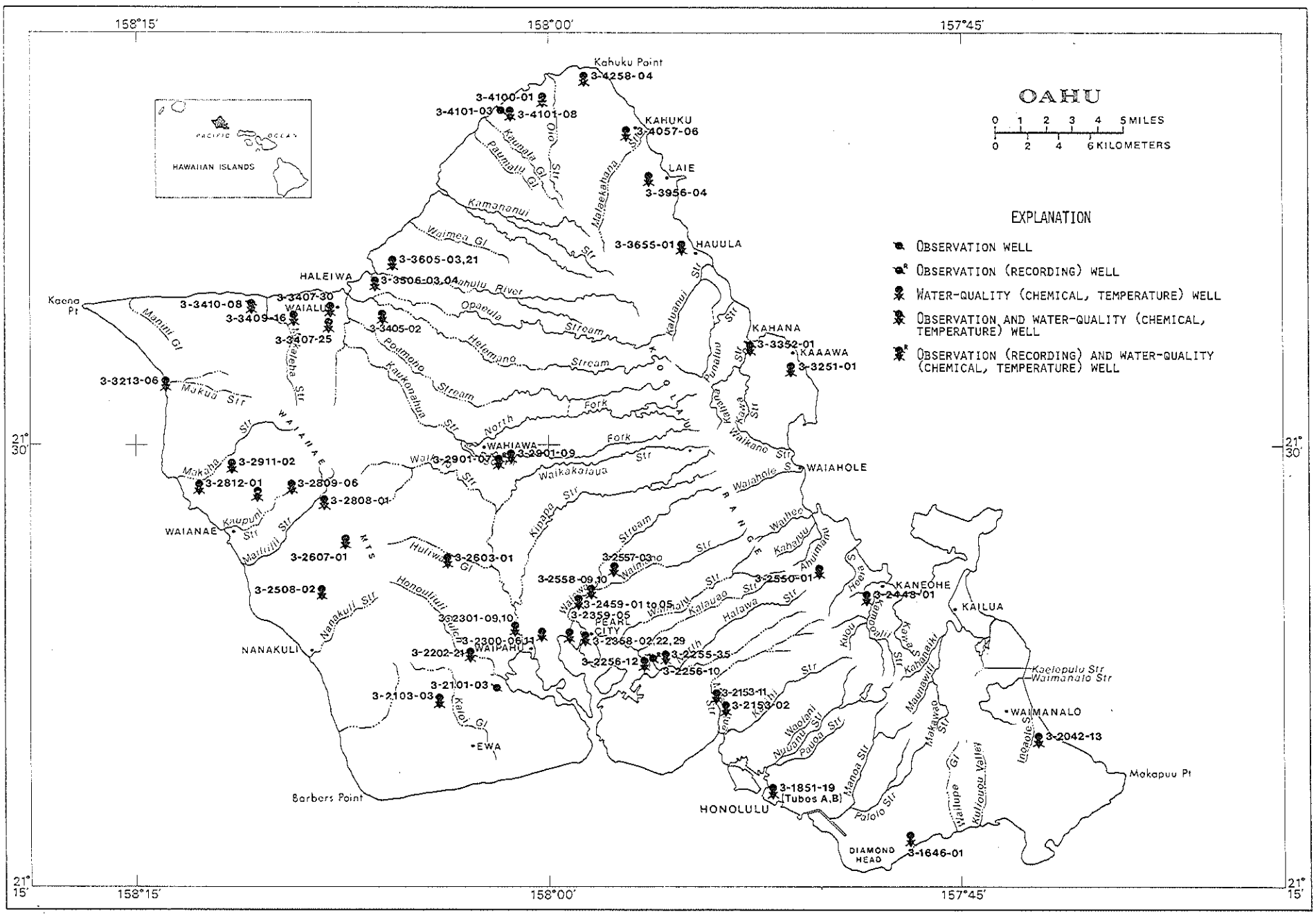

FIGURE 5.--LOCATIONS OF OBSERVATION WELLS AND GROUND-WATER QUALITY SAMPLING SITES ON OAHU.

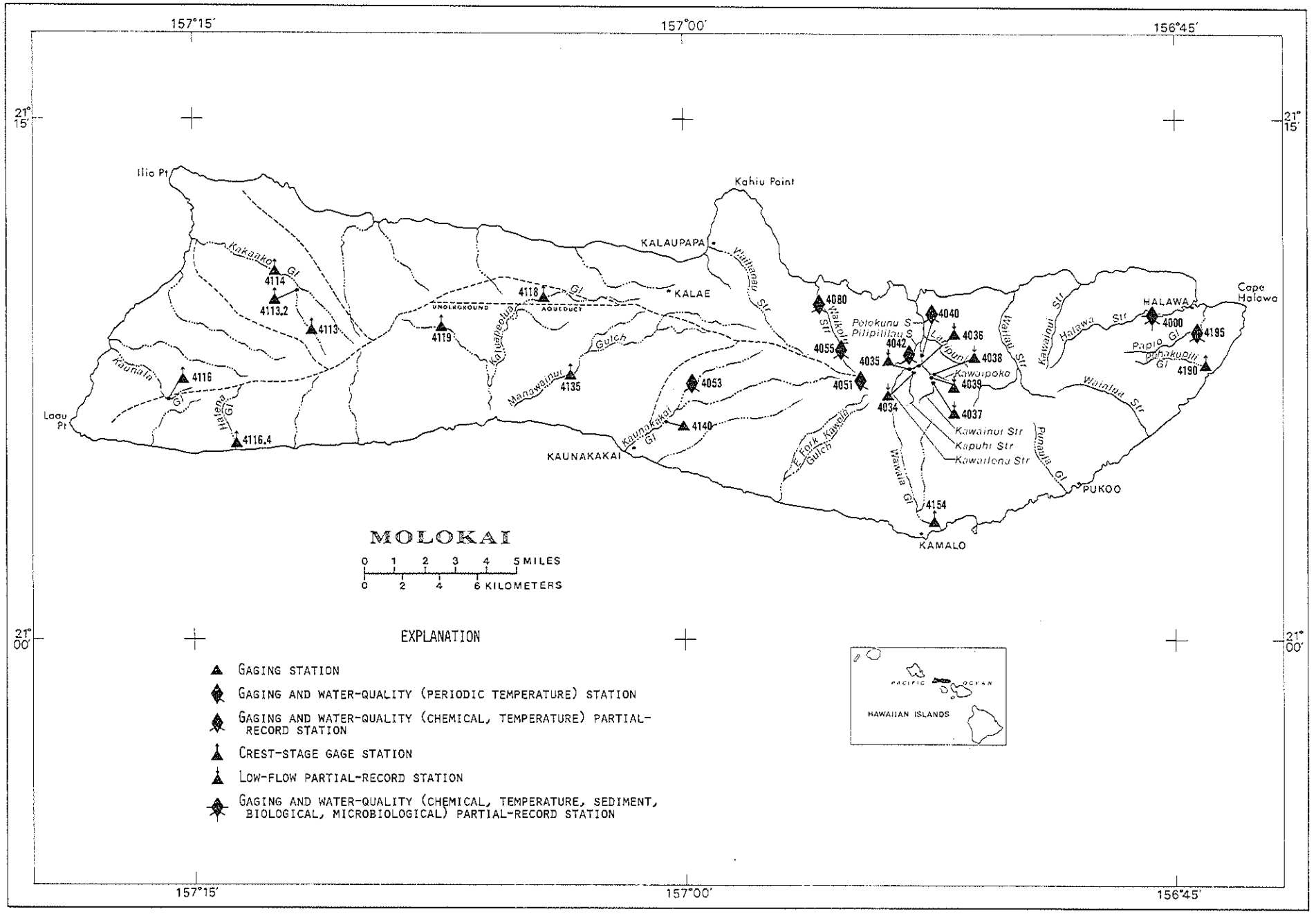

FIGURE 6.--LOCATIONS OF GAGING, WATER-QUALITY, AND PARTIAL-RECORD STATIONS ON MOLOKAI.

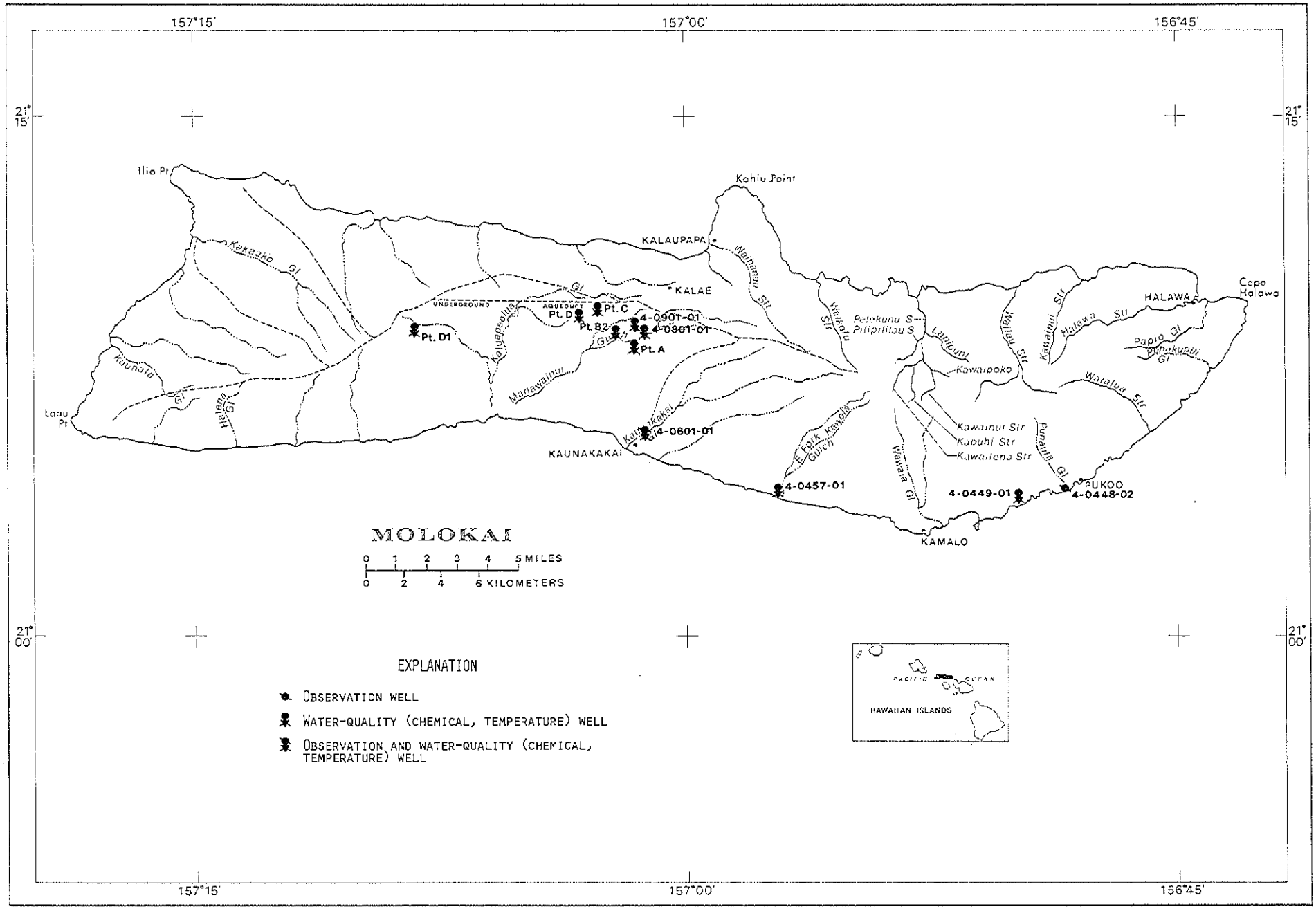

FIGURE 7.--LOCATIONS OF OBSERVATION WELLS AND GROUND-WATER QUALITY SAMPLING SITES ON MOLOKAI.

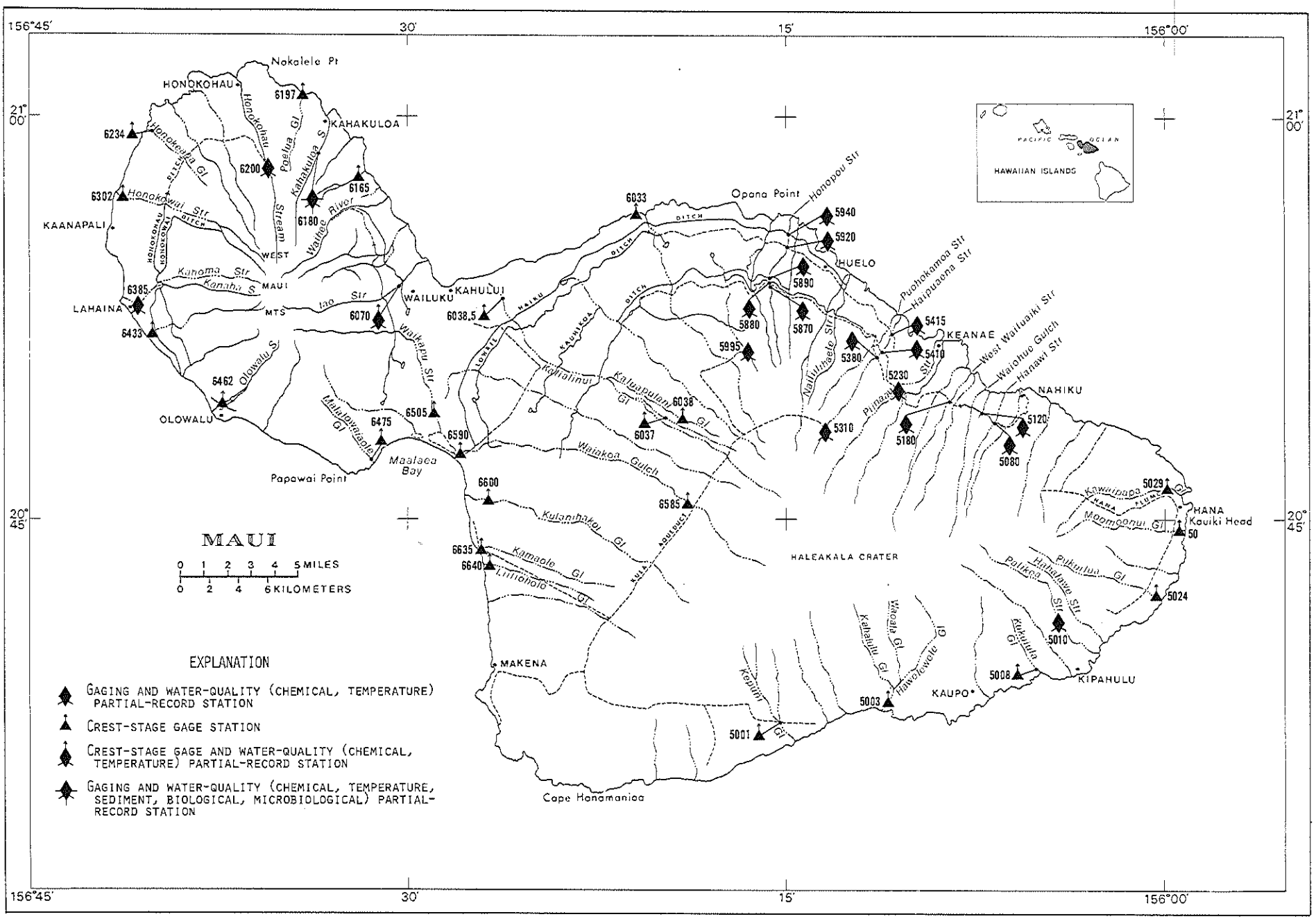

FIGURE 8.--LOCATIONS OF GAGING, WATER-QUALITY, AND PARTIAL-RECORD STATIONS ON MAUI.

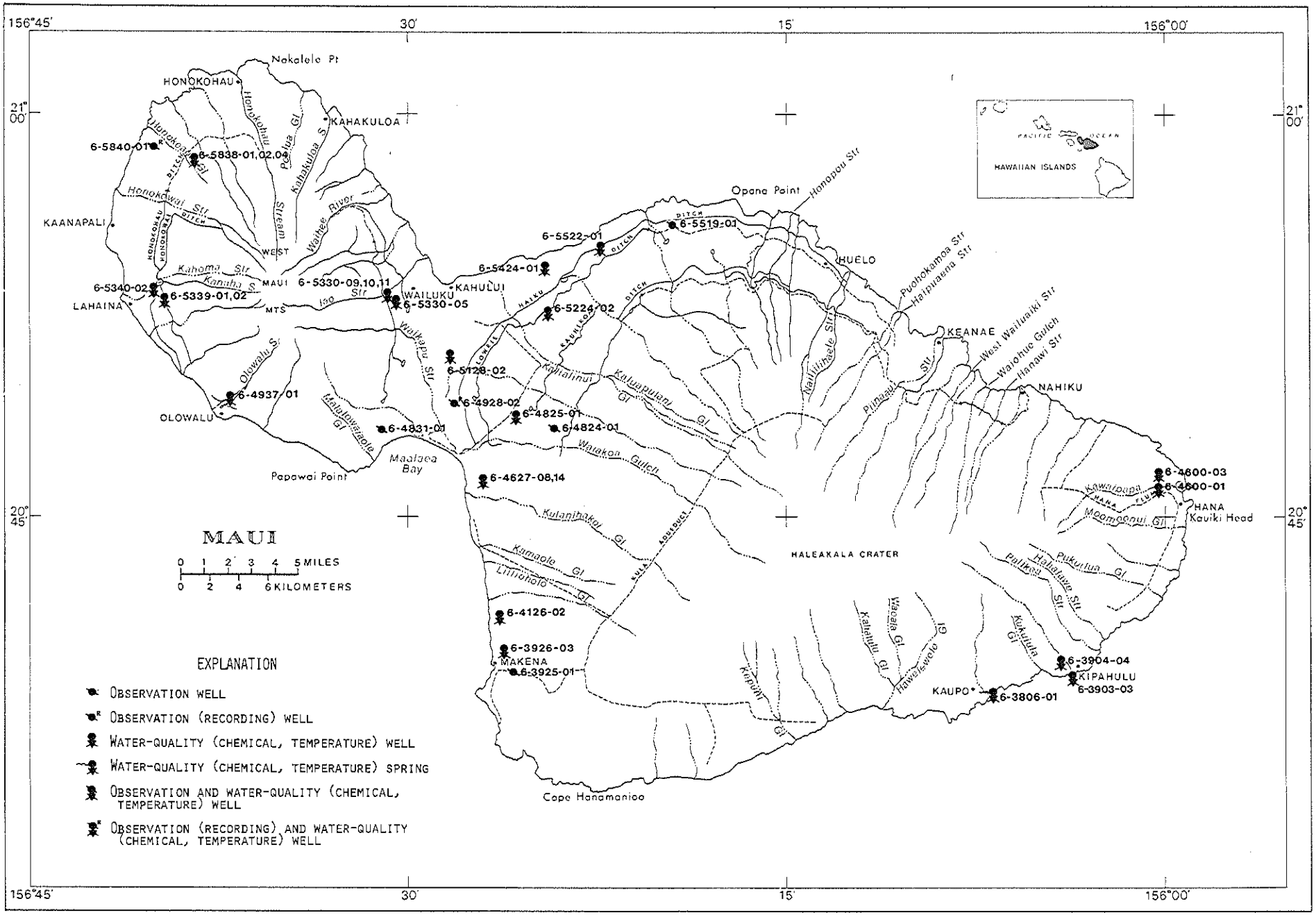

FIGURE 9.--LOCATIONS OF OBSERVATION WELLS AND GROUND-WATER QUALITY SAMPLING SITES ON MAUI.

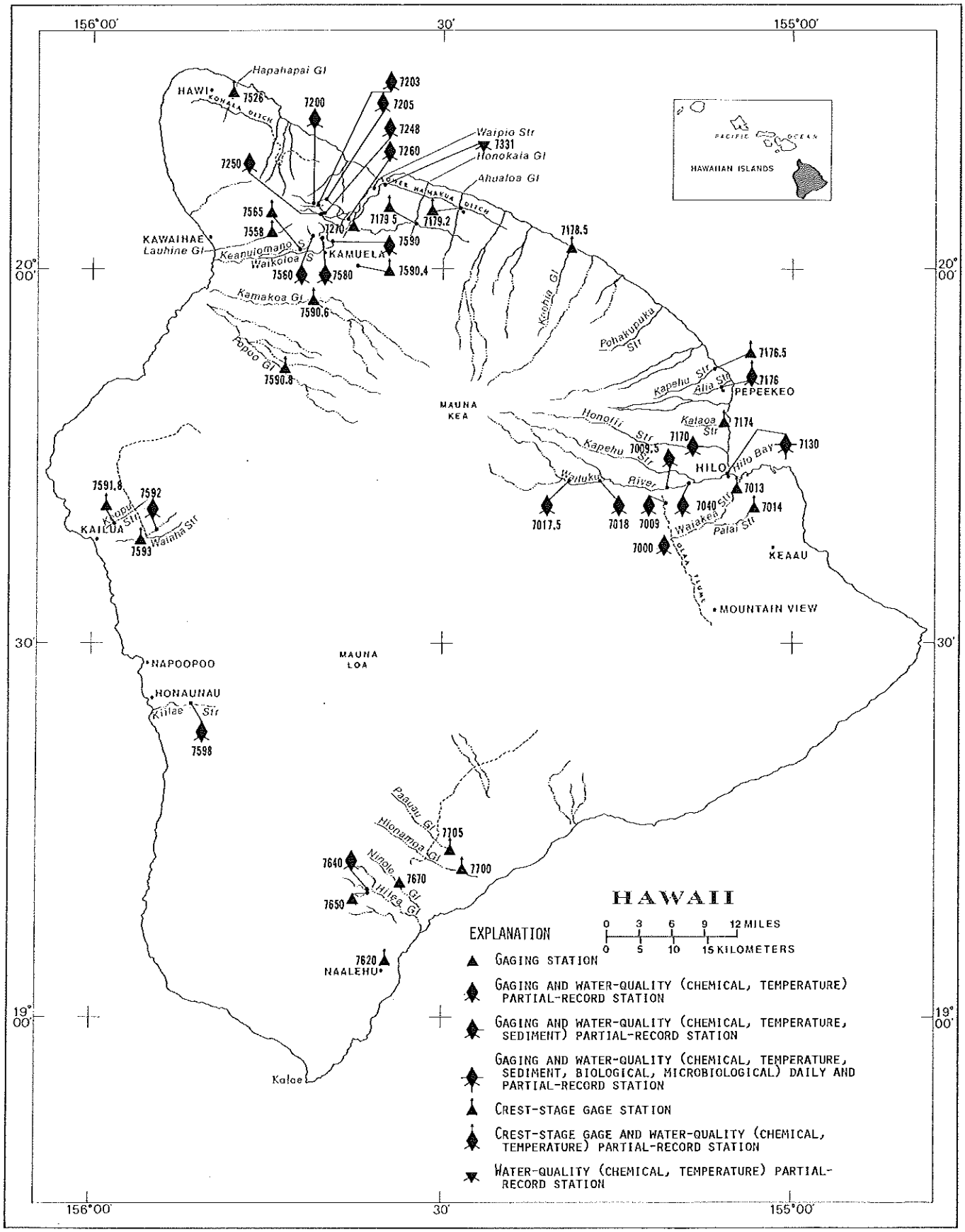

FIGURE 10.--LOCATIONS OF GAGING, WATER-QUALITY, AND PARTIAL-RECORD STATIONS ON HAWAII.

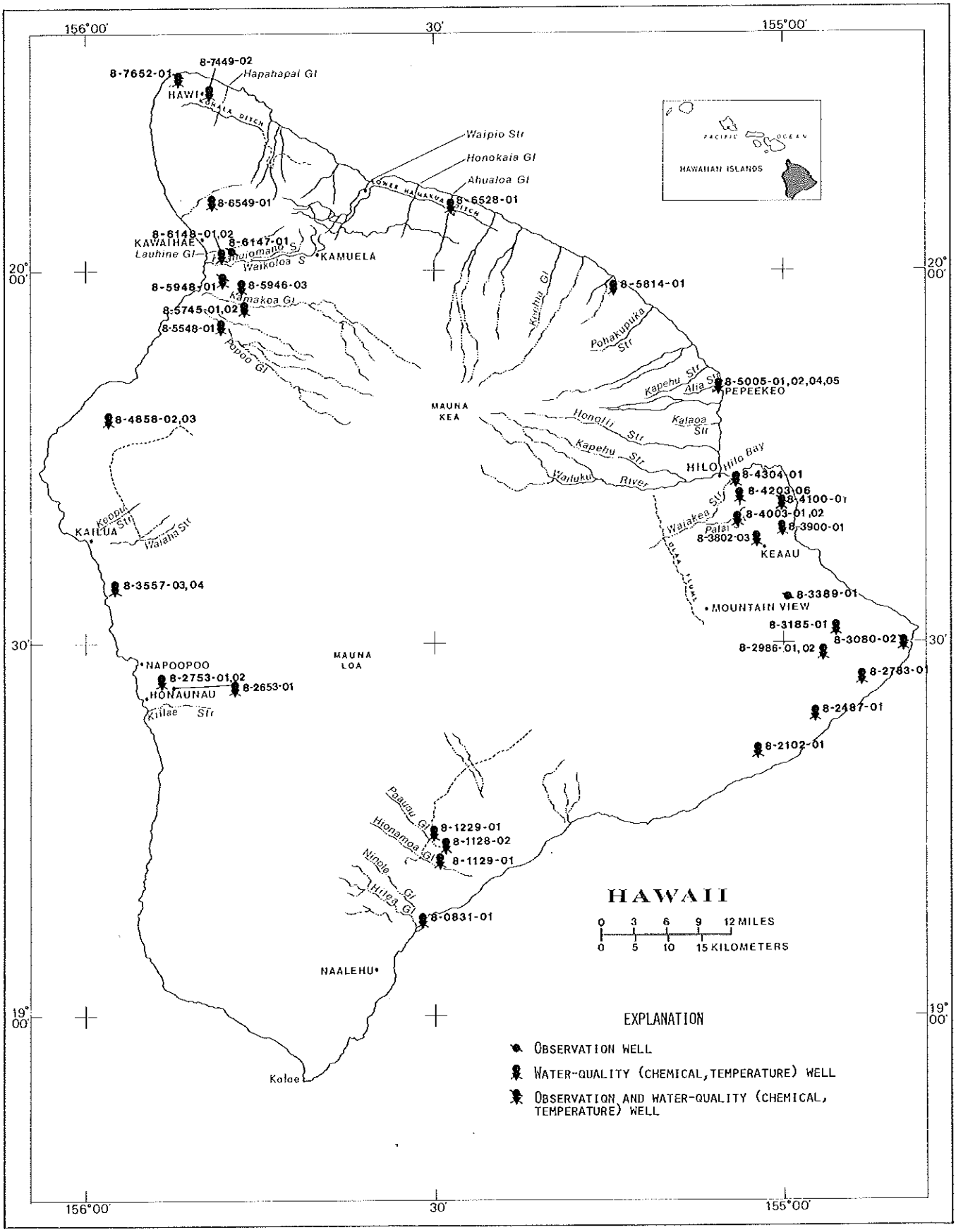

FIGURE 11.--LOCATIONS OF OBSERVATION WELLS AND GROUND-WATER QUALITY SAMPLING SITES ON HAWAII.

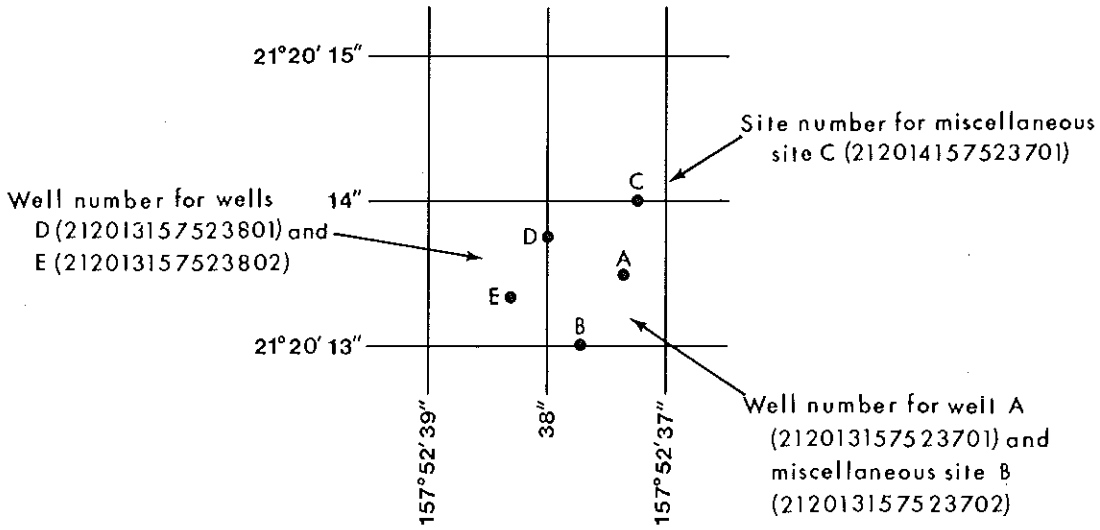

Figure 12. Sketch showing system for numbering wells and miscellaneous sites

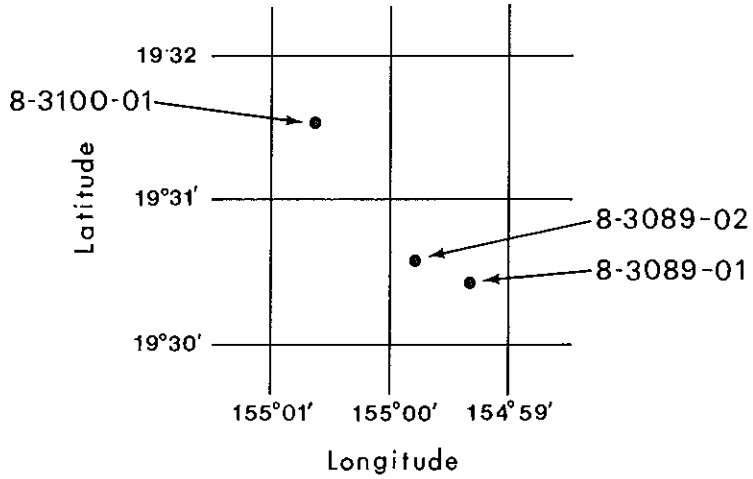

Figure 13. Sketch showing local well numbering system

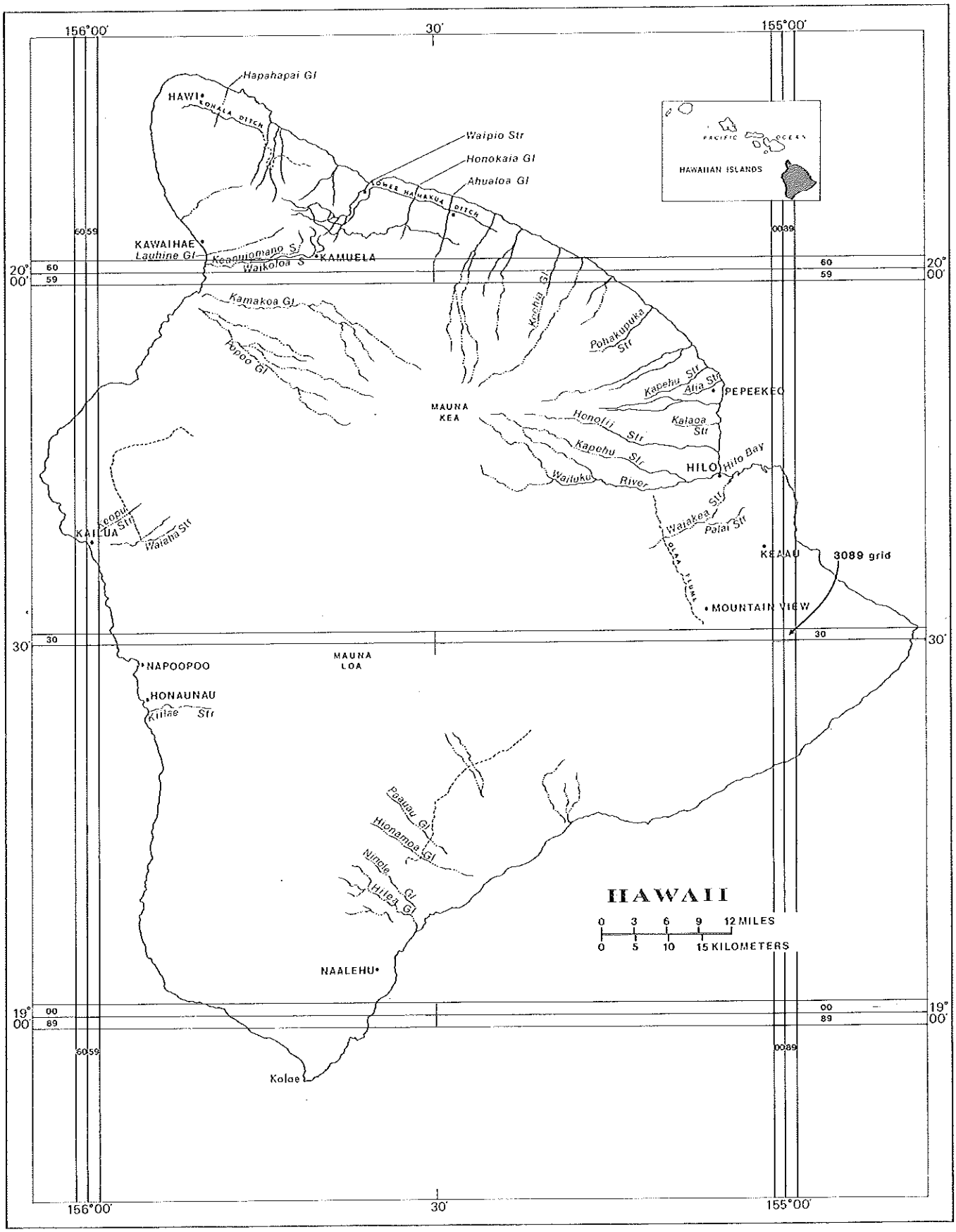

FIGURE 14.--MAP OF HAWAII SHOWING SYSTEM FOR NUMBERING LOCAL WELL NUMBERS.

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		
1966	1996	1969	2150		

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	2162
1939	886	1946	1076	1953	1270		
1940	911	1947	1101	1954	1326		
1941	941	1948	1131	1955	1409		

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).

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-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.
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.
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.
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.
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.
3-A3. *Measurement of peak discharge at culverts by indirect methods,* by G. L. Bodhaine: USGS--TWRI Book 3, Chapter A3. 1968. 60 pages.
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.
3-A5. *Measurement of peak discharge at dams by indirect methods,* by Harry Hulsing: USGS--TWRI Book 3, Chapter A5. 1967. 29 pages.
3-A6. *General procedure for gaging streams,* by R. W. Carter and Jacob Davidian: USGS--TWRI Book 3, Chapter A6. 1968. 13 pages.
3-A7. *Stage measurements at gaging stations,* by T. J. Buchanan and W. P. Somers: USGS--TWRI Book 3, Chapter A7. 1968. 28 pages.
3-A8. *Discharge measurements at gaging stations,* by T. J. Buchanan and W. P. Somers: USGS--TWRI Book 3, Chapter A8. 1969. 65 pages.
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.
3-B1. *Aquifer-test design, observation, and data analysis,* by R. W. Stallman: USGS--TWRI Book 3, Chapter B1. 1971. 26 pages.
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.
3-C1. *Fluvial sediment concepts,* by H. P. Guy: USGS--TWRI Book 3, Chapter C1. 1970. 55 pages.
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.
3-C3. *Computation of fluvial-sediment discharge,* by George Porterfield: USGS--TWRI Book 3, Chapter C3. 1972. 66 pages.
4-A1. *Some statistical tools in hydrology,* by H. C. Riggs: USGS--TWRI Book 4, Chapter A1. 1968. 39 pages.
4-A2. *Frequency curves,* by H. C. Riggs: USGS--TWRI Book 4, Chapter A2. 1968. 15 pages.
4-B1. *Low-flow investigations,* by H. C. Riggs: USGS--TWRI Book 4, Chapter B1. 1972. 18 pages.
4-B2. *Storage analyses for water supply,* by H. C. Riggs and C. H. Hardison: USGS--TWRI Book 4, Chapter B2. 1973. 20 pages.
4-B3. *Regional analyses of streamflow characteristics,* by H. C. Riggs: USGS--TWRI Book 4, Chapter B3. 1973. 15 pages.
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.
5-A1. *Methods for determination of inorganic substances in water and fluvial sediments,* by M. W. Skougstad and others, editors: USGS--TWRI Book 5, Chapter A1. 1979. 626 pages.
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.
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.
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.
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.
5-C1. *Laboratory theory and methods for sediment analysis,* by H. P. Guy: USGS--TWRI Book 5, Chapter C1. 1969. 58 pages.
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.
7-C2. *Computer model of two-dimensional solute transport and dispersion in ground water,* by L. F. Konikow and J. D. Bredehoeft: USGS--TWRI Book 7, Chapter C2. 1978. 90 pages.
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.
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.

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).

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.--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 good. No diversion above station. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--64 years (water years, 1912, 1914, 1920-81), 34.2 ft³/s (0.969 m³/s), 24,780 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, 1,540 ft³/s (43.6 m³/s) Feb. 11, gage height, 7.22 ft (2.201 m), from rating curve extended as explained above, no peak above base of 2,100 ft³/s (59.5 m³/s); minimum, 3.2 ft³/s (0.091 m³/s) Oct. 4, 5.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.6	12	6.4	7.4	8.1	21	157	123	10	12	9.4	7.8
2	3.4	9.5	6.8	6.8	6.8	21	88	143	10	8.1	9.3	7.4
3	3.4	9.5	6.0	45	6.0	44	33	53	7.6	12	12	88
4	3.3	8.1	5.6	16	5.6	19	65	28	20	43	322	32
5	51	7.4	109	9.0	135	15	346	141	48	23	125	52
6	30	6.8	68	7.4	15	14	50	73	120	9.5	40	23
7	7.4	6.4	35	6.8	15	14	31	28	48	7.2	25	12
8	5.8	6.4	15	6.6	223	58	21	21	19	21	16	8.8
9	28	36	10	6.4	70	21	17	18	17	11	13	8.6
10	14	12	8.4	6.0	22	14	14	15	20	50	12	10
11	63	64	7.2	13	408	27	13	14	22	33	13	9.6
12	155	20	7.4	8.7	61	14	12	13	14	16	43	8.3
13	21	12	63	6.4	28	11	12	12	20	45	16	20
14	14	8.1	84	5.8	20	12	81	11	11	202	12	14
15	10	444	79	5.4	16	10	259	11	8.7	145	9.8	8.1
16	7.4	223	32	5.8	14	10	45	10	7.9	151	12	6.8
17	35	30	15	22	13	9.2	27	36	9.3	62	12	6.1
18	50	19	12	8.7	289	8.4	23	102	13	32	26	5.9
19	21	15	14	24	50	7.9	15	37	8.4	27	79	5.6
20	11	12	17	12	22	7.4	13	24	7.6	18	27	5.8
21	8.1	11	11	7.2	121	24	11	17	9.2	46	22	6.0
22	6.8	9.8	9.5	6.4	129	19	10	11	8.1	19	15	5.4
23	82	9.2	8.4	6.0	74	9.5	10	9.8	13	15	11	6.0
24	250	8.7	40	5.6	125	7.6	12	9.0	16	28	9.9	8.5
25	202	8.1	24	5.3	190	7.2	13	9.0	8.4	19	8.8	7.6
26	35	7.6	12	10	77	6.8	9.8	8.7	7.0	15	8.1	6.1
27	17	7.2	9.5	96	38	6.6	9.2	8.1	6.4	12	7.5	5.3
28	16	6.8	8.4	18	25	21	298	7.6	6.0	70	7.4	5.3
29	41	6.6	7.6	12	---	62	155	7.6	5.6	31	7.2	5.2
30	44	6.2	8.4	8.1	---	66	265	7.6	5.8	14	7.9	4.9
31	18	---	9.2	12	---	137	---	7.4	---	11	13	---
TOTAL	1257.2	1042.4	748.8	415.8	2206.5	724.6	2115.0	1015.8	527.0	1207.8	951.3	400.1
MEAN	40.6	34.7	24.2	13.4	78.8	23.4	70.5	32.8	17.6	39.0	30.7	13.3
MAX	250	444	109	96	408	137	346	143	120	202	322	88
MIN	3.3	6.2	5.6	5.3	5.6	6.6	9.2	7.4	5.6	7.2	7.2	4.9
AC-FT	2490	2070	1490	825	4380	1440	4200	2010	1050	2400	1890	794

CAL YR 1980 TOTAL 15256.3 MEAN 41.7 MAX 539 MIN 3.3 AC-FT 30260
WTR YR 1981 TOTAL 12612.3 MEAN 34.6 MAX 444 MIN 3.3 AC-FT 25020

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.

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. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--55 years, 24.5 ft^3/s (0.694 m^3/s), 17,750 acre-ft/yr (21.9 hm^3/yr).

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

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 88 ft^3/s (2.49 m^3/s) Feb. 8; minimum daily, 5.3 ft^3/s (0.15 m^3/s) Oct. 4.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.8	17	8.5	16	17	48	83	81	14	20	13	10
2	5.5	14	9.5	14	14	43	77	74	16	13	12	9.2
3	5.5	14	8.5	42	12	67	55	73	12	13	11	60
4	5.3	12	8.0	34	11	42	58	50	20	25	53	28
5	22	11	51	20	56	34	84	48	52	30	79	54
6	44	9.8	65	16	38	32	72	78	68	13	57	30
7	13	9.2	52	15	25	34	53	50	59	9.5	42	17
8	8.5	8.7	29	14	88	56	38	38	28	21	24	13
9	27	34	19	14	84	42	30	34	24	14	20	11
10	22	18	16	13	53	32	26	30	19	46	17	17
11	33	51	14	23	68	40	23	26	32	41	15	22
12	79	27	14	17	74	30	22	24	18	21	45	14
13	37	20	20	13	67	25	22	23	26	42	26	22
14	21	13	42	12	59	25	57	21	17	78	17	23
15	16	58	61	11	49	24	69	20	13	78	14	13
16	11	70	54	11	42	23	66	20	11	79	16	11
17	33	48	34	30	37	21	39	41	11	65	19	9.2
18	54	29	25	17	78	20	37	71	17	50	26	8.5
19	30	23	24	32	75	19	26	51	12	38	59	8.0
20	16	19	38	22	50	18	23	34	11	27	39	7.8
21	11	16	23	14	72	29	21	27	11	47	29	8.2
22	9.5	14	20	13	86	33	20	21	11	35	21	7.3
23	16	13	17	11	56	20	19	18	12	21	16	7.3
24	80	12	41	11	60	18	20	17	20	33	14	10
25	80	12	51	10	58	17	23	16	11	28	12	9.5
26	52	11	28	10	58	16	18	16	9.8	24	11	8.0
27	27	10	21	63	60	15	18	15	9.0	17	10	7.0
28	20	9.8	19	31	53	26	45	14	8.5	39	9.8	6.6
29	45	9.2	17	22	---	54	80	14	8.0	50	9.5	6.6
30	54	8.7	17	16	---	73	79	13	7.8	22	9.5	6.2
31	26	---	19	25	---	79	---	13	---	16	14	---
TOTAL	909.1	621.4	865.5	612	1500	1055	1303	1071	588.1	1055.5	759.8	464.4
MEAN	29.3	20.7	27.9	19.7	53.6	34.0	43.4	34.5	19.6	34.0	24.5	15.5
MAX	80	70	65	63	88	79	84	81	68	79	79	60
MIN	5.3	8.7	8.0	10	11	15	18	13	7.8	9.5	9.5	6.2
AC-FT	1800	1230	1720	1210	2980	2090	2580	2120	1170	2090	1510	921

CAL YR 1980 TOTAL 13045.6 MEAN 35.6 MAX 86 MIN 5.3 AC-FT 25880
WTR YR 1981 TOTAL 10804.8 MEAN 29.6 MAX 88 MIN 5.3 AC-FT 21430

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 or Waimea.

DRAINAGE AREA.--1.79 mi^2 (4.64 km^2).

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.--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 good. No diversion above station.

AVERAGE DISCHARGE.--40 years (water years, 1921-31, 1953-81), 22.0 ft^3/s (0.623 m^3/s), 15,940 acre-ft/yr (19.7 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,530 ft^3/s (128 m^3/s) Jan. 16, 1921, gage height, 8.44 ft (2.573 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 4.60 ft (1.402 m); minimum, 0.99 ft^3/s (0.028 m^3/s) May 17, 18, May 30 to June 2, 1966.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 2,180 ft^3/s (61.7 m^3/s) Aug. 4, gage height 5.82 ft (1.744 m), from rating curve extended as explained above, no other peak above base of 1,300 ft^3/s (36.8 m^3/s); minimum, 1.7 ft^3/s (0.048 m^3/s) Oct. 4, 5.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.9	5.2	3.4	4.2	6.9	7.2	114	78	2.2	3.2	5.8	3.4
2	2.2	4.4	3.4	3.8	5.5	13	139	48	2.2	2.2	4.7	3.6
3	1.9	4.0	3.0	24	4.4	35	58	19	2.2	2.1	4.7	59
4	1.8	3.8	3.2	11	4.0	20	14	8.1	2.2	1.9	261	25
5	2.8	3.4	114	6.1	31	8.6	12	6.9	3.5	1.9	111	26
6	7.7	3.2	65	4.7	9.5	11	9.5	8.6	7.2	1.8	22	8.1
7	4.0	3.0	23	4.2	6.1	10	8.6	7.2	7.7	1.8	14	5.2
8	3.6	3.0	14	4.0	28	7.7	7.7	5.8	4.4	4.5	8.1	4.2
9	8.6	9.1	8.6	3.8	24	6.9	6.4	5.2	3.4	9.7	6.6	4.0
10	6.9	7.2	6.9	3.6	9.5	6.4	5.2	4.4	3.2	44	5.2	9.6
11	13	94	6.4	3.6	290	5.8	4.4	3.8	3.6	16	5.3	6.6
12	39	18	11	3.4	24	4.7	4.0	3.4	5.3	10	72	4.4
13	9.5	9.5	165	3.2	11	4.4	3.8	3.6	12	19	11	4.2
14	27	6.4	80	3.0	7.7	5.5	6.5	3.4	9.0	110	6.6	4.2
15	7.2	75	15	2.8	6.4	4.4	21	3.4	15	124	5.2	3.6
16	4.8	93	11	3.4	5.5	4.2	12	3.2	6.4	53	4.7	3.2
17	9.8	15	8.6	5.8	4.4	3.8	7.7	4.2	5.2	14	4.2	3.0
18	37	9.0	6.9	3.8	37	3.4	6.6	7.2	6.6	10	26	2.8
19	10	6.9	6.1	3.8	18	3.4	5.5	6.9	4.0	12	38	2.8
20	6.4	6.1	5.2	3.4	7.2	3.2	4.7	7.3	3.0	14	13	3.2
21	5.0	5.2	5.2	3.0	10	4.6	4.3	7.3	3.2	101	8.1	4.0
22	4.0	5.0	6.4	3.4	33	4.7	3.8	4.4	3.0	12	6.4	3.2
23	13	4.4	5.2	3.4	69	3.4	3.8	3.6	3.4	7.7	5.8	4.7
24	121	4.7	70	2.8	94	3.2	4.4	3.0	3.8	9.5	6.6	6.6
25	102	4.7	19	2.8	64	3.0	6.1	3.2	3.0	20	5.0	5.2
26	23	4.4	9.0	2.8	22	3.2	4.7	2.8	2.4	9.0	4.0	4.0
27	10	4.0	6.6	75	11	3.4	5.5	2.6	4.0	7.7	3.6	3.2
28	6.9	3.8	5.8	116	8.6	7.9	25	2.4	4.4	85	3.6	10
29	7.7	3.4	5.2	14	---	16	39	2.4	3.0	21	3.4	5.8
30	9.5	3.4	5.0	11	---	14	30	2.3	2.4	11	3.4	4.0
31	7.7	---	4.7	12	---	54	---	2.2	---	7.7	3.2	---
TOTAL	514.9	422.2	701.8	351.8	851.7	286.0	577.2	273.8	140.9	746.7	682.2	236.8
MEAN	16.6	14.1	22.6	11.3	30.4	9.23	19.2	8.83	4.70	24.1	22.0	7.89
MAX	121	94	165	116	290	54	139	78	15	124	261	59
MIN	1.8	3.0	3.0	2.8	4.0	3.0	3.8	2.2	2.2	1.8	3.2	2.8
AC-FT	1020	837	1390	698	1690	567	1140	543	279	1480	1350	470

CAL YR 1980 TOTAL 8304.5 MEAN 22.7 MAX 258 MIN 1.8 AC-FT 16470
WTR YR 1981 TOTAL 5786.0 MEAN 15.9 MAX 290 MIN 1.8 AC-FT 11480

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

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1972 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (UMHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)
OCT					
16...	0935	4.9	32	5.9	16.5
DEC					
17...	1025	9.0	28	6.2	12.0
FEB					
10...	1005	9.8	30	6.3	10.5
APR					
21...	0945	4.2	31	6.3	15.5
JUN					
11...	1010	3.6	36	6.0	17.5
AUG					
17...	1030	4.2	27	5.6	17.5

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	HARD-NESS (MG/L AS CACO3)	HARD-NESS NONCAR-BONATE (MG/L AS CACO3)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	PERCENT SODIUM	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY LAB (MG/L AS CACO3)
OCT											
16...	0935	4.8	7	7.0	1.2	1.0	3.4	50	.6	.3	.00
DEC											
17...	1025	9.0	9	.00	2.6	.7	3.1	40	.4	.5	10
FEB											
10...	1005	9.8	7	7.0	1.0	1.1	3.9	53	.6	.3	.00
APR											
21...	0945	4.2	12	12	3.2	.9	3.8	40	.5	.5	.00
JUN											
11...	1010	3.6	--	--	--	--	--	--	--	--	--
AUG											
17...	1030	4.2	6	5.0	1.1	.7	3.2	53	.7	.4	1.0

DATE	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SIO2)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	SOLIDS, DIS-SOLVED (TONS PER AC-FT)	NITRO-GEN, NITRATE DIS-SOLVED (MG/L AS N)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N)	PHOS-PHORUS, DIS-SOLVED (MG/L AS P)	ARSENIC DIS-SOLVED (UG/L AS AS)
OCT											
16...	6.1	6.5	.1	3.8	23	.03	--	--	.01	.010	--
DEC											
17...	2.2	3.8	.1	5.1	24	.03	--	--	.00	.050	--
FEB											
10...	5.9	6.1	.1	3.5	22	.03	--	--	.00	.020	--
APR											
21...	3.2	5.9	.1	4.7	23	.03	.00	.060	.06	--	--
JUN											
11...	--	--	--	--	--	--	--	--	--	.050	2
AUG											
17...	4.0	5.4	.1	5.4	22	.03	--	--	.03	.050	--

DATE	BARIUM, DIS-SOLVED (UG/L AS BA)	CADMIUM DIS-SOLVED (UG/L AS CD)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR)	COPPER, DIS-SOLVED (UG/L AS CU)	IRON, DIS-SOLVED (UG/L AS FE)	LEAD, DIS-SOLVED (UG/L AS PB)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)	MERCURY DIS-SOLVED (UG/L AS HG)	SELE-NIUM, DIS-SOLVED (UG/L AS SE)	SILVER, DIS-SOLVED (UG/L AS AG)	ZINC, DIS-SOLVED (UG/L AS ZN)
OCT											
16...	--	--	--	--	480	--	4	--	--	--	--
DEC											
17...	--	--	--	--	330	--	3	--	--	--	--
FEB											
10...	--	--	--	--	410	--	9	--	--	--	--
APR											
21...	--	--	--	--	310	--	8	--	--	--	--
JUN											
11...	70	<1	10	3	240	0	5	.0	0	0	100
AUG											
17...	--	--	--	--	380	--	0	--	--	--	--

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

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 19.7 ft (6.00 m), (revised), 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.--40 years (water years 1911-17, 1945-68, 1970-72, 1976-81), 126 ft³/s (3.568 m³/s), 91,290 acre-ft/yr (113 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 2,200 ft³/s (62.3 m³/s) on basis of slope-area measurement at gage height 19.05 ft (5.806 m).

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 7,750 ft³/s (219 m³/s) Feb. 11, gage height, 10.62 ft (3.237 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 (0.045 m³/s) Nov. 26.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.2	5.8	2.8	4.8	7.9	13	398	486	3.4	4.8	7.9	2.9
2	2.9	3.9	3.2	4.4	5.4	9.3	407	143	3.4	6.1	5.6	3.0
3	4.0	3.4	3.2	45	4.4	54	160	192	3.4	5.2	5.0	134
4	4.0	3.3	3.6	56	3.6	44	47	21	3.4	4.6	690	35
5	3.4	3.0	412	9.9	240	17	352	7.9	3.4	7.9	790	86
6	13	2.9	515	5.2	49	12	140	127	5.0	6.1	102	15
7	9.0	2.8	68	4.6	8.2	25	75	16	44	4.8	28	4.2
8	3.2	3.2	35	4.2	278	16	63	5.8	6.7	4.2	11	3.0
9	2.9	3.6	8.2	3.9	319	16	56	5.0	3.4	5.2	7.0	4.2
10	8.4	7.9	6.7	3.9	42	7.7	50	4.4	3.0	40	5.8	31
11	5.0	186	7.0	3.9	1950	7.4	44	4.0	3.2	43	5.2	32
12	197	25	5.8	4.2	614	5.8	32	3.7	3.4	12	88	4.4
13	48	14	250	3.9	134	5.4	4.4	3.4	5.8	12	36	2.7
14	25	4.0	1070	3.6	51	5.0	6.7	3.6	8.5	423	6.0	8.4
15	16	433	157	3.7	28	5.2	250	3.7	4.8	511	3.6	2.6
16	3.7	902	49	4.4	19	5.0	70	3.6	11	342	3.0	2.2
17	2.3	55	19	6.5	16	4.4	13	3.6	5.6	83	4.4	1.9
18	40	10	8.2	7.7	296	5.2	6.5	54	4.4	31	3.0	1.6
19	27	3.6	4.6	4.8	183	5.8	5.0	23	4.6	16	75	1.8
20	5.4	2.8	4.0	4.2	29	4.4	4.2	4.2	4.0	22	61	2.3
21	3.4	2.3	4.2	3.7	68	4.0	4.0	4.0	3.6	227	7.7	3.2
22	2.8	2.4	4.0	4.2	206	4.2	4.0	4.2	3.7	65	4.0	2.7
23	2.5	2.4	3.9	3.3	296	4.8	4.0	3.2	4.0	17	3.3	2.3
24	459	2.4	237	4.0	331	4.0	4.0	3.2	5.6	6.7	3.2	2.2
25	640	2.6	186	3.7	311	3.9	4.4	3.3	5.0	11	3.4	3.2
26	111	2.8	32	3.2	257	3.3	5.2	3.6	4.6	26	2.9	2.9
27	20	2.9	12	128	52	3.6	6.1	3.4	4.4	7.7	2.5	2.7
28	6.5	2.8	7.7	201	23	3.6	116	3.3	5.6	105	2.5	2.6
29	4.4	2.6	6.1	51	---	4.8	492	3.3	4.8	158	2.7	4.2
30	22	2.6	5.6	7.7	---	30	206	3.3	4.4	24	3.0	3.2
31	10	---	5.2	18	---	172	---	3.3	---	35	3.0	---
TOTAL	1705.0	1701.0	3136.0	616.6	5821.5	505.8	3029.5	1153.0	180.1	2266.3	1975.7	407.4
MEAN	55.0	56.7	101	19.9	208	16.3	101	37.2	6.00	73.1	63.7	13.6
MAX	640	902	1070	201	1950	172	492	486	44	511	790	134
MIN	2.3	2.3	2.8	3.2	3.6	3.3	4.0	3.2	3.0	4.2	2.5	1.6
AC-FT	3380	3370	6220	1220	11550	1000	6010	2290	357	4500	3920	808

CAL YR 1980 TOTAL 35719.0 MEAN 97.6 MAX 2080 MIN 2.3 AC-FT 70850
WTR YR 1981 TOTAL 22497.9 MEAN 61.6 MAX 1950 MIN 1.6 AC-FT 44620

HAWAII, ISLAND OF KAUAI

16031000 WAIMEA RIVER NEAR WAIMEA--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1971-74, November 1974 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (UMHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)	TUR-BID-ITY (NTU)	OXYGEN, DIS-SOLVED (MG/L)	COLI-FORM, FECAL, 0.7 UM-MF (COLS. / 100 ML)	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARD-NESS (MG/L AS CACO3)
OCT										
06...	1015	16	180	7.7	24.5	3.5	8.8	2800	1900	72
NOV										
03...	1045	3.5	150	7.7	21.5	2.0	8.5	390	400	60
DEC										
01...	1130	2.6	180	7.9	22.0	.70	8.3	K2600	--	70
JAN										
05...	1130	10	120	7.5	19.0	4.1	9.0	860	720	40
FEB										
02...	1330	3.5	135	7.8	23.0	3.2	9.3	860	740	50
MAR										
02...	1130	9.4	110	7.9	20.0	3.4	9.6	320	4500	40
APR										
06...	1130	128	54	7.3	18.0	3.7	9.5	230	770	17
MAY										
21...	1100	3.9	138	7.8	24.5	2.6	8.7	440	K90	54
JUN										
03...	1030	3.7	190	7.6	22.0	2.0	8.6	510	630	73
JUL										
13...	1115	6.9	140	7.6	26.0	3.5	8.8	550	360	55
AUG										
03...	1200	5.1	140	8.1	26.0	2.6	8.8	--	790	53
SEP										
01...	1120	3.0	185	7.2	24.5	1.9	8.4	370	410	70

DATE	HARD-NESS NONCAR-BONATE (MG/L AS CACO3)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	PERCENT SODIUM	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY LAB (MG/L AS CACO3)	SULFATE DIS-SOLVED (MG/L AS SO4)
OCT									
06...	.00	8.9	12	11	25	.6	.9	73	.4
NOV									
03...	.00	7.4	10	8.7	24	.5	.7	65	1.0
DEC									
01...	.00	8.3	12	9.1	22	.5	.9	73	1.9
JAN									
05...	.00	5.0	6.7	7.3	28	.5	.6	47	.3
FEB									
02...	.00	6.6	8.2	8.4	26	.5	.8	52	1.4
MAR									
02...	3.0	5.1	6.7	7.2	28	.5	.6	37	1.5
APR									
06...	.00	2.5	2.6	4.4	35	.5	.4	17	3.0
MAY									
21...	2.0	7.3	8.7	8.2	24	.5	.8	52	1.4
JUN									
03...	4.0	9.5	12	11	24	.6	.8	69	1.0
JUL									
13...	16	7.8	8.7	8.6	25	.5	.4	39	1.9
AUG									
03...	6.0	6.7	8.8	8.0	24	.6	.6	47	<1.0
SEP									
01...	.00	8.4	12	9.0	22	.5	.8	73	1.0

K Results based on colony count outside the acceptable range (non-ideal colony count).
< Actual value is known to be less than the value shown.

16031000 WAIMEA RIVER NEAR WAIMEA--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	CHLORIDE, DISSOLVED (MG/L AS CL)	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)	SOLIDS, DISSOLVED (TONS PER AC-FT)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N)	NITROGEN, AMMONIA TOTAL (MG/L AS N)	NITROGEN, AMMONIA DISSOLVED (MG/L AS N)
OCT										
06...	14	.1	27	123	118	.17	.00	.00	.000	.000
NOV										
03...	11	.1	25	97	103	.13	.00	.00	.000	.010
DEC										
01...	12	.1	26	114	114	.16	.00	.00	.000	.020
JAN										
05...	11	.1	19	74	78	.10	.04	.05	.020	.050
FEB										
02...	11	.1	20	86	88	.12	.05	.05	.000	.020
MAR										
02...	11	.1	18	84	72	.11	.00	.00	.000	.000
APR										
06...	6.6	.1	10	43	40	.06	.06	.05	.060	.020
MAY										
21...	10	.0	20	91	88	.12	.02	.02	.070	.060
JUN										
03...	15	.1	26	123	117	.17	.09	.00	.110	.020
JUL										
13...	19	.1	23	93	93	.13	.01	.02	.020	.020
AUG										
03...	13	.1	24	95	--	.13	.10	.11	.090	.110
SEP										
01...	15	.0	28	113	118	.15	<.10	<.10	.130	.140

DATE	NITROGEN, ORGANIC TOTAL (MG/L AS N)	NITROGEN, ORGANIC DISSOLVED (MG/L AS N)	NITROGEN DISSOLVED (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITROGEN, NH4 + ORG. SUSP. TOTAL (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC DIS. (MG/L AS N)	NITROGEN, TOTAL (MG/L AS N)	PHOSPHORUS, TOTAL (MG/L AS P)	PHOSPHORUS, DISSOLVED (MG/L AS P)
OCT									
06...	.51	.39	.39	.51	.12	.39	.51	.020	.010
NOV									
03...	.40	.31	.32	.40	.08	.32	.40	.040	.010
DEC									
01...	.23	.21	.23	.23	.00	.23	.23	.030	.040
JAN									
05...	.55	.43	.53	.57	.09	.48	.61	.020	.010
FEB									
02...	.57	.39	.46	.57	.16	.41	.57	.010	.020
MAR									
02...	.53	.53	.53	.53	.00	.53	.53	.030	.060
APR									
06...	.47	.51	.58	.53	.00	.53	.59	.040	.030
MAY									
21...	.81	.42	.50	.88	.40	.48	.90	.010	.010
JUN									
03...	.37	.26	.28	.48	.20	.28	.57	.030	.010
JUL									
13...	.55	.36	.40	.57	.19	.38	.58	.020	.010
AUG									
03...	.32	.24	.46	.41	.06	.35	.51	.020	.010
SEP									
01...	.24	.19	.72	.37	.04	.33	--	.040	<.010

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

16031000 WAIMEA RIVER NEAR WAIMEA--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	TIME	ARSENIC TOTAL (UG/L AS AS)	ARSENIC SUS-PENDED TOTAL (UG/L AS AS)	ARSENIC DIS-SOLVED (UG/L AS AS)	BARIUM, TOTAL RECOV-ERABLE (UG/L AS BA)	BARIUM, SUS-PENDED RECOV-ERABLE (UG/L AS BA)	BARIUM, DIS-SOLVED (UG/L AS BA)	CADMIUM TOTAL RECOV-ERABLE (UG/L AS CD)	CADMIUM SUS-PENDED RECOV-ERABLE (UG/L AS CD)	CADMIUM DIS-SOLVED (UG/L AS CD)	CHRO-MIUM, TOTAL RECOV-ERABLE (UG/L AS CR)
OCT											
06...	1015	2	0	2	100	90	10	0	---	<1	0
JAN											
05...	1130	1	0	1	8	0	8	1	0	1	10
APR											
06...	1130	2	0	2	7	0	7	2	0	2	10
JUL											
13...	1115	1	0	1	0	0	0	<1	--	<1	0

DATE	CHRO-MIUM, SUS-PENDED RECOV. (UG/L AS CR)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR)	COBALT, TOTAL RECOV-ERABLE (UG/L AS CO)	COBALT, SUS-PENDED RECOV-ERABLE (UG/L AS CO)	COBALT, DIS-SOLVED (UG/L AS CO)	COPPER, TOTAL RECOV-ERABLE (UG/L AS CU)	COPPER, SUS-PENDED RECOV-ERABLE (UG/L AS CU)	COPPER, DIS-SOLVED (UG/L AS CU)	IRON, TOTAL RECOV-ERABLE (UG/L AS FE)	IRON, SUS-PENDED RECOV-ERABLE (UG/L AS FE)	IRON, DIS-SOLVED (UG/L AS FE)
OCT											
06...	0	0	<3	---	<3	24	22	2	760	630	130
JAN											
05...	10	0	<3	0	<3	11	0	11	690	490	200
APR											
06...	0	10	1	--	<3	3	1	2	820	700	120
JUL											
13...	0	0	6	--	<3	6	4	2	390	330	60

DATE	LEAD, TOTAL RECOV-ERABLE (UG/L AS PB)	LEAD, SUS-PENDED RECOV-ERABLE (UG/L AS PB)	LEAD, DIS-SOLVED (UG/L AS PB)	MANGA-NESE, TOTAL RECOV-ERABLE (UG/L AS MN)	MANGA-NESE, SUS-PENDED RECOV. (UG/L AS MN)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)	MERCURY TOTAL RECOV-ERABLE (UG/L AS HG)	MERCURY SUS-PENDED RECOV-ERABLE (UG/L AS HG)	MERCURY DIS-SOLVED (UG/L AS HG)	NICKEL, TOTAL RECOV-ERABLE (UG/L AS NI)	NICKEL, SUS-PENDED RECOV-ERABLE (UG/L AS NI)
OCT											
06...	3	2	1	110	90	20	.0	.0	.0	5	5
JAN											
05...	5	3	2	20	10	10	.0	.0	.0	2	2
APR											
06...	2	2	0	30	20	6	.0	.0	.0	3	0
JUL											
13...	2	1	1	20	0	20	.1	.1	.0	5	2

DATE	NICKEL, DIS-SOLVED (UG/L AS NI)	SELE-NIUM, TOTAL (UG/L AS SE)	SELE-NIUM, SUS-PENDED TOTAL (UG/L AS SE)	SELE-NIUM, DIS-SOLVED (UG/L AS SE)	SILVER, TOTAL RECOV-ERABLE (UG/L AS AG)	SILVER, SUS-PENDED RECOV-ERABLE (UG/L AS AG)	SILVER, DIS-SOLVED (UG/L AS AG)	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN)	ZINC, SUS-PENDED RECOV-ERABLE (UG/L AS ZN)	ZINC, DIS-SOLVED (UG/L AS ZN)
OCT										
06...	0	0	0	0	0	0	0	20	15	5
JAN										
05...	0	0	0	0	0	0	0	10	7	<3
APR										
06...	3	0	0	0	0	0	0	30	20	10
JUL										
13...	3	0	0	0	0	0	0	20	0	20

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

16031000 WAIMEA RIVER NEAR WAIMEA--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	TIME	CARBON, ORGANIC TOTAL (MG/L AS C)	CARBON, ORGANIC DIS-SOLVED (MG/L AS C)	CARBON, ORGANIC SUS-PENDED TOTAL (MG/L AS C)
OCT				
06...	1015	--	2.8	.4
NOV				
03...	1045	3.6	--	--
DEC				
01...	1130	4.3	--	--
JAN				
05...	1130	--	3.5	.4
FEB				
02...	1330	3.9	--	--
MAR				
02...	1130	3.5	--	--
APR				
06...	1130	--	7.9	.0
MAY				
21...	1100	5.6	--	--
JUN				
03...	1030	3.8	--	--
JUL				
13...	1115	--	3.2	.0
AUG				
03...	1200	3.6	--	--
SEP				
01...	1120	2.5	--	--

DATE	TIME	PHYTO-PLANK-TON, TOTAL (CELLS PER ML)	PERI-PHYTON BIOMASS ASH WEIGHT G/SQ M	PERI-PHYTON BIOMASS TOTAL DRY WEIGHT G/SQ M	CHLOR-A PERI-PHYTON CHROMO-GRAPHIC FLUOROM (MG/M2)	CHLOR-B PERI-PHYTON CHROMO-GRAPHIC FLUOROM (MG/M2)	BIOMASS CHLORO-PHYLL RATIO PERI-PHYTON (UNITS)	LENGTH OF EXPO-SURE (DAYS)
OCT								
06...	1015	2000	5.12	6.46	7.24	.280	185	32
NOV								
03...	1045	350	--	--	--	--	--	--
DEC								
01...	1130	52	--	--	--	--	--	--
JAN								
05...	1130	180	--	--	--	--	--	--
FEB								
02...	1330	600	--	--	--	--	--	--
MAR								
02...	1130	37	--	--	--	--	--	--
APR								
06...	1130	190	--	--	--	--	--	--
MAY								
21...	1100	210	--	--	--	--	--	--
JUN								
03...	1030	90	--	--	--	--	--	--
JUL								
13...	1115	100	--	--	--	--	--	--
AUG								
03...	1200	310	--	--	--	--	--	--
SEP								
01...	1120	140	--	--	--	--	--	--

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SEDI-MENT, SUS-PENDED (MG/L)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
OCT					
06...	1015	16	20	.86	100
NOV					
03...	1045	3.5	4	.04	100
DEC					
01...	1130	2.6	4	.03	100
JAN					
05...	1130	10	5	.13	100
FEB					
02...	1330	3.5	3	.03	100
MAR					
02...	1130	9.4	4	.10	100
APR					
06...	1130	128	9	3.1	100
MAY					
21...	1100	3.9	4	.04	100
JUN					
03...	1030	3.7	4	.04	100
JUL					
13...	1115	6.9	6	.11	100
AUG					
03...	1200	5.1	4	.06	100
SEP					
01...	1120	3.0	4	.03	100

16031000 WAIMEA RIVER NEAR WAIMEA--Continued

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA

PHYTOPLANKTON ANALYSES, OCTOBER 1980 TO SEPTEMBER 1981

DATE	OCT 6,80		NOV 3,80		DEC 1,80		JAN 5,81		FEB 2,81		MAR 2,81	
TIME	1015		1045		1130		1130		1330		1130	
TOTAL CELLS/ML	2000		350		52		180		600		37	
DIVERSITY: DIVISION	0.6		0.2		0.0		0.4		1.0		0.9	
. CLASS	0.6		0.2		0.0		0.4		1.0		0.9	
.. ORDER	0.6		0.5		0.0		0.4		1.6		0.9	
... FAMILY	0.7		0.5		1.0		1.5		2.9		0.9	
.... GENUS	0.7		0.5		1.0		1.5		3.1		0.9	
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												
... MICRACTINIACEAE												
.... MICRACTINIUM	--	-	--	-	--	-	--	-	--	-	--	-
... OOCYSTACEAE												
.... ANKISTRODESMUS	--	-	--	-	--	-	--	-	14	2	--	-
.... SELENASTRUM	--	-	--	-	--	-	--	-	--	-	--	-
... SCENEDESMACEAE												
.... SCENEDESMUS	100	5	--	-	--	-	--	-	--	-	12#	33
.. VOLVOCALES												
... CHLAMYDOMONADACEAE												
.... CHLAMYDOMONAS	--	-	--	-	--	-	14	8	14	2	--	-
CHRYSOPHYTA												
. BACILLARIOPHYCEAE												
.. CENTRALES												
... COSCINODISCACEAE												
.... CYCLOTELLA	--	-	--	-	--	-	--	-	14	2	--	-
.... MELOSIRA	--	-	--	-	--	-	--	-	82	14	--	-
.. PENNALES												
... ACHNANTHACEAE												
.... ACHNANTHES	--	-	--	-	--	-	--	-	--	-	--	-
.... COCCONEIS	--	-	--	-	--	-	--	-	--	-	--	-
... CYMBELLACEAE												
.... CYMBELLA	13	1	--	-	--	-	14	8	69	11	--	-
... DIATOMACEAE												
.... DIATOMA	--	-	--	-	26#	50	--	-	--	-	--	-
... FRAGILARIACEAE												
.... FRAGILARIA	--	-	--	-	--	-	--	-	27	5	--	-
.... SYNEDRA	13	1	--	-	--	-	14	8	41	7	--	-
... GOMPHONEMATACEAE												
.... GOMPHONEMA	--	-	--	-	--	-	--	-	82	14	--	-
... NAVICULACEAE												
.... NAVICULA	13	1	13	4	--	-	120#	69	96#	16	25#	67
... NITZSCHIACEAE												
.... NITZSCHIA	64	3	--	-	26#	50	14	8	41	7	--	-
CRYPTOPHYTA (CRYPTOMONADS)												
. CRYPTOPHYCEAE												
.. CRYPTOMONADALES												
... CRYPTOMONADACEAE												
.... CRYPTOMONAS	--	-	--	-	--	-	--	-	--	-	--	-
CYANOPHYTA (BLUE-GREEN ALGAE)												
. CYANOPHYCEAE												
.. CHROOCOCCALES												
... CHROOCOCCACEAE												
.... ANACYSTIS	--	-	13	4	--	-	--	-	--	-	--	-
.. HORMOGONALES												
... OSCILLATORIACEAE												
.... OSCILLATORIA	1800#	89	320#	93	--	-	--	-	120#	20	--	-
EUGLENOPHYTA (EUGLENOIDS)												
. EUGLENOPHYCEAE												
.. EUGLENALES												
... EUGLENACEAE												
.... EUGLENA	13	1	--	-	--	-	--	-	--	-	--	-
PYRRHOPHYTA (FIRE ALGAE)												
. DINOPHYCEAE												
.. PERIDINIALES												
... GLENODINIACEAE												
.... GLENODINIUM	--	-	--	-	--	-	--	-	--	-	--	-

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

PHYTOPLANKTON ANALYSES, OCTOBER 1980 TO SEPTEMBER 1981

DATE	APR 6,81	MAY 21,81	JUN 3,81	JUL 13,81	AUG 3,81	SEP 1,81
TIME	1130	1100	1030	1115	1200	1120
TOTAL CELLS/ML	190	210	90	100	310	140
DIVERSITY: DIVISION	1.0	1.6	1.1	1.3	0.3	0.0
.CLASS	1.0	1.6	1.1	1.3	0.3	0.0
..ORDER	1.5	2.1	1.7	1.8	0.5	0.0
...FAMILY	2.0	2.7	2.8	2.5	2.6	0.9
....GENUS	2.0	2.7	2.8	2.5	2.9	0.9

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												
...MICRACTINIACEAE												
....MICRACTINIUM	--	-	51#	25	--	-	--	-	--	-	--	-
...OOCYSTACEAE												
....ANKISTRODESMUS	--	-	26	13	--	-	--	-	--	-	--	-
....SELENASTRUM	--	-	--	-	--	-	13	13	--	-	--	-
...SCENEDESMACEAE												
....SCENEDESMUS	--	-	--	-	--	-	--	-	--	-	--	-
..VOLVOCALES												
...CHLAMYDOMONADACEAE												
....CHLAMYDOMONAS	--	-	39#	19	--	-	--	-	14	5	--	-
CHRYSOPHYTA												
.BACILLARIOPHYCEAE												
..CENTRALES												
...COSCINODISCACEAE												
....CYCLOTELLA	39#	20	--	-	13	14	13	13	14	5	--	-
....MELOSIRA	--	-	--	-	--	-	--	-	--	-	--	-
..PENNALES												
...ACHNANTHACEAE												
....ACHNANTHES	--	-	--	-	--	-	--	-	14	5	--	-
....COCCONEIS	--	-	--	-	--	-	--	-	14	5	--	-
...CYMBELLACEAE												
....CYMBELLA	--	-	--	-	13	14	--	-	56#	18	--	-
...DIATOMACEAE												
....DIATOMA	--	-	--	-	--	-	--	-	--	-	--	-
...FRAGILARIACEAE												
....FRAGILARIA	--	-	--	-	--	-	--	-	42	14	--	-
....SYNEDRA	--	-	--	-	--	-	13	13	28	9	--	-
...GOMPHONEMATACEAE												
....GOMPHONEMA	13	7	--	-	13	14	--	-	--	-	--	-
...NAVICULACEAE												
....NAVICULA	13	7	13	6	13	14	13	13	84#	27	43#	30
...NITZSCHIACEAE												
....NITZSCHIA	39#	20	39#	19	13	14	26#	25	42	14	100#	70
CRYPTOPHYTA (CRYPTOMONADS)												
.CRYPTOPHYCEAE												
..CRYPTOMONADALES												
...CRYPTOMONADACEAE												
....CRYPTOMONAS	--	-	13	6	13	14	--	-	--	-	--	-
CYANOPHYTA (BLUE-GREEN ALGAE)												
.CYANOPHYCEAE												
..CHROOCOCCALES												
...CHROOCOCCACEAE												
....ANACYSTIS	90#	47	--	-	--	-	--	-	--	-	--	-
..HORMOGONALES												
...OSCILLATORIACEAE												
....OSCILLATORIA	--	-	--	-	--	-	--	-	--	-	--	-
EUGLENOPHYTA (EUGLENOIDS)												
.EUGLENOPHYCEAE												
..EUGLENALES												
...EUGLENACEAE												
....EUGLENA	--	-	26	13	--	-	--	-	--	-	--	-
PYRRHOPHYTA (FIRE ALGAE)												
.DINOPHYCEAE												
..PERIDINIALES												
...GLENODINIACEAE												
....GLENODINIUM	--	-	--	-	13	14	26#	25	--	-	--	-

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).

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. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--38 years, 85.7 ft^3/s (2.427 m^3/s), 62,090 acre-ft/yr (76.6 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, 3,480 ft^3/s (98.6 m^3/s) Aug. 5, gage height, 5.90 ft (1.798 m), from rating curve extended as explained above, no peak above base of 4,700 ft^3/s (135 m^3/s); minimum, 7.3 ft^3/s (0.21 m^3/s) June 10.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	12	14	12	23	27	28	264	68	12	9.5	14	15
2	15	13	14	22	27	32	322	92	11	9.5	31	14
3	19	12	12	55	26	86	202	51	11	9.0	15	107
4	14	12	13	39	21	46	55	23	11	10	716	55
5	20	12	254	26	74	28	40	19	25	10	732	60
6	30	12	279	22	35	46	37	22	13	10	116	28
7	24	12	59	22	25	65	40	19	12	9.5	64	22
8	50	11	41	21	25	31	40	24	10	12	41	20
9	30	27	30	20	35	30	26	23	10	21	33	29
10	16	17	27	19	24	28	21	17	9.5	110	25	27
11	40	326	24	19	804	29	19	15	10	40	25	26
12	91	52	29	25	172	21	18	14	17	28	312	20
13	29	26	73	56	61	19	17	13	35	45	43	24
14	178	19	324	50	44	19	19	13	14	362	28	30
15	28	106	56	52	36	19	28	12	55	370	22	21
16	17	240	39	50	31	17	22	12	20	99	21	19
17	46	41	30	22	27	16	24	13	14	38	22	17
18	78	23	27	19	52	15	22	15	14	24	174	15
19	26	19	24	17	48	15	16	14	11	21	83	18
20	17	18	22	15	26	15	16	19	10	35	41	23
21	14	16	22	15	23	15	15	19	11	374	27	47
22	12	15	22	16	75	17	15	14	10	44	22	24
23	14	14	19	17	147	15	14	11	11	23	26	20
24	296	14	277	17	264	31	23	10	10	22	20	31
25	289	14	113	16	120	22	20	11	10	93	17	23
26	65	13	53	16	82	15	15	12	9.5	28	16	16
27	28	12	43	275	43	33	18	11	11	32	14	15
28	21	11	38	378	34	27	40	11	12	218	18	91
29	17	11	33	59	---	19	85	10	10	77	16	23
30	17	11	29	32	---	21	23	10	8.5	36	14	16
31	15	---	26	36	---	114	---	11	---	20	15	---
TOTAL	1568	1143	2064	1471	2408	934	1516	628	427.5	2239.5	2763	896
MEAN	50.6	38.1	66.6	47.5	86.0	30.1	50.5	20.3	14.3	72.2	89.1	29.9
MAX	296	326	324	378	804	114	322	92	55	374	732	107
MIN	12	11	12	15	21	15	14	10	8.5	9.0	14	14
AC-FT	3110	2270	4090	2920	4780	1850	3010	1250	848	4440	5480	1780

CAL YR 1980 TOTAL 27268.0 MEAN 74.5 MAX 1100 MIN 11 AC-FT 54090
WTR YR 1981 TOTAL 18058.0 MEAN 49.5 MAX 804 MIN 8.5 AC-FT 35820

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 mi^2 (47.9 km^2).

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.--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. Koula ditch diverts 3.0 mi (4.8 km) above station for irrigation in vicinity of Makaweli. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--57 years (water years, 1918-20, 1928-81), 85.4 ft^3/s (2.419 m^3/s), 61,870 acre-ft/yr (76.3 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 39,000 ft^3/s (1,100 m^3/s) Apr. 15, 1963, gage height, 14.87 ft (4.532 m), from rating curve extended above 7,600 ft^3/s (215 m^3/s) on basis of slope-area measurement of peak flow; minimum, 5.1 ft^3/s (0.14 m^3/s) May 21, 1954.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 8,820 ft^3/s (250 m^3/s) Aug. 5, gage height, 8.73 ft (2.661 m), from rating curve extended as explained above, no other peak above base of 3,600 ft^3/s (102 m^3/s); minimum, 14 ft^3/s (0.40 m^3/s) July 7.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	18	18	18	19	18	20	295	22	17	16	20	17
2	18	18	18	18	18	24	268	85	17	16	35	17
3	18	18	18	30	18	69	200	31	17	16	19	60
4	18	18	20	21	17	34	52	19	17	16	839	46
5	21	18	286	18	62	23	32	20	26	16	1250	52
6	26	18	226	18	24	70	49	21	16	17	219	21
7	17	18	44	18	20	157	39	18	16	15	66	18
8	44	18	27	18	19	28	59	71	16	18	34	18
9	27	30	21	18	18	24	24	24	17	26	29	21
10	17	44	20	18	17	56	20	16	17	138	23	27
11	39	370	19	18	277	29	19	16	18	42	29	21
12	75	74	23	18	65	20	19	16	23	20	337	18
13	22	26	61	18	24	20	18	16	38	54	42	19
14	177	20	215	18	20	19	21	16	16	520	26	20
15	31	66	37	18	18	19	20	16	29	470	21	18
16	18	161	25	18	18	18	21	16	16	138	21	17
17	42	37	22	18	17	18	39	17	18	39	23	17
18	59	22	20	18	18	17	20	20	18	22	156	17
19	23	21	19	18	20	17	18	17	16	19	85	18
20	18	19	19	17	17	17	18	25	16	19	34	24
21	19	18	19	17	18	18	20	18	19	593	25	23
22	17	18	20	18	39	18	18	16	17	49	21	18
23	27	18	19	17	59	17	19	16	16	24	46	22
24	286	19	128	17	157	50	38	16	16	22	21	21
25	210	18	43	17	85	19	23	17	16	127	19	18
26	54	18	24	17	50	17	19	17	17	25	18	17
27	26	18	21	277	26	17	32	17	18	26	18	17
28	21	18	20	277	21	20	51	17	17	345	24	61
29	20	18	20	44	---	20	50	17	17	88	18	17
30	21	18	19	21	---	23	19	17	16	47	18	16
31	18	---	19	20	---	124	---	17	---	24	19	---
TOTAL	1447	1215	1510	1117	1180	1042	1540	687	553	3007	3555	716
MEAN	46.7	40.5	48.7	36.0	42.1	33.6	51.3	22.2	18.4	97.0	115	23.9
MAX	286	370	286	277	277	157	295	85	38	593	1250	61
MIN	17	18	18	17	17	17	18	16	16	15	18	16
AC-FT	2870	2410	3000	2220	2340	2070	3050	1360	1100	5960	7050	1420

CAL YR 1980 TOTAL 26873 MEAN 73.4 MAX 1190 MIN 12 AC-FT 53300
WTR YR 1981 TOTAL 17569 MEAN 48.1 MAX 1250 MIN 15 AC-FT 34850

16060000 SOUTH FORK WAILUA RIVER NEAR LIHUE

LOCATION.--Lat 22°02'24", long 159°22'58", Hydrologic Unit 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 mi² (58.0 km²).

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.--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. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--64 years (water years, 1913-18, 1920, 1922-24, 1926-56, 1959-81), 115 ft³/s (3.257 m³/s), 83,320 acre-ft/yr (103 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 87,300 ft³/s (2,470 m³/s) Apr. 15, 1963, gage height, 22.90 ft (6.980 m), from rating curve extended above 13,000 ft³/s (368 m³/s) on basis of slope-area measurement of peak flow; minimum, 1.69 ft³/s (0.048 m³/s) Sept. 21, 1953.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 7,950 ft³/s (225 m³/s) Aug. 5, gage height, 15.28 ft (4.657 m), from rating curve extended as explained above; no other peak above base of 5,800 ft³/s (164 m³/s); minimum, 3.2 ft³/s (0.091 m³/s) June 25, 26.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	13	12	10	7.9	9.6	4.1	129	98	6.6	4.1	48	8.1
2	33	11	16	7.7	8.1	3.8	250	113	6.6	4.6	91	7.7
3	12	11	18	7.9	6.1	28	207	93	6.1	5.7	41	64
4	10	12	13	11	5.9	8.1	93	32	5.5	5.4	629	35
5	38	14	337	7.7	14	6.3	78	21	6.1	7.2	1340	64
6	147	13	431	7.4	10	16	105	44	7.9	7.4	803	19
7	30	12	173	7.9	6.6	73	90	17	5.9	7.2	307	11
8	88	11	84	9.0	6.1	45	73	48	5.4	7.0	138	7.9
9	58	42	21	9.3	6.1	76	26	66	5.5	15	109	278
10	28	24	17	9.0	6.1	24	21	27	5.7	100	79	111
11	41	492	16	8.7	357	13	19	21	5.9	47	72	46
12	116	167	15	8.1	112	6.8	15	13	6.3	17	520	21
13	33	67	24	7.7	19	4.8	12	11	14	51	170	21
14	225	42	396	7.7	6.3	5.2	70	10	6.8	530	178	52
15	59	134	65	7.7	5.0	5.5	112	9.8	4.8	443	94	24
16	30	344	25	7.4	4.5	5.4	122	9.3	6.1	326	101	12
17	69	128	15	7.2	4.5	4.5	401	8.4	5.0	131	109	8.1
18	89	73	13	7.4	4.8	4.3	127	9.0	5.0	92	234	7.4
19	34	57	12	7.4	6.3	4.6	76	8.4	4.6	113	102	24
20	22	47	12	7.4	5.7	4.6	58	8.7	4.1	79	49	11
21	29	35	11	6.8	5.2	6.5	29	24	4.0	521	45	16
22	17	32	11	7.0	5.4	16	21	12	3.8	150	30	14
23	12	30	11	7.2	30	7.4	15	7.7	3.5	47	50	8.7
24	335	32	39	7.2	57	48	28	7.2	3.5	35	28	21
25	288	28	60	6.8	11	31	27	7.7	3.4	258	13	22
26	108	24	30	6.6	6.6	7.4	13	8.4	3.5	67	11	7.9
27	45	23	25	192	5.0	6.8	13	7.0	4.0	59	9.8	7.4
28	23	18	22	228	4.1	15	116	6.6	5.0	427	14	87
29	23	14	20	50	---	12	194	6.3	5.4	246	13	13
30	22	12	9.6	15	---	14	66	6.1	4.5	108	8.4	6.8
31	17	---	8.4	11	---	88	---	6.1	---	66	10	---
TOTAL	2094	1961	1960.0	699.1	728.0	595.1	2606	766.7	164.5	3976.6	5446.2	1036.0
MEAN	67.5	65.4	63.2	22.6	26.0	19.2	86.9	24.7	5.48	128	176	34.5
MAX	335	492	431	228	357	88	401	113	14	530	1340	278
MIN	10	11	8.4	6.6	4.1	3.8	12	6.1	3.4	4.1	8.4	6.8
AC-FT	4150	3890	3890	1390	1440	1180	5170	1520	326	7890	10800	2050

CAL YR 1980 TOTAL 40674.7 MEAN 111 MAX 2180 MIN 4.3 AC-FT 80680
WTR YR 1981 TOTAL 22033.2 MEAN 60.4 MAX 1340 MIN 3.4 AC-FT 43700

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.

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

REVISED RECORDS.--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. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--49 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.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 28 ft^3/s (0.82 m^3/s) Aug. 5; minimum daily, no flow Oct. 10, 13.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	16	19	18	17	18	18	22	22	17	16	20	20
2	16	19	18	17	18	19	22	24	17	16	21	20
3	16	19	18	19	17	20	21	21	16	16	20	22
4	16	19	19	17	17	19	20	20	17	17	27	21
5	18	19	23	17	19	18	20	20	20	18	28	20
6	18	18	21	17	17	20	22	20	19	18	25	20
7	16	18	21	17	17	20	21	22	19	17	22	19
8	7.1	18	20	17	18	20	21	20	19	18	22	19
9	.36	20	19	17	18	20	20	20	18	19	21	21
10	.00	21	19	17	18	19	19	19	20	21	20	20
11	.20	23	19	16	24	19	19	19	18	20	21	20
12	.10	21	19	17	20	18	19	19	20	19	25	19
13	.00	20	21	17	19	18	19	19	20	11	22	19
14	.03	19	21	17	19	19	20	19	18	1.2	21	20
15	5.0	24	19	16	18	18	23	19	20	13	21	20
16	5.5	22	19	17	18	18	23	19	18	23	21	19
17	12	20	19	17	18	18	22	19	18	21	23	19
18	10	20	19	16	21	18	20	19	17	22	25	20
19	6.9	20	19	17	20	18	20	18	17	22	22	21
20	4.8	19	19	16	19	18	20	19	18	22	21	20
21	6.1	19	18	16	19	20	20	19	17	25	21	20
22	1.2	19	18	17	20	20	20	18	17	21	20	19
23	13	19	18	16	20	19	20	18	17	21	22	21
24	24	19	21	16	21	21	20	18	17	21	20	21
25	22	19	19	16	20	20	20	19	16	24	20	20
26	20	19	18	17	19	20	19	18	17	21	20	20
27	20	19	18	23	19	20	20	17	19	22	19	20
28	19	19	18	22	18	20	23	17	19	26	20	24
29	19	18	18	19	---	20	23	17	18	22	19	20
30	19	18	18	18	---	20	24	17	17	21	20	20
31	19	---	17	18	---	21	---	17	---	20	20	---
TOTAL	350.29	586	591	536	529	596	622	592	540	594.2	669	604
MEAN	11.3	19.5	19.1	17.3	18.9	19.2	20.7	19.1	18.0	19.2	21.6	20.1
MAX	24	24	23	23	24	21	24	24	20	26	28	24
MIN	.00	18	17	16	17	18	19	17	16	1.2	19	19
AC-FT	695	1160	1170	1060	1050	1180	1230	1170	1070	1180	1330	1200

CAL YR 1980 TOTAL 6393.29 MEAN 17.5 MAX 29 MIN .00 AC-FT 12680
WTR YR 1981 TOTAL 6809.49 MEAN 18.7 MAX 28 MIN .00 AC-FT 13510

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.

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. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--16 years, 23.5 ft^3/s (0.666 m^3/s), 17,030 acre-ft/yr (21.0 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.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 31 ft^3/s (0.88 m^3/s) Feb. 11, Aug. 5; minimum daily, 0.13 ft^3/s (0.004 m^3/s) Oct. 10, 13.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	19	21	20	20	20	21	26	25	19	18	21	20
2	18	21	20	20	20	21	28	28	19	17	22	20
3	19	20	20	22	20	24	26	24	19	17	21	24
4	18	20	21	20	19	22	23	22	19	19	30	22
5	20	20	30	19	21	22	23	23	21	20	31	22
6	21	20	26	19	20	25	26	22	20	20	28	20
7	19	20	26	19	19	25	24	22	20	18	23	20
8	7.6	20	24	21	20	24	24	24	20	18	22	20
9	.21	22	22	21	20	25	22	22	21	20	21	25
10	.13	23	22	20	19	22	22	22	21	22	21	22
11	.27	28	22	19	31	22	22	21	21	20	22	21
12	.15	25	22	19	24	21	21	21	21	19	29	21
13	.13	22	26	19	22	21	21	21	21	11	25	21
14	.30	22	25	19	21	22	23	21	19	.69	22	22
15	2.1	27	22	19	21	21	26	21	20	15	22	20
16	2.4	27	22	19	21	21	26	21	19	25	22	20
17	5.7	24	21	19	20	20	26	21	19	22	23	20
18	5.0	22	21	18	22	20	23	21	19	22	27	20
19	2.7	22	21	19	22	20	22	20	18	22	23	21
20	1.9	22	21	18	21	20	22	21	18	22	22	20
21	2.9	22	20	18	21	23	23	21	18	28	22	20
22	2.8	21	20	18	22	22	22	20	18	22	21	20
23	17	22	21	18	24	21	22	20	18	21	22	21
24	29	21	26	18	25	26	23	20	18	21	21	22
25	27	21	22	18	24	23	22	21	17	25	20	21
26	24	21	21	18	22	23	22	20	18	22	20	21
27	22	21	21	27	21	23	22	19	20	23	20	21
28	22	21	21	27	21	24	27	19	19	29	21	24
29	22	20	21	22	---	23	26	19	19	23	20	21
30	21	20	20	21	---	23	27	19	18	22	21	20
31	21	---	20	21	---	25	---	20	---	21	20	---
TOTAL	373.29	658	687	615	603	695	712	661	577	624.69	705	632
MEAN	12.0	21.9	22.2	19.8	21.5	22.4	23.7	21.3	19.2	20.2	22.7	21.1
MAX	29	28	30	27	31	26	28	28	21	29	31	25
MIN	.13	20	20	18	19	20	21	19	17	.69	20	20
AC-FT	740	1310	1360	1220	1200	1380	1410	1310	1140	1240	1400	1250

CAL YR 1980 TOTAL 7109.29 MEAN 19.4 MAX 31 MIN .13 AC-FT 14100
WTR YR 1981 TOTAL 7542.98 MEAN 20.7 MAX 31 MIN .13 AC-FT 14960

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.

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. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--44 years (water years 1938-81), 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.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 49 ft^3/s (1.39 m^3/s) Feb. 11; minimum daily, 0.05 ft^3/s (0.001 m^3/s) for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	7.5	.20	22	.50	26	.92	15	.50	21	22	.28	.05
2	7.2	.20	22	.50	25	15	1.2	.50	22	30	.28	.05
3	7.2	.20	21	.62	25	33	1.1	.38	21	29	.28	23
4	7.2	13	23	.50	24	28	1.1	.38	22	33	.61	29
5	7.5	22	12	9.7	33	24	1.1	.38	31	36	.58	29
6	7.8	21	.28	21	24	34	1.1	.38	26	38	.20	24
7	7.5	21	.28	21	22	33	1.1	.38	25	32	.20	22
8	7.8	21	20	24	29	30	.92	.50	24	38	.20	21
9	7.8	29	29	22	28	16	17	.38	23	40	.05	32
10	7.8	31	27	21	23	1.1	34	.38	30	45	.05	29
11	8.1	45	26	20	49	.92	34	.38	26	42	.05	24
12	8.1	37	26	19	39	.85	34	.38	34	39	.05	23
13	7.8	29	33	22	31	.78	32	.38	33	18	.05	24
14	8.1	26	37	25	26	.92	23	.38	25	1.2	.05	28
15	7.5	46	11	25	25	.92	1.2	.38	31	.78	.05	23
16	7.5	45	.77	25	24	.78	1.1	.38	21	.78	.05	22
17	7.8	36	.77	25	23	13	1.1	.38	21	.64	.05	21
18	7.5	32	.77	24	37	23	1.1	.28	19	.64	.05	22
19	7.2	32	.77	24	30	26	.92	.28	18	.50	.05	26
20	7.2	28	.77	24	26	26	.92	21	18	.64	.05	22
21	7.2	27	.77	24	22	36	.92	32	19	.69	.05	24
22	6.8	26	.62	24	26	34	.92	27	18	.50	.05	21
23	4.0	28	.62	24	36	32	.92	25	15	.50	.05	26
24	.38	27	.62	20	38	40	.78	22	9.5	.50	.05	28
25	.38	25	.50	20	19	36	.78	26	7.8	.50	.05	22
26	.28	25	.50	21	1.1	36	.78	23	12	.50	.05	22
27	.28	22	.50	46	1.1	36	.64	22	20	.50	.05	22
28	.20	22	.50	47	.92	36	.64	21	24	.64	.05	38
29	.20	21	.50	36	---	35	.38	21	24	.50	.05	24
30	.20	20	.50	30	---	34	.50	21	21	.38	.05	22
31	.20	---	.50	28	---	39	---	23	---	.38	.05	---
TOTAL	172.22	757.60	319.54	673.82	713.12	702.19	210.22	291.38	661.3	452.77	3.78	693.10
MEAN	5.56	25.3	10.3	21.7	25.5	22.7	7.01	9.40	22.0	14.6	.12	23.1
MAX	8.1	46	37	47	49	40	34	32	34	45	.61	38
MIN	.20	.20	.28	.50	.92	.78	.38	.28	7.8	.38	.05	.05
AC-FT	342	1500	634	1340	1410	1390	417	578	1310	898	7.5	1370

CAL YR 1980 TOTAL 2632.98 MEAN 7.19 MAX 46 MIN .01 AC-FT 5220
WTR YR 1981 TOTAL 5651.04 MEAN 15.5 MAX 49 MIN .05 AC-FT 11210

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 mi² (13.70 km²).

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.--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 good. 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 160620000) divert water above station for power development and irrigation in vicinity of Lihue. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--65 years (water years, 1916-18, 1920-81), 72.9 ft³/s (2.065 m³/s), 52,820 acre-ft/yr (65.1 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 13,200 ft³/s (374 m³/s) Nov. 12, 1955, gage height, 13.53 ft (4.124 m), from rating curve extended above 2,300 ft³/s (65.1 m³/s) on basis of slope-area measurement at gage height 10.65 ft (3.246 m); minimum, 0.23 ft³/s (0.007 m³/s) June 5, 1968.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 3,550 ft³/s (101 m³/s) Aug. 5, gage height, 8.11 ft (2.472 m), from rating curve extended as explained above, no other peak above base of 2,800 ft³/s (79.4 m³/s); minimum, 0.55 ft³/s (0.016 m³/s) June 25, 26.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	53	38	9.3	28	1.2	29	72	142	2.6	1.0	67	48
2	37	37	13	27	1.0	18	134	199	2.8	1.2	114	47
3	44	36	9.3	43	.88	32	94	96	2.3	1.1	66	79
4	35	21	12	29	.82	14	59	68	2.3	11	498	32
5	107	10	297	19	8.4	9.3	54	75	15	11	531	43
6	82	9.0	104	7.1	.95	51	85	71	5.4	26	258	22
7	45	9.0	103	7.1	2.1	29	82	54	5.7	3.6	126	19
8	86	8.7	38	8.7	9.5	26	85	116	3.9	17	99	18
9	90	19	18	8.4	9.4	58	36	62	4.6	31	83	91
10	66	60	16	7.1	3.9	42	8.7	48	14	82	71	37
11	131	155	14	7.4	354	36	6.0	43	5.4	43	84	25
12	106	42	14	8.1	47	33	5.7	39	19	21	276	22
13	93	18	87	4.6	19	32	4.1	39	18	73	119	26
14	211	14	74	1.1	13	45	49	38	6.4	312	86	33
15	79	190	36	1.0	10	34	171	34	24	264	74	22
16	66	115	43	.95	9.0	30	140	33	9.8	179	81	20
17	94	34	39	.88	8.4	17	129	33	9.3	115	118	18
18	66	24	37	.95	45	5.6	63	34	8.1	114	224	19
19	55	22	36	.88	18	2.5	54	31	7.1	113	115	30
20	54	17	34	.88	13	1.4	51	16	7.1	126	79	20
21	57	16	34	.82	7.4	22	60	2.6	7.8	348	79	23
22	51	15	33	.82	14	14	44	1.2	7.1	104	64	17
23	79	17	32	.77	37	4.1	47	1.8	5.4	85	69	29
24	185	16	84	.77	59	78	63	3.4	1.3	86	59	33
25	148	13	36	.71	43	13	44	5.5	.55	154	52	22
26	69	13	33	.82	45	11	38	3.4	.66	77	51	18
27	55	11	31	88	34	17	38	2.9	3.0	110	46	40
28	49	9.8	30	87	29	12	220	2.8	7.0	264	59	79
29	51	9.0	30	5.5	---	8.8	153	2.5	1.6	120	47	22
30	47	8.1	29	.88	---	6.2	202	2.5	1.1	95	47	18
31	40	---	28	1.2	---	34	---	3.4	---	69	49	---
TOTAL	2431	1006.6	1433.6	398.43	842.95	764.9	2291.5	1303.0	208.31	3056.9	3791	972
MEAN	78.4	33.6	46.2	12.9	30.1	24.7	76.4	42.0	6.94	98.6	122	32.4
MAX	211	190	297	88	354	78	220	199	24	348	531	91
MIN	35	8.1	9.3	.71	.82	1.4	4.1	1.2	.55	1.0	46	17
AC-FT	4820	2000	2840	790	1670	1520	4550	2580	413	6060	7520	1930

CAL YR 1980 TOTAL 31954.57 MEAN 87.3 MAX 699 MIN .92 AC-FT 63380
WTR YR 1981 TOTAL 18500.19 MEAN 50.7 MAX 531 MIN .55 AC-FT 36700

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).

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.--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. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--66 years (water years, 1913-14, 1916-17, 1920-81), 48.0 ft³/s (1.359 m³/s), 34,780 acre-ft/yr (42.9 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.--Maximum discharge, 720 ft³/s (20.4 m³/s) Aug. 5, gage height, 3.98 ft (1.213 m), from rating curve extended above 2,700 ft³/s (76.5 m³/s), no peak above base of 1,900 ft³/s (53.8 m³/s); minimum, 13 ft³/s (0.37 m³/s) Jan. 20-22, 24-26, Feb. 4, 5.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	26	27	24	17	15	19	29	103	18	16	35	22
2	25	26	27	17	14	20	54	136	18	15	45	22
3	25	25	24	18	14	30	37	72	17	15	32	32
4	24	25	22	16	13	22	31	52	17	14	207	25
5	58	24	147	16	25	20	38	53	25	19	218	30
6	47	23	81	16	16	27	38	56	21	17	143	25
7	26	22	83	16	14	26	29	38	22	15	70	25
8	31	22	42	16	22	25	54	53	19	20	54	21
9	38	31	35	16	21	32	29	50	20	24	46	54
10	27	38	31	16	16	22	25	35	20	45	41	29
11	51	108	28	16	80	20	24	31	20	29	42	24
12	50	43	27	15	30	19	22	29	25	25	89	23
13	36	31	31	15	21	18	21	27	26	31	53	39
14	60	27	52	14	18	27	70	26	19	114	44	31
15	34	157	27	14	17	21	113	25	21	141	36	25
16	29	170	26	14	16	18	72	24	17	95	32	22
17	40	56	24	14	15	17	138	24	17	52	41	22
18	33	43	24	14	66	16	53	24	16	54	65	21
19	31	38	22	14	33	16	41	22	15	46	49	27
20	28	34	22	14	21	16	36	24	15	44	36	22
21	28	32	22	13	22	36	34	25	14	134	36	40
22	25	30	21	14	25	53	30	21	14	48	31	26
23	44	32	20	14	38	26	29	20	16	39	31	28
24	108	29	21	13	57	30	36	20	21	46	29	27
25	81	27	20	13	34	25	29	21	15	70	27	22
26	46	26	19	14	26	23	27	20	18	40	26	22
27	36	25	19	38	22	21	28	19	32	40	25	21
28	33	25	18	41	20	22	130	19	22	109	28	39
29	34	24	18	19	---	22	113	18	19	68	25	22
30	32	22	18	15	---	22	186	18	16	46	25	20
31	29	---	18	16	---	30	---	18	---	39	24	---
TOTAL	1215	1242	1013	518	731	741	1596	1123	575	1510	1685	808
MEAN	39.2	41.4	32.7	16.7	26.1	23.9	53.2	36.2	19.2	48.7	54.4	26.9
MAX	108	170	147	41	80	53	186	136	32	141	218	54
MIN	24	22	18	13	13	16	21	18	14	14	24	20
AC-FT	2410	2460	2010	1030	1450	1470	3170	2230	1140	3000	3340	1600

CAL YR 1980 TOTAL 19371 MEAN 52.9 MAX 363 MIN 11 AC-FT 38420
WTR YR 1981 TOTAL 12757 MEAN 35.0 MAX 218 MIN 13 AC-FT 25300

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.

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. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--44 years (water years 1938-81), 15.3 ft^3/s (0.433 m^3/s), 11,080 acre-ft/yr (13.7 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.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 41 ft^3/s (1.16 m^3/s) July 17, 18; no flow Nov. 30, Dec. 14-21, Sept. 17.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.3	29	9.5	1.8	22	21	18	17	29	26	33	33
2	20	29	12	1.9	21	21	18	17	28	23	33	33
3	27	29	27	1.9	20	22	18	17	27	19	33	34
4	31	29	26	1.9	20	22	18	17	26	18	31	33
5	34	29	.23	1.8	19	22	18	17	26	23	32	34
6	38	29	.20	1.9	20	22	18	17	27	25	32	33
7	38	29	.17	14	19	22	18	17	27	25	32	33
8	18	29	.14	22	19	22	18	16	26	25	32	33
9	8.5	29	.11	23	20	22	18	16	26	27	31	33
10	8.5	29	.08	23	21	22	18	16	25	30	31	34
11	7.9	30	.08	23	21	22	18	16	26	33	32	34
12	7.3	30	.06	23	22	30	18	28	26	35	32	34
13	7.3	29	.02	29	23	35	18	34	28	36	33	34
14	7.7	29	.00	31	24	35	18	35	28	38	32	34
15	8.5	29	.00	30	25	36	18	36	28	39	32	34
16	9.1	28	.00	29	25	36	18	36	29	40	32	15
17	9.1	27	.00	27	25	36	17	36	28	41	33	.00
18	9.1	27	.00	27	25	35	17	30	28	41	33	11
19	9.1	28	.00	25	25	34	16	28	28	40	33	32
20	22	28	.00	24	25	33	16	28	27	40	33	33
21	29	29	.00	23	25	33	16	18	27	40	33	33
22	30	30	.89	22	25	35	16	15	27	40	32	33
23	30	30	2.0	22	26	35	17	28	26	40	32	33
24	30	29	2.0	21	26	22	18	28	26	37	33	34
25	28	28	2.0	20	26	.14	18	28	25	36	33	34
26	26	26	1.8	18	26	7.5	18	28	24	37	33	34
27	25	11	1.8	20	22	18	18	28	24	34	33	33
28	26	.12	1.8	22	21	18	17	28	24	32	33	34
29	27	.01	1.8	23	---	18	16	30	27	31	33	34
30	28	.00	1.8	23	---	18	17	31	28	32	33	34
31	29	---	1.8	22	---	18	---	30	---	33	33	---
TOTAL	629.4	758.13	93.28	597.2	638	772.64	525	766	801	1016	1006	930.00
MEAN	20.3	25.3	3.01	19.3	22.8	24.9	17.5	24.7	26.7	32.8	32.5	31.0
MAX	38	30	27	31	26	36	18	36	29	41	33	34
MIN	1.3	.00	.00	1.8	19	.14	16	15	24	18	31	.00
AC-FT	1250	1500	185	1180	1270	1530	1040	1520	1590	2020	2000	1840

CAL YR 1980 TOTAL 6773.53 MEAN 18.5 MAX 41 MIN .00 AC-FT 13440
WTR YR 1981 TOTAL 8532.65 MEAN 23.4 MAX 41 MIN .00 AC-FT 16920

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).

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. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--29 years, 125 ft³/s (3.540 m³/s), 90,560 acre-ft/yr (112 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, 3,270 ft³/s (92.6 m³/s) Aug. 5, gage height, 6.48 ft (1.975 m), from rating curve extended as explained above, no peak above base of 4,100 ft³/s (116 m³/s); minimum, 5.3 ft³/s (0.150 m³/s) Feb. 7-9, 16, 17.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	87	52	31	58	6.3	28	83	285	7.8	6.8	73	42
2	18	49	15	57	6.0	24	177	342	7.4	6.6	134	40
3	11	46	14	75	6.0	46	142	190	7.1	6.4	78	85
4	10	34	13	60	5.7	23	89	133	6.8	6.0	605	33
5	93	15	276	39	16	16	90	134	12	7.7	739	49
6	109	14	294	10	7.8	47	121	153	7.8	7.1	466	26
7	68	14	240	9.0	5.6	53	87	104	6.8	11	218	22
8	121	13	126	9.7	5.3	34	166	169	6.8	7.4	157	17
9	135	28	82	9.2	16	72	81	138	7.4	17	134	99
10	119	23	71	8.6	7.3	50	32	97	6.4	77	101	62
11	217	224	64	9.7	235	38	25	78	10	32	99	37
12	214	108	61	10	84	27	21	63	11	18	358	25
13	126	45	92	9.0	23	14	20	46	14	43	160	43
14	279	31	216	8.7	12	29	122	27	7.3	382	132	49
15	98	286	85	8.5	7.8	23	307	27	9.2	372	97	31
16	91	374	89	8.2	6.0	17	240	36	9.0	246	91	32
17	154	109	83	8.0	8.6	14	340	35	7.7	149	136	80
18	118	55	79	7.8	81	7.4	160	36	7.7	145	261	47
19	112	42	76	7.7	77	6.8	124	32	6.8	143	156	32
20	89	33	74	7.3	38	6.8	109	30	6.8	165	110	18
21	68	27	73	7.1	20	25	109	23	6.7	425	109	32
22	58	26	71	7.4	18	61	40	21	6.6	134	79	27
23	90	29	68	7.2	61	11	41	9.4	6.6	90	74	23
24	312	42	115	7.1	92	65	66	9.0	6.7	104	64	35
25	297	56	77	6.9	54	59	67	9.0	6.4	200	54	25
26	157	55	67	7.2	61	46	68	8.6	7.2	96	48	20
27	95	52	65	60	39	36	67	8.6	8.0	122	44	16
28	59	49	63	116	29	27	284	8.2	9.9	389	59	102
29	62	46	63	19	---	20	349	7.8	9.6	203	45	27
30	54	44	61	7.1	---	19	378	7.8	7.1	115	43	17
31	50	---	60	6.5	---	55	---	7.8	---	84	48	---
TOTAL	3571	2021	2864	671.9	1028.4	1000.0	4005	2275.2	240.6	3810.0	4972	1193
MEAN	115	67.4	92.4	21.7	36.7	32.3	134	73.4	8.02	123	160	39.8
MAX	312	374	294	116	235	72	378	342	14	425	739	102
MIN	10	13	13	6.5	5.3	6.8	20	7.8	6.4	6.0	43	16
AC-FT	7080	4010	5680	1330	2040	1980	7940	4510	477	7560	9860	2370

CAL YR 1980 TOTAL 32329.7 MEAN 143 MAX 1810 MIN 3.6 AC-FT 103800
WTR YR 1981 TOTAL 27652.1 MEAN 75.8 MAX 739 MIN 5.3 AC-FT 54850

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).

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. Observations of conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--21 years, 2.58 ft^3/s (0.073 m^3/s), 1,870 acre-ft/yr (2.31 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, 46 ft^3/s (1.30 m^3/s) Sept. 9, gage height, 2.00 ft (0.610 m), from rating curve extended above 415 ft^3/s (11.8 m^3/s), no peak above base of 70 ft^3/s (1.98 m^3/s); minimum, 0.60 ft^3/s (0.017 m^3/s) Mar. 18-21.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.3	2.4	1.8	1.4	1.1	.75	1.0	7.0	1.6	1.2	2.1	1.7
2	2.2	2.4	1.9	1.4	1.1	.75	1.4	5.0	1.6	1.2	2.1	1.7
3	2.2	2.3	1.8	1.4	.91	.91	1.4	3.9	1.5	1.2	2.0	1.8
4	2.1	2.3	1.7	1.4	.91	.83	1.2	3.6	1.5	1.1	3.1	1.6
5	3.1	2.2	4.1	1.4	.91	.83	1.3	3.4	1.6	1.2	5.5	1.7
6	2.9	2.1	4.7	1.4	.91	.91	1.3	3.1	1.5	1.1	8.3	1.6
7	2.3	2.1	5.2	1.4	.91	.83	1.2	2.9	1.5	1.0	4.6	1.6
8	2.4	2.0	3.1	1.5	.91	.83	1.1	3.1	1.5	.95	3.8	1.5
9	2.5	2.1	2.5	1.4	.91	.83	1.2	3.6	1.6	.83	3.4	7.9
10	2.3	2.1	2.4	1.3	.91	.75	1.1	2.7	1.5	1.3	3.1	2.4
11	2.8	2.9	2.3	1.3	1.4	.75	1.1	2.5	1.5	1.0	2.8	1.8
12	3.1	2.4	2.2	1.3	1.3	.75	1.1	2.4	1.4	.91	3.2	1.7
13	2.7	2.1	2.5	1.3	1.0	.67	1.1	2.3	1.4	1.2	2.8	1.9
14	2.9	2.0	3.0	1.3	.91	.75	1.9	2.3	1.3	2.5	2.7	1.8
15	2.7	2.9	2.2	1.2	.91	.83	3.1	2.2	1.2	2.5	2.5	1.7
16	2.5	4.3	2.1	1.2	.83	.67	2.7	2.2	1.2	2.5	2.4	1.7
17	2.9	2.7	2.1	1.2	.83	.67	9.4	2.1	1.2	2.1	2.4	1.6
18	2.7	2.4	2.1	1.1	1.0	.60	3.8	2.1	1.2	1.7	2.5	1.5
19	2.5	2.3	2.1	1.1	1.0	.60	2.7	1.9	1.1	1.9	2.3	1.5
20	2.5	2.3	1.9	1.1	.91	.60	2.3	1.9	1.1	2.3	2.2	1.6
21	2.5	2.2	1.9	1.1	.91	1.2	2.2	1.8	1.1	3.3	2.1	1.5
22	2.4	2.1	1.8	1.1	.91	2.8	2.0	1.8	1.1	2.3	2.1	1.5
23	2.3	2.2	1.8	1.1	.91	1.5	2.0	1.7	1.1	2.0	2.0	1.5
24	3.9	2.1	1.8	1.1	1.4	1.5	2.0	1.7	1.3	1.9	1.9	1.6
25	4.1	2.1	1.8	1.1	1.0	1.2	1.9	1.7	1.0	2.0	1.8	1.4
26	3.1	2.0	1.7	1.1	.91	1.0	1.9	1.7	1.0	1.8	1.8	1.4
27	2.9	2.0	1.7	1.6	.83	.91	1.8	1.6	1.4	2.0	1.8	1.4
28	2.8	2.0	1.7	1.3	.75	1.0	2.0	1.6	1.3	3.5	1.8	1.4
29	2.7	2.0	1.7	1.1	---	.91	2.9	1.6	1.2	3.1	1.8	1.3
30	2.5	1.9	1.6	1.1	---	.91	7.0	1.6	1.2	2.4	1.7	1.2
31	2.5	---	1.4	1.1	---	1.0	---	1.6	---	2.3	1.7	---
TOTAL	83.3	68.9	70.6	38.9	27.19	29.04	67.1	78.6	39.7	56.29	84.3	54.5
MEAN	2.69	2.30	2.28	1.25	.97	.94	2.24	2.54	1.32	1.82	2.72	1.82
MAX	4.1	4.3	5.2	1.6	1.4	2.8	9.4	7.0	1.6	3.5	8.3	7.9
MIN	2.1	1.9	1.4	1.1	.75	.60	1.0	1.6	1.0	.83	1.7	1.2
AC-FT	165	137	140	77	54	58	133	156	79	112	167	108

CAL YR 1980 TOTAL 1144.69 MEAN 3.13 MAX 53 MIN .75 AC-FT 2270
WTR YR 1981 TOTAL 698.42 MEAN 1.91 MAX 9.4 MIN .60 AC-FT 1390

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.

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. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--44 years (water years 1938-81), 6.76 ft^3/s (0.191 m^3/s), 4,900 acre-ft/yr (6.04 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.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 25 ft^3/s (0.71 m^3/s) Mar. 22; minimum daily, 0.52 ft^3/s (0.015 m^3/s) Jan. 5, 6.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	9.0	2.0	5.3	.74	7.9	9.7	7.3	7.7	8.7	12	9.7	8.0
2	9.4	1.9	12	.74	7.9	11	2.1	4.3	9.1	9.4	15	8.4
3	11	4.1	9.7	.63	7.8	16	1.8	3.3	8.7	12	11	13
4	9.3	9.4	9.8	.58	7.8	11	1.8	2.3	9.3	9.4	22	12
5	16	9.3	1.4	.52	11	4.1	1.6	1.9	16	15	16	13
6	12	9.0	1.8	.52	8.4	15	1.6	10	14	12	2.1	13
7	2.6	9.0	3.0	5.1	8.3	13	1.5	14	15	9.4	1.4	10
8	2.2	8.7	2.2	12	14	12	4.6	14	11	15	.93	8.7
9	1.9	15	1.5	9.4	11	10	11	15	13	17	.74	13
10	1.7	15	1.1	8.6	8.6	11	10	12	15	21	.63	13
11	1.5	15	.93	8.7	13	12	8.3	11	13	17	8.6	10
12	1.3	1.5	.87	8.7	9.4	5.8	3.9	11	12	13	20	9.4
13	1.2	1.5	.87	8.3	8.3	3.5	5.0	10	3.5	16	13	13
14	1.3	1.5	1.1	8.0	7.6	15	22	8.7	3.0	23	16	13
15	7.6	1.7	.87	7.9	7.1	11	15	8.0	6.2	10	11	9.7
16	12	2.6	.81	7.9	6.9	11	4.2	8.9	10	2.1	11	8.6
17	12	1.8	.74	7.8	7.0	9.4	2.9	9.0	10	1.9	7.9	7.9
18	3.5	1.5	.74	6.2	10	8.8	2.0	10	9.8	1.7	7.4	8.0
19	3.2	8.3	3.5	4.8	1.6	8.7	1.7	9.8	9.3	1.6	6.8	13
20	6.9	12	9.7	7.4	5.2	8.4	1.5	11	9.4	6.4	6.4	10
21	13	7.8	9.4	7.6	15	22	3.9	11	8.7	18	5.8	9.5
22	11	1.5	8.9	8.0	15	25	11	8.2	7.4	11	5.4	10
23	8.6	1.4	8.6	7.6	16	18	13	9.0	3.6	10	4.9	15
24	5.7	3.6	6.3	7.4	12	9.0	18	9.0	4.9	18	7.8	16
25	2.2	10	1.2	7.4	1.8	1.8	14	10	5.3	18	8.3	8.2
26	1.9	7.4	1.1	7.9	1.8	1.5	12	8.7	9.0	15	7.9	1.2
27	1.9	1.2	1.1	14	6.7	1.4	13	8.3	15	14	7.2	1.4
28	6.7	1.1	.99	13	10	1.2	18	8.6	13	11	9.1	1.2
29	15	1.1	.87	9.7	---	1.2	13	7.9	11	2.9	9.5	.99
30	14	.99	.81	8.4	---	5.0	8.6	7.6	9.4	7.8	8.6	3.0
31	8.6	---	.74	7.9	---	15	---	8.6	---	11	8.3	---
TOTAL	214.2	166.89	107.94	213.43	247.1	307.5	234.3	278.8	293.3	361.6	270.40	281.19
MEAN	6.91	5.56	3.48	6.88	8.83	9.92	7.81	8.99	9.78	11.7	8.72	9.37
MAX	16	15	12	14	16	25	22	15	16	23	22	16
MIN	1.2	.99	.74	.52	1.6	1.2	1.5	1.9	3.0	1.6	.63	.99
AC-FT	425	331	214	423	490	610	465	553	582	717	536	558

CAL YR 1980 TOTAL 2069.00 MEAN 5.65 MAX 24 MIN .28 AC-FT 4100
WTR YR 1981 TOTAL 2976.65 MEAN 8.16 MAX 25 MIN .52 AC-FT 5900

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.

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. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--63 years (water years, 1918-20, 1922-81), 6.32 ft^3/s (0.179 m^3/s), 4,580 acre-ft/yr (5.65 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.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 25 ft^3/s (0.708 m^3/s) Feb. 19, June 13, July 10; minimum daily, 0.25 ft^3/s (0.007 m^3/s) Apr. 3, 4, 7, 8, 13, 18-21.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.4	.68	4.3	1.7	2.8	3.3	.31	.58	3.8	3.6	6.4	4.1
2	4.2	.51	5.2	.51	2.8	3.5	.37	5.7	3.8	3.3	6.8	4.1
3	5.0	5.3	4.2	.51	2.6	12	.25	1.2	3.8	3.9	3.9	6.7
4	4.2	4.6	4.8	.45	2.6	9.4	.25	12	3.6	3.5	5.9	5.6
5	14	4.4	6.7	7.2	5.9	12	.73	21	11	7.1	.66	7.9
6	16	4.2	.83	10	3.2	7.4	.40	13	4.9	4.1	.90	7.4
7	4.8	4.1	.89	6.4	2.8	7.0	.25	11	7.7	3.3	.38	6.2
8	1.5	3.9	3.3	7.6	11	14	.25	16	5.4	6.1	.31	3.9
9	.99	8.5	2.0	4.9	9.8	14	3.2	18	6.6	10	.31	12
10	.90	7.5	.51	4.1	3.8	4.1	4.1	9.8	9.5	25	11	10
11	.74	17	.38	3.8	17	4.6	4.5	7.6	8.0	11	12	6.2
12	.58	8.5	.38	3.3	11	8.6	3.3	6.6	17	7.9	6.0	5.0
13	.66	.45	.38	3.3	5.0	9.4	.25	5.9	25	14	.45	8.4
14	.74	.38	.51	3.2	3.9	8.2	1.8	6.4	13	11	.38	6.4
15	.58	1.5	12	3.3	3.5	4.2	.79	6.6	10	1.5	.31	5.0
16	.51	1.9	17	3.2	3.3	3.3	.63	5.6	3.6	.51	7.9	4.4
17	1.2	13	14	3.3	3.3	2.9	.46	5.4	3.5	.38	17	4.1
18	.38	21	13	5.0	23	2.8	.25	5.4	3.3	7.2	13	3.9
19	.38	12	10	6.0	25	2.6	.25	4.9	3.3	17	.38	5.2
20	.38	6.4	4.6	3.2	14	2.5	.25	6.0	3.5	14	.38	4.1
21	1.4	4.5	4.4	3.0	7.4	23	.25	6.2	3.3	16	.38	6.3
22	4.9	2.2	4.2	3.0	7.8	24	1.1	5.7	4.1	3.2	.38	6.4
23	8.7	.58	4.1	2.9	14	.51	6.8	4.2	7.4	9.6	8.0	6.3
24	18	2.0	3.2	2.8	23	.45	11	4.1	7.8	11	8.5	7.0
25	1.3	4.9	1.1	2.8	23	.38	6.4	4.6	6.2	4.4	6.1	6.7
26	1.8	7.2	.51	3.0	18	.38	4.9	4.1	4.1	6.4	4.9	13
27	9.2	3.4	.38	11	8.7	.31	5.6	3.9	9.0	9.1	5.2	5.6
28	12	7.5	.38	11	3.5	.31	6.5	3.8	5.8	6.2	7.6	.51
29	7.8	9.7	.38	4.1	---	.31	.58	3.6	4.1	3.7	4.9	6.4
30	7.0	.85	.38	3.0	---	.31	1.3	3.6	3.5	7.8	4.2	8.8
31	8.0	---	.45	2.8	---	.31	---	3.8	---	7.6	4.1	---
TOTAL	142.24	168.65	124.46	130.37	261.7	186.07	67.02	216.28	205.6	239.39	148.62	187.61
MEAN	4.59	5.62	4.01	4.21	9.35	6.00	2.23	6.98	6.85	7.72	4.79	6.25
MAX	18	21	17	11	25	24	11	21	25	25	17	13
MIN	.38	.38	.38	.45	2.6	.31	.25	.58	3.3	.38	.31	.51
AC-FT	282	335	247	259	519	369	133	429	408	475	295	372

CAL YR 1980 TOTAL 2232.91 MEAN 6.10 MAX 27 MIN .38 AC-FT 4430
WTR YR 1981 TOTAL 2078.01 MEAN 5.69 MAX 25 MIN .25 AC-FT 4120

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).

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). Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--45 years, 20.1 ft³/s (0.569 m³/s), 14,560 acre-ft/yr (18.0 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, 1,040 ft³/s (29.5 m³/s) Aug. 6, gage height, 2.31 ft (0.704 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 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	12	2.9	10	.00	.00	19	83	.00	.00	.00	.00
2	.00	11	.00	12	.00	.00	40	108	.00	.00	9.7	.00
3	.00	4.2	.00	12	.00	.10	24	40	.00	.00	4.3	.00
4	.00	.00	.00	12	.00	.00	21	12	.00	.00	135	.55
5	92	.00	82	3.7	.00	.00	34	22	.74	.00	83	.10
6	38	.00	45	.00	.00	.02	40	31	.00	.00	55	.24
7	15	.00	89	.00	.00	.00	20	.66	.00	.00	30	.00
8	30	.00	24	.00	1.4	1.4	14	3.1	.00	.00	25	.00
9	34	1.8	17	.00	.00	.00	2.0	7.7	.00	.00	21	29
10	18	11	16	.00	.00	.00	.00	.00	.00	2.4	6.8	.00
11	36	35	15	.00	4.1	.00	.00	.00	.00	.00	4.0	.00
12	32	13	15	.00	.00	.00	5.4	.00	.58	.00	10	.00
13	23	14	20	.00	.00	.00	7.7	.00	1.6	.28	9.0	.00
14	35	13	30	.00	.00	.19	90	.00	.00	47	8.0	.00
15	12	197	5.3	.00	.00	.00	125	.00	.00	99	7.0	.00
16	5.8	89	.00	.00	.00	.00	88	.00	.00	65	3.0	.00
17	15	14	.00	.00	.00	.00	66	.00	.00	40	.00	.00
18	16	.73	.00	.00	71	.00	26	.00	.00	29	3.2	.00
19	16	.00	.00	.00	4.3	.00	20	.00	.00	19	18	.00
20	9.3	.00	.00	.00	.00	.00	19	.00	.00	.00	16	.00
21	3.7	4.4	.00	.00	.00	59	14	.00	.00	70	14	12
22	.00	11	.00	.00	.00	32	5.2	.00	.00	14	12	.00
23	23	12	.00	.00	1.7	18	.00	.00	.00	.00	4.0	3.1
24	60	7.8	4.2	.00	14	31	3.5	.00	.00	.27	.00	.27
25	49	.00	12	.00	1.7	20	.00	.00	.00	25	.00	.01
26	22	.45	12	.00	.00	18	.00	.00	.00	4.1	.00	1.1
27	7.9	9.1	12	2.1	.00	16	.00	.00	.20	.07	.00	9.4
28	.00	3.7	12	.00	.00	15	113	.00	.00	62	.00	27
29	.00	2.3	12	.00	---	17	97	.00	.00	36	.00	4.9
30	.00	10	12	.00	---	13	290	.00	.00	7.7	.00	.67
31	.49	---	12	.00	---	11	---	.00	---	.00	.00	---
TOTAL	593.19	476.48	449.40	51.80	98.20	251.71	1183.80	307.46	3.12	520.82	478.00	88.34
MEAN	19.1	15.9	14.5	1.67	3.51	8.12	39.5	9.92	.10	16.8	15.4	2.94
MAX	92	197	89	12	71	59	290	108	1.6	99	135	29
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	1180	945	891	103	195	499	2350	610	6.2	1030	948	175

CAL YR 1980 TOTAL 7954.08 MEAN 21.7 MAX 397 MIN .00 AC-FT 15780
WTR YR 1981 TOTAL 4502.32 MEAN 12.3 MAX 290 MIN .00 AC-FT 8930

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.

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. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--45 years, 4.38 ft^3/s (0.124 m^3/s), 3,170 acre-ft/yr (3.91 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.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 25 ft^3/s (0.71 m^3/s) Apr. 30; no flow Oct. 4.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.08	.13	.08	.08	.13	.08	.13	14	.42	.08	.08	.30
2	.08	.13	.13	.08	.13	.08	.10	18	.42	.13	.08	.42
3	.04	.20	.13	.08	.08	.13	.13	12	.42	.20	.20	.13
4	.00	.20	.08	.08	.08	.11	.13	9.9	.42	.20	.20	.15
5	.03	.20	.08	.08	.13	.08	.20	11	.42	.30	.15	.13
6	.08	.20	.08	.08	.08	.08	2.7	18	.42	.13	.08	.13
7	.04	.20	3.4	.08	.08	.08	7.7	10	.30	.13	.08	.13
8	.06	.30	3.3	.13	.08	.13	5.5	10	.30	.20	.08	.13
9	.06	.42	2.8	.08	.13	.13	.58	11	.30	.20	.08	.13
10	.07	.30	2.6	.08	.08	.08	.42	7.7	.30	.30	.08	.08
11	.07	.30	1.4	.08	.08	.13	.42	5.5	.20	.30	.08	.08
12	2.0	.20	.20	.08	.08	.13	.42	.58	.20	.20	.13	.08
13	2.3	.13	.20	.08	.08	.08	.42	.42	.30	.20	.13	.13
14	.13	.13	.30	.08	.04	.13	.42	.42	.30	.30	.20	.13
15	.13	.20	.30	.08	.04	.13	5.6	.42	.30	.40	.13	.13
16	.13	.30	.20	.08	.04	.13	12	.42	.30	.30	3.3	.08
17	.20	.30	.20	.08	.04	.13	12	.42	.30	.20	6.4	.08
18	.20	.20	.20	.08	.13	.13	8.9	.42	.30	.30	8.1	.08
19	.08	.13	.20	.08	.13	.13	7.7	.58	.30	.30	3.0	.08
20	.13	.08	.20	.08	.13	.13	7.1	.58	.20	.15	.42	.13
21	.13	.08	.20	.08	.13	.20	3.0	.42	.13	.20	.58	.08
22	.13	.08	.20	.08	.13	.08	.42	.42	.13	.15	.42	.04
23	.13	.08	.13	.13	.13	.08	.42	.42	.13	.15	.42	.13
24	.13	.13	.13	.13	.08	.08	.30	.42	.13	.15	.42	.08
25	.13	.08	.13	.13	.08	.08	.20	.42	.08	.15	.42	.04
26	.13	.13	.13	.13	.04	.08	.20	.42	.08	.08	.42	.04
27	.13	.13	.13	.13	.04	.08	.20	.30	.20	.08	.42	.04
28	.13	.13	.13	.13	.08	.04	.20	.30	.08	.08	.42	.08
29	.13	.08	.13	.08	---	.08	7.1	.30	.08	.08	.30	.04
30	.13	.04	.13	.08	---	.13	25	.42	.08	.08	.20	.04
31	.13	---	.08	.13	---	.08	---	.42	---	.08	.30	---
TOTAL	7.34	5.21	17.60	2.88	2.50	3.24	109.61	135.62	7.54	5.80	27.32	3.34
MEAN	.24	.17	.57	.093	.089	.10	3.65	4.37	.25	.19	.88	.11
MAX	2.3	.42	3.4	.13	.13	.20	25	18	.42	.40	8.1	.42
MIN	.00	.04	.08	.08	.04	.04	.10	.30	.08	.08	.08	.04
AC-FT	15	10	35	5.7	5.0	6.4	217	269	15	12	54	6.6

CAL YR 1980 TOTAL 799.80 MEAN 2.19 MAX 25 MIN .00 AC-FT 1590
WTR YR 1981 TOTAL 328.00 MEAN .90 MAX 25 MIN .00 AC-FT 651

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.

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). Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--57 years (water years, 1923-25, 1928-81), 4.17 ft^3/s (0.118 m^3/s) 3,020 acre-ft/yr (3.72 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.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 24 ft^3/s (0.68 m^3/s) Nov. 15, Feb. 18; minimum daily, 0.06 ft^3/s (0.002 m^3/s) Aug. 18.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.8	3.9	4.1	3.0	1.4	3.5	4.0	.33	2.9	3.2	5.9	3.2
2	3.8	3.9	7.8	2.9	1.4	4.1	4.5	.44	2.9	2.9	7.8	3.5
3	3.6	3.9	4.1	3.0	1.4	10	3.8	.33	2.6	5.2	7.0	10
4	3.5	3.9	4.4	2.8	1.2	7.2	3.1	.28	2.9	2.8	19	7.4
5	9.3	3.6	8.5	2.6	3.3	4.1	5.0	.33	6.7	7.7	19	9.3
6	8.9	3.8	5.9	2.6	2.0	4.8	.30	.38	7.4	3.2	13	4.8
7	5.7	3.6	3.9	2.6	2.1	3.3	.30	.24	7.8	2.6	9.8	4.8
8	6.6	3.5	.79	3.1	10	14	.45	.28	3.9	5.6	8.2	3.3
9	6.2	9.6	.72	2.2	5.7	9.5	4.0	.28	4.4	5.8	7.6	10
10	5.1	7.5	.64	1.8	4.1	5.1	5.0	.24	5.3	11	6.8	5.7
11	5.5	16	2.3	2.0	4.8	3.6	5.0	2.5	5.5	8.9	8.0	3.9
12	3.0	8.2	3.3	1.9	4.4	4.8	6.0	5.3	5.7	6.2	13	3.5
13	2.5	5.0	3.3	1.6	3.2	3.3	5.0	5.0	7.3	8.2	9.6	3.9
14	5.5	4.4	3.6	1.4	2.6	4.0	4.0	4.8	3.3	13	8.5	4.8
15	4.4	24	3.9	1.4	2.3	3.0	.09	4.3	3.3	15	6.8	3.3
16	4.3	22	3.6	1.4	2.2	2.5	.09	4.1	2.9	10	2.2	2.9
17	5.5	12	3.2	1.4	1.9	2.4	.09	3.9	4.6	9.3	.09	2.8
18	4.6	8.0	3.2	1.2	24	2.3	.09	4.4	5.4	12	.06	2.8
19	4.8	6.8	3.4	1.2	12	2.3	.09	3.8	3.5	12	5.4	4.5
20	4.4	5.9	3.6	1.2	8.9	2.3	.09	6.3	3.0	8.0	6.1	5.5
21	4.6	5.1	3.3	1.2	6.8	23	3.3	6.4	2.6	16	6.6	7.2
22	4.3	5.0	3.2	1.2	9.6	17	3.9	3.6	2.4	8.7	4.8	4.1
23	6.0	4.6	3.2	1.2	8.1	13	4.1	3.2	3.3	7.8	4.8	7.1
24	7.2	4.6	3.2	1.0	10	11	7.0	3.2	4.4	9.3	4.1	7.5
25	5.7	4.3	3.2	1.0	8.1	7.0	4.6	4.3	2.6	12	3.8	4.4
26	4.8	4.8	3.2	1.4	6.6	5.0	3.6	3.0	2.4	7.8	3.6	4.3
27	4.4	5.1	3.2	4.0	4.1	4.2	4.3	2.9	6.5	8.7	3.6	3.3
28	4.1	4.1	3.2	4.1	3.6	3.5	15	2.8	4.4	13	4.8	5.9
29	4.4	3.6	3.3	2.6	---	3.5	9.7	2.8	3.2	10	3.6	3.0
30	4.1	3.5	3.2	1.7	---	4.0	1.1	2.8	2.6	8.0	3.3	2.6
31	4.1	---	3.2	1.8	---	4.6	---	2.9	---	6.8	3.6	---
TOTAL	154.7	204.2	109.65	62.5	155.8	191.9	107.59	85.43	125.7	260.7	210.45	149.3
MEAN	4.99	6.81	3.54	2.02	5.56	6.19	3.59	2.76	4.19	8.41	6.79	4.98
MAX	9.3	24	8.5	4.1	24	23	15	6.4	7.8	16	19	10
MIN	2.5	3.5	.64	1.0	1.2	2.3	.09	.24	2.4	2.6	.06	2.6
AC-FT	307	405	217	124	309	381	213	169	249	517	417	296

CAL YR 1980 TOTAL 1724.13 MEAN 4.71 MAX 24 MIN .04 AC-FT 3420
WTR YR 1981 TOTAL 1817.92 MEAN 4.98 MAX 24 MIN .06 AC-FT 3610

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).

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.--WSP 1719: 1915, 1916-18(M). 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 16088000) diverts 3 mi (5 km) above station for irrigation in vicinity of Kealia. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--66 years (water years, 1914-17, 1920-81), 22.5 ft³/s (0.637 m³/s), 16,300 acre-ft/yr (20.1 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, 1,230 ft³/s (34.8 m³/s) Apr. 30, gage height, 4.72 ft (1.439 m), from rating curve extended above 240 ft³/s (6.80 m³/s) on basis of slope-area measurement at gage height 10.6 ft (3.23 m), no peak above base of 2,200 ft³/s (62.3 m³/s); minimum, 4.3 ft³/s (0.122 m³/s) Feb. 4, 5.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	9.4	13	6.6	6.5	6.5	7.8	12	49	7.3	4.6	13	5.5
2	8.9	12	19	6.5	5.0	8.5	17	86	7.1	4.6	16	5.6
3	8.7	11	8.4	6.6	4.6	12	12	42	6.8	6.2	18	11
4	8.0	11	8.0	6.3	4.4	10	11	27	6.5	5.5	124	8.1
5	118	10	62	6.2	29	8.5	170	37	11	23	124	15
6	83	9.6	39	6.2	7.3	7.4	71	97	8.7	6.0	68	6.6
7	19	9.4	75	6.1	9.6	6.8	28	29	14	5.0	31	7.1
8	29	9.1	18	13	106	46	20	30	7.6	7.3	21	5.6
9	25	12	11	8.7	26	18	17	30	7.0	7.6	18	45
10	15	10	9.4	6.8	9.9	8.5	16	20	9.2	38	16	8.5
11	15	26	8.5	7.0	14	7.4	15	18	12	24	18	6.3
12	29	9.8	7.8	7.0	12	7.8	14	17	9.7	10	45	5.7
13	15	8.9	8.0	5.9	7.6	6.6	15	16	11	17	24	5.6
14	29	8.5	10	5.7	6.3	7.1	163	15	6.8	58	19	7.0
15	14	68	14	5.5	5.9	6.0	116	15	5.9	71	12	5.2
16	13	62	11	5.4	5.6	5.8	66	13	6.0	29	11	4.8
17	23	16	8.5	5.4	5.5	5.4	50	12	6.2	21	10	4.6
18	15	12	7.8	5.1	140	5.2	30	12	8.5	56	18	4.8
19	14	11	7.8	5.2	23	5.2	25	12	6.0	36	19	6.6
20	12	9.6	14	5.2	10	5.2	21	12	5.4	15	10	7.3
21	13	9.4	8.3	5.2	8.9	142	20	13	4.8	101	10	14
22	10	8.9	7.8	5.5	9.8	100	18	10	4.7	19	9.1	7.3
23	35	8.5	7.4	5.5	9.1	47	17	9.8	5.2	15	8.3	8.9
24	79	8.0	7.4	5.1	15	30	27	9.4	5.9	17	8.0	11
25	52	7.6	7.4	5.1	10	18	18	11	4.7	42	7.3	8.0
26	27	8.3	7.1	5.7	9.6	15	16	9.1	4.8	15	7.0	7.0
27	19	8.5	7.0	16	8.3	13	15	8.3	9.2	20	7.0	6.5
28	16	7.8	7.0	17	7.8	11	79	7.6	6.3	54	6.8	6.6
29	19	6.8	7.6	7.3	---	11	72	7.4	5.1	35	6.3	5.1
30	15	6.3	6.8	5.4	---	12	228	7.3	4.5	18	6.0	4.8
31	14	---	6.6	5.7	---	13	---	7.3	---	15	5.9	---
TOTAL	802.0	419.0	434.2	213.8	516.7	607.2	1399	689.2	217.9	795.8	716.7	255.1
MEAN	25.9	14.0	14.0	6.90	18.5	19.6	46.6	22.2	7.26	25.7	23.1	8.50
MAX	118	68	75	17	140	142	228	97	14	101	124	45
MIN	8.0	6.3	6.6	5.1	4.4	5.2	11	7.3	4.5	4.6	5.9	4.6
AC-FT	1590	831	861	424	1020	1200	2770	1370	432	1580	1420	506

CAL YR 1980 TOTAL 10145.9 MEAN 27.7 MAX 403 MIN 4.6 AC-FT 20120
WTR YR 1981 TOTAL 7066.6 MEAN 19.4 MAX 228 MIN 4.4 AC-FT 14020

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.

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 fair. Ditch diverts from Anahola Stream for irrigation of sugarcane in vicinity of Anahola. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--44 years (water years 1938-81), 2.98 ft^3/s (0.084 m^3/s), 2,160 acre-ft/yr (2.66 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.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 8.5 ft^3/s (0.241 m^3/s) Aug. 6; no flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.3	.16	1.3	.00	.00	.23	.16	.09	4.9	2.4	3.6	3.3
2	3.4	.91	1.6	.00	.00	.26	.12	.05	4.7	2.3	3.5	3.2
3	2.3	1.2	1.6	.00	.00	.30	.16	.04	3.2	2.2	3.4	3.2
4	.19	.90	1.8	.00	.00	.30	.16	.00	.37	2.1	4.2	3.2
5	.48	.95	1.7	.00	1.4	.30	.16	.04	.40	1.0	8.2	3.1
6	.50	.80	.40	.00	2.3	.26	.16	.12	.40	.01	8.5	2.9
7	.33	.90	.37	.00	2.0	.23	.16	.00	.40	.41	8.4	2.8
8	.37	.90	.37	.00	4.7	.26	.04	.00	.40	1.8	6.8	2.8
9	.33	1.0	.30	.01	4.5	.30	.00	.00	.37	2.0	5.0	3.3
10	.30	1.0	.30	.01	3.7	.26	.00	.00	.30	2.6	4.5	4.4
11	.23	1.2	.30	.01	4.5	.23	.00	.00	.40	2.7	4.5	3.7
12	.23	1.1	.30	.03	4.1	.23	.00	.10	.37	2.4	5.6	3.4
13	.16	1.1	.30	.03	2.6	.30	.00	.12	.37	2.2	4.4	3.4
14	.16	1.2	.30	.03	.16	.23	.28	.16	.33	2.4	4.6	3.6
15	1.1	2.2	.30	.03	.12	.23	.16	.12	.26	1.6	4.2	3.6
16	2.6	3.6	.30	.03	.12	.23	.04	.12	.95	.30	4.1	3.4
17	1.2	3.9	.30	.03	.09	.19	.19	.12	2.6	1.4	8.3	3.2
18	.12	4.8	.30	.03	1.2	.19	.12	1.5	2.9	2.2	8.4	3.0
19	.09	3.9	.30	.03	1.0	.19	.12	3.1	3.0	2.2	8.3	3.0
20	.06	1.8	.23	.00	.63	.19	.12	.16	2.8	2.2	4.8	3.0
21	.09	1.4	.06	.00	.58	.90	.12	.16	2.6	4.0	4.5	2.9
22	.06	1.6	.03	.00	.50	.84	.12	2.7	2.6	5.3	4.0	3.0
23	.16	1.6	.01	.00	.47	.23	.12	3.3	2.6	3.4	3.9	3.0
24	.26	1.6	.03	.00	.54	.19	.12	1.1	2.6	3.0	3.8	3.5
25	.19	2.0	.03	.00	.47	.19	.12	2.4	2.6	3.4	3.7	3.3
26	.69	1.3	.01	.00	.37	.19	.12	1.5	2.4	3.5	4.2	2.8
27	.30	1.2	.01	.00	.33	.16	.12	.47	2.5	3.8	4.5	2.6
28	.19	1.3	.00	.00	.23	.12	.12	.47	2.7	4.0	3.6	2.6
29	.16	1.2	.00	.00	---	.12	.12	.40	2.6	6.1	3.3	1.5
30	.19	1.2	.00	.00	---	.12	.05	3.1	2.4	6.2	3.1	.03
31	.19	---	.00	.00	---	.12	---	5.0	---	4.2	3.2	---
TOTAL	17.93	47.92	12.85	.27	36.61	8.09	3.28	26.44	55.02	83.32	155.1	90.73
MEAN	.58	1.60	.41	.009	1.31	.26	.11	.85	1.83	2.69	5.00	3.02
MAX	3.4	4.8	1.8	.03	4.7	.90	.28	5.0	4.9	6.2	8.5	4.4
MIN	.06	.16	.00	.00	.00	.12	.00	.00	.26	.01	3.1	.03
AC-FT	36	95	25	.5	73	16	6.5	52	109	165	308	180

CAL YR 1980 TOTAL 276.52 MEAN .76 MAX 5.8 MIN .00 AC-FT 548
WTR YR 1981 TOTAL 537.56 MEAN 1.47 MAX 8.5 MIN .00 AC-FT 1070

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.--9.24 mi² (23.93 km²).

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. Observations of specific conductance, pH, and water temperature are published elsewhere in this report.

AVERAGE DISCHARGE.--16 years (water years 1966-81), 34.0 ft³/s (0.963 m³/s), 24,630 acre-ft/yr (30.4 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 13,400 ft³/s (379 m³/s) May 15, 1965, gage height, 15.84 ft (4.83 m), present site, 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, 2,100 ft³/s (59.5 m³/s) Apr. 30, gage height, 9.50 ft (2.90 m), from rating curve extended as explained above, no peak above base of 2,200 ft³/s (62.3 m³/s); minimum, 5.1 ft³/s (0.144 m³/s) Sept. 17.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	12	18	12	14	11	14	18	95	8.2	5.7	17	7.8
2	10	18	26	14	9.4	14	21	142	8.2	5.7	18	7.8
3	11	17	15	14	9.0	19	23	73	9.0	6.4	16	14
4	12	16	14	14	9.0	17	20	43	10	7.0	147	8.6
5	159	14	107	14	34	14	251	61	12	25	191	16
6	106	14	85	14	10	14	114	147	11	13	92	7.8
7	29	14	170	14	7.0	14	44	44	14	11	41	7.8
8	41	14	58	21	120	43	31	42	11	11	24	7.4
9	35	16	35	17	32	26	20	41	10	11	20	50
10	26	15	27	14	12	16	17	28	11	38	17	11
11	24	31	23	14	11	14	16	25	14	25	16	7.0
12	48	14	20	14	14	14	16	20	11	14	51	6.4
13	29	13	20	13	9.0	14	16	18	12	17	23	6.4
14	43	12	35	12	9.4	14	239	17	10	60	28	6.7
15	23	88	34	12	9.0	14	186	17	9.4	83	16	6.0
16	18	94	28	12	9.0	13	103	16	8.6	33	14	5.4
17	32	35	21	14	8.6	12	76	15	7.0	22	17	5.4
18	24	20	17	14	162	12	45	14	8.2	60	23	5.4
19	22	14	16	13	40	12	37	12	7.0	36	25	6.4
20	19	14	29	12	18	12	30	14	6.7	16	15	7.0
21	20	13	17	11	17	218	28	16	6.0	118	13	15
22	18	12	16	12	17	122	21	12	6.0	29	12	8.5
23	45	12	15	12	16	68	20	11	6.0	19	11	6.4
24	111	12	15	11	24	44	28	12	6.7	20	9.8	9.8
25	86	12	14	11	17	31	21	12	6.0	49	9.0	8.6
26	41	12	14	11	17	26	18	11	5.7	19	8.2	6.0
27	31	13	14	22	14	20	18	12	7.2	23	8.6	5.7
28	25	13	14	17	14	18	98	11	9.0	62	8.2	6.0
29	27	12	16	13	---	17	134	11	6.4	48	7.8	6.0
30	22	11	14	10	---	17	409	9.0	5.7	24	7.8	6.7
31	20	---	14	9.8	---	20	---	8.2	---	18	7.8	---
TOTAL	1169	613	955	419.8	679.4	923	2118	1009.2	263.0	928.8	914.2	279.0
MEAN	37.7	20.4	30.8	13.5	24.3	29.8	70.6	32.6	8.77	30.0	29.5	9.30
MAX	159	94	170	22	162	218	409	147	14	118	191	50
MIN	10	11	12	9.8	7.0	12	16	8.2	5.7	5.7	7.8	5.4
AC-FT	2320	1220	1890	833	1350	1830	4200	2000	522	1840	1810	553

CAL YR 1980 TOTAL 14398.5 MEAN 39.3 MAX 597 MIN 5.7 AC-FT 28560
WTR YR 1981 TOTAL 10271.4 MEAN 28.1 MAX 409 MIN 5.4 AC-FT 20370

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.--1.19 mi² (3.08 km²).

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. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--23 years (water years 1959-81), 11.3 ft³/s (0.320 m³/s), 8,190 acre-ft/yr (10.1 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,070 ft³/s (58.6 m³/s) Aug. 6, 1959, gage height, 8.30 ft (2.530 m), from rating curve extended above 190 ft³/s (5.38 m³/s) on basis of slope-area measurement of peak flow; minimum, 1.8 ft³/s (0.051 m³/s) Sept. 6-8, 1968.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 465 ft³/s (13.2 m³/s) Apr. 14, gage height, 4.16 ft (1.268 m), from rating curve extended above 190 ft³/s (5.38 m³/s), no peak above base of 580 ft³/s (16.4 m³/s); minimum, 5.3 ft³/s (0.15 m³/s) Jan. 24-26, Feb. 3-5.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	7.7	8.7	7.1	6.0	5.4	6.7	9.5	18	6.9	6.0	8.8	6.6
2	7.5	8.5	16	6.0	5.4	7.1	14	26	6.5	6.0	9.1	6.8
3	7.3	8.3	7.7	6.0	5.4	11	11	15	6.2	6.0	10	8.7
4	7.3	8.1	7.1	5.9	5.3	8.4	9.8	11	6.3	6.2	68	7.3
5	43	7.9	27	5.9	11	7.0	88	17	7.5	8.9	50	9.0
6	38	7.7	21	5.8	5.8	7.3	75	36	6.9	6.1	23	7.3
7	12	7.5	40	5.7	6.6	6.5	19	13	7.4	5.9	14	6.8
8	16	7.6	13	7.2	36	23	13	19	6.7	6.6	11	6.8
9	15	11	9.7	6.0	12	18	10	16	6.8	7.2	9.7	18
10	11	8.9	8.8	5.8	7.2	9.0	9.1	10	7.4	18	9.1	8.6
11	13	18	8.1	6.4	7.4	8.3	8.5	9.3	7.5	12	12	7.3
12	17	10	7.8	5.9	7.0	8.7	8.0	8.7	7.3	7.9	27	7.0
13	13	8.5	7.5	5.7	6.2	7.4	8.3	8.3	7.3	10	13	6.8
14	20	8.0	7.8	5.7	5.9	7.3	67	7.9	6.5	22	11	6.8
15	11	20	10	5.6	5.7	6.9	44	7.7	7.3	37	9.1	6.6
16	10	26	8.1	5.6	5.7	6.6	27	7.5	6.4	14	8.7	6.4
17	14	11	7.3	5.6	5.6	6.3	26	7.4	7.1	11	8.4	6.4
18	11	9.2	7.0	5.4	44	6.2	14	7.6	7.2	43	9.9	6.6
19	11	8.7	8.0	5.5	16	6.0	11	7.2	6.5	22	11	7.1
20	9.7	8.2	8.4	5.4	8.5	6.0	9.7	8.1	6.3	11	8.5	7.5
21	13	7.9	6.9	5.4	7.7	69	9.0	7.8	6.1	51	8.7	6.6
22	9.6	7.8	6.7	5.4	9.0	29	8.4	7.0	6.0	13	8.0	6.4
23	15	7.6	6.6	5.4	10	22	8.1	6.7	6.3	10	8.1	7.5
24	43	7.3	6.6	5.4	13	16	10	6.7	7.0	11	7.5	9.3
25	29	7.3	6.4	5.4	9.7	11	8.2	7.4	6.1	28	7.3	7.5
26	15	7.3	6.4	5.7	8.4	9.3	7.6	6.7	6.5	11	7.0	7.7
27	12	7.2	6.2	9.7	7.3	8.4	7.3	6.5	8.2	11	7.0	7.1
28	11	7.0	6.6	8.3	6.9	8.2	36	6.4	6.6	29	7.1	8.1
29	10	6.9	6.8	6.1	---	8.5	27	6.5	6.2	16	7.0	6.6
30	9.7	6.8	6.2	5.6	---	8.6	69	6.4	6.0	11	6.8	6.4
31	9.0	---	6.1	5.5	---	11	---	6.4	---	9.4	6.8	---
TOTAL	470.8	284.9	308.9	185.0	284.1	374.7	672.5	335.2	203.0	467.2	412.6	227.6
MEAN	15.2	9.50	9.96	5.97	10.1	12.1	22.4	10.8	6.77	15.1	13.3	7.59
MAX	43	26	40	9.7	44	69	88	36	8.2	51	68	18
MIN	7.3	6.8	6.1	5.4	5.3	6.0	7.3	6.4	6.0	5.9	6.8	6.4
AC-FT	934	565	613	367	564	743	1330	665	403	927	818	451

CAL YR 1980 TOTAL 5322.7 MEAN 14.5 MAX 111 MIN 4.6 AC-FT 10560
WTR YR 1981 TOTAL 4226.5 MEAN 11.6 MAX 88 MIN 5.3 AC-FT 8380

16100000 HANALEI TUNNEL OUTLET NEAR LIHUE

LOCATION.--Lat 22°05'03", long 159°27'51", Hydrologic Unit 20070000, on left 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.

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

GAGE.--Water-stage recorder and concrete control. 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. Observations of specific conductance, pH and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--49 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.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 64 ft^3/s (1.81 m^3/s) Aug. 5; minimum daily, 0.34 ft^3/s (0.010 m^3/s) June 27.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	23	20	17	19	17	14	26	31	15	16	34	28
2	20	19	16	19	17	16	31	39	16	23	42	29
3	22	18	16	22	16	22	26	26	15	23	34	41
4	19	17	18	19	16	17	22	22	15	23	57	35
5	40	17	36	19	22	14	23	26	21	32	64	36
6	35	17	29	18	16	22	27	25	20	35	54	30
7	28	17	32	18	16	20	25	20	18	26	46	27
8	32	16	23	20	27	22	25	31	17	34	41	26
9	32	23	21	19	22	25	20	22	15	41	37	33
10	28	26	20	18	18	20	19	20	22	52	35	32
11	40	35	20	18	42	18	18	18	19	44	38	28
12	37	25	20	18	26	18	18	18	23	35	56	27
13	36	20	26	18	22	18	18	19	23	42	47	28
14	50	20	27	18	20	20	30	18	20	60	40	30
15	38	44	23	18	19	18	39	18	27	59	35	27
16	35	39	22	18	18	17	35	17	19	56	38	26
17	40	25	21	18	18	16	32	18	21	49	44	25
18	33	23	21	18	33	16	23	18	19	47	51	27
19	30	22	20	18	22	16	22	17	18	48	50	32
20	28	20	20	18	18	16	21	20	18	47	40	28
21	31	20	20	18	11	25	23	18	18	59	40	30
22	35	20	20	18	15	20	19	16	18	45	34	26
23	45	21	20	18	25	18	20	16	10	42	38	33
24	48	21	26	13	29	30	24	16	.38	43	31	36
25	35	20	21	14	25	22	20	18	.38	49	29	28
26	28	20	20	15	20	20	18	16	.38	38	28	25
27	26	16	20	33	17	19	18	15	.34	40	27	27
28	24	16	20	37	14	18	34	15	14	55	33	46
29	25	16	20	20	---	20	34	15	14	46	28	30
30	23	15	20	18	---	19	41	15	12	40	30	28
31	21	---	19	18	---	23	---	16	---	34	27	---
TOTAL	987	648	674	593	581	599	751	619	468.48	1283	1228	904
MEAN	31.8	21.6	21.7	19.1	20.8	19.3	25.0	20.0	15.6	41.4	39.6	30.1
MAX	50	44	36	37	42	30	41	39	27	60	64	46
MIN	19	15	16	13	11	14	18	15	.34	16	27	25
AC-FT	1960	1290	1340	1180	1150	1190	1490	1230	929	2540	2440	1790

CAL YR 1980 TOTAL 10647.00 MEAN 29.1 MAX 63 MIN 14 AC-FT 21120
WTR YR 1981 TOTAL 9335.48 MEAN 25.6 MAX 64 MIN .34 AC-FT 18520

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).

PERIOD OF RECORD.--January 1912 to November 1919, annual maximum, water years 1962-63, December 1962 to current year.

REVISED RECORDS.--WSP 1937: Drainage area. WSP 2137: 1962(M), 1963-65(P). WDR HI-77-1: 1970-76(M), 1975-76.

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. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE (since diversion to Hanalei tunnel).--18 years (water years 1964-81), 214 ft³/s (6.060 m³/s) 155,000 acre-ft/yr (191 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, 7,680 ft³/s (217 m³/s) Aug. 4, gage height, 9.24 ft (2.816 m), from rating curve extended above 9,600 ft³/s (272 m³/s), no peak above base of 9,200 ft³/s (261 m³/s); minimum, 45 ft³/s (1.27 m³/s) Jan. 20-24.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	74	96	75	60	58	100	248	558	67	77	95	65
2	71	91	92	59	54	105	327	578	62	54	133	63
3	68	87	73	79	53	183	215	292	58	58	106	178
4	69	82	72	63	52	134	199	187	58	54	1400	89
5	379	79	483	54	201	95	1520	287	95	65	1190	161
6	295	76	286	53	68	158	471	348	103	58	486	86
7	102	75	370	52	92	121	226	173	105	54	215	77
8	126	75	157	64	389	308	374	177	71	70	153	66
9	174	134	120	55	188	204	159	166	77	70	129	83
10	109	108	106	52	95	117	128	122	68	167	112	79
11	189	487	96	56	481	109	112	109	78	119	133	72
12	353	149	90	52	185	102	113	102	74	80	509	62
13	155	102	90	50	106	87	107	95	97	112	187	89
14	317	87	179	49	84	133	531	88	64	496	164	71
15	134	1100	110	48	71	87	1040	84	152	587	117	60
16	110	741	93	48	68	78	414	81	77	373	120	56
17	206	211	80	48	64	73	372	82	85	210	148	54
18	173	153	76	46	808	69	191	129	83	326	273	54
19	139	130	82	46	400	67	155	91	63	249	206	64
20	113	116	78	46	126	64	134	119	60	231	128	65
21	123	103	72	45	150	476	127	100	58	682	117	86
22	102	98	70	45	218	232	107	78	58	173	95	61
23	236	105	67	45	248	124	102	73	76	130	105	66
24	600	103	81	48	334	192	124	69	106	151	88	75
25	426	90	70	49	214	129	100	72	77	288	80	63
26	199	84	66	59	166	114	88	67	111	129	74	64
27	149	80	64	324	120	103	82	63	145	129	72	58
28	128	80	65	405	109	103	836	61	98	423	78	197
29	132	76	65	108	---	123	772	60	85	205	70	63
30	123	76	62	68	---	148	1710	60	61	129	67	54
31	103	---	61	66	---	217	---	62	---	107	67	---
TOTAL	5677	5074	3551	2342	5202	4355	11084	4633	2472	6056	6917	2381
MEAN	183	169	115	75.5	186	140	369	149	82.4	195	223	79.4
MAX	600	1100	483	405	808	476	1710	578	152	682	1400	197
MIN	68	75	61	45	52	64	82	60	58	54	67	54
AC-FT	11260	10060	7040	4650	10320	8640	21990	9190	4900	12010	13720	4720

CAL YR 1980 TOTAL 88906 MEAN 243 MAX 2230 MIN 41 AC-FT 176300
WTR YR 1981 TOTAL 59744 MEAN 164 MAX 1710 MIN 45 AC-FT 118500

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).

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. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--26 years (water years, 1953-55, 1959-81), 137 ft^3/s (3.880 m^3/s), 99,260 acre-ft/yr (122 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, 33.0 ft^3/s (0.93 m^3/s) Feb. 11, 12, 1978.

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, 3,920 ft^3/s (111 m^3/s) Aug. 4, gage height, 5.35 ft (1.631 m), from rating curve extended as explained above, no other peak above base of 3,600 ft^3/s (102 m^3/s); minimum, 42 ft^3/s (1.19 m^3/s) Mar. 20.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	53	63	54	50	49	71	318	380	49	59	60	62
2	53	59	55	49	47	87	373	390	50	46	108	66
3	53	57	53	92	45	165	217	146	47	46	78	214
4	53	56	57	56	45	101	122	77	52	46	1190	161
5	158	54	305	51	106	58	197	100	116	58	696	118
6	119	53	159	50	54	113	167	116	110	66	137	72
7	61	52	146	49	51	66	114	69	88	48	76	59
8	114	53	77	52	135	80	96	89	65	102	67	57
9	146	130	64	50	105	89	60	62	70	122	65	72
10	88	215	58	48	62	56	54	53	89	262	59	80
11	190	432	96	48	740	61	90	49	64	135	102	58
12	235	135	60	48	126	50	49	49	118	81	415	49
13	130	77	273	47	68	47	51	59	111	158	81	53
14	272	67	193	47	56	54	161	59	66	516	65	56
15	82	869	88	47	51	46	322	51	160	558	56	47
16	74	528	71	47	49	45	156	50	58	324	53	45
17	160	119	63	53	47	45	159	67	86	137	81	45
18	154	83	58	48	348	44	71	83	61	101	258	45
19	94	81	56	48	126	44	69	62	50	100	213	71
20	75	68	54	46	75	42	67	87	52	140	84	57
21	80	64	54	45	119	63	64	68	57	618	85	49
22	63	61	58	46	188	55	52	51	57	95	65	45
23	172	75	54	47	238	45	67	49	68	81	96	79
24	486	84	137	45	352	122	95	46	61	105	62	84
25	356	70	66	45	228	62	65	66	47	183	52	58
26	129	64	55	49	121	67	52	48	102	71	49	60
27	82	58	53	470	74	86	51	45	84	100	47	55
28	71	56	52	384	60	70	455	44	67	455	66	211
29	89	55	52	76	---	107	340	43	53	126	54	55
30	95	54	52	56	---	105	440	44	50	101	57	49
31	69	---	51	53	---	215	---	51	---	63	57	---
TOTAL	4056	3892	2684	2342	3765	2361	4554	2653	2208	5103	4634	2232
MEAN	131	130	86.6	75.5	134	76.2	152	85.6	73.6	165	149	74.4
MAX	486	869	305	470	740	215	455	390	160	618	1190	214
MIN	53	52	51	45	45	42	49	43	47	46	47	45
AC-FT	8050	7720	5320	4650	7470	4680	9030	5260	4380	10120	9190	4430

CAL YR 1980 TOTAL 53914 MEAN 147 MAX 1150 MIN 35 AC-FT 106900
WTR YR 1981 TOTAL 40484 MEAN 111 MAX 1190 MIN 42 AC-FT 80300

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).

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.--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. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--58 years (water years, 1914-24, 1927-52, 1961-81), 16.4 ft³/s (0.464 m³/s), 11,880 acre-ft/yr (14.6 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.--Maximum discharge, 1,280 ft³/s (36.2 m³/s), Apr. 7, gage height, 6.21 ft (1.893 m), from rating curve extended as explained above, no peak above base of 1,300 ft³/s (36.8 m³/s); minimum, 0.34 ft³/s (0.010 m³/s) Jan. 25, 26.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.7	3.1	1.3	.72	1.5	.80	5.1	30	2.0	1.6	4.5	5.9
2	2.9	2.8	1.2	.68	1.2	11	52	7.4	1.5	1.5	5.8	3.1
3	3.9	2.7	1.1	.68	1.0	4.0	9.9	6.2	1.4	2.0	3.9	48
4	2.4	2.5	1.0	.64	.90	1.9	4.0	4.1	1.6	1.5	207	5.5
5	7.4	2.3	7.1	.60	5.0	5.5	5.1	4.2	2.0	1.3	55	10
6	4.4	2.2	3.8	.56	1.4	41	64	5.4	8.1	4.0	14	7.1
7	5.5	2.3	2.6	.52	.85	17	105	176	2.2	1.6	7.6	3.4
8	16	12	1.4	1.2	1.0	65	60	21	2.8	24	5.7	3.0
9	4.0	2.7	1.1	1.4	1.5	28	7.1	10	2.3	18	9.6	2.7
10	3.1	4.5	1.0	.72	.85	9.0	4.9	16	1.6	6.9	8.0	2.5
11	2.5	31	.90	.56	1.4	4.1	4.0	5.9	9.7	3.0	29	2.3
12	7.3	4.2	.85	.49	2.1	3.2	10	4.9	6.4	2.1	20	7.8
13	50	2.7	.80	.46	.85	2.5	105	4.2	5.0	2.2	17	3.0
14	28	2.2	29	.46	.64	2.2	83	4.0	6.1	20	5.3	2.5
15	4.7	7.9	4.4	.43	.52	2.0	48	3.6	14	37	4.4	2.1
16	3.8	14	2.3	.43	.49	1.8	21	3.4	2.7	18	20	1.9
17	17	3.5	1.4	.52	.43	1.6	8.8	5.6	1.9	4.2	11	1.8
18	28	2.3	1.1	.46	.40	1.5	6.4	8.9	1.6	4.1	30	32
19	4.6	6.6	1.0	.43	.46	1.5	5.9	4.9	1.4	4.0	51	8.6
20	4.7	2.5	.95	.40	15	1.3	4.9	11	1.3	26	7.3	6.7
21	10	2.2	3.9	.37	2.4	1.2	5.1	3.8	2.8	117	5.5	2.5
22	3.6	2.0	2.2	.37	16	1.1	4.0	3.1	1.5	6.2	8.9	2.7
23	3.0	1.7	4.9	.40	2.6	1.0	3.5	2.7	2.0	4.9	9.3	4.1
24	32	1.7	3.0	.37	23	2.7	13	3.3	2.3	6.4	8.9	2.0
25	91	1.9	4.9	.34	2.5	3.5	3.8	2.4	9.4	21	4.4	1.7
26	8.3	7.0	1.8	.34	1.5	4.0	3.7	2.8	10	4.1	3.8	7.4
27	5.5	3.2	1.2	98	1.0	8.1	3.0	2.4	27	4.7	5.2	20
28	4.6	1.8	1.0	44	.90	2.3	3.1	2.6	4.5	36	9.8	6.8
29	4.1	1.5	.90	22	---	2.1	20	2.4	2.2	8.0	3.5	2.4
30	3.8	1.3	.80	3.1	---	18	83	1.7	1.7	6.8	4.6	2.1
31	3.4	---	.76	1.9	---	11	---	2.6	---	3.8	5.7	---
TOTAL	372.2	138.3	89.66	183.55	87.39	259.90	756.3	366.5	139.0	401.9	585.7	211.6
MEAN	12.0	4.61	2.89	5.92	3.12	8.38	25.2	11.8	4.63	13.0	18.9	7.05
MAX	91	31	29	98	23	65	105	176	27	117	207	48
MIN	2.4	1.3	.76	.34	.40	.80	3.0	1.7	1.3	1.3	3.5	1.7
AC-FT	738	274	178	364	173	516	1500	727	276	797	1160	420

CAL YR 1980 TOTAL 7085.57 MEAN 19.4 MAX 444 MIN .40 AC-FT 14050
WTR YR 1981 TOTAL 3592.00 MEAN 9.84 MAX 207 MIN .34 AC-FT 7120

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).

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 good. Prior to 1960, diversions from reservoirs above station for use at Schofield Barracks. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE (since termination of diversions to Schofield Barracks).--19 years (water years, 1961-62, 1965-81), 21.5 ft³/s (0.609 m³/s), 15,580 acre-ft/yr (19.2 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 at times.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 865 ft³/s (24.5 m³/s), Aug. 4, gage height, 4.67 ft (1.423 m), from rating curve extended as explained above, no peak above base of 1,100 ft³/s (31.2 m³/s); minimum, 0.52 ft³/s (0.015 m³/s) Jan. 26, 27.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.9	5.9	1.7	1.2	1.6	1.3	9.6	73	3.6	1.3	4.1	8.5
2	2.7	5.4	1.8	1.1	1.2	8.1	44	8.2	2.4	1.2	6.1	3.7
3	3.5	5.0	1.8	1.1	1.0	4.8	18	10	1.9	1.1	4.0	52
4	2.9	4.7	1.6	1.1	.87	2.4	7.1	4.7	2.4	1.6	151	8.2
5	2.9	4.3	5.6	1.0	10	1.5	9.6	3.9	2.6	1.2	113	16
6	15	4.0	9.8	1.0	4.4	29	14	4.6	23	.93	18	13
7	3.5	4.0	4.8	.96	1.6	38	6.8	276	6.7	.88	11	5.7
8	18	16	2.8	1.1	2.7	8.9	130	48	8.3	14	7.3	4.0
9	5.8	8.1	1.8	1.0	4.0	38	9.8	13	4.9	7.7	6.3	3.3
10	5.4	4.2	1.4	.99	2.1	28	6.0	59	2.9	7.4	6.8	3.0
11	3.8	29	1.3	.92	1.5	4.7	4.7	9.9	20	3.6	23	2.6
12	10	7.5	1.3	.83	3.7	3.1	4.1	7.3	8.5	1.8	20	2.6
13	52	4.4	1.2	.79	2.0	2.2	97	6.1	6.7	1.7	32	4.2
14	30	3.6	51	.75	1.2	1.8	111	5.3	3.4	50	7.4	2.7
15	7.0	3.4	16	.71	.89	1.6	47	4.6	3.6	70	5.4	2.4
16	5.0	18	5.6	.71	.77	1.4	37	4.3	4.2	50	7.8	1.9
17	20	7.4	3.5	1.0	.66	1.2	11	13	2.8	12	11	1.7
18	30	3.9	2.4	.88	.61	1.1	7.2	15	3.0	5.9	30	5.5
19	6.0	4.4	1.8	.86	.61	1.1	5.9	15	2.1	5.0	86	14
20	6.4	4.1	1.6	.91	2.4	1.1	5.2	19	1.6	4.4	13	9.8
21	12	3.0	2.1	.84	7.3	1.0	4.7	8.6	2.3	108	6.6	4.7
22	5.0	2.7	7.1	.62	37	.97	4.0	4.9	3.1	8.6	5.6	2.3
23	4.2	2.4	4.0	.68	8.1	.90	3.8	5.6	1.6	8.0	16	7.4
24	40	2.4	9.7	.64	34	.88	11	5.7	1.8	6.3	6.3	3.0
25	70	2.3	8.0	.57	6.5	3.2	5.4	4.6	1.8	32	5.4	1.8
26	20	2.1	5.3	.54	3.3	3.8	3.4	3.1	2.4	6.5	3.9	1.5
27	12	3.1	2.6	52	2.0	2.2	3.6	3.4	15	5.7	6.7	13
28	9.4	2.4	1.9	78	1.5	2.4	2.9	3.8	4.4	25	7.8	8.6
29	7.9	2.0	1.5	28	---	4.7	27	8.3	2.8	20	5.1	2.8
30	7.3	1.7	1.3	5.3	---	37	60	3.0	1.6	9.4	5.3	1.7
31	6.4	---	1.3	2.5	---	28	---	2.4	---	5.2	5.0	---
TOTAL	427.0	171.4	163.6	188.60	143.51	264.35	710.8	653.3	151.4	476.41	636.9	211.6
MEAN	13.8	5.71	5.28	6.08	5.13	8.53	23.7	21.1	5.05	15.4	20.5	7.05
MAX	70	29	51	78	37	38	130	276	23	108	151	52
MIN	2.7	1.7	1.2	.54	.61	.88	2.9	2.4	1.6	.88	3.9	1.5
AC-FT	847	340	325	374	285	524	1410	1300	300	945	1260	420

CAL YR 1980 TOTAL 11715.62 MEAN 32.0 MAX 657 MIN .66 AC-FT 23240
WTR YR 1981 TOTAL 4198.87 MEAN 11.5 MAX 276 MIN .54 AC-FT 8330

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).

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. At times during January and February small amounts of water were pumped from the stream just upstream of the gage. Recording rain gage located at station. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--22 years, 1.88 ft³/s (0.053 m³/s), 1,360 acre-ft/yr (1.68 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, 97 ft³/s (2.75 m³/s) May 7, gage height, 2.81 ft (0.856 m), from rating curve extended as explained above, no peak above base of 200 ft³/s (5.66 m³/s); minimum, 0.02 ft³/s (0.001 m³/s), Sept. 29, 30.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.14	.25	.17	1.0	1.1	.57	.64	6.8	.65	.36	.30	.17
2	.13	.22	.18	.91	.76	.52	.61	3.8	.63	.35	.28	.16
3	.13	.20	.17	1.1	.62	.49	.66	3.2	.60	.34	.26	.24
4	.12	.19	.16	1.0	.52	.47	.55	2.1	.58	.87	1.1	.23
5	.21	.18	.31	.79	7.5	.44	.60	1.7	.57	.71	1.5	.23
6	.40	.17	1.0	.64	2.2	.56	.47	5.5	.60	.50	.68	.22
7	.28	.14	1.1	.61	1.9	.81	.41	33	.73	.45	.58	.18
8	.27	.16	.58	.60	2.8	.61	.36	16	.69	.43	.45	.17
9	.25	.14	.46	.56	2.0	.62	.30	8.6	.63	.46	.38	.17
10	.22	.14	.37	.53	1.5	.57	.26	6.2	.58	.77	.32	.17
11	.20	.14	.32	.54	3.3	.49	.24	4.7	.57	.53	.33	.16
12	.22	.14	.30	.48	2.5	.44	2.5	3.8	.55	.41	.29	.14
13	.35	.19	.27	.46	2.0	.42	14	3.1	.54	.36	.28	.17
14	.32	.20	8.0	.42	1.6	.39	4.6	2.5	.52	.33	.31	.17
15	.33	.65	5.5	.39	1.3	.39	15	2.1	.51	.31	.33	.15
16	.33	.77	2.8	.40	1.1	.41	8.3	1.8	.49	.54	.32	.13
17	.28	.54	1.6	.36	.97	.47	4.2	1.7	.49	2.0	.30	.12
18	.25	.46	1.2	.38	1.1	.42	2.7	1.6	.47	1.4	.26	.12
19	.22	.38	.91	.43	1.4	.39	1.9	1.5	.43	1.4	.54	.11
20	.20	.35	.75	.53	1.5	.38	1.5	1.5	.41	1.2	.52	.13
21	.20	.32	.84	.42	1.1	.35	1.2	1.3	.38	1.1	.42	.11
22	.18	.27	1.7	.40	1.8	.35	1.0	1.1	.40	.70	.33	.12
23	.16	.26	7.4	.40	1.2	.35	.96	1.0	.58	.55	.29	.11
24	.18	.22	6.7	.42	1.4	.34	.89	.96	.59	.45	.28	.10
25	2.5	.21	9.6	.37	1.0	.30	.85	.91	.49	.38	.25	.10
26	1.0	.20	4.3	.33	.77	.28	.81	.83	.45	.35	.23	.09
27	.59	.18	2.7	1.4	.65	.28	.76	.78	.42	.31	.20	.09
28	.46	.18	2.0	3.0	.61	.26	1.1	.80	.39	.32	.18	.08
29	.38	.17	1.6	1.7	---	.24	2.1	.74	.37	.38	.17	.07
30	.31	.17	1.3	.97	---	.62	12	.69	.35	.38	.20	.05
31	.27	---	1.2	.86	---	.59	---	.67	---	.33	.18	---
TOTAL	11.08	7.79	65.49	22.40	46.20	13.82	81.47	120.98	15.66	18.97	12.06	4.26
MEAN	.36	.26	2.11	.72	1.65	.45	2.72	3.90	.52	.61	.39	.14
MAX	2.5	.77	9.6	3.0	7.5	.81	15	33	.73	2.0	1.5	.24
MIN	.12	.14	.16	.33	.52	.24	.24	.67	.35	.31	.17	.05
AC-FT	22	15	130	44	92	27	162	240	31	38	24	8.4

CAL YR 1980 TOTAL 568.85 MEAN 1.55 MAX 15 MIN .12 AC-FT 1130
WTR YR 1981 TOTAL 420.18 MEAN 1.15 MAX 33 MIN .05 AC-FT 833

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.--24 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 (*), from rating curve extended as explained above:

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Mar. 6	1700	1100	31.2	7.29	2.222
Aug. 4	2030	*2030	57.5	*8.96	2.731

Minimum discharge, 0.12 ft³/s (0.003 m³/s) Jan. 22.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.70	1.2	.38	1.0	1.5	.89	4.3	53	1.0	.54	2.2	3.8
2	.70	1.0	.41	.96	1.0	4.0	39	8.4	.89	.49	5.2	1.5
3	1.2	.96	.41	1.3	.82	2.4	8.4	8.0	.76	.54	2.4	5.7
4	.89	.82	.41	1.8	.70	1.4	3.9	3.4	.82	.96	153	2.9
5	.76	.76	3.0	1.0	6.2	3.3	4.1	3.6	.82	.64	73	15
6	.89	.70	5.7	.76	2.4	97	8.2	3.9	6.0	.41	21	14
7	.76	.76	3.1	.70	.96	23	29	162	2.9	.33	7.0	2.5
8	8.4	2.0	1.6	.70	1.3	7.4	60	36	1.7	5.4	3.9	1.5
9	2.7	3.0	.76	2.3	4.3	73	6.5	9.8	1.5	2.5	3.0	1.3
10	1.4	1.0	.48	.89	1.5	26	3.8	19	.89	3.2	3.6	1.0
11	.89	7.4	.37	.59	8.5	5.6	2.9	5.7	2.4	1.2	13	.96
12	3.6	2.1	.37	.54	4.6	3.8	2.4	3.9	2.7	.70	12	.96
13	5.9	1.0	.41	.54	1.6	2.5	49	3.6	2.1	.59	14	2.0
14	23	.76	46	.49	.96	2.0	70	3.4	1.3	7.8	4.3	2.0
15	3.4	1.6	11	.54	.70	1.6	14	2.9	1.2	23	2.9	1.0
16	2.7	13	3.8	.54	.64	1.5	21	2.4	.96	22	4.5	.76
17	7.8	3.0	1.8	.59	.59	1.1	5.1	3.8	.54	6.5	2.7	.64
18	21	1.1	1.1	.59	.54	1.0	3.4	3.8	.41	6.8	18	4.1
19	3.6	1.1	.89	.41	.54	1.1	2.9	4.3	.30	2.5	46	6.8
20	2.2	1.7	.82	.37	32	.96	2.4	9.0	.27	1.8	6.5	1.7
21	2.1	.70	1.1	.33	7.7	.89	2.2	3.6	.27	80	3.4	1.6
22	1.5	.54	12	.22	15	.82	1.7	2.0	.41	5.7	2.4	.96
23	.96	.49	19	.30	5.1	.76	1.5	1.7	.37	3.2	5.1	2.2
24	1.0	.45	17	.45	9.7	.96	4.1	1.5	.30	2.5	3.9	1.4
25	93	.45	20	.45	3.8	2.2	2.4	1.3	.32	21	2.9	.76
26	9.9	.45	6.2	.30	2.1	1.8	1.4	1.8	.34	2.7	2.2	.59
27	4.3	1.9	3.4	67	1.4	3.5	1.3	1.5	1.6	1.6	4.2	3.6
28	3.0	.96	2.1	49	1.1	5.1	1.1	1.1	2.0	19	3.8	5.4
29	2.1	.70	1.6	14	---	2.1	27	2.5	.82	5.9	2.4	1.3
30	1.8	.45	1.3	4.3	---	18	90	1.2	.70	2.7	2.5	.76
31	1.5	---	1.1	2.2	---	11	---	.96	---	1.6	1.5	---
TOTAL	213.65	52.05	167.61	155.16	117.25	306.68	473.0	369.06	36.59	233.80	432.5	88.69
MEAN	6.89	1.74	5.41	5.01	4.19	9.89	15.8	11.9	1.22	7.54	14.0	2.96
MAX	93	13	46	67	32	97	90	162	6.0	80	153	15
MIN	.70	.45	.37	.22	.54	.76	1.1	.96	.27	.33	1.5	.59
AC-FT	424	103	332	308	233	608	938	732	73	464	858	176

CAL YR 1980	TOTAL 6032.62	MEAN 16.5	MAX 672	MIN .37	AC-FT 11970		
WTR YR 1981	TOTAL 2646.04	MEAN 7.25	MAX 162	MIN .22	AC-FT 5250		

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, water-quality samples were collected at this station.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SEDIMENT CONCENTRATIONS: Maximum daily mean, 1,330 mg/L Mar. 19, 1980; minimum daily mean, 0 mg/L on many days.
SEDIMENT DISCHARGE: Maximum daily 5,580 tons (5,070 tonnes) Mar. 19, 1980; minimum daily, 0 ton (0 tonne) on many days.

EXTREMES FOR CURRENT YEAR.--
SEDIMENT CONCENTRATIONS: Maximum daily mean, 562 mg/L Mar. 6; minimum daily mean, 2 mg/L on many days during the year.
SEDIMENT DISCHARGE: Maximum daily, 893 tons (810 tonnes) Aug. 4; minimum daily, 0 ton (0 tonne) on many days during the year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (UMHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)
OCT					
03...	1145	1.1	80	7.0	26.0
27...	1610	3.9	62	7.1	24.5
DEC					
10...	1415	.44	61	7.2	23.0
JAN					
22...	1250	.08	74	7.0	20.0
MAR					
04...	1200	1.4	75	6.4	23.0
APR					
15...	1340	6.3	46	6.7	22.5
MAY					
14...	1400	3.3	65	6.9	26.0
JUN					
25...	1145	.30	68	7.1	27.5
JUL					
24...	1145	2.5	55	6.8	26.0
AUG					
31...	1205	1.5	52	7.0	26.5

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SEDI-MENT, SUS-PENDED (MG/L)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY)	SED. SUSP. FALL DIAM. % FINER THAN .002 MM	SED. SUSP. FALL DIAM. % FINER THAN .004 MM	SED. SUSP. FALL DIAM. % FINER THAN .008 MM
MAR							
06...	1700	1100	2980	8850	23	31	47
09...	1930	530	1410	2020	18	26	--
AUG							
04...	2030	1450	3240	12700	22	31	42

DATE	SED. SUSP. FALL DIAM. % FINER THAN .016 MM	SED. SUSP. FALL DIAM. % FINER THAN .031 MM	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM	SED. SUSP. SIEVE DIAM. % FINER THAN .125 MM	SED. SUSP. SIEVE DIAM. % FINER THAN .250 MM	SED. SUSP. SIEVE DIAM. % FINER THAN .500 MM	SED. SUSP. SIEVE DIAM. % FINER THAN 1.00 MM
MAR							
06...	60	76	84	87	94	98	100
09...	53	--	87	92	97	100	--
AUG							
04...	60	66	79	87	94	100	--

16212800 KIPAPA STREAM NEAR WAHIAWA--Continued

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

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	.70	4	.00	1.2	6	.02	.38	3	.00
2	.70	4	.00	1.0	5	.01	.41	3	.00
3	1.2	5	.02	.96	5	.01	.41	3	.00
4	.89	4	.00	.82	4	.00	.41	3	.00
5	.76	5	.01	.76	3	.00	3.0	15	.12
6	.89	5	.01	.70	2	.00	5.7	10	.15
7	.76	4	.00	.76	2	.00	3.1	7	.06
8	8.4	20	.45	2.0	7	.04	1.6	6	.03
9	2.7	10	.07	3.0	6	.05	.76	5	.01
10	1.4	5	.02	1.0	5	.01	.48	7	.00
11	.89	4	.00	7.4	10	.20	.37	7	.00
12	3.6	8	.08	2.1	6	.03	.37	7	.00
13	5.9	30	.48	1.0	6	.02	.41	7	.00
14	23	50	3.1	.76	5	.01	46	128	34
15	3.4	10	.09	1.6	7	.03	11	65	1.9
16	2.7	8	.06	13	20	.70	3.8	20	.21
17	7.8	15	.32	3.0	10	.08	1.8	12	.06
18	21	40	2.3	1.1	7	.02	1.1	10	.03
19	3.6	10	.10	1.1	8	.02	.89	5	.01
20	2.2	6	.04	1.7	8	.04	.82	4	.00
21	2.1	5	.03	.70	5	.00	1.1	6	.02
22	1.5	5	.02	.54	6	.00	12	80	2.6
23	.96	4	.01	.49	5	.00	19	50	2.6
24	1.0	5	.01	.45	5	.00	17	20	.92
25	93	205	76	.45	5	.00	20	25	1.4
26	9.9	20	.53	.45	5	.00	6.2	11	.18
27	4.3	10	.12	1.9	10	.05	3.4	7	.06
28	3.0	9	.07	.96	7	.02	2.1	6	.03
29	2.1	8	.05	.70	3	.00	1.6	6	.03
30	1.8	7	.03	.45	3	.00	1.3	5	.02
31	1.5	6	.02	---	---	---	1.1	5	.01
TOTAL	213.65	---	84.04	52.05	---	1.36	167.61	---	44.45
		JANUARY			FEBRUARY			MARCH	
1	1.0	4	.01	1.5	6	.02	.89	4	.00
2	.96	3	.00	1.0	6	.02	4.0	20	.22
3	1.3	8	.03	.82	5	.01	2.4	10	.06
4	1.8	6	.03	.70	5	.00	1.4	4	.02
5	1.0	3	.00	6.2	16	.27	3.3	6	.05
6	.76	3	.00	2.4	9	.06	97	562	583
7	.70	3	.00	.96	7	.02	23	100	6.2
8	.70	3	.00	1.3	11	.04	7.4	10	.20
9	2.3	10	.06	4.3	17	.20	73	250	249
10	.89	7	.02	1.5	9	.04	26	180	13
11	.59	5	.00	8.5	20	.46	5.6	10	.15
12	.54	3	.00	4.6	8	.10	3.8	5	.05
13	.54	3	.00	1.6	7	.03	2.5	3	.02
14	.49	3	.00	.96	6	.02	2.0	3	.02
15	.54	4	.00	.70	6	.01	1.6	3	.01
16	.54	6	.00	.64	6	.01	1.5	2	.00
17	.59	6	.00	.59	5	.00	1.1	2	.00
18	.59	4	.00	.54	4	.00	1.0	2	.00
19	.41	4	.00	.54	3	.00	1.1	2	.00
20	.37	3	.00	32	77	15	.96	2	.00
21	.33	5	.00	7.7	20	.42	.89	2	.00
22	.22	5	.00	15	20	.81	.82	2	.00
23	.30	5	.00	5.1	10	.14	.76	5	.01
24	.45	7	.00	9.7	10	.26	.96	2	.00
25	.45	6	.00	3.8	7	.07	2.2	2	.01
26	.30	5	.00	2.1	6	.03	1.8	2	.00
27	67	150	55	1.4	6	.02	3.5	2	.02
28	49	40	5.3	1.1	5	.01	5.1	3	.04
29	14	15	.57	---	---	---	2.1	3	.02
30	4.3	8	.09	---	---	---	18	25	1.2
31	2.2	7	.04	---	---	---	11	15	.45
TOTAL	155.16	---	61.15	117.25	---	18.07	306.68	---	853.75

16212800 KIPAPA STREAM NEAR WAHIAWA--Continued

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

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	4.3	15	.17	53	50	7.2	1.0	2	.00
2	39	75	7.9	8.4	8	.18	.89	2	.00
3	8.4	5	.11	8.0	6	.13	.76	2	.00
4	3.9	3	.03	3.4	4	.04	.82	2	.00
5	4.1	4	.04	3.6	4	.04	.82	2	.00
6	8.2	12	.27	3.9	5	.05	6.0	5	.08
7	29	89	48	162	130	65	2.9	4	.03
8	60	168	66	36	20	1.9	1.7	3	.01
9	6.5	18	.32	9.8	6	.16	1.5	3	.01
10	3.8	10	.10	19	10	.51	.89	3	.00
11	2.9	8	.06	5.7	6	.09	2.4	4	.03
12	2.4	10	.06	3.9	4	.04	2.7	3	.02
13	49	60	7.9	3.6	2	.02	2.1	3	.02
14	70	169	77	3.4	2	.02	1.3	2	.00
15	14	25	.95	2.9	2	.02	1.2	3	.00
16	21	20	1.1	2.4	2	.01	.96	3	.00
17	5.1	8	.11	3.8	3	.03	.54	2	.00
18	3.4	6	.06	3.8	2	.02	.41	2	.00
19	2.9	5	.04	4.3	2	.02	.30	2	.00
20	2.4	5	.03	9.0	5	.12	.27	2	.00
21	2.2	3	.02	3.6	4	.04	.27	2	.00
22	1.7	3	.01	2.0	4	.02	.41	2	.00
23	1.5	3	.01	1.7	3	.01	.37	2	.00
24	4.1	8	.09	1.5	3	.01	.30	2	.00
25	2.4	6	.04	1.3	3	.01	.32	5	.00
26	1.4	5	.02	1.8	2	.00	.34	3	.00
27	1.3	5	.02	1.5	2	.00	1.6	9	.04
28	1.1	5	.01	1.1	2	.00	2.0	3	.02
29	27	50	3.6	2.5	2	.01	.82	2	.00
30	90	140	87	1.2	2	.00	.70	2	.00
31	---	---	---	.96	2	.00	---	---	---
TOTAL	473.0	---	301.07	369.06	---	75.70	36.59	---	0.26
		JULY			AUGUST			SEPTEMBER	
1	.54	2	.00	2.2	5	.03	3.8	6	.06
2	.49	2	.00	5.2	4	.06	1.5	4	.02
3	.54	2	.00	2.4	3	.02	5.7	8	.12
4	.96	2	.00	153	463	893	2.9	6	.05
5	.64	2	.00	73	120	24	15	19	1.6
6	.41	2	.00	21	20	1.1	14	50	2.7
7	.33	3	.00	7.0	8	.15	2.5	20	.14
8	5.4	9	.13	3.9	6	.06	1.5	10	.04
9	2.5	6	.04	3.0	4	.03	1.3	8	.03
10	3.2	8	.07	3.6	2	.02	1.0	6	.02
11	1.2	6	.02	13	20	.70	.96	4	.01
12	.70	5	.00	12	18	.58	.96	6	.02
13	.59	4	.00	14	18	.68	2.0	5	.03
14	7.8	20	.42	4.3	10	.12	2.0	5	.03
15	23	30	1.9	2.9	6	.05	1.0	4	.01
16	22	28	1.7	4.5	10	.12	.76	4	.00
17	6.5	12	.21	2.7	3	.02	.64	4	.00
18	6.8	12	.22	18	40	1.9	4.1	7	.29
19	2.5	3	.02	46	123	35	6.8	14	.26
20	1.8	3	.01	6.5	20	.35	1.7	11	.05
21	80	137	70	3.4	10	.09	1.6	7	.03
22	5.7	8	.12	2.4	6	.04	.96	5	.01
23	3.2	5	.04	5.1	8	.11	2.2	6	.04
24	2.5	6	.04	3.9	6	.06	1.4	4	.02
25	21	19	1.7	2.9	5	.04	.76	3	.00
26	2.7	10	.07	2.2	5	.03	.59	3	.00
27	1.6	8	.03	4.2	6	.07	3.6	10	.10
28	19	30	1.5	3.8	6	.06	5.4	8	.12
29	5.9	14	.22	2.4	7	.05	1.3	6	.02
30	2.7	8	.06	2.5	6	.04	.76	5	.01
31	1.6	6	.03	1.5	6	.02	---	---	---
TOTAL	233.80	---	78.55	432.5	---	958.60	88.69	---	5.83
YEAR	2646.04		2482.83						

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 mi² (118.4 km²).

WATER-DISCHARGE RECORDS

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

REVISED RECORDS.--WSP 1639: 1955(M). 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.--28 years (water years, 1953-59, 1961-81), 38.0 ft³/s (1.076 m³/s), 27,530 acre-ft/yr (33.9 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 13,600 ft³/s (385 m³/s) Nov. 28, 1954, gage height, 14.82 ft (4.517 m), site and datum then in use, from rating curve extended above 730 ft³/s (20.7 m³/s) on basis of slope-area measurement of peak flow; no flow for part of Feb. 25, 1978.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,050 ft³/s (29.7 m³/s) Aug. 4, gage height, 4.44 ft (1.353 m), from rating curve extended as explained above, no peak above base of 1,300 ft³/s (36.8 m³/s); minimum, 1.7 ft³/s (0.048 m³/s) July 13, 14.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	11	14	26	29	28	23	24	140	14	5.2	10	9.4
2	13	17	24	28	27	22	41	30	13	5.0	16	8.5
3	9.4	14	23	32	20	25	30	35	13	19	7.5	8.5
4	11	11	23	30	19	21	16	22	12	28	79	11
5	21	8.3	42	29	38	20	17	12	8.7	25	238	24
6	19	10	44	29	33	81	16	15	12	13	38	35
7	5.9	9.7	40	28	31	105	14	269	22	6.4	28	30
8	8.9	14	32	28	39	32	120	108	17	7.7	21	14
9	15	14	24	29	37	65	24	42	9.5	8.3	22	6.0
10	11	15	23	29	32	96	15	75	8.6	8.5	17	4.5
11	18	14	23	28	34	34	21	33	7.9	15	11	5.7
12	36	16	20	28	39	26	32	20	9.3	16	26	9.6
13	37	14	19	25	31	23	58	16	9.0	8.4	21	16
14	39	7.5	95	20	29	24	142	13	16	3.8	18	11
15	19	13	76	20	28	23	29	14	16	19	14	5.8
16	12	18	43	22	27	19	53	24	6.5	35	19	8.3
17	12	21	35	27	28	17	32	30	6.8	28	16	8.5
18	39	12	29	23	28	13	32	21	6.1	18	18	9.8
19	31	8.6	28	20	28	12	25	11	5.1	29	57	16
20	19	8.4	27	19	41	14	17	14	8.1	14	35	19
21	9.8	10	34	22	46	16	10	18	17	89	15	12
22	9.5	10	41	27	48	20	8.3	13	12	22	15	8.7
23	10	9.2	52	26	39	16	7.5	16	8.0	8.9	19	9.3
24	9.6	8.1	64	27	32	9.8	7.5	20	5.6	5.6	15	10
25	109	12	65	23	34	11	11	13	4.8	23	11	13
26	45	14	49	20	27	10	19	12	4.3	24	9.6	15
27	29	45	39	49	22	11	14	13	13	13	8.8	16
28	13	36	32	108	23	15	8.8	9.7	17	13	10	14
29	12	30	31	55	---	17	18	9.1	10	18	15	8.7
30	11	29	29	30	---	20	85	14	5.8	6.8	19	8.3
31	13	---	29	32	---	37	---	19	---	5.9	13	---
TOTAL	658.1	462.8	1161	942	888	877.8	947.1	1100.8	318.1	541.5	861.9	375.6
MEAN	21.2	15.4	37.5	30.4	31.7	28.3	31.6	35.5	10.6	17.5	27.8	12.5
MAX	109	45	95	108	48	105	142	269	22	89	238	35
MIN	5.9	7.5	19	19	19	9.8	7.5	9.1	4.3	3.8	7.5	4.5
AC-FT	1310	918	2300	1870	1760	1740	1880	2180	631	1070	1710	745

CAL YR 1980 TOTAL 20295.5 MEAN 55.5 MAX 2080 MIN 5.9 AC-FT 40260
WTR YR 1981 TOTAL 9134.7 MEAN 25.0 MAX 269 MIN 3.8 AC-FT 18120

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 September 1981 (discontinued).
WATER TEMPERATURES: April 1973 to September 1981 (discontinued).
SUSPENDED SEDIMENT DISCHARGE: July 1972 to current year.

INSTRUMENTATION.--Water-quality monitor since April 1973 to September 1981. Automatic pumping sediment sampler since July 1972.

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

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: Maximum, 796 micromhos/cm Dec. 1, 1980; 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, 8 mg/L Jan. 26, Mar. 5, 1981.
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, 796 micromhos/cm Dec. 1; minimum recorded, 106 micromhos/cm Oct. 25.
WATER TEMPERATURES: Maximum recorded, 28.5°C July 5, 6, Sept. 7, 26; minimum recorded, 19.5°C Dec. 17.
SEDIMENT CONCENTRATIONS: Maximum daily mean, 451 mg/L Mar. 6; minimum daily mean, 8 mg/L Jan. 26, Mar. 5.
SEDIMENT DISCHARGE: Maximum daily, 498 tons (452 tonnes) Aug. 5; minimum daily, 0.30 ton (0.27 tonne) Sept. 10.

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (UMHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)	TUR-BID-ITY (NTU)	OXYGEN, DIS-SOLVED (MG/L)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARD-NESS (MG/L AS CACO3)
OCT										
27...	1100	40	510	7.0	24.5	1.6	7.8	10800	3300	84
NOV										
24...	1100	7.2	480	7.0	22.5	5.0	7.4	9400	860	68
DEC										
29...	0930	30	450	7.0	22.0	1.0	7.8	9000	4200	65
JAN										
26...	0930	22	490	7.4	22.0	1.5	7.7	7000	3400	71
FEB										
24...	0915	30	360	6.5	21.8	6.2	7.6	2000	2700	60
MAR										
30...	0945	12	420	6.9	22.0	3.6	8.1	10000	1700	66
APR										
28...	1000	7.7	480	7.0	22.7	16	6.4	>60000	21000	74
MAY										
19...	0915	9.4	400	6.8	23.0	1.6	6.6	--	--	80
26...	1055	14	460	6.9	23.5	--	--	>60000	>100000	--
JUN										
23...	0945	6.6	495	6.8	23.0	18	5.3	--	20000	78
JUL										
21...	0910	732	75	6.8	23.0	110	8.2	26000	430000	12
AUG										
24...	0915	13	500	6.6	25.6	3.0	5.3	--	--	93
31...	0915	--	--	--	--	--	--	22000	9300	--
SEP										
22...	1030	7.0	500	6.8	23.7	26	2.1	>120000	>200000	85

> Actual value is known to be greater than the value shown.

16213000 WAIKELE STREAM AT WAIPAHU--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	HARDNESS NONCARBONATE (MG/L AS CACO3)	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	PERCENT SODIUM	SODIUM ADSORPTION RATIO	POTASSIUM, DISSOLVED (MG/L AS K)	ALKALINITY LAB (MG/L AS CACO3)	SULFATE DISSOLVED (MG/L AS SO4)
OCT 27	36	14	12	63	61	3.0	3.6	48	25
NOV 24	11	12	9.3	64	65	3.4	4.3	57	22
DEC 29	8	11	9.2	56	64	2.9	3.2	57	26
JAN 26	---	12	10	67	66	3.5	3.9	51	24
FEB 24	---	11	7.9	47	61	2.6	3.2	34	21
MAR 30	20	11	9.4	60	65	3.2	3.1	46	24
APR 28	17	13	10	62	63	3.1	3.6	57	27
MAY 19	28	17	9.0	52	57	2.5	3.5	52	24
26	--	--	--	--	--	--	--	--	--
JUN 23	12	13	11	66	63	3.3	4.1	66	27
JUL 21	.00	2.3	1.6	10	59	1.2	2.1	13	3.2
AUG 24	48	16	13	69	60	3.1	4.2	45	27
31	--	--	--	--	--	--	--	--	--
SEP 22	6.0	16	11	64	60	3.0	4.9	79	10

DATE	CHLORIDE, DISSOLVED (MG/L AS CL)	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)	SOLIDS, DISSOLVED (TONS PER AC-FT)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N)	NITROGEN, AMMONIA TOTAL (MG/L AS N)	NITROGEN, AMMONIA DISSOLVED (MG/L AS N)
OCT 27	110	.2	51	311	316	.42	2.0	1.9	.190	.170
NOV 24	86	.1	62	309	294	.42	.16	--	.020	--
DEC 29	82	.2	60	284	297	.39	3.4	3.4	.070	.090
JAN 26	89	.2	63	318	321	.43	4.0	4.0	.180	.050
FEB 24	64	.2	43	235	233	.32	3.6	3.5	.050	.050
MAR 30	81	.2	56	287	283	.39	2.4	2.4	.110	.080
APR 28	86	.2	59	317	307	.43	2.8	2.8	.080	.120
MAY 19	80	.1	50	275	276	.37	1.8	1.9	.080	.100
26	---	--	--	--	--	--	--	--	--	--
JUN 23	97	.1	66	346	332	.47	1.8	1.8	.090	.110
JUL 21	12	.1	8.3	--	49	.11	.25	.27	.200	.220
AUG 24	120	.1	60	345	349	.47	3.2	2.8	.070	.070
31	--	--	--	--	--	--	--	--	--	--
SEP 22	95	.2	63	321	316	.44	.91	.94	.200	.150

16213000 WAIKELE STREAM AT WAIPAHU--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC DIS-SOLVED (MG/L AS N)	NITRO-GEN DIS-SOLVED (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, NH4 + ORG. SUSP. TOTAL (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC DIS. (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS N)	PHOS-PHORUS, TOTAL (MG/L AS P)	PHOS-PHORUS, DIS-SOLVED (MG/L AS P)
OCT 27...	.91	.93	3.0	1.10	.00	1.1	3.1	.910	.910
NOV 24...	.35	--	--	.37	--	--	.53	.040	--
DEC 29...	.63	.51	4.0	.70	.10	.60	4.1	1.40	1.40
JAN 26...	.82	.84	4.9	1.00	.11	.89	5.0	2.20	.030
FEB 24...	.94	.90	4.5	.99	.04	.95	4.6	1.50	1.70
MAR 30...	1.3	.92	3.4	1.40	.40	1.0	3.8	.960	.940
APR 28...	1.6	.88	3.8	1.70	.70	1.0	4.5	1.50	1.50
MAY 19...	.92	1.0	3.0	1.00	.00	1.1	2.8	.900	.840
26...	--	--	--	--	--	--	--	--	--
JUN 23...	.50	.58	2.8	.59	.00	.69	2.4	1.50	1.30
JUL 21...	2.1	.39	.88	2.30	1.7	.61	2.6	.530	.220
AUG 24...	1.3	.82	3.7	1.40	.51	.89	4.6	1.30	1.30
31...	--	--	--	--	--	--	--	--	--
SEP 22...	.80	.38	1.5	1.00	.47	.53	1.9	1.30	1.10

DATE	TIME	ARSENIC TOTAL (UG/L AS AS)	ARSENIC SUS-PENDED TOTAL (UG/L AS AS)	ARSENIC DIS-SOLVED (UG/L AS AS)	BARIUM, TOTAL RECOV-ERABLE (UG/L AS BA)	BARIUM, SUS-PENDED RECOV-ERABLE (UG/L AS BA)	BARIUM, DIS-SOLVED (UG/L AS BA)	CADMIUM TOTAL RECOV-ERABLE (UG/L AS CD)	CADMIUM DIS-SOLVED (UG/L AS CD)	CHRO-MIUM, TOTAL RECOV-ERABLE (UG/L AS CR)	CHRO-MIUM, SUS-PENDED RECOV. (UG/L AS CR)
NOV 24...	1100	2	2	0	10	0	10	4	<1	0	0
FEB 24...	0915	2	2	0	100	90	10	<1	<1	10	10
MAY 19...	0915	1	0	1	100	80	20	0	<1	10	0
AUG 24...	0915	0	0	0	10	0	10	0	<1	10	10

DATE	CHRO-MIUM, DIS-SOLVED (UG/L AS CR)	COBALT, TOTAL RECOV-ERABLE (UG/L AS CO)	COBALT, DIS-SOLVED (UG/L AS CO)	COPPER, TOTAL RECOV-ERABLE (UG/L AS CU)	COPPER, SUS-PENDED RECOV-ERABLE (UG/L AS CU)	COPPER, DIS-SOLVED (UG/L AS CU)	IRON, TOTAL RECOV-ERABLE (UG/L AS FE)	IRON, SUS-PENDED RECOV-ERABLE (UG/L AS FE)	IRON, DIS-SOLVED (UG/L AS FE)	LEAD, TOTAL RECOV-ERABLE (UG/L AS PB)
NOV 24...	0	3	<3	5	0	5	760	730	30	6
FEB 24...	0	<3	<3	7	1	6	670	510	160	3
MAY 19...	10	1	<3	8	3	5	1700	1600	60	6
AUG 24...	0	2	<3	8	3	5	690	660	34	11

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

16213000 WAIKELE STREAM AT WAIPAHU--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	LEAD, SUS-PENDED RECOV-ERABLE (UG/L AS PB)	LEAD, DIS-SOLVED (UG/L AS PB)	MANGA-NESE, TOTAL RECOV-ERABLE (UG/L AS MN)	MANGA-NESE, SUS-PENDED RECOV. (UG/L AS MN)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)	MERCURY TOTAL RECOV-ERABLE (UG/L AS HG)	MERCURY SUS-PENDED RECOV-ERABLE (UG/L AS HG)	MERCURY DIS-SOLVED (UG/L AS HG)	NICKEL, TOTAL RECOV-ERABLE (UG/L AS NI)	NICKEL, SUS-PENDED RECOV-ERABLE (UG/L AS NI)
NOV 24...	5	1	70	10	60	.2	.2	.0	4	1
FEB 24...	2	1	60	10	50	.1	.0	.1	2	2
MAY 19...	2	4	190	50	140	.2	.2	.0	6	2
AUG 24...	11	0	190	20	170	.0	.0	.0	3	2

DATE	NICKEL, DIS-SOLVED (UG/L AS NI)	SELE-NIUM, TOTAL (UG/L AS SE)	SELE-NIUM, SUS-PENDED TOTAL (UG/L AS SE)	SELE-NIUM, DIS-SOLVED (UG/L AS SE)	SILVER, TOTAL RECOV-ERABLE (UG/L AS AG)	SILVER, SUS-PENDED RECOV-ERABLE (UG/L AS AG)	SILVER, DIS-SOLVED (UG/L AS AG)	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN)	ZINC, SUS-PENDED RECOV-ERABLE (UG/L AS ZN)	ZINC, DIS-SOLVED (UG/L AS ZN)
NOV 24...	3	1	0	1	0	0	0	10	7	3
FEB 24...	0	1	0	1	0	0	0	10	3	7
MAY 19...	4	1	0	1	1	1	0	20	0	20
AUG 24...	1	2	1	1	0	0	0	50	--	<3

DATE	TIME	CARBON, ORGANIC TOTAL (MG/L AS C)	CARBON, ORGANIC DIS-SOLVED (MG/L AS C)	CARBON, ORGANIC SUS-PENDED TOTAL (MG/L AS C)
OCT 27...	1100	3.7	--	--
NOV 24...	1100	--	1.4	--
DEC 29...	0930	8.4	--	--
JAN 26...	0930	3.4	--	--
FEB 24...	0915	--	3.2	.4
MAR 30...	0945	2.3	--	--
APR 28...	1000	5.4	--	--
MAY 19...	0915	--	6.9	1.7
JUN 23...	0945	4.3	--	--
JUL 21...	0910	16	--	--
AUG 24...	0915	--	2.4	.1
SEP 22...	1030	4.4	--	--

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

16213000 WAIKELE STREAM AT WAIPAHU--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

DATE	TIME	AROCLOR 1254 PCB TOTAL (UG/L)	PCB, TOTAL (UG/L)	ALDRIN, TOTAL (UG/L)	CHLORDANE, TOTAL (UG/L)	DDD, TOTAL (UG/L)	DDE, TOTAL (UG/L)	DDT, TOTAL (UG/L)	DIAZINON, TOTAL (UG/L)	DIELDRIN TOTAL (UG/L)	ENDRIN, TOTAL (UG/L)
DEC 10...	1030	--	ND	ND	ND	ND	ND	ND	ND	ND	ND
FEB 19...	0930	--	ND	ND	ND	ND	ND	ND	ND	ND	ND
MAY 27...	0915	.1	--	ND	ND	ND	ND	ND	ND	ND	ND
AUG 25...	1030	--	ND	ND	ND	ND	ND	ND	ND	ND	ND

DATE	ETHION, TOTAL (UG/L)	HEPTACHLOR, TOTAL (UG/L)	HEPTACHLOR EPOXIDE TOTAL (UG/L)	LINDANE TOTAL (UG/L)	MALATHION, TOTAL (UG/L)	METHOXYCHLOR, TOTAL (UG/L)	METHYL PARATHION, TOTAL (UG/L)	METHYL TRITHION, TOTAL (UG/L)	PARATHION, TOTAL (UG/L)	TOXAPHENE, TOTAL (UG/L)	TOTAL TRITHION (UG/L)
DEC 10...	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
FEB 19...	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MAY 27...	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
AUG 25...	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	TIME	PCB, TOTAL (UG/L)	ALDRIN, TOTAL (UG/L)	CHLORDANE, TOTAL (UG/L)	DDD, TOTAL (UG/L)	DDE, TOTAL (UG/L)	DDT, TOTAL (UG/L)	DIAZINON, TOTAL (UG/L)	DIELDRIN TOTAL (UG/L)	ENDRIN, TOTAL (UG/L)	ETHION, TOTAL (UG/L)
NOV 24...	1100	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

DATE	HEPTACHLOR, TOTAL (UG/L)	HEPTACHLOR EPOXIDE TOTAL (UG/L)	LINDANE TOTAL (UG/L)	MALATHION, TOTAL (UG/L)	METHOXYCHLOR, TOTAL (UG/L)	METHYL PARATHION, TOTAL (UG/L)	METHYL TRITHION, TOTAL (UG/L)	PARATHION, TOTAL (UG/L)	TOXAPHENE, TOTAL (UG/L)	TOTAL TRITHION (UG/L)
NOV 24...	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

ND Material specifically analyzed for but not detected.

16213000 WAIKELE STREAM AT WAIPAHU--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	TIME	PHYTOPLANKTON, TOTAL (CELLS PER ML)
OCT		
27...	1100	39
NOV		
24...	1100	530
DEC		
29...	0930	600
JAN		
26...	0930	39
FEB		
24...	0915	39
MAR		
30...	0945	90
APR		
28...	1000	64
MAY		
19...	0915	740
JUN		
23...	0945	3700
JUL		
21...	0910	7300
AUG		
24...	0915	8800
SEP		
22...	1030	0

DATE	TIME	STREAMFLOW, INSTANTANEOUS (CFS)	SEDIMENT, SUSPENDED (MG/L)	SEDIMENT, DISCHARGE, SUSPENDED (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
OCT					
27...	1100	40	16	1.7	100
NOV					
24...	1100	7.2	11	.21	100
DEC					
29...	0930	30	9	.73	100
JAN					
26...	0930	22	6	.36	100
FEB					
24...	0915	30	11	.89	100
MAR					
30...	0945	12	9	.29	100
APR					
28...	1000	7.7	24	.50	100
MAY					
19...	0915	9.4	34	.86	100
JUN					
23...	0945	6.6	29	.52	100
JUL					
21...	0910	732	245	484	100
AUG					
24...	0915	13	8	.28	100

DATE	TIME	STREAMFLOW, INSTANTANEOUS (CFS)	SEDIMENT, SUSPENDED (MG/L)	SEDIMENT, DISCHARGE, SUSPENDED (T/DAY)	SED. SUSP. FALL DIAM. % FINER THAN .002 MM	SED. SUSP. FALL DIAM. % FINER THAN .004 MM	SED. SUSP. FALL DIAM. % FINER THAN .008 MM	SED. SUSP. FALL DIAM. % FINER THAN .016 MM	SED. SUSP. FALL DIAM. % FINER THAN .031 MM	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM	SED. SUSP. SIEVE DIAM. % FINER THAN .125 MM
MAR											
06...	2100	390	2280	2400	34	49	66	82	93	99	100
10...	0030	420	1170	1330	33	52	--	88	--	98	100

DATE	TIME	STREAMFLOW, INSTANTANEOUS (CFS)	SEDIMENT, SUSPENDED (MG/L)	SEDIMENT, DISCHARGE, SUSPENDED (T/DAY)	SED. SUSP. FALL DIAM. % FINER THAN .002 MM	SED. SUSP. FALL DIAM. % FINER THAN .004 MM	SED. SUSP. FALL DIAM. % FINER THAN .008 MM	SED. SUSP. FALL DIAM. % FINER THAN .016 MM	SED. SUSP. FALL DIAM. % FINER THAN .031 MM	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM	SED. SUSP. SIEVE DIAM. % FINER THAN .125 MM	SED. SUSP. SIEVE DIAM. % FINER THAN .250 MM
AUG												
04...	2230	902	1970	4800	26	40	52	69	84	92	96	100

16213000 WAIKELE STREAM AT WAIPAHU--Continued

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	483	470	476	533	485	509	796	610	658	467	451	460
2	480	469	475	503	485	492	634	574	609	470	460	466
3	482	471	476	505	475	492	571	516	536	472	456	465
4	499	475	483	524	487	503	551	522	534	459	441	449
5	503	481	494	504	486	494	536	403	498	470	453	461
6	475	402	420	492	478	486	453	401	437	---	---	---
7	462	422	442	498	483	490	495	455	474	---	---	---
8	473	457	465	525	481	496	505	455	488	---	---	---
9	471	394	424	538	509	519	453	428	438	---	---	---
10	443	411	426	524	496	510	451	445	449	---	---	---
11	631	444	480	498	463	478	466	456	461	---	---	---
12	650	551	598	470	408	430	470	460	467	---	---	---
13	575	521	545	454	427	439	474	468	471	---	---	---
14	538	231	362	463	449	455	470	134	332	---	---	---
15	595	257	340	548	463	490	256	154	216	484	472	479
16	586	400	452	548	488	515	331	262	310	483	472	479
17	---	---	---	486	390	421	403	332	357	477	466	473
18	---	---	---	434	414	421	442	402	415	479	467	473
19	---	---	---	465	437	451	455	426	441	482	474	479
20	---	---	---	479	459	468	463	442	455	484	474	480
21	---	---	---	479	458	466	465	444	457	486	473	482
22	---	---	---	464	449	458	442	360	392	498	486	492
23	---	---	---	476	458	465	361	300	323	491	482	486
24	467	452	459	482	466	475	322	261	281	507	473	489
25	469	106	239	483	465	474	289	243	267	507	465	483
26	342	171	249	529	472	484	322	264	293	487	481	483
27	540	344	441	648	520	563	388	323	346	488	268	430
28	441	410	424	628	455	560	432	390	408	239	176	202
29	446	424	436	626	601	616	445	424	434	285	176	231
30	451	432	442	626	613	619	453	437	446	387	281	330
31	524	444	476	---	---	---	462	447	455	428	358	394
MONTH	650	106	439	648	390	491	796	134	424	507	176	439
		FEBRUARY			MARCH			APRIL			MAY	
1	433	353	400	510	481	496	358	280	325	---	---	---
2	439	435	437	513	483	500	380	187	288	291	180	239
3	471	453	465	518	469	493	300	210	263	388	299	340
4	478	440	472	488	463	475	373	301	342	438	366	400
5	481	291	395	511	470	478	427	373	402	421	388	405
6	445	324	363	---	---	---	458	421	434	428	418	423
7	493	428	468	---	---	---	447	390	405	---	---	---
8	496	426	466	362	289	334	---	---	---	---	---	---
9	482	416	457	---	---	---	311	196	251	451	357	398
10	482	439	461	---	---	---	375	315	345	---	---	---
11	481	460	471	372	276	321	423	376	392	606	513	555
12	468	423	447	429	374	398	490	427	465	553	509	541
13	480	445	464	463	423	436	499	159	367	554	511	530
14	504	472	486	524	452	478	---	---	---	531	501	511
15	515	496	506	517	470	489	325	196	259	507	479	489
16	531	511	520	524	476	490	313	163	215	---	---	---
17	521	500	511	534	486	508	403	200	291	---	---	---
18	527	512	520	497	488	493	494	404	448	---	---	---
19	532	524	529	495	485	491	504	414	468	---	---	---
20	538	465	523	496	489	493	518	437	478	---	---	---
21	441	329	378	502	483	493	459	440	448	---	---	---
22	434	314	374	542	500	512	476	441	461	---	---	---
23	361	316	338	551	517	538	458	440	451	---	---	---
24	377	352	368	516	484	500	467	446	460	---	---	---
25	432	349	377	502	483	494	470	431	456	---	---	---
26	465	426	448	498	482	492	498	418	439	---	---	---
27	476	460	466	494	479	488	513	468	492	---	---	---
28	496	474	486	491	459	476	481	457	474	---	---	---
29	---	---	---	465	439	448	508	415	482	---	---	---
30	---	---	---	456	405	447	---	---	---	---	---	---
31	---	---	---	389	245	294	---	---	---	---	---	---
MONTH	538	291	450	551	245	465	518	159	393	606	180	439

16213000 WAIKELE STREAM AT WAIPAHU--Continued

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	---	---	---	494	483	487	612	447	482	527	461	498
2	---	---	---	495	482	488	628	486	574	472	441	452
3	---	---	---	727	483	580	594	496	523	465	432	445
4	---	---	---	723	704	714	---	---	---	479	412	449
5	---	---	---	721	537	657	---	---	---	512	323	414
6	---	---	---	698	486	589	275	151	217	646	301	477
7	---	---	---	487	474	479	310	220	249	671	482	606
8	---	---	---	481	474	477	484	312	381	625	486	551
9	---	---	---	499	479	488	551	458	493	493	470	481
10	---	---	---	484	462	471	554	456	510	487	467	479
11	---	---	---	601	454	505	465	436	444	495	467	481
12	---	---	---	593	485	553	434	262	321	641	462	505
13	---	---	---	604	493	551	330	252	285	681	583	635
14	---	---	---	501	479	488	340	252	303	672	510	610
15	---	---	---	---	---	---	430	343	388	507	478	491
16	---	---	---	308	152	258	571	432	460	503	480	491
17	---	---	---	297	154	220	594	407	497	509	482	496
18	---	---	---	535	303	372	424	304	387	542	501	517
19	---	---	---	546	357	467	---	---	---	539	454	510
20	---	---	---	489	354	409	257	118	183	637	493	575
21	---	---	---	---	---	---	353	261	312	649	468	568
22	---	---	---	---	---	---	577	353	414	507	469	494
23	---	---	---	---	---	---	621	452	548	507	488	499
24	---	---	---	---	---	---	592	428	513	517	495	508
25	477	449	463	460	226	385	466	430	453	535	501	523
26	484	474	478	499	358	425	464	441	449	655	502	552
27	555	451	479	521	442	487	467	436	448	697	525	618
28	616	486	560	452	320	417	476	438	446	694	504	607
29	617	483	551	376	284	324	544	430	458	513	427	457
30	492	483	490	413	342	377	615	504	563	483	448	462
31	---	---	---	445	408	423	581	498	539	---	---	---
MONTH	617	449	504	727	152	465	628	118	423	697	301	515
YEAR	796	106	452									

NOTE.--NUMBER OF MISSING DAYS OF RECORD EXCEEDED 20% OF YEAR.

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

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

16213000 WAIKELE STREAM AT WAIPAHU--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	22.5	21.5	22.0	23.0	21.5	22.0	24.0	21.5	22.5	---	---	---
2	22.0	21.5	21.5	23.0	21.5	22.0	23.0	21.5	22.5	23.0	20.0	21.5
3	22.5	21.5	22.0	23.0	21.5	22.0	24.0	21.0	22.5	24.5	21.5	23.0
4	23.0	21.0	22.0	23.0	21.5	22.0	24.0	22.0	22.5	24.5	22.5	23.5
5	22.0	21.0	21.5	23.0	21.5	22.0	24.0	22.0	23.0	24.0	21.5	22.5
6	21.5	20.0	20.5	---	---	---	23.0	22.0	22.5	23.0	22.0	22.5
7	22.0	20.5	21.0	---	---	---	23.0	21.5	22.5	---	---	---
8	22.0	20.5	21.5	23.5	21.0	22.0	---	---	---	---	---	---
9	21.5	20.0	21.0	---	---	---	22.5	20.5	21.5	25.5	21.0	23.0
10	22.0	20.5	21.0	---	---	---	22.5	21.5	22.0	---	---	---
11	22.5	21.5	22.0	23.0	21.0	22.0	23.5	21.0	22.5	25.0	23.0	23.5
12	22.5	21.5	22.0	23.0	21.5	22.0	24.5	23.5	24.0	24.5	22.5	23.5
13	23.0	22.0	22.5	23.5	21.5	22.5	24.0	21.5	23.0	25.5	22.5	23.5
14	23.0	22.0	22.5	24.5	22.0	23.0	---	---	---	25.5	22.5	23.5
15	23.0	21.5	22.5	23.0	22.0	22.5	24.5	21.0	22.5	25.5	22.5	23.5
16	23.0	22.0	22.5	24.0	22.5	23.0	23.5	21.0	22.5	---	---	---
17	23.0	21.5	22.0	23.5	22.0	22.5	25.0	21.0	23.0	---	---	---
18	23.0	21.5	22.0	23.0	21.0	22.0	25.5	23.5	24.0	---	---	---
19	22.5	21.5	22.0	23.0	21.5	22.0	25.0	23.5	24.5	---	---	---
20	23.5	21.5	22.0	23.0	21.0	22.0	25.0	22.5	24.0	---	---	---
21	22.5	21.5	22.0	23.5	21.5	22.5	23.0	22.0	22.5	---	---	---
22	23.0	21.5	22.5	24.5	22.0	23.5	24.5	21.5	23.0	---	---	---
23	23.0	21.5	22.0	24.0	22.5	23.5	24.5	22.0	23.0	---	---	---
24	23.5	21.5	22.5	24.0	22.0	23.0	25.0	22.5	23.0	---	---	---
25	23.0	21.5	22.0	24.0	22.0	23.0	24.5	22.0	23.0	---	---	---
26	22.5	21.5	22.0	24.0	22.0	22.5	25.0	22.0	23.0	---	---	---
27	22.5	21.0	21.5	23.5	22.0	22.5	23.5	22.0	23.0	---	---	---
28	23.0	21.0	22.0	24.5	22.0	23.0	24.0	22.0	23.0	---	---	---
29	---	---	---	23.0	22.0	22.5	24.0	22.0	23.0	---	---	---
30	---	---	---	23.5	22.0	23.0	---	---	---	---	---	---
31	---	---	---	23.0	21.5	22.0	---	---	---	---	---	---
MONTH	23.5	20.0	22.0	24.5	21.0	22.5	25.5	20.5	23.0	25.5	20.0	23.0
		JUNE			JULY			AUGUST			SEPTEMBER	
1	---	---	---	25.0	22.5	23.5	27.5	23.0	24.5	26.0	23.5	25.0
2	---	---	---	25.0	22.5	23.5	26.5	23.0	25.5	25.5	23.0	24.0
3	---	---	---	28.0	22.5	25.5	25.0	23.0	24.5	24.5	23.5	24.0
4	---	---	---	28.0	27.0	27.5	---	---	---	26.0	24.0	25.0
5	---	---	---	28.5	25.0	27.0	---	---	---	28.0	23.5	25.5
6	---	---	---	28.5	23.5	26.5	24.5	20.0	23.0	28.0	24.0	25.5
7	---	---	---	24.0	22.5	23.0	26.5	23.5	25.0	28.5	26.0	27.0
8	---	---	---	24.5	22.5	23.5	27.0	23.5	25.5	26.5	23.5	25.0
9	---	---	---	25.0	22.5	23.5	26.5	25.0	25.5	25.0	23.0	24.0
10	---	---	---	25.0	23.0	23.5	26.5	24.0	25.5	25.5	22.5	24.0
11	---	---	---	27.5	23.0	25.0	26.0	23.5	24.5	25.0	22.5	23.5
12	---	---	---	26.0	25.0	25.5	26.5	24.5	25.5	28.0	23.0	25.0
13	---	---	---	26.0	23.5	25.0	27.0	24.0	25.5	27.0	25.0	26.0
14	---	---	---	25.0	23.0	23.5	25.5	24.0	24.5	26.5	23.5	26.0
15	---	---	---	---	---	---	25.5	23.0	24.5	25.0	23.0	24.0
16	---	---	---	25.0	23.5	24.0	26.5	23.5	24.5	25.0	23.0	24.0
17	---	---	---	23.5	22.5	23.0	26.5	24.0	25.5	25.0	23.0	24.0
18	---	---	---	27.5	22.5	24.5	27.0	23.0	24.5	25.0	23.0	24.5
19	---	---	---	26.5	24.0	25.0	---	---	---	28.0	24.0	25.5
20	---	---	---	25.5	24.0	25.0	25.5	22.5	24.0	28.0	25.5	27.0
21	---	---	---	---	---	---	25.5	23.0	24.0	27.5	24.0	26.0
22	---	---	---	26.0	23.5	24.5	26.5	23.0	24.5	25.0	23.5	24.0
23	---	---	---	26.0	23.5	24.5	26.5	25.5	26.0	25.5	23.5	24.5
24	---	---	---	24.0	23.5	23.5	26.0	24.5	25.5	25.0	24.0	24.5
25	25.0	22.5	23.5	27.5	23.5	25.0	25.0	23.5	24.0	25.0	24.0	24.5
26	24.0	22.5	23.0	26.5	25.0	26.0	25.5	23.0	24.0	28.5	24.5	26.0
27	25.5	23.0	24.0	26.5	24.0	25.5	25.5	23.0	24.0	28.0	25.0	26.5
28	26.5	24.0	25.5	26.5	23.5	24.5	26.0	23.5	25.0	27.0	24.5	26.0
29	26.0	23.5	25.5	26.0	23.5	25.0	27.0	23.5	25.0	25.0	23.5	24.0
30	25.5	23.0	24.0	25.5	23.0	24.5	27.0	25.5	26.0	24.5	23.0	23.5
31	---	---	---	25.5	23.0	24.0	26.0	24.5	25.0	---	---	---
MONTH	26.5	22.5	24.5	28.5	22.5	24.5	27.5	20.0	25.0	28.5	22.5	25.0
YEAR	28.5	19.5	23.0									

16213000 WAIKELE STREAM AT WAIPAHU--Continued

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

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	11	18	.53	14	15	.57	26	12	.84
2	13	20	.70	17	15	.69	24	13	.84
3	9.4	17	.43	14	18	.68	23	12	.75
4	11	17	.50	11	18	.53	23	12	.75
5	21	60	3.4	8.3	17	.38	42	97	15
6	19	45	2.3	10	16	.43	44	100	12
7	5.9	20	.32	9.7	16	.42	40	40	4.3
8	8.9	20	.48	14	16	.60	32	22	1.9
9	15	22	.89	14	16	.60	24	18	1.2
10	11	18	.53	15	20	.81	23	15	.93
11	18	15	.73	14	20	.76	23	10	.62
12	36	17	1.7	16	18	.78	20	11	.59
13	37	30	3.0	14	17	.64	19	13	.67
14	39	80	8.4	7.5	16	.32	95	107	43
15	19	30	1.5	13	20	.70	76	90	18
16	12	18	.58	18	35	1.7	43	25	2.9
17	12	19	.62	21	40	2.3	35	20	1.9
18	39	40	4.2	12	22	.71	29	16	1.3
19	31	26	2.2	8.6	18	.42	28	12	.91
20	19	26	1.3	8.4	18	.41	27	12	.87
21	9.8	27	.71	10	17	.46	34	20	1.8
22	9.5	20	.51	10	15	.41	41	25	2.8
23	10	16	.43	9.2	15	.37	52	30	4.2
24	9.6	14	.36	8.1	15	.33	64	35	6.0
25	109	102	40	12	16	.52	65	24	4.2
26	45	45	5.5	14	17	.64	49	20	2.6
27	29	35	2.7	45	74	17	39	18	1.9
28	13	30	1.1	36	35	3.4	32	15	1.3
29	12	20	.65	30	17	1.4	31	13	1.1
30	11	16	.48	29	13	1.0	29	11	.86
31	13	16	.56	---	---	---	29	11	.86
TOTAL	658.1	---	87.31	462.8	---	39.98	1161	---	136.89
		JANUARY			FEBRUARY			MARCH	
1	29	12	.94	28	18	1.4	23	11	.68
2	28	11	.83	27	12	.87	22	11	.65
3	32	16	1.4	20	12	.65	25	12	.81
4	30	14	1.1	19	11	.56	21	10	.57
5	29	11	.86	38	35	3.6	20	8	.43
6	29	11	.86	33	25	2.2	81	451	369
7	28	10	.76	31	11	.92	105	331	161
8	28	11	.83	39	12	1.3	32	38	3.3
9	29	12	.94	37	11	1.1	65	221	192
10	29	11	.86	32	12	1.0	96	335	170
11	28	10	.76	34	15	1.4	34	42	3.9
12	28	11	.83	39	20	2.1	26	26	1.8
13	25	12	.81	31	14	1.2	23	21	1.3
14	20	13	.70	29	16	1.3	24	24	1.6
15	20	12	.65	28	16	1.2	23	23	1.4
16	22	11	.65	27	14	1.0	19	15	.77
17	27	10	.73	28	12	.91	17	20	.92
18	23	10	.62	28	11	.83	13	18	.63
19	20	10	.54	28	10	.76	12	14	.45
20	19	10	.51	41	35	3.9	14	16	.60
21	22	10	.59	46	25	3.1	16	12	.52
22	27	12	.87	48	22	2.9	20	12	.65
23	26	12	.84	39	16	1.7	16	13	.56
24	27	9	.66	32	14	1.2	9.8	16	.42
25	23	9	.56	34	15	1.4	11	18	.53
26	20	8	.43	27	13	.95	10	18	.49
27	49	55	14	22	12	.71	11	16	.48
28	108	80	23	23	12	.75	15	16	.65
29	55	30	4.5	---	---	---	17	14	.64
30	30	18	1.5	---	---	---	20	18	.97
31	32	36	3.1	---	---	---	37	22	2.2
TOTAL	942	---	66.23	888	---	40.91	877.8	---	919.92

16213000 WAIKELE STREAM AT WAIPAHU--Continued

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

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	24	18	1.2	140	124	66	14	18	.68
2	41	35	3.9	30	30	2.4	13	22	.77
3	30	30	2.4	35	22	2.1	13	18	.63
4	16	16	.69	22	22	1.3	12	17	.55
5	17	16	.73	12	22	.71	8.7	22	.52
6	16	25	1.1	15	23	.93	12	26	.84
7	14	24	.91	269	306	308	22	24	1.4
8	120	167	83	108	73	26	17	20	.92
9	24	40	2.6	42	35	4.0	9.5	28	.72
10	15	35	1.4	75	88	27	8.6	22	.51
11	21	60	3.4	33	35	3.1	7.9	20	.43
12	32	50	4.3	20	30	1.6	9.3	36	.90
13	58	70	11	16	50	2.2	9.0	32	.78
14	142	306	172	13	30	1.1	16	34	1.5
15	29	60	4.7	14	40	1.5	16	46	2.0
16	53	45	6.4	24	40	2.6	6.5	25	.44
17	32	44	3.8	30	18	1.5	6.8	25	.46
18	32	50	4.3	21	22	1.2	6.1	30	.49
19	25	38	2.6	11	30	.89	5.1	30	.41
20	17	27	1.2	14	25	.95	8.1	40	.87
21	10	25	.68	18	27	1.3	17	50	48
22	8.3	25	.56	13	20	.70	12	40	1.3
23	7.5	22	.45	16	24	1.0	8.0	36	.78
24	7.5	23	.47	20	25	1.4	5.6	35	.53
25	11	24	.71	13	24	.84	4.8	35	.45
26	19	24	1.2	12	24	.78	4.3	30	.35
27	14	24	.91	13	22	.77	13	28	.98
28	8.8	24	.57	9.7	21	.55	17	32	1.5
29	18	45	2.2	9.1	20	.49	10	35	.95
30	85	102	62	14	36	1.4	5.8	35	.55
31	---	---	---	19	38	1.9	---	---	---
TOTAL	947.1	---	381.38	1100.8	---	466.21	318.1	---	71.21
		JULY			AUGUST			SEPTEMBER	
1	5.2	30	.42	10	25	.68	9.4	25	.63
2	5.0	30	.41	16	20	.86	8.5	23	.53
3	19	40	2.1	7.5	20	.41	8.5	30	.69
4	28	50	3.8	79	225	392	11	30	.89
5	25	55	3.7	238	428	498	24	26	1.7
6	13	45	1.6	38	55	5.6	35	25	2.4
7	6.4	45	.78	28	30	2.3	30	25	2.0
8	7.7	45	.94	21	25	1.4	14	25	.95
9	8.3	50	1.1	22	24	1.4	6.0	25	.41
10	8.5	50	1.1	17	22	1.0	4.5	25	.30
11	15	40	1.6	11	36	1.1	5.7	27	.42
12	16	28	1.2	26	32	2.2	9.6	28	.73
13	8.4	32	.73	21	50	2.8	16	20	.86
14	3.8	36	.37	18	50	2.4	11	20	.59
15	19	55	2.8	14	25	.95	5.8	22	.34
16	35	46	4.3	19	23	1.2	8.3	22	.49
17	28	40	3.0	16	18	.78	8.5	38	.87
18	18	50	2.4	18	45	2.2	9.8	45	1.2
19	29	80	6.3	57	60	13	16	36	1.6
20	14	40	1.5	35	37	3.5	19	17	.87
21	89	130	31	15	28	1.1	12	20	.65
22	22	40	2.4	15	30	1.2	8.7	40	.94
23	8.9	28	.67	19	20	1.0	9.3	36	.90
24	5.6	25	.38	15	20	.81	10	42	1.1
25	23	40	2.5	11	40	1.2	13	50	1.8
26	24	26	1.7	9.6	30	.78	15	36	1.5
27	13	22	.77	8.8	25	.59	16	32	1.4
28	13	38	1.3	10	35	.95	14	40	1.5
29	18	34	1.7	15	32	1.3	8.7	55	1.3
30	6.8	25	.46	19	20	1.0	8.3	60	1.3
31	5.9	25	.40	13	18	.63	---	---	---
TOTAL	541.5	---	83.43	861.9	---	944.34	375.6	---	30.86
YEAR	9134.7		3268.67						

16213000 WAIKELE STREAM AT WAIPAHU--Continued

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA

PHYTOPLANKTON ANALYSES, OCTOBER 1980 TO SEPTEMBER 1981

DATE	OCT 27,80		NOV 24,80		DEC 29,80		JAN 26,81		FEB 24,81		MAR 30,81	
TIME	1100		1100		0930		0930		0915		0945	
TOTAL CELLS/ML	39		530		600		39		39		90	
DIVERSITY: DIVISION	0.9		0.2		1.0		0.0		0.0		0.0	
.CLASS	0.9		0.2		1.0		0.0		0.0		0.0	
..ORDER	0.9		0.2		1.2		0.0		0.0		0.0	
...FAMILY	1.6		0.2		1.9		0.9		0.9		1.0	
....GENUS	1.6		0.2		1.9		0.9		0.9		1.0	
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	--	-	--	-	--	-	--	-	--	-	--	-
....DICTYOSPHAERIUM	--	-	--	-	--	-	--	-	--	-	--	-
..TETRASPORALES												
...COCCOMYXACEAE												
....ELAKATOTHRIX	--	-	--	-	--	-	--	-	--	-	--	-
..ULOTRICHALES												
...MICROSPORACEAE												
....CYLINDROCAPSA	--	-	--	-	--	-	--	-	--	-	--	-
..VOLVOCALES												
...CHLAMYDOMONADACEAE												
....CHLAMYDOMONAS	--	-	--	-	--	-	--	-	--	-	--	-
..ZYGNEMATALES												
...DESMIDIACEAE												
....COSMARIUM	--	-	--	-	--	-	--	-	--	-	--	-
...ZYGNEMATACEAE												
....MOUGEOTIA	--	-	--	-	--	-	--	-	--	-	--	-
CHRYSOPHYTA												
.BACILLARIOPHYCEAE												
..CENTRALES												
...COSCINODISCACEAE												
....CYCLOTELLA	--	-	13	2	14	2	--	-	--	-	--	-
....MELOSIRA	--	-	--	-	--	-	--	-	--	-	--	-
..PENNALES												
...ACHNANTHACEAE												
....ACHNANTHES	--	-	--	-	14	2	--	-	--	-	--	-
...EUNOTIACEAE												
....EUNOTIA	--	-	--	-	--	-	--	-	--	-	--	-
...FRAGILARIACEAE												
....FRAGILARIA	--	-	--	-	--	-	--	-	13#	33	--	-
....SYNEDRA	13#	33	--	-	27	5	--	-	--	-	--	-
...GOMPHONEMATACEAE												
....GOMPHONEMA	--	-	--	-	27	5	13#	33	26#	67	--	-
...NAVICULACEAE												
....FRUSTULIA	--	-	--	-	--	-	--	-	--	-	--	-
....NAVICULA	--	-	--	-	55	9	--	-	--	-	39#	43
...NITZSCHIACEAE												
....NITZSCHIA	13#	33	--	-	41	7	26#	67	--	-	51#	57
...TABELLARIACEAE												
....TABELLARIA	--	-	--	-	14	2	--	-	--	-	--	-
.CHRYSOPHYCEAE												
..CHRYSOMONADALES												
...OCHROMONADACEAE												
....DINOBRYON	--	-	--	-	--	-	--	-	--	-	--	-
CYANOPHYTA (BLUE-GREEN ALGAE)												
.CYANOPHYCEAE												
..CHROOCOCCALES												
...CHROOCOCCACEAE												
....ANACYSTIS	--	-	--	-	--	-	--	-	--	-	--	-
....COCCOCHLORIS	--	-	--	-	--	-	--	-	--	-	--	-
..HORMOGONALES												
...NOSTOCACEAE												
....APHANIZOMENON	--	-	--	-	--	-	--	-	--	-	--	-
...OSCILLATORIACEAE												
....LYNGBYA	--	-	--	-	--	-	--	-	--	-	--	-
....OSCILLATORIA	--	-	520#	98	400#	66	--	-	--	-	--	-
EUGLENOPHYTA (EUGLENOIDS)												
.EUGLENOPHYCEAE												
..EUGLENALES												
...EUGLENACEAE												
....EUGLENA	--	-	--	-	--	-	--	-	--	-	--	-
....TRACHELOMONAS	13#	33	--	-	14	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

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA

PHYTOPLANKTON ANALYSES, OCTOBER 1980 TO SEPTEMBER 1981

DATE	APR 28,81	MAY 19,81	JUN 23,81	JUL 21,81	AUG 24,81	SEP 22,81
TIME	1000	0915	0945	0910	0915	1030
TOTAL CELLS/ML	64	740	3700	7300	8800	0
DIVERSITY: DIVISION	0.0	0.6	0.5	1.0	0.1	0.0
. CLASS	0.0	0.6	0.5	1.1	0.1	0.0
.. ORDER	0.0	0.7	0.7	1.2	0.1	0.0
... FAMILY	1.4	0.8	0.7	2.0	0.3	0.0
.... GENUS	1.4	1.6	0.8	2.5	1.0	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	--	-	14	2	70	2	100	1	--	-	--	-
.... DICTYOSPHAERIUM	--	-	--	-	56	2	--	-	--	-	--	-
.. TETRASPORALES												
... COCCOMYXACEAE												
.... ELAKATOTHRIX	--	-	--	-	28	1	--	-	--	-	--	-
.. ULOTRICHALES												
... MICROSPORACEAE												
.... CYLINDROCAPSA	--	-	--	-	--	-	80	1	--	-	--	-
.. VOLVOCALES												
... CHLAMYDOMONADACEAE												
.... CHLAMYDOMONAS	--	-	--	-	*	0	60	1	--	-	--	-
.. ZYGNEMATALES												
... DESMIDIACEAE												
.... COSMARIUM	--	-	--	-	--	-	40	1	--	-	--	-
... ZYGNEMATACEAE												
.... MOUGEOTIA	--	-	--	-	--	-	180	2	--	-	--	-
CHRYSOPHYTA												
. BACILLARIOPHYCEAE												
.. CENTRALES												
... COSCINODISCACEAE												
.... CYCLOTELLA	--	-	14	2	*	0	*	0	--	-	--	-
.... MELOSIRA	--	-	--	-	--	-	40	1	--	-	--	-
.. PENNALES												
... ACHNANTHACEAE												
.... ACHNANTHES	--	-	--	-	84	2	100	1	--	-	--	-
... EUNOTIACEAE												
.... EUNOTIA	--	-	--	-	--	-	40	1	--	-	--	-
... FRAGILARIACEAE												
.... FRAGILARIA	--	-	--	-	--	-	--	-	--	-	--	-
.... SYNEDRA	--	-	--	-	--	-	*	0	*	0	--	-
... GOMPHONEMATACEAE												
.... GOMPHONEMA	--	-	14	2	--	-	260	4	*	0	--	-
... NAVICULACEAE												
.... FRUSTULIA	--	-	--	-	--	-	60	1	--	-	--	-
.... NAVICULA	13#	20	14	2	--	-	340	5	*	0	--	-
... NITZSCHIACEAE												
.... NITZSCHIA	13#	20	28	4	--	-	280	4	--	-	--	-
... TABELLARIACEAE												
.... TABELLARIA	39#	60	--	-	--	-	120	2	--	-	--	-
. CHRYSOPHYCEAE												
.. CHRYSOMONADALES												
... OCHROMONADACEAE												
.... DINOBRYON	--	-	--	-	--	-	*	0	--	-	--	-
CYANOPHYTA (BLUE-GREEN ALGAE)												
. CYANOPHYCEAE												
.. CHROOCOCCALES												
... CHROOCOCCACEAE												
.... ANACYSTIS	--	-	--	-	42	1	--	-	--	-	--	-
.... COCCOCHLORIS	--	-	--	-	56	2	--	-	--	-	--	-
.. HORMOGONALES												
... NOSTOCACEAE												
.... APHANIZOMENON	--	-	--	-	--	-	600	8	280	3	--	-
... OSCILLATORIACEAE												
.... LYNGBYA	--	-	240#	32	--	-	900	12	1700#	20	--	-
.... OSCILLATORIA	--	-	420#	57	3300#	89	4000#	55	6700#	76	--	-
EUGLENOPHYTA (EUGLENOIDS)												
. EUGLENOPHYCEAE												
.. EUGLENALES												
... EUGLENACEAE												
.... EUGLENA	--	-	--	-	--	-	40	1	--	-	--	-
.... TRACHELOMONAS	--	-	--	-	28	1	--	-	--	-	--	-

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

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).

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 good except those above 100 ft³/s (2.83 m³/s), which are poor. Low flow affected by effluent from sewage treatment plant and occasional small irrigation diversion and return flow above station. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--29 years, 33.1 ft³/s (0.937 m³/s), 23,980 acre-ft/yr (29.6 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, Mar. 25, Apr. 2-4, 1978, Apr. 22, Sept. 15, 20, 1981.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 2,300 ft³/s (65.1 m³/s) and maximum (*), from rating curve extended above 160 ft³/s (4.53 m³/s) on basis of slope-area measurements as explained above:

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Apr. 14	0100	3250	92.0	10.00	3.048
May 7	1100	2630	74.5	9.23	2.813
Aug. 4	2115	*7380	209	*13.63	4.154

Minimum discharge, 1.7 ft³/s (0.048 m³/s) Apr. 22, Sept. 15, 20.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.5	4.0	3.3	3.7	4.8	5.3	13	105	5.7	3.5	3.3	3.0
2	3.6	3.7	3.2	3.6	4.0	5.3	71	16	3.1	3.4	3.3	2.7
3	3.5	3.6	3.1	4.5	3.7	6.4	30	12	3.1	3.4	3.2	2.8
4	3.4	3.4	3.1	3.6	3.7	6.4	13	6.9	3.5	3.3	843	2.7
5	5.6	3.6	6.9	3.7	4.6	6.0	9.1	5.0	4.2	3.1	238	5.5
6	7.0	3.7	4.8	3.4	4.5	126	12	4.5	5.4	3.5	33	21
7	6.4	3.6	4.0	3.3	5.1	75	21	951	5.6	3.6	16	6.3
8	7.0	3.8	3.5	3.8	5.5	13	319	137	4.7	4.0	7.7	4.1
9	4.9	3.7	3.3	3.3	4.9	154	28	33	4.5	4.0	5.2	3.6
10	3.8	3.7	3.3	3.3	4.7	118	13	41	4.7	3.9	4.1	3.4
11	3.3	4.0	3.3	3.4	5.5	14	11	15	5.0	4.4	15	3.6
12	4.6	3.6	3.3	3.4	4.3	8.0	8.5	9.0	5.3	3.7	24	3.5
13	3.4	3.6	3.5	3.2	4.2	5.4	84	6.8	4.4	3.9	22	3.7
14	35	3.5	225	3.2	4.1	4.3	471	5.7	4.3	3.8	8.9	3.7
15	9.6	3.2	38	3.2	3.9	3.8	38	5.0	4.1	27	6.1	3.2
16	5.2	3.4	11	3.2	3.8	3.6	65	5.0	4.1	42	7.0	3.2
17	6.7	3.3	5.6	3.4	3.7	3.4	16	4.4	4.1	22	5.7	2.8
18	40	3.1	4.2	3.3	3.5	3.4	8.3	4.0	4.2	7.4	8.5	2.6
19	13	3.1	3.7	3.3	3.4	3.4	5.6	4.0	4.0	8.5	77	2.5
20	6.6	3.1	3.4	3.1	3.4	3.6	4.3	7.8	3.4	5.2	21	2.7
21	4.9	3.0	4.2	3.1	7.0	3.5	3.6	6.5	3.2	145	8.8	2.8
22	4.1	3.0	4.6	3.1	29	3.5	3.6	5.2	3.1	16	6.0	2.8
23	3.8	3.1	9.9	3.4	16	3.6	3.1	4.7	3.0	6.5	5.0	3.4
24	4.0	3.2	27	3.0	28	4.0	3.0	4.3	2.8	4.2	4.9	4.2
25	294	3.4	30	3.1	15	4.0	3.3	4.3	2.8	17	7.0	3.8
26	33	3.6	16	3.1	9.4	4.3	3.7	4.3	4.7	7.4	4.6	4.2
27	14	3.6	8.0	15	6.5	4.2	3.4	3.8	7.0	3.8	3.5	3.8
28	7.8	3.6	5.4	94	5.8	5.5	3.3	3.7	5.5	5.3	3.2	4.3
29	5.6	3.4	4.3	33	---	5.2	3.3	3.5	4.1	6.9	3.0	4.3
30	6.0	3.3	4.0	11	---	5.9	227	3.4	3.7	4.1	3.3	4.0
31	4.6	---	3.8	6.4	---	15	---	5.1	---	3.6	3.1	---
TOTAL	557.9	103.9	456.7	247.1	202.0	627.0	1498.1	1426.9	127.3	383.4	1404.4	124.2
MEAN	18.0	3.46	14.7	7.97	7.21	20.2	49.9	46.0	4.24	12.4	45.3	4.14
MAX	294	4.0	225	94	29	154	471	951	7.0	145	843	21
MIN	3.3	3.0	3.1	3.0	3.4	3.4	3.0	3.4	2.8	3.1	3.0	2.5
AC-FT	1110	206	906	490	401	1240	2970	2830	252	760	2790	246

CAL YR 1980	TOTAL	24692.1	MEAN 67.5	MAX 4870	MIN 3.0	AC-FT	48980
WTR YR 1981	TOTAL	7158.9	MEAN 19.6	MAX 951	MIN 2.5	AC-FT	14200

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).

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

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 fair. No diversion above station. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--24 years, 2.90 ft³/s (0.082 m³/s), 2,100 acre-ft/yr (2.59 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 at times most years.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 300 ft³/s (8.50 m³/s) and maximum (*), from rating curve extended as explained above:

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)
Dec. 14	1545	328	9.29	3.72	1.134	May 7	0415	*662	18.7	*4.37	1.332
Apr. 30	1745	352	9.97	3.78	1.152	Aug. 4	2045	515	14.6	4.11	1.253

No flow several days in October.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.01	.06	.06	.17	.20	.42	.24	17	.12	.08	.17	.06
2	.02	.08	.10	.17	.17	.20	1.6	2.4	.09	.08	.08	.08
3	.00	.08	.02	.22	.17	.17	1.2	3.6	.10	.08	.15	.09
4	.00	.06	.04	.18	.15	.15	.18	.87	.09	.09	40	.17
5	.18	.11	.67	.17	1.1	.17	.09	.22	.09	.17	14	.17
6	.03	.04	.11	.18	.17	1.1	.10	.18	.11	.24	2.6	.07
7	.12	.01	.04	.18	.24	3.6	.20	217	.10	.24	1.5	.08
8	.14	.03	.03	.17	.20	.46	3.7	30	.12	.18	.20	.09
9	.17	.02	.05	.17	.17	.35	3.5	5.3	.15	.15	.10	.12
10	.18	.05	.05	.17	.17	.17	.42	2.7	.12	.17	.08	.12
11	.24	.08	.05	.17	.26	.15	.82	1.4	.11	.26	.08	.12
12	.39	.08	.08	.20	.18	.12	.99	.72	.10	.18	.32	.09
13	.18	.07	.06	.17	.20	.14	16	.32	.08	.07	4.0	.07
14	.35	.07	28	.22	.18	.15	34	.17	.09	.09	.72	.08
15	.26	.08	5.6	.35	.18	.11	7.7	.15	.09	.26	.17	.08
16	.18	.08	1.9	.20	.22	.12	6.4	.11	.10	3.6	.26	.08
17	.17	.07	.77	.18	.17	.11	1.4	.20	.11	1.5	.22	.08
18	.11	.07	.18	.17	.17	.11	.35	.54	.09	.20	.07	.17
19	.12	.06	.15	.17	.18	.11	.14	.62	.15	.26	3.2	.18
20	.10	.06	.17	.15	.17	.11	.11	.54	.15	.08	1.4	.29
21	.09	.08	.35	.18	.24	.11	.10	.46	.08	6.0	.18	.08
22	.09	.08	1.3	.32	.35	.10	.09	.18	.17	.82	.09	.11
23	.09	.07	6.3	.32	.20	.17	.08	.29	.14	.18	.08	.10
24	.11	.10	5.2	.39	.26	.14	.08	.35	.08	.09	.07	.15
25	11	.07	4.1	.35	.22	.12	.08	.18	.08	.08	.07	.12
26	1.1	.05	1.8	.42	.29	.11	.09	.11	.39	.08	.08	.06
27	.01	.14	.62	.58	.39	.12	.09	.11	.12	.07	.08	.09
28	.00	.09	.32	10	.46	.12	.10	.11	.26	.08	.10	.08
29	.00	.07	.24	3.7	---	.10	.08	.10	.26	.14	.18	.08
30	.04	.07	.18	.87	---	.18	38	.10	.20	.20	.10	.09
31	.06	---	.17	.24	---	.22	---	.11	---	.26	.07	---
TOTAL	15.54	2.08	58.71	21.13	7.06	9.51	117.93	286.14	3.94	15.98	70.42	3.25
MEAN	.50	.069	1.89	.68	.25	.31	3.93	9.23	.13	.52	2.27	.11
MAX	11	.14	28	10	1.1	3.6	38	217	.39	6.0	40	.29
MIN	.00	.01	.02	.15	.15	.10	.08	.10	.08	.07	.07	.06
AC-FT	31	4.1	116	42	14	19	234	568	7.8	32	140	6.4

CAL YR 1980 TOTAL 2034.31 MEAN 5.56 MAX 247 MIN .00 AC-FT 4040
WTR YR 1981 TOTAL 611.69 MEAN 1.68 MAX 217 MIN .00 AC-FT 1210

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).

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.--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. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--31 years (water years, 1930-32, 1954-81), 4.90 ft^3/s (0.139 m^3/s), 3,550 acre-ft/yr (4.38 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, 872 ft^3/s (24.7 m^3/s) May 7, gage height, 9.78 ft (2.981 m), from rating curve extended above 63 ft^3/s (1.78 m^3/s) on basis of slope-area measurements at gage heights 10.3 ft (3.140 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 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.02	.03	.00	.09	.35	.00	.01	43	.02	.00	.02	.02
2	.02	.02	.00	.07	.20	.01	1.8	7.0	.02	.00	.02	.02
3	.02	.02	.00	.06	.11	.01	1.8	5.9	.02	.00	.02	.01
4	.01	.02	.00	.04	.07	.00	.68	2.4	.01	.00	50	.01
5	.01	.01	.01	.03	.13	.00	.39	1.3	.01	.00	24	.01
6	.01	.01	.01	.02	.10	14	.32	7.3	.01	.00	6.2	.02
7	.00	.01	.00	.02	.07	3.5	.58	257	.01	.00	2.1	.02
8	.00	.01	.00	.02	.07	.74	2.1	53	.01	.00	.74	.02
9	.00	.01	.00	.02	.06	2.9	1.8	13	.01	.00	.43	.02
10	.00	.01	.00	.01	.03	2.5	.63	5.9	.00	.00	.23	.01
11	.00	.01	.00	.01	.03	.58	.43	3.7	.00	.00	3.2	.01
12	.00	.01	.00	.01	.03	.30	.23	2.4	.00	.00	3.7	.00
13	.00	.01	.00	.01	.02	.16	36	1.7	.00	.00	4.9	.00
14	1.3	.01	28	.01	.02	.10	38	1.4	.00	.00	1.2	.00
15	.10	.02	7.7	.01	.02	.06	22	1.0	.00	5.2	.58	.00
16	.11	.02	1.7	.00	.01	.03	11	.80	.00	11	3.0	.00
17	.07	.02	.48	.00	.01	.02	2.8	.80	.00	3.7	1.9	.00
18	2.0	.01	.27	.00	.01	.02	1.0	.74	.00	.80	7.1	.00
19	.43	.01	.15	.00	.01	.02	.48	.58	.00	.35	11	.00
20	.23	.01	.08	.00	.01	.01	.32	2.2	.00	.21	3.7	.00
21	.13	.01	.25	.00	.01	.01	.25	1.0	.00	16	1.5	.00
22	.07	.01	2.9	.00	.01	.01	.14	.63	.00	2.4	.74	.00
23	.03	.01	9.1	.00	.01	.01	.07	.43	.00	.74	.48	.00
24	.02	.01	6.1	.00	.01	.01	.07	.27	.00	.39	.35	.00
25	21	.00	5.1	.00	.01	.01	.05	.16	.00	1.6	.23	.00
26	2.9	.00	2.5	.00	.01	.01	.03	.11	.01	.48	.12	.00
27	.87	.00	1.1	.01	.01	.01	.02	.08	.02	.27	.07	.00
28	.35	.00	.68	21	.01	.01	.02	.06	.01	.16	.05	.00
29	.25	.00	.48	6.3	---	.01	.48	.04	.00	.09	.03	.00
30	.12	.00	.25	1.5	---	.01	55	.03	.00	.07	.02	.00
31	.07	---	.14	.63	---	.01	---	.02	---	.04	.02	---
TOTAL	30.14	.32	67.00	29.87	1.44	25.07	178.50	413.95	.16	43.50	127.65	.17
MEAN	.97	.011	2.16	.96	.051	.81	5.95	13.4	.005	1.40	4.12	.006
MAX	21	.03	28	21	.35	14	55	257	.02	16	50	.02
MIN	.00	.00	.00	.00	.01	.00	.01	.02	.00	.00	.02	.00
AC-FT	60	.6	133	59	2.9	50	354	821	.3	86	253	.3

CAL YR 1980 TOTAL 2825.66 MEAN 7.72 MAX 360 MIN .00 AC-FT 5600
WTR YR 1981 TOTAL 917.77 MEAN 2.51 MAX 257 MIN .00 AC-FT 1820

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.--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.--67 years (water years 1915-81), 6.71 ft³/s (0.190 m³/s), 4,860 acre-ft/yr (5.99 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.--Maximum dicharge, 1,010 ft³/s (28.6 m³/s) May 7, gage height, 8.06 ft (2.457 m), from rating curve extended as explained above, no other peak above base of 700 ft³/s (19.8 m³/s); minimum, 0.43 ft³/s (0.012 m³/s) Sept. 30.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.6	1.4	1.0	1.8	1.8	.91	1.0	9.4	1.8	1.1	1.0	1.2
2	1.6	1.3	1.0	1.6	1.5	1.0	2.2	3.8	1.6	1.2	.91	1.1
3	1.8	1.3	1.1	1.8	1.4	1.1	1.3	2.8	1.6	1.1	1.3	1.6
4	1.5	1.2	1.2	1.6	1.3	1.0	.91	3.0	1.5	1.0	40	1.5
5	2.0	1.2	3.0	1.4	5.2	.91	.82	2.6	1.9	1.0	16	1.9
6	1.6	1.2	2.4	1.4	1.8	5.0	1.8	9.9	2.0	1.1	5.4	1.6
7	1.6	1.2	2.6	1.4	1.5	1.9	1.1	258	1.6	1.0	3.0	1.2
8	2.0	2.4	1.5	3.4	1.6	1.2	1.6	97	1.8	1.3	2.3	1.0
9	1.5	1.3	1.2	1.9	1.3	1.4	1.1	21	1.5	1.3	2.0	.91
10	1.4	1.2	1.1	1.6	1.2	1.1	.91	12	1.4	1.1	1.9	.82
11	1.3	4.0	1.0	1.4	1.7	.91	.73	8.0	2.2	.91	4.6	1.0
12	2.3	1.3	1.0	1.5	1.2	.91	2.2	6.8	1.9	.82	3.0	.91
13	5.2	1.2	.91	1.4	1.2	.82	28	5.6	1.5	.91	3.6	.91
14	9.9	1.2	65	1.3	1.2	.79	15	5.1	1.5	2.8	2.3	.82
15	2.3	1.4	10	1.3	1.1	.79	15	4.6	1.8	4.5	2.0	.73
16	2.0	1.3	3.5	1.3	1.1	.73	7.4	4.2	1.4	3.0	2.0	.82
17	2.3	1.1	2.2	1.3	1.0	.65	3.6	4.0	1.3	1.8	1.6	.73
18	5.9	1.0	2.4	1.2	1.0	.73	2.4	3.8	1.2	1.5	3.0	.73
19	1.9	1.8	2.0	1.1	1.1	.70	2.2	3.8	1.2	1.3	4.2	.82
20	1.9	1.0	2.0	1.1	2.4	.70	1.6	4.0	1.2	3.0	2.6	1.2
21	1.6	1.2	2.2	1.0	2.2	.65	1.5	2.8	1.1	11	1.9	1.0
22	1.4	.91	19	.91	2.0	.65	1.4	2.6	1.1	2.4	1.6	.91
23	1.3	.91	9.9	1.0	1.3	.65	1.5	2.4	1.1	1.9	1.6	.82
24	1.4	1.2	7.4	.91	1.4	.72	2.0	2.4	1.2	3.3	1.4	.73
25	12	1.4	8.3	.91	1.1	.77	1.4	2.3	1.3	5.4	1.3	.57
26	2.3	1.4	4.4	.82	1.0	1.0	1.4	2.2	2.4	2.1	1.3	.57
27	1.6	1.3	3.4	4.0	1.0	1.1	1.3	2.2	2.0	1.5	1.3	.73
28	1.6	1.3	2.6	17	.91	.82	1.2	2.0	1.4	1.5	1.4	.65
29	2.2	1.2	2.3	4.9	---	1.1	1.5	1.9	1.2	1.2	1.3	.57
30	1.6	1.1	2.0	3.0	---	1.6	27	1.9	1.1	1.1	1.6	.50
31	1.5	---	1.9	2.1	---	1.1	---	2.2	---	1.0	1.3	---
TOTAL	80.1	40.92	169.51	67.35	42.51	33.41	131.07	494.3	45.8	64.14	118.71	28.55
MEAN	2.58	1.36	5.47	2.17	1.52	1.08	4.37	15.9	1.53	2.07	3.83	.95
MAX	12	4.0	65	17	5.2	5.0	28	258	2.4	11	40	1.9
MIN	1.3	.91	.91	.82	.91	.65	.73	1.9	1.1	.82	.91	.50
AC-FT	159	81	336	134	84	66	260	980	91	127	235	57

CAL YR 1980 TOTAL 3384.83 MEAN 9.25 MAX 207 MIN .80 AC-FT 6710
WTR YR 1981 TOTAL 1316.37 MEAN 3.61 MAX 258 MIN .50 AC-FT 2610

16229000 KALIHI STREAM NEAR HONOLULU--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1972, 1974-80.

REMARKS.--Miscellaneous chemical analyses published for this station for 1969, 1973 water years.

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (UMHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)
OCT 27...	1015	1.7	145	7.1	21.5
NOV 24...	1000	.87	175	7.3	22.5
DEC 22...	1055	1.6	140	7.2	22.0
JAN 26...	1215	.76	150	7.4	21.0
FEB 23...	1500	1.3	160	7.1	20.5
MAR 25...	1030	.76	160	7.3	20.5
APR 27...	1030	1.1	145	7.1	19.0
JUL 27...	1115	.94	150	6.9	22.5
AUG 25...	1100	1.3	150	6.9	23.0
25...	1300	1.3	150	6.9	23.0
SEP 24...	1010	.71	140	7.0	22.5

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	HARD-NESS (MG/L AS CACO3)	HARD-NESS NONCAR-BONATE (MG/L AS CACO3)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	PERCENT SODIUM	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY LAB (MG/L AS CACO3)
NOV 24...	1000	.87	42	2.0	6.3	6.4	15	43	1.0	1.1	40
FEB 23...	1500	1.3	36	8.0	6.0	5.0	14	45	1.0	.9	28
AUG 25...	1300	1.3	34	3.0	5.5	5.0	14	46	1.0	.9	31

DATE	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SIO2)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	SOLIDS, DIS-SOLVED (TONS PER AC-FT)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N)	PHOS-PHORUS, DIS-SOLVED (MG/L AS P)	IRON, DIS-SOLVED (UG/L AS FE)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)
NOV 24...	7.3	21	.0	13	95	.13	.10	.020	230	10
FEB 23...	9.2	20	.1	13	85	.12	.00	.030	280	8
AUG 25...	1.0	28	.4	14	88	.12	.13	<.010	170	8

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

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.--19 years, 10.9 ft³/s (0.309 m³/s), 7,900 acre-ft/yr (9.74 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, 1,120 ft³/s (31.7 m³/s) May 7, gage height, 4.24 ft (1.292 m), from rating curve extended as explained above, no peak above base of 1,600 ft³/s (45.3 m³/s); minimum, 0.80 ft³/s (0.023 m³/s) Sept. 26-30.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.1	2.3	1.2	2.9	2.8	1.8	3.5	18	2.7	2.0	1.6	2.2
2	1.9	2.0	1.2	2.7	2.5	2.9	5.6	5.6	2.3	2.0	1.6	2.0
3	2.1	1.9	1.5	3.6	2.2	2.3	2.6	4.1	2.4	1.7	2.3	4.3
4	2.1	1.7	1.3	2.6	2.1	2.0	1.8	3.5	2.3	1.7	55	2.6
5	5.6	1.7	10	2.5	11	1.6	1.6	2.9	2.4	1.7	29	4.3
6	2.5	1.6	4.0	2.2	2.9	5.7	3.6	8.3	3.1	1.6	8.5	3.9
7	2.5	1.8	5.1	2.2	2.5	3.7	2.0	355	2.5	1.3	5.7	2.0
8	4.2	4.0	1.9	4.3	3.3	2.7	2.8	116	2.3	2.0	4.0	1.9
9	2.3	2.4	1.6	2.8	2.1	2.4	2.3	26	1.8	2.2	3.5	2.3
10	2.5	2.5	1.5	2.3	2.0	1.9	1.5	16	1.8	1.7	3.2	2.1
11	2.3	8.2	1.4	2.1	4.5	1.5	1.4	12	3.5	1.4	7.9	2.6
12	6.5	2.0	1.4	2.2	2.0	1.6	2.3	9.5	2.8	1.6	6.1	1.5
13	8.0	1.8	1.3	2.4	1.8	1.5	23	7.7	2.0	1.6	5.1	1.5
14	16	2.2	114	1.9	1.7	1.6	24	6.7	1.8	4.9	3.7	1.5
15	3.6	3.2	17	1.9	1.7	1.3	16	5.8	2.3	11	3.2	1.2
16	3.0	2.5	5.5	1.9	1.6	1.2	11	5.3	2.0	12	4.4	1.2
17	4.5	1.9	3.5	1.9	1.7	1.2	4.6	5.6	2.1	3.7	2.9	1.1
18	11	2.1	3.5	1.7	1.5	1.2	3.4	5.1	1.8	2.6	4.3	1.1
19	3.3	3.1	2.5	1.7	1.5	1.4	2.9	5.2	1.6	2.0	7.9	1.2
20	3.0	1.7	2.5	1.6	3.7	1.2	2.5	5.6	1.5	2.4	4.3	2.0
21	2.5	1.6	2.8	1.6	4.4	1.3	2.3	4.1	1.4	16	3.3	1.1
22	2.3	1.4	39	1.8	6.7	1.2	2.1	3.9	1.5	3.9	3.0	2.0
23	2.1	1.4	31	2.1	2.5	1.2	2.1	3.6	2.2	3.0	2.8	3.0
24	2.5	1.4	18	1.7	4.2	1.3	3.5	3.6	1.7	2.8	2.1	1.2
25	19	1.4	16	1.6	2.1	1.8	2.3	3.3	1.9	9.3	2.1	1.4
26	3.9	1.4	8.0	1.5	2.1	1.3	1.9	3.2	24	3.2	1.9	.90
27	2.8	1.4	5.4	10	1.9	1.7	1.7	3.0	8.3	2.5	1.8	1.0
28	2.5	1.3	4.1	36	1.9	2.4	1.6	3.0	2.7	3.8	3.1	1.0
29	3.2	1.3	3.7	8.3	---	2.1	2.9	2.7	2.0	2.3	1.9	1.1
30	2.5	1.2	3.4	5.1	---	5.2	29	2.5	1.8	1.9	2.9	1.1
31	2.2	---	3.1	3.5	---	2.7	---	2.8	---	1.6	1.8	---
TOTAL	134.5	64.4	316.4	120.6	80.9	62.9	167.8	659.6	92.5	111.4	190.9	56.30
MEAN	4.34	2.15	10.2	3.89	2.89	2.03	5.59	21.3	3.08	3.59	6.16	1.88
MAX	19	8.2	114	36	11	5.7	29	355	24	16	55	4.3
MIN	1.9	1.2	1.2	1.5	1.5	1.2	1.4	2.5	1.4	1.3	1.6	.90
AC-FT	267	128	628	239	160	125	333	1310	183	221	379	112

CAL YR 1980 TOTAL 5911.10 MEAN 16.2 MAX 370 MIN 1.2 AC-FT 11720
WTR YR 1981 TOTAL 2058.20 MEAN 5.64 MAX 355 MIN .90 AC-FT 4080

16229300 KALIHI STREAM AT KALIHI--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1970-74, 1975 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (UMHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)	TUR-BID-ITY (NTU)	OXYGEN, DIS-SOLVED (MG/L)	COLI-FORM, FECAL, 0.7 UM-MF (COLS. / 100 ML)	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARD-NESS (MG/L AS CACO3)
OCT 27...	1345	2.7	230	8.4	26.5	1.2	9.0	3700	3200	62
NOV 24...	0945	1.4	280	7.4	22.0	.90	8.7	13000	K110000	74
DEC 29...	1145	3.4	250	7.6	22.0	1.0	9.2	12000	15000	72
JAN 26...	1045	1.3	300	8.1	22.5	.70	9.4	4300	10000	76
FEB 24...	1115	3.5	260	7.5	22.0	25	8.9	6300	8300	74
MAR 30...	1145	4.8	250	7.6	22.5	110	8.3	45000	59000	74
APR 28...	1200	1.6	260	7.4	24.0	.90	9.7	3000	3300	64
MAY 19...	1100	5.2	210	7.5	23.5	1.4	--	--	--	60
26...	1125	3.3	200	7.9	24.0	--	--	7100	8400	--
JUN 23...	1100	1.4	270	7.8	25.0	.80	10.0	2400	970	67
JUL 21...	1045	14	140	7.5	24.0	17	8.8	14000	42000	34
AUG 24...	1100	2.3	220	7.9	25.5	1.3	9.7	4800	74000	59
SEP 22...	1200	1.0	265	8.2	25.5	1.8	10.0	10000	9200	70

DATE	HARD-NESS NONCAR-BONATE (MG/L AS CACO3)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	PERCENT SODIUM	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY LAB (MG/L AS CACO3)	SULFATE DIS-SOLVED (MG/L AS SO4)
OCT 27...	.00	12	7.7	21	42	1.2	1.4	64	9.6
NOV 24...	.00	15	8.9	25	42	1.3	1.7	74	3.4
DEC 29...	1.0	14	8.9	22	39	1.1	1.4	71	13
JAN 26...	--	15	9.3	25	41	1.3	1.3	67	11
FEB 24...	--	16	8.3	25	42	1.3	1.7	64	14
MAR 30...	15	17	7.7	22	38	1.1	2.0	59	16
APR 28...	3.0	12	8.2	21	41	1.1	1.4	61	8.0
MAY 19...	16	13	6.7	20	41	1.1	1.1	44	6.1
26...	--	--	--	--	--	--	--	--	--
JUN 23...	.00	13	8.5	24	43	1.3	1.4	73	1.3
JUL 21...	10	7.2	3.8	12	42	.9	1.4	24	<5.0
AUG 24...	10	11	7.6	21	43	1.3	1.4	49	<5.0
SEP 22...	.00	13	9.2	26	44	1.3	1.6	71	6.0

K Results based on colony count outside the acceptable range (non-ideal colony count).
< Actual value is known to be less than the value shown.

16229300 KALIHI STREAM AT KALIHI--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	CHLORIDE, DISSOLVED (MG/L AS CL)	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)	SOLIDS, DISSOLVED (TONS PER AC-FT)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N)	NITROGEN, AMMONIA TOTAL (MG/L AS N)	NITROGEN, AMMONIA DISSOLVED (MG/L AS N)
OCT 27...	30	.2	14	134	142	.18	.00	.01	.410	.170
NOV 24...	33	.0	13	153	146	.21	.37	.23	.080	.070
DEC 29...	30	.1	57	146	190	.20	.21	.23	.050	.060
JAN 26...	35	.1	14	155	155	.21	.22	.14	.090	.060
FEB 24...	31	.1	12	152	148	.21	.31	.33	.030	.050
MAR 30...	29	.1	11	148	143	.20	.52	.51	.130	.100
APR 28...	32	.1	12	148	132	.20	.08	.08	.090	.110
MAY 19...	44	.1	13	122	131	.17	.03	.05	.110	.080
26...	--	--	--	--	--	--	--	--	--	--
JUN 23...	36	.1	7.5	145	136	.20	1.8	.03	.090	.100
JUL 21...	19	.0	11	85	71	.12	.12	.10	.190	.100
AUG 24...	33	.1	14	118	--	.16	.12	.09	.090	.070
SEP 22...	36	.1	17	145	152	.20	.22	.13	.200	.170

DATE	NITROGEN, ORGANIC TOTAL (MG/L AS N)	NITROGEN, ORGANIC DISSOLVED (MG/L AS N)	NITROGEN DISSOLVED (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITROGEN, NH4 + ORG. SUSP. TOTAL (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC DIS. (MG/L AS N)	NITROGEN, TOTAL (MG/L AS N)	PHOSPHORUS, TOTAL (MG/L AS P)	PHOSPHORUS, DISSOLVED (MG/L AS P)
OCT 27...	.28	.11	.29	.69	.41	.28	.69	.080	.030
NOV 24...	1.2	.92	1.2	1.30	.31	.99	1.7	2.00	.060
DEC 29...	.68	.40	.69	.73	.27	.46	.94	.080	.090
JAN 26...	.48	.41	.61	.57	.10	.47	.79	.070	--
FEB 24...	1.4	.76	1.1	1.40	.59	.81	1.7	.140	.090
MAR 30...	1.4	.55	1.2	1.50	.85	.65	2.0	.550	.110
APR 28...	.39	.34	.53	.48	.03	.45	.56	.060	.060
MAY 19...	.23	.20	.33	.34	.06	.28	.37	.060	.080
26...	--	--	--	--	--	--	--	--	--
JUN 23...	1.1	.41	.54	1.20	.69	.51	3.0	1.60	.040
JUL 21...	.59	.62	.82	.78	.06	.72	.90	.100	.040
AUG 24...	.32	.32	.48	.41	.02	.39	.53	.070	.060
SEP 22...	.29	.27	.57	.49	.05	.44	.71	.060	.050

16229300 KALIHI STREAM AT KALIHI--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	TIME	ARSENIC TOTAL (UG/L AS AS)	ARSENIC SUS-PENDED TOTAL (UG/L AS AS)	ARSENIC DIS-SOLVED (UG/L AS AS)	BARIUM, TOTAL RECOV-ERABLE (UG/L AS BA)	BARIUM, SUS-PENDED RECOV-ERABLE (UG/L AS BA)	BARIUM, DIS-SOLVED (UG/L AS BA)	CADMIUM TOTAL RECOV-ERABLE (UG/L AS CD)	CADMIUM DIS-SOLVED (UG/L AS CD)	CHRO-MIUM, TOTAL RECOV-ERABLE (UG/L AS CR)	CHRO-MIUM, SUS-PENDED RECOV. (UG/L AS CR)
NOV											
24...	0945	1	1	0	10	0	10	4	<1	0	0
FEB											
24...	1115	2	1	1	100	90	10	<1	<1	10	10
MAY											
19...	1100	1	0	1	100	90	10	<1	<1	20	10
AUG											
24...	1100	1	1	0	8	0	8	0	<1	0	0

DATE	CHRO-MIUM, DIS-SOLVED (UG/L AS CR)	COBALT, TOTAL RECOV-ERABLE (UG/L AS CO)	COBALT, DIS-SOLVED (UG/L AS CO)	COPPER, TOTAL RECOV-ERABLE (UG/L AS CU)	COPPER, SUS-PENDED RECOV-ERABLE (UG/L AS CU)	COPPER, DIS-SOLVED (UG/L AS CU)	IRON, TOTAL RECOV-ERABLE (UG/L AS FE)	IRON, SUS-PENDED RECOV-ERABLE (UG/L AS FE)	IRON, DIS-SOLVED (UG/L AS FE)	LEAD, TOTAL RECOV-ERABLE (UG/L AS PB)
NOV										
24...	0	<3	<3	7	0	7	260	160	100	7
FEB										
24...	0	<3	<3	9	3	6	1200	1100	100	5
MAY										
19...	10	<3	<3	4	0	4	220	110	110	2
AUG										
24...	0	1	<3	6	4	2	230	110	120	4

DATE	LEAD, SUS-PENDED RECOV-ERABLE (UG/L AS PB)	LEAD, DIS-SOLVED (UG/L AS PB)	MANGA-NESE, TOTAL RECOV-ERABLE (UG/L AS MN)	MANGA-NESE, SUS-PENDED RECOV. (UG/L AS MN)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)	MERCURY TOTAL RECOV-ERABLE (UG/L AS HG)	MERCURY SUS-PENDED RECOV-ERABLE (UG/L AS HG)	MERCURY DIS-SOLVED (UG/L AS HG)	NICKEL, TOTAL RECOV-ERABLE (UG/L AS NI)	NICKEL, SUS-PENDED RECOV-ERABLE (UG/L AS NI)
NOV										
24...	4	3	20	10	10	.2	.2	.0	2	0
FEB										
24...	2	3	40	30	8	.2	.1	.1	4	0
MAY										
19...	0	2	20	10	9	.1	.1	.0	4	0
AUG										
24...	4	0	10	2	8	.1	.1	.0	3	0

DATE	NICKEL, DIS-SOLVED (UG/L AS NI)	SELE-NIUM, TOTAL (UG/L AS SE)	SELE-NIUM, SUS-PENDED TOTAL (UG/L AS SE)	SELE-NIUM, DIS-SOLVED (UG/L AS SE)	SILVER, TOTAL RECOV-ERABLE (UG/L AS AG)	SILVER, SUS-PENDED RECOV-ERABLE (UG/L AS AG)	SILVER, DIS-SOLVED (UG/L AS AG)	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN)	ZINC, SUS-PENDED RECOV-ERABLE (UG/L AS ZN)	ZINC, DIS-SOLVED (UG/L AS ZN)
NOV										
24...	2	0	0	0	0	0	0	20	20	5
FEB										
24...	4	0	0	0	0	0	0	30	0	30
MAY										
19...	4	0	0	0	0	0	0	10	0	10
AUG										
24...	3	0	0	0	0	0	0	10	---	<3

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

16229300 KALIHI STREAM AT KALIHI--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	TIME	CARBON, ORGANIC TOTAL (MG/L AS C)	CARBON, ORGANIC DIS-SOLVED (MG/L AS C)	CARBON, ORGANIC SUS-PENDED TOTAL (MO/L AS C)	DATE	TIME	CARBON, ORGANIC TOTAL (MG/L AS C)	CARBON, ORGANIC DIS-SOLVED (MG/L AS C)	CARBON, ORGANIC SUS-PENDED TOTAL (MG/L AS C)
OCT					APR				
27...	1345	4.9	--	--	28...	1200	5.2	--	--
NOV					MAY				
24...	0945	--	5.6	.2	19...	1100	--	5.6	.2
DEC					JUN				
29...	1145	5.4	--	--	23...	1100	4.8	--	--
JAN					JUL				
26...	1045	3.8	--	--	21...	1045	4.8	--	--
FEB					AUG				
24...	1115	--	5.0	.7	24...	1100	--	1.7	.4
MAR					SEP				
30...	1145	8.1	--	--	22...	1200	2.9	--	--

WATER QUALITY DATA, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

DATE	TIME	AROCLOR 1254 PCB TOTAL (UG/L)	PCB, TOTAL (UG/L)	ALDRIN, TOTAL (UG/L)	CHLOR-DANE, TOTAL (UG/L)	DDD, TOTAL (UG/L)	DDE, TOTAL (UG/L)	DDT, TOTAL (UG/L)	DI-AZINON, TOTAL (UG/L)	DI-ELDRIN TOTAL (UG/L)	ENDRIN, TOTAL (UG/L)
DEC											
10...	1330	--	ND	ND	ND	ND	ND	ND	ND	ND	ND
FEB											
19...	1115	--	ND	ND	ND	ND	ND	ND	ND	ND	ND
MAY											
27...	1100	.0	--	ND	ND	ND	ND	ND	ND	ND	ND
AUG											
25...	1300	--	ND	ND	ND	ND	ND	ND	ND	ND	ND

DATE	ETHION, TOTAL (UG/L)	HEPTA-CHLOR, TOTAL (UG/L)	HEPTA-CHLOR EPOXIDE TOTAL (UG/L)	LINDANE TOTAL (UG/L)	MALA-THION, TOTAL (UG/L)	METH-OXY-CHLOR, TOTAL (UG/L)	METHYL PARA-THION, TOTAL (UG/L)	METHYL TRI-THION, TOTAL (UG/L)	PARA-THION, TOTAL (UG/L)	TOX-APHENE, TOTAL (UG/L)	TOTAL TRI-THION (UG/L)
DEC											
10...	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
FEB											
19...	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MAY											
27...	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
AUG											
25...	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

ND Material specifically analyzed for but not detected.

16229300 KALIHI STREAM AT KALIHI--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	TIME	PHYTOPLANKTON, TOTAL (CELLS PER ML)
OCT 27...	1345	210
NOV 24...	0945	450
DEC 29...	1145	1600
JAN 26...	1045	270
FEB 24...	1115	390
MAR 30...	1145	2800
APR 28	1200	26
MAY 19...	0915	460
JUN 23...	1100	310
JUL 21...	1045	1600
AUG 24...	1100	72
SEP 22...	1200	72

DATE	TIME	STREAMFLOW, INSTANTANEOUS (CFS)	SEDIMENT, SUSPENDED (MG/L)	SEDIMENT, DISCHARGE, SUSPENDED (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
OCT 27...	1345	2.7	2	.01	100
NOV 24...	0945	1.4	2	.01	100
DEC 29...	1145	3.4	2	.02	100
JAN 26...	1045	1.3	1	.00	100
FEB 24...	1115	3.5	16	.15	100
MAR 30...	1145	4.8	72	.93	100
APR 28...	1200	1.6	1	.00	100
MAY 19...	1100	5.2	2	.03	100
JUN 23...	1100	1.4	1	.00	100
JUL 21...	1045	14	25	.94	100
AUG 24...	1100	2.3	2	.01	100
SEP 22...	1200	1.0	1	.00	100

16229300 KALIHI STREAM AT KALIHI--Continued

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA

PHYTOPLANKTON ANALYSES, OCTOBER 1980 TO SEPTEMBER 1981

DATE	OCT 27,80	NOV 24,80	DEC 29,80	JAN 26,81	FEB 24,81	MAR 30,81
TIME	1345	0945	1145	1045	1115	1145
TOTAL CELLS/ML	210	450	1600	270	390	2800
DIVERSITY: DIVISION	0.0	1.1	0.5	1.0	0.9	1.3
. CLASS	0.0	1.1	0.5	1.0	0.9	1.3
.. ORDER	0.0	1.3	0.9	1.7	0.9	1.3
... FAMILY	1.9	1.5	0.7	2.0	1.1	2.0
.... GENUS	1.9	1.5	0.7	2.1	1.1	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												
... HYDRODICTYACEAE												
.... PEDIASTRUM	--	-	--	-	--	-	--	-	--	-	110	4
... OOCYSTACEAE												
.... ANKISTRODESMUS	--	-	--	-	--	-	--	-	--	-	68	2
... SCENEDESMACEAE												
.... SCENEDESMUS	--	-	--	-	--	-	--	-	--	-	--	-
.. VOLVOCALES												
... CHLAMYDOMONADACEAE												
.... CHLAMYDOMONAS	--	-	26	6	--	-	13	5	--	-	*	0
CHRYSOPHYTA												
. BACILLARIOPHYCEAE												
.. CENTRALES												
... COSCINODISCACEAE												
.... CYCLOTELLA	--	-	39	9	--	-	--	-	--	-	*	0
.... MELOSIRA	--	-	--	-	--	-	120#	43	--	-	--	-
.. PENNALES												
... ACHNANTHACEAE												
.... ACHNANTHES	--	-	--	-	14	1	13	5	--	-	--	-
.... COCCONEIS	--	-	--	-	--	-	13	5	--	-	--	-
.... RHOICOSPHENIA	--	-	--	-	--	-	--	-	13	3	41	1
... FRAGILARIACEAE												
.... FRAGILARIA	--	-	--	-	--	-	--	-	--	-	--	-
.... HANNAEA	--	-	--	-	--	-	--	-	--	-	*	0
.... SYNEDRA	13	6	--	-	27	2	--	-	--	-	27	1
... GOMPHONEMATACEAE												
.... GOMPHONEMA	90#	44	--	-	27	2	--	-	13	3	150	5
... NAVICULACEAE												
.... FRUSTULIA	--	-	--	-	--	-	--	-	--	-	--	-
.... NAVICULA	26	13	39	9	69	4	--	-	--	-	*	0
... NITZSCHIACEAE												
.... NITZSCHIA	64#	31	39	9	41	3	64#	24	39	10	230	8
... SURIRELLACEAE												
.... SURIRELLA	13	6	--	-	--	-	--	-	--	-	--	-
CYANOPHYTA (BLUE-GREEN ALGAE)												
. CYANOPHYCEAE												
.. CHROOCOCCALES												
... CHROOCOCCACEAE												
.... ANACYSTIS	--	-	--	-	--	-	--	-	--	-	--	-
.. HORMOGONALES												
... OSCILLATORIACEAE												
.... LYNGBYA	--	-	--	-	--	-	--	-	310#	80	--	-
.... OSCILLATORIA	--	-	310#	69	1400#	89	--	-	--	-	1800#	65
... RIVULARIACEAE												
.... RAPHIDIOPSIS	--	-	--	-	--	-	--	-	--	-	140	5
EUGLENOPHYTA (EUGLENOIDS)												
. EUGLENOPHYCEAE												
.. EUGLENALES												
... EUGLENACEAE												
.... EUGLENA	--	-	--	-	--	-	51#	19	13	3	140	5
.... TRACHELOMONAS	--	-	--	-	--	-	--	-	--	-	--	-
UNKNOWN 1CSPARSE	--	-	--	-	--	-	--	-	--	-	--	-

NOTE: # - 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

PHYTOPLANKTON ANALYSES, OCTOBER 1980 TO SEPTEMBER 1981

DATE	APR 28,81	MAY 19,81	JUN 23,81	JUL 21,81	AUG 24,81	SEP 22,81
TIME	1200	0915	1100	1045	1100	1200
TOTAL CELLS/ML	26	460	310	1600	72	72
DIVERSITY: DIVISION	1.0	1.1	1.1	1.3	1.0	0.0
.CLASS	1.0	1.1	1.1	1.3	0.0	0.0
..ORDER	1.0	1.2	2.1	1.8	0.0	0.0
...FAMILY	1.0	1.4	2.8	2.8	0.0	0.0
....GENUS	1.0	1.4	2.8	3.1	0.0	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												
...HYDRODICTYACEAE												
....PEDIASTRUM	--	-	--	-	--	-	--	-	--	-	--	-
...OOCYSTACEAE												
....ANKISTRODESMUS	--	-	39	8	13	4	56	3	--	-	--	-
...SCENEDESMACEAE												
....SCENEDESMUS	--	-	52	11	52#	17	--	-	--	-	--	-
..VOLVOCALES												
...CHLAMYDOMONADACEAE												
....CHLAMYDOMONAS	13#	50	--	-	39	13	56	3	43#	60	--	-
CHRYSOPHYTA												
.BACILLARIOPHYCEAE												
..CENTRALES												
...COSCINODISCACEAE												
....CYCLOTELLA	--	-	--	-	--	-	14	1	--	-	--	-
....MELOSIRA	--	-	26	6	77#	25	84	5	--	-	--	-
..PENNALES												
...ACHNANTHACEAE												
....ACHNANTHES	--	-	--	-	--	-	42	3	--	-	--	-
....COCCONEIS	--	-	--	-	--	-	--	-	--	-	--	-
....RHOICOSPHENIA	--	-	--	-	--	-	42	3	--	-	--	-
...FRAGILARIACEAE												
....FRAGILARIA	--	-	--	-	26	8	--	-	--	-	--	-
....HANNAEA	--	-	--	-	--	-	--	-	--	-	--	-
....SYNEDRA	--	-	13	3	--	-	110	7	--	-	--	-
...GOMPHONEMATACEAE												
....GOMPHONEMA	--	-	--	-	--	-	110	7	--	-	72#	100
...NAVICULACEAE												
....FRUSTULIA	--	-	--	-	--	-	14	1	--	-	--	-
....NAVICULA	--	-	--	-	39	13	--	-	--	-	--	-
...NITZSCHIACEAE												
....NITZSCHIA	13#	50	--	-	52#	17	150	10	--	-	--	-
...SURIRELLACEAE												
....SURIRELLA	--	-	--	-	--	-	--	-	--	-	--	-
CYANOPHYTA (BLUE-GREEN ALGAE)												
.CYANOPHYCEAE												
..CHROOCOCCALES												
...CHROOCOCCACEAE												
....ANACYSTIS	--	-	340#	72	13	4	98	6	--	-	--	-
..HORMOGONALES												
...OSCILLATORIACEAE												
....LYNGBYA	--	-	--	-	--	-	84	5	--	-	--	-
....OSCILLATORIA	--	-	--	-	--	-	630#	39	--	-	--	-
...RIVULARIACEAE												
....RAPHIDIOPSIS	--	-	--	-	--	-	110	7	--	-	--	-
EUGLENOPHYTA (EUGLENOIDS)												
.EUGLENOPHYCEAE												
..EUGLENALES												
...EUGLENACEAE												
....EUGLENA	--	-	--	-	--	-	--	-	--	-	--	-
....TRACHELOMONAS	--	-	--	-	--	-	--	-	29#	40	--	-
UNKNOWN ICSPARSE	--	-	--	-	--	-	--	-	*	0	--	-

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).

PERIOD OF RECORD.--October 1913 to January 1921, September 1921 to current year.

REVISED RECORDS.--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 good. 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. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--65 years (water years 1915-16, 1918-20, 1922-81), 7.04 ft³/s (0.199 m³/s), 5,100 acre-ft/yr (6.29 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.--Maximum discharge, 600 ft³/s (17.0 m³/s) May 7, gage height, 4.70 ft (1.433 m), from rating curve extended as explained above, no other peak above base of 240 ft³/s (6.80 m³/s), minimum, 0.90 ft³/s (0.026 m³/s) Nov. 13, Dec. 1, Mar. 11, Sept. 28, 29.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.6	2.2	1.6	2.4	2.3	1.6	1.4	7.4	3.4	2.1	1.9	1.9
2	2.6	2.1	1.4	2.3	2.2	1.7	1.8	2.5	3.4	2.3	1.8	2.2
3	2.6	2.1	1.5	2.4	2.2	1.7	1.5	2.2	3.4	2.2	1.7	2.2
4	2.5	2.1	1.5	2.3	2.1	1.6	1.4	2.1	3.4	2.1	20	1.9
5	2.7	2.0	2.3	2.3	3.3	1.6	1.4	2.1	3.6	2.2	8.3	2.1
6	2.5	2.0	1.9	2.3	2.0	4.0	2.4	2.8	3.8	2.3	2.9	2.1
7	2.7	2.1	1.9	2.2	1.9	2.4	1.6	223	3.4	2.2	2.4	1.9
8	2.6	2.7	1.5	2.5	2.2	1.9	1.4	105	2.7	2.0	2.2	1.6
9	2.4	2.7	1.5	2.5	2.0	1.9	1.3	88	2.9	1.8	2.2	1.5
10	2.4	2.7	1.5	2.2	2.0	1.8	1.2	80	2.9	1.9	2.1	1.6
11	2.4	6.0	1.6	2.2	2.0	1.5	1.4	34	3.2	1.9	2.8	1.7
12	2.6	2.2	1.5	2.4	2.0	1.4	2.0	6.4	3.1	1.9	2.6	1.6
13	3.8	1.5	1.5	2.2	1.9	1.5	8.3	6.2	3.0	1.8	2.4	1.7
14	6.2	1.8	32	2.2	1.8	1.5	4.5	6.1	3.0	2.6	2.2	1.6
15	2.7	2.0	4.9	2.1	1.9	1.5	3.3	5.9	2.8	2.5	2.1	1.5
16	2.5	1.9	2.3	2.1	1.9	1.4	2.2	5.8	2.5	2.5	3.2	1.4
17	2.7	1.8	2.0	2.2	1.8	1.5	1.7	5.9	2.7	2.0	2.3	1.4
18	4.0	1.8	1.9	2.0	1.8	1.4	1.7	5.3	2.6	2.0	2.8	1.6
19	2.6	2.0	1.8	1.8	1.9	1.4	1.7	5.2	2.5	1.8	2.9	1.5
20	2.4	1.8	1.8	1.9	2.8	1.3	1.7	5.2	2.4	2.8	2.2	1.7
21	2.4	1.7	1.9	1.9	2.2	1.3	1.7	4.4	2.5	8.6	2.1	1.5
22	2.5	1.7	7.8	1.9	2.7	1.3	1.7	4.0	2.3	2.2	2.1	1.8
23	2.4	1.7	11	1.8	1.8	1.3	1.7	4.0	2.4	1.8	2.2	1.8
24	2.6	1.7	5.6	1.9	2.0	1.3	1.7	4.0	2.4	2.3	2.1	1.6
25	5.2	1.7	4.1	1.8	1.9	1.5	1.6	3.9	2.4	2.8	2.0	1.5
26	2.7	1.7	3.0	1.7	1.7	1.4	1.6	3.8	4.2	1.6	1.8	1.5
27	2.4	1.6	2.8	3.8	1.6	1.4	1.6	3.8	3.1	1.8	1.9	1.6
28	2.2	1.6	2.7	14	1.7	1.4	1.5	3.8	2.4	2.1	2.0	1.2
29	2.3	1.7	2.5	6.4	---	1.4	1.9	3.6	2.2	1.9	1.9	1.0
30	2.2	1.9	2.5	3.0	---	1.5	12	3.5	2.1	1.8	2.1	1.1
31	2.2	---	2.5	2.3	---	1.3	---	3.6	---	1.8	1.9	---
TOTAL	86.6	62.5	114.3	85.0	57.6	49.7	70.9	643.5	86.7	71.6	93.1	49.3
MEAN	2.79	2.08	3.69	2.74	2.06	1.60	2.36	20.8	2.89	2.31	3.00	1.64
MAX	6.2	6.0	32	14	3.3	4.0	12	223	4.2	8.6	20	2.2
MIN	2.2	1.5	1.4	1.7	1.6	1.3	1.2	2.1	2.1	1.6	1.7	1.0
AC-FT	172	124	227	169	114	99	141	1280	172	142	185	98

CAL YR 1980 TOTAL 3566.7 MEAN 9.75 MAX 159 MIN 1.4 AC-FT 7070
WTR YR 1981 TOTAL 1470.8 MEAN 4.03 MAX 223 MIN 1.0 AC-FT 2920

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).

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.--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. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--63 years (water years, 1914-20, 1926-81), 3.59 ft³/s (0.102 m³/s), 2,600 acre-ft/yr (3.21 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 (*), from rating curve extended above 60 ft³/s (1.70 m³/s):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
May 7	0930	*480	13.6	*4.67	1.423
Aug. 4	2115	360	10.2	4.28	1.305

Minimum discharge, 0.21 ft³/s (0.006 m³/s) Feb. 19, Mar. 17, 18, 20-24.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.0	1.0	.48	.85	.92	.58	.99	8.9	1.2	.90	.87	1.1
2	.66	.86	.46	.81	.67	.72	3.0	2.7	.78	.88	.84	1.4
3	.70	.94	.48	.80	.60	.82	1.5	1.8	.70	.75	2.3	2.9
4	.59	.86	.49	.72	.54	.61	1.1	1.4	.78	.59	42	1.1
5	.93	.78	1.2	.66	1.8	.53	.99	1.2	1.0	.52	11	2.1
6	.84	.70	.98	.64	.66	1.5	1.5	3.3	2.7	.62	4.3	3.0
7	2.1	.70	1.5	.56	.53	.90	.88	134	1.2	.46	2.6	1.2
8	2.3	2.2	.68	1.7	.65	1.6	.73	21	1.3	.94	2.1	1.0
9	.99	.76	.58	1.2	.51	1.4	.66	7.5	.86	.86	1.9	.83
10	1.2	.69	.52	.67	.45	.81	.57	4.9	.78	1.1	1.7	.75
11	.88	5.4	.47	.59	.39	.61	.47	3.9	2.6	.70	5.8	.70
12	2.4	1.0	.49	.82	.30	.51	.77	3.5	2.0	.62	3.5	.70
13	5.4	.88	.39	.66	.32	.44	17	3.1	1.2	.62	4.2	.71
14	7.2	.76	22	.56	.30	.39	6.6	2.7	1.0	5.0	2.0	.69
15	2.3	.96	3.6	.52	.36	.39	5.7	2.3	1.6	4.4	1.7	.59
16	1.7	1.3	1.6	.45	.35	.36	2.6	2.1	.91	7.5	5.4	.54
17	2.3	.79	1.0	.48	.36	.26	1.7	3.0	.79	2.1	1.9	.51
18	4.0	.69	.86	.39	.31	.22	1.3	2.0	.73	1.7	4.6	.78
19	1.8	1.1	.70	.36	.30	.29	1.1	1.8	.60	1.1	6.4	.74
20	1.6	.72	.62	.33	2.6	.24	1.1	5.3	.61	8.0	2.3	1.8
21	1.4	.60	.70	.59	2.1	.21	1.0	2.2	.65	14	1.9	.57
22	1.2	.62	7.4	.65	3.7	.21	.87	1.9	.55	2.7	2.6	3.3
23	1.1	.60	13	.77	1.4	.21	.93	1.6	.55	2.0	2.1	1.5
24	2.9	.55	4.5	.72	2.4	.37	1.5	1.5	.59	4.0	1.4	.78
25	8.5	.58	3.8	.66	1.3	1.2	.74	1.3	.46	3.8	1.3	.58
26	2.3	.76	2.1	.62	.95	.52	.67	1.2	2.8	1.5	1.1	.70
27	1.7	.64	1.6	3.0	.77	.40	.58	1.1	2.6	1.3	1.0	1.0
28	1.4	.56	1.4	8.1	.67	.40	.55	1.1	1.3	1.6	1.8	.72
29	1.5	.51	1.2	6.3	---	1.1	2.4	1.0	.82	1.3	1.1	.49
30	1.2	.49	1.1	1.9	---	2.1	19	.86	.82	1.0	1.8	.44
31	1.0	---	.97	1.2	---	1.0	---	1.6	---	.92	1.1	---
TOTAL	65.09	29.00	76.87	38.28	26.21	20.90	78.50	231.76	34.48	73.48	124.61	33.22
MEAN	2.10	.97	2.48	1.23	.94	.67	2.62	7.48	1.15	2.37	4.02	1.11
MAX	8.5	5.4	22	8.1	3.7	2.1	19	134	2.8	14	42	3.3
MIN	.59	.49	.39	.33	.30	.21	.47	.86	.46	.46	.84	.44
AC-FT	129	58	152	76	52	41	156	460	68	146	247	66

CAL YR 1980 TOTAL 1775.12 MEAN 4.85 MAX 73 MIN .32 AC-FT 3520
WTR YR 1981 TOTAL 832.40 MEAN 2.28 MAX 134 MIN .21 AC-FT 1650

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 mi^2 (2.75 km^2).

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.--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. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--63 years (water years, 1914-20, 1926-81), 5.06 ft^3/s (0.143 m^3/s), 3,670 acre-ft/yr (4.53 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,090 ft^3/s (87.5 m^3/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 ft^3/s (1.64 m^3/s); minimum, 0.6 ft^3/s (0.017 m^3/s) June 7, 8, 1926.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 310 ft^3/s (8.78 m^3/s) and maximum (*), from rating curve extended as explained above:

Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)
May 7	0900	*450	12.7	*3.65	1.113
Aug. 4	2130	330	9.35	3.30	1.006

Minimum discharge, 1.6 ft^3/s (0.045 m^3/s) Mar. 17, 22-24, Apr. 10-12.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.7	3.3	2.6	2.6	2.4	2.0	2.1	11	2.7	2.5	2.2	2.5
2	3.6	3.2	2.6	2.6	2.2	2.1	4.1	3.6	2.4	2.4	2.1	3.4
3	3.7	3.2	2.5	2.6	2.1	2.1	2.3	2.8	2.4	2.2	3.7	3.9
4	3.5	3.2	2.5	2.5	2.0	2.1	2.0	2.5	2.3	2.1	41	2.6
5	4.0	3.1	3.6	2.4	3.0	2.1	2.0	2.4	2.6	2.0	10	4.0
6	3.6	3.2	3.1	2.4	2.1	2.2	2.0	6.6	4.3	2.1	6.4	4.1
7	5.0	3.1	4.2	2.4	2.0	2.0	1.8	150	2.6	2.1	4.0	2.7
8	5.4	4.4	2.7	5.0	2.1	2.7	1.9	22	2.7	2.5	3.8	2.5
9	3.9	3.2	2.6	3.4	2.0	2.7	1.8	8.0	2.4	2.2	3.6	2.2
10	3.9	3.1	2.5	2.6	2.0	2.4	1.6	5.9	2.4	2.4	3.3	2.2
11	3.7	6.0	2.6	2.5	2.1	2.0	1.6	5.0	5.2	1.9	6.5	2.2
12	5.3	3.2	2.6	2.7	2.0	1.9	1.8	4.6	4.0	1.9	5.5	2.3
13	5.9	3.1	2.5	2.4	1.9	1.8	31	4.0	2.9	1.9	5.8	2.2
14	9.0	3.0	26	2.4	1.9	1.8	6.4	3.6	2.5	6.4	3.3	2.1
15	4.3	3.3	5.4	2.2	1.9	1.8	7.0	3.4	2.8	5.0	3.0	2.0
16	4.3	3.5	3.4	2.2	1.9	1.8	4.2	3.2	2.4	9.6	8.1	2.0
17	5.2	3.0	2.9	2.4	1.9	1.7	2.7	4.2	2.3	3.3	3.2	2.0
18	4.7	3.0	2.8	2.3	1.9	1.7	2.1	3.3	2.1	3.0	5.5	2.2
19	3.9	3.3	2.7	2.2	2.0	1.9	2.0	3.2	2.0	2.5	6.5	2.2
20	3.8	2.9	2.6	2.1	4.7	1.7	2.0	6.0	2.1	6.5	3.6	3.4
21	3.7	2.8	2.7	2.1	4.6	1.7	1.9	3.4	2.2	13	3.1	2.0
22	3.5	2.8	7.6	2.2	5.2	1.6	1.8	3.0	2.1	3.3	3.8	6.8
23	3.4	2.7	11	2.2	2.8	1.6	2.0	2.9	2.1	3.2	3.4	3.1
24	5.2	2.7	5.3	2.1	3.3	2.0	2.6	2.8	2.2	5.9	2.8	2.2
25	8.2	2.8	4.5	2.0	2.5	2.6	1.9	2.8	1.9	5.1	2.6	2.1
26	4.1	3.1	3.4	2.0	2.2	1.8	1.8	2.7	3.7	2.8	2.6	2.2
27	3.7	3.0	3.1	4.4	2.1	1.8	1.9	2.6	4.2	2.6	2.6	2.6
28	3.6	2.8	2.9	7.4	2.1	1.7	1.8	2.7	2.7	2.7	3.0	2.1
29	3.6	2.7	2.8	4.1	---	2.5	3.2	2.5	2.2	2.6	2.7	2.0
30	3.4	2.6	2.7	2.9	---	3.4	35	2.5	2.4	2.4	3.0	2.0
31	3.3	---	2.7	2.5	---	2.2	---	3.0	---	2.1	2.6	---
TOTAL	136.1	95.3	131.1	85.8	68.9	63.4	136.3	286.2	80.8	110.2	163.3	79.8
MEAN	4.39	3.18	4.23	2.77	2.46	2.05	4.54	9.23	2.69	3.55	5.27	2.66
MAX	9.0	6.0	26	7.4	5.2	3.4	35	150	5.2	13	41	6.8
MIN	3.3	2.6	2.5	2.0	1.9	1.6	1.6	2.4	1.9	1.9	2.1	2.0
AC-FT	270	189	260	170	137	126	270	568	160	219	324	158

CAL YR 1980 TOTAL 2384.8 MEAN 6.52 MAX 56 MIN 1.9 AC-FT 4730
WTR YR 1981 TOTAL 1437.2 MEAN 3.94 MAX 150 MIN 1.6 AC-FT 2850

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).

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

REVISED RECORDS.--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 fair except those for period of no gage-height record, which are poor. No diversion above station. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--55 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, 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.--Maximum discharge, 202 ft³/s (5.72 m³/s) May 7, gage height, 3.71 ft (1.131 m), from rating curve extended as explained above, no other peak above base of 140 ft³/s (3.96 m³/s); minimum, 0.30 ft³/s (0.008 m³/s) Mar. 12-21, 23, 28, 29.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.47	.37	.36	.70	.39	.39	.33	9.7	.58	.43	.51	.53
2	.47	.39	.36	.65	.39	.39	.36	1.7	.53	.44	.49	.52
3	.46	.39	.35	.63	.39	.39	.36	.81	.51	.44	.51	.57
4	.45	.39	.34	.58	.39	.39	.36	.70	.51	.45	13	.53
5	.44	.39	.37	.56	.45	.39	.36	.75	.51	.45	6.7	.60
6	.45	.40	.37	.53	.41	.36	.36	4.0	.52	.44	2.5	.96
7	.44	.39	.41	.51	.39	.33	.36	61	.50	.43	.89	.45
8	.50	.50	.39	.71	.39	.33	.39	11	.47	.43	.75	.43
9	.43	.40	.36	.74	.39	.33	.41	4.1	.47	.43	.75	.43
10	.43	.40	.36	.49	.38	.33	.39	2.8	.45	.43	.74	.42
11	.43	.52	.36	.47	.39	.33	.35	3.3	.47	.43	1.2	.43
12	.44	.40	.36	.47	.37	.33	.33	2.9	.47	.43	.76	.42
13	.45	.40	.35	.47	.36	.30	4.9	2.9	.45	.43	1.0	.42
14	.60	.39	11	.47	.36	.30	2.7	2.4	.44	.43	.72	.42
15	.49	.41	3.0	.48	.36	.30	3.3	1.3	.44	.43	.70	.41
16	.45	.42	.62	.47	.36	.30	1.8	1.2	.45	.67	.71	.41
17	.48	.41	.51	.47	.36	.30	.56	1.2	.60	.49	.67	.40
18	.44	.39	.54	.45	.36	.30	.56	1.0	.70	.45	.86	.40
19	.43	.40	.55	.43	.36	.31	.56	.97	.70	.43	1.4	.39
20	.42	.39	.55	.43	.36	.32	.58	1.2	.62	.53	.70	.40
21	.42	.39	.58	.43	.38	.33	.57	.89	.43	3.9	.67	.39
22	.42	.39	2.3	.43	.67	.33	.56	.83	.43	.52	.66	.49
23	.42	.39	5.4	.41	.43	.33	.56	.81	.43	.54	.67	.52
24	.46	.39	2.1	.39	.39	.33	.57	.78	.43	.60	.62	.39
25	.56	.39	1.6	.39	.39	.35	.51	.75	.43	1.5	.59	.36
26	.45	.39	.82	.39	.39	.33	.50	.72	.50	.56	.57	.36
27	.43	.39	.75	.39	.39	.33	.49	.67	.67	.58	.53	.36
28	.42	.38	.75	.58	.39	.32	.47	.67	.47	.65	.52	.36
29	.41	.36	.75	.44	---	.30	.51	.62	.44	.58	.50	.36
30	.39	.36	.72	.40	---	.33	12	.60	.43	.53	.50	.36
31	.39	---	.70	.39	---	.33	---	.61	---	.51	.50	---
TOTAL	13.94	11.98	37.98	15.35	11.04	10.33	36.06	122.88	15.05	19.56	41.89	13.49
MEAN	.45	.40	1.23	.50	.39	.33	1.20	3.96	.50	.63	1.35	.45
MAX	.60	.52	11	.74	.67	.39	12	61	.70	3.9	13	.96
MIN	.39	.36	.34	.39	.36	.30	.33	.60	.43	.43	.49	.36
AC-FT	28	24	75	30	22	20	72	244	30	39	83	27

CAL YR 1980 TOTAL 798.59 MEAN 2.18 MAX 31 MIN .34 AC-FT 1580
WTR YR 1981 TOTAL 349.55 MEAN .96 MAX 61 MIN .30 AC-FT 693

NOTE.--No gage-height record Oct. 11 to Nov. 12.

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 mi² (5.28 km²).

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 good except those for period of no gage-height record, which are poor. Maunawili ditch diverts 1.5 mi (2.4 km) above station for irrigation in vicinity of Waimanalo. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--25 years (water years, 1914-15, 1959-81), 4.96 ft³/s (0.140 m³/s), 3,590 acre-ft/yr (4.43 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,000 ft³/s (170 m³/s) Feb. 4, 1965, gage height, 12.41 ft (3.783 m), from rating curve extended above 470 ft³/s (13.3 m³/s) on basis of slope-area measurement of peak flow; minimum, 0.43 ft³/s (0.012 m³/s) Sept. 8-12, 14, 16-20, 22, 23, 1964.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,810 ft³/s (51.3 m³/s) May 7, gage height, 8.27 ft (2.521 m), from rating curve extended as explained above, no other peak above base of 390 ft³/s (11.0 m³/s); minimum, 1.4 ft³/s (0.040 m³/s) Apr. 26, Sept. 24-26, 28-30.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.2	2.2	2.7	3.5	5.0	3.8	1.7	10	5.9	2.3	1.9	2.1
2	2.0	2.2	2.7	3.3	4.7	3.9	1.8	6.1	5.6	2.3	1.8	1.8
3	2.0	2.1	2.7	3.3	4.4	4.1	1.6	5.4	5.5	2.2	2.0	2.0
4	2.0	2.0	2.7	3.2	4.1	4.0	1.6	5.5	5.7	2.2	8.7	1.7
5	2.1	2.1	3.3	3.0	8.4	4.0	1.6	4.4	5.0	2.2	6.9	1.8
6	2.1	2.0	3.3	2.9	4.7	5.2	1.6	18	5.0	2.1	3.7	2.1
7	2.1	2.2	3.6	2.9	4.3	4.0	1.6	260	4.3	2.2	2.9	1.7
8	2.2	2.4	2.5	6.1	5.0	3.7	1.6	32	5.3	2.2	2.5	1.8
9	2.1	2.2	1.8	5.7	4.0	3.1	1.6	18	6.2	2.2	2.4	1.8
10	2.1	2.3	1.7	4.0	3.9	3.3	1.5	14	5.8	2.1	2.3	1.7
11	2.1	2.9	1.7	3.6	3.8	3.1	1.6	12	5.2	2.0	2.9	1.8
12	2.2	2.2	1.7	4.2	3.8	3.5	1.9	11	4.0	2.0	2.5	2.0
13	2.2	2.2	1.5	3.4	4.0	2.6	4.7	10	3.1	2.0	2.6	1.8
14	2.3	2.1	36	3.1	4.2	2.7	4.4	10	3.0	2.3	2.3	1.6
15	2.2	2.1	8.2	2.9	4.1	2.5	12	9.3	2.9	2.4	2.2	1.7
16	2.2	2.1	4.2	3.0	4.0	1.8	9.1	8.7	2.8	2.6	2.2	1.7
17	2.1	1.9	3.3	3.1	4.0	1.8	5.3	8.4	2.8	2.3	2.2	1.7
18	2.2	1.8	2.5	3.2	3.9	1.8	4.1	8.0	2.8	2.4	2.3	1.7
19	2.2	2.0	2.3	2.9	3.9	1.8	3.1	7.7	2.7	2.4	2.2	1.8
20	2.2	1.9	2.3	2.8	4.0	1.8	3.9	7.7	2.6	2.4	2.0	2.0
21	2.2	2.0	2.6	2.8	4.0	1.8	3.9	7.0	2.6	2.8	2.0	1.6
22	2.1	2.1	10	3.5	4.0	1.7	3.6	6.7	2.6	2.1	2.3	1.7
23	1.8	2.0	18	5.0	4.0	1.7	3.6	6.3	2.6	2.1	3.3	1.8
24	2.0	2.0	10	5.0	4.0	1.9	2.6	6.2	2.6	2.3	2.7	1.5
25	2.1	1.9	8.1	5.0	3.9	1.7	1.6	6.4	2.6	2.4	1.9	1.5
26	1.9	1.9	6.4	3.7	3.9	1.7	1.7	6.3	2.6	1.9	1.9	1.5
27	1.9	1.9	5.1	3.9	3.9	1.7	1.7	6.0	2.8	1.9	1.8	1.6
28	1.9	2.0	5.1	5.2	3.8	1.6	2.0	5.9	2.5	1.9	1.9	1.5
29	1.8	2.1	5.2	10	---	1.7	1.7	5.7	2.4	1.9	1.8	1.5
30	1.9	2.7	3.8	6.7	---	1.7	34	5.8	2.4	1.9	1.9	1.5
31	1.9	---	3.6	5.3	---	1.7	---	5.8	---	1.9	1.8	---
TOTAL	64.3	63.5	168.6	126.2	119.7	81.4	122.7	534.3	111.9	67.9	81.8	52.0
MEAN	2.07	2.12	5.44	4.07	4.28	2.63	4.09	17.2	3.73	2.19	2.64	1.73
MAX	2.3	2.9	36	10	8.4	5.2	34	260	6.2	2.8	8.7	2.1
MIN	1.8	1.8	1.5	2.8	3.8	1.6	1.5	4.4	2.4	1.9	1.8	1.5
AC-FT	128	126	334	250	237	161	243	1060	222	135	162	103

CAL YR 1980 TOTAL 2207.6 MEAN 6.03 MAX 170 MIN 1.5 AC-FT 4380
WTR YR 1981 TOTAL 1594.3 MEAN 4.37 MAX 260 MIN 1.5 AC-FT 3160

NOTE.--No gage-height record Oct. 27 to Nov. 26.

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 current year.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 116.39 ft (35.476 m) above mean sea level (levels by Corps of Engineers).

REMARKS.--Records good except those above 400 ft³/s (11.3 m³/s), which are poor. Flow regulated by a flood-control dam upstream. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,500 ft³/s (42.5 m³/s) Mar. 18, 1980, gage height, 5.50 ft (1.676 m), minimum, 0.60 ft³/s (0.017 m³/s) Mar. 27, 1978.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 715 ft³/s (20.2 m³/s) May 8, gage height, 4.23 ft (1.289 m); minimum, 0.94 ft³/s (0.027 m³/s) Oct. 19, 23.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	8.2	6.8	5.6	8.2	7.3	6.1	5.6	21	9.0	6.7	6.0	5.6
2	8.1	6.6	5.9	7.8	7.1	6.6	6.5	9.3	8.6	7.1	5.9	5.6
3	7.9	6.3	5.7	8.8	7.0	7.9	5.2	8.4	8.4	7.2	6.5	5.8
4	7.8	5.8	5.4	7.6	6.8	6.6	5.0	7.9	8.3	7.0	19	5.6
5	8.2	6.3	8.0	7.3	14	6.3	5.4	7.3	8.8	6.9	17	5.8
6	7.9	6.1	8.5	7.1	7.7	23	5.4	27	9.0	6.7	8.6	6.4
7	7.9	6.6	10	7.1	7.2	13	5.5	198	8.3	6.7	7.2	5.6
8	7.9	7.0	7.6	11	8.2	7.4	6.8	157	8.2	6.7	6.5	5.6
9	7.6	6.2	6.9	11	7.6	6.8	6.1	25	8.0	6.4	6.3	5.6
10	4.0	7.4	6.3	8.5	7.2	6.6	5.5	18	7.7	6.4	6.0	5.6
11	1.1	7.9	6.2	8.3	8.5	6.4	5.5	15	8.4	6.0	7.6	5.6
12	1.2	6.3	6.1	9.1	8.8	6.1	6.1	14	8.2	6.0	6.4	5.6
13	1.2	6.2	5.7	8.5	7.1	6.1	14	13	7.8	5.9	6.5	5.6
14	1.5	6.3	84	7.7	5.8	6.1	22	12	7.8	7.3	6.2	5.3
15	1.3	6.3	21	7.3	5.8	6.1	14	12	7.7	8.6	6.0	5.3
16	1.2	6.3	9.5	7.3	6.1	6.0	9.4	12	7.6	7.3	6.1	5.6
17	1.0	5.6	7.7	7.1	6.4	5.8	6.8	12	7.7	6.8	6.1	5.8
18	1.3	5.2	7.1	6.7	6.4	6.1	6.3	11	7.4	6.8	6.7	5.6
19	1.1	5.6	6.8	6.6	6.6	6.1	6.0	11	7.0	6.8	6.7	5.3
20	1.1	5.3	6.7	6.7	7.6	6.0	5.8	12	7.0	6.8	6.4	5.8
21	1.1	5.6	6.8	6.4	7.2	6.1	5.8	11	7.0	9.4	6.1	5.3
22	1.1	5.8	26	6.7	6.6	6.0	5.7	11	6.7	6.3	6.1	5.6
23	1.1	5.8	28	6.8	6.2	5.8	5.7	10	6.7	6.2	6.4	5.6
24	1.1	5.8	16	6.7	6.3	7.0	5.8	10	6.7	6.9	6.1	5.0
25	2.0	5.8	15	6.3	6.1	6.0	5.3	10	6.7	7.9	5.8	5.0
26	1.2	6.9	9.9	5.9	6.3	6.2	5.5	10	7.0	6.9	6.1	4.7
27	1.1	6.0	8.8	9.4	6.0	6.5	5.5	9.7	7.7	6.8	5.8	5.0
28	1.1	6.2	8.5	11	6.1	6.1	6.7	9.5	7.0	6.9	6.4	4.7
29	1.4	5.8	8.3	26	---	6.0	6.2	9.3	6.7	7.0	6.1	4.7
30	4.4	5.8	7.8	10	---	6.2	44	9.1	6.8	6.9	7.0	5.0
31	7.0	---	8.0	7.7	---	5.8	---	9.2	---	6.4	5.6	---
TOTAL	110.1	185.6	373.8	262.6	200.0	218.8	249.1	711.7	229.9	213.7	221.2	163.3
MEAN	3.55	6.19	12.1	8.47	7.14	7.06	8.30	23.0	7.66	6.89	7.14	5.44
MAX	8.2	7.9	84	26	14	23	44	198	9.0	9.4	19	6.4
MIN	1.0	5.2	5.4	5.9	5.8	5.8	5.0	7.3	6.7	5.9	5.6	4.7
AC-FT	218	368	741	521	397	434	494	1410	456	424	439	324

CAL YR 1980 TOTAL 5149.2 MEAN 14.1 MAX 253 MIN 1.0 AC-FT 10210
WTR YR 1981 TOTAL 3139.8 MEAN 8.60 MAX 198 MIN 1.0 AC-FT 6230

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, observations of specific conductance, pH, and water temperature were collected during the year.

EXTREMES FOR PERIOD OF RECORD.--
SEDIMENT CONCENTRATIONS: Maximum daily mean, 879 mg/L Mar. 18, 1980; minimum daily mean, 3 mg/L Apr. 14-17, 1977, many days in 1981.
SEDIMENT DISCHARGE: Maximum daily, 1,380 tons (1,250 tonnes) Mar. 18, 1980; minimum daily, 0.05 ton (0.05 tonne) Apr. 14-17, 1977, many days in 1981.

EXTREMES FOR CURRENT YEAR.--
SEDIMENT CONCENTRATIONS: Maximum daily mean, 262 mg/L May 7; minimum daily mean, 3 mg/L for many days during the year.
SEDIMENT DISCHARGE: Maximum daily, 215 tons (195 tonnes) May 8; minimum daily, 0.05 ton (0.05 tonne) for many days.

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (UMHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)
OCT					
17...	1610	1.1	200	7.0	24.0
NOV					
24...	1400	6.2	250	7.1	25.0
FEB					
19...	0955	6.2	190	7.2	23.0
JUL					
09...	1350	6.9	220	7.2	24.0
SEP					
30...	1430	4.9	200	6.8	28.0

16272200 KAMOOALII STREAM BELOW LULUKU STREAM NEAR KANEOHE--Continued

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

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	8.2	50	1.1	6.8	30	.55	5.6	15	.23
2	8.1	50	1.1	6.6	30	.53	5.9	20	.32
3	7.9	50	1.1	6.3	16	.27	5.7	18	.28
4	7.8	45	.95	5.8	12	.19	5.4	15	.22
5	8.2	70	1.5	6.3	10	.17	8.0	15	.32
6	7.9	40	.85	6.1	12	.20	8.5	15	.34
7	7.9	40	.85	6.6	15	.27	10	15	.41
8	7.9	40	.85	7.0	16	.30	7.6	10	.21
9	7.6	70	1.4	6.2	15	.25	6.9	10	.19
10	4.0	40	.43	7.4	15	.30	6.3	10	.17
11	1.1	45	.13	7.9	15	.32	6.2	15	.25
12	1.2	40	.13	6.3	20	.34	6.1	15	.25
13	1.2	35	.11	6.2	15	.25	5.7	15	.23
14	1.5	25	.10	6.3	12	.20	84	107	67
15	1.3	50	.18	6.3	14	.24	21	25	1.4
16	1.2	60	.19	6.3	12	.20	9.5	25	.64
17	1.0	30	.08	5.6	15	.23	7.7	20	.42
18	1.3	35	.12	5.2	20	.28	7.1	15	.29
19	1.1	38	.11	5.6	20	.30	6.8	15	.28
20	1.1	30	.09	5.3	24	.34	6.7	15	.27
21	1.1	30	.09	5.6	20	.30	6.8	15	.28
22	1.1	30	.09	5.8	15	.23	26	43	5.3
23	1.1	25	.07	5.8	13	.20	28	20	1.5
24	1.1	20	.06	5.8	18	.28	16	20	.86
25	2.0	35	.19	5.8	20	.31	15	50	2.0
26	1.2	35	.11	6.9	24	.45	9.9	50	1.3
27	1.1	32	.10	6.0	25	.41	8.8	38	.90
28	1.1	25	.07	6.2	20	.33	8.5	32	.73
29	1.4	30	.11	5.8	18	.28	8.3	30	.67
30	4.4	20	.24	5.8	15	.23	7.8	28	.59
31	7.0	15	.28	---	---	---	8.0	25	.54
TOTAL	110.1	---	12.78	185.6	---	8.75	373.8	---	88.39
		JANUARY			FEBRUARY			MARCH	
1	8.2	30	.66	7.3	35	.69	6.1	30	.49
2	7.8	25	.53	7.1	30	.58	6.6	30	.53
3	8.8	20	.48	7.0	30	.57	7.9	40	.85
4	7.6	15	.31	6.8	38	.70	6.6	30	.53
5	7.3	13	.26	14	50	1.9	6.3	25	.43
6	7.1	14	.27	7.7	30	.62	23	68	11
7	7.1	16	.31	7.2	32	.62	13	30	1.1
8	11	20	.59	8.2	30	.66	7.4	25	.50
9	11	30	.89	7.6	35	.72	6.8	22	.40
10	8.5	30	.69	7.2	36	.70	6.6	20	.36
11	8.3	23	.52	8.5	45	1.0	6.4	23	.40
12	9.1	26	.64	8.8	40	.95	6.1	30	.49
13	8.5	15	.34	7.1	45	.86	6.1	30	.49
14	7.7	15	.31	5.8	50	.78	6.1	25	.41
15	7.3	15	.30	5.8	40	.63	6.1	25	.41
16	7.3	30	.59	6.1	36	.59	6.0	21	.34
17	7.1	20	.38	6.4	40	.69	5.8	30	.47
18	6.7	17	.31	6.4	35	.60	6.1	30	.49
19	6.6	12	.21	6.6	30	.53	6.1	25	.41
20	6.7	10	.18	7.6	25	.51	6.0	35	.57
21	6.4	10	.17	7.2	35	.68	6.1	40	.66
22	6.7	15	.27	6.6	38	.68	6.0	28	.45
23	6.8	20	.37	6.2	36	.60	5.8	30	.47
24	6.7	20	.36	6.3	38	.65	7.0	25	.47
25	6.3	20	.34	6.1	30	.49	6.0	22	.36
26	5.9	20	.32	6.3	25	.43	6.2	30	.50
27	9.4	40	1.0	6.0	23	.37	6.5	25	.44
28	11	40	1.2	6.1	30	.49	6.1	21	.35
29	26	150	11	---	---	---	6.0	25	.41
30	10	75	2.0	---	---	---	6.2	30	.50
31	7.7	40	.83	---	---	---	5.8	30	.47
TOTAL	262.6	---	26.63	200.0	---	19.29	218.8	---	25.75

16272200 KAMOOALII STREAM BELOW LULUKU STREAM NEAR KANEOHE--Continued

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

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	5.6	30	.45	21	100	5.7	9.0	30	.73
2	6.5	25	.44	9.3	90	2.3	8.6	30	.70
3	5.2	23	.32	8.4	60	1.4	8.4	35	.79
4	5.0	25	.34	7.9	30	.64	8.3	40	.90
5	5.4	20	.29	7.3	30	.59	8.8	35	.83
6	5.4	16	.23	27	90	6.6	9.0	30	.73
7	5.5	18	.27	198	262	211	8.3	30	.67
8	6.8	15	.28	157	241	215	8.2	37	.82
9	6.1	20	.33	25	80	5.4	8.0	30	.65
10	5.5	25	.37	18	60	2.9	7.7	17	.35
11	5.5	20	.30	15	50	2.0	8.4	17	.39
12	6.1	20	.33	14	35	1.3	8.2	17	.38
13	14	40	1.5	13	30	1.1	7.8	18	.38
14	22	50	3.0	12	30	.97	7.8	30	.63
15	14	30	1.1	12	22	.71	7.7	30	.62
16	9.4	35	.89	12	23	.75	7.6	20	.41
17	6.8	35	.64	12	23	.75	7.7	20	.42
18	6.3	25	.43	11	20	.59	7.4	15	.30
19	6.0	30	.49	11	22	.65	7.0	14	.26
20	5.8	30	.47	12	15	.49	7.0	15	.28
21	5.8	25	.39	11	25	.74	7.0	15	.28
22	5.7	18	.28	11	25	.74	6.7	18	.33
23	5.7	32	.49	10	20	.54	6.7	13	.24
24	5.8	30	.47	10	100	2.7	6.7	15	.27
25	5.3	30	.43	10	80	2.2	6.7	18	.33
26	5.5	30	.45	10	15	.41	7.0	30	.57
27	5.5	30	.45	9.7	15	.39	7.7	33	.69
28	6.7	40	.72	9.5	15	.38	7.0	20	.38
29	6.2	40	.67	9.3	12	.30	6.7	15	.27
30	44	250	30	9.1	10	.25	6.8	15	.28
31	---	---	---	9.2	15	.37	---	---	---
TOTAL	249.1	---	46.82	711.7	---	469.86	229.9	---	14.88
		JULY			AUGUST			SEPTEMBER	
1	6.7	5	.09	6.0	4	.06	5.6	3	.05
2	7.1	5	.10	5.9	4	.06	5.6	3	.05
3	7.2	5	.10	6.5	7	.12	5.8	4	.06
4	7.0	4	.08	19	30	1.5	5.6	3	.05
5	6.9	5	.09	17	25	1.1	5.8	3	.05
6	6.7	6	.11	8.6	10	.23	6.4	3	.05
7	6.7	6	.11	7.2	5	.10	5.6	3	.05
8	6.7	6	.11	6.5	3	.05	5.6	3	.05
9	6.4	7	.12	6.3	4	.07	5.6	3	.05
10	6.4	5	.09	6.0	4	.06	5.6	3	.05
11	6.0	4	.06	7.6	3	.06	5.6	3	.05
12	6.0	4	.06	6.4	3	.05	5.6	4	.06
13	5.9	4	.06	6.5	3	.05	5.6	4	.06
14	7.3	6	.12	6.2	3	.05	5.3	4	.06
15	8.6	15	.35	6.0	3	.05	5.3	4	.06
16	7.3	5	.10	6.1	3	.05	5.6	3	.05
17	6.8	3	.06	6.1	3	.05	5.8	3	.05
18	6.8	3	.06	6.7	3	.05	5.6	4	.06
19	6.8	3	.06	6.7	4	.07	5.3	4	.06
20	6.8	5	.09	6.4	5	.09	5.8	5	.08
21	9.4	10	.25	6.1	5	.08	5.3	4	.06
22	6.3	4	.07	6.1	4	.07	5.6	5	.08
23	6.2	4	.07	6.4	3	.05	5.6	4	.06
24	6.9	5	.09	6.1	4	.07	5.0	5	.07
25	7.9	5	.11	5.8	3	.05	5.0	5	.07
26	6.9	6	.11	6.1	3	.05	4.7	4	.05
27	6.8	5	.09	5.8	3	.05	5.0	5	.07
28	6.9	5	.09	6.4	4	.07	4.7	4	.05
29	7.0	5	.09	6.1	3	.05	4.7	5	.06
30	6.9	5	.09	7.0	10	.19	5.0	5	.07
31	6.4	5	.09	5.6	3	.05	---	---	---
TOTAL	213.7	---	3.17	221.2	---	4.70	163.3	---	1.74
YEAR	3139.8		722.76						

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 mi² (0.08 km²).

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. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--19 years, 1.67 ft³/s (0.047 m³/s), 1,210 acre-ft/yr (1.49 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 279 ft³/s (7.90 m³/s) May 2, 1965, gage height, 3.96 ft (1.207 m), from rating curve extended above 3.9 ft³/s (0.11 m³/s); no flow July 7, 1977.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 44 ft³/s (1.25 m³/s) Dec. 14, gage height, 2.08 ft (0.634 m), from rating curve extended above 3.9 ft³/s (0.11 m³/s), no peak above base of 47 ft³/s (1.33 m³/s); minimum, 0.30 ft³/s (0.008 m³/s) July 13, 14.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.91	.91	.91	.91	.80	.75	.65	.74	.42	.37	.47	.51
2	.91	.91	.91	.91	.80	.75	.75	.56	.42	.37	.47	.51
3	.91	.91	.91	.98	.80	.75	.65	.56	.42	.37	.47	.51
4	.91	.91	.91	.91	.80	.75	.60	.56	.37	.37	3.2	.56
5	.91	.91	.98	.91	.85	.75	.60	.56	.37	.37	.84	.51
6	.91	.91	.91	.91	.80	1.2	.60	1.2	.37	.37	.56	.51
7	.91	.91	.91	.91	.80	.85	.60	5.2	.37	.37	.51	.51
8	.91	.91	.91	1.2	.80	.80	1.8	2.3	.37	.33	.47	.51
9	.91	.91	.91	.91	.80	.75	.65	.65	.37	.33	.47	.51
10	.91	.91	.91	.91	.80	.75	.60	.60	.37	.33	.47	.51
11	.91	.91	.91	.91	.96	.80	.60	.51	.37	.33	.53	.51
12	.91	.91	.91	.91	.80	.75	.70	.51	.37	.33	.51	.47
13	.91	.91	.91	.91	.75	.75	2.5	.51	.37	.30	.51	.47
14	1.0	.91	2.6	.91	.75	.75	1.0	.51	.37	.37	.51	.47
15	.91	.91	1.0	.91	.75	.75	1.1	.51	.37	.47	.51	.47
16	.91	.91	.98	.91	.75	.75	.75	.51	.37	.47	.51	.47
17	.91	.91	.98	.91	.75	.70	.65	.51	.37	.42	.51	.47
18	.91	.91	.98	.91	.75	.70	.60	.51	.37	.47	.51	.51
19	.91	.91	.98	.91	.75	.70	.60	.49	.37	.47	.51	.51
20	.91	.91	.98	.91	.80	.70	.60	.47	.37	.47	.51	.56
21	.91	.91	1.3	.91	.85	.70	.60	.47	.37	.61	.51	.51
22	.91	.91	1.1	.85	.80	.70	.60	.47	.37	.42	.51	.51
23	.91	.91	1.3	.85	.75	.65	.60	.47	.37	.42	.51	.51
24	.91	.91	1.1	.85	.80	.65	.60	.47	.37	.47	.51	.47
25	1.5	.91	1.2	.85	.75	.65	.60	.47	.37	.47	.51	.51
26	.91	.91	1.0	.85	.75	.65	.60	.47	.37	.42	.51	.56
27	.91	.91	.91	1.1	.75	.65	.60	.47	.37	.47	.51	.60
28	.91	.91	.91	.98	.75	.65	.56	.47	.37	.47	.51	.60
29	.91	.91	.91	.91	---	.65	.56	.42	.37	.47	.47	.60
30	.91	.91	.91	.85	---	.65	2.1	.42	.37	.47	.47	.60
31	.91	---	.91	.80	---	.65	---	.42	---	.47	.47	---
TOTAL	28.89	27.30	31.95	28.36	22.06	22.70	24.02	22.99	11.25	12.84	18.54	15.53
MEAN	.93	.91	1.03	.91	.79	.73	.80	.74	.38	.41	.60	.52
MAX	1.5	.91	2.6	1.2	.96	1.2	2.5	5.2	.42	.61	3.2	.60
MIN	.91	.91	.91	.80	.75	.65	.56	.42	.37	.30	.47	.47
AC-FT	57	54	63	56	44	45	48	46	22	25	37	31

CAL YR 1980 TOTAL 350.72 MEAN .96 MAX 16 MIN .24 AC-FT 696
WTR YR 1981 TOTAL 266.43 MEAN .73 MAX 5.2 MIN .30 AC-FT 528

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 mi^2 (0.08 km^2).

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 except those for period of no gage-height record, which are fair. Honolulu Board of Water Supply diverts water from wells in South Fork Waihee which affects the low flow at this station. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--19 years, 1.75 ft^3/s (0.050 m^3/s), 1,270 acre-ft/yr (1.57 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 376 ft^3/s (10.6 m^3/s) Feb. 4, 1965, gage height, 3.38 ft (1.030 m), from rating curve extended above 19 ft^3/s (0.54 m^3/s); no flow July 7, 8, 1977.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 71 ft^3/s (2.01 m^3/s) Aug. 4, gage height, 2.00 ft (0.610 m), from rating curve extended above 19 ft^3/s (0.54 m^3/s), no other peak above base of 45 ft^3/s (1.27 m^3/s); minimum, 0.76 ft^3/s (0.022 m^3/s) for several days in June and July.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.2	1.4	1.4	1.3	1.2	1.1	1.0	1.1	.86	.76	.86	.91
2	1.2	1.4	1.4	1.3	1.2	1.1	1.1	.91	.86	.76	.86	.91
3	1.2	1.4	1.4	1.3	1.2	1.1	1.0	.91	.86	.76	.86	.91
4	1.2	1.4	1.4	1.3	1.2	1.1	.96	.91	.86	.76	4.4	.91
5	1.2	1.4	1.4	1.3	1.2	1.1	.96	.91	.86	.76	1.4	.91
6	1.2	1.4	1.4	1.3	1.2	1.5	.96	1.3	.86	.81	1.0	.91
7	1.2	1.4	1.4	1.3	1.2	1.2	1.1	4.3	.86	.81	.91	.86
8	1.3	1.4	1.4	1.5	1.2	1.1	1.8	2.1	.86	.76	.86	.86
9	1.3	1.4	1.4	1.3	1.2	1.1	.96	1.1	.86	.76	.86	.86
10	1.3	1.4	1.4	1.2	1.2	1.1	.96	.96	.86	.76	.86	.86
11	1.3	1.4	1.4	1.2	1.3	1.2	.96	.91	.86	.76	.91	.86
12	1.3	1.4	1.4	1.2	1.2	1.1	1.0	.86	.86	.76	.91	.86
13	1.3	1.4	1.4	1.2	1.1	1.1	2.3	.86	.86	.76	.91	.86
14	1.5	1.4	2.4	1.2	1.1	1.1	1.3	.86	.86	.81	.91	.86
15	1.3	1.4	1.4	1.2	1.1	1.1	1.4	.86	.86	.86	.91	.86
16	1.3	1.4	1.4	1.2	1.1	1.1	1.1	.86	.86	.91	.91	.86
17	1.4	1.4	1.4	1.2	1.1	1.1	.96	.86	.86	.86	.91	.86
18	1.4	1.4	1.4	1.2	1.1	1.1	.96	.86	.86	.86	.91	.86
19	1.4	1.4	1.4	1.3	1.1	1.1	.96	.86	.86	.86	.91	.86
20	1.4	1.4	1.4	1.3	1.1	1.1	.96	.86	.86	.86	.91	.86
21	1.4	1.4	1.5	1.3	1.2	1.1	.91	.86	.86	1.0	.91	.86
22	1.4	1.4	1.4	1.3	1.1	1.1	.91	.86	.86	.86	.91	.86
23	1.4	1.4	1.6	1.3	1.1	1.0	.91	.86	.86	.86	.91	.86
24	1.4	1.4	1.4	1.3	1.1	1.0	.91	.86	.86	.86	.91	.86
25	1.9	1.4	1.5	1.2	1.1	1.0	.91	.86	.86	.86	.91	.91
26	1.4	1.4	1.4	1.2	1.1	1.0	.91	.86	.86	.86	.91	.96
27	1.4	1.4	1.3	1.4	1.1	1.0	.91	.86	.81	.86	.91	.96
28	1.4	1.4	1.3	1.4	1.1	1.0	.86	.81	.81	.86	.91	.96
29	1.4	1.4	1.3	1.3	---	1.0	.86	.81	.81	.86	.91	.96
30	1.4	1.4	1.3	1.2	---	1.0	2.0	.86	.76	.86	.91	.96
31	1.4	---	1.3	1.2	---	1.0	---	.86	---	.86	.91	---
TOTAL	41.8	42.0	44.3	39.4	32.2	33.8	32.79	32.51	25.55	25.60	31.98	26.65
MEAN	1.35	1.40	1.43	1.27	1.15	1.09	1.09	1.05	.85	.83	1.03	.89
MAX	1.9	1.4	2.4	1.5	1.3	1.5	2.3	4.3	.86	1.0	4.4	.96
MIN	1.2	1.4	1.3	1.2	1.1	1.0	.86	.81	.76	.76	.86	.86
AC-FT	83	83	88	78	64	67	65	64	51	51	63	53

CAL YR 1980 TOTAL 471.22 MEAN 1.29 MAX 12 MIN .68 AC-FT 935
WTR YR 1981 TOTAL 408.58 MEAN 1.12 MAX 4.4 MIN .76 AC-FT 810

NOTE.--No gage-height record Feb. 25 to Mar. 31.

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 mi² (2.41 km²).

PERIOD OF RECORD.--December 1935 to current year.

REVISED RECORDS.--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). 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 except for the peak flow, which is poor. Honolulu Board of Water Supply diverts water from tunnel and wells in drainage area. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--45 years (water years 1937-81), 7.77 ft³/s (0.220 m³/s), 5,630 acre-ft/yr (6.94 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,110 ft³/s (145 m³/s) Feb. 4, 1965, gage height, 8.72 ft (2.658 m), from floodmarks, from rating curve extended above 77 ft³/s (2.18 m³/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.--Peak discharges above base of 140 ft³/s (3.96 m³/s) and maximum (*), from rating curve extended as explained above:

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Dec. 14	1415	a240	6.80	Unknown	
May 8	0230	a250	7.08	Unknown	
Aug. 4	1900	*a390	11.0	Unknown	

Minimum discharge, 1.0 ft³/s (0.028 m³/s) Aug. 28, 29.

a About.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.0	2.8	2.8	2.8	2.3	2.0	2.1	3.4	1.7	1.4	1.5	1.2
2	3.0	2.8	2.8	2.8	2.3	2.1	2.4	2.3	1.7	1.5	1.5	1.2
3	3.0	2.8	2.8	2.8	2.2	2.0	2.2	2.0	1.6	1.5	1.5	1.3
4	3.0	2.8	2.8	2.7	2.2	2.0	2.1	1.9	1.6	1.5	22	1.3
5	3.0	2.8	3.1	2.7	2.5	2.1	2.1	1.9	1.7	1.5	9.0	1.4
6	3.0	2.8	3.1	2.6	2.3	6.5	2.0	7.1	1.7	1.5	3.1	1.3
7	3.0	2.8	3.0	2.6	2.3	3.6	2.0	45	1.6	1.4	2.2	1.3
8	3.0	2.9	3.0	3.6	2.3	2.6	6.0	33	1.7	1.5	1.8	1.3
9	3.0	2.8	3.0	2.6	2.2	2.4	2.0	5.7	1.7	1.5	1.6	1.3
10	3.0	2.8	3.0	2.5	2.2	2.4	1.9	3.6	1.7	1.5	1.5	1.3
11	3.0	2.9	3.0	2.4	3.0	2.2	1.8	2.9	1.7	1.5	1.6	1.3
12	3.0	2.8	3.0	2.4	2.4	2.2	2.3	2.5	1.8	1.5	1.5	1.3
13	3.0	2.8	3.0	2.4	2.2	2.1	11	2.2	1.7	1.5	1.5	1.3
14	3.5	2.8	13	2.4	2.2	2.0	7.0	2.0	1.7	1.5	1.5	1.3
15	2.8	2.9	4.3	2.3	2.2	2.0	5.2	1.9	1.7	1.7	1.4	1.3
16	2.9	2.9	3.3	2.4	2.2	2.0	3.7	1.9	1.7	1.8	1.4	1.3
17	3.0	2.8	3.1	2.4	2.2	1.9	2.7	1.9	1.7	1.7	1.4	1.3
18	3.1	2.8	3.0	2.3	2.1	1.9	2.3	1.8	1.7	1.7	1.3	1.4
19	2.8	2.9	2.8	2.3	2.1	2.0	2.1	1.8	1.6	1.6	1.3	1.3
20	2.8	2.8	2.8	2.3	2.2	2.0	2.0	1.9	1.6	1.6	1.3	1.4
21	2.8	2.9	4.8	2.3	2.2	2.0	1.9	1.8	1.6	2.1	1.3	1.2
22	2.8	2.8	3.3	2.3	2.2	2.0	1.9	1.8	1.6	1.6	1.2	1.3
23	2.8	2.8	4.9	2.3	2.1	1.9	1.9	1.8	1.6	1.6	1.2	1.2
24	2.9	2.8	3.9	2.3	2.1	2.1	1.9	1.8	1.6	1.6	1.2	1.2
25	5.6	2.8	4.3	2.3	2.1	2.0	1.8	1.8	1.6	1.6	1.2	1.3
26	3.0	2.9	3.5	2.3	2.1	2.0	1.9	1.8	1.5	1.5	1.2	1.4
27	2.8	2.9	3.2	3.0	2.1	2.0	1.8	1.7	1.5	1.5	1.1	1.4
28	2.8	2.8	3.1	2.8	2.1	1.9	1.8	1.7	1.4	1.6	1.0	1.4
29	2.9	2.8	3.0	2.8	---	1.9	1.8	1.7	1.4	1.5	1.0	1.4
30	2.8	2.8	3.0	2.4	---	2.2	9.0	1.7	1.4	1.5	1.2	1.4
31	2.8	---	2.9	2.3	---	2.1	---	1.7	---	1.5	1.2	---
TOTAL	93.9	84.8	110.6	78.4	62.6	70.1	90.6	146.0	48.8	48.5	72.7	39.3
MEAN	3.03	2.83	3.57	2.53	2.24	2.26	3.02	4.71	1.63	1.56	2.35	1.31
MAX	5.6	2.9	13	3.6	3.0	6.5	11	45	1.8	2.1	22	1.4
MIN	2.8	2.8	2.8	2.3	2.1	1.9	1.8	1.7	1.4	1.4	1.0	1.2
AC-FT	186	168	219	156	124	139	180	290	97	96	144	78

CAL YR 1980 TOTAL 1356.1 MEAN 3.71 MAX 80 MIN 1.5 AC-FT 2690
WTR YR 1981 TOTAL 946.3 MEAN 2.59 MAX 45 MIN 1.0 AC-FT 1880

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 mi² (2.51 km²).

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. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--7 years, 5.22 ft³/s (0.148 m³/s), 3,780 acre-ft/yr (4.66 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 828 ft³/s (23.4 m³/s) Jan. 8, 1980, gage height, 6.72 ft (2.048 m) from rating curve extended above 100 ft³/s (2.83 m³/s); minimum, 1.1 ft³/s (0.031 m³/s) Apr. 7, 1977.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 150 ft³/s (4.25 m³/s) and maximum (*), from rating curve extended above 100 ft³/s (2.83 m³/s):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Dec. 14	1415	251	7.11	4.87	1.484
May 8	0230	271	7.67	4.96	1.512
Aug. 4	1900	*417	11.8	*5.54	1.689

Minimum discharge, 3.0 ft³/s (0.085 m³/s) Aug. 30, 31.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.0	6.2	6.0	5.6	5.6	5.0	4.9	6.9	5.0	4.6	4.6	4.0
2	6.0	6.2	6.0	5.4	5.6	5.2	5.2	5.6	4.9	4.6	4.4	4.1
3	6.0	6.2	6.0	5.6	5.2	5.0	5.0	5.2	4.9	4.6	4.4	4.1
4	6.0	6.2	6.0	5.4	5.6	5.0	4.9	4.9	4.9	4.4	31	4.2
5	6.0	6.2	6.2	5.4	6.0	5.2	4.9	4.9	5.0	4.4	14	4.2
6	6.0	6.2	6.0	5.4	5.6	10	4.9	9.9	5.0	4.4	7.1	4.2
7	6.0	6.2	6.0	5.4	5.6	7.0	4.9	54	5.0	4.4	5.8	4.2
8	6.0	6.2	5.8	6.6	5.6	6.0	8.7	42	5.0	4.4	5.0	4.1
9	6.0	6.2	5.8	5.8	5.4	5.6	5.0	9.5	5.0	4.4	4.9	4.1
10	6.0	6.2	5.8	5.6	5.4	5.8	4.9	7.3	4.9	4.4	4.7	4.1
11	6.0	6.2	5.8	5.4	6.6	5.4	4.9	6.6	5.0	4.4	5.0	4.1
12	6.0	6.2	5.8	5.4	5.6	5.4	5.0	6.2	5.0	4.4	4.9	4.2
13	6.0	6.2	5.8	5.4	5.4	5.2	16	6.0	5.0	4.4	4.9	4.2
14	6.9	6.2	19	5.4	5.2	5.2	12	5.6	4.9	4.6	4.7	4.1
15	6.2	6.2	7.3	5.4	5.2	5.2	8.6	5.4	4.9	4.9	4.7	4.1
16	6.2	6.2	6.6	5.8	5.2	5.2	7.1	5.4	4.9	4.9	4.6	4.1
17	6.2	6.2	6.2	5.6	5.2	5.0	6.0	5.4	4.9	4.7	4.6	4.1
18	6.4	6.2	6.0	5.6	5.2	5.2	5.6	5.2	4.7	4.7	4.6	4.2
19	6.2	6.0	5.8	5.6	5.0	5.2	5.4	5.2	4.7	4.6	4.7	4.1
20	6.2	5.8	5.8	5.6	5.2	5.2	5.2	5.2	4.6	4.6	4.6	4.2
21	6.0	5.8	7.4	5.6	5.4	5.2	5.2	5.2	4.6	5.2	4.6	4.0
22	6.0	5.8	6.6	5.6	5.4	5.0	5.0	5.2	4.6	4.6	4.6	4.1
23	6.0	5.8	8.0	5.6	5.2	4.9	5.0	5.2	4.6	4.6	4.4	4.0
24	6.0	5.8	7.3	5.6	5.4	5.2	5.0	5.2	4.6	4.6	4.4	4.0
25	9.0	5.8	7.7	5.6	5.2	5.0	5.0	5.2	4.6	4.6	4.4	4.0
26	6.4	5.8	6.9	5.6	5.2	4.9	5.0	5.0	4.6	4.6	4.4	4.1
27	6.2	5.8	6.6	6.6	5.2	4.9	4.9	5.0	4.7	4.6	4.2	4.2
28	6.0	5.8	6.2	6.4	5.2	4.9	4.9	5.0	4.6	4.6	3.2	4.1
29	6.2	5.8	6.0	6.6	---	4.9	4.9	5.0	4.6	4.6	3.1	4.0
30	6.2	5.8	5.8	6.0	---	5.0	12	5.0	4.6	4.6	3.0	4.1
31	6.2	---	5.6	5.8	---	4.9	---	5.0	---	4.6	3.6	---
TOTAL	192.5	181.4	207.8	176.4	151.6	166.8	186.0	262.4	144.3	142.0	177.1	123.3
MEAN	6.21	6.05	6.70	5.69	5.41	5.38	6.20	8.46	4.81	4.58	5.71	4.11
MAX	9.0	6.2	19	6.6	6.6	10	16	54	5.0	5.2	31	4.2
MIN	6.0	5.8	5.6	5.4	5.0	4.9	4.9	4.9	4.6	4.4	3.0	4.0
AC-FT	382	360	412	350	301	331	369	520	286	282	351	245

CAL YR 1980 TOTAL 2577.2 MEAN 7.04 MAX 94 MIN 4.4 AC-FT 5110
WTR YR 1981 TOTAL 2111.6 MEAN 5.79 MAX 54 MIN 3.0 AC-FT 4190

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).

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 except those for period of no gage-height record, which are poor. Waiahole tunnel diverts from two tributaries above station for irrigation in vicinity of Waipahu. Recording rain gage located at station. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--21 years (water years 1961-81), 8.30 ft³/s (0.235 m³/s), 6,010 acre-ft/yr (7.41 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.--Peak discharges above base of 700 ft³/s (19.8 m³/s) and maximum (*), from rating curve extended as explained above:

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Apr. 14	0100	*1620	45.9	*6.48	1.975
May 8	0630	910	25.8	5.30	1.615
Aug. 4	2000	1120	31.7	5.70	1.737

Minimum discharge, 1.6 ft³/s (0.045 m³/s) probably Sept. 30.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.8	2.3	2.0	2.6	2.8	2.4	2.5	23	3.6	2.4	2.1	2.8
2	2.7	2.2	2.0	2.5	2.7	2.4	3.5	11	3.4	2.5	2.1	3.2
3	2.6	2.2	2.0	2.8	2.6	2.5	2.9	8.2	3.4	2.5	2.2	6.2
4	2.6	2.2	2.0	2.6	2.6	2.2	2.5	6.8	3.4	2.5	108	3.8
5	2.7	2.2	2.4	2.5	5.7	2.7	2.5	6.4	3.1	2.4	42	3.7
6	2.5	2.2	2.6	2.5	2.9	66	2.4	9.2	3.3	2.2	23	3.5
7	2.5	2.2	3.1	2.4	2.6	14	2.3	75	3.1	2.2	8.8	3.2
8	2.8	3.2	2.3	3.8	2.9	5.5	3.9	92	3.1	2.4	5.7	2.9
9	2.7	2.4	2.2	2.9	2.7	11	2.5	25	2.9	2.4	4.8	2.6
10	2.6	2.4	2.1	2.6	2.4	12	2.3	51	2.9	2.3	4.2	3.1
11	2.5	2.4	2.0	2.5	4.7	4.7	2.3	15	3.1	2.2	5.2	3.8
12	2.5	2.3	2.0	2.4	3.5	3.9	4.4	12	3.1	2.1	4.6	4.4
13	2.5	2.3	2.0	2.3	3.0	3.5	22	10	2.9	2.1	6.5	3.1
14	2.5	2.3	13	2.3	2.7	3.4	75	8.6	2.7	2.4	4.6	2.8
15	2.5	2.5	5.5	2.3	2.6	3.3	29	7.5	2.7	3.0	6.5	2.5
16	2.4	3.8	3.3	2.3	2.5	3.1	35	6.8	2.5	4.0	5.4	2.4
17	2.5	2.5	2.7	2.4	2.5	3.0	14	6.8	2.5	3.3	4.8	3.0
18	3.2	2.3	2.4	2.2	2.5	2.9	9.3	6.4	2.5	2.9	7.0	7.0
19	2.5	2.3	2.3	2.2	2.5	2.9	7.4	5.8	2.4	2.4	21	3.9
20	2.4	2.3	2.2	2.1	3.4	2.8	6.5	5.8	2.4	2.2	5.0	3.2
21	2.4	2.3	3.4	2.1	2.7	2.7	5.8	5.0	2.5	12	4.4	3.1
22	2.3	2.2	4.1	2.2	3.0	2.7	5.4	4.7	2.2	2.8	4.5	2.6
23	2.3	2.1	6.9	2.4	2.7	2.6	5.0	4.4	2.2	2.4	5.0	2.4
24	2.8	2.1	5.5	2.2	2.5	2.9	5.3	4.4	2.2	2.3	4.4	2.3
25	9.4	2.1	7.9	2.2	2.4	2.8	4.6	4.2	2.2	3.4	4.1	2.2
26	3.3	2.2	4.4	2.1	2.4	2.7	4.9	4.7	2.0	2.3	4.0	2.3
27	2.6	2.3	3.6	8.8	2.4	2.6	4.3	4.1	2.4	2.2	4.1	2.5
28	2.5	2.4	3.2	4.9	2.7	2.5	4.3	4.3	2.2	2.6	4.6	2.1
29	2.4	2.1	3.0	18	---	2.5	5.5	3.9	2.2	2.3	3.6	2.0
30	2.4	2.1	2.8	4.0	---	3.4	82	3.8	2.2	2.1	3.4	1.8
31	2.3	---	2.7	3.1	---	2.7	---	3.9	---	2.1	3.1	---
TOTAL	86.7	70.4	107.6	102.2	80.6	184.3	359.3	439.7	81.3	86.9	318.7	94.4
MEAN	2.80	2.35	3.47	3.30	2.88	5.95	12.0	14.2	2.71	2.80	10.3	3.15
MAX	9.4	3.8	13	18	5.7	66	82	92	3.6	12	108	7.0
MIN	2.3	2.1	2.0	2.1	2.4	2.2	2.3	3.8	2.0	2.1	2.1	1.8
AC-FT	172	140	213	203	160	366	713	872	161	172	632	187

CAL YR 1980 TOTAL 3341.7 MEAN 9.13 MAX 366 MIN 2.0 AC-FT 6630
WTR YR 1981 TOTAL 2012.1 MEAN 5.51 MAX 108 MIN 1.8 AC-FT 3990

NOTE.--No gage-height record Aug. 14 to Sept. 30.

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 mi² (9.69 km²).

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

REVISED RECORDS.--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 ft³/s (0.25 m³/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. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--22 years (water years 1960-81), 31.7 ft³/s (0.898 m³/s), 25,720 acre-ft/yr (31.7 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,430 ft³/s (154 m³/s) Apr. 15, 1963, gage height, 8.10 ft (2.469 m), from rating curve extended above 530 ft³/s (15.0 m³/s) on basis of computation of peak flow over submerged weir; minimum, 10 ft³/s (0.28 m³/s) Sept. 17, 18, 20, 1961.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 1,600 ft³/s (45.3 m³/s) and maximum (*), from rating curve extended as explained above:

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Mar. 6	1730	2510	71.1	5.77	1.759
Apr. 14	0030	*3600	102	*6.76	2.060
Aug. 4	1930	2020	57.2	5.25	1.600

Minimum discharge, 13 ft³/s (0.37 m³/s) Jan. 18-27.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	20	16	20	15	17	14	16	52	16	15	16	17
2	20	16	20	15	16	15	29	26	16	15	17	16
3	21	16	21	15	16	15	19	23	16	16	16	41
4	20	16	20	15	16	15	17	21	16	15	377	17
5	24	16	24	15	21	31	16	21	17	15	247	18
6	22	16	22	14	16	368	22	38	18	18	64	17
7	20	16	20	14	16	148	32	294	16	16	30	16
8	20	19	20	16	16	49	224	148	16	20	25	16
9	20	16	20	15	16	217	23	84	16	18	22	16
10	19	16	19	14	15	96	20	148	16	17	21	16
11	18	18	18	14	18	31	20	33	17	16	26	17
12	19	16	19	14	17	26	19	29	17	15	26	19
13	20	16	20	14	16	23	272	26	16	15	32	16
14	30	16	30	14	15	21	373	24	17	18	22	16
15	20	16	20	14	15	21	74	22	19	30	33	16
16	18	20	18	14	15	20	89	22	16	25	28	16
17	18	16	18	14	15	18	39	21	16	18	21	15
18	24	16	24	14	14	18	31	21	16	19	29	64
19	18	16	18	13	14	18	28	21	16	19	102	20
20	18	16	18	13	18	17	25	22	15	17	22	17
21	18	16	18	13	16	17	23	20	16	224	20	16
22	18	15	18	13	18	16	22	19	15	23	22	16
23	17	15	17	13	16	16	21	18	15	21	23	16
24	24	15	24	13	19	16	23	18	15	20	20	15
25	96	15	17	13	16	16	20	18	15	24	18	15
26	21	24	16	13	15	17	25	24	15	18	18	15
27	18	19	16	121	15	16	20	18	57	18	20	17
28	17	16	16	45	15	16	20	18	17	20	22	16
29	17	16	15	173	---	15	21	17	16	18	18	15
30	17	15	15	22	---	18	228	17	15	17	17	15
31	16	---	15	19	---	18	---	17	---	16	17	---
TOTAL	688	495	596	744	452	1362	1811	1300	524	776	1391	562
MEAN	22.2	16.5	19.2	24.0	16.1	43.9	60.4	41.9	17.5	25.0	44.9	18.7
MAX	96	24	30	173	21	368	373	294	57	224	377	64
MIN	16	15	15	13	14	14	16	17	15	15	16	15
AC-FT	1360	982	1180	1480	897	2700	3590	2580	1040	1540	2760	1110

CAL YR 1980 TOTAL 15940 MEAN 43.6 MAX 757 MIN 15 AC-FT 31620
WTR YR 1981 TOTAL 10701 MEAN 29.3 MAX 377 MIN 13 AC-FT 21230

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.--WSP 1719: 1954-55.

GAGE.--Water-stage recorder. Altitude of gage is 200 ft (61 m), from topographic map.

REMARKS.--Records poor. Ditch diverts from Punaluu Stream for irrigation in Punaluu Valley. Periodic determinations of water temperature for the current year are published elsewhere in this report.

AVERAGE DISCHARGE.--28 years, 7.76 ft^3/s (0.220 m^3/s), 5,620 acre-ft/yr (6.93 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 at times most years.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 16 ft^3/s (0.45 m^3/s) Apr. 13; no flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.00	.00	1.1	.00	.00	.00	.00	.00
2	.00	.00	.00	.00	.00	.00	1.7	.00	.00	.00	.00	.00
3	.00	.00	.00	.00	.00	.00	1.2	.01	.00	.00	.00	.00
4	.00	.00	.00	.00	.00	.00	1.1	.01	.00	.00	.75	.00
5	.00	.00	.00	.00	.00	.00	1.2	.01	.00	.00	.32	.00
6	.00	.00	.00	.00	.00	.10	1.4	.05	.31	.02	.00	.00
7	.00	.00	.00	.00	.00	.02	6.6	.33	.92	.00	.00	.00
8	.00	.00	.00	.00	.00	.00	4.1	.16	.97	.00	.00	.00
9	.00	.00	.00	.00	.00	.00	.00	.05	1.0	.00	.00	.00
10	.00	.00	.00	.00	.00	.00	.00	.04	1.1	.00	.00	.00
11	.00	.00	.00	.00	.00	.00	.57	.03	.92	.01	.00	.00
12	.00	.00	.00	.00	.05	.00	2.0	.03	.40	.01	.00	.00
13	.00	.00	.00	.00	.05	.00	16	.03	.36	.01	.00	.00
14	.00	.00	.02	.00	.05	.00	8.0	.02	.36	.03	.00	.00
15	.00	.00	.00	.00	.05	.00	5.0	.00	.37	.05	.00	.00
16	.00	.00	.00	.00	.05	.00	3.1	.00	.15	.00	.00	.00
17	.00	.00	.00	.00	.00	.00	.87	.00	.17	.00	.00	.00
18	.00	.00	.00	.00	.00	.00	.24	.00	.19	.00	.00	.06
19	.00	.00	.00	.00	.00	.00	.03	.01	.17	.00	.08	.00
20	.00	.00	.00	.00	.00	.00	.03	.02	.19	.00	.00	.00
21	.00	.00	.00	.00	.00	.21	.04	.01	.23	2.7	.00	.00
22	.00	.00	.00	.00	.00	.65	.04	.01	.55	.00	.00	.00
23	.00	.00	.00	.00	.00	.69	.03	.01	1.0	.00	.00	.00
24	.00	.00	.00	.00	.05	.73	.04	.00	1.1	.00	.00	.00
25	.05	.00	.00	.00	.00	.87	.04	.00	1.2	.00	.00	.00
26	.00	.00	.00	.00	.00	.71	.04	.00	1.5	.00	.00	.07
27	.00	.00	.00	.02	.00	.50	.04	.00	2.4	.00	.00	.19
28	.00	.00	.00	.05	.00	.65	.04	.00	.00	.00	.00	.23
29	.00	.00	.00	.02	---	.82	.04	.00	.00	.00	.00	.33
30	.00	.00	.00	.00	---	1.1	.20	.01	.00	.00	.00	.46
31	.00	---	.00	.00	---	1.1	---	.00	---	.00	.00	---
TOTAL	.05	.00	.02	.09	.30	8.15	54.79	.84	15.56	2.83	1.15	1.34
MEAN	.002	.000	.001	.003	.011	.26	1.83	.027	.52	.091	.037	.045
MAX	.05	.00	.02	.05	.05	1.1	16	.33	2.4	2.7	.75	.46
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	.10	.00	.04	.2	.6	16	109	1.7	31	5.6	2.3	2.7

CAL YR 1980 TOTAL 51.42 MEAN .14 MAX 9.4 MIN .00 AC-FT 102
WTR YR 1981 TOTAL 85.12 MEAN .23 MAX 16 MIN .00 AC-FT 169

NOTE.--No gage-height record Oct. 16 to Dec. 3.

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 mi² (7.20 km²).

PERIOD OF RECORD.--May 1953 to current year.

REVISED RECORDS.--WSP 1569: Drainage area. WRD Hawaii 1974: 1971-72(P), 1973(M). WDR HI-78-1: 1954(M), 1955-70(P).

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). Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--28 years, 17.2 ft³/s (0.487 m³/s), 12,460 acre-ft/yr (15.4 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,700 ft³/s (161 m³/s) July 17, 1974, gage height, 7.60 ft (2.316 m), from rating curve extended above 170 ft³/s (4.81 m³/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 ft³/s (26.3 m³/s) and maximum (*), from rating curve extended above 30 ft³/s (0.85 m³/s) as explained above:

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Apr. 7	2230	1580	44.7	4.42	1.347
Apr. 13	2400	*3160	89.5	*6.06	1.847

Minimum discharge, 11 ft³/s (0.31 m³/s) several days in September.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	15	13	14	13	16	12	15	26	15	14	13	13
2	16	13	14	13	15	13	24	18	15	14	13	13
3	17	13	14	13	15	13	15	16	15	14	13	16
4	15	13	14	13	15	12	15	16	15	14	72	13
5	24	14	18	13	22	22	15	15	15	14	62	18
6	16	14	15	13	15	108	17	31	14	17	23	14
7	15	14	20	13	15	33	103	131	13	15	16	13
8	16	15	14	13	16	23	147	77	13	17	15	13
9	15	14	13	15	15	30	18	32	13	14	15	13
10	15	14	13	13	14	21	15	25	13	14	13	13
11	14	16	13	13	16	16	15	21	13	14	16	14
12	14	14	12	13	15	15	21	20	15	13	17	15
13	16	13	12	13	15	15	254	19	14	13	15	13
14	21	13	33	13	14	15	218	19	16	14	16	13
15	15	15	16	13	14	14	82	19	20	24	13	13
16	14	15	14	13	14	13	63	18	15	16	13	13
17	14	13	13	13	14	13	27	17	15	14	13	13
18	15	13	13	13	14	13	23	17	14	15	17	25
19	14	13	13	12	13	13	22	17	13	15	30	14
20	15	13	13	12	15	13	21	19	13	14	15	13
21	14	18	13	12	13	12	21	16	15	53	14	12
22	13	13	13	13	15	12	19	16	13	15	15	12
23	13	13	14	13	13	12	18	16	13	13	15	12
24	16	13	14	13	18	12	19	16	13	15	18	11
25	27	13	16	13	15	12	17	16	13	15	14	11
26	15	22	14	13	14	13	19	16	14	14	13	11
27	15	16	13	38	13	13	17	15	23	14	13	12
28	14	15	13	43	13	12	19	16	13	14	15	11
29	14	15	13	37	---	12	21	15	13	14	13	11
30	13	15	13	19	---	16	78	15	13	13	13	11
31	13	---	13	16	---	15	---	15	---	13	13	---
TOTAL	483	428	450	490	416	568	1378	745	432	492	576	399
MEAN	15.6	14.3	14.5	15.8	14.9	18.3	45.9	24.0	14.4	15.9	18.6	13.3
MAX	27	22	33	43	22	108	254	131	23	53	72	25
MIN	13	13	12	12	13	12	15	15	13	13	13	11
AC-FT	958	849	893	972	825	1130	2730	1480	857	976	1140	791

CAL YR 1980 TOTAL 9462 MEAN 25.9 MAX 294 MIN 12 AC-FT 18770
WTR YR 1981 TOTAL 6857 MEAN 18.8 MAX 254 MIN 11 AC-FT 13600

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).

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 except those for period of no gage-height record, which are poor. No diversion above station. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--14 years, 3.90 ft³/s (0.110 m³/s), 2,830 acre-ft/yr (3.49 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 at times.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 457 ft³/s (12.9 m³/s) May 8, gage height, 8.29 ft (2.527 m), from rating curve extended as explained above, no peak above base of 500 ft³/s (14.2 m³/s); no flow Jan. 26.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.39	.44	.26	.21	.54	.22	3.3	6.3	.34	.65	.84	.49
2	.32	.36	.23	.17	.40	.55	11	2.1	.30	.39	1.3	.45
3	.30	.33	.20	.20	.32	.65	1.9	1.9	.28	.37	1.6	1.7
4	.26	.31	.18	.33	.25	.40	1.3	1.2	.28	1.3	38	1.4
5	3.8	.26	2.0	.17	8.0	6.9	1.1	1.0	.55	.44	17	2.0
6	1.7	.23	4.3	.23	.71	29	.77	15	1.4	.67	9.2	.98
7	.56	.33	7.6	.15	.36	3.7	.56	43	.70	4.0	1.9	.45
8	3.9	5.5	.75	4.8	6.4	3.0	15	39	.29	4.0	1.3	.31
9	1.4	.87	.46	1.5	1.9	9.3	.88	15	.26	.97	1.1	.25
10	.67	2.5	.34	.41	.59	3.0	.59	3.1	.24	3.8	1.4	.20
11	.39	6.2	.28	.23	3.6	.95	.48	2.0	.52	.77	6.1	7.0
12	2.1	.66	.25	.18	2.2	.84	12	1.5	1.0	.43	5.6	4.8
13	4.3	.38	.21	.12	.65	.58	95	1.3	.69	.31	4.8	1.4
14	3.6	.31	18	.10	.41	.46	31	1.1	.54	2.0	1.8	.69
15	1.1	8.1	5.4	.07	.31	.39	32	.96	1.8	7.7	1.3	.37
16	.60	6.5	1.5	.06	.28	.44	32	.97	.54	4.6	1.3	.28
17	.66	1.1	.78	.08	.23	.32	3.9	2.4	.32	1.5	1.1	.25
18	2.0	.63	.49	.11	.19	.30	2.3	1.7	.60	3.2	5.8	7.9
19	.58	1.6	.40	.06	.20	.41	1.8	1.6	.35	1.9	17	2.0
20	1.6	.72	.45	.05	9.8	.32	1.5	8.4	.23	.82	1.6	4.8
21	1.8	4.8	.38	.04	1.3	.24	2.6	1.1	.28	31	1.1	.69
22	.54	.65	.37	.02	3.1	.23	1.1	.95	.40	1.2	2.9	.41
23	.61	.42	1.3	.02	1.1	.23	1.0	.64	.32	1.0	4.2	.69
24	11	.36	1.0	.02	7.2	1.3	4.6	.53	.22	1.7	4.8	.34
25	21	.46	2.8	.03	.77	1.8	.98	.99	.30	5.4	1.1	.28
26	1.6	2.3	.82	.00	.43	1.7	1.9	1.5	.33	.88	.85	.22
27	.92	1.7	.45	23	.32	.93	.79	.50	2.6	.74	.79	.85
28	.71	.87	.37	28	.25	.55	3.7	1.6	1.5	6.4	1.0	1.3
29	.64	.51	1.3	9.9	---	.96	8.4	.74	.55	1.7	.79	.37
30	.70	.31	.39	1.4	---	5.0	52	.37	.57	1.1	.91	.23
31	.49	---	.27	.79	---	1.8	---	.32	---	.69	.64	---
TOTAL	70.24	49.71	53.50	72.45	51.81	76.47	325.45	158.77	18.30	91.63	139.12	43.10
MEAN	2.27	1.66	1.73	2.34	1.85	2.47	10.8	5.12	.61	2.96	4.49	1.44
MAX	21	8.1	18	28	9.8	29	95	43	2.6	31	38	7.9
MIN	.26	.23	.18	.00	.19	.22	.48	.32	.22	.31	.64	.20
AC-FT	139	99	106	144	103	152	646	315	36	182	276	85

CAL YR 1980 TOTAL 1883.55 MEAN 5.15 MAX 97 MIN .18 AC-FT 3740
WTR YR 1981 TOTAL 1150.55 MEAN 3.15 MAX 95 MIN .00 AC-FT 2280

NOTE.--No gage-height record May 31 to June 25.

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).

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 poor. No diversion above station. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--18 years, 10.4 ft³/s (0.295 m³/s), 7,530 acre-ft/yr (9.28 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 at times.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 616 ft³/s (17.4 m³/s) Apr. 14, gage height, 6.46 ft (1.969 m), from rating curve extended as explained above, no peak above base of 950 ft³/s (26.9 m³/s); minimum, 0.08 ft³/s (0.002 m³/s) Feb. 4.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.8	2.6	.71	.55	.34	.24	11	33	2.0	.81	.81	1.2
2	1.3	2.3	.66	.40	.18	1.3	27	8.3	1.6	.76	.62	.96
3	1.2	2.0	.66	.37	.14	3.5	8.2	7.4	1.5	.71	.51	7.6
4	1.2	1.9	.66	.37	.10	.91	2.2	4.4	1.5	.58	19	2.9
5	6.6	1.8	1.0	.44	4.8	10	2.0	3.7	1.6	.44	36	23
6	13	1.5	10	.51	3.2	31	1.4	8.9	4.5	.40	6.5	7.3
7	2.1	1.5	8.7	.51	.81	19	4.8	90	3.5	.37	3.4	2.7
8	4.6	2.0	3.1	.55	7.1	6.1	12	75	1.8	5.0	1.8	1.6
9	2.9	6.3	1.3	3.5	10	5.9	4.1	17	1.9	2.2	1.3	1.2
10	1.8	2.3	.91	1.2	1.9	1.6	1.2	14	1.3	3.6	1.3	1.0
11	1.4	13	.81	.76	.96	.86	.58	9.2	1.3	3.7	5.0	.91
12	1.6	4.1	.76	.66	8.1	.55	.61	7.4	3.9	1.0	20	1.5
13	5.9	1.9	.66	.51	2.3	.34	121	6.1	7.0	.58	3.9	2.4
14	13	1.5	29	.39	.86	.26	81	5.4	2.8	3.0	2.6	1.2
15	2.7	2.0	14	.37	.40	.20	42	5.0	2.4	24	1.2	.86
16	1.7	19	8.6	.34	.24	.24	54	5.2	1.5	15	1.1	.76
17	1.6	7.5	3.1	.37	.18	.28	23	7.7	1.1	5.4	2.0	.71
18	6.8	2.6	1.6	.40	.14	.22	10	6.5	.91	3.4	9.7	.81
19	2.7	1.8	1.1	.44	.16	.22	7.2	5.6	.76	3.7	31	8.1
20	2.5	1.5	1.0	.40	3.5	.26	5.4	9.7	.71	1.5	7.2	11
21	2.5	1.5	1.1	.38	3.1	.20	5.8	5.2	.86	44	2.1	3.2
22	1.5	1.9	1.6	.31	8.0	.18	4.1	3.2	.96	5.4	1.4	1.3
23	1.2	1.2	2.1	.26	4.5	.16	3.0	2.9	.81	1.9	6.6	3.7
24	1.8	.96	1.5	.27	17	1.7	6.8	2.6	.81	1.1	18	1.7
25	49	1.0	1.9	.28	3.7	2.3	3.9	2.3	.81	13	5.4	.81
26	13	5.0	3.2	.37	1.3	.76	2.9	2.3	.91	2.3	1.9	.66
27	6.7	3.7	1.3	15	.58	.91	2.8	2.1	5.6	1.3	1.5	.66
28	4.9	1.8	.76	38	.34	.86	2.4	2.4	3.1	9.0	2.1	.96
29	3.9	1.0	.62	13	---	.81	14	2.4	1.2	10	1.7	1.6
30	3.7	.81	1.2	2.1	---	10	63	1.9	1.1	2.3	2.3	.66
31	2.9	---	.81	.76	---	7.2	---	1.9	---	1.7	2.0	---
TOTAL	167.5	97.97	104.42	83.77	83.93	108.06	527.39	358.7	59.74	168.15	199.94	92.96
MEAN	5.40	3.27	3.37	2.70	3.00	3.49	17.6	11.6	1.99	5.42	6.45	3.10
MAX	49	19	29	38	17	31	121	90	7.0	44	36	23
MIN	1.2	.81	.62	.26	.10	.16	.58	1.9	.71	.37	.51	.66
AC-FT	332	194	207	166	166	214	1050	711	118	334	397	184

CAL YR 1980 TOTAL 4561.42 MEAN 12.5 MAX 346 MIN .34 AC-FT 9050
WTR YR 1981 TOTAL 2052.53 MEAN 5.62 MAX 121 MIN .10 AC-FT 4070

16330000 KAMANANUI STREAM AT MAUNAWAI

LOCATION (REVISED).--Lat 21°38'20", long 158°03'27", Hydrologic Unit 20060000, on right bank 0.5 mi (0.8 km) upstream from Kamehameha Highway, 4.9 mi (7.9 km) northeast of Waialua School, and 7.3 mi (11.7 km) southwest of Kahuku School.

DRAINAGE AREA.--12.36 mi² (32.01 km²), revised, including that of Elehaha Stream which is mostly diverted into Kamananui Stream since June 14, 1975.

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

REVISED RECORDS.--WSP 1937: 1958-60. WRD Hawaii 1974: 1971(P), 1972-73(M). WDR HI-81-1: Drainage area.

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 except those for period of no gage-height record, which are poor. Small diversion above station. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--23 years, 16.6 ft³/s (0.470 m³/s), 12,030 acre-ft/yr (14.8 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 8,540 ft³/s (242 m³/s) Mar. 18, 1980, gage height, 11.46 ft (3.493 m), from rating curve extended above 150 ft³/s (4.25 m³/s) on basis of slope-area measurements at gage heights 5.68 ft (1.731 m) and 11.46 ft (3.493 m); no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,460 ft³/s (41.3 m³/s) Apr. 14, gage height, 5.68 ft (1.731 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) Jan. 19, 20, 24-27.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.7	1.4	.71	.60	1.2	.60	9.0	90	1.9	.91	.80	2.4
2	1.4	1.3	.52	.46	.74	.53	26	14	1.8	.67	.60	1.5
3	1.2	1.2	.44	.30	.46	3.2	12	10	1.5	.53	.51	5.8
4	1.3	1.1	.33	.22	.30	2.1	4.0	6.0	1.3	.53	25	5.8
5	3.9	1.0	.56	.19	3.6	9.7	2.7	4.4	1.4	.46	49	22
6	19	.91	8.0	.19	6.8	59	2.2	3.8	2.2	.30	8.3	8.1
7	4.2	.87	11	.26	1.9	48	1.7	225	4.6	.19	2.2	3.8
8	5.2	.93	5.3	.26	6.8	8.1	12	197	2.2	1.4	1.3	2.2
9	5.7	2.6	1.8	1.3	13	10	5.1	26	1.9	2.9	1.1	1.5
10	2.9	1.9	1.0	1.3	3.8	4.6	2.4	19	1.8	2.2	.94	1.2
11	2.2	10	.67	1.0	1.8	3.0	1.3	12	1.4	5.3	10	1.0
12	2.0	5.1	.46	.60	7.4	1.8	1.1	9.0	2.4	1.9	35	.91
13	4.2	2.2	.35	.46	4.6	1.2	308	7.1	5.8	1.2	3.8	1.8
14	17	1.4	36	.35	1.8	.91	254	6.0	4.2	.91	2.4	1.4
15	5.7	1.3	18	.26	1.1	.67	86	5.5	3.2	26	1.3	.91
16	2.8	14	10	.14	.91	.53	118	5.3	2.1	16	.90	.74
17	2.2	9.6	4.0	.08	.60	.46	39	6.3	1.5	6.4	2.7	.60
18	7.1	3.2	2.1	.04	.46	.53	15	8.1	1.1	3.4	7.7	.53
19	4.6	1.8	1.4	.02	.35	.46	11	5.8	.91	4.5	52	5.8
20	2.5	1.3	1.1	.04	.30	.40	7.7	8.4	.74	1.5	16	9.7
21	3.4	1.2	1.0	.08	4.0	.40	6.8	7.4	.67	64	5.1	5.8
22	2.6	1.1	.91	.04	4.2	.46	5.3	4.2	.74	5.7	3.0	2.2
23	1.8	1.2	1.4	.03	6.8	.40	4.2	3.4	.67	1.6	5.3	2.4
24	1.8	.87	1.1	.03	15	.35	6.0	3.0	.60	1.0	30	2.4
25	90	.81	1.1	.02	6.8	2.1	5.3	2.7	.60	17	10	1.2
26	16	1.3	1.8	.02	2.4	1.7	3.6	2.5	.53	2.0	3.8	.91
27	5.1	4.8	1.7	5.1	1.3	1.0	3.4	2.4	2.5	1.3	2.4	.74
28	3.1	2.2	1.0	50	.82	1.2	3.2	2.2	3.8	11	2.2	.67
29	2.2	1.4	.67	21	---	.91	11	2.5	1.8	14	2.9	1.2
30	1.9	.87	.53	4.6	---	6.6	142	1.9	1.1	2.0	2.5	.91
31	1.6	---	.82	2.1	---	12	---	1.8	---	1.5	3.4	---
TOTAL	226.3	78.86	115.77	91.09	99.24	182.91	1109.0	702.7	56.96	198.30	292.15	96.12
MEAN	7.30	2.63	3.73	2.94	3.54	5.90	37.0	22.7	1.90	6.40	9.42	3.20
MAX	90	14	36	50	15	59	308	225	5.8	64	52	22
MIN	1.2	.81	.33	.02	.30	.35	1.1	1.8	.53	.19	.51	.53
AC-FT	449	156	230	181	197	363	2200	1390	113	393	579	191

CAL YR 1980 TOTAL 11290.60 MEAN 30.8 MAX 1080 MIN .33 AC-FT 22390
WTR YR 1981 TOTAL 3249.40 MEAN 8.90 MAX 308 MIN .02 AC-FT 6450

NOTE.--No gage-height record July 17 to Aug. 17.

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).

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 poor. Minor regulation by reservoir on upstream tributary. Diversions into basin for irrigation of sugarcane; low flow affected by irrigation return flow and releases. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--13 years (1968-81), 10.4 ft³/s (0.295 m³/s), 7,530 acre-ft/yr (9.28 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 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, 1,840 ft³/s (52.1 m³/s) Apr. 14, gage height, 9.74 ft (2.969 m), from rating curve extended as explained above, no other 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 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.14	04	.04	.02	.05	.06	.11	145	.14	.01	.03	.00
2	.08	.04	.04	.03	.05	.05	.08	13	.14	.01	.05	.00
3	.05	.04	.04	.03	.05	.05	.11	3.1	.14	.01	.03	.00
4	.03	.04	.03	.03	.06	.05	.11	1.6	.11	.01	.03	.00
5	.06	.04	.03	.03	.11	.05	.08	.50	.11	.01	74	.00
6	.04	.04	.03	.03	.14	.05	.08	.32	.08	.01	12	.00
7	.05	.04	.02	.03	.14	29	.05	111	.06	.01	.90	.00
8	.05	.04	.02	.03	.08	4.0	65	52	.02	.01	.11	.00
9	.06	.04	.02	.03	.06	.20	4.8	11	.01	.01	.02	.00
10	.06	.04	.03	.02	.06	.06	.23	8.4	.01	.01	.02	.00
11	.09	.04	.02	.02	.02	.08	.14	5.1	.01	.01	.01	.00
12	.04	.04	.02	.02	.02	.08	.11	1.6	.01	.01	.01	.00
13	.06	.04	.02	.02	.02	.03	71	.65	.00	.01	.01	.00
14	.04	.04	.04	.02	.02	.03	241	.50	.00	.02	.02	.00
15	.04	.04	.02	.02	.02	.03	16	.42	.00	.02	.02	.00
16	.04	.05	.03	.02	.01	.03	59	.35	.00	.01	.02	.00
17	.04	.05	.02	.02	.02	.03	11	.35	.00	.01	.01	.00
18	.04	.05	.02	.02	.03	.05	3.4	.35	.00	.01	.01	.00
19	.03	.05	.02	.02	.06	.05	.88	.32	.00	.01	.01	.00
20	.04	.05	.02	.02	.17	.03	.35	.35	.00	.01	.01	.01
21	.04	.05	.02	.01	.14	.03	.29	.35	.00	.01	.01	.01
22	.21	.04	.02	.01	.14	.03	.20	.35	.00	.01	.00	.01
23	.06	.04	.03	.01	.11	.05	.23	.26	.01	.02	.01	.01
24	.03	.03	.03	.02	.08	.08	.20	.20	.02	.02	.01	.01
25	.03	.03	.03	.02	.14	.06	.14	.20	.02	.02	.01	.01
26	.03	.03	.03	.02	.17	.06	.11	.26	.03	.02	.01	.01
27	.03	.03	.02	.02	.14	.11	.08	.20	.03	.02	.00	.01
28	.03	.03	.02	64	.08	.14	.11	.20	.02	.02	.00	.01
29	.04	.03	.03	36	---	.14	.14	.20	.01	.03	.00	.01
30	.04	.04	.03	3.4	---	.17	9.6	.20	.01	.02	.00	.01
31	.04	---	.03	.11	---	.14	---	.20	---	.02	.00	---
TOTAL	1.66	1.20	.82	104.10	2.19	35.02	484.63	358.53	.99	.43	87.37	.11
MEAN	.054	.040	.026	3.36	.078	1.13	16.2	11.6	.033	.014	2.82	.004
MAX	.21	.05	.04	64	.17	29	241	145	.14	.03	74	.01
MIN	.03	.03	.02	.01	.01	.03	.05	.20	.00	.01	.00	.00
AC-FT	3.3	2.4	1.6	206	4.3	69	961	711	2.0	.9	173	.2

CAL YR 1980 TOTAL 4781.60 MEAN 13.1 MAX 1300 MIN .02 AC-FT 9480
WTR YR 1981 TOTAL 1077.05 MEAN 2.95 MAX 241 MIN .00 AC-FT 2140

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 School in Wahiawa and 8.1 mi (13.0 km) east of Waialua School.

DRAINAGE AREA.--2.98 mi² (7.72 km²).

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

REVISED RECORDS.--WSP 1937: 1960.

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

REMARKS.--Records good. No diversion above station. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--22 years, 13.3 ft³/s (0.377 m³/s), 9,640 acre-ft/yr (11.9 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, Feb. 18, 1978.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,480 ft³/s (41.9 m³/s) Apr. 14, gage height, 6.86 ft (2.091 m), from rating curve extended as explained above, no other peak above base of 1,200 ft³/s (34.0 m³/s); minimum, 0.07 ft³/s (0.002 m³/s) Jan. 26, 27.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.5	1.7	1.0	.57	1.8	1.0	6.6	83	1.9	1.6	1.8	1.6
2	1.3	1.5	.84	.53	1.3	1.2	29	10	1.8	2.3	1.4	1.3
3	1.2	1.3	.72	.57	.98	3.6	11	11	1.2	1.4	2.0	5.1
4	1.0	1.2	.63	.61	.77	1.9	4.5	5.5	1.1	.97	75	4.7
5	1.3	1.1	.89	.59	1D	12	3.2	4.3	1.1	.88	86	20
6	5.8	1.0	11	.89	6.2	23	3.0	4.0	9.0	.92	8.9	6.4
7	3.0	.92	11	.59	2.2	41	2.3	227	6.2	1.3	7.0	3.6
8	3.7	2.0	4.4	.51	2.6	5.5	42	44	2.7	11	3.6	1.8
9	5.5	7.4	2.2	3.3	14	11	5.1	35	1.9	3.8	2.8	1.3
10	3.0	2.5	1.3	2.8	3.8	7.9	2.6	17	1.7	3.9	2.7	1.1
11	2.2	20	.91	1.3	2.4	3.9	1.8	6.9	4.0	5.5	7.4	25
12	4.9	5.3	.74	.84	8.1	2.3	2.8	5.4	7.1	2.2	22	10
13	7.1	2.4	.61	.53	3.7	1.7	215	4.7	5.5	1.4	9.7	5.4
14	28	1.6	41	.42	1.9	1.4	188	4.2	3.4	1.9	5.7	2.5
15	5.5	7.8	1.3	.33	1.2	1.2	101	3.8	19	28	4.3	2.1
16	3.2	23	7.1	.24	.87	1.1	89	3.4	6.4	15	5.2	1.3
17	2.5	8.2	3.1	.24	.66	1.0	15	4.1	2.8	8.0	4.5	.98
18	7.8	3.2	2.0	.20	.55	.94	7.4	5.6	4.4	7.1	15	11
19	4.8	2.3	1.4	.18	.51	.96	5.4	7.2	2.6	5.2	54	14
20	2.5	4.0	1.2	.18	19	.96	4.6	21	1.9	2.9	9.0	11
21	9.0	15	1.4	.16	7.7	1.1	7.5	6.7	1.4	76	3.9	4.9
22	3.7	5.1	1.7	.12	11	.86	5.1	3.2	2.2	6.7	3.0	2.3
23	2.1	2.3	1.3	.14	6.7	.89	3.5	2.6	1.7	3.5	6.7	2.5
24	11	1.7	4.1	.12	25	.87	9.1	2.3	1.2	2.8	6.7	2.3
25	73	1.5	5.2	.09	6.2	.71	5.7	2.0	.99	9.6	6.0	1.4
26	11	1.4	5.6	.07	2.8	2.3	3.1	1.8	.93	4.5	2.6	1.1
27	4.2	3.0	2.2	42	1.7	3.6	3.1	2.2	5.6	2.4	2.1	.92
28	2.9	2.3	1.3	105	1.3	3.0	2.7	2.2	5.5	3.7	2.1	3.9
29	2.3	1.6	.94	23	---	4.4	68	3.2	2.8	9.8	2.3	3.2
30	2.1	1.2	.74	5.2	---	8.2	149	2.4	2.0	3.5	2.1	1.6
31	2.0	---	.63	2.7	---	7.5	---	1.6	---	2.7	1.6	---
TOTAL	219.1	133.92	118.45	194.02	144.94	156.99	996.1	537.3	106.02	230.47	367.1	154.30
MEAN	7.07	4.45	3.82	6.26	5.18	5.06	33.2	17.3	3.53	7.43	11.8	5.14
MAX	73	23	41	105	25	41	215	227	15	76	86	25
MIN	1.0	.92	.61	.07	.51	.71	1.8	1.6	.93	.88	1.4	.92
AC-FT	435	265	235	385	287	311	1980	1070	210	457	728	306

CAL YR 1980 TOTAL 6221.03 MEAN 17.0 MAX 685 MIN .38 AC-FT 12340
WTR YR 1981 TOTAL 3358.31 MEAN 9.20 MAX 227 MIN .07 AC-FT 6660

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.--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.--57 years (water years, 1918-31, 1939-81), 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 105 ft³/s (2.97 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, 1,780 ft³/s (50.4 m³/s) Aug. 4, gage height, 8.12 ft (2.475 m), no peak above base of 1,900 ft³/s (53.8 m³/s); minimum, 2.2 ft³/s (0.062 m³/s) July 6-8.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	8.4	35	3.9	3.2	4.3	8.3	27	205	16	2.9	4.8	3.7
2	6.6	14	3.6	3.1	3.7	13	47	44	4.8	2.9	4.9	3.5
3	6.0	7.7	3.5	5.5	3.4	30	12	26	3.7	3.2	12	23
4	5.7	7.1	3.4	7.7	3.2	7.0	7.0	14	3.5	2.6	347	6.5
5	5.4	6.0	12	4.7	76	5.0	5.5	11	6.8	2.4	55	57
6	5.3	5.5	7.7	4.7	7.3	34	5.5	9.1	15	2.2	36	22
7	5.8	5.5	6.8	3.3	4.3	23	4.4	17	7.5	2.2	12	6.4
8	23	6.6	3.9	5.4	171	6.1	19	32	10	5.8	8.3	4.4
9	6.3	6.8	3.4	35	57	7.3	48	8.3	5.5	18	7.2	3.7
10	48	5.7	3.2	5.2	9.1	13	6.0	7.1	5.8	10	7.9	3.3
11	13	44	3.1	8.1	12	4.4	5.0	5.8	139	5.7	111	3.2
12	81	7.0	3.0	6.0	26	3.7	4.2	5.4	34	5.1	106	3.2
13	58	5.8	2.9	3.5	6.5	3.4	7.5	5.0	8.3	7.8	29	12
14	35	5.4	3.2	3.0	5.0	3.1	102	4.7	8.1	20	11	4.9
15	13	4.7	125	2.8	4.6	2.9	64	4.4	16	38	8.4	3.4
16	11	4.4	61	2.8	4.6	11	26	4.2	7.1	35	7.2	3.3
17	29	4.3	7.5	17	4.0	4.4	8.5	4.1	6.1	7.8	6.2	3.0
18	31	4.7	5.1	4.1	3.7	3.3	6.6	7.5	5.2	6.8	8.1	4.8
19	8.1	21	5.8	3.8	3.5	16	5.5	6.1	4.3	36	36	7.8
20	32	12	4.8	6.0	5.2	4.2	5.0	33	4.0	46	7.8	39
21	38	8.5	4.0	2.9	5.7	3.1	7.9	7.1	3.9	83	5.7	4.9
22	15	4.6	49	2.6	24	2.8	5.0	5.2	3.8	9.1	21	4.5
23	8.7	4.0	10	2.5	6.6	2.6	4.3	4.3	3.8	26	51	8.7
24	12	4.6	4.8	2.4	34	6.6	17	3.9	4.4	31	11	14
25	48	7.7	22	2.5	8.1	32	5.2	3.8	3.9	31	6.8	5.1
26	9.3	19	7.7	12	5.8	7.3	4.7	4.4	3.3	6.9	5.4	11
27	6.8	11	4.7	45	4.2	48	4.1	3.7	4.2	13	4.6	39
28	6.1	8.5	4.2	77	3.7	17	10	17	6.5	23	4.1	7.7
29	5.8	5.0	4.0	82	---	73	574	8.3	4.1	37	3.8	4.6
30	76	4.1	3.6	12	---	26	718	4.7	3.2	9.5	5.7	3.7
31	12	---	3.5	5.5	---	8.1	---	13	---	5.7	4.3	---
TOTAL	669.3	290.2	390.3	381.3	506.5	429.6	1765.9	529.1	351.8	535.6	949.2	321.3
MEAN	21.6	9.67	12.6	12.3	18.1	13.9	58.9	17.1	11.7	17.3	30.6	10.7
MAX	81	44	125	82	171	73	718	205	139	83	347	57
MIN	5.3	4.0	2.9	2.4	3.2	2.6	4.1	3.7	3.2	2.2	3.8	3.0
AC-FT	1330	576	774	756	1000	852	3500	1050	698	1060	1880	637

CAL YR 1980 TOTAL 13652.4 MEAN 37.3 MAX 582 MIN 2.9 AC-FT 27080
WTR YR 1981 TOTAL 7120.1 MEAN 19.5 MAX 718 MIN 2.2 AC-FT 14120

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 1980 TO SEPTEMBER 1981

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (UMHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)	TUR-BID-ITY (NTU)	OXYGEN, DIS-SOLVED (MG/L)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARD-NESS (MG/L AS CACO3)
OCT										
14...	1415	20	53	6.7	21.5	8.3	9.1	220	990	7
NOV										
17...	1200	5.2	63	7.0	21.0	2.1	9.0	32	270	10
DEC										
09...	1400	3.4	63	6.7	20.0	6.1	8.9	99	650	12
JAN										
06...	1145	5.6	60	7.8	19.0	4.1	9.4	53	1100	9
FEB										
02...	1400	3.5	65	6.8	19.5	2.8	9.2	72	280	11
MAR										
16...	1530	19	64	6.7	19.0	6.1	9.5	230	580	9
APR										
13...	1200	7.2	57	6.7	21.5	10	9.0	170	840	16
MAY										
20...	1200	101	54	--	20.5	6.4	8.8	K2500	1900	9
JUN										
15...	1200	28	47	6.8	21.5	3.0	8.6	100	340	7
JUL										
13...	1300	15	58	6.2	23.0	3.0	9.8	31	550	9
AUG										
10...	1130	7.6	50	6.1	22.0	2.6	9.0	23	810	7
31...	1230	4.1	58	7.1	22.5	1.4	8.6	51	520	8

DATE	HARD-NESS NONCAR-BONATE (MG/L AS CACO3)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	PERCENT SODIUM	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY LAB (MG/L AS CACO3)	SULFATE DIS-SOLVED (MG/L AS SO4)
OCT									
14...	.00	1.0	1.0	6.2	65	1.1	.6	7.0	2.9
NOV									
17...	.00	1.5	1.5	7.7	61	1.1	.7	10	.6
DEC									
09...	.00	2.5	1.5	7.1	53	.9	.8	14	1.9
JAN									
06...	4.0	1.5	1.3	7.7	63	1.1	.6	5.0	1.7
FEB									
02...	2.0	2.1	1.5	7.6	57	1.0	.8	9.0	1.7
MAR									
16...	--	1.4	1.4	7.8	63	1.1	.7	8.0	2.2
APR									
13...	3.0	4.1	1.3	7.4	49	.8	.7	13	2.0
MAY									
20...	2.0	1.9	1.0	7.2	62	1.1	.6	7.0	3.2
JUN									
15...	.00	1.2	1.0	5.9	62	1.0	.6	9.0	1.2
JUL									
13...	4.0	1.4	1.3	7.6	64	1.1	.5	5.0	4.4
AUG									
10...	.00	1.1	1.1	6.7	64	1.1	.7	8.0	2.0
31...	.00	1.2	1.3	7.4	64	1.1	.6	9.0	1.0

K 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 1980 TO SEPTEMBER 1981

DATE	CHLORIDE, DISSOLVED (MG/L AS CL)	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)	SOLIDS, DISSOLVED (TONS PER AC-FT)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N)	NITROGEN, AMMONIA TOTAL (MG/L AS N)	NITROGEN, AMMONIA DISSOLVED (MG/L AS N)
OCT										
14...	11	.1	4.1	35	32	.05	.00	.00	.010	.000
NOV										
17...	14	.1	9.4	48	42	.07	.03	.01	.070	.050
DEC										
09...	10	.3	8.7	43	41	.06	.04	.06	.040	.000
JAN										
06...	12	.0	9.2	43	37	.06	.17	.08	.330	.060
FEB										
02...	13	.0	7.2	52	40	.07	.02	--	.020	--
MAR										
16...	14	.0	8.6	51	41	.07	.01	.00	.030	.000
APR										
13...	11	.0	8.0	39	43	.05	.03	--	.040	--
MAY										
20...	11	.0	6.9	44	36	.06	.03	.03	.040	.030
JUN										
15...	--	.0	6.6	35	--	.05	.01	.01	.020	.020
JUL										
13...	12	.1	7.7	42	38	.06	.00	.01	.010	.020
AUG										
10...	11	.0	8.1	44	36	.06	.11	.12	.090	.070
31...	13	.0	9.5	37	40	.05	.15	.10	.110	.140

DATE	NITROGEN, ORGANIC TOTAL (MG/L AS N)	NITROGEN, ORGANIC DISSOLVED (MG/L AS N)	NITROGEN DISSOLVED (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITROGEN, NH4 + ORG. SUSP. TOTAL (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC DIS. (MG/L AS N)	NITROGEN, TOTAL (MG/L AS N)	PHOSPHORUS, TOTAL (MG/L AS P)	PHOSPHORUS, DISSOLVED (MG/L AS P)
OCT									
14...	.94	.40	.40	.95	.55	.40	.95	.040	.020
NOV									
17...	.49	.31	.37	.56	.20	.36	.59	.030	.030
DEC									
09...	.51	.55	.61	.55	.00	.55	.59	.040	.030
JAN									
06...	.14	.32	.46	.47	.09	.38	.64	.150	.020
FEB									
02...	.23	--	--	.25	--	--	.27	.050	.020
MAR									
16...	.61	.29	.29	.64	.35	.29	.65	.050	.030
APR									
13...	.57	--	--	.61	--	--	.64	.050	.020
MAY									
20...	.48	.36	.42	.52	.13	.39	.55	.090	.040
JUN									
15...	.34	.05	.08	.36	.29	.07	.37	.060	.040
JUL									
13...	.77	.47	.50	.78	.29	.49	.78	.040	.030
AUG									
10...	.68	.42	.61	.77	.28	.49	.88	.040	.040
31...	.55	.52	.76	.66	.00	.66	.81	.040	<.010

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

16400000 HALAWA STREAM NEAR HALAWA--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	TIME	ARSENIC TOTAL (UG/L AS AS)	ARSENIC SUS-PENDED TOTAL (UG/L AS AS)	ARSENIC DIS-SOLVED (UG/L AS AS)	BARIUM, TOTAL RECOV-ERABLE (UG/L AS BA)	BARIUM, SUS-PENDED RECOV-ERABLE (UG/L AS BA)	BARIUM, DIS-SOLVED (UG/L AS BA)	CADMIUM TOTAL RECOV-ERABLE (UG/L AS CD)	CADMIUM DIS-SOLVED (UG/L AS CD)	CHRO-MIUM, TOTAL RECOV-ERABLE (UG/L AS CR)	CHRO-MIUM, SUS-PENDED RECOV. (UG/L AS CR)
OCT 14...	1415	1	1	0	4	0	4	<1	<1	10	10
JAN 06...	1145	1	1	0	5	0	5	0	<1	0	0
APR 13...	1200	1	1	0	6	0	6	<1	<1	10	0
JUL 13...	1300	1	1	0	200	0	90	0	<1	10	0

DATE	CHRO-MIUM, DIS-SOLVED (UG/L AS CR)	COBALT, TOTAL RECOV-ERABLE (UG/L AS CO)	COBALT, DIS-SOLVED (UG/L AS CO)	COPPER, TOTAL RECOV-ERABLE (UG/L AS CU)	COPPER, SUS-PENDED RECOV-ERABLE (UG/L AS CU)	COPPER, DIS-SOLVED (UG/L AS CU)	IRON, TOTAL RECOV-ERABLE (UG/L AS FE)	IRON, SUS-PENDED RECOV-ERABLE (UG/L AS FE)	IRON, DIS-SOLVED (UG/L AS FE)	LEAD, TOTAL RECOV-ERABLE (UG/L AS PB)
OCT 14...	0	<3	<3	46	41	5	600	230	370	3
JAN 06...	0	<3	<3	3	1	2	470	280	190	0
APR 13...	10	<3	<3	5	0	5	480	290	190	3
JUL 13...	10	1	<3	7	0	8	340	170	170	2

DATE	LEAD, SUS-PENDED RECOV-ERABLE (UG/L AS PB)	LEAD, DIS-SOLVED (UG/L AS PB)	MANGA-NESE, TOTAL RECOV-ERABLE (UG/L AS MN)	MANGA-NESE, SUS-PENDED RECOV. (UG/L AS MN)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)	MERCURY TOTAL RECOV-ERABLE (UG/L AS HG)	MERCURY SUS-PENDED RECOV-ERABLE (UG/L AS HG)	MERCURY DIS-SOLVED (UG/L AS HG)	NICKEL, TOTAL RECOV-ERABLE (UG/L AS NI)	NICKEL, SUS-PENDED RECOV-ERABLE (UG/L AS NI)
OCT 14...	0	3	20	14	6	.1	.1	.0	6	6
JAN 06...	0	0	20	10	8	.0	.0	.0	1	1
APR 13...	1	2	20	10	10	.1	.1	.0	2	0
JUL 13...	0	2	20	10	6	.1	.1	.0	3	0

DATE	NICKEL, DIS-SOLVED (UG/L AS NI)	SELE-NIUM, TOTAL (UG/L AS SE)	SELE-NIUM, SUS-PENDED TOTAL (UG/L AS SE)	SELE-NIUM, DIS-SOLVED (UG/L AS SE)	SILVER, TOTAL RECOV-ERABLE (UG/L AS AG)	SILVER, SUS-PENDED RECOV-ERABLE (UG/L AS AG)	SILVER, DIS-SOLVED (UG/L AS AG)	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN)	ZINC, SUS-PENDED RECOV-ERABLE (UG/L AS ZN)	ZINC, DIS-SOLVED (UG/L AS ZN)
OCT 14...	0	0	0	0	0	0	0	60	56	4
JAN 06...	0	0	0	0	0	0	0	10	5	5
APR 13...	--	0	0	0	2	0	2	110	10	100
JUL 13...	3	0	0	0	0	0	0	20	20	4

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

16400000 HALAWA STREAM NEAR HALAWA--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	TIME	CARBON, ORGANIC TOTAL (MG/L AS C)	CARBON, ORGANIC DIS-SOLVED (MG/L AS C)	CARBON, ORGANIC SUS-PENDED TOTAL (MG/L AS C)
OCT				
14...	1415	--	7.3	.1
NOV				
17...	1200	2.3	--	--
DEC				
09...	1400	3.9	--	--
JAN				
06...	1145	--	3.1	.3
FEB				
02...	1400	4.4	--	--
MAR				
16...	1530	4.4	--	--
APR				
13...	1200	--	4.9	.0
MAY				
20...	1200	6.3	--	--
JUN				
15...	1200	4.1	--	--
JUL				
13...	1300	--	3.8	.2
AUG				
10...	1130	3.8	--	--
31...	1230	2.1	--	--

DATE	TIME	PHYTO-PLANK-TON, TOTAL (CELLS PER ML)
OCT		
14...	1415	2900
NOV		
17...	1200	13
DEC		
09...	1400	26
JAN		
06...	1145	160
FEB		
02...	1400	52
MAR		
16...	1530	77
APR		
13	1200	140
MAY		
20...	1200	120
JUN		
15...	1200	1200
JUL		
13...	1300	65
AUG		
10...	1130	14
31...	1230	14

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SEDI-MENT, SUS-PENDED (MG/L)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
OCT					
14...	1415	20	7	.38	100
NOV					
17...	1200	5.2	4	.06	100
DEC					
09...	1400	3.4	5	.05	100
JAN					
06...	1145	5.6	5	.08	100
FEB					
02...	1400	3.5	4	.04	100
MAR					
16...	1530	19	11	.56	100
APR					
13...	1200	7.2	7	.14	100
MAY					
20...	1200	101	14	3.8	100
JUN					
15...	1200	28	4	.30	100
JUL					
13...	1300	15	4	.16	100
AUG					
10...	1130	7.6	3	.06	100
31...	1230	4.1	2	.02	100

16400000 HALAWA STRBAM NEAR HALAWA--Continued

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA

PHYTOPLANKTON ANALYSES, OCTOBER 1980 TO AUGUST 1981

DATE	OCT 14,80	NOV 17,80	DEC 9,80	JAN 6,81	FEB 2,81	MAR 16,81
TIME	1415	1200	1400	1145	1400	1530
TOTAL CELLS/ML	2900	13	26	160	52	77
DIVERSITY: DIVISION	0.2	0.0	0.0	0.0	0.8	0.7
.CLASS	0.2	0.0	0.0	0.0	0.8	0.7
..ORDER	0.2	0.0	0.0	0.0	0.8	0.7
...FAMILY	0.2	0.0	0.0	1.8	0.8	1.9
....GENUS	0.2	0.0	0.0	1.8	0.8	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	--	-	--	-	--	-	--	-	--	-	--	-
..VOLVOCALES												
...CHLAMYDOMONADACEAE												
....CHLAMYDOMONAS	--	-	--	-	--	-	--	-	39#	75	--	-
CHRYSOPHYTA												
.BACILLARIOPHYCEAE												
..CENTRALES												
...COSCINODISCACEAE												
....STEPHANODISCUS	--	-	--	-	--	-	--	-	--	-	--	-
..PENNALES												
...ACHNANTHACEAE												
....ACHNANTHES	--	-	--	-	--	-	--	-	--	-	--	-
...CYMBELLACEAE												
....CYMBELLA	--	-	--	-	--	-	14	8	--	-	--	-
...FRAGILARIACEAE												
....FRAGILARIA	--	-	--	-	--	-	--	-	--	-	26#	33
....SYNEDRA	--	-	--	-	--	-	41#	25	--	-	--	-
...GOMPHONEMATACEAE												
....GOMPHONEMA	52	2	--	-	--	-	69#	42	--	-	13#	17
...NAVICULACEAE												
....NAVICULA	*	0	--	-	26#	100	41#	25	--	-	26#	33
...NITZSCHIACEAE												
....NITZSCHIA	--	-	--	-	--	-	--	-	13#	25	--	-
CYANOPHYTA (BLUE-GREEN ALGAE)												
.CYANOPHYCEAE												
..CHROOCOCCALES												
...CHROOCOCCACEAE												
....ANACYSTIS	--	-	13#	100	--	-	--	-	--	-	--	-
..HORMOGONALES												
...OSCILLATORIACEAE												
....LYNGBYA	--	-	--	-	--	-	--	-	--	-	--	-
....OSCILLATORIA	2800#	97	--	-	--	-	--	-	--	-	--	-
EUGLENOPHYTA (EUGLENOIDS)												
.EUGLENOPHYCEAE												
..EUGLENALES												
...EUGLENACEAE												
....EUGLENA	26	1	--	-	--	-	--	-	--	-	--	-
PYRRHOPHYTA (FIRE ALGAE)												
.DINOPHYCEAE												
..PERIDINIALES												
...GLENODINIACEAE												
....GLENODINIUM	--	-	--	-	--	-	--	-	--	-	13#	17

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

16400000 HALAWA STREAM NEAR HALAWA--Continued

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA

PHYTOPLANKTON ANALYSES, OCTOBER 1980 TO AUGUST 1981

DATE	APR 13,81	MAY 20,81	JUN 15,81	JUL 13,81	AUG 10,81	AUG 31,81
TIME	1200	1200	1200	1300	1130	1230
TOTAL CELLS/ML	140	120	1200	65	14	14
DIVERSITY: DIVISION	0.4	0.0	0.7	0.0	0.0	0.0
.CLASS	0.4	0.0	0.7	0.0	0.0	0.0
..ORDER	1.2	0.0	0.7	0.0	0.0	0.0
...FAMILY	1.5	1.0	0.9	1.5	0.0	0.0
....GENUS	1.5	1.0	1.7	1.5	0.0	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	--	-	--	-	14	1	--	-	--	-	--	-
..VOLVOCALES												
...CHLAMYDOMONADACEAE												
....CHLAMYDOMONAS	13	9	--	-	28	2	--	-	--	-	--	-
CHRYSOPHYTA												
.BACILLARIOPHYCEAE												
..CENTRALES												
...COSCINODISCACEAE												
....STEPHANODISCUS	90#	64	--	-	--	-	--	-	--	-	--	-
..PENNALES												
...ACHNANTHACEAE												
....ACHNANTHES	--	-	--	-	14	1	--	-	--	-	--	-
...CYMBELLACEAE												
....CYMBELLA	--	-	--	-	--	-	--	-	--	-	--	-
...FRAGILARIACEAE												
....FRAGILARIA	--	-	--	-	--	-	--	-	--	-	--	-
....SYNEDRA	--	-	--	-	--	-	26#	40	--	-	--	-
...GOMPHONEMATACEAE												
....GOMPHONEMA	--	-	13	11	42	3	26#	40	--	-	--	-
...NAVICULACEAE												
....NAVICULA	13	9	90#	78	14	1	--	-	--	-	14#	100
...NITZSCHIACEAE												
....NITZSCHIA	26#	18	13	11	42	3	13#	20	14#	100	--	-
CYANOPHYTA (BLUE-GREEN ALGAE)												
.CYANOPHYCEAE												
..CHROOCOCCALES												
...CHROOCOCCACEAE												
....ANACYSTIS	--	-	--	-	--	-	--	-	--	-	--	-
..HORMOGONALES												
...OSCILLATORIACEAE												
....LYNGBYA	--	-	--	-	490#	41	--	-	--	-	--	-
....OSCILLATORIA	--	-	--	-	560#	47	--	-	--	-	--	-
EUGLENOPHYTA (EUGLENOIDS)												
.EUGLENOPHYCEAE												
..EUGLENALES												
...EUGLENACEAE												
....EUGLENA	--	-	--	-	--	-	--	-	--	-	--	-
PYRRHOPHYTA (FIRE ALGAE)												
.DINOPHYCEAE												
..PERIDINIALES												
...GLENODINIACEAE												
....GLENODINIUM	--	-	--	-	--	-	--	-	--	-	--	-

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

16404000 PELEKUNU STREAM NEAR PELEKUNU

LOCATION.--Lat 21°08'11", long 156°52'43", Hydrologic Unit 20050000, on left bank 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).

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.--WSP 1569: 1940(M). WRD Hawaii 1972-74, WDR HI-1975-80-1.

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 below 150 ft³/s (4.25 m³/s) and fair above. No diversion above station. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--36 years (water years, 1921-28, 1938-47, 1949-56, 1972-81), 16.6 ft³/s (0.470 m³/s), 12,030 acre-ft/yr (14.8 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,750 ft³/s (119 m³/s) Jan. 8, 1980, gage height, 7.16 ft (2.182 m), from rating curve extended above 150 ft³/s (4.25 m³/s) on basis of slope-area measurement at gage height, 7.16 ft (2.182 m); 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.--Peak discharges above base of 700 ft³/s (19.8 m³/s), revised, and maximum (*), from rating curve extended as explained above:

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Dec. 22	1400	914	25.9	3.78	1.152
May 1	0130	1130	29.2	*4.03	1.228

Minimum discharge, 3.6 ft³/s (0.102 m³/s) July 5, 6, 7.

REVISIONS.--The peak discharges and annual maximum (*) for water years 1972-80 have been revised, superseding figures published in the reports for 1972-80.

Water Year	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
1972	Jan. 24, 1972	0400	*1350	38.2	*4.25	1.295
	Feb. 4, 1972	2100	1060	30.0	3.95	1.204
	Mar. 3, 1972	1730	970	27.5	3.85	1.174
1973	Feb. 20, 1973	1600	*498	14.1	*3.16	.963
1974	Dec. 8, 1973	0330	1320	37.4	4.22	1.286
	Jan. 6, 1974	2330	*2810	79.6	*5.35	1.631
	Mar. 2, 1974	0100	2120	60.0	4.90	1.494
1975	Nov. 21, 1974	1000	*556	15.7	*3.26	.994
1976	Feb. 6, 1976	1100	*1410	39.9	*4.31	1.314
1977	May 14, 1977	0200	*538	15.2	*3.23	0.985
1978	Mar. 1, 1978	1400	*1700	48.1	*4.58	1.396
1979	Nov. 13, 1978	1530	1570	44.5	4.47	1.363
	Dec. 7, 1978	0500	1050	29.7	3.94	1.201
	Jan. 11, 1979	1830	1740	49.3	4.61	1.405
	Feb. 10, 1979	0830	*3600	102	*5.79	1.765
1980	Jan. 8, 1980	1900	*6750	191	*7.16	2.182
	Feb. 24, 1980	2400	906	25.7	3.77	1.149

16404000 PELEKUNU STREAM NEAR PELEKUNU--Continued

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.8	12	4.9	8.5	9.3	14	14	331	6.7	4.1	5.2	4.3
2	5.8	11	4.6	7.8	8.1	14	26	63	5.5	4.1	4.9	4.6
3	5.5	8.5	4.6	9.3	7.8	16	15	35	5.5	3.8	9.8	14
4	5.5	7.8	4.6	7.8	7.4	10	12	26	5.2	3.8	68	5.8
5	5.5	7.4	9.7	7.8	37	10	10	20	7.1	3.8	30	18
6	5.2	7.4	5.8	7.1	13	18	9.3	17	9.7	3.8	14	8.5
7	6.1	6.7	5.2	6.7	11	13	9.9	15	6.1	3.8	10	6.4
8	9.1	7.1	4.6	6.7	23	12	12	13	7.4	4.3	8.5	5.8
9	5.8	6.4	4.6	6.4	18	10	8.5	12	5.5	6.1	7.4	5.2
10	15	9.7	4.6	6.1	13	9.3	8.1	11	5.5	7.1	6.7	4.9
11	8.8	16	4.6	6.1	20	9.3	7.4	10	13	4.6	15	4.9
12	48	7.4	4.3	5.8	21	8.9	7.4	9.7	7.8	4.3	16	4.6
13	37	7.1	4.9	5.8	13	8.5	7.1	9.3	5.8	6.1	9.7	4.9
14	28	6.4	24	5.5	12	8.1	6.7	8.9	6.4	6.7	7.8	4.3
15	15	6.1	45	5.5	9.7	7.4	11	8.1	9.7	8.1	7.1	4.1
16	13	6.1	26	16	9.3	13	8.4	7.8	6.1	13	6.4	3.8
17	15	6.1	12	17	8.9	8.5	6.7	8.1	5.8	6.4	6.1	3.8
18	17	6.4	8.9	7.8	8.5	8.5	6.4	8.9	5.2	5.2	6.4	4.3
19	10	9.5	23	8.1	8.1	8.5	6.1	7.8	5.2	4.6	7.4	4.6
20	10	6.1	11	7.1	12	7.4	6.7	12	5.2	7.1	5.8	14
21	8.9	6.7	9.3	6.1	8.1	7.1	7.1	7.4	5.2	23	5.2	4.9
22	8.5	5.8	104	5.8	30	6.4	5.8	7.1	4.9	7.8	5.8	5.2
23	8.1	5.5	27	5.5	10	6.4	5.8	6.4	4.6	11	7.8	5.5
24	9.5	7.8	17	5.5	30	6.4	6.1	6.1	4.9	8.1	5.5	4.9
25	26	6.1	76	5.2	16	11	5.2	5.8	4.6	9.3	4.9	4.3
26	10	5.8	26	5.5	13	8.1	4.9	5.8	4.3	6.7	4.9	4.9
27	8.5	5.5	18	20	10	11	4.6	5.8	4.3	6.1	4.6	6.4
28	7.6	5.2	14	50	9.7	28	17	6.4	4.4	7.8	4.6	4.6
29	7.4	5.2	12	22	---	28	430	6.1	4.3	7.4	4.3	4.1
30	23	4.9	10	13	---	37	456	5.8	4.3	5.8	4.6	3.8
31	12	---	9.3	10	---	17	---	7.4	---	5.2	4.6	---
TOTAL	400.6	219.7	539.5	307.5	396.9	380.8	1141.2	703.7	180.2	209.0	309.0	179.4
MEAN	12.9	7.32	17.4	9.92	14.2	12.3	38.0	22.7	6.01	6.74	9.97	5.98
MAX	48	16	104	50	37	37	456	331	13	23	68	18
MIN	5.2	4.9	4.3	5.2	7.4	6.4	4.6	5.8	4.3	3.8	4.3	3.8
AC-FT	795	436	1070	610	787	755	2260	1400	357	415	613	356

CAL YR 1980 TOTAL 9243.9 MEAN 25.3 MAX 435 MIN 4.3 AC-FT 18340
WTR YR 1981 TOTAL 4967.5 MEAN 13.6 MAX 456 MIN 3.8 AC-FT 9850

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 mi^2 (1.27 km^2).

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 fair except those above 8 ft^3/s (0.23 m^3/s), which are poor. No diversion above station. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--13 years, 1.45 ft^3/s (0.041 m^3/s), 1,050 acre-ft/yr (1.29 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 328 ft^3/s (9.29 m^3/s) Feb. 10, 1979, gage height, 3.96 ft (1.207 m), from rating curve extended above 6.2 ft^3/s (0.18 m^3/s); minimum, 0.50 ft^3/s (0.014 m^3/s) Sept. 2-8, 21-29, 1975, Nov. 26 to Dec. 3, 1977.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 90 ft^3/s (2.55 m^3/s) Apr. 29, gage height, 3.00 ft (0.914 m), from rating curve extended as explained above, no other peak above base of 80 ft^3/s (2.27 m^3/s); minimum, 0.80 ft^3/s (0.023 m^3/s) Sept. 24-30.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.94	1.0	.84	1.2	.99	1.5	1.5	16	1.5	1.1	.94	.84
2	.94	.99	.84	1.1	.94	1.3	2.1	6.1	1.4	1.1	.94	.84
3	.94	.94	.84	1.5	.94	1.3	1.5	4.6	1.4	1.1	1.0	1.3
4	.94	.94	.84	1.2	.94	1.1	1.3	4.0	1.4	1.1	2.0	.89
5	.94	.94	1.5	1.1	4.0	1.2	1.2	3.4	1.5	1.0	1.3	1.0
6	.94	.94	.99	1.0	1.3	1.4	1.2	3.0	1.5	1.0	.99	.99
7	.94	.94	.89	1.0	1.2	1.3	1.2	2.8	1.4	1.0	.94	.89
8	.99	.94	.84	.99	3.6	1.3	1.5	2.5	1.3	1.1	.94	.89
9	.94	.94	.84	.99	1.9	1.2	1.2	2.4	1.3	1.1	.94	.84
10	1.1	.99	.84	.99	1.3	1.2	1.2	2.3	1.3	1.0	.94	.84
11	.99	1.0	.84	.94	2.0	1.2	1.2	2.2	1.5	1.0	1.0	.84
12	2.5	.94	.84	.94	2.1	1.2	1.2	2.1	1.3	1.0	1.1	.84
13	1.6	.94	.89	.94	1.3	1.1	1.2	2.0	1.2	1.1	.99	.84
14	1.4	.94	1.8	.94	1.2	1.1	1.1	2.0	1.3	1.1	.94	.84
15	1.0	.94	3.5	.94	1.2	1.1	1.8	2.0	1.3	1.1	.94	.84
16	.99	.94	2.9	1.8	1.2	1.8	1.1	1.9	1.2	1.2	.94	.84
17	.99	.89	1.2	2.0	1.0	1.2	1.0	1.9	1.2	.99	.89	.84
18	.99	.94	1.0	1.0	1.0	1.2	.99	2.0	1.2	.99	.94	.84
19	.94	.94	1.7	1.2	1.0	1.2	.99	1.9	1.2	.99	.99	.84
20	.94	.89	1.1	.99	1.1	1.1	1.0	1.9	1.2	1.2	.94	1.1
21	.94	.94	1.0	.94	1.0	1.1	.99	1.7	1.2	1.1	.89	.84
22	.94	.89	6.7	.94	2.8	1.1	.99	1.7	1.2	.99	.99	.89
23	.89	.84	2.0	.94	1.3	1.1	.99	1.6	1.2	1.0	.99	.89
24	.94	.94	1.6	.94	2.0	1.2	.99	1.6	1.2	1.0	.89	.84
25	1.2	.89	5.9	.89	1.4	1.2	.94	1.6	1.2	.99	.89	.80
26	.94	.89	2.1	.89	1.3	1.2	.94	1.6	1.1	.99	.89	.80
27	.89	.84	1.6	1.2	1.2	1.2	.94	1.6	1.1	.99	.84	.80
28	.89	.84	1.5	2.4	1.2	2.2	1.6	1.6	1.2	1.0	.84	.80
29	.89	.84	1.3	1.2	---	3.4	31	1.6	1.1	1.0	.84	.80
30	1.3	.84	1.3	1.0	---	2.9	25	1.5	1.2	.99	.94	.80
31	.99	---	1.2	.99	---	1.6	---	1.6	---	.94	.89	---
TOTAL	32.76	27.67	51.23	35.09	42.41	43.2	89.86	84.7	38.3	32.26	30.49	26.24
MEAN	1.06	.92	1.65	1.13	1.51	1.39	3.00	2.73	1.28	1.04	.98	.87
MAX	2.5	1.0	6.7	2.4	4.0	3.4	31	16	1.5	1.2	2.0	1.3
MIN	.89	.84	.84	.89	.94	1.1	.94	1.5	1.1	.94	.84	.80
AC-FT	65	55	102	70	84	86	178	168	76	64	60	52

CAL YR 1980 TOTAL 877.83 MEAN 2.40 MAX 39 MIN .84 AC-FT 1740
WTR YR 1981 TOTAL 534.21 MEAN 1.46 MAX 31 MIN .80 AC-FT 1060

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. Water is used for irrigation in west-central Molokai. Periodic determinations of water temperature for the current year are published elsewhere in this report.

AVERAGE DISCHARGE.--15 years, 3.09 ft^3/s (0.088 m^3/s), 2,240 acre-ft/yr (2.76 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 30 ft^3/s (0.85 m^3/s) Apr. 29, 1981; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 30 ft^3/s (0.85 m^3/s) Apr. 29, minimum daily, 0.05 ft^3/s (0.001 m^3/s) May 27.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.2	5.4	1.7	2.0	1.9	4.5	4.8	21	2.1	1.4	1.4	1.2
2	2.1	5.0	1.7	2.0	1.7	6.6	16	14	.45	1.4	1.3	1.2
3	2.1	2.6	1.6	3.7	1.6	5.4	4.3	9.3	.21	1.4	1.6	6.6
4	2.0	2.3	1.6	3.4	1.5	3.0	2.5	4.9	1.0	1.4	22	2.2
5	2.0	2.1	4.6	2.3	13	2.3	1.9	4.3	2.8	1.4	8.8	6.9
6	2.0	2.0	3.2	2.0	3.5	2.6	1.7	3.1	5.1	1.3	2.4	4.3
7	2.0	2.0	2.2	1.6	2.2	2.9	1.4	2.8	2.8	1.3	1.7	1.9
8	2.1	2.0	1.9	1.7	17	2.1	1.5	2.6	2.5	1.4	1.5	1.5
9	2.1	2.0	1.9	1.7	8.6	1.9	1.5	2.8	2.2	1.4	1.4	1.4
10	5.1	2.0	1.6	1.7	2.8	1.9	1.5	2.6	1.9	2.0	1.3	1.3
11	4.0	4.9	1.6	1.7	9.7	1.7	1.5	2.3	9.0	1.7	2.7	1.3
12	25	2.5	1.6	1.6	12	1.7	1.4	2.3	4.0	1.6	8.3	1.3
13	15	2.1	1.7	1.6	3.0	1.6	1.5	1.0	2.2	1.8	4.1	1.3
14	13	2.0	4.7	1.6	2.2	1.6	1.4	.47	2.0	2.2	1.9	1.3
15	3.3	2.0	21	1.6	2.0	1.6	2.9	.44	3.6	2.9	1.5	1.2
16	2.7	1.9	14	3.6	1.9	2.8	3.1	.42	2.4	11	1.4	1.2
17	2.7	1.9	3.6	14	1.8	2.1	1.9	.46	2.0	3.9	1.3	1.2
18	3.6	1.9	2.5	2.7	1.7	2.0	1.6	.63	1.8	2.1	1.3	1.2
19	2.5	2.5	9.3	2.6	1.7	2.4	1.4	.84	1.6	2.0	1.5	1.3
20	2.2	2.1	3.9	3.1	1.8	2.0	1.4	1.3	1.6	2.3	1.7	7.2
21	2.2	2.0	2.4	2.3	2.2	1.7	1.4	.42	1.5	11	1.4	1.8
22	2.1	2.0	23	2.0	19	1.6	1.5	.18	1.5	2.5	1.3	1.5
23	2.1	1.9	7.3	1.9	5.1	1.5	1.4	.12	1.4	4.0	2.6	2.1
24	2.1	2.0	3.7	1.8	14	1.5	1.4	.09	1.4	2.6	1.8	1.8
25	12	2.1	24	1.7	5.3	3.5	1.4	.08	1.4	3.4	1.4	1.4
26	3.3	2.0	5.5	1.7	3.4	3.0	1.4	.06	1.4	2.0	1.3	1.3
27	2.3	1.9	3.0	2.8	2.3	4.3	1.3	.05	1.4	1.6	1.2	1.3
28	2.1	1.8	2.8	20	2.2	11	4.0	.07	1.4	1.5	1.2	1.5
29	2.0	1.7	2.6	4.1	---	19	30	.09	1.4	1.6	1.2	1.3
30	12	1.7	2.3	2.5	---	20	29	.07	1.4	1.6	1.3	1.2
31	4.7	---	2.2	2.0	---	4.7	---	1.2	---	1.5	1.3	---
TOTAL	144.6	70.3	164.7	99.0	145.1	124.5	128.0	79.99	65.46	79.2	85.1	62.2
MEAN	4.66	2.34	5.31	3.19	5.18	4.02	4.27	2.58	2.18	2.55	2.75	2.07
MAX	25	5.4	24	20	19	20	30	21	9.0	11	22	7.2
MIN	2.0	1.7	1.6	1.6	1.5	1.5	1.3	.05	.21	1.3	1.2	1.2
AC-FT	287	139	327	196	288	247	254	159	130	157	169	123

CAL YR 1980 TOTAL 1492.49 MEAN 4.08 MAX 25 MIN .90 AC-FT 2960
WTR YR 1981 TOTAL 1248.15 MEAN 3.42 MAX 30 MIN .05 AC-FT 2480

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.

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. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--16 years, 5.44 ft^3/s (0.154 m^3/s), 3,940 acre-ft/yr (4.86 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.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 31 ft^3/s (0.88 m^3/s) Apr. 29, minimum daily, 3.1 ft^3/s (0.088 m^3/s) May 22-30.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.3	8.0	4.5	4.5	4.3	6.8	7.5	22	5.5	4.1	4.1	3.9
2	5.3	8.3	4.3	4.5	4.3	8.8	17	18	3.7	4.1	4.1	3.9
3	5.3	5.8	4.3	6.0	4.1	8.0	7.3	12	3.3	4.1	4.1	8.7
4	5.0	5.3	4.3	6.5	3.9	5.5	5.3	7.8	4.1	4.1	20	5.0
5	5.0	5.0	6.9	5.0	15	4.8	4.5	7.5	5.3	4.1	14	8.9
6	5.0	4.8	6.0	4.8	6.3	5.3	4.3	6.0	8.0	4.3	5.5	7.5
7	5.0	4.8	4.8	4.3	4.8	5.3	4.1	5.8	5.8	4.3	4.8	5.0
8	5.3	4.8	4.5	4.3	18	4.8	4.1	5.5	5.3	4.3	4.3	4.5
9	5.3	4.8	4.5	4.3	12	4.5	4.1	5.8	5.0	4.3	4.3	4.3
10	7.7	4.8	4.5	4.1	5.5	4.5	4.1	5.8	4.8	5.0	4.3	4.3
11	7.0	7.5	4.5	4.1	9.6	4.3	4.1	5.5	11	4.8	5.0	4.3
12	26	5.5	4.5	4.1	16	4.3	3.9	5.3	7.3	4.8	10	4.1
13	17	5.0	4.5	4.1	5.8	4.1	3.9	4.3	5.3	5.0	7.8	4.1
14	16	4.8	5.1	4.1	4.8	4.1	3.9	3.9	3.7	4.8	5.3	4.8	4.1
15	6.5	4.8	23	4.1	4.5	4.1	4.8	3.7	6.3	6.0	4.3	4.1
16	5.8	4.8	18	4.2	4.5	5.1	6.0	3.7	5.5	12	4.3	4.1
17	5.8	4.8	6.5	18	4.3	4.8	4.3	3.7	5.0	7.0	4.1	4.1
18	6.8	4.8	5.0	5.3	4.3	4.5	4.1	3.7	4.8	5.0	4.1	4.1
19	5.8	5.3	11	5.0	4.3	5.0	4.1	3.7	4.5	4.8	4.3	4.1
20	5.3	5.3	6.5	5.8	4.3	4.8	3.9	4.3	4.5	4.8	4.5	9.6
21	5.3	5.0	5.0	4.8	4.8	4.5	3.9	3.7	4.5	13	4.1	4.8
22	5.3	5.0	22	4.5	20	4.3	3.9	3.1	4.5	5.3	4.1	4.3
23	5.3	4.8	11	4.5	7.8	4.1	3.9	3.1	4.5	6.5	5.3	4.8
24	5.0	5.0	6.3	4.3	16	4.1	3.9	3.1	4.5	5.5	4.5	4.5
25	12	5.0	24	4.3	8.0	5.5	3.9	3.1	4.5	6.0	4.1	4.3
26	6.5	4.8	8.6	4.3	6.3	5.5	3.7	3.1	4.3	4.8	3.9	4.1
27	5.5	4.8	5.5	4.5	5.0	6.8	3.7	3.1	4.3	4.5	3.9	4.1
28	5.3	4.8	5.3	21	4.5	11	3.9	3.1	4.3	4.3	3.9	4.3
29	5.3	4.5	5.0	6.8	---	21	31	3.1	4.3	4.3	3.9	4.3
30	14	4.5	4.8	5.0	---	23	30	3.1	4.3	4.3	3.9	4.1
31	8.0	---	4.8	4.5	---	8.0	---	3.5	---	4.3	3.9	---
TOTAL	233.7	157.2	239.5	175.6	213.0	201.2	197.1	172.9	153.8	165.0	168.2	146.3
MEAN	7.54	5.24	7.73	5.66	7.61	6.49	6.57	5.58	5.13	5.32	5.43	4.88
MAX	26	8.3	24	21	20	23	31	22	11	13	20	9.6
MIN	5.0	4.5	4.3	4.1	3.9	4.1	3.7	3.1	3.3	4.1	3.9	3.9
AC-FT	464	312	475	348	422	399	391	343	305	327	334	290

CAL YR 1980 TOTAL 2588.6 MEAN 7.07 MAX 26 MIN 3.3 AC-FT 5130
WTR YR 1981 TOTAL 2223.5 MEAN 6.09 MAX 31 MIN 3.1 AC-FT 4410

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 mi² (5.15 km²).

PERIOD OF RECORD.--May 1956 to October 1961, July 1962 to current year.

REVISED RECORDS.--WSP 1719: 1959. 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. Since Nov. 16, 1960, water diverted above station at times, either into or from Molokai tunnel. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE (since Molokai tunnel diversion began).--20 years (water years, 1961, 1963-81), 7.22 ft³/s (0.207 m³/s), 5,300 acre-ft/yr (6.53 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,090 ft³/s (59.2 m³/s) Jan. 8, 1980, gage height, 6.14 ft (1.872 m), from rating curve extended above 43 ft³/s (1.22 m³/s) on basis of slope-area measurement at gage height 5.75 ft (175 m); minimum, 0.02 ft³/s (0.001 m³/s) Oct. 26, 27, 1978.

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 ft³/s (176 m³/s), by slope-area measurement.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 590 ft³/s (16.7 m³/s) and maximum (*), from rating curve extended as explained above:

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Dec. 22	1330	908	25.7	4.48	1.366
Apr. 30	2400	*1780	50.4	*5.75	1.753

Minimum discharge, 1.1 ft³/s (0.031 m³/s) on many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.6	1.9	1.3	1.2	1.2	1.8	1.7	152	3.8	1.6	1.6	1.2
2	1.6	1.9	1.3	1.2	1.2	2.2	4.2	15	3.2	1.6	1.5	1.1
3	1.5	1.5	1.2	1.6	1.2	2.0	1.6	8.1	3.1	1.6	1.7	2.6
4	1.5	1.4	1.3	1.5	1.1	1.5	1.2	3.3	2.3	1.6	15	1.2
5	1.5	1.4	1.9	1.2	27	1.6	1.2	3.1	1.8	1.6	4.3	2.3
6	1.5	1.5	1.4	1.2	1.3	1.7	1.2	2.4	2.7	1.6	1.6	1.7
7	1.5	1.5	1.2	1.3	1.1	1.8	1.2	2.2	1.9	1.6	1.4	1.2
8	1.5	1.5	1.2	1.2	8.3	1.6	1.2	2.2	1.8	1.6	1.4	1.2
9	1.5	1.5	1.2	1.2	2.8	1.4	1.2	2.2	1.8	1.5	1.4	1.2
10	2.1	1.5	1.2	1.2	1.2	1.3	1.2	2.2	1.8	1.5	1.4	1.1
11	1.8	2.0	1.2	1.2	13	1.3	1.3	2.1	4.3	1.6	1.7	1.2
12	18	1.5	1.2	1.2	5.1	1.3	1.3	1.9	2.4	1.6	4.6	1.2
13	4.1	1.4	1.6	1.2	1.2	1.3	1.3	3.3	1.8	1.7	2.1	1.2
14	4.1	1.4	15	1.2	1.1	1.3	1.4	3.3	1.8	1.7	1.5	1.2
15	1.5	1.4	24	1.1	1.1	1.3	1.5	3.3	2.4	2.0	1.4	1.2
16	1.4	1.3	7.5	3.8	1.1	1.3	1.4	3.3	1.9	4.5	1.4	1.2
17	1.4	1.3	1.4	5.7	1.1	1.2	1.2	3.1	1.8	2.0	1.4	1.1
18	1.5	1.3	1.2	1.3	1.1	1.2	1.2	3.3	1.6	1.6	1.4	1.2
19	1.4	1.4	2.7	1.3	1.2	1.2	1.2	3.3	1.6	1.6	1.3	1.2
20	1.3	1.4	1.5	1.4	1.2	1.2	1.2	3.6	1.6	1.7	1.2	2.6
21	1.4	1.3	1.3	1.3	1.3	1.2	1.2	3.6	1.6	4.8	1.2	1.1
22	1.4	1.3	101	1.1	16	1.2	1.2	3.3	1.6	1.7	1.2	1.1
23	1.4	1.3	2.2	1.2	1.7	1.2	1.2	3.3	1.6	2.1	1.6	1.3
24	1.4	1.3	1.5	1.2	4.0	1.2	1.2	3.2	1.6	1.8	1.2	1.2
25	3.6	1.3	58	1.2	1.8	1.5	1.2	3.1	1.6	2.0	1.2	1.1
26	1.6	1.3	1.8	1.3	1.4	1.4	1.2	3.1	1.6	1.6	1.2	1.2
27	1.4	1.3	1.3	1.4	1.2	1.7	1.2	3.1	1.6	1.6	1.2	1.2
28	1.4	1.3	1.3	12	1.2	21	12	3.2	1.6	1.6	1.2	1.1
29	1.4	1.3	1.3	1.6	---	25	462	3.3	1.6	1.6	1.2	1.2
30	5.2	1.3	1.3	1.2	---	12	302	3.1	1.6	1.6	1.2	1.2
31	1.8	---	1.2	1.2	---	1.7	---	3.7	---	1.6	1.1	---
TOTAL	74.3	43.0	242.7	56.9	102.2	98.6	813.3	259.2	61.4	57.8	62.8	39.8
MEAN	2.40	1.43	7.83	1.84	3.65	3.18	27.1	8.36	2.05	1.86	2.03	1.33
MAX	18	2.0	101	12	27	25	462	152	4.3	4.8	15	2.6
MIN	1.3	1.3	1.2	1.1	1.1	1.2	1.2	1.9	1.6	1.5	1.1	1.1
AC-FT	147	85	481	113	203	196	1610	514	122	115	125	79

CAL YR 1980 TOTAL 3724.7 MEAN 10.2 MAX 300 MIN 1.2 AC-FT 7390
WTR YR 1981 TOTAL 1912.0 MEAN 5.24 MAX 462 MIN 1.1 AC-FT 3790

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 mi² (9.53 km²).

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.--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 fair. 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. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE (since Molokai tunnel diversion began).--21 years (water years 1961-81), 15.2 ft³/s (0.431 m³/s), 11,010 acre-ft/yr (13.6 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,600 ft³/s (187 m³/s) Oct. 31, 1961, gage height, 13.75 ft (4.191 m), present datum, from floodmarks, from rating curve extended above 39 ft³/s (1.10 m³/s) on basis of slope-area measurement of peak flow; minimum, 2.0 ft³/s (0.057 m³/s) Nov. 1, 2, 1925, June 5, 1926.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 700 ft³/s (19.8 m³/s) and maximum (*), from rating curve extended above 19 ft³/s (0.54 m³/s) on basis of slope-area measurement at gage height 7.81 ft (2.380 m):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Dec. 22	1330	1120	31.7	5.24	1.597
May 1	0030	*1170	33.1	*5.30	1.615

Minimum discharge, 5.0 ft³/s (0.14 m³/s) Sept. 24.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	11	11	8.4	8.6	8.0	8.6	9.6	161	12	8.2	7.5	6.7
2	11	11	8.3	8.6	7.8	9.1	13	28	11	8.2	7.5	6.7
3	11	10	8.3	9.7	7.7	8.9	9.0	21	11	8.2	9.0	9.0
4	10	9.8	8.3	9.4	7.7	8.1	8.4	15	9.7	8.2	23	7.2
5	10	9.6	9.8	8.7	22	8.3	7.9	14	9.7	8.2	13	8.5
6	10	9.6	9.0	8.5	9.0	8.7	7.6	13	10	8.0	8.5	7.7
7	10	9.4	8.5	8.5	8.5	8.8	7.6	13	9.5	8.0	8.0	7.0
8	10	9.5	8.2	8.4	21	8.6	7.3	13	9.2	8.0	7.7	6.7
9	10	9.3	8.1	8.4	13	8.5	7.3	12	9.2	8.0	7.5	6.5
10	11	9.3	8.1	8.3	9.0	8.3	7.3	12	9.5	8.0	7.5	6.5
11	11	10	8.1	8.1	16	8.3	7.0	12	13	7.7	9.5	6.5
12	29	9.5	8.1	8.1	15	8.3	7.2	12	9.7	7.7	11	6.5
13	16	9.1	8.5	8.1	8.8	8.3	7.0	13	9.0	7.7	9.0	6.2
14	16	9.1	13	8.1	8.4	8.3	6.8	13	9.0	7.7	8.0	6.2
15	11	9.1	30	8.1	8.2	8.1	8.2	13	9.2	8.2	7.5	6.2
16	11	8.9	18	8.4	8.1	7.9	7.5	13	9.0	11	7.2	6.2
17	11	8.8	9.7	16	8.1	7.7	6.8	13	8.7	8.5	7.2	6.2
18	11	9.0	9.0	8.6	8.1	7.6	6.7	13	8.7	7.7	7.2	6.2
19	10	9.1	11	8.5	8.1	7.6	6.6	12	8.5	7.7	7.5	6.7
20	10	8.8	9.4	8.8	7.9	7.5	6.6	12	8.5	8.2	7.2	9.7
21	10	8.8	8.8	8.5	8.0	7.4	6.6	12	8.5	11	7.2	6.7
22	10	8.7	105	8.4	23	7.3	6.6	12	8.5	8.0	7.2	6.5
23	10	8.7	13	8.1	9.4	7.3	6.7	12	8.5	8.2	8.5	6.7
24	9.9	8.7	10	8.1	13	7.7	6.5	11	8.5	8.2	7.2	6.2
25	13	8.7	51	8.1	9.4	10	6.5	11	8.5	8.0	7.0	6.2
26	10	8.6	11	8.0	8.6	7.8	6.5	11	8.5	7.7	7.0	6.0
27	9.9	8.6	9.6	8.0	8.1	8.2	6.3	11	8.2	7.5	7.0	6.0
28	9.7	8.5	9.4	19	8.0	14	11	11	8.2	7.5	6.7	5.8
29	9.8	8.4	9.1	9.0	---	21	545	11	8.2	7.5	6.7	5.8
30	17	8.4	8.9	8.4	---	29	348	11	8.2	7.5	7.2	5.8
31	11	---	8.7	8.1	---	11	---	11	---	7.5	6.7	---
TOTAL	360.3	276.0	454.3	279.6	297.9	296.2	1105.1	552	277.9	251.7	258.9	200.8
MEAN	11.6	9.20	14.7	9.02	10.6	9.55	36.8	17.8	9.26	8.12	8.35	6.69
MAX	29	11	105	19	23	29	545	161	13	11	23	9.7
MIN	9.7	8.4	8.1	8.0	7.7	7.3	6.3	11	8.2	7.5	6.7	5.8
AC-FT	715	547	901	555	591	588	2190	1090	551	499	514	398

CAL YR 1980 TOTAL 7711.8 MEAN 21.1 MAX 332 MIN 8.1 AC-FT 15300
WTR YR 1981 TOTAL 4610.7 MEAN 12.6 MAX 545 MIN 5.8 AC-FT 9150

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 mi² (17.02 km²).

PERIOD OF RECORD.--December 1949 to current year. Prior to July 1958, published as Kaunakakai Stream at Kaunakakai.

REVISED RECORDS.--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.--31 years (water years 1951-81), 1.55 ft³/s (0.044 m³/s), 1,120 acre-ft/yr (1.38 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,060 ft³/s (86.7 m³/s) Oct. 31, 1961, gage height, 9.30 ft (2.835 m), from rating curve extended above 620 ft³/s (17.6 m³/s) on basis of slope-area measurements at gage heights 7.22 ft (2.201 m) and 9.30 ft (2.835 m); no flow at times each year.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 280 ft³/s (7.93 m³/s) and maximum (*), from rating curve extended as explained above:

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Dec. 22	1400	*950	26.9	6.24	1.902
Apr. 30	2130	552	15.6	5.38	1.640

No flow most of time.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.00	.00	.00	92	.00	.00	.00	.00
2	.00	.00	.00	.00	.00	.00	.00	10	.00	.00	.00	.00
3	.00	.00	.00	.00	.00	.00	.00	4.6	.00	.00	.00	.00
4	.00	.00	.00	.00	.00	.00	.00	.69	.00	.00	.00	.00
5	.00	.00	.00	.00	.00	.00	.00	.03	.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	1.9	.00	.00	.00	.00	.00	.00	.00
13	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
14	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
15	.00	.00	3.8	.00	.00	.00	.00	.00	.00	.00	.00	.00
16	.00	.00	.05	.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	.00	.00	111	.00	.00	.00	.00	.00	.00	.00	.00	.00
23	.00	.00	7.2	.00	.00	.00	.00	.00	.00	.00	.00	.00
24	.00	.00	.09	.00	.00	.00	.00	.00	.00	.00	.00	.00
25	.00	.00	36	.00	.00	.00	.00	.00	.00	.00	.00	.00
26	.00	.00	4.5	.00	.00	.00	.00	.00	.00	.00	.00	.00
27	.00	.00	.08	.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	231	.00	.00	.00	.00	.00
30	.00	.00	.00	.00	---	1.5	168	.00	.00	.00	.00	.00
31	.00	---	.00	.00	---	.01	---	.00	---	.00	.00	---
TOTAL	.00	.00	162.72	.00	1.90	1.51	399.00	107.32	.00	.00	.00	.00
MEAN	.000	.000	5.25	.000	.068	.049	13.3	3.46	.000	.000	.000	.000
MAX	.00	.00	111	.00	1.9	1.5	231	92	.00	.00	.00	.00
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	.00	.00	323	.00	3.8	3.0	791	213	.00	.00	.00	.00

CAL YR 1980 TOTAL 1092.50 MEAN 2.98 MAX 236 MIN .00 AC-FT 2170
WTR YR 1981 TOTAL 672.45 MEAN 1.84 MAX 231 MIN .00 AC-FT 1330

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 mi² (2.43 km²).

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 fair. Diversion above station for domestic use at Puu O Hoku Ranch. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--18 years, 0.755 ft³/s (0.021 m³/s), 547 acre-ft/yr (674,000 m³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,720 ft³/s (77.0 m³/s) Apr. 13, 1965, gage height, 11.25 ft (3.429 m), from rating curve extended above 37 ft³/s (1.05 m³/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, 42 ft³/s (1.19 m³/s) Apr. 30, gage height, 2.38 ft (0.725 m), no peak above base of 210 ft³/s (5.95 m³/s); no flow on many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.30	.64	.12	.16	.03	.03	.12	6.1	.00	.00	.00	.00
2	.27	.44	.12	.16	.03	.06	.27	.73	.00	.00	.00	.00
3	.27	.27	.10	.18	.02	.08	.14	.33	.00	.00	.00	.00
4	.27	.24	.10	.21	.02	.12	.03	.21	.00	.00	1.7	.00
5	.27	.24	.30	.14	2.1	.08	.01	.18	.00	.00	2.0	.00
6	.24	.21	.24	.12	.30	.08	.01	.12	.00	.00	.08	.00
7	.27	.21	.14	.10	.12	.03	.01	.10	.00	.00	.01	.00
8	.30	.21	.12	.12	1.6	.02	.00	1.2	.00	.00	.00	.00
9	.27	.21	.10	.55	3.5	.02	2.0	.18	.00	.00	.00	.00
10	.33	.18	.10	.24	.33	.01	.12	.08	.00	.00	.00	.00
11	.33	.27	.10	.16	.24	.01	.02	.04	3.4	.00	1.5	.00
12	.60	.21	.10	.14	.40	.01	.02	.02	.30	.00	.70	.00
13	.44	.18	.08	.10	.18	.00	.01	.02	.06	.00	.44	.00
14	.75	.16	.10	.10	.12	.00	.00	.01	.00	.00	.04	.00
15	.33	.16	1.4	.08	.10	.00	.44	.01	.00	.00	.00	.00
16	.27	.21	.89	.10	.08	.00	.68	.00	.00	.00	.00	.00
17	.24	.18	.27	.18	.08	.00	.10	.00	.00	.00	.00	.00
18	.40	.16	.16	.14	.06	.00	.02	.00	.00	.00	.00	.00
19	.27	.18	.18	.08	.06	.00	.01	.00	.00	.00	.00	.00
20	.27	.18	.21	.08	.08	.00	.00	.00	.00	.00	.00	.00
21	.40	.16	.16	.06	.08	.00	.00	.00	.00	.00	.00	.00
22	.30	.16	2.4	.04	.06	.00	.00	.00	.00	.00	.00	.00
23	.27	.14	.74	.04	.08	.00	.00	.00	.00	.00	.00	.00
24	.24	.14	.30	.04	.12	.00	.00	.00	.00	.00	.00	.00
25	.36	.14	.73	.04	.10	.00	.00	.00	.00	.00	.00	.00
26	.30	.18	.48	.06	.06	.00	.00	.00	.00	.00	.00	.00
27	.27	.21	.33	.12	.04	.04	.00	.00	.00	.00	.00	.00
28	.24	.21	.33	.63	.02	.12	.00	.00	.00	.00	.00	.00
29	.24	.18	.24	.18	---	.39	7.2	.00	.00	.00	.00	.00
30	1.3	.14	.21	.08	---	.30	18	.00	.00	.00	.00	.00
31	.48	---	.18	.04	---	.16	---	.00	---	.00	.00	---
TOTAL	11.09	6.40	11.03	4.47	10.01	1.56	29.21	9.33	3.76	.00	6.47	.00
MEAN	.36	.21	.36	.14	.36	.050	.97	.30	.13	.000	.21	.000
MAX	1.3	.64	2.4	.63	3.5	.39	18	6.1	3.4	.00	2.0	.00
MIN	.24	.14	.08	.04	.02	.00	.00	.00	.00	.00	.00	.00
AC-FT	22	13	22	8.9	20	3.1	58	19	7.5	.00	13	.00

CAL YR 1980 TOTAL 382.77 MEAN 1.05 MAX 29 MIN .07 AC-FT 759
WTR YR 1981 TOTAL 93.33 MEAN .26 MAX 18 MIN .00 AC-FT 185

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).

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.--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. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--46 years (water years, 1928, 1933-34, 1937, 1940-81), 57.1 ft³/s (1.617 m³/s), 41,370 acre-ft/yr (51.0 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.--Maximum discharge, 2,340 ft³/s (66.3 m³/s) Feb. 11, gage height, 8.42 ft (2.566 m), from rating curve extended as explained above, no peak above base of 3,700 ft³/s (105 m³/s); minimum, no flow Mar. 23.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.02	.09	.07	.12	.02	.24	36	62	.02	.02	.02	.03
2	.02	.03	.03	.07	.01	126	294	.73	.03	.02	.02	.03
3	.02	.02	.03	.03	.01	170	118	.07	.03	.02	31	186
4	.03	.02	.03	.02	.01	17	6.9	.09	.03	.02	871	4.2
5	.02	.02	.29	.02	.01	17	.64	.24	.03	.03	67	56
6	.02	.03	.05	.03	.01	98	5.5	.03	.02	.02	11	1.2
7	.02	.03	.03	.02	.01	25	81	.02	.02	.02	2.1	.12
8	.03	.03	.03	.02	.45	2.6	236	.02	.02	.03	1.1	.03
9	.02	.03	.03	.02	.03	.72	14	.02	.02	.03	.72	.02
10	21	23	.02	.02	.02	.41	5.1	.02	.02	.03	.41	.02
11	33	162	.02	.78	457	.12	1.4	.02	.02	.03	256	.85
12	329	46	.02	.29	51	.07	.72	.02	.03	.03	63	.12
13	187	16	.02	.24	1.2	.03	.35	.03	.02	.05	3.4	6.5
14	128	8.6	.02	.03	.41	.02	134	.03	32	2.4	1.0	.15
15	29	.07	.07	.01	.15	.02	156	.02	137	17	.48	.03
16	13	.02	.05	.01	.07	.02	6.6	.03	2.0	6.2	.29	.02
17	133	5.0	.03	.02	.09	.02	2.0	.03	.03	.12	.24	.02
18	75	11	.02	.02	.02	.02	1.2	36	.02	.03	1.0	31
19	2.8	60	.03	.02	.18	.09	.81	2.1	.02	12	1.1	.92
20	168	2.0	.05	.02	.29	.03	48	72	.02	40	.64	.03
21	56	.24	.16	.02	.15	.01	48	1.7	.02	168	.29	.03
22	4.7	.07	23	.02	287	.01	1.5	.15	.01	3.2	8.6	.02
23	1.0	.03	.63	.02	7.2	.00	1.0	.03	.01	8.7	330	.02
24	26	22	.19	.02	312	.01	.91	.02	.01	47	15	.03
25	93	4.6	.19	.03	20	.02	.41	.02	.02	22	2.9	.03
26	4.7	2.4	.29	.05	16	38	.29	.07	.02	.41	1.9	1.8
27	.64	.29	.09	19	4.7	186	.12	.03	.02	.05	.41	38
28	.24	.35	.07	171	.48	73	.07	.03	.02	.50	.19	8.9
29	.09	.07	5.8	165	---	32	.03	.02	.02	.24	.03	.09
30	.29	.27	1.5	19	---	35	105	.02	.02	.03	.03	.03
31	.19	---	.29	.05	---	15	---	.02	---	.02	.09	---
TOTAL	1305.85	364.31	33.15	376.02	1158.52	836.46	1305.55	175.63	171.57	328.25	1670.96	336.24
MEAN	42.1	12.1	1.07	12.1	41.4	27.0	43.5	5.67	5.72	10.6	53.9	11.2
MAX	329	162	23	171	457	186	294	72	137	168	871	186
MIN	.02	.02	.02	.01	.01	.00	.03	.02	.01	.02	.02	.02
AC-FT	2590	723	66	746	2300	1660	2590	348	340	651	3310	667

CAL YR 1980 TOTAL 28297.29 MEAN 77.3 MAX 1910 MIN .01 AC-FT 56130
WTR YR 1981 TOTAL 8062.51 MEAN 22.1 MAX 871 MIN .00 AC-FT 15990

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).

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.--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. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--59 years (water years 1923-81), 22.8 ft^3/s (0.646 m^3/s), 16,520 acre-ft/yr (20.4 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, 1,750 ft^3/s (49.6 m^3/s) Apr. 30, gage height, 6.49 ft (1.978 m), from rating curve extended as explained above, no other peak above base of 1,700 ft^3/s (48.1 m^3/s); minimum, 1.6 ft^3/s (0.045 m^3/s) Feb. 16-18, 20, 21, July 3-11, 19, 20.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.7	6.1	3.2	2.1	1.9	2.3	4.1	226	2.5	1.7	2.2	2.5
2	3.5	4.8	3.1	2.1	1.9	60	80	29	2.4	1.7	2.1	2.6
3	3.4	4.4	3.0	2.0	1.8	40	25	9.5	2.4	1.7	31	57
4	3.3	4.2	3.0	5.1	1.8	5.3	5.0	5.5	2.4	1.6	81	5.1
5	3.2	4.0	3.7	7.1	2.6	3.2	3.5	4.4	2.4	1.6	9.3	18
6	3.2	5.1	3.6	2.6	2.0	3.7	2.9	3.8	2.4	1.6	4.0	4.2
7	3.1	4.0	3.1	2.4	1.9	2.8	2.7	4.9	2.3	1.6	3.2	3.2
8	3.3	4.3	3.0	2.3	1.9	2.5	2.6	3.7	2.4	1.6	2.9	2.8
9	3.1	8.7	2.8	2.2	1.8	2.4	2.4	3.2	2.2	1.7	2.9	2.6
10	10	6.4	2.8	2.2	1.7	2.2	2.3	3.1	2.2	1.6	2.8	2.5
11	21	26	2.7	2.2	1.7	2.2	2.2	3.0	2.3	1.7	23	2.3
12	175	7.1	2.6	2.1	1.7	2.1	2.1	2.9	2.3	1.7	11	2.3
13	79	5.7	2.6	2.1	1.7	2.0	2.1	3.3	2.1	1.7	4.4	2.2
14	24	4.5	2.5	2.0	1.7	2.0	2.1	3.0	2.4	1.8	3.3	2.1
15	7.7	4.2	2.8	2.0	1.7	2.0	2.2	2.8	3.0	2.1	3.0	2.1
16	8.3	4.1	3.5	1.9	1.6	1.9	2.1	2.8	2.3	2.7	2.7	2.0
17	26	14	3.0	1.9	1.6	1.9	2.0	2.9	2.1	2.4	2.6	2.0
18	22	14	2.6	1.9	1.6	3.8	2.0	6.4	2.1	1.9	2.6	3.1
19	6.3	14	2.5	1.8	1.7	4.0	1.9	8.3	2.0	1.7	3.3	2.2
20	9.5	5.7	2.5	1.8	1.6	2.2	2.0	12	2.0	5.0	4.2	3.7
21	6.5	5.0	2.5	1.8	1.7	1.9	2.4	3.8	2.0	9.5	3.1	2.2
22	6.6	4.3	2.4	1.8	134	1.9	1.9	3.1	2.0	2.8	12	2.1
23	7.3	4.0	2.4	1.8	5.0	1.8	1.9	2.9	1.9	4.9	151	2.1
24	5.4	4.4	2.3	1.7	135	1.9	1.9	2.8	1.9	4.8	6.6	2.1
25	7.5	3.9	2.3	1.8	15	2.2	1.8	2.8	1.8	4.1	3.9	2.0
26	5.0	3.7	2.4	1.7	11	2.7	1.8	2.7	1.8	2.7	3.3	2.3
27	4.3	3.5	2.3	2.4	4.7	5.7	1.7	2.6	1.8	2.5	3.0	9.8
28	4.2	3.4	2.2	6.5	2.7	5.2	1.7	2.6	1.8	3.7	2.8	3.1
29	4.3	3.3	2.2	3.0	---	5.8	34	2.6	1.7	2.6	2.5	2.5
30	6.3	3.2	2.2	2.4	---	12	599	2.5	1.8	2.3	2.5	2.3
31	19	---	2.1	2.0	---	5.8	---	2.5	---	2.2	2.8	---
TOTAL	495.0	190.0	83.9	76.7	345.0	195.4	799.3	371.4	64.7	81.2	395.0	155.0
MEAN	16.0	6.33	2.71	2.47	12.3	6.30	26.6	12.0	2.16	2.62	12.7	5.17
MAX	175	26	3.7	7.1	135	60	599	226	3.0	9.5	151	57
MIN	3.1	3.2	2.1	1.7	1.6	1.8	1.7	2.5	1.7	1.6	2.1	2.0
AC-FT	982	377	166	152	684	388	1590	737	128	161	783	307

CAL YR 1980 TOTAL 17003.5 MEAN 46.5 MAX 963 MIN 2.1 AC-FT 33730
WTR YR 1981 TOTAL 3252.6 MEAN 8.91 MAX 599 MIN 1.6 AC-FT 6450

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.

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 good. Ditch diverts water from nearly all streams from the Makapipi west to the Alo for power, domestic use, and irrigation in central Maui. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--62 years, 33.9 ft³/s (0.960 m³/s), 24,560 acre-ft/yr (30.3 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 104 ft³/s (2.95 m³/s) Mar. 17, 1980; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 91 ft³/s (2.58 m³/s) Oct. 12, May 1; minimum daily, 6.0 ft³/s (0.17 m³/s) July 10, 19.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	19	29	15	8.4	8.1	9.7	20	91	10	6.8	9.0	15
2	18	24	15	8.4	7.7	66	65	71	9.8	6.7	8.7	14
3	17	22	14	8.1	7.5	45	61	43	9.6	6.7	47	65
4	16	21	14	20	7.4	24	27	32	9.4	6.7	88	27
5	16	20	17	33	10	17	21	28	9.7	6.3	43	54
6	15	23	16	12	8.2	23	19	24	9.7	6.3	24	25
7	15	19	14	10	7.5	17	18	27	9.2	6.3	19	19
8	16	20	13	9.8	7.5	16	18	22	9.5	6.3	18	17
9	15	32	13	9.5	7.1	15	16	19	8.8	6.3	17	16
10	32	25	12	9.0	7.0	14	15	18	8.5	6.0	16	15
11	32	60	11	9.1	6.3	13	14	17	9.3	6.3	65	14
12	91	30	11	8.6	6.2	12	13	16	9.4	6.3	50	13
13	90	25	11	8.4	6.5	12	13	16	8.4	6.3	27	13
14	69	22	11	8.1	6.6	11	12	14	9.8	6.7	22	12
15	42	20	12	8.1	6.3	11	13	14	13	7.7	19	12
16	41	19	14	7.7	6.3	10	12	13	9.6	9.6	17	11
17	60	42	12	7.7	6.3	10	11	13	8.7	7.7	16	10
18	60	42	11	7.7	6.3	15	10	21	8.5	6.7	16	16
19	36	47	10	7.4	6.3	17	10	24	8.3	6.0	17	11
20	46	27	10	7.3	6.3	11	11	37	8.1	20	20	19
21	36	26	10	7.3	6.7	9.9	12	17	8.1	38	16	12
22	32	23	10	7.0	66	9.4	9.9	14	7.7	13	27	11
23	33	21	9.8	7.0	19	9.0	9.7	13	7.7	20	85	11
24	29	22	9.6	7.0	75	9.4	9.5	13	7.7	20	37	11
25	34	20	9.7	7.2	41	11	9.2	12	7.4	18	25	10
26	26	19	9.6	6.9	31	13	8.9	12	7.4	12	22	11
27	23	18	9.4	9.2	18	23	8.5	11	7.2	11	19	33
28	22	17	9.3	26	12	19	8.4	11	7.2	16	18	16
29	22	16	9.1	13	---	25	48	11	7.0	13	16	13
30	27	16	8.8	10	---	39	90	11	7.1	10	16	12
31	54	---	8.8	8.6	---	24	---	10	---	9.6	16	---
TOTAL	1084	767	360.1	317.5	410.1	560.4	613.1	695	261.8	328.3	855.7	538
MEAN	35.0	25.6	11.6	10.2	14.6	18.1	20.4	22.4	8.73	10.6	27.6	17.9
MAX	91	60	17	33	75	66	90	91	13	38	88	65
MIN	15	16	8.8	6.9	6.2	9.0	8.4	10	7.0	6.0	8.7	10
AC-FT	2150	1520	714	630	813	1110	1220	1380	519	651	1700	1070

CAL YR 1980	TOTAL	16426.80	MEAN	44.9	MAX	104	MIN	.00	AC-FT	32580
WTR YR 1981	TOTAL	6791.00	MEAN	18.6	MAX	91	MIN	6.0	AC-FT	13470

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).

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.--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). 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. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--61 years (water years, 1915, 1917, 1923-81), 35.1 ft³/s (0.994 m³/s), 25,430 acre-ft/yr (31.4 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, 3,050 ft³/s (86.4 m³/s) Apr. 30, gage height, 9.09 ft (2.771 m), from rating curve extended as explained above, no other peak above base of 1,900 ft³/s (53.8 m³/s); minimum, 0.94 ft³/s (0.027 m³/s) Feb. 19.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.2	9.0	3.3	1.7	1.3	12	11	369	3.3	1.6	2.0	4.1
2	3.9	7.4	3.1	1.6	1.2	89	84	52	2.9	1.5	1.9	5.3
3	3.7	6.4	3.0	1.6	1.1	53	31	20	2.8	1.4	67	99
4	3.5	5.5	2.9	5.7	1.1	14	11	11	2.7	1.3	72	12
5	3.3	5.1	3.6	10	4.9	8.3	7.9	8.5	3.3	1.3	15	36
6	3.2	6.6	3.9	2.2	2.5	6.9	6.1	7.1	3.8	1.3	6.8	9.8
7	3.2	4.7	3.6	1.9	1.5	5.4	5.4	6.9	3.3	1.2	5.0	6.8
8	6.9	8.8	2.8	1.8	1.8	5.0	4.7	11	3.3	1.3	4.6	5.5
9	5.2	17	2.6	1.8	1.9	4.3	4.2	9.4	2.7	1.5	4.3	4.7
10	31	9.0	2.5	1.8	1.4	3.7	3.8	6.2	2.5	1.4	3.8	5.2
11	50	56	2.5	1.8	1.2	3.3	3.5	5.5	2.9	2.0	47	5.1
12	286	11	2.3	1.7	1.3	3.1	3.3	6.6	2.8	2.2	19	3.9
13	131	7.9	2.3	1.7	1.3	2.8	3.2	8.7	2.3	2.2	7.8	3.4
14	39	6.1	2.2	1.5	1.2	2.7	3.2	5.3	2.5	2.9	5.5	3.1
15	13	5.4	3.6	1.3	1.1	2.5	4.7	4.4	2.7	7.2	4.6	2.9
16	15	5.5	10	1.3	1.0	2.6	5.0	4.7	2.2	5.6	4.1	2.7
17	44	25	3.9	1.3	1.0	3.0	3.3	8.2	2.0	3.0	3.7	2.6
18	41	27	2.8	1.2	1.0	14	2.9	14	2.0	1.9	4.2	5.2
19	11	24	2.4	1.2	1.1	8.6	2.8	14	1.9	1.7	8.5	3.1
20	14	8.7	2.2	1.2	1.1	3.7	2.8	22	1.9	6.2	8.3	10
21	10	7.1	2.1	1.2	26	2.9	2.9	6.8	2.0	16	4.9	4.2
22	9.9	6.2	2.1	1.2	194	2.6	2.4	5.2	1.7	3.4	28	3.1
23	9.7	5.5	2.0	1.2	16	2.4	2.3	4.6	1.7	8.0	299	3.2
24	8.6	6.1	1.9	1.1	172	3.1	2.3	4.2	1.8	7.8	18	2.9
25	13	4.9	2.0	1.3	59	3.7	2.3	5.5	1.7	6.6	9.0	2.5
26	7.1	4.4	2.3	1.2	67	4.5	2.1	6.0	1.7	3.1	7.0	3.2
27	6.1	4.2	2.0	2.2	25	8.8	2.0	4.4	1.6	2.8	5.5	18
28	6.1	4.0	1.9	7.2	19	22	2.0	4.1	1.6	4.3	5.2	4.3
29	5.9	3.7	1.9	2.1	---	28	127	3.7	1.6	2.9	4.2	3.2
30	14	3.5	1.9	1.8	---	57	842	3.3	1.9	2.4	4.1	2.9
31	43	---	1.8	1.4	---	22	---	3.3	---	2.2	6.1	---
TOTAL	845.5	305.7	87.4	66.2	608.0	404.9	1191.1	645.6	71.1	108.2	686.1	277.9
MEAN	27.3	10.2	2.82	2.14	21.7	13.1	39.7	20.8	2.37	3.49	22.1	9.26
MAX	286	56	10	10	194	89	842	369	3.8	16	299	99
MIN	3.2	3.5	1.8	1.1	1.0	2.4	2.0	3.3	1.6	1.2	1.9	2.5
AC-FT	1680	606	173	131	1210	803	2360	1280	141	215	1360	551

CAL YR 1980 TOTAL 21900.7 MEAN 59.8 MAX 1220 MIN 1.8 AC-FT 43440
WTR YR 1981 TOTAL 5297.7 MEAN 14.5 MAX 842 MIN 1.0 AC-FT 10510

16523000 KOOLAU DITCH NEAR KEANAE

LOCATION.--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 of Kailua.

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. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--65 years (water years, 1911-12, 1918-81), 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.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 224 ft^3/s (6.34 m^3/s) Oct. 12; minimum daily, 16 ft^3/s (0.45 m^3/s) Feb. 15-19, July 5-8, 10.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	51	88	42	22	20	58	76	223	30	18	26	46
2	49	72	41	22	19	196	186	212	29	17	24	46
3	47	65	39	21	18	195	193	155	28	17	172	205
4	45	59	38	62	18	94	89	98	27	17	222	102
5	43	56	48	116	44	60	67	79	30	16	136	178
6	42	77	44	34	26	69	55	67	31	16	67	76
7	41	55	39	28	20	50	51	71	28	16	52	57
8	59	72	36	26	23	45	48	75	31	16	49	53
9	50	132	34	25	21	41	44	63	26	17	48	50
10	162	83	34	24	18	37	41	50	25	16	45	49
11	135	191	32	24	17	34	39	47	29	19	204	47
12	224	96	31	23	18	33	37	50	29	21	175	42
13	222	75	31	22	17	31	35	59	24	21	80	40
14	203	63	30	21	17	30	35	45	27	25	60	38
15	128	57	39	21	16	28	46	40	35	42	52	36
16	135	57	67	20	16	28	41	42	26	40	47	34
17	190	145	37	20	16	29	33	51	24	26	43	33
18	184	165	32	19	16	87	31	89	24	19	45	59
19	107	163	30	19	16	71	31	93	22	18	73	37
20	148	81	29	19	17	34	31	154	22	61	75	97
21	106	74	28	19	35	29	38	56	22	141	48	41
22	98	66	28	18	196	28	30	46	21	37	79	36
23	96	60	27	18	97	26	28	41	20	75	222	37
24	83	66	26	18	194	31	28	39	21	85	146	35
25	115	56	26	19	204	39	27	39	20	71	82	32
26	73	52	28	18	190	47	26	40	20	36	69	38
27	65	51	26	25	131	86	25	36	19	33	57	121
28	65	48	25	91	90	73	24	35	19	60	55	50
29	65	46	25	33	---	132	165	33	18	38	47	40
30	121	44	24	27	---	210	221	31	20	32	46	37
31	184	---	23	22	---	124	---	31	---	28	59	---
TOTAL	3336	2415	1039	896	1530	2075	1821	2190	747	1094	2605	1792
MEAN	108	80.5	33.5	28.9	54.6	66.9	60.7	70.6	24.9	35.3	84.0	59.7
MAX	224	191	67	116	204	210	221	223	35	141	222	205
MIN	41	44	23	18	16	26	24	31	18	16	24	32
AC-FT	6620	4790	2060	1780	3030	4120	3610	4340	1480	2170	5170	3550

CAL YR 1980 TOTAL 44920 MEAN 123 MAX 224 MIN 23 AC-FT 89100
WTR YR 1981 TOTAL 21540 MEAN 59.0 MAX 224 MIN 16 AC-FT 42720

16531000 KULA DIVERSION FROM HAIPUAENA STREAM NEAR OLINDA

LOCATION.--Lat 20°48'24", 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.

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 poor. Water is diverted from Haipuaena Stream at station for domestic use and irrigation of truck crops in the Olinda and Kula areas. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--36 years, 0.718 ft^3/s (0.020 m^3/s), 520 acre-ft/yr (641,000 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.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 9.3 ft^3/s (0.26 m^3/s) Oct. 12; minimum daily, 0.01 ft^3/s (<0.001 m^3/s) on many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.14	.72	.12	.01	.01	1.4	.66	5.2	.25	.03	.07	.22
2	.12	.36	.08	.01	.01	6.5	5.0	3.1	.14	.03	.04	.26
3	.10	.22	.07	.01	.01	4.2	1.1	1.0	.09	.10	6.3	5.3
4	.09	.16	.05	.01	.01	1.2	.54	.54	.06	.36	8.7	.97
5	.07	.14	.04	.01	2.2	.60	.65	.28	.08	.12	2.0	2.7
6	.05	.12	.03	.01	.40	1.6	.72	.22	.19	.07	.60	.66
7	.04	.09	.03	.01	.12	.97	.40	.19	.19	.04	.36	.36
8	.94	.10	.03	.01	1.3	.44	.54	.32	.14	.03	.19	.22
9	.36	.22	.02	.01	.44	.40	.28	.60	.10	.02	.16	.16
10	2.4	.16	.02	.01	.16	.48	.54	.28	.07	.02	.12	.14
11	3.4	4.8	.02	.01	.62	.25	.60	.19	.06	.02	3.9	.12
12	9.3	.54	.01	.01	3.4	.16	.28	.22	.07	.02	1.6	.09
13	6.5	.36	.01	.01	.44	.14	.19	.60	.05	.05	.60	.07
14	2.7	.22	.01	.01	.19	.10	.16	.25	.03	.22	.32	.06
15	.84	.14	.03	.01	.12	.08	.28	.16	.03	1.2	.19	.04
16	.44	.12	1.6	.01	.08	.08	.28	.14	.02	.78	.16	.03
17	2.8	.66	.44	.06	.05	.68	.28	.54	.02	.44	.22	.03
18	3.3	.44	.19	.10	.03	1.7	.16	.84	.02	2.1	.19	.03
19	.66	.78	.10	.04	.02	.84	.12	.66	.01	.97	1.1	.03
20	4.1	.32	.07	.01	.02	.32	.08	2.0	.01	1.3	.78	2.3
21	2.0	.19	.05	.01	2.8	.16	.07	.54	.01	3.4	.44	.66
22	.84	.14	.03	.01	4.6	.12	.06	.25	.01	.54	2.3	.22
23	.60	.12	.03	.01	1.8	.09	.04	.16	.01	.54	4.7	.14
24	.40	.12	.02	.01	7.9	.07	.08	.14	.01	1.6	1.1	.16
25	.97	.12	.02	.01	6.7	.07	.12	.14	.01	1.4	.66	.12
26	.40	.12	.02	.01	6.6	.08	.19	.32	.34	.40	.36	.12
27	.22	1.4	.01	.01	3.7	.63	.12	.19	.48	.19	.25	1.4
28	.19	.60	.01	.03	3.9	3.9	.08	.16	.16	.16	.19	.60
29	.16	.22	.01	.04	---	4.9	4.1	.14	.09	.14	.16	.25
30	.44	.14	.01	.03	---	6.2	7.2	.10	.06	.12	.14	.16
31	3.1	---	.01	.02	---	2.2	---	.12	---	.10	.19	---
TOTAL	47.67	13.84	3.19	.56	47.63	40.56	24.92	19.59	2.81	16.51	38.09	17.62
MEAN	1.54	.46	.10	.018	1.70	1.31	.83	.63	.094	.53	1.23	.59
MAX	9.3	4.8	1.6	.10	7.9	6.5	7.2	5.2	.48	3.4	8.7	5.3
MIN	.04	.09	.01	.01	.01	.07	.04	.10	.01	.02	.04	.03
AC-FT	95	27	6.3	1.1	94	80	49	39	5.6	33	76	35

CAL YR 1980 TOTAL 529.28 MEAN 1.45 MAX 9.7 MIN .01 AC-FT 1050
WTR YR 1981 TOTAL 272.99 MEAN .75 MAX 9.3 MIN .01 AC-FT 541

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.

PERIOD OF RECORD.--April 1922 to current year. Published as "at Haipuaena, near Huelo" 1930-35.

REVISED RECORDS.--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. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE (since termination of powerplant diversion).--20 years (water years 1962-81), 28.9 ft^3/s (0.818 m^3/s), 20,940 acre-ft/yr (25.8 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.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 97 ft^3/s (2.75 m^3/s) Oct. 12; minimum daily, 1.2 ft^3/s (0.034 m^3/s) June 4, 17, 18.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	9.1	17	6.5	3.1	2.8	14	13	85	4.4	2.2	4.9	10
2	8.4	14	6.2	3.0	2.5	77	56	54	2.5	2.0	4.4	17
3	8.0	12	5.9	3.0	2.4	60	41	33	1.3	2.1	66	72
4	7.5	10	5.5	27	2.4	23	17	18	1.2	2.0	88	23
5	7.0	9.5	5.3	38	29	15	14	14	2.2	1.9	34	58
6	6.6	24	7.2	6.8	7.5	12	11	11	4.8	1.9	16	18
7	6.6	10	6.4	4.8	3.7	11	9.7	5.7	4.4	1.8	13	14
8	24	18	5.1	4.2	23	9.8	8.6	6.9	3.3	1.9	11	11
9	13	41	4.7	3.9	19	8.6	7.9	9.4	1.5	2.1	9.8	9.9
10	54	20	4.5	3.6	5.1	7.8	7.3	7.5	1.3	2.0	8.5	10
11	40	66	4.4	3.5	3.8	6.9	6.7	4.3	1.8	3.6	78	9.7
12	97	20	4.2	3.3	22	6.5	6.4	3.4	2.6	4.1	50	7.9
13	94	16	4.0	3.2	6.1	6.0	4.0	4.2	3.6	5.3	19	7.2
14	61	12	4.0	3.1	3.8	5.6	2.0	2.6	3.4	6.6	14	6.5
15	25	10	8.9	3.0	3.3	5.4	2.4	2.1	3.2	20	11	6.1
16	28	13	42	2.9	3.1	7.1	3.8	2.1	2.2	11	9.7	5.7
17	60	47	8.1	3.1	3.0	8.2	5.6	2.9	1.2	5.8	8.7	5.4
18	51	53	5.4	3.0	2.8	44	4.9	21	1.2	9.5	9.8	18
19	20	50	4.7	2.8	2.9	21	5.0	28	1.6	7.5	19	7.9
20	46	17	4.3	2.7	2.8	8.3	4.8	46	2.9	18	16	43
21	30	13	4.0	2.6	19	6.4	5.5	11	3.1	41	9.3	12
22	24	12	4.0	2.6	75	5.6	2.7	7.8	1.8	8.1	26	8.0
23	20	11	3.9	2.5	29	5.2	1.4	6.9	1.7	17	86	9.9
24	17	12	3.7	2.5	86	11	2.3	6.3	3.1	31	32	8.0
25	23	9.5	3.7	2.7	67	14	4.0	9.2	2.6	21	17	6.6
26	13	8.8	4.1	2.6	74	11	5.2	6.7	2.3	7.9	13	10
27	11	14	3.9	5.3	33	23	2.8	1.8	2.2	6.7	10	42
28	12	11	3.7	21	23	26	1.6	2.0	2.3	17	10	12
29	12	7.8	3.7	4.4	---	43	54	2.6	2.2	9.0	8.4	8.5
30	31	7.0	3.4	3.6	---	73	94	4.8	2.5	5.9	8.6	9.6
31	63	---	3.2	3.0	---	23	---	4.6	---	5.6	20	---
TOTAL	922.2	585.6	188.6	180.8	557.0	598.4	404.6	424.8	74.4	281.5	731.1	486.9
MEAN	29.7	19.5	6.08	5.83	19.9	19.3	13.5	13.7	2.48	9.08	23.6	16.2
MAX	97	66	42	38	86	77	94	85	4.8	41	88	72
MIN	6.6	7.0	3.2	2.5	2.4	5.2	1.4	1.8	1.2	1.8	4.4	5.4
AC-FT	1830	1160	374	359	1100	1190	803	843	148	558	1450	966

CAL YR 1980 TOTAL 12375.4 MEAN 33.8 MAX 97 MIN 3.2 AC-FT 24550
WTR YR 1981 TOTAL 5435.9 MEAN 14.9 MAX 97 MIN 1.2 AC-FT 10780

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.

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. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--49 years, 115 ft^3/s (3.257 m^3/s), 83,320 acre-ft/yr (103 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.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 281 ft^3/s (7.96 m^3/s) Apr. 30; minimum daily, 15 ft^3/s (0.42 m^3/s) Feb. 17-18.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	52	89	42	22	20	62	77	280	30	18	25	47
2	50	74	41	22	19	227	198	232	31	18	24	48
3	48	67	39	21	19	205	187	154	31	17	190	225
4	46	61	38	77	18	97	91	100	30	17	255	100
5	44	57	48	123	51	62	70	82	32	17	132	181
6	42	78	45	34	27	72	58	69	31	16	68	77
7	42	57	40	28	20	52	54	78	29	16	54	59
8	60	72	36	26	24	46	50	81	34	16	50	54
9	51	132	35	25	22	41	45	65	29	17	48	52
10	154	82	34	24	19	37	41	52	27	16	45	50
11	137	202	32	23	18	35	39	51	33	20	229	48
12	275	96	32	23	18	33	37	61	32	21	166	43
13	271	78	31	22	17	31	38	69	25	21	80	40
14	208	65	30	21	16	30	39	51	27	25	62	38
15	126	59	39	21	16	28	57	46	35	42	53	36
16	133	59	70	20	16	29	47	47	27	39	47	34
17	197	153	37	20	15	29	33	60	26	26	43	33
18	188	160	31	20	15	92	31	92	26	19	45	58
19	107	164	30	20	16	71	31	96	24	18	69	38
20	144	81	29	19	16	34	31	150	22	70	73	104
21	107	75	28	19	34	30	38	58	23	155	48	42
22	97	67	27	19	240	27	32	47	22	37	83	36
23	97	61	26	18	101	26	31	42	21	73	269	37
24	84	67	26	18	240	32	30	39	22	86	142	35
25	112	57	26	19	211	40	27	40	20	72	83	32
26	75	53	28	18	201	48	26	44	20	36	71	37
27	66	52	26	24	137	84	26	42	19	33	59	121
28	66	49	25	90	95	80	27	42	19	60	56	51
29	67	46	25	33	---	137	202	36	19	38	48	41
30	114	44	24	27	---	210	281	32	20	33	47	37
31	195	---	23	22	---	121	---	32	---	28	60	---
TOTAL	3455	2457	1043	918	1661	2148	1974	2370	786	1120	2724	1834
MEAN	111	81.9	33.6	29.6	59.3	69.3	65.8	76.5	26.2	36.1	87.9	61.1
MAX	275	202	70	123	240	227	281	280	35	155	269	225
MIN	42	44	23	18	15	26	26	32	19	16	24	32
AC-FT	6850	4870	2070	1820	3290	4260	3920	4700	1560	2220	5400	3640

CAL YR 1980	TOTAL	47300.3	MEAN	129	MAX 287	MIN 1.3	AC-FT	93820
WTR YR 1981	TOTAL	22490.0	MEAN	61.6	MAX 281	MIN 15	AC-FT	44610

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.

PERIOD OF RECORD.--December 1917 to November 1924, January 1925 to current year.

REVISED RECORDS.--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. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--62 years (water years, 1919-24, 1926-81), 8.21 ft^3/s (0.233 m^3/s), 5,950 acre-ft/yr (7.34 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.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 121 ft^3/s (3.43 m^3/s) Apr. 30; minimum daily, 0.06 ft^3/s (0.002 m^3/s) several days in January, February, June, July.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.62	1.0	.24	.09	.06	.19	.62	97	.14	.06	.09	.40
2	.62	.71	.24	.09	.06	22	14	17	.14	.07	.09	.42
3	.53	.62	.24	.09	.06	8.6	3.7	6.3	.14	.06	30	33
4	.45	.62	.24	7.2	.06	1.0	1.1	3.2	.14	.06	32	.74
5	.45	.53	.24	9.0	4.3	.30	.71	2.0	.14	.06	2.7	4.1
6	.45	1.2	.24	.19	.30	.45	.53	1.5	.14	.06	.71	.67
7	.45	.45	.24	.14	.09	.30	.45	1.3	.14	.06	.45	.51
8	.91	.53	.19	.09	1.9	.24	.37	1.2	.14	.06	.37	.45
9	.53	3.2	.19	.09	.81	.19	.37	.91	.14	.06	.30	.38
10	3.3	1.1	.19	.09	.14	.19	.30	.81	.09	.06	.30	.37
11	1.9	17	.19	.09	.09	.14	.24	.71	.14	.06	43	.37
12	102	.81	.19	.09	.45	.14	.24	.71	.14	.06	2.6	.30
13	66	.53	.14	.09	.09	.14	.24	.71	.09	.06	1.1	.30
14	13	.45	.14	.06	.09	.09	.24	.53	.14	.06	.81	.27
15	1.8	.45	.45	.06	.09	.09	.45	.45	.14	.10	.62	.25
16	2.1	.45	2.9	.06	.06	.19	.45	.45	.14	.21	.53	.29
17	9.8	6.3	.24	.06	.06	.19	.24	.45	.09	.08	.45	.24
18	13	3.0	.19	.06	.06	3.3	.19	.53	.09	.06	.45	.47
19	1.4	6.0	.14	.06	.06	1.8	.14	.62	.09	.07	.45	.31
20	3.2	.53	.14	.06	.09	.19	.14	2.0	.09	.73	.50	9.7
21	2.0	.53	.14	.06	.37	.14	.19	.45	.09	4.6	.34	.44
22	1.2	.53	.14	.06	58	.14	.14	.37	.09	.21	9.3	.31
23	1.0	.37	.14	.06	1.9	.09	.14	.30	.09	.19	89	.30
24	.91	.81	.14	.06	59	.37	.14	.30	.09	.56	2.1	.29
25	1.1	.45	.14	.06	6.3	1.1	.14	.24	.06	.93	1.1	.28
26	.81	.45	.14	.06	8.8	.37	.14	.24	.06	.17	.90	.29
27	.71	.37	.09	.14	2.2	1.6	.09	.19	.06	.13	.69	2.5
28	.71	.37	.09	1.6	.71	3.6	.09	.19	.06	.71	.66	.50
29	.71	.30	.09	.19	---	6.2	36	.19	.06	.34	.50	.38
30	1.6	.30	.09	.09	---	7.4	121	.19	.06	.18	.48	.35
31	12	---	.09	.09	---	1.5	---	.19	---	.12	.63	---
TOTAL	245.26	49.96	8.26	20.23	146.20	62.24	182.79	141.23	3.22	10.24	223.22	59.18
MEAN	7.91	1.67	.27	.65	5.22	2.01	6.09	4.56	.11	.33	7.20	1.97
MAX	102	17	2.9	9.0	59	22	121	97	.14	4.6	89	33
MIN	.45	.30	.09	.06	.06	.09	.09	.19	.06	.06	.09	.24
AC-FT	486	99	16	40	290	123	363	280	6.4	20	443	117

CAL YR 1980 TOTAL 6085.62 MEAN 16.6 MAX 135 MIN .09 AC-FT 12070
WTR YR 1981 TOTAL 1152.03 MEAN 3.16 MAX 121 MIN .06 AC-FT 2290

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).

PERIOD OF RECORD.--December 1910 to current year. Monthly discharge only for some periods, published in WSP 1319.

REVISED RECORDS.--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. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--70 years (water years 1912-81), 4.66 ft^3/s (0.132 m^3/s), 3,380 acre-ft/yr (4.17 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, 194 ft^3/s (5.49 m^3/s) Apr. 30, gage height, 2.87 ft (0.875 m), from rating curve extended as explained above, no peak above base of 270 ft^3/s (7.65 m^3/s); minimum, 0.24 ft^3/s (0.007 m^3/s) on July 8-11, 18-20, Aug. 1-3.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.5	1.9	1.1	.54	.38	1.1	1.1	53	.84	.38	.24	.84
2	1.5	1.6	1.1	.54	.38	3.4	3.7	10	.74	.30	.24	.88
3	1.3	1.5	1.1	.54	.38	3.6	2.3	6.9	.74	.30	1.8	5.7
4	1.3	1.3	.96	3.8	.38	1.7	1.5	5.1	.74	.30	4.3	1.6
5	1.3	1.3	.96	4.7	2.9	1.5	1.3	4.3	.74	.30	1.2	1.7
6	1.2	2.3	1.2	.96	.84	1.6	1.2	3.7	.74	.30	.64	1.3
7	1.1	1.3	1.1	.84	.54	1.3	1.1	3.2	.74	.30	.54	1.2
8	1.5	1.3	.96	.74	5.3	1.2	1.1	2.8	.84	.30	.54	1.1
9	1.3	3.8	.84	.74	.96	1.2	1.1	2.7	.64	.30	.46	1.1
10	1.9	1.8	.84	.64	.74	1.1	.96	2.5	.64	.24	.46	.96
11	1.6	4.7	.84	.64	.64	.96	.96	2.4	.64	.24	3.9	.96
12	13	1.9	.84	.64	.84	.96	.84	2.3	.64	.30	1.6	.96
13	14	1.6	.84	.54	.64	.84	.84	2.1	.54	.38	.84	.84
14	6.1	1.5	.74	.54	.54	.84	.84	2.0	.54	.38	.74	.84
15	3.2	1.5	4.0	.54	.54	.96	.84	1.9	.54	.46	.64	.84
16	3.3	1.3	3.2	.54	.54	1.1	.84	1.7	.54	.46	.64	.74
17	4.6	2.7	1.2	.64	.54	1.1	.74	1.6	.46	.38	.64	.74
18	3.7	4.0	.96	.54	.46	1.5	.74	2.0	.46	.30	.64	1.1
19	2.5	6.3	.96	.46	.54	1.2	.74	1.7	.46	.30	.74	.96
20	2.8	2.0	.84	.46	.46	.84	.74	2.7	.46	.90	.74	6.1
21	2.4	1.9	.84	.46	.74	.74	.74	1.6	.46	1.5	.54	1.6
22	2.3	1.7	.84	.46	10	.74	.64	1.3	.38	.38	.84	1.1
23	2.1	1.6	.74	.46	1.4	.64	.64	1.2	.38	.46	6.9	1.2
24	2.0	2.0	.74	.46	9.0	.74	.64	1.1	.46	.46	1.7	1.1
25	2.1	1.5	.64	.54	2.0	.84	.64	1.1	.38	.54	1.2	.96
26	1.7	1.5	.64	.46	1.5	.84	.54	1.1	.38	.38	1.1	.96
27	1.7	1.5	.64	.74	1.3	1.3	.54	.96	.38	.30	.96	1.2
28	1.7	1.3	.64	1.5	1.2	1.8	.54	.96	.38	.46	.96	.96
29	1.6	1.2	.64	.54	---	2.3	5.9	.84	.38	.38	.84	.84
30	2.4	1.2	.64	.46	---	1.7	65	.84	.46	.30	.84	.84
31	3.9	---	.54	.46	---	1.2	---	.84	---	.30	1.2	---
TOTAL	92.6	61.0	32.12	26.12	45.68	40.84	99.30	126.44	16.72	12.58	38.62	41.22
MEAN	2.99	2.03	1.04	.84	1.63	1.32	3.31	4.08	.56	.41	1.25	1.37
MAX	14	6.3	4.0	4.7	10	3.6	65	53	.84	1.5	6.9	6.1
MIN	1.1	1.2	.54	.46	.38	.64	.54	.84	.38	.24	.24	.74
AC-FT	184	121	64	52	91	81	197	251	33	25	77	82

CAL YR 1980 TOTAL 2829.40 MEAN 7.73 MAX 117 MIN .54 AC-FT 5610
WTR YR 1981 TOTAL 633.24 MEAN 1.73 MAX 65 MIN .24 AC-FT 1260

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.

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 good. 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. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--58 years (water years 1924-81), 170 ft^3/s (4.814 m^3/s), 123,200 acre-ft/yr (152 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.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 322 ft^3/s (9.12 m^3/s) Apr. 30, May 1; minimum daily, 24 ft^3/s (0.68 m^3/s) July 6-8.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	97	168	72	35	31	120	138	322	51	28	43	90
2	90	132	69	34	29	275	254	309	49	27	40	89
3	85	117	66	34	28	290	275	270	47	26	196	290
4	81	107	63	77	27	198	172	194	46	25	292	192
5	77	100	69	200	86	125	132	157	50	25	223	257
6	74	161	75	65	65	139	108	129	53	24	132	154
7	74	102	68	49	37	109	98	125	48	24	100	115
8	114	124	59	44	136	93	89	124	55	24	90	102
9	101	227	56	42	97	85	81	113	45	26	84	93
10	237	145	54	39	44	77	75	92	41	25	76	90
11	220	267	52	38	37	66	71	86	48	29	261	87
12	304	182	50	37	104	62	67	93	53	36	253	77
13	307	146	49	35	51	58	63	119	41	38	160	72
14	291	116	47	34	37	55	65	87	43	45	116	67
15	239	104	94	33	34	54	86	76	51	87	99	63
16	236	101	205	33	32	70	82	76	41	76	87	60
17	277	226	79	34	31	69	59	88	37	45	79	57
18	280	236	56	32	30	165	55	165	37	36	85	121
19	202	253	51	31	31	159	54	154	36	44	122	73
20	247	156	48	31	30	72	54	251	35	58	135	216
21	233	133	46	30	62	59	64	111	35	187	89	108
22	183	123	45	29	218	54	51	84	33	72	106	75
23	184	107	44	29	196	51	49	75	31	117	306	78
24	151	135	42	28	285	69	49	69	34	111	230	74
25	205	102	41	31	281	106	47	70	32	149	158	64
26	135	97	44	30	278	94	46	75	30	66	126	74
27	119	99	41	43	232	146	42	63	29	56	105	189
28	117	94	40	157	177	106	41	66	29	120	101	102
29	121	81	40	51	---	223	227	59	28	72	86	77
30	212	76	38	40	---	277	322	55	32	57	84	71
31	262	---	36	33	---	214	---	54	---	48	123	---
TOTAL	5555	4217	1839	1458	2726	3740	3016	3811	1220	1803	4187	3277
MEAN	179	141	59.3	47.0	97.4	121	101	123	40.7	58.2	135	109
MAX	307	267	205	200	285	290	322	322	55	187	306	290
MIN	74	76	36	28	27	51	41	54	28	24	40	57
AC-FT	11020	8360	3650	2890	5410	7420	5980	7560	2420	3580	8300	6500

CAL YR 1980 TOTAL 64145.6 MEAN 175 MAX 307 MIN 9.6 AC-FT 127200
WTR YR 1981 TOTAL 36849.0 MEAN 101 MAX 322 MIN 24 AC-FT 73090

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.

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 Waikamoi Stream and Halehaku Gulch above Center and Lowrie ditches for irrigation in central Maui. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--63 years, 36.0 ft^3/s (1.020 m^3/s), 26,080 acre-ft/yr (32.2 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.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 159 ft^3/s (4.50 m^3/s) Apr. 30; minimum daily, 0.08 ft^3/s (0.002 m^3/s) July 2.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.7	2.5	.72	.35	.27	.66	.99	158	.55	.12	.21	.48
2	1.6	1.6	.66	.35	.27	111	94	150	.50	.08	.16	1.8
3	1.5	1.4	.66	.35	.23	127	92	84	.45	.10	92	136
4	1.4	1.3	.66	34	.23	9.6	3.9	12	.45	.12	149	6.8
5	1.3	1.2	.60	82	67	.85	.92	8.4	.45	.13	69	79
6	1.2	11	.78	.92	1.9	1.7	.72	5.2	.55	.23	.99	1.5
7	1.1	1.1	.99	.50	.40	.99	.66	3.8	.45	.22	.60	.65
8	29	1.1	.60	.40	55	.66	.60	2.5	.50	.21	.49	.53
9	1.3	67	.55	.35	.99	.60	.50	2.1	.35	.23	.44	.45
10	75	2.2	.55	.35	.50	.55	.50	1.8	.31	.23	.37	.40
11	30	130	.55	.35	.35	.50	.45	1.7	.31	.19	125	.40
12	154	4.0	.50	.35	48	.45	.45	1.6	.31	.19	110	.35
13	156	1.1	.50	.31	.45	.45	.45	1.7	.23	.20	2.2	.34
14	141	.99	.50	.31	.31	.45	.55	1.6	.27	.23	.98	.31
15	18	.92	4.0	.31	.31	.40	.45	1.3	.35	3.0	.75	.28
16	28	.85	40	.31	.31	.50	1.1	1.2	.27	.31	.61	.27
17	103	70	1.1	.31	.27	.60	.40	1.1	.19	.27	.55	.24
18	109	68	.66	.27	.27	39	.35	11	.19	.17	.58	.67
19	4.5	111	.60	.27	.27	31	.35	21	.19	.16	6.0	.37
20	56	1.9	.55	.27	.27	.66	.35	94	.19	26	.63	90
21	26	1.1	.50	.27	1.1	.50	.40	1.6	.19	93	.52	1.9
22	2.6	1.7	.50	.27	143	.40	.35	.99	.15	.80	12	.56
23	6.2	1.1	.45	.31	25	.40	.31	.85	.15	6.0	154	.49
24	1.8	1.8	.45	.31	125	.45	.31	.78	.19	24	72	.49
25	6.6	1.1	.40	.31	123	.92	.27	.72	.15	33	1.1	.40
26	1.7	.99	.45	.35	109	.66	.27	.66	.15	.50	.81	.40
27	1.6	.92	.40	.55	50	37	.23	.60	.15	.35	.66	55
28	1.5	.85	.40	23	.99	13	.19	.50	.15	5.0	.60	.96
29	1.4	.78	.40	.55	---	64	123	.50	.15	.53	.51	.56
30	11	.72	.35	.35	---	131	159	.60	.15	.36	.51	.45
31	108	---	.35	.31	---	38	---	.55	---	.26	.59	---
TOTAL	1083.0	490.22	60.38	149.21	754.69	613.95	484.02	572.35	8.64	196.19	803.86	382.05
MEAN	34.9	16.3	1.95	4.81	27.0	19.8	16.1	18.5	.29	6.33	25.9	12.7
MAX	156	130	40	82	143	131	159	158	.55	93	154	136
MIN	1.1	.72	.35	.27	.23	.40	.19	.50	.15	.08	.16	.24
AC-FT	2150	972	120	296	1500	1220	960	1140	17	389	1590	758

CAL YR 1980 TOTAL 13550.59 MEAN 37.0 MAX 165 MIN .00 AC-FT 26880
WTR YR 1981 TOTAL 5598.56 MEAN 15.3 MAX 159 MIN .08 AC-FT 11100

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.

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 stream westward to Maliko Gulch for irrigation in central Maui. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--67 years (water years, 1911-26, 1931-81), 36.9 ft^3/s (1.045 m^3/s), 26,730 acre-ft/yr (33.0 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.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 107 ft^3/s (3.03 m^3/s) Apr. 30; minimum daily, 1.6 ft^3/s (0.045 m^3/s) July 6-8.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	16	16	8.4	5.0	3.8	15	21	104	4.1	2.3	2.5	11
2	13	12	8.2	5.0	3.6	60	52	91	3.9	2.0	2.3	4.8
3	12	11	7.9	4.9	3.5	60	26	61	3.7	1.9	19	71
4	12	20	7.8	11	3.5	17	16	31	3.6	1.8	86	15
5	11	25	7.6	58	36	22	18	24	3.9	1.7	41	44
6	11	27	7.6	20	19	18	15	22	4.8	1.6	24	11
7	12	21	10	23	13	7.0	14	20	3.8	1.6	18	8.6
8	14	19	7.5	19	42	5.7	14	17	4.5	1.6	17	15
9	12	35	7.2	21	15	16	15	12	3.6	2.0	16	24
10	18	27	7.0	7.7	5.6	25	17	11	3.2	1.8	14	23
11	20	68	6.8	4.8	4.3	21	10	16	3.5	1.7	69	16
12	81	20	6.6	5.3	11	6.2	4.7	22	3.8	1.8	39	12
13	90	28	6.4	4.6	5.3	4.6	5.7	22	3.1	1.7	19	7.2
14	79	21	6.4	4.4	4.1	4.3	7.4	22	3.8	2.4	24	4.1
15	30	20	13	4.2	3.8	4.6	4.9	14	4.7	2.8	23	3.8
16	33	21	23	4.1	3.6	6.0	6.0	7.5	3.5	3.6	19	3.7
17	49	41	11	4.2	3.6	5.8	4.3	9.3	3.1	2.4	16	3.5
18	65	29	12	4.0	3.4	7.8	3.9	20	3.4	1.8	15	5.4
19	22	65	8.5	3.7	3.4	21	3.5	16	3.0	2.3	8.7	3.6
20	38	27	6.5	3.6	3.8	16	3.7	25	2.8	3.9	6.8	41
21	32	18	6.2	3.6	3.6	7.1	4.2	11	2.9	61	5.4	7.6
22	30	11	6.1	3.6	83	4.4	3.4	13	2.7	24	5.9	5.2
23	30	11	6.0	3.5	21	4.1	3.1	12	2.4	21	94	5.1
24	23	28	5.8	3.5	78	5.3	3.3	11	2.8	22	35	7.9
25	18	24	5.7	3.7	55	10	3.0	9.7	2.6	19	18	7.9
26	18	18	5.7	3.8	50	7.5	3.2	8.8	2.3	12	20	8.8
27	21	8.6	5.5	4.0	32	11	2.8	5.6	2.1	8.2	19	16
28	14	11	5.7	11	15	8.0	2.6	5.2	2.2	7.8	15	7.4
29	12	21	5.7	6.9	---	47	48	5.2	2.1	8.4	13	12
30	19	8.9	5.3	4.7	---	45	107	4.8	3.0	4.5	13	13
31	50	---	5.2	4.1	---	24	---	4.4	---	2.8	12	---
TOTAL	905	712.5	242.3	269.9	528.9	516.4	442.7	657.5	98.9	233.4	729.6	418.6
MEAN	29.2	23.8	7.82	8.71	18.9	16.7	14.8	21.2	3.30	7.53	23.5	14.0
MAX	90	68	23	58	83	60	107	104	4.8	61	94	71
MIN	11	8.6	5.2	3.5	3.4	4.1	2.6	4.4	2.1	1.6	2.3	3.5
AC-FT	1800	1410	481	535	1050	1020	878	1300	196	463	1450	830

CAL YR 1980 TOTAL 9874.2 MEAN 27.0 MAX 93 MIN 1.6 AC-FT 19590
WTR YR 1981 TOTAL 5755.7 MEAN 15.8 MAX 107 MIN 1.6 AC-FT 11420

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.

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. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--66 years (water years, 1911, 1914, 1916-28, 1931-81), 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, 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.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 105 ft^3/s (2.97 m^3/s) Apr. 30; minimum daily, 0.19 ft^3/s (0.005 m^3/s) Apr. 28, June 27.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.2	2.5	1.1	.87	.56	.66	.83	103	.63	.45	.37	.51
2	2.1	1.8	1.1	.87	.60	55	37	62	.63	.39	.38	.49
3	2.0	1.8	1.0	.74	.57	39	2.6	4.3	.68	.39	11	57
4	1.9	1.7	1.0	1.1	.53	1.4	.95	3.3	.60	.38	101	2.5
5	1.8	1.7	1.1	43	17	.83	.86	2.7	.66	.37	26	17
6	1.9	1.7	1.1	1.1	1.4	.87	.85	1.7	.79	.37	2.4	2.3
7	1.9	1.6	1.1	.87	.67	.76	.79	1.1	.65	.37	1.9	2.0
8	2.0	1.6	1.0	.80	4.0	.71	.67	.75	.73	.38	1.2	1.7
9	1.8	3.5	.94	.74	1.1	.73	.63	.66	.59	.40	.55	.92
10	2.2	1.7	.94	.74	.78	.59	.60	.64	.56	.42	.51	.56
11	2.2	50	.94	.74	.81	.56	.60	.63	.57	.42	59	.52
12	89	2.0	.87	.87	1.1	.55	.43	.59	.50	.44	4.0	.50
13	101	1.6	.94	.58	.82	.53	.27	.53	.45	.48	2.4	.48
14	59	1.5	.87	.58	.74	.53	.28	.48	.47	.56	1.9	.45
15	2.8	1.4	1.5	.58	.73	.52	.28	.51	.56	.61	.84	.44
16	2.9	1.4	1.7	.53	.72	.55	.27	.45	.45	.77	.58	.47
17	3.3	7.3	1.2	.63	.69	.57	.28	.39	.43	.55	.55	.43
18	48	1.5	1.0	.58	.67	.64	.36	.59	.44	.49	.55	.64
19	2.4	47	1.0	.58	.68	.61	.42	.53	.43	.48	.55	.54
20	2.4	1.7	1.0	.63	.72	.55	.48	1.5	.33	.46	.59	11
21	2.2	1.5	1.0	.63	.66	.52	.56	.74	.23	30	.56	2.6
22	2.2	1.4	1.0	.63	68	.45	.52	.59	.36	2.4	.73	2.1
23	2.1	1.3	.87	.60	1.5	.25	.50	.57	.45	1.9	93	1.4
24	1.9	1.4	.80	.61	70	.33	.49	.54	.45	1.2	9.3	.60
25	2.1	1.3	.80	.62	28	.67	.52	.52	.44	.93	2.2	.58
26	1.8	1.4	.87	.68	19	.56	.47	.51	.28	.52	1.9	.77
27	1.7	1.3	.87	.60	14	.68	.29	.48	.19	.47	1.2	.95
28	1.7	1.2	.94	.84	.79	.56	.19	.49	.38	.48	.55	.73
29	1.7	1.2	.94	.79	---	21	27	.49	.42	.47	.51	.66
30	2.7	1.1	.94	.61	---	1.4	105	.47	.45	.44	.59	.61
31	26	---	.87	.59	---	.90	---	.51	---	.41	.58	---
TOTAL	378.9	148.1	31.30	64.33	236.84	133.48	184.99	192.26	14.80	48.40	327.39	111.45
MEAN	12.2	4.94	1.01	2.08	8.46	4.31	6.17	6.20	.49	1.56	10.6	3.72
MAX	101	50	1.7	43	70	55	105	103	.79	30	101	57
MIN	1.7	1.1	.80	.53	.53	.25	.19	.39	.19	.37	.37	.43
AC-FT	752	294	62	128	470	265	367	381	29	96	649	221

CAL YR 1980 TOTAL 7965.38 MEAN 21.8 MAX 103 MIN .22 AC-FT 15800
WTR YR 1981 TOTAL 1872.24 MEAN 5.13 MAX 105 MIN .19 AC-FT 3710

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. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--16 years, 2.99 ft^3/s (0.085 m^3/s), 2,170 acre-ft/yr (2.68 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 14 ft^3/s (0.40 m^3/s) Mar. 23, Apr. 1, 15, 1980; minimum daily, 0.11 ft^3/s (0.003 m^3/s) Nov. 5-10, 1973, Oct. 5, 6, 25, 26, 1974.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 11 ft^3/s (0.31 m^3/s) Apr. 30, May 1, Aug. 23; minimum daily, 0.20 ft^3/s (0.006 m^3/s) Dec. 13-15, Jan. 6-16, Feb. 2-4, Aug. 1, 2.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.75	2.3	.76	.25	.24	3.1	2.4	11	.87	.32	.20	.52
2	.71	1.7	.65	.24	.20	7.2	4.4	6.3	.84	.30	.20	.55
3	.69	1.4	.48	.23	.20	5.4	3.3	4.3	.79	.28	1.5	8.3
4	.64	1.3	.40	.22	.20	3.6	2.1	3.4	.76	.28	8.6	2.9
5	.58	1.2	.34	.21	2.6	2.7	1.6	3.1	.77	.28	5.0	3.1
6	.58	1.1	.31	.20	1.5	2.4	1.3	2.8	.76	.27	1.4	1.8
7	.56	1.0	.28	.20	.59	2.3	1.1	2.7	.71	.26	.78	1.1
8	.83	1.1	.25	.20	3.4	1.8	1.0	2.6	.72	.26	.52	.86
9	.75	1.6	.24	.20	2.4	2.2	.97	2.4	.64	.26	.39	.71
10	1.2	1.2	.23	.20	1.1	2.5	.87	2.2	.61	.25	.33	.61
11	1.6	3.8	.22	.20	1.0	1.7	.84	2.1	.64	.34	4.8	.57
12	10	2.1	.21	.20	6.3	1.4	.79	2.2	.60	.32	3.2	.52
13	8.2	1.6	.20	.20	2.1	1.2	.75	2.2	.55	.34	1.3	.49
14	5.6	1.2	.20	.20	1.1	1.1	.71	1.9	.52	.33	.77	.45
15	3.1	1.1	.20	.20	.68	1.0	.72	1.7	.52	.38	.54	.43
16	2.5	1.1	8.0	.20	.51	1.5	.71	1.6	.49	.34	.42	.41
17	3.0	1.7	4.0	1.0	.41	1.7	.64	1.7	.46	.27	.35	.40
18	5.8	1.6	2.0	.66	.35	2.1	.61	2.0	.46	.41	.37	.47
19	2.9	1.8	1.4	.46	.32	1.6	.58	2.1	.44	.53	.43	.43
20	3.5	1.3	1.1	.28	.30	1.2	.56	2.6	.43	.47	.52	2.0
21	3.8	1.1	.80	.24	.96	1.1	.54	1.9	.42	1.6	.41	1.4
22	2.6	.98	.70	.24	8.3	.97	.52	1.5	.40	.70	.59	.71
23	2.1	.91	.56	.24	3.8	.88	.48	1.4	.38	.56	11	.55
24	1.8	.96	.46	.24	8.0	.90	.50	1.3	.39	.49	5.7	.49
25	1.9	.83	.40	.24	7.1	.89	.48	1.2	.36	.68	2.0	.44
26	1.6	.79	.35	.24	8.2	.83	.48	1.2	.36	.46	1.2	.43
27	1.4	.83	.32	.25	5.4	1.1	.45	1.2	.34	.34	.88	.52
28	1.3	1.2	.29	.35	4.2	2.1	.43	1.1	.34	.28	.75	.52
29	1.2	.83	.28	.25	---	4.8	2.9	1.0	.32	.26	.60	.44
30	1.5	.79	.27	.24	---	6.1	11	.95	.33	.24	.56	.41
31	3.8	---	.26	.24	---	4.1	---	.95	---	.23	.61	---
TOTAL	76.49	40.42	26.16	8.52	71.46	71.47	43.73	74.60	16.22	12.33	55.92	32.53
MEAN	2.47	1.35	.84	.27	2.55	2.31	1.46	2.41	.54	.40	1.80	1.08
MAX	10	3.8	8.0	1.0	8.3	7.2	11	11	.87	1.6	11	8.3
MIN	.56	.79	.20	.20	.20	.83	.43	.95	.32	.23	.20	.40
AC-FT	152	80	52	17	142	142	87	148	32	24	111	65

CAL YR 1980 TOTAL 1236.38 MEAN 3.38 MAX 14 MIN .20 AC-FT 2450
WTR YR 1981 TOTAL 529.85 MEAN 1.45 MAX 11 MIN .20 AC-FT 1050

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.--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 fair. No diversion above station.

AVERAGE DISCHARGE.--32 years (1940-42, 1948-70, 1976-81), 17.0 ft³/s (0.481 m³/s) 12,320 acre-ft/yr (15.2 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 (*), from rating curve extended as explained above:

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Apr. 30	2000	*1260	35.7	6.22	1.896
Aug. 4	1530	521	14.8	5.18	1.579

Minimum discharge, 4.0 ft³/s (0.11 m³/s) July 3-8, 11-13.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	9.0	11	6.1	5.3	5.0	5.6	6.1	237	4.9	4.6	4.4	4.6
2	8.0	8.3	6.1	5.3	4.8	5.9	11	37	4.8	4.2	4.3	4.4
3	7.5	7.4	5.9	5.3	4.7	9.6	6.7	24	4.7	4.0	29	27
4	7.3	7.8	5.9	7.7	4.7	6.4	5.7	9.5	4.6	4.0	150	6.3
5	7.3	7.0	5.9	39	16	5.9	5.4	7.9	9.0	4.0	16	11
6	7.1	8.9	6.7	6.8	6.4	23	5.4	7.0	10	4.0	7.3	6.0
7	7.1	7.3	6.9	5.7	5.3	10	5.0	6.6	7.8	4.0	6.0	5.0
8	12	7.3	5.9	5.6	21	6.0	6.7	8.6	8.0	4.0	5.5	4.7
9	8.1	8.6	5.8	6.2	6.5	26	4.9	6.4	5.6	4.1	6.1	4.5
10	12	7.3	5.7	5.5	5.3	11	4.8	5.8	5.0	4.2	6.3	4.4
11	13	8.3	5.7	5.4	15	5.9	4.8	5.6	27	4.0	82	4.4
12	48	7.2	5.6	5.3	19	5.4	4.6	5.4	9.4	4.0	19	4.5
13	27	6.8	5.6	5.3	6.1	5.2	4.5	5.5	5.8	4.0	9.0	4.7
14	22	6.6	5.6	5.1	5.4	5.0	15	5.3	5.3	5.0	6.3	4.4
15	12	6.4	10	5.1	5.2	4.9	6.0	5.2	5.3	8.9	5.5	4.2
16	12	6.6	11	5.1	5.1	5.6	4.8	5.3	5.1	8.3	5.2	4.1
17	24	22	6.6	7.0	5.0	5.2	4.7	5.3	4.8	5.9	4.9	4.1
18	24	7.2	5.9	5.6	5.0	31	4.6	7.9	4.7	4.6	5.2	20
19	8.8	9.0	5.8	5.2	4.8	19	4.6	6.0	4.6	7.2	17	5.8
20	9.8	10	5.8	5.1	5.1	6.2	4.6	18	4.5	25	7.1	31
21	8.9	9.2	5.6	5.0	6.4	5.4	4.6	6.5	4.4	32	5.4	5.8
22	7.9	7.0	5.7	5.0	32	5.1	4.5	5.4	4.4	6.3	30	4.9
23	7.6	6.7	5.6	5.0	7.8	4.9	4.4	5.1	4.4	9.5	73	6.0
24	7.6	7.0	5.5	5.0	24	7.9	8.1	5.0	4.6	26	9.0	6.1
25	9.0	6.7	8.4	5.0	9.3	24	4.9	5.6	4.4	11	6.3	4.7
26	7.6	6.9	7.3	5.7	7.6	6.5	5.1	8.3	4.3	5.6	5.5	8.6
27	7.2	11	5.8	5.4	8.0	7.2	4.7	5.2	4.7	4.9	5.1	27
28	7.1	9.1	5.6	6.8	5.9	6.6	5.5	6.1	4.5	16	5.0	7.5
29	7.2	6.7	5.4	9.8	---	20	101	6.6	4.3	6.2	4.8	5.3
30	21	6.4	5.4	5.4	---	28	412	5.5	5.4	5.1	4.9	4.9
31	16	---	5.4	5.1	---	7.8	---	5.0	---	4.6	4.7	---
TOTAL	393.1	247.7	194.2	209.8	256.4	326.2	674.7	483.6	186.3	245.2	549.8	245.9
MEAN	12.7	8.26	6.26	6.77	9.16	10.5	22.5	15.6	6.21	7.91	17.7	8.20
MAX	48	22	11	39	32	31	412	237	27	32	150	31
MIN	7.1	6.4	5.4	5.0	4.7	4.9	4.4	5.0	4.3	4.0	4.3	4.1
AC-FT	780	491	385	416	509	647	1340	959	370	486	1090	488

CAL YR 1980 TOTAL 8916.8 MEAN 24.4 MAX 498 MIN 5.4 AC-FT 17690
WTR YR 1981 TOTAL 4012.9 MEAN 11.0 MAX 412 MIN 4.0 AC-FT 7960

16618000 KAHAKULOA STREAM NEAR HONOKOHAU--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--December 1974 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (UMHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)	TUR-BID-ITY (NTU)	OXYGEN, DIS-SOLVED (MG/L)	COLI-FORM, FECAL, 0.7 UM-MF (COLS. / 100 ML)	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARD-NESS (MG/L AS CACO3)
OCT										
06...	1230	7.2	89	7.2	20.5	.40	9.6	11	460	22
NOV										
04...	1200	7.7	84	7.5	20.5	.50	9.2	68	1860	22
DEC										
01...	1300	6.1	90	7.4	20.0	.50	9.2	25	420	36
JAN										
06...	1200	6.6	85	7.4	19.5	.20	9.1	39	480	23
FEB										
09...	1215	6.2	83	7.1	16.5	2.5	9.5	50	180	22
MAR										
09...	1100	6.6	83	7.4	20.0	.70	9.5	30	510	21
APR										
06...	1230	5.3	90	7.6	19.5	1.1	9.4	130	99	22
MAY										
04...	1215	9.6	64	6.8	18.5	2.5	9.3	22	160	14
JUN										
08...	1115	12	65	6.9	21.0	1.5	9.5	62	220	15
JUL										
06...	1300	4.0	94	7.4	23.5	.70	8.8	8	300	25
AUG										
03...	1300	20	50	6.5	22.0	6.4	8.5	1000	2300	12
SEP										
14...	1245	4.3	87	7.4	23.0	4.0	9.5	230	590	22

DATE	HARD-NESS NONCAR-BONATE (MG/L AS CACO3)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	PERCENT SODIUM	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY LAB (MG/L AS CACO3)	SULFATE DIS-SOLVED (MG/L AS SO4)
OCT									
06...	.00	4.2	2.7	7.9	43	.7	.8	26	1.0
NOV									
04...	3.0	4.2	2.8	8.2	43	.8	1.1	19	1.9
DEC									
01...	2.0	4.6	5.9	7.8	31	.6	1.0	34	.5
JAN									
06...	3.0	4.8	2.6	8.2	43	.8	.9	20	1.5
FEB									
09...	2.0	4.4	2.6	7.8	43	.7	.9	20	1.1
MAR									
09...	--	4.0	2.7	8.1	44	.8	.9	20	.9
APR									
06...	.00	4.4	2.7	8.6	44	.8	1.0	24	.6
MAY									
04...	.00	2.7	1.8	7.0	50	.8	.8	18	1.2
JUN									
08...	.00	2.8	2.0	6.7	47	.7	.8	16	.5
JUL									
06...	1.0	5.0	3.0	8.9	43	.8	1.0	24	1.9
AUG									
03...	3.0	2.7	1.2	5.3	48	.7	.6	9.0	1.0
SEP									
14...	.00	4.3	2.7	7.9	43	.8	.9	22	<5.0

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

16618000 KAHAKULOA STREAM NEAR HONOKOHAU--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	CHLORIDE, DISSOLVED (MG/L AS CL)	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)	SOLIDS, DISSOLVED (TONS PER AC-FT)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N)	NITROGEN, AMMONIA TOTAL (MG/L AS N)	NITROGEN, AMMONIA DISSOLVED (MG/L AS N)
OCT 06...	11	.1	22	73	65	.10	.08	.08	.000	.000
NOV 04...	12	.1	22	66	64	.09	.10	.10	.010	.030
DEC 01...	12	.1	23	70	76	.10	.25	.17	.010	.010
JAN 06...	12	.1	19	70	62	.10	.36	.28	.030	.020
FEB 09...	10	.1	19	57	59	.08	.21	.21	.010	.040
MAR 09...	12	.0	19	64	61	.09	.05	--	.010	.000
APR 06...	11	.1	22	62	65	.08	.07	.07	.020	.050
MAY 04...	9.0	.1	15	36	49	.05	.12	.12	.010	.060
JUN 08...	8.1	.0	16	46	47	.06	.09	.07	.030	.000
JUL 06...	10	.0	25	70	70	.10	.09	.10	.050	.080
AUG 03...	7.7	.0	9.2	50	34	.07	.17	.17	.150	.120
SEP 14...	11	.0	23	66	--	.09	.15	.17	.090	.100

DATE	NITROGEN, ORGANIC TOTAL (MG/L AS N)	NITROGEN, ORGANIC DISSOLVED (MG/L AS N)	NITROGEN DISSOLVED (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITROGEN, NH4 + ORG. SUSP. TOTAL (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC DIS. (MG/L AS N)	NITROGEN, TOTAL (MG/L AS N)	PHOSPHORUS, TOTAL (MG/L AS P)	PHOSPHORUS, DISSOLVED (MG/L AS P)
OCT 06...	.51	.36	.44	.51	.15	.36	.59	.030	.020
NOV 04...	.38	.34	.47	.39	.02	.37	.49	.080	.060
DEC 01...	.28	.29	.47	.29	.00	.30	.54	.040	.050
JAN 06...	.54	.20	.50	.57	.35	.22	.93	--	.030
FEB 09...	.33	.23	.48	.34	.07	.27	.55	.030	.030
MAR 09...	.63	--	--	.64	--	--	.69	.000	.000
APR 06...	.76	.73	.85	.78	.00	.78	.85	.070	.070
MAY 04...	.33	.10	.28	.34	.18	.16	.46	.040	.040
JUN 08...	.57	.41	.48	.60	.19	.41	.69	.030	.020
JUL 06...	.69	.52	.70	.74	.14	.60	.83	.050	.040
AUG 03...	1.2	.28	.57	1.30	.90	.40	1.5	.050	.030
SEP 14...	.59	.51	.78	.68	.07	.61	.83	.020	.020

16618000 KAHAKULOA STREAM NEAR HONOKOHAU--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	TIME	ARSENIC TOTAL (UG/L AS AS)	ARSENIC SUS-PENDED TOTAL (UG/L AS AS)	ARSENIC DIS-SOLVED (UG/L AS AS)	BARIUM, TOTAL RECOV-ERABLE (UG/L AS BA)	BARIUM, SUS-PENDED RECOV-ERABLE (UG/L AS BA)	BARIUM, DIS-SOLVED (UG/L AS BA)	CADMIUM TOTAL RECOV-ERABLE (UG/L AS CD)	CADMIUM DIS-SOLVED (UG/L AS CD)	CHRO-MIUM, TOTAL RECOV-ERABLE (UG/L AS CR)	CHRO-MIUM, SUS-PENDED RECOV. (UG/L AS CR)
OCT											
06...	1230	1	0	1	100	90	8	<1	<1	10	10
JAN											
06...	1200	1	1	0	5	0	5	<1	<1	10	10
APR											
06...	1230	1	0	1	4	0	4	0	<1	10	0
JUL											
06...	1300	1	1	0	0	0	0	<1	<1	10	0

DATE	CHRO-MIUM, DIS-SOLVED (UG/L AS CR)	COBALT, TOTAL RECOV-ERABLE (UG/L AS CO)	COBALT, DIS-SOLVED (UG/L AS CO)	COPPER, TOTAL RECOV-ERABLE (UG/L AS CU)	COPPER, SUS-PENDED RECOV-ERABLE (UG/L AS CU)	COPPER, DIS-SOLVED (UG/L AS CU)	IRON, TOTAL RECOV-ERABLE (UG/L AS FE)	IRON, SUS-PENDED RECOV-ERABLE (UG/L AS FE)	IRON, DIS-SOLVED (UG/L AS FE)	LEAD, TOTAL RECOV-ERABLE (UG/L AS PB)
OCT										
06...	0	<3	<3	4	3	1	100	80	20	3
JAN										
06...	0	<3	<3	3	3	0	130	90	40	0
APR										
06...	10	<3	<3	5	0	5	410	--	<10	1
JUL										
06...	10	<1	<1	6	0	6	10	--	<10	4

DATE	LEAD, SUS-PENDED RECOV-ERABLE (UG/L AS PB)	LEAD, DIS-SOLVED (UG/L AS PB)	MANGA-NESE, TOTAL RECOV-ERABLE (UG/L AS MN)	MANGA-NESE, SUS-PENDED RECOV. (UG/L AS MN)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)	MERCURY TOTAL RECOV-ERABLE (UG/L AS HG)	MERCURY SUS-PENDED RECOV-ERABLE (UG/L AS HG)	MERCURY DIS-SOLVED (UG/L AS HG)	NICKEL, TOTAL RECOV-ERABLE (UG/L AS NI)	NICKEL, SUS-PENDED RECOV-ERABLE (UG/L AS NI)
OCT										
06...	1	2	10	--	<1	.0	.0	.0	5	5
JAN										
06...	0	0	10	6	4	.0	.0	.0	1	1
APR										
06...	1	0	10	--	<1	.0	.0	.0	3	0
JUL										
06...	0	4	0	--	<1	.2	.2	.0	1	0

DATE	NICKEL, DIS-SOLVED (UG/L AS NI)	SELE-NIUM, TOTAL (UG/L AS SE)	SELE-NIUM, SUS-PENDED TOTAL (UG/L AS SE)	SELE-NIUM, DIS-SOLVED (UG/L AS SE)	SILVER, TOTAL RECOV-ERABLE (UG/L AS AG)	SILVER, SUS-PENDED RECOV-ERABLE (UG/L AS AG)	SILVER, DIS-SOLVED (UG/L AS AG)	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN)	ZINC, SUS-PENDED RECOV-ERABLE (UG/L AS ZN)	ZINC, DIS-SOLVED (UG/L AS ZN)
OCT										
06...	0	0	0	0	0	0	0	10	--	<3
JAN										
06...	0	0	0	0	0	0	0	30	0	30
APR										
06...	3	0	0	0	1	1	0	20	--	<3
JUL										
06...	2	0	0	0	0	0	0	4	0	4

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

16618000 KAHAKULOA STREAM NEAR HONOKOHAU--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	TIME	CARBON, ORGANIC TOTAL (MG/L AS C)	CARBON, ORGANIC DIS-SOLVED (MG/L AS C)	CARBON, ORGANIC SUS-PENDED TOTAL (MG/L AS C)
OCT 06...	1230	--	.8	.0
NOV 04...	1200	2.2	--	--
DEC 01...	1300	1.3	--	--
JAN 06...	1200	--	1.8	.0
FEB 09...	1215	2.3	--	--
MAR 09...	1100	1.9	--	--
APR 06...	1230	--	1.1	.0
MAY 04...	1215	1.9	--	--
JUN 08...	1115	2.2	--	--
JUL 06...	1300	--	.7	.0
AUG 03...	1300	4.4	--	--
SEP 14...	1245	1.0	--	--

DATE	TIME	PHYTO-PLANK-TON, TOTAL (CELLS PER ML)
OCT 06...	1230	26
NOV 04...	1200	26
DEC 01...	1300	520
JAN 06...	1200	430
FEB 09...	1215	26
MAR 09...	1100	26
APR 06...	1230	52
MAY 04...	1215	77
JUN 08...	1115	150
JUL 06...	1300	350
AUG 03...	1300	120
SEP 14...	1245	70

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SEDI-MENT, SUS-PENDED (MG/L)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
OCT 06...	1230	7.2	0	.00	100
NOV 04...	1200	7.7	2	.04	100
DEC 01...	1300	6.1	1	.02	100
JAN 06...	1200	6.6	1	.02	100
FEB 09...	1215	6.2	1	.02	100
MAR 09...	1100	6.6	1	.02	100
APR 06...	1230	5.3	1	.01	100
MAY 04...	1215	9.6	2	.05	100
JUN 08...	1115	12	2	.06	100
JUL 06...	1300	4.0	1	.01	100
AUG 03...	1300	20	8	.43	100
SEP 14...	1245	4.3	1	.01	100

16618000 KAHAKULOA STREAM NEAR HONOKOHAU--Continued

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA

PHYTOPLANKTON ANALYSES, OCTOBER 1980 TO SEPTEMBER 1981

DATE	OCT 6,80	NOV 4,80	DEC 1,80	JAN 6,81	FEB 9,81	MAR 9,81
TIME	1230	1200	1300	1200	1215	1100
TOTAL CELLS/ML	26	26	520	430	26	26
DIVERSITY: DIVISION	1.0	0.0	0.2	0.8	0.0	0.0
. CLASS	1.0	0.0	0.2	0.8	0.0	0.0
.. ORDER	1.0	1.0	0.2	1.2	0.0	0.0
... FAMILY	1.0	1.0	0.2	1.2	1.0	0.0
.... GENUS	1.0	1.0	0.2	1.2	1.0	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												
.... DICTYOSPHAERIUM	--	-	--	-	--	-	110#	26	--	-	--	-
.... KIRCHNERIELLA	--	-	--	-	--	-	--	-	--	-	--	-
.... OOCYSTIS	--	-	--	-	--	-	--	-	--	-	--	-
... SCENEDESMACEAE												
.... SCENEOESMUS	--	-	--	-	--	-	--	-	--	-	--	-
.. ZYGNEMATALES												
... DESMIDIACEAE												
.... CLOSTERIUM	--	-	--	-	--	-	--	-	--	-	--	-
CHRYSOPHYTA												
. BACILLARIOPHYCEAE												
.. CENTRALES												
... COSCINODISCACEAE												
.... CYCLOTELLA	--	-	13#	50	--	-	--	-	--	-	--	-
.. PENNALES												
... ACHNANTHACEAE												
.... ACHNANTHES	--	-	--	-	--	-	--	-	--	-	--	-
.... RHOICOSPHENIA	13#	50	13#	50	--	-	--	-	13#	50	--	-
... GOMPHONEMATACEAE												
.... GOMPHONEMA	--	-	--	-	--	-	--	-	--	-	--	-
... NAVICULACEAE												
.... NAVICULA	--	-	--	-	--	-	--	-	13#	50	--	-
... NITZSCHIACEAE												
.... NITZSCHIA	--	-	--	-	13	2	--	-	--	-	26#	100
CYANOPHYTA (BLUE-GREEN ALGAE)												
. CYANOPHYCEAE												
.. CHROOCOCCALES												
... CHROOCOCCACEAE												
.... ANACYSTIS	13#	50	--	-	--	-	41	10	--	-	--	-
.. HORMOGONALES												
... OSCILLATORIACEAE												
.... OSCILLATORIA	--	-	--	-	500#	97	280#	65	--	-	--	-

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

PHYTOPLANKTON ANALYSES, OCTOBER 1980 TO SEPTEMBER 1981

DATE	APR 6,81	MAY 4,81	JUN 8,81	JUL 6,81	AUG 3,81	SEP 14,81
TIME	1230	1215	1115	1300	1300	1245
TOTAL CELLS/ML	52	77	150	350	120	70
DIVERSITY: DIVISION	0.0	0.9	0.0	1.0	0.5	1.0
. CLASS	0.0	0.9	0.0	1.0	0.5	1.0
.. ORDER	0.0	1.5	0.0	1.6	0.5	1.5
... FAMILY	0.8	1.9	0.0	2.8	2.2	1.5
.... GENUS	1.5	1.9	0.0	2.8	2.2	1.5

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												
.... DICTYOSPHAERIUM	--	-	--	-	--	-	--	-	--	-	--	-
.... KIRCHNERIELLA	--	-	--	-	--	-	52	15	--	-	--	-
.... OOCYSTIS	--	-	--	-	150#	100	--	-	--	-	--	-
... SCENEDESMACEAE												
.... SCENEDESMUS	--	-	--	-	--	-	26	7	--	-	--	-
.. ZYGNEMATALES												
... DESMIDIACEAE												
.... CLOSTERIUM	--	-	--	-	--	-	--	-	14	13	--	-
CHRYSOPHYTA												
. BACILLARIOPHYCEAE												
.. CENTRALES												
... COSCINODISCACEAE												
.... CYCLOTELLA	--	-	13#	17	--	-	64#	19	--	-	14#	20
.. PENNALES												
... ACHNANTHACEAE												
.... ACHNANTHES	26#	50	--	-	--	-	--	-	--	-	--	-
.... RHOICOSPHENIA	13#	25	--	-	--	-	13	4	14	13	--	-
... GOMPHONEMATACEAE												
.... GOMPHONEMA	--	-	13#	17	--	-	52	15	14	13	--	-
... NAVICULACEAE												
.... NAVICULA	13#	25	26#	33	--	-	77#	22	29#	25	--	-
... NITZSCHIACEAE												
.... NITZSCHIA	--	-	--	-	--	-	52	15	43#	38	28#	40
CYANOPHYTA (BLUE-GREEN ALGAE)												
. CYANOPHYCEAE												
.. CHROOCOCCALES												
... CHROOCOCCACEAE												
.... ANACYSTIS	--	-	26#	33	--	-	13	4	--	-	28#	40
.. HORMOGONALES												
... OSCILLATORIACEAE												
.... OSCILLATORIA	--	-	--	-	--	-	--	-	--	-	--	-

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 mi² (10.64 km²).

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. WDR HI-79-1: 1927-48(M), 1949-78(P).

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. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--65 years (water years, 1914-19, 1923-81), 39.3 ft³/s (1.113 m³/s), 28,470 acre-ft/yr (35.1 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 7,120 ft³/s (202 m³/s) revised, Dec. 14, 1942, gage height, 8.40 ft (2.560 m), from rating curve extended above 547 ft³/s (15.5 m³/s), on basis of slope-area measurement at gage height 6.76 ft (2.060 m); minimum, 8.4 ft³/s (0.24 m³/s) May 1, 1945, Jan. 5, 1946.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,110 ft³/s (31.4 m³/s) Aug. 4, gage height, 5.14 ft (1.567 m), from rating curve extended as explained above, no other peak above base of 1,100 ft³/s (31.2 m³/s); minimum, 11 ft³/s (0.31 m³/s) Apr. 27-28, July 2-7, 18-20, Aug. 2.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	24	28	18	16	14	16	14	220	13	12	12	13
2	23	22	18	16	14	36	31	39	12	12	12	13
3	23	21	18	17	14	41	19	23	12	11	133	75
4	23	21	18	20	14	17	15	17	12	11	375	16
5	23	20	18	60	31	14	30	16	23	11	37	32
6	23	22	18	17	15	31	16	15	26	11	17	17
7	29	21	18	16	14	17	28	15	17	11	15	13
8	54	22	17	16	35	21	17	14	27	13	14	13
9	27	35	17	16	15	59	13	14	13	18	17	12
10	51	21	17	16	14	21	15	14	16	14	16	12
11	33	65	17	15	58	14	14	14	106	13	151	12
12	152	25	17	15	37	14	12	14	24	13	54	12
13	138	21	17	15	15	13	12	15	14	16	20	12
14	50	20	17	15	14	13	12	13	40	23	15	12
15	27	20	33	15	14	13	12	13	33	30	14	12
16	40	21	23	15	14	13	12	14	14	24	13	12
17	76	51	18	20	14	13	12	15	13	14	13	12
18	48	32	17	15	13	37	12	24	12	12	22	70
19	24	56	19	15	14	27	12	22	12	12	42	16
20	51	23	18	15	22	14	12	50	12	151	23	47
21	27	22	17	15	25	13	14	14	12	89	14	14
22	24	20	22	15	115	13	12	13	12	16	49	14
23	24	19	18	15	21	13	13	13	13	40	180	17
24	23	24	17	15	93	28	22	13	12	82	19	15
25	31	21	62	15	25	50	12	13	12	26	15	13
26	23	20	20	16	29	17	12	13	55	13	14	31
27	22	20	17	22	21	29	12	12	17	24	13	53
28	22	19	17	35	18	37	18	14	14	59	13	18
29	26	18	16	17	---	47	172	13	12	16	13	14
30	67	18	16	15	---	47	401	13	18	13	13	13
31	44	---	16	14	---	17	---	13	---	12	13	---
TOTAL	1272	768	611	559	742	755	1008	725	628	822	1371	635
MEAN	41.0	25.6	19.7	18.0	26.5	24.4	33.6	23.4	20.9	26.5	44.2	21.2
MAX	152	65	62	60	115	59	401	220	106	151	375	75
MIN	22	18	16	14	13	13	12	12	12	11	12	12
AC-FT	2520	1520	1210	1110	1470	1500	2000	1440	1250	1630	2720	1260

CAL YR 1980 TOTAL 21131 MEAN 57.7 MAX 694 MIN 16 AC-FT 41910
WTR YR 1981 TOTAL 9896 MEAN 27.1 MAX 401 MIN 11 AC-FT 19630

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 mi² (13.52 km²).

PERIOD OF RECORD.--October 1962 to current year.

REVISED RECORDS.--WSP 2137: 1963-65(P).

GAGE.--Water-stage recorder. Altitude of gage is 90 ft (27 m), from topographic map.

REMARKS.--Records 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. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--18 years (water years 1964-81), 3.47 ft³/s (0.098 m³/s), 2,510 acre-ft/yr (3.09 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,490 ft³/s (70.5 m³/s) July 11, 1965, gage height, 11.03 ft (3.362 m), from rating curve extended above 206 ft³/s (5.83 m³/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 ft³/s (219 m³/s), by slope-area measurement at site 0.5 mi (0.8 km) upstream.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 770 ft³/s (21.8 m³/s) Feb. 24, gage height, 7.50 ft (2.286 m), from rating curve extended as explained above, no other peak above base of 590 ft³/s (16.7 m³/s); no flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.00	.00	.00	11	.00	.00	.00	.00
2	.00	.00	.00	.00	.00	23	.00	.00	.00	.00	.00	.00
3	.00	.00	.00	.00	.00	7.9	.00	.00	.00	.00	1.0	8.1
4	.00	.00	.00	.00	.00	.12	.00	.00	.00	.00	26	.00
5	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.07	.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	1.0	.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	5.8	.00	.00	3.9	.00	.00	.00	.00	.00	7.3	.00
12	57	.00	.00	.00	2.8	.00	.00	.00	.00	.00	.82	.00
13	21	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
14	2.2	.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	3.5	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
18	9.2	.19	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
19	.00	4.4	.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	2.4	.00	.00
22	.00	.00	.00	.00	71	.00	.00	.00	.00	.00	.00	.00
23	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	24	.00
24	.00	.00	.00	.00	68	.00	.00	.00	.00	.00	.00	.00
25	.00	.00	13	.00	3.4	.00	.00	.00	.00	.00	.00	.00
26	.00	.00	.23	.00	4.9	.00	.00	.00	.00	.00	.00	.00
27	.00	.00	.00	.00	2.3	.00	.00	.00	.00	.00	.00	.00
28	.00	.00	.00	.00	.85	20	.00	.00	.00	.00	.00	.00
29	.00	.00	.00	.00	---	23	.00	.00	.00	.00	.00	.00
30	.00	.00	.00	.00	---	1.2	.48	.00	.00	.00	.00	.00
31	.00	---	.00	.00	---	.00	---	.00	---	.00	.00	---
TOTAL	93.90	10.39	13.23	.00	157.15	75.22	.48	11.00	.00	2.40	59.19	8.10
MEAN	3.03	.35	.43	.000	5.61	2.43	.016	.35	.000	.077	1.91	.27
MAX	57	5.8	13	.00	71	23	.48	11	.00	2.4	26	8.1
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	186	21	26	.00	312	149	1.0	22	.00	4.8	117	16

CAL YR 1980	TOTAL	3711.71	MEAN 10.1	MAX 365	MIN .00	AC-FT 7360
WTR YR 1981	TOTAL	431.06	MEAN 1.18	MAX 71	MIN .00	AC-FT 855

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 mi² (45.1 km²).

PERIOD OF RECORD.--September 1930 to current year. Prior to July 1960, published as "at middle flume house, near Mountain View."

REVISED RECORDS.--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. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--51 years, 11.8 ft³/s (0.334 m³/s), 8,550 acre-ft/yr (10.5 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 565 ft³/s (16.0 m³/s) Mar. 14, 1942, Aug. 26, 1970, from rating curve extended above 160 ft³/s (4.53 m³/s); maximum gage height, 4.45 ft (1.356 m) Aug. 26, 1970; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 83 ft³/s (2.35 m³/s) Sept. 26, gage height, 3.33 ft (1.015 m), no peak above base of 100 ft³/s (2.83 m³/s); no flow July 17-20.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	15	9.2	8.8	.36	.08	4.2	5.4	3.5	.75	.10	.08	5.2
2	13	8.7	8.3	.32	.08	3.6	10	3.3	.70	.10	.08	4.9
3	12	8.1	7.5	.20	.08	3.3	14	3.0	.60	.10	1.9	4.9
4	11	7.2	6.9	.16	.08	3.3	13	2.9	.52	.12	26	4.5
5	10	6.6	6.2	.16	.06	3.1	12	2.6	.48	.12	19	4.3
6	9.2	6.2	5.7	.14	.06	3.0	12	2.4	.40	.12	20	4.0
7	7.5	5.7	5.2	.12	.06	3.0	13	2.6	.32	.12	22	3.9
8	10	5.4	4.8	.10	.06	3.0	13	2.4	.24	.12	20	3.7
9	7.9	7.1	4.4	.10	.06	2.9	13	2.1	.20	.10	18	3.3
10	8.2	6.6	4.2	.10	.06	2.7	12	1.9	.16	.10	17	3.2
11	12	15	4.0	.08	.06	2.5	12	1.7	.16	.14	18	3.3
12	23	13	3.8	.08	.06	2.4	11	1.7	.12	.10	19	2.9
13	18	12	3.5	.08	.06	2.3	10	1.7	.12	.08	18	2.8
14	17	12	3.2	.08	.06	2.2	9.7	1.5	.14	.06	16	2.4
15	16	12	3.0	.06	.06	2.1	9.2	1.4	.32	.04	16	2.3
16	15	11	2.9	.06	.06	2.1	8.5	1.4	.16	.02	14	2.1
17	17	16	2.6	.06	.06	2.0	7.9	1.8	.14	.00	14	2.0
18	16	17	2.4	.06	.06	2.0	7.2	2.0	.16	.00	13	3.4
19	16	16	2.1	.06	.06	1.9	6.6	1.6	.14	.00	12	2.4
20	16	16	2.0	.06	.06	1.8	6.2	3.3	.12	.00	12	2.1
21	16	16	1.8	.06	.06	1.7	6.1	2.8	.12	.36	10	2.0
22	15	16	1.7	.06	.20	1.7	5.7	2.4	.12	.16	9.8	1.8
23	15	14	1.5	.06	.56	2.0	5.4	2.0	.12	.14	9.6	1.7
24	13	14	1.2	.06	3.9	2.7	5.1	1.8	.10	.34	8.9	1.5
25	13	13	1.0	.06	2.6	2.0	5.0	1.7	.10	.28	8.4	1.4
26	12	12	1.0	.08	2.9	1.9	4.7	1.5	.10	.14	8.1	11
27	11	12	.85	.10	2.3	3.0	4.4	1.3	.10	.10	7.5	24
28	10	12	.75	.10	5.1	4.6	4.1	1.2	.10	.24	6.9	22
29	12	11	.60	.10	---	4.1	3.9	1.0	.10	.12	6.4	20
30	10	9.6	.52	.10	---	4.0	3.8	.95	.12	.08	6.1	19
31	9.7	---	.44	.10	---	4.1	---	.80	---	.08	5.6	---
TOTAL	406.5	340.4	102.86	3.32	18.90	85.2	253.9	62.25	7.03	3.58	383.36	172.0
MEAN	13.1	11.3	3.32	.11	.68	2.75	8.46	2.01	.23	.12	12.4	5.73
MAX	23	17	8.8	.36	5.1	4.6	14	3.5	.75	.36	26	24
MIN	7.5	5.4	.44	.06	.06	1.7	3.8	.80	.10	.00	.08	1.4
AC-FT	806	675	204	6.6	37	169	504	123	14	7.1	760	341

CAL YR 1980 TOTAL 4302.04 MEAN 11.8 MAX 195 MIN .16 AC-FT 8530
WTR YR 1981 TOTAL 1839.30 MEAN 5.04 MAX 26 MIN .00 AC-FT 3650

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.

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. County of Hawaii, Department of Water Supply, diverts by 16 inch (41 cm) pipeline 50 ft (15 m) above station for domestic use in the Kaumana and Piihonua areas since Oct. 2, 1978. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--7 years, 9.53 ft^3/s (0.270 m^3/s), 6,900 acre-ft/yr (8.51 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 43 ft^3/s (1.22 m^3/s) Jan. 8, 1975; minimum daily, 0.26 ft^3/s (0.007 m^3/s) Aug. 17, 18, 1980, during period when tunnel caved in and diverted part of flow.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 14 ft^3/s (0.40 m^3/s) Sept. 28; minimum daily, 0.42 ft^3/s (0.012 m^3/s) Dec. 24-26, Feb. 15-20.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	7.2	6.8	6.0	.78	.70	6.2	4.0	3.6	2.9	.86	.58	.62
2	7.2	6.4	5.9	.70	.70	5.8	8.0	3.6	2.9	.86	.58	.62
3	7.0	6.2	5.8	.78	.70	5.4	7.0	3.6	2.8	.86	1.3	.58
4	7.0	6.2	5.4	.86	.70	5.6	6.5	3.6	2.8	.86	3.6	.58
5	7.0	6.0	5.3	.94	.58	5.6	6.0	3.6	1.3	.86	9.1	.58
6	7.0	5.8	5.0	.86	.50	5.4	6.0	3.6	.66	.78	7.5	.58
7	6.4	5.3	4.8	.86	.50	5.4	5.0	3.6	.66	.78	4.5	.58
8	6.6	4.8	4.6	.78	.50	5.3	5.0	3.6	.62	.70	3.9	.54
9	7.0	4.8	4.4	.78	.66	5.3	4.5	3.6	.62	.78	2.8	.54
10	7.0	5.8	4.2	.78	.66	5.2	4.5	3.6	.62	.78	2.0	.58
11	7.2	7.2	2.6	.78	.58	5.2	4.0	3.6	.62	.78	1.9	.58
12	8.1	8.9	1.4	.78	.58	7.2	4.0	3.6	.62	.94	5.6	.58
13	9.3	8.9	1.3	1.1	.58	7.0	3.5	3.5	.58	.94	8.9	.62
14	8.7	7.5	1.3	.86	.54	6.8	3.6	3.5	.58	.94	7.7	.66
15	7.9	7.2	1.4	.70	.42	6.2	3.6	3.5	.58	.94	5.2	.66
16	7.5	6.6	1.4	.66	.42	5.9	3.6	3.5	.58	.94	3.5	.70
17	8.3	7.2	1.4	.62	.42	5.8	3.5	3.5	.54	1.0	2.3	.86
18	9.3	8.9	1.3	.58	.42	4.7	3.4	3.5	.54	1.0	1.8	.86
19	9.1	9.7	1.3	.54	.42	4.5	3.5	3.5	.50	1.0	1.8	.94
20	8.7	9.3	1.2	.50	.42	4.2	3.5	3.5	.50	1.0	2.8	.94
21	8.7	8.3	1.2	.46	.46	3.6	3.5	3.5	.50	.70	1.8	1.0
22	8.1	7.7	.83	.46	.58	3.3	3.5	3.5	.58	.86	.94	1.1
23	7.7	7.3	.46	.46	.86	2.9	3.5	3.4	.78	.78	.70	1.2
24	7.5	7.2	.42	.46	2.5	2.8	3.5	3.4	.78	.66	1.1	1.3
25	7.2	7.0	.42	.46	5.2	2.8	3.5	3.4	.86	.62	.70	1.3
26	7.0	6.8	.42	.46	5.9	2.8	3.5	3.4	.78	.62	.70	1.3
27	6.8	6.8	.58	.46	5.9	3.0	3.5	3.4	.78	.58	.66	5.8
28	6.8	6.6	.58	.46	5.9	3.5	3.6	3.3	.78	.58	.70	14
29	7.0	6.4	.58	.58	---	3.0	3.6	3.2	.86	.66	.70	13
30	7.0	6.2	.66	.66	---	3.5	3.6	3.2	.78	.62	.66	10
31	6.8	---	.78	.70	---	3.5	---	3.0	---	.62	2.1	---
TOTAL	234.1	209.8	72.93	20.86	38.30	147.4	128.0	107.9	29.00	24.90	88.12	63.20
MEAN	7.55	6.99	2.35	.67	1.37	4.75	4.27	3.48	.97	.80	2.84	2.11
MAX	9.3	9.7	6.0	1.1	5.9	7.2	8.0	3.6	2.9	1.0	9.1	14
MIN	6.4	4.8	.42	.46	.42	2.8	3.4	3.0	.50	.58	.58	.54
AC-FT	464	416	145	41	76	292	254	214	58	49	175	125

CAL YR 1980 TOTAL 1022.42 MEAN 2.79 MAX 12 MIN .26 AC-FT 2030
WTR YR 1981 TOTAL 1164.51 MEAN 3.19 MAX 14 MIN .42 AC-FT 2310

16700950 LYMAN SPRINGS NO. 2 NEAR PIIHONUA

LOCATION.--Lat 19°42'02", long 155°10'36", Hydrologic Unit 20010000, on right bank 3 ft (0.91 m) downstream from tunnel entrance, 2.7 mi (4.3 km) southwest of Piihonua and 5.8 mi (9.3 km) southwest of Hilo Post Office.

PERIOD OF RECORD.--February to September 1981.

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 1,700 ft (518 m), from topographic map.

REMARKS.--Records good. No diversion above station. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge during period February to September, 12 ft^3/s (0.34 m^3/s) Sept. 27; minimum daily, 0.05 ft^3/s (0.001 m^3/s) July 28, 29.

DISCHARGE, IN CUBIC FEET PER SECOND, FEBRUARY TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1					.31	5.0	4.9	3.6	3.0	.60	.12	3.6
2					.36	5.2	7.1	3.3	2.9	.65	.14	3.5
3					.38	5.1	6.7	3.2	2.8	.65	.52	4.2
4					.38	5.0	5.7	3.0	2.7	.68	9.5	3.5
5					.32	4.8	5.5	3.0	2.5	.70	6.3	3.5
6					.23	4.8	5.6	3.1	2.4	.74	5.6	3.4
7					.16	4.5	5.8	2.6	2.3	.78	5.1	3.3
8					.13	5.7	6.0	2.8	2.2	.81	5.1	3.2
9					.09	5.1	5.5	3.0	2.1	.85	5.2	3.1
10					.11	4.7	5.3	3.1	2.0	.87	5.3	3.1
11					.11	4.5	5.1	3.1	1.9	.85	7.0	3.2
12					.11	4.5	5.0	3.1	1.8	.80	6.3	3.1
13					.11	4.4	4.9	3.1	1.6	.91	5.6	3.0
14					.11	4.3	5.1	3.0	1.5	.99	5.4	2.8
15					.10	4.2	4.6	3.0	1.4	1.0	5.3	2.6
16					.09	4.1	4.5	3.0	1.3	1.1	5.2	2.4
17					.08	3.8	4.7	2.4	1.2	1.1	5.2	2.2
18					.07	3.4	4.3	2.0	1.2	1.1	5.3	3.5
19					.07	3.2	4.2	2.5	1.1	.84	5.4	3.0
20					.07	3.1	4.2	1.6	1.1	.92	5.1	3.0
21					.08	2.9	4.5	1.9	1.0	.35	5.0	3.0
22					.73	2.7	4.2	2.1	.98	.36	4.9	2.8
23					1.2	2.5	4.1	2.2	.92	.34	4.8	2.7
24					5.0	3.2	4.2	2.2	.87	.28	4.6	2.7
25					4.9	2.4	4.1	2.3	.82	.11	4.5	2.5
26					5.7	2.6	4.0	2.4	.76	.13	4.3	4.9
27					4.9	3.8	3.9	2.6	.70	.12	4.2	12
28					5.4	3.9	3.9	2.7	.70	.05	4.2	7.2
29					---	4.0	3.6	2.8	.65	.05	4.1	6.2
30					---	4.4	3.5	3.0	.60	.06	4.0	5.9
31					---	4.4	---	3.1	---	.09	3.9	---
TOTAL					31.30	126.2	144.7	84.8	47.00	18.88	147.18	113.1
MEAN					1.12	4.07	4.82	2.74	1.57	.61	4.75	3.77
MAX					5.7	5.7	7.1	3.6	3.0	1.1	9.5	12
MIN					.07	2.4	3.5	1.6	.60	.05	.12	2.2
AC-FT					62	250	287	168	93	37	292	224

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 mi² (90.1 km²).

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 and those above 40 ft³/s (1.13 m³/s), which are fair. No diversion above station. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--16 years, 3.13 ft³/s (0.089 m³/s), 2,270 acre-ft/yr (2.80 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 8,300 ft³/s (235 m³/s) Nov. 17, 1979, gage height, 11.87 ft (3.618 m), from rating curve extended above 18 ft³/s (0.51 m³/s) on basis of slope-area measurement at gage height 11.87 ft (3.618 m); no flow at times in 1965, 1969-81.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 3,200 ft³/s (90.6 m³/s) Aug. 4, gage height, 9.02 ft (2.749 m), from rating curve extended as explained above, no other 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 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.10	.00	.00	.00	.00	.01	.20	.00	.00	.00	.00	.10
2	.05	.00	.00	.00	.00	.01	4.5	.00	.00	.00	.00	.09
3	.05	.00	.00	.00	.00	.01	1.5	.00	.00	.00	.29	.14
4	.04	.00	.00	.00	.00	.01	.45	.00	.00	.00	446	.10
5	.03	.00	.00	.00	.00	.01	.20	.00	.00	.00	5.1	.10
6	.03	.00	.00	.00	.00	.01	.20	.00	.00	.00	1.8	.09
7	.02	.00	.00	.00	.00	.01	.16	.01	.00	.00	1.4	.08
8	.01	.00	.00	.00	.00	.01	.13	.01	.00	.00	.87	.08
9	.01	.08	.00	.00	.00	.01	.05	.02	.00	.00	.65	.08
10	.01	.01	.00	.00	.00	.01	.05	.02	.00	.00	.40	.20
11	.01	2.3	.00	.00	.00	.01	.04	.01	.00	.00	.50	.18
12	1.0	.35	.00	.00	.00	.01	.03	.01	.00	.00	1.5	.12
13	1.5	.04	.00	.00	.00	.00	.02	.01	.00	.00	.50	.10
14	.50	.01	.00	.00	.00	.00	.02	.00	.00	.00	.30	.09
15	.30	.01	.00	.00	.00	.00	.01	.00	.00	.00	.28	.08
16	.10	.01	.00	.00	.00	.00	.01	.01	.00	.00	.28	.08
17	1.5	3.2	.00	.00	.00	.00	.02	.01	.00	.00	.26	.08
18	2.0	.65	.00	.00	.00	.00	.01	.01	.00	.00	.28	.60
19	.80	.20	.00	.00	.00	.00	.01	.01	.00	.00	.26	.20
20	.50	.04	.00	.00	.00	.00	.01	.01	.00	.00	.16	.14
21	.30	.02	.00	.00	.00	.00	.05	.01	.00	.00	.16	.10
22	.10	.01	.00	.00	.00	.00	.01	.00	.00	.00	.20	.09
23	.05	.01	.00	.00	.00	.00	.01	.00	.00	.00	.22	.08
24	.03	.01	.00	.00	.20	.00	.01	.00	.00	.00	.18	.08
25	.03	.01	.00	.00	.05	.00	.01	.00	.00	.00	.16	.08
26	.02	.01	.00	.00	.03	.20	.01	.00	.00	.00	.16	.14
27	.02	.01	.00	.00	.01	.45	.01	.00	.00	.00	.14	.94
28	.01	.01	.00	.00	.01	.70	.01	.00	.00	.00	.14	1.5
29	.01	.01	.00	.00	---	.20	.01	.00	.00	.00	.14	.35
30	.01	.01	.00	.00	---	.05	.01	.00	.00	.00	.12	.26
31	.01	---	.00	.00	---	.05	---	.00	---	.00	.10	---
TOTAL	9.15	7.01	.00	.00	.30	1.77	7.76	.15	.00	.00	462.55	6.35
MEAN	.30	.23	.000	.000	.011	.057	.26	.005	.000	.000	14.9	.21
MAX	2.0	3.2	.00	.00	.20	.70	4.5	.02	.00	.00	446	1.5
MIN	.01	.00	.00	.00	.00	.00	.01	.00	.00	.00	.00	.08
AC-FT	18	14	.00	.00	.6	3.5	15	.3	.00	.00	917	13

CAL YR 1980	TOTAL	2490.35	MEAN 6.80	MAX 600	MIN .00	AC-FT 4940		
WTR YR 1981	TOTAL	495.04	MEAN 1.36	MAX 446	MIN .00	AC-FT 982		

NOTE.--No gage-height record Nov. 21 to May 21.

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 mi^2 (112.4 km^2).

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. No diversion above station. Recording rain gage located at station. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--15 years, 29.7 ft^3/s (0.841 m^3/s), 21,520 acre-ft/yr (26.5 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 13,800 ft^3/s (391 m^3/s) Nov. 17, 1979, gage height, 16.30 ft (4.968 m), from rating curve extended above 2,200 ft^3/s (62.3 m^3/s); no flow at times in 1970, 1978, 1980, 1981.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 6,090 ft^3/s (172 m^3/s) Aug. 4, gage height, 11.00 ft (3.353 m), from rating curve extended above 2,200 ft^3/s (62.3 m^3/s), no other peak above base of 1,500 ft^3/s (42.5 m^3/s); no flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.0	1.4	1.5	.20	.22	2.8	7.4	1.0	.44	.08	.00	1.0
2	.80	1.3	1.4	.18	.12	3.2	72	.80	.38	.06	.02	.92
3	.75	1.2	1.3	.16	.05	4.2	86	.74	.38	.08	10	1.7
4	.60	1.2	1.2	.14	.03	4.7	19	.80	.35	.05	1660	1.1
5	.50	1.1	1.2	.12	.02	2.6	10	.80	.32	.05	60	.92
6	.85	1.0	1.3	.10	.01	3.1	8.4	.71	.30	.05	16	.86
7	1.5	.95	1.0	.08	.00	4.0	10	.77	.28	.03	11	.74
8	2.4	.98	.95	.06	.00	3.2	9.2	.98	.28	.01	8.4	.65
9	1.7	6.8	.92	.05	.00	2.3	7.2	1.3	.28	.00	6.4	.59
10	1.5	2.8	.89	.04	.00	2.8	6.1	1.4	.24	.00	6.6	4.1
11	5.0	67	.86	.03	.00	2.9	4.9	.86	.20	.02	14	7.3
12	10	14	.80	.02	.00	1.8	4.4	.77	.16	.06	32	2.0
13	8.0	6.6	.74	.01	.00	1.5	3.7	.80	.18	.06	9.2	1.3
14	7.0	4.6	.71	.00	.00	1.3	3.5	.77	.77	.04	6.6	.95
15	6.0	3.5	.68	.00	.00	1.2	3.1	.65	1.0	.01	5.6	.83
16	5.0	2.9	.71	.00	.00	1.2	2.8	.77	.56	.00	5.2	.77
17	50	78	.80	.00	.00	1.1	3.7	.80	.32	.00	4.9	.71
18	20	16	.65	.00	.00	1.0	2.0	1.2	.35	.03	4.9	10
19	15	10	.59	.00	.00	1.0	1.7	.89	.38	.02	4.0	3.1
20	10	6.4	.56	.00	.00	.89	1.6	1.4	.28	.02	2.9	1.7
21	7.8	5.2	.65	.00	.05	.80	2.3	1.3	.20	.24	2.3	1.4
22	5.2	4.6	.50	.00	1.0	.74	1.5	.86	.14	.18	3.4	1.2
23	4.6	4.0	.47	.00	1.5	.71	1.3	.74	.10	.06	3.9	1.1
24	3.7	4.0	.44	.00	13	1.0	1.3	.77	.08	.16	2.3	1.0
25	3.2	3.1	.38	.00	9.2	.89	1.2	.74	.06	.74	1.8	.95
26	2.8	2.8	.35	.00	9.2	1.6	1.0	.74	.06	.20	1.6	7.3
27	2.4	2.6	.30	.00	5.8	5.9	1.1	.65	.16	.08	1.5	104
28	2.0	2.2	.28	.00	5.4	12	1.2	.56	.18	.04	1.3	71
29	2.4	1.8	.26	.38	---	3.9	.95	.56	.22	.03	1.2	12
30	1.7	1.6	.24	.44	---	2.8	.86	.59	.14	.02	1.2	8.0
31	1.6	---	.22	.38	---	3.5	---	.50	---	.00	1.1	---
TOTAL	185.00	259.63	22.85	2.39	45.60	80.63	279.41	26.22	8.79	2.42	1889.32	249.19
MEAN	5.97	8.65	.74	.077	1.63	2.60	9.31	.85	.29	.078	60.9	8.31
MAX	50	78	1.5	.44	13	12	86	1.4	1.0	.74	1660	104
MIN	.50	.95	.22	.00	.00	.71	.86	.50	.06	.00	.00	.59
AC-FT	367	515	45	4.7	90	160	554	52	17	4.8	3750	494

CAL YR 1980 TOTAL 22264.34 MEAN 60.8 MAX 4140 MIN .00 AC-FT 44160
WTR YR 1981 TOTAL 3051.45 MEAN 8.36 MAX 1660 MIN .00 AC-FT 6050

16704000 WAILUKU RIVER AT PIIHONUA

LOCATION.--Lat 19°42'56", long 155°09'12", Hydrologic Unit 20010000, on right 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. Prior to Nov. 16, 1977, at opposite site on left bank.

DRAINAGE AREA.--230 mi² (596 km²), of which 81 mi² (210 km²) probably is noncontributing.

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.--WSP 865: 1929-36(M). WSP 965: 1941. WDR HI-80-1: 1929-79(P). WDR HI-81-1: 1940(M).

GAGE.--Water-stage recorder. Altitude of gage is 1,090 ft (332 m), from topographic map. Prior to Nov. 16, 1977, at opposite site on left bank at same datum.

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. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--50 years (water years, 1929-39, 1942-47, 1949-81), 284 ft³/s (8.043 m³/s), 205,800 acre-ft/yr (254 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 80,200 ft³/s (2,270 m³/s), revised, Aug. 11, 1940, gage height, 28.6 ft (8.72 m), from floodmarks, from rating curve extended above 13,000 ft³/s (312 m³/s); minimum, 0.15 ft³/s (0.004 m³/s) Jan. 20, 1981.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 21,200 ft³/s (600 m³/s) Aug. 4, gage height, 19.00 ft (5.791 m), from rating curve extended as explained above, no other peak above base of 8,700 ft³/s (246 m³/s); minimum, 0.15 ft³/s (0.004 m³/s) Jan. 20.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	58	55	34	3.2	.34	118	167	21	6.3	2.4	1.7	15
2	53	48	30	3.1	.32	92	627	17	5.7	.77	1.6	14
3	50	41	27	2.9	.31	117	1050	13	5.3	.78	1.6	66
4	39	40	25	2.9	.31	144	546	12	5.0	.73	6400	60
5	34	33	24	2.9	.31	78	268	10	4.6	.69	660	20
6	54	29	23	2.8	.29	61	198	9.7	4.7	.66	340	15
7	62	29	20	2.6	.28	135	234	14	4.2	.61	230	12
8	84	29	17	2.5	.28	148	248	24	4.1	.57	170	12
9	66	159	16	2.5	.27	75	221	17	3.8	.56	148	10
10	64	96	15	1.7	.26	55	149	20	3.4	.56	125	10
11	167	965	14	.66	.26	43	109	15	3.1	.72	320	10
12	429	492	12	.67	.26	33	82	13	3.0	.78	462	15
13	388	228	12	.39	.26	28	66	16	2.8	1.3	252	14
14	202	147	11	.33	.26	23	57	20	6.1	1.2	187	12
15	156	108	9.4	.34	.25	19	55	15	30	.47	146	10
16	141	82	7.2	.31	.25	17	43	13	14	.43	109	9.0
17	673	520	7.2	.30	.25	15	65	17	7.9	.42	92	9.0
18	407	667	6.5	.29	.25	12	41	46	7.9	.42	95	110
19	268	370	6.3	.27	.26	11	35	38	6.9	1.0	97	50
20	290	215	6.2	.26	.26	9.0	33	48	5.2	1.6	92	13
21	278	171	5.7	.26	.29	6.6	73	66	4.2	4.7	62	15
22	174	126	5.3	.24	3.0	5.6	47	34	3.4	8.8	50	12
23	147	103	4.9	.28	38	5.3	34	25	3.0	2.2	57	9.0
24	110	110	4.6	.27	364	14	32	21	2.7	1.5	47	8.0
25	92	79	4.3	.26	382	14	32	18	2.4	8.3	37	7.0
26	80	68	4.1	.29	367	17	27	16	2.4	3.0	33	45
27	66	65	3.9	.27	195	113	23	15	2.6	1.6	28	1500
28	92	52	3.8	.30	197	225	30	12	2.9	2.3	26	1000
29	180	47	3.5	.41	---	77	22	9.7	3.2	2.7	22	500
30	88	38	3.4	.37	---	61	18	8.8	3.0	1.7	20	250
31	67	---	3.3	.34	---	87	---	7.5	---	1.7	17	---
TOTAL	5059	5212	369.6	34.21	1551.82	1858.5	4652	631.7	163.8	55.17	10328.9	3832.0
MEAN	163	174	11.9	1.10	55.4	60.0	155	20.4	5.46	1.78	333	128
MAX	673	965	34	3.2	382	225	1050	66	30	8.8	6400	1500
MIN	34	29	3.3	.24	.25	5.3	18	7.5	2.4	.42	1.6	7.0
AC-FT	10030	10340	733	68	3080	3690	9230	1250	325	109	20490	7600

CAL YR 1980 TOTAL 117566.18 MEAN 321 MAX 8500 MIN .35 AC-FT 233200
WTR YR 1981 TOTAL 33748.70 MEAN 92.5 MAX 6400 MIN .24 AC-FT 66940

16713000 WAILUKU RIVER AT HILO
(National stream-quality accounting network station)

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 1977 to September 1979. Station destroyed by flood of November 17, 1979. June 1980 to current year.

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, 65,500 ft³/s (1,850 m³/s) Nov. 17, 1979, gage height 34.57 ft (10.54 m) from floodmarks and from rating curve extended above 6,840 ft³/s (194 m³/s) on basis of slope-area measurements at gage heights 23.30 ft (7.102 m) and 34.57 ft (10.54 m); minimum, 4.6 ft³/s (0.13 m³/s) July 17, 1981.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 41,700 ft³/s (1,180 m³/s) Aug. 4, gage height, 25.82 ft (7.870 m) from rating curve extended as explained above, no other peak above base of 9,500 ft³/s (269 m³/s); minimum, 4.6 ft³/s (0.13 m³/s) July 17.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	93	69	26	26	16	136	228	52	11	6.5	7.3	28
2	75	52	26	24	14	63	906	21	19	7.0	6.2	39
3	79	39	26	26	14	144	1580	16	18	8.8	6.7	128
4	52	38	23	26	14	210	802	23	17	8.2	10400	73
5	38	28	22	26	14	61	385	20	17	8.1	1560	30
6	32	37	21	25	13	28	260	17	16	7.1	700	22
7	81	35	23	23	12	152	373	22	17	6.5	410	19
8	112	36	36	24	12	226	370	46	15	6.2	252	18
9	94	333	34	23	12	52	322	30	15	5.9	196	16
10	73	230	28	22	12	20	186	31	13	5.7	131	17
11	295	1580	26	21	12	13	111	23	12	6.5	355	18
12	775	875	23	20	12	9.8	62	19	11	8.8	1020	23
13	800	385	21	20	12	13	35	18	11	7.9	435	22
14	442	232	19	18	12	28	24	34	13	7.9	292	18
15	310	162	17	18	10	23	38	23	54	6.5	200	16
16	220	110	15	17	10	18	22	18	24	5.1	136	14
17	1150	856	15	16	10	18	45	18	9.5	4.6	112	14
18	775	1130	17	17	10	15	24	28	9.8	5.1	144	142
19	519	620	20	16	9.8	12	22	25	9.3	7.3	139	66
20	578	370	19	14	9.0	11	22	27	7.5	21	125	20
21	526	272	19	14	11	14	87	71	8.6	20	66	24
22	310	196	17	15	22	14	52	16	11	15	38	18
23	260	167	16	15	105	12	25	15	9.5	10	45	15
24	190	171	15	15	676	20	22	22	9.3	30	34	14
25	150	112	14	15	635	26	22	20	9.5	15	25	12
26	123	76	13	15	612	27	19	21	9.6	10	23	58
27	92	67	12	15	280	210	16	17	15	6.0	24	3110
28	78	52	11	16	295	397	21	16	16	12	24	2290
29	385	34	18	18	---	103	18	14	13	14	21	668
30	150	28	28	18	---	45	23	15	7.8	5.8	18	400
31	99	---	28	17	---	81	---	13	---	8.8	18	---
TOTAL	8976	8392	648	595	2875.8	2201.8	6122	751	428.4	297.3	16963.2	7352
MEAN	290	280	20.9	19.2	103	71.0	204	24.2	14.3	9.59	547	245
MAX	1150	1580	36	26	676	397	1580	71	54	30	10400	3110
MIN	32	28	11	14	9.0	9.8	16	13	7.5	4.6	6.2	12
AC-FT	17800	16650	1290	1180	5700	4370	12140	1490	850	590	33650	14580

WTR YR 1981 TOTAL 55602.5 MEAN 152 MAX 10400 MIN 4.6 AC-FT 110300

16713000 WAILUKU RIVER AT HILO--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--March 1977 to current year.

PERIOD OF DAILY RECORD.--
SUSPENDED SEDIMENT DISCHARGE: March 1977 to September 1979. June 1980 to current year.

INSTRUMENTATION.--Automatic pumping sediment sampler since March 1977.

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

EXTREMES FOR PERIOD OF DAILY RECORD.--
SEDIMENT CONCENTRATIONS: Maximum daily mean, 292 mg/L Sept. 21, 1980; minimum daily mean, 1 mg/L on several days in April, July, August, September 1978, and Sept. 17, 1979.
SEDIMENT DISCHARGE: Maximum daily, 14,100 tons (12,800 tonnes) Feb. 20, 1979; minimum daily, 0.03 ton (0.03 tonne) Sept. 17, 1979.

EXTREMES FOR CURRENT YEAR.--
SEDIMENT CONCENTRATIONS: Maximum daily mean, 296 mg/L Aug. 4; minimum daily mean, 0 mg/L June 20, 21, 30, July 1-11, 16-18.
SEDIMENT DISCHARGE: Maximum daily, 14,000 tons (12,700 tonnes) Aug. 4, minimum daily, 0 ton (0 tonne) June 20, 21, 30, July 1-11, 16-18.

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (UMHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)	TUR-BID-ITY (NTU)	OXYGEN, DIS-SOLVED (MG/L)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARD-NESS (MG/L AS CACO3)
OCT										
29...	1015	400	60	7.0	19.0	1.0	8.9	400	3600	17
NOV										
18...	1015	1840	26	6.6	19.0	6.0	8.9	K2300	2000	9
DEC										
23...	1015	13	76	7.2	19.0	.40	8.8	60	750	30
FEB										
04...	0815	11	90	8.1	21.0	.30	8.7	18	800	45
25...	0955	755	31	6.4	18.5	4.6	9.1	1600	980	9
MAR										
31...	1000	138	42	6.9	21.0	2.2	8.8	120	220	15
APR										
28...	0930	12	67	7.1	22.0	.50	9.0	190	330	23
MAY										
18...	1015	50	72	7.4	22.0	.30	9.1	100	210	26
JUN										
08...	1045	11	76	7.4	21.0	.60	8.8	55	180	28
JUL										
13...	1030	8.1	85	7.8	25.0	.60	9.1	110	840	31
AUG										
31...	1030	18	72	7.6	23.5	.30	8.6	61	350	26
SEP										
22...	1005	19	84	7.6	23.5	.90	8.6	39	620	25

DATE	HARD-NESS NONCAR-BONATE (MG/L AS CACO3)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	PERCENT SODIUM	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY LAB (MG/L AS CACO3)	SULFATE DIS-SOLVED (MG/L AS SO4)
OCT									
29...	.00	3.5	2.1	3.1	27	.3	.7	19	.7
NOV									
18...	7.0	1.8	1.0	2.0	32	.3	.4	2.0	1.9
DEC									
23...	.00	5.9	3.7	4.5	24	.4	.6	30	5.8
FEB									
04...	.00	9.6	5.2	4.9	19	.3	.5	55	.7
25...	4.0	1.7	1.1	3.2	42	.5	.8	5.0	1.9
MAR									
31...	3.0	3.1	1.7	3.4	32	.4	.8	12	1.4
APR									
28...	1.0	4.8	2.7	4.3	28	.4	.7	22	4
MAY									
10...	5.0	5.2	3.1	4.2	26	.4	.6	21	1.2
JUN									
08...	7.0	5.5	3.4	4.9	27	.4	.7	21	.7
JUL									
13...	.00	6.3	3.7	5.0	26	.4	.6	35	.9
AUG									
31...	.00	5.3	3.0	4.7	28	.5	.7	28	<1.0
SEP									
22...	.00	5.0	3.0	4.0	25	.4	.7	27	<5.0

K Results based on colony count outside the acceptable range (non-ideal colony count).
< Actual value is known to be less than the value shown.

16713000 WAILUKU RIVER AT HILO--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	CHLORIDE, DISSOLVED (MG/L AS CL)	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)	SOLIDS, DISSOLVED (TONS PER AC-FT)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N)	NITROGEN, AMMONIA TOTAL (MG/L AS N)	NITROGEN, AMMONIA DISSOLVED (MG/L AS N)
OCT 29...	4.8	.1	11	43	38	.06	.12	.14	.020	.040
NOV 18...	4.6	.1	5.2	--	19	.03	.11	.10	.080	.070
DEC 23...	5.5	.0	18	58	63	.08	.23	.23	.000	.000
FEB 04...	3.5	.0	25	83	82	.11	.17	.00	.000	.000
25...	4.9	.1	3.7	22	21	.03	.18	.17	.020	.040
MAR 31...	4.1	.0	8.7	36	31	.05	.07	.07	.040	.030
APR 28...	4.9	.1	15	52	47	.07	.16	.19	.060	--
MAY 18...	5.1	.0	15	53	48	.07	.10	--	.070	--
JUN 08...	11	.0	16	51	51	.07	.15	.17	.030	.000
JUL 13...	5.4	.0	19	61	62	.08	.14	.11	.020	<.050
AUG 31...	5.6	.0	18	54	55	.07	.34	.27	.100	.110
SEP 22...	4.9	.0	17	53	56	.07	.25	.14	.080	.050

DATE	NITROGEN, ORGANIC TOTAL (MG/L AS N)	NITROGEN, ORGANIC DISSOLVED (MG/L AS N)	NITROGEN DISSOLVED (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITROGEN, NH4 + ORG. SUSP. TOTAL (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC DIS. (MG/L AS N)	NITROGEN, TOTAL (MG/L AS N)	PHOSPHORUS, TOTAL (MG/L AS P)	PHOSPHORUS, DISSOLVED (MG/L AS P)
OCT 29...	.51	.45	.63	.53	.04	.49	.65	.020	.010
NOV 18...	1.0	.15	.32	1.10	.88	.22	1.2	.030	.040
DEC 23...	.25	.26	.49	.25	.00	.26	.48	.020	.030
FEB 04...	.46	.26	.26	.46	.20	.26	.63	.010	.030
25...	.59	.53	.74	.61	.04	.57	.79	.060	.050
MAR 31...	.66	.50	.60	.70	.17	.53	.77	.020	.030
APR 28...	.69	--	--	.75	--	--	.91	.020	.020
MAY 18...	.38	--	--	.45	--	--	.55	.030	.050
JUN 08...	1.1	.47	.64	1.10	.63	.47	1.3	.030	.010
JUL 13...	.57	--	.48	.59	.22	.37	.73	.140	.040
AUG 31...	.06	--	--	.16	--	--	.50	.030	<.010
SEP 22...	.88	.61	.80	.96	.30	.66	1.2	.130	<.010

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

16713000 WAILUKU RIVER AT HILO--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	TIME	ARSENIC TOTAL (UG/L AS AS)	ARSENIC SUS-PENDED TOTAL (UG/L AS AS)	ARSENIC DIS-SOLVED (UG/L AS AS)	BARIUM, TOTAL RECOV-ERABLE (UG/L AS BA)	BARIUM, SUS-PENDED RECOV-ERABLE (UG/L AS BA)	BARIUM, DIS-SOLVED (UG/L AS BA)	CADMIUM TOTAL RECOV-ERABLE (UG/L AS CD)	CADMIUM DIS-SOLVED (UG/L AS CD)	CHRO-MIUM, TOTAL RECOV-ERABLE (UG/L AS CR)	CHRO-MIUM, SUS-PENDED RECOV. (UG/L AS CR)
DEC 23...	1015	1	0	1	6	0	6	<1	<1	0	0
MAR 31...	1000	1	0	1	7	0	7	0	<1	30	20
JUN 08...	1045	0	0	0	0	0	0	0	<1	10	10
SEP 22...	1005	0	0	0	0	0	4	1	<1	0	0

DATE	CHRO-MIUM, DIS-SOLVED (UG/L AS CR)	COBALT, TOTAL RECOV-ERABLE (UG/L AS CO)	COBALT, SUS-PENDED RECOV-ERABLE (UG/L AS CO)	COBALT, DIS-SOLVED (UG/L AS CO)	COPPER, TOTAL RECOV-ERABLE (UG/L AS CU)	COPPER, SUS-PENDED RECOV-ERABLE (UG/L AS CU)	COPPER, DIS-SOLVED (UG/L AS CU)	IRON, TOTAL RECOV-ERABLE (UG/L AS FE)	IRON, SUS-PENDED RECOV-ERABLE (UG/L AS FE)	IRON, DIS-SOLVED (UG/L AS FE)	LEAD, TOTAL RECOV-ERABLE (UG/L AS PB)
DEC 23...	0	<3	--	<3	4	1	3	120	90	30	3
MAR 31...	10	<3	--	<3	6	5	1	270	150	120	0
JUN 08...	0	3	0	3	2	0	3	80	40	40	15
SEP 22...	0	0	0	0	2	0	3	120	90	32	1

DATE	LEAD, SUS-PENDED RECOV-ERABLE (UG/L AS PB)	LEAD, DIS-SOLVED (UG/L AS PB)	MANGA-NESE, TOTAL RECOV-ERABLE (UG/L AS MN)	MANGA-NESE, SUS-PENDED RECOV. (UG/L AS MN)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)	MERCURY TOTAL RECOV-ERABLE (UG/L AS HG)	MERCURY SUS-PENDED RECOV-ERABLE (UG/L AS HG)	MERCURY DIS-SOLVED (UG/L AS HG)	NICKEL, TOTAL RECOV-ERABLE (UG/L AS NI)	NICKEL, SUS-PENDED RECOV-ERABLE (UG/L AS NI)
DEC 23...	3	0	10	9	1	.0	.0	.0	3	3
MAR 31...	0	0	10	8	2	.1	.1	.0	2	1
JUN 08...	15	0	10	8	2	.1	.1	.0	2	2
SEP 22...	0	1	10	6	4	.0	.0	.0	0	0

DATE	NICKEL, DIS-SOLVED (UG/L AS NI)	SELE-NIUM, TOTAL (UG/L AS SE)	SELE-NIUM, SUS-PENDED TOTAL (UG/L AS SE)	SELE-NIUM, DIS-SOLVED (UG/L AS SE)	SILVER, TOTAL RECOV-ERABLE (UG/L AS AG)	SILVER, SUS-PENDED RECOV-ERABLE (UG/L AS AG)	SILVER, DIS-SOLVED (UG/L AS AG)	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN)	ZINC, SUS-PENDED RECOV-ERABLE (UG/L AS ZN)	ZINC, DIS-SOLVED (UG/L AS ZN)
DEC 23...	0	0	0	0	0	0	0	10	--	<3
MAR 31...	1	0	0	0	0	0	0	10	0	10
JUN 08...	0	0	0	0	0	0	0	10	--	<3
SEP 22...	0	0	0	0	1	1	0	0	--	<3

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

16713000 WAILUKU RIVER AT HILO--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	TIME	CARBON, ORGANIC TOTAL (MG/L AS C)	CARBON, ORGANIC DIS-SOLVED (MG/L AS C)	CARBON, ORGANIC SUS-PENDED TOTAL (MG/L AS C)
OCT				
29...	1015	2.7	---	---
NOV				
18...	1015	6.6	---	---
DEC				
23...	1015	---	2.5	---
FEB				
04...	0815	3.9	---	---
25...	0955	5.0	---	---
MAR				
31...	1000	---	3.5	0
APR				
28...	0930	3.4	---	---
MAY				
18...	1015	2.4	---	---
JUN				
00...	1045	---	2.1	.0
JUL				
13...	1030	1.2	---	---
AUG				
31...	1030	5	---	---
SEP				
22...	1005	---	1.2	<.1

DATE	TIME	PHYTO-PLANK-TON, TOTAL (CELLS PER ML)
OCT		
29...	1015	660
NOV		
18...	1015	39
DEC		
23...	1015	940
FEB		
04...	0815	1200
25...	0955	240
MAR		
31...	1000	180
APR		
28...	0930	270
MAY		
18...	1015	180
JUN		
08...	1045	300
JUL		
13...	1030	11000
AUG		
31...	1030	270
SEP		
22...	1005	400

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SEDI-MENT, SUS-PENDED (MG/L)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
OCT					
29...	1015	400	7	7.6	100
NOV					
18...	1015	1840	14	70	100
DEC					
23...	1015	13	1	.04	100
FEB					
04...	0815	11	1	.03	100
25...	0955	755	5	10	100
MAR					
31...	1000	138	3	1.1	100
APR					
28...	0930	12	1	.03	100
MAY					
18...	1015	50	2	.27	100
JUN					
08...	1045	11	3	.09	100
JUL					
13...	1030	8.1	2	.04	100
AUG					
31...	1030	18	3	.15	100
SEP					
22...	1005	19	1	.05	100

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

16713000 WAILUKU RIVER AT HILO--Continued

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

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	93	4	1.0	69	4	.75	26	2	.14
2	75	3	.61	52	3	.42	26	2	.14
3	79	3	.64	39	3	.32	26	2	.14
4	52	4	.56	38	3	.31	23	2	.12
5	38	4	.41	28	3	.23	22	2	.12
6	32	3	.26	37	2	.20	21	2	.11
7	81	3	.66	35	2	.19	23	2	.12
8	112	5	1.5	36	2	.19	36	2	.19
9	94	4	1.0	333	7	6.3	34	2	.18
10	73	4	.79	230	8	5.0	28	2	.15
11	295	5	4.0	1580	33	181	26	2	.14
12	775	8	17	875	10	24	23	2	.12
13	800	9	19	385	5	5.2	21	2	.11
14	442	4	4.8	232	5	3.1	19	1	.05
15	310	3	2.5	162	3	1.3	17	1	.05
16	220	4	2.4	110	4	1.2	15	1	.04
17	1150	12	37	856	10	23	15	1	.04
18	775	8	17	1130	14	43	17	1	.05
19	519	5	7.0	620	6	10	20	1	.05
20	578	6	9.4	370	6	6.0	19	1	.05
21	526	5	7.1	272	4	2.9	19	1	.05
22	310	4	3.3	196	3	1.6	17	1	.05
23	260	3	2.1	167	2	.90	16	1	.04
24	190	3	1.5	171	3	1.4	15	1	.04
25	150	3	1.2	112	3	.91	14	1	.04
26	123	3	1.0	76	2	.41	13	1	.04
27	92	3	.75	67	2	.36	12	1	.03
28	98	3	.79	52	3	.42	11	1	.03
29	385	7	7.3	34	2	.18	18	1	.05
30	150	6	2.4	28	2	.15	28	2	.08
31	99	6	1.6	---	---	---	28	2	.08
TOTAL	8976	---	156.57	8392	---	320.94	648	---	2.64
		JANUARY			FEBRUARY			MARCH	
1	26	2	.14	16	1	.04	136	3	1.1
2	24	2	.13	14	1	.04	63	3	.51
3	26	2	.14	14	1	.04	144	4	1.6
4	26	2	.14	14	1	.04	210	4	2.3
5	26	2	.14	14	1	.04	61	3	.49
6	25	2	.14	13	1	.04	28	2	.15
7	23	2	.12	12	1	.03	152	4	1.6
8	24	2	.13	12	1	.03	226	5	3.1
9	23	2	.12	12	1	.03	52	4	.56
10	22	2	.12	12	1	.03	20	3	.16
11	21	1	.06	12	1	.03	13	2	.07
12	20	1	.05	12	1	.03	9.8	1	.03
13	20	1	.05	12	1	.03	13	1	.04
14	18	1	.05	12	1	.03	28	3	.23
15	18	1	.05	10	1	.03	23	2	.12
16	17	1	.05	10	1	.03	18	2	.10
17	16	1	.04	10	1	.03	18	2	.10
18	17	1	.05	10	1	.03	15	1	.04
19	16	1	.04	9.8	1	.03	12	1	.03
20	14	1	.04	9.0	1	.02	11	1	.03
21	14	1	.04	11	1	.03	14	1	.04
22	15	1	.04	22	2	.12	14	1	.04
23	15	1	.04	105	4	1.1	12	1	.03
24	15	1	.04	676	14	26	20	2	.11
25	15	1	.04	635	8	14	26	2	.14
26	15	1	.04	612	8	13	27	2	.15
27	15	1	.04	280	4	3.0	210	4	2.3
28	16	1	.04	295	5	4.0	397	6	6.4
29	18	1	.05	---	---	---	103	5	1.4
30	18	1	.05	---	---	---	45	4	.49
31	17	1	.05	---	---	---	81	4	.87
TOTAL	595	---	2.27	2875.8	---	61.90	2201.8	---	24.33

16713000 WAILUKU RIVER AT HILO--Continued

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

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	228	5	3.1	52	2	.28	11	1	.03
2	906	12	29	21	1	.06	19	1	.05
3	1580	20	85	16	1	.04	18	1	.05
4	802	5	11	23	1	.06	17	1	.05
5	385	3	3.1	20	1	.05	17	1	.05
6	260	3	2.1	17	1	.05	16	1	.04
7	373	3	3.0	22	1	.06	17	1	.05
8	370	3	3.0	46	1	.12	15	2	.08
9	322	3	2.6	30	1	.08	15	1	.04
10	186	3	1.5	31	1	.08	13	1	.04
11	111	2	.60	23	1	.06	12	1	.03
12	62	2	.33	19	1	.05	11	1	.03
13	35	2	.19	18	1	.05	11	1	.03
14	24	2	.13	34	1	.09	13	1	.04
15	38	2	.21	23	1	.06	54	4	.58
16	22	2	.12	18	1	.05	24	2	.13
17	45	2	.24	18	1	.05	9.5	1	.03
18	24	2	.13	28	2	.15	9.8	1	.03
19	22	2	.12	25	2	.14	9.3	1	.03
20	22	2	.12	27	1	.07	7.5	0	.00
21	87	3	.70	71	3	.58	8.6	0	.00
22	52	2	.28	16	1	.04	11	1	.03
23	25	2	.14	15	1	.04	9.5	1	.03
24	22	2	.12	22	1	.06	9.3	1	.03
25	22	2	.12	20	1	.05	9.5	1	.03
26	19	1	.05	21	1	.06	9.6	1	.03
27	16	1	.04	17	1	.05	15	1	.04
28	21	1	.06	16	1	.04	16	1	.04
29	18	1	.05	14	1	.04	13	1	.04
30	23	2	.12	15	1	.04	7.8	0	.00
31	---	---	---	13	1	.04	---	---	---
TOTAL	6122	---	147.27	751	---	2.69	428.4	---	1.68
		JULY			AUGUST			SEPTEMBER	
1	6.5	0	.00	7.3	1	.02	28	1	.08
2	7.0	0	.00	6.2	1	.02	39	1	.11
3	8.8	0	.00	6.7	1	.02	128	3	1.0
4	8.2	0	.00	10400	296	14000	73	3	.59
5	8.1	0	.00	1560	22	93	30	2	.16
6	7.1	0	.00	700	5	9.5	22	2	.12
7	6.5	0	.00	410	4	4.4	19	1	.05
8	6.2	0	.00	252	3	2.0	18	1	.05
9	5.9	0	.00	196	2	1.1	16	1	.04
10	5.7	0	.00	131	2	.71	17	1	.05
11	6.5	0	.00	355	5	4.8	18	1	.05
12	8.8	1	.02	1020	10	28	23	1	.06
13	7.9	1	.02	435	5	5.9	22	1	.06
14	7.9	1	.02	292	4	3.2	18	1	.05
15	6.5	1	.02	200	3	1.6	16	1	.04
16	5.1	0	.00	136	3	1.1	14	1	.04
17	4.6	0	.00	112	3	.91	14	1	.04
18	5.1	0	.00	144	3	1.2	142	3	1.2
19	7.3	1	.02	139	3	1.1	66	2	.36
20	21	1	.06	125	3	1.0	20	2	.11
21	20	1	.05	66	2	.36	24	2	.13
22	15	1	.04	38	2	.21	18	1	.05
23	10	1	.03	45	3	.36	15	1	.04
24	30	3	.24	34	3	.28	14	1	.04
25	15	1	.04	25	2	.14	12	1	.03
26	10	1	.03	23	2	.12	58	3	.47
27	6.0	1	.02	24	2	.13	3110	50	420
28	12	1	.03	24	2	.13	2290	25	155
29	14	1	.04	21	2	.11	668	8	14
30	5.8	1	.02	18	1	.05	400	5	5.4
31	8.8	1	.02	18	1	.05	---	---	---
TOTAL	297.3	---	0.72	16963.2	---	14161.52	7352	---	599.42
YEAR	55602.5		15481.95						

16713000 WAILUKU RIVER AT HILO--Continued

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA

PHYTOPLANKTON ANALYSES, OCTOBER 1980 TO SEPTEMBER 1981

DATE	OCT 29,80	NOV 18,80	DEC 23,80	FEB 4,81	FEB 25,81	MAR 31,81
TIME	1015	1015	1015	0815	0955	1000
TOTAL CELLS/ML	660	39	940	1200	240	180
DIVERSITY: DIVISION	1.1	0.9	0.7	1.4	1.4	0.9
.CLASS	1.1	0.9	0.7	1.4	1.4	0.9
..ORDER	1.3	0.9	0.7	2.1	1.4	1.4
...FAMILY	1.7	1.6	0.8	2.5	2.0	2.7
....GENUS	1.7	1.6	0.9	2.6	2.0	2.7

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												
...MICRACTINIACEAE												
....GOLENKINIA	--	-	--	-	--	-	--	-	--	-	--	-
...OOCYSTACEAE												
....ANKISTRODESMUS	26	4	--	-	26	3	42	4	26	11	--	-
....KIRCHNERIELLA	--	-	--	-	--	-	--	-	--	-	--	-
....SELENASTRUM	--	-	13#	33	--	-	56	5	--	-	--	-
...SCENEDESMACEAE												
....SCENEDESMUS	--	-	--	-	--	-	--	-	--	-	--	-
..VOLVOCALES												
...CHLAMYDOMONADACEAE												
....CHLAMYDOMONAS	13	2	--	-	13	1	--	-	--	-	13	7
..ZYGNEMATALES												
...DESMIDIACEAE												
....COSMARIUM	--	-	--	-	--	-	--	-	--	-	--	-
....EUASTRUM	--	-	--	-	--	-	--	-	--	-	13	7
...ZYGNEMATACEAE												
....MOUGEOTIA	--	-	--	-	--	-	350#	30	--	-	--	-
CHRYSOPHYTA												
.BACILLARIOPHYCEAE												
..CENTRALES												
...COSCINODISCACEAE												
....COSCINODISCUS	--	-	--	-	--	-	--	-	--	-	13	7
....CYCLOTELLA	13	2	--	-	13	1	14	1	--	-	--	-
..PENNALES												
...ACHNANTHACEAE												
....ACHNANTHES	--	-	--	-	--	-	--	-	--	-	--	-
...CYMBELLACEAE												
....CYMBELLA	--	-	--	-	--	-	14	1	13	5	--	-
...FRAGILARIACEAE												
....FRAGILARIA	13	2	--	-	13	1	--	-	--	-	--	-
....SYNEDRA	52	8	--	-	13	1	28	2	--	-	26	14
...GOMPHONEMATACEAE												
....GOMPHONEMA	--	-	13#	33	--	-	--	-	--	-	26	14
...NAVICULACEAE												
....NAVICULA	26	4	13#	33	26	3	14	1	26	11	65#	36
...NITZSCHIACEAE												
....NITZSCHIA	77	12	--	-	13	1	14	1	13	5	13	7
...TABELLARIACEAE												
....TABELLARIA	--	-	--	-	--	-	--	-	39#	16	--	-
CYANOPHYTA (BLUE-GREEN ALGAE)												
.CYANOPHYCEAE												
..CHROOCOCCALES												
...CHROOCOCCACEAE												
....ANACYSTIS	440#	67	--	-	--	-	130	11	--	-	--	-
..HORMOGONALES												
...NOSTOCACEAE												
....ANABAENA	--	-	--	-	--	-	--	-	130#	53	--	-
....ANABAENOPSIS	--	-	--	-	--	-	--	-	--	-	--	-
...OSCILLATORIACEAE												
....LYNGBYA	--	-	--	-	830#	88	--	-	--	-	--	-
....OSCILLATORIA	--	-	--	-	--	-	390#	33	--	-	--	-
...RIVULARIACEAE												
....RAPHIDIOPSIS	--	-	--	-	--	-	110	10	--	-	--	-
EUGLENOPHYTA (EUGLENOIDS)												
.EUGLENOPHYCEAE												
..EUGLENALES												
...EUGLENACEAE												
....EUGLENA	--	-	--	-	--	-	14	1	--	-	--	-
PYRRHOPHYTA (FIRE ALGAE)												
.DINOPHYCEAE												
..PERIDINIALES												
...GLENODINIACEAE												
....GLENODINIUM	--	-	--	-	--	-	--	-	--	-	13	7

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

16713000 WAILUKU RIVER AT HILO--Continued

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA

PHYTOPLANKTON ANALYSES, OCTOBER 1980 TO SEPTEMBER 1981

DATE	APR 28,81		MAY 18,81		JUN 8,81		JUL 13,81		AUG 31,81		SEP 22,81	
TIME	0930		1015		1045		1030		1030		1005	
TOTAL CELLS/ML	270		180		300		11000		270		400	
DIVERSITY: DIVISION	0.9		1.4		1.0		0.6		0.3		0.8	
.CLASS	0.9		1.4		1.0		0.6		0.3		0.8	
..ORDER	0.9		1.4		1.0		0.7		0.3		0.8	
...FAMILY	0.9		2.5		2.6		0.8		1.8		2.1	
....GENUS	0.9		2.5		2.8		0.8		1.8		2.1	
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												
...MICRACTINIACEAE												
....GOLENKINIA	--	-	--	-	--	-	70	1	--	-	--	-
...OOCYSTACEAE												
....ANKISTRODESMUS	26	10	13	7	39	13	350	3	14	5	--	-
....KIRCHNERIELLA	--	-	--	-	--	-	140	1	--	-	--	-
....SELENASTRUM	--	-	--	-	--	-	--	-	--	-	--	-
...SCENEDESMACEAE												
....SCENEDESMUS	--	-	52#	29	100#	35	140	1	--	-	--	-
..VOLVOCALES												
...CHLAMYDOMONADACEAE												
....CHLAMYDOMONAS	--	-	--	-	--	-	--	-	--	-	--	-
..ZYGNEMATALES												
...DESMIDIACEAE												
....COSMARIUM	--	-	--	-	--	-	350	3	--	-	--	-
....EUASTRUM	--	-	--	-	--	-	--	-	--	-	--	-
...ZYGNEMATACEAE												
....MOUGEOTIA	--	-	--	-	--	-	--	-	--	-	--	-
CHRYSOPHYTA												
.BACILLARIOPHYCEAE												
..CENTRALES												
...COSCINODISCACEAE												
....COSCINODISCUS	--	-	--	-	--	-	--	-	--	-	--	-
....CYCLOTELLA	--	-	--	-	--	-	70	1	--	-	--	-
..PENNALES												
...ACHNANTHACEAE												
....ACHNANTHES	--	-	--	-	13	4	--	-	29	11	--	-
...CYMBELLACEAE												
....CYMBELLA	--	-	13	7	13	4	--	-	--	-	58	14
...FRAGILARIACEAE												
....FRAGILARIA	--	-	--	-	39	13	--	-	--	-	--	-
....SYNEDRA	--	-	13	7	26	9	140	1	86#	32	29	7
...GOMPHONEMATACEAE												
....GOMPHONEMA	--	-	13	7	13	4	--	-	--	-	29	7
...NAVICULACEAE												
....NAVICULA	26	10	52#	29	13	4	--	-	130#	47	170#	43
...NITZSCHIACEAE												
....NITZSCHIA	--	-	--	-	39	13	70	1	14	5	14	4
...TABELLARIACEAE												
....TABELLARIA	--	-	--	-	--	-	--	-	--	-	--	-
CYANOPHYTA (BLUE-GREEN ALGAE)												
.CYANOPHYCEAE												
..CHROOCOCCALES												
...CHROOCOCCACEAE												
....ANACYSTIS	--	-	26	14	--	-	10000#	88	--	-	--	-
..HORMOGONALES												
...NOSTOCACEAE												
....ANABAENA	--	-	--	-	--	-	--	-	--	-	--	-
....ANABAENOPSIS	220#	81	--	-	--	-	--	-	--	-	--	-
...OSCILLATORIACEAE												
....LYNGBYA	--	-	--	-	--	-	--	-	--	-	--	-
....OSCILLATORIA	--	-	--	-	--	-	--	-	--	-	100#	25
...RIVULARIACEAE												
....RAPHIDIOPSIS	--	-	--	-	--	-	--	-	--	-	--	-
EUGLENOPHYTA (EUGLENOIDS)												
.EUGLENOPHYCEAE												
..EUGLENALES												
...EUGLENACEAE												
....EUGLENA	--	-	--	-	--	-	--	-	--	-	--	-
PYRRHOPHYTA (FIRE ALGAE)												
.DINOPHYCEAE												
..PERIDINIALES												
...GLENODINIACEAE												
....GLENODINIUM	--	-	--	-	--	-	--	-	--	-	--	-

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

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 mi^2 (30.0 km^2).

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 ft^3/s (0.091 m^3/s) above station for fluming cane and domestic use.

AVERAGE DISCHARGE.--15 years, 126 ft^3/s (3.568 m^3/s), 91,290 acre-ft/yr (113 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 22,600 ft^3/s (640 m^3/s) May 23, 1978, gage height, 20.00 ft (6.096 m), from floodmarks and from rating curve extended above 4,610 ft^3/s (131 m^3/s) on basis of slope-area measurement at gage height 20.00 ft (6.096 m); minimum, 0.8 ft^3/s (0.023 m^3/s) Jan. 31, 1912.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 9,200 ft^3/s (261 m^3/s) Aug. 4, gage height, 15.85 ft (4.831 m), from rating curve as explained above, no other peak above base of 4,400 ft^3/s (125 m^3/s); minimum, 4.2 ft^3/s (0.12 m^3/s) Feb. 17, 18, 20, July 9, 18.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	24	26	18	6.3	6.9	72	112	40	7.7	6.9	5.2	9.6
2	26	22	16	6.2	6.2	62	313	21	7.1	6.2	5.1	9.1
3	25	20	15	6.0	5.6	91	512	16	6.7	5.5	33	57
4	20	19	13	6.0	5.1	91	171	14	6.8	5.1	3720	29
5	18	17	13	6.0	5.0	49	71	14	6.6	4.5	239	18
6	16	16	14	6.0	4.9	46	55	14	6.4	4.5	77	15
7	18	15	14	5.8	4.7	139	79	13	6.3	4.5	50	12
8	59	19	13	5.8	4.5	94	83	17	6.0	4.4	38	9.3
9	40	143	13	5.8	4.5	48	58	15	6.4	4.3	41	8.6
10	40	74	13	5.8	4.5	33	44	24	6.0	4.3	36	8.2
11	121	620	12	5.6	4.5	23	34	16	5.8	4.3	128	17
12	366	204	12	5.6	4.3	18	25	14	5.5	4.5	256	29
13	188	65	12	5.6	4.3	15	21	25	5.5	6.2	66	25
14	98	45	11	5.6	4.3	12	24	24	11	5.9	45	14
15	60	35	11	5.5	4.3	10	30	17	49	5.2	34	9.9
16	76	29	11	5.4	4.3	9.5	20	18	19	4.7	30	8.6
17	358	310	11	5.4	4.3	9.3	32	18	11	4.5	34	7.8
18	164	293	11	5.4	4.3	8.9	21	46	10	4.2	62	71
19	111	132	11	5.4	4.3	9.1	22	39	9.8	21	59	39
20	119	62	11	5.3	4.2	8.9	22	50	7.9	12	51	18
21	99	50	11	5.2	4.5	7.8	65	51	6.9	44	31	13
22	92	39	10	5.2	53	6.4	33	26	6.3	23	24	9.9
23	57	34	8.5	5.2	90	7.2	24	18	5.8	13	31	9.0
24	42	52	7.4	5.1	486	8.8	26	15	5.5	9.7	25	8.5
25	36	35	6.8	5.4	299	10	26	13	5.2	25	19	8.1
26	36	28	6.4	5.3	277	38	20	12	5.1	11	17	228
27	28	28	6.7	5.2	118	138	17	11	5.3	7.1	15	1170
28	36	23	6.6	5.4	159	169	25	9.6	5.7	20	13	418
29	90	21	6.5	5.9	---	70	17	9.4	5.4	11	12	82
30	40	19	6.5	5.6	---	56	14	9.0	6.5	7.0	10	55
31	36	---	6.3	6.8	---	97	---	8.5	---	5.9	8.3	---
TOTAL	2499	2495	337.7	174.8	1581.5	1456.9	2016	637.5	258.2	299.4	5214.6	2416.6
MEAN	80.6	83.2	10.9	5.64	56.5	47.0	67.2	20.6	8.61	9.66	168	80.6
MAX	366	620	18	6.8	486	169	512	51	49	44	3720	1170
MIN	16	15	6.3	5.1	4.2	6.4	14	8.5	5.1	4.2	5.1	7.8
AC-FT	4960	4950	670	347	3140	2890	4000	1260	512	594	10340	4790

CAL YR 1980 TOTAL 68654.6 MEAN 188 MAX 5590 MIN 1.0 AC-FT 136200
WTR YR 1981 TOTAL 19387.2 MEAN 53.1 MAX 3720 MIN 4.2 AC-FT 38450

16717000 HONOLII STREAM NEAR PAPAIKOU--Continued

WATER QUALITY RECORDS

PERIOD OF RECORD.--September 1969 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (UMHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)	OXYGEN, DIS-SOLVED (MG/L)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARD-NESS (MG/L AS CACO3)
OCT									
29...	0830	88	28	7.2	17.0	8.9	K1700	4300	9
NOV									
18...	0915	540	18	6.5	17.0	8.8	1300	2300	5
DEC									
23...	0915	2.3	105	7.0	17.5	8.9	4	330	46
FEB									
04...	1015	1.1	105	8.3	17.5	8.6	10	210	38
25...	1230	173	29	6.6	17.0	9.0	620	150	10
MAR									
31...	0900	101	26	7.0	17.0	9.0	76	200	7
APR									
28...	0830	22	56	7.3	18.0	8.9	9	60	16
MAY									
18...	0930	30	52	7.1	17.0	9.2	K14	110	17
JUN									
08...	0915	7.0	85	7.6	17.5	9.0	6	160	36
JUL									
13...	0930	7.2	82	7.8	19.0	8.9	17	160	34
AUG									
31...	0915	10	70	7.5	18.0	8.7	1	130	28
SEP									
22...	0845	9.8	70	7.5	18.0	8.7	92	840	25

DATE	HARD-NESS NONCAR-BONATE (MG/L AS CACO3)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	PERCENT SODIUM	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY LAB (MG/L AS CACO3)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVEI (MG/L AS CL)
OCT										
29...	.00	1.6	1.2	2.1	33	.3	.3	10	2.4	3.2
NOV										
18...	.00	.7	.7	1.5	39	.3	.3	7.0	2.3	2.7
DEC										
23...	.00	9.2	5.6	4.5	17	.3	.4	54	3.1	3.6
FEB										
04...	.00	7.0	5.0	5.3	23	.4	.6	48	.7	6.0
25...	6.0	2.4	1.0	2.7	35	.4	.5	4.0	2.0	5.7
MAR										
31...	2.0	1.3	.8	2.1	40	.4	.3	5.0	.5	3.6
APR										
28...	.00	3.2	2.0	3.0	28	.3	.3	20	.6	3.3
MAY										
18...	2.0	3.5	1.9	3.2	29	.3	.4	15	1.8	3.6
JUN										
08...	4.0	7.5	4.1	4.5	21	.4	.4	32	<5.0	3.2
JUL										
13...	.00	7.1	3.9	4.4	22	.3	.4	42	.4	3.7
AUG										
31...	.00	5.7	3.3	3.5	21	.3	.3	31	<1.0	5.0
SEP										
22...	.00	5.0	3.1	4.3	26	.4	.7	26	<5.0	4.9

K Results based on colony count outside the acceptable range (non-ideal colony count).
< Actual value is known to be less than the value shown.

16717000 HONOLII STREAM NEAR PAPAIKOU--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)	SOLIDS, DISSOLVED (TONS PER AC-FT)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N)	NITROGEN, AMMONIA TOTAL (MG/L AS N)	NITROGEN, AMMONIA DISSOLVED (MG/L AS N)
OCT									
29...	.1	1.8	30	19	.04	.00	.01	.060	.050
NOV									
18...	.1	1.6	--	15	.04	.03	.03	.060	.040
DEC									
23...	.1	24	75	83	.10	.00	.00	.000	.000
FEB									
04...	.0	16	72	70	.10	.00	--	.000	.010
25...	.0	2.3	23	20	.03	.17	.18	.050	.110
MAR									
31...	.0	3.3	27	15	.04	.03	.04	.060	.120
APR									
28...	.1	9.9	48	35	.07	.02	.05	.050	.120
MAY									
18...	.0	8.6	35	32	.05	.08	.03	.090	.060
JUN									
08...	.0	21	63	65	.09	.00	.00	.020	.000
JUL									
13...	.0	20	63	65	.09	.53	.07	.020	.050
AUG									
31...	.0	17	58	55	.08	.13	.15	.100	.090
SEP									
22...	.0	17	54	56	.07	<.10	<.10	.080	.050

DATE	NITROGEN, ORGANIC TOTAL (MG/L AS N)	NITROGEN, ORGANIC DISSOLVED (MG/L AS N)	NITROGEN DISSOLVED (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITROGEN, NH4 + ORG. SUSP. TOTAL (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC DIS. (MG/L AS N)	NITROGEN, TOTAL (MG/L AS N)	PHOSPHORUS, TOTAL (MG/L AS P)	PHOSPHORUS, DISSOLVED (MG/L AS P)
OCT									
29...	.63	.60	.66	.69	.04	.65	.69	.030	.010
NOV									
18...	.59	.23	.30	.65	.38	.27	.68	.030	.030
DEC									
23...	.27	.26	.26	.27	.01	.26	.27	.040	.040
FEB									
04...	.23	--	--	.23	--	--	.23	.020	.020
25...	.44	.32	.61	.49	.06	.43	.66	.050	.080
MAR									
31...	.51	.45	.61	.57	.00	.57	.60	.020	.030
APR									
28...	.50	.33	.50	.55	.10	.45	.57	.010	.020
MAY									
18...	1.3	.56	.65	1.40	.78	.62	1.5	.040	.040
JUN									
08...	.98	.37	.37	1.00	.63	.37	1.0	.010	.010
JUL									
13...	.77	--	1.2	.79	.00	--	1.3	.090	.100
AUG									
31...	.10	.09	.33	.20	.02	.18	.33	.030	<.010
SEP									
22...	.45	.24	.43	.53	.24	.29	.53	.010	<.010

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

16717000 HONOLII STREAM NEAR PAPAIKOU--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	TIME	ARSENIC TOTAL (UG/L AS AS)	ARSENIC SUS-PENDED TOTAL (UG/L AS AS)	ARSENIC DIS-SOLVED (UG/L AS AS)	BARIUM, TOTAL RECOV-ERABLE (UG/L AS BA)	BARIUM, SUS-PENDED RECOV-ERABLE (UG/L AS BA)	BARIUM, DIS-SOLVED (UG/L AS BA)	BERYL-LIUM, DIS-SOLVED (UG/L AS BE)	CADMIUM TOTAL RECOV-ERABLE (UG/L AS CD)	CADMIUM DIS-SOLVED (UG/L AS CD)
NOV 18...	0915	1	0	1	200	200	5	<1	0	<1
JUN 08...	0915	0	0	0	0	0	0	<1	1	<1

DATE	CHRO-MIUM, TOTAL RECOV-ERABLE (UG/L AS CR)	CHRO-MIUM, SUS-PENDED RECOV. (UG/L AS CR)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR)	COBALT, DIS-SOLVED (UG/L AS CO)	COPPER, TOTAL RECOV-ERABLE (UG/L AS CU)	COPPER, DIS-SOLVED (UG/L AS CU)	IRON, TOTAL RECOV-ERABLE (UG/L AS FE)	IRON, SUS-PENDED RECOV-ERABLE (UG/L AS FE)	IRON, DIS-SOLVED (UG/L AS FE)	LEAD, TOTAL RECOV-ERABLE (UG/L AS PB)
NOV 18...	0	0	1	<3	5	<10	1600	1200	430	1
JUN 08...	10	7	3	<3	2	<10	80	50	32	16

DATE	LEAD, DIS-SOLVED (UG/L AS PB)	LITHIUM DIS-SOLVED (UG/L AS LI)	MANGA-NESE, TOTAL RECOV-ERABLE (UG/L AS MN)	MANGA-NESE, SUS-PENDED RECOV. (UG/L AS MN)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)	MERCURY TOTAL RECOV-ERABLE (UG/L AS HG)	MERCURY SUS-PENDED RECOV-ERABLE (UG/L AS HG)	MERCURY DIS-SOLVED (UG/L AS HG)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO)	SELE-NIUM, TOTAL (UG/L AS SE)
NOV 18...	<10	<4	30	20	9	.1	.1	.0	<10	0
JUN 08...	<10	<4	10	8	2	.2	.0	.2	<10	0

DATE	SELE-NIUM, SUS-PENDED TOTAL (UG/L AS SE)	SELE-NIUM, DIS-SOLVED (UG/L AS SE)	SILVER, TOTAL RECOV-ERABLE (UG/L AS AG)	SILVER, SUS-PENDED RECOV-ERABLE (UG/L AS AG)	SILVER, DIS-SOLVED (UG/L AS AG)	STRON-TIUM, DIS-SOLVED (UG/L AS SR)	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN)	ZINC, SUS-PENDED RECOV-ERABLE (UG/L AS ZN)	ZINC, DIS-SOLVED (UG/L AS ZN)
NOV 18...	0	0	0	0	0	7	230	--	<3
JUN 08...	0	0	0	0	0	53	4	0	4

DATE	TIME	GROSS ALPHA, DIS-SOLVED (UG/L AS U-NAT)	GROSS ALPHA, SUSP. TOTAL (UG/L AS U-NAT)	GROSS ALPHA, DIS-SOLVED (PCI/L AS U-NAT)	GROSS ALPHA, SUSP. TOTAL (PCI/L AS U-NAT)	GROSS BETA, DIS-SOLVED (PCI/L AS CS-137)	GROSS BETA, SUSP. TOTAL (PCI/L AS CS-137)	GROSS BETA, DIS-SOLVED (PCI/L AS SR/YT-90)	GROSS BETA, SUSP. TOTAL (PCI/L AS SR/YT-90)	RADIUM 226, DIS-SOLVED, RADON METHOD (PCI/L)	URANIUM DIS-SOLVED, EXTRAC-TION (UG/L)
FEB 25...	1230	<.4	<.4	.3	.3	5.0	1.5	4.7	1.6	.04	.03

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

16717000 HONOLII STREAM NEAR PAPAIKOU--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	TIME	CARBON, ORGANIC TOTAL (MG/L AS C)	CARBON, ORGANIC DIS-SOLVED (MG/L AS C)	CARBON, ORGANIC SUS-PENDED TOTAL (MG/L AS C)	CYANIDE TOTAL (MG/L AS CN)	DATE	TIME	CARBON, ORGANIC TOTAL (MG/L AS C)	CARBON, ORGANIC DIS-SOLVED (MG/L AS C)	CARBON, ORGANIC SUS-PENDED TOTAL (MG/L AS C)	CYANIDE TOTAL (MG/L AS CN)
OCT						MAY					
29...	0830	5.8	--	--	--	18...	0930	2.9	--	--	--
NOV						JUN					
18...	0915	--	7.4	.0	--	08...	0915	--	3.0	.0	.01
DEC						JUL					
23...	0915	2.4	--	--	--	13...	0930	1.0	--	--	--
FEB						AUG					
04...	1015	1.9	--	--	--	31...	0915	1.5	--	--	--
25...	1230	4.3	--	--	--	SEP					
MAR						22...	0845	3.3	--	--	--
31...	0900	4.3	--	--	--						
APR											
28...	0830	3.3	--	--	--						

DATE	TIME	PCB, TOTAL (UG/L)	PCB, TOTAL IN BOT-TOM MA-TERIAL (UG/KG)	ALDRIN, TOTAL (UG/L)	ALDRIN, TOTAL IN BOT-TOM MA-TERIAL (UG/KG)	CHLOR-DANE, TOTAL (UG/L)	CHLOR-DANE, TOTAL IN BOT-TOM MA-TERIAL (UG/KG)	DDD, TOTAL (UG/L)	DDD, TOTAL IN BOT-TOM MA-TERIAL (UG/KG)	DDE, TOTAL (UG/L)	DDE, TOTAL IN BOT-TOM MA-TERIAL (UG/KG)	DDT, TOTAL (UG/L)
FEB												
25...	1230	.00	1	.00	.0	.00	.0	.00	.0	.00	.0	.00

DATE	DDT, TOTAL IN BOT-TOM MA-TERIAL (UG/KG)	DI-AZINON, TOTAL (UG/L)	DI-ELDRIN TOTAL (UG/L)	DI-ELDRIN, TOTAL IN BOT-TOM MA-TERIAL (UG/KG)	ENDO-SULFAN, TOTAL (UG/L)	ENDO-SULFAN, TOTAL IN BOT-TOM MA-TERIAL (UG/KG)	ENDRIN, TOTAL (UG/L)	ENDRIN, TOTAL IN BOT-TOM MA-TERIAL (UG/KG)	ETHION, TOTAL (UG/L)	HEPTA-CHLOR, TOTAL (UG/L)	HEPTA-CHLOR, TOTAL IN BOT-TOM MA-TERIAL (UG/KG)	HEPTA-CHLOR EPOXIDE TOTAL (UG/L)
FEB												
25...	.0	.00	.00	.0	.00	.0	.00	.0	.00	.00	.0	.00

DATE	HEPTA-CHLOR EPOXIDE TOT. IN BOTTOM MATL. (UG/KG)	LINDANE TOTAL (UG/L)	LINDANE TOTAL IN BOT-TOM MA-TERIAL (UG/KG)	MALA-THION, TOTAL (UG/L)	METH-OXY-CHLOR, TOTAL (UG/L)	METH-OXY-CHLOR, TOT. IN BOTTOM MATL. (UG/KG)	METHYL PARA-THION, TOTAL (UG/L)	METHYL TRI-THION, TOTAL (UG/L)	NAPH-THA-LENES, POLY-CHLOR. TOTAL (UG/L)	MIREX, TOTAL (UG/L)	MIREX, TOTAL IN BOT-TOM MA-TERIAL (UG/KG)
FEB											
25...	.0	.00	.0	.00	.00	.0	.00	.00	.00	.00	.0

DATE	PARA-THION, TOTAL (UG/L)	PER-THANE TOTAL (UG/L)	PER-THANE IN BOTTOM MATERIL (UG/KG)	PCN, TOTAL IN BOT-TOM MA-TERIAL (UG/KG)	TOX-APHENE, TOTAL (UG/L)	TOXA-PHENE, TOTAL IN BOT-TOM MA-TERIAL (UG/KG)	TOTAL TRI-THION (UG/L)	2,4-D, TOTAL (UG/L)	2, 4-DP TOTAL (UG/L)	2,4,5-T TOTAL (UG/L)	SILVEX, TOTAL (UG/L)
FEB											
25...	.00	.00	.00	.0	.00	.0	.00	.00	.00	.00	.00

16717000 HONOLII STREAM NEAR PAPAIKOU--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SEDI-MENT, SUS-PENDED (MG/L)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
OCT					
29...	0830	88	6	1.4	--
NOV					
18...	0915	540	9	13	100
DEC					
23...	0915	2.3	1	.01	100
FEB					
04...	1015	1.1	0	.00	100
25...	1230	173	2	.93	100
MAR					
31...	0900	101	1	.27	100
APR					
28...	0830	22	3	.18	100
MAY					
18...	0930	30	3	.24	100
JUN					
08...	0915	7.0	2	.04	100
JUL					
13...	0930	7.2	2	.04	100
AUG					
31...	0915	10	1	.03	100
SEP					
22...	0845	9.8	1	.03	100

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).

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. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--17 years, 14.4 ft³/s (0.408 m³/s), 10,430 acre-ft/yr (12.9 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,160 ft³/s (89.5 m³/s) Nov. 18, 1979, gage height, 10.03 ft (3.057 m), from rating curve extended above 53 ft³/s (1.50 m³/s) on basis of computations of peak flow over dam and slope-area measurement at gage height 10.03 ft (3.057 m); minimum, 0.01 ft³/s (<0.001 m³/s) Jan. 20, 21, 24-28, Feb. 20-22, 1977, Dec. 16-20, 1979, Feb. 23, 24, 1980.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 422 ft³/s (12.0 m³/s) Oct. 30, gage height, 4.93 ft (1.503 m), from rating curve extended as explained above, no peak above base of 440 ft³/s (12.5 m³/s); minimum, 0.08 ft³/s (0.002 m³/s) Jan. 14-16, Feb. 3, July 9-11.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.5	4.8	.78	.15	.10	24	1.5	122	2.3	.42	.44	1.5
2	1.5	2.1	.60	.13	.09	37	1.1	20	3.1	.29	.52	2.6
3	1.2	1.5	.47	.10	.09	28	16	3.8	2.2	.22	30	17
4	.82	1.2	.38	.12	.10	15	11	1.8	1.5	.17	40	4.2
5	.64	.92	.33	.50	.34	3.8	4.5	1.2	4.1	.13	9.2	9.5
6	.70	.73	.30	.27	1.1	2.9	2.1	.82	27	.13	2.6	2.8
7	1.1	.58	.28	.18	.41	2.7	2.1	.56	4.6	.11	1.6	1.6
8	74	7.0	.25	.16	26	2.9	1.7	.40	51	.09	19	1.0
9	25	45	.22	.13	14	7.1	1.1	.31	7.9	.09	37	.66
10	19	11	.22	.11	2.5	2.6	.89	.24	2.9	.08	34	.43
11	41	79	.19	.10	1.4	1.6	.73	.20	2.4	.09	27	.32
12	129	32	.19	.09	1.1	1.1	.44	.19	2.8	.29	42	.27
13	31	5.5	.17	.09	.84	.79	.32	.16	2.4	2.1	5.1	.23
14	11	2.2	.16	.08	.51	.54	.27	.13	3.8	1.8	2.3	.22
15	4.1	1.6	.40	.08	.34	.36	.22	.10	4.8	1.2	1.6	.17
16	8.4	1.7	1.2	.08	.25	.32	.21	.11	2.7	3.2	1.1	.12
17	39	29	1.8	1.8	.20	.55	.18	1.4	1.8	1.7	.87	.10
18	13	53	1.0	1.4	.16	1.3	.14	2.4	5.5	1.1	12	.68
19	10	28	.63	.56	.13	1.4	.96	1.6	2.3	1.8	33	.78
20	3.9	7.3	1.9	.95	.12	.91	1.9	18	1.6	24	16	15
21	4.1	2.4	1.2	.89	28	.53	3.7	5.5	1.7	53	2.9	2.1
22	7.8	1.8	.86	.64	51	.34	1.8	2.0	1.2	6.2	2.8	1.2
23	17	6.9	.51	.40	6.5	.27	2.2	1.3	.76	15	13	1.3
24	3.4	6.7	.36	.30	70	.25	17	.94	.50	12	2.9	2.4
25	1.9	2.5	.30	.24	32	.25	22	.64	.36	8.5	1.6	1.6
26	1.5	2.7	.26	.20	48	.33	4.1	.45	.29	2.6	1.2	10
27	1.2	3.3	.23	.17	54	4.8	1.8	.33	.26	1.6	1.0	60
28	9.0	1.7	.19	.18	75	12	1.2	.28	.40	1.3	.91	21
29	34	1.3	.20	.17	---	5.0	.78	1.0	.38	.92	1.2	3.6
30	36	1.0	.18	.16	---	2.3	24	1.3	.55	.73	1.2	1.8
31	81	---	.16	.13	---	2.6	---	4.8	---	.59	1.5	---
TOTAL	612.76	344.43	15.92	10.56	414.28	163.54	125.94	193.96	143.10	141.45	345.54	164.18
MEAN	19.8	11.5	.51	.34	14.8	5.28	4.20	6.26	4.77	4.56	11.1	5.47
MAX	129	79	1.9	1.8	75	37	24	122	51	53	42	60
MIN	.64	.58	.16	.08	.09	.25	.14	.10	.26	.08	.44	.10
AC-FT	1220	683	32	21	822	324	250	385	284	281	685	326

CAL YR 1980	TOTAL 8444.45	MEAN 23.1	MAX 548	MIN .01	AC-FT	16750	
WTR YR 1981	TOTAL 2675.66	MEAN 7.33	MAX 129	MIN .08	AC-FT	5310	

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 Hamakua ditch intake and 4.4 mi (7.1 km) north of Kamuela.

DRAINAGE AREA.--0.45 mi² (1.17 km²).

PERIOD OF RECORD.--June 1968 to current year.

REVISED RECORDS.--WDR HI-80-1: 1969-79(P).

GAGE.--Water-stage recorder. Altitude of gage is 4,090 ft (1,247 m), from topographic map.

REMARKS.--Records good except those for period of no gage-height record, which are fair. No diversion above station. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--13 years, 4.21 ft³/s (0.119 m³/s), 3,050 acre-ft/yr (3.76 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,470 ft³/s (41.6 m³/s) Nov. 18, 1979, gage height, 8.32 ft (2.536 m), from rating curve extended above 33 ft³/s (0.94 m³/s) on basis of slope-area measurement at gage height 8.32 ft (2.536 m); minimum, 0.03 ft³/s (0.001 m³/s) Nov. 12-15, 1968.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 146 ft³/s (4.13 m³/s) Oct. 30, gage height, 3.16 ft (0.963 m), from rating curve extended as explained above, no other peak above base of 100 ft³/s (2.83 m³/s); minimum, 0.07 ft³/s (0.002 m³/s) July 7-11.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.92	1.6	.50	.12	.11	5.0	.48	27	.89	.23	.48	1.2
2	.87	.78	.40	.12	.11	6.9	.28	4.3	1.8	.15	.61	1.2
3	.80	.70	.30	.12	.11	6.5	2.7	1.2	1.2	.11	7.5	3.3
4	.65	.60	.25	.12	.11	3.3	2.2	.61	.75	.09	10	1.8
5	.40	.54	.20	.35	.41	1.6	1.5	.48	1.3	.08	3.3	2.7
6	.45	.52	.20	.25	.30	1.6	.76	.36	6.7	.08	1.5	1.2
7	.85	.48	.18	.18	.14	1.8	.85	.28	1.7	.07	.95	.68
8	18	2.2	.16	.15	6.3	2.1	.61	.28	13	.07	6.1	.48
9	7.0	10	.16	.13	2.3	3.7	.48	.28	2.2	.07	12	.36
10	5.0	3.0	.15	.13	.70	1.8	.32	.21	.99	.07	10	.23
11	10	21	.15	.13	.37	.91	.28	.18	1.2	.07	8.1	.19
12	35	7.8	.14	.13	.19	.85	.18	.18	1.2	.10	10	.18
13	10	1.7	.12	.13	.24	.69	.15	.18	.89	.71	2.1	.17
14	3.0	.78	.25	.13	.18	.61	.15	.15	1.3	.48	1.3	.14
15	1.7	.90	.80	.13	.14	.53	.12	.15	1.7	.28	.95	.12
16	2.3	.95	.95	.14	.12	.53	.12	.12	.82	1.6	.76	.10
17	9.2	7.0	.70	2.0	.10	.60	.12	.36	.69	.54	.68	.10
18	3.4	15	.50	.32	.09	.62	.12	.68	2.2	.48	2.9	.23
19	3.1	7.0	.95	.19	.11	.87	.36	.42	.80	.95	8.5	.95
20	1.0	2.5	.75	.57	.11	.78	.61	3.7	.66	6.1	4.1	3.1
21	1.5	1.0	.65	.28	7.9	.60	1.2	1.6	.68	12	1.5	.85
22	2.5	.95	.40	.24	9.8	.48	.61	.80	.32	2.4	1.9	.54
23	5.0	2.0	.25	.16	1.7	.40	1.2	.58	.26	4.5	4.3	1.0
24	1.4	2.0	.20	.13	16	.40	4.7	.42	.22	4.7	1.8	1.2
25	.82	1.0	.18	.10	7.0	.40	4.5	.19	.18	2.7	1.2	.85
26	.76	1.0	.16	.10	9.1	.81	1.5	.25	.15	1.5	.68	4.1
27	.69	1.5	.15	.11	13	2.5	.76	.20	.13	.95	.68	16
28	3.7	.90	.15	.10	18	3.1	.54	.19	.17	.85	.68	3.7
29	10	.80	.15	.10	---	1.6	.36	1.0	.19	.68	.76	1.2
30	11	.70	.14	.11	---	.68	7.9	.89	.35	.54	.76	.68
31	23	---	.13	.10	---	.68	---	2.5	---	.54	1.0	---
TOTAL	174.01	96.90	10.37	7.07	94.74	52.94	35.66	49.74	44.64	43.69	107.09	48.55
MEAN	5.61	3.23	.33	.23	3.38	1.71	1.19	1.60	1.49	1.41	3.45	1.62
MAX	35	21	.95	2.0	18	6.9	7.9	27	13	12	12	16
MIN	.40	.48	.12	.10	.09	.40	.12	.12	.13	.07	.48	.10
AC-FT	345	192	21	14	188	105	71	99	89	87	212	96

CAL YR 1980 TOTAL 2549.98 MEAN 6.97 MAX 135 MIN .12 AC-FT 5060
WTR YR 1981 TOTAL 765.40 MEAN 2.10 MAX 35 MIN .07 AC-FT 1520

NOTE.--No gage-height record Nov. 15 to Jan. 6.

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.

PERIOD OF RECORD.--January 1964 to September 1979. 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. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--16 years, 7.69 ft^3/s (0.218 m^3/s), 5,570 acre-ft/yr (6.87 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, no flow Nov. 18, 1979 to Oct. 23, 1980.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 21 ft^3/s (0.59 m^3/s) Oct. 29; minimum daily, no flow Oct. 1-23.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	15	2.9	.03	.08	19	1.9	19	3.2	.62	.84	2.0
2	.00	8.9	1.9	.03	.08	19	1.3	16	4.7	.38	.94	3.9
3	.00	6.5	1.4	.03	.07	19	9.8	5.3	3.1	.28	9.1	13
4	.00	5.2	1.0	.02	.08	18	13	2.7	1.7	.20	17	5.4
5	.00	3.6	.84	.45	1.1	12	7.0	1.5	4.3	.14	12	11
6	.00	2.9	.62	.28	1.0	10	3.4	1.0	16	.14	4.3	3.6
7	.00	2.3	.45	.17	.38	11	3.4	.78	6.0	.10	2.4	1.8
8	.00	13	.38	.09	8.2	8.3	2.5	.67	16	.10	12	1.1
9	.00	20	.28	.08	17	16	1.4	.50	9.6	.09	17	.72
10	.00	18	.20	.08	8.9	8.4	1.0	.42	4.0	.09	17	.56
11	.00	20	.17	.08	2.5	5.6	.89	.38	3.9	.10	16	.42
12	.00	20	.10	.07	1.3	2.5	.67	.34	4.1	.34	16	.38
13	.00	15	.09	.06	.84	1.1	.50	.28	3.0	2.7	7.2	.38
14	.00	8.4	.08	.06	.56	.78	.42	.24	5.3	2.0	3.6	.34
15	.00	5.8	.28	.05	.38	.62	.34	.20	7.4	1.2	2.4	.28
16	.00	6.6	1.9	.05	.31	.56	.31	.20	3.9	4.8	1.5	.24
17	.00	19	3.4	7.8	.24	.78	.28	2.2	2.4	2.3	1.3	.20
18	.00	20	.84	2.3	.20	1.8	.24	3.4	8.3	1.4	11	.89
19	.00	20	.45	.50	.17	2.1	1.3	1.9	3.5	2.9	13	1.4
20	.00	16	4.1	1.3	.14	1.3	2.7	11	2.1	8.0	13	11
21	.00	9.6	1.0	.84	12	.84	5.6	7.3	2.3	17	4.0	3.0
22	.00	6.6	.56	.62	20	.67	2.4	2.7	1.3	9.0	4.1	1.4
23	.00	11	.34	.34	16	.50	3.3	1.5	.84	14	13	1.9
24	18	16	.20	.20	17	.45	10	.94	.62	11	4.0	3.6
25	15	9.6	.10	.20	20	.50	16	.67	.45	11	2.1	2.3
26	13	9.6	.08	.20	20	.78	5.6	.50	.38	4.1	1.4	8.4
27	8.8	12	.08	.14	20	4.2	2.7	.38	.34	2.5	1.3	17
28	9.9	5.9	.07	.17	20	14	1.6	.34	.56	1.9	1.2	16
29	21	4.8	.07	.14	---	7.3	1.0	1.5	.50	1.3	1.6	5.2
30	17	3.9	.05	.10	---	3.2	6.0	1.8	.84	1.2	2.1	2.5
31	20	---	.04	.08	---	3.8	---	7.1	---	.94	2.0	---
TOTAL	122.70	335.2	23.97	16.56	188.53	194.08	106.55	92.74	120.63	101.82	214.38	119.91
MEAN	3.96	11.2	.77	.53	6.73	6.26	3.55	2.99	4.02	3.28	6.92	4.00
MAX	21	20	4.1	7.8	20	19	16	19	16	17	17	17
MIN	.00	2.3	.04	.02	.07	.45	.24	.20	.34	.09	.84	.20
AC-FT	243	665	48	33	374	385	211	184	239	202	425	238

WTR YR 1981 TOTAL 1637.07 MEAN 4.49 MAX 21 MIN .00 AC-FT 3250

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.

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. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--13 years, 5.13 ft^3/s (0.145 m^3/s), 3,720 acre-ft/yr (4.59 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 a times each year.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 19 ft^3/s (0.54 m^3/s) May 1; no flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.28	4.4	.45	.00	.00	6.8	1.1	19	2.1	.05	.58	1.3
2	.60	2.2	.33	.00	.00	6.9	.56	12	3.1	.00	.78	1.9
3	1.9	1.2	.26	.00	.00	6.7	4.4	4.1	2.1	.00	4.2	8.2
4	4.1	.82	.19	.00	.00	5.8	9.7	1.6	1.0	.00	11	4.4
5	.88	.60	.16	.00	.00	3.2	4.8	.78	2.1	.00	8.5	7.2
6	.41	.49	.12	.00	.00	2.3	2.2	.49	10	.00	2.5	2.7
7	.20	.41	.08	.00	.00	2.7	1.9	.30	4.7	.00	1.4	1.3
8	.21	3.6	.05	.00	2.8	2.3	1.5	.20	12	.00	8.0	.60
9	.88	7.9	.02	.00	6.0	5.0	.78	.11	7.4	.00	12	.26
10	.34	5.8	.01	.00	1.9	3.0	.49	.05	3.1	.00	12	.12
11	.20	10	.01	.00	.51	1.4	.33	.02	2.6	.00	12	.03
12	.24	7.8	.00	.00	.20	.78	.18	.01	2.9	.00	12	.00
13	.10	4.4	.00	.00	.05	.45	.05	.00	2.0	.00	5.7	.00
14	.60	2.1	.00	.00	.00	.26	.02	.00	3.7	.87	2.4	.00
15	.33	1.1	.08	.00	.00	.13	.00	.00	4.8	.77	1.5	.00
16	.22	1.2	.53	.00	.00	.05	.00	.00	2.9	2.7	.91	.00
17	.60	7.1	.86	1.9	.00	.26	.00	.00	1.6	1.5	.65	.00
18	.52	9.2	.35	.59	.00	1.1	.00	.00	5.0	.85	6.3	.00
19	.33	7.9	.16	.03	.00	1.2	.12	.00	2.4	1.7	9.3	.01
20	.26	5.2	1.0	.16	.00	.78	1.4	2.1	1.4	5.4	9.7	6.6
21	.20	2.5	.43	.06	2.9	.37	2.7	4.4	1.4	12	3.3	1.6
22	.22	1.5	.21	.00	.00	.18	1.2	1.4	.71	6.5	2.4	.45
23	.52	2.8	.08	.00	4.1	.07	1.0	.64	.31	10	9.0	.76
24	.18	4.7	.02	.00	7.0	.02	10	.33	.15	7.5	3.2	2.1
25	.07	2.4	.00	.00	7.0	.02	12	.17	.03	8.0	1.5	.95
26	.04	2.4	.00	.00	7.3	.05	4.2	.06	.00	2.4	.84	4.7
27	.02	3.2	.00	.00	7.9	2.0	1.6	.01	.00	1.6	.71	12
28	.44	1.4	.00	.00	8.9	10	.84	.00	.00	1.5	.65	10
29	6.6	.82	.00	.00	---	4.8	.41	.55	.00	.94	.93	3.8
30	5.8	.58	.00	.00	---	2.0	2.8	.66	.01	.88	.85	1.5
31	12	---	.00	.00	---	2.6	---	3.6	---	.87	1.2	---
TOTAL	39.29	105.72	5.40	2.74	56.56	73.22	66.28	52.58	79.51	66.03	146.00	72.48
MEAN	1.27	3.52	.17	.088	2.02	2.36	2.21	1.70	2.65	2.13	4.71	2.42
MAX	12	10	1.0	1.9	8.9	10	12	19	12	12	12	12
MIN	.02	.41	.00	.00	.00	.02	.00	.00	.00	.00	.58	.00
AC-FT	78	210	11	5.4	112	145	131	104	158	131	290	144

CAL YR 1980 TOTAL 595.24 MEAN 1.63 MAX 30 MIN .00 AC-FT 1180
WTR YR 1981 TOTAL 765.81 MEAN 2.10 MAX 19 MIN .00 AC-FT 1520

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).

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. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--17 years, 6.66 ft³/s (0.189 m³/s), 4,830 acre-ft/yr (5.96 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,170 ft³/s (61.4 m³/s) Nov. 18, 1979, gage height, 9.90 ft (3.018 m), from rating curve extended above 28 ft³/s (0.79 m³/s) on basis of computations of peak flow over dam and slope-area measurement at gage height 9.90 ft (3.018 m); minimum, 0.03 ft³/s (0.001 m³/s) on several days in 1965.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 260 ft³/s (7.36 m³/s) Oct. 31, gage height, 5.45 ft (1.661 m), from rating curve extended as explained above, no other peak above base of 120 ft³/s (3.40 m³/s); minimum discharge, 0.06 ft³/s (0.002 m³/s) July 10, 12.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.2	5.2	.77	.39	.25	8.8	.95	50	2.6	.14	.13	.70
2	2.2	4.4	.70	.39	.25	11	.69	10	2.5	.12	.12	.77
3	1.6	2.5	.64	.39	.27	11	2.8	4.2	2.2	.12	4.0	3.7
4	1.4	1.1	.62	.39	.25	7.1	5.9	2.2	1.3	.11	13	2.0
5	1.2	.92	.59	.39	.30	3.2	3.6	1.4	1.5	.11	4.2	2.7
6	1.2	.82	.57	.35	.32	2.7	2.1	1.0	9.6	.11	2.3	1.9
7	1.3	.71	.55	.29	.27	3.7	1.6	.83	4.0	.10	1.1	.88
8	37	1.0	.54	.29	9.4	4.0	1.4	.64	20	.10	6.2	.49
9	10	12	.50	.27	5.9	8.2	1.1	.41	6.2	.10	16	.21
10	7.6	3.6	.50	.25	2.4	4.0	.84	.36	2.4	.08	16	.14
11	16	32	.46	.25	1.3	2.5	.63	.36	1.4	.07	8.9	.14
12	50	12	.46	.25	.87	1.7	.56	.33	1.7	.07	12	.13
13	14	2.6	.46	.25	.66	1.3	.53	.29	1.1	.16	3.1	.13
14	5.5	1.7	.46	.25	.39	1.0	.50	.29	2.0	.13	2.0	.12
15	3.5	1.2	.47	.23	.36	.76	.51	.29	2.5	.13	1.2	.12
16	3.2	1.1	.69	.22	.35	.55	.48	.29	2.0	1.5	.83	.12
17	12	8.0	.82	2.1	.33	.69	.45	.33	1.2	.83	.60	.12
18	6.7	17	.63	1.6	.33	1.3	.43	.44	2.8	.30	2.8	.20
19	4.9	8.8	.53	.73	.30	1.7	.58	.61	1.7	.99	10	.41
20	3.0	3.5	.77	.84	.29	1.2	1.1	4.1	.92	4.3	6.2	3.6
21	2.8	1.8	.67	.81	9.8	.91	2.1	4.2	.65	36	2.3	1.4
22	3.2	1.4	.56	.63	19	.62	1.5	1.7	.39	3.4	1.9	.56
23	7.3	1.5	.47	.39	3.6	.52	1.7	1.0	.20	6.4	4.9	.78
24	3.0	1.9	.43	.36	16	.56	8.4	.76	.13	5.8	2.1	2.0
25	2.0	1.3	.43	.35	14	.58	10	.54	.13	4.0	1.1	.94
26	1.6	1.5	.43	.33	12	.74	4.1	.51	.12	2.0	.70	2.6
27	1.4	2.2	.43	.32	23	2.2	2.4	.48	.11	1.0	.57	25
28	4.3	1.3	.43	.29	31	6.7	1.4	.49	.13	.66	.46	7.8
29	21	.99	.41	.27	---	3.4	1.0	1.5	.12	.42	.49	2.7
30	15	.85	.39	.25	---	1.6	13	1.6	.14	.28	.50	1.6
31	45	---	.39	.24	---	1.3	---	3.8	---	.17	.52	---
TOTAL	291.1	134.89	16.77	14.36	153.19	95.53	72.35	94.95	71.74	69.70	126.22	63.96
MEAN	9.39	4.50	.54	.46	5.47	3.08	2.41	3.06	2.39	2.25	4.07	2.13
MAX	50	32	.82	2.1	31	11	13	50	20	36	16	25
MIN	1.2	.71	.39	.22	.25	.52	.43	.29	.11	.07	.12	.12
AC-FT	577	268	33	28	304	189	144	188	142	138	250	127

CAL YR 1980 TOTAL 3821.15 MEAN 10.4 MAX 315 MIN .26 AC-FT 7580
WTR YR 1981 TOTAL 1204.76 MEAN 3.30 MAX 50 MIN .07 AC-FT 2390

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.

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, which are fair. Ditch diverts from Kawainui, Kawaiki, and Alakahi Streams for use in vicinity of Kamuela. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--7 years, 9.21 ft^3/s (0.261 m^3/s), 6,670 acre-ft/yr (8.22 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 48 ft^3/s (1.36 m^3/s) Apr. 6, 1977, and Jan. 13, 1979; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 36 ft^3/s (1.02 m^3/s) May 1; no flow Jan. 2-4, 7-17, 27, Feb. 10-12, July 3-15, Sept. 10-17.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.3	4.1	2.1	.05	14	14	1.6	36	1.7	.05	.35	.85
2	3.8	2.5	1.8	.00	4.7	8.3	.89	14	2.9	.01	.20	1.0
3	2.5	3.0	1.6	.00	1.8	4.5	3.4	6.2	2.8	.00	5.0	4.0
4	1.9	3.8	1.4	.00	.84	2.6	7.0	3.7	1.4	.00	15	1.5
5	1.7	3.1	1.3	.10	.56	1.7	6.7	1.9	1.5	.00	5.0	2.0
6	1.6	2.6	1.1	.05	.32	1.2	3.7	1.2	7.6	.00	3.0	1.0
7	1.8	2.2	.99	.00	.17	.84	2.7	.91	6.0	.00	2.0	.50
8	19	4.4	.91	.00	.10	.74	2.1	.75	14	.00	7.0	.10
9	13	18	.83	.00	.01	.92	1.2	.62	6.9	.00	20	.05
10	9.3	13	.63	.00	.00	3.5	.81	.54	5.1	.00	20	.00
11	16	25	.52	.00	.00	3.5	.68	.50	3.4	.00	10	.00
12	25	22	.46	.00	.00	2.0	.44	.45	4.0	.00	15	.00
13	17	10	.44	.00	2.6	1.1	.32	.40	2.2	.00	3.5	.00
14	9.5	6.5	.41	.00	13	.70	.25	.35	5.3	.00	2.5	.00
15	5.7	4.6	.47	.00	5.7	.53	.48	.32	5.6	.00	2.0	.00
16	4.5	4.5	.73	.00	15	.55	.62	.29	3.7	.16	1.5	.00
17	11	17	1.7	.00	13	.60	.29	.30	1.9	.13	1.0	.00
18	9.8	23	.99	5.9	13	1.5	.17	.99	6.2	.10	3.5	.16
19	6.6	21	.66	1.5	22	2.0	.17	.60	2.9	.20	12	.62
20	4.8	13	1.3	.50	23	1.5	1.2	1.5	1.7	6.2	7.0	9.7
21	4.4	6.7	1.0	.51	11	.95	2.1	2.8	1.3	26	3.0	1.6
22	5.2	5.3	.68	.38	10	.65	.94	1.1	.85	8.5	2.5	.48
23	12	5.2	.49	.23	9.1	.55	1.6	.66	.49	14	5.0	.73
24	4.7	8.1	.38	.14	8.1	.60	9.6	.40	.33	13	2.5	2.1
25	3.4	6.1	.30	.10	5.7	.65	13	.28	.26	11	1.5	.53
26	2.6	6.3	.26	.01	5.2	.78	6.2	.26	.21	3.5	1.0	4.8
27	2.1	8.3	.23	.00	8.0	1.4	2.7	.18	.16	1.7	.70	26
28	3.4	5.0	.21	.07	6.7	8.6	1.3	.17	.20	1.4	.65	21
29	20	3.3	.20	.05	---	7.4	.68	1.4	.15	.97	.70	6.2
30	12	2.5	.16	.01	---	2.9	10	1.0	.12	.56	.75	3.6
31	17	---	.11	.56	---	3.2	---	2.5	---	.45	.80	---
TOTAL	254.6	260.1	24.36	10.16	193.60	79.96	82.84	82.27	90.87	87.93	154.65	88.52
MEAN	8.21	8.67	.79	.33	6.91	2.58	2.76	2.65	3.03	2.84	4.99	2.95
MAX	25	25	2.1	5.9	23	14	13	36	14	26	20	26
MIN	1.6	2.2	.11	.00	.00	.53	.17	.17	.12	.00	.20	.00
AC-FT	505	516	48	20	384	159	164	163	180	174	307	176

CAL YR 1980 TOTAL 3104.41 MEAN 8.48 MAX 31 MIN .11 AC-FT 6160
WTR YR 1981 TOTAL 1409.86 MEAN 3.86 MAX 36 MIN .00 AC-FT 2800

NOTE.--No gage-height record July 31 to Sept. 17.

16727000 UPPER HAMAKUA DITCH ABOVE PUUKAPU RESERVOIR, NEAR KAMUELA

LOCATION.--Lat 20°02'53", long 155°37'17", Hydrologic Unit 20010000, on right bank 25 ft (7.6 m) downstream from pipe railed bridge and 4.0 mi (6.4 km) northeast of Kamuela Post Office.

PERIOD OF RECORD.--October 1977 to current year.

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 2,890 ft (881 m), from topographic map.

REMARKS.--Records good. Ditch diverts above into 60 mg Waimea Reservoir for use in vicinity of Kamuela.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 29 ft^3/s (0.82 m^3/s) Nov. 11, 12, 19, 1980; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 29 ft^3/s (0.82 m^3/s) Nov. 11, 12, 19; no flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	3.8	.00	.00	.00	4.8	.02	26	.00	.00	.00	.00
2	.00	1.8	.00	.00	.00	1.6	.04	16	.00	.00	.00	.00
3	.00	.51	.00	.00	.00	.38	.05	1.9	.00	.00	1.5	1.1
4	.00	.03	.00	.00	.00	6.1	.12	.70	.00	.00	5.4	.04
5	.00	.00	.02	.00	.00	3.2	.24	.04	.00	.00	3.6	1.4
6	.00	.00	.04	.00	.00	.04	.11	.00	4.1	.00	.02	.07
7	.00	.00	.04	.00	.00	.05	.00	.00	2.0	.00	.00	.00
8	.00	.05	.01	.00	.02	.08	.00	.00	15	.00	2.8	.00
9	.00	.12	.00	.04	1.7	.15	.00	.00	1.7	.00	5.6	.00
10	.00	8.6	.03	.00	.00	11	.00	.00	.00	.00	5.6	.00
11	.00	29	.06	.00	.00	4.9	.00	.00	.00	.00	5.3	.00
12	.00	29	.06	.00	.00	.00	.00	.00	.00	.00	5.3	.00
13	.00	13	.06	.00	.00	.00	.00	.00	.00	.00	4.6	.00
14	.00	6.6	.05	.00	.00	.00	.00	.00	.00	.00	1.6	.00
15	.00	4.1	.02	.00	.00	.00	.00	.00	.08	.00	.30	.00
16	.00	3.8	.00	.00	.00	.00	.00	.00	.02	.00	.07	.00
17	.00	22	.00	.00	.05	.00	.00	.00	.00	.00	.00	.00
18	.00	28	.00	.00	.00	.00	.00	.00	.11	.00	1.9	.00
19	.00	29	.00	.00	.00	.00	.00	.00	.00	.00	4.0	.00
20	.00	19	.00	.00	.00	.00	.00	.00	.00	5.0	5.3	.29
21	.00	6.6	.00	.00	.02	.00	.00	.00	.00	10	1.4	.00
22	.30	2.2	.00	.00	1.4	.00	.00	.00	.00	.87	.80	.00
23	1.5	.01	.00	.00	.00	.00	.00	.00	.00	.54	5.3	.00
24	1.0	.05	.00	.00	5.4	.00	.00	.00	.00	1.5	2.3	.00
25	.90	.02	.00	.00	6.6	.00	.24	.00	.00	1.9	.88	.00
26	.80	.08	.00	.00	1.7	.00	.01	.00	.00	.00	.18	.61
27	.75	.12	.00	.00	7.2	.00	.00	.00	.00	.00	.00	4.8
28	.50	.12	.00	.00	15	.00	.00	.00	.00	.00	.00	.80
29	10	.03	.00	.00	---	.00	.00	.00	.00	.00	.00	.00
30	20	.00	.00	.00	---	.00	.11	.00	.00	.00	.00	.00
31	15	---	.00	.00	---	.00	---	.00	---	.00	.00	---
TOTAL	50.75	207.64	.39	.04	39.09	32.30	.94	44.64	23.01	19.81	63.75	9.11
MEAN	1.64	6.92	.013	.001	1.40	1.04	.031	1.44	.77	.64	2.06	.30
MAX	20	29	.06	.04	15	11	.24	26	15	10	5.6	4.8
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	101	412	.8	.08	78	64	1.9	89	46	39	126	18

CAL YR 1980 TOTAL 516.83 MEAN 1.41 MAX 29 MIN .00 AC-FT 1030
WTR YR 1981 TOTAL 491.47 MEAN 1.35 MAX 29 MIN .00 AC-FT 975

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 mi² (6.50 km²).

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. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--25 years, 8.61 ft³/s (0.244 m³/s), 6,240 acre-ft/yr (7.69 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,880 ft³/s (110 m³/s) Aug. 7, 1958, gage height, 10.76 ft (3.280 m), site and datum then in use, from rating curve extended above 70 ft³/s (1.98 m³/s), by test of model of station site; no flow at times in 1968, 1971-81.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 360 ft³/s (10.2 m³/s) Oct. 31, gage height, 4.50 ft (1.372 m), from rating curve extended above 46 ft³/s (1.30 m³/s) on basis of computation of flow over dam at gage height 6.20 ft (1.890 m), no other 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 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.85	5.7	.00	.00	.00	2.2	.00	43	.00	.00	.00	.00
2	1.2	2.9	.00	.00	.00	6.4	.00	4.5	.00	.00	.00	.00
3	.64	2.2	.00	.00	.00	5.0	.00	.00	.00	.00	.00	.00
4	.56	1.7	.00	.00	.00	1.9	.00	.00	.00	.00	7.8	.00
5	.10	1.4	.00	.00	.00	.00	.00	.00	.00	.00	.01	.00
6	.00	1.1	.00	.00	.00	.25	.00	.00	.13	.00	.00	.00
7	.00	.48	.00	.00	.00	.66	.00	.00	.00	.00	.00	.00
8	38	.01	.00	.00	11	.36	.00	.00	17	.00	1.8	.00
9	13	7.1	.00	.00	4.9	1.3	.00	.00	.41	.00	7.5	.00
10	8.8	1.1	.00	.00	.00	.60	.00	.00	.00	.00	12	.00
11	27	35	.00	.00	.00	.17	.00	.00	.00	.00	8.1	.00
12	76	23	.00	.00	.00	.05	.00	.00	.00	.00	19	.00
13	27	3.6	.00	.00	.00	.03	.00	.00	.00	.00	1.5	.00
14	8.3	1.7	.00	.00	.00	.00	.00	.00	.00	.00	.41	.00
15	3.5	1.2	.00	.00	.00	.00	.00	.00	.00	.00	.20	.00
16	2.7	.95	.00	.00	.00	.00	.00	.00	.00	.00	.15	.00
17	14	4.2	.00	.00	.00	.00	.00	.00	.00	.00	.02	.00
18	13	23	.00	.00	.00	.00	.00	.00	.00	.00	.35	.00
19	4.6	16	.00	.00	.00	.00	.00	.00	.00	.00	9.7	.00
20	2.9	5.0	.00	.00	.00	.00	.00	.00	.00	.00	5.2	.00
21	2.3	1.4	.00	.00	.04	.00	.00	.00	.00	12	.65	.00
22	2.4	.90	.00	.00	17	.00	.00	.00	.00	.00	.23	.00
23	8.3	.62	.00	.00	.00	.00	.00	.00	.00	.00	1.7	.00
24	2.9	.53	.00	.00	17	.00	.00	.00	.00	.25	.33	.00
25	2.0	.36	.00	.00	11	.00	.39	.00	.00	.06	.06	.00
26	1.6	.20	.00	.00	6.6	.00	.00	.00	.00	.00	.03	.00
27	1.3	.00	.00	.00	24	.00	.00	.00	.00	.00	.01	8.2
28	.30	.00	.00	.00	32	.00	.00	.00	.00	.00	.00	3.6
29	17	.00	.00	.00	---	.00	.00	.00	.00	.00	.00	.00
30	6.2	.00	.00	.00	---	.00	1.8	.00	.00	.00	.00	.00
31	73	---	.00	.00	---	.00	---	.00	---	.00	.00	---
TOTAL	359.45	141.35	.00	.00	123.54	18.92	2.19	47.50	17.54	12.31	76.75	11.80
MEAN	11.6	4.71	.000	.000	4.41	.61	.073	1.53	.58	.40	2.48	.39
MAX	76	35	.00	.00	32	6.4	1.8	43	17	12	19	8.2
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	713	280	.00	.00	245	38	4.3	94	35	24	152	23

CAL YR 1980	TOTAL	5931.12	MEAN	16.2	MAX 411	MIN .00	AC-FT	11760
WTR YR 1981	TOTAL	811.35	MEAN	2.22	MAX 76	MIN .00	AC-FT	1610

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).

PERIOD OF RECORD.--May 1947 to current year.

REVISED RECORDS.--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. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--34 years, 8.82 ft³/s (0.250 m³/s), 6,390 acre-ft/yr (7.88 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,410 ft³/s (96.6 m³/s) Nov. 18, 1979, gage height, 6.84 ft (2.085 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, 248 ft³/s (7.02 m³/s) Oct. 31, gage height, 3.56 ft (1.085 m); minimum, 0.81 ft³/s (0.023 m³/s) July 12.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.6	7.2	2.8	2.0	1.1	11	1.3	69	4.5	1.4	1.3	1.9
2	3.8	4.7	2.7	2.0	1.1	9.8	1.3	16	3.1	1.2	1.2	1.9
3	2.7	3.9	2.6	2.0	1.1	9.5	1.4	7.1	1.9	1.1	5.5	2.5
4	3.0	3.5	2.6	2.0	1.1	7.6	1.7	4.2	1.5	1.0	14	2.3
5	2.9	3.2	2.5	2.3	1.5	5.3	2.0	3.2	1.4	1.0	5.7	2.8
6	2.8	3.0	2.5	2.0	1.2	3.4	1.7	2.8	4.4	1.0	3.1	2.4
7	2.8	2.9	2.5	1.9	1.1	4.6	1.5	2.4	3.3	.99	2.2	2.0
8	28	3.1	2.5	1.9	5.2	4.7	1.4	2.1	13	.91	11	1.9
9	12	7.3	2.4	1.9	6.9	7.0	1.3	1.8	4.6	.88	18	1.8
10	7.7	5.5	2.4	1.9	2.6	3.8	1.4	1.6	2.9	.88	21	1.7
11	22	24	2.4	1.9	1.7	2.7	1.3	1.5	2.4	.92	12	1.7
12	56	16	2.4	1.8	1.5	2.3	1.2	1.4	2.2	.88	20	1.7
13	15	5.7	2.4	1.8	1.3	2.0	1.2	1.3	2.2	2.1	5.0	1.6
14	12	4.0	2.3	1.8	1.3	1.9	1.2	1.3	3.0	2.2	3.3	1.6
15	5.3	3.4	2.7	1.8	1.3	1.8	1.4	1.3	5.7	1.9	2.8	1.6
16	4.8	3.4	2.8	1.8	1.2	1.9	1.4	1.2	5.2	3.9	2.4	1.5
17	8.4	10	2.8	2.5	1.2	1.9	1.3	1.5	3.4	3.4	2.4	1.5
18	7.2	18	2.5	2.0	1.2	2.6	1.2	2.5	5.1	2.5	3.4	1.8
19	5.3	13	2.5	1.8	1.2	2.6	1.4	2.3	4.0	4.2	10	2.0
20	4.1	7.7	3.1	2.2	1.1	2.1	1.7	3.7	2.6	10	7.4	4.9
21	3.6	4.4	2.6	2.0	3.6	1.8	3.1	4.9	2.2	22	3.4	2.7
22	5.1	3.8	2.4	1.8	14	1.6	2.9	3.6	1.9	7.2	4.2	2.1
23	8.9	3.6	2.3	1.7	5.5	1.6	3.1	2.2	1.6	7.6	7.3	2.3
24	4.3	3.5	2.4	1.7	15	1.6	10	1.9	1.4	7.8	3.5	2.9
25	3.5	3.4	2.2	1.6	13	1.5	14	1.6	1.2	5.2	2.6	2.2
26	3.0	3.7	2.2	1.6	13	1.7	7.0	1.4	1.2	2.9	2.4	3.9
27	2.8	4.4	2.2	1.3	26	1.7	3.9	1.2	1.2	2.2	2.2	22
28	3.8	3.4	2.2	1.1	28	2.7	2.9	1.1	1.3	1.8	2.1	10
29	20	3.1	2.2	1.2	---	2.0	2.3	2.6	1.2	1.6	2.1	3.7
30	16	2.9	2.1	1.1	---	1.6	9.4	2.5	1.4	1.4	2.0	2.7
31	60	---	2.0	1.1	---	1.4	---	4.9	---	1.4	2.0	---
TOTAL	340.4	185.7	76.2	55.5	154.0	107.7	86.9	156.1	91.0	103.46	185.5	95.6
MEAN	11.0	6.19	2.46	1.79	5.50	3.47	2.90	5.04	3.03	3.34	5.98	3.19
MAX	60	24	3.1	2.5	28	11	14	69	13	22	21	22
MIN	2.7	2.9	2.0	1.1	1.1	1.4	1.2	1.1	1.2	.88	1.2	1.5
AC-FT	675	368	151	110	305	214	172	310	180	205	368	190

CAL YR 1980	TOTAL	5463.90	MEAN 14.9	MAX 351	MIN 1.7	AC-FT	10840
WTR YR 1981	TOTAL	1638.06	MEAN 4.49	MAX 69	MIN .88	AC-FT	3250

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 mi² (1.22 km²).

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 (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. Observations of specific conductance, pH, and water temperature made during the year are published elswehere in this report.

AVERAGE DISCHARGE.--25 years, 1.55 ft³/s (0.044 m³/s), 1,120 acre-ft/yr (1.38 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 822 ft³/s (23.3 m³/s) Nov. 18, 1979, gage height, 4.56 ft (1.390 m), from rating curve extended above 11 ft³/s (0.31 m³/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, 108 ft³/s (3.06 m³/s) Oct. 30, gage height, 2.79 ft (0.850 m), from rating curve extended above 54 ft³/s (1.53 m³/s), no other peak above base of 78 ft³/s (2.21 m³/s); no flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.26	.77	.19	.06	.00	.95	.03	16	.06	.02	.02	.07
2	.26	.47	.18	.06	.00	.70	.02	2.1	.06	.01	.02	.08
3	.25	.38	.18	.06	.00	.46	.02	.43	.05	.00	.90	.10
4	.25	.33	.17	.06	.00	.30	.05	.21	.04	.00	2.1	.08
5	.22	.30	.16	.12	.05	.15	.07	.14	.05	.00	.58	.13
6	.22	.28	.16	.07	.02	.12	.06	.09	.41	.00	.21	.09
7	.24	.28	.16	.06	.00	.10	.04	.08	.13	.00	.11	.06
8	4.8	.29	.16	.06	.09	.08	.03	.07	2.3	.00	1.6	.05
9	1.4	.49	.15	.06	.47	.12	.02	.06	.31	.00	3.1	.05
10	1.0	.38	.14	.05	.08	.09	.05	.06	.13	.00	3.8	.04
11	2.6	4.0	.13	.04	.04	.07	.12	.05	.09	.00	2.7	.04
12	18	2.1	.12	.04	.02	.06	.05	.05	.08	.00	4.4	.04
13	2.9	.55	.12	.04	.00	.04	.03	.04	.07	.00	.60	.05
14	1.1	.37	.12	.04	.00	.04	.02	.04	.08	.00	.29	.04
15	.70	.31	.19	.03	.00	.03	.04	.03	.15	.00	.19	.03
16	.54	.37	.17	.03	.00	.04	.09	.03	.14	.00	.15	.03
17	1.3	1.5	.13	.06	.00	.04	.05	.05	.08	.00	.13	.02
18	1.0	3.3	.11	.06	.00	.06	.03	.05	.12	.00	.16	.06
19	.58	1.4	.10	.05	.00	.06	.03	.04	.08	.06	.86	.06
20	.43	.77	.12	.09	.00	.05	.03	.06	.06	.75	.73	.41
21	.37	.44	.10	.06	.89	.03	.03	.07	.05	2.4	.21	.10
22	.50	.37	.09	.04	1.4	.02	.02	.05	.04	.24	.46	.06
23	.94	.33	.09	.03	.14	.02	.02	.04	.03	.16	.73	.07
24	.41	.32	.08	.03	2.0	.04	.80	.03	.02	.31	.22	.09
25	.32	.30	.08	.03	1.0	.03	1.4	.02	.02	.26	.14	.06
26	.27	.32	.08	.04	1.7	.06	.33	.00	.00	.10	.10	.12
27	.25	.39	.08	.07	3.9	.06	.12	.00	.01	.07	.09	2.6
28	.38	.27	.08	.05	5.7	.20	.08	.00	.05	.06	.09	.82
29	2.7	.23	.08	.00	---	.08	.06	.13	.03	.04	.08	.19
30	4.5	.21	.08	.00	---	.06	2.3	.08	.03	.04	.07	.11
31	12	---	.07	.00	---	.04	---	.07	---	.03	.07	---
TOTAL	60.69	21.82	3.87	1.49	17.50	4.20	6.04	20.17	4.77	4.55	24.91	5.75
MEAN	1.96	.73	.12	.048	.63	.14	.20	.65	.16	.15	.80	.19
MAX	18	4.0	.19	.12	5.7	.95	2.3	16	2.3	2.4	4.4	2.6
MIN	.22	.21	.07	.00	.00	.02	.02	.00	.00	.00	.02	.02
AC-FT	120	43	7.7	3.0	35	8.3	12	40	9.5	9.0	49	11

CAL YR 1980 TOTAL 1062.62 MEAN 2.90 MAX 108 MIN .07 AC-FT 2110
WTR YR 1981 TOTAL 175.76 MEAN .48 MAX 18 MIN .00 AC-FT 349

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 mi² (4.90 km²).

PERIOD OF RECORD.--April 1960 to current year.

REVISED RECORDS.--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. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--21 years, 0.309 ft³/s (0.009 m³/s), 224 acre-ft/yr (276,000 m³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,630 ft³/s (46.2 m³/s) Oct. 3, 1968, gage height, 5.78 ft (1.762 m), from rating curve extended above 9.1 ft³/s (0.26 m³/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, 269 ft³/s (7.62 m³/s) Apr. 28, gage height, 4.43 ft (1.350 m), from rating curve extended as explained above, no other peak above base of 115 ft³/s (3.26 m³/s); no flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.09	.00	.00	.00	.00	.00	.00	.10	.07	.02	.00	.01
2	.48	.00	.00	.00	.00	.00	.00	.14	.06	.02	.00	.01
3	.25	.00	.00	.00	.00	.00	.00	.07	.05	.02	.00	.00
4	.16	.00	.00	.00	.00	.00	.00	.05	.03	.05	.00	.00
5	.08	.00	.00	.00	.00	.00	.01	.02	.02	.10	.00	.02
6	.05	.00	.00	.00	.00	.00	.01	.01	.03	.14	.06	.02
7	.04	.00	.00	.00	.00	.00	.01	.01	.07	.07	.19	.01
8	.05	.00	.00	.00	.00	.00	.00	.01	.06	.04	.14	.01
9	.04	.00	.00	.00	.00	.00	.00	.00	.05	.04	.05	.01
10	.05	.00	.00	.00	.00	.00	.00	.00	.04	.03	.03	.00
11	.08	.00	.00	.00	.00	.00	.00	.02	.02	.03	.04	.00
12	.09	.00	.00	.00	.00	.00	.00	.04	.02	.09	.05	.00
13	.08	.00	.00	.00	.00	.00	.00	.02	.09	.10	.12	.00
14	.08	.00	.00	.00	.00	.00	.00	.01	.04	.09	.16	.00
15	.06	.00	.32	.00	.00	.00	.00	.01	.03	.05	.11	.00
16	.05	.00	.02	.00	.00	.00	.00	.01	.02	.03	.21	.00
17	.02	.00	.01	.00	.00	.00	.00	.01	.02	.03	.17	.00
18	.02	.00	.00	.00	.00	.00	.01	.01	.04	.02	.09	.00
19	.01	.00	.00	.00	.00	.00	.06	.01	.09	.03	.05	.00
20	.01	.00	.00	.00	.00	.00	.05	.15	.06	.02	.04	.00
21	.04	.00	.00	.00	.00	.00	.02	.10	.03	.01	.03	.00
22	.06	.00	.00	.00	.00	.00	.01	.06	.02	.08	.02	.00
23	.06	.00	.00	.00	.00	.00	.00	.05	.01	.11	.01	.00
24	.05	.00	.00	.00	.00	.00	.00	.08	.01	.10	.01	.00
25	.02	.00	.00	.00	.00	.00	.00	.16	.01	.04	.01	.00
26	.02	.00	.00	.00	.00	.00	.00	.11	.01	.01	.01	.00
27	.01	.00	.00	.00	.00	.00	.05	.09	.01	.01	.00	.00
28	.01	.00	.00	.00	.00	.00	12	.06	.01	.01	.00	.00
29	.01	.00	.00	.00	---	.00	.55	.05	.01	.01	.05	.00
30	.01	.00	.00	.00	---	.00	.25	.06	.01	.00	.03	.00
31	.01	---	.00	.00	---	.00	---	.06	---	.00	.01	---
TOTAL	2.09	.00	.35	.00	.00	.00	13.03	1.58	1.04	1.40	1.69	.09
MEAN	.067	.000	.011	.000	.000	.000	.43	.051	.035	.045	.055	.003
MAX	.48	.00	.32	.00	.00	.00	12	.16	.09	.14	.21	.02
MIN	.01	.00	.00	.00	.00	.00	.00	.00	.01	.00	.00	.00
AC-FT	4.1	.00	.7	.00	.00	.00	26	3.1	2.1	2.8	3.4	.2

CAL YR 1980 TOTAL 175.84 MEAN .48 MAX 68 MIN .00 AC-FT 349
WTR YR 1981 TOTAL 21.27 MEAN .058 MAX 12 MIN .00 AC-FT 42

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 mi² (1.74 km²).

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 except those for period of no gage-height record, which are fair. No diversion above station. Banks overflow at high stage and part of overflow is lost in lava. Recording rain gage located at station. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--23 years, 0.205 ft³/s (0.006 m³/s), 149 acre-ft/yr (184,000 m³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 104 ft³/s (2.95 m³/s) Jan. 13, 1959, gage height, 2.32 ft (0.707 m), from rating curve extended above 5.7 ft³/s (0.161 m³/s); no flow at times each year.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 25 ft³/s (0.71 m³/s) and maximum (*), from rating curve extended above 17 ft³/s (0.48 m³/s):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Apr. 28	1430	25	0.71	1.58	0.482
Sept. 28	1730	*34	.96	*1.67	.509

No flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.05	.06	.00	.00	.00	.00	.00	.04	.12	.11	.00	.02
2	.06	.00	.00	.00	.00	.00	.01	.07	.02	.03	.00	.02
3	.01	.00	.00	.00	.00	.00	.02	.20	.00	.06	.00	.01
4	.00	.00	.00	.00	.00	.00	.04	.31	.00	.03	.00	.01
5	.00	.00	.00	.00	.02	.00	.04	.07	.00	.02	.01	.10
6	.00	.00	.01	.00	.01	.01	.28	.01	.00	.04	.07	.05
7	.00	.00	.01	.00	.00	.01	1.2	.00	.07	.02	.25	.04
8	.00	.00	.00	.00	.00	.08	.20	.00	.07	.05	.15	.03
9	.01	.02	.00	.00	.00	.11	.06	.01	.00	.10	.10	.02
10	.09	.73	.00	.00	.00	.04	.03	.04	.02	.04	.05	.00
11	.11	.16	.00	.00	.00	.04	.06	.14	.04	.04	.05	.00
12	.04	.01	.00	.18	.00	.00	1.5	.18	.03	.37	.10	.00
13	.53	.11	.00	.01	.00	.00	.16	.18	.04	.15	.15	.00
14	.07	.01	.01	.00	.00	.00	.02	.09	.00	.06	.20	.00
15	.01	.00	1.2	.00	.00	.00	.04	.07	.01	.02	.15	.00
16	.01	.00	.03	.00	.00	.00	.10	.26	.07	.04	.30	.01
17	.00	.00	.00	.00	.00	.00	.20	.10	.07	.03	.20	.01
18	.00	.00	.00	.00	.00	.00	.22	.04	.20	.02	.10	.00
19	.00	.00	.00	.00	.00	.00	.56	.48	.06	.94	.05	.00
20	.00	.00	.00	.00	.00	.00	.09	.77	.02	.10	.05	.00
21	.00	.00	.00	.00	.00	.00	.04	.20	.00	.03	.03	.00
22	.04	.00	.00	.00	.00	.00	.02	.11	.00	.31	.02	.00
23	.00	.00	.00	.00	.00	.00	.00	.07	.00	.11	.01	.00
24	.00	.00	.00	.00	.00	.00	.00	.18	.24	.03	.01	.00
25	.00	.00	.00	.00	.00	.01	.01	.14	.05	.00	.01	.00
26	.12	.00	.00	.00	.05	1.6	.01	.04	.01	.00	.00	.00
27	.04	.00	.00	.00	.02	1.7	.07	.02	.03	.00	.00	.00
28	.00	.00	.00	.00	.00	.22	2.2	.01	.06	.00	.00	3.9
29	.00	.00	.00	.08	---	.14	.16	.00	.37	.00	.05	.37
30	.00	.00	.00	.02	---	.06	.07	.03	.15	.00	.04	.07
31	1.0	---	.00	.00	---	.01	---	.15	---	.00	.03	---
TOTAL	2.19	1.10	1.26	.29	.10	4.03	7.41	4.01	1.75	2.75	2.18	4.66
MEAN	.071	.037	.041	.009	.004	.13	.25	.13	.058	.089	.070	.16
MAX	1.0	.73	1.2	.18	.05	1.7	2.2	.77	.37	.94	.30	3.9
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	4.3	2.2	2.5	.6	.2	8.0	15	8.0	3.5	5.5	4.3	9.2

CAL YR 1980 TOTAL 96.87 MEAN .26 MAX 6.6 MIN .00 AC-FT 192
WTR YR 1981 TOTAL 31.73 MEAN 087 MAX 3.9 MIN .00 AC-FT 63

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).

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. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--15 years, 8.72 ft^3/s (0.247 m^3/s), 6,320 acre-ft/yr (7.79 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,400 ft^3/s (68.0 m^3/s) Mar. 18, 1980, gage height, 8.00 ft (2.438 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, 1,040 ft^3/s (29.5 m^3/s) Aug. 4, gage height, 6.00 ft (1.829 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 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.3	.39	.32	.00	.18	.00	.06	.87	.49	21	.04	1.6
2	15	.34	.30	.00	.04	.00	1.0	.44	.47	10	.03	.61
3	2.4	.36	.00	.00	.00	.00	7.5	.31	.26	3.1	.02	.46
4	9.7	.32	.00	.00	.00	.00	19	.29	4.4	5.6	286	.36
5	2.5	.31	.00	.00	.00	.00	13	.24	.86	2.7	8.1	18
6	42	.30	.38	.00	.00	.00	8.7	.16	.39	.95	2.8	1.1
7	4.7	.29	.04	.00	.00	.83	18	.46	.37	.63	2.4	.50
8	2.8	.28	.00	.00	.00	.81	2.2	1.1	.27	.95	21	.52
9	2.3	.29	.20	.00	.00	54	.65	1.9	.17	.59	24	.46
10	2.2	.27	.05	.00	.00	2.2	7.4	.80	.13	.43	3.6	.33
11	2.2	1.3	.04	.00	.00	2.9	1.7	7.7	.11	1.2	4.0	2.4
12	2.2	.63	.00	.00	.00	1.1	.46	1.1	.10	.44	5.8	2.8
13	4.5	.38	.00	.00	.00	.23	1.5	.36	.09	26	.80	1.9
14	8.9	.35	.00	.00	.00	.14	.77	.22	1.0	1.5	1.1	.51
15	11	.37	.00	.00	.00	.10	1.3	.16	1.0	.40	1.3	.55
16	1.7	.29	.00	.00	.00	.07	5.7	.13	.75	3.4	1.6	1.4
17	1.3	.28	.00	.00	.00	.05	1.7	.12	3.5	1.3	1.0	.73
18	1.0	.51	.00	.00	.00	.11	.41	1.7	2.1	1.4	.89	.84
19	29	15	.00	.00	.00	.24	.26	9.8	.65	.76	1.2	.43
20	47	8.4	.00	.00	.00	.15	.76	36	.19	.56	.75	.29
21	8.3	1.3	.00	.00	.00	.09	1.5	2.3	.12	.64	.71	.21
22	12	.41	.00	.00	.00	.06	.45	.57	.10	.38	1.1	.18
23	2.1	.35	.00	.00	.00	.05	1.0	.34	.09	.26	.71	1.9
24	.71	.32	.00	.00	.00	.80	.69	.77	.19	9.0	5.0	.62
25	.57	.75	.00	.00	.00	.30	.31	1.5	3.5	1.1	1.2	1.3
26	.53	4.3	.00	.18	.00	3.1	.20	.60	.89	.27	.66	32
27	.48	1.6	.00	.00	.00	18	.41	.34	.51	.18	.59	60
28	.45	.83	.00	.00	.00	.57	1.6	.30	.32	.15	5.8	11
29	.43	.36	.08	.16	---	.18	.95	.79	.26	.10	6.2	46
30	.38	.34	.05	.45	---	.11	.61	9.7	.12	.07	1.6	12
31	.44	---	.00	.50	---	.08	---	1.4	---	.05	5.6	---
TOTAL	221.09	41.22	1.46	1.29	.22	86.27	99.79	82.47	23.40	95.11	395.60	201.00
MEAN	7.13	1.37	.047	.042	.008	2.78	3.33	2.66	.78	3.07	12.8	6.70
MAX	47	15	.38	.50	.18	54	19	36	4.4	26	286	60
MIN	.38	.27	.00	.00	.00	.00	.06	.12	.09	.05	.02	.18
AC-FT	439	82	2.9	2.6	.4	171	198	164	46	189	785	399

CAL YR 1980 TOTAL 4823.06 MEAN 13.2 MAX 613 MIN .00 AC-FT 9570
WTR YR 1981 TOTAL 1248.92 MEAN 3.42 MAX 286 MIN .00 AC-FT 2480

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 mi^2 (4.82 km^2).

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.--15 years, 2.93 ft^3/s (0.083 m^3/s), 2,120 acre-ft/yr (2.61 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 915 ft^3/s (25.9 m^3/s) Mar. 18, 1980, gage height, 8.75 ft (2.667 m), from rating curve extended above 41 ft^3/s (1.16 m^3/s); no flow many days each year.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 590 ft^3/s (16.7 m^3/s) Aug. 4, gage height, 7.50 ft (2.286 m), from rating curve extended above 41 ft^3/s (1.16 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 1980 TO SEPTEMBER 1981
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	.44	.00	.00
2	1.0	.00	.00	.00	.00	.00	.41	.00	.00	.00	.00	.00
3	.00	.00	.00	.00	.00	.00	.40	.00	.00	.02	.00	.00
4	.50	.00	.00	.00	.00	.00	4.0	.00	.00	.00	139	.00
5	.00	.00	.00	.00	.00	.00	1.5	.00	.00	.00	.60	2.6
6	5.0	.00	.00	.00	.00	.00	.37	.00	.00	.00	.00	.00
7	.00	.00	.00	.00	.00	.00	1.5	.00	.00	.00	.00	.00
8	.00	.00	.00	.00	.00	.00	.01	.00	.00	.00	2.5	.00
9	.00	.00	.00	.00	.00	14	.00	.00	.00	.00	7.6	.00
10	.00	.00	.00	.00	.00	.00	.01	.00	.00	.00	.16	.00
11	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.74	.00
12	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.59	.00
13	.00	.00	.00	.00	.00	.00	.00	.00	.00	3.0	.00	.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	.15	.00	.00	.00	.00	.00
17	.00	.00	.00	.00	.00	.00	.01	.00	.00	.00	.00	.00
18	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
19	7.0	4.9	.00	.00	.00	.00	.00	.03	.00	.00	.00	.00
20	13	2.0	.00	.00	.00	.00	.00	7.3	.00	.00	.00	.00
21	6.5	.02	.00	.00	.00	.00	.00	.03	.00	.00	.00	.00
22	3.4	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
23	.06	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
24	.00	.00	.00	.00	.00	.00	.00	.00	.00	.12	.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	8.6
27	.00	.00	.00	.00	.00	3.4	.00	.00	.00	.00	.00	13
28	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.36
29	.00	.00	.00	.00	---	.00	.00	.00	.00	.00	.00	8.4
30	.00	.00	.00	.00	---	.00	.00	.20	.00	.00	.00	.54
31	.00	---	.00	.00	---	.00	---	.00	---	.00	.05	---
TOTAL	36.46	6.92	.00	.00	.00	17.40	8.36	7.56	.00	3.58	151.24	33.50
MEAN	1.18	.23	.000	.000	.000	.56	.28	.24	.000	.12	4.88	1.12
MAX	13	4.9	.00	.00	.00	14	4.0	7.3	.00	3.0	139	13
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	72	14	.00	.00	.00	35	17	15	.00	7.1	300	66

CAL YR 1980 TOTAL 1374.95 MEAN 3.76 MAX 386 MIN .00 AC-FT 2730
WTR YR 1981 TOTAL 265.02 MEAN .73 MAX 139 MIN .00 AC-FT 526

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 mi^2 (40.1 km^2).

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.--15 years, 3.76 ft^3/s (0.107 m^3/s), 2,720 acre-ft/yr (3.35 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,610 ft^3/s (73.9 m^3/s) June 1, 1979, gage height, 6.74 ft (2.054 m), from rating curve extended above 30 ft^3/s (0.85 m^3/s); no flow for many days each year.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 468 ft^3/s (13.2 m^3/s) Aug. 4, gage height, 4.83 ft (1.472 m), from rating curve extended above 30 ft^3/s (0.85 m^3/s), no peak above base of 1,000 ft^3/s (28.3 m^3/s); no flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
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	.46	.00	.00	.00	.00	.00	.00	.00	.00	.00	141	.00
5	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.03	.28
6	9.6	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
7	.01	.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	24	.00	.00	.00	.00	2.3	.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	.22
12	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
13	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.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	5.5	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
20	22	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
21	.00	.00	.00	.00	.00	.00	.25	.00	.00	.00	.00	.00
22	.23	.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	6.5
27	.00	.00	.00	.00	.00	.00	.00	.00	.00	.19	.00	1.3
28	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
29	.00	.00	.00	.00	---	.00	.00	.00	.00	.00	.00	6.4
30	.00	.00	.00	.00	---	.00	.00	.00	.00	.00	.00	.00
31	.00	---	.00	.00	---	.00	---	.00	---	.00	.00	---
TOTAL	37.80	.00	.00	.00	.00	24.00	.25	.00	.00	.19	143.33	14.70
MEAN	1.22	.000	.000	.000	.000	.77	.008	.000	.000	.006	4.62	.49
MAX	22	.00	.00	.00	.00	24	.25	.00	.00	.19	141	6.5
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	75	.00	.00	.00	.00	48	.5	.00	.00	.4	284	29

CAL YR 1980 TOTAL 1526.17 MEAN 4.17 MAX 502 MIN .00 AC-FT 3030
WTR YR 1981 TOTAL 220.27 MEAN .60 MAX 141 MIN .00 AC-FT 437

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 stations during water year 1981

Station No.	Station name	Location	Drainage area mi² (km²)	Period of record	Measurements Date	Measurements Discharge (ft³/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, 1972-81	3-11-81 4-28-81 9-14-81	5.6 3.1 4.1
16012000	Kauaikinana 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, 1966-81	3-11-81 4-28-81 9-14-81	2.9 2.8 1.2
16029500	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, 1964-81	12- 1-80 2- 2-81 8- 3-81	No flow 1.1 No flow
16030000	Peekauai ditch near Waimea	Lat 21°58'43",long 159°39'37", on right bank, 0.8 mi (1.3 km) upstream from Makaweli River, 1.6 mi (2.6 km) north of Waimea highway bridge and 1.6 mi (2.6 km) north of Waimea Post Office.	-	1911-19, 1979-81	10- 6-80 11- 3-80 12- 1-80 1- 5-81 3- 2-81 4- 6-81 6- 3-81 7-13-81 8- 3-81 9-11-81	2.0 2.2 2.4 2.6 2.7 3.0 1.5 1.4 1.6 2.5
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)	1974-81	10- 1-80 1- 6-81 9- 2-81	3.5 2.8 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≠, 1977-81	10- 7-80 4- 7-81 5-27-81	16 13 14
		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, 1968-81	10-28-80 3 -5-81 5-27-81 8-18-81	2.6 4.6 1.8 9.8
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, 1970-81	3-10-81 6- 3-81	15 14

≠ Operated as a continuous-record gaging station.

Discharge measurements made at low-flow partial-record stations during water year 1981--Continued

Station No.	Station name	Location	Drainage area mi² (km²)	Period of record	Measurements Date	Measurements Discharge (ft³/s)
		Hawaii, Island of Oahu--Continued				
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 Office.	-	1931-62≠, 1964-65≠, 1966-68, 1970-81	3- 9-81 6- 4-81	16 14
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, 1971-81	6-24-81 9-23-81	1.1 .75
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, 1972-81	6-24-81 9-23-81	1.6 1.3
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, 1974-81	6-23-81 9-24-81	13 14
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, 1974-81	9-24-81	a.70
		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)	1968-81	10-28-80 2-10-81 4-16-81 7-21-81	1.3 2.6 1.3 2.4
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)	1968-81	10-28-80 2-10-81 4-16-81 7-21-81	1.8 2.6 2.5 1.8
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≠, 1974-81	10-28-80 2-10-81 4-16-81 7-21-81	3.2 5.3 3.9 4.9
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)	1968-81	10-28-80 2-10-81 4-16-81	2.8 4.1 2.6
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)	1968-81	10-28-80 2-10-81 4-16-81	.65 1.1 .48
16403900	Kawainui Stream near Pelekunu	Lat 21°07'59", long 156°52'38", 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.	1.17 (3.03)	1969-79≠, 1980-81	10-28-80 12-16-80 2-10-81 4-16-81	4.0 11 6.4 3.3

≠ Operated as a continuous-record gaging station.
a Estimated.
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 or 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 1981

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)	1944-81b	4- 2-81	5.85	-
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)	1950-81b	8- 5-81	4.52	-
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≠, 1973-81	8- 5-81	2.62	368
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≠, 1971-81	8- 5-81	9.64	2,490
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)	1962-81b	8- 5-81	5.34	-
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, 1970-81	8- 6-81	-	a65
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)	1964-81	4-30-81	4.33	265
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)	1962-81	10- 5-80	10.72	4,520
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)	1964-81	4-30-81	-	a160
16097900	Puukumu Stream near Kilauea	Lat 22°13'01", 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, 1971-81	4-14-81	3.50	53

≠ Operated as a continuous-record gaging station.
a Estimated.
b Gage height only.

Annual maximum discharge at crest-stage partial-record stations during water year 1981--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)	1963-81b	-	(/)	-
16130000	Nahomalu 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≠, 1972-81	11-16-80	2.62	99
		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, 1968-81	4-14-81	-	a650
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)	1967-81	4-14-81	-	a250
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≠, 1966-81	12-14-80	4.98	274
16211400	Manini Gulch at Kaena	Lat 21°34'50", long 158°15'12", 180 ft (55 m) 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)	1974-81	12-14-80	-	a40
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)	1958-81	5- 7-81	7.15	a300
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)	1966-81	5- 7-81	6.92	a200
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≠, 1973-81	5- 7-81	3.80	70
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)	1958-81	2- 5-81	1.33	a50
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)	1968-81	2- 5-81	-	a100

/ Gage height not determined.
≠ Operated as a continuous-record gaging station.
a Estimated.
b Gage height only.

Annual maximum discharge at crest-stage partial-record stations during water year 1981--Continued

Station No.	Station name	Location	Drainage area mi² (km²)	Period of record	Annual maximum Date	Annual maximum Gage height (feet)	Annual maximum 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)	1968-81	4-14-81	-	a45
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)	1956-81	12-14-80	.88	54
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, 1960-81	10-25-80	2.96	a100
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)	1958-81	4- 8-81	4.06	404
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)	1974-81	5- 6-81	5.50	a25
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≠, 1973-81	5- 7-81	2.45	815
**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)	1969-81	5- 7-81	4.67	a600
**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)	1971-81	5- 7-81	14.09	a650
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≠, 1972-81	5- 8-81	3.27	383
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)	1958-81	5- 7-81	2.01	403
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)	1958-81	5- 7-81	-	a300
16247100	Manoa-Palolo Drainage Canal at Moiliili	Lat 21°17'24", long 157°49'17", on left bank at Kaimuki 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)	1968-81	5- 7-81	8.32	3,980
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)	1958-81	5- 7-81	3.01	a960

** Also a water-quality partial-record station.
≠ Operated as a continuous-record gaging station.
a Estimated.

Annual maximum discharge at crest-stage partial-record stations during water year 1981--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					
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, 1970-81	5- 7-81	28.79	720
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 Waimanalo Post Office.	1.21 (3.13)	1958-81	5- 7-81	7.55	a1,600
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≠, 1971-81	5- 7-81	8.67	a3,340
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)	1963-81	5- 7-81	2.35	63
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≠, 1972-81	5- 7-81	11.82	3,640
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, 1967-81b	5- 7-81	2.32	-
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, 1977-81	5- 7-81	7.53	929
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, 1977-81	5- 8-81	4.00	150
*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)	1959-81	5- 8-81	2.56	a450
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, 1968-81	5- 8-81	-	a170
*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)	1963-81	8- 4-81	9.00	a1,000
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)	1958-81	5- 8-81	3.11	a600

* Also a low-flow partial-record station.
≠ Operated as a continuous-record gaging station.
a Estimated.
b Gage height only.

Annual maximum discharge at crest-stage partial-record stations during water year 1981--Continued

Station No.	Station name	Location	Drainage area mi^2 (km^2)	Period of record	Annual maximum Date	Gage height (feet)	Discharge (ft^3/s)
		Hawaii, Island of Oahu--Continued					
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 plantation road and Highway 83, and 1.2 mi (1.9 km) south of Kahuku Hospital.	4.05 (10.49)	1958-81	5- 8-81	-	a50
16311000	Oio Stream near Kahuku	Lat 21°41'32", long 157°59'48", 0.6 mi (1.0 km) southwest of junction of Plantation Road and Highway 83 and 2.7 mi (4.3 km) west of Kahuku Hospital.	2.13 (5.52)	1958-81	5- 8-81	-	a50
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)	1973-81	4-14-81	3.64	a150
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)	1968-81	4-14-81	4.60	a200
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)	1968-81	4-14-81	-	a15
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)	1958-81	4-14-81	6.08	1,950
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)	1956-81	4-14-81	12.00	950
		Hawaii, Island of Molokai					
16411300	Kakaako Gulch at 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)	1964-81	2-11-81	1.07	9
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 from Highway 46, and 2.5 mi (4.0 km) northeast of Mauna Loa.	1.40 (3.63)	1964-81	12-22-80	-	a1
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≠, 1973-81	12-22-80	1.4	a20
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)	1964-81	2-11-81	1.06	13

≠ Operated as a continuous-record gaging station.
a Estimated.

Annual maximum discharge at crest-stage partial-record stations during water year 1981--Continued

Station No.	Station name	Location	Drainage area mi^2 (km^2)	Period of record	Annual maximum Date	Gage height (feet)	Discharge (ft^3/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)	1965-81	2-11-81	1.92	169
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)	1964-81	-	-	No flow
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)	1964-81	12-22-80	5.73	<30
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)	1965-81	4-30-81	6.16	324
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)	1964-81	2- 2-81	1.39	409
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)	1964-81	8-31-81	3.09	17
		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.	1.91 (4.95)	1963-72≠, 1973-81	2-11-81	4.31	170
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)	1967-81	2-11-81	9.06	6,690
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≠, 1969-81	4-14-81	3.16	549
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)	1963-81	4-14-81	-	<50
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)	1963-81	4-30-81	5.70	184
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)	1965-81	4-30-81	-	<500
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 Hamakuapoko.	.43 (1.11)	1963-81	-	-	No flow

< Actual value is known to be less than the value shown.
≠ Operated as a continuous-record gaging station.

Annual maximum discharge at crest-stage partial-record stations during water year 1981--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					
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)	1967-81	9-20-81	2.74	53
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)	1963-81	2-11-81	1.68	32
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)	1967-81	-	-	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≠, 1952-81	8- 4-81	3.72	1,670
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)	1964-81	-	-	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)	1965-81	4-30-81	6.32	151
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)	1964-81	-	-	No flow
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, 1965-81	8- 4-81	3.28	306
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, 1964-81	12-25-80	3.20	191
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≠, 1973-81	12-25-80	3.38	364
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)	1964-81	-	-	No flow
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)	1963-81	8- 4-81	2.49	227

** Also a water-quality partial-record station.
≠ Operated as a continuous-record gaging station.
a Estimated.

Annual maximum discharge at crest-stage partial-record stations during water year 1981--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					
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)	1964-81	2-11-81	-	a10
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)	1963-81	-	-	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≠, 1971-81	-	-	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)	1972-81	6-23-81	4.24	25
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)	1972-81	6-23-81	-	<30
		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)	1968-81	9-26-81	-	a2
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)	1965-81	9-26-81	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 Papaikou and 5.1 mi (8.2 km) north of Hilo Post Office.	.24 (.62)	1963-81	11-11-80	3.18	28
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≠, 1973-81	11-11-80	-	a40
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)	1963-81	11-11-80	-	a60
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)	1963-81	-	-	No flow
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)	1963-81	-	-	No flow

< Actual value is known to be less than the value shown.
≠ Operated as a continuous-record gaging station.
a Estimated.

Annual maximum discharge at crest-stage partial-record stations during water year 1981--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					
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)	1963-81	-	-	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)	1963-81	-	-	No flow
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)	1963-81	10-31-80	2.09	39
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≠, 1973-81	10-31-80	5.88	908
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.	.27 (.70)	1963-81	-	-	No flow
16759060	Kamakoa Gulch near Waimea	Lat 19°57'32", long 155°41'02", at bridge, 1.4 mi (2.2 km) north of Saddle Road Junction and 4.5 mi (7.2 km) south of Waimea.	50.6 (131.1)	1963-81	-	-	No flow
16759080	Popoo Gulch near Waikii	Lat 19°52'11", long 155°43'51", at bridge on Highway 19, 2.0 mi (3.2 km) north of Keamuku and 5.2 mi (8.4 km) west of Waikii.	33.1 (85.7)	1963-81	-	-	No flow
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, 1965-81	-	-	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)	1961-81	4-28-81	2.25	20
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)	1963-81	8- 4-81	4.40	566
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)	1963-81	8- 4-81	7.02	a500
16770500	Paauau Gulch at Pahala	Lat 19°12'39", long 155°28'48", on right bank 100 ft (30 m) downstream from bridge on Wood Valley Road and 0.7 mi (1.1 km) north of Pahala.	1.74 (4.51)	1962-79≠, 1980-81	8- 4-81	3.50	125

≠ Operated as a continuous-record gaging station.
a Estimated.

DISCHARGE MEASUREMENTS MADE AT MISCELLANEOUS SITES DURING WATER YEAR 1981

Stream	Tributary to	Location	Drainage area mi² (km²)	Measured previously (water years)	Measurements Date	Measurements Discharge (ft³/s)
		Hawaii, Island of Oahu				
Makaha Stream near Makaha	Pacific Ocean	Lat 21°30'46", long 158°10'24", 1.6 mi (2.6 km) northeast of Kaneaki Heiau and 4.1 mi (6.6 km) northeast of junction of Farrington Highway and Makaha Valley Road.			2-23-81 2-25-81 2-26-81 2-27-81 3-10-81 3-11-81	1.0 .80 .65 .58 .50 .44
Makaha Stream near Makaha	Pacific Ocean	Lat 21°30'20", long 158°10'56", 0.9 mi (1.4 km) northeast of Kaneaki Heiau and 3.4 mi (5.5 km) northeast of junction of Farrington Highway and Makaha Valley Road.			2-23-81 2-25-81 2-26-81 2-27-81 3-10-81 3-11-81	.97 .84 .70 .64 .58 .53
Makaha Stream near Makaha	Pacific Ocean	Lat 21°30'12", long 158°10'59", 0.75 mi (1.2 km) northeast of Kaneaki Heiau and 3.2 mi (5.1 km) northeast of junction of Farrington Highway and Makaha Valley Road.			2-23-81 2-25-81 2-26-81 2-27-81 3-10-81 3-11-81	.94 .84 .68 .60 .50 .45
Haiku Stream	Heeia Stream	Lat 21°24'36", long 157°50'03", 2.0 mi (3.2 km) southwest of St. Ann's School and 2.1 mi (3.4 km) west of intersection of Likelike Highway and Kamehameha Highway.			2- 3-81 2- 9-81 2-17-81 2-19-81 2-22-81 2-24-81 2-27-81	.05 .07 .03 .02 <.01 <.01 <.01
Haiku Stream	Heeia Stream	Lat 21°24'36", long 157°50'00", 1.9 mi (3.1 km) southwest of St. Ann's School and 2.0 mi (3.2 km) west of intersection of Likelike Highway and Kamehameha Highway.			2 -3-81 2- 9-81 2-17-81 2-19-81 2-22-81 2-24-81 2-27-81	1.0 1.1 .94 .96 .98 .97 .93
Haiku Stream	Heeia Stream	Lat 21°24'46", long 157°49'33", 1.4 mi (2.2 km) southwest of St. Ann's School and 1.6 mi (2.6 km) west of intersection of Likelike Highway and Kamehameha Highway.		1959-61	6-17-59 8- 5-60 8-11-61 2 -3-81 2- 9-81 2-17-81 2-24-81 2-27-81	.43 .57 .57 1.6 1.5 1.4 1.5 1.4
Haiku Stream	Heeia Stream	Lat 21°25'13", long 157°49'09", 0.75 mi (1.2 km) west of St. Ann's School and 1.5 mi (2.4 km) northwest of intersection of Likelike Highway and Kamehameha Highway.		1959-61	6-17-59 8- 5-60 8-11-61 2- 3-81 2- 9-81 2-17-81 2-24-81 2-27-81	2.6 2.4 2.3 3.9 3.6 3.4 3.6 3.4
Iolekaa Stream	Heeia Stream	Lat 21°25'15", long 157°49'10", 0.75 mi (1.2 km) west of St. Ann's School and 1.5 mi (2.4 km) northwest of intersection of Likelike Highway and Kamehameha Highway.		1959-61	6-17-59 8- 5-60 8-11-61 2- 3-81 2- 9-81 2-17-81 2-19-81 2-22-81 2-24-81 2-27-81	.55 .59 .27 .85 .84 .77 .70 .77 .69 .64
Kahaluu Stream	Pacific Ocean	Lat 21°26'13", long 157°51'25", 2.0 mi (3.2 km) southwest from Kamehameha Highway bridge at mouth and 3.2 mi (5.1 km) west from King Intermediate School at Heeia.			10-30-80 10-31-80 11- 4-80	.28 .25 .22
Kahaluu Stream	Pacific Ocean	Lat 21°26'20", long 157°51'20", 1.8 mi (2.9 km) southwest from Kamehameha Highway bridge at mouth and 3.1 mi (5.0 km) west from King Intermediate School at Heeia.		1935-70	7- 7-59 10-30-80 10-31-80 11- 4-80 11-13-80 11-14-80	.22 .25 .22 .20 .24 .24

< Actual value is known to he less than the value shown.

DISCHARGE MEASUREMENTS MADE AT MISCELLANEOUS SITES DURING WATER YEAR 1981

Stream	Tributary to	Location	Drainage area mi² (km²)	Measured previously (water years)	Measurements Date	Measurements Discharge (ft³/s)
		Hawaii, Island of Oahu--Continued				
Kahaluu Stream	Pacific Ocean	Lat 21°26'26", long 157°50'59", 1.5 mi (2.4 km) southwest from Kamehameha Highway bridge at mouth and 2.8 mi (4.5 km) northwest from King Intermediate School at Heeia.		1959	7- 7-59 10-30-80 10-31-80 11- 4-80 11-13-80 11-14-80	.74 .50 .43 .39 .44 .40
Kahaluu Stream	Pacific Ocean	Lat 21°26'32", long 157°50'47", 1.3 mi (2.1 km) southwest from Kamehameha Highway bridge at mouth and 2.6 mi (4.2 km) northwest from King Intermediate School at Heeia.		1959	7- 7-59 10-30-80 10-31-80 11- 4-80 11-13-80 11-14-80	1.9 1.5 1.4 1.5 1.5 1.5
Kahaluu Stream	Pacific Ocean	Lat 21°26'41", long 157°50'43", 1.2 mi (1.9 km) west from Kamehameha Highway bridge at mouth and 2.6 mi (4.2 km) northwest from King Intermediate School at Heeia.		1959	7- 7-80 10-30-80 10-31-80 11- 4-80 11-13-80 11-14-80	2.0 1.6 1.6 1.6 1.6 1.6
		Hawaii, Island of Maui				
Wailoa ditch at Opana		Lat 20°53'13", long 156°16'33", 20 ft (6.1 m) upstream from E.M.I. Company gage, 1.3 mi (2.1 km) downstream from station 16588000 Wailoa ditch at Honopou, near Huelo.			7- 8-81	26
Halehaku Stream at Wailoa ditch intake		Lat 20°53'06", long 156°15'58", at intake to Wailoa ditch, 0.75 mi (1.2 km) downstream from station 16588000 Wailoa ditch at Honopou, near Huelo.			7- 8-81	.12
		Hawaii, Island of Hawaii				
Lyman Springs No. 2	Kahoama Stream	Lat 19°42'02", long 155°10'36", 2.7 mi (4.3 km) southwest of Piihonua and 5.8 mi (9.3 km) southwest of Hilo.			7- 7-80 1- 2-81 1-12-81	5.0 .66 .36
Kapehu Springs	Wailuku River	Lat 19°43'56", long 155°11'11", 3.4 mi (5.5 km) northwest of Piihonua and 6.5 mi (10.5 km) west of Hilo.			1-27-81	1.4
Kapehu Stream	Wailuku River	Lat 19°43'11", long 155°08'25", 0.3 mi (0.5 km) northwest of Piihonua and 3.4 mi (5.5 km) west of Hilo.			1-27-81	4.5
Kaiwiki Stream	Honolii Stream	Lat 19°45'38", long 155°09'05", 0.5 mi (0.8 km) southwest of Paukaa and 2.7 mi (4.3 km) north of Hilo.			2-20-81	.62
Omoto Springs		Lat 19°41'40", long 155°08'55", 1.1 mi (1.8 km) northwest of Kaumana School and 5.0 mi (8.0 km) southwest of Hilo.			2-12-81 2-17-81	.08 No flow
Unnamed spring		Lat 19°41'45", long 155°09'23", at altitude 1,320 ft (402 m), 1.4 mi (2.3 km) northwest of Kaumana School and 5.4 mi (8.7 km) southwest of Hilo.			2-12-81	No flow
Manowaiopae Stream	Pacific Ocean	Lat 19°58'35", long 155°14'45", 1.1 mi (1.8 km) upstream from mouth, 1.2 mi (1.9 km) south of Laupahoehoe, and 1.5 mi (2.4 km) west of Papaaloa.	1.04	1965-71	2-18-81	.23
Alia Stream	Pacific Ocean	Lat 19°50'38", long 155°06'21", 2.0 mi (3.2 km) south of Honomu and 8.0 mi (12.9 km) north of Hilo.	.58	1962-72	2-17-81	.83

DISCHARGE MEASUREMENTS MADE AT MISCELLANEOUS SITES DURING WATER YEAR 1981

Stream	Tributary to	Location	Drainage area mi² (km²)	Measured previously (water years)	Measurements Date	Measurements Discharge (ft³/s)
		Hawaii, Island of Hawaii--Continued				
Waikoloa Stream	Waiulaula Gulch	Lat 20°03'17", long 155°40'01", 0.2 mi (0.3 km) south of Puu Iki and 2.2 mi (3.5 km) north of Kamuela.	.78	1947-71	2-12-81 7-15-81	1.2 1.7
Lower Hamakua ditch main weir at Kukuihaele	Pacific Ocean	Lat 20°07'07", long 155°35'09", 0.8 mi (1.3 km) west of Kukuihale School and 1.0 mi (1.6 km) northeast of Waipio.		1964-73	2-19-81	40
Kohala ditch at Hawi	Pacific Ocean	Lat 20°13'30", long 155°49'45", 0.2 mi (0.3 km) east of Kaauhuhu and 1.1 mi (1.8 km) south of Hawi.			2-19-81	11
Kaholopoohina Spring		Lat 20°04'35", long 155°37'45", 1.1 mi (1.8 km) west of Alakahi gaging station and 3.6 mi (5.8 km) north of Kamuela.			2- 3-81 6- 3-81 7-10-81 8- 3-81	1.2 1.4 .99 *.52
Hakalau Stream	Pacific Ocean	Lat 19°54'00", long 155°03'10", 0.4 mi (0.6 km) northwest of Hakalau and 2.4 mi (3.9 km) southeast of Honohina.		1962	2-20-81	2.0
Kawainui Stream	Pacific Ocean	Lat 19°49'20", long 155°06'36", 1.4 mi (2.3 km) south of Pepeekeo and 4.5 mi (7.2 km) north of Honolii cove.		1961-62	2-20-81	.88
Kolekole Stream	Pacific Ocean	Lat 19°53'00", long 155°07'25", 0.6 mi (1.0 km) northwest of Honomu and 1.3 mi (2.1 km) southeast of Hakalau.		1962	2-20-81	3.0
Nanue Stream	Pacific Ocean	Lat 19°54'40", long 155°11'15", at altitude 1,320 ft (402 m) and 2.3 mi (3.7 km) southwest of Honohina.		1963	2-20-81	No flow
Umauma Stream	Pacific Ocean	Lat 19°54'30", long 155°08'40", at altitude 350 ft (107 m) and 1.3 mi (2.1 km) northwest of Hakalau.		1963	2-20-81	1.0
Paheehee Stream	Pacific Ocean	Lat 19°52'37", long 155°06'45", 1.3 mi (2.1 km) south of Hakalau and 2.6 mi (4.2 km) north of Pepeekeo.		1961-62	2-20-81	.83
Waiaama Stream	Pacific Ocean	Lat 19°50'00", long 155°08'00", at altitude 1,000 ft (305 m) and 2.0 mi (3.2 km) southwest of Pepeekeo.		1963	2-20-81	No flow
Ninole Springs		Lat 19°07'57", long 155°30'54", 1.1 mi (1.8 km) southwest of Punaluu and 3.6 mi (5.8 km) northeast of Honuapo.		1964-70	2-20-81	/No flow

* Department of Water Supply pump running.
/ Springs covered up during Feb. 20, 1979 Kau area flood.

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 1980 TO SEPTEMBER 1981

HAWAII, ISLAND OF OAHU

16228200 MOANALUA STREAM NEAR AIEA (LAT 21°22'37" LONG 157°52'58")

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SEDI-MENT, SUS-PENDED (MG/L)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY)
DEC				
14...	1500	40	1430	154
14...	1525	143	1290	498
14...	1540	100	1140	308
APR				
13...	2400	600	1100	1780
14...	0100	270	566	413
30...	1700	380	600	616
30...	1800	176	419	199
MAY				
07...	0430	570	1380	2120
07...	0530	558	596	898
07...	0630	450	574	697
07...	0715	843	500	1140
07...	0730	660	821	1460
07...	0830	480	446	578
MAY				
07...	0930	570	442	680
07...	1030	510	301	414
07...	1130	278	289	217
07...	1230	455	208	256
07...	1330	358	311	301
07...	1430	212	356	204
07...	1530	160	185	80
08...	0430	690	556	1040
08...	0530	366	463	458
08...	0630	231	377	235
AUG				
04...	2130	534	515	743
04...	2230	250	343	232

16284500 WAIHEE STREAM AT KAHALUU (LAT 21°27'32" LONG 157°50'26")

DATE	TIME	SPE-CIFIC CON-DUCT-ANCE LAB (UMHOS)	PH LAB (UNITS)	TEMPER-ATURE (DEG C)	TUR-BID-ITY (NTU)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS N)	PHOS-PHORUS, TOTAL (MG/L AS P)	SEDI-MENT, SUS-PENDED (MG/L)
OCT												
23...	0955	--	--	22.0	1.3	.15	.020	.40	.42	.57	.100	6
JAN												
20...	1020	--	--	19.4	1.6	.23	.150	.51	.66	.89	.100	10
MAR												
25...	1025	180	7.5	22.0	6.5	.21	.030	.57	.60	.81	.170	22

NOTE.--Water-quality samples collected by Soil Conservation Service.

212604158012700 DRAIN A NEAR MILILANI TOWN (LAT 21°26'04" LONG 158°01'27")

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (UMHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)	TUR-BID-ITY (NTU)	OXYGEN DEMAND, CHEM-ICAL (HIGH LEVEL) (MG/L)	COLI-FORM, FECAL, 0.7 UM-MF (COLS. / 100 ML)	HARD-NESS (MG/L AS CACO3)	HARD-NESS, NONCAR-BONATE (MG/L CACO3)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)
DEC												
05...	1055	15	145	7.0	--	84	130	--	--	--	--	--
05...	1058	--	--	--	--	--	--	2300	--	--	--	--
05...	1100	--	--	--	--	--	--	5100	--	--	--	--
05...	1110	75	125	7.0	--	96	110	--	--	--	--	--
05...	1113	--	--	--	--	--	--	5000	--	--	--	--
05...	1115	--	--	--	--	--	--	1500	--	--	--	--
05...	1125	105	110	7.0	--	110	180	--	--	--	--	--
05...	1128	--	--	--	--	--	--	>12000	--	--	--	--
05...	1130	--	--	--	--	--	--	>12000	--	--	--	--
05...	1140	48	115	7.4	--	170	140	--	--	--	--	--
05...	1143	--	--	--	--	--	--	3900	--	--	--	--
05...	1145	--	--	--	--	--	--	4900	--	--	--	--
05...	1155	56	92	7.5	--	150	170	--	--	--	--	--
05...	1158	--	--	--	--	--	--	6000	--	--	--	--
05...	1200	--	--	--	--	--	--	5700	--	--	--	--
05...	1315	5.0	71	8.3	22.0	110	23	>12000	19	0	6.1	.9
14...	0415	15	120	--	--	40	47	--	--	--	--	--
14...	0435	22	100	--	--	35	49	--	--	--	--	--
14...	0845	30	80	--	--	62	49	--	--	--	--	--
14...	0905	15	70	--	--	68	59	--	--	--	--	--
14...	0940	15	65	--	--	70	48	--	--	--	--	--
14...	1000	22	60	--	--	99	37	--	--	--	--	--
14...	1015	30	60	--	--	88	30	--	--	--	--	--
14...	1030	15	60	--	--	96	21	--	--	--	--	--
14...	1355	22	55	--	--	76	19	--	--	--	--	--
14...	1410	56	50	--	--	72	21	--	--	--	--	--
14...	1425	22	50	--	--	60	19	--	--	--	--	--
14...	1440	15	50	--	--	60	22	--	--	--	--	--

> Actual value is known to be greater than the value shown.

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

HAWAII, ISLAND OF OAHU--Continued

212604158012700 DRAIN A NEAR MILILANI TOWN (LAT 21°26'04" LONG 158°01'27")

DATE	SODIUM, DIS-SOLVED (MG/L AS NA)	PERCENT SODIUM	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY LAB (MG/L AS CACO3)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	SOLIDS, DIS-SOLVED (TONS PER AC-FT)
DEC												
05...	--	--	--	--	--	--	--	--	--	101	--	.14
05...	--	--	--	--	--	--	--	--	--	--	--	--
05...	--	--	--	--	--	--	--	--	--	--	--	--
05...	--	--	--	--	--	--	--	--	--	84	--	.11
05...	--	--	--	--	--	--	--	--	--	--	--	--
05...	--	--	--	--	--	--	--	--	--	--	--	--
05...	--	--	--	--	--	--	--	--	--	72	--	.10
05...	--	--	--	--	--	--	--	--	--	--	--	--
05...	--	--	--	--	--	--	--	--	--	--	--	--
05...	--	--	--	--	--	--	--	--	--	81	--	.11
05...	--	--	--	--	--	--	--	--	--	--	--	--
05...	--	--	--	--	--	--	--	--	--	--	--	--
05...	--	--	--	--	--	--	--	--	--	63	--	.09
05...	--	--	--	--	--	--	--	--	--	--	--	--
05...	--	--	--	--	--	--	--	--	--	--	--	--
05...	5.8	38	.6	1.4	20	7.6	3.1	.2	4.8	46	45	.06
14...	--	--	--	--	--	--	--	--	--	73	--	.10
14...	--	--	--	--	--	--	--	--	--	62	--	.08
14...	--	--	--	--	--	--	--	--	--	50	--	.07
14...	--	--	--	--	--	--	--	--	--	43	--	.06
14...	--	--	--	--	--	--	--	--	--	35	--	.05
14...	--	--	--	--	--	--	--	--	--	35	--	.05
14...	--	--	--	--	--	--	--	--	--	28	--	.04
14...	--	--	--	--	--	--	--	--	--	31	--	.04
14...	--	--	--	--	--	--	--	--	--	28	--	.04
14...	--	--	--	--	--	--	--	--	--	21	--	.03
14...	--	--	--	--	--	--	--	--	--	19	--	.03
14...	--	--	--	--	--	--	--	--	--	24	--	.03

DATE	SOLIDS, RESIDUE AT 105 DEG. C, SUS-PENDED (MG/L)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC DIS-SOLVED (MG/L AS N)	NITRO-GEN DIS-SOLVED (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, NH4 + ORG. SUSP. TOTAL (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC DIS. (MG/L AS N)
DEC											
05...	446	.37	.33	.020	.000	2.7	.47	.80	2.70	2.2	.47
05...	--	--	--	--	--	--	--	--	--	--	--
05...	--	--	--	--	--	--	--	--	--	--	--
05...	300	.50	.47	.000	.010	2.1	.43	.91	2.10	1.7	.44
05...	--	--	--	--	--	--	--	--	--	--	--
05...	--	--	--	--	--	--	--	--	--	--	--
05...	600	.04	.02	.310	.310	3.9	.46	.79	4.20	3.4	.77
05...	--	--	--	--	--	--	--	--	--	--	--
05...	--	--	--	--	--	--	--	--	--	--	--
05...	614	.28	.26	.010	.020	2.9	.54	.82	2.90	2.3	.56
05...	--	--	--	--	--	--	--	--	--	--	--
05...	--	--	--	--	--	--	--	--	--	--	--
05...	458	.43	.43	.030	.020	2.8	.62	1.1	2.80	2.2	.64
05...	--	--	--	--	--	--	--	--	--	--	--
05...	--	--	--	--	--	--	--	--	--	--	--
05...	62	.70	.69	.390	.380	.91	.58	1.7	1.30	.34	.96
14...	115	.34	.35	.230	.220	.87	.42	.99	1.10	.46	.64
14...	160	.27	.29	.230	.260	.97	.50	1.1	1.20	.44	.76
14...	169	.22	.21	.210	.190	.99	.19	.59	1.20	82	.38
14...	193	.20	.22	.200	.240	1.6	.35	.81	1.80	1.2	.59
14...	183	.21	.21	.230	.220	.97	.32	.75	1.20	.66	.54
14...	167	.21	.21	.250	.240	1.3	.56	1.0	1.50	.70	.80
14...	180	.20	.21	.180	.180	.92	.31	.70	1.10	.61	.49
14...	140	.21	.23	.210	.200	.79	.80	1.2	1.00	.00	1.0
14...	115	.22	.23	.170	.180	70	33	.74	.87	.36	.51
14...	92	.21	.21	.190	.180	1.0	.66	1.1	1.20	.36	.84
14...	77	.21	.21	.180	.180	.79	.41	.80	97	.38	.59
14...	75	.25	.22	.190	.210	1.0	70	1.1	1.20	29	.91

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

HAWAII, ISLAND OF OAHU--Continued

212604158012700 DRAIN A NEAR MILILANI TOWN (LAT 21°26'04" LONG 158°01'27")

DATE	NITRO-GEN, TOTAL (MG/L AS N)	PHOS-PHORUS, TOTAL (MG/L AS P)	PHOS-PHORUS, DIS-SOLVED (MG/L AS P)	ARSENIC TOTAL (UG/L AS AS)	CADMIUM TOTAL RECOV-ERABLE (UG/L AS CD)	IRON, DIS-SOLVED (UG/L AS FE)	LEAD, TOTAL RECOV-ERABLE (UG/L AS PB)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)	CARBON, ORGANIC DIS-SOLVED (MG/L AS C)	CARBON, ORGANIC SUS-PENDED TOTAL (MG/L AS C)	OIL AND GREASE, TOTAL RECOV. GRAVI-METRIC (MG/L)
DEC											
05...	3.1	.790	.170	--	10	--	200	--	9.9	1.8	--
05...	--	--	--	--	--	--	--	--	--	--	--
05...	--	--	--	--	--	--	--	--	--	--	--
05...	2.6	.620	.170	--	0	--	0	--	7.9	3.8	--
05 ...	--	--	--	--	--	--	--	--	--	--	--
05...	--	--	--	--	--	--	--	--	--	--	--
05...	4.2	1.40	.080	--	10	--	800	--	5.5	1.4	--
05...	--	--	--	--	--	--	--	--	--	--	--
05...	--	--	--	--	--	--	--	--	--	--	--
05...	3.2	890	.150	--	10	--	200	--	12	--	--
05...	--	--	--	--	--	--	--	--	--	--	--
05...	--	--	--	--	--	--	--	--	--	--	--
05...	3.2	.590	.120	--	10	--	200	--	4.5	1.0	--
05...	--	--	--	--	--	--	--	--	--	--	--
05...	--	--	--	--	--	--	--	--	--	--	--
05...	2.0	.300	.220	3	10	10	0	0	5.4	--	0
14...	1.4	.190	.120	--	0	--	100	--	--	--	--
14...	1.5	.200	.110	--	0	--	100	--	--	--	--
14...	1.4	.080	090	--	0	--	100	--	--	--	--
14...	2.0	.300	.090	--	0	--	100	--	--	--	--
14...	1.4	.260	.110	--	0	--	100	--	--	--	--
14...	1.7	.300	.120	--	0	--	100	--	--	--	--
14...	1.3	.200	.080	--	0	--	100	--	--	--	--
14...	1.2	.220	.080	--	0	--	100	--	--	--	--
14...	1.1	.170	.080	--	0	--	0	--	--	--	--
14...	1.4	.120	.090	--	0	--	0	--	--	--	--
14...	1.2	.120	.070	--	0	--	100	--	--	--	--
14...	1.5	.130	.080	--	0	--	100	--	--	--	--

DATE	TIME	PCB, TOTAL (UG/L)	ALDRIN, TOTAL (UG/L)	CHLOR-DANE, TOTAL (UG/L)	DDD, TOTAL (UG/L)	DDE, TOTAL (UG/L)	DDT, TOTAL (UG/L)	DI-AZINON, TOTAL (UG/L)	DI-ELDRIN TOTAL (UG/L)	ENDO-SULFAN, TOTAL (UG/L)
DEC										
05...	1315	.00	.00	.10	.00	.00	.00	2.3	.00	.00

DATE	ENDRIN, TOTAL (UG/L)	ETHION, TOTAL (UG/L)	HEPTA-CHLOR, TOTAL (UG/L)	HEPTA-CHLOR EPOXIDE TOTAL (UG/L)	LINDANE TOTAL (UG/L)	MALA-THION, TOTAL (UG/L)	METH-OXY-CHLOR, TOTAL (UG/L)	METHYL PARA-THION, TOTAL (UG/L)	METHYL TRI-THION, TOTAL (UG/L)	MIREX, TOTAL (UG/L)
DEC										
05...	.00	.00	.01	.00	.01	1.1	.00	.00	.00	.00

DATE	NAPH-THA-LENES, POLY-CHLOR. TOTAL (UG/L)	PER-THANE TOTAL (UG/L)	PARA-THION, TOTAL (UG/L)	TOX-APHENE, TOTAL (UG/L)	TOTAL TRI-THION (UG/L)	2,4-D, TOTAL (UG/L)	2, 4-DP TOTAL (UG/L)	2,4,5-T TOTAL (UG/L)	SILVEX, TOTAL (UG/L)
DEC									
05...	.00	.00	.00	.00	.00	.25	.00	.00	.03

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

HAWAII, ISLAND OF OAHU--Continued

212604158012700 DRAIN A NEAR MILILANI TOWN (LAT 21°26'04" LONG 158°01'27")

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (UMHOS)	TUR-BID-ITY (NTU)	SOLIDS, RESIDUE AT 105 DEG. C, SUS-PENDED (MG/L)
JAN					
31...	1425	15	150	--	--
31...	1426	15	130	28	415
31...	1440	65	115	120	616
31...	1441	65	130	120	688
31...	1455	60	155	110	696
31...	1456	60	118	96	525
31...	1510	60	106	76	571
31...	1511	60	102	37	532
31...	1525	45	84	84	349
31...	1526	45	78	110	339
31...	1540	22	78	--	--
31...	1555	15	79	110	395
31...	1556	15	81	99	323
31...	1655	15	80	110	335
31...	1656	15	81	100	399
31...	1855	15	80	99	260
31...	1856	15	72	96	335
MAR					
06...	1600	15	202	34	468
06...	1601	15	171	110	385
06...	1615	15	143	110	279
MAR					
06...	1616	15	142	92	271
30...	0035	15	142	35	89
30...	0036	15	115	37	188
31...	0140	30	117	34	185
31...	0141	30	116	39	205
31...	2000	22	164	34	117
31...	2001	22	150	36	111
31...	2025	30	180	76	308
31...	2026	30	163	34	409
31...	2040	22	125	37	579
31...	2041	22	120	34	629
31...	2110	15	118	38	673
31...	2125	15	94	64	204
31...	2126	15	83	64	143
31...	2230	15	87	60	182
31...	2231	15	80	60	135
APR					
01...	2345	15	77	60	118
01...	2346	15	118	29	53

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	ARSENIC TOTAL (UG/L AS AS)	BARIUM, TOTAL RECOV-ERABLE (UG/L AS BA)	CADMIUM TOTAL RECOV-ERABLE (UG/L AS CD)	CHRO-MIUM, TOTAL RECOV-ERABLE (UG/L AS CR)	COPPER, TOTAL RECOV-ERABLE (UG/L AS CU)	IRON, TOTAL RECOV-ERABLE (UG/L AS FE)
JAN								
31...	1425	15	2	200	3	50	90	15000
31...	1540	22	2	100	1	60	54	23000

DATE	LEAD, TOTAL RECOV-ERABLE (UG/L AS PB)	MANGA-NESE, TOTAL RECOV-ERABLE (UG/L AS MN)	MERCURY TOTAL RECOV-ERABLE (UG/L AS HG)	SILVER, TOTAL RECOV-ERABLE (UG/L AS AG)	SELE-NIUM, TOTAL (UG/L AS SE)	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN)	CYANIDE TOTAL (MG/L AS CN)
JAN							
31...	450	1400	.3	0	0	310	.00
31...	76	830	.2	0	0	90	.00

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

HAWAII, ISLAND OF OAHU--Continued

21255315801I000 DRAIN B NEAR MILILANI TOWN (LAT 21°25'53" LONG 158°01'10")

DATE	TIME	SPE-CIFIC CON-DUCT-ANCE (UMHOS)	TUR-BID-ITY (NTU)	PH LAB (UNITS)	OXYGEN DEMAND, CHEM-ICAL (HIGH LEVEL) (MG/L)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L)	SOLIDS, DIS-SOLVED (TONS PER AC-FT)	SOLIDS, RESIDUE AT 105 DEG. C, SUS-PENDED (MG/L)	CADMIUM TOTAL RECOV-ERABLE (UG/L AS CD)	LEAD, TOTAL RECOV-ERABLE (UG/L AS PB)	MERCURY TOTAL RECOV-ERABLE (UG/L AS HG)
OCT											
05...	1515	77	5.5	6.8	71	54	.07	298	0	400	.2
05...	1523	76	1.9	7.0	51	51	.07	134	0	200	.2
05...	1530	60	3.7	6.9	43	40	.05	147	0	0	.1
05...	1538	59	4.9	6.8	29	31	.04	126	0	200	.1
05...	1600	58	3.2	6.8	28	41	.06	121	0	100	.1
05...	1608	54	4.0	6.7	23	41	.06	96	0	100	.3
05...	1615	54	7.5	6.8	27	35	.05	86	0	100	.0
05...	1623	86	2.6	7.2	37	65	.09	111	0	100	.1

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (UMHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)	TUR-BID-ITY (NTU)	OXYGEN DEMAND, CHEM-ICAL (HIGH LEVEL) (MG/L)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	HARD-NESS (MG/L AS CACO3)	HARD-NESS, NONCAR-BONATE (MG/L CACO3)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)
DEC												
05...	1400	1.0	60	7.8	23.0	17	31	8800	17	0	5.5	.7

DATE	SODIUM, DIS-SOLVED (MG/L AS NA)	PERCENT SODIUM	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY LAB (MG/L AS CACO3)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)
DEC											
05...	3.9	32	.4	1.1	20	3.7	2.4	.1	3.9	45	35

DATE	SOLIDS, DIS-SOLVED (TONS PER AC-FT)	SOLIDS, DIS-SOLVED (TONS PER DAY)	SOLIDS, RESIDUE AT 105 DEG. C, SUS-PENDED (MG/L)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC DIS-SOLVED (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, NH4 + ORG. SUSP. TOTAL (MG/L AS N)
DEC											
05...	.06	.12	23	30	.27	.020	.010	.47	.39	.49	.09

DATE	NITRO-GEN, AM-MONIA + ORGANIC DIS. (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS N)	NITRO-GEN DIS-SOLVED (MG/L AS N)	PHOS-PHORUS, TOTAL (MG/L AS P)	PHOS-PHORUS, DIS-SOLVED (MG/L AS P)	OIL AND GREASE, TOTAL RECOV. GRAVI-METRIC (MG/L)	CADMIUM TOTAL RECOV-ERABLE (UG/L AS CD)	IRON, DIS-SOLVED (UG/L AS FE)	LEAD, TOTAL RECOV-ERABLE (UG/L AS PB)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)	MERCURY TOTAL RECOV-ERABLE (UG/L AS HG)
DEC											
05...	.40	.79	.67	.150	.130	0	0	0	100	<1	.0

DATE	TIME	CARBON, ORGANIC DIS-SOLVED (MG/L AS C)	PCB, TOTAL (UG/L)	ALDRIN, TOTAL (UG/L)	CHLOR-DANE, TOTAL (UG/L)	DDD, TOTAL (UG/L)	DDE, TOTAL (UG/L)	DDT, TOTAL (UG/L)	DI-AZINON, TOTAL (UG/L)	DI-ELDRIN TOTAL (UG/L)
DEC										
05...	1400	5.3	.00	.00	.30	.00	.00	.00	.68	.01

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

ANALYSES OF SAMPLES COLLECTED AT WATER-QUALITY PARTIAL-RECORD STATIONS

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

HAWAII, ISLAND OF OAHU--Continued

212553158011000 DRAIN B NEAR MILILANI TOWN (LAT 21°25'53" LONG 158°01'10")

DATE	ENDO-SULFAN, TOTAL (UG/L)	ENDRIN, TOTAL (UG/L)	ETHION, TOTAL (UG/L)	HEPTA-CHLOR, TOTAL (UG/L)	HEPTA-CHLOR EPOXIDE TOTAL (UG/L)	LINDANE TOTAL (UG/L)	MALA-THION, TOTAL (UG/L)	METH-OXY-CHLOR, TOTAL (UG/L)	METHYL PARA-THION, TOTAL (UG/L)	METHYL TRI-THION, TOTAL (UG/L)
DEC 05...	.00	.00	.00	.02	.01	.01	.33	.00	.00	.00

DATE	MIREX, TOTAL (UG/L)	NAPH-THA-LENES, POLY-CHLOR. TOTAL (UG/L)	PER-THANE TOTAL (UG/L)	PARA-THION, TOTAL (UG/L)	TOX-APHENE, TOTAL (UG/L)	TOTAL TRI-THION (UG/L)	2,4-D, TOTAL (UG/L)	2, 4-DP TOTAL (UG/L)	2,4,5-T TOTAL (UG/L)	SILVEX, TOTAL (UG/L)
DEC 05...	.00	.00	.00	.00	.00	.00	.15	.00	.01	.03

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (UMHOS)	TUR-BID-ITY (NTU)	SOLIDS, RESIDUE AT 105 DEG. C, SUS-PENDED (MG/L)
JAN					
31...	1353	11	87	33	270
31...	1354	11	145	--	--
31...	1445	14	95	27	337
31...	1446	14	89	31	420
31...	1500	9.0	76	33	351
31...	1501	9.0	64	26	239
31...	1510	9.0	58	28	150
31...	1511	9.0	54	25	149
31...	1525	14	56	--	--

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (UMHOS)	TUR-BID-ITY (NTU)	SOLIDS, RESIDUE AT 105 DEG. C, SUS-PENDED (MG/L)
JAN					
31...	1541	16	56	31	104
FEB					
01...	0612	25	57	39	137
01...	0613	25	48	140	201
01...	0625	14	47	150	177
01...	0626	14	50	110	127
01...	0630	9.0	52	--	--

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	ARSENIC TOTAL (UG/L AS AS)	BARIUM, TOTAL RECOV-ERABLE (UG/L AS BA)	CADMIUM TOTAL RECOV-ERABLE (UG/L AS CD)	CHRO-MIUM, TOTAL RECOV-ERABLE (UG/L AS CR)	COPPER, TOTAL RECOV-ERABLE (UG/L AS CU)	IRON, TOTAL RECOV-ERABLE (UG/L AS FE)
JAN								
31...	1354	11	3	100	2	50	80	15000
31...	1525	14	2	100	1	20	37	6600
FEB								
01...	0630	9.0	2	100	1	20	16	5900

DATE	LEAD, TOTAL RECOV-ERABLE (UG/L AS PB)	MANGA-NESE, TOTAL RECOV-ERABLE (UG/L AS MN)	MERCURY TOTAL RECOV-ERABLE (UG/L AS HG)	SILVER, TOTAL RECOV-ERABLE (UG/L AS AG)	SELE-NIUM, TOTAL (UG/L AS SE)	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN)	CYANIDE TOTAL (MG/L AS CN)
JAN							
31...	330	1080	.2	0	0	310	.00
31...	110	400	.1	0	0	90	.00
FEB							
01...	22	170	.1	0	0	40	.00

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

HAWAII, ISLAND OF OAHU--Continued

212732157502200 KAHALUU STREAM AT ALTITUDE 10 FT AT KAHALUU (LAT 21°27'32" LONG 157°50'22")

DATE	TIME	SPECIFIC CONDUCTANCE LAB (UMHOS)	PH LAB (UNITS)	TEMPERATURE (DEG C)	TURBIDITY (NTU)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN, AMMONIA TOTAL (MG/L AS N)	NITROGEN, ORGANIC TOTAL (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITROGEN, TOTAL (MG/L AS N)	PHOSPHORUS, TOTAL (MG/L AS P)	SEDIMENT, SUSPENDED (MG/L)
OCT												
23...	0930	--	--	23.0	.55	.82	.000	.38	.38	1.2	.450	5
JAN												
20...	1110	--	--	20.6	.60	1.3	.660	.54	1.20	2.5	.650	7
MAR												
25...	1040	302	7.3	23.0	6.6	1.0	.180	.41	.59	1.6	.670	8

NOTE.--Water-quality samples collected by Soil Conservation Service.

212742157503200 KAHALUU STREAM AT HIGHWAY 83 AT KAHALUU (LAT 21°27'42" LONG 157°50'32")

DATE	TIME	SPECIFIC CONDUCTANCE LAB (UMHOS)	PH LAB (UNITS)	TEMPERATURE (DEG C)	TURBIDITY (NTU)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN, AMMONIA TOTAL (MG/L AS N)	NITROGEN, ORGANIC TOTAL (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITROGEN, TOTAL (MG/L AS N)	PHOSPHORUS, TOTAL (MG/L AS P)	SEDIMENT, SUSPENDED (MG/L)
OCT												
23...	0905	--	--	24.0	.20	.00	.020	.54	.56	.56	.060	36
JAN												
20...	1045	--	--	20.5	.40	.00	.110	.68	.79	.79	.070	25
MAR												
25...	1100	30500	8.0	24.0	8.9	.27	.020	.24	.26	.53	.170	37

NOTE.--Water-quality samples collected by Soil Conservation Service.

ANALYSES OF SAMPLES COLLECTED AT MISCELLANEOUS SITES

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 1980 TO SEPTEMBER 1981

HAWAII, ISLAND OF HAWAII

16717600 ALIA STREAM NEAR HILO (LAT 19°50'38" LONG 155°06'21")

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (UMHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)	HARD-NESS (MG/L AS CACO3)	HARD-NESS, NONCAR-BONATE (MG/L CACO3)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	PERCENT SODIUM	SODIUM AD-SORP-TION RATIO
FEB 17...	1530	.83	125	7.8	23.0	48	10	7.5	7.0	6.4	22	.4

DATE	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY LAB (MG/L AS CACO3)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	SILICA, DIS-SOLVED (MG/L AS SIO2)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	SOLIDS, DIS-SOLVED (TONS PER AC-FT)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS N)	PHOS-PHORUS, TOTAL (MG/L AS P)
FEB 17...	2.3	38	4.0	13	14	77	.10	.44	2.20	2.6	.030

16717820 MANOWAIOPAE STREAM NEAR LAUPAHOEHOE (LAT 19°58'35" LONG 155°14'45")

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (UMHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)	HARD-NESS (MG/L AS CACO3)	HARD-NESS, NONCAR-BONATE (MG/L CACO3)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	PERCENT SODIUM
FEB 18...	0955	.23	130	8.3	20.0	52	0	11	5.9	7.3	23

DATE	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY LAB (MG/L AS CACO3)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS N)	PHOS-PHORUS, TOTAL (MG/L AS P)
FEB 18...	.4	.8	52	1.4	7.3	.41	.50	.91	.050

ANALYSES OF SAMPLES COLLECTED AT MISCELLANEOUS SITES

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

HAWAII, ISLAND OF HAWAII--Continued

16733100 LOWER HAMAKUA DITCH BELOW MAIN WEIR NEAR KUKUIHAELE (LAT 20°07'07" LONG 155°35'09")

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (UMHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)	HARD-NESS (MG/L AS CACO3)	HARD-NESS, NONCAR-BONATE (MG/L CACO3)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	PERCENT SODIUM	SODIUM AD-SORP-TION RATIO
FEB 19...	1220	40	100	7.6	19.0	35	0	7.5	3.9	7.7	31	.6

DATE	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY LAB (MG/L AS CACO3)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	SILICA, DIS-SOLVED (MG/L AS SIO2)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	SOLIDS, DIS-SOLVED (TONS PER AC-FT)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS N)	PHOS-PHORUS, TOTAL (MG/L AS P)
FEB 19...	1.8	40	2.7	5.7	36	89	.12	.30	.21	.51	.070

201330155494500 KOHALA DITCH AT HAWI, HAWAII (LAT 20°13'30" LONG 155°49'45")

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (UMHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)	HARD-NESS (MG/L AS CACO3)	HARD-NESS, NONCAR-BONATE (MG/L CACO3)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	PERCENT SODIUM	SODIUM AD-SORP-TION RATIO
FEB 19...	1015	11	100	8.3	20.0	38	0	8.8	4.0	7.8	29	.5

DATE	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY LAB (MG/L AS CACO3)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	SILICA, DIS-SOLVED (MG/L AS SIO2)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	SOLIDS, DIS-SOLVED (TONS PER AC-FT)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS N)	PHOS-PHORUS, TOTAL (MG/L AS P)
FEB 19...	1.7	43	1.0	6.1	40	95	.13	.01	.35	.36	.070

OBSERVATIONS OF PHYSICAL PARAMETERS

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

HAWAII, ISLAND OF KAUAI

16010000 - KAWAIKOI STREAM NR WAIMEA, KAUAI, HI (LAT 22 08 09 LONG 159 37 22)

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (UMHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)
OCT , 1980					
14...	1035	14	28	5.2	17.5
DEC					
10...	1005	8.2	26	6.0	16.0
JAN , 1981					
28...	1045	17	32	5.7	15.5
MAR					
11...	1130	32	30	5.9	16.0
APR , 1981					
22...	1145	10	27	6.1	17.0
JUN					
12...	1220	11	25	5.2	20.0
JUL					
23...	1240	12	25	5.7	20.5
SEP					
14...	1030	14	25	5.9	17.5

16014000 - KOKEE DITCH NR WAIMEA, KAUAI, HI (LAT 22 06 42 LONG 159 40 43)

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (UMHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)
OCT , 1980					
14...	1400	22	32	5.9	18.0
DEC					
10...	1440	15	32	6.4	16.0
JAN , 1981					
28...	1315	29	36	6.5	15.5
MAR					
11...	1425	45	34	6.3	15.5
APR , 1981					
22...	1355	19	34	6.5	16.0
JUN					
12...	1410	16	33	7.0	18.0
JUL					
23...	1410	20	27	6.1	18.5
SEP					
15...	1040	13	29	6.1	18.5

16036000 - MAKAWELI RIVER NR WAIMEA, KAUAI, HI (LAT 21 58 31 LONG 159 38 55)

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (UMHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)
OCT , 1980					
10...	1305	16	115	7.8	22.0
DEC					
04...	1310	13	150	7.3	22.0
JAN , 1981					
20...	1400	16	140	6.7	20.0
MAR					
06...	1355	47	110	7.6	21.5
APR					
23...	1340	15	130	8.0	23.0
JUN , 1981					
08...	1315	11	140	7.7	--
JUL					
15...	1410	380	--	--	21.5
24...	0940	30	109	7.3	22.0
SEP					
08...	1045	19	125	7.6	22.0

16049000 - HANAPEPE RIVER BL MANUAHI STR NR ELEELE, KAUAI, HI (LAT 21 57 29 LONG 159 33 13)

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (UMHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)
OCT , 1980					
10...	1005	17	125	7.4	22.0
DEC					
04...	1025	20	125	7.4	21.0
05...	1200	441	51	6.3	20.0
JAN , 1981					
20...	1045	17	130	7.1	18.0
MAR					
06...	1110	73	96	7.2	19.5
APR , 1981					
23...	1030	18	130	8.2	21.0
JUN					
08...	1045	15	130	8.2	22.5
JUL					
21...	1115	1250	38	6.6	21.5
SEP					
09...	1115	18	125	7.7	21.5

16060000 - SF WAILUA RIVER NR LIHUE, KAUAI, HI (LAT 22 02 24 LONG 159 22 58)

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (UMHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)
OCT , 1980					
01...	1405	9.5	65	7.1	26.5
NOV					
05...	1255	15	140	7.4	23.0
DEC					
02...	1410	12	125	7.4	22.5
JAN , 1981					
06...	1405	7.8	140	7.2	21.5
FEB					
03...	1345	6.3	115	7.2	23.0
MAR					
03...	1410	93	118	7.2	22.0
APR , 1981					
01...	1345	266	80	7.3	20.0
MAY					
01...	1340	99	82	7.4	20.0
JUN					
01...	1335	6.6	140	7.0	26.0
30...	1335	4.2	155	7.0	27.0
AUG					
04...	1415	67	96	7.1	24.0
SEP					
02...	0935	7.6	132	7.0	21.0

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

HAWAII, ISLAND OF KAUAI--Continued

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (UMHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)
16061000 - NORTH WAILUA DITCH NR LIHUE, KAUAI, HI (LAT 22 03 56 LONG 159 28 14)					
OCT , 1980					
02...	1355	15	72	7.9	21.0
NOV					
06...	1450	18	73	7.7	20.5
DEC					
03...	1405	18	75	7.6	20.0
JAN , 1981					
07...	1340	17	75	7.5	19.0
FEB					
04...	1255	17	73	7.6	20.0
MAR					
04...	1350	19	70	7.6	18.0
APR , 1981					
02...	1240	22	63	7.2	18.0
MAY					
04...	1340	20	75	7.8	19.0
JUN					
02...	1235	18	72	7.3	19.5
30...	1115	16	--	--	20.0
AUG					
05...	1130	33	24	6.5	20.5
31...	1430	19	65	6.9	19.5
16061200 - N WAILUA DITCH BL WAIKOKO STR NR LIHUE, KAUAI, HI (LAT 22 03 34 LONG 159 28 00)					
OCT , 1980					
20...	1130	1.6	75	7.6	20.5
NOV					
20...	1105	22	75	7.8	18.5
DEC					
19...	1120	21	78	7.5	17.5
JAN , 1981					
22...	1055	19	73	7.5	17.5
FEB					
18...	1120	22	63	7.7	18.5
MAR					
20...	1125	19	75	7.7	17.5
APR , 1981					
20...	1135	22	79	7.5	19.5
MAY					
19...	1105	20	75	7.9	19.0
JUN					
22...	1055	19	72	7.4	20.0
JUL					
20...	1140	22	68	7.4	20.0
AUG					
20...	1105	22	74	7.5	20.0
SEP					
21...	1050	21	74	6.8	22.0
16062000 - STABLE STORM DITCH NR LIHUE, KAUAI, HI (LAT 22 04 09 LONG 159 26 46)					
OCT , 1980					
20...	0945	6.7	80	7.6	20.0
NOV					
20...	0940	28	85	7.6	19.0
DEC					
19...	0950	.75	86	7.4	17.5
JAN , 1981					
22...	0940	23	90	7.4	17.5
FEB					
18...	0940	37	75	7.6	18.5
MAR					
20...	0950	26	90	7.3	17.5
APR , 1981					
20...	0925	.97	92	7.4	19.5
MAY					
19...	0935	.27	91	7.8	20.0
JUN					
22...	0930	18	85	7.0	20.0
JUL					
20...	0945	.67	70	7.4	21.0
AUG					
20...	0930	.05	108	6.3	22.0
SEP					
21...	0925	20	86	7.6	21.0
16063000 - NF WAILUA R AT ALT 650 FT NR LIHUE, KAUAI, HI (LAT 22 04 02 LONG 159 26 21)					
OCT , 1980					
02...	1040	37	85	7.3	19.5
NOV					
06...	1030	8.8	90	7.3	19.5
DEC					
03...	1025	8.9	90	7.5	19.0
JAN , 1981					
07...	1035	7.1	90	7.4	18.5
FEB					
04...	0955	.83	108	6.9	19.5
MAR					
04...	1030	16	80	7.3	18.0
APR , 1981					
02...	1045	122	65	7.1	19.0
MAY					
04...	1020	71	84	7.5	18.0
JUN					
02...	1015	2.6	96	6.7	21.0
30...	0910	1.0	100	6.7	22.0
AUG					
05...	0930	1990	28	6.2	21.0
SEP					
02...	1410	45	70	7.0	20.5

OBSERVATIONS OF PHYSICAL PARAMETERS

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

HAWAII, ISLAND OF KAUAI--Continued

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (UMHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)
16068000 - EB OF NF WAILUA RIVER NR LIHUE, KAUAI, HI (LAT 22 04 19 LONG 159 25 05)					
OCT , 1980					
22...	1110	25	97	7.1	21.0
NOV					
24...	1105	31	95	7.1	21.5
DEC					
18...	1020	25	108	7.2	17.5
JAN , 1981					
26...	1050	14	110	7.1	20.5
FEB					
23...	1015	73	80	7.4	20.0
MAR					
25...	1040	26	88	7.1	19.5
APR , 1981					
24...	1030	31	95	7.3	21.0
MAY					
22...	1045	21	100	7.0	22.0
JUN					
24...	0935	30	90	7.4	22.0
JUL					
27...	1100	52	85	7.2	21.0
AUG					
25...	0910	28	88	7.1	21.5
SEP					
24...	1020	28	90	6.9	22.0
16069000 - WAILUA DITCH NR KAPAA, KAUAI, HI (LAT 22 04 34 LONG 159 24 04)					
OCT , 1980					
20...	1350	30	78	7.1	25.0
NOV					
20...	1440	30	83	7.3	24.5
JAN , 1981					
22...	1250	23	110	7.4	21.5
FEB					
18...	1320	26	92	7.5	22.5
MAR					
20...	1320	34	90	7.4	22.0
APR					
20...	1340	16	82	7.1	24.0
MAY , 1981					
19...	1310	29	90	7.5	24.0
JUN					
22...	1310	28	95	7.1	26.5
JUL					
20...	1405	39	70	7.2	26.0
AUG					
20...	1305	33	77	6.9	24.5
SEP					
21...	1255	33	90	6.8	27.5
16071000 - NF WAILUA RIVER NR KAPAA, KAUAI, HI (LAT 22 03 08 LONG 159 22 22)					
OCT , 1980					
08...	1015	265	85	7.5	23.0
NOV					
18...	1015	56	95	7.6	21.5
JAN , 1981					
09...	1005	9.2	145	7.4	20.5
FEB					
25...	1010	36	83	7.1	19.5
APR , 1981					
08...	1025	127	70	7.3	20.0
MAY					
28...	1010	8.2	140	7.2	23.5
JUL					
08...	1005	7.4	148	7.3	25.0
AUG					
28...	0900	44	140	7.2	--
16071500 - LEFT BRANCH OPAEKAA STREAM NR KAPAA, KAUAI, HI (LAT 22 04 44 LONG 159 23 55)					
OCT , 1980					
08...	1355	2.3	90	6.9	23.0
NOV					
18...	1315	2.4	90	7.0	22.0
JAN , 1981					
09...	1325	1.3	100	6.8	22.0
FEB					
25...	1225	1.1	100	7.5	21.0
APR , 1981					
08...	1245	1.1	100	6.9	22.0
MAY					
29...	1015	1.6	95	6.6	22.0
JUL					
08...	1215	1.0	100	6.8	23.5
AUG					
28...	1050	1.9	93	6.6	23.0
16077000 - MAKALEHA DITCH NR KEALIA, KAUAI, HI (LAT 22 07 06 LONG 159 22 04)					
OCT , 1980					
20...	1315	12	55	7.3	21.0
NOV					
20...	1340	12	65	7.2	20.0
DEC					
19...	1320	.70	68	7.6	19.0
JAN , 1981					
22...	1240	8.1	70	7.3	20.0
FEB					
18...	1255	19	65	8.5	18.5
MAR					
20...	1325	8.0	69	7.1	19.5
APR , 1981					
20...	1345	1.4	78	7.4	20.0
MAY					
19...	1355	9.6	65	7.4	20.0
JUN					
22...	1300	8.0	65	7.2	20.0
JUL					
20...	1300	11	75	7.0	22.0
AUG					
20...	1330	6.6	60	6.9	22.0
SEP					
21...	1240	7.3	65	7.0	22.0

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (UMHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)	DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (UMHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)
16079000 - KAPAHI DITCH NR KEALIA, KAUAI, HI (LAT 22 06 09 LONG 159 22 28)											
OCT , 1980						APR , 1981					
20...	1440	.37	60	7.3	22.0	20...	1525	.26	80	7.2	20.0
NOV						MAY					
20...	1510	6.4	70	7.3	20.0	19...	1455	4.9	76	7.3	20.0
DEC						JUN					
19...	1500	12	70	7.0	18.5	22...	1425	3.2	75	7.2	22.0
JAN , 1981						JUL					
22...	1515	3.2	85	7.1	19.0	20...	1505	9.2	80	7.1	22.5
FEB						AUG					
18...	1500	33	80	8.3	18.5	20...	1455	.36	65	7.0	22.5
MAR						SEP					
20...	1510	2.5	70	7.1	20.0	21...	1500	3.9	78	7.2	23.5
16080000 - KAPAA BTR AT KAPAHI DITCH INTK NR KAPAA, KAUAI, HI (LAT 22 06 15 LONG 159 22 29)											
APR , 1981						AUG , 1981					
02...	0955	39	60	7.8	18.5	06...	0955	40	65	6.9	20.0
MAY											
04...	0955	26	70	7.4	19.0						
16087000 - ANAHOLA DITCH WASTEWAY NR KEALIA, KAUAI, HI (LAT 22 08 16 LONG 159 22 28)											
OCT , 1980						APR , 1981					
02...	1355	.04	68	7.1	22.0	02...	1455	.19	65	7.6	19.5
NOV						MAY					
06...	1400	.19	75	7.1	22.0	04...	1440	10	68	7.4	21.0
DEC						JUN					
03...	1410	.19	75	7.5	23.0	02...	1315	.44	80	7.0	22.0
JAN , 1981						JUL					
07...	1435	.07	75	7.2	22.0	01...	1010	.11	85	6.7	21.0
FEB						AUG					
04...	1435	.08	90	7.3	20.0	06...	1110	.13	95	7.3	22.0
MAR						SEP					
04...	1425	.07	70	7.0	20.0	04. .	0835	.09	60	6.6	24.0
16088000 - ANAHOLA DITCH AB KANEHA RES NR KEALIA, KAUAI, HI (LAT 22 08 10 LONG 159 22 28)											
OCT , 1980						APR , 1981					
20...	0905	4.8	70	7.3	20.0	20...	1000	.11	82	7.0	19.0
NOV						MAY					
20...	0950	5.9	70	7.3	20.0	19...	0920	3.9	70	7.2	20.0
DEC						JUN					
19...	0920	3.2	73	7.5	17.5	22...	1000	2.4	75	7.4	22.0
JAN , 1981						JUL					
22...	0955	1.2	78	7.4	20.0	20...	0930	8.2	80	7.4	21.0
FEB						AUG					
18...	0925	32	75	7.8	18.5	20...	0955	5.8	70	7.0	22.0
MAR						SEP					
20...	1000	2.3	80	7.3	18.5	21...	0950	3.0	85	7.0	22.0
16089000 - ANAHOLA STREAM NR KEALIA, KAUAI, HI (LAT 22 09 05 LONG 159 21 17)											
OCT , 1980						APR , 1981					
02...	1135	8.8	65	6.9	19.5	02...	1305	20	58	8.0	18.5
NOV						MAY					
06...	1210	9.7	80	7.4	22.0	04...	1250	26	78	7.5	20.0
DEC						JUN					
03...	1205	8.3	85	7.8	21.0	02...	1115	7.5	85	7.1	21.0
JAN , 1981						JUL					
07...	1315	6.0	95	7.6	18.0	01...	0845	4.7	115	7.6	22.0
FEB						AUG					
04...	1215	4.4	120	7.2	20.0	06...	1330	80	60	6.8	21.0
MAR						SEP					
04...	1210	9.6	105	7.2	19.5	04...	1035	6.8	110	7.0	24.0

OBSERVATIONS OF PHYSICAL PARAMETERS

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

HAWAII, ISLAND OF KAUAI--Continued

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (UMHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)
16091000 - LOWER ANAHOLA DITCH NR KEALIA, KAUAI, HI (LAT 22 08 14 LONG 159 19 31)					
OCT , 1980					
20...	1105	.10	70	7.6	21.5
NOV					
20...	1120	.90	85	7.3	22.0
DEC					
19...	1110	.36	90	7.2	19.0
FEB , 1981					
18...	1020	.84	85	8.3	19.0
MAR					
20...	1130	.16	90	7.0	19.5
APR					
20...	1135	.10	110	7.2	20.0
MAY , 1981					
19...	1200	5.0	90	7.3	21.0
JUN					
22...	1125	2.5	105	7.3	22.5
JUL					
20...	1135	2.1	110	7.2	23.0
AUG					
20...	1140	4.8	95	7.3	22.0
SEP					
21...	1140	2.9	105	7.1	23.0
16093200 - ANAHOLA STREAM AT ANAHOLA, KAUAI, HI (LAT 22 08 42 LONG 159 18 59)					
OCT , 1980					
09...	0910	42	195	7.6	20.0
NOV					
19...	1020	14	110	7.4	20.0
JAN , 1981					
12...	0925	15	185	7.3	18.5
FEB					
26...	1100	17	130	7.4	20.0
APR , 1981					
09...	0945	20	135	7.6	19.0
JUN					
04...	1005	10	130	7.4	21.0
JUL					
10...	1005	44	120	7.1	23.0
AUG					
27...	0945	8.7	123	7.0	22.0
16097500 - HALAULANI STR AT ALT 400 FT NR KILAUEA, KAUAI, HI (LAT 22 10 54 LONG 159 25 17)					
OCT , 1980					
08...	1055	21	72	7.6	21.0
NOV					
18...	1000	9.0	75	7.6	20.0
JAN , 1981					
09...	1010	6.0	75	7.5	19.0
FEB					
25...	1040	8.1	75	7.2	19.0
APR , 1981					
09...	1240	10	85	7.3	19.5
MAY					
28...	0955	6.2	85	7.6	22.0
JUL					
09...	0950	6.8	108	7.0	22.5
AUG					
26...	1030	6.7	80	6.9	22.0
16100000 - HANALEI TUNNEL OUTLET NR LIHUE, KAUAI, HI (LAT 22 05 02 LONG 159 27 50)					
OCT , 1980					
01...	1030	23	38	6.6	19.0
NOV					
05...	1040	17	80	7.8	17.0
DEC					
02...	1045	17	80	7.7	18.0
JAN , 1981					
06...	1030	19	80	7.4	16.5
FEB					
03...	1045	17	80	7.3	19.0
MAR					
03...	1025	21	56	7.3	17.0
APR , 1981					
01...	1020	30	57	7.3	17.0
MAY					
01...	1035	31	67	7.6	16.5
JUN					
01...	1035	15	78	7.0	18.5
AUG					
04...	1035	59	66	7.4	19.5
31...	1040	27	63	7.3	19.0
16103000 - HANALEI RIVER NR HANALEI, KAUAI, HI (LAT 22 11 31 LONG 159 27 57)					
OCT , 1980					
07...	1015	100	80	8.0	22.0
NOV					
17...	1005	206	85	7.3	19.0
JAN , 1981					
08...	1020	64	100	7.4	21.0
FEB					
24...	1115	408	72	7.1	19.0
APR , 1981					
07...	1100	210	75	7.6	18.0
MAY					
27...	0940	63	100	7.2	21.0
JUL					
16...	1140	462	65	7.1	22.0
AUG					
24...	0920	87	63	7.0	21.5
16108000 - WAINIHA RIVER NEAR HANALEI, KAUAI, HI (LAT 22 08 20 LONG 159 33 38)					
OCT , 1980					
16...	1225	72	60	7.4	20.0
DEC					
17...	1240	61	67	7.5	17.0
FEB , 1981					
10...	1220	62	60	6.3	16.0
APR , 1981					
21...	1200	83	59	7.5	18.0
JUN					
11...	1210	61	54	7.3	19.5
AUG					
17...	1315	100	36	6.7	22.0

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

HAWAII, ISLAND OF OAHU

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (UMHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)
16200000 - NF KAUKONAHUA STR AB RB NR WAHIAWA, OAHU, HI (LAT 21 31 09 LONG 157 56 53)					
OCT , 1980					
02...	1150	2.4	90	7.7	23.0
28...	1320	4.6	50	7.0	21.5
DEC					
11...	1355	.84	55	7.3	19.5
JAN , 1981					
29...	1550	8.1	36	6.8	20.5
MAR					
05...	1240	6.8	55	6.4	21.0
APR , 1981					
16...	1510	14	36	6.7	23.0
MAY					
27...	1355	2.2	80	7.5	21.0
JUL					
08...	1140	8.8	35	7.2	21.5
AUG					
18...	1300	15	30	6.7	22.5
16208000 - S F KAUKONAHUA STR AT E PUMP RE WAHIAWA, OAHU, HI (LAT 21 29 32 LONG 157 59 54)					
OCT , 1980					
02...	1540	2.8	80	6.9	24.0
28...	1720	9.4	65	6.9	21.5
DEC					
19...	0940	1.9	62	6.8	18.0
JAN , 1981					
26...	1115	.50	72	6.5	20.0
MAR					
06...	1500	6.4	70	6.4	22.5
APR , 1981					
20...	1710	5.6	50	6.4	23.5
JUN					
01...	1725	3.7	57	6.3	24.5
JUL					
16...	1630	49	46	6.6	22.0
AUG					
27...	1145	8.6	46	6.3	25.0
16211600 - MAKAHA STREAM NR MAKAHA, OAHU, HI (LAT 21 30 16 LONG 158 10 59)					
OCT , 1980					
23...	1645	.12	145	7.1	21.0
DEC					
15...	1430	10	63	7.7	19.0
JAN , 1981					
20...	1355	.44	110	7.2	18.5
FEB					
11...	1400	3.7	100	7.2	19.5
25...	1535	.85	100	7.4	19.5
26...	1330	.68	110	7.1	18.5
27...	1030	.62	100	7.1	17.5
MAR					
05...	0905	.43	110	7.2	18.0
06...	1445	.40	110	7.3	19.0
07...	1245	.77	98	7.3	19.0
MAR , 1981					
08...	1125	.60	105	7.4	19.0
09...	0825	.57	106	7.3	18.0
10...	1455	.53	104	7.3	20.0
11...	1215	.50	108	7.3	19.0
APR					
23...	1530	.92	120	7.3	20.0
MAY					
26...	1125	.82	115	7.3	20.5
JUL					
10...	1500	.94	105	7.3	21.5
AUG					
19...	1155	.36	140	7.4	21.5
16216000 - WAIAWA STREAM NR PEARL CITY, OAHU, HI (LAT 21 23 57 LONG 157 58 51)					
OCT , 1980					
03...	1515	3.2	900	7.0	24.0
NOV					
13...	1525	3.1	1000	7.1	23.0
DEC					
30...	1230	3.4	725	6.8	22.5
FEB , 1981					
09...	1130	4.9	1500	6.5	21.0
MAR					
18...	1430	3.1	850	6.6	23.0
APR , 1981					
28...	1115	3.1	825	6.9	24.0
JUN					
15...	1130	3.6	1300	7.3	25.5
JUL					
22...	1130	14	260	7.0	25.0
SEP					
15...	1135	3.0	1650	6.8	25.5

OBSERVATIONS OF PHYSICAL PARAMETERS

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

HAWAII, ISLAND OF OAHU--Continued

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (UMHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)
16224500 - KALAUAO STREAM AT MOANALUA RD, AT AIEA, OAHU, HI (LAT 21 23 07 LONG 157 56 22)					
DEC , 1980					
15...	1035	4.8	125	7.3	21.5
23...	1510	3.3	170	6.8	23.5
FEB , 1981					
05...	1045	7.7	450	7.3	22.0
05...	1515	.29	530	7.0	22.5
MAR					
12...	1125	.15	670	6.9	22.5
APR , 1981					
28...	1300	.19	725	6.6	24.5
MAY					
07...	1150	300	58	6.8	19.5
08...	1000	32	62	6.6	20.0
JUN					
12...	1500	.17	730	7.0	25.5
16226000 - NORTH HALAWA STREAM NR AIEA, OAHU, HI (LAT 21 23 46 LONG 157 53 37)					
DEC , 1980					
29...	1315	.50	135	6.9	21.5
FEB , 1981					
06...	1130	.11	150	6.7	19.0
APR					
27...	1205	.03	160	6.2	22.5
JUL , 1981					
28...	1130	.17	120	7.2	24.0
AUG					
05...	1235	17	95	6.8	23.5
16232000 - NUUANU STR BL RES 2 WSTEWY NR HONOLULU, OAHU, HI (LAT 21 20 57 LONG 157 49 40)					
OCT , 1980					
03...	1105	2.7	120	7.4	23.5
NOV					
12...	1520	2.2	120	7.0	21.5
DEC					
24...	1235	4.6	120	7.0	22.5
FEB , 1981					
03...	1530	2.1	120	7.0	21.0
MAR , 1981					
18...	1150	1.4	125	7.1	19.0
APR					
24...	1505	1.8	120	6.7	23.5
JUN					
11...	1445	3.4	125	7.0	23.5
SEP					
10...	1050	1.6	120	6.8	22.5
16238500 - WAIHI STREAM AT HONOLULU, OAHU, HI (LAT 21 19 55 LONG 157 48 12)					
OCT , 1980					
01...	1510	.70	140	7.0	23.5
NOV					
07...	1420	.68	130	7.0	23.0
DEC					
22...	1435	.95	140	6.9	22.5
FEB , 1981					
02...	1420	.79	150	6.8	21.0
MAR					
17...	1145	.31	160	6.3	19.5
APR , 1981					
24...	1140	1.3	120	6.6	21.0
JUN					
10...	1245	.80	160	6.6	22.5
JUL					
27...	1350	1.1	145	--	23.0
SEP					
11...	1400	.67	150	6.7	23.0
16240500 - WAIAKEAKUA STREAM AT HONOLULU, OAHU, HI (LAT 21 19 53 LONG 157 48 08)					
OCT , 1980					
01...	1230	3.8	130	7.3	22.5
NOV					
07...	1125	3.3	135	7.3	22.0
DEC					
22...	1230	3.0	130	7.0	22.0
FEB , 1981					
02...	1200	2.5	130	7.1	21.0
MAR					
17...	1030	1.8	140	6.9	19.5
APR , 1981					
24...	1020	2.7	110	6.9	21.0
JUN					
10...	1130	2.3	140	6.9	22.0
JUL					
27...	1225	2.7	135	--	22.5
SEP					
11...	1115	2.3	135	7.1	22.0

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

HAWAII, ISLAND OF OAHU--Continued

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (UMHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)
16244000 - PUKELE STREAM NEAR HONOLULU, OAHU, HI (LAT 21 18 36 LONG 157 47 27)					
OCT , 1980					
02...	1135	.46	220	6.4	22.5
NOV					
12...	1145	.40	220	6.7	22.5
DEC					
23...	1200	10	110	6.8	22.0
FEB , 1981					
04...	1450	.36	220	6.4	22.5
MAR					
17...	1400	.32	220	6.5	22.5
APR , 1981					
30...	1355	3.5	180	6.8	21.5
JUN					
11...	1130	.46	230	6.8	22.5
JUL					
29...	1105	.59	200	--	22.5
SEP					
10...	1615	.39	220	6.2	22.5
16254000 - MAKAWAO STREAM NEAR KAILUA, OAHU, HI (LAT 21 21 49 LONG 157 46 02)					
OCT , 1980					
10...	1425	2.1	210	7.3	22.5
NOV					
26...	1550	2.0	210	7.5	23.0
JAN , 1981					
12...	1310	3.6	220	7.2	22.5
FEB					
19...	1630	3.6	230	7.3	21.5
APR , 1981					
08...	1530	1.6	190	7.5	23.0
MAY ,					
21...	1440	6.8	200	7.5	23.0
AUG					
11...	1100	4.4	210	7.7	22.5
SEP					
30...	1110	1.6	210	7.3	23.0
16283600 - SF WAIHEE STR NR HEEIA, OAHU, HI (LAT 21 26 47 LONG 157 52 12)					
OCT , 1980					
08...	1135	.88	120	7.4	20.5
NOV					
25...	1430	.73	140	7.5	20.0
JAN , 1981					
08...	1130	1.3	110	7.1	20.0
FEB					
18...	1055	.74	110	7.8	20.0
MAR					
31...	0930	.68	130	7.6	19.5
MAY , 1981					
19...	1255	.47	130	7.4	21.0
JUN					
22...	1200	.36	120	7.4	21.0
JUL					
07...	1505	.38	150	7.5	21.0
AUG					
11...	1500	.63	140	7.6	21.0
SEP					
29...	1415	.60	150	7.2	21.5
16283700 - NF WAIHEE STREAM NR HEEIA, OAHU, HI (LAT 21 26 48 LONG 157 52 18)					
OCT , 1980					
08...	1320	1.3	120	7.2	21.0
NOV					
25...	1210	1.3	130	7.3	21.5
JAN , 1981					
08...	1225	1.5	110	7.0	19.5
FEB					
18...	1310	1.1	110	7.8	20.0
MAR					
31...	1135	1.0	105	7.6	19.5
MAY , 1981					
19...	1200	.89	120	7.4	20.0
JUN					
22...	1225	.83	110	7.0	21.0
AUG					
11...	1500	.96	120	7.2	21.5
SEP					
29...	1545	1.0	140	6.9	21.5
16284000 - WAIHEE STREAM NR HEEIA, OAHU, HI (LAT 21 27 01 LONG 157 51 38)					
OCT , 1980					
08...	1655	3.1	150	--	21.0
NOV					
26...	1045	2.8	140	6.9	21.0
JAN , 1981					
12...	1625	2.4	140	7.4	22.0
MAR					
31...	1335	2.1	150	7.5	20.5
MAY , 1981					
19...	1425	2.0	160	7.4	22.0
JUN					
22...	1520	1.6	150	7.0	21.0
SEP					
29...	1210	1.4	130	6.9	22.5

OBSERVATIONS OF PHYSICAL PARAMETERS

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

HAWAII, ISLAND OF OAHU--Continued

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (UMHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)
16284200 - WAIHEE STREAM NR KAHALUU, OAHU, HI (LAT 21 27 04 LONG 157 51 36)					
OCT , 1980					
06...	1505	6.1	150	7.4	21.0
NOV					
26...	1310	5.8	160	7.6	21.0
JAN , 1981					
13...	1100	5.2	150	7.4	19.5
FEB					
18...	1555	4.9	150	7.1	21.0
MAR					
31...	1530	4.6	160	7.3	20.5
MAY , 1981					
26...	1250	5.3	150	7.5	21.5
JUN					
22...	1455	4.7	170	7.3	20.5
AUG					
05...	0945	14	145	7.0	22.0
SEP					
29...	1000	4.1	150	7.1	22.0
16284500 - WAIHEE STREAM AT KAHALUU, OAHU, HI (LAT 21 27 32 LONG 157 50 26)					
OCT , 1980					
23...	0955	--	--	--	22.0
JAN , 1981					
20...	1020	--	--	--	19.4
MAR , 1981					
25...	1025	--	--	--	22.0
16294900 - WAIKANE STREAM AT ALT 75 FT AT WAIKANE, OAHU, HI (LAT 21 30 00 LONG 157 51 54)					
OCT , 1980					
17...	1100	2.5	180	7.2	22.5
DEC					
01...	1440	1.9	190	7.3	22.0
JAN , 1981					
07...	1450	2.2	180	7.6	22.0
FEB					
23...	1525	2.5	170	7.5	22.0
JUN , 1981					
29...	1500	1.9	180	7.2	23.0
AUG					
04...	1100	5.7	130	7.0	23.5
SEP					
30...	1720	1.8	190	6.8	23.5
16296500 - KAHANA STR AT ALT 30 FT NR KAHANA, OAHU, HI (LAT 21 32 37 LONG 157 53 07)					
OCT , 1980					
15...	1455	19	130	6.8	21.0
DEC					
01...	1230	14	130	6.8	22.0
JAN , 1981					
06...	1300	--	140	6.9	22.0
APR					
02...	1230	27	120	6.2	21.0
MAY , 1981					
15...	1515	24	130	6.7	23.0
JUN					
23...	1420	14	140	6.6	22.0
AUG					
10...	1455	22	140	6.8	23.5
SEP					
24...	1350	15	150	6.9	23.0
16303000 - PUNALUU STREAM NR PUNALUU, OAHU, HI (LAT 21 33 33 LONG 157 54 06)					
OCT , 1980					
09...	1150	16	120	7.3	21.0
DEC					
03...	1200	14	130	6.4	20.0
JAN , 1981					
07...	1050	14	125	7.2	20.0
FEB					
24...	1300	16	130	7.2	20.0
APR					
08...	1230	29	110	7.1	20.5
MAY , 1981					
14...	1300	19	--	7.1	21.5
20...	1545	18	125	7.9	22.5
JUN					
29...	1140	12	120	7.2	23.0
AUG					
10...	1130	14	130	7.2	22.5
SEP					
28...	1140	11	130	6.9	22.0
16304200 - KALUANUI STREAM NR PUNALUU, OAHU, HI (LAT 21 35 22 LONG 157 54 38)					
OCT , 1980					
15...	1015	.96	50	6.9	20.0
DEC					
02...	1100	.17	70	6.8	21.0
JAN , 1981					
06...	1150	.24	70	6.8	20.0
FEB					
23...	1240	1.2	75	6.7	22.0
APR					
02...	1515	11	75	6.0	20.0
MAY , 1981					
15...	1125	1.0	68	7.0	23.0
JUN					
25...	1105	.15	70	6.7	24.5
AUG					
13...	1215	5.0	70	6.5	20.0
SEP					
28...	1450	1.0	63	5.8	21.5

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

HAWAII, ISLAND OF OAHU--Continued

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (UMHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)
16325000 - KAMANANUI STR AT PUPUKEA MIL RD NR MAUNAWAI, OAHU (LAT 21 37 25 LONG 158 01 04)					
OCT , 1980					
21...	1145	2.4	70	7.0	23.0
DEC					
09...	1020	1.3	67	7.0	21.0
JAN , 1981					
21...	1140	.36	76	7.0	18.5
MAR					
03...	1115	2.9	78	6.9	21.5
APR , 1981					
20...	1125	5.2	70	6.9	21.5
JUN					
01...	1300	2.1	80	7.0	26.0
JUL					
14...	1415	.92	67	6.9	27.0
AUG					
25...	1310	4.0	44	6.6	26.0
16330000 - KAMANANUI STREAM AT MAUNAWAI, OAHU, HI (LAT 21 38 20 LONG 158 03 27)					
OCT , 1980					
21...	1550	3.2	85	6.8	23.5
NOV					
19...	1100	1.8	87	6.6	23.5
DEC					
04...	1600	.33	100	6.7	22.5
08...	1630	3.6	80	--	22.5
17...	1610	3.5	70	6.8	20.0
JAN , 1981					
21...	1500	.06	150	6.8	21.0
MAR					
02...	1420	.53	95	7.0	21.5
APR , 1981					
14...	0900	128	47	6.8	19.5
MAY					
28...	1230	2.2	90	7.2	25.0
JUN					
03...	1710	1.4	95	6.7	26.0
JUL					
09...	1540	2.7	86	7.0	27.5
AUG					
25...	1500	6.7	57	6.8	26.0
16343000 - HELEMANO STREAM AT HALEIWA, OAHU, HI (LAT 21 34 40 LONG 158 06 12)					
OCT , 1980					
24...	1410	.02	1150	6.8	23.0
NOV					
19...	0945	.05	900	6.9	23.0
DEC					
12...	1620	.02	840	6.7	23.5
JAN , 1981					
23...	1630	.01	875	7.1	23.5
MAR					
02...	1500	.05	950	6.2	23.0
APR , 1981					
22...	1810	.17	275	6.6	24.5
MAY					
08...	1350	34	55	6.6	20.0
JUN					
08...	1600	.02	510	6.8	22.5
JUL					
13...	1500	.01	850	6.8	24.5
AUG					
24...	1230	.01	760	6.8	25.0
16345000 - OPAEULA STREAM NR WAHIAWA, OAHU, HI (LAT 21 33 55 LONG 158 00 10)					
OCT , 1980					
20...	1730	2.4	52	6.7	23.5
DEC					
12...	1305	.74	47	6.9	20.5
JAN , 1981					
23...	1330	.16	49	7.1	21.0
MAR					
02...	1230	1.0	65	6.0	22.0
APR , 1981					
21...	1440	14	44	6.9	23.5
JUN					
03...	1235	1.2	53	6.4	26.0
JUL					
13...	1010	1.4	45	6.8	24.5
AUG					
17...	1300	6.8	38	6.6	26.0

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

HAWAII, ISLAND OF MOLOKAI

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (UMHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)
16404000 - PELEKUNU STREAM NR PELEKUNU, MOLOKAI, HI (LAT 21 08 11 LONG 156 52 43)					
OCT , 1980					
28...	1500	7.7	138	7.1	20.5
DEC					
16...	0915	40	98	7.2	18.0
FEB , 1981					
10...	1600	12	126	7.2	17.5
APR , 1981					
16...	1600	7.5	128	7.3	20.5
JUL					
21...	1315	16	110	6.8	20.5
16404200 - PILIPILILAU STREAM NR PELEKUNU, MOLOKAI, HI (LAT 21 08 08 LONG 156 53 09)					
OCT , 1980					
28...	1150	.89	150	7.0	20.5
DEC					
16...	1100	3.1	118	7.1	17.5
FEB , 1981					
10...	1140	1.3	149	7.3	17.5
JUL					
21...	1100	1.1	150	7.0	21.0
16405100 - MOLOKAI TUNNEL AT EAST PORTAL, MOLOKAI, HI (LAT 21 08 38 LONG 156 55 17)					
OCT , 1980					
15...	1015	3.1	--	--	18.5
DEC					
10...	1040	1.6	--	--	18.0
FEB , 1981					
03...	1000	1.6	--	--	16.5
MAR					
17...	1010	2.0	--	--	17.0
MAY , 1981					
19...	0930	.74	--	--	17.0
JUL					
15...	1500	3.2	--	--	20.0
SEP					
01...	1305	1.2	--	--	19.5
16405300 - MOLOKAI TUNNEL AT WEST PORTAL, MOLOKAI, HI (LAT 21 07 28 LONG 156 59 42)					
OCT , 1980					
15...	1645	6.0	94	7.3	18.5
DEC					
08...	1520	4.5	110	7.0	18.5
FEB , 1981					
03...	1720	4.1	108	7.3	18.0
MAR					
17...	1645	4.5	106	7.3	17.5
MAY , 1981					
19...	1715	3.7	110	--	18.0
JUL					
15...	1825	6.5	96	6.8	18.0
SEP					
01...	1635	3.9	114	7.7	19.0
16405500 - WAIKOLU STR AT ALT 900 FT NR KALAUPAPA, MOLO, HI (LAT 21 08 45 LONG 156 55 18)					
OCT , 1980					
15...	1350	1.8	98	7.3	20.5
DEC					
10...	1515	1.3	110	6.8	18.5
FEB , 1981					
03...	1500	1.2	106	7.3	19.5
MAR					
17...	1340	1.3	105	7.2	19.5
MAY , 1981					
19...	1425	3.2	97	--	19.0
JUL					
15...	1405	1.7	96	7.1	20.0
SEP					
01...	1100	.98	106	7.6	19.0
16408000 - WAIKOLU STR BL PIPE CROSS NR KALAUPAPA, MOLO, HI (LAT 21 09 45 LONG 156 55 54)					
OCT , 1980					
15...	1245	11	112	7.2	22.0
DEC					
10...	1250	8.1	116	6.7	19.5
FEB , 1981					
03...	1205	8.8	114	7.4	20.5
MAR					
17...	1250	7.7	114	7.3	18.5
MAY , 1981					
19...	1200	11	112	--	20.0
JUL					
15...	1030	7.7	116	7.1	20.0
SEP					
01...	1230	7.0	118	7.6	21.5
16419500 - PAPIO OULCH AT HALAWA, MOLOKAI, HI (LAT 21 08 56 LONG 156 44 16)					
OCT , 1980					
14...	1330	.73	124	6.7	22.0
DEC					
08...	1245	.07	148	6.4	20.5
FEB , 1981					
02...	1330	.04	155	6.4	19.5

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

HAWAII, ISLAND OF MAUI

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (UMHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)
16501000 - PALIKEA STREAM BL DIV DAM NR KIPAHULU, MAUI, HI (LAT 20 41 03 LONG 156 04 10)					
OCT , 1980					
02...	1030	.02	39	6.6	22.0
NOV					
20...	1105	1.6	29	6.2	18.5
JAN , 1981					
15...	1200	.01	40	6.1	17.5
MAR					
05...	1020	19	29	6.4	17.0
APR , 1981					
23...	1200	1.2	42	6.2	21.0
JUN					
23...	1000	.01	41	6.6	21.0
AUG					
20...	1150	.70	38	6.3	22.0
16508000 - HANAWI STREAM NEAR NAHIKU, MAUI, HI (LAT 20 48 37 LONG 156 07 00)					
OCT , 1980					
01...	1555	3.6	45	6.8	20.0
NOV					
19...	1500	10	36	6.6	18.5
JAN , 1981					
14...	1500	2.0	49	7.1	18.0
MAR					
04...	1320	4.8	32	6.5	17.0
APR , 1981					
22...	1425	1.9	48	6.6	21.0
JUN					
22...	1500	1.9	48	7.5	22.0
AUG					
19...	1330	4.9	44	6.4	21.0
16512000 - KOOLAU DITCH AT NAHIKU WEIR NR NAHIKU, MAUI, HI (LAT 20 48 56 LONG 156 07 15)					
OCT , 1980					
01...	1420	18	49	6.9	21.0
NOV					
19...	1510	40	40	6.5	19.5
JAN , 1981					
14...	1515	8.1	51	7.5	18.5
MAR					
04...	1510	21	43	6.6	19.0
APR , 1981					
22...	1330	10	51	7.5	20.0
JUN					
22...	1135	7.7	51	8.4	21.0
AUG					
21...	0800	17	46	6.3	19.0
16518000 - WEST WAILUAIKI STREAM NEAR KEANAE, MAUI, HI (LAT 20 49 16 LONG 156 08 37)					
OCT , 1980					
01...	1130	4.2	45	6.8	20.5
NOV					
19...	1045	27	34	6.9	19.0
JAN , 1981					
14...	1035	1.4	52	7.7	16.5
MAR					
04...	1100	14	34	6.2	18.5
APR , 1981					
22...	1200	2.5	50	6.6	20.5
JUN					
22...	1200	1.5	53	8.1	23.0
AUG					
19...	0800	3.9	40	6.3	22.0
16523000 - KOOLAU DITCH NR KEANAE, MAUI, HI (LAT 20 49 53 LONG 156 10 30)					
OCT , 1980					
01...	0945	53	49	6.9	19.0
NOV					
19...	1140	184	38	6.5	18.0
JAN , 1981					
14...	1200	22	53	7.2	17.5
MAR					
04...	1120	93	37	6.0	17.0
APR , 1981					
22...	1205	30	53	7.2	20.0
JUN					
22...	0915	21	57	7.6	19.0
AUG					
19...	1235	120	42	6.3	20.0
16531000 - KULA DIV FROM HAIPUAENA STR NR OLINDA, MAUI, HI (LAT 20 48 24 LONG 156 13 27)					
OCT , 1980					
07...	1105	.03	15	6.0	15.5
NOV					
25...	1040	.12	16	5.9	13.5
JAN , 1981					
20...	1100	.01	19	5.4	11.5
MAR					
10...	1050	.48	24	4.7	11.0
MAY , 1981					
06...	1300	.22	13	5.8	13.5
JUL					
01...	1010	.03	20	5.7	16.0
AUG					
17...	1050	.22	16	5.2	14.5

OBSERVATIONS OF PHYSICAL PARAMETERS

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

HAWAII, ISLAND OF MAUI--Continued

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (UMHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)
16538000 - SPRECKELS DI AT HAIPUAENA W NR HUELO, MAUI, HI (LAT 20 51 15 LONG 156 11 25)					
OCT , 1980					
06...	1405	6.3	41	7.1	23.0
NOV					
21...	1350	13	37	6.8	19.5
JAN , 1981					
16...	1005	2.9	49	6.8	16.0
MAR					
06...	1100	14	39	6.7	18.5
APR , 1981					
24...	1020	1.5	44	6.8	21.5
JUN					
24...	0920	3.9	54	6.8	20.5
AUG					
21...	1050	9.0	33	6.0	20.0
16541000 - KOOLAU DITCH AT HAIPUAENA NR HUELO, MAUI, HI (LAT 20 51 17 LONG 156 11 19)					
OCT , 1980					
06...	1150	42	51	7.1	19.0
NOV					
21...	1345	72	43	7.0	19.0
JAN , 1981					
16...	1340	20	55	7.1	17.0
MAR					
06...	1240	84	45	6.7	18.5
APR , 1981					
24...	1255	32	52	6.8	19.5
JUN					
24...	1210	23	54	6.7	20.5
AUG					
21...	1045	49	45	6.2	20.5
16541500 - MANUEL LUIS DI AT PUOHOKAMOA GL NR HUELO, MAUI (LAT 20 51 48 LONG 156 10 59)					
OCT , 1980					
03...	1115	.11	65	6.7	20.5
NOV					
21...	1000	.56	60	6.3	21.0
JAN , 1981					
16...	1145	.07	69	6.8	18.5
MAR					
06...	1030	.56	61	6.5	19.0
APR , 1981					
24...	1130	.16	68	7.1	21.0
JUN					
24...	0930	.04	72	6.1	21.0
AUG					
19...	1000	.37	58	6.2	21.0
16587000 - HONOPOU STREAM NR HUELO, MAUI, HI (LAT 20 53 20 LONG 156 15 20)					
OCT , 1980					
07...	1230	1.1	55	6.9	23.0
NOV					
24...	1415	2.0	55	6.7	20.0
JAN , 1981					
19...	1415	.46	57	6.8	20.0
MAR					
03...	1555	3.0	55	6.1	21.0
APR , 1981					
27...	0730	.54	50	6.6	18.5
JUN					
24...	1215	.46	58	6.7	23.0
AUG					
25...	1400	1.2	48	6.2	23.5
16588000 - WAILOA DITCH AT HONOPOU NR HUELO, MAUI, HI (LAT 20 53 20 LONG 156 15 19)					
OCT , 1980					
07...	1415	73	56	6.7	21.0
NOV					
24...	1245	146	46	6.4	19.5
JAN , 1981					
19...	1320	31	55	6.7	17.0
MAR					
03...	1510	298	39	6.1	18.0
APR , 1981					
28...	1030	41	53	6.6	18.5
JUL					
01...	1000	29	56	6.3	20.0
AUG					
25...	1305	158	38	6.2	21.0
16589000 - NEW HAMAKUA DITCH AT HONOPOU NR HUELO, MAUI, HI (LAT 20 53 28 LONG 156 15 22)					
OCT , 1980					
07...	1105	1.2	64	6.9	22.5
NOV					
24...	1125	4.0	60	6.5	20.0
JAN , 1981					
19...	1520	.27	63	7.1	19.5
MAR					
03...	1240	150	41	6.1	18.0
APR , 1981					
28...	1255	.16	66	7.3	22.0
JUL					
01...	1400	.11	69	6.7	27.0
AUG					
25...	1050	1.1	43	6.6	22.0

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

HAWAII, ISLAND OF MAUI--Continued

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (UMHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)
16592000 - LOWRIE DITCH AT HONOPOU GULCH NR HUELO, MAUI, HI (LAT 20 54 57 LONG 156 15 08)					
OCT , 1980					
03...	1425	12	74	6.8	23.5
NOV					
13...	1215	28	45	7.1	21.0
24...	1245	29	50	6.9	20.5
JAN , 1981					
21...	1255	3.7	76	7.3	18.5
MAR					
03...	1310	89	47	6.5	19.5
APR , 1981					
28...	1430	2.5	81	7.6	24.0
JUL					
02...	1245	1.9	85	7.5	26.0
AUG					
24...	1300	23	32	6.4	23.5
16594000 - HAIKU DITCH AT HONOPOU GULCH NR KAILUA, MAUI, HI (LAT 20 55 07 LONG 156 14 58)					
OCT , 1980					
03...	1230	2.0	104	6.7	23.0
NOV					
13...	1140	1.5	91	6.9	21.5
24...	1100	1.4	100	6.8	21.5
JAN , 1981					
21...	1105	.68	110	6.9	19.5
MAR					
03...	0930	2.4	70	6.6	19.0
APR , 1981					
28...	1155	.14	113	7.8	24.0
JUL					
02...	1000	.39	120	6.7	22.0
AUG					
24...	1010	3.6	46	5.9	22.0
16599500 - OPANA TUNNEL NR KAILIILI, MAUI, HI (LAT 20 51 04 LONG 156 16 17)					
OCT , 1980					
07...	1500	.52	62	6.4	20.0
NOV					
25...	1315	.86	47	6.4	18.5
JAN , 1981					
20...	1440	.27	75	6.0	17.0
MAR					
10...	1345	2.3	36	5.9	17.0
MAY , 1981					
06...	0935	2.9	40	6.5	16.0
JUL					
01...	1345	.32	72	5.9	19.5
AUG					
17...	1415	.37	59	6.0	19.5
16607000 - IAO STREAM AT WAILUKU, MAUI, HI (LAT 20 53 38 LONG 156 30 27)					
APR , 1981					
30...	1130	158	62	6.9	19.5
16620000 - HONOKOHAU STREAM NR HONOKOHAU, MAUI, HI (LAT 20 57 48 LONG 156 35 22)					
OCT , 1980					
08...	1205	40	47	7.3	19.5
DEC					
02...	1150	18	70	7.1	18.0
JAN , 1981					
20...	1200	15	71	7.8	17.0
MAR					
10...	1130	19	61	6.8	19.0
MAY , 1981					
05...	1010	16	65	7.0	17.5
JUN					
29...	1220	12	67	7.5	22.0
AUG					
27...	1015	13	64	6.9	20.0
16638500 - KAHOMA STREAM AT LAHAINA, MAUI, HI (LAT 20 53 10 LONG 156 40 36)					
OCT , 1980					
08...	1020	.38	58	5.8	22.5

OBSERVATIONS OF PHYSICAL PARAMETERS

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

HAWAII, ISLAND OF HAWAII

16700900 - WAIAKEA STREAM NR MOUNTAIN VIEW, HAWAII, HI (LAT 19 38 30 LONG 155 10 28)

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (UMHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)
OCT , 1980					
27...	0955	11	40	7.0	17.0
NOV					
24...	1030	14	41	6.7	16.5
DEC					
24...	0925	1.3	44	7.0	17.0
JAN , 1981					
26...	0920	.06	46	7.2	17.0
FEB					
23...	1310	1.0	44	7.6	17.0
MAR , 1981					
26...	0855	1.9	42	7.3	16.0
MAY					
22...	0900	2.4	60	7.5	19.0
JUL					
28...	0920	.36	45	7.1	16.0
SEP					
24...	1345	1.4	35	7.2	17.0

16700900 - OLAA FLUME SPRING NR KAUMANA, HI (LAT 19 41 59 LONG 155 11 13)

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (UMHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)
OCT , 1980					
14...	1045	9.1	36	6.7	17.0
NOV					
14...	1340	7.0	34	6.5	17.5
MAR , 1981					
12...	1220	7.3	37	6.7	17.0
JUN					
12...	1225	.20	39	6.8	18.0
JUL , 1981					
24...	1145	.20	45	6.8	17.5
AUG					
12...	1115	7.5	32	6.8	18.0
SEP					
17...	1125	.45	42	6.7	17.0

16700950 - LYMAN SPRINGS NO. 2 NEAR PIIHONUA HAWAII (LAT 19 42 02 LONG 155 10 36)

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (UMHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)
FEB , 1981					
05...	1130	.30	46	6.8	18.0
MAR					
12...	1010	4.3	39	6.8	17.5
MAY					
05...	1100	2.8	42	6.8	18.0
JUL , 1981					
01...	1005	.62	38	7.0	17.0
AUG					
17...	1215	5.1	33	6.8	19.0

16701750 - WAILUKU RIVER NR HUMUULA, HAWAII, HI (LAT 19 42 55 LONG 155 18 36)

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (UMHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)
OCT , 1980					
30...	1230	.01	32	6.7	20.0
APR , 1981					
28...	1210	.01	37	7.1	21.0
MAY , 1981					
21...	1145	.01	34	6.8	22.0

16701800 - WAILUKU RIVER NR KAUMANA, HAWAII, HI (LAT 19 43 15 LONG 155 16 08)

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (UMHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)
OCT , 1980					
07...	1015	1.6	28	6.7	18.5
DEC					
08...	1200	.95	29	6.7	17.0
FEB , 1981					
02...	1255	.13	29	6.8	16.5
APR					
13...	1130	3.8	26	7.1	16.5
JUN , 1981					
02...	1100	.38	33	6.7	20.0
JUL					
24...	1040	.03	32	7.0	19.5
SEP					
25...	0925	.71	34	6.8	16.5

16704000 - WAILUKU RIVER AT PIIHONUA HAWAII HI (LAT 19 42 58 LONG 155 09 13)

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (UMHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)
OCT , 1980					
27...	0935	63	32	7.1	18.0
DEC					
15...	1140	10	42	7.3	18.0
JAN , 1981					
13...	1125	.39	58	7.2	19.0
FEB					
17...	1500	.23	60	7.1	20.0
MAR , 1981					
13...	1025	32	42	7.2	18.0
APR					
16...	1240	49	40	7.0	19.5
JUN					
23...	1115	3.0	50	7.2	19.0
SEP					
01...	1440	15	38	7.0	20.0

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

HAWAII, ISLAND OF HAWAII--Continued

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (UMHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)
16720000 - KAWAINUI STREAM NR KAMUELA, HAWAII (LAT 20 05 18 LONG 155 40 58)					
OCT , 1980					
23...	1235	11	25	6.2	11.0
JAN , 1981					
06...	1145	.22	23	6.0	12.0
MAR					
10...	1130	2.5	28	6.5	15.0
MAY , 1981					
21...	1130	5.0	26	6.4	14.0
JUL					
14...	1200	1.5	25	6.5	15.0
SEP					
09...	1145	.62	26	6.3	14.0
16720300 - KAWAIKI STREAM NEAR KAMUELA, HAWAII, HI (LAT 20 05 13 LONG 155 40 59)					
OCT , 1980					
23...	1150	3.7	25	6.0	11.0
JAN , 1981					
06...	1115	.28	23	6.1	12.0
MAR					
10...	1125	1.8	28	6.3	15.0
MAY , 1981					
21...	1105	1.6	30	6.2	16.0
JUL					
14...	1055	.36	28	6.3	16.0
SEP					
09...	1055	.28	24	6.5	14.0
16720500 - UPPER HAMAKUA DITCH BL KAWAIKI STR NR KAMUELA HI (LAT 20 05 15 LONG 155 40 42)					
NOV , 1980					
14...	1120	17	22	6.0	13.0
JAN , 1981					
06...	1035	.31	24	6.2	12.0
MAR					
10...	1045	10	22	6.3	13.0
MAY , 1981					
21...	1030	7.2	25	6.4	14.0
JUL					
14...	1000	1.9	26	6.4	15.0
SEP					
09...	1020	.72	28	6.5	15.0
16724800 - UPPER HAMAKUA DITCH AB ALAKAHI STR NR KAMUELA (LAT 20 04 31 LONG 155 40 26)					
OCT , 1980					
23...	1025	.45	25	6.1	12.0
29...	1125	5.4	25	6.2	14.0
MAR , 1981					
10...	0935	3.0	26	6.4	13.0
MAY					
21...	0910	5.0	24	6.3	14.0
JUL , 1981					
14...	1310	1.0	26	6.4	15.0
SEP					
09...	0905	.26	28	6.4	15.0
16725000 - ALAKAHI STREAM NEAR KAMUELA, HAWAII, HI (LAT 20 04 27 LONG 155 40 25)					
OCT , 1980					
23...	0945	7.2	25	6.1	11.0
JAN , 1981					
06...	0920	.32	28	6.0	12.0
MAR					
10...	0935	4.1	26	6.3	14.0
MAY , 1981					
21...	0915	5.0	24	6.5	14.0
JUL					
10...	1055	.07	35	6.4	14.0
SEP					
09...	0830	.18	38	6.5	15.0
16726000 - UPPER HAMAKUA D AB WAIMEA RES DIV NR KAMUELA HI (LAT 20 03 31 LONG 155 37 40)					
OCT , 1980					
02...	1335	3.8	29	6.3	15.0
DEC					
10...	1325	.53	30	6.4	15.0
MAR , 1981					
25...	1350	.53	29	6.3	15.0
MAY , 1981					
27...	1330	.19	38	6.9	16.0
JUN					
19...	1215	3.1	28	6.7	14.0
JUL					
31...	1225	.46	35	6.8	16.0
16733100 - LOWER HAMAKUA DI BL MN WEIR NR KUKUIHAELE HAWAII (LAT 20 07 07 LONG 155 35 09)					
FEB , 1981					
19...	1220	40	100	7.6	19.0
16756000 - KOHAKOHAU STREAM NEAR KAMUELA, HAWAII, HI (LAT 20 03 02 LONG 155 40 58)					
OCT , 1980					
03...	1030	60	34	6.5	18.0

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

HAWAII, ISLAND OF HAWAII--Continued

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (UMHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)
16758000 - WAIKOLOA STR AT MARINE OM NR KAMUELA, HAWAII, HI (LAT 20 02 48 LONG 155 39 58)					
OCT , 1980					
03...	0930	3.0	30	6.4	16.0
29...	1005	28	32	6.4	14.0
DEC					
11...	0925	2.3	32	6.6	15.0
JAN , 1981					
27...	0955	1.3	36	6.4	15.0
MAR					
26...	1000	1.8	32	6.3	15.0
MAY , 1981					
28...	0935	1.2	30	6.5	16.0
JUL					
10...	1215	.94	30	6.4	17.0
SEP					
02...	1245	1.8	50	6.7	19.5
16759000 - HAUANI GULCH NEAR KAMUELA, HAWAII, HI (LAT 20 02 28 LONG 155 39 05)					
OCT , 1980					
02...	1230	.28	28	6.2	15.0
DEC					
10...	1225	.14	30	6.4	14.0
JAN , 1981					
28...	1325	.09	31	6.4	15.0
MAR , 1981					
25...	1235	.04	32	6.5	14.0
JUN					
04...	1105	.03	34	6.6	14.0
JUL					
31...	0935	.03	30	6.5	15.0
16759200 - R BR WAIAHA STREAM NEAR HOLUALOA, HAWAII, HI (LAT 19 38 41 LONG 155 54 55)					
OCT , 1980					
01...	1130	.08	42	6.8	17.0
MAY , 1981					
26...	1155	.11	38	6.7	18.0
JUL , 1981					
08...	1240	.04	40	6.9	19.0
16759800 - KIILAE STREAM NEAR HONAUNAU, HAWAII, HI (LAT 19 24 52 LONG 155 50 56)					
OCT , 1980					
02...	0830	.04	26	6.7	16.0
MAR , 1981					
25...	0810	.01	29	6.7	17.0
MAY , 1981					
27...	0805	.02	28	6.8	16.0
JUL					
09...	0830	.08	25	6.7	18.0
16764000 - HILEA GULCH TRIBUTARY NEAR HONUAPO, HAWAII, HI (LAT 19 10 27 LONG 155 35 58)					
OCT , 1980					
20...	1150	1.5	37	6.5	17.0
APR , 1981					
29...	0955	.74	42	6.8	17.0
JUN , 1981					
17...	1305	.34	46	6.7	16.0
JUL					
29...	1125	.10	44	6.9	17.0

GROUND-WATER LEVELS

HAWAII, 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 pump-base at breather hole, 155.98 ft (47.543 m) above mean sea level.
REMARKS.--Water-quality records for 1960, 1966, 1972-80 are available in files of district office. Water pumped from this well is used frequently for public 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.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 9	6.88	JAN 12	5.96	APR 10	7.94	MAY 26	8.00	JUL 10	8.71	AUG 25	8.00
NOV 19	6.08	FEB 26	8.82								

HAWAII, ISLAND OF OAHU

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. Water overflows casing at 13.53 ft (4.124 m) above mean sea level since 1978.
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, 1978-80 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 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 17	15.39	FEB 10	17.59	MAR 10	16.62	APR 30	15.64	JUL 30	13.83	SEP 17	13.02
DEC 31	19.45										

212238157561101. Local number, 3-2256-10.
LOCATION.--Lat 21°22'38", long 157°56'11", Hydrologic 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 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.
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, 12.97 ft (3.953 m) above mean sea level, Oct. 5, 1978.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	16.40	16.33	16.62	17.82	17.55	17.08	16.36	16.01	15.61	15.04	14.65	14.32
10	16.36	16.41	16.92	17.74	17.62	16.97	16.22	16.10	15.53	14.83	14.71	14.27
15	16.51	16.42	17.12	*	17.61	16.92	16.29	15.97	15.41	14.78	14.61	14.27
20	16.53	16.37	17.35	*	17.39	16.50	16.26	15.93	15.20	14.84	14.53	14.31
25	16.48	16.42	17.56	*	17.33	16.25	16.19	15.92	15.10	14.71	14.43	14.20
EOM	16.42	16.61	17.76	*	17.26	16.21	16.00	15.79	15.03	14.62	14.35	14.16

WTR YEAR 1981 MAX 17.87 JAN 5, 1981 MIN 14.09 SEPT 30, 1981

* No record.

HAWAII, ISLAND OF OAHU--Continued

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, 1975-80 are available in files of district office; those for 1981 are published elsewhere in this report. Water pumped from this well is used continually for public 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, 269.52 ft (82.150 m) above mean sea level, Dec. 5, 1978.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MAXIMUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	276.98	277.08	277.29	277.31	277.06	276.64	276.21	275.66	275.27	274.98	274.75	274.48
10	277.02	277.21	277.23	277.41	277.01	276.09	276.04	275.60	275.24	274.93	274.47	274.35
15	277.08	277.19	277.30	277.26	276.88	276.58	276.01	275.49	274.95	274.86	274.63	274.22
20	277.16	277.21	277.30	277.20	276.85	276.61	275.87	275.51	275.06	274.82	274.58	274.22
25	277.17	277.17	277.31	277.21	276.78	276.52	275.86	275.45	274.90	274.80	274.37	274.11
EOM	277.17	277.25	277.35	277.10	276.76	276.23	275.74	275.25	275.03	274.51	274.31	274.05

Note:--Well being pumped throughout the year.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
NONPUMPING VALUES

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 1	277.04	JAN 1	277.46	MAR 1	276.91	APR 1	276.38	JUN 1	275.52	AUG 1	274.80
NOV 1	277.31	FEB 1	277.25	16	276.71	MAY 1	275.84	JUL 1	275.24	SEP 1	274.59
DEC 1	277.40										

Note:--Water levels are measured after all pumps being shut off for 2 hours.

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 "T", 7.31 ft (2.228 m) above mean sea level.
REMARKS.--Water-quality records for 1935-80 are available in files of district office; those for 1981 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 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
DEC 3	15.93	APR 3	15.46	MAY 22	15.51	JUL 7	14.59	AUG 12	14.98	SEP 28	14.83
FEB 24	15.73										

HAWAII, ISLAND OF OAHU--Continued

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 1929-80 are available in files of district office; those for 1981 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 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 30	18.52	JAN 28	18.60	APR 22	18.47	JUN 4	18.22	JUL 16	18.19	SEP 3	18.39
DEC 17	19.26	MAR 3	18.39								

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 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 28	13.38	FEB 20	13.29	MAY 22	12.79	JUN 26	12.74	AUG 7	12.68	SEP 28	12.97
JAN 9	12.88	APR 3	13.22								

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 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 14	4.41	FEB 2	4.50	MAR 16	4.25	MAY 18	4.12	JUL 13	4.28	AUG 31	4.35
DEC 8	4.36										

HAWAII, ISLAND OF MOLOKAI--Continued

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 1954-80 are available in files of district office; those for 1981 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 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 17	2.70	FEB 5	2.90	MAR 19	2.84	MAY 21	2.71	JUL 16	2.84	SEP 2	2.97
DEC 11	2.84										

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 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 10	0.10	JAN 22	0.29	MAR 12	0.08	APR 30	-0.08	JUN 9	0.07	AUG 28	0.11
NOV 26	.25										

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 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 20	4.41	NOV 28	4.45	JAN 22	4.18	APR 30	4.04	JUN 9	3.95	SEP 4	4.13

HAWAII, ISLAND OF MAUI--Continued

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, 5.66 ft (1.725 m) above mean sea level, Nov. 26, 1980; 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 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 20	5.54	JAN 22	5.58	APR 30	5.42	JUN 26	5.44	SEP 4	5.54	OCT 8	5.60
NOV 26	5.66	MAR 11	5.46								

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, 5.09 ft (1.551 m) above mean sea level, Jan. 12, 1980; 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 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	4.12	3.91	3.99	4.02	3.90	3.74	3.72	3.84	3.63	3.70	3.79	3.80
10	4.07	3.98	3.93	3.82	3.94	3.77	3.77	3.77	3.64	3.72	3.81	3.84
15	4.06	4.00	4.04	3.81	3.99	3.81	3.74	3.68	3.68	3.66	3.81	3.86
20	4.02	3.98	4.00	3.90	3.93	3.84	3.71	3.69	3.68	3.64	3.80	3.95
25	4.05	4.00	4.05	3.89	3.79	3.81	3.72	3.63	3.72	3.64	3.84	3.94
EOM	3.95	4.05	4.09	3.90	3.72	3.72	3.68	3.64	3.68	3.70	3.81	3.89

WTR YEAR 1981 MAX 4.22 OCT 1, 1980 MIN 3.58 JUN 7, 1981

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, 1980 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, 5.85 ft (1.783 m) above mean sea level, Jan. 16, 1980; 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 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 20	5.72	JAN 21	5.80	MAR 6	5.56	APR 24	5.45	JUN 10	5.26	SEP 4	5.51
NOV 24	5.70										

HAWAII, ISLAND OF MAUI--Continued

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 257.34 ft (78.437 m), revised, above mean sea level.
REMARKS.--Recording gage installed Aug. 6, 1975. Water-quality records for 1964, 1980 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, 3.68 ft (1.122 m) above mean sea level, Sept. 20, 1981; 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 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	3.42	3.35	3.47	3.51	3.41	3.33	3.28	3.25	3.12	3.34	3.48	3.40
10	3.38	3.41	3.43	3.28	3.48	3.28	3.29	3.17	3.12	3.35	3.43	3.45
15	3.37	3.42	3.52	3.35	3.49	3.25	3.26	3.11	3.20	3.28	3.45	3.50
20	3.36	3.44	3.50	3.47	3.36	3.35	3.17	3.12	3.22	3.28	3.46	3.59
25	3.43	3.45	3.52	3.32	3.24	3.31	3.24	3.08	3.28	3.26	3.47	3.50
EOM	3.30	3.46	3.63	3.48	3.16	3.24	3.22	3.13	3.30	3.38	3.39	3.49

WTR YEAR 1981 MAX 3.68 SEPT 20, 1981 MIN 2.94 MAY 22, 1981

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 1972-80 are available in files of district office; those for 1981 are published elsewhere in this report. Water pumped from this shaft is used frequently for public supply.
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, 4.10 ft (1.250 m) above mean sea level, Apr. 18, 1979; 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 1980 to SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 3	a2.95	JAN 19	a3.07	APR 1	3.76	MAY 19	3.49	JUL 21	3.70

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, 26.37 ft (8.038 m) above mean sea level, Mar. 26, 1979; lowest measured, 15.99 ft (4.874 m) above mean sea level, Apr. 25, 1978.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 28	19.50	DEC 24	18.49	FEB 24	17.50	APR 27	16.83	JUN 25	16.54	AUG 26	16.21
NOV 24	18.94	JAN 26	18.00	MAR 26	17.08	MAY 26	16.59	JUL 28	16.24	SEP 25	16.37

HAWAII, ISLAND OF HAWAII--Continued

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, 1973-80 are available in files of district office; those for 1981 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, 5.73 ft (1.746 m) above mean sea level, Apr. 9, 1980; 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 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 19	5.08	FEB 10	5.24	APR 14	4.47	JUN 16	3.50	AUG 26	4.30

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, 246.47 ft (75.1 m), revised, above mean sea level.
REMARKS.--Water-quality records for 1970, 1973-80 are available in files of district office; those for 1981 are published elsewhere in this report. Water pumped from this well is used frequently for irrigation.
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, 4.10 ft (1.952 m) above mean sea level, May 27, 1981; 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 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 5	3.13	JAN 30	a1.90	APR 27	4.08	MAY 27	4.10	JUL 22	4.01	SEP 14	3.34

a Well being pumped.

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).
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, 6.2 ft (1.9 m), above mean sea level, Aug. 23, 1978, 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 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 5	5.94	JAN 30	5.95	MAR 19	5.90	MAY 27	5.82	JUL 22	5.90	SEP 14	6.13

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 1973-80 are available in files of district office; those for 1981 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, Jan. 16, 1980.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 11	2.65	DEC 17	2.65	FEB 11	3.00	APR 6	2.10	JUN 11	2.60	AUG 6	2.95

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

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)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)
			HAWAII, ISLAND OF KAUAI						
220016159442701	2-0044-15 S14 KSC	22 00 16	159 44 27	01	80-10-15	1025	5100	23.0	1600
					80-12-08	1000	2500	23.0	640
					81-01-23	1015	640	22.0	110
					81-03-09	1030	1050	22.0	220
					81-04-17	1030	3000	22.0	800
					81-06-10	0945	3500	24.0	1000
					81-07-22	1010	6200	22.5	1900
					81-09-10	1045	5000	22.0	1400
220136159205501	2-0120-01 W7 CNTY	22 01 36	159 20 55	01	80-10-09	1515	790	24.5	140
					80-11-18	1500	890	25.0	160
					81-01-12	1430	900	25.0	140
					81-04-10	1430	780	25.5	140
					81-05-28	1130	890	26.0	160
					81-07-08	1445	820	27.5	180
220134159205401	2-0120-02 W8 CNTY	22 01 34	159 20 54	01	81-02-25	1500	900	25.0	150
220148159453501	2-0145-10 W45F KSC, MANA	22 01 48	159 45 35	01	81-01-23	1110	1100	24.5	240
					81-03-09	1100	1520	22.0	360
					81-04-17	1100	1800	21.5	450
					81-06-10	1040	1550	21.5	380
					81-07-22	1050	2000	21.5	510
					81-09-10	1145	1550	21.5	370
220341159453901	2-0345-04 S16 KSC	22 03 41	159 45 39	01	80-10-15	1130	1650	22.0	400
					80-12-08	1115	800	22.0	150
					81-01-23	1145	1500	22.0	350
					81-03-09	1140	770	22.0	140
					81-04-17	1130	1800	22.0	420
					81-06-10	1130	1800	22.5	450
					81-07-22	1130	1800	22.5	440
					81-09-10	1230	1900	22.0	470
220530159450401	2-0545-01 W59 SAKIMANA	22 05 30	159 45 04	01	80-10-15	1200	950	27.5	180
					80-12-08	1145	920	25.0	180
					81-03-09	1220	960	26.0	180
					81-04-17	1145	950	26.0	180
					81-06-10	1200	920	25.0	170
					81-07-22	1200	940	24.5	180
					81-09-10	1245	900	24.0	160
220827159185401	2-0818-01 W90A ANAHOLA	22 08 27	159 18 54	01	81-02-26	0925	260	23.5	19
					81-05-26	1020	245	23.5	19
220826159185401	2-0818-02 W90B CNTY	22 08 26	159 18 54	01	80-10-09	1040	230	23.5	20
					80-11-19	0855	230	23.0	20
					81-04-10	0935	230	23.0	18
221038159203801	2-1020-03 W78 LPC, MOLOA	22 10 38	159 20 38	01	81-07-09	1445	220	22.5	18
					81-08-26	1500	220	22.5	17
221141159252501	2-1125-01 CNTY, KILAUEA	22 11 41	159 25 25	01	81-07-09	1200	160	24.5	13
221201159293401	2-1229-03 W73 HANALEI	22 12 01	159 29 34	01	80-10-07	1410	220	23.0	23
					80-11-17	1135	230	23.5	22
					81-02-24	1145	220	23.0	21
					81-05-27	1145	230	23.5	22
221247159324801	2-1232-01 W67 CNTY	22 12 47	159 32 48	01	80-10-07	1330	140	23.0	18
					81-04-08	1300	150	23.0	16
					81-05-27	1330	140	23.0	18
					81-07-16	1455	135	22.5	18
					81-08-24	1415	145	23.0	18

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

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)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)
HAWAII, ISLAND OF KAUAI--Continued									
221318159335901	2-1333-01 W66 HAENA	22 13 18	159 33 59	01	80-11-17	1305	220	21.5	19
					81-01-08	1220	225	21.5	18
					81-02-24	1320	215	22.5	16
					81-04-08	1345	220	22.5	18
					81-05-27	1310	220	22.0	18
					81-08-24	1330	220	22.0	18
215454159274201	2-5427-01 W16A KOLOA	21 54 54	159 27 42	01	80-10-17	1315	240	23.0	24
					80-12-09	1415	250	23.0	25
					81-01-29	1115	250	23.0	24
					81-03-12	0920	240	23.0	23
					81-06-09	1050	240	23.0	--
					81-07-24	1430	240	24.0	23
215536159263501	2-5526-01 GRV FRM, KOLOA	21 55 36	159 26 35	01	81-04-27	1350	240	23.0	19
					81-06-09	1145	240	22.5	20
					81-07-24	1325	240	24.0	20
215528159303001	2-5530-02 W23 MSCO	21 55 28	159 30 30	01	80-10-17	1120	240	23.0	28
					81-03-10	1325	230	23.0	24
					81-04-27	1210	240	23.0	25
					81-06-09	1010	260	22.5	26
					81-07-24	1210	260	23.0	26
					81-09-09	1440	250	22.5	46
215535159302601	2-5530-03 W22 LAWAI	21 55 35	159 30 26	01	80-10-17	1055	230	23.0	24
					81-01-29	1045	240	23.0	22
					81-06-09	1020	230	22.5	22
					81-09-09	1450	220	22.5	23
215549159334501	2-5533-02 CNTY, HANAPEPE	21 55 49	159 33 45	01	80-10-30	0930	--	--	32
215635159355001	2-5635-01 S7 KAUMAKANI	21 56 35	159 35 50	01	80-12-09	0930	780	23.0	150
					81-01-29	0930	800	23.0	150
					81-04-27	1000	805	23.0	140
					81-06-09	0845	780	23.0	140
					81-07-24	1105	790	23.5	150
					81-09-09	1345	800	23.0	160
215803159401201	2-5840-02 W26 WAIMEA	21 58 03	159 40 12	01	80-10-15	1310	690	25.0	130
					80-12-08	1345	700	24.0	120
					81-03-09	1335	630	24.5	100
					81-04-17	1335	650	24.5	120
					81-06-10	1445	700	24.5	130
					81-07-22	1330	650	24.0	110
					81-09-10	1430	720	24.0	140
215854159424601	2-5842-02 S11 KSC	21 58 54	159 42 46	01	80-10-15	0945	740	25.4	120
					80-12-08	0920	700	24.0	100
					81-01-23	0935	720	24.0	110
					81-03-09	1000	700	24.0	110
					81-04-17	0945	720	24.0	100
					81-06-10	1410	720	24.0	110
					81-07-22	0915	710	24.0	110
					81-09-10	1000	710	24.0	110
215843159422901	2-5842-03 S10 KSC	21 58 43	159 42 29	01	80-10-15	0930	1200	24.0	260
					81-01-23	0920	700	23.0	110
					81-03-09	0930	930	24.0	190
					81-04-17	0930	1050	24.0	220
					81-06-10	0830	1080	24.0	260
					81-07-22	0930	1100	24.0	230
					81-09-10	0930	1180	24.0	250

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

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)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)
HAWAII, ISLAND OF KAUAI--Continued									
215912159234101	2-5923-05 CNTY, KILOHANA	21 59 12	159 23 41	01	81-08-01	1530	--	--	17
215906159395601	2-5939-01 S9 CNTY	21 59 06	159 39 56	01	80-10-15	1330	600	24.0	100
					80-12-08	1405	380	24.0	38
					81-01-23	1405	460	23.5	62
					81-03-09	1400	460	23.5	60
					81-04-17	1410	520	23.0	74
					81-06-10	1515	660	23.5	120
					81-07-22	1400	720	24.0	130
					81-09-10	1500	550	23.0	87
215937159434201	2-5943-01 S13 WAIAWA	21 59 37	159 43 42	01	80-10-15	1010	1290	24.0	300
					80-12-08	0945	1300	24.0	320
					81-01-23	1000	1290	24.0	300
					81-03-09	1010	1400	24.0	300
					81-04-17	1015	1200	24.5	250
					81-06-10	0915	1400	24.5	320
					81-07-22	0955	1180	24.0	240
					81-09-10	1030	1310	24.0	290
HAWAII, ISLAND OF OAHU									
211646157465201	3-1646-01 W1B WAIALAE GC	21 16 46	157 46 52	01	80-11-14	0915	800	23.0	190
					80-12-19	1400	690	23.5	120
					81-03-16	1345	800	22.0	180
					81-04-30	1145	750	23.0	170
					81-06-10	1415	800	23.5	180
					81-07-29	1145	800	23.0	190
					81-09-16	0930	750	23.0	190
211832157515501	3-1851-19 W102 TUBE A	21 18 32	157 51 55	01	80-11-17	1500	18500	24.0	8000
					81-01-07	0950	19000	24.5	8000
					81-02-10	1605	15000	24.0	5800
					81-03-20	1510	22500	23.5	8400
					81-05-01	1455	18000	23.5	8400
					81-06-16	1540	19000	23.5	7900
					81-07-29	1500	16000	24.0	--
211832157515502	3-1851-19 W102 TUBE B	21 18 32	157 51 55	02	80-11-17	1505	2000	23.5	590
					81-02-10	1600	2100	24.0	630
					81-03-20	1515	2100	23.5	630
					81-05-01	1500	2100	23.5	640
					81-06-16	1545	2100	23.5	650
					81-07-29	1505	2200	23.5	650
212038157422501	3-2042-13 W420-1A PAC CO	21 20 02	157 42 07	01	81-01-12	1015	6120	26.0	1800
					81-04-06	1050	6500	25.0	1900
					81-07-01	1000	7500	26.0	2000
					81-08-03	1300	8500	25.5	--
					81-09-23	1305	8500	25.0	2600
212133158035501	3-2103-03 S14 NAVY	21 21 33	158 03 55	01	80-12-31	0915	1080	23.5	220
					81-02-10	0900	1000	23.0	220
					81-03-20	0900	1080	23.0	220
					81-04-30	0905	1050	23.5	220
					81-06-16	0910	1080	23.0	--
					81-07-30	0935	1100	23.0	220

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

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)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)
HAWAII, ISLAND OF OAHU--Continued									
212106157533701	3-2153-02 W153 DAMON EST	21 21 06	157 53 37	01	80-11-14	1045	400	22.0	72
					80-12-31	1240	400	22.5	67
					81-03-16	1145	400	22.0	69
					81-06-15	1455	400	22.0	70
					81-07-23	0940	380	22.0	69
					81-09-15	1445	380	22.0	66
212120157535400	3-2153-11 CNTY, MOANALUA	21 21 20	157 53 54	00	81-02-13	1030	433	--	83
212252158025001	3-2202-21 S3 OSCO EP 15	21 22 52	158 02 50	01	81-01-08	0945	877	--	170
212259157554201	3-2255-35 W189-3A C&H SG	21 22 59	157 55 42	01	80-11-17	1345	950	22.0	240
					81-02-10	1415	900	22.5	240
					81-03-20	1345	925	22.0	230
					81-06-16	1435	950	22.0	240
					81-07-30	1500	900	23.0	220
212238157561102	3-2256-12 W187C NAVY	21 22 38	157 56 11	02	80-11-14	1505	650	25.5	170
					80-12-30	1615	650	24.0	160
					81-02-05	1240	650	23.0	170
					81-03-20	1415	650	25.0	170
					81-06-09	1505	600	26.5	160
					81-09-14	1510	600	26.5	160
212300158004801	3-2300-06 W253 CNTY	21 23 00	158 00 48	01	80-11-17	1120	690	22.0	160
					80-12-30	1420	580	22.0	130
					81-02-10	1105	530	20.5	120
					81-03-20	1015	580	20.5	130
					81-05-01	1055	530	22.5	160
212343158001001	3-2300-11 W238 WATANABE	21 23 43	158 00 10	01	80-11-17	1315	850	22.0	200
					80-12-30	1440	825	22.5	170
					81-02-10	1140	800	22.5	200
					81-03-20	1045	800	22.5	190
					81-05-01	1110	800	22.5	190
					81-06-16	1200	850	22.5	190
					81-07-30	1315	850	22.5	190
					81-09-17	1435	800	22.5	190
212358158010901	3-2301-09 TO 10 W247 I-J	21 23 58	158 01 09	01	80-11-17	1300	530	23.0	100
					80-12-30	1400	625	23.0	130
					81-02-10	1130	600	22.0	130
					81-03-20	1030	590	22.0	120
					81-05-01	1040	600	23.0	120
					81-06-16	1145	580	23.5	110
					81-07-30	1245	530	24.0	98
					81-09-17	1310	500	24.0	94
212332157582201	3-2358-02 W201 NAVY	21 23 32	157 58 22	01	80-11-14	1335	2900	20.5	900
					80-12-31	1100	7200	20.5	2400
					81-02-10	1235	6500	21.0	2200
					81-03-20	1300	4700	20.5	1400
					81-05-01	1305	2200	20.5	650
					81-06-16	1330	1500	20.5	420
					81-07-30	1410	1300	20.5	390
					81-09-15	1340	1300	20.5	380
212342157584301	3-2358-22 W204-4	21 23 42	157 58 43	01	80-11-14	1400	1000	20.5	260
					80-12-30	1450	1200	20.5	320
					81-02-10	1325	1300	20.5	370
					81-03-20	1105	1200	20.5	330
					81-05-01	1135	1050	20.5	280
					81-06-16	1230	1000	20.5	270
					81-07-30	1345	875	20.5	230
					81-09-17	1445	800	20.5	210

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

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)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)
HAWAII, ISLAND OF OAHU--Continued									
212343157584701	3-2358-29 W204-9	21 23 43	157 58 47	01	80-11-14	1410	2700	20.5	840
					80-12-30	1455	4000	20.5	1200
					81-02-10	1330	4200	20.5	1400
					81-03-20	1110	3600	20.5	1100
					81-05-01	1140	2600	20.5	840
					81-06-16	1235	2100	20.5	580
					81-07-30	1340	1300	20.5	380
					81-09-17	1450	1100	20.5	320
212336157591801	3-2359-05 W204-11 OSHITA	21 23 36	157 59 18	01	80-11-14	1420	2400	22.5	720
					80-12-30	1510	3000	22.5	820
					81-02-10	1340	2700	22.5	810
					81-03-20	1055	2600	22.5	770
					81-05-01	1125	2400	22.5	720
					81-06-16	1215	2300	22.5	650
					81-07-30	1330	2100	22.5	630
					81-09-17	1505	1800	22.5	570
212422157485601	3-2448-01 W416 STATE	21 24 22	157 48 56	01	80-12-10	1000	195	20.5	18
					81-04-03	0925	195	20.5	18
					81-05-22	1430	195	20.5	18
					81-07-01	1430	190	20.5	18
					81-08-11	1130	200	21.0	17
					81-09-23	1400	200	20.0	16
212436157590111	3-2459-01 TD 05 W239 A-E	21 24 36	157 59 01	11	81-03-30	1150	4630	--	1400
					81-06-23	1515	4750	--	1400
					81-07-28	1100	4890	--	1500
					81-08-25	1335	5010	--	1500
					81-09-30	1020	4250	23.5	1400
212501158080701	3-2508-02 52 CNTY	21 25 01	158 08 07	01	80-10-29	1340	1280	27.5	280
					80-12-16	1335	1200	28.0	280
					81-01-27	1215	1200	28.0	280
					81-03-10	1130	1300	28.0	280
					81-04-24	0930	1120	28.0	280
					81-06-05	0820	1410	28.0	280
					81-07-15	1300	1380	28.0	270
					81-09-02	1015	1310	28.0	260
212556157500301	3-2550-01 W407-16	21 25 56	157 50 03	01	80-12-10	0930	150	22.5	16
					81-04-03	0950	140	23.0	15
					81-05-22	0800	140	23.0	16
					81-07-01	1500	140	23.0	15
					81-08-11	1200	140	23.0	16
					81-09-30	0800	140	23.0	16
212553157573101	3-2557-03 CNTY, PEARL	21 25 53	157 57 31	01	81-03-26	1030	--	--	25
212517157582501	3-2558-09 (T-40) NAVY	21 25 17	157 58 25	01	81-03-26	1222	1970	--	500
					81-04-02	1250	2360	--	680
					81-06-23	1548	2510	23.8	760
					81-07-28	1024	2730	23.6	800
					81-08-25	1404	1920	--	550
					81-09-30	1400	1640	31.0	470
212506157582301	3-2558-10 S16 NAVY	21 25 06	157 58 23	01	80-10-10	2215	--	--	230
					80-11-14	1215	900	21.5	240
					80-12-31	1115	950	21.5	250
					81-02-10	1200	950	22.0	250
					81-03-20	1135	1000	22.0	270
					81-03-30	1345	1050	22.0	270
					81-05-01	1200	950	21.5	260
					81-06-16	1400	900	21.5	240
					81-07-30	1425	850	21.5	210
					81-09-17	1520	825	21.5	220
					81-09-30	1445	--	--	230

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

STATION NUMBER	LOCAL IDENTIFIER	LATITUDE	LONGITUDE	SEQ. NO.	DATE OF SAMPLE	TIME	SPECIFIC CONDUCTANCE (MICROMHOS)	TEMPERATURE (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)
			HAWAII, ISLAND OF OAHU--Continued						
212617158033801	3-2603-01 W330-8 HAW CC	21 26 17	158 03 38	01	81-04-30	1040	350	22.5	46
212656158071801	3-2607-01 W277-97 NAVY	21 26 56	158 07 18	01	80-10-29	1225	360	24.5	44
					80-12-16	1205	345	24.5	45
					81-01-27	1035	340	24.0	46
					81-04-24	1040	300	24.0	36
					81-06-05	0920	375	24.0	46
					81-07-15	1140	370	24.5	42
					81-09-02	0930	355	24.5	45
212813158080201	3-2808-01 W277-92 NAVY	21 28 13	158 08 02	01	80-10-29	1200	1250	26.5	180
					80-12-16	1150	1200	26.5	170
					81-01-27	1015	1140	26.5	180
					81-04-24	1015	1110	26.0	170
					81-06-05	0950	1300	26.0	160
					81-07-15	1120	1310	26.5	160
					81-09-02	0900	1240	26.5	160
212828158092001	3-2809-06 CNTY, WAIANAE	21 28 28	158 09 20	01	80-10-23	1240	340	22.0	27
					81-01-27	1345	360	22.5	30
					81-03-09	1525	340	22.5	26
					81-04-23	1000	350	22.5	29
					81-06-05	1045	365	22.0	31
					81-07-10	1020	340	22.5	30
					81-09-02	1120	360	22.5	31
212859158124301	3-2812-01 S1 CNTY	21 28 59	158 12 43	01	80-10-23	1405	590	25.0	100
					80-12-15	1340	580	25.0	100
					81-01-27	1525	580	24.5	100
					81-03-10	1030	600	25.0	100
					81-04-23	1125	560	25.0	100
					81-06-05	1205	620	25.5	100
					81-07-10	1205	620	26.0	100
					81-09-02	1320	610	25.5	100
212927158014801	3-2901-07 S4 ARMY	21 29 27	158 01 48	01	80-10-29	1630	180	22.5	15
					80-12-16	0945	168	22.5	17
					81-01-29	0900	170	22.0	16
					81-03-09	1015	160	22.0	15
					81-04-16	0930	170	22.0	16
					81-05-29	0920	178	22.0	17
					81-07-16	0900	185	22.0	16
					81-09-01	0840	170	22.5	18
212945158014301	3-2901-09 W330-6 CNTY	21 29 45	158 01 43	01	80-10-29	1715	195	22.0	20
					80-12-17	1730	200	21.5	18
					81-04-22	0835	195	21.5	20
					81-05-28	1730	200	21.5	20
					81-07-10	1720	200	22.0	18
					81-09-02	1650	200	22.0	20
212939158112301	3-2911-02 WDCO, MAKAHA	21 29 39	158 11 23	01	80-10-23	1700	265	21.0	25
					80-12-15	1800	260	21.0	24
					81-01-27	1625	265	21.0	25
					81-03-09	1600	280	21.0	24
					81-04-23	1550	260	21.0	23
					81-06-05	1230	275	21.5	24
					81-07-10	1530	275	21.5	23
					81-09-02	1220	270	21.5	26

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

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)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)
HAWAII, ISLAND OF OAHU--Continued									
213224158135901	3-3213-06 W277-101 PAGE	21 32 24	158 13 59	01	80-10-23	1320	835	24.0	200
					80-12-15	1300	830	23.0	200
					81-01-27	1425	830	23.5	200
					81-03-09	1420	875	25.0	200
					81-04-23	1035	780	23.5	200
					81-06-05	1120	900	24.0	200
					81-07-10	1100	900	25.0	200
					81-09-02	1400	875	24.5	200
213243157510001	3-3251-01 W406 SWANZY	21 32 43	157 51 00	01	80-11-28	1430	950	23.0	230
					81-01-09	1550	950	23.0	240
					81-02-24	1715	950	23.5	240
					81-04-03	1455	980	22.5	240
					81-05-22	1300	1000	23.0	240
					81-07-07	1230	980	23.0	240
					81-08-12	1330	1000	23.0	240
					81-09-28	1620	1000	23.0	240
213327157524401	3-3352-01 W405 FOSTER	21 33 27	157 52 44	01	80-12-03	1400	270	23.0	36
					81-02-24	1600	270	23.0	35
					81-04-03	1430	270	23.0	34
					81-05-22	1245	270	23.0	35
					81-07-07	1140	430	23.0	86
					81-08-12	1320	280	23.0	34
					81-09-28	1600	280	23.0	34
213427158055501	3-3405-02 W323-2 CNTY	21 34 27	158 05 55	01	80-12-05	1520	600	22.5	140
					81-01-21	1615	570	22.0	130
					81-03-09	1145	600	23.0	130
					81-04-24	1630	520	22.0	100
					81-05-28	1700	550	22.5	100
					81-07-13	1540	650	23.0	120
					81-08-24	1600	560	23.0	100
213411158074501	3-3407-25 W320 CNTY	21 34 11	158 07 45	01	80-12-17	1700	2100	22.5	690
					81-01-30	1140	1850	22.5	630
					81-04-22	1540	2340	22.5	640
					81-06-04	1600	2440	22.5	690
					81-09-03	1345	2500	22.5	660
213444158075501	3-3407-30 W318-2 WSCO	21 34 44	158 07 55	01	80-12-17	1435	5550	25.0	1700
					81-04-20	1410	4050	25.0	1100
					81-06-04	1050	5450	25.0	1600
					81-07-16	1315	6000	25.0	1700
					81-09-03	1210	6300	25.5	1800
213438158091101	3-3409-16 W308 MENDONCA	21 34 38	158 09 11	01	80-10-30	1200	825	22.5	180
					80-12-17	1200	840	22.0	200
					81-01-28	1545	830	22.0	200
					81-03-03	1430	810	22.0	200
					81-04-24	1545	810	22.0	200
					81-06-04	1215	935	22.0	200
					81-07-16	1115	940	22.5	190
					81-09-03	1110	950	22.5	200
213446158104901	3-3410-08 W286 WSCO	21 34 46	158 10 49	01	80-10-30	1305	950	21.5	240
					80-12-17	1225	950	21.5	240
					81-01-28	1520	920	21.5	240
					81-03-03	1500	900	21.5	230
					81-04-22	1445	875	22.0	240
					81-06-04	1625	1040	21.5	240
					81-07-16	1205	1050	22.0	230
					81-09-03	1045	1000	22.0	230

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

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)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)
HAWAII, ISLAND OF OAHU--Continued									
213512158061601	3-3506-03 TO 04 W329 A-B	21 35 12	158 06 16	01	80-10-24	1500	580	22.0	120
					80-12-12	1445	580	22.0	120
					81-01-23	1500	570	22.0	120
					81-03-02	1015	580	22.5	120
					81-04-21	1120	540	22.0	120
					81-06-03	1440	645	22.0	130
					81-07-13	1315	650	22.0	130
					81-08-17	1440	650	22.5	130
213636158053701	3-3605-03 W334C WSCO	21 36 36	158 05 37	01	80-10-24	1600	1430	21.0	400
					80-12-05	1425	1900	21.0	620
					81-01-28	1245	1850	21.5	590
					81-03-02	1700	1780	21.5	440
					81-04-20	0810	1730	21.5	460
					81-05-28	1630	2400	21.5	630
					81-07-14	0900	2300	22.0	620
					81-08-24	1400	2450	22.0	530
213636158053702	3-3605-21 W334U WSCO	21 36 35	158 05 40	02	80-10-24	1545	1820	21.0	540
					80-12-05	1450	1410	21.5	400
					81-01-28	1300	1300	21.5	390
					81-03-02	1720	1560	21.5	380
					81-04-20	0820	1520	21.5	400
					81-05-28	1610	1600	21.5	410
					81-07-14	0915	1600	22.0	410
					81-08-24	1440	1750	22.0	420
213656157550401	3-3655-01 W394 CNTY	21 36 56	157 55 04	01	80-11-28	1410	240	21.0	32
					81-01-09	1500	240	21.0	30
					81-02-20	1300	240	21.5	31
					81-04-03	1400	240	21.5	32
					81-05-22	1200	240	21.5	31
					81-06-26	1215	240	21.5	31
					81-08-07	1345	240	21.5	31
					81-09-28	1450	240	21.5	32
213902157561601	3-3956-04 W366 KAHAWAI	21 39 02	157 56 16	01	80-11-28	1350	410	21.5	80
					81-01-09	1350	430	21.5	79
					81-02-20	1145	430	21.5	78
					81-04-03	1345	400	21.5	74
					81-05-22	1100	420	21.5	38
					81-08-07	1330	450	21.5	97
					81-09-28	1430	440	21.5	110
214029157570101	3-4057-06 W357 CMPBL EST	21 40 29	157 57 01	01	80-11-28	1325	1500	22.0	420
214157158000101	3-4100-01 W338 DEL WEBB	21 41 57	158 00 01	01	80-11-28	1020	380	21.0	65
					81-06-26	0930	390	21.0	64
					81-09-28	1000	400	21.0	67
214131158011601	3-4101-08 W337-6 CNTY	21 41 31	158 01 16	01	80-11-28	1140	230	21.0	32
					81-01-09	1200	240	21.5	32
					81-02-20	1010	250	21.5	32
					81-04-03	1130	220	20.5	31
					81-05-22	0930	220	21.0	28
					81-08-07	1130	220	21.0	30
					81-09-28	1200	230	21.0	30
214233157583501	3-4258-04 W345 RCA	21 42 33	157 58 35	01	80-11-28	1205	1900	24.5	560
					81-01-09	0900	1900	23.5	550
					81-02-20	0840	2000	23.5	550

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

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)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)
			HAWAII, ISLAND OF MOLOKAI						
210402156495801	4-0449-01 S6 CNTY	21 04 02	156 49 58	01	80-10-14	1050	330	20.5	60
					81-02-02	1120	320	20.5	53
					81-05-18	1345	310	20.5	54
210419156570501	4-0457-01 S4 CNTY	21 04 19	156 57 05	01	80-10-14	1640	210	23.0	39
					81-02-02	1005	260	23.0	50
					81-05-18	1040	310	23.0	67
					81-07-16	0925	380	23.5	84
					81-08-31	1625	400	23.0	91
210605157012001	4-0601-01 W11 MD RANCH	21 06 05	157 01 20	01	80-10-17	0910	320	24.5	31
					80-12-11	1555	320	24.5	34
					81-02-05	0810	310	23.5	30
					81-03-19	0835	310	23.5	32
					81-05-21	1310	230	24.0	15
					81-07-16	0845	280	24.5	20
					81-09-02	1605	310	24.5	30
210856157011201	4-0801-01 W16 HHC	21 08 56	157 01 12	01	80-12-08	0730	401	--	83
					81-03-18	0800	410	--	86
210903157013001	4-0901-01 W17 DEL MONTE	21 09 03	157 01 30	01	80-10-16	1020	350	--	76
					80-12-11	1350	390	--	81
					81-02-04	1100	370	--	80
					81-03-18	1130	340	--	69
					81-07-14	1325	310	--	62
					81-09-02	1320	290	21.5	58
210825157014501	SAMPLE PT. A STATE	21 08 25	157 01 45	01	80-10-16	0945	100	19.5	12
					80-12-11	1430	112	19.0	10
					81-02-04	1035	110	19.0	10
					81-03-18	1045	108	18.5	12
					81-07-14	1235	114	21.0	12
					81-09-02	1250	104	20.5	12
210855157021001	SAMPLE PT. B2 STATE	21 08 55	157 02 10	01	80-10-16	1025	350	21.5	76
					80-12-11	1405	390	21.5	80
					81-02-04	1115	370	21.5	81
					81-03-18	1200	340	21.5	74
					81-07-14	1355	310	22.5	62
					81-09-02	1350	290	22.5	58
210928157024801	SAMPLE PT. C STATE	21 09 28	157 02 48	01	80-10-16	1045	220	20.5	39
					80-12-11	1330	112	19.0	11
					81-02-04	1125	250	20.0	50
					81-03-18	1215	225	19.5	39
					81-07-14	1415	180	21.0	27
					81-09-02	1405	180	21.0	26
210923157031501	SAMPLE PT. D STATE	21 09 23	157 03 15	01	80-10-16	1100	115	24.0	16
					81-02-04	1140	110	21.5	10
					81-03-18	1235	110	21.0	14
					81-07-14	1440	124	25.5	17
					81-09-02	1420	124	26.0	21
210850157080201	SAMPLE PT. D1 STATE	21 08 50	157 08 02	01	80-12-11	1500	122	23.5	14

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

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)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)
			HAWAII, ISLAND OF MAUI						
203835156065001	6-3806-01 KAUPO RANCH	20 38 35	156 06 50	01	80-10-03	1400	851	26.0	220
					80-12-29	1300	740	19.0	190
					81-08-20	1440	470	--	120
203955156031401	6-3903-03 NATIONAL PARK	20 39 55	156 03 14	01	80-10-02	1700	59	18.5	4.2
203917156042301	6-3904-04 MAHINA AINA	20 39 17	156 04 23	01	81-04-23	0910	1160	--	280
203947156261201	6-3926-03 WAILEA PUMP 8	20 39 47	156 26 12	01	80-10-10	1030	3900	18.5	1100
					81-01-22	1155	3200	18.5	780
					81-06-09	1140	3400	18.5	950
204126156262101	6-4126-02 W78-1 A&B INC	20 41 26	156 26 21	01	80-10-10	1045	1950	19.5	500
					80-11-26	1350	2000	19.5	490
					81-01-22	1135	2100	19.5	520
					81-03-12	1145	1750	19.5	460
					81-04-30	1230	1850	19.0	470
					81-08-28	1130	2000	20.0	510
204601156001501	6-4600-01 W55 HANA RANCH	20 46 01	156 00 15	01	80-10-02	1430	400	--	54
					80-11-19	1630	380	21.0	55
					81-01-14	1635	380	21.0	56
					81-03-05	1505	400	21.5	64
					81-04-22	1430	440	21.0	73
					81-06-22	1635	530	21.0	93
					81-08-20	0830	590	20.5	110
204633156003201	6-4600-03 STATE WELL B	20 46 33	156 00 32	01	80-10-02	1445	125	19.5	18
					80-11-19	1600	165	19.0	26
					81-01-14	1640	360	19.0	90
					81-03-04	1550	620	18.5	160
					81-04-22	1510	900	19.0	240
					81-06-22	1710	930	18.5	250
					81-08-20	0805	1100	18.5	310
204634156271101	6-4627-08 W225 HASHIMOTO	20 46 34	156 27 11	01	80-10-10	0840	1900	23.0	390
204635156270101	6-4627-14 W226 HASHIMOTO	20 46 35	156 27 01	01	80-11-26	1515	1650	22.5	340
					81-01-22	0945	1650	22.5	340
					81-03-12	0930	1600	23.0	340
					81-04-30	1330	1700	22.5	340
					81-06-09	1330	1550	22.5	340
					81-08-28	1305	1700	23.0	350
204845156255001	6-4825-01 S15 HC&S	20 48 45	156 25 50	01	80-10-27	0900	1720	--	360
					81-03-16	1200	1690	--	350
					81-06-26	1230	1680	--	340
204931156371201	6-4937-01 S10 PNR MILL	20 49 31	156 37 12	01	81-05-06	1215	1860	--	470
205102156282501	6-5128-02 S16 HC&S	20 51 02	156 28 25	01	80-10-28	0725	2060	--	420
					81-03-16	0725	2090	--	450
					81-06-29	0635	2160	--	460
205243156243201	6-5224-02 S22 HC&S	20 52 43	156 24 32	01	80-10-27	1020	1670	--	390
					81-03-16	0810	1620	--	380
					81-06-26	1430	1680	--	390
205305156304401	6-5330-05 S33 WSCO	20 53 05	156 30 44	01	81-03-11	1210	290	21.5	26
					81-06-26	1400	310	21.0	30
205329156305502	6-5330-09 W15A CNTY	20 53 29	156 30 55	02	80-10-20	1015	560	22.5	110
					80-11-28	0955	570	22.5	110
					81-01-22	1440	550	22.5	100
					81-04-30	1430	560	22.5	120
					81-06-26	1540	650	22.5	120
205329156305501	6-5330-10 W15B CNTY	20 53 29	156 30 55	01	81-09-04	0930	580	22.5	120
205330156305401	6-5330-11 W15F CNTY	20 53 30	156 30 54	01	81-03-11	1320	300	23.0	35

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

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)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)
HAWAII, ISLAND OF MAUI--Continued									
205322156394501	6-5339-01 W291 CNTY	20 53 22	156 39 45	01	81-04-20	1345	950	21.5	180
					81-06-26	1400	960	21.5	200
					81-08-26	1115	880	22.0	160
205320156394501	6-5339-02 W292 CNTY	20 53 20	156 39 45	01	81-08-26	1105	900	22.5	170
205343156401101	6-5340-02 S5 PNR MILL	20 53 43	156 40 11	01	81-05-06	0805	1690	---	440
205416156244301	6-5424-01 S24 HC&S	20 54 16	156 24 43	01	81-06-27	0530	2500	---	630
205511156222101	6-5522-01 S31 HC&S, PAIA	20 55 11	156 22 21	01	80-10-27	---	1160	---	260
					81-03-16	0930	1250	---	280
					81-06-27	0900	1690	---	280
205837156384601	6-5838-01 STATE, NAPILI	20 58 37	156 38 46	01	80-10-08	1300	670	20.5	150
					80-11-25	1310	670	21.0	140
					81-01-21	1320	630	---	150
					81-03-11	1240	620	20.5	150
					81-04-20	1245	640	20.5	140
					81-06-26	1225	610	20.5	130
					81-08-26	1225	620	21.0	140
205838156383101	6-5838-02 STATE, NAPILI	20 58 38	156 38 31	01	80-10-08	1315	240	---	50
					80-11-25	1335	315	19.5	62
					81-01-21	1345	280	19.5	54
					81-03-11	1355	260	20.0	51
					81-04-20	1225	280	20.0	51
					81-06-26	1240	280	20.0	50
					81-08-26	1240	340	20.0	70
205848156383601	6-5838-04 STATE, NAPILI	20 58 48	156 38 36	01	81-04-20	1125	300	20.5	61
HAWAII, ISLAND OF HAWAII									
190832155310801	8-0831-01 HWN INVEST CO	19 08 32	155 31 08	01	81-01-14	1100	560	19.0	130
					81-03-30	1130	540	19.0	120
					81-05-18	1055	534	19.0	120
					81-09-04	1255	530	19.0	120
191108155281701	8-1128-02 MAUNA LOA MAC.	19 11 08	155 28 17	01	80-11-17	1040	135	20.5	10
					81-01-14	1205	135	19.5	10
					81-03-30	1050	120	19.5	10
					81-05-18	1005	120	19.5	10
					81-07-29	1020	118	19.5	9.5
					81-09-04	1050	115	19.5	9.5
191114155294801	8-1129-01 MAUNA LOA MAC.	19 11 14	155 29 48	01	80-11-17	1130	100	18.0	3.0
					81-05-18	1025	93	18.0	4.0
					81-07-29	1050	93	18.0	2.5
					81-09-04	1110	93	18.0	2.5
191219155291601	8-1229-01 CNTY, PAHALA	19 12 19	155 29 16	01	81-01-14	1140	96	17.5	3.0
					81-03-30	1025	95	17.5	2.5
					81-07-29	0955	93	17.5	3.0
192108155021201	8-2102-01 W9-10 STATE	19 21 08	155 02 12	01	80-11-03	1230	1170	25.0	290
					81-01-19	1355	1100	25.0	280
					81-04-01	1350	1180	25.0	300
					81-05-19	1340	1150	25.0	300
					81-07-21	1320	1100	25.0	300
192456154571901	8-2487-01 W9-7 CNTY	19 24 56	154 57 19	01	81-01-19	1435	440	25.5	96
192646155532001	8-2653-01 CNTY, HONAUNAU	19 26 46	155 53 20	01	81-03-30	1420	210	19.0	28

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

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)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)
HAWAII, ISLAND OF HAWAII--Continued									
192738155534201	8-2753-01 W12-4 CNTY	19 27 31	155 53 42	01	80-11-13	0800	700	19.0	150
					81-03-30	1500	550	19.0	120
					81-07-29	1445	590	19.0	150
					81-09-16	1100	600	19.0	140
192731155534101	8-2753-02 W12-8 CNTY	19 27 31	155 53 41	01	81-01-14	0730	840	18.5	220
					81-07-29	1430	570	19.0	140
					81-09-16	1030	560	18.5	130
192728154530101	8-2783-01 W9-9 STATE	19 27 28	154 53 01	01	80-11-03	0945	13900	53.0	4400
					81-01-19	1130	16800	54.0	5400
					81-04-01	1030	16200	54.0	5200
					81-05-19	1100	13600	54.0	4500
					81-07-21	1035	14300	55.0	5100
192923154564701	8-2986-01 W9-5A CNTY.	19 29 23	154 56 47	01	80-11-03	1350	120	23.0	6.0
					81-07-21	0935	120	23.0	5.0
192924154564701	8-2986-02 W9-5B CNTY	19 29 24	154 56 47	01	81-01-19	0950	118	23.0	4.5
					81-04-01	1440	120	23.0	4.5
					81-07-21	0935	120	23.0	5.0
193017154502101	8-3080-02 S9 CNTY	19 30 17	154 50 21	01	80-11-03	1035	1070	25.5	180
					81-01-19	1245	1060	25.5	160
193113154555801	8-3185-01 W9-11 HAW BCH	19 31 13	154 55 58	01	81-01-19	1520	125	21.0	12
					81-05-29	1515	128	21.0	13
					81-07-28	0920	125	21.5	14
193508155570701	8-3557-03 CNTY, KAHALUU	19 35 08	155 57 07	01	80-11-13	0940	160	20.0	14
					81-01-13	1435	145	20.0	12
					81-06-12	0835	135	20.0	20
					81-09-15	1520	135	20.0	10
193505155570701	8-3557-04 CNTY, KAHALUU	19 35 05	155 57 07	01	80-11-13	0925	240	20.0	30
					81-01-13	1505	220	20.0	26
					81-03-31	0855	190	19.5	20
					81-06-12	0905	190	20.0	23
					81-07-30	0855	170	20.0	20
193805155020201	8-3802-03 PUNA SGR CO	19 38 05	155 02 02	01	80-11-07	0940	85	18.5	4.5
					81-04-09	1115	80	18.5	3.5
					81-06-09	1030	78	19.0	3.5
					81-07-23	0955	80	18.5	4.0
193937155004301	8-3900-01 W9-2 RYL HWN	19 39 37	155 00 43	01	81-02-06	0950	330	19.0	61
					81-06-09	1010	325	19.0	73
					81-07-23	0925	370	19.0	79
194037155035301	8-4003-01 W8-3 CNTY	19 40 37	155 03 53	01	80-11-07	1150	100	20.5	4.5
					81-02-06	1030	87	20.5	3.0
					81-04-09	1440	85	20.5	3.5
					81-06-09	1125	82	20.5	3.0
					81-07-23	0900	82	20.0	2.5
194040155035201	8-4003-02 CNTY, PANAEWA	19 40 40	155 03 52	01	80-11-07	1130	100	20.5	4.5
					81-02-06	1020	85	20.5	3.0
					81-04-09	1430	85	20.5	3.5
					81-06-09	1105	82	20.5	2.5
194134155005601	8-4100-01 HAW PRDSE PARK	19 41 34	155 00 56	01	80-11-19	0930	1200	19.0	310
					81-02-10	0950	1350	18.5	360
					81-04-14	1055	1300	18.5	340
					81-06-16	0930	1410	19.0	380
					81-08-26	1100	1380	19.0	400
194222155034801	8-4203-06 W8-2B HELCO	19 42 22	155 03 48	01	80-11-07	0850	105	24.5	8.5
					81-02-06	1105	135	25.0	16
					81-04-09	0925	130	26.0	18
					81-06-09	0925	160	26.5	26

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

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)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)
HAWAII, ISLAND OF HAWAII--Continued									
194337155041801	8-4304-01 HELCO, WAIAKEA	19 43 37	155 04 18	01	80-11-19	1120	41700	20.0	15000
					81-02-06	1135	39800	21.0	14000
					81-04-09	1400	46000	20.5	16000
					81-06-09	1150	19400	20.5	6200
194818155582301	8-4858-02 KONA VILLAGE	19 48 18	155 58 23	01	81-01-13	1325	2100	20.5	400
					81-03-31	1120	2100	21.0	410
					81-06-11	1255	2200	21.5	410
					81-07-30	1205	2200	21.0	420
					81-09-15	1355	2100	22.0	410
194820155582401	8-4858-03 ISL COPRA	19 48 20	155 58 24	01	80-11-12	1605	2500	20.5	730
					81-01-13	1320	3100	21.0	720
					81-09-15	1350	4000	21.0	1000
195035155054501	8-5005-01 HILO CST PROC	19 50 35	155 05 45	01	80-11-21	1440	200	21.0	11
					81-02-10	1320	185	19.5	10
					81-06-01	0955	170	20.0	11
					81-07-23	1350	190	20.0	10
195043155053801	8-5005-02 PEPEEKEO SGR	19 50 43	155 05 38	01	80-11-21	1415	220	23.0	13
					81-02-10	1300	240	21.5	22
					81-04-06	0910	250	21.5	28
					81-06-01	0940	260	21.0	32
					81-07-23	1340	280	20.5	40
195049155051601	8-5005-04 HILO CST PROC	19 50 49	155 05 16	01	80-11-21	1500	10000	19.0	3600
					81-02-10	1410	21700	18.0	7200
195051155051501	8-5005-05 HILO COAST PRO	19 50 51	155 05 15	01	81-06-01	0930	11800	18.5	3600
					81-07-23	1410	14500	18.0	4800
195546155480301	8-5548-01 BOISE CASCADE	19 55 46	155 48 03	01	80-11-14	1140	1900	28.0	560
					81-04-27	1500	2190	28.0	560
					81-05-27	1435	2100	28.5	570
					81-07-22	1025	2200	28.5	560
					81-09-15	1240	2000	29.0	570
195724155455301	8-5745-01 BOISE CASCADE	19 57 24	155 45 53	01	81-01-30	1345	305	27.0	26
					81-09-15	1135	280	27.0	24
195722155455201	8-5745-02 BOISE CASCADE	19 57 22	155 45 52	01	81-04-08	1105	305	27.0	27
					81-05-27	1410	280	27.0	26
195857155142301	8-5814-01 CNTY	19 58 57	155 14 23	01	81-02-10	1510	500	19.0	100
					81-04-06	1025	510	19.0	110
195939155464201	8-5946-03 STATE	19 59 35	155 46 45	01	80-12-04	1305	390	27.0	56
					80-12-07	0745	--	--	59
195947155485801	8-5948-01 STATE, HAPUNA	19 59 47	155 48 58	01	80-11-05	1310	1800	25.5	460
					81-01-30	1110	1800	25.5	460
					81-04-27	1315	1750	25.5	460
					81-05-27	1225	1630	26.0	460
					81-07-22	1220	1630	26.0	450
					81-09-14	1330	1500	26.0	450
200122155480901	8-6148-01 W14 CNTY	20 01 22	155 48 09	01	80-11-05	1100	1550	27.0	390
					81-05-27	1115	1370	27.5	380
200121155480801	8-6148-02 CNTY, KAWAIHAE	20 01 21	155 48 08	01	80-11-05	1055	1600	27.0	400
200518155281601	8-6528-01 STATE, HAINA	20 05 18	155 28 16	01	81-03-18	1130	300	23.0	--

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

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)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)
HAWAII, ISLAND OF HAWAII--Continued									
200527155493601	B-6549-01 HILTON HD CO	20 05 29	155 49 23	01	81-03-19	1345	300	20.5	44
201428155494201	B-7449-02 CNTY, HAWI	20 14 28	155 49 42	01	81-02-11	1150	200	21.5	18
201603155521801	B-7652-01 S1 KOHALA SGR	20 16 03	155 52 18	01	80-11-12	1320	1900	22.0	480
					80-12-17	1245	1900	22.0	490
					81-02-11	1110	1850	22.0	460
					81-04-06	1300	1900	22.0	500
					81-06-11	1055	1940	22.0	500
					81-08-06	1100	1750	22.0	530

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

HAWAII, ISLAND OF KAUAI

	LOCAL IDENTIFIER	LAT-ITUDE	LONG-ITUDE	SEQ. NO.	STATION NUMBER	DATE OF SAMPLE	TIME	HARDNESS (MG/L AS CACO3)	HARDNESS NONCARBONATE (MG/L AS CACO3)	CALCIUM DISSOLVED (MG/L AS CA)
2-5533-02	CNTY, HANAPEPE	21 55 49	159 33 45	01	215549159334501	80-10-30	0930	74	36	10
2-5923-05	CNTY, KILOHANA	21 59 12	159 23 41	01	215912159234101	81-08-01	1530	37	5.0	5.8

DATE OF SAMPLE	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	PERCENT SODIUM	SODIUM ADSORPTION RATIO	POTASSIUM, DISSOLVED (MG/L AS K)	ALKALINITY LAB (MG/L AS CACO3)	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)	SOLIDS, DISSOLVED (TONS PER AC-FT)
80-10-30	12	28	44	1.4	1.6	38	16	32	.2	52	175	.31
81-08-01	5.4	17	49	1.2	1.3	32	10	17	.1	27	107	--

DATE OF SAMPLE	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N)	IRON, DISSOLVED (UG/L AS FE)	MANGANESE, DISSOLVED (UG/L AS MN)	AGENCY COLLECTING SAMPLE (CODE NUMBER)
80-10-30	--	70	5	j9999
81-08-01	.89	10	0	j9999

j Collected by non-USGS agency.

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

HAWAII, ISLAND OF OAHU

LOCAL IDENTIFIER	LAT-I-TUDE	LONG-I-TUDE	SEQ. NO.	STATION NUMBER	DATE OF SAMPLE	TIME	DEPTH TO BOTTOM OF SAMPLE INTERVAL (FT)	ELEV. OF LAND SURFACE DATUM (FT. ABOVE NGVD)	FLOW RATE (GPD)
3-2459-01 TO 05 W239 A-E	21 24 36	157 59 01	11	212436157590111	81-03-30	1150	--	41.06	--
					81-06-23	1515	--	41.06	--
					81-07-28	1100	--	41.06	--
					81-08-25	1335	--	41.06	--
					81-09-30	1020	E700	41.06	E8000000
3-2558-09 (T-40) NAVY	21 25 17	157 58 25	01	212517157582501	81-03-26	1222	--	--	--
					81-04-02	1250	--	--	--
					81-06-23	1548	--	--	--
					81-07-28	1024	--	--	--
					81-08-25	1404	--	--	--
					81-09-30	1400	E385	--	0

DATE OF SAMPLE	SPECIFIC CONDUCTANCE (UMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	HARDNESS (MG/L AS CACO3)	HARDNESS NONCARBONATE (MG/L AS CACO3)	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	PERCENT SODIUM	SODIUM ADSORPTION RATIO	POTASSIUM, DISSOLVED (MG/L AS K)	ALKALINITY LAB (MG/L AS CACO3)
81-03-30	4630	--	--	--	--	--	--	--	--	--	--	--
81-06-23	4750	--	--	--	--	--	--	--	--	--	--	--
81-07-28	4890	--	--	--	--	--	--	--	--	--	--	--
81-08-25	5010	--	--	--	--	--	--	--	--	--	--	--
81-09-30	4250	6.7	23.5	940	890	130	150	520	54	7.4	12	48
81-03-26	1970	--	--	--	--	--	--	--	--	--	--	--
81-04-02	2360	--	--	--	--	--	--	--	--	--	--	--
81-06-23	2510	--	23.8	--	--	--	--	--	--	--	--	--
81-07-28	2730	--	23.6	--	--	--	--	--	--	--	--	--
81-08-25	1920	--	--	--	--	--	--	--	--	--	--	--
81-09-30	1640	6.1	31.0	340	310	60	45	160	50	4.3	9.0	29

DATE OF SAMPLE	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC DIS. (MG/L AS N)	NITROGEN DISSOLVED (MG/L AS N)	AGENCY COLLECTING SAMPLE (CODE NUMBER)
81-03-30	--	1400	--	--	--	--	--	--	--
81-06-23	--	1400	--	--	--	--	--	--	--
81-07-28	--	1500	--	--	--	--	--	--	--
81-08-25	--	1500	--	--	--	--	--	--	--
81-09-30	170	1400	.1	55	2470	1.2	1.1	2.3	--
81-03-26	--	500	--	--	--	--	--	--	--
81-04-02	--	680	--	--	--	--	--	--	--
81-06-23	--	760	--	--	--	--	--	--	--
81-07-28	--	800	--	--	--	--	--	--	--
81-08-25	--	550	--	--	--	--	--	--	--
81-09-30	84	470	.2	--	--	.12	2.5	2.6	--

E Estimated.

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

HAWAII, ISLAND OF OAHU--Continued

LOCAL IDENTIFIER	LAT-I-TUDE	LONG-I-TUDE	SEQ. NO.	STATION NUMBER	DATE OF SAMPLE	TIME	DEPTH TO BOTTOM OF SAMPLE INTERVAL (FT)	ELEV. OF LAND SURFACE DATUM (FT. ABOVE NGVD)	FLOW RATE (GPD)
3-2558-10 S16 NAVY	21 25 06	157 58 23	01	212506157582301	80-10-10	2215	--	--	--
					80-11-14	1215	--	--	--
					80-12-31	1115	--	--	--
					81-02-10	1200	--	--	--
					81-03-20	1135	--	--	--
					81-03-30	1345	--	--	--
					81-05-01	1200	--	--	--
					81-06-16	1400	--	--	--
					81-07-30	1425	--	--	--
					81-09-17	1520	--	--	--
					81-09-30	1445	--	--	E1500000

DATE OF SAMPLE	SPECIFIC CONDUCTANCE (UMHOS)	PH (UNITS)	TEMPERATURE (DEG C)	HARDNESS (MG/L AS CACO3)	HARDNESS NONCARBONATE (MG/L AS CACO3)	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	PERCENT SODIUM	SODIUM ADSORPTION RATIO	POTASSIUM, DISSOLVED (MG/L AS K)	ALKALINITY LAB (MG/L AS CACO3)
80-10-10	--	--	--	--	--	--	--	--	--	--	--	--
80-11-14	900	--	21.5	--	--	--	--	--	--	--	--	--
80-12-31	950	--	21.5	--	--	--	--	--	--	--	--	--
81-02-10	950	--	22.0	--	--	--	--	--	--	--	--	--
81-03-20	1000	--	22.0	--	--	--	--	--	--	--	--	--
81-03-30	1050	--	22.0	--	--	--	--	--	--	--	--	--
81-05-01	950	--	21.5	--	--	--	--	--	--	--	--	--
81-06-16	900	--	21.5	--	--	--	--	--	--	--	--	--
81-07-30	850	--	21.5	--	--	--	--	--	--	--	--	--
81-09-17	825	--	21.5	--	--	--	--	--	--	--	--	--
81-09-30	--	--	--	170	130	27	26	95	54	3.1	3.8	47

DATE OF SAMPLE	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC DIS. (MG/L AS N)	NITROGEN DISSOLVED (MG/L AS N)	AGENCY COLLECTING SAMPLE (CODE NUMBER)
80-10-10	--	230	--	--	--	--	--	--	j 9999
80-11-14	--	240	--	--	--	--	--	--	--
80-12-31	--	250	--	--	--	--	--	--	--
81-02-10	--	250	--	--	--	--	--	--	--
81-03-20	--	270	--	--	--	--	--	--	--
81-03-30	--	270	--	--	--	--	--	--	--
81-05-01	--	260	--	--	--	--	--	--	--
81-06-16	--	240	--	--	--	--	--	--	--
81-07-30	--	210	--	--	--	--	--	--	--
81-09-17	--	220	--	--	--	--	--	--	--
81-09-30	26	230	.1	57	498	1.1	--	--	--

E Estimated.
j Collected by non-USGS agency.

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

HAWAII, ISLAND OF MAUI

	LOCAL IDENTIFIER	LATITUDE	LONGITUDE	SEQ. NO.	STATION NUMBER	DATE OF SAMPLE	TIME	SPECIFIC CONDUCTANCE (UMHOS)	PH (UNITS)	TEMPERATURE (DEG C)
6-3903-03	NATIONAL PARK	20 39 55	156 03 14	01	203955156031401	80-10-02	1700	59	8.3	18.5

DATE OF SAMPLE	HARDNESS (MG/L AS CACO3)	HARDNESS, NONCARBONATE (MG/L CACO3)	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	PERCENT SODIUM	SODIUM ADSORPTION RATIO	POTASSIUM, DISSOLVED (MG/L AS K)	ALKALINITY FIELD (MG/L AS CACO3)	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	FLUORIDE, DISSOLVED (MG/L AS F)
80-10-02	11	0	2.7	1.1	6.7	51	.9	2.0	25	.5	4.2	.1

DATE OF SAMPLE	SILICA, DISSOLVED (MG/L AS SIO2)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)	SOLIDS, DISSOLVED (TONS PER AC-FT)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N)	ARSENIC TOTAL (UG/L AS AS)	BARIUM, TOTAL RECOVERABLE (UG/L AS BA)	CADMIUM TOTAL RECOVERABLE (UG/L AS CD)	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR)	COPPER, TOTAL RECOVERABLE (UG/L AS CU)	IRON, TOTAL RECOVERABLE (UG/L AS FE)	IRON, DISSOLVED (UG/L AS FE)	LEAD, TOTAL RECOVERABLE (UG/L AS PB)
80-10-02	16	49	.07	.13	0	0	0	20	48	260	<10	23

DATE OF SAMPLE	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN)	MANGANESE, DISSOLVED (UG/L AS MN)	MERCURY TOTAL RECOVERABLE (UG/L AS HG)	SELENIUM, TOTAL (UG/L AS SE)	SILVER, TOTAL RECOVERABLE (UG/L AS AG)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN)	CYANIDE TOTAL (MG/L AS CN)
80-10-02	10	<1	.2	0	0	30	.00

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

HAWAII, ISLAND OF HAWAII

	LOCAL IDENTIFIER		LATITUDE	LONGITUDE	SEQ. NO.	STATION NUMBER	DATE OF SAMPLE	TIME	SPECIFIC CONDUCTANCE (UMHOS)	PH (UNITS)	TEMPERATURE (DEG C)
8-5946-03	STATE,	LALAMILO	19 59 35	155 46 45	01	195939155464201	80-12-04	1305	390	--	27.0
							80-12-07	0745	--	--	--
8-6528-01	STATE,	HAINA	20 05 18	155 28 16	01	200518155281601	81-03-18	1130	300	7.8	23.0

DATE OF SAMPLE	TURBIDITY (NTU)	HARDNESS (MG/L AS CACO3)	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	PERCENT SODIUM	SODIUM ADSORPTION RATIO	POTASSIUM, DISSOLVED (MG/L AS K)	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	SILICA, DISSOLVED (MG/L AS SIO2)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)
80-12-04	--	--	--	--	--	--	--	--	--	56	--	--
80-12-07	--	79	10	13	50	56	2.5	5.5	20	59	57	--
81-03-18	8.6	--	--	--	--	--	--	--	--	--	--	.20

DATE OF SAMPLE	NITROGEN, AMMONIA TOTAL (MG/L AS N)	ARSENIC TOTAL (UG/L AS AS)	BARIUM, TOTAL RECOVERABLE (UG/L AS BA)	CADMIUM TOTAL RECOVERABLE (UG/L AS CD)	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR)	IRON, DISSOLVED (UG/L AS FE)	LEAD, TOTAL RECOVERABLE (UG/L AS PB)	MANGANESE, DISSOLVED (UG/L AS MN)	MERCURY TOTAL RECOVERABLE (UG/L AS HG)	SELENIUM, TOTAL (UG/L AS SE)	SILVER, TOTAL RECOVERABLE (UG/L AS AG)	PCB, TOTAL (UG/L)
80-12-04	--	--	--	--	--	--	--	--	--	--	--	--
80-12-07	--	--	--	--	--	10	--	<1	--	--	--	--
81-03-18	.010	1	0	0	15	--	6	--	.3	0	0	.00

DATE OF SAMPLE	ALDRIN, TOTAL (UG/L)	CHLORDANE, TOTAL (UG/L)	DDD, TOTAL (UG/L)	DDE, TOTAL (UG/L)	DDT, TOTAL (UG/L)	DIAZINON, TOTAL (UG/L)	DIELDRIN TOTAL (UG/L)	ENDOSULFAN, TOTAL (UG/L)	ENDRIN, TOTAL (UG/L)	ETHION, TOTAL (UG/L)	HEPTACHLOR, TOTAL (UG/L)	HEPTACHLOR EPOXIDE TOTAL (UG/L)
80-12-04	--	--	--	--	--	--	--	--	--	--	--	--
80-12-07	--	--	--	--	--	--	--	--	--	--	--	--
81-03-18	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00

DATE OF SAMPLE	LINDANE TOTAL (UG/L)	MALATHION, TOTAL (UG/L)	METHYL PARATHION, TOTAL (UG/L)	METHYL TRITHION, TOTAL (UG/L)	MIREX, TOTAL (UG/L)	NAPHTHALENES, POLYCHLOR. TOTAL (UG/L)	PERTHANE TOTAL (UG/L)	PARATHION, TOTAL (UG/L)	TOXAPHENE, TOTAL (UG/L)	TOTAL TRITHION (UG/L)	2,4-D, TOTAL (UG/L)	2,4-DP TOTAL (UG/L)
80-12-04	--	--	--	--	--	--	--	--	--	--	--	--
80-12-07	--	--	--	--	--	--	--	--	--	--	--	--
81-03-18	.00	.00	.00	.00	.00	.00	.00	.00	0	14	.00	.00

DATE OF SAMPLE	2,4,5-T TOTAL (UG/L)	SILVEX, TOTAL (UG/L)	AGENCY COLLECTING SAMPLE (CODE NUMBER)
80-12-04	--	--	--
80-12-07	--	--	j 9999
81-03-18	.00	.00	j 9999

< Actual value is known to be less than the value shown.
j Collected by non-USGS agency.

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October 1, 1978

FACTORS FOR CONVERTING INCH-POUND UNITS TO INTERNATIONAL SYSTEM UNITS (SI)

The following factors may be used to convert the inch-pound units published herein to the International System of Units (SI). This report contains both the inch-pound and SI unit equivalents in the station manuscript descriptions.

Multiply inch-pound units	By	To obtain SI units
	Length	
inches (in)	2.54×10^{1}	millimeters (mm)
	2.54×10^{-2}	meters (m)
feet (ft)	3.048×10^{-1}	meters (m)
miles (mi)	1.609×10^{0}	kilometers (km)
	Area	
acres	4.047×10^{3}	square meters (m^2)
	4.047×10^{-1}	square hectometers (hm^2)
	4.047×10^{-3}	square kilometers (km^2)
square miles (mi^2)	2.590×10^{0}	square kilometers (km^2)
	Volume	
gallons (gal)	3.785×10^{0}	liters (L)
	3.785×10^{0}	cubic decimeters (dm^3)
	3.785×10^{-3}	cubic meters (m^3)
million gallons	3.785×10^{3}	cubic meters (m^3)
	3.785×10^{-3}	cubic hectometers (hm^3)
cubic feet (ft^3)	2.832×10^{1}	cubic decimeters (dm^3)
	2.832×10^{-2}	cubic meters (m^3)
cfs-days	2.447×10^{3}	cubic meters (m^3)
	2.447×10^{-3}	cubic hectometers (hm^3)
acre-feet (acre-ft)	1.233×10^{3}	cubic meters (m^3)
	1.233×10^{-3}	cubic hectometers (hm^3)
	1.233×10^{-6}	cubic kilometers (km^3)
	Flow	
cubic feet per second (ft^3/s)	2.832×10^{1}	liters per second (L/s)
	2.832×10^{1}	cubic decimeters per second (dm^3/s)
	2.832×10^{-2}	cubic meters per second (m^3/s)
gallons per minute (gal/min)	6.309×10^{-2}	liters per second (L/s)
	6.309×10^{-2}	cubic decimeters per second (dm^3/s)
	6.309×10^{-5}	cubic meters per second (m^3/s)
million gallons per day	4.381×10^{1}	cubic decimeters per second (dm^3/s)
	4.381×10^{-2}	cubic meters per second (m^3/s)
	Mass	
tons (short)	9.072×10^{-1}	megagrams (Mg) or metric tons

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