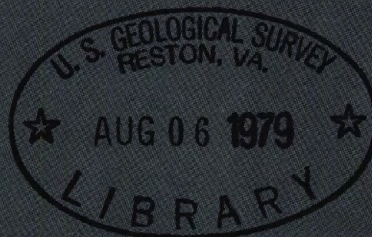


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Water Resources Data for Hawaii and other Pacific Areas

Volume 1. Hawaii

U.S. GEOLOGICAL SURVEY WATER-DATA REPORT HI-78-1

WATER YEAR 1978

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

CALENDAR FOR WATER YEAR 1978

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Water Resources Data for Hawaii and other Pacific Areas

Volume 1. Hawaii

U.S. GEOLOGICAL SURVEY WATER-DATA REPORT HI-78-1

WATER YEAR 1978

Prepared in cooperation with the State of Hawaii
and with agencies

UNITED STATES DEPARTMENT OF THE INTERIOR

CECIL D. ANDRUS, Secretary

GEOLOGICAL SURVEY

H. William Menard, Director

For information on the water program in Hawaii
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PREFACE

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

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

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

Volume 1. State of Hawaii

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

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(Letter after station name designates type of data: (d) discharge, (c) chemical,
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WATER RESOURCES DATA FOR HAWAII AND OTHER PACIFIC AREAS, 1978

Volume 1

INTRODUCTION

Water resources data for the 1978 water year for Hawaii and other Pacific areas consist of records of stage, discharge, and water quality of streams; and water-levels and water quality of wells and springs. This report contains discharge records for 114 gaging stations; water quality for 11 gaging stations, 98 partial-record flow stations, and 182 wells; and water levels for 25 observation wells. Also included are data for 106 crest-stage partial-record stations and 18 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-78-1." 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.
 Hawaii Department of Transportation, E. Alvey Wright, succeeded by Ryokichi Higashionna, director.
 City and County of Honolulu, Board of Water Supply, E. Y. Hirata, succeeded by Kazuyoshi Hayashida, manager and chief engineer.
 City and County of Honolulu, Division of Engineering, Kazuyoshi Hayashida, succeeded by Wallace Miyahira, director and chief engineer.

Assistance in the form of funds or services are given by the Corps of Engineers, U.S. Army in collecting records for 11 gaging stations, 4 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.

HYDROLOGIC CONDITIONS

Runoff during the first half of the 1978 water year was predominately below normal (in the lower 25 percent of record) at the four representative or index stations on the four major islands within the state. Deficient streamflow throughout the state was the result of the small amount of rain that fell in January and February. Streamflow increased significantly after May and monthly mean flows at all index stations were mostly in the above-normal range during the last four months of the water year. However, annual mean discharges at all index stations were below normal and ranged between 51 and 80 percent of the annual medians for each station.

At the index station, East Branch of North Fork Wailua River near Lihue, Kauai, streamflow was deficient from November to March. Lihue Airport recorded its driest February of record with 0.08 inch (2.0 mm), only 2 percent of the February average and the monthly mean flow of $10.8 \text{ ft}^3/\text{s}$ ($0.31 \text{ m}^3/\text{s}$) at the index station nearly equaled the recorded low of $10.6 \text{ ft}^3/\text{s}$ ($0.30 \text{ m}^3/\text{s}$) since record began in July 1912. Streamflow at Kalihi Stream near Honolulu, Oahu, was deficient from October to March and the minimum daily discharge of $0.16 \text{ ft}^3/\text{s}$ ($0.025 \text{ m}^3/\text{s}$) for February was the lowest ever recorded since record began in September 1913. This exceeded the previous record of $0.19 \text{ ft}^3/\text{s}$ ($0.005 \text{ m}^3/\text{s}$) recorded last year in February. Streamflow at the index stations Honopou Stream near Huelo, Maui, and Waiakea Stream near Mountain View, Hawaii, was deficient 4 of the 7 months beginning in October. The 0.22 inch (5.6 mm) of rainfall recorded for February at Kahalui Airport or 8 percent of the average for February contributed to the lowest minimum daily mean discharge ever recorded at Honopou Stream near Huelo, Maui, for March since record began in December 1910. Monthly and annual mean discharge is compared with medians at the four index gaging stations in figure 1.

Records at four observation wells equipped with continuous recorders showed that the ground-water levels at two of them reached minimums for their respective periods of records, and the other two reached maximums for their respective periods of records. The two minimums occurred in September on Maui. The two maximums occurred in July on Oahu. Analyses of water samples taken at more than 200 basal water-table wells did not in general show significant changes in the chloride contents.

DEFINITION TERMS

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

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

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

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

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

Bacteria are 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 number of colonies per 100 mL of sample.

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

Fecal streptococcal bacteria are bacteria found also in the intestine of warmblooded animals. Their presence in water is considered to verify fecal pollution. They are characterized as gram-positive, cocci bacteria which are capable of growth in brain-heart infusion broth. In the laboratory they are defined as all the organisms which produce red or pink colonies within 48 hours at 35°C + 1.0°C on M-enterococcus 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/m³ (grams per cubic meter), and periphyton and benthic organisms in g/m² (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) or 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. Chlorophyll 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 (FT³/S, ft³/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 um 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 um 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 um 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 um 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 per-cent) 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:

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

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 ($\mu\text{g/g}$) 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 , $\mu\text{g/L}$) is a unit expressing the concentration of chemical constituents in solution as mass (micrograms) of solute per unit volume (liter) of water. One thousand micrograms per liter is equivalent to one milligram per liter.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Blue-green algae are a group of phytoplankton organisms having a blue pigment, in 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 the grazers in the aquatic environment, the zooplankton are a vital part of the aquatic feed web. The zooplankton community is dominated by small crustaceans and rotifers.

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

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

Milligrams of carbon per area or volume per unit time [$\text{mg C}/(\text{m}^2 \cdot \text{time})$ for periphyton and macrophytes and $\text{mg C}/(\text{m}^3 \cdot \text{time})$] 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 [$\text{mg O}_2/(\text{m}^2 \cdot \text{time})$ for periphyton and macrophyte and $\text{mg O}_2/(\text{m}^3 \cdot \text{time})$] 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 emerged or submerged 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-glas strips for periphyton collection.

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

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

Kingdom.....Animal
Phylum.....Arthropoda
Class.....Insecta
Order.....Ephemeroptera
Family.....Ephemeridae
Genus.....Hexagenia
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 REVISTONS paragraph to refer to previously published State annual basic-data reports.

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

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

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

DOWNSTREAM ORDER AND STATION NUMBER

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

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

NUMBERING SYSTEM FOR WELLS AND MISCELLANEOUS SITES

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

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

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

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

SPECIAL NETWORKS AND PROGRAMS

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

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

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

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

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

EXPLANATION OF STAGE AND WATER-DISCHARGE RECORDS

Collection and computation of data

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

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

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

For some gaging stations there are periods when no gage-height record is obtained or the recorded gage height is so faulty that it cannot be used to

compute daily discharge or contents. This happens when the recorder stops or otherwise fails to operate properly, intakes are plugged, the float is frozen in the well, or for various other reasons. For such periods the daily discharges are estimated on the bases of recorded range in stage, prior and subsequent records, discharge measurements, weather records, and comparison with records for other stations, in the same or nearby basins. Likewise daily contents may be estimated on the basis of operator's log, prior and subsequent records, inflow-outflow studies, and other information.

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

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

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

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

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

The average discharge for the number of years indicated is given under "AVERAGE DISCHARGE", it is not given for stations having fewer than 5 complete years of record or for stations where changes in water development during the period of record cause the figure to have little significance. In addition, the median of yearly mean discharges is given for stream-gaging stations having

10 or more complete years of record if the median differs from the average by more than 10 percent. Under "EXTREMES" are given first, the extremes for the period of record, second, information available outside the period of record, and last, those for the current year. Unless otherwise qualified, the maximum discharge (or contents) is the instantaneous maximum corresponding to the crest stage obtained by use of a water-stage recorder (graphic or digital), a crest-stage gage, or a nonrecording gage read at the time of the crest. If the maximum gage height did not occur on the same day as the maximum discharge (or contents), it is given separately. Similarly, the minimum is the instantaneous minimum unless otherwise qualified. For some stations peak discharges are listed with EXTREMES FOR THE CURRENT YEAR; if they are, all independent peaks, including the maximum for the year, above the selected base with time of occurrence and corresponding gage heights are published in tabular format. The base discharge, which is given in the table heading, is selected so that an average of about three peaks a year will be presented. Peak discharges are not published for any canals, ditches, drains, or for any stream for which the peaks are subject to substantial control by man. Time of day is expressed in 24-hour local standard time; for example, 12:30 a.m. is 0030, 1:30 p.m. is 1330. The minimums for these stations are published in a separate paragraph following the table of peaks.

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

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

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

Data collected at partial-record stations follow the information for continuous-record sites. Data for partial-record discharge stations are presented in two tables. The first is a table of discharge measurements at low-flow partial-record stations, and the second is a table of annual maximum stage and discharge at crest-stage stations. The tables of partial-record stations are followed by a listing of discharge measurements made at sites other than continuous-record or partial-record stations. Occasionally, a series of discharge measurements are made within a short time period to investigate the

seepage gains or losses along a reach of a stream or to determine the low-flow characteristics of an area. Such measurements are also given in special tables following the tables of partial-record stations.

Accuracy of field data and computed results

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

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

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

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

Records of discharge collected by agencies other than the Geological Survey

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

Other data available

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

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

Publications

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

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

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

EXPLANATION OF WATER-QUALITY RECORDS

Collection and examination of data

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

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

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

Water analysis

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

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

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

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

Water temperature

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

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

Sediment

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

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

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

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

Publications

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

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

A In preparation.

EXPLANATION OF GROUND-WATER LEVEL RECORDS

Collection of the data

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

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

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

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

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

Publications

Publication of ground-water level data for the United States in Water-Supply Papers was begun by the Geological Survey in 1935. From 1935 through 1939, a single Water-Supply Paper for each year covering the entire nation 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.

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

A In preparation.

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

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

- 1-D1. *Water temperature-influential factors, field measurement, and data presentation*, by H. H. Stevens Jr., J. F. Ficke, and G. F. Smoot: USGS--TWRI Book 1, Chapter D1. 1975. 65 pages. \$1.60.
- 1-D2. *Guidelines for collection and field analysis of ground-water samples for selected unstable constituents*, by W.W. Wood: USGS--TWRI Book 1, Chapter D2. 1976. 24 pages. \$0.85.
- 2-D1. *Application of surface geophysics to ground-water investigations*, by A. A. R. Zohdy, G. P. Eaton, and D. R. Mabey: USGS--TWRI Book 2, Chapter D1. 1974. 116 pages. \$1.90.
- 2-E1. *Application of borehole geophysics to water-resources investigations*, by W. S. Keys and L. M. MacCary: USGS--TWRI Book 2, Chapter E1. 1971. 126 pages. \$1.75.
- 3-A1. *General field and office procedures for indirect discharge measurements*, by M. A. Benson and Tate Dalrymple: USGS--TWRI Book 3, Chapter A1. 1967. 30 pages. \$1.00.
- 3-A2. *Measurement of peak discharge by the slope-area method*, by Tate Dalrymple and M. A. Benson: USGS--TWRI Book 3, Chapter A2. 1967. 12 pages. \$0.35.
- 3-A3. *Measurement of peak discharge at culverts by indirect methods*, by G. L. Bodhaine: USGS--TWRI Book 3, Chapter A3. 1968. 60 pages. \$0.40.
- 3-A4. *Measurement of peak discharge at width contractions by indirect methods*, by H. F. Matthai: USGS--TWRI Book 3, Chapter A4. 1967. 44 pages. \$1.00.
- 3-A5. *Measurement of peak discharge at dams by indirect methods*, by Harry Hulsing: USGS--TWRI Book 3, Chapter A5. 1967. 29 pages. \$0.35.
- 3-A6. *General procedure for gaging streams*, by R. W. Carter and Jacob Davidian: USGS--TWRI Book 3, Chapter A6. 1968. 13 pages. \$1.00.
- 3-A7. *Stage measurements at gaging stations*, by T. J. Buchanan and W. P. Somers: USGS--TWRI Book 3, Chapter A7. 1968. 28 pages. \$1.40.
- 3-A8. *Discharge measurements at gaging stations*, by T. J. Buchanan and W. P. Somers: USGS--TWRI Book 3, Chapter A8. 1969. 65 pages. \$1.25.
- 3-A11. *Measurement of discharge by moving-boat method*, by G. F. Smoot and C. E. Novak: USGS--TWRI Book 3, Chapter A11. 1969. 22 pages. \$1.20.
- 3-A12. *Fluorometric procedures for dye tracing*, by J. F. Wilson Jr.: USGS--TWRI Book 3, Chapter A12. 1968. 31 pages. \$0.35. Not currently available.
- 3-B1. *Aquifer-test design, observation, and data analysis*, by R. W. Stallman: USGS--TWRI Book 3, Chapter B1. 1971. 26 pages. \$0.70.
- 3-B2. *Introduction to ground-water hydraulics, a programed text for self-instruction*, by G. D. Bennett: USGS--TWRI Book 3, Chapter B2. 1976. 172 pages. \$2.50.
- 3-C1. *Fluvial sediment concepts*, by H. P. Guy: USGS--TWRI Book 3, Chapter C1. 1970. 55 pages. \$2.50.
- 3-C2. *Field methods for measurement of fluvial sediment*, by H. P. Guy and V. W. Norman: USGS--TWRI Book 3, Chapter C2. 1970. 59 pages. \$2.50.
- 3-C3. *Computation of fluvial-sediment discharge*, by George Porterfield: USGS--TWRI Book 3, Chapter C3. 1972. 66 pages. \$2.10.
- 4-A1. *Some statistical tools in hydrology*, by H. C. Riggs: USGS--TWRI Book 4 Chapter A1. 1968. 39 pages. \$1.60.
- 4-A2. *Frequency curves*, by H. C. Riggs: USGS--TWRI Book 4, Chapter A2. 1968. 15 pages. \$1.20.
- 4-B1. *Low-flow investigations*, by H. C. Riggs: USGS--TWRI Book 4, Chapter B1. 1972. 18 pages. \$0.65.
- 4-B2. *Storage analyses for water supply*, by H. C. Riggs and C. H. Hardison: USGS--TWRI Book 4, Chapter B2. 1973. 20 pages. \$0.75.
- 4-B3. *Regional analyses of streamflow characteristics*, by H. C. Riggs: USGS--TWRI Book 4, Chapter B3. 1973. 15 pages. \$0.65.
- 4-D1. *Computation of rate and volume of stream depletion by wells*, by C. T. Jenkins: USGS--TWRI Book 4, Chapter D1. 1970. 17 pages. \$1.10.
- 5-A1. *Methods for collection and analysis of water samples for dissolved minerals and gases*, by Eugene Brown, M. W. Skougstad, and M. J. Fishman: USGS--TWRI Book 5, Chapter A1. 1970. 160 pages. \$2.40.
- 5-A2. *Determination of minor elements in water by emission spectroscopy*, by P. R. Barnett and E. C. Mallory, Jr.: USGS--TWRI Book 5, Chapter A2. 1971. 31 pages. \$0.80.
- 5-A3. *Methods for analysis of organic substances in water*, by D. F. Goerlitz and Eugene Brown: USGS--TWRI Book 5, Chapter A3. 1972. 40 pages. \$0.90.
- 5-A4.* *Methods for collection and analysis of aquatic biological and microbiological samples*, edited by P.E. Greeson, T.A. Ehlike, G.A. Irwin, B.W. Liim, and K.V. Slack: USGS--TWRI Book 5, Chapter A4. 1977. 332 pages. \$20.00.
- 5-A5.* *Methods for determination of radioactive substances in water and fluvial sediments*, by L.L. Thatcher, V.J. Janzer, and K.W. Edwards: USGS--TWRI Book 5, Chapter A5. 1977. 95 pages. \$16.00.
- 5-C1. *Laboratory theory and methods for sediment analysis*, by H. P. Guy: USGS--TWRI Book 5, Chapter C1. 1969. 58 pages. \$2.10.
- 7-C1. *Finite difference model for aquifer simulation in two dimensions with results of numerical experiments*, by P. C. Trescott, G. F. Pinder, and S. P. Larson: USGS--TWRI Book 7, Chapter C1. 1976. 116 pages. \$2.30.
- 8-A1. *Methods of measuring water levels in deep wells*, by M. S. Garber and F. C. Koopman: USGS--TWRI Book 8, Chapter A1. 1968. 23 pages. \$0.70.
- 8-B2. *Calibration and maintenance of vertical-axis type current meters*, by G. F. Smoot and C. E. Novak: USGS--TWRI Book 8, Chapter B2. 1968. 15 pages. \$1.10.

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

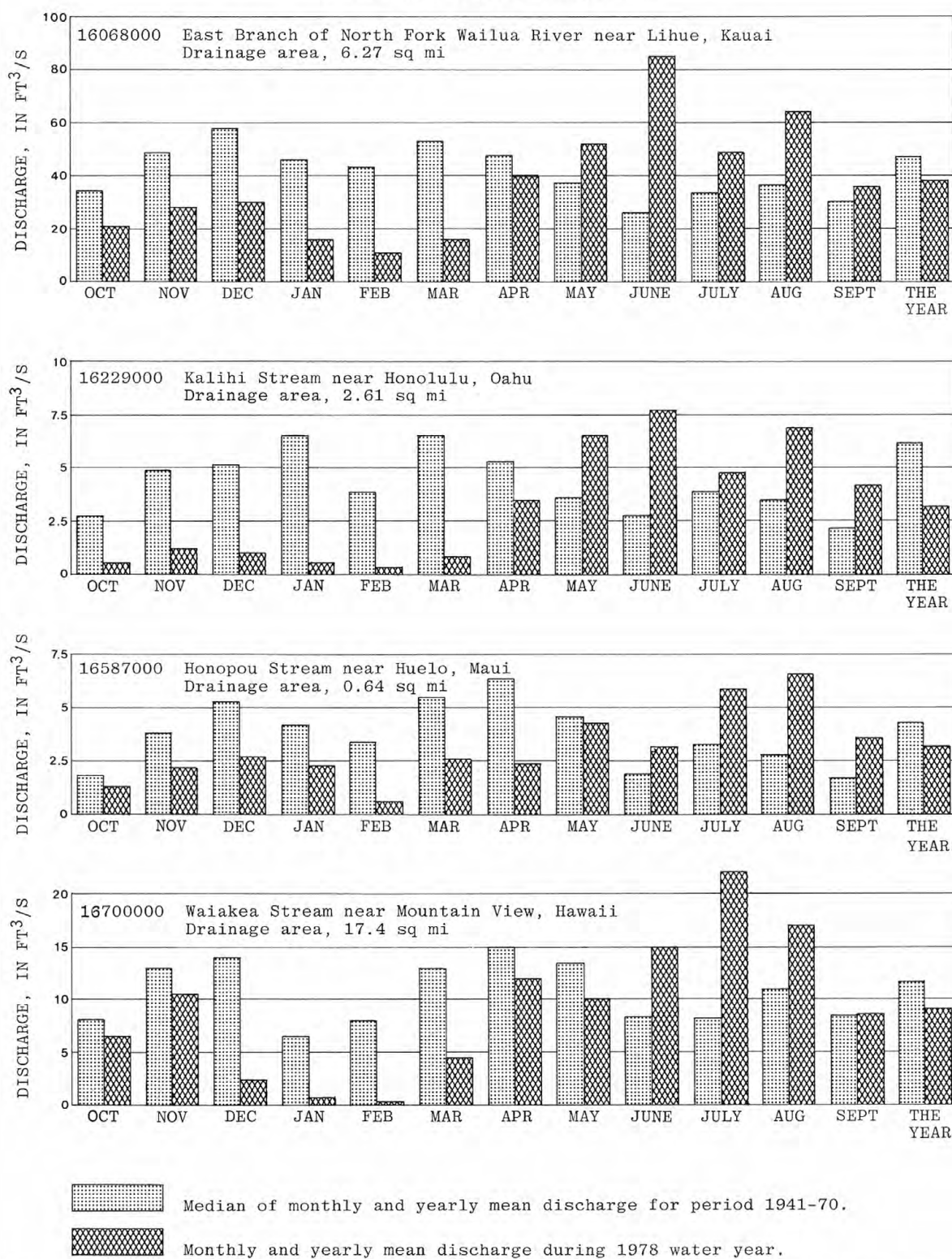


FIGURE 1.--DISCHARGE DURING 1978 WATER YEAR COMPARED WITH MEDIAN DISCHARGE FOR PERIOD 1941-70 FOR FOUR REPRESENTATIVE GAGING STATIONS.

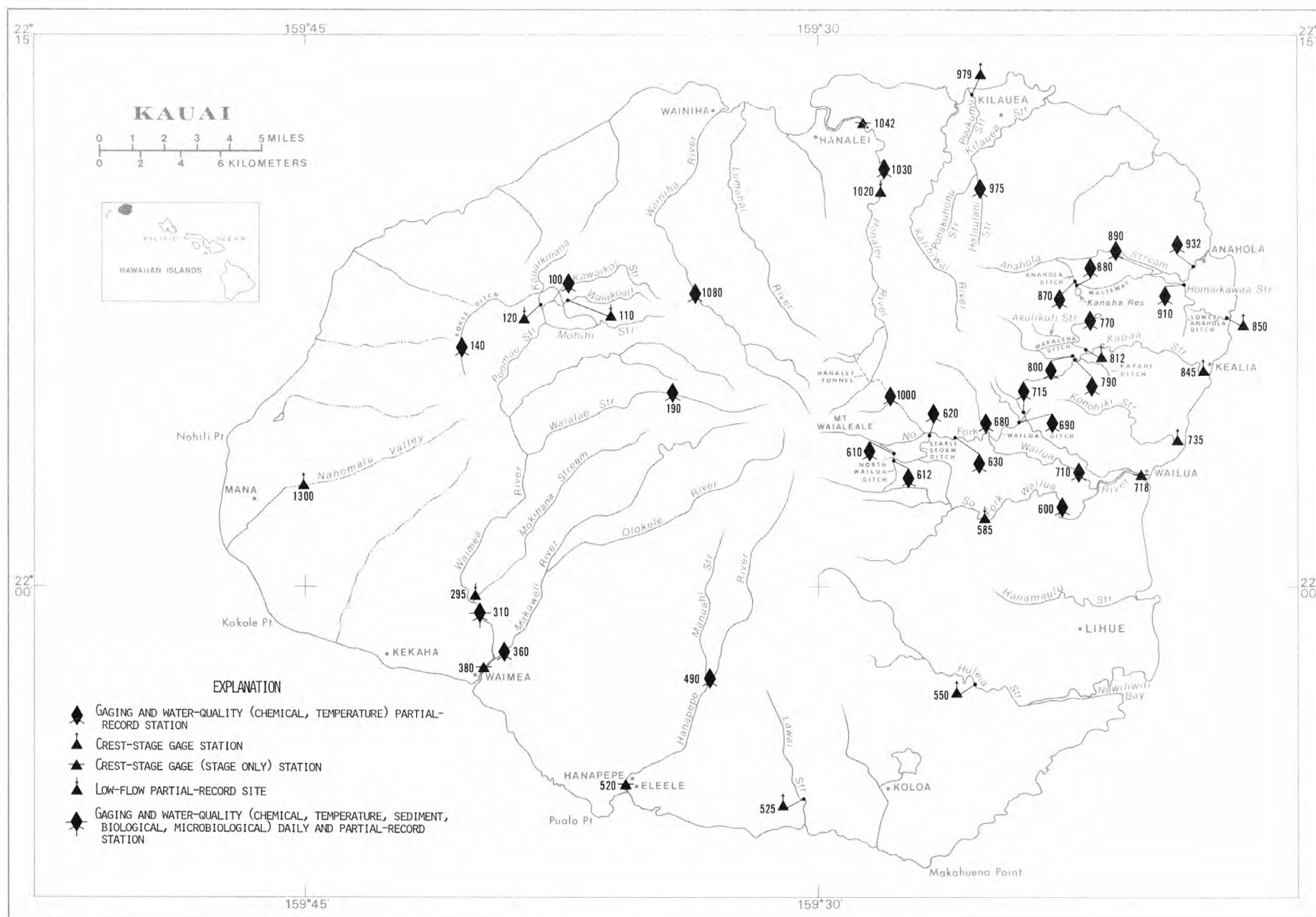


FIGURE 2.--MAP OF KAUAI SHOWING LOCATIONS OF GAGING, WATER-QUALITY, AND PARTIAL-RECORD STATIONS.

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

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



FIGURE 7.--Map of MOLOKAI showing locations of observation wells and ground-water quality sampling sites.

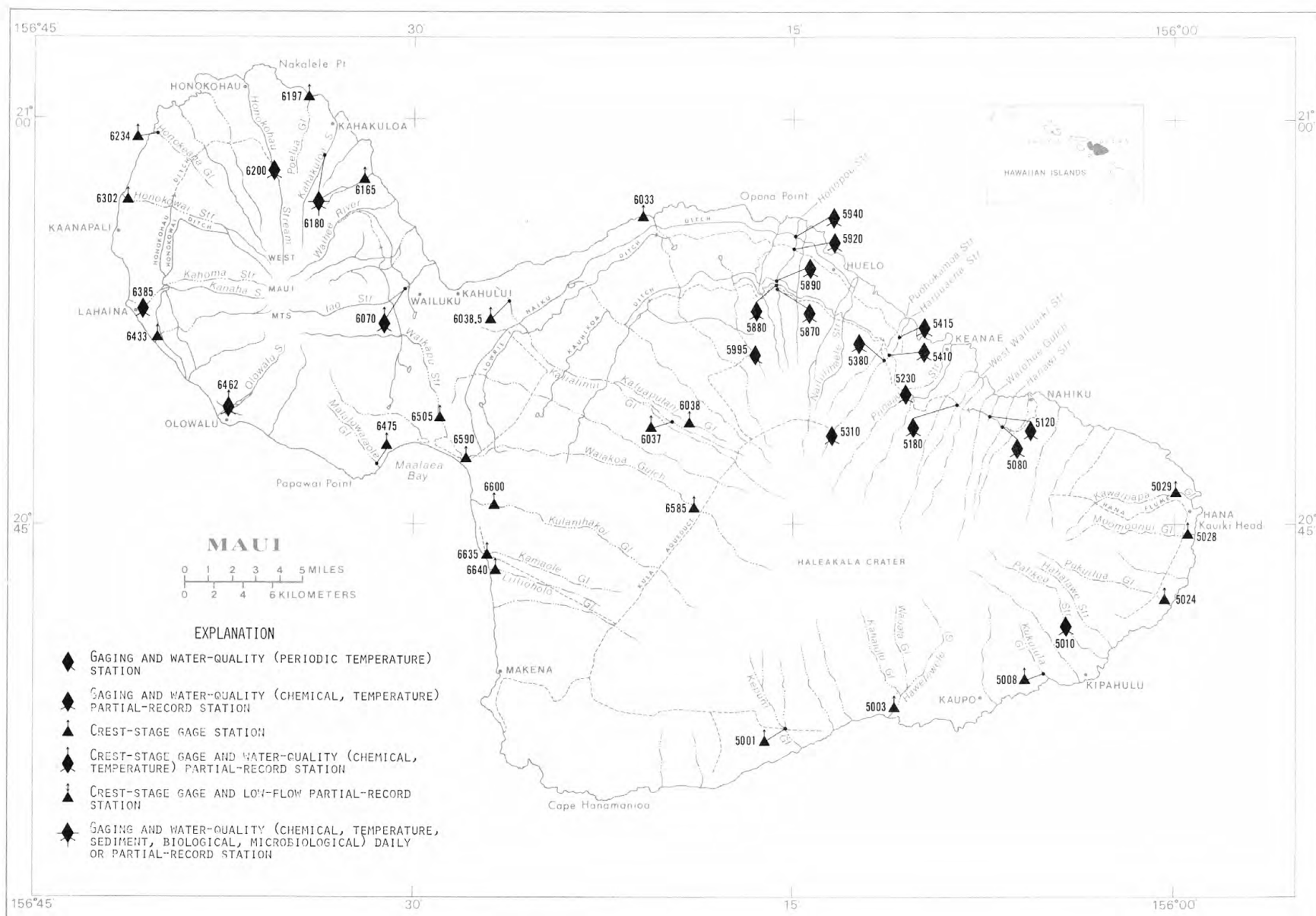


FIGURE 8.--MAP OF MAUI SHOWING LOCATIONS OF GAGING, WATER-QUALITY, AND PARTIAL-RECORD STATIONS.

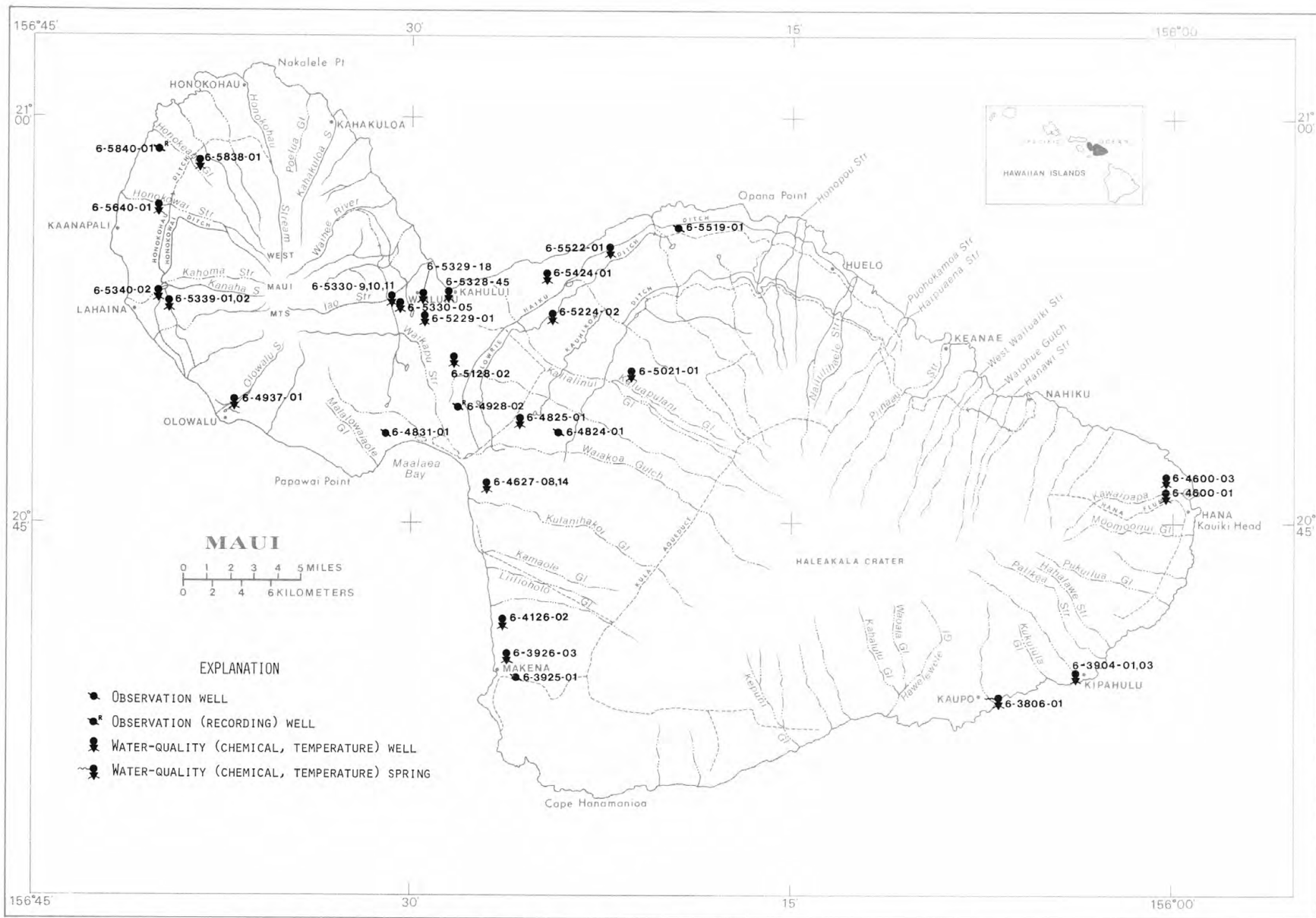


FIGURE 9.--Map of Maui showing locations of observation wells and ground-water quality sampling sites.

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

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

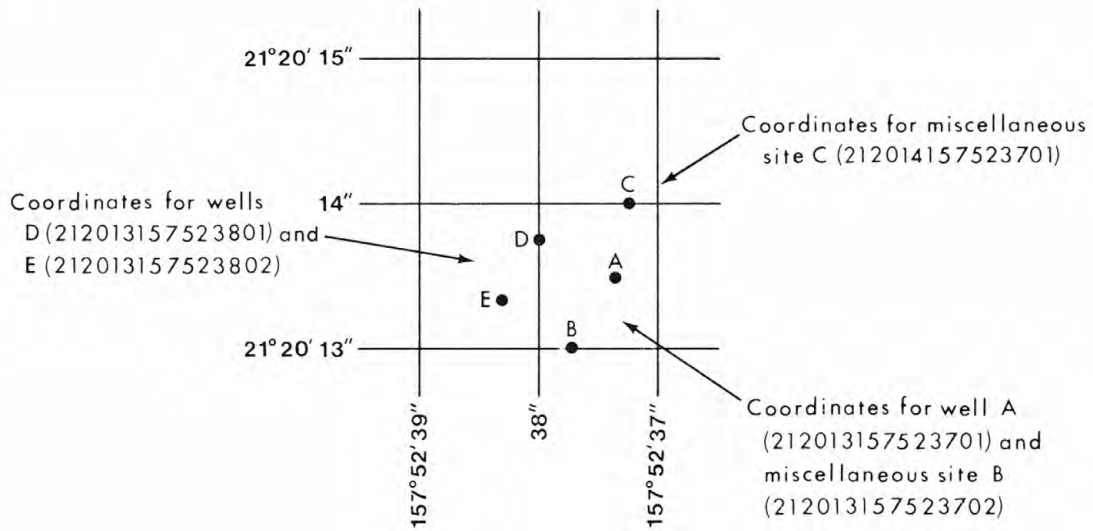


Figure 12. Sketch showing system for numbering wells and miscellaneous sites

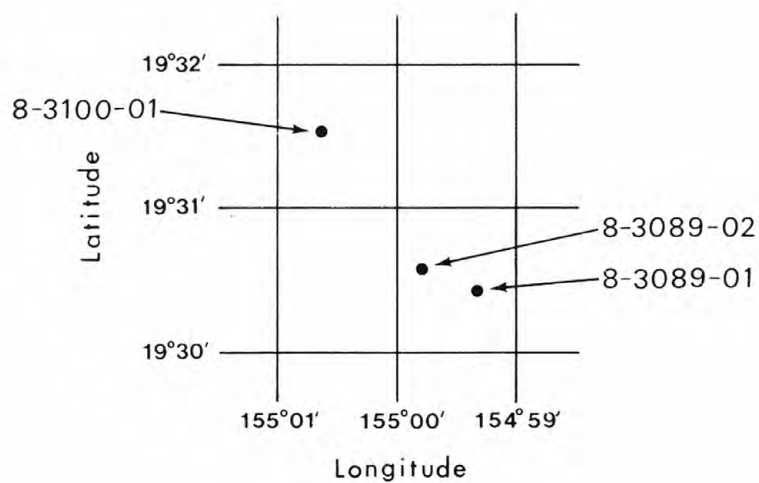


Figure 13. Sketch showing local well numbering system

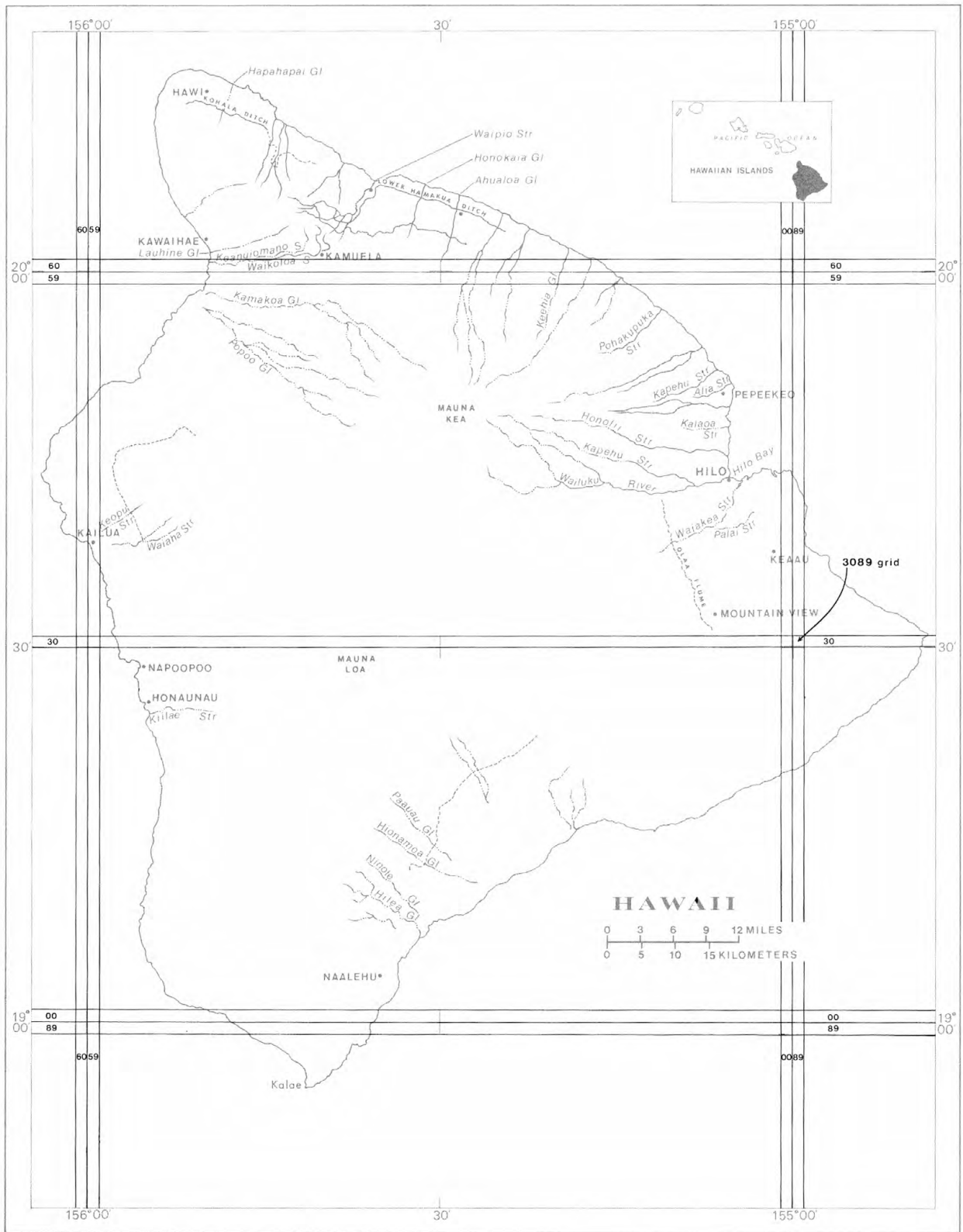


FIGURE 14.--Map of HAWAII SHOWING SYSTEM FOR NUMBERING LOCAL WELL NUMBERS.

HYDROLOGIC-DATA STATION RECORDS

HAWAII, ISLAND OF KAUAI

16010000 KAWAIKOI STREAM NEAR WAIMEA

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

DRAINAGE AREA.--3.95 mi² (10.23 km²).

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

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

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

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

AVERAGE DISCHARGE.--61 years (water years, 1912, 1914, 1920-78), 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, 5,190 ft³/s (147 m³/s) June 7, gage height, 11.41 ft (3.478 m), from rating curve extended as explained above; no other peak above base of 2,100 ft³/s (59.5 m³/s); minimum, 2.1 ft³/s (0.060 m³/s) Oct.15-18.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.1	5.6	5.0	30	5.4	43	6.3	9.8	6.9	16	41	6.3
2	3.0	25	7.0	12	5.2	15	12	9.1	6.7	18	71	8.7
3	2.9	96	90	8.9	5.0	6.3	8.4	8.4	6.8	17	92	7.2
4	2.9	26	30	7.5	4.9	4.7	7.4	10	18	13	51	15
5	2.9	40	10	6.9	4.5	6.5	56	18	147	13	21	10
6	2.9	75	60	6.5	4.5	22	44	23	75	11	16	6.8
7	2.8	30	30	9.2	4.4	7.2	19	57	602	20	52	11
8	2.6	12	15	36	6.8	4.7	9.5	14	175	12	85	8.4
9	2.6	12	12	11	5.2	3.9	90	15	27	9.8	25	6.3
10	2.6	20	9.0	8.2	4.5	3.6	87	10	18	9.7	14	6.5
11	2.6	35	7.0	12	4.2	3.4	186	11	15	12	56	5.6
12	2.4	40	5.8	7.7	4.1	3.1	51	23	16	26	23	5.0
13	2.3	40	5.6	6.4	3.9	2.0	25	195	15	15	14	17
14	2.2	20	5.4	5.8	3.9	3.0	31	210	24	11	11	23
15	2.2	9.0	5.0	7.0	3.8	215	50	148	30	15	10	12
16	2.2	7.0	143	113	3.6	171	29	45	57	38	9.1	16
17	2.1	6.0	146	24	3.6	18	25	25	48	61	8.6	22
18	2.2	5.6	105	11	3.5	134	17	18	38	48	8.1	18
19	2.4	5.0	51	9.0	3.6	40	28	15	69	29	9.1	8.9
20	3.6	4.5	20	7.9	3.5	38	54	13	78	35	7.8	29
21	8.3	4.4	21	7.3	3.2	25	19	11	80	36	24	15
22	3.8	4.2	15	6.8	3.4	28	14	11	38	15	21	10
23	2.9	4.0	12	22	3.2	15	38	11	45	12	15	7.2
24	2.5	4.5	9.8	13	3.1	11	20	9.5	26	11	12	5.9
25	220	4.0	8.7	8.0	3.0	14	15	8.9	16	14	8.2	5.4
26	91	3.6	8.0	6.8	3.2	14	49	9.0	16	9.3	7.1	5.4
27	45	9.6	9.6	6.2	3.2	9.2	71	13	29	11	6.6	5.0
28	72	3.2	14	5.9	17	8.9	23	12	260	27	7.3	4.5
29	15	3.0	9.7	5.6	---	9.3	14	8.7	57	31	7.9	4.2
30	8.3	3.5	7.8	5.4	---	7.9	11	7.9	21	17	8.0	3.6
31	6.3	---	55	5.2	---	6.8	---	7.3	---	24	9.0	---
TOTAL	527.6	591.5	932.4	432.2	127.4	894.5	1109.6	986.6	2060.4	676.8	749.8	308.9
MEAN	17.0	19.7	30.1	13.9	4.55	28.9	37.0	31.8	68.7	20.5	24.2	10.3
MAX	220	96	146	113	17	215	186	210	602	61	92	29
MIN	2.1	3.0	5.0	5.2	3.0	3.0	6.3	7.3	6.7	9.3	6.6	3.6
AC-FT	1050	1170	1850	857	253	1770	2200	1960	4090	1260	1490	613
CAL YR 1977	TOTAL	7692.4	MEAN	21.1	MAX	283	MIN	2.1	AC-FT	15260		
WTR YR 1978	TOTAL	9757.7	MEAN	25.6	MAX	602	MIN	2.1	AC-FT	18560		

HAWAII, ISLAND OF KAUAI

35

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.--52 years, 24.2 ft³/s (0.685 m³/s), 17,530 acre-ft/yr (21.6 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 105 ft³/s (2.97 m³/s) Dec. 2, 1929, Mar. 4, 1933; no flow at times.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.8	8.0	5.8	42	9.8	54	10	14	9.8	22	48	11
2	4.8	23	6.9	21	9.5	28	15	15	9.5	22	68	12
3	4.6	45	66	15	9.0	12	12	14	9.2	22	44	10
4	4.6	41	77	13	8.5	9.2	11	14	18	18	61	18
5	4.4	41	18	12	8.0	12	33	29	48	17	33	14
6	4.4	66	52	11	7.8	35	53	23	65	15	27	11
7	4.4	46	44	12	7.3	15	30	55	82	23	36	14
8	4.1	21	24	45	13	9.5	15	24	54	16	77	13
9	4.1	14	17	20	9.5	8.0	49	21	36	14	43	10
10	4.1	21	14	15	8.0	7.1	69	17	26	13	25	9.8
11	3.9	28	12	18	7.3	6.7	76	15	22	14	58	8.8
12	3.9	57	11	14	7.1	6.0	56	18	22	27	39	7.8
13	3.7	47	9.5	11	6.9	5.8	30	78	21	20	23	12
14	3.7	18	8.5	10	6.9	5.6	46	77	24	14	20	30
15	3.5	12	8.0	12	6.7	63	55	79	35	16	17	18
16	3.7	9.8	51	50	6.4	75	46	47	47	26	15	23
17	3.5	8.8	76	45	6.2	35	44	29	52	31	14	29
18	3.5	7.8	73	25	6.0	72	31	22	47	41	13	29
19	3.7	7.1	60	19	6.0	58	35	19	55	43	13	16
20	3.7	6.4	34	16	6.0	52	73	17	65	35	13	31
21	10	6.2	32	14	5.8	34	39	15	68	48	23	28
22	5.6	5.8	25	14	5.8	38	28	14	44	25	33	17
23	4.4	5.6	20	25	5.8	24	42	15	45	21	22	12
24	3.9	6.0	16	21	5.6	18	31	13	34	18	20	10
25	52	5.6	14	15	5.4	19	24	12	22	21	14	8.8
26	68	5.2	13	13	5.6	20	26	12	18	15	12	8.2
27	50	4.8	16	12	5.8	14	61	15	32	16	11	8.0
28	70	4.6	24	11	22	13	33	16	64	31	12	6.9
29	28	4.4	19	10	---	14	23	12	59	40	12	6.7
30	14	4.6	14	10	---	12	19	11	27	28	12	6.7
31	9.8	---	40	9.8	---	11	---	10	---	27	13	---
TOTAL	396.8	580.7	860.7	580.8	217.7	785.9	1115	776	1162.5	739	873	439.7
MEAN	12.8	19.4	27.8	18.7	7.78	25.4	37.2	25.0	38.8	23.8	28.2	14.7
MAX	70	66	76	50	22	75	76	79	82	48	77	31
MIN	3.5	4.4	5.8	9.8	5.4	5.6	10	10	9.2	13	11	6.7
AC-FI	787	1150	1710	1150	432	1560	2210	1540	2310	1470	1730	872
CAL YR 1977	TOTAL	8990.2	MEAN	24.6	MAX	87	MIN	3.5	AC-FI	17830		
WTR YR 1978	TOTAL	8527.8	MEAN	23.4	MAX	82	MIN	3.5	AC-FI	16910		

HAWAII, ISLAND OF KAUAI

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

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

DRAINAGE AREA.--1.79 mi² (4.64 km²).

WATER-DISCHARGE RECORDS

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

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

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

REMARKS.--Records fair except those for period of no gage-height record, which are poor. No diversion above station.

AVERAGE DISCHARGE.--37 years (water years, 1921-31, 1953-78), 22.3 ft³/s (0.632 m³/s), 16,160 acre-ft/yr (19.9 hm³/yr).

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

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,350 ft³/s (38.2 m³/s) Dec. 6, gage height, 4.58 ft (1.396 m), no other peak above base of 1,300 ft³/s (36.8 m³/s); minimum recorded, 1.8 ft³/s (0.051 m³/s) Oct. 16-18, 24.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.4	3.8	4.0	20	4.0	25	4.5	7.0	4.8	13	21	4.2
2	2.2	29	5.0	7.5	3.7	10	9.0	6.4	4.8	18	54	3.8
3	2.2	109	60	6.0	3.5	5.0	6.4	6.0	4.6	10	10	3.4
4	2.2	26	17	5.0	3.3	4.0	5.6	7.0	12	9.0	13	4.2
5	2.1	152	7.0	4.7	3.2	6.0	40	12	100	8.0	17	4.7
6	2.2	205	140	4.2	3.2	15	30	16	56	14	12	4.0
7	2.3	41	20	5.0	3.2	5.0	10	40	200	10	26	5.5
8	2.4	9.5	10	25	5.0	3.6	6.4	11	120	8.0	85	5.0
9	2.4	6.6	8.0	8.0	4.0	3.0	60	8.6	20	7.5	16	4.2
10	2.4	5.2	6.0	6.0	3.3	2.5	70	7.0	10	8.0	8.6	3.8
11	2.2	8.2	4.5	9.0	2.9	2.3	120	8.0	11	18	7.7	3.2
12	2.2	26	4.0	5.0	2.8	2.2	30	15	10	14	7.2	3.0
13	2.1	32	3.8	4.5	2.5	2.1	18	100	15	8.0	7.2	3.2
14	1.9	6.9	3.7	4.0	2.4	2.3	20	130	20	7.0	7.2	8.1
15	1.9	5.2	3.7	5.0	2.2	150	35	100	35	6.9	6.1	32
16	1.8	4.2	90	80	2.2	100	20	30	30	10	5.2	46
17	1.8	3.8	100	10	2.2	13	15	16	25	14	5.0	62
18	1.8	3.4	70	8.0	2.3	90	12	11	45	29	4.4	28
19	1.9	3.2	40	6.0	2.1	30	25	9.0	50	14	17	21
20	2.2	3.0	15	5.4	1.9	25	35	8.0	52	12	10	56
21	2.8	3.0	16	5.2	1.9	17	13	7.4	25	19	133	18
22	2.4	2.8	10	5.0	1.8	19	10	7.0	30	9.5	28	18
23	1.9	3.0	8.0	16	2.0	10	25	7.6	20	8.1	12	8.1
24	1.8	3.8	7.0	10	1.9	8.0	15	7.0	10	6.6	9.0	6.1
25	83	2.8	6.0	6.0	1.8	9.0	10	6.4	12	5.8	6.6	5.0
26	63	2.6	5.0	5.0	2.0	10	30	8.0	20	5.0	5.8	4.7
27	32	2.4	6.0	4.5	4.0	7.0	45	10	50	4.7	5.2	4.2
28	51	2.3	10	4.2	10	6.6	15	9.0	150	6.1	4.7	3.8
29	7.2	2.2	7.0	3.9	---	7.0	10	6.2	30	10	4.4	3.4
30	4.4	3.0	6.0	3.7	---	5.6	8.0	5.6	11	8.1	4.2	3.4
31	3.6	---	40	3.6	---	5.0	---	5.2	---	6.9	4.2	---
TOTAL	295.7	710.5	732.7	295.4	85.3	600.2	752.9	627.4	1183.2	328.2	556.7	380.0
MEAN	9.54	23.7	23.6	9.53	3.05	19.4	25.1	20.2	39.4	10.6	18.0	12.7
MAX	83	205	140	80	10	150	120	130	200	29	133	62
MIN	1.8	2.2	3.7	3.6	1.8	2.1	4.5	5.2	4.6	4.7	4.2	3.0
AC-FT	587	1410	1450	586	169	1190	1490	1240	2350	651	1100	754
CAL YR 1977	TOTAL	7477.4	MEAN	20.5	MAX	328	MIN	1.8	AC-FT	14830		
WTR YR 1978	TOTAL	6548.2	MEAN	17.9	MAX	205	MIN	1.8	AC-FT	12990		

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

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1972-1978.

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

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)	SODIUM PERCENT	SODIUM AD- SORP- TION RATIO
OCT 21...	0930	4.6	11	6	1.9	1.4	3.9	44	.5
DEC 15...	0950	3.6	5	1	.8	.8	3.3	56	.6
FEB 15...	0930	2.2	9	5	1.8	1.0	3.6	47	.5
MAY 10...	1015	6.9	7	4	1.0	1.1	2.8	45	.5
JUL 14...	0920	6.7	13	10	3.8	.8	3.0	33	.4

DATE	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	BICAR- BONATE (MG/L AS HCO3)	CAR- BONATE (MG/L AS CO3)	ALKA- LINITY (MG/L AS CaCO3)	CARBON DIOXIDE DIS- SOLVED (MG/L AS CO2)	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)
OCT 21...	.3	5	0	4	1.3	2.8	6.1	.1	7.1
DEC 15...	.3	5	0	4	4.0	3.2	5.9	.0	6.5
FEB 15...	.3	5	0	4	1.6	2.3	6.5	.1	6.7
MAY 10...	.3	4	0	3	8.1	7.3	6.0	.0	4.3
JUL 14...	.2	4	0	3	4.0	6.5	7.3	.0	4.4

DATE	SOLIDS, SUM OF CONSOLI- DENTS, DIS- SOLVED (MG/L)	SOLIDS, DIS- SOLVED (TNS PER AC-FT)	SOLIDS, DIS- SOLVED (TNS PER DAY)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	PHOS- PHORUS, ORTHO, DIS- SOLVED (MG/L AS P)	PHOS- PHATE, ORTHO, DIS- SOLVED (MG/L AS PO4)	IRON, DIS- SOLVED (UG/L AS FE)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)
OCT 21...	26	.04	.32	.01	.00	.00	240	4
DEC 15...	24	.03	.23	.13	.01	.03	200	0
FEB 15...	25	.03	.15	.03	.01	.03	150	0
MAY 10...	25	.03	.47	.01	.01	.03	470	0
JUL 14...	29	.04	.52	.03	.02	.06	470	0

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH (UNITS)	TEMPER- ATURE (DEG C)	DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH (UNITS)	TEMPER- ATURE (DEG C)
OCT 21...	0930	4.6	36	6.8	15.0	MAY 10...	1015	6.9	29	5.9	16.0
DEC 15...	0950	3.6	31	6.3	14.5	JUL 14...	0920	6.7	27	6.2	17.0
FEB 15...	0930	2.2	34	6.7	12.0						

HAWAII, ISLAND OF KAUAI

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

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

DRAINAGE AREA.--57.8 mi² (149.7 km²).

WATER-DISCHARGE RECORDS

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

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

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

AVERAGE DISCHARGE.--37 years (water years 1911-17, 1945-68, 1970-72, 1976-78), 130 ft³/s (3.682 m³/s), 94,180 acre-ft/yr (116 hm³/yr).

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

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

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 6,630 ft³/s (188 m³/s) June 8, gage height, 9.96 ft (3.036 m), from rating curve extended as explained above, no peak above base of 8,700 ft³/s (246 m³/s); minimum, 0.41 ft³/s (0.012 m³/s) Feb. 22.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.0	1.4	3.7	75	3.0	6.6	3.7	3.7	5.0	14	3.9	2.6
2	1.8	14	6.1	26	3.9	9.9	2.7	3.7	4.0	161	130	3.2
3	2.6	131	75.3	22	4.0	5.0	2.6	3.3	3.9	62	35	3.2
4	3.0	160	84	16	3.7	3.5	3.3	10	13	17	76	3.5
5	2.7	90	9.9	16	3.3	6.1	3.0	16	57	6.6	13	4.0
6	2.4	328	668	19	3.7	12	92	8.8	137	4.6	20	3.3
7	2.9	228	189	29	2.8	9.3	62	9.5	377	22	5.2	2.4
8	3.3	35	45	84	2.5	5.2	13	9.9	849	17	248	3.5
9	4.2	12	8.0	18	2.9	3.9	13	5.2	57	6.4	66	3.7
10	4.6	6.4	5.0	8.5	3.0	3.3	51	5.6	19	4.6	9.3	3.5
11	4.0	3.2	4.0	6.6	3.0	3.5	232	3.9	8.8	4.2	3.5	2.3
12	3.3	72	3.7	5.4	3.2	3.3	96	3.0	6.9	5.0	4.4	2.4
13	3.3	74	3.5	5.0	7.4	2.6	14	105	6.6	14	4.0	2.2
14	3.3	29	3.3	4.8	3.5	3.0	83	312	41	7.4	3.2	2.7
15	3.5	8.2	2.9	6.6	2.9	90	234	380	126	5.9	3.9	23
16	3.2	5.9	104	279	2.7	444	246	118	83	5.4	3.0	57
17	4.7	4.4	255	147	2.4	28	158	37	125	24	2.7	51
18	24	3.5	244	28	2.3	90	27	12	125	70	2.4	72
19	35	2.7	151	9.0	2.2	79	29	7.4	47	33	2.7	8.5
20	34	2.9	26	6.1	2.0	12	338	5.6	159	7.7	12	40
21	27	3.2	8.5	5.2	2.0	7.1	85	5.2	427	23	123	48
22	4.0	3.0	8.2	5.0	1.4	3.7	19	5.4	148	13	128	10
23	2.9	2.6	6.4	4.4	2.2	2.7	7.4	12	116	4.8	13	6.1
24	2.2	2.4	5.2	3.9	2.4	3.2	3.9	11	52	3.2	8.2	3.2
25	270	2.3	5.0	3.5	2.4	2.9	3.0	8.8	18	3.2	3.5	2.7
26	140	2.2	5.0	3.9	2.4	2.9	3.3	120	9.3	3.0	2.4	1.9
27	136	2.3	158	3.7	2.6	2.9	57	229	6.1	3.0	2.4	2.0
28	115	2.3	328	3.5	3.5	3.3	27	113	266	3.0	2.3	2.0
29	30	1.9	88	3.5	---	3.2	8.2	24	401	4.0	2.7	2.0
30	4.2	2.7	24	3.3	---	5.9	3.0	10	46	7.4	2.6	2.0
31	1.7	---	13	2.7	---	4.6	---	7.1	---	4.8	2.3	---
TOTAL	880.8	1236.5	3218.4	853.6	83.3	862.6	1920.1	1605.1	3739.6	564.2	938.6	373.9
MEAN	28.4	41.2	104	27.5	2.98	27.8	64.0	51.8	125	18.2	30.3	12.5
MAX	270	328	753	279	7.4	444	338	380	849	161	248	72
MIN	1.7	1.4	2.9	2.7	1.4	2.6	2.6	3.0	3.9	3.0	2.3	1.9
AC-FT	1750	2450	6380	1690	165	1710	3810	3180	7420	1120	1860	742
CAL YR 1977	TOTAL	25121.6	MEAN	68.8	MAX	2190	MIN	1.4	AC-FT	49830		
WTR YR 1978	TOTAL	16276.7	MEAN	44.6	MAX	849	MIN	1.4	AC-FT	32280		

16031000 WAIMEA RIVER NEAR WAIMEA--Continued

WATER-QUALITY RECORDS

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH (UNITS)	TEMPER- ATURE (DEG C)	TUR- BID- ITY (JTU)	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)
OCT										
03...	1145	3.2	200	8.2	26.5	4	--	8.4	720	220
NOV										
07...	1330	172	49	6.9	20.0	6	--	8.6	280	7000
DEC										
05...	1315	9.0	120	7.2	22.0	5	--	8.9	600	12000
JAN										
09...	1230	16	140	7.4	19.5	5	--	8.8	240	2400
FEB										
06...	1120	3.7	198	7.4	21.0	2	--	9.2	430	1700
MAR										
06...	1130	14	200	7.2	21.5	9	--	9.1	880	14000
APR										
03...	1115	3.2	200	8.2	23.0	2	--	9.2	190	670
MAY										
01...	1200	4.6	140	8.3	25.5	5	--	9.2	410	440
JUN										
05...	1245	9.2	145	7.9	22.0	--	--	8.9	880	2900
JUL										
10...	1300	4.8	140	7.7	26.0	--	3.2	8.5	530	5100
AUG										
07...	1320	4.9	140	8.4	27.0	--	3.2	8.5	300	790
SEP										
11...	1140	1.7	220	8.3	25.0	--	1.0	8.7	570	--

DATE	HARD- NESS (MG/L AS CAC03)	HARD- NESS, NONCAR- BONATE (MG/L CAC03)	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM AD- SORP- TION RATIO	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	BICAR- BONATE (MG/L AS HCO3)	CAR- BONATE (MG/L AS CO3)
OCT										
03...	79	1	10	13	9.9	21	.5	.7	94	0
NOV										
07...	14	3	2.1	2.1	3.1	32	.4	.5	13	0
DEC										
05...	44	4	5.5	7.3	6.9	25	.5	.9	49	0
JAN										
09...	53	7	8.5	7.8	7.3	23	.4	.8	56	0
FEB										
06...	85	7	9.5	15	10	20	.5	.9	96	0
MAR										
06...	70	3	8.4	12	9.5	22	.5	1.0	82	0
APR										
03...	83	2	10	14	9.9	21	.5	.8	98	0
MAY										
01...	64	2	7.4	11	8.0	21	.4	.7	75	0
JUN										
05...	56	3	6.6	9.5	8.7	25	.5	.9	64	0
JUL										
10...	53	0	6.5	8.9	8.0	24	.5	.7	--	--
AUG										
07...	49	9	6.3	8.0	6.9	23	.4	.6	--	--
SEP										
11...	72	1	9.0	12	9.0	21	.5	.9	--	--

HAWAII, ISLAND OF KAUAI
16031000 WAIMEA RIVER NEAR WAIMEA--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	ALKA- LINITY (MG/L AS CAC03)	CARBON DIOXIDE DIS- SOLVED (MG/L AS C02)	SULFATE DIS- SOLVED (MG/L AS S04)	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)	SOLIDS, DIS- SOLVED (TONS PER DAY)
OCT										
03...	77	.9	3.8	17	.1	28	121	129	.16	1.05
NOV										
07...	11	2.6	3.0	6.5	.0	8.3	33	32	.04	15.3
DEC										
05...	40	4.9	2.5	9.5	.0	19	78	76	.11	1.90
JAN										
09...	46	3.6	3.3	10	.1	24	83	90	.11	3.59
FEB										
06...	79	6.1	3.1	18	.1	27	114	131	.16	1.14
MAR										
06...	67	8.3	2.5	15	.1	23	103	112	.14	3.89
APR										
03...	80	1.0	2.9	14	.0	25	114	125	.16	.98
MAY										
01...	62	.6	5.9	14	.1	23	94	107	.13	1.17
JUN										
05...	53	1.3	4.2	9.1	.1	20	87	91	.12	2.16
JUL										
10...	53	--	1.9	10	.1	24	82	92	.11	1.06
AUG										
07...	40	--	3.3	9.6	.1	21	85	80	.12	1.12
SEP										
11...	71	--	1.9	15	.1	27	114	118	.16	.52

DATE	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,NH4 + ORG. SUSP. TOTAL (MG/L AS N)	NITRO- GEN,AM- MONIA + ORGANIC DIS. TOTAL (MG/L AS N)	NITRO- GEN, TOTAL (MG/L AS N)	NITRO- GEN, TOTAL (MG/L AS NO3)	PHOS- PHORUS, TOTAL (MG/L AS P)	PHOS- PHORUS, DIS- SOLVED (MG/L AS P)
OCT										
03...	.03	.03	--	--	--	--	--	--	.00	.00
NOV										
07...	.07	.18	--	--	--	--	--	--	.02	.02
DEC										
05...	.20	.01	--	--	--	.25	--	--	.08	.00
JAN										
09...	.13	.06	.04	.10	--	.10	.23	1.0	.02	.01
FEB										
06...	.02	.01	.04	.05	.00	--	.07	.31	.01	.01
MAR										
06...	.01	.02	.20	.22	.12	.10	.23	1.0	.03	.01
APR										
03...	.01	.00	.21	.21	.17	.04	.22	.97	.01	.00
MAY										
01...	.01	.01	.44	.45	.32	.13	.46	2.0	.02	.00
JUN										
05...	.02	.01	.68	.69	.28	.41	.71	3.1	.01	.00
JUL										
10...	.02	.00	.40	.40	.05	.35	.42	1.9	.02	.01
AUG										
07...	.03	.01	.52	.53	.35	.18	.56	2.5	.00	.00
SEP										
11...	.01	.01	.30	.31	.13	.18	.32	1.4	.01	.00

16031000 WAIMEA RIVER NEAR WAIMEA--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	TIME	ARSENIC		ARSENIC		BARIUM,		BARIUM,		CADMIUM		CADMIUM	
		TOTAL (UG/L AS AS)	SUS- PENDE TOTAL (UG/L AS AS)	DIS- SOLVED (UG/L AS AS)	TOTAL RECOV- ERABLE (UG/L AS BA)	SUS- PENDE RECOV- ERABLE (UG/L AS BA)	DIS- SOLVED (UG/L AS BA)	TOTAL RECOV- ERABLE (UG/L AS CD)	SUS- PENDE RECOV- ERABLE (UG/L AS CD)	CADMIUM DIS- SOLVED (UG/L AS CD)			
OCT 03...	1145	0	0	0	200	100	100	<10	<9	1			
JAN 09...	1230	1	1	0	0	0	0	1	0	1			
APR 03...	1115	1	0	1	100	100	0	1	0	1			
JUL 10...	1300	1	1	0	200	0	200	3	0	3			

DATE	CHRO- MIUM, TOTAL RECOV- ERABLE (UG/L AS CR)	CHRO- MIUM, SUS- PENDE RECOV. (UG/L AS CR)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)	COBALT, TOTAL RECOV- ERABLE (UG/L AS CO)	COBALT, SUS- PENDE RECOV- ERABLE (UG/L AS CO)	COBALT, DIS- SOLVED (UG/L AS CO)	COPPER, TOTAL RECOV- ERABLE (UG/L AS CU)	COPPER, SUS- PENDE RECOV- ERABLE (UG/L AS CU)	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, TOTAL RECOV- ERABLE (UG/L AS FE)
OCT 03...	2	2	0	<50	<49	1	<10	<9	1	420
JAN 09...	10	0	10	0	0	0	13	11	2	360
APR 03...	10	10	0	4	0	4	3	0	3	430
JUL 10...	0	0	0	3	0	3	5	4	1	520

DATE	IRON, SUS- PENDE RECOV- ERABLE (UG/L AS FE)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, TOTAL RECOV- ERABLE (UG/L AS PB)	LEAD, SUS- PENDE 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- PENDE RECOV- ERABLE (UG/L AS MN)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY TOTAL RECOV- ERABLE (UG/L AS HG)	MERCURY SUS- PENDE RECOV- ERABLE (UG/L AS HG)
OCT 03...	--	110	<100	< 92	8	20	0	20	.0	.0
JAN 09...	--	80	16	11	5	20	10	10	.0	.0
APR 03...	--	110	15	0	15	20	10	10	.0	.0
JUL 10...	410	110	15	8	7	40	20	20	.0	.0

DATE	MERCURY DIS- SOLVED (UG/L AS HG)	SELE- NIUM, TOTAL (UG/L AS SE)	SELE- NIUM, SUS- PENDE TOTAL (UG/L AS SE)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	SILVER, TOTAL RECOV- ERABLE (UG/L AS AG)	SILVER, SUS- PENDE RECOV- ERABLE (UG/L AS AG)	SILVER, DIS- SOLVED (UG/L AS AG)	ZINC, TOTAL RECOV- ERABLE (UG/L AS ZN)	ZINC, SUS- PENDE RECOV- ERABLE (UG/L AS ZN)	ZINC, DIS- SOLVED (UG/L AS ZN)
OCT 03...	.0	0	0	0	<10	<10	0	20	10	10
JAN 09...	.0	0	0	0	0	0	0	10	10	0
APR 03...	.0	0	0	0	0	0	0	10	0	10
JUL 10...	.0	0	0	0	10	10	0	10	10	0

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

HAWAII, ISLAND OF KAUAI
16031000 WAIMEA RIVER NEAR WAIMEA--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

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)	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)
NOV 07...	1330	8.2	--	--	APR 03...	1115	--	1.8	--
JAN 09...	1230	--	3.0	.1	MAY 01...	1200	2.3	--	--
FEB 06...	1120	1.5	--	--	JUN 05...	1245	2.6	--	--
MAR 06...	1130	2.6	--	--	JUL 10...	1300	--	4.3	1.8

DATE	TIME	PHYTO- PLANK- TON, TOTAL (CFLLS PER ML)	PERI- PHYTON BIOMASS TOTAL DRY WEIGHT G/50 M	PERI- PHYTON BIOMASS ASH WEIGHT G/50 M	CHLOR-A PERI- PHYTON CHROMO- GRAPHIC FLUOROM (MG/M2)	CHLOR-B PERI- PHYTON CHROMO- GRAPHIC FLUOROM (MG/M2)	LENGTH OF EXPO- SURE (DAYS)
OCT 03...	1145	1000	--	--	.441	.290	27
NOV 07...	1330	240	--	--	--	--	--
DEC 09...	1500	7	--	--	--	--	--
JAN 09...	1230	74	25.7	21.2	6.40	.700	35
FEB 06...	1120	170	--	--	--	--	--
MAR 06...	1130	790	--	--	--	--	--
APR 03...	1115	110	25.8	21.4	13.7	2.13	26
MAY 01...	1200	210	--	--	--	--	--
JUN 05...	1245	89	--	--	--	--	--
JUL 10...	1300	490	--	--	--	--	--

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	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 03...	1145	3.2	4	.03	100	APR 03...	1115	3.2	3	.03	100
NOV 07...	1330	172	10	4.6	100	MAY 01...	1200	4.6	6	.07	100
DEC 05...	1315	9.0	4	.10	100	JUN 05...	1245	9.2	22	.55	100
JAN 09...	1230	16	7	.30	100	JUL 10...	1300	4.8	10	.13	100
FEB 06...	1120	3.7	4	.04	100	AUG 07...	1320	4.9	5	.07	100
MAR 06...	1130	14	9	.34	100	SEP 11...	1140	1.7	4	.02	100

16031000 WAIMEA RIVER NEAR WAIMEA--Continued

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA

PHYTOPLANKTON ANALYSES, OCTOBER 1977 TO JULY 1978

DATE TIME	OCT 3, 77 1145	NOV 7, 77 1330	DEC 9, 77 1500	JAN 9, 78 1230	FEB 6, 78 1120
TOTAL CELLS/ML	1000	240	7	74	170
DIVERSITY: DIVISION	1.6	0.7	0.0	0.0	1.1
..CLASS	1.6	0.7	0.0	0.0	1.1
..ORDER	1.9	0.7	0.0	0.0	1.1
...FAMILY	2.3	1.7	0.0	2.0	0.0
....GENUS	2.4	2.0	0.0	2.2	0.0

ORGANISM	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT
CHLOROPHYTA (GREEN ALGAE)										
..CHLOROPHYCEAE										
...CHLOROCOCCALES										
....OOCYSTACEAE										
.....ANKISTRODESMUS	210#	21	--	-	--	-	--	-	--	-
.....SCENEDESMACEAE										
.....SCENEDESMUS	--	-	--	-	--	-	--	-	--	-
...VOLVOCALES										
...CHLAMYDOMONADACEAE										
.....CHLAMYDOMONAS	--	-	--	-	--	-	--	-	--	-
...ZYGNEMATALES										
...DESMIDIACEAE										
.....STAUSTRUM	19	2	--	-	--	-	--	-	--	-
CHRYSOPHYTA										
..BACILLARIOPHYCEAE										
...CENTRALES										
...COSCINODISCAEAE										
....CYCLOTELLA	19	2	--	-	--	-	--	-	--	-
....MELOSIRA	--	-	--	-	--	-	--	-	--	-
....STEPHANODISCUS	39	4	--	-	--	-	--	-	--	-
...PENNALES										
...ACHNANTHACEAE										
....ACHNANTHES	--	-	--	-	--	-	--	-	--	-
....RHOICOSPHEA	--	-	--	-	--	-	--	-	--	-
...CYMBELLACEAE										
....AMPHORA	19	2	--	-	--	-	--	-	--	-
....CYMBELLA	19	2	--	-	*	0	12#	17	6	4
....EPITHEMIA	--	-	22	9	--	-	--	-	--	-
...FRAGILARIACEAE										
....SYNEORA	19	2	--	-	--	-	--	-	--	-
...GOMPHONEMACEAE										
....GOMPHONEMA	19	2	44#	18	--	-	18#	25	24	14
...NAVICULACEAE										
....GYROSIGMA	--	-	22	9	--	-	--	-	--	-
....NAVICULA	19	2	110#	45	*	0	18#	25	6	4
....PINNULARIA	--	-	--	-	--	-	6	8	--	-
...NITZSCHIAEAE										
....NITZSCHIA	97	10	--	-	7#	100	18#	25	--	-
CRYPTOPHYTA (CRYPTOMONADS)										
..CRYPTOPHYCEAE										
...CRYPTOMONIDALES	--	-	--	-	--	-	--	-	12	7
CYANOPHYTA (BLUE-GREEN ALGAE)										
..CYANOPHYCEAE										
...CHROCOCCALES										
....CHROCOCCACEAE										
.....ANACYSTIS	--	-	44#	18	--	-	--	-	--	-
...HORMOGONALES										
...NOSTOCACEAE										
....ANABAENA	510#	50	--	-	--	-	--	-	--	-
...OSCILLATORIACEAE	--	-	--	-	--	-	--	-	120#	71
....OSCILLATORIA	--	-	--	-	--	-	--	-	--	-
EUGLENOPHYTA (EUGLENOIDS)										
..EUGLENOPHYCEAE										
...EUGLENALES										
....EUGLENACEAE										
.....TRACHELOMONAS	19	2	--	-	--	-	--	-	--	-

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 1977 TO JULY 1978

DATE TIME	MAR 6,78 1130	APR 3,78 1115	MAY 1,78 1200	JUN 5,78 1245	JUL 10,78 1300
TOTAL CELLS/ML	790	110	210	89	490
DIVERSITY: DIVISION	1.1	0.0	0.4	0.0	1.0
..CLASS	1.1	0.0	0.4	0.0	1.0
...ORDER	1.4	1.0	0.9	0.0	1.0
...FAMILY	2.2	1.6	2.1	1.5	1.8
....GENUS	2.3	1.6	2.1	1.5	1.9

ORGANISM	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT
CHLOROPHYTA (GREEN ALGAE)										
..CHLOROPHYCEAE										
...CHLOROCOCCALES										
....DOCYSTACEAE										
....ANKISTRODESMUS	--	-	--	-	--	-	--	-	--	-
....SCENEDESMACEAE										
....SCENEDESMUS	14	2	--	-	--	-	--	-	--	-
...VOLVOCALES										
...CHLAMYDOMONADACEAE										
....CHLAMYDOMONAS	--	-	--	-	19	9	--	-	--	-
...ZYGNEMATALES										
....DESMIDIACEAE										
....STAUSTRUM	--	-	--	-	--	-	--	-	--	-
CHRYSTOPHYTA										
..BACILLARIOPHYCEAE										
...CENTRALES										
...COSCINODISCACEAE										
....CYCLOTELLA	27	3	41#	38	19	9	--	-	--	-
....MELOSIRA	27	3	--	-	--	-	--	-	--	-
....STEPHANODISCUS	--	-	--	-	--	-	--	-	--	-
...PENNALES										
...ACHNANTHACEAE										
....ACHNANTHES	--	-	--	-	--	-	--	-	23	5
....RHOICOSPHENIA	--	-	--	-	--	-	--	-	23	5
...CYMBELLACEAE										
....AMPHORA	--	-	--	-	--	-	--	-	--	-
....CYMBELLA	27	3	27#	25	38#	18	22#	25	--	-
....EPITHEMIA	--	-	--	-	--	-	--	-	--	-
...FRAGILARIACEAE										
....SYNEDRA	--	-	41#	38	--	-	--	-	--	-
...GOMPHONEMACEAE										
....GOMPHONEMA	55	7	--	-	--	-	22#	25	--	-
...NAVICULACEAE										
....GYROSIGMA	--	-	--	-	--	-	--	-	--	-
....NAVICULA	150#	19	--	-	76#	36	--	-	69	14
...PINNULARIA	--	-	--	-	--	-	--	-	--	-
...NITZSCHACEAE										
....NITZSCHIA	150#	19	--	-	57#	27	45#	50	160#	33
CRYPTOPHYTA (CRYPTOMONADS)										
..CRYPTOPHYCEAE										
...CRYPTOMONIDALES	--	-	--	-	--	-	--	-	--	-
CYANOPHYTA (BLUE-GREEN ALGAE)										
..CYANOPHYCEAE										
...CHROCOCCALES										
....CHROCOCCACEAE										
....ANACYSTIS	--	-	--	-	--	-	--	-	--	-
...HORMOGONALES										
...NOSTOCACEAE										
....ANABAENA	--	-	--	-	--	-	--	-	--	-
...OSCILLATORIA	--	-	--	-	--	-	--	-	--	-
....OSCILLATORIA	340#	43	--	-	--	-	--	-	210#	43
EUGLENOPHYTA (EUGLENOIDS)										
..EUGLENOPHYCEAE										
...EUGLENALES										
....EUGLENACEAE										
....TRACHELOMONAS	--	-	--	-	--	-	--	-	--	-

NOTE: # - DOMINANT ORGANISM; EQUAL TO OR GREATER THAN 15%

* - OBSERVED ORGANISM, MAY NOT HAVE BEEN COUNTED; LESS THAN 1/2%

HAWAII, ISLAND OF KAUAI

45

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 mi² (67.3 km²).

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.--35 years, 87.9 ft³/s (2.489 m³/s), 63,680 acre-ft/yr (78.5 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 26,000 ft³/s (736 m³/s) Jan. 31, 1975, gage height, 15.51 ft (4.727 m), from rating curve extended above 3,200 ft³/s (90.6 m³/s) on basis of slope-area measurement at gage height 10.65 ft (3.246 m); minimum, 3.15 ft³/s (0.089 m³/s) July 19, 1951.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 3,730 ft³/s (106 m³/s) Dec. 6, gage height, 6.09 ft (1.856 m), from rating curve extended as explained above, no peak above base of 4,700 ft³/s (135 m³/s); minimum, 10 ft³/s (0.28 m³/s) Oct. 20, 23, Nov. 29.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	13	16	19	40	14	21	12	12	19	25	19	11
2	13	90	31	32	15	19	12	12	19	392	125	11
3	12	215	476	28	13	13	12	12	20	65	25	11
4	13	81	52	23	13	12	11	30	22	77	33	15
5	12	97	31	19	13	23	45	21	74	28	60	12
6	13	492	498	18	12	32	117	15	51	58	23	12
7	13	197	97	20	12	18	54	15	74	127	78	16
8	15	44	45	41	12	15	33	13	31	76	401	13
9	15	25	32	26	11	31	19	14	29	21	41	12
10	25	20	26	22	11	16	16	14	19	21	21	12
11	21	19	24	19	11	13	45	12	16	29	18	11
12	12	46	22	17	12	13	32	11	16	36	19	12
13	11	86	21	17	13	12	19	33	19	31	20	12
14	11	23	19	16	16	11	246	145	88	30	35	22
15	11	18	18	19	13	15	125	197	103	22	16	168
16	11	16	24	123	11	60	150	65	117	20	14	115
17	14	15	30	52	11	17	92	30	127	29	15	105
18	24	14	55	32	11	22	32	19	119	55	13	82
19	11	13	27	26	11	24	24	16	119	30	50	24
20	11	13	19	23	11	16	83	15	92	26	20	151
21	11	14	17	21	11	13	41	13	616	44	289	48
22	11	13	16	19	11	12	26	13	135	23	103	43
23	11	13	15	17	11	12	21	36	180	21	101	23
24	11	15	13	17	11	12	17	20	45	17	25	19
25	105	13	13	16	11	11	15	16	34	15	26	16
26	99	11	15	16	11	11	15	145	28	13	16	15
27	103	11	222	16	11	11	21	99	24	14	14	13
28	75	11	616	15	13	11	16	78	125	15	13	12
29	31	10	95	14	---	16	15	34	232	17	12	12
30	16	12	51	13	---	27	13	26	36	17	28	12
31	13	---	42	13	---	16	---	23	---	14	17	---
TOTAL	767	1663	2681	790	336	555	1379	1204	2629	1328	1690	1040
MEAN	24.7	55.4	86.5	25.5	12.0	17.9	46.0	38.8	87.6	42.8	54.5	34.7
MAX	105	492	616	123	16	60	246	197	616	392	401	168
MIN	11	10	13	13	11	11	11	11	16	13	12	11
AC-FT	1520	3300	5320	1570	666	1100	2740	2390	5210	2630	3350	2060
CAL YR 1977 TOTAL	25346		MEAN 69.4	MAX 1860	MIN 10	AC-FT 50270						
WTR YR 1978 TOTAL	16062		MEAN 44.0	MAX 616	MIN 10	AC-FT 31860						

HAWAII, ISLAND OF KAUAI

16049000 HANAPEPE RIVER BELOW MANUAHI STREAM, NEAR ELEEELE

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 Eleeele.

DRAINAGE AREA.--18.5 mi² (47.9 km²).

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

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

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

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

AVERAGE DISCHARGE.--54 years (water years, 1918-20, 1928-78), 86.7 ft³/s (2.455 m³/s), 62,810 acre-ft/yr (77.4 hm³/yr).

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

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 4,170 ft³/s (118 m³/s) July 2, gage height, 6.38 ft (1.945 m), no other peak above base of 3,600 ft³/s (102 m³/s); minimum, 13 ft³/s (0.37 m³/s) Dec. 24, 25.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	17	29	20	18	16	20	27	21	22	48	51	23
2	16	144	75	16	17	17	30	22	24	834	289	21
3	18	325	509	15	16	16	27	23	24	163	54	21
4	17	108	38	15	16	17	27	31	24	70	74	24
5	17	120	23	15	16	18	84	28	347	51	165	22
6	22	565	449	15	17	20	129	25	106	197	56	23
7	17	176	69	24	17	17	60	39	222	280	277	29
8	19	41	32	33	17	17	33	25	70	114	846	22
9	20	26	22	18	16	20	27	26	46	71	129	22
10	81	22	19	17	16	17	25	23	29	56	58	22
11	21	27	17	16	16	17	49	23	24	81	45	21
12	16	33	16	15	16	16	38	23	25	87	42	25
13	26	74	15	15	17	16	54	65	26	70	167	21
14	18	21	15	15	18	16	340	259	142	87	87	40
15	14	21	15	20	17	17	205	385	136	49	50	146
16	14	20	15	84	16	24	136	210	265	49	32	170
17	20	18	15	26	16	27	75	53	315	92	45	123
18	24	17	17	17	16	28	23	30	202	133	28	85
19	16	17	15	18	17	28	20	27	239	66	86	42
20	18	19	14	17	16	28	27	26	183	81	42	169
21	17	19	14	17	16	29	21	27	1090	74	389	66
22	16	17	14	16	16	28	19	25	389	60	152	111
23	16	19	14	16	16	27	19	37	344	54	253	38
24	16	17	13	16	16	27	18	26	101	41	99	26
25	81	17	13	16	16	27	18	27	58	35	96	24
26	119	17	14	19	16	27	17	186	44	33	41	22
27	86	17	93	16	16	27	29	286	36	43	31	22
28	120	17	402	16	18	29	22	215	225	41	28	21
29	32	17	44	16	---	30	22	37	401	50	31	21
30	26	20	24	16	---	39	21	46	77	37	49	21
31	24	---	21	16	---	28	---	27	---	34	27	---
TOTAL	984	2000	2076	609	459	714	1642	2303	5236	3181	3819	1441
MEAN	31.7	66.7	67.0	19.6	16.4	23.0	54.7	74.3	175	103	123	48.0
MAX	120	565	509	84	18	39	340	385	1090	834	846	170
MIN	14	17	13	15	16	16	17	21	22	33	27	21
AC-FT	1950	3970	4120	1210	910	1420	3260	4570	10390	6310	7570	2860
CAL YR 1977	TOTAL	24141	MEAN 66.1	MAX 1220	MIN 13	AC-FT 47880						
WTR YR 1978	TOTAL	24464	MEAN 67.0	MAX 1090	MIN 13	AC-FT 48520						

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

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

REMARKS.--Records good. Lihue and Hanamaulu ditches divert upstream for irrigation of sugarcane in vicinity of Lihue. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--61 years (water years, 1913-18, 1920, 1922-24, 1926-56, 1959-78), 117 ft³/s (3.313 m³/s), 84,770 acre-ft/yr (105 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, 6,500 ft³/s (184 m³/s) July 2, gage height, 14.79 ft (4.508 m), from rating curve extended as explained above, no other peak above base of 5,800 ft³/s (164 m³/s); minimum, 2.6 ft³/s (0.074 m³/s) Feb. 27, 28.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.0	4.9	5.1	3.8	4.2	4.0	3.9	3.9	20	70	37	29
2	4.8	115	10	31	4.2	4.4	3.2	4.0	33	880	454	22
3	4.0	220	356	73	4.0	3.0	3.1	8.7	50	261	102	18
4	3.7	238	21	89	4.0	2.8	3.0	9.2	86	124	178	39
5	3.7	180	7.5	23	3.9	2.9	3.2	8.4	792	85	266	21
6	4.8	478	347	6.8	3.5	2.9	51	7.9	431	228	136	13
7	7.9	266	82	9.9	3.2	2.8	75	95	518	439	253	14
8	4.4	132	10	21	3.1	3.5	43	12	331	233	943	13
9	9.1	108	7.5	20	3.0	3.2	7.5	7.3	247	138	274	9.3
10	40	111	9.9	13	3.0	6.2	6.0	6.2	190	111	132	8.7
11	32	115	17	4.9	2.9	3.4	30	5.1	156	77	59	11
12	4.4	175	12	4.8	3.1	3.0	16	4.6	64	84	82	15
13	36	197	5.7	4.4	3.4	2.9	26	7.1	16	93	376	16
14	39	106	4.9	4.0	5.3	4.4	288	114	22	121	266	40
15	6.2	112	4.8	4.6	4.0	6.2	247	551	70	96	183	132
16	4.9	103	4.9	35	3.4	6.0	166	520	153	97	63	193
17	9.1	70	4.9	18	3.2	5.7	151	204	222	112	86	117
18	72	33	4.9	14	3.0	4.0	50	102	239	178	48	97
19	7.0	30	5.1	36	3.0	4.2	7.5	42	177	110	100	51
20	4.9	29	4.9	36	2.9	4.2	6.2	18	154	111	78	181
21	4.6	34	4.9	35	2.9	3.9	5.1	55	1190	190	290	100
22	4.0	23	4.6	34	2.9	3.9	4.2	27	669	98	252	199
23	4.0	6.0	4.2	35	2.8	3.7	3.9	191	515	110	409	78
24	3.7	4.6	4.0	23	2.8	3.4	3.7	110	285	75	179	59
25	26	4.2	3.9	6.0	2.8	3.5	3.5	30	211	57	189	32
26	9.9	4.0	3.7	5.1	2.7	4.0	3.5	154	108	36	92	18
27	76	3.9	52	4.9	2.6	4.0	6.4	618	49	21	74	21
28	78	3.7	526	4.8	2.7	3.7	5.1	623	152	16	51	18
29	23	3.7	102	4.8	---	3.7	4.2	199	366	22	53	16
30	6.8	4.2	25	4.6	---	5.4	3.9	124	122	44	107	12
31	6.6	---	20	4.4	---	6.9	---	45	---	36	72	---
TOTAL	544.5	2914.2	1675.4	648.0	92.5	125.8	1230.1	3906.4	7638	4353	5884	1593.0
MEAN	17.6	97.1	54.0	20.9	3.30	4.06	41.0	126	255	140	190	53.1
MAX	76	478	526	89	5.3	6.9	288	623	1190	880	943	199
MIN	3.7	3.7	3.7	4.0	2.6	2.8	3.0	3.9	16	16	37	8.7
AC-FT	1080	5780	3320	1290	183	250	2840	7750	15150	8630	11670	3160

CAL YR 1977 TOTAL 24239.4 MEAN 66.4 MAX 1620 MIN 2.8 AC-FT 48080
WTR YR 1978 TOTAL 30604.9 MEAN 83.8 MAX 1190 MIN 2.6 AC-FT 60700

HAWAII, ISLAND OF KAUAI

16061000 NORTH WAILUA DITCH NEAR LIHUE

LOCATION.--Lat 22°03'56", long 159°28'14", Hydrologic Unit 2007000, 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 (FISCAL YEAR).--WSP 770: 1933.

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

REMARKS.--Records good. Ditch diverts from North Fork Wailua River for power and irrigation in vicinity of Lihue. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--46 years, 18.8 ft³/s (0.532 m³/s), 13,620 acre-ft/yr(16.8 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 59 ft³/s (1.67 m³/s) Dec. 21, 1933, Apr. 24, 1934; no flow at times.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	17	21	16	19	15	18	17	21	19	20	20	16
2	17	20	18	18	15	14	17	22	20	23	22	16
3	20	20	20	17	15	13	16	22	19	20	17	16
4	20	19	16	17	15	14	15	21	20	20	17	17
5	20	19	16	17	15	14	20	20	23	20	18	16
6	22	21	20	17	15	14	24	23	22	22	17	16
7	20	19	17	17	15	14	24	23	22	22	19	17
8	22	18	17	17	14	18	20	22	20	21	20	16
9	20	18	17	16	14	20	21	22	20	20	17	16
10	21	18	16	16	9.1	16	21	20	20	20	16	16
11	20	20	16	16	11	15	25	20	19	20	16	17
12	19	19	16	16	13	15	21	20	19	20	16	17
13	20	18	16	16	14	14	23	22	19	21	19	16
14	19	18	16	15	16	14	27	26	20	20	18	17
15	20	19	16	17	14	20	27	28	20	20	16	19
16	21	17	18	17	13	18	24	25	21	20	16	19
17	23	17	17	16	13	16	23	20	21	20	16	19
18	22	17	19	16	13	18	21	8.2	20	20	16	17
19	20	17	17	16	13	17	22	13	21	20	17	17
20	21	17	17	16	13	17	22	19	21	20	16	19
21	19	16	17	16	13	19	20	19	24	20	19	18
22	18	16	17	15	13	16	20	20	9.5	21	18	18
23	17	16	16	19	13	17	19	20	14	20	20	17
24	17	16	16	16	13	16	18	20	20	20	19	16
25	21	16	16	16	13	17	18	20	19	19	18	16
26	19	16	16	16	13	18	21	21	19	19	17	16
27	19	16	20	16	13	16	21	22	19	20	17	16
28	20	16	22	16	14	19	22	22	22	20	16	16
29	17	16	18	15	---	20	21	20	21	20	18	16
30	17	16	18	15	---	21	22	20	19	19	18	16
31	17	---	19	15	---	18	---	19	---	19	17	---
TOTAL	605	532	536	507	380.1	516	632	640.2	592.5	626	546	504
MEAN	19.5	17.7	17.3	16.4	13.6	16.6	21.1	20.7	19.8	20.2	17.6	16.8
MAX	23	21	22	19	16	21	27	28	24	23	22	19
MIN	17	16	16	15	9.1	13	15	8.2	9.5	19	16	16
AC-FI	1200	1060	1060	1010	754	1020	1250	1270	1180	1240	1080	1000
CAL YR 1977	TOTAL	6741.9	MEAN 18.5	MAX 27	MIN 4.9	AC-FI	13370					
WTR YR 1978	TOTAL	6616.8	MEAN 18.1	MAX 28	MIN 8.2	AC-FI	13120					

HAWAII, ISLAND OF KAUAI

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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.--13 years, 24.3 ft³/s (0.688 m³/s), 17,610 acre-ft/yr (21.7 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 58 ft³/s (1.64 m³/s) Oct. 11, 1966; no flow Jan. 1-18, 1965.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	19	22	17	20	16	19	19	21	21	22	22	20
2	19	24	20	20	15	15	19	22	22	29	28	19
3	20	24	25	19	15	14	18	23	20	23	22	20
4	20	23	20	19	15	14	17	22	23	22	24	20
5	20	23	19	19	15	15	21	21	30	21	25	19
6	23	28	25	18	15	15	25	25	25	25	22	19
7	21	23	21	19	15	14	25	24	28	27	27	19
8	22	21	20	19	15	19	21	22	24	26	30	18
9	21	21	19	18	15	21	21	22	23	23	23	18
10	23	21	19	18	8.8	17	21	21	22	22	21	18
11	22	22	19	17	11	17	24	20	21	22	21	20
12	20	22	18	17	14	16	22	20	21	23	21	20
13	22	22	18	17	14	16	24	22	21	23	28	19
14	21	21	18	16	17	15	27	26	24	24	27	21
15	22	21	17	19	15	21	28	30	23	22	23	24
16	22	21	19	21	14	20	27	28	25	22	21	25
17	24	20	19	19	14	18	24	25	25	22	22	23
18	23	20	20	17	14	20	22	8.8	23	24	20	22
19	22	19	20	17	14	19	22	15	24	22	23	21
20	21	19	19	16	14	19	22	21	24	23	21	25
21	21	20	19	16	14	19	21	21	31	22	26	24
22	20	19	18	16	14	18	20	21	13	23	24	24
23	20	19	17	19	14	18	20	24	18	22	27	21
24	19	18	17	17	14	17	20	21	22	21	24	20
25	24	18	17	17	14	18	20	22	21	21	23	20
26	24	18	17	16	14	19	21	24	21	20	21	20
27	23	18	23	16	14	18	21	27	21	21	20	19
28	24	17	28	16	15	20	22	26	24	22	20	19
29	21	17	21	16	---	21	21	22	25	22	21	19
30	20	18	20	16	---	22	22	23	22	21	22	19
31	20	---	21	16	---	20	---	22	---	21	20	---
TOTAL	663	619	610	546	398.8	554	657	691.8	687	703	719	615
MEAN	21.4	20.6	19.7	17.6	14.2	17.9	21.9	22.3	22.9	22.7	23.2	20.5
MAX	24	28	28	21	17	22	28	30	31	29	30	25
MIN	19	17	17	16	8.8	14	17	8.8	13	20	20	18
AC-FT	1320	1230	1210	1080	791	1100	1300	1370	1360	1390	1430	1220
CAL YR 1977	TOTAL	7665.5	MEAN 21.0	MAX 32	MIN 5.5	AC-FT 15200						
WTR YR 1978	TOTAL	7463.6	MEAN 20.4	MAX 31	MIN 8.8	AC-FT 14800						

HAWAII, ISLAND OF KAUAI

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.--41 years (water years 1938-78), 10.6 ft³/s (0.300 m³/s), 7,680 acre-ft/yr (9.47 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 71 ft³/s (2.01 m³/s) Apr. 3, 1948; no flow at times.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	24	.57	22	.28	21	9.4	23	.28	.18	.18	23	.72
2	24	.57	14	.28	21	12	22	.28	.18	.47	13	.72
3	26	.57	1.0	.28	21	18	21	.28	.18	.12	.72	.72
4	26	.57	.57	.28	21	18	21	.28	.18	.12	.57	.72
5	26	.42	16	.28	20	19	29	.28	.28	.12	.57	.72
6	32	.42	8.8	.18	20	19	36	.28	.28	.12	.63	.57
7	28	.42	.42	.18	20	18	38	.28	.28	.18	.72	.57
8	32	.42	.28	.18	20	24	30	.28	.28	.18	.57	.57
9	28	.42	.28	.18	20	29	30	.28	.28	.18	.42	.57
10	29	.42	.28	.28	22	21	32	.28	.28	.18	.42	.57
11	28	.42	.28	.28	22	20	23	.28	.28	.18	.42	.57
12	25	.42	.28	.28	20	20	19	.28	.18	.18	.28	.57
13	32	.42	.28	.28	20	19	38	.42	.18	.18	.42	.42
14	32	.42	.28	.28	21	19	23	.42	.28	.28	.28	.42
15	33	.42	.28	.42	20	34	1.2	.42	.28	.28	.28	.28
16	34	.42	.28	.42	19	34	.88	.28	.28	.18	.28	.28
17	36	.42	.28	.42	19	24	.57	.28	.28	.18	.28	.28
18	17	.42	.28	16	19	34	.42	.28	.28	.18	.28	.28
19	.72	.42	.28	22	19	30	.42	.28	.28	.18	.28	.28
20	.57	.42	.28	22	19	27	.42	.28	.28	.18	.28	.28
21	.57	.42	.28	22	19	26	.42	.28	.28	.18	.28	.28
22	.57	.42	.28	22	19	24	.42	.28	.28	.18	.90	.18
23	.57	.28	.28	28	18	24	.28	.28	.28	.28	.42	.18
24	.57	.28	.28	23	18	19	.28	.28	.18	.18	.42	.18
25	.57	.28	.28	22	18	23	.28	.28	.18	.18	.42	.18
26	.57	.28	.28	22	18	22	.28	.28	.18	.12	.42	.28
27	.57	.28	9.2	21	18	22	.28	.28	.18	.18	.72	.18
28	.57	13	.72	21	19	26	.28	.28	.18	.18	.88	.18
29	.57	22	.57	21	---	26	.28	.18	.28	.18	.72	.18
30	.57	23	.42	21	---	31	.28	.18	.18	.18	.72	.18
31	.57	---	.28	21	---	24	---	.18	---	5.1	.72	---
TOTAL	519.56	69.24	79.30	308.78	551	715.4	391.99	8.80	7.20	10.79	50.32	12.11
MEAN	16.8	2.31	2.56	9.96	19.7	23.1	13.1	.28	.24	.35	1.62	.40
MAX	36	23	22	28	22	34	38	.42	.28	5.1	23	.72
MIN	.57	.28	.28	.18	18	9.4	.28	.18	.16	.12	.28	.18
AC-FT	1030	137	157	612	1090	1420	778	17	14	21	100	24
CAL YR 1977	TOTAL	2171.58	MEAN	5.95	MAX	47	MIN	.06	AC-FT	4310		
WTR YR 1978	TOTAL	2724.49	MEAN	7.46	MAX	38	MIN	.12	AC-FT	5400		

HAWAII, ISLAND OF KAUAI

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

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

REMARKS.--Records 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 16062000) 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.--62 years (water years, 1916-18, 1920-78), 73.2 ft³/s (2.073 m³/s), 53,030 acre-ft/yr (65.4 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, 4,040 ft³/s (114 m³/s) July 2, gage height, 8.51 ft (2.594 m), from rating curve extended as explained above, no other peak above base of 2,800 ft³/s (79.4 m³/s); minimum, 0.58 ft³/s (0.016 m³/s) Mar. 7, 14, 24.

DISCHARGE, IN CURIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.6	53	2.5	63	1.6	17	4.2	41	54	72	52	53
2	3.6	106	26	47	1.6	8.0	4.0	43	68	385	181	49
3	5.4	108	129	42	1.4	.85	7.2	61	50	111	99	49
4	6.9	75	29	39	1.2	.67	7.0	43	91	78	124	59
5	6.1	82	13	37	1.2	.85	16	37	306	78	153	46
6	22	205	159	35	1.1	.99	44	97	179	145	80	44
7	11	90	42	36	1.1	.67	43	85	244	219	257	48
8	20	58	33	37	1.1	5.5	17	50	124	127	397	43
9	9.5	61	29	32	1.1	17	14	47	99	100	106	44
10	30	52	27	29	2.2	2.1	15	37	74	82	78	41
11	9.0	79	26	28	3.3	1.7	87	34	63	85	72	48
12	5.9	80	26	27	1.1	1.2	37	35	60	95	80	59
13	67	82	25	27	1.2	.92	62	52	62	93	196	45
14	15	50	24	26	2.7	.92	159	131	115	94	153	62
15	22	71	24	37	1.4	29	227	248	81	72	90	119
16	19	48	38	48	1.1	38	141	264	121	74	68	160
17	29	41	42	28	.99	4.5	87	106	126	80	84	133
18	48	38	59	12	1.2	20	59	86	87	100	59	88
19	42	37	39	3.4	1.1	12	63	70	118	69	86	76
20	40	37	32	3.0	.92	8.6	56	58	118	92	66	149
21	35	36	33	2.8	.85	6.3	43	56	435	75	182	110
22	32	34	29	2.7	.92	5.1	40	72	304	90	128	102
23	31	29	25	8.3	.85	4.9	37	137	224	78	239	75
24	30	27	24	3.4	.85	2.8	35	66	110	59	137	62
25	123	26	23	2.7	.85	4.3	30	70	86	50	104	55
26	91	25	23	2.2	.85	4.9	57	130	76	50	75	53
27	81	24	207	2.1	.85	4.0	57	239	64	68	64	49
28	113	12	415	2.1	1.6	7.5	49	160	198	74	62	46
29	54	2.7	78	1.8	---	9.0	43	86	148	70	96	44
30	44	2.7	53	1.7	---	24	47	78	75	58	103	45
31	42	---	77	1.7	---	5.9	---	63	---	51	62	---
TOTAL	1091.0	1671.4	1811.5	667.9	36.23	249.17	1568.4	2782	3960	2974	3733	2056
MEAN	35.2	55.7	58.4	21.5	1.29	8.04	52.3	89.7	132	95.9	120	68.5
MAX	123	205	415	63	3.3	38	227	264	435	385	397	160
MIN	3.6	2.7	2.5	1.7	.85	.67	3.0	34	50	50	52	41
AC-FT	2160	3320	3590	1320	72	494	3110	5520	7850	5900	7400	4080
CAL YR 1977	TOTAL	22843.18	MEAN	62.6	MAX	985	MIN	.64	AC-FT	45310		
WTR YR 1978	TOTAL	22600.60	MEAN	61.9	MAX	435	MIN	.67	AC-FT	44830		

HAWAII, ISLAND OF KAUAI

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

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

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

AVERAGE DISCHARGE.--63 years (water years, 1913-14, 1916-17, 1920-78), 48.2 ft³/s (1.365 m³/s), 34,920 acre-ft/yr (43.1 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, 964 ft³/s (27.3 m³/s) May 27, gage height, 4.42 ft (1.347 m), from rating curve extended as explained above, no peak above base of 1,900 ft³/s (53.8 m³/s); minimum, 9.0 ft³/s (0.25 m³/s) Mar. 6, 7.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	12	24	15	33	12	16	11	17	29	48	36	33
2	13	38	19	25	11	10	11	18	31	79	81	32
3	12	44	54	22	11	10	10	16	26	54	58	32
4	12	33	19	20	11	9.8	9.8	23	74	44	62	39
5	12	33	16	20	11	9.8	17	19	226	42	66	31
6	17	63	45	19	11	9.8	37	57	96	60	45	29
7	14	44	22	18	11	9.4	94	53	148	85	112	30
8	14	29	18	17	11	11	32	25	79	58	210	28
9	14	25	16	17	11	12	34	23	56	52	72	29
10	12	24	16	16	11	11	36	20	47	48	55	27
11	18	44	16	16	11	11	77	18	39	46	52	27
12	16	46	15	15	11	11	36	17	37	50	46	31
13	83	53	14	15	11	10	94	30	34	46	131	28
14	28	28	14	15	13	19	103	86	41	50	67	42
15	18	26	14	16	11	48	116	149	40	42	53	46
16	22	24	19	18	11	63	95	85	56	48	46	66
17	21	23	21	15	11	14	66	76	53	43	53	45
18	26	21	33	14	11	28	42	52	53	50	41	40
19	19	21	20	14	11	24	33	45	67	43	41	34
20	16	21	18	14	11	19	30	42	78	68	39	60
21	16	21	18	14	10	18	26	42	339	56	78	55
22	14	19	16	13	10	15	23	48	198	42	62	55
23	13	19	14	15	10	14	22	100	168	40	110	40
24	13	18	14	14	10	12	20	46	85	37	61	35
25	13	18	14	14	9.8	13	19	39	67	33	55	32
26	34	16	14	13	9.8	14	23	48	60	31	45	30
27	35	16	96	13	9.8	12	30	200	50	43	41	28
28	56	16	219	13	10	13	22	88	149	43	39	27
29	26	16	36	13	---	13	19	46	72	49	42	25
30	22	16	25	12	---	17	19	38	49	40	49	25
31	19	---	51	12	---	12	---	32	---	34	37	---
TOTAL	660	839	941	505	302.4	508.8	1206.8	1598	2547	1504	1985	1081
MEAN	21.3	28.0	30.4	16.3	10.8	16.4	40.2	51.5	84.9	48.5	64.0	36.0
MAX	83	63	219	33	13	63	116	200	339	85	210	66
MTN	12	16	14	12	9.8	9.4	9.8	16	26	31	36	25
AC-FT	1310	1660	1870	1000	600	1010	2390	3170	5050	2980	3940	2140
CAL YR 1977	TOTAL	12654.0	MEAN	34.7	MAX	641	MIN	12	AC-FT	25100		
WTR YR 1978	TOTAL	13678.0	MEAN	37.5	MAX	339	MIN	9.4	AC-FT	27130		

HAWAII, ISLAND OF KAUAI

53

16069000 WAILUA DITCH NEAR KAPAA

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

WATER-DISCHARGE RECORDS

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

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

REMARKS.--Records good. Ditch diverts water from North Fork Wailua River to reservoir, 2,000 ft (610 m) above station and thence to fields for irrigation of sugarcane in vicinity of Kapaa. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--41 years, (water years 1938-78), 15.0 ft³/s (0.425 m³/s), 10,879 acre-ft/yr (13.4 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 63 ft³/s (1.78 m³/s) June 4, 1937; no flow at times.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	28	30	32	3.4	20	17	22	27	21	21	19	24
2	27	18	28	3.2	20	17	21	26	21	21	20	24
3	26	8.9	27	3.2	21	19	20	26	21	21	20	23
4	25	8.7	28	9.8	21	20	20	19	21	21	20	23
5	24	8.7	29	16	20	20	19	16	22	21	20	23
6	25	8.5	17	18	19	20	22	24	23	21	20	23
7	26	8.1	4.9	24	18	20	25	24	24	21	20	23
8	26	8.1	4.7	24	18	20	27	24	24	21	20	23
9	28	7.7	4.7	24	19	20	27	24	23	21	20	23
10	28	7.5	4.9	25	17	20	24	24	22	20	20	22
11	29	7.3	4.9	25	17	20	16	25	21	20	20	23
12	29	7.3	5.3	26	17	20	16	25	20	20	20	23
13	29	7.1	5.3	27	17	20	16	26	19	20	20	22
14	33	5.7	16	27	17	20	16	26	22	20	20	22
15	34	4.9	22	27	17	25	16	24	24	20	20	22
16	35	4.9	22	27	17	29	16	20	23	20	19	22
17	36	4.9	22	25	17	29	16	20	23	20	19	22
18	38	4.9	22	22	17	29	21	20	23	20	19	22
19	39	4.5	22	22	17	29	25	19	18	20	19	22
20	40	5.1	24	26	17	29	33	19	16	20	18	22
21	40	5.3	26	31	13	29	36	19	15	20	19	22
22	38	15	25	31	16	27	36	19	20	20	20	22
23	39	26	22	29	16	26	36	14	20	20	20	22
24	39	30	16	28	17	26	36	9.7	20	20	21	22
25	39	31	15	27	17	26	36	9.5	21	20	22	22
26	38	31	16	22	17	26	36	9.3	21	20	22	22
27	35	32	12	20	17	22	32	9.1	21	20	23	22
28	33	34	10	20	17	21	29	9.1	21	20	23	22
29	31	35	10	19	---	21	28	14	21	20	24	22
30	30	33	10	19	---	22	28	20	21	19	24	22
31	30	---	8.4	20	---	22	---	21	---	19	24	---
TOTAL	997	443.1	516.1	670.6	493	711	751	611.7	632	627	635	673
MEAN	32.2	14.8	16.6	21.6	17.6	22.9	25.0	19.7	21.1	20.2	20.5	22.4
MAX	40	35	32	31	21	29	36	27	24	21	24	24
MIN	24	4.5	4.7	3.2	13	17	16	9.1	15	19	18	22
AC-FT	1980	879	1020	1330	978	1410	1490	1210	1250	1240	1260	1330

CAL YR 1977 TOTAL 7395.26 MEAN 20.3 MAX 40 MIN .00 AC-FT 14670
WIR YR 1978 TOTAL 7760.50 MEAN 21.3 MAX 40 MIN 3.2 AC-FT 15390

NOTE.--No gage-height record Feb. 8 to Mar. 30.

HAWAII, ISLAND OF KAUAI

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.--26 years, 127 ft³/s (3.600 m³/s), 92,010 acre-ft/yr (113 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, 3,160 ft³/s (89.5 m³/s) July 2, gage height, 6.41 ft (1.954 m), from rating curve extended as explained above, no peak above base of 4,100 ft³/s (116 m³/s); minimum, 3.8 ft³/s (0.11 m³/s) Feb. 27, 28, Mar. 2, 3, 7.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.8	51	5.6	108	4.7	4.9	4.5	40	79	176	86	79
2	7.3	148	6.3	89	4.7	4.3	4.5	48	97	490	327	70
3	6.0	179	107	78	4.5	3.9	4.5	68	70	205	163	72
4	6.0	148	14	60	4.5	3.9	4.5	61	143	139	237	89
5	5.8	141	8.3	52	4.5	4.0	4.8	66	635	174	256	66
6	5.8	307	179	26	4.5	4.5	18	108	338	209	152	63
7	5.8	201	81	21	4.4	4.1	71	196	445	369	313	68
8	5.4	115	43	20	4.5	5.3	34	68	261	213	746	58
9	5.0	105	30	14	4.4	4.8	5.9	54	201	167	222	56
10	9.7	94	29	13	4.3	4.5	22	34	153	154	153	54
11	8.6	127	28	12	4.3	4.4	141	27	128	147	138	66
12	5.0	160	27	11	4.3	4.4	84	23	120	153	135	75
13	38	173	35	11	4.3	4.3	133	53	118	166	342	59
14	25	94	30	13	5.9	4.2	286	210	153	163	244	94
15	7.0	113	26	30	4.9	4.3	373	438	140	131	168	150
16	5.4	82	51	51	4.6	5.0	290	403	173	136	116	237
17	7.0	76	59	27	4.5	4.9	176	207	178	138	143	189
18	26	68	70	14	4.3	4.9	96	155	170	182	99	138
19	21	63	34	7.9	4.3	6.9	75	122	192	131	126	101
20	16	60	31	7.1	4.2	4.7	73	108	189	167	103	222
21	22	62	29	5.3	4.2	4.6	48	105	820	169	240	175
22	35	37	22	5.2	4.2	4.7	35	124	553	141	189	179
23	8.6	9.0	25	5.3	4.2	4.7	30	296	475	136	382	122
24	7.3	6.8	29	5.2	4.2	4.8	25	150	228	111	186	99
25	148	6.3	28	5.2	4.2	5.7	21	130	173	94	170	84
26	99	5.8	29	5.1	4.2	5.0	18	204	145	87	108	78
27	101	5.6	481	5.0	4.2	5.0	72	450	126	120	90	72
28	184	5.6	399	5.1	4.1	4.8	55	370	322	127	82	66
29	84	5.4	115	5.4	---	4.8	51	165	268	133	116	63
30	57	5.6	87	5.2	---	6.1	54	120	138	110	153	62
31	40	---	165	4.9	---	5.2	---	97	---	96	97	---
TOTAL	1007.5	2654.1	2303.2	721.9	124.1	147.6	2309.7	4700	7231	5054	6082	3006
MEAN	32.5	88.5	74.3	23.3	4.43	4.76	77.0	152	241	163	196	100
MAX	184	307	481	108	5.9	6.9	373	450	820	490	746	237
MIN	5.0	5.4	5.6	4.9	4.1	3.9	4.5	23	70	87	82	54
AC-FT	2000	5260	4570	1430	246	293	4580	9320	14340	10020	12060	5960

CAL YR 1977 TOTAL 31057.5 MEAN 85.1 MAX 1650 MIN 4.5 AC-FT 61600
WTR YR 1978 TOTAL 35341.1 MEAN 96.8 MAX 820 MIN 3.9 AC-FT 70100

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 mi² (1.68 km²).

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.--18 years, 2.60 ft³/s (0.074 m³/s), 1,880 acre-ft/yr (2.32 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 724 ft³/s (20.5 m³/s) Jan. 31, 1975, gage height, 5.58 ft (1.701 m), from rating curve extended above 415 ft³/s (11.8 m³/s); minimum, 0.09 ft³/s (0.003 m³/s) Sept. 27-30, 1968.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 23 ft³/s (0.65 m³/s) June 4, gage height 1.60 ft (0.488 m), from rating curve extended as explained above, no peak above base of 70 ft³/s (1.98 m³/s); minimum, 0.35 ft³/s (0.010 m³/s) Mar. 28.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.75	.91	.83	1.2	.60	.60	.41	.53	1.8	3.1	2.3	2.0
2	.75	1.0	.91	1.0	.60	.47	.41	.53	1.9	3.2	3.2	1.9
3	.67	.91	1.9	.91	.60	.47	.41	.53	1.7	3.1	2.4	2.0
4	.60	1.0	.91	.75	.60	.47	.41	.91	5.9	2.9	2.8	2.0
5	.60	.91	.75	.75	.60	.47	.47	.67	7.5	2.8	2.8	1.9
6	.67	1.4	1.3	.67	.53	.47	.75	.75	5.0	2.8	2.7	1.9
7	.67	1.2	1.0	.67	.53	.47	1.3	1.4	5.7	3.2	3.1	1.8
8	.60	1.1	.83	.67	.47	.60	1.4	.83	5.0	2.8	3.8	1.8
9	.60	1.0	.83	.67	.47	.53	.67	.67	4.3	2.7	2.9	1.8
10	.60	1.0	.83	.67	.47	.47	.60	.60	3.9	2.7	2.8	1.8
11	.67	1.1	.83	.60	.47	.53	.75	.60	3.6	2.7	2.7	1.8
12	.67	1.3	.83	.60	.47	.53	.67	.60	3.4	2.7	2.5	1.9
13	1.3	1.2	.75	.60	.60	.47	.91	.60	3.1	2.7	2.5	1.9
14	1.2	1.1	.75	.60	1.0	.53	1.0	1.3	3.1	2.8	2.4	1.9
15	.75	1.0	.75	.67	.60	.67	.83	2.2	2.8	2.5	2.3	1.8
16	.67	1.0	.75	.67	.60	.60	1.4	1.7	2.9	2.5	2.2	2.1
17	.83	1.0	.75	.60	.60	.53	2.6	1.4	2.7	2.7	2.4	2.0
18	.91	1.0	.75	.60	.53	.53	1.7	1.2	2.7	3.1	2.2	1.9
19	.75	1.0	.75	.60	.53	.53	1.2	1.2	2.8	2.7	2.1	1.7
20	.67	.91	.60	.60	.53	.53	1.0	1.1	2.9	2.9	2.1	1.9
21	.67	1.0	.60	.60	.53	.53	.91	1.1	9.5	3.1	2.1	1.8
22	.67	.91	.60	.60	.47	.53	.83	1.1	6.8	2.8	2.2	2.1
23	.67	.83	.60	.60	.47	.47	.83	2.1	5.7	2.5	3.1	1.8
24	.67	.83	.60	.60	.47	.47	.67	1.5	4.6	2.4	2.5	1.7
25	1.0	.83	.60	.60	.47	.47	.67	1.3	3.9	2.4	2.3	1.6
26	.91	.83	.60	.60	.47	.53	.67	1.5	3.8	2.3	2.2	1.6
27	1.0	.83	.83	.60	.47	.47	.67	4.2	3.6	2.4	2.1	1.5
28	1.2	.83	1.7	.60	.47	.41	.60	3.4	3.9	2.5	2.1	1.5
29	1.0	.83	.91	.60	---	.41	.60	2.3	3.8	2.5	2.1	1.5
30	.83	.83	.75	.60	---	.47	.60	2.0	3.4	2.4	2.1	1.4
31	.83	---	1.2	.60	---	.41	---	1.9	---	2.2	2.1	---
TOTAL	24.38	29.59	26.59	20.70	15.22	15.64	25.94	41.72	121.7	84.1	77.1	54.3
MEAN	.79	.99	.86	.67	.54	.50	.86	1.35	4.06	2.71	2.49	1.81
MAX	1.3	1.4	1.9	1.2	1.0	.67	2.6	4.2	9.5	3.2	3.8	2.1
MIN	.60	.83	.60	.60	.47	.41	.41	.53	1.7	2.2	2.1	1.4
AC-FT	48	59	53	41	30	31	51	83	241	167	153	108

CAL YR 1977 TOTAL 578.55 MEAN 1.59 MAX 19 MIN .47 AC-FT 1150
WTR YR 1978 TOTAL 536.98 MEAN 1.47 MAX 9.5 MIN .41 AC-FT 1070

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.

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

AVERAGE DISCHARGE.--41 years (water years 1938-78), 6.73 ft³/s (0.191 m³/s), 4,880 acre-ft/yr (6.02 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 31 ft³/s (0.88 m³/s) Aug. 1, 1961; no flow at times.

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.2	8.6	5.0	.52	5.0	10	5.5	8.5	6.6	1.5	7.6	2.3
2	6.5	12	5.2	.47	4.9	6.1	5.0	7.4	9.7	1.4	15	1.9
3	6.2	5.8	9.4	.42	4.9	5.3	4.5	4.2	7.5	1.3	14	1.5
4	6.3	.42	4.9	3.1	4.8	5.0	5.3	12	17	4.4	20	1.1
5	8.4	.42	4.3	7.9	4.5	5.0	7.9	9.8	24	10	17	6.5
6	11	.42	9.1	6.3	4.3	4.7	11	18	11	15	11	10
7	7.9	.38	9.0	5.8	4.2	4.7	9.8	19	2.9	13	9.5	12
8	8.7	.33	6.8	5.4	4.9	7.6	8.9	12	2.5	.99	1.8	8.7
9	8.3	.33	6.4	5.2	4.6	8.4	9.0	12	2.1	.93	1.7	11
10	7.6	.33	6.1	5.3	4.3	6.2	6.6	7.3	1.8	6.6	1.5	7.3
11	7.9	.33	5.6	5.3	4.3	5.3	5.0	6.5	1.5	14	4.8	7.3
12	8.3	.33	5.5	5.0	4.4	4.2	5.4	6.4	5.1	14	14	13
13	11	.33	5.5	5.2	4.7	4.2	5.5	18	8.3	14	20	12
14	11	.24	5.0	5.0	8.6	6.6	7.0	23	12	15	12	18
15	8.6	.24	4.9	6.2	5.5	4.1	10	12	12	12	2.2	16
16	9.7	.24	9.0	8.3	4.9	10	10	12	18	15	1.4	19
17	11	.24	10	6.1	4.8	7.6	6.1	17	16	13	4.5	18
18	11	.21	11	5.4	5.0	11	3.4	9.5	14	11	8.3	11
19	9.7	.21	8.0	5.2	5.0	10	3.4	1.5	8.1	3.0	6.7	4.9
20	9.3	.17	7.0	5.3	4.7	9.0	3.3	1.4	.81	2.8	2.6	17
21	8.4	.17	9.6	5.3	4.7	9.0	4.3	1.2	4.1	2.5	13	18
22	7.3	3.7	7.8	5.2	5.4	8.3	6.0	2.5	4.3	2.6	15	11
23	6.8	6.2	6.2	9.9	5.0	8.0	6.2	1.3	2.5	2.6	22	.74
24	6.4	5.8	5.7	7.6	4.8	6.4	5.4	1.1	1.6	5.8	8.7	.69
25	11	5.7	5.6	6.2	4.7	8.6	5.0	.93	1.2	9.8	2.2	4.7
26	11	5.6	5.5	5.8	4.8	9.3	12	.99	6.2	9.4	2.1	7.9
27	12	5.5	6.5	5.4	9.3	7.1	12	2.4	10	17	2.1	7.3
28	12	5.2	7.5	5.7	6.4	7.6	8.2	2.2	9.9	17	6.2	6.3
29	10	5.2	9.4	6.1	---	8.2	7.6	6.9	2.1	19	18	5.7
30	8.4	4.9	4.8	5.5	---	8.2	12	9.4	1.8	14	17	7.4
31	6.9	---	.47	5.3	---	6.5	---	7.4	---	8.1	6.7	---
TOTAL	274.8	79.54	206.77	165.41	139.4	222.2	211.3	253.82	224.61	276.72	288.6	268.23
MEAN	8.86	2.65	6.67	5.34	4.98	7.17	7.04	8.19	7.49	8.93	9.31	8.94
MAX	12	12	11	9.9	8.6	11	12	23	24	19	22	19
MIN	6.2	.17	.47	.42	4.2	4.1	3.3	.93	.81	.93	1.4	.69
AC-FT	545	158	410	328	276	441	419	503	446	549	572	532
CAL YR 1977	TOTAL	2503.23	MEAN	6.86	MAX	17	MIN	.02	AC-FT	4970		
WTR YR 1978	TOTAL	2611.40	MEAN	7.15	MAX	24	MIN	.17	AC-FT	5180		

HAWAII, ISLAND OF KAUAI

57

16079000 KAPAHU 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.--60 years (water years, 1918-20, 1922-78), 6.34 ft³/s (0.180 m³/s), 4,590 acre-ft/yr (5.66 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 138 ft³/s (3.91 m³/s) Feb. 6, 1913; no flow at times.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.8	4.4	3.9	.31	2.0	8.6	2.4	1.6	6.4	.78	11	3.8
2	3.6	5.4	5.3	.25	2.0	2.6	2.6	3.6	7.4	.78	21	.25
3	3.0	2.8	15	5.2	2.0	2.0	3.2	4.8	6.2	.38	25	.99
4	2.6	.45	6.1	7.4	2.0	2.0	2.3	9.2	15	.31	29	1.2
5	2.6	.45	4.7	3.9	2.2	2.0	9.9	6.2	20	.31	15	2.9
6	6.8	.38	2.5	3.3	2.4	1.9	23	12	14	.45	12	4.9
7	3.2	.83	.38	3.2	2.2	1.9	21	14	8.2	.51	13	5.9
8	4.4	1.8	.38	3.2	2.2	3.4	7.0	9.2	.45	.51	9.6	4.6
9	2.9	1.7	.38	2.8	2.3	4.2	.45	7.4	.38	2.0	14	4.6
10	2.5	1.7	2.1	2.6	2.2	2.3	2.4	5.0	.38	2.2	18	5.0
11	2.9	1.5	2.3	2.5	2.5	2.5	6.1	4.1	.38	1.6	16	5.2
12	11	1.4	2.6	2.4	2.5	3.3	12	3.8	.38	1.5	10	6.9
13	24	1.3	2.8	2.5	4.2	3.3	25	11	4.6	1.5	18	5.1
14	12	1.2	2.8	2.4	11	8.8	20	12	6.6	3.1	17	11
15	4.1	1.2	3.2	2.5	2.5	23	8.2	.74	6.8	10	17	7.4
16	7.8	1.2	4.3	3.2	2.3	22	11	.31	12	12	13	7.2
17	6.4	1.1	4.4	2.6	2.2	3.2	8.2	14	6.3	11	16	8.1
18	10	.99	10	2.4	2.3	20	9.8	17	.45	5.8	6.1	12
19	4.4	.99	3.8	2.3	2.2	7.2	10	19	.38	1.6	7.4	14
20	3.6	1.1	2.9	2.2	2.2	5.3	11	15	.50	1.1	11	11
21	3.8	.99	3.2	2.3	2.2	5.4	6.8	7.4	1.7	.90	21	11
22	3.2	3.0	2.9	2.3	2.2	4.4	3.5	7.8	.51	.82	19	13
23	3.0	2.8	2.5	6.1	2.2	3.2	3.3	.58	.38	.74	29	18
24	2.9	2.8	2.2	2.6	2.0	2.6	3.0	.45	.38	10	21	15
25	20	2.8	2.0	2.4	2.0	5.1	2.9	8.0	.31	8.4	14	8.4
26	10	2.6	2.2	2.3	2.0	4.1	8.4	7.6	.38	7.6	.58	4.4
27	11	2.6	2.6	2.2	2.2	2.9	7.5	8.6	.38	15	9.2	4.2
28	5.4	2.6	2.1	2.2	3.4	3.7	.58	13	1.0	13	9.2	4.6
29	.45	2.5	4.3	2.2	---	3.3	.51	17	.31	17	11	5.4
30	2.4	2.9	5.9	2.2	---	5.6	.51	9.4	.38	13	8.4	3.8
31	3.9	---	3.1	2.0	---	2.9	---	7.8	---	10	6.2	---
TOTAL	186.65	57.48	112.84	85.96	73.6	172.7	232.55	257.58	122.53	157.09	447.68	209.84
MEAN	6.02	1.92	3.64	2.77	2.63	5.57	7.75	8.31	4.08	4.94	14.4	6.99
MAX	24	5.4	15	7.4	11	23	25	19	20	17	29	18
MIN	.45	.38	.38	.25	2.0	1.9	.45	.31	.31	.31	.58	.25
AC-FT	370	114	224	171	146	343	461	511	243	304	888	416

CAL YR 1977 TOTAL 1925.54 MEAN 5.28 MAX 41 MIN .19 AC-FT 3820
WTR YR 1978 TOTAL 2112.50 MEAN 5.79 MAX 29 MIN .25 AC-FT 4190

16080000 KAPAA STREAM AT KAPAHU DITCH INTAKE, NEAR KAPAA

LOCATION.--Lat 22°06'15", long 159°22'29", Hydrologic Unit 20070000, on right bank at Kapahu 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 Kapahu 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 Kapahu ditch (see sta 16079000). Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--42 years (20.3 ft³/s (0.575 m³/s), 14,710 acre-ft/yr (18.1 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, 1,250 ft³/s (35.4 m³/s) May 27, gage height, 2.50 ft (0.762 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 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	24	.00	.00	.00	.90	.00	24	.00	9.1
2	.00	5.1	.00	14	.00	.00	.00	.00	.00	33	1.7	12
3	.00	11	15	4.8	.00	.00	.00	.00	.00	33	5.9	13
4	.00	14	.00	.13	.00	.00	.00	5.3	65	13	1.7	17
5	.00	18	.00	.00	.00	.00	.00	.00	92	9.1	11	6.5
6	.00	41	15	.00	.00	.00	.58	51	60	31	.15	.78
7	.00	17	2.6	.00	.00	.00	21	29	95	38	64	.00
8	.00	9.1	1.8	.00	.00	.00	5.3	.00	44	30	90	.00
9	.00	7.6	1.5	.00	.00	.00	23	.00	27	23	11	.00
10	.00	6.9	.45	.00	.00	.00	20	.00	17	14	.00	.00
11	.00	32	.36	.00	.00	.00	61	.00	13	8.3	.04	.00
12	.00	27	.19	.00	.00	.00	8.9	.00	9.9	8.3	.23	.02
13	18	31	.00	.00	6.0	.00	35	1.6	1.4	7.6	16	.00
14	.00	11	.00	.00	2.2	.00	12	41	.00	11	1.7	.02
15	.00	9.1	.00	.00	.00	10	27	117	.00	.00	.38	.00
16	.00	8.3	.00	.00	.00	2.9	13	39	1.1	2.1	.00	11
17	.00	7.6	.04	.00	.00	.00	12	13	7.2	.00	4.7	3.2
18	.00	6.9	.83	.00	.00	.00	3.4	.08	9.9	9.0	.00	.29
19	.00	6.9	.00	.00	.00	.00	.00	2.8	24	13	.00	.02
20	.00	6.9	.00	.00	.00	.21	.00	3.1	59	47	.00	.20
21	.00	7.6	.00	.00	.00	.08	.00	9.9	181	27	20	.35
22	.00	2.0	.00	.00	.00	.00	.00	9.3	90	14	2.4	.32
23	.00	.00	.00	5.0	.00	.00	.00	53	52	17	26	.60
24	.00	.00	.00	.00	.00	.00	.00	18	24	5.1	.32	.00
25	13	.00	.00	.00	.00	.00	.00	7.4	18	.00	5.0	.00
26	2.2	.00	.00	.00	.00	.00	.87	28	12	.00	12	.00
27	5.4	.00	19	.00	.00	.00	1.9	137	9.1	.40	2.9	.00
28	20	.00	57	.00	.00	.00	5.9	30	111	.00	.03	.00
29	4.0	.00	1.7	.00	---	.00	.32	.33	36	1.4	.60	.00
30	1.0	.00	.21	.00	---	.05	2.2	.00	20	.00	11	.00
31	.00	---	43	.00	---	.00	---	.00	---	.00	6.5	---
TOTAL	63.60	286.00	158.68	47.93	8.20	13.24	253.37	596.71	1078.60	419.30	295.26	74.40
MEAN	2.05	9.53	5.12	1.55	.29	.43	8.45	19.2	36.0	13.5	9.52	2.48
MAX	20	41	57	24	6.0	10	61	137	181	47	90	17
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	126	567	315	95	16	26	503	1180	2140	832	586	148
CAL YR 1977	TOTAL	3105.77	MEAN	8.51	MAX	258	MIN	.00	AC-FT	6160		
WTR YR 1978	TOTAL	3295.29	MEAN	9.03	MAX	181	MIN	.00	AC-FT	6540		

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.--42 years, 4.55 ft³/s (0.129 m³/s), 3,300 acre-ft/yr (4.07 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 84 ft³/s (2.38 m³/s) Nov. 12, 1955; no flow at times.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.11	.11	.19	.11	.19	.04	.04	.11	.11	0.9	.47	.11
2	.19	.11	.33	.11	.19	.04	.11	.19	.11	12	.47	.19
3	.11	.11	.19	.11	.19	.04	.19	.19	.19	10	.33	.47
4	.11	.11	.11	.11	.11	.04	.19	.11	.19	4.0	.45	.78
5	.04	.11	.11	.04	.11	.04	.33	.04	.11	.47	5.9	.78
6	.19	.11	.19	.11	.11	.04	.33	.11	.11	.47	8.0	.78
7	.11	.04	.03	.11	.11	.04	.19	.04	.11	.33	5.8	.62
8	.33	.04	.04	.11	.19	.11	.11	.04	5.1	.33	7.9	.62
9	.47	.04	.04	.04	.04	.11	.11	.04	7.0	.19	5.3	.62
10	.62	.04	.11	.11	.04	.11	.19	.04	.19	.19	.62	.33
11	.78	.11	.11	.04	.04	.11	.19	.11	.19	.33	.78	.33
12	.78	.11	.11	.04	.11	.11	.19	.11	.19	.33	3.7	.33
13	.62	.04	.11	.04	.11	.11	.11	.11	.19	.33	8.3	.11
14	.04	.04	.19	.11	.11	.19	.11	.19	.19	.33	4.4	.33
15	.04	.04	.19	.19	.04	.19	.11	.11	.19	.33	.47	.33
16	.04	.04	.19	.19	.04	.19	.11	.04	.19	.33	.62	.47
17	.04	.04	.19	.04	.04	.11	.11	.04	.19	.19	.62	.33
18	.11	.04	.11	.04	.04	.19	.11	.04	.11	.19	.47	.11
19	.04	.04	.07	.04	.04	.11	.04	.04	.11	.11	.47	.07
20	.04	.11	.04	.04	.11	.11	.04	.04	.11	.11	.33	.19
21	.04	.11	.11	.11	.19	.07	.04	.04	11	5.4	.20	.19
22	.04	.19	.19	.19	.19	.11	.04	3.3	14	8.3	.04	.33
23	.04	.19	.11	.33	.19	.11	.11	9.9	13	3.2	4.8	.33
24	.04	.33	.11	.33	.19	.04	.19	3.0	11	.19	9.9	.62
25	.04	.33	.11	.19	.19	.11	.19	.47	11	.19	4.1	.47
26	.04	.33	.19	.19	.33	.04	.33	.33	4.8	.19	.62	.62
27	.04	.47	.33	.19	.47	.04	.11	.19	.33	.47	.62	.62
28	.04	.33	.11	.19	.47	.11	.19	.04	16	.47	1.1	.94
29	.04	.33	.04	.19	---	.11	.11	.04	13	.47	.47	.94
30	.04	.19	.04	.19	---	.11	.11	.11	11	.47	.33	.78
31	.11	---	.19	.19	---	.04	---	.11	---	.47	.04	---
TOTAL	5.32	4.23	4.18	4.02	4.18	2.92	4.33	19.27	120.01	60.28	85.67	13.74
MEAN	.17	.14	.13	.13	.15	.094	.14	.62	4.00	1.94	2.76	.46
MAX	.78	.47	.33	.33	.47	.19	.33	9.9	16	12	9.9	.94
MIN	.04	.04	.03	.04	.04	.04	.04	.04	.11	.11	.04	.07
AC-FI	11	8.4	8.3	8.0	8.3	5.8	8.6	38	238	120	170	27
CAL YR 1977	TOTAL	269.84	MEAN	.74	MAX	28	MIN	.00	AC-FI	535		
WTR YR 1978	TOTAL	328.15	MEAN	.90	MAX	16	MIN	.03	AC-FI	651		

HAWAII, ISLAND OF KAUAI

16088000 ANAHOLA DITCH ABOVE KANEHA RESERVOIR, NEAR KEALIA

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

WATER-DISCHARGE RECORDS

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

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

REMARKS.--Records good. Ditch diverts water from Anahola Stream to Kaneha Reservoir, where it is stored for irrigation. Flow sometimes diverted above station by Anahola ditch wasteway (see sta 16087000). Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report

AVERAGE DISCHARGE.--54 years (water years, 1923-25, 1928-78), 4.17 ft³/s (0.118 m³/s), 3,020 acre-ft/yr (3.72 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 62 ft³/s (1.76 m³/s) Nov. 12, 1947; no flow at times.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.8	3.1	1.6	9.3	1.4	13	2.8	5.0	4.6	.09	8.0	6.1
2	1.7	6.8	2.9	6.1	1.2	3.0	2.6	5.7	6.2	.09	13	5.1
3	1.6	7.3	9.8	4.1	1.2	1.8	2.2	10	5.9	.06	12	7.4
4	1.6	5.9	3.2	3.5	1.2	1.4	2.2	9.2	18	4.4	7.3	9.3
5	1.7	6.6	2.2	3.3	1.0	1.4	5.3	9.1	20	7.6	.33	6.1
6	3.6	13	6.3	2.9	1.0	1.4	12	16	16	8.4	.28	5.1
7	2.2	8.2	3.9	2.6	1.0	1.2	11	16	22	13	6.1	7.2
8	2.6	4.8	2.4	2.4	4.3	3.3	6.8	9.5	11	9.1	7.2	4.6
9	2.3	4.3	2.2	2.2	1.4	5.9	12	8.7	5.3	8.2	3.9	7.2
10	1.6	4.4	1.9	2.0	1.2	2.9	13	6.6	9.5	7.6	8.5	5.3
11	1.4	12	1.8	1.9	1.0	1.9	22	5.7	8.5	7.8	10	5.7
12	2.3	11	1.7	1.8	1.0	1.4	13	4.8	7.6	9.3	5.8	9.1
13	7.7	11	1.6	1.8	1.7	1.4	17	9.2	7.2	7.8	1.2	6.8
14	5.3	6.6	1.6	1.8	4.8	2.8	15	13	7.2	8.9	3.7	9.3
15	2.2	5.0	1.6	2.2	1.4	11	17	17	8.2	9.3	6.8	7.8
16	2.9	4.3	3.2	4.1	1.2	10	12	12	8.7	10	6.1	11
17	4.4	3.8	4.4	2.4	1.2	3.2	9.8	11	8.0	8.5	6.8	8.8
18	5.9	3.5	7.3	1.7	1.2	12	7.4	9.3	7.4	8.9	5.3	8.7
19	2.4	3.2	2.8	1.6	1.2	9.1	6.2	8.7	8.2	9.3	5.5	7.4
20	4.3	3.6	2.4	1.6	1.0	5.3	5.9	9.3	11	12	7.6	11
21	3.9	4.4	3.6	1.6	1.0	7.3	4.8	8.2	7.6	5.3	13	8.7
22	1.9	2.8	2.6	1.4	1.7	5.5	4.3	4.3	.13	.33	13	11
23	1.7	2.3	1.8	6.5	1.4	5.0	4.1	.20	.13	4.6	13	9.6
24	1.6	2.4	1.6	3.9	1.0	3.2	3.5	4.0	.13	8.5	.28	6.1
25	12	2.4	1.4	2.3	.97	6.9	3.3	5.5	.13	8.2	5.6	4.6
26	8.9	2.0	1.4	1.8	1.0	7.3	9.5	7.6	4.5	6.6	6.6	4.3
27	7.2	1.9	7.0	1.4	1.0	3.9	10	11	7.8	11	5.9	3.9
28	11	1.8	13	1.4	10	4.1	7.6	8.5	2.6	10	5.0	3.6
29	4.8	1.8	5.6	1.6	---	4.4	5.0	7.2	.09	10	11	3.5
30	3.3	1.7	3.5	1.4	---	7.4	4.8	6.4	.09	8.9	10	3.5
31	2.9	---	12	1.4	---	3.5	---	5.0	---	8.5	6.8	---
TOTAL	118.7	151.9	118.3	84.0	48.67	151.9	252.1	263.70	223.70	232.27	215.59	207.8
MEAN	3.83	5.06	3.82	2.71	1.74	4.90	8.40	8.51	7.46	7.49	6.95	6.93
MAX	12	13	13	9.3	10	13	22	17	22	13	13	11
MIN	1.4	1.7	1.4	1.4	.97	1.2	2.2	.20	.09	.06	.28	3.5
AC-F1	235	301	235	167	97	301	500	523	444	461	428	412
CAL YR 1977	TOTAL	1841.80	MEAN	5.05	MAX	22	MIN	.04	AC-F1	3650		
WTR YR 1978	TOTAL	2068.63	MEAN	5.67	MAX	22	MIN	.06	AC-F1	4100		

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

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

REMARKS.--Records poor. Records include flow in Lower Anahola ditch (see sta 16091000). Anahola ditch (see sta 16088000) diverts 3 mi (5 km) above station for irrigation in vicinity of Kealia. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--63 years (water years, 1914-17, 1920-78), 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, 926 ft³/s (26.2 m³/s) June 4, gage height, 4.26 ft (1.298 m); no peak above base of 2,200 ft³/s (62.3 m³/s); minimum, 3.2 ft³/s (0.091 m³/s) Feb. 25, 26.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.7	4.3	3.7	25	3.6	22	3.7	6.5	10	23	13	10
2	3.7	5.3	4.5	11	3.5	6.1	3.9	6.4	13	30	50	9.8
3	3.6	8.9	23	8.0	3.5	4.0	3.6	14	15	23	47	10
4	3.6	7.4	8.0	6.5	3.5	3.6	3.9	33	141	18	61	11
5	3.8	8.8	5.5	6.1	3.4	3.5	4.7	16	134	18	43	10
6	4.5	42	18	5.7	3.3	3.4	15	143	95	16	22	10
7	4.4	16	9.7	5.5	3.3	3.3	17	75	198	47	55	11
8	4.0	6.1	6.1	4.9	5.0	5.0	9.5	20	92	18	89	9.4
9	3.9	6.1	5.5	4.7	3.6	6.5	13	16	38	15	26	11
10	3.8	5.5	4.9	4.5	3.3	4.1	16	10	26	14	19	9.8
11	3.7	35	4.6	4.3	3.3	3.6	103	9.6	21	15	23	8.8
12	5.3	23	4.5	4.2	3.3	3.3	36	9.4	18	18	19	11
13	37	33	4.3	4.2	3.4	3.3	69	15	15	13	27	10
14	11	9.6	4.2	4.0	14	3.5	40	66	15	18	16	12
15	6.5	7.2	4.2	5.0	3.7	12	79	125	18	22	13	10
16	6.0	7.0	5.6	7.4	3.6	12	28	42	18	26	12	12
17	6.6	6.0	4.8	5.8	3.4	4.2	22	30	16	15	12	12
18	6.5	5.6	13	4.2	3.4	14	17	24	15	18	11	12
19	4.7	5.0	5.0	4.1	3.3	9.4	13	18	17	15	10	10
20	4.3	5.7	4.5	4.0	3.2	6.1	13	22	37	35	12	19
21	6.6	7.1	5.8	4.0	3.2	6.5	12	17	169	28	47	11
22	4.2	5.6	4.8	3.9	3.6	5.3	10	15	74	15	25	12
23	3.8	4.7	4.1	9.0	3.5	4.6	9.6	32	52	12	55	12
24	3.4	4.5	3.9	5.8	3.3	4.0	9.0	15	27	15	16	9.4
25	31	4.6	3.9	4.7	3.2	4.8	7.8	13	22	18	14	8.2
26	10	4.2	3.9	4.2	3.3	8.0	23	14	21	12	12	7.8
27	8.6	4.0	18	3.8	3.4	5.7	12	47	18	31	11	7.4
28	16	3.9	74	3.7	31	4.2	7.7	19	165	22	11	7.0
29	7.0	3.8	10	4.0	---	4.0	7.0	13	52	22	15	7.0
30	4.8	3.8	5.6	3.6	---	7.7	6.4	11	26	18	18	6.5
31	4.3	---	68	3.6	---	4.5	---	10	---	14	11	---
TOTAL	230.3	293.7	345.6	179.4	135.1	192.2	614.8	906.9	1578	624	815	507.1
MEAN	7.43	9.79	11.1	5.79	4.83	6.20	20.5	29.3	52.6	20.1	26.3	10.2
MAX	37	42	74	25	31	22	103	143	198	47	89	19
MIN	3.4	3.8	3.7	3.6	3.2	3.3	3.6	6.4	10	12	10	6.5
AC-FT	457	583	685	356	268	381	1220	1800	3130	1240	1620	609
CAL YR 1977	TOTAL	5776.1	MEAN	15.8	MAX	344	MIN	3.4	AC-FT	11460		
WIR YR 1978	TOTAL	6222.1	MEAN	17.0	MAX	198	MIN	3.2	AC-FT	12340		

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.

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).

AVERAGE DISCHARGE.--41 years (water years 1938-78), 3.10 ft³/s (0.088 m³/s), 2,250 acre-ft/yr (2.77 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 18.6 ft³/s (0.53 m³/s) June 1, 1938; no flow at times each year.

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.2	4.0	1.5	.00	1.7	3.8	.75	1.4	4.1	.09	3.5	1.7
2	2.2	.84	1.2	.00	1.7	3.0	.61	1.4	4.2	.20	3.4	4.2
3	2.5	.06	1.7	.00	1.6	2.2	.56	1.2	4.0	.20	3.8	4.2
4	2.4	.04	1.2	.00	1.5	1.8	.56	2.3	3.9	1.4	1.2	1.3
5	2.0	.04	1.5	.00	1.4	1.6	.61	3.8	3.9	1.8	.04	.16
6	2.2	.06	1.8	.00	1.4	1.5	.80	4.7	5.2	1.1	.06	.13
7	2.5	.06	1.2	.00	1.3	1.4	.89	5.9	4.6	.07	.27	.09
8	2.0	.06	1.9	.00	1.7	1.1	.70	6.8	3.1	.04	.18	2.1
9	1.8	.06	1.2	.01	2.0	1.2	.80	5.0	1.3	.02	.48	3.8
10	1.7	.06	1.1	1.0	1.4	.99	1.1	4.7	2.2	.10	.16	3.8
11	1.7	.06	.99	1.6	1.2	.94	1.7	4.8	5.0	.08	.04	3.8
12	1.7	.06	1.1	1.8	1.1	.89	1.3	4.2	3.0	.08	.04	4.5
13	2.9	.09	2.4	1.8	1.1	.89	1.4	4.7	2.2	.12	.04	4.2
14	3.6	.06	1.2	.75	1.8	.89	1.2	4.5	2.2	.11	.09	4.0
15	2.6	.06	1.8	.75	2.7	1.3	.99	6.2	2.1	.02	.18	3.8
16	2.5	.06	1.7	1.2	1.8	1.4	1.2	7.0	2.2	.02	.13	3.5
17	2.6	.06	.99	2.1	1.5	.70	1.2	7.0	1.7	.22	1.1	3.7
18	2.9	.06	.94	2.8	1.4	.65	1.2	6.6	1.6	.29	3.7	3.7
19	2.7	.06	1.7	2.9	1.5	.65	.94	5.4	1.1	.33	4.6	3.4
20	2.2	.04	1.4	2.8	1.3	.80	1.2	5.1	.06	.04	4.8	3.4
21	2.2	.03	1.2	1.8	1.2	.70	.89	6.8	.10	.13	5.4	3.4
22	1.9	2.5	1.2	1.8	1.2	.70	.75	3.5	.02	.04	5.4	3.3
23	1.7	3.2	1.1	2.8	1.4	.70	.89	.02	.04	.04	6.1	3.2
24	2.0	3.0	.85	3.5	1.2	.65	1.2	3.5	.06	.17	2.4	6.0
25	3.1	3.7	.80	3.0	1.1	.75	1.2	4.6	.13	.19	.42	4.1
26	3.9	3.7	.80	2.4	1.1	.75	1.5	4.3	.17	.41	.35	3.5
27	3.5	3.0	.46	2.2	.82	.89	1.7	5.0	.16	.09	.35	3.8
28	3.8	2.1	.00	2.0	1.6	.89	1.9	5.9	.25	1.3	2.2	4.0
29	3.8	2.4	.00	2.0	---	1.1	1.5	5.1	.09	3.0	3.4	3.7
30	2.5	1.4	.00	2.0	---	.89	1.4	4.6	.16	2.7	.26	3.3
31	3.3	---	.00	1.8	---	.89	---	4.2	---	3.0	.23	---
TOTAL	78.6	30.92	34.93	44.81	40.72	36.61	32.64	140.22	58.84	17.40	54.32	97.78
MEAN	2.54	1.03	1.13	1.45	1.45	1.18	1.09	4.52	1.96	.56	1.75	3.26
MAX	3.9	4.0	2.4	3.5	2.7	3.8	1.9	7.0	5.2	3.0	6.1	6.0
MIN	1.7	.03	.00	.00	.82	.65	.56	.02	.02	.02	.04	.09
AC-FT	156	61	69	89	81	73	65	278	117	35	108	194
CAL YR 1977	TOTAL	860.60	MEAN	2.36	MAX	8.2	MIN	.00	AC-FT	1710		
WTR YR 1978	TOTAL	667.79	MEAN	1.83	MAX	7.0	MIN	.00	AC-FT	1320		

HAWAII, ISLAND OF KAUAI

63

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.--13 years (water years 1966-78), 34.5 ft³/s (0.977 m³/s), 25,000 acre-ft/yr (30.8 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, 1,300 ft³/s (36.8 m³/s), June 4, 1978, gage height, 8.34 ft (2.542 m), no peak above base of 2,200 ft³/s (62.3 m³/s); minimum, 3.4 ft³/s (0.10 m³/s) Feb. 16, 17.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.5	7.6	6.9	4.9	4.8	4.0	5.1	8.4	12	41	16	13
2	4.8	7.6	7.6	21	4.8	8.4	5.1	8.7	14	63	53	9.6
3	4.8	12	51	14	4.5	5.4	4.8	16	11	52	49	9.6
4	4.5	13	15	11	4.5	4.8	4.8	34	173	30	75	13
5	4.8	11	6.5	10	4.2	4.5	5.1	24	215	21	66	15
6	5.4	57	31	9.1	4.8	4.8	20	165	122	18	48	13
7	6.1	27	18	8.0	4.2	5.1	18	128	252	56	73	16
8	5.4	9.1	8.0	7.2	5.4	7.6	14	42	181	30	151	12
9	5.1	8.4	6.5	7.2	4.8	9.1	12	23	74	24	48	10
10	5.1	8.0	5.4	7.2	4.2	7.2	16	16	50	22	24	9.6
11	5.1	49	5.1	5.8	4.0	5.8	134	13	44	18	28	9.6
12	5.1	42	5.1	6.1	4.0	5.1	47	11	28	24	26	12
13	51	103	5.8	6.5	4.0	5.1	89	16	20	18	52	10
14	26	21	4.5	5.8	12	5.4	47	78	17	21	34	14
15	7.6	11	5.1	6.9	4.5	15	99	216	21	25	18	11
16	7.2	14	6.5	9.6	3.7	15	67	112	21	28	14	14
17	8.7	20	6.5	11	3.7	7.2	34	81	21	21	14	12
18	9.1	18	19	7.2	3.7	18	21	52	23	23	10	14
19	6.5	17	7.2	6.1	3.7	11	16	23	31	21	8.7	11
20	6.1	17	5.4	5.4	3.7	8.0	14	23	44	32	9.1	22
21	9.1	21	6.5	5.4	3.7	7.2	11	43	306	39	52	11
22	5.8	22	6.9	5.8	4.0	7.2	10	25	145	39	30	16
23	5.4	14	5.1	10	4.2	6.1	10	84	105	31	68	13
24	5.1	8.4	4.5	7.2	3.7	5.8	9.1	31	63	23	34	14
25	51	10	4.2	5.4	3.7	5.4	8.7	18	52	23	28	11
26	16	10	4.2	4.8	4.0	9.1	27	18	40	16	16	9.1
27	11	8.4	27	4.5	4.8	8.7	29	82	23	34	17	8.7
28	27	7.6	152	4.5	29	5.8	10	69	253	25	15	8.7
29	10	9.6	22	4.8	---	5.4	8.7	30	113	25	18	8.0
30	6.5	8.7	12	4.5	---	8.0	8.0	17	50	18	21	7.2
31	6.5	---	113	4.5	---	6.9	---	13	---	16	17	---
TOTAL	336.3	592.4	583.5	275.5	150.3	268.1	804.4	1520.1	2524	877	1132.8	357.1
MEAN	10.8	19.7	18.8	8.89	5.37	8.65	26.8	49.0	84.1	28.3	36.5	11.9
MAX	51	103	152	49	29	40	134	216	306	63	151	22
MIN	4.5	7.6	4.2	4.5	3.7	4.5	4.8	8.4	11	16	8.7	7.2
AC-FT	667	1180	1160	546	298	532	1600	3020	5010	1740	2250	708
CAL YR 1977	TOTAL	8815.6	MEAN	24.2	MAX	589	MIN	4.2	AC-FT	17490		
WTR YR 1978	TOTAL	9421.5	MEAN	25.8	MAX	306	MIN	3.7	AC-FT	18690		

HAWAII, ISLAND OF KAUAI

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

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

DRAINAGE AREA.--1.9 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.--20 years (water years 1959-78), 11.2 ft³/s (0.317 m³/s), 8,110 acre-ft/yr (10.0 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, 345 ft³/s (9.77 m³/s) June 7, gage height, 3.68 ft (1.122 m), no peak above base of 580 ft³/s (16.4 m³/s); minimum, 3.4 ft³/s (0.10 m³/s) Feb. 19, 20.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.4	7.1	4.4	14	4.6	12	5.3	5.5	6.6	13	11	9.9
2	4.4	8.7	5.5	8.4	4.6	5.1	4.8	5.7	7.1	16	30	8.7
3	4.4	13	10	6.8	4.3	4.2	4.8	9.1	8.7	13	25	9.6
4	4.4	9.3	5.7	6.2	4.3	4.2	5.1	13	28	11	27	10
5	4.4	9.0	5.1	5.9	4.3	4.1	6.2	8.1	8.4	12	17	9.0
6	4.1	22	7.8	4.9	4.3	4.2	14	47	32	17	11	8.7
7	4.4	14	5.9	5.5	4.0	4.1	12	23	116	22	20	9.0
8	4.2	9.6	5.1	5.3	4.0	4.1	8.7	11	59	13	35	8.1
9	4.1	8.7	4.9	4.9	4.2	4.9	9.3	9.9	28	11	15	9.9
10	4.1	7.8	4.8	4.8	3.8	4.2	12	7.5	16	9.6	11	8.7
11	4.1	17	4.6	4.8	3.8	4.2	48	6.8	13	10	13	8.1
12	4.2	16	4.6	4.6	3.8	4.2	17	6.4	12	11	12	11
13	16	39	4.4	4.6	3.7	4.2	19	9.8	10	9.6	18	9.3
14	7.4	9.9	4.4	4.4	3.7	5.0	17	52	9.6	10	10	12
15	5.3	8.7	4.2	4.9	3.9	7.1	42	59	9.3	16	9.6	12
16	6.2	7.5	4.8	5.5	3.7	6.6	16	21	13	12	8.7	17
17	6.6	7.1	4.9	4.8	3.6	4.6	11	14	10	12	9.3	14
18	6.6	6.6	6.2	4.4	3.6	6.6	9.0	11	9.9	12	8.1	11
19	5.7	6.4	4.4	4.2	3.6	5.9	7.5	10	19	12	8.4	10
20	7.3	8.8	4.2	4.2	3.6	5.1	6.8	10	22	18	9.0	18
21	6.6	6.2	4.4	4.1	3.6	8.2	6.4	9.6	80	16	32	14
22	5.7	5.7	4.4	4.2	4.1	6.8	6.2	9.3	42	12	18	11
23	5.7	5.7	4.2	5.3	3.9	6.6	5.7	17	50	11	25	9.0
24	5.7	5.9	4.1	4.9	3.7	5.7	5.7	9.0	35	11	14	7.4
25	9.1	5.7	4.2	4.6	3.7	6.4	5.3	8.1	22	12	12	6.6
26	7.8	5.3	4.2	4.4	3.7	7.3	7.9	7.8	15	12	9.9	6.6
27	7.6	5.1	13	4.4	3.6	6.6	7.3	19	10	13	9.0	6.4
28	9.9	5.1	37	4.4	16	6.6	5.9	10	72	14	8.7	6.2
29	6.8	4.9	8.4	4.6	---	6.6	5.7	7.8	23	15	12	6.2
30	6.6	4.8	6.4	4.6	---	7.5	5.3	7.3	14	11	16	6.6
31	6.2	---	29	4.6	---	6.4	---	6.8	---	9.0	11	---
TOTAL	190.2	290.6	225.2	163.2	121.7	179.3	336.9	451.5	872.2	396.2	475.7	294.0
MEAN	6.14	9.69	7.26	5.26	4.35	5.78	11.2	14.6	29.1	12.8	15.3	9.80
MAX	16	39	37	14	16	12	48	59	116	22	35	18
MIN	4.1	4.8	4.1	4.1	3.6	4.1	4.8	5.5	6.6	9.0	8.1	6.2
AC-FT	377	576	447	324	241	356	668	896	1730	786	944	583
CAL YR 1977	TOTAL	3340.9	MEAN	9.15	MAX	71	MIN	3.8	AC-FT	6630		
WTR YR 1978	TOTAL	3996.7	MEAN	10.9	MAX	116	MIN	3.6	AC-FT	7930		

HAWAII, ISLAND OF KAUAI

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16100000 HANAIEI TUNNEL OUTLET NEAR LIHUE

LOCATION.--Lat 22°05'02", long 159°27'50", Hydrologic Unit 2007000, on right bank at outlet of Hanalei tunnel, 2.2 mi (3.5 km) downstream from intake on Kaapoko Stream, and 9.4 mi (15.1 km) northwest of Lihue.

WATER-DISCHARGE RECORDS

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

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

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

AVERAGE DISCHARGE.--46 years, 27.3 ft³/s (0.773 m³/s), 19,780 acre-ft (24.4 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 99 ft³/s (2.80 m³/s) Apr. 11, 25, 26, 1942; no flow at times.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	23	28	18	31	17	21	23	27	25	27	27	27
2	23	35	23	27	17	15	21	29	27	42	37	25
3	25	17	36	26	17	14	21	32	25	33	32	26
4	26	33	22	25	17	14	20	30	28	27	35	28
5	25	36	21	24	16	14	28	29	46	27	36	25
6	31	47	38	24	17	15	34	37	41	38	30	25
7	27	42	26	23	17	14	33	37	43	39	37	27
8	32	35	23	23	17	23	27	30	34	31	48	25
9	28	36	22	22	16	27	30	30	25	29	33	24
10	29	31	22	22	16	17	31	27	25	27	30	24
11	27	39	21	21	16	18	45	27	23	28	30	25
12	25	40	21	21	15	17	32	27	23	30	30	27
13	33	36	21	20	15	15	37	32	24	28	35	25
14	27	30	20	20	17	14	49	40	34	27	38	27
15	27	34	20	21	16	33	46	45	29	26	33	35
16	28	29	28	25	15	31	38	45	32	25	29	38
17	32	28	28	20	14	21	33	34	32	27	30	36
18	30	27	31	19	15	34	30	30	28	30	27	31
19	26	27	25	19	14	29	30	28	30	26	30	31
20	27	27	25	18	14	27	30	27	34	31	28	34
21	24	27	24	18	14	27	27	27	47	27	36	33
22	23	25	21	18	13	25	26	28	42	32	35	30
23	22	20	21	24	13	25	25	32	39	28	43	28
24	22	18	20	19	13	21	24	27	30	25	36	27
25	41	18	19	18	13	22	24	29	27	23	34	26
26	35	18	19	18	13	22	31	34	26	24	29	25
27	33	17	44	18	13	21	31	36	25	27	28	25
28	38	17	56	18	17	25	29	35	37	29	28	25
29	28	17	33	17	---	26	27	29	37	28	29	24
30	26	18	28	17	---	30	28	28	28	25	32	24
31	25	---	37	17	---	24	---	26	---	26	27	---
TOTAL	868	872	813	653	427	681	910	974	946	892	1012	832
MEAN	28.0	29.1	26.2	21.1	15.3	22.0	30.3	31.4	31.5	28.8	32.6	27.7
MAX	41	47	56	31	17	34	49	45	47	42	48	38
MIN	22	17	18	17	13	14	20	26	23	23	27	24
AC-FT	1720	1730	1610	1300	847	1350	1800	1930	1880	1770	2010	1650
CAL YR 1977	TOTAL	9346.5	MEAN 25.6	MAX 56	MIN 7.7	AC-FT 18540						
WTR YR 1978	TOTAL	9880.0	MEAN 27.1	MAX 56	MIN 13	AC-FT 19600						

HAWAII, ISLAND OF KAUAI

16103000 HANAIEI RIVER NEAR HANAIEI

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 (WATER YEARS).--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).--15 years (water years 1964-78), 217 ft³/s (6.145 m³/s) 157,200 ac-ft/yr (194 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, 7,020 ft³/s (119 m³/s) Dec. 27, gage height, 8.91 ft (2.716 m), no peak above base of 9,200 ft³/s (261 m³/s); minimum, 38 ft³/s (1.08 m³/s) Feb. 28.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	41	73	52	209	46	85	57	71	71	153	150	98
2	40	183	59	119	44	49	61	77	82	519	755	90
3	40	290	181	92	44	42	55	133	70	239	538	94
4	41	176	61	80	44	41	52	104	221	141	619	121
5	42	164	54	75	44	40	78	94	1890	135	296	92
6	54	493	246	69	43	41	251	337	680	329	155	85
7	48	298	78	66	43	41	298	521	2860	465	521	90
8	49	109	59	63	47	49	108	135	952	215	890	80
9	47	93	56	60	43	80	353	108	350	155	235	94
10	50	86	54	58	42	49	303	86	192	145	160	82
11	45	331	52	56	42	44	895	78	145	144	198	77
12	46	327	51	54	41	44	299	75	141	155	180	94
13	254	329	50	53	41	44	452	245	131	168	397	85
14	120	114	49	52	44	46	821	783	286	176	236	165
15	53	113	49	53	42	457	787	1180	229	145	158	405
16	58	87	78	67	40	351	310	746	287	217	112	362
17	67	80	102	56	40	68	192	324	278	155	125	246
18	100	74	176	51	43	205	125	228	243	192	98	202
19	52	69	81	50	42	110	104	141	356	202	131	155
20	58	67	65	49	40	85	96	131	435	219	104	417
21	61	68	67	49	39	87	85	110	1680	224	628	300
22	53	62	61	48	40	82	76	108	995	157	310	200
23	44	61	55	99	40	70	70	165	1100	135	462	140
24	43	60	52	56	39	62	67	90	740	112	198	110
25	780	60	51	50	39	68	64	93	490	100	190	90
26	168	58	51	49	40	64	230	151	310	90	125	90
27	155	56	1010	47	39	58	250	242	143	138	106	86
28	278	55	1590	46	67	66	103	230	1000	162	100	80
29	104	54	196	46	---	80	88	94	480	175	115	80
30	76	52	110	46	---	106	82	85	188	155	189	90
31	69	---	407	46	---	64	---	77	---	115	112	---
TOTAL	3136	4142	5303	2014	1198	2778	6812	7042	17025	5832	8593	4400
MEAN	101	138	171	65.0	42.8	89.6	227	227	568	188	277	147
MAX	780	493	1590	209	67	457	895	1180	2860	519	890	417
MIN	40	52	49	46	39	40	52	71	70	90	98	77
AC-FI	6220	8220	10520	3990	2380	5510	13510	13970	33770	11570	17040	8730
CAL YR 1977	TOTAL	55579	MEAN 152	MAX 1590	MIN 40	AC-FI 110200						
WTR YR 1978	TOTAL	68275	MEAN 187	MAX 2860	MIN 39	AC-FI 135400						

HAWAII, ISLAND OF KAUAI

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16108000 WAINIHA RIVER NEAR HANAIEI

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 mi² (26.4 km²).

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.--23 years (water years, 1953-55, 1959-78), 139 ft³/s (3.936 m³/s), 100,700 acre-ft/yr (124 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 28,100 ft³/s (796 m³/s) Apr. 19, 1974, gage height, 9.47 ft (2.886 m), from rating curve extended above 1,100 ft³/s (31.2 m³/s) on basis of slope-area measurement at gage height 7.72 ft (2.353 m); minimum, 33.0 ft³/s (0.93 m³/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 ft³/s (1,130 m³/s), from unit-discharge study.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 3,100 ft³/s (87.8 m³/s) July 2, gage height, 5.02 ft (1.530 m), from rating curve extended as explained above, no peak above base of 3,600 ft³/s (102 m³/s); minimum, 33 ft³/s (0.93 m³/s) Feb. 11, 12.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	47	79	45	88	37	82	56	66	43	81	144	66
2	47	202	68	61	37	46	62	74	74	460	304	58
3	53	355	264	52	37	37	52	65	59	118	162	66
4	65	174	58	48	37	36	49	68	78	76	174	100
5	62	205	45	47	37	45	171	76	340	83	204	65
6	85	533	333	45	36	48	230	98	218	241	102	62
7	67	182	83	47	36	37	126	176	475	220	468	92
8	84	81	57	53	37	43	64	72	262	108	522	63
9	62	67	49	45	35	92	128	89	126	94	118	65
10	75	61	47	43	35	45	160	56	68	81	83	61
11	51	154	44	42	35	48	418	50	58	102	107	66
12	43	171	42	40	35	45	136	61	75	122	122	87
13	42	178	42	40	36	38	147	210	88	110	136	76
14	43	77	41	40	53	35	419	400	250	105	114	103
15	47	85	40	45	38	195	244	480	150	81	75	445
16	58	55	154	95	36	262	177	225	247	108	59	273
17	92	52	230	51	35	74	97	87	235	117	98	245
18	75	48	253	43	36	220	66	64	142	154	57	146
19	53	47	142	41	35	126	85	53	218	108	149	141
20	72	48	95	40	35	95	126	49	282	162	88	221
21	54	47	88	41	35	88	63	47	230	121	527	152
22	45	45	64	40	35	72	54	51	256	131	185	113
23	45	44	51	52	35	60	56	81	290	93	272	71
24	45	45	48	45	34	49	49	47	102	76	122	62
25	445	42	46	41	34	56	47	69	78	63	104	56
26	198	41	45	40	34	51	87	130	77	62	72	56
27	165	40	276	39	34	44	128	93	72	93	66	52
28	214	40	385	40	42	72	90	95	630	123	71	49
29	80	39	72	40	---	104	70	52	293	120	90	49
30	60	41	56	39	---	111	76	56	97	86	134	56
31	55	---	110	38	---	55	---	48	---	100	72	---
TOTAL	2629	3278	3373	1461	1021	2411	3733	3238	5613	3799	5001	3222
MEAN	84.8	109	109	47.1	36.5	77.8	124	104	187	123	161	107
MAX	445	533	385	95	53	262	419	480	630	460	527	445
MIN	42	39	40	38	34	35	47	47	43	62	57	49
AC-FT	5210	6500	6690	2900	2030	4780	7400	6420	11130	7540	9920	6390

CAL YR 1977 TOTAL 39321 MEAN 108 MAX 696 MIN 39 AC-FT 77990
WTR YR 1978 TOTAL 38779 MEAN 106 MAX 630 MIN 34 AC-FT 76920

HAWAII, ISLAND OF OAHU

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

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

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

AVERAGE DISCHARGE.--55 years (water years, 1914-24, 1927-52, 1961-78), 16.5 ft³/s (0.467 m³/s), 11,950 acre-ft/yr (14.7 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, 1,400 ft³/s (39.6 m³/s) June 28, gage height, 6.43 ft (1.960 m), no other peak above base of 1,300 ft³/s (36.8 m³/s); minimum, 0.18 ft³/s (0.005 m³/s) Feb. 26, 27, Mar. 7, 8.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.4	20	.95	1.8	.31	3.0	1.7	13	5.1	12	44	9.4
2	4.4	32	.85	3.7	.26	.72	1.7	9.5	4.7	75	25	6.6
3	5.7	61	.70	1.3	.26	.31	2.3	7.5	4.2	24	6.9	6.2
4	2.5	28	2.3	.72	.24	.22	1.0	4.0	4.0	49	17	5.7
5	1.5	18	1.1	.52	.24	.22	.90	6.6	65	12	42	22
6	2.1	23	1.6	.49	.31	.20	9.9	45	39	119	17	18
7	1.6	6.8	3.1	.43	.52	.18	15	17	9.8	33	143	21
8	2.4	4.6	1.0	.40	.56	.20	7.3	5.7	19	21	102	6.8
9	12	5.5	.85	.37	.56	12	41	5.1	10	26	15	6.2
10	22	3.4	1.0	.37	.52	3.8	38	4.0	6.4	12	11	8.2
11	2.3	4.2	.95	.34	.52	3.7	42	3.5	5.1	12	9.2	5.9
12	1.5	4.8	.72	.34	.76	.76	9.0	8.9	8.0	24	29	18
13	1.3	3.4	.64	.34	3.7	.68	46	20	6.9	16	60	6.2
14	1.1	2.5	.60	.31	7.1	20	53	50	29	9.2	17	13
15	1.1	13	.56	.43	2.0	2.9	10	72	10	7.8	9.6	6.2
16	5.2	3.1	.95	1.1	1.2	11	12	41	16	7.6	15	44
17	2.1	3.0	36	1.3	1.9	1.4	5.9	14	22	7.8	53	71
18	1.5	2.4	27	.46	1.7	1.8	4.4	8.0	9.2	13	27	30
19	1.0	2.0	4.4	.34	1.4	1.3	5.1	6.2	66	8.3	19	31
20	1.1	1.8	2.6	.23	.40	.68	81	5.1	114	17	14	33
21	.95	1.6	1.6	.31	.28	3.4	8.6	29	52	9.5	170	65
22	1.2	1.6	1.3	2.0	.22	5.1	5.5	9.5	19	6.6	40	30
23	1.1	1.6	1.0	.68	.22	14	5.1	59	12	5.5	52	20
24	1.1	1.5	.90	.40	.20	2.0	4.1	16	0.4	13	15	11
25	18	1.3	.85	1.5	.20	3.7	4.1	6.9	13	11	21	9.4
26	14	1.2	.80	.95	.19	25	13	16	27	5.9	14	9.4
27	7.1	1.1	.72	.43	.18	3.4	8.7	39	11	11	9.8	8.1
28	5.0	1.0	.68	.31	.24	2.4	15	8.3	256	4.9	8.9	7.1
29	1.6	1.0	.64	6.8	---	1.6	8.4	12	20	17	20	7.5
30	1.3	1.0	.60	1.2	---	14	7.8	8.8	12	7.9	17	6.6
31	3.2	---	.64	.49	---	2.0	---	6.4	---	4.6	8.0	---
TOTAL	128.35	255.4	116.90	30.41	55.48	141.67	467.50	557.0	884.8	602.6	1050.4	542.3
MEAN	4.14	8.51	3.77	.98	1.98	4.57	15.6	18.0	29.5	19.4	33.9	18.1
MAX	22	61	36	6.8	33	25	91	72	256	119	170	71
MIN	.95	1.0	.56	.28	.18	.18	.90	3.5	4.0	4.6	6.9	5.7
AC-FT	255	507	232	60	110	281	927	1100	1750	1200	2080	1080
CAL YR 1977	TOTAL	4343.93	MEAN	11.9	MAX	294	MIN	.16	AC-FT	8620		
WTR YR 1978	TOTAL	4832.81	MEAN	13.2	MAX	256	MIN	.18	AC-FT	9590		

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).--16 years (water years, 1961-62, (1965-78), 21.7 ft³/s (0.615 m³/s), 15,720 acre-ft/yr (19.4 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,460 ft³/s (155 m³/s) Apr. 15, 1963, gage height, 11.33 ft (3.453 m), from rating curve extended above 1,100 ft³/s (31.2 m³/s) on basis of computation of peak flow over dam; no flow Dec. 24, 25, 27, 28, 1960, Feb. 23, 24, 1963, and many days in 1977, 1978.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 775 ft³/s (21.9 m³/s) June 28, gage height, 4.49 ft (1.369 m), no peak above base of 1,100 ft³/s (31.2 m³/s); no flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.3	2.9	.82	1.1	.20	.00	.85	4.2	6.3	18	20	8.5
2	1.4	60	.75	2.5	.14	.00	.63	6.3	5.2	59	46	8.6
3	1.1	217	27	2.5	.05	.00	.53	5.6	4.7	23	8.9	6.2
4	1.3	33	8.4	1.3	.01	.00	.69	3.4	4.3	92	17	6.2
5	1.2	24	2.3	.85	.00	.00	.47	2.7	68	25	27	6.5
6	2.1	24	1.6	.69	.00	.00	1.8	28	64	88	27	20
7	3.0	8.6	3.2	.65	.00	.00	6.7	45	15	31	59	53
8	1.4	5.6	2.3	.60	.00	.00	12	6.1	10	20	130	10
9	1.1	4.8	1.2	.54	.00	.00	47	5.2	8.8	18	22	7.6
10	32	4.1	.90	.50	.00	.00	85	3.5	5.6	15	14	6.0
11	4.4	7.7	.76	.47	.00	.00	87	2.7	4.8	13	15	5.7
12	1.8	7.4	.69	.43	.00	.00	23	2.8	5.7	25	24	23
13	1.2	4.6	.64	.38	.00	.00	12	36	5.4	22	86	8.7
14	1.1	2.9	.61	.36	4.1	19	39	106	10	12	13	24
15	.82	6.9	.61	.40	1.4	4.6	8.0	70	13	10	9.8	6.8
16	.77	4.2	.73	.81	.58	23	14	65	27	11	8.8	36
17	.83	2.9	37	2.1	.36	3.8	9.3	16	18	12	53	64
18	1.0	2.3	79	2.2	.24	1.4	4.7	15	13	18	11	27
19	.91	1.6	13	1.2	.17	4.3	3.6	8.3	76	12	13	27
20	.98	1.2	5.0	.82	.36	1.3	166	7.4	68	29	22	73
21	.78	.97	3.1	.63	.48	3.6	25	60	100	16	123	98
22	.62	1.1	2.3	4.2	.30	3.2	10	21	36	8.5	34	51
23	.53	1.3	1.6	3.8	.17	4.3	7.2	121	26	7.1	33	28
24	.48	1.2	1.3	1.9	.05	2.4	5.8	23	15	14	14	15
25	13	1.2	1.1	1.2	.00	1.0	5.3	13	22	18	13	13
26	7.1	1.0	1.0	.91	.00	32	30	11	57	8.1	26	12
27	14	.90	.96	.74	.00	7.3	24	40	21	16	11	10
28	9.4	.83	.88	.60	.00	4.6	12	11	268	7.5	9.2	9.2
29	3.7	.80	.79	.51	---	2.6	6.5	7.9	45	13	13	8.2
30	1.4	.85	.75	.42	---	1.1	5.0	7.9	23	17	15	7.6
31	.88	---	.85	.28	---	1.4	---	8.3	---	7.8	8.1	---
TOTAL	111.60	435.85	201.14	35.59	8.61	120.90	653.07	763.3	1045.8	686.0	925.8	629.8
MEAN	3.60	14.5	6.49	1.15	.31	3.90	21.8	24.6	34.9	22.1	29.9	21.0
MAX	32	217	79	4.2	4.1	32	166	121	268	92	130	73
MIN	.48	.80	.61	.28	.00	.00	.47	2.7	4.3	7.1	8.1	5.7
AC-FT	221	865	399	71	17	240	1300	1510	2070	1360	1840	1250
CAL YR 1977	TOTAL	5278.99	MEAN	14.5	MAX	379	MIN	.00	AC-FT	10470		
WTR YR 1978	TOTAL	5617.46	MEAN	15.4	MAX	268	MIN	.00	AC-FT	11140		

HAWAII, ISLAND OF OAHU

16210900 POAMOHO TUNNEL NEAR WAHIAWA

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

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

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

REMARKS.--Records good. Tunnel diverts from Poamoho Stream to North Fork Kaukonahua Stream to augment storage in Wahiawa Reservoir.

AVERAGE DISCHARGE.--20 years, 4.82 ft³/s (0.137 m³/s), 3,490 acre-ft/yr (4.30 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 265 ft³/s (7.50 m³/s) Mar. 16, 1968; no flow at times.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.11	1.5	.08	.15	.11	.00	.36	8.6	2.7	4.4	7.3	1.9
2	2.7	6.8	.08	.90	.05	.00	.23	8.2	2.3	20	8.2	1.8
3	1.6	32	12	1.1	.02	.00	.16	6.1	2.1	4.3	1.6	1.5
4	.93	4.7	2.7	.36	.01	.00	.11	2.3	2.0	9.6	7.6	1.5
5	.54	4.3	.62	.17	.01	.00	.06	1.7	9.8	4.3	7.5	6.4
6	.32	10	.41	.11	.01	.00	.05	11	21	22	3.0	7.6
7	.21	3.8	3.2	.08	.01	.00	12	10	6.4	11	21	4.7
8	1.9	1.4	.62	.05	.01	.00	5.1	2.4	3.7	5.3	25	2.0
9	.98	.98	.32	.03	.00	.36	12	1.9	4.6	5.2	4.7	1.5
10	5.6	.74	.47	.02	.00	7.9	17	1.4	2.3	3.3	2.8	1.5
11	1.0	.66	.44	.02	.00	2.1	16	1.2	1.8	2.7	2.2	1.6
12	.44	3.1	.23	.02	.00	.58	5.8	1.8	2.0	2.8	15	1.6
13	.27	1.1	.13	.02	.00	.41	8.3	11	2.7	2.8	17	1.5
14	.21	.62	.09	.01	4.2	1.9	13	15	12	2.1	4.5	2.2
15	.15	2.0	.06	.01	.70	.88	3.4	10	4.7	1.8	2.7	1.4
16	.13	.91	.06	.01	.21	4.3	3.8	13	2.4	1.9	2.1	6.4
17	.21	1.6	12	.71	.10	1.0	2.9	3.4	4.0	1.8	9.8	21
18	.19	.74	16	.34	.11	.38	1.4	3.0	2.9	2.0	2.6	7.8
19	.11	.47	3.5	.12	.07	.27	1.2	2.0	10	1.7	12	11
20	.11	.36	1.2	.06	.21	.21	35	2.2	22	3.2	3.4	10
21	.07	.30	.70	.03	.10	.15	6.1	23	54	2.1	30	8.4
22	.05	.27	.47	.90	.05	.50	2.7	7.6	7.5	1.5	8.9	10
23	.03	.25	.36	.70	.02	2.5	2.0	41	5.1	1.3	12	3.4
24	.03	.23	.27	.25	.02	.74	1.5	7.9	3.6	1.4	5.0	2.4
25	5.2	.19	.21	.10	.01	.30	1.3	4.7	3.4	3.4	5.3	2.0
26	3.6	.27	.16	.05	.01	6.0	2.6	4.7	5.0	2.4	4.5	1.8
27	3.0	.16	.13	.02	.00	2.3	3.9	23	4.8	1.6	2.9	1.7
28	2.8	.12	.12	.02	.00	.88	5.5	5.3	68	1.4	2.4	1.5
29	.98	.10	.11	.50	---	.66	3.0	7.9	14	1.3	2.7	1.4
30	.38	.08	.09	1.2	---	4.0	3.3	4.4	5.8	1.3	3.1	1.4
31	.21	---	.10	.30	---	.93	---	3.6	---	1.2	2.2	---
TOTAL	34.06	79.75	56.93	8.36	6.04	39.25	169.77	249.3	291.6	131.1	238.0	128.9
MEAN	1.10	2.66	1.84	.27	.22	1.27	5.66	8.04	9.72	4.23	7.68	4.30
MAX	5.6	32	16	1.2	4.2	7.9	35	41	68	22	30	21
MIN	.03	.08	.06	.01	.00	.00	.05	1.2	1.8	1.2	1.6	1.4
AC-FI	68	158	113	17	12	78	337	494	578	260	472	256
CAL YR 1977	TOTAL	1463.58	MEAN	4.01	MAX	71	MIN	.00	AC-FT	2900		
WTR YR 1978	TOTAL	1433.06	MEAN	3.93	MAX	68	MIN	.00	AC-FT	2840		

HAWAII, ISLAND OF OAHU

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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. 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.--19 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, 126 ft³/s (3.57 m³/s) May 23, gage height, 3.00 ft (0.914 m), from rating curve extended as explained above, no peak above base of 200 ft³/s (5.66 m³/s); no flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.05	.13	.03	1.2	.24	1.9	.78	1.3	1.6	2.1	.85	.24
2	.02	.11	.02	.78	.24	.99	.66	1.2	1.4	1.6	1.3	.24
3	.02	.13	1.3	.66	.24	.66	.54	1.1	1.3	1.3	.78	.24
4	.01	.13	1.8	.54	.21	.60	.49	4.1	1.2	1.1	.66	.24
5	.01	.09	.92	.44	.21	.72	.44	7.0	3.9	.99	.60	.21
6	.00	.09	3.0	.39	.21	.92	.44	7.6	3.7	1.1	.66	.21
7	.00	.07	2.4	.39	.18	.78	.60	7.0	2.3	1.1	1.1	.21
8	.00	.09	1.1	.39	.18	.66	.72	3.9	1.7	.78	3.7	.18
9	.00	.11	.85	.39	.15	.54	2.1	2.8	1.4	.72	1.1	.18
10	.00	.13	.72	.44	.18	.44	7.8	2.3	1.2	.66	.78	.18
11	.00	.13	.60	.39	.15	.39	6.7	1.9	1.2	.78	.66	.18
12	.00	.13	.49	.39	.15	.39	4.7	1.9	.99	.72	.54	.15
13	.00	.11	.39	.35	.15	.35	4.7	2.4	.92	.72	.54	.15
14	.00	.09	.35	.35	.15	.35	4.1	2.8	.85	.72	.49	.15
15	.00	.09	.31	2.5	.15	.35	2.7	3.0	.85	.78	.49	.15
16	.00	.09	.31	6.7	.13	1.9	2.7	2.1	.78	.66	.44	.15
17	.00	.07	1.9	3.5	.13	.99	1.9	1.6	.78	.66	.49	.18
18	.00	.05	4.7	2.0	.24	.72	1.6	1.4	.78	.78	.49	.39
19	.00	.05	2.3	1.5	.35	.72	2.7	1.3	.54	.85	.49	.39
20	.00	.04	1.3	.99	.35	.60	21	1.9	.49	.72	.44	.35
21	.00	.04	.99	.85	.35	.54	9.0	8.4	2.3	.72	.54	.27
22	.00	.04	.78	.72	.31	.44	5.4	3.5	.99	.78	.60	.24
23	.00	.05	.66	.60	.31	.39	3.9	16	.60	.78	.54	.21
24	.00	.03	.54	.54	.27	.35	2.8	8.7	.49	8.1	.44	.18
25	.60	.04	.49	.44	.24	.49	2.3	5.4	.49	2.7	.44	.15
26	.09	.02	.39	.39	.21	6.4	4.5	3.9	.60	1.4	.39	.15
27	.09	.02	.39	.35	.18	3.0	3.2	3.5	.78	1.1	.39	.13
28	.11	.02	.35	.35	1.8	1.9	2.0	3.2	8.1	.99	.35	.13
29	.13	.01	.31	.31	---	1.4	1.7	2.4	6.1	.99	.35	.11
30	.15	.03	.27	.27	---	1.1	1.4	2.1	3.2	.85	.35	.11
31	.15	---	.99	.27	---	.85	---	1.8	---	.72	.27	---
TOTAL	1.43	2.23	42.65	29.38	7.66	31.83	103.57	117.5	51.53	37.97	21.26	6.05
MEAN	.046	.074	1.38	.95	.27	1.03	3.45	3.79	1.72	1.22	.69	.20
MAX	.60	.13	13	6.7	1.8	6.4	21	16	8.1	8.1	3.7	.39
MIN	.00	.01	.02	.27	.13	.35	.44	1.1	.49	.66	.27	.11
AC-FT	2.8	4.4	85	58	15	63	205	233	102	75	42	12

CAL YR 1977 TOTAL 312.41 MEAN .86 MAX 13 MIN .00 AC-FT 620
WTR YR 1978 TOTAL 453.06 MEAN 1.24 MAX 21 MIN .00 AC-FT 899

HAWAII, ISLAND OF OAHU

16212800 KIPAPA STREAM NEAR WAHIAWA

LOCATION.--Lat 12°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) north-east 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.--21 years, 10.6 ft³/s (0.300 m³/s), 7,680 acre-ft/yr (9.47 hm³/yr).

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

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

Date	Time	Discharge (ft ³ /s) (m ³ /s)	Gage height (ft) (m)
June 28	1415	*1410 39.9	7.92 2.414
Aug. 12	0640	956 27.1	6.94 2.115

No flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.17	.71	.23	2.2	.06	.00	.32	3.0	2.2	8.1	13	3.1
2	.17	19	.09	4.0	.02	.00	.20	7.2	1.5	50	25	3.6
3	.09	53	34	1.8	.00	.00	.11	3.2	1.3	8.4	3.1	2.4
4	.23	10	4.8	.57	.00	.00	.09	1.4	1.2	21	9.9	2.2
5	.11	13	1.2	.26	.00	.00	.08	1.1	95	7.6	26	8.9
6	.11	14	.68	.15	.00	.00	.09	30	31	4.2	8.9	9.5
7	.20	4.3	3.5	.11	.00	.00	12	28	10	17	91	19
8	.20	2.0	1.2	.09	.00	.00	24	4.7	6.0	9.0	98	4.0
9	4.0	1.6	.44	.06	.00	.00	37	2.6	4.5	7.0	12	2.2
10	14	1.2	.32	.04	.00	.00	47	1.6	2.9	5.8	7.3	1.7
11	1.4	.86	.36	.01	.00	.77	36	1.2	2.4	5.4	5.6	1.8
12	1.2	.74	.32	.00	.00	.44	11	2.4	2.2	4.9	14	15
13	3.2	.62	.20	.00	.00	.13	8.5	19	2.0	4.5	146	3.9
14	.57	.40	.15	.00	.00	1.4	9.8	19	4.0	3.4	11	9.3
15	.26	8.4	.17	.00	.00	2.6	6.0	18	5.4	2.8	6.8	2.8
16	.24	2.4	.36	2.0	.00	6.4	8.1	38	9.6	2.8	5.1	27
17	1.2	2.0	11	3.8	1.5	1.8	4.3	6.8	7.6	2.9	24	47
18	.40	1.1	29	.48	1.6	1.5	1.8	8.0	4.3	3.6	5.6	11
19	.17	.52	6.0	.15	1.6	1.0	1.7	4.5	23	2.6	9.6	7.0
20	.09	.32	2.4	.06	.40	.40	123	2.9	38	15	9.4	19
21	.02	.23	1.2	.03	.11	.40	18	5.2	79	4.1	79	15
22	.00	.20	.86	18	.03	.68	7.3	5.9	21	2.2	24	14
23	.00	.40	.57	1.3	.00	.29	5.6	67	9.7	2.1	32	7.0
24	.00	.36	.40	.40	.00	.44	3.7	9.4	6.8	4.9	9.0	4.7
25	6.2	.32	.32	.15	.00	.17	2.6	5.1	6.8	14	7.0	4.1
26	3.2	.26	.29	.08	.00	15	2.2	3.6	23	3.4	6.3	2.9
27	1.7	.17	.23	.04	.00	3.9	4.6	21	8.7	2.2	4.7	2.4
28	2.5	.13	.20	.01	.00	.86	5.9	5.1	210	1.8	3.7	2.0
29	1.5	.11	.17	.00	---	.36	2.8	3.1	27	1.4	7.4	1.8
30	.48	.09	.15	.05	---	.36	2.7	3.6	11	1.9	5.8	1.7
31	.23	---	.20	.20	---	.74	---	2.8	---	1.9	3.7	---
TOTAL	43.84	139.44	101.01	36.04	5.32	39.64	386.49	334.4	656.1	263.7	713.9	256.0
MEAN	1.41	4.61	3.26	1.16	.19	1.28	12.9	10.8	21.9	8.51	23.0	8.53
MAX	14	53	34	18	1.6	15	123	67	210	50	146	47
MIN	.00	.09	.09	.00	.00	.00	.08	1.1	1.2	1.4	3.1	1.7
AC-FI	87	275	200	71	11	79	767	663	1300	523	1420	508

CAL YR 1977 TOTAL 2571.49 MEAN 7.05 MAX 127 MIN .00 AC-FT 5100
WTR YR 1978 TOTAL 2974.88 MEAN 8.15 MAX 210 MIN .00 AC-FT 5900

WATER-QUALITY RECORDS

PERIOD OF DAILY RECORD.--

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

EXTREMES FOR PERIOD OF DAILY RECORD.--

SEDIMENT DISCHARGE: Maximum daily 4,110 tons (3,730 tonnes) Apr. 19, 1974; minimum daily, 0 ton (0 tonne) on many days each year.

EXTREMES FOR CURRENT YEAR.--

SEDIMENT CONCENTRATIONS: Maximum daily mean, 377 mg/L June 28; minimum daily mean, 0 mg/L on many days during the year.

SEDIMENT DISCHARGE: Maximum daily, 534 tons (484 tonnes) June 28; minimum daily, 0 ton (0 tonne) on many days during the year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH	TEMPER- ATURE (DEG C)	DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH	TEMPER- ATURE (DEG C)
NOV 14...	1000	3.39	80	7.1	21.0	MAY 26...	1115	3.1	62	7.1	25.0
DEC 30...	1040	3.14	85	7.0	18.0	ALG 01...	1310	2.0	72	7.3	24.0
FEB 03...	1400	3.01	75	6.9	21.5	SEP 08...	1500	3.2	48	7.6	25.0
APR 21...	1400	15	65	6.7	21.0						

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
JUN 28...	1500	780	2260	4760	30	42	61

	SED.	SED.	SED.	SED.	SED.	SED.
	SUSP.	SUSP.	SUSP.	SUSP.	SUSP.	SUSP.
	FALL	FALL	FALL	FALL	FALL	FALL
	DIAM.	DIAM.	DIAM.	DIAM.	DIAM.	DIAM.
	% FINER	% FINER	% FINER	% FINER	% FINER	% FINER
	THAN	THAN	THAN	THAN	THAN	THAN
DATE	.016 MM	.031 MM	.062 MM	.125 MM	.500 MM	1.00 MM
JUN						
28...	75	88	95	98	99	100

16212800 KIPAPA STREAM NEAR WAHIAWA--Continued

SUSPENDED-SEDIMENT DISCHARGE (TONS/DAY), WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

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	.17	3	.00	.71	5	.01	.23	4	.00
2	.17	3	.00	19	25	1.3	.09	3	.00
3	.09	3	.00	53	80	21	.34	103	.34
4	.23	3	.00	10	15	.41	4.8	12	.16
5	.11	3	.00	13	15	.53	1.2	6	.02
6	.11	4	.00	14	10	.38	.68	6	.01
7	.20	4	.00	4.3	5	.06	3.5	10	.09
8	.20	4	.00	2.0	4	.02	1.2	5	.02
9	4.0	37	7.3	1.6	4	.02	.44	3	.00
10	14	147	12	1.2	3	.01	.32	3	.00
11	1.4	10	.04	.86	2	.00	.36	2	.00
12	1.2	10	.03	.74	2	.00	.32	2	.00
13	3.2	15	.13	.62	2	.00	.20	2	.00
14	.57	5	.01	.40	2	.00	.15	2	.00
15	.26	5	.00	8.4	35	.79	.17	2	.00
16	.24	5	.00	2.4	7	.05	.36	5	.00
17	1.2	5	.02	2.0	6	.03	11	15	.45
18	.40	4	.00	1.1	5	.01	29	10	.78
19	.17	4	.00	.52	3	.00	6.0	5	.08
20	.09	2	.00	.32	3	.00	2.4	3	.02
21	.02	2	.00	.23	3	.00	1.2	3	.01
22	.00	0	.00	.20	3	.00	.86	2	.00
23	.00	0	.00	.40	3	.00	.57	2	.00
24	.00	0	.00	.36	2	.00	.40	2	.00
25	6.2	12	.20	.32	2	.00	.32	2	.00
26	3.2	9	.08	.26	2	.00	.29	2	.00
27	1.7	9	.04	.17	2	.00	.23	2	.00
28	2.5	6	.04	.13	2	.00	.20	2	.00
29	1.5	5	.02	.11	2	.00	.17	2	.00
30	.48	4	.01	.09	2	.00	.15	2	.00
31	.23	4	.00	---	---	---	.20	2	.00
TOTAL	43.84	---	19.92	138.44	---	24.62	101.01	---	35.64
JANUARY				FEBRUARY				MARCH	
1	2.2	7	.04	.06	2	.00	.00	0	.00
2	4.0	7	.08	.02	2	.00	.00	0	.00
3	1.8	5	.02	.00	0	.00	.00	0	.00
4	.57	3	.00	.00	0	.00	.00	0	.00
5	.26	2	.00	.00	0	.00	.00	0	.00
6	.15	2	.00	.00	0	.00	.00	0	.00
7	.11	2	.00	.00	0	.00	.00	0	.00
8	.09	2	.00	.00	0	.00	.00	0	.00
9	.06	2	.00	.00	0	.00	.00	0	.00
10	.04	2	.00	.00	0	.00	.00	0	.00
11	.01	2	.00	.00	0	.00	.77	5	.01
12	.00	0	.00	.00	0	.00	.44	4	.00
13	.00	0	.00	.00	0	.00	.13	3	.00
14	.00	0	.00	.00	0	.00	1.4	5	.02
15	.00	0	.00	.00	0	.00	2.6	10	.07
16	2.0	20	.11	.00	0	.00	6.4	15	.26
17	3.8	8	.08	1.5	5	.02	1.8	8	.04
18	.48	4	.01	1.6	5	.02	1.5	8	.03
19	.15	3	.00	1.6	5	.02	1.0	6	.02
20	.06	3	.00	.40	4	.00	.40	4	.00
21	.03	3	.00	.11	3	.00	.40	4	.00
22	18	30	1.5	.03	2	.00	.68	4	.01
23	1.3	5	.02	.00	0	.00	.29	4	.00
24	.40	3	.00	.00	0	.00	.44	4	.00
25	.15	2	.00	.00	0	.00	.17	3	.00
26	.08	2	.00	.00	0	.00	15	30	1.2
27	.04	2	.00	.00	0	.00	3.9	7	.07
28	.01	2	.00	.00	0	.00	.86	4	.01
29	.00	0	.00	---	---	---	.36	4	.00
30	.05	3	.00	---	---	---	.36	5	.00
31	.20	2	.00	---	---	---	.74	5	.01
TOTAL	36.04	---	1.86	5.32	---	0.06	39.64	---	1.75

16212800 KIPAPA STREAM NEAR WAHIAWA--Continued

SUSPENDED-SEDIMENT DISCHARGE (TONS/DAY), WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

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	.32	4	.00	3.0	10	.08	2.2	4	.02
2	.20	4	.00	7.2	12	.23	1.5	3	.01
3	.11	4	.00	3.2	7	.06	1.3	2	.01
4	.09	4	.00	1.4	6	.02	1.2	2	.01
5	.08	5	.00	1.1	6	.02	95	163	86
6	.09	5	.00	30	50	4.1	31	30	2.5
7	12	40	1.3	28	40	3.0	10	8	.22
8	24	80	5.2	4.7	8	.10	6.0	6	.10
9	37	70	7.0	2.6	5	.04	4.5	4	.05
10	47	20	2.5	1.6	4	.02	2.9	3	.02
11	36	25	2.4	1.2	4	.01	2.4	2	.01
12	11	7	.21	2.4	15	.10	2.2	3	.02
13	8.5	8	.18	19	30	1.5	2.0	3	.02
14	9.8	8	.21	19	30	1.5	4.0	7	.08
15	6.0	8	.13	18	20	.97	5.4	4	.06
16	8.1	8	.17	38	45	8.3	8.6	10	.23
17	4.3	6	.07	6.8	12	.22	7.6	10	.21
18	1.8	4	.02	8.0	10	.22	4.3	5	.06
19	1.7	10	.05	4.5	8	.10	23	41	4.7
20	123	199	117	2.9	7	.05	38	49	15
21	18	15	.73	5.2	15	.21	79	73	23
22	7.3	8	.16	5.9	10	.16	21	18	1.0
23	5.6	7	.11	67	95	40	9.7	8	.21
24	3.7	6	.06	9.4	15	.38	6.8	6	.11
25	2.6	4	.03	5.1	8	.11	6.8	8	.15
26	2.2	4	.02	3.6	6	.06	23	82	12
27	4.6	10	.12	21	40	2.3	8.7	25	.59
28	5.9	10	.16	5.1	12	.17	210	377	534
29	2.8	8	.06	3.1	7	.06	27	25	1.8
30	2.7	8	.06	3.6	6	.06	11	8	.24
31	---	---	---	2.8	5	.04	---	---	---
TOTAL	386.49	---	137.95	334.4	---	64.19	656.1	---	682.43
JULY				AUGUST				SEPTEMBER	
1	8.1	4	.09	13	18	.63	3.1	4	.03
2	50	76	28	25	20	1.4	3.6	4	.04
3	8.4	3	.07	3.1	7	.06	2.4	4	.03
4	21	15	.85	9.9	30	.80	2.2	4	.02
5	7.6	8	.16	26	50	3.5	8.9	15	.36
6	42	35	4.0	8.9	10	.24	9.5	12	.31
7	17	20	.92	91	102	69	19	18	.92
8	9.0	8	.19	98	81	40	4.0	8	.09
9	7.0	6	.11	12	7	.23	2.2	5	.03
10	5.8	5	.08	7.3	5	.10	1.7	4	.02
11	5.4	5	.07	5.6	4	.06	1.8	3	.01
12	4.9	4	.05	14	12	.45	15	28	.33
13	4.5	3	.04	146	242	314	3.9	15	.16
14	3.4	3	.03	11	10	.30	9.3	15	.38
15	2.8	3	.02	6.8	6	.11	2.8	6	.05
16	2.8	5	.04	5.1	5	.07	27	22	2.6
17	2.9	3	.02	24	15	.97	47	68	15
18	3.6	5	.05	5.6	7	.11	11	12	.36
19	2.6	3	.02	9.6	10	.26	7.0	8	.15
20	15	20	.81	9.4	10	.25	19	15	.77
21	4.1	6	.07	79	102	57	15	20	.81
22	2.2	4	.02	24	15	.97	14	20	.76
23	2.1	3	.02	32	25	2.2	7.0	12	.23
24	4.9	8	.11	9.0	8	.19	4.7	8	.10
25	14	15	.57	7.0	6	.11	4.1	6	.07
26	3.4	5	.05	6.3	5	.09	2.9	6	.05
27	2.2	4	.02	4.7	4	.05	2.4	5	.03
28	1.8	3	.01	3.7	3	.03	2.0	4	.02
29	1.4	3	.01	7.4	8	.16	1.8	4	.02
30	1.9	4	.02	5.8	6	.09	1.7	4	.02
31	1.9	3	.02	3.7	4	.04	---	---	---
TOTAL	263.7	---	36.54	713.9	---	493.47	256.0	---	26.74
YEAR	2974.88		1525.17						

HAWAII, ISLAND OF OAHU

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

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

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

AVERAGE DISCHARGE.--25 years (water years, 1953-59, 1961-78), 37.8 ft³/s (1.070 m³/s), 27,390 acre-ft/yr (33.8 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, 1,130 ft³/s (32.0 m³/s) June 28, gage height, 4.54 ft (1.384 m), no peak above base of 1,300 ft³/s (36.8 m³/s); no flow for part of Feb. 25.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	7.5	3.1	4.2	30	9.4	4.9	3.5	11	13	26	8.4	6.6
2	12	22	2.9	29	9.7	4.4	5.5	13	10	75	38	6.8
3	15	120	48	29	12	6.8	4.8	15	16	29	16	13
4	5.3	59	27	26	19	2.2	8.0	18	25	47	17	22
5	4.8	48	16	28	21	2.1	12	10	94	28	35	8.6
6	2.6	46	17	24	13	1.4	8.9	14	85	49	29	13
7	3.3	37	22	27	8.5	1.9	2.5	74	38	44	46	26
8	7.6	32	15	26	8.4	3.5	18	23	19	23	206	13
9	10	29	14	23	8.0	2.1	26	13	14	27	38	7.6
10	14	28	17	21	9.3	5.5	105	11	12	26	23	12
11	6.6	28	16	20	7.6	4.2	79	8.9	17	14	17	9.8
12	6.4	25	11	14	7.6	2.0	53	8.3	10	14	19	7.9
13	3.2	26	9.7	14	8.2	8.3	20	24	11	13	183	16
14	5.0	28	9.8	17	9.5	5.1	22	31	14	12	34	11
15	7.4	28	9.9	21	11	2.4	14	56	18	10	18	9.7
16	14	27	13	23	12	5.5	18	60	15	16	14	22
17	9.6	27	26	23	6.3	4.2	20	24	19	14	32	64
18	5.3	32	80	19	2.6	4.1	11	17	22	9.4	20	36
19	8.1	29	37	18	2.7	8.2	11	13	41	9.5	16	18
20	6.0	26	23	19	3.8	7.0	259	15	25	18	20	22
21	3.2	18	18	21	5.1	4.3	87	38	157	18	106	22
22	4.1	16	15	33	5.1	6.9	40	41	49	15	62	26
23	9.5	14	17	18	7.9	6.4	37	163	31	21	45	16
24	2.7	7.2	24	11	3.1	12	34	64	23	15	26	19
25	2.4	16	26	9.4	.61	15	33	33	26	17	19	10
26	4.0	13	24	9.4	1.4	15	23	20	29	19	16	4.6
27	4.0	7.5	20	12	.69	24	15	29	37	10	21	3.6
28	3.9	2.4	23	18	2.6	7.6	21	30	296	9.1	17	3.7
29	8.4	2.2	24	17	---	6.3	18	22	109	8.9	10	3.3
30	13	1.3	25	14	---	3.7	13	18	37	9.2	11	3.9
31	15	---	30	12	---	3.0	---	17	---	8.9	8.4	---
TOTAL	223.9	797.7	664.5	625.8	216.10	190.0	1022.2	934.2	1312	655.0	1170.8	457.1
MEAN	7.22	26.6	21.4	20.2	7.72	6.13	34.1	30.1	43.7	21.1	37.8	15.2
MAX	15	120	80	33	21	24	259	163	296	75	206	64
MIN	2.4	1.3	2.9	9.4	.61	1.4	2.5	8.3	10	8.9	8.4	3.3
AC-FT	444	1580	1320	1240	429	377	2030	1850	2600	1300	2320	907
CAL YR 1977	TOTAL	7836.50	MEAN	21.5	MAX	276	MIN	1.3	AC-FT	15540		
WTR YR 1978	TOTAL	8269.30	MEAN	22.7	MAX	296	MIN	.61	AC-FT	16400		

16213000 WAIKELE STREAM AT WAIPAHU--Continued

WATER-QUALITY RECORDS

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

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: April 1973 to current year.

WATER TEMPERATURES: April 1973 to current year.

SUSPENDED SEDIMENT DISCHARGE: July 1972 to current year.

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

REMARKS.--In addition to the water-quality monitor record, water-quality samples were collected once a month. No record Mar. 9-19, July 25 to Aug. 8, Sept. 13-30. Pesticide analyses for 1977 water year also published in this report.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum 679 micromhos/cm Oct. 14, 1976; minimum, 30 micromhos/cm Apr. 19, 1974.

WATER TEMPERATURES: Maximum, 30.0°C May 6, 1973; minimum, 16.0°C Mar. 16, 1976.

SEDIMENT CONCENTRATIONS: Maximum daily mean, 3,420 mg/L Feb. 7, 1976; minimum daily mean, 10 mg/L May 10, Aug. 10, 29-31, Sept. 1, 1974, Oct. 29 to Nov. 2, Nov. 15-17, Dec. 11, 12, 1975.

SEDIMENT DISCHARGE: Maximum daily, 32,200 tons (29,200 tonnes) Apr. 19, 1974; minimum daily, 0.07 ton (0.06 tonne) Sept. 4, Oct. 1, 1975.

EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: Maximum recorded, 605 micromhos/cm Nov. 2; minimum recorded, 62 micromhos/cm Aug. 13.

WATER TEMPERATURES: Maximum recorded, 27.0°C Oct. 19, July 11, Aug. 27, 28, Sept. 1; minimum recorded, 20.0°C Dec. 22, Apr. 12.

SEDIMENT CONCENTRATIONS: Maximum daily mean, 558 mg/L Apr. 20; minimum daily mean, 12 mg/L Jan. 5-8.

SEDIMENT DISCHARGE: Maximum daily, 574 tons (521 tonnes) Apr. 20; minimum daily, 0.02 ton (0.02 tonne) Feb. 25.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	CARBON, ORGANIC TOTAL (MG/L AS C)	ALDFIN, TOTAL (UG/L)	ALDFIN, TOTAL (UG/KG)	CHLOR- DANE, TOTAL (UG/L)	CHLOR- DANE, TOTAL (UG/KG)	DDE, TOTAL (UG/L)	DDE, TOTAL (UG/KG)	DDE, TOTAL (UG/L)	DDE, TOTAL (UG/KG)
NOV 22...	1245	3.9	ND	--	ND	--	ND	--	ND	--
FEB 22...	1145	1.8	ND	--	ND	--	ND	--	ND	--
MAY 23...	1100	3.5	--	--	--	--	--	--	--	--
JUN 27...	0900	--	ND	ND	ND	371	ND	38	ND	134
AUG 22...	1000	2.1	--	--	--	--	--	--	--	--
SEP 26...	0730	2.3	ND	--	ND	--	ND	--	ND	--

DATE	TIME	P,P' DDT, TOTAL IN BOT- TOM MA- TERIAL (UG/L)	P,P' DDT, TOTAL IN BOT- TOM MA- TERIAL (UG/KG)	CI- AZINON, TOTAL IN BOT- TOM MA- TERIAL (UG/L)	CI- AZINON, TOTAL IN BOT- TOM MA- TERIAL (UG/KG)	DI- ELDRIN, TOTAL IN BOT- TOM MA- TERIAL (UG/L)	DI- ELDRIN, TOTAL IN BOT- TOM MA- TERIAL (UG/KG)	ENDRIN, TOTAL IN BOT- TOM MA- TERIAL (UG/L)	ENDRIN, TOTAL IN BOT- TOM MA- TERIAL (UG/KG)	ETHION, TOTAL IN BOT- TOM MA- TERIAL (UG/L)	ETHION, TOTAL IN BOT- TOM MA- TERIAL (UG/KG)
NOV 22...	ND	--	--	ND	--	ND	--	ND	--	ND	--
FEB 22...	ND	--	--	ND	--	ND	--	ND	--	ND	--
MAY 23...	--	--	--	--	--	--	--	--	--	--	--
JUN 27...	ND	24	ND	ND	ND	5.4	ND	ND	ND	ND	ND
AUG 22...	--	--	--	--	--	--	--	--	--	--	--
SEP 26...	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 1976 TO SEPTEMBER 1977

DATE	HEPTA- CHLOR, TOTAL (UG/L)	HEPTA- CHLOR, TOTAL (UG/KG)	HEPTA- CHLOR, TOTAL (UG/L)	HEPTA- CHLOR, TOTAL (UG/KG)	LINDANE TOTAL (UG/L)	LINDANE TOTAL (UG/KG)	MALA- THION, TOTAL (UG/L)	MALA- THION, TOTAL (UG/KG)	METH- OXY- CHLOR, TOTAL (UG/L)	METH- OXY- CHLOR, TOTAL (UG/KG)
NOV 22...	ND	--	ND	--	ND	--	ND	--	ND	--
FEB 22...	ND	--	ND	--	ND	--	ND	--	ND	--
MAY 23...	--	--	--	--	--	--	--	--	--	--
JUN 27...	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
AUG 22...	--	--	--	--	--	--	--	--	--	--
SEP 26...	ND	--	ND	--	ND	--	ND	--	ND	--

DATE	METHYL PARA- THION, TOTAL (UG/L)	METHYL PARA- THION, TOTAL (UG/KG)	METHYL TRI- THION, TOTAL (UG/L)	METHYL TRI- THION, TOTAL (UG/KG)	PARA- THION, TOTAL (UG/L)	PARA- THION, TOTAL (UG/KG)	TOX- APHENE, TOTAL (UG/L)	TOX- APHENE, TOTAL (UG/KG)	TRI- THION, TOTAL (UG/L)	TRI- THION, TOTAL (UG/KG)
NOV 22...	ND	--	ND	--	ND	--	ND	--	ND	--
FEB 22...	ND	--	ND	--	ND	--	ND	--	ND	--
MAY 23...	--	--	--	--	--	--	--	--	--	--
JUN 27...	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
AUG 22...	--	--	--	--	--	--	--	--	--	--
SEP 26...	ND	--	ND	--	ND	--	ND	--	ND	--

DATE	2,4-D, TOTAL (UG/L)	2,4-D, TOTAL (UG/KG)	2,4,5-T TOTAL (UG/L)	2,4,5-T TOTAL (UG/KG)	SILVEX, TOTAL (UG/L)	SILVEX, TOTAL (UG/KG)	ATRA- ZINE, TOTAL (UG/L)	ATRA- ZINE, TOTAL (UG/KG)	SIMA- ZINE, TOTAL (UG/L)	SIMA- ZINE, TOTAL (UG/L)
NOV 22...	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
FEB 22...	ND	--	ND	--	ND	--	ND	--	ND	--
MAY 23...	--	--	--	--	--	--	--	--	--	--
JUN 27...	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
AUG 22...	--	--	--	--	--	--	--	--	--	--
SEP 26...	ND	--	ND	--	ND	--	ND	--	ND	--

ND Material specifically analyzed for but not detected.

HAWAII, ISLAND OF OAHU

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16213000 WAIKELE STREAM AT WAIPAHU--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH (UNITS)	TEMPER- ATURE (DEG C)	TUR- BID- ITY (JTU)	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)
OCT										
26...	0800	3.7	440	6.7	22.3	9	--	5.4	49000	53000
NOV										
28...	1030	1.6	460	6.9	22.0	7	--	5.4	2800	1900
DEC										
27...	0900	20	470	6.9	21.0	6	--	6.2	700	3700
JAN										
30...	0900	9.9	440	6.9	21.0	5	--	6.5	9300	4600
FEB										
27...	0930	.91	460	6.7	21.5	6	--	5.9	970	10000
MAR										
20...	0845	6.1	480	6.7	21.9	5	--	5.5	95000	30000
APR										
17...	0830	24	305	6.4	21.5	20	--	6.0	--	7600
MAY										
16...	1030	96	120	6.6	22.0	40	--	7.6	2000	19000
JUN										
14...	1000	8.8	400	7.0	23.3	--	21	6.0	7900	12000
JUL										
17...	0945	19	400	6.7	23.2	--	5.0	5.8	9000	12000
AUG										
15...	0900	16	260	6.9	23.2	--	17	7.0	6400	3900
SEP										
12...	0830	2.8	400	6.9	23.2	--	4.4	6.4	2600	1600

DATE	HARD- NESS (MG/L AS CAC03)	HARD- NESS, NONCAR- BONATE (MG/L CAC03)	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM AD- SORP- TION RATIO	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	BICAR- BONATE (MG/L AS HC03)	CAR- BONATE (MG/L AS C03)
OCT										
26...	64	10	11	8.8	59	65	3.2	5.1	65	0
NOV										
28...	67	7	11	9.6	69	67	3.7	4.8	73	0
DEC										
27...	78	22	13	11	63	62	3.1	4.5	68	0
JAN										
30...	63	6	9.9	9.4	59	65	3.2	3.8	70	0
FEB										
27...	74	16	13	10	63	63	3.2	4.3	70	0
MAR										
20...	78	21	13	11	63	62	3.1	4.6	69	0
APR										
17...	50	14	9.3	6.5	38	60	2.3	4.1	44	0
MAY										
16...	21	8	3.8	2.8	13	55	1.2	1.7	16	0
JUN										
14...	57	50	11	7.1	54	66	3.1	3.6	--	--
JUL										
17...	67	20	13	8.3	51	61	2.7	4.4	--	--
AUG										
15...	49	19	8.9	6.4	18	43	1.1	2.9	--	--
SEP										
12...	63	11	13	7.5	53	63	2.9	4.3	--	--

16213000 WAIKELE STREAM AT WAIPAHO--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	ALKA- LITY (MG/L AS CAC03)	CARRON DIOXIDE DIS- SOLVED (MG/L AS CO2)	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 CONSTITUENTS, DIS- SOLVED (MG/L)	SOLIDS, DIS- SOLVED (TONS PER AC-FT)	SOLIDS, DIS- SOLVED (TONS PER DAY)
OCT 26...	53	21	23	66	.2	44	288	--	.39	2.88
NOV 28...	60	15	33	80	.2	67	333	311	.45	1.44
DEC 27...	56	14	25	88	.2	64	302	302	.41	16.3
JAN 30...	57	14	25	74	.2	66	285	282	.39	7.62
FEB 27...	57	22	26	85	.2	59	307	295	.42	.75
MAR 20...	57	22	26	86	.2	60	298	298	.41	4.91
APR 17...	36	28	21	48	.4	17	205	--	.28	13.3
MAY 16...	13	6.4	5.1	20	.1	13	83	68	.11	21.5
JUN 14...	52	--	29	69	.2	45	265	261	.36	6.30
JUL 17...	47	--	26	64	.2	55	260	250	.35	13.3
AUG 15...	30	--	11	42	.1	15	172	--	.23	7.76
SEP 12...	52	--	21	64	.2	57	275	251	.37	2.08

DATE	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, 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)	NITRO- GEN, TOTAL (MG/L AS NO3)	PHOS- PHORUS, TOTAL (MG/L AS P)	PHOS- PHORUS, DIS- SOLVED (MG/L AS P)
OCT 26...	5.4	.22	--	--	--	--	--	--	12	9.5
NOV 28...	4.0	.62	--	--	--	1.2	--	--	6.5	2.6
DEC 27...	3.3	.84	--	--	--	2.9	--	--	2.3	2.1
JAN 30...	3.9	.06	.27	.33	.02	.31	4.2	19	2.0	1.9
FEB 27...	4.3	.07	.38	.45	.06	.39	4.8	21	2.8	2.7
MAR 20...	4.2	.60	.80	1.4	1.3	.09	5.6	25	2.8	2.7
APR 17...	5.4	.19	1.0	1.2	.83	.37	6.6	29	2.3	2.1
MAY 16...	.47	.25	.71	.96	.51	.45	1.4	6.3	.72	.52
JUN 14...	3.4	.39	.81	1.2	.00	1.2	4.6	20	1.4	1.4
JUL 17...	4.9	.35	1.7	2.0	.50	1.5	6.9	31	2.3	2.2
AUG 15...	3.2	.12	.50	.62	.10	.52	3.8	17	1.8	1.7
SEP 12...	4.3	.15	.85	1.0	.25	.75	5.3	23	2.8	2.8

HAWAII, ISLAND OF OAHU

16213000 WAIKELE STREAM AT WAIPAHU--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

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)	P,P' DDF, TOTAL IN BOT- TOM MA- TERIAL (UG/KG)	DDT, TOTAL (UG/L)
DEC 27...	0900	ND	ND	ND	ND	ND	665	ND	ND	ND	230	ND
MAY 16...	1030	ND	--	ND	--	ND	--	ND	--	ND	--	ND
AUG 15...	0900	ND	--	ND	--	ND	--	ND	--	ND	--	ND

DATE	DDT, TOTAL IN BOT- TOM MA- TERIAL (UG/KG)	DI- AZINON, TOTAL (UG/L)	DI- AZINON, TOTAL IN BOT- TOM MA- TERIAL (UG/KG)	DI- ELDRIN, TOTAL (UG/L)	DI- ELDRIN, 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)	ETHION, TOTAL IN BOT- TOM MA- TERIAL (UG/KG)	HEPTA- CHLOR, TOTAL (UG/L)	HEPTA- CHLOR, TOTAL IN BOT- TOM MA- TERIAL (UG/KG)	HEPTA- CHLOR EPOXIDE TOTAL (UG/L)
DEC 27...	ND	1.8	.0	ND	6.7	ND	ND	ND	ND	ND	ND	ND
MAY 16...	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND
AUG 15...	--	ND	--	ND	--	ND	--	ND	--	ND	--	ND

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)	MALA- THION, TOTAL IN BOT- TOM MA- TERIAL (UG/KG)	METH- OXY- CHLOR, TOTAL (UG/L)	METH- OXY- CHLOR, TOTAL IN BOT- TOM MA- TERIAL (UG/KG)	METHYL PARA- THION, TOTAL (UG/L)	METHYL PARA- THION, TOTAL IN BOT- TOM MA- TERIAL (UG/KG)	METHYL TRI- THION, TOTAL (UG/L)	METHYL TRI- THION, TOTAL IN BOT- TOM MA- TERIAL (UG/KG)
DEC 27...	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MAY 16...	--	ND	--	ND	--	ND	--	ND	--	ND	--
AUG 15...	--	ND	--	ND	--	ND	--	ND	--	ND	--

DATE	PARA- THION, TOTAL (UG/L)	PARA- THION, TOTAL IN BOT- TOM MA- TERIAL (UG/KG)	TOX- APHENE, TOTAL (UG/L)	TOX- APHENE, TOTAL IN BOT- TOM MA- TERIAL (UG/KG)	TRI- THION, TOTAL (UG/L)	TRI- THION, TOTAL IN BOT- TOM MA- TERIAL (UG/KG)	2,4-D, TOTAL (UG/L)	2,4,5-T TOTAL (UG/L)	SILVEX, TOTAL (UG/L)	ATRA- ZINE, TOTAL (UG/L)	SIMA- ZINE TOTAL COND. (UG/L)
DEC 27...	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MAY 16...	ND	--	ND	--	ND	--	--	--	--	ND	ND
AUG 15...	ND	--	ND	--	ND	--	--	--	--	ND	ND

ND Material specifically analyzed for but not detected.

HAWAII, ISLAND OF OAHU

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16213000 WAIKELE STREAM AT WAIPAHU--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

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)	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				
26...	0800	3.3	--	--	17...	0830	1.9	--	--
NOV					MAY				
28...	1030	--	2.2	.4	16...	1030	--	3.8	2.2
DEC					JUN				
27...	0900	3.0	--	--	14...	1000	4.5	--	--
JAN					JUL				
30...	0900	3.4	--	--	17...	0945	7.5	--	--
FEB					AUG				
27...	0930	--	2.3	--	15...	0900	--	2.5	1.0
MAR					SEP				
20...	0845	2.8	--	--	12...	0830	2.2	--	--

DATE	TIME	PHYTO- PLANK- TON, TOTAL (CELLS PER ML)	PERI- PHYTON BIOMASS TOTAL DRY WEIGHT G/SQ M	PERI- PHYTON BIOMASS ASH WEIGHT G/SQ M	CHLOR-A PERI- PHYTON CHROMO- GRAPHIC FLUOROM (MG/M2)	CHLOR-B PERI- PHYTON CHROMO- GRAPHIC FLUOROM (MG/M2)	LENGTH OF EXPO- SURE (DAYS)
OCT							
26...	0800	150	--	--	--	--	--
NOV							
28...	1030	--	16.9	11.7	25.4	17.6	34
DEC							
27...	0900	160	--	--	--	--	--
JAN							
30...	0900	550	--	--	--	--	--
FEB							
27...	0930	130	7.64	3.07	44.6	14.7	28
MAR							
20...	0845	1700	--	--	--	--	--
APR							
17...	0830	60	--	--	--	--	--
MAY							
16...	1030	460	3.94	2.68	38.1	13.2	29
JUN							
14...	1000	58	--	--	--	--	--
JUL							
17...	0945	1000	--	--	--	--	--

HAWAII, ISLAND OF OAHU

16213000 WAIKELE STREAM AT WAIPAHU--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SEDI- MENT, SUS- PENDE (MG/L)	SEDI- MENT DIS- CHARGE, SUS- PENDE (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM	SED. SUSP. FALL DIAM. % FINER THAN .002 MM	SED. SUSP. FALL DIAM. % FINER THAN .004 MM
OCT							
26...	0800	3.7	14	.14	100	--	--
NOV							
28...	1030	1.6	11	.05	100	--	--
DEC							
27...	0900	20	14	.76	100	--	--
JAN							
30...	0900	9.9	12	.32	100	--	--
FEB							
27...	0930	.91	12	.03	100	--	--
MAR							
20...	0845	6.1	10	.16	100	--	--
APR							
17...	0830	24	27	1.7	94	--	--
MAY							
16...	1030	96	77	20	100	--	--
JUN							
14...	1000	8.8	25	.59	100	--	--
28...	1710	1140	1660	5110	--	29	42
JUL							
17...	0945	19	17	.87	100	--	--
AUG							
15...	0900	16	24	1.1	100	--	--
SEP							
12...	0830	2.8	29	.22	100	--	--

DATE	SED. SUSP. FALL DIAM. % FINER THAN .016 MM	SED. SUSP. FALL DIAM. % FINER THAN .062 MM	SED. SUSP. FALL DIAM. % FINER THAN .125 MM	SED. SUSP. FALL DIAM. % FINER THAN .250 MM	SED. SUSP. FALL DIAM. % FINER THAN .500 MM	SED. SUSP. FALL DIAM. % FINER THAN 1.00 MM
OCT						
26...	--	--	--	--	--	--
NOV						
28...	--	--	--	--	--	--
DEC						
27...	--	--	--	--	--	--
JAN						
30...	--	--	--	--	--	--
FEB						
27...	--	--	--	--	--	--
MAR						
20...	--	--	--	--	--	--
APR						
17...	--	--	--	--	--	--
MAY						
16...	--	--	--	--	--	--
JUN						
14...	--	--	--	--	--	--
28...	72	90	96	98	99	100
JUL						
17...	--	--	--	--	--	--
AUG						
15...	--	--	--	--	--	--
SEP						
12...	--	--	--	--	--	--

16213000 WAIKELE STREAM AT WAIPAHU--Continued

SPECIFIC CONDUCTANCE (MICROMH/CM AT 25 DEG. C), WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
1	510	468	478	546	426	466	462	441	451	484	463	475
2	574	482	523	605	428	490	443	429	436	484	473	480
3	588	509	548	458	145	282	434	156	330	486	474	480
4	579	468	507	359	185	275	269	168	216	480	421	456
5	557	435	465	383	315	351	458	274	363	485	470	477
6	450	413	425	401	318	363	473	449	461	487	452	---
7	427	410	419	444	362	400	481	418	443	494	483	---
8	518	416	439	500	446	465	501	400	458	493	476	---
9	554	454	511	517	490	502	493	396	459	490	452	476
10	558	316	466	528	504	517	493	468	480	512	448	483
11	369	316	344	543	523	533	507	485	493	500	470	488
12	431	369	394	544	465	505	512	443	481	500	457	469
13	416	394	404	538	466	509	456	431	446	461	441	451
14	429	411	419	537	523	530	463	444	456	456	442	448
15	487	409	430	539	471	514	465	439	455	525	446	469
16	555	494	532	518	426	460	467	443	457	525	462	498
17	553	438	507	518	432	479	498	453	471	545	419	477
18	436	415	424	524	493	506	503	168	268	482	447	465
19	508	415	463	531	492	508	303	200	270	474	442	457
20	462	428	441	500	515	528	361	287	308	497	438	455
21	474	431	444	513	446	477	419	360	386	533	453	493
22	492	404	444	469	442	455	399	367	384	540	335	481
23	562	396	457	475	457	465	541	395	426	393	328	355
24	550	412	446	462	430	444	553	428	507	417	386	397
25	434	416	424	545	442	489	547	527	540	429	419	423
26	428	413	421	530	463	493	550	504	537	437	425	432
27	420	374	396	479	457	469	534	443	471	441	425	434
28	407	391	398	469	447	457	492	441	453	437	423	432
29	421	405	412	445	431	439	478	449	467	432	420	427
30	481	393	438	448	430	438	483	445	471	449	420	432
31	579	479	557	---	---	---	488	478	481	452	439	447
MONTH	588	316	451	605	145	460	553	156	430	545	328	456
	FEBRUARY			MARCH			APRIL			MAY		
1	450	438	446	458	419	445	429	422	425	436	396	416
2	464	440	452	436	421	428	470	427	448	431	398	407
3	464	442	450	464	426	438	468	449	459	424	340	371
4	495	461	475	466	440	449	459	432	446	380	336	358
5	498	461	482	458	435	444	464	437	452	469	393	413
6	486	446	464	456	434	443	454	437	445	426	397	406
7	506	439	462	468	444	452	447	432	440	394	123	195
8	481	441	454	467	440	453	436	232	347	302	240	274
9	467	440	450	---	---	450	334	236	275	364	311	340
10	459	444	452	---	---	450	350	106	151	400	356	374
11	458	439	448	---	---	450	177	112	147	409	389	403
12	455	445	449	---	---	450	184	118	145	426	413	420
13	456	443	451	---	---	450	268	186	235	430	253	379
14	465	444	453	---	---	450	273	226	250	350	242	286
15	460	443	453	---	---	450	290	239	267	238	135	174
16	460	452	456	---	---	450	325	260	304	251	117	165
17	463	446	456	---	---	450	309	257	289	281	170	231
18	455	447	451	---	---	450	347	282	307	299	268	282
19	460	444	452	---	---	450	368	335	354	345	282	316
20	474	451	459	480	440	452	390	104	206	352	322	339
21	479	467	474	453	433	444	263	139	205	388	185	308
22	478	450	467	471	435	449	357	229	315	297	207	246
23	463	447	453	468	442	449	499	360	443	266	102	177
24	464	443	458	520	434	462	506	481	496	333	189	273
25	484	445	464	588	484	530	517	497	507	372	295	329
26	463	452	457	487	443	456	551	460	499	353	316	334
27	468	455	461	499	321	390	464	425	444	360	219	317
28	461	442	448	363	330	349	426	326	359	361	226	269
29	---	---	---	412	359	378	350	324	337	462	367	399
30	---	---	---	418	391	404	399	353	381	405	359	389
31	---	---	---	425	410	418	---	---	---	421	372	393
MONTH	506	438	457	588	321	441	551	104	346	465	102	322

HAWAII, ISLAND OF OAHU

16213000 WAIKELE STREAM AT WAIPAHO--Continued

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	JUNE			JULY			AUGUST			SEPTEMBER		
1	410	384	396	282	243	261	---	---	---	375	340	353
2	458	392	414	290	142	197	---	---	---	379	359	373
3	576	400	442	270	171	223	---	---	---	390	365	370
4	588	512	561	348	221	262	---	---	---	400	360	380
5	532	84	331	289	225	261	---	---	---	457	396	418
6	236	116	158	324	142	260	---	---	---	403	288	334
7	234	157	199	227	143	178	---	---	---	305	214	253
8	292	229	264	279	220	260	---	---	---	289	217	255
9	325	291	309	396	268	321	220	160	191	346	291	321
10	361	330	346	407	351	382	276	217	244	406	346	373
11	476	357	423	418	323	375	312	282	300	479	412	450
12	422	393	404	406	373	392	345	309	321	413	377	402
13	404	380	394	413	379	393	308	62	145	---	---	---
14	427	390	401	426	372	392	226	116	181	---	---	---
15	434	356	408	399	375	383	280	227	252	---	---	---
16	376	352	363	485	387	427	322	280	300	---	---	---
17	358	309	325	469	404	433	351	168	279	---	---	---
18	359	308	330	440	385	398	265	200	246	---	---	---
19	412	220	324	387	372	378	326	265	302	---	---	---
20	281	221	246	384	258	365	313	287	301	---	---	---
21	258	91	124	320	253	287	309	94	242	---	---	---
22	194	132	169	369	299	326	168	94	126	---	---	---
23	254	188	217	500	351	433	218	145	171	---	---	---
24	291	254	273	501	408	456	236	168	202	---	---	---
25	320	288	305	---	---	---	415	242	299	---	---	---
26	312	204	294	---	---	---	316	294	306	---	---	---
27	258	192	228	---	---	---	442	290	345	---	---	---
28	294	67	178	---	---	---	501	380	457	---	---	---
29	193	84	134	---	---	---	375	346	357	---	---	---
30	260	173	219	---	---	---	369	291	340	---	---	---
31	---	---	---	---	---	---	352	293	325	---	---	---
MONTH	588	67	306	501	142	335	501	62	271	479	214	357
YEAR	605	62	390									

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
1	25.0	22.5	23.5	23.5	22.5	23.0	24.0	22.0	23.0	22.0	21.5	21.5
2	25.0	24.0	24.5	24.0	22.5	23.0	23.0	22.0	22.5	22.0	21.5	21.5
3	25.5	24.0	24.5	23.0	21.5	22.5	23.5	22.0	22.5	22.0	21.0	21.5
4	25.5	23.0	24.0	22.5	21.5	22.0	22.0	21.0	21.5	22.0	21.0	21.5
5	24.5	22.5	23.5	22.5	22.0	22.5	22.5	21.5	22.0	22.0	21.5	22.0
6	24.5	22.5	23.5	23.0	22.0	22.5	23.0	21.5	22.0	22.5	21.0	21.5
7	24.5	22.5	23.0	23.0	22.0	22.5	22.5	22.0	22.0	22.5	21.5	21.5
8	24.5	22.0	23.5	23.0	21.5	22.0	23.0	21.5	22.0	22.5	21.5	22.0
9	25.0	24.0	24.5	22.5	21.5	22.0	23.0	21.5	22.0	22.5	21.5	22.0
10	24.5	23.0	24.0	23.0	21.5	22.0	23.0	22.0	22.5	22.5	21.5	22.0
11	24.5	22.5	23.5	22.5	22.0	22.0	22.5	21.5	22.0	22.5	21.5	22.0
12	26.0	22.5	24.0	23.0	22.0	22.5	23.0	21.5	22.0	22.0	21.0	21.5
13	24.5	22.5	23.5	23.0	21.5	22.0	23.0	21.5	22.5	22.0	20.5	21.5
14	23.5	22.5	23.0	23.0	21.5	22.0	22.5	21.5	22.0	22.5	21.0	21.5
15	24.5	22.5	23.5	23.0	22.0	22.0	23.0	21.5	22.0	22.0	21.5	21.5
16	26.0	24.0	25.0	23.0	22.0	22.5	22.5	21.5	22.0	22.5	21.5	22.0
17	25.5	23.5	24.5	22.5	22.0	22.0	22.5	22.0	22.0	22.0	20.5	21.5
18	24.5	23.0	23.5	23.0	22.0	22.5	22.0	20.5	21.0	22.0	20.5	21.0
19	27.0	23.0	24.5	22.5	21.5	22.0	21.0	20.5	21.0	22.0	20.5	21.5
20	24.5	23.0	23.5	22.5	21.5	22.0	21.0	20.5	20.5	22.5	21.0	21.5
21	24.0	22.5	23.0	23.0	21.5	22.5	21.5	20.5	21.0	22.5	21.0	21.5
22	23.5	22.5	23.0	24.0	22.0	23.0	21.5	20.0	21.0	22.0	21.5	21.5
23	24.5	22.0	23.0	24.0	23.0	24.0	21.5	20.5	21.0	22.0	21.0	21.5
24	23.5	22.0	23.0	22.5	22.0	22.5	21.5	20.5	21.0	22.5	21.0	21.5
25	23.5	22.5	23.0	23.0	22.0	22.5	22.0	20.5	21.0	22.5	21.0	22.0
26	24.0	22.5	23.0	23.0	22.0	22.5	21.5	20.5	21.0	22.5	21.0	21.5
27	24.5	22.5	23.5	23.0	22.0	22.5	22.0	21.0	21.5	22.5	21.0	21.5
28	23.5	22.5	23.0	23.0	22.0	22.5	22.5	21.0	21.5	22.5	21.5	22.0
29	24.0	22.5	23.0	23.0	21.5	22.0	22.0	21.0	21.5	23.0	21.5	22.0
30	26.5	22.5	24.0	23.5	21.5	22.5	22.5	21.0	22.0	22.5	21.0	22.0
31	23.5	22.0	23.0	---	---	---	22.0	21.5	21.5	22.5	21.0	21.5
MONTH	27.0	22.0	23.5	24.0	21.5	22.5	24.0	20.0	21.5	23.0	20.5	21.5

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

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

16213000 WAIKELE STREAM AT WAIPAHI--Continued

SUSPENDED-SEDIMENT DISCHARGE (TONS/DAY), WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DAY	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
OCTOBER				NOVEMBER			DECEMBER		
1	7.5	25	.51	3.1	15	.13	4.2	20	.23
2	12	25	.91	22	30	1.8	2.9	20	.16
3	15	30	1.2	120	186	84	48	286	66
4	5.3	30	.43	59	50	8.0	27	80	5.8
5	4.8	30	.39	48	25	3.2	16	20	.86
6	2.6	20	.14	46	25	3.1	17	20	.92
7	3.3	20	.18	37	20	2.0	22	30	1.8
8	7.6	25	.51	32	20	1.7	15	25	1.0
9	10	25	.68	29	15	1.2	14	20	.76
10	14	30	1.1	28	15	1.1	17	20	.92
11	6.6	30	.53	28	15	1.1	16	20	.86
12	6.4	30	.52	25	15	1.0	11	20	.59
13	3.2	20	.17	26	15	1.1	9.7	20	.52
14	5.0	20	.27	28	15	1.1	9.8	20	.53
15	7.4	20	.40	28	15	1.1	9.9	20	.53
16	14	20	.76	27	15	1.1	13	20	.70
17	9.6	20	.52	27	15	1.1	26	30	2.1
18	5.3	20	.29	32	15	1.3	80	100	22
19	8.1	25	.55	29	15	1.2	37	35	3.5
20	6.0	25	.41	26	15	1.1	23	20	1.2
21	3.2	25	.22	18	15	.73	18	20	.97
22	4.1	25	.28	16	20	.86	15	20	.81
23	9.5	25	.64	14	20	.76	17	20	.92
24	2.7	25	.18	7.2	20	.39	24	20	1.3
25	2.4	25	.16	16	20	.86	26	20	1.4
26	4.0	20	.22	13	20	.70	24	20	1.3
27	4.0	20	.22	7.5	20	.41	20	15	.81
28	3.9	20	.21	2.4	20	.13	23	20	1.2
29	8.4	20	.45	2.2	20	.12	24	20	1.3
30	13	20	.70	1.3	20	.07	25	20	1.4
31	15	20	.81	---	---	---	30	20	1.6
TOTAL	223.9	---	14.46	797.7	---	122.46	664.5	---	123.99
JANUARY				FEBRUARY			MARCH		
1	30	17	1.4	9.4	25	.63	4.9	30	.40
2	29	17	1.3	9.7	30	.79	4.4	20	.24
3	29	17	1.3	12	30	.97	6.8	30	.55
4	26	17	1.2	19	30	1.5	2.2	25	.15
5	28	12	.91	21	30	1.7	2.1	20	.11
6	24	12	.78	13	30	1.1	1.4	25	.09
7	27	12	.87	8.5	30	.69	1.9	25	.13
8	26	12	.84	8.4	30	.68	3.5	25	.24
9	23	15	.93	8.0	30	.65	2.1	20	.11
10	21	15	.85	9.3	30	.75	5.5	30	.45
11	20	15	.81	7.6	20	.41	4.2	30	.34
12	14	15	.57	7.6	20	.41	2.0	30	.16
13	14	15	.57	8.2	20	.44	8.3	30	.67
14	17	15	.69	9.5	20	.51	5.1	25	.34
15	21	20	1.1	11	20	.59	2.4	20	.13
16	23	20	1.2	12	20	.65	5.5	40	.59
17	23	20	1.2	6.3	20	.74	4.2	40	.45
18	19	15	.77	2.6	20	.14	4.1	40	.44
19	18	20	.97	2.7	20	.15	8.2	35	.77
20	19	20	1.0	3.8	20	.21	7.0	35	.66
21	21	20	1.1	5.1	20	.28	4.3	35	.41
22	33	30	2.7	5.1	25	.34	6.9	35	.65
23	18	20	.97	7.9	25	.53	6.4	35	.60
24	11	20	.59	3.1	20	.17	12	50	1.6
25	9.4	20	.51	.61	15	.02	15	50	2.0
26	9.4	20	.51	1.4	15	.06	15	50	2.0
27	12	20	.65	.69	15	.03	24	60	3.9
28	18	20	.97	2.6	30	.21	7.6	60	1.2
29	17	20	.92	---	---	---	6.3	50	.85
30	14	20	.76	---	---	---	3.7	50	.50
31	12	20	.65	---	---	---	3.0	50	.41
TOTAL	625.8	---	29.59	216.10	---	14.95	190.0	---	21.14

16213000 WAIKELE STREAM AT WAIPAHO--Continued

SUSPENDED-SEDIMENT DISCHARGE (TONS/DAY), WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

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	3.5	50	.47	11	25	.74	13	25	.88
2	5.5	50	.74	13	25	.88	10	25	.68
3	4.8	60	.78	15	25	1.0	16	25	1.1
4	8.0	60	1.3	18	40	1.9	25	25	1.7
5	12	40	1.3	10	30	.81	94	185	105
6	8.9	30	.72	14	30	1.1	85	70	16
7	2.5	30	.20	74	100	20	38	35	3.6
8	18	50	2.4	23	35	2.2	19	30	1.5
9	26	40	2.8	13	25	.88	14	30	1.1
10	105	100	28	11	20	.59	12	30	.97
11	79	50	11	8.9	20	.48	17	40	1.8
12	53	40	5.7	8.3	20	.45	10	35	.94
13	20	25	1.4	24	40	2.6	11	30	.89
14	22	25	1.5	31	25	2.1	14	30	1.1
15	14	20	.76	56	45	6.8	18	30	1.5
16	18	30	1.5	60	50	8.1	15	30	1.2
17	20	30	1.6	24	30	1.9	19	30	1.5
18	11	30	.89	17	20	.92	22	30	1.8
19	11	30	.89	13	20	.70	41	90	10
20	259	558	574	15	20	.81	25	40	2.7
21	87	140	33	38	145	25	157	100	42
22	40	40	4.3	41	100	11	49	35	4.6
23	37	30	3.0	163	313	212	31	25	2.1
24	34	30	2.8	64	80	14	23	25	1.6
25	33	30	2.7	33	70	6.2	26	20	1.4
26	23	30	1.9	20	50	2.7	29	35	2.7
27	15	30	1.2	29	60	4.7	37	35	3.5
28	21	30	1.7	30	40	3.2	296	466	805
29	18	25	1.2	22	35	2.1	109	191	85
30	13	25	.88	18	30	1.5	37	70	7.0
31	---	---	---	17	25	1.1	---	---	---
TOTAL	1022.2	---	690.63	934.2	---	338.46	1312	---	1110.86
JULY			AUGUST			SEPTEMBER			
1	26	45	3.2	8.4	25	.57	6.6	45	.80
2	75	83	22	38	50	5.1	6.8	45	.83
3	29	35	2.7	16	30	1.3	13	40	1.4
4	47	50	6.3	17	40	1.8	22	40	2.4
5	28	30	2.3	35	45	4.3	8.6	40	.93
6	49	50	6.6	29	35	2.7	13	60	2.1
7	44	40	4.8	46	80	17	26	50	3.5
8	23	25	1.6	206	326	271	13	40	1.4
9	27	25	1.8	38	40	4.1	7.6	40	.82
10	26	25	1.8	23	35	2.2	12	40	1.3
11	14	25	.94	17	35	1.6	9.8	40	1.1
12	14	25	.94	19	35	1.8	7.9	50	1.1
13	13	25	.88	183	357	368	16	50	2.2
14	12	25	.81	34	60	5.5	11	50	1.5
15	10	25	.68	18	40	1.9	9.7	50	1.3
16	16	25	1.1	14	40	1.5	22	60	3.6
17	14	25	.94	32	60	5.2	64	70	12
18	9.4	25	.63	20	50	2.7	36	60	5.8
19	9.5	25	.64	16	40	1.7	18	50	2.4
20	18	40	1.9	20	45	2.4	22	50	3.0
21	18	35	1.7	106	171	86	22	50	3.0
22	15	25	1.0	62	90	15	26	60	4.2
23	21	25	1.4	45	50	6.1	16	50	2.2
24	15	20	.81	26	40	2.8	19	50	2.6
25	17	30	1.4	19	40	2.1	10	50	1.4
26	19	30	1.5	16	40	1.7	4.6	45	.56
27	10	25	.68	21	40	2.3	3.6	45	.44
28	9.1	25	.61	17	40	1.8	3.7	45	.45
29	8.9	25	.60	10	45	1.2	3.3	45	.40
30	9.2	25	.62	11	45	1.3	3.9	45	.47
31	8.9	25	.60	8.4	45	1.0	---	---	---
TOTAL	655.0	---	73.48	1170.8	---	823.67	457.1	---	65.20
YEAR	8269.30		3428.89						

16213000 WAIKELE STREAM AT WAIPAHU--Continued

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA

PHYTOPLANKTON ANALYSES, OCTOBER 1977 TO JULY 1978

DATE TIME	OCT 26, 77 0800	DEC 27, 77 0900	JAN 30, 78 0900	FEB 27, 78 0930	MAR 20, 78 0845
TOTAL CELLS/ML	150	160	550	130	1700
DIVERSITY: DIVISION	1.0	0.0	1.0	0.0	0.2
..CLASS	1.0	0.0	1.0	0.0	0.2
...ORDER	1.0	0.0	1.4	0.0	0.3
...FAMILY	1.0	0.0	1.6	1.9	0.3
....GENUS	1.0	0.0	1.6	1.9	0.3

ORGANISM	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT
CHLOROPHYTA (GREEN ALGAE)										
..CHLOROPHYCEAE										
...CHLOROCOCCALES										
....OOCYSTACEAE										
....ANKISTRODESMUS	--	-	--	-	--	-	--	-	--	-
....CHODATELLA	--	-	--	-	--	-	--	-	--	-
....OOCYSTIS	--	-	--	-	--	-	--	-	--	-
....SELENASTRUM	--	-	--	-	--	-	--	-	--	-
...SCENEDESMACEAE										
....CRUCIGENIA	73#	50	--	-	300#	55	--	-	--	-
....SCENEDESMUS	--	-	--	-	--	-	--	-	--	-
..TETRASPORALES										
...COCCOMYXACEAE										
....ELAKATOTHRIX	--	-	--	-	--	-	--	-	--	-
..VOLVOCALES										
...CHLAMYDOMONADACEAE										
....CHLAMYDOMONAS	--	-	--	-	--	-	--	-	--	-
..ZYGNEMATALES										
...DESMIDIACEAE										
....CLOSTERIUM	--	-	--	-	--	-	--	-	--	-
CHRYSTOPHYTA										
..BACILLARIOPHYCEAE										
...CENTRALES										
...COSCINODISCACEAE										
....CYCLOTELLA	--	-	--	-	--	-	--	-	*	0
....MELOSIRA	--	-	--	-	160#	29	--	-	--	-
..PENNALES										
...ACHNANTHACEAE										
....COCONEIS	--	-	--	-	--	-	6	5	--	-
...EUNOTIACEAE										
....EUNOTIA	--	-	--	-	--	-	--	-	--	-
...FRAGILARIACEAE										
....SYNEDRA	--	-	--	-	--	-	6	5	--	-
...GOMPHONEMATACEAE										
....GOMPHONEMA	--	-	--	-	59	11	58#	45	*	0
...NAVICULACEAE										
....GYROSIGMA	--	-	--	-	--	-	--	-	*	0
....NAVICULA	--	-	160#	100	20	4	26#	20	22	1
...STAURONEIS	--	-	--	-	--	-	--	-	--	-
...NITZSCHACEAE										
....NITZSCHIA	--	-	--	-	13	2	32#	25	15	1
CYANOPHYTA (BLUE-GREEN ALGAE)										
..CYANOPHYCEAE										
...HORMOGONALES										
...OSCILLATORIACEAE										
....OSCILLATORIA	73#	50	--	-	--	-	--	-	1600#	96
...SCYTONEMATACEAE										
....PLECTONEMA	--	-	--	-	--	-	--	-	--	-
EUGLENOPHYTA (EUGLENOIDS)										
..EUGLENOPHYCEAE										
...EUGLENALES										
....EUGLENACEAE										
....EUGLENA	--	-	--	-	--	-	--	-	*	0
....TRACHELOMONAS	--	-	--	-	--	-	--	-	*	0

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 1977 TO JULY 1978

DATE TIME	APR 17,78 0830	MAY 16,78 1030	JUN 14,78 1000	JUL 17,78 0945
TOTAL CELLS/ML	60	460	58	1000
DIVERSITY: DIVISION	0.9	1.1	0.0	1.6
..CLASS	0.9	1.1	0.0	1.6
...ORDER	0.9	1.5	0.0	1.6
...FAMILY	1.6	2.4	0.8	2.3
....GENUS	1.6	2.7	0.8	2.3

ORGANISM	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT
CHLOROPHYTA (GREEN ALGAE)								
..CHLOROPHYCEAE								
...CHLOROCOCCALES								
....OOCYSTACEAE								
.....ANKISTRODESMUS	--	-	--	-	--	-	100	10
.....CHODATELLA	--	-	--	-	--	-	14	1
.....OOCYSTIS	--	-	38	8	--	-	--	-
.....SELENASTRUM	--	-	38	8	--	-	--	-
...SCENEDESMACEAE								
....CRUCIGENIA	--	-	--	-	--	-	--	-
....SCENEDESMUS	--	-	--	-	--	-	140	14
..TETRASPORALES								
...COCCOMYXACEAE								
....ELAKATOTHRIX	20#	33	--	-	--	-	--	-
..VOLVOCALES								
...CHLAMYDOMONADACEAE								
....CHLAMYDOMONAS	--	-	19	4	--	-	--	-
..ZYGNEMATALES								
...DESMIDIACEAE								
....CLOSTERIUM	--	-	38	8	--	-	--	-
CHRYSTOPHYTA								
..BACILLARIOPHYCEAE								
...CENTRALES								
...COSCINODISCACEAE								
....CYCLOTELLA	--	-	--	-	--	-	--	-
....MELOSIRA	--	-	--	-	--	-	--	-
..PENNALES								
...ACHNANTHACEAE								
....COCCONEIS	--	-	--	-	--	-	--	-
...EUNOTIACEAE								
....FUNOTIA	--	-	38	8	--	-	--	-
...FRAGILARIACEAE								
....SYNEDRA	--	-	--	-	--	-	29	3
...GOMPHONEMATACEAE								
....GOMPHONEMA	20#	33	76#	17	14#	25	230#	22
...NAVICULACEAE								
....GYROSIGMA	--	-	--	-	--	-	--	-
....NAVICULA	--	-	170#	38	43#	75	57	5
....STAURONEIS	--	-	19	4	--	-	--	-
...NITZSCHACEAE								
....NITZSCHIA	20#	33	--	-	--	-	29	3
CYANOPHYTA (BLUE-GREEN ALGAE)								
..CYANOPHYCEAE								
...HORMOGONALES								
...OSCILLATORIACEAE								
....OSCILLATORIA	--	-	--	-	--	-	--	-
...SCYTONEMATACEAE								
....PLECTONEMA	--	-	--	-	--	-	450#	42
EUGLENOPHYTA (EUGLENOIDS)								
..EUGLENOPHYCEAE								
...EUGLENALES								
....EUGLENACEAE								
.....EUGLENA	--	-	--	-	--	-	--	-
....TRACHELOMONAS	--	-	19	4	--	-	--	-

NOTE: # - DOMINANT ORGANISM; EQUAL TO OR GREATER THAN 15%

* - OBSERVED ORGANISM; MAY NOT HAVE BEEN COUNTED; LESS THAN 1/2%

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.

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 (2.8 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.--26 years, 31.9 ft³/s (0.903 m³/s), 23,110 acre-ft/yr (28.5 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.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 2,300 ft³/s (65.1 m³/s) and maximum (*):

Date	Time	Discharge (ft ³ /s) (m ³ /s)		Gage height (ft) (m)	
Apr. 20	1545	2550	72.2	9.12	2.780
June 28	1530	*4780	135	11.50	3.505
Aug. 21	1100	3140	88.9	9.86	3.005

Minimum discharge, 1.7 ft³/s (0.048 m³/s) Mar. 25, Apr. 2-4.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.6	4.2	2.4	3.3	2.9	3.4	2.3	3.0	4.3	16	2.5	4.2
2	2.6	3.4	2.5	3.1	2.7	2.7	2.2	5.4	3.4	82	46	4.2
3	2.6	28	99	3.1	2.6	2.6	2.2	4.0	3.1	15	6.7	3.4
4	2.9	12	15	3.0	2.7	2.6	2.2	4.2	3.0	31	10	3.4
5	3.3	11	4.6	3.0	2.9	2.7	2.3	3.3	97	13	31	5.8
6	3.1	8.3	4.2	3.9	3.0	2.7	2.6	45	55	89	13	9.1
7	3.6	6.0	3.4	3.1	2.6	3.0	3.0	58	22	40	113	30
8	3.4	3.7	3.4	3.1	2.6	2.5	3.0	12	11	17	447	9.1
9	4.3	3.0	3.1	3.9	2.6	2.5	9.4	6.0	7.6	11	30	5.0
10	3.6	2.9	3.3	3.1	2.5	2.4	131	4.2	5.6	9.6	13	4.2
11	3.7	2.9	3.0	3.3	2.5	2.3	91	3.4	4.6	6.7	8.0	3.3
12	3.6	2.9	3.0	4.3	2.5	2.3	33	3.1	4.2	5.4	20	20
13	4.0	2.7	3.7	4.2	2.5	2.2	11	8.0	3.7	4.6	362	10
14	3.4	2.7	3.4	3.7	2.4	2.2	12	29	3.1	4.0	20	5.8
15	3.0	27	3.6	4.6	2.4	3.0	7.8	58	5.0	4.0	9.4	4.3
16	3.1	8.3	4.5	4.5	2.2	6.0	4.6	74	3.6	3.7	6.0	15
17	3.7	5.8	18	4.0	2.3	2.4	3.9	16	4.3	3.3	35	72
18	2.6	3.7	76	4.5	2.9	2.5	3.1	14	3.9	4.5	8.5	24
19	2.5	3.3	18	5.0	2.6	2.3	6.7	11	12	4.2	8.0	13
20	2.5	2.9	8.0	4.3	2.6	2.3	533	7.3	38	8.5	8.8	28
21	2.9	2.7	5.4	3.9	2.4	2.4	74	147	264	6.2	392	30
22	3.7	3.0	4.2	3.6	2.3	2.4	18	38	42	3.7	64	25
23	3.6	3.1	3.3	3.6	2.3	2.3	9.4	302	19	3.0	48	16
24	3.6	3.1	3.1	3.4	2.3	2.2	6.0	48	10	2.7	19	9.6
25	4.5	3.1	3.1	3.3	2.4	2.2	4.5	18	7.3	5.2	11	6.0
26	3.3	3.0	3.1	3.3	2.4	3.3	3.7	11	20	8.3	11	4.5
27	3.1	2.7	3.3	3.3	2.1	5.4	3.4	46	16	4.5	6.9	4.0
28	3.7	2.6	2.9	3.1	2.7	3.1	3.6	18	1180	2.9	5.2	3.1
29	3.3	2.5	3.1	3.1	---	2.4	2.7	8.0	91	3.3	4.0	2.9
30	3.4	2.5	4.0	3.1	---	2.4	3.3	5.8	28	2.6	6.5	3.0
31	3.7	---	3.7	2.9	---	2.3	---	5.6	---	2.6	4.5	---
TOTAL	102.9	173.0	321.3	111.6	70.9	85.0	995.9	1016.3	1971.7	417.5	1770.0	377.9
MEAN	3.32	5.77	10.4	3.60	2.53	2.74	33.2	32.8	65.7	13.5	57.1	12.6
MAX	4.5	28	99	5.0	3.0	6.0	533	302	1180	89	447	72
MIN	2.5	2.5	2.4	2.9	2.1	2.2	2.2	3.0	3.0	2.6	2.5	2.9
AC-FT	204	343	637	221	141	169	1980	2020	3910	828	3510	750
CAL YR 1977	TOTAL	6808.9	MEAN	18.7	MAX	641	MIN	2.1	AC-FT	13510		
WTR YR 1978	TOTAL	7414.0	MEAN	20.3	MAX	1180	MIN	2.1	AC-FT	14710		

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 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.--21 years, 2.75 ft³/s (0.078 m³/s), 1,990 acre-ft/yr (2.45 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,580 ft³/s (73.1 m³/s) May 14, 1963, gage height, 6.63 ft (2.021 m), datum then in use, from rating curve extended above 77 ft³/s (2.18 m³/s) on basis of slope-area measurements at gage heights 6.29 ft (1.917 m) and 6.63 ft (2.021 m); no flow for many days in 1970-74, 1977, 1978.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 312 ft³/s (8.84 m³/s) Apr. 20, gage height, 3.53 ft (1.076 m), from rating curve extended as explained above, no other peak above base of 300 ft³/s (8.50 m³/s); no flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.00	.04	.00	.00	.06	1.0	.00	.02
2	.00	.00	.00	.00	.00	.00	.00	.00	.04	4.0	.00	.00
3	.00	.00	.62	.00	.00	.00	.00	.00	.02	.77	.00	.00
4	.00	.00	.00	.00	.00	.00	.00	.13	.03	2.9	.02	.00
5	.00	.00	.00	.00	.01	.00	.00	.00	5.6	2.0	.77	.00
6	.00	.00	.06	.00	.01	.00	.00	12	4.3	8.0	.61	.00
7	.00	.00	.00	.00	.00	.00	.00	7.9	1.2	4.0	9.1	1.4
8	.00	.00	.00	.00	.00	.00	.00	1.2	.37	1.2	26	.14
9	.00	.00	.24	.00	.00	.00	.02	.19	.10	.48	2.8	.00
10	.00	.00	.02	.00	.00	.00	13	.04	.07	.80	1.2	.00
11	.00	.00	.02	.00	.00	.00	3.5	.00	.04	.49	.77	.00
12	.00	.00	.04	.00	.00	.00	2.1	.01	.01	.05	.07	.00
13	.00	.00	.04	.00	.00	.00	.38	.01	.00	.01	9.9	.00
14	.00	.00	.00	.00	.00	.00	1.8	.01	.00	.00	.62	.03
15	.00	3.0	.00	.06	.00	.06	2.8	2.9	.00	.00	.07	.04
16	.00	3.7	.14	.14	.00	.32	2.7	4.7	.01	.00	.03	.00
17	.00	.38	.29	.00	.00	.00	.30	1.2	.00	.00	1.4	2.1
18	.00	.66	5.8	.00	.02	.00	.03	1.1	.00	.01	.17	.93
19	.00	.02	1.3	.00	.00	.00	.53	2.0	.00	.00	.04	.11
20	.00	.00	.16	.00	.00	.00	50	.66	.42	.01	.01	.11
21	.00	.00	.02	.00	.00	.00	12	14	14	.01	20	.13
22	.00	.00	.00	.00	.00	.00	2.9	5.0	2.1	.01	4.4	.13
23	.00	.00	.03	.00	.00	.00	1.3	40	.84	.00	3.0	.13
24	.00	.00	.07	.00	.00	.00	.15	5.9	.18	.00	1.1	.12
25	.01	.00	.00	.00	.00	.00	1.0	2.3	.07	.00	.18	.06
26	.00	.00	.00	.00	.00	.00	.00	.55	.16	.00	1.2	.02
27	.00	.00	.00	.00	.00	.00	1.3	.96	.90	.00	.14	.00
28	.00	.00	.00	.00	.02	.01	.14	.82	73	.00	.04	.00
29	.00	.00	.00	.00	---	.00	.03	.17	9.5	.00	.01	.00
30	.00	.00	.00	.01	---	.00	.00	.07	3.2	.00	.00	.00
31	.00	---	.03	.00	---	.00	---	.38	---	.00	.60	---
TOTAL	.01	7.76	8.88	.21	.06	.43	95.98	104.20	116.22	25.74	83.65	5.47
MEAN	.000	.26	.29	.007	.002	.014	3.20	3.36	3.87	.83	2.70	.18
MAX	.01	3.7	5.8	.14	.02	.32	50	40	73	8.0	26	2.1
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	.02	15	18	.4	.1	.9	190	207	231	51	166	11

CAL YR 1977 TOTAL 426.56 MEAN 1.17 MAX 59 MIN .00 AC-FT 846
WTR YR 1978 TOTAL 448.61 MEAN 1.23 MAX 73 MIN .00 AC-FT 890

16226000 NORTH HALAWA STREAM NEAR AIEA

LOCATION.--Lat 12°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 mi² (8.94 km²).

PERIOD OF RECORD.--August 1929 to June 1933, July 1953 to current year. Monthly discharge only May, June 1931, published in WSP 1319.

REVISED RECORDS (FISCAL YEARS).--WSP 1319: Drainage area. WSP 1719: 1954-55(P), 1956, 1957(P), 1958-59.

GAGE.--Water-stage recorder. Altitude of gage is 320 ft (98 m), from topographic map.

REMARKS.--Records fair. Recording rain gage located at station. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--28 years (water years, 1930-32, 1954-78), 4.85 ft³/s (0.137 m³/s), 3,510 acre-ft/yr (4.33 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,650 ft³/s (188 m³/s) Feb. 28, 1932, gage height, 13.36 ft (4.103 m), from rating curve extended above 420 ft³/s (11.9 m³/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, 295 ft³/s (8.35 m³/s) June 28, gage height, 7.63 ft (2.326 m) from rating curve extended above 63 ft³/s (1.78 m³/s) on basis of slope-area measurements at gage heights 10.3 ft (3.14 m), 13.04 ft (3.975 m), and 13.46 ft (4.103 m), no peak above base of 570 ft³/s (16.1 m³/s); no flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.00	.00	.00	.21	.43	3.0	4.7	.23
2	.00	.00	.00	.00	.00	.00	.00	.13	.25	9.8	6.8	.16
3	.00	.01	.01	.00	.00	.00	.00	.08	.15	2.5	.94	.12
4	.00	.01	.00	.00	.00	.00	.00	.07	.11	7.0	1.7	.07
5	.00	.00	.00	.00	.00	.00	.00	6.7	20	3.0	3.4	1.2
6	.00	.00	.00	.00	.00	.00	.00	26	9.8	17	1.6	3.0
7	.00	.00	.00	.00	.00	.00	.00	18	3.1	8.0	20	6.0
8	.00	.00	.00	.00	.00	.00	.00	3.3	1.5	3.6	43	1.1
9	.00	.00	.00	.00	.00	.00	.05	1.4	.74	2.2	5.7	.35
10	.00	.00	.00	.00	.00	.00	26	.63	.39	1.6	2.2	.18
11	.00	.00	.00	.00	.00	.00	5.3	.35	.23	1.0	1.2	.10
12	.00	.00	.00	.00	.00	.00	2.1	.20	.14	.74	.94	2.4
13	.00	.00	.00	.00	.00	.00	.53	.14	.10	.53	17	1.0
14	.00	.00	.00	.00	.00	.00	.30	.85	.08	.32	1.7	4.9
15	.00	.00	.00	.00	.00	.00	2.4	4.5	.07	.21	.68	1.0
16	.00	6.4	.00	.00	.00	.00	3.8	4.4	.01	.15	.32	1.6
17	.00	3.6	.01	.00	.00	.00	.68	2.2	.01	.12	4.8	10
18	.00	3.5	.32	.00	.00	.00	.30	1.9	.01	.99	.94	4.2
19	.00	.39	.80	.00	.00	.00	.18	1.8	1.4	.53	.63	2.1
20	.00	.23	.30	.00	.00	.00	.00	28	1.3	3.8	.65	7.8
21	.00	.12	.18	.00	.00	.00	10	11	25	.58	33	6.7
22	.00	.07	.09	.00	.00	.00	2.1	6.1	4.4	.25	8.2	3.7
23	.00	.03	.06	.00	.00	.00	.80	57	2.0	.15	7.7	2.1
24	.00	.02	.03	.00	.00	.00	.43	12	1.2	.11	2.8	1.2
25	.00	.02	.03	.00	.00	.00	.25	3.8	.74	1.1	1.7	.68
26	.00	.02	.02	.00	.00	.00	2.5	2.1	1.7	.87	1.5	.39
27	.00	.01	.02	.00	.00	.00	2.9	4.6	1.7	.35	.80	.23
28	.00	.01	.02	.00	.00	.00	1.1	1.9	102	.27	.35	.14
29	.00	.01	.02	.00	---	.00	.58	1.2	21	.15	5.1	.09
30	.00	.00	.00	.00	---	.00	.35	1.1	5.9	.11	1.5	.07
31	.00	---	.01	.00	---	.00	---	.63	---	.08	.58	---
TOTAL	.00	14.45	1.92	.00	.00	.00	90.65	175.59	207.96	66.96	181.83	62.81
MEAN	.000	.48	.062	.000	.000	.000	3.02	5.66	6.93	2.16	5.87	2.09
MAX	.00	6.4	.80	.00	.00	.00	28	57	102	17	43	10
MIN	.00	.00	.00	.00	.00	.00	.00	.07	.01	.08	.32	.07
AC-FT	.00	29	3.8	.00	.00	.00	180	348	412	133	361	125

CAL YR 1977 TOTAL 840.45 MEAN 2.30 MAX 61 MIN .00 AC-FT 1670
WTR YR 1978 TOTAL 802.17 MEAN 2.20 MAX 102 MIN .00 AC-FT 1590

16227500 MOANALUA STREAM NEAR KANEOHE

LOCATION.--Lat 21°23'29", long 157°51'05", Hydrologic Unit 20060000, on left bank 3.3 mi (5.3 km) northeast of Tripler Hospital and 3.6 mi (5.8 km) southwest of Kaneohe Post Office.

DRAINAGE AREA.--0.94 mi² (2.43 km²).

PERIOD OF RECORD.--October 1968 to March 1978 (discontinued).

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 660 ft (201 m), from topographic map.

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

AVERAGE DISCHARGE.--9 years, 1.23 ft³/s (0.035 m³/s), 891 acre-ft/yr (1.10 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,530 ft³/s (43.3 m³/s) Nov. 26, 1970, gage height, 8.07 ft (2.460 m), from rating curve extended above 18 ft³/s (0.51 m³/s) on basis of slope-area measurement at gage height 5.94 ft (1.811 m); no flow for many days each year.

EXTREMES FOR CURRENT YEAR.--Maximum discharge during period October 1977 to March 1978, 43 ft³/s (1.22 m³/s) Nov. 16, gage height, 3.56 ft (1.085 m), no peak above base of 250 ft³/s (7.08 m³/s); no flow most of time.

DISCHARGE, IN CUBIC FEET PER SECOND, OCTOBER 1977 TO MARCH 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.00	.00						
2	.00	.00	.00	.00	.00	.00						
3	.00	.00	.00	.00	.00	.00						
4	.00	.00	.00	.00	.00	.00						
5	.00	.00	.00	.00	.00	.00						
6	.00	.00	.00	.00	.00	.00						
7	.00	.00	.00	.00	.00	.00						
8	.00	.00	.00	.00	.00	.00						
9	.00	.00	.00	.00	.00	.00						
10	.00	.00	.00	.00	.00	.00						
11	.00	.00	.00	.00	.00	.00						
12	.00	.00	.00	.00	.00	.00						
13	.00	.00	.00	.00	.00	.00						
14	.00	.00	.00	.00	.00	.00						
15	.00	.00	.00	.00	.00	.00						
16	.00	4.8	.00	.00	.00	.00						
17	.00	.08	.00	.00	.00	.00						
18	.00	.85	.00	.00	.00	.00						
19	.00	.01	.00	.00	.00	.00						
20	.00	.00	.00	.00	.00	.00						
21	.00	.00	.00	.00	.00	.00						
22	.00	.00	.00	.00	.00	.00						
23	.00	.00	.00	.00	.00	.00						
24	.00	.00	.00	.00	.00	.00						
25	.00	.00	.00	.00	.00	.00						
26	.00	.00	.00	.00	.00	.00						
27	.00	.00	.00	.00	.00	.00						
28	.00	.00	.00	.00	.00	.00						
29	.00	.00	.00	.00	.00	---						
30	.00	.00	.00	.00	.00	---						
31	.00	---	.00	.00	---	.00						
TOTAL	.00	5.74	.00	.00	.00	.00						
MEAN	.000	.19	.000	.000	.000	.000						
MAX	.00	4.8	.00	.00	.00	.00						
MIN	.00	.00	.00	.00	.00	.00						
AC-FT	.00	11	.00	.00	.00	.00						

CAL YR 1977 TOTAL 162.11 MEAN .44 MAX 18 MIN .00 AC-FT 322

HAWAII, ISLAND OF OAHU

16227500 MOANALUA STREAM NEAR KANEOHE--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1970-71, 1972 to March 31, 1978 (discontinued).

PERIOD OF DAILY RECORD.--

SUSPENDED SEDIMENT DISCHARGE: October 1971 to March 31, 1978 (discontinued).

INSTRUMENTATION.--Automatic pumping sediment sampler October 1971 to March 31, 1978.

EXTREMES FOR PERIOD OF RECORD.--

SEDIMENT CONCENTRATIONS: Maximum daily mean, 303 mg/L Nov. 25, 1975; minimum daily mean, 0 mg/L on many days each year.

SEDIMENT DISCHARGE: Maximum daily, 162 ton (147 tonnes) Nov. 25, 1975; minimum daily, 0 ton (0 tonne) on many days each year.

EXTREMES FOR THE PERIOD OCTOBER 1977 TO MARCH 1978.--

SEDIMENT CONCENTRATIONS: Maximum daily mean, 50 mg/L Nov. 16; minimum daily mean, 0 mg/L on many days during year.

SEDIMENT DISCHARGE: Maximum daily, 0.65 tons (0.59 tonnes) Nov. 16; minimum daily, 0 ton (0 tonne) on many days during year.

SUSPENDED-SEDIMENT DISCHARGE (TONS/DAY), OCTOBER 1977 TO MARCH 1978

DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
OCTOBER			NOVEMBER			DECEMBER			
1	.00	0	.00	.00	0	.00	.00	0	.00
2	.00	0	.00	.00	0	.00	.00	0	.00
3	.00	0	.00	.00	0	.00	.00	0	.00
4	.00	0	.00	.00	0	.00	.00	0	.00
5	.00	0	.00	.00	0	.00	.00	0	.00
6	.00	0	.00	.00	0	.00	.00	0	.00
7	.00	0	.00	.00	0	.00	.00	0	.00
8	.00	0	.00	.00	0	.00	.00	0	.00
9	.00	0	.00	.00	0	.00	.00	0	.00
10	.00	0	.00	.00	0	.00	.00	0	.00
11	.00	0	.00	.00	0	.00	.00	0	.00
12	.00	0	.00	.00	0	.00	.00	0	.00
13	.00	0	.00	.00	0	.00	.00	0	.00
14	.00	0	.00	.00	0	.00	.00	0	.00
15	.00	0	.00	.00	0	.00	.00	0	.00
16	.00	0	.00	4.8	50	.65	.00	0	.00
17	.00	0	.00	.08	10	.00	.00	0	.00
18	.00	0	.00	.85	10	.02	.00	0	.00
19	.00	0	.00	.01	5	.00	.00	0	.00
20	.00	0	.00	.00	0	.00	.00	0	.00
21	.00	0	.00	.00	0	.00	.00	0	.00
22	.00	0	.00	.00	0	.00	.00	0	.00
23	.00	0	.00	.00	0	.00	.00	0	.00
24	.00	0	.00	.00	0	.00	.00	0	.00
25	.00	0	.00	.00	0	.00	.00	0	.00
26	.00	0	.00	.00	0	.00	.00	0	.00
27	.00	0	.00	.00	0	.00	.00	0	.00
28	.00	0	.00	.00	0	.00	.00	0	.00
29	.00	0	.00	.00	0	.00	.00	0	.00
30	.00	0	.00	.00	0	.00	.00	0	.00
31	.00	0	.00	---	---	---	.00	0	.00
TOTAL	0.00	---	0.00	5.74	---	0.67	0.00	---	0.00

16227500 MOANALUA STREAM NEAR KANEOHE--Continued

SUSPENDED-SEDIMENT DISCHARGE (TONS/DAY), OCTOBER 1977 TO MARCH 1978

DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
		JANUARY			FEBRUARY			MARCH	
1	.00	0	.00	.00	0	.00	.00	0	.00
2	.00	0	.00	.00	0	.00	.00	0	.00
3	.00	0	.00	.00	0	.00	.00	0	.00
4	.00	0	.00	.00	0	.00	.00	0	.00
5	.00	0	.00	.00	0	.00	.00	0	.00
6	.00	0	.00	.00	0	.00	.00	0	.00
7	.00	0	.00	.00	0	.00	.00	0	.00
8	.00	0	.00	.00	0	.00	.00	0	.00
9	.00	0	.00	.00	0	.00	.00	0	.00
10	.00	0	.00	.00	0	.00	.00	0	.00
11	.00	0	.00	.00	0	.00	.00	0	.00
12	.00	0	.00	.00	0	.00	.00	0	.00
13	.00	0	.00	.00	0	.00	.00	0	.00
14	.00	0	.00	.00	0	.00	.00	0	.00
15	.00	0	.00	.00	0	.00	.00	0	.00
16	.00	0	.00	.00	0	.00	.00	0	.00
17	.00	0	.00	.00	0	.00	.00	0	.00
18	.00	0	.00	.00	0	.00	.00	0	.00
19	.00	0	.00	.00	0	.00	.00	0	.00
20	.00	0	.00	.00	0	.00	.00	0	.00
21	.00	0	.00	.00	0	.00	.00	0	.00
22	.00	0	.00	.00	0	.00	.00	0	.00
23	.00	0	.00	.00	0	.00	.00	0	.00
24	.00	0	.00	.00	0	.00	.00	0	.00
25	.00	0	.00	.00	0	.00	.00	0	.00
26	.00	0	.00	.00	0	.00	.00	0	.00
27	.00	0	.00	.00	0	.00	.00	0	.00
28	.00	0	.00	.00	0	.00	.00	0	.00
29	.00	0	.00	---	---	---	.00	0	.00
30	.00	0	.00	---	---	---	.00	0	.00
31	.00	0	.00	---	---	---	.00	0	.00
TOTAL	0.00	---	0.00	0.00	---	0.00	0.00	---	0.00

HAWAII, ISLAND OF OAHU

16227700 MOANALUA STREAM TRIBUTARY NEAR KANEOHE

LOCATION.--Lat 21°23'27", long 157°50'53", Hydrologic Unit 20060000, on left bank 3.4 mi (5.5 km) northeast of Tripler Hospital and 3.6 mi (5.8 km) southwest of Kaneohe Post Office.

DRAINAGE AREA.--0.62 mi² (1.61 km²).

PERIOD OF RECORD.--October 1968 to March 1978 (discontinued).

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 700 ft (213 m), from topographic map.

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

AVERAGE DISCHARGE.--9 years, 0.727 ft³/s (0.021 m³/s), 527 acre-ft/yr (650,000 m³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 892 ft³/s (25.3 m³/s) Feb. 1, 1969, gage height, 5.57 ft (1.698 m), from rating curve extended above 28 ft³/s (0.79 m³/s) on basis of slope-area measurement at gage height 5.19 ft (1.582 m); no flow at times most years.

EXTREMES FOR CURRENT YEAR.--Maximum discharge during period October 1977 to March 1978, 33 ft³/s (0.93 m³/s) Nov. 16, gage height, 2.75 ft (0.838 m), no peak above base of 150 ft³/s (4.25 m³/s); no flow most of time.

DISCHARGE, IN CUBIC FEET PER SECOND, OCTOBER 1977 TO MARCH 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.00	.00						
2	.00	.00	.00	.00	.00	.00						
3	.00	2.0	.06	.00	.00	.00						
4	.00	.12	.00	.00	.00	.00						
5	.00	.07	.00	.00	.00	.00						
6	.00	.02	.00	.00	.00	.00						
7	.00	.00	.00	.00	.00	.00						
8	.00	.00	.00	.00	.00	.00						
9	.00	.00	.00	.00	.00	.00						
10	.00	.00	.00	.00	.00	.00						
11	.00	.05	.00	.00	.00	.00						
12	.00	.00	.00	.00	.00	.00						
13	.00	.00	.00	.00	.00	.00						
14	.00	.00	.00	.00	.00	.00						
15	.00	.00	.00	.00	.00	.00						
16	.00	2.5	.00	.00	.00	.00						
17	.00	.21	.08	.00	.00	.00						
18	.00	.38	.42	.00	.00	.00						
19	.00	.03	.08	.00	.00	.00						
20	.00	.03	.00	.00	.00	.00						
21	.00	.00	.00	.00	.00	.00						
22	.00	.00	.00	.00	.00	.00						
23	.00	.00	.00	.00	.00	.00						
24	.00	.00	.00	.00	.00	.00						
25	.00	.00	.00	.00	.00	.00						
26	.00	.00	.00	.00	.00	.22						
27	.00	.00	.00	.00	.00	.00						
28	.00	.00	.00	.00	.00	.00						
29	.00	.00	.00	.00	.00	.00						
30	.00	.00	.00	.00	.00	.00						
31	.00	---	.00	.00	.00	.00						
TOTAL	.00	5.41	.64	.00	.00	.22						
MEAN	.000	.18	.021	.000	.000	.007						
MAX	.00	2.5	.42	.00	.00	.22						
MIN	.00	.00	.00	.00	.00	.00						
AC-FT	.00	11	1.3	.00	.00	.4						

CAL YR 1977 TOTAL 157.42 MEAN .43 MAX 19 MIN .00 AC-FT 312

HAWAII, ISLAND OF OAHU

99

16228000 MOANALUA STREAM NEAR HONOLULU

LOCATION.--Lat 21°22'53", long 157°52'22", Hydrologic Unit 20060000, on left bank 1.8 mi (2.9 km) northeast of Tripler Hospital and 5.0 mi (8.0 km) north of Honolulu Post Office.

DRAINAGE AREA.--2.73 mi² (7.07 km²).

PERIOD OF RECORD--June 1926 to September 1978 (discontinued).

REVISED RECORDS (FISCAL YEARS)--WSP 935: 1931(M). WSP 1319: 1927-30(M), 1932-41(M). WSP 1569: Drainage area.

GAGE.--Water-stage recorder and concrete weir. Datum of gage is 338.12 ft (103.059 m) above mean sea level (city and county of Honolulu bench mark). Prior to July 1, 1960, at datum 1.00 ft (0.305 m) higher.

REMARKS.--Records good except those for period of no gage-height record, Aug. 17 to Sept. 21, which are poor. No diversion above station. Recording rain gage located at station.

AVERAGE DISCHARGE.--52 years, 3.11 ft³/s (0.088 m³/s), 2,250 acre-ft/yr (2.77 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,580 ft³/s (130 m³/s) Nov. 18, 1930, gage height, 12.58 ft (3.834 m), present datum, from rating curve extended above 110 ft³/s (3.12 m³/s) by test of model of station site; no flow at times each year.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, about 750 ft³/s (21.2 m³/s) Aug. 21, no other peak above base of 400 ft³/s (11.3 m³/s); no flow most of time.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.00	.00	.00	.00	.01	2.5	.00	.01
2	.00	.00	.00	.00	.00	.00	.00	.00	.00	8.5	.00	.00
3	.00	.00	.00	.00	.00	.00	.00	.00	.00	1.8	.00	.00
4	.00	.00	.00	.00	.00	.00	.00	.00	.00	2.9	.00	.00
5	.00	.00	.00	.00	.00	.00	.00	.25	17	1.1	.00	.25
6	.00	.00	.00	.00	.00	.00	.00	10	2.9	7.1	.00	.31
7	.00	.00	.00	.00	.00	.00	.00	7.5	1.2	3.6	15	.01
8	.00	.00	.00	.00	.00	.00	.00	.96	.34	1.6	52	.00
9	.00	.00	.00	.00	.00	.00	.00	.10	.07	1.0	4.2	.00
10	.00	.00	.00	.00	.00	.00	4.2	.01	.03	.52	1.5	.00
11	.00	.00	.00	.00	.00	.00	.29	.00	.02	.17	.64	.00
12	.00	.00	.00	.00	.00	.00	.08	.00	.00	.06	1.4	.00
13	.00	.00	.00	.00	.00	.00	.00	.00	.00	.03	11	.00
14	.00	.00	.00	.00	.00	.00	.00	.00	.00	.02	1.0	.00
15	.00	.00	.00	.00	.00	.00	.00	.00	.00	.02	.26	.00
16	.00	1.3	.00	.00	.00	.00	.00	.00	.00	.01	.05	.10
17	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	1.2	5.0
18	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.09	10
19	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.02	3.0
20	.00	.00	.00	.00	.00	.00	15	.00	.00	.00	.00	2.2
21	.00	.00	.00	.00	.00	.00	3.2	.00	9.1	.00	40	1.5
22	.00	.00	.00	.00	.00	.00	.18	.00	1.5	.00	11	.58
23	.00	.00	.00	.00	.00	.00	.01	27	.38	.00	7.1	.38
24	.00	.00	.00	.00	.00	.00	.00	3.8	.10	.00	1.0	.12
25	.00	.00	.00	.00	.00	.00	.00	.93	.04	.00	.10	.04
26	.00	.00	.00	.00	.00	.00	.00	.25	1.1	.00	.02	.02
27	.00	.00	.00	.00	.00	.00	.00	.46	.59	.00	.00	.01
28	.00	.00	.00	.00	.00	.00	.00	.38	107	.00	.00	.00
29	.00	.00	.00	.00	---	.00	.00	.08	15	.00	12	.00
30	.00	.00	.00	.00	---	.00	.00	.04	4.7	.00	1.5	.00
31	.00	---	.00	.00	---	.00	---	.02	---	.00	.02	---
TOTAL	.00	1.30	.00	.00	.00	.00	22.96	51.78	161.08	30.93	161.10	23.53
MEAN	.000	.043	.000	.000	.000	.000	.77	1.67	5.37	1.00	5.20	.78
MAX	.00	1.3	.00	.00	.00	.00	15	27	107	8.5	52	10
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	.00	2.6	.00	.00	.00	.00	46	103	320	61	320	47

CAL YR 1977 TOTAL 440.22 MEAN 1.21 MAX 51 MIN .00 AC-FT 873
WTR YR 1978 TOTAL 452.68 MEAN 1.24 MAX 107 MIN .00 AC-FT 898

HAWAII, ISLAND OF OAHU

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 Kamaikai Stream and 4.1 mi (6.6 km) north of Honolulu Post Office.

DRAINAGE AREA.--2.61 mi² (6.76 km²).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--September 1913 to April 1914, July 1914 to current year. Monthly discharge only for some periods, published in WSP 1319.

REVISED RECORDS (FISCAL YEARS).--WSP 1569: Drainage area. WSP 1719: 1921-22(M), 1923-24, 1925-26(M), 1927-28, 1929-32(M), 1935, 1937, 1938-39(M), 1943(M), 1948-52(P), 1955-56, 1957-58(M), 1959.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 464.40 ft (141.549 m) above mean sea level. Prior to Oct. 12, 1923, at datum 2.00 ft (0.610 m) lower.

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

AVERAGE DISCHARGE.--64 years (water years 1915-78), 6.72 ft³/s (0.190 m³/s), 4,870 acre-ft/yr (6.00 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 discharge, 316 ft³/s (8.95 m³/s) June 28, gage height, 5.87 ft (1.789 m), no other peak above base of 700 ft³/s (19.8 m³/s); minimum, 0.16 ft³/s (0.005 m³/s) several days in February.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.50	.92	.57	1.6	.30	2.2	.43	2.0	3.2	6.5	2.6	4.0
2	.50	1.4	.57	1.6	.24	.91	.36	2.2	3.2	12	3.3	2.8
3	.50	4.1	1.7	.73	.17	.50	.30	1.8	2.6	5.9	1.9	2.4
4	.50	1.8	.82	.57	.16	.43	.30	1.6	3.4	8.6	0.6	2.4
5	.43	1.2	.65	.50	.16	.36	.30	7.9	8.3	5.4	5.8	5.4
6	.82	.91	.65	.43	.16	.43	.43	16	5.9	23	3.2	5.8
7	.50	.65	.82	.43	.19	.43	1.1	11	4.4	8.9	31	4.6
8	.43	.57	.57	.36	.19	.48	.65	5.6	3.4	6.8	32	3.2
9	.50	.50	.57	.30	.24	1.8	6.0	3.8	3.0	6.8	6.8	2.6
10	.43	.43	.57	.30	.24	1.7	12	3.2	2.6	5.1	4.9	2.6
11	.43	.91	.50	.36	.24	1.1	9.2	2.6	2.4	4.4	4.2	2.2
12	.36	.82	.50	.36	.30	.73	4.4	2.3	2.4	4.0	4.2	4.5
13	.43	.57	.43	.30	.24	.65	3.4	2.8	2.3	3.6	3.8	4.2
14	.43	.43	.43	.30	.19	.50	4.6	6.2	3.0	3.4	3.4	4.0
15	.43	.50	.36	.65	.24	.50	3.2	5.9	2.4	3.0	2.8	2.8
16	.65	12	1.5	1.0	.19	.99	2.6	4.9	2.0	3.0	6.2	6.3
17	.50	1.9	5.1	.73	1.5	.50	1.8	3.8	2.3	3.2	7.6	19
18	.43	1.9	5.0	.43	.78	.43	1.4	3.0	2.3	3.8	3.6	8.3
19	.36	1.1	1.6	.43	.73	.43	3.1	2.6	5.7	2.6	3.8	4.4
20	.36	.91	.91	.30	.36	.36	17	2.3	8.1	3.0	3.0	4.9
21	.36	.73	.82	.43	.30	.36	7.4	8.7	14	2.8	21	4.4
22	.36	.80	.65	.50	.24	.30	3.8	4.2	5.4	2.3	6.2	4.0
23	.36	.91	.57	.36	.24	.57	3.2	49	4.4	2.2	5.9	3.6
24	.36	.95	.57	.30	.30	.50	2.0	9.1	4.0	3.5	4.2	2.8
25	1.4	.73	.50	.30	.30	.94	2.0	5.9	3.2	3.0	4.6	2.4
26	.65	.65	.50	.36	.24	3.6	3.5	5.6	6.5	2.1	4.0	2.7
27	.65	.57	.43	.30	.30	1.3	3.2	9.0	4.2	2.0	3.0	2.2
28	1.4	.50	.43	.30	.70	.73	2.6	5.4	92	2.0	2.6	2.0
29	.50	.65	.43	1.1	---	.50	2.2	5.1	16	1.9	12	2.0
30	.43	.57	.43	.43	---	1.0	1.6	4.4	8.0	1.6	4.2	2.0
31	.50	---	1.1	.30	---	.50	---	3.8	---	1.5	3.2	---
TOTAL	16.46	40.58	30.25	16.36	9.44	25.73	104.07	201.7	230.6	147.9	214.6	124.5
MEAN	.53	1.35	.98	.53	.34	.83	3.47	6.51	7.69	4.77	6.92	4.15
MAX	1.4	12	5.1	1.6	1.5	3.6	17	49	92	23	32	19
MIN	.36	.43	.36	.30	.16	.30	.30	1.6	2.0	1.5	1.9	2.0
AC-FT	33	80	60	32	19	51	206	400	457	293	426	247
CAL YR 1977	TOTAL	1254.50	MEAN	3.44	MAX	72	MIN	.19	AC-FT	2490		
WTR YR 1978	TOTAL	1162.19	MEAN	3.18	MAX	92	MIN	.16	AC-FT	2310		

HAWAII, ISLAND OF OAHU

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16229000 KALIHI STREAM NEAR HONOLULU--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1972, 1974-78.

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH (UNITS)	TEMPER- ATURE (DEG C)	DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH (UNITS)	TEMPER- ATURE (DEG C)
OCT 25...	1455	2.1	160	7.6	21.0	JUN 27...	1130	3.6	150	7.2	21.5
NOV 22...	1425	.64	150	7.2	21.5	AUG 28...	1010	2.4	150	7.3	21.0
DEC 27...	1030	.43	190	7.0	19.0	SEP 26...	1040	2.8	170	7.2	21.5
FEB 22...	1225	.26	145	7.6	19.5	26...	1140	2.8	170	7.2	21.5
22...	1230	.26	145	7.6	19.5						

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	COLOR (PLAT- INUM- COBALT UNITS)	TUR- BID- ITY (JTU)	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)	SODIUM PERCENT
FEB 22...	1230	.26	--	--	42	8	7.1	5.8	13	40
JUN 27...	1130	3.6	6	3	40	13	7.7	5.0	13	41
SEP 26...	1140	2.8	--	--	38	11	7.8	4.6	12	40

DATE	SOLIDS, SUM OF CONSTITUENTS, DIS- SOLVED (MG/L)	SOLIDS, DIS- SOLVED (IONS PER AC-FT)	SOLIDS, DIS- SOLVED (IONS PER DAY)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	PHOS- PHORUS, DIS- SOLVED (MG/L AS P)	PHOS- PHORUS, ORTHO, DIS- SOLVED (MG/L AS P)	PHOS- PHATE, ORTHO, DIS- SOLVED (MG/L AS PO4)	IRON, DIS- SOLVED (MG/L AS FE)	MANGA- NESE, DIS- SOLVED (MG/L AS MN)
FEB 22...	95	.13	.07	.11	--	.01	.03	410	0
JUN 27...	90	.12	.87	.04	--	.02	.06	200	30
SEP 26...	82	.11	.62	.09	.00	--	--	80	20

DATE	SODIUM AD- SORP- TION RATIO	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	BICAR- BONATE (MG/L AS HCO3)	CAR- BONATE (MG/L AS CO3)	ALKA- LINITY (MG/L AS CACO3)	CARBON DIOXIDE DIS- SOLVED (MG/L AS CO2)	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)
FEB 22...	.9	.9	41	0	34	1.6	8.6	23	.0	15
JUN 27...	.9	1.3	33	0	27	3.3	10	22	.0	14
SEP 26...	.8	.9	34	0	28	3.4	5.3	22	.0	12

HAWAII, ISLAND OF OAHU

16229000 KALIHI STREAM NEAR HONOLULU--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SEDI- MENT, SUS- PENDED (MG/L)	SEDI- MENT DIS- CHARGE, SUS- PENDED (T/DAY)	DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SEDI- MENT, SUS- PENDED (MG/L)	SEDI- MENT DIS- CHARGE, SUS- PENDED (T/DAY)
APR					MAY				
10...	1105	10	56	1.5	23...	1100	89	54	13
10...	1115	9.8	20	.53	23...	1115	85	57	13
20...	1345	13	113	4.0	JUN				
20...	1405	17	99	4.5	28...	0745	242	429	280
20...	1420	19	137	7.0	28...	0800	246	450	299
20...	1450	27	156	11	28...	0815	212	380	218
20...	1500	48	352	46	28...	0830	200	374	180
20...	1515	73	325	64	28...	0845	254	287	197
20...	1530	81	264	58	28...	0900	286	300	232
20...	1545	78	194	41	28...	0915	254	389	267
20...	1615	66	138	25	28...	0930	239	367	237
20...	1645	59	83	13	28...	0945	254	300	206
20...	1715	49	58	7.7	28...	1000	254	264	181
20...	1745	42	43	4.9	28...	1030	155	213	89
MAY					28...	1100	127	136	47
23...	0840	127	124	43	28...	1130	113	96	29
23...	0900	125	105	35	28...	1200	119	75	24
23...	0920	119	92	30	28...	1230	177	84	40
23...	0940	111	84	25	28...	1245	212	232	133
23...	1010	105	69	20					
23...	1035	101	53	14					
DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SEDI- MENT, SUS- PENDED (MG/L)	SEDI- MENT DIS- CHARGE, SUS- PENDED (T/DAY)	DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SEDI- MENT, SUS- PENDED (MG/L)	SEDI- MENT DIS- CHARGE, SUS- PENDED (T/DAY)
JUN					JUN				
28...	1300	225	278	169	28...	1500	87	47	11
28...	1330	136	204	75	28...	1530	82	44	9.7
28...	1400	119	124	40					

NOTE.-- Sediment samples collected by U.S. Forest Service.

HAWAII, ISLAND OF OAHU

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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.--16 years, 10.8 ft³/s (0.306 m³/s), 7,820 acre-ft/yr (9.65 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, 406 ft³/s (11.5 m³/s) June 28, gage height, 2.76 ft (0.841 m), from rating curve extended as explained above, no peak above base of 1,600 ft³/s (45.3 m³/s); minimum, 0.49 ft³/s (0.014 m³/s) for several days in February.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.95	2.0	.98	1.6	.66	4.0	.80	2.9	3.2	7.6	2.6	5.1
2	.80	4.4	.90	2.0	.56	1.3	.80	3.2	3.4	15	4.3	3.1
3	.80	14	3.8	1.3	.56	.81	.71	2.3	3.3	6.8	2.3	3.1
4	1.2	4.1	1.5	.95	.56	.66	.71	4.5	3.1	11	11	3.1
5	1.0	2.8	1.0	.94	.49	.68	.72	6.7	9.5	6.7	6.5	5.7
6	1.4	2.4	1.2	.81	.58	.73	1.6	15	6.1	24	3.8	6.1
7	1.0	2.0	1.3	.86	.68	.75	1.8	15	4.4	12	22	6.4
8	.90	1.6	.91	.81	.71	.84	1.2	6.5	3.5	7.6	46	4.0
9	1.2	1.4	.98	.73	.71	2.8	8.9	5.0	3.1	7.7	9.2	3.4
10	1.1	1.3	.81	.71	.56	2.6	17	4.1	2.8	5.5	5.7	3.2
11	1.3	2.8	.80	.83	.56	1.6	13	3.5	2.8	5.2	4.7	2.5
12	1.3	3.5	.80	.75	.74	1.1	5.6	3.2	2.5	4.7	4.6	5.1
13	1.1	1.8	.80	.65	.70	1.0	4.2	4.7	2.5	4.1	3.9	4.9
14	.90	2.2	.80	.72	.54	2.0	6.1	11	3.8	3.5	3.6	5.2
15	.80	2.4	.97	1.2	.63	2.0	3.8	9.5	2.6	3.3	3.3	3.1
16	1.0	14	3.9	2.8	.64	6.1	3.1	6.9	2.4	3.6	6.7	7.2
17	.80	3.7	19	1.3	2.1	1.4	2.3	5.0	2.5	3.8	9.4	26
18	.83	2.7	12	.86	1.3	1.8	1.8	4.1	2.7	4.3	4.0	12
19	.90	1.6	3.5	.86	1.4	.90	3.5	3.8	6.8	3.0	5.5	6.5
20	.63	1.3	2.2	.87	.87	.63	38	3.5	7.1	3.7	3.8	8.3
21	.63	1.2	1.7	.88	.75	1.2	11	17	24	3.4	24	8.7
22	.56	2.2	1.4	1.0	.60	1.1	4.9	5.2	7.4	2.7	7.9	5.9
23	.66	1.5	1.1	1.0	.64	1.7	4.1	73	5.8	2.5	7.0	5.0
24	.80	4.5	.99	.90	.63	.92	2.9	14	5.2	3.8	4.7	3.8
25	3.3	1.4	.89	1.0	.56	.79	2.9	7.5	4.7	3.4	5.1	3.4
26	1.5	1.1	.91	1.1	.56	3.7	4.4	6.7	8.0	2.7	4.3	3.4
27	2.5	1.0	.97	1.0	.56	1.9	4.0	12	4.8	2.5	3.5	2.9
28	3.7	.90	.83	1.1	1.9	1.3	3.5	5.8	134	2.4	3.2	2.7
29	1.1	.98	.80	1.8	---	.96	2.9	5.6	26	2.3	12	2.6
30	1.0	1.0	.80	.90	---	1.5	2.5	4.2	11	2.2	4.3	2.6
31	1.1	---	1.4	.67	---	.83	---	3.9	---	2.1	3.4	---
TOTAL	36.76	87.78	69.94	32.90	21.75	49.60	158.74	275.3	309.0	173.1	242.3	165.0
MEAN	1.19	2.93	2.26	1.06	.78	1.60	5.29	8.88	10.3	5.58	7.82	5.50
MAX	3.7	14	19	2.8	2.1	6.1	38	73	134	24	46	26
MIN	.56	.90	.80	.65	.49	.63	.71	2.3	2.4	2.1	2.3	2.5
AC-FT	73	174	139	65	43	98	315	546	613	343	481	327
CAL YR 1977	TOTAL	2323.29	MEAN	6.37	MAX	202	MIN	.49	AC-FT	4610		
WTR YR 1978	TOTAL	1622.17	MEAN	4.44	MAX	134	MIN	.49	AC-FT	3220		

16229300 KALIHI STREAM AT KALIHI--Continued

WATER-QUALITY RECORDS

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

REMARKS.--Available pesticide data for water year 1977 are also published for this station.

WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	TIME	CARBON, ORGANIC TOTAL (MG/L AS C)	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)
NOV 22...	1030	3.2	ND	--	ND	--	ND	--	ND	--
FEB 22...	0915	2.7	ND	--	.0	--	ND	--	ND	--
MAY 23...	0830	2.8	--	--	--	--	--	--	--	--
JUN 27...	1115	--	ND	63	ND	2064	ND	ND	ND	ND
AUG 22...	1200	3.2	--	--	--	--	--	--	--	--
SEP 26...	0930	2.0	ND	--	ND	--	ND	--	ND	--

DATE	DDT, TOTAL (UG/L)	DDT, TOTAL IN BOT- TOM MA- TERIAL (UG/KG)	DI- AZINON, TOTAL (UG/L)	DI- AZINON, TOTAL IN BOT- TOM MA- TERIAL (UG/KG)	DI- ELDRIN TOTAL (UG/L)	DI- ELDRIN, 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)	ETHION, TOTAL IN BOT- TOM MA- TERIAL (UG/KG)
NOV 22...	ND	--	ND	--	.04	--	ND	--	ND	--
FEB 22...	ND	--	ND	--	.04	--	ND	--	ND	--
MAY 23...	--	--	--	--	--	--	--	--	--	--
JUN 27...	ND	ND	ND	ND	.01	322	ND	ND	ND	ND
AUG 22...	--	--	--	--	--	--	--	--	--	--
SEP 26...	ND	--	ND	--	.03	--	ND	--	ND	--

DATE	HEPTA- CHLOR, TOTAL (UG/L)	HEPTA- CHLOR, TOTAL IN BOT- TOM MA- TERIAL (UG/KG)	HEPTA- CHLOR EPOXIDE TOTAL (UG/L)	HEPTA- CHLOR EPOXIDE TOT. IN BOTTOM MATERIAL (UG/KG)	LINDANE TOTAL (UG/L)	LINDANE TOTAL IN BOT- TOM MA- TERIAL (UG/KG)	MALA- THION, TOTAL (UG/L)	MALA- THION, TOTAL IN BOT- TOM MA- TERIAL (UG/KG)	METH- OXY- CHLOR, TOTAL (UG/L)	METH- OXY- CHLOR, TOT. IN BOTTOM MATERIAL (UG/KG)
NOV 22...	ND	--	ND	--	ND	--	ND	--	ND	--
FEB 22...	ND	--	.01	--	ND	--	ND	--	ND	--
MAY 23...	--	--	--	--	--	--	--	--	--	--
JUN 27...	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
AUG 22...	--	--	--	--	--	--	--	--	--	--
SEP 26...	ND	--	ND	--	ND	--	ND	--	ND	--

ND Material specifically analyzed for but not detected.

HAWAII, ISLAND OF OAHU
16229300 KALIHI STREAM AT KALIHI--Continued

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WATER QUALITY DATA, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DATE	METHYL PARA- THION, TOTAL (UG/L)	METHYL PARA- THION, TOT. IN BOTTOM MATL. (UG/KG)	METHYL TRI- THION, TOTAL (UG/L)	METHYL TRI- THION, TOT. IN BOTTOM MATL. (UG/KG)	PARA- THION, TOTAL (UG/L)	PARA- THION, 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)	TRI- THION, TOTAL IN BOT- TOM MA- TERIAL (UG/KG)
NOV 22...	ND	--	ND	--	ND	--	ND	--	ND	--
FEB 22...	ND	--	ND	--	ND	--	ND	--	ND	--
MAY 23...	--	--	--	--	--	--	--	--	--	--
JUN 27...	ND	ND	ND	ND	ND	ND	ND	0	ND	ND
AUG 22...	--	--	--	--	--	--	--	--	--	--
SEP 26...	ND	--	ND	--	ND	--	ND	--	ND	--

DATE	2,4-D, TOTAL (UG/L)	2,4-D, TOTAL IN BOT- TOM MA- TERIAL (UG/KG)	2,4,5-T TOTAL (UG/L)	2,4,5-T TOTAL IN BOT- TOM MA- TERIAL (UG/KG)	SILVEX, TOTAL (UG/L)	SILVEX, TOTAL IN BOT- TOM MA- TERIAL (UG/KG)	ATRA- ZINE, TOTAL (UG/L)	ATRA- ZINE, TOTAL IN BOT- TOM MA- TERIAL (UG/KG)	SIMA- ZINE TOTAL COUL- SON COND. (UG/L)	SIMA- ZINE IN BOTTOM MATERI- AL (UG/ KG DRY SOLIDS)
NOV 22...	ND	--	ND	--	ND	--	ND	--	ND	--
FEB 22...	ND	--	ND	--	ND	--	ND	--	ND	--
MAY 23...	--	--	--	--	--	--	--	--	--	--
JUN 27...	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
AUG 22...	--	--	--	--	--	--	--	--	--	--
SEP 26...	ND	--	ND	--	ND	--	ND	--	ND	--

ND Material specifically analyzed for but not detected.

HAWAII, ISLAND OF OAHU
16229300 KALIHI STREAM AT KALIHI--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH (UNITS)	TEMPER- ATURE (DEG C)	TUR- BID- ITY (JTU)	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)
OCT										
26...	1030	1.2	300	7.6	22.5	5	--	7.5	6800	21000
NOV										
28...	1230	.90	300	7.5	23.0	2	--	8.0	24000	15000
DEC										
27...	1030	.97	340	7.4	20.0	2	--	7.7	11000	57000
JAN										
30...	1015	.76	300	6.9	20.0	1	--	7.5	3900	8700
FEB										
27...	1130	.56	350	7.0	21.0	1	--	7.0	1300	4700
MAR										
20...	1110	.58	350	7.2	20.5	2	--	7.0	3400	4700
APR										
17...	1015	2.4	265	7.0	21.0	1	--	8.4	--	13000
MAY										
15...	1000	9.0	180	7.4	24.0	--	--	--	--	--
16...	1330	6.9	230	8.0	23.5	--	1.3	9.0	2600	1600
JUN										
21...	1100	20	180	7.7	23.0	--	9.1	9.2	14000	15000
JUL										
17...	1300	3.5	235	7.8	22.0	--	1.7	8.8	16000	4800
AUG										
15...	1230	3.2	195	7.8	24.5	--	6.0	8.8	2600	1500
SEP										
12...	1045	12	200	7.6	23.0	--	2.3	8.5	4800	7900

DATE	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)	SODIUM PERCENT	SODIUM AD- SORP- TION RATIO	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	BICAR- BONATE (MG/L AS HCO3)	CAR- BONATE (MG/L AS CO3)
OCT										
26...	84	13	19	8.8	23	37	1.1	1.9	96	0
NOV										
28...	91	9	20	10	27	39	1.2	1.7	100	0
DEC										
27...	100	23	21	12	30	38	1.3	2.0	96	0
JAN										
30...	84	4	17	10	26	40	1.2	1.5	97	0
FEB										
27...	100	3	21	12	30	39	1.3	1.4	120	0
MAR										
20...	100	6	22	12	30	38	1.3	1.5	120	0
APR										
17...	74	16	15	8.8	21	38	1.1	1.1	70	0
MAY										
15...	--	--	--	--	--	--	--	--	--	--
16...	59	14	12	6.9	18	40	1.0	1.1	--	--
JUN										
21...	64	23	17	5.2	14	32	0.8	1.3	--	--
JUL										
17...	62	14	13	7.2	18	38	1.0	1.3	--	--
AUG										
15...	38	0	6.8	5.1	33	63	2.3	2.8	--	--
SEP										
12...	58	10	12	6.7	19	41	1.1	1.0	--	--

16229300 KALIHI STREAM AT KALIHI--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	ALKA- LINIT (MG/L AS CACO3)	CARBON DIOXIDE DIS- SOLVED (MG/L AS CO2)	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)	SOLIDS, DIS- SOLVED (TONS PER DAY)
OCT										
26...	71	3.5	9.4	33	.1	16	147	154	.20	.48
NOV										
28...	82	5.1	10	39	.0	20	188	178	.26	.46
DEC										
27...	79	6.1	15	48	.1	18	194	193	.26	.51
JAN										
30...	80	20	11	41	.1	19	161	173	.22	.33
30...	--	--	--	--	--	--	--	--	--	--
FEB										
27...	98	19	11	45	.1	20	188	200	.26	.28
MAR										
20...	98	12	10	44	.1	18	181	197	.25	.28
APR										
17...	57	11	12	34	--	12	132	139	.18	.86
MAY										
15...	--	--	--	--	--	--	--	--	--	--
16...	45	--	12	28	.1	14	122	120	.17	2.27
JUN										
21...	41	--	18	20	.0	14	99	114	.13	5.35
JUL										
17...	48	--	12	27	.1	14	111	121	.15	1.05
AUG										
15...	42	--	11	26	.1	38	101	--	.14	.87
SEP										
12...	48	--	8.0	26	.0	15	114	117	.16	3.69

DATE	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, 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)	NITRO- GEN, TOTAL (MG/L AS NO3)	PHOS- PHORUS, TOTAL (MG/L AS P)	PHOS- PHORUS, DIS- SOLVED (MG/L AS P)
OCT										
26...	.16	.01	--	--	--	--	--	--	.08	.06
NOV										
28...	.25	.04	--	--	--	.27	--	--	.08	.08
DEC										
27...	.26	.07	--	--	--	.33	--	--	.06	.05
JAN										
30...	.23	.03	.11	.14	.09	.05	.37	1.6	.08	.07
30...	--	--	--	--	--	--	--	--	--	--
FEB										
27...	.18	.02	.23	.25	.10	.15	.43	1.9	.07	.06
MAR										
20...	.05	.01	.32	.33	.24	.09	.38	1.7	.13	.12
APR										
17...	.08	.01	.09	.10	.04	.06	.18	.80	.05	.04
MAY										
15...	--	--	--	--	--	--	--	--	--	--
16...	.15	.03	--	--	--	.91	--	--	.06	.04
JUN										
21...	.18	.03	.96	.95	.37	.62	1.2	5.2	.09	.04
JUL										
17...	.11	.01	.29	.30	.00	.30	.41	1.8	.04	.03
AUG										
15...	.08	.00	.48	.48	.00	.48	.56	2.5	.04	.03
SEP										
12...	.06	.02	.33	.35	.02	.33	.41	1.8	.04	.04

16229300 KALIHI STREAM AT KALIHI--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	TIME	ARSENIC		ARSENIC		BARIUM,		BARIUM,		CADMIUM		CADMIUM	
		TOTAL (UG/L AS AS)	SUS- PENDE TOTAL (UG/L AS AS)	DIS- SOLVED (UG/L AS AS)	TOTAL RECOV- ERABLE (UG/L AS BA)	SUS- PENDE RECOV- ERABLE (UG/L AS BA)	DIS- SOLVED (UG/L AS BA)	TOTAL RECOV- ERABLE (UG/L AS CD)	SUS- PENDE RECOV- ERABLE (UG/L AS CD)	DIS- SOLVED (UG/L AS CD)			
NOV 28...	1230	1	0	1	500	0	500	0	0	0	0		
FEB 27...	1130	1	0	1	0	0	0	13	12	1			
MAY 16...	1330	1	1	0	300	100	200	--	--	--			
AUG 15...	1230	2	0	2	100	91	9	--	--	--			

DATE	CHRO- MIUM, TOTAL RECOV- ERABLE (UG/L AS CR)	CHRO- MIUM, SUS- PENDE RECOV. (UG/L AS CR)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)	COBALT, TOTAL RECOV- ERABLE (UG/L AS CO)	COBALT, SUS- PENDE RECOV- ERABLE (UG/L AS CO)	COBALT, DIS- SOLVED (UG/L AS CO)	COPPER, TOTAL RECOV- ERABLE (UG/L AS CU)	COPPER, SUS- PENDE RECOV- ERABLE (UG/L AS CU)	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, TOTAL RECOV- ERABLE (UG/L AS FE)
NOV 28...	8	0	8	0	0	0	3	1	2	310
FEB 27...	10	10	0	0	0	0	6	1	5	270
MAY 16...	--	--	5	0	0	0	8	6	2	390
AUG 15...	0	0	0	3	<2	<1	6	1	5	610

DATE	IRON, SUS- PENDE RECOV- ERABLE (UG/L AS FE)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, TOTAL RECOV- ERABLE (UG/L AS PB)	LEAD, SUS- PENDE 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- PENDE RECOV- ERABLE (UG/L AS MN)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY TOTAL RECOV- ERABLE (UG/L AS HG)	MERCURY SUS- PENDE RECOV- ERABLE (UG/L AS HG)
NOV 28...	--	180	11	5	6	40	0	40	.0	.0
FEB 27...	--	150	170	168	2	30	0	30	.0	.0
MAY 16...	220	170	--	--	--	20	10	10	.1	.1
AUG 15...	430	180	--	--	--	70	0	70	.0	.0

DATE	MERCURY	SELE-	SELE-	SILVER,	SILVER,	SILVER,	ZINC,	ZINC,	ZINC,
	DIS- SOLVED (UG/L AS HG)	NIMUM, TOTAL (UG/L AS SE)	NIMUM, DIS- SOLVED (UG/L AS SE)	TOTAL RECOV- ERABLE (UG/L AS AG)	SUS- PENDE RECOV- ERABLE (UG/L AS AG)	DIS- SOLVED (UG/L AS AG)	TOTAL RECOV- ERABLE (UG/L AS ZN)	SUS- PENDE RECOV- ERABLE (UG/L AS ZN)	DIS- SOLVED (UG/L AS ZN)
NOV 28...	.0	0	0	0	0	0	10	4	6
FFB 27...	.0	0	0	1	1	0	20	10	10
MAY 16...	.0	0	0	0	0	0	120	110	10
AUG 15...	.0	0	0	0	0	0	10	7	3

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

16229300 KALIHI STREAM AT KALIHI--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

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)	PCB, TOTAL IN BOT- TOM MA- TERIAL (UG/KG)	PCB, TOTAL IN BOT- TOM MA- TERIAL (UG/KG)	ALDRIN, TOTAL IN BOT- TOM MA- TERIAL (UG/KG)	ALDRIN, TOTAL IN BOT- TOM MA- TERIAL (UG/KG)	CHLOR- DANE, TOTAL IN BOT- TOM MA- TERIAL (UG/KG)	CHLOR- DANE, TOTAL IN BOT- TOM MA- TERIAL (UG/KG)	DDD, TOTAL (UG/L)
OCT											
26...	1030	3.7	--	--	--	--	--	--	--	--	--
NOV											
28...	1230	--	2.4	.0	--	--	--	--	--	--	--
DEC											
27...	1030	5.2	--	--	ND	ND	ND	62	ND	909	ND
JAN											
30...	1015	2.4	--	--	--	--	--	--	--	--	--
FEB											
27...	1130	--	2.5	.1	--	--	--	--	--	--	--
MAR											
20...	1110	4.1	--	--	--	--	--	--	--	--	--
APR											
17...	1015	5.4	--	--	--	--	--	--	--	--	--
MAY											
16...	1330	--	3.2	.4	ND	--	ND	--	ND	--	ND
JUL											
17...	1300	6.5	--	--	--	--	--	--	--	--	--
AUG											
15...	1230	--	1.8	.5	ND	--	ND	--	ND	--	ND
SEP											
12...	1045	5.2	--	--	--	--	--	--	--	--	--

DATE	P,P' DDD, TOTAL IN BOT- TOM MA- TERIAL (UG/KG)	DDE, TOTAL IN BOT- TOM MA- TERIAL (UG/L)	DDE, TOTAL IN BOT- TOM MA- TERIAL (UG/KG)	DDT, TOTAL (UG/L)	P,P' DDT, TOTAL IN BOT- TOM MA- TERIAL (UG/KG)	DI- AZINON, TOTAL IN BOT- TOM MA- TERIAL (UG/L)	DI- AZINON, TOTAL IN BOT- TOM MA- TERIAL (UG/KG)	DI- ELDRIN, TOTAL IN BOT- TOM MA- TERIAL (UG/L)	DI- ELDRIN, TOTAL IN BOT- TOM MA- TERIAL (UG/KG)	ENDRIN, TOTAL IN BOT- TOM MA- TERIAL (UG/L)	ENDRIN, TOTAL IN BOT- TOM MA- TERIAL (UG/KG)
OCT											
26...	--	--	--	--	--	--	--	--	--	--	--
NOV											
28...	--	--	--	--	--	--	--	--	--	--	--
DEC											
27...	55	ND	ND	ND	58	--	ND	ND	165	ND	ND
JAN											
30...	--	--	--	--	--	--	--	--	--	--	--
FEB											
27...	--	--	--	--	--	--	--	--	--	--	--
MAR											
20...	--	--	--	--	--	--	--	--	--	--	--
APR											
17...	--	--	--	--	--	--	--	--	--	--	--
MAY											
16...	--	ND	--	ND	--	ND	--	.03	--	ND	--
JUL											
17...	--	--	--	--	--	--	--	--	--	--	--
AUG											
15...	--	ND	--	ND	--	ND	--	ND	--	ND	--
SEP											
12...	--	--	--	--	--	--	--	--	--	--	--

ND Material specifically analyzed for but not detected.

16229300 KALIHI STREAM AT KALIHI--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	ETHION, TOTAL (UG/L)	ETHION, TOTAL IN BOT- TOM MA- TERIAL (UG/KG)	HEPTA- CHLOR, TOTAL (UG/L)	HEPTA- CHLOR, TOTAL IN BOT- TOM MA- TERIAL (UG/KG)	HEPTA- CHLOR EPOXIDE TOT. IN BOT. IN MATERIAL (UG/L)	HEPTA- CHLOR EPOXIDE TOT. IN BOT. IN MATERIAL (UG/KG)	LINDANE TOTAL (UG/L)	LINDANE TOTAL IN BOT- TOM MA- TERIAL (UG/KG)	MALA- THION, TOTAL (UG/L)	MALA- THION, TOTAL IN BOT- TOM MA- TERIAL (UG/KG)	METH- OXY- CHLOR, TOTAL (UG/L)
OCT											
26...	--	--	--	--	--	--	--	--	--	--	--
NOV											
28...	--	--	--	--	--	--	--	--	--	--	--
DEC											
27...	--	ND	ND	ND	ND	11	ND	ND	--	ND	ND
JAN											
30...	--	--	--	--	--	--	--	--	--	--	--
FEB											
27...	--	--	--	--	--	--	--	--	--	--	--
MAR											
20...	--	--	--	--	--	--	--	--	--	--	--
APR											
17...	--	--	--	--	--	--	--	--	--	--	--
MAY											
16...	ND	--	ND	--	.01	--	ND	--	ND	--	ND
JUL											
17...	--	--	--	--	--	--	--	--	--	--	--
AUG											
15...	ND	--	ND	--	ND	--	ND	--	ND	--	ND
SEP											
12...	--	--	--	--	--	--	--	--	--	--	--

DATE	METH- OXY- CHLOR, TOT. IN BOTTOM MATERIAL (UG/KG)	METHYL PARA- THION, TOTAL, (UG/L)	METHYL PARA- THION, TOT. IN BOTTOM MATERIAL (UG/KG)	METHYL TRI- THION, TOTAL (UG/L)	METHYL TRI- THION, TOT. IN BOTTOM MATERIAL (UG/KG)	PARA- THION, TOTAL (UG/L)	PARA- THION, TOTAL IN BOT- TOM MA- TERIAL (UG/KG)	TOX- APHENE, TOTAL (UG/L)	TOX- APHENE, TOTAL IN BOT- TOM MA- TERIAL (UG/KG)	TRI- THION, TOTAL (UG/L)	TRI- THION, TOTAL IN BOT- TOM MA- TERIAL (UG/KG)
OCT											
26...	--	--	--	--	--	--	--	--	--	--	--
NOV											
28...	--	--	--	--	--	--	--	--	--	--	--
DEC											
27...	ND	--	ND	--	ND	--	ND	ND	ND	--	ND
JAN											
30...	--	--	--	--	--	--	--	--	--	--	--
FEB											
27...	--	--	--	--	--	--	--	--	--	--	--
MAR											
20...	--	--	--	--	--	--	--	--	--	--	--
APR											
17...	--	--	--	--	--	--	--	--	--	--	--
MAY											
16...	--	ND	--	ND	--	ND	--	ND	--	ND	--
JUL											
17...	--	--	--	--	--	--	--	--	--	--	--
AUG											
15...	--	ND	--	ND	--	ND	--	ND	--	ND	--
SEP											
12...	--	--	--	--	--	--	--	--	--	--	--

ND Material specifically analyzed for but not detected.

16229300 KALIHI STREAM AT KALIHI--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	2,4-D, TOTAL (UG/L)	2,4-D, TOTAL IN BOT- TOM MA- TERIAL (UG/KG)	2,4,5-T TOTAL (UG/L)	2,4,5-T TOTAL IN BOT- TOM MA- TERIAL (UG/KG)	SILVEX, TOTAL (UG/L)	SILVEX, TOTAL IN BOT- TOM MA- TERIAL (UG/KG)	ATRA- ZINE, TOTAL (UG/L)	ATRA- ZINE, TOTAL IN BOT- TOM MA- TERIAL (UG/KG)	SIMA- ZINE, TOTAL COND. (UG/L)	SIMA- ZINE IN BOTTOM MATERI- AL (UG/ KG DRY SOLIDS)
OCT 26...	--	--	--	--	--	--	--	--	--	--
NOV 28...	--	--	--	--	--	--	--	--	--	--
DEC 27...	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
JAN 30...	--	--	--	--	--	--	--	--	--	--
FEB 27...	--	--	--	--	--	--	--	--	--	--
MAR 20...	--	--	--	--	--	--	--	--	--	--
APR 17...	--	--	--	--	--	--	--	--	--	--
MAY 16...	--	--	--	--	--	--	ND	--	ND	--
JUL 17...	--	--	--	--	--	--	--	--	--	--
AUG 15...	--	--	--	--	--	--	ND	--	ND	--
SEP 12...	--	--	--	--	--	--	--	--	--	--

DATE	TIME	PHYTO- PLANK- TON, TOTAL (CFLLS PER ML)	PERI- PHYTON BIOMASS INITIAL DRY WEIGHT G/SQ M	PERI- PHYTON BIOMASS ASH WEIGHT G/SQ M	CHLOR-A PERI- PHYTON CHROMO- GRAPHIC FLUOROM (MG/M2)	CHLOR-B PERI- PHYTON CHROMO- GRAPHIC FLUOROM (MG/M2)	LENGTH OF EXPO- SURE (DAYS)
OCT 26...	1030	92	--	--	--	--	--
NOV 28...	1230	13	.472	.394	5.52	1.68	34
DEC 27...	1030	130	--	--	--	--	--
JAN 30...	1015	16	--	--	--	--	--
FEB 27...	1130	240	1.65	.472	9.61	.700	28
MAR 20...	1110	230	--	--	--	--	--
APR 17...	1015	18	--	--	--	--	--
MAY 16...	1330	170	--	--	42.7	10.9	29
JUN 21...	1100	2200	--	--	--	--	--
JUL 17...	1300	1600	--	--	--	--	--

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	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 26...	1030	1.2	6	.02	100	MAY 16...	1330	6.9	5	.09	100
NOV 28...	1230	.90	6	.01	100	23...	1145	175	82	38	--
DEC 27...	1030	.97	3	.01	100	JUN 21...	1100	20	18	.97	100
JAN 30...	1015	.76	3	.01	100	JUL 17...	1300	3.5	4	.04	100
FEB 27...	1130	.56	2	.00	100	AUG 15...	1230	3.2	8	.07	100
MAR 20...	1110	.58	2	.00	100	SEP 12...	1045	12	5	.16	100
APR 17...	1015	2.4	2	.01	100						

ND Material specifically analyzed for but not detected.

16229300 KALIHI STREAM AT KALIHI--Continued

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA

PHYTOPLANKTON ANALYSES, OCTOBER 1977 TO JULY 1978

DATE TIME	OCT 26,77 1030	NOV 28,77 1230	DEC 27,77 1030	JAN 30,78 1015	FEB 27,78 1130					
TOTAL CELLS/ML	92	13	130	16	240					
DIVERSITY: DIVISION	1.6	0.0	1.9	0.0	0.8					
..CLASS	1.6	0.0	1.9	0.0	0.8					
...ORDER	1.6	0.0	1.9	0.0	1.0					
...FAMILY	1.6	0.0	2.5	0.0	1.3					
....GENUS	1.6	0.0	2.5	0.0	1.3					
ORGANISM	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT
CHLDROPHYTA (GREEN ALGAE)										
..CHLOROPHYCEAE										
...CHLOROCOCCALES										
...COELASTRACEAE										
....COELASTRUM	--	-	--	-	--	-	--	-	--	-
...OOCYSTACEAE										
....ANKISTRODESMUS	--	-	--	-	--	-	--	-	--	-
...SCENEDESMACEAE										
....SCENEDESMUS	--	-	--	-	--	-	--	-	--	-
..VOLVOCALES										
...CHLAMYDOMONADACEAE										
....CHLAMYDOMONAS	34#	38	--	-	11	9	--	-	--	-
..ZYGNEATALES										
...DESMIDIACEAE										
....CLOSTERIUM	--	-	--	-	--	-	--	-	--	-
CHRYSTOPHYTA										
..BACILLARIOPHYCEAE										
...CENTRALES										
...COSCINODISCACEAE										
....CYCLOTELLA	--	-	--	-	--	-	--	-	11	5
..PENNALES										
...ACHNANTHACEAE										
....COCCONEIS	--	-	--	-	5	4	--	-	--	-
....RHOICOSPHEA	--	-	--	-	--	-	--	-	6	2
...FRAGILARIACEAE										
....SYNEDRA	--	-	--	-	5	4	--	-	--	-
...GOMPHONEMATAACEAE										
....GOMPHONEMA	--	-	13#100		16	13	*	0	--	-
...NAVICULACEAE										
....NAVICULA	34#	38	--	-	5	4	--	-	11	5
....PINNULARIA	--	-	--	-	--	-	--	-	--	-
...NITZSCHACEAE										
....NITZSCHIA	--	-	--	-	5	4	*	0	11	5
...SURIRELLACEAE										
....SURIRELLA	--	-	--	-	--	-	--	-	17	7
CYANOPHYTA (BLUE-GREEN ALGAE)										
..CYANOPHYCEAE										
...HORMOGONALES										
...OSCILLATORIACEAE										
....OSCILLATORIA	--	-	--	-	44#	35	--	-	180#	76
...RIVULARIACEAE										
....RAPHDIOIPSIS	23#	25	--	-	--	-	--	-	--	-
EUGLENOPHYTA (EUGLENOIDS)										
..EUGLENOPHYCEAE										
...EUGLENALES										
...EUGLENACEAE										
....EUGLENA	--	-	--	-	33#	26	16#100		--	-

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 1977 TO JULY 1978

DATE TIME	MAR 20,78 1110		APR 17,78 1015		MAY 16,78 1330		JUN 21,78 1100		JUL 17,78 1300	
TOTAL CELLS/ML	230		18		170		2200		1600	
DIVERSITY: DIVISION	0.6		0.0		0.0		1.0		1.3	
..CLASS	0.6		0.0		0.0		1.0		1.3	
..ORDER	0.6		0.0		0.0		1.0		1.3	
...FAMILY	0.6		0.0		1.7		1.6		1.5	
....GENUS	0.6		0.0		1.7		1.6		1.5	
ORGANISM	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT
CHLOROPHYTA (GREEN ALGAE)										
..CHLOROPHYCEAE										
...CHLOROCOCCALES										
....COELASTRACEAE										
.....COELASTRUM	--	-	--	-	--	-	--	-	890#	56
....OOCYSTACEAE										
.....ANKISTRODESMUS	--	-	--	-	--	-	46	2	--	-
...SCENEDESMACEAE										
....SCENEDESMUS	--	-	--	-	--	-	93	4	--	-
..VOLVOCALES										
...CHLAMYDOMONADACEAE										
....CHLAMYDOMONAS	--	-	--	-	--	-	23	1	--	-
..ZYGNEMATALES										
...DESMIDIACEAE										
....CLOSTERIUM	--	-	--	-	--	-	23	1	--	-
CHRYSTOPHYTA										
..BACILLARIOPHYCEAE										
..CENTRALES										
...COSCINODISCACEAE										
....CYCLOTELLA	--	-	--	-	--	-	23	1	--	-
..PENNALES										
...ACHNANTHACEAE										
....COCCONEIS	--	-	--	-	--	-	23	1	--	-
....RHOICOSPHEA	--	-	--	-	86#	50	160	7	22	1
...FRAGILARIACEAE										
....SYNEDRA	--	-	--	-	43#	25	--	-	--	-
...GOMPHONEMACEAE										
....GOMPHONEMA	7	3	18#	100	14	8	46	2	67	4
...NAVICULACEAE										
....NAVICULA	--	-	--	-	29#	17	69	3	22	1
....PINNULARIA	--	-	--	-	--	-	23	1	--	-
...NITZSCHACEAE										
....NITZSCHIA	--	-	--	-	--	-	23	1	44	3
...SURIARELLACEAE										
....SURIARELLA	--	-	--	-	--	-	--	-	--	-
CYANOPHYTA (BLUE-GREEN ALGAE)										
..CYANOPHYCEAE										
...HORMOGONALES										
....OSCILLATORIACEAE										
.....OSCILLATORIA	200#	88	--	-	--	-	1700#	74	530#	34
...RIVULARIACEAE										
....RAPHIDIOPSIS	--	-	--	-	--	-	23	1	--	-
EUGLENOPHYTA (EUGLENOIDS)										
..EUGLENOPHYCEAE										
...EUGLENALES										
....EUGLENACEAE										
.....EUGLENA	21	9	--	-	--	-	--	-	--	-

NOTE: # - DOMINANT ORGANISM; EQUAL TO OR GREATER THAN 15%

* - OBSERVED ORGANISM; MAY NOT HAVE BEEN COUNTED; LESS THAN 1/2%

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.

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

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.

AVERAGE DISCHARGE.--62 years (water years 1915-16, 1918-20, 1922-78), 7.05 ft³/s (0.200 m³/s), 5,110 acre-ft/yr (6.29 hm³/yr).

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 430 ft³/s (12.2 m³/s), May 23, gage height, 4.35 ft (1.326 m), no other peak above base of 240 ft³/s (6.80 m³/s); minimum discharge, 0.33 ft³/s (0.009 m³/s) Mar. 23, Apr. 3, 4.

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.2	1.0	.73	.87	.61	.73	.45	1.3	4.1	6.1	5.3	4.0
2	1.1	1.4	.73	.82	.53	.57	.42	1.1	4.0	8.0	5.2	3.8
3	1.1	2.4	1.7	.61	.49	.53	.39	.97	4.0	6.1	3.9	3.7
4	1.1	1.2	.92	.61	.49	.53	.36	1.9	4.2	8.6	6.4	3.7
5	1.1	.97	.77	.69	.49	.57	.39	2.6	12	6.2	6.8	3.9
6	1.2	.97	.77	.73	.49	.53	.49	6.5	5.6	11	4.5	3.7
7	1.1	.82	.82	.73	.49	.53	.65	5.6	4.6	7.6	8.8	3.7
8	1.2	.82	.73	.73	.53	.61	.45	2.0	4.1	6.5	9.8	3.5
9	1.0	.87	.69	.73	.45	.61	1.1	1.7	3.8	7.1	5.0	3.5
10	.97	.87	.69	.73	.45	.87	3.6	1.6	4.0	5.9	4.6	3.5
11	.92	1.0	.69	.73	.45	.61	3.3	1.5	3.8	5.6	28	3.4
12	.97	1.0	.69	.61	.49	.69	1.5	1.2	3.6	5.3	17	4.0
13	.97	.97	.73	.61	.53	.65	1.4	1.4	3.0	5.2	6.0	3.5
14	.97	.77	.69	.61	.49	.57	1.8	3.1	3.7	5.4	4.5	3.3
15	1.0	.87	.61	.73	.49	.57	1.2	2.7	3.6	4.8	4.4	3.4
16	1.1	3.4	1.2	.73	.53	.69	1.3	2.8	3.2	4.7	5.6	4.9
17	.73	.97	2.0	.65	.69	.49	.82	1.9	3.2	4.6	6.8	10
18	.77	1.0	2.2	.65	.49	.61	.65	1.6	3.5	5.7	4.3	4.4
19	.92	.87	1.1	.69	.49	.53	1.6	1.5	5.2	4.5	4.5	3.7
20	.97	.82	.77	.73	.45	.42	8.5	1.4	5.6	5.1	4.2	4.6
21	.82	.82	.82	.69	.45	.49	2.8	2.6	8.4	4.5	4.3	5.1
22	.77	.97	.77	.69	.49	.42	1.3	1.9	4.5	4.0	4.6	4.1
23	.82	.87	.69	.53	.49	.45	1.3	60	3.9	4.0	5.1	3.8
24	.87	1.1	.65	.57	.49	.39	1.1	7.8	3.8	4.5	4.2	3.6
25	1.2	.87	.69	.61	.49	.42	.97	6.8	3.6	4.2	25	3.6
26	.92	.77	.69	.53	.53	.69	1.9	6.5	4.9	4.0	14	3.5
27	.92	.73	.77	.57	.57	.39	1.0	10	3.8	3.9	4.0	3.4
28	1.0	.73	.69	.61	.69	.42	1.1	6.3	41	4.0	3.9	3.3
29	.87	.73	.61	.73	---	.45	1.1	6.2	8.8	4.0	4.2	3.3
30	.87	.73	.61	.65	---	.57	1.0	4.6	6.8	3.9	3.9	3.3
31	.87	---	.87	.65	---	.42	---	4.1	---	3.8	3.8	---
TOTAL	30.32	31.31	27.09	20.82	14.32	17.02	43.94	161.17	178.3	168.8	226.6	119.2
MEAN	.98	1.04	.87	.67	.51	.55	1.46	5.20	5.94	5.45	7.31	3.97
MAX	1.2	3.4	2.2	.87	.69	.87	8.5	60	41	11	28	10
MIN	.73	.73	.61	.53	.45	.39	.36	.97	3.0	3.8	3.8	3.3
AC-FT	60	62	54	41	28	34	87	320	354	335	449	236
CAL YR 1977	TOTAL	1260.55	MEAN	3.45	MAX	85	MIN	.34	AC-FT	2500		
WTR YR 1978	TOTAL	1038.89	MEAN	2.85	MAX	60	MIN	.36	AC-FT	2060		

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 Waialoa 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 (FISCAL YEARS).--WSP 1319: 1930-32(M), 1939(M). WSP 1569: Drainage area.

GAGE.--Water-stage recorder and combination Parshall flume and V-notch weir. Datum of gage is 289.84 ft (88.343 m) above mean sea level (Honolulu Board of Water Supply bench mark). Prior to June 17, 1914, non-recording gage at same site at different datum. June 17, 1914, to Jan. 16, 1921, water-stage recorder at site 150 ft (46 m) upstream at different datum, Aug. 4, 1925, to Mar. 15, 1928, at present site at datum 2.35 ft (1.021 m) lower and Mar. 16, 1928 to Mar. 23, 1977 at datum 1.00 ft (0.305 m) higher.

REMARKS.--Records fair except for the period of no gage-height record Feb. 13 to Apr. 3, which are poor. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--60 years (water years, 1914-20, 1926-78), 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.--Maximum discharge, 437 ft³/s (12.4 m³/s) May 23, gage height, 4.54 ft (1.384 m), no other peak above base of 310 ft³/s (8.78 m³/s); minimum, 0.12 ft³/s (0.003 m³/s) Feb. 6-8, 11, 12.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.38	.88	.26	.83	.17	2.0	.35	3.0	2.2	4.1	5.1	6.4
2	.35	2.2	.25	.93	.16	.70	.30	2.7	1.9	10	3.3	2.5
3	.29	9.7	2.1	.45	.16	.15	.28	2.3	1.8	6.2	1.5	2.8
4	.26	3.2	.56	.31	.15	.15	.23	1.9	1.7	14	6.2	2.3
5	.25	1.9	.32	.28	.14	.15	.21	4.3	15	4.7	7.8	4.0
6	.38	1.2	.31	.24	.14	.19	.69	8.3	4.9	18	4.2	5.7
7	.24	.84	.55	.23	.13	.15	2.2	4.0	3.3	6.7	20	3.9
8	.21	.76	.30	.25	.14	.20	2.3	2.6	2.8	4.4	27	2.3
9	.21	.52	.27	.26	.16	1.8	7.6	2.2	2.3	6.6	6.1	2.1
10	.21	.51	.29	.23	.21	3.2	9.7	1.8	2.1	3.6	4.0	1.9
11	.24	1.2	.23	.20	.16	.80	17	1.6	1.9	3.2	3.9	1.8
12	.21	1.1	.21	.18	.14	.28	5.9	1.5	1.8	3.3	3.2	7.7
13	.21	.57	.21	.18	.18	.20	3.5	2.8	1.7	2.9	6.6	3.3
14	.21	.40	.24	.18	.17	1.8	2.8	7.2	2.0	2.5	2.8	2.2
15	.21	1.1	.22	.39	.14	1.0	4.0	5.9	1.8	2.3	2.3	2.0
16	.32	3.7	1.6	.65	.14	2.3	2.8	5.4	1.9	2.2	10	8.3
17	.26	.87	10	.39	.19	.60	1.8	3.2	2.7	2.2	8.2	12
18	.21	.74	7.2	.21	.14	.80	1.4	2.4	2.0	5.9	3.8	3.6
19	.17	.49	2.6	.20	.14	.40	3.3	2.0	6.4	2.3	3.8	3.5
20	.38	.41	1.6	.19	.14	.19	12	1.7	7.7	2.9	3.2	5.5
21	.17	.38	1.3	.17	.14	.30	4.4	3.4	8.2	2.6	15	6.9
22	.17	.33	1.0	.28	.14	.24	2.7	1.9	3.8	2.0	8.3	3.6
23	.17	.41	.77	.26	.14	.80	2.5	57	2.9	1.8	19	3.0
24	.21	.91	.60	.25	.14	.45	1.8	6.6	2.7	2.4	3.6	2.4
25	1.9	.50	.54	.30	.14	.40	1.7	4.0	2.8	2.2	6.0	2.2
26	.31	.32	.52	.31	.14	4.5	5.8	4.3	5.8	1.8	3.2	1.9
27	.60	.29	.48	.28	.14	1.4	3.0	8.6	2.7	1.8	2.7	1.8
28	1.2	.25	.44	.34	.35	.60	2.3	3.5	52	1.5	2.1	1.7
29	.34	.22	.37	.75	---	.45	1.9	3.1	12	1.4	6.4	1.7
30	.26	.26	.30	.25	---	1.1	1.6	3.6	5.4	1.3	3.1	1.0
31	.25	---	.35	.17	---	.45	---	2.5	---	1.4	2.1	---
TOTAL	10.78	36.16	35.99	10.14	4.43	27.75	106.06	165.3	166.2	128.2	204.5	110.6
MEAN	.35	1.21	1.16	.33	.16	.90	3.54	5.33	5.54	4.14	6.60	3.69
MAX	1.9	9.7	10	.93	.35	4.5	17	57	52	18	27	12
MIN	.17	.22	.21	.17	.13	.15	.21	1.5	1.7	1.3	1.5	1.6
AC-FT	21	72	71	20	8.8	55	210	328	330	254	406	219
CAL YR 1977	TOTAL	893.74	MEAN	2.45	MAX	67	MIN	.08	AC-FT 1977			
WTR YR 1978	TOTAL	1006.11	MEAN	2.76	MAX	57	MIN	.13	AC-FT 2000			

HAWAII, ISLAND OF OAHU

16240500 WAIKAKEAUA STREAM AT HONOLULU

LOCATION.--Lat 21°19'53", long 157°48'12", Hydrologic Unit 20060000, on right bank 5 ft (2 m) downstream from bridge on Waaloa Way, 500 ft (152 m) upstream from confluence with Waihi Stream, and 4.2 mi (6.8 km) northeast of Honolulu Post Office.

DRAINAGE AREA.--1.06 mi² (2.75 km²).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--May 1913 to January 1921, August 1925 to current year. Prior to July 1960, published as East Branch Manoa Stream near Honolulu.

REVISED RECORDS (FISCAL YEARS).--WSP 1319: 1919(M), 1930-33(M). WSP 1569: Drainage area. WSP 1937: 1949(M), 1960(M).

GAGE.--Water-stage recorder and combination Parshall flume and concrete weir. Datum of gage is 294.50 ft (89.764 m) above mean sea level (Honolulu Board of Water Supply bench mark). Prior to May 20, 1914, nonrecording gage at site 200 ft (61 m) upstream at different datum. May 20, 1914, to Jan. 16, 1921, water-stage recorder at site 30 ft (9 m) upstream at different datum. Aug. 18, 1925, to Mar. 15, 1928, water-stage recorder at present site at datum 2.99 ft (0.911 m) lower, and Mar. 16, 1928, to Oct. 18, 1933, at datum 0.41 ft (0.125 m) higher than present datum.

REMARKS.--Records fair. Honolulu Board of Water Supply at times diverts a small amount of ground water from tunnel above station. Occasional small diversions for irrigation above station. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--60 years (water years, 1914-20, 1926-78), 5.05 ft³/s (0.143 m³/s), 3,660 acre-ft/yr (4.51 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,090 ft³/s (87.5 m³/s) Jan. 16, 1921, gage height, 10.4 ft (3.17 m), from floodmarks, site and datum then in use, from rating curve extended above 58 ft³/s (1.64 m³/s); minimum, 0.6 ft³/s (0.017 m³/s) June 7, 8, 1926.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 732 ft³/s (20.7 m³/s) May 23, gage height, 4.17 ft (1.271 m), no other peak above base of 310 ft³/s (8.78 m³/s); minimum, 0.85 ft³/s (0.024 m³/s) Feb. 10.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.9	2.0	1.3	2.4	1.1	2.9	1.0	3.8	2.3	4.7	6.6	5.2
2	1.9	4.1	1.3	2.4	1.1	1.2	1.0	3.2	2.1	9.7	4.7	3.4
3	1.8	10	2.5	1.5	1.0	.92	1.0	2.1	2.1	5.7	3.1	4.0
4	1.8	3.5	1.4	1.4	1.0	.92	.92	1.9	2.1	12	9.0	3.9
5	1.8	2.4	1.3	1.3	1.0	1.0	.92	6.1	28	4.7	8.8	5.1
6	2.2	2.0	1.4	1.3	1.0	1.1	1.2	14	8.0	18	5.1	7.0
7	1.9	1.8	1.4	1.3	1.0	.92	2.4	6.0	4.4	6.3	19	5.0
8	1.8	1.9	1.3	1.3	1.0	1.3	2.7	2.9	3.4	4.8	30	3.5
9	1.8	1.7	1.4	1.3	.92	2.0	9.1	2.3	3.1	5.7	6.3	3.4
10	1.8	1.6	1.3	1.3	.92	4.6	13	2.0	2.8	4.2	4.5	3.3
11	1.8	2.2	1.3	1.3	1.0	1.6	17	1.9	2.7	3.9	4.9	3.2
12	1.8	2.1	1.3	1.1	1.0	1.2	4.6	1.9	2.6	4.2	4.1	7.5
13	1.8	1.8	1.3	1.3	1.0	1.2	3.0	3.1	2.5	3.7	8.4	4.3
14	1.8	1.6	1.3	1.1	1.0	2.8	2.4	7.4	2.5	3.4	3.9	3.4
15	1.7	2.0	1.2	1.4	1.0	1.6	3.9	5.9	2.4	3.2	3.5	3.2
16	2.0	6.2	3.4	1.6	1.0	3.3	3.1	5.7	2.6	3.1	6.1	6.0
17	1.8	2.5	14	1.3	1.7	1.5	1.9	2.9	3.1	3.3	7.0	7.4
18	1.7	1.9	10	1.1	1.4	1.7	1.7	2.3	2.7	5.9	3.9	3.7
19	1.7	1.7	2.9	1.1	1.2	1.4	3.1	2.1	6.8	3.5	3.8	3.4
20	1.8	1.6	2.1	1.1	1.0	1.2	11	1.8	5.0	4.1	3.4	4.3
21	1.7	1.5	1.8	1.1	1.0	1.3	3.3	4.0	5.5	3.8	11	4.6
22	1.7	1.5	1.6	1.2	.92	1.2	2.0	2.1	3.2	3.1	5.1	3.5
23	1.7	1.5	1.5	1.1	1.1	1.6	2.3	61	3.1	3.0	6.8	3.3
24	1.8	2.2	1.4	1.1	.92	1.1	1.7	6.1	3.1	4.0	4.2	3.0
25	3.3	1.6	1.4	1.2	.92	1.0	1.7	4.1	3.1	3.6	4.8	2.9
26	1.7	1.5	1.4	1.1	.92	5.7	6.2	4.4	4.9	3.0	3.9	2.9
27	2.1	1.4	1.5	1.1	.92	1.8	3.0	6.6	3.8	2.9	3.5	2.8
28	2.3	1.4	1.4	1.1	1.7	1.2	2.0	3.4	62	2.8	3.3	2.8
29	1.7	1.4	1.4	1.6	---	1.0	1.7	3.2	10	2.7	8.0	2.8
30	1.6	1.4	1.3	1.1	---	1.5	1.6	3.2	5.4	2.6	4.1	2.8
31	1.6	---	1.6	1.1	---	1.1	---	2.6	---	2.7	3.4	---
TOTAL	57.8	70.0	69.7	40.7	29.74	52.86	110.44	180.0	195.3	148.3	204.2	121.6
MEAN	1.86	2.33	2.25	1.31	1.06	1.71	3.68	5.81	6.51	4.78	6.59	4.05
MAX	3.3	10	14	2.4	1.7	5.7	17	61	62	18	30	7.5
MIN	1.6	1.4	1.2	1.1	.92	.92	.92	1.8	2.1	2.6	3.1	2.8
AC-FI	115	139	138	81	59	105	219	357	387	294	405	241
CAL YR 1977	TOTAL	1183.60	MEAN	3.24	MAX	83	MIN	1.0	AC-FI	2350		
WTR YR 1978	TOTAL	1280.64	MEAN	3.51	MAX	62	MIN	.92	AC-FI	2540		

HAWAII, ISLAND OF OAHU

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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 (FISCAL YEARS).--WSP 835: 1930(M). WSP 1569: Drainage area. WSP 1639: 1927-29(M), 1931(M), 1932, 1933-34(M). WSP 1719: 1935(M), 1937-40(M), 1942(M), 1948-59(P).

GAGE.--Water-stage recorder and V-notch weir. Datum of gage is 344.78 ft (105.089 m) above mean sea level (Honolulu Board of Water Supply bench mark).

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

AVERAGE DISCHARGE.--52 years, 1.93 ft³/s (0.055 m³/s), 1,400 acre-ft/yr (1.73 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, 612 ft³/s (17.3 m³/s) May 23, gage height, 5.13 ft (1.564 m), no other peak above base of 140 ft³/s (3.96 m³/s); minimum, 0.20 ft³/s (0.006 m³/s) Mar. 9, 10.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.40	.30	.29	.40	.26	.26	.26	1.6	1.4	2.1	1.1	1.3
2	.39	.45	.29	.40	.26	.25	.26	1.1	1.4	4.6	1.0	1.2
3	.37	2.0	.32	.40	.23	.23	.26	.81	1.3	2.2	.95	1.2
4	.36	.85	.32	.40	.23	.23	.29	.82	1.3	3.8	2.0	1.1
5	.36	.40	.29	.36	.23	.23	.29	3.8	8.4	2.2	1.8	1.1
6	.36	.39	.29	.36	.23	.24	.29	9.8	3.5	7.5	.93	1.1
7	.36	.38	.29	.36	.23	.25	.29	5.7	2.0	3.7	7.1	1.1
8	.36	.38	.29	.36	.23	.24	.29	1.7	1.3	2.3	13	1.0
9	.36	.38	.26	.36	.23	.23	1.1	1.1	1.1	2.0	3.2	1.0
10	.36	.37	.26	.34	.23	.20	5.0	1.1	.90	2.0	1.6	.98
11	.34	.37	.26	.34	.23	.24	4.9	1.1	.87	2.0	1.4	.99
12	.33	.37	.26	.32	.23	.26	1.7	1.1	1.0	2.0	1.5	1.1
13	.32	.37	.26	.32	.23	.24	.73	1.2	.85	1.9	4.3	.99
14	.32	.37	.26	.32	.23	.25	.76	1.3	.85	1.8	1.5	.92
15	.32	.37	.23	.32	.23	.26	.73	1.3	.85	1.7	1.5	.87
16	.32	.65	.29	.32	.23	.23	.77	2.4	.85	1.6	1.8	.94
17	.31	.37	4.1	.32	.23	.23	.75	1.1	.85	1.4	3.7	1.7
18	.31	.37	5.2	.32	.23	.23	.76	1.0	1.2	1.4	1.4	.92
19	.31	.36	.83	.31	.23	.23	.87	.99	1.6	1.2	1.5	.92
20	.31	.34	.50	.29	.23	.23	6.2	.98	1.4	1.2	1.4	1.1
21	.31	.34	.50	.29	.23	.23	2.4	1.1	1.2	1.2	4.6	.98
22	.30	.34	.50	.29	.23	.23	.89	.93	1.1	1.1	2.0	.97
23	.30	.32	.50	.29	.23	.23	.89	51	1.1	1.0	2.2	.97
24	.30	.32	.50	.29	.23	.23	.86	3.5	1.1	1.1	1.5	.93
25	.40	.32	.50	.29	.23	.23	.85	2.4	1.0	1.0	1.5	.89
26	.32	.29	.50	.29	.23	.23	.93	2.2	1.0	.98	1.5	.86
27	.32	.29	.50	.28	.23	.23	.91	2.4	1.0	.97	1.4	.82
28	.31	.29	.45	.28	.23	.23	.86	2.0	23	.97	1.4	.80
29	.30	.29	.45	.27	---	.23	.81	1.8	6.9	.97	1.8	.75
30	.30	.29	.43	.26	---	.23	.77	1.7	2.8	.95	1.3	.73
31	.30	---	.40	.26	---	.23	---	1.5	---	.94	1.2	---
TOTAL	10.33	12.93	20.32	10.01	6.50	7.29	36.67	110.53	73.12	59.78	73.08	30.23
MEAN	.33	.43	.66	.32	.23	.24	1.22	3.57	2.44	1.93	2.36	1.01
MAX	.40	2.0	5.2	.40	.26	.26	6.2	51	23	7.5	13	1.7
MIN	.30	.29	.23	.26	.23	.20	.26	.81	.85	.94	.93	.73
AC-FT	20	26	40	70	13	14	73	219	145	119	145	60

CAL YR 1977 TOTAL 455.58 MEAN 1.25 MAX 41 MIN .23 AC-FT 904
WTR YR 1978 TOTAL 450.79 MEAN 1.24 MAX 51 MIN .20 AC-FT 894

NOTE.--No gage-height record Oct. 14 to Nov. 23, May 24 to June 26.

16247000 PALOLO STREAM NEAR HONOLULU

LOCATION.--Lat 21°17'35", long 157°48'25", Hydrologic Unit 20060000, on left bank 250 ft (76 m) downstream from bridge on Palolo Avenue and 3.9 mi (6.3 km) east of Honolulu Post Office.

DRAINAGE AREA.--3.63 mi² (9.40 km²).

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

REVISED RECORDS (FISCAL YEARS).--WSP 1569: Drainage area. WSP 1937: 1953, 1955-60.

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 95 ft (29 m), from topographic map.

REMARKS.--Records poor. Honolulu Board of Water Supply diverts ground water from tunnels in drainage area. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--26 years, 5.53 ft³/s (0.157 m³/s), 4,010 acre-ft/yr (4.94 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,270 ft³/s (121 m³/s) Dec. 18, 1967, gage height, 5.98 ft (1.823 m), from rating curve extended above 140 ft³/s (3.96 m³/s) on basis of slope-conveyance study and slope-area measurements at gage heights 3.92 ft (1.195 m) and 4.13 ft (1.259 m); minimum, 0.02 ft³/s (0.001 m³/s) June 25, 1958.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,960 ft³/s (55.5 m³/s) May 23, gage height, 4.37 ft (1.332 m), no other peak above base of 500 ft³/s (14.2 m³/s); minimum, 0.19 ft³/s (0.005 m³/s) Feb. 27.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.51	.60	.58	2.5	.37	3.6	.48	6.8	1.9	3.7	2.0	2.7
2	.49	1.5	.58	2.4	.35	.83	.43	3.9	1.9	14	1.4	1.6
3	.57	7.5	9.1	2.3	.36	.55	.40	2.7	1.7	4.9	1.3	1.4
4	.47	1.9	.99	.85	.37	.46	.70	1.7	1.7	13	11	1.4
5	.48	1.6	.63	.70	.39	.53	.89	11	34	4.4	6.2	1.9
6	.56	1.4	1.1	.63	.39	.56	.48	30	14	28	2.5	2.0
7	.51	1.3	.70	.63	.34	.53	4.8	16	5.2	10	31	1.9
8	.47	1.2	.53	.58	.35	.55	2.3	6.2	2.2	5.1	59	1.4
9	.45	1.2	.55	.57	.34	2.0	8.5	3.6	1.7	4.0	8.7	1.4
10	.45	1.2	.56	.51	.35	3.5	21	2.9	1.5	3.2	4.0	1.3
11	.44	1.2	.46	.52	.35	1.1	21	2.7	1.4	2.8	3.3	1.3
12	.46	1.3	.44	.49	.47	.69	7.2	3.2	2.0	2.5	1.4	2.3
13	.41	1.1	.41	.48	.37	.58	4.7	6.2	1.6	2.3	12	2.3
14	.40	1.0	.40	.47	.35	.67	4.5	8.0	1.6	2.1	2.4	1.4
15	.40	1.1	.45	.65	.36	.74	2.6	8.7	1.5	2.0	1.8	1.2
16	.42	6.7	4.0	1.7	.87	7.1	3.5	12	1.6	1.9	4.3	3.2
17	.38	4.0	33	.58	1.4	1.4	1.7	5.6	1.7	1.8	9.9	6.2
18	.41	1.3	28	.51	.41	1.9	1.5	5.6	2.2	1.7	2.5	2.0
19	.66	1.4	1.8	.47	.36	.60	5.0	2.0	6.0	1.7	2.8	1.4
20	.46	.78	2.0	.44	.35	1.0	37	2.0	2.5	1.6	1.9	2.7
21	.40	.74	1.8	.44	.34	1.7	7.5	9.9	3.2	1.6	12	2.3
22	.39	.69	1.3	.44	.36	.73	1.9	2.5	2.0	1.5	2.7	1.3
23	.40	.70	.61	.44	.47	.71	2.0	241	1.6	1.5	3.2	1.2
24	.39	2.7	.58	.40	.36	.60	1.3	12	2.7	3.0	1.7	1.2
25	3.0	.93	.56	.46	.34	.56	1.3	4.5	1.7	2.0	1.6	1.2
26	.82	.77	.81	.41	.36	3.5	4.5	3.6	3.6	1.7	1.6	1.2
27	.80	.70	.77	.40	.32	.77	3.9	4.9	2.9	1.6	1.3	1.1
28	.72	.63	.65	.48	.75	.53	2.5	2.5	120	1.5	1.3	1.1
29	.60	.58	.62	.41	---	.43	1.7	2.7	24	1.4	2.7	1.0
30	.56	.58	.61	.40	---	.63	1.4	2.4	7.6	1.3	1.9	1.0
31	.57	---	1.1	.38	---	.58	---	2.2	---	1.3	1.4	---
TOTAL	18.05	48.30	95.69	22.64	12.20	39.63	158.68	429.0	257.2	129.1	200.8	53.6
MEAN	.58	1.61	3.09	.73	.44	1.28	5.22	13.8	8.57	4.16	6.48	1.79
MAX	3.0	7.5	33	2.5	1.4	7.1	37	241	120	28	59	6.2
MIN	.38	.58	.40	.38	.32	.43	.40	1.7	1.4	1.3	1.3	1.0
AC-FT	36	96	190	45	24	79	311	851	510	256	398	106

CAL YR 1977 TOTAL 1509.07 MEAN 4.13 MAX 180 MIN .36 AC-FT 2990
WTR YR 1978 TOTAL 1462.89 MEAN 4.01 MAX 241 MIN .32 AC-FT 2900

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. 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.--22 years (water years, 1914-15, 1959-78), 4.86 ft³/s (0.138 m³/s), 3,520 acre-ft/yr (4.34 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, 375 ft³/s (10.6 m³/s) May 23, gage height, 4.86 ft (1.481 m), no peak above base of 390 ft³/s (11.0 m³/s); minimum, 0.97 ft³/s (0.027 m³/s) for several days in February and April.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.2	1.2	1.1	1.8	1.2	3.1	1.1	1.6	3.3	2.8	2.4	1.8
2	1.2	1.2	1.2	2.0	1.1	1.5	1.1	1.6	3.1	2.8	2.0	1.7
3	1.2	1.3	1.8	1.5	1.1	1.2	1.0	1.5	3.0	2.6	1.9	1.7
4	1.1	1.2	1.3	1.3	1.1	1.2	1.0	1.6	3.1	2.8	2.0	1.7
5	1.1	1.2	1.2	1.2	1.1	1.3	1.0	6.6	7.6	2.4	2.0	2.0
6	1.3	1.1	1.3	1.6	1.0	1.3	1.1	8.1	4.3	3.8	1.9	1.8
7	1.1	1.1	1.2	2.2	1.0	1.2	1.3	6.1	3.7	2.6	2.6	1.7
8	1.1	1.1	1.2	1.8	1.2	1.3	1.3	3.1	3.1	2.4	4.5	1.7
9	1.1	1.1	1.2	1.6	1.0	1.4	1.3	2.5	2.8	2.4	2.1	1.7
10	1.1	1.1	1.2	2.1	1.0	1.2	2.0	2.3	2.7	2.3	1.9	1.6
11	1.2	1.1	1.2	2.0	1.0	1.2	2.8	2.2	2.6	2.2	1.9	1.6
12	1.2	1.1	1.1	1.2	1.0	1.2	1.8	2.1	2.6	2.2	1.8	1.9
13	1.2	1.1	1.1	1.2	1.0	1.1	1.5	2.2	2.5	2.3	2.0	1.7
14	1.2	1.1	1.1	1.5	1.0	1.1	1.3	2.5	2.5	2.2	1.8	1.6
15	1.2	1.1	1.1	1.3	1.0	1.1	2.4	2.6	2.5	2.2	1.8	1.6
16	1.2	3.0	1.3	1.4	1.0	1.1	2.1	2.9	2.4	2.2	2.2	1.8
17	1.2	2.2	1.4	1.2	1.3	1.1	1.7	3.2	2.5	2.2	2.2	1.8
18	1.1	1.7	1.4	1.9	1.5	1.1	1.5	3.4	2.5	2.6	2.0	1.7
19	1.2	1.3	1.2	2.7	1.2	1.1	1.6	3.4	2.7	2.4	2.0	1.6
20	1.2	1.2	1.2	2.2	1.1	1.1	12	2.4	2.4	2.3	1.8	1.7
21	1.1	1.2	1.2	1.2	1.0	1.1	7.1	3.2	2.9	2.1	4.0	1.6
22	1.1	1.2	1.2	1.2	1.1	1.1	4.5	2.4	2.4	2.1	2.2	1.6
23	1.2	1.2	1.1	1.5	1.1	1.1	4.1	46	2.3	2.1	2.0	1.6
24	1.2	1.4	1.1	1.2	1.0	1.1	3.6	8.0	2.3	2.1	1.9	1.6
25	1.4	1.3	1.1	1.2	1.0	1.1	3.3	6.0	2.4	2.2	1.9	1.6
26	1.2	1.2	1.1	1.2	1.0	1.7	4.0	6.7	2.5	2.0	1.8	1.6
27	1.2	1.2	1.2	1.1	1.1	1.2	3.3	9.2	2.4	2.0	1.8	1.5
28	1.1	1.1	1.2	1.1	2.0	1.1	2.4	7.0	18	1.9	1.8	1.5
29	1.1	1.1	1.2	1.3	---	1.1	1.6	6.6	4.8	1.9	2.1	1.5
30	1.1	1.1	1.2	1.2	---	1.1	1.6	5.4	3.2	1.9	1.8	1.5
31	1.1	---	1.5	1.2	---	1.1	---	3.4	---	1.9	1.7	---
TOTAL	36.2	38.5	37.9	47.1	31.2	38.7	76.4	165.8	105.1	71.9	65.8	50.0
MEAN	1.17	1.28	1.22	1.52	1.11	1.25	2.55	5.35	3.50	2.32	2.12	1.67
MAX	1.4	3.0	1.8	2.7	2.0	3.1	12	46	18	3.8	4.5	2.0
MIN	1.1	1.1	1.1	1.1	1.0	1.1	1.0	1.5	2.3	1.9	1.7	1.5
AC-FT	72	76	75	93	62	77	152	329	208	143	131	99

CAL YR 1977 TOTAL 972.5 MEAN 2.66 MAX 156 MIN 1.0 AC-FT 1930
WTR YR 1978 TOTAL 764.6 MEAN 2.09 MAX 46 MIN 1.0 AC-FT 1520

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.

PERIOD OF RECORD.--November 1976 to current year.

GAGE.--Water-stage recorder and concrete control.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 968 ft³/s (27.4 m³/s) May 12, 1977, gage height, 4.68 ft (1.426 m), minimum, 0.60 ft³/s (0.017 m³/s) Mar. 27, 1978.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 217 ft³/s (6.15 m³/s) May 23, gage height, 2.76 ft (0.841 m), no peak above base of 700 ft³/s (19.8 m³/s); minimum, 0.60 ft³/s (0.017 m³/s) Mar. 27.

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.0	4.7	4.1	5.2	3.8	7.7	3.6	4.4	6.7	7.0	5.8	7.0
2	4.7	4.4	4.1	6.6	3.8	5.3	3.6	4.4	6.1	8.5	6.7	6.7
3	4.7	5.3	7.1	5.0	3.7	4.2	3.6	3.9	5.3	6.7	5.8	6.7
4	4.7	5.0	5.6	5.5	3.6	4.2	3.6	4.7	6.1	7.4	6.4	6.4
5	4.7	4.4	5.2	4.4	3.7	4.2	3.6	17	12	6.7	6.1	7.7
6	5.0	4.4	8.2	4.2	3.6	3.9	3.6	11	7.7	10	5.8	7.7
7	5.0	4.1	5.3	4.0	3.6	3.7	4.1	8.1	6.7	7.0	9.2	6.7
8	4.7	4.4	4.4	4.0	3.9	4.1	4.4	6.4	6.7	7.0	13	6.4
9	4.7	4.4	4.7	3.8	3.7	4.9	6.4	5.8	6.4	6.7	7.0	6.4
10	4.7	4.4	4.1	3.7	3.7	4.1	7.0	5.3	6.7	6.1	6.4	6.1
11	4.7	5.0	4.4	3.7	3.7	3.9	7.0	5.0	6.6	6.1	6.1	5.8
12	4.4	5.0	4.4	3.7	3.7	3.9	5.3	5.0	6.6	6.1	5.8	6.4
13	4.7	5.0	4.4	3.7	3.8	3.9	5.0	5.3	6.1	6.1	10	6.4
14	4.7	4.7	4.4	3.7	3.9	3.8	4.7	5.8	5.8	5.8	6.4	7.0
15	4.4	4.7	4.4	4.1	3.7	3.7	8.9	6.1	5.6	6.1	5.8	6.1
16	4.4	17	5.3	4.4	3.8	3.7	8.9	5.8	5.6	6.1	6.4	6.7
17	4.4	6.5	5.3	4.0	3.8	3.8	5.3	5.3	5.3	6.1	7.0	8.5
18	4.1	6.7	5.0	3.8	4.4	3.6	4.7	5.0	5.3	6.1	6.1	7.4
19	4.1	5.3	4.7	3.7	4.1	3.7	8.1	5.3	4.7	6.1	6.4	6.4
20	4.1	5.0	4.1	3.7	3.8	3.6	24	5.3	6.2	6.4	6.1	6.4
21	4.1	4.7	3.9	4.1	3.9	3.6	8.5	13	9.5	6.1	19	6.1
22	4.4	4.7	3.8	4.4	3.6	3.5	6.1	6.7	6.4	6.1	8.1	6.1
23	4.4	4.7	3.7	3.9	3.8	3.6	5.6	64	6.4	6.1	7.7	6.1
24	4.4	5.0	3.7	3.9	3.6	4.1	5.3	10	5.8	6.4	6.7	5.8
25	5.0	4.4	3.6	3.9	3.6	3.7	5.0	7.7	5.8	8.1	6.7	5.8
26	4.7	4.1	3.7	3.8	3.8	5.0	5.6	7.0	7.4	6.1	6.4	5.8
27	4.4	4.1	3.7	3.7	3.7	2.1	5.3	7.7	6.4	5.8	6.7	5.8
28	4.4	4.4	3.9	3.7	5.4	4.0	5.0	6.4	26	5.8	6.7	5.8
29	4.1	4.4	3.8	4.5	---	3.9	4.7	6.7	9.2	5.6	15	5.8
30	4.1	4.1	3.9	3.8	---	3.9	4.4	7.0	7.4	5.3	7.7	5.8
31	4.1	---	4.6	3.8	---	3.6	---	7.4	---	5.3	7.0	---
TOTAL	140.0	155.0	141.5	128.4	107.2	124.9	180.9	268.5	218.5	200.8	236.0	193.8
MEAN	4.52	5.17	4.56	4.14	3.83	4.03	6.03	9.66	7.28	6.48	7.61	6.46
MAX	5.0	17	8.2	6.6	5.4	7.7	24	64	26	10	19	8.5
MIN	4.1	4.1	3.6	3.7	3.6	2.1	3.6	3.9	4.7	5.3	5.8	5.8
AC-FT	278	307	281	255	213	248	359	533	433	398	468	384
CAL YR 1977	TOTAL	2456.5	MEAN	6.73	MAX	105	MIN	3.4	AC-FT	4870		
WIR YR 1978	TOTAL	2095.5	MEAN	5.74	MAX	64	MIN	2.1	AC-FT	4160		

16272200 KAMOOALII STREAM BELOW LULUKU STREAM NEAR KANEOHE--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--November 1976 to current year.

PERIOD OF DAILY RECORD.--

SUSPENDED SEDIMENT DISCHARGE: November 1976 to current year.

INSTRUMENTATION.--Automatic pumping sediment sampler since November 1976.

REMARKS.--In addition to the sediment sampler record, water-quality samples were collected during the year.

EXTREMES FOR PERIOD OF RECORD.--

SEDIMENT CONCENTRATIONS: Maximum daily mean, 726 mg/L June 8, 1977; minimum daily mean, 3 mg/L Apr. 14-17, 1977.

SEDIMENT DISCHARGE: Maximum daily, 694 tons (630 tonnes) May 2, 1977; minimum daily, 0.05 ton (0.04 tonne) Apr. 14-17, 1977.

EXTREMES FOR CURRENT YEAR.--

SEDIMENT CONCENTRATIONS: Maximum daily mean, 422 mg/L Aug. 21; minimum daily mean, 10 mg/L for several days in October, November, and December.

SEDIMENT DISCHARGE: Maximum daily, 35 tons (32 tonnes) May 23; minimum daily, 0.10 ton (0.09 tonne) for several days in December.

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH	TEMPER- ATURE (DEG C)	DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH	TEMPER- ATURE (DEG C)
NOV 03...	1710	5.1	190	7.6	23.5	MAY 25...	1210	7.5	200	7.3	24.0
DEC 08...	1520	4.2	200	7.8	24.0	JUL 10...	1140	5.7	210	7.8	25.0
JAN 18...	1615	3.7	190	6.8	23.0	ALG 21...	1030	45	170	6.8	23.5
APR 12...	1520	4.5	200	7.5	22.5						

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SEDI- MENT, SUS- PENDE (MG/L)	SEDI- MENT DIS- CHARGE, SUS- PENDE (T/DAY)	SED. SUSP. FALL DIAM. % FINER THAN .002 MM	SED. SUSP. FALL DIAM. % FINER THAN .004 MM	SED. SUSP. FALL DIAM. % FINER THAN .016 MM	SED. SUSP. FALL DIAM. % FINER THAN .062 MM	SED. SUSP. FALL DIAM. % FINER THAN .125 MM
MAY 23...	0950	154	932	388	43	56	87	97	100

16272200 KAMOOALII STREAM BELOW LULUKU STREAM NEAR KANEOHE--Continued

SUSPENDED-SEDIMENT DISCHARGE (TONS/DAY), WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

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	5.0	20	.27	4.7	15	.19	4.1	15	.17
2	4.7	20	.25	4.4	10	.12	4.1	15	.17
3	4.7	20	.25	5.3	10	.14	7.1	50	.96
4	4.7	20	.25	5.0	15	.20	5.6	20	.30
5	4.7	20	.25	4.4	10	.12	5.2	20	.28
6	5.0	30	.41	4.4	10	.12	8.2	60	1.3
7	5.0	20	.27	4.1	10	.11	5.3	30	.43
8	4.7	20	.25	4.4	10	.12	4.4	20	.24
9	4.7	20	.25	4.4	10	.12	4.7	20	.25
10	4.7	20	.25	4.4	15	.18	4.1	20	.22
11	4.7	20	.25	5.0	15	.20	4.4	15	.18
12	4.4	15	.18	5.0	10	.14	4.4	15	.18
13	4.7	20	.25	5.0	10	.14	4.4	15	.18
14	4.7	15	.19	4.7	10	.13	4.4	15	.18
15	4.4	15	.18	4.7	10	.13	4.4	15	.18
16	4.4	15	.18	17	155	7.1	5.3	20	.29
17	4.4	15	.18	6.5	35	.61	5.3	20	.29
18	4.1	15	.17	6.7	30	.54	5.0	15	.20
19	4.1	15	.17	5.3	16	.23	4.7	15	.19
20	4.1	10	.11	5.0	15	.20	4.1	10	.11
21	4.1	10	.11	4.7	12	.15	3.9	10	.11
22	4.4	15	.18	4.7	12	.15	3.8	10	.10
23	4.4	15	.18	4.7	10	.13	3.7	10	.10
24	4.4	10	.12	5.0	15	.20	3.7	10	.10
25	5.0	15	.20	4.4	15	.18	3.6	10	.10
26	4.7	10	.13	4.1	15	.17	3.7	10	.10
27	4.4	15	.18	4.1	15	.17	3.7	10	.10
28	4.4	25	.30	4.4	15	.18	3.9	10	.11
29	4.1	20	.22	4.4	15	.18	3.8	10	.10
30	4.1	10	.11	4.1	15	.17	3.9	10	.11
31	4.1	15	.17	---	---	---	4.6	20	.25
TOTAL	140.0	---	6.46	155.0	---	12.52	141.5	---	7.58
JANUARY				FEBRUARY				MARCH	
1	5.2	30	.42	3.8	20	.21	7.7	50	1.0
2	6.6	30	.53	3.8	20	.21	5.3	30	.43
3	5.0	15	.20	3.7	20	.20	4.2	30	.34
4	5.5	20	.30	3.6	20	.19	4.2	40	.45
5	4.4	15	.18	3.7	20	.20	4.2	40	.45
6	4.2	20	.23	3.6	20	.19	3.9	40	.42
7	4.0	25	.27	3.6	20	.19	3.7	30	.30
8	4.0	25	.27	3.9	25	.26	4.1	30	.33
9	3.8	25	.26	3.7	20	.20	4.9	40	.53
10	3.7	25	.25	3.7	20	.20	4.1	40	.44
11	3.7	25	.25	3.7	20	.20	3.9	30	.32
12	3.7	25	.25	3.7	20	.20	3.9	30	.32
13	3.7	25	.25	3.8	20	.21	3.9	40	.42
14	3.7	25	.25	3.9	20	.21	3.8	40	.41
15	4.1	30	.33	3.7	20	.20	3.7	40	.40
16	4.4	25	.30	3.8	20	.21	3.7	30	.30
17	4.0	25	.27	3.8	25	.26	3.8	30	.31
18	3.8	25	.26	4.4	30	.36	3.6	30	.29
19	3.7	25	.25	4.1	20	.22	3.7	30	.30
20	3.7	30	.30	3.8	20	.21	3.6	30	.29
21	4.1	30	.33	3.9	20	.21	3.6	30	.29
22	4.4	30	.36	3.6	20	.19	3.5	30	.28
23	3.9	20	.21	3.8	20	.21	3.6	30	.29
24	3.9	20	.21	3.6	20	.19	4.1	30	.33
25	3.9	20	.21	3.6	20	.19	3.7	30	.30
26	3.8	20	.21	3.8	20	.21	5.0	40	.54
27	3.7	20	.20	3.7	20	.20	2.1	20	.11
28	3.7	20	.20	5.4	40	.58	4.0	20	.22
29	4.5	30	.36	---	---	---	3.9	30	.32
30	3.8	30	.31	---	---	---	3.9	30	.32
31	3.8	20	.21	---	---	---	3.6	20	.19
TOTAL	128.4	---	8.43	107.2	---	6.31	124.9	---	11.24

16272200 KAMOOALII STREAM BELOW LULUKU STREAM NEAR KANEOHE--Continued

SUSPENDED-SEDIMENT DISCHARGE (TONS/DAY), WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

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	3.6	25	.24	4.4	40	.48	6.7	50	.90
2	3.6	25	.24	4.4	40	.48	6.1	50	.82
3	3.6	25	.24	3.9	40	.42	5.3	60	.86
4	3.6	25	.24	4.7	50	.63	6.1	60	.99
5	3.6	20	.19	17	100	4.6	12	90	2.9
6	3.6	30	.29	11	75	2.2	7.7	70	1.5
7	4.1	30	.33	8.1	65	1.4	6.7	70	1.3
8	4.4	25	.30	6.4	60	1.0	6.7	70	1.3
9	6.4	30	.52	5.8	60	.94	6.4	60	1.0
10	7.0	40	.76	5.3	50	.72	6.7	50	.90
11	7.0	30	.57	5.0	50	.68	6.6	40	.71
12	5.3	30	.43	5.0	50	.68	6.6	40	.71
13	5.0	30	.41	5.3	50	.72	6.1	20	.33
14	4.7	30	.38	5.8	50	.78	5.8	40	.63
15	8.9	136	3.3	6.1	40	.66	5.6	30	.45
16	8.9	207	5.0	5.8	30	.47	5.6	20	.30
17	5.3	60	.86	5.3	20	.29	5.3	20	.29
18	4.7	50	.63	5.0	20	.27	5.3	20	.29
19	8.1	90	2.0	5.3	30	.43	4.7	30	.38
20	24	263	17	5.3	30	.43	6.2	120	2.0
21	8.5	80	1.8	13	155	5.4	9.5	180	4.6
22	6.1	50	.82	6.7	150	2.7	6.4	70	1.2
23	5.6	50	.76	64	205	35	6.4	80	1.4
24	5.3	50	.72	10	130	3.5	5.8	90	1.4
25	5.0	50	.68	7.7	100	2.1	5.8	90	1.4
26	5.6	50	.76	7.0	90	1.7	7.4	100	2.0
27	5.3	40	.57	7.7	90	1.9	6.4	80	1.4
28	5.0	40	.54	6.4	90	1.6	26	190	13
29	4.7	40	.51	6.7	80	1.4	9.2	110	2.7
30	4.4	40	.48	7.0	60	1.1	7.4	110	2.2
31	---	---	---	7.4	60	1.2	---	---	---
TOTAL	180.9	---	41.57	268.5	---	75.88	218.5	---	49.86
JULY			AUGUST			SEPTEMBER			
1	7.0	100	1.9	5.8	50	.78	7.0	80	1.5
2	8.5	100	2.3	6.7	50	.90	6.7	80	1.4
3	6.7	70	1.3	5.8	40	.63	6.7	70	1.3
4	7.4	70	1.4	6.4	40	.69	6.4	60	1.0
5	6.7	60	1.1	6.1	30	.49	7.7	80	1.7
6	10	80	2.2	5.8	40	.63	7.7	80	1.7
7	7.0	70	1.3	9.2	70	1.7	6.7	60	1.1
8	7.0	60	1.1	13	70	2.5	6.4	70	1.2
9	6.7	50	.90	7.0	40	.76	6.4	90	1.6
10	6.1	40	.66	6.4	30	.52	6.1	90	1.5
11	6.1	20	.33	6.1	30	.49	5.8	90	1.4
12	6.1	20	.33	5.8	40	.63	6.4	70	1.2
13	6.1	20	.33	10	50	1.4	6.4	70	1.2
14	5.8	20	.31	6.4	50	.86	7.0	70	1.3
15	6.1	20	.33	5.8	40	.63	6.1	50	.82
16	6.1	20	.33	6.4	30	.52	6.7	50	.90
17	6.1	20	.33	7.0	30	.57	8.5	60	1.4
18	6.1	20	.33	6.1	25	.41	7.4	60	1.2
19	6.1	40	.66	6.4	25	.43	6.4	50	.86
20	6.4	80	1.4	6.1	25	.41	6.4	50	.86
21	6.1	50	.82	19	422	27	6.1	40	.66
22	6.1	30	.49	8.1	200	4.4	6.1	40	.66
23	6.1	30	.49	7.7	130	2.7	6.1	30	.49
24	6.4	30	.52	6.7	120	2.2	5.8	30	.47
25	8.1	80	1.7	6.7	110	2.0	5.8	40	.63
26	6.1	80	1.3	6.4	100	1.7	5.8	60	.94
27	5.8	60	.94	6.7	90	1.6	5.8	70	1.1
28	5.8	50	.78	6.7	90	1.6	5.8	60	.94
29	5.6	40	.60	15	200	8.1	5.8	60	.94
30	5.3	30	.43	7.7	100	2.1	5.8	40	.63
31	5.3	30	.43	7.0	80	1.5	---	---	---
TOTAL	200.8	---	27.34	236.0	---	65.85	193.8	---	32.60
YEAR	2095.5		345.64						

16273900 KAMOOALII STREAM AT KANEOHE

LOCATION.--Lat 21°24'51", long 157°48'13", Hydrologic Unit 20060000, on right bank 500 ft (150 m) upstream from Highway 83 and 0.2 mi (0.3 km) south of Parker School in Kaneohe.

DRAINAGE AREA.--4.38 mi² (11.34 km²).

PERIOD OF RECORD.--January 1959 to October 1963, November 1965 to current year.

REVISED RECORDS.--WSP 1937: Drainage area.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 38.75 ft (11.811 m) above mean sea level (levels by city and county of Honolulu). Prior to Oct. 5, 1963, at site 50 ft (15 m) downstream at datum 0.93 ft (0.283 m) lower.

REMARKS.--Records good. Flow regulated to some extent by the construction of a dam upstream. Recording rain gage located at station. Observations of specific conductance, pH, water temperature and suspended sediment discharge made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--16 years (water years 1960-63, 1967-78), 13.9 ft³/s (0.394 m³/s), 10,070 acre-ft/yr (12.4 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 12,000 ft³/s (340 m³/s) Feb. 1, 1969, gage height, 10.16 ft (3.097 m), from rating curve extended above 380 ft³/s (10.8 m³/s) on basis of slope-area measurements at gage heights 5.26 ft (1.603 m), 7.14 ft (2.176 m), 7.47 ft (2.277 m), and 10.16 ft (3.097 m); minimum, 1.0 ft³/s (0.028 m³/s) Mar. 27, 1978.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Oct. 23, 1958, reached a stage of 8.3 ft (2.53 m), from floodmarks, former site and datum, discharge, 6,610 ft³/s (187 m³/s), from rating curve extended above 120 ft³/s (3.40 m³/s) on basis of slope-area measurement at gage height 5.69 ft (1.734 m). Discharge for peaks of Feb. 4 and May 2, 1965, 6,190 ft³/s (175 m³/s) and 5,400 ft³/s (153 m³/s), respectively; results of slope-area measurements of peak flow.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 257 ft³/s (7.28 m³/s) May 23, gage height, 2.42 ft (0.738 m), no peak above base of 950 ft³/s (26.9 m³/s); minimum, 1.0 ft³/s (0.028 m³/s) Mar. 27.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.2	5.1	4.8	6.4	4.2	9.0	4.8	5.5	6.6	7.5	8.9	7.8
2	5.2	5.0	4.8	9.3	4.2	5.2	4.5	5.5	6.3	9.3	8.5	7.5
3	5.0	6.4	10	5.5	4.2	5.0	4.2	5.0	6.0	7.8	6.9	7.5
4	5.0	5.5	5.5	5.9	4.0	4.8	4.5	6.0	7.4	8.1	7.8	7.2
5	5.0	5.2	5.2	5.0	4.0	5.5	4.5	22	12	7.2	7.5	9.3
6	5.6	5.0	8.5	5.0	4.2	5.0	4.5	12	8.5	11	7.2	9.3
7	5.0	4.8	6.0	4.8	4.2	5.2	5.7	8.9	7.5	8.4	12	8.1
8	5.0	5.0	5.0	4.8	5.0	5.7	6.0	6.9	7.2	7.8	16	7.5
9	5.0	4.8	5.2	4.5	4.0	6.3	9.7	6.3	6.9	7.5	8.5	7.5
10	5.0	4.8	4.8	4.5	4.0	5.0	8.7	6.0	6.9	7.5	7.8	7.2
11	5.0	5.6	5.0	4.5	4.0	4.8	7.8	5.8	6.6	7.5	7.5	7.2
12	5.2	5.2	5.0	4.5	4.2	4.8	5.8	6.0	6.6	7.5	7.8	7.8
13	5.0	5.0	5.0	4.5	4.5	4.8	7.2	6.6	6.6	7.2	12	8.1
14	5.0	4.8	5.0	4.8	4.2	4.8	5.8	7.6	6.6	7.2	7.8	9.3
15	5.0	4.8	5.0	5.2	4.2	4.8	11	7.5	6.3	7.2	7.5	7.5
16	5.2	17	6.0	5.6	4.5	4.8	14	7.2	6.6	7.5	8.0	8.1
17	5.0	8.3	6.0	4.5	4.8	4.8	6.6	6.4	6.3	7.5	8.9	9.7
18	4.8	7.7	5.2	4.5	6.6	4.5	7.8	6.7	6.6	7.5	7.5	8.9
19	4.8	5.8	4.8	4.2	5.0	4.5	7.0	6.3	5.9	7.2	7.8	7.8
20	4.8	5.5	4.2	4.2	4.5	4.2	36	6.6	7.6	7.8	7.5	7.5
21	4.5	5.2	4.5	4.9	5.0	4.2	11	18	13	7.2	21	7.5
22	4.8	5.2	4.5	5.0	4.8	4.2	7.2	8.4	7.5	7.2	10	7.2
23	4.9	5.2	4.5	4.5	5.0	4.2	6.9	83	7.5	7.2	9.3	7.2
24	4.8	5.7	4.5	4.5	4.5	4.6	6.3	12	6.6	7.8	7.8	6.9
25	6.2	5.2	4.5	4.5	4.5	4.8	6.0	9.0	6.9	9.3	7.8	6.6
26	5.0	5.0	4.8	4.5	4.5	7.6	6.6	8.5	9.0	7.8	7.5	6.3
27	5.0	4.8	4.8	4.5	4.5	2.9	6.0	9.1	7.2	7.2	7.8	6.3
28	5.0	5.0	4.5	4.5	9.3	4.2	6.0	7.5	32	7.5	7.8	6.3
29	4.5	5.0	4.5	6.2	---	4.8	5.5	7.5	10	7.2	18	6.0
30	4.5	4.8	4.5	4.5	---	4.8	5.2	6.9	8.1	6.9	8.9	6.0
31	4.5	---	6.3	4.2	---	4.5	---	7.8	---	6.9	7.8	---
TOTAL	154.5	172.4	162.9	154.0	130.6	154.3	232.8	328.5	248.8	238.4	287.1	227.1
MEAN	4.98	5.75	5.25	4.97	4.66	4.98	7.76	10.6	8.29	7.69	9.26	7.57
MAX	6.2	17	10	9.3	9.3	9.0	36	83	32	11	21	9.7
MIN	4.5	4.8	4.2	4.2	4.0	2.9	4.2	5.0	5.9	6.9	6.9	6.0
AC-FT	306	342	323	305	259	306	462	652	493	473	569	450

CAL YR 1977 TOTAL 2802.0 MEAN 7.68 MAX 129 MIN 3.8 AC-FT 5560
WTR YR 1978 TOTAL 2491.4 MEAN 6.83 MAX 83 MIN 2.9 AC-FT 4940

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

AVERAGE DISCHARGE.--16 years, 1.82 ft³/s (0.052 m³/s), 1,320 acre-ft/yr (1.63 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, 58 ft³/s (1.64 m³/s) June 28, gage height, 2.30 ft (0.701 m), from rating curve extended above 3.9 ft³/s (0.11 m³/s), no other peak above base of 47 ft³/s (1.33 m³/s); minimum, 0.47 ft³/s (0.013 m³/s) many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.72	.67	.67	.72	.67	.72	.55	.67	.51	.55	.62	.59
2	.72	.67	.67	.72	.67	.63	.55	.67	.51	.59	.59	.59
3	.72	.77	1.3	.67	.67	.59	.55	.63	.51	.55	.51	.59
4	.72	.67	.82	.67	.67	.59	.55	.63	.51	.63	.67	.59
5	.72	.67	.77	.67	.67	.59	.55	.61	1.0	.55	.59	.72
6	.72	.67	.82	.67	.67	.59	.55	1.1	.59	.77	.51	.63
7	.72	.67	.77	.67	.67	.59	.55	.77	.55	.55	1.8	.63
8	.67	.67	.72	.67	.67	.59	.55	.63	.55	.55	1.0	.63
9	.67	.63	.72	.67	.67	.63	.78	.63	.51	.55	.63	.63
10	.67	.63	.72	.63	.67	.63	.84	.63	.51	.51	.59	.63
11	.67	.63	.72	.63	.67	.59	.85	.63	.51	.51	.59	.63
12	.67	.63	.72	.63	.67	.59	.63	.63	.47	.47	.63	.77
13	.81	.63	.72	.63	.63	.59	.59	.63	.47	.47	2.3	.67
14	.72	.75	.67	.63	.63	.59	.59	.72	.47	.47	.63	.63
15	.72	.82	.67	.72	.63	.59	.63	.67	.47	.47	.59	.63
16	.72	.77	.72	.72	.63	.59	.63	.67	.47	.47	.59	.77
17	.72	.77	.72	.67	.67	.59	.63	.63	.47	.47	.72	.82
18	.72	.72	.72	.63	.67	.59	.59	.67	.51	.47	.63	.67
19	.72	.67	.72	.63	.63	.59	.63	.67	.51	.47	.59	.67
20	.67	.67	.67	.63	.63	.59	1.8	.63	.78	.47	.59	.67
21	.67	.67	.67	.76	.63	.59	.82	1.4	1.2	.47	1.6	.67
22	.67	.67	.67	.98	.63	.55	.82	.67	.59	.47	.67	.63
23	.67	.67	.67	.67	.63	.55	.77	1.6	.55	.47	.63	.63
24	.67	.67	.67	.67	.63	.55	.72	.63	.51	.51	.59	.63
25	.72	.67	.67	.67	.63	.55	.72	.59	.51	.59	.55	.63
26	.67	.67	.67	.67	.63	1.1	.72	.59	.55	.47	.55	.63
27	.67	.67	.67	.67	.63	.67	.67	.67	.55	.47	.55	.63
28	.67	.67	.67	.67	.69	.63	.67	.59	3.6	.47	.55	.63
29	.67	.67	.67	.67	---	.59	.67	.55	.63	.47	.59	.63
30	.67	.67	.67	.67	---	.59	.67	.55	.55	.47	.59	.63
31	.67	---	.72	.67	---	.55	---	.61	---	.47	.59	---
TOTAL	21.61	20.48	22.45	21.05	18.26	18.97	20.84	21.97	20.12	15.97	22.83	19.50
MEAN	.70	.68	.72	.68	.65	.61	.69	.71	.67	.51	.74	.65
MAX	.91	.82	1.3	.98	.69	1.1	1.9	1.6	3.6	.77	2.3	.82
MIN	.67	.63	.67	.63	.63	.55	.55	.51	.47	.47	.51	.59
AC-FT	43	41	45	42	36	38	41	43	40	31	45	39

CAL YR 1977 TOTAL 362.61 MFAN .99 MAX 3.7 MIN .00 AC-FT 719
WTR YR 1978 TOTAL 243.85 MEAN .67 MAX 3.6 MIN .47 AC-FT 484

HAWAII, ISLAND OF OAHU

16283700 NORTH FORK WAIHEE STREAM NEAR HEEIA

LOCATION.--Lat 21°26'48", long 157°52'18", Hydrologic Unit 20060000, on left bank 0.3 mi (0.5 km) upstream from confluence with South Fork, 2.8 mi (4.5 km) southwest of Waiahole School, and 4.3 mi (6.9 km) northwest of Heeia.

DRAINAGE AREA.--0.03 mi² (0.08 km²).

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, June 26 to July 13, which are fair. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--16 years, 1.83 ft³/s (0.052 m³/s), 1,330 acre-ft/yr (1.64 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 376 ft³/s (10.6 m³/s) Feb. 4, 1965, gage height, 3.38 ft (1.030 m), from rating curve extended above 19 ft³/s (0.54 m³/s); no flow July 7, 8, 1977.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 43 ft³/s (1.22 m³/s) June 28, gage height, 1.71 ft (0.521 m), from rating curve extended above 19 ft³/s (0.54 m³/s), no peak above base of 45 ft³/s (1.27 m³/s); minimum, 0.78 ft³/s (0.022 m³/s) for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.98	.98	.98	.98	.78	.88	.83	.83	.83	.88	.98	.93
2	.98	.98	.98	.98	.78	.83	.83	.83	.83	.93	.88	.93
3	.98	1.0	2.5	.98	.78	.78	.83	.83	.83	.88	.83	.93
4	.98	.98	1.0	.98	.78	.78	.83	.83	.83	.98	.93	.93
5	.98	.98	.98	.98	.78	.78	.83	.94	1.1	.88	.88	.98
6	.98	.98	1.0	.98	.78	.78	.83	1.2	.93	1.1	.88	.93
7	.98	.98	.98	.98	.78	.78	.83	.88	.83	.88	2.3	.93
8	.98	.98	.98	.98	.78	.78	.83	.83	.83	.88	1.3	.93
9	.98	.98	.98	.93	.78	.78	.98	.83	.83	.88	.88	.93
10	.98	.98	.98	.93	.78	.78	1.2	.83	.78	.83	.88	.93
11	.98	.98	.98	.93	.78	.78	1.1	.83	.78	.83	.88	.93
12	.98	.98	.98	.93	.78	.78	.88	.83	.78	.83	.93	1.0
13	1.0	.98	.98	.93	.78	.78	.83	.83	.78	.83	2.1	.93
14	.98	1.2	.98	.93	.78	.78	.83	.88	.78	.83	.88	.93
15	.98	1.1	.98	.98	.78	.78	.83	.88	.78	.83	.88	.93
16	.98	1.1	.98	.93	.78	.78	.83	.83	.78	.83	.88	.98
17	.98	1.0	.98	.93	.78	.78	.83	.83	.78	.83	1.1	1.0
18	.98	1.0	.98	.93	.83	.78	.83	.83	.78	.83	.93	.93
19	.98	.98	.98	.93	.78	.78	.88	.88	.83	.78	.93	.93
20	.98	.98	.98	.93	.78	.78	1.8	.83	.83	.78	.93	.93
21	.98	.98	.98	.98	.78	.83	.93	1.4	1.6	.78	1.6	.93
22	.98	.98	.98	1.2	.78	.83	.88	.88	.83	.78	.88	.93
23	.98	.98	.98	.93	.78	.83	.83	1.9	.83	.78	.88	.93
24	.98	.98	.98	.93	.83	.83	.83	.83	.83	.83	.88	.93
25	.98	.98	.98	.93	.83	.83	.83	.83	.83	.83	.88	.93
26	.98	.98	.98	.88	.83	1.3	.83	.83	.88	.93	.88	.93
27	.98	.98	.98	.88	.83	.83	.83	.91	.88	.83	.93	.93
28	.98	.98	.98	.83	.88	.83	.83	.83	3.5	.83	.93	.93
29	.98	.98	.98	.83	---	.83	.83	.83	.98	.83	.93	.93
30	.98	.98	.98	.83	---	.83	.83	.83	.93	.83	.93	.93
31	.98	---	.98	.83	---	.83	---	.83	---	.83	.93	---
TOTAL	30.40	29.92	31.94	29.10	22.19	25.35	26.91	28.18	28.51	26.30	31.83	28.14
MEAN	.98	1.00	1.03	.94	.79	.82	.90	.91	.95	.85	1.03	.94
MAX	1.0	1.2	2.5	1.2	.88	1.3	1.8	1.9	3.5	1.1	2.3	1.0
MIN	.98	.98	.98	.83	.78	.78	.83	.83	.78	.78	.83	.93
AC-FT	60	59	63	58	44	50	53	56	57	52	63	56

CAL YR 1977 TOTAL 435.06 MEAN 1.19 MAX 3.9 MIN .00 AC-FT 863
WTR YR 1978 TOTAL 338.77 MEAN .93 MAX 3.5 MIN .78 AC-FT 672

HAWAII, ISLAND OF OAHU

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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 (FISCAL YEARS).--WSP 1569: Drainage area. WSP 1719: 1956-57. WSP 1937: 1940-43(M), 1947(M), 1948(P), 1949-50(M), 1953(M), 1955(M), 1958(M), 1959(P). (WATER YEAR).--WRD Hawaii 1972: 1971(P).

GAGE.--Water-stage recorder and Parshall flume. Datum of gage is 193.44 ft (58.961 m) above mean sea level (levels by Honolulu Board of Water Supply).

REMARKS.--Records good. Honolulu Board of Water Supply diverts water from tunnel 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.--42 years (water years 1937-78), 8.08 ft³/s (0.229 m³/s), 5,850 acre-ft/yr (7.21 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.--Maximum discharge, 174 ft³/s (4.92 m³/s) June 28, gage height, 3.65 ft (1.113 m), no other peak above base of 140 ft³/s (3.96 m³/s); minimum discharge, 1.0 ft³/s (0.028 m³/s) Feb. 15-25, Apr. 3-5, 17, 18.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.3	1.4	1.4	1.4	1.1	1.6	1.1	1.1	1.3	1.8	1.7	1.5
2	1.3	1.4	1.4	1.4	1.1	1.2	1.1	1.1	1.2	1.9	1.6	1.5
3	1.3	1.5	6.8	1.3	1.1	1.1	1.0	1.1	1.2	1.5	1.3	1.5
4	1.3	1.5	2.0	1.3	1.1	1.1	1.0	1.1	1.2	1.6	1.5	1.5
5	1.3	1.4	1.5	1.3	1.1	1.2	1.0	1.5	2.9	1.4	1.4	1.7
6	1.3	1.4	1.5	1.3	1.1	1.1	1.1	2.9	1.9	2.2	1.3	1.6
7	1.3	1.4	1.4	1.3	1.1	1.1	1.2	1.8	1.7	1.6	7.7	1.6
8	1.3	1.4	1.4	1.3	1.1	1.2	1.1	1.4	1.5	1.4	5.9	1.5
9	1.3	1.4	1.3	1.3	1.1	1.3	1.7	1.2	1.4	1.3	2.4	1.5
10	1.3	1.3	1.3	1.3	1.1	1.2	2.5	1.1	1.3	1.3	1.8	1.5
11	1.3	1.4	1.3	1.3	1.1	1.2	2.4	1.1	1.3	1.3	1.6	1.6
12	1.3	1.4	1.3	1.3	1.1	1.2	1.4	1.1	1.3	1.3	1.8	2.0
13	1.8	1.3	1.3	1.2	1.1	1.2	1.2	1.2	1.2	1.3	12	1.6
14	1.4	1.4	1.3	1.2	1.1	1.2	1.1	1.4	1.2	1.3	2.2	1.7
15	1.4	2.5	1.3	1.4	1.0	1.1	1.1	1.6	1.2	1.2	1.8	1.6
16	1.4	1.8	1.4	1.4	1.0	1.1	1.1	1.5	1.2	1.2	1.7	1.9
17	1.4	1.8	1.4	1.3	1.0	1.1	1.0	1.3	1.2	1.2	2.3	2.4
18	1.4	1.8	1.3	1.2	1.1	1.1	1.0	1.3	1.2	1.3	1.6	1.8
19	1.3	1.5	1.3	1.2	1.0	1.1	1.2	1.6	1.4	1.2	1.5	1.7
20	1.3	1.5	1.3	1.1	1.0	1.1	8.3	1.3	1.5	1.2	1.5	1.7
21	1.3	1.5	1.3	1.3	1.0	1.1	3.3	6.7	6.3	1.2	9.1	1.7
22	1.3	1.5	1.3	2.1	1.0	1.1	2.1	2.3	1.7	1.2	2.4	1.6
23	1.3	1.4	1.3	1.3	1.0	1.1	1.6	12	1.4	1.2	2.1	1.6
24	1.3	1.4	1.3	1.2	1.0	1.1	1.4	3.7	1.3	1.3	1.8	1.6
25	1.5	1.4	1.3	1.2	1.0	1.1	1.3	2.3	1.3	1.4	1.7	1.6
26	1.4	1.4	1.3	1.2	1.1	3.0	1.3	1.7	1.3	1.2	1.6	1.6
27	1.4	1.4	1.3	1.2	1.2	1.4	1.2	1.8	1.3	1.2	1.6	1.6
28	1.4	1.4	1.3	1.2	1.1	1.2	1.2	1.5	24	1.2	1.5	1.6
29	1.4	1.4	1.3	1.2	---	1.1	1.1	1.4	4.3	1.2	1.6	1.6
30	1.5	1.4	1.3	1.1	---	1.1	1.1	1.3	2.3	1.2	1.5	1.6
31	1.4	---	1.4	1.1	---	1.1	---	1.3	---	1.2	1.5	---
TOTAL	42.2	44.7	47.6	39.9	29.9	37.9	48.2	63.7	73.5	42.0	81.0	49.5
MEAN	1.36	1.49	1.54	1.29	1.07	1.22	1.61	2.05	2.45	1.35	2.61	1.65
MAX	1.8	2.5	6.8	2.1	1.2	3.0	8.3	12	24	2.2	12	2.4
MIN	1.3	1.3	1.3	1.1	1.0	1.1	1.0	1.1	1.2	1.2	1.3	1.5
AC-FT	84	99	94	79	59	75	96	126	146	83	161	98

CAL YR 1977 TOTAL 727.35 MEAN 1.99 MAX 16 MIN .00 AC-FT 1440
WTR YR 1978 TOTAL 600.10 MEAN 1.64 MAX 24 MIN 1.0 AC-FT 1190

HAWAII, ISLAND OF OAHU

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.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 508 ft³/s (14.4 m³/s) Nov. 21, 1974, gage height, 5.96 ft (1.817 m) from rating curve extended above 10 ft³/s (0.28 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 (*):

Date	Time	Discharge (ft ³ /s) (m ³ /s)		Gage height (ft) (m)	
Dec. 3	1000	160	4.53	4.40	1.341
June 28	1300	*222	6.29	4.73	1.442
Aug. 13	0515	157	4.45	4.38	1.335

Minimum discharge, 3.6 ft³/s (0.102 m³/s) many days in January to May.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.0	4.0	3.8	4.1	3.6	4.2	3.6	3.7	4.0	4.7	4.6	4.2
2	4.1	4.0	3.8	4.2	3.6	3.6	3.6	3.7	3.8	4.9	4.4	4.2
3	4.0	4.1	12	4.0	3.6	3.6	3.6	3.6	3.8	4.2	4.0	4.2
4	4.0	4.0	4.4	3.8	3.6	3.6	3.6	3.6	4.0	4.2	4.4	4.2
5	4.0	4.0	4.1	3.7	3.6	3.6	3.6	4.1	5.9	4.1	4.2	4.0
6	4.1	4.0	4.2	3.7	3.6	3.6	3.7	5.7	4.9	4.9	4.1	4.4
7	4.1	3.8	4.0	3.7	3.6	3.6	3.8	4.4	4.6	4.2	11	4.4
8	4.1	3.8	3.8	3.7	3.6	3.7	3.7	3.8	4.2	4.0	9.8	4.2
9	4.1	3.8	3.8	3.7	3.6	3.6	4.5	3.7	4.1	4.0	5.2	4.2
10	4.1	3.8	3.8	3.7	3.6	3.6	5.4	3.6	4.0	4.0	4.9	4.4
11	4.1	4.0	3.8	3.7	3.6	3.6	5.2	3.6	4.0	4.0	4.6	4.4
12	4.1	4.0	3.7	3.7	3.6	3.6	4.0	3.6	4.0	4.0	5.0	5.0
13	4.7	3.8	3.7	3.6	3.6	3.6	3.8	3.6	4.0	4.0	16	4.6
14	4.2	3.9	3.8	3.6	3.6	3.6	3.7	4.0	4.0	4.0	5.4	4.6
15	4.1	5.6	3.8	3.8	3.6	3.6	3.7	4.1	3.8	3.8	4.9	4.4
16	4.1	4.6	4.0	3.8	3.6	3.6	3.7	4.0	4.0	3.8	4.9	4.7
17	4.1	4.5	3.8	3.7	3.6	3.6	3.6	3.8	3.8	3.8	5.8	5.2
18	4.1	4.5	3.8	3.6	3.7	3.6	3.6	4.0	3.8	4.0	4.9	4.7
19	4.1	4.2	3.7	3.6	3.6	3.6	3.7	4.2	4.2	4.0	4.6	4.6
20	4.1	4.1	3.7	3.6	3.6	3.6	12	3.8	4.2	3.8	4.6	4.7
21	4.1	4.0	3.7	3.8	3.6	3.6	6.3	10	10	3.8	13	4.7
22	4.1	4.1	3.7	4.7	3.6	3.6	4.7	5.2	4.6	3.8	5.9	4.7
23	4.0	4.0	3.7	3.7	3.6	3.6	4.1	17	4.2	3.8	4.9	4.7
24	4.0	4.0	3.7	3.6	3.6	3.6	3.8	7.1	4.2	3.8	4.6	4.7
25	4.2	4.0	3.7	3.6	3.6	3.6	3.8	5.4	4.1	4.1	4.6	4.6
26	4.0	4.0	3.8	3.6	3.6	5.8	3.7	4.6	4.2	4.0	4.4	4.6
27	4.0	4.0	3.8	3.6	3.7	4.0	3.7	4.7	4.0	4.0	4.4	4.4
28	4.0	4.0	3.8	3.6	4.0	3.7	3.7	4.2	29	4.0	4.4	4.4
29	4.0	4.0	3.8	3.6	---	3.6	3.7	4.1	7.9	4.0	4.4	4.4
30	4.0	3.8	3.8	3.6	---	3.6	3.7	4.0	5.2	4.0	4.2	4.4
31	4.0	---	4.1	3.6	---	3.6	---	4.0	---	4.0	4.2	---
TOTAL	126.7	122.4	127.1	116.0	101.4	115.0	127.3	148.9	160.5	125.7	176.3	135.5
MEAN	4.09	4.08	4.10	3.74	3.62	3.71	4.24	4.80	5.35	4.05	5.69	4.52
MAX	4.7	5.6	12	4.7	4.0	5.8	12	17	29	4.9	16	5.2
MIN	4.0	3.8	3.7	3.6	3.6	3.6	3.6	3.6	3.8	3.8	4.0	4.2
AC-FT	251	243	252	230	201	228	252	295	318	249	350	269

CAL YR 1977 TOTAL 1230.6 MEAN 3.37 MAX 21 MIN 1.3 AC-FT 2440
WTR YR 1978 TOTAL 1582.8 MEAN 4.34 MAX 29 MIN 3.6 AC-FT 3140

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 Waieekee 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. 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.--18 years (water years 1961-78), 8.29 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 (ft ³ /s) (m ³ /s)		Gage height (ft) (m)	
June 28	1430	*2,520	71.4	7.60	2.316
Aug. 21	0930	1,480	41.9	6.28	1.914

Minimum discharge, 1.2 ft³/s (0.034 m³/s) Jan. 13, 14.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.0	1.6	1.7	4.4	1.7	3.1	1.7	3.6	6.4	12	6.7	5.1
2	2.1	2.5	1.7	7.8	1.7	2.3	1.6	5.8	16	8.2	4.7	
3	2.1	3.7	8.2	3.1	1.7	1.9	1.6	3.3	5.4	9.9	4.3	4.6
4	2.1	2.8	2.4	2.2	1.7	1.7	1.7	3.3	5.4	10	5.0	4.4
5	2.1	2.8	1.8	1.9	1.7	1.7	1.7	7.7	31	8.0	7.3	5.2
6	2.1	3.0	1.9	1.8	1.7	1.7	1.8	25	22	14	5.4	6.0
7	2.1	2.3	2.0	1.6	1.7	1.7	2.3	18	11	9.5	31	5.1
8	2.0	2.3	1.8	1.6	1.8	1.7	3.3	8.0	9.6	7.8	27	4.0
9	1.8	2.2	1.8	1.5	1.7	2.0	5.8	6.1	7.4	6.4	8.9	3.8
10	2.0	2.1	1.8	1.5	1.7	1.7	15	5.5	6.6	5.8	6.8	3.8
11	2.1	2.3	1.6	1.5	1.7	1.7	15	5.0	6.2	5.5	6.2	3.7
12	2.1	2.1	1.6	1.5	1.7	1.6	7.0	5.8	5.9	5.2	6.8	4.0
13	2.0	2.0	1.7	1.4	1.7	1.6	4.7	7.3	5.5	5.0	31	3.7
14	2.0	2.0	1.7	1.3	1.6	2.0	3.8	11	5.3	4.7	7.3	4.4
15	2.0	2.1	1.8	1.5	1.6	1.7	8.4	15	5.1	4.4	6.1	3.7
16	2.0	2.8	2.0	2.0	1.6	1.8	11	12	5.2	4.4	6.1	5.3
17	1.8	3.6	2.3	1.8	3.1	1.7	6.4	12	5.2	4.4	7.6	6.1
18	1.8	3.6	2.8	1.5	2.3	2.1	4.4	9.5	4.8	4.4	5.5	4.1
19	1.8	2.4	2.4	1.5	2.0	1.7	4.4	7.7	7.3	4.4	5.5	3.5
20	1.8	2.3	2.3	1.5	1.7	1.7	46	7.0	6.1	7.1	5.0	3.6
21	2.0	2.1	2.3	1.8	1.7	1.7	14	9.5	19	4.8	45	4.7
22	2.0	2.1	2.1	2.4	1.8	1.7	8.0	8.7	7.2	4.3	13	4.4
23	2.1	2.0	2.1	2.0	1.7	1.7	6.4	61	5.7	4.1	11	3.4
24	2.1	2.0	2.0	1.3	1.6	1.7	5.2	19	5.2	6.0	7.7	3.3
25	2.5	2.0	2.0	1.8	1.6	2.0	4.7	12	5.0	5.4	6.7	3.2
26	1.8	1.8	2.0	1.7	1.6	6.4	4.7	11	7.7	4.4	6.1	3.0
27	1.8	1.8	2.1	1.7	1.6	3.1	4.4	13	6.0	4.1	5.7	3.0
28	1.8	1.8	2.0	1.7	2.0	2.3	4.2	8.9	210	3.9	6.5	2.9
29	1.5	1.7	2.0	2.0	---	1.8	3.8	7.9	30	4.0	7.4	2.9
30	1.4	1.8	2.1	1.8	---	1.8	3.6	7.4	16	4.0	5.8	2.8
31	1.4	---	3.1	1.7	---	1.7	---	7.5	---	3.7	5.2	---
TOTAL	60.2	69.7	69.1	63.3	49.7	62.9	204.6	342.3	478.0	197.6	317.8	122.4
MEAN	1.94	2.32	2.23	2.04	1.78	2.03	6.89	11.0	15.9	6.37	10.3	4.08
MAX	2.5	3.7	8.2	7.8	3.1	6.4	46	61	210	16	45	6.1
MIN	1.4	1.6	1.6	1.3	1.6	1.6	1.6	3.3	4.8	3.7	4.3	2.8
AC-FI	119	138	137	126	99	125	810	679	948	392	630	243

CAL YR 1977 TOTAL 1742.0 MEAN 4.77 MAX 167 MIN 1.3 AC-FI 3460
WTR YR 1978 TOTAL 2039.6 MEAN 5.59 MAX 210 MIN 1.3 AC-FI 4050

HAWAII, ISLAND OF OAHU

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 Swanz Beach Park in Kaaawa.

DRAINAGE AREA.--3.74 mi² (9.69 km²).

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

REVISED RECORDS (FISCAL YEARS).--WSP 1937: 1959-60.

GAGE.--Water-stage recorder and concrete-masonry control. Altitude of gage is 30 ft (9.1 m), from topographic map.

REMARKS.--Records fair. Approximately 9 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.--19 years (water years 1960-78), 35.0 ft³/s (0.991 m³/s), 25,360 acre-ft/yr (31.3 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 (*):

Date	Time	Discharge (ft ³ /s) (m ³ /s)	Gage height (ft) (m)
June 28	1430	*2980 84.4	6.22 1.896
Aug. 13	0500	1920 54.4	5.14 1.567
Aug. 21	0900	2110 59.8	5.36 1.634

Minimum discharge, 12 ft³/s (0.34 m³/s) for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	14	16	14	15	13	16	14	23	27	39	50	27
2	18	21	14	23	13	14	14	23	26	135	49	26
3	15	36	45	15	13	13	13	27	25	38	24	25
4	14	25	16	14	13	12	13	19	25	50	34	25
5	14	24	14	14	13	13	13	32	110	33	62	31
6	14	28	14	14	12	12	14	42	81	112	31	30
7	14	19	15	13	12	12	19	43	39	49	247	30
8	14	18	14	13	13	13	23	26	39	40	307	25
9	15	21	14	13	12	14	36	24	32	36	52	25
10	57	17	14	13	12	14	44	22	29	31	39	24
11	17	18	14	13	12	14	54	20	27	30	34	23
12	16	17	13	13	12	13	27	21	27	29	57	26
13	15	16	13	13	13	14	26	27	25	29	330	24
14	15	16	13	13	14	151	27	41	25	27	52	26
15	15	20	13	13	13	20	101	52	23	25	39	24
16	16	22	13	14	13	17	75	48	23	25	35	43
17	15	26	14	13	22	15	30	36	25	25	72	57
18	15	20	15	13	17	15	24	28	23	25	35	29
19	14	17	13	13	15	15	22	24	38	25	36	31
20	15	16	13	13	13	14	177	22	68	35	31	29
21	14	16	13	13	13	14	37	32	129	24	228	46
22	15	16	13	25	13	14	27	24	34	23	68	38
23	15	16	13	14	13	14	24	176	29	23	102	31
24	14	16	13	13	12	14	21	50	27	27	40	27
25	25	15	12	13	12	14	20	34	27	27	37	25
26	17	15	13	13	12	25	22	46	39	23	34	25
27	16	15	13	13	12	16	20	86	27	23	31	25
28	15	15	13	13	13	15	22	36	523	22	31	23
29	15	15	12	15	---	14	19	35	79	22	39	23
30	14	15	12	14	---	16	20	35	45	23	31	22
31	15	---	14	13	---	14	---	31	---	21	28	---
TOTAL	517	567	449	437	370	591	998	1225	1696	1096	2285	865
MEAN	16.7	18.9	14.5	14.1	13.2	19.1	33.3	39.5	56.5	35.4	73.7	28.8
MAX	57	36	45	25	22	151	177	176	523	135	330	57
MIN	14	15	12	13	12	12	13	19	23	21	24	22
AC-FT	1030	1120	891	867	734	1170	1980	2430	3360	2170	4530	1720

CAL YR 1977 TOTAL 8563 MEAN 23.5 MAX 328 MIN 12 AC-FT 16980
WTR YR 1978 TOTAL 11096 MEAN 30.4 MAX 523 MIN 12 AC-FT 22010

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.

REVISED RECORDS (FISCAL YEARS).--WSP 1719: 1954-55.

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

REMARKS.--Records fair except those for period of no gage-height, Jan. 31 to Mar. 1, which are 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.--25 years, 8.56 ft³/s (0.242 m³/s), 6,200 acre-ft/yr (7.64 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 54 ft³/s (1.53 m³/s) Oct. 31, 1964; no flow for several days in 1963, 1966, 1969, 1972, 1974, 1977.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.21	.97	3.7	6.0	4.9	4.4	3.0	2.6	1.4	.43	6.2	3.2
2	.41	1.1	3.8	7.3	4.9	4.4	2.9	2.4	1.4	.95	4.5	3.3
3	.43	1.5	4.1	5.8	4.9	4.2	2.9	2.6	2.4	.26	4.0	3.6
4	.40	1.0	1.6	5.3	4.9	4.1	2.9	2.3	3.8	.50	6.5	3.7
5	.40	1.1	1.4	5.2	4.9	4.1	2.9	3.0	9.0	1.3	6.4	4.8
6	.40	1.1	1.6	5.2	4.9	4.1	3.0	3.8	6.3	10	4.5	4.4
7	.40	.97	1.5	5.1	4.9	4.1	4.0	2.8	4.8	5.0	16	4.4
8	.46	1.2	1.4	5.1	4.8	4.2	3.7	2.3	4.4	4.5	11	4.0
9	1.6	.48	1.3	5.1	4.8	4.4	4.2	2.2	4.1	4.4	4.4	4.0
10	1.0	.33	1.3	5.1	5.0	4.5	4.9	2.1	4.0	4.1	3.9	3.9
11	.33	.59	1.3	5.2	5.0	4.1	5.2	2.1	3.9	3.9	3.7	4.0
12	.31	1.1	1.3	5.2	4.7	4.0	4.8	2.3	3.9	3.9	5.2	4.2
13	.28	1.0	3.0	5.2	5.5	4.1	5.1	2.6	3.8	3.9	13	4.1
14	.26	1.0	4.4	5.2	6.1	4.8	4.8	3.1	3.9	3.8	.78	4.5
15	.29	1.1	4.4	5.5	5.5	3.7	4.9	3.3	3.8	3.7	.61	4.4
16	.40	1.2	4.6	5.6	5.5	3.7	3.8	2.8	3.8	3.8	.57	6.4
17	.43	1.4	5.2	5.3	6.0	3.3	2.3	2.4	3.9	3.9	1.4	7.8
18	.46	1.2	5.2	5.3	6.2	3.3	2.2	2.4	3.8	4.0	.53	5.2
19	.50	1.1	4.8	5.2	5.0	3.3	2.3	2.2	4.7	4.1	.57	6.1
20	.46	1.0	4.7	5.1	4.5	3.3	2.3	2.1	7.1	4.5	.40	5.1
21	.50	.97	4.7	5.2	5.0	3.2	2.2	4.8	12	4.1	5.0	5.8
22	.46	1.0	4.7	5.8	4.5	3.2	2.3	2.5	2.8	4.1	.86	6.1
23	.73	1.2	4.6	5.0	4.9	3.3	2.5	9.4	2.4	4.1	.87	4.4
24	1.0	1.8	4.7	5.0	4.6	3.2	2.6	2.6	2.1	4.4	.43	4.2
25	1.0	2.7	4.7	4.8	4.6	3.3	2.2	1.9	2.1	4.5	.26	4.2
26	.75	3.4	4.7	4.8	4.8	4.5	2.4	1.8	2.5	3.9	.17	4.4
27	.97	3.6	4.8	4.8	4.9	3.3	2.4	3.6	2.4	3.8	1.5	4.2
28	.92	3.6	4.8	5.0	4.4	3.2	2.4	1.8	18	3.8	3.0	4.2
29	.87	3.7	4.8	5.3	---	3.2	2.4	1.8	1.3	3.7	3.4	4.2
30	.87	3.7	4.7	5.0	---	3.3	2.3	1.7	.73	3.6	3.3	4.1
31	.97	---	5.3	4.8	---	3.2	---	1.6	---	3.6	3.3	---
TOTAL	18.47	46.11	113.1	163.5	140.6	117.0	95.8	84.9	130.53	114.54	116.25	136.9
MEAN	.60	1.54	3.65	5.27	5.02	3.77	3.19	2.74	4.35	3.69	3.75	4.56
MAX	1.6	3.7	5.3	7.3	6.2	4.8	5.2	9.4	18	10	16	7.8
MIN	.21	.33	1.3	4.8	4.4	3.2	2.2	1.6	.73	.26	.17	3.2
AC-FT	37	91	224	324	279	232	190	168	259	227	231	272
CAL YR 1977 TOTAL	578.94		MEAN 1.59	MAX 9.0	MIN .00	AC-FT 1150						
WIR YR 1978 TOTAL	1277.70		MEAN 3.50	MAX 18	MIN .17	AC-FI 2530						

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 (FISCAL YEARS).--WSP 1569: Drainage area. WSP 1937: 1956(P), 1957(M), 1959(M). (WATER YEARS).--WRD Hawaii 1974: 1971-72(P), 1973(M).

GAGE.--Water-stage recorder and masonry control. Altitude of gage is 212 ft (65 m), from topographic map.

REMARKS.--Records fair. 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.--25 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, 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 (*):

Date	Time	Discharge (ft ³ /s) (m ³ /s)	Gage height (ft) (m)
June 28	1330	*1490 42.2	4.28 1.305
Aug. 21	1000	1020 28.9	3.56 1.085

Minimum discharge, 6.0 ft³/s (0.17 m³/s) Feb. 10.

REVISIONS.--Revised peak discharges and annual maximum (*) for the fiscal years 1954-60, superseding figures published in WSP 1399, 1449, 1569, 1639, 1719, 1739, 1937, and for water years 1960-70, superseding figures published in WSP 1937 and 2137.

Fiscal Year	Date	Time	Discharge (ft ³ /s)(m ³ /s)	Gage height (ft) (m)	Fiscal Year	Date	Time	Discharge (ft ³ /s)(m ³ /s)	Gage height (ft) (m)
1954	Apr. 29, 1954	0500	*501 14.2	2.54 0.774	1957	Feb. 4, 1957	1500	760 21.5	3.10 0.945
1955	Nov. 28, 1954	1830	1350 38.2	4.08 1.244	1957	Apr. 14, 1957	0730	*1710 48.4	4.59 1.399
1955	Jan. 21, 1955	0800	860 24.4	3.30 1.006	1958	Nov. 21, 1957	1230	835 23.6	3.25 .991
1955	Feb. 7, 1955	1100	*1370 38.8	4.12 1.256	1958	Dec. 1, 1957	1000	878 24.9	3.33 1.015
1956	Aug. 20, 1955	1230	*2060 58.3	5.03 1.533	1958	Dec. 6, 1957	1730	*890 25.2	3.35 1.021
1956	Dec. 31, 1955	1000	1800 51.0	4.70 1.433	1958	Mar. 5, 1958	1700	878 24.9	3.33 1.015
1956	Jan. 26, 1956	1000	1190 33.7	3.85 1.174	1959	Aug. 8, 1958	1230	660 18.7	2.90 .884
1956	Apr. 21, 1956	1630	938 26.6	3.43 1.046	1959	Oct. 23, 1958	1930	*1920 54.4	4.85 1.478
1957	Oct. 17, 1956	1600	745 21.1	3.07 .936	1959	Feb. 11, 1959	1830	745 21.1	3.07 .936
1957	Nov. 14, 1956	1600	670 19.0	2.92 .890	1960	Mar. 6, 1960	0430	675 19.1	2.93 .893
1957	Dec. 6, 1956	2000	675 19.1	2.93 .893	1960	May 13, 1960	1300	*760 21.5	3.10 .945
1957	Jan. 21, 1957	1530	1180 33.4	3.84 1.170					
Water Year	Date	Time	Discharge (ft ³ /s)(m ³ /s)	Gage height (ft) (m)	Water Year	Date	Time	Discharge (ft ³ /s)(m ³ /s)	Gage height (ft) (m)
1960	May 13, 1960	1300	*760 21.5	3.10 .945	1965	May 4, 1965	1930	1380 39.1	4.13 1.259
1961	Jan. 14, 1961	0800	*1220 34.6	3.90 1.189	1965	May 15, 1965	0400	1430 40.5	4.20 1.280
1961	Feb. 13, 1961	0200	914 25.9	3.39 1.033	1965	July 21, 1965	2230	825 23.4	3.23 .985
1962	Oct. 28, 1961	1500	896 25.4	3.36 1.024	1965	Aug. 26, 1965	0830	a1000 28.3	-- --
1962	Nov. 1, 1961	1330	*3160 89.5	6.06 1.847	1966	Oct. 13, 1965	1730	1800 51.0	4.70 1.433
1962	Mar. 11, 1962	2200	1180 33.4	3.85 1.174	1966	Nov. 12, 1965	2130	980 27.8	3.50 1.067
1962	Mar. 14, 1962	0200	1270 36.0	3.98 1.213	1966	Nov. 14, 1965	1430	*1870 53.0	4.79 1.460
1963	Mar. 26, 1963	1030	962 27.2	3.47 1.058	1967	Oct. 11, 1966	a2300	1540 43.6	4.36 1.329
1963	Apr. 15, 1963	1300	*2800 79.3	5.77 1.759	1967	Nov. 4, 1966	a1200	1160 32.9	b3.80 1.158
1963	May 14, 1963	1330	1270 36.0	3.97 1.210	1967	May 20, 1967	1830	810 22.9	3.20 .975
1964	Oct. 4, 1963	1900	896 25.4	3.36 1.024	1967	Aug. 9, 1967	Unknown	*3080 87.2	b6.00 1.829
1964	Jan. 6, 1964	1200	*2890 81.8	5.84 1.780	1968	Dec. 8, 1967	0230	*2020 57.2	4.98 1.518
1964	Mar. 22, 1964	1600	1710 48.4	4.59 1.399	1968	Dec. 10, 1967	0400	920 26.1	3.40 1.036
1964	July 25, 1964	0330	1350 38.2	4.08 1.244	1968	Dec. 18, 1967	0430	785 22.2	3.15 .960
1965	Nov. 14, 1964	a0130	3060 86.7	5.98 1.823	1968	Mar. 14, 1968	0100	1030 29.2	3.58 1.091
1965	Dec. 10, 1964	1300	878 24.9	3.33 1.015	1968	Apr. 20, 1968	a0400	884 25.0	b3.34 1.018
1965	Dec. 15, 1964	1530	2520 71.4	5.52 1.683	1969	Jan. 2, 1969	2330	2040 57.8	5.00 1.524
1965	Dec. 19, 1964	1130	1280 36.2	3.98 1.213	1969	Feb. 1, 1969	1230	*3510 99.4	6.33 1.929
1965	Feb. 4, 1965	a0330	*3160 89.5	b6.06 1.847	1970	Dec. 24, 1969	2230	*1140 32.3	3.77 1.149
1965	May 2, 1965	1130	2370 67.1	5.37 1.637	1970	May 2, 1970	1830	932 26.4	3.42 1.042

a About.

b From floodmarks.

HAWAII, ISLAND OF OAHU

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16303000 PUNALUU STREAM NEAR PUNALUU--Continued

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	11	13	9.1	10	6.8	9.6	9.1	17	19	24	30	19
2	14	14	9.1	16	6.8	7.2	8.7	16	19	32	23	17
3	11	22	32	9.1	6.3	7.2	8.7	19	18	23	18	17
4	11	16	13	7.7	6.3	6.8	8.7	12	17	27	32	17
5	11	18	11	7.2	6.3	6.8	8.7	27	61	21	30	25
6	11	19	13	6.3	6.3	6.8	9.1	45	60	63	23	23
7	11	15	13	6.3	6.3	6.8	15	30	27	21	108	22
8	12	18	12	6.3	7.2	8.2	15	21	24	16	78	18
9	35	17	12	6.3	6.3	9.1	20	19	23	15	30	17
10	27	14	12	6.3	6.0	9.1	23	18	20	14	26	17
11	14	16	11	6.3	6.3	7.2	24	16	19	14	24	16
12	13	15	11	6.3	6.3	6.8	15	20	19	15	33	18
13	12	14	9.1	6.3	7.2	8.1	16	23	19	14	138	17
14	12	13	8.2	6.3	7.7	20	14	29	19	13	27	19
15	12	15	8.2	6.8	7.2	10	16	31	18	13	22	16
16	13	17	7.2	7.7	7.2	10	30	30	18	13	21	29
17	12	19	7.7	7.2	9.1	9.1	13	23	19	14	32	35
18	12	16	8.6	6.8	9.6	9.1	12	22	17	15	22	21
19	12	15	7.2	6.3	8.2	9.1	12	20	26	15	23	22
20	12	14	6.8	6.3	7.7	9.1	63	19	42	18	19	20
21	12	13	6.8	7.7	7.2	9.1	23	54	120	15	72	24
22	12	13	6.3	10	7.7	8.7	18	30	25	16	30	22
23	12	13	6.3	6.8	7.2	8.7	16	106	22	15	35	16
24	12	12	6.3	6.8	6.8	8.7	14	30	21	18	24	15
25	19	11	6.3	6.3	6.8	9.1	13	23	21	20	22	15
26	14	9.6	6.3	6.3	6.8	16	14	22	26	16	21	14
27	13	9.6	6.8	6.3	6.8	10	13	49	23	16	19	14
28	13	9.6	6.3	6.8	9.1	9.6	14	25	193	16	19	13
29	12	9.1	6.3	8.2	---	9.6	13	24	38	15	23	13
30	12	9.1	6.3	6.8	---	11	12	23	28	15	21	12
31	12	---	8.6	6.8	---	9.1	---	21	---	15	20	---
TOTAL	421	429.0	293.8	226.6	199.5	285.7	491.0	864	1021	577	1065	563
MEAN	13.6	14.3	9.48	7.31	7.13	9.22	16.4	27.9	34.0	18.6	34.4	18.8
MAX	35	22	32	16	9.6	20	63	106	193	63	138	35
MIN	11	9.1	6.3	6.3	6.0	6.8	8.7	12	17	13	18	12
AC-FT	835	851	583	449	396	567	974	1710	2030	1140	2110	1120
CAL YR 1977	TOTAL	5458.9	MEAN	15.0	MAX	134	MIN	6.3	AC-FT	10830		
WTR YR 1978	TOTAL	6436.6	MEAN	17.6	MAX	193	MIN	6.0	AC-FT	12770		

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

AVERAGE DISCHARGE.--11 years, 3.73 ft³/s (0.106 m³/s), 2,700 acre-ft/yr (3.33 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,010 ft³/s (56.9 m³/s) Feb. 1, 1969, gage height, 10.0 ft (3.05 m), from rating curve extended above 14 ft³/s (0.40 m³/s) on basis of slope-area measurements at gage heights 8.85 ft (2.697 m) and 10.0 ft (3.05 m); maximum gage height, 10.84 ft (3.304 m) July 17, 1974; no flow for several days in July and August 1971, Sept. 14, 27, 1975, many days in January and February 1977, and Feb. 12-17, 27, 1978.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 704 ft³/s (19.9 m³/s) June 28, gage height, 9.01 ft (2.746 m), from rating curve extended as explained above, no other peak above base of 500 ft³/s (14.2 m³/s); no flow Feb. 12-17, 27.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.23	.94	.21	8.3	.21	5.0	.44	3.7	1.1	2.8	7.2	2.4
2	.71	3.9	.18	12	.15	1.1	.44	3.7	.91	14	7.0	1.6
3	.32	12	17	1.5	.11	.34	.42	1.4	.74	4.3	1.5	1.2
4	.29	4.7	1.3	.74	.09	.18	.32	1.0	.85	9.4	11	1.3
5	.25	3.3	.45	.49	.07	.12	.26	20	24	2.2	7.9	4.6
6	.35	4.4	2.2	.37	.05	.11	1.1	24	5.0	24	4.0	2.2
7	.30	1.7	1.6	.30	.03	.10	12	6.5	2.7	6.9	50	5.0
8	1.9	5.0	.41	.25	.05	.42	3.3	2.3	1.6	3.1	23	1.4
9	.93	4.7	.28	.20	.09	2.4	11	1.7	1.8	3.6	3.8	1.2
10	3.2	1.1	.98	.16	.04	6.2	9.2	1.4	1.1	2.0	2.6	1.1
11	.44	1.5	.31	.15	.01	1.1	10	1.1	.92	1.7	2.3	1.2
12	.28	2.6	.20	.12	.00	.54	3.2	3.8	.83	1.9	6.4	2.5
13	.22	1.4	.16	.10	.00	.36	3.1	9.3	.73	2.4	33	1.2
14	.35	.81	.16	.08	.00	.55	2.1	15	.82	1.4	2.7	3.9
15	.17	4.7	.14	.20	.00	.36	2.5	9.3	1.1	1.2	1.9	1.1
16	1.0	.93	.10	1.8	.00	2.7	5.0	5.8	1.2	2.1	2.9	10
17	.38	1.7	4.4	1.1	.00	.51	2.1	2.3	1.4	2.4	14	11
18	.47	2.4	3.1	.26	4.5	.27	1.3	1.7	1.0	3.9	1.8	2.7
19	.23	.74	1.0	.14	1.1	.21	1.7	1.4	6.4	3.5	3.2	2.1
20	1.2	.59	.38	.08	.25	.18	20	2.4	14	7.4	1.9	5.5
21	.41	.51	.26	2.6	.11	.26	2.5	10	40	1.7	23	3.6
22	.52	.48	.21	7.9	.05	.25	1.4	2.3	3.6	1.6	9.9	2.5
23	.30	.53	.15	.80	.13	.64	1.1	37	2.6	1.2	13	1.6
24	.28	.49	.10	.39	.14	.46	.85	2.9	1.8	9.0	2.6	1.7
25	19	.44	.08	.29	.05	3.0	.91	1.7	3.7	3.6	2.3	1.2
26	3.2	.32	.07	.43	.01	9.7	.56	2.4	9.1	2.5	2.7	1.5
27	2.0	.27	.09	.26	.00	1.5	2.6	13	3.7	2.5	1.5	1.2
28	2.6	.28	.09	.21	5.5	3.2	2.6	1.8	80	1.5	2.1	.85
29	.78	.45	.07	3.9	---	.97	3.1	1.7	5.7	2.1	4.9	.74
30	.52	.33	.05	.76	---	1.6	2.3	1.5	2.9	1.6	3.6	.71
31	.45	---	3.8	.32	---	.66	---	1.6	---	1.1	2.0	---
TOTAL	43.28	63.21	39.53	46.20	12.74	44.99	107.40	193.7	221.30	128.6	255.7	78.80
MEAN	1.40	2.11	1.28	1.49	.46	1.45	3.58	6.25	7.38	4.15	8.25	2.63
MAX	19	12	17	12	5.5	9.7	20	37	80	24	50	11
MIN	.17	.27	.05	.08	.00	.10	.26	1.0	.73	1.1	1.5	.71
AC-FT	86	125	78	92	25	89	213	384	439	255	507	156

CAL YR 1977 TOTAL 1060.37 MEAN 2.91 MAX 65 MIN .00 AC-FT 2100
WTR YR 1978 TOTAL 1235.45 MEAN 3.33 MAX 80 MIN .00 AC-FT 2450

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 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.--15 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, 3,390 ft³/s (96.0 m³/s) Jan. 30, 1975, gage height, 10.06 ft (3.066 m), from rating curve extended above 42 ft³/s (1.19 m³/s) on basis of slope-area measurement at gage height 10.06 ft (3.066 m); no flow Aug. 26 to Sept. 1, Sept. 23, Oct. 15-25, 1971, many days in September 1975, Feb. 10-20, 1978.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 834 ft³/s (23.6 m³/s) June 28, gage height, 7.01 ft (2.137 m), from rating curve extended as explained above, no peak above base of 950 ft³/s (26.9 m³/s); no flow Feb. 10-20.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.40	.62	.14	6.6	.35	7.2	.97	2.3	2.2	12	7.1	3.9
2	.41	12	.12	18	.18	4.6	.55	7.4	2.1	26	18	3.8
3	.69	27	12	7.8	.12	1.3	.30	3.5	7.0	10	4.2	3.5
4	.83	7.5	7.1	1.4	.07	.55	.18	9.3	2.1	15	12	3.7
5	.69	4.7	1.7	.69	.03	.23	.12	34	63	9.5	11	5.8
6	.48	8.3	1.0	.35	.02	.20	.12	40	27	25	6.3	7.6
7	.55	4.1	7.3	.30	.01	.20	5.9	20	12	19	39	13
8	.97	2.0	1.9	.26	.01	.26	7.8	5.4	5.8	9.8	59	4.9
9	.62	2.9	.97	.23	.01	.20	15	3.4	5.4	8.3	9.8	3.4
10	.41	1.4	.62	.16	.01	4.4	22	2.6	4.4	7.8	5.6	3.1
11	.30	.97	.76	.10	.00	3.8	17	2.1	3.7	5.6	4.5	3.7
12	.48	1.5	.26	.06	.00	1.2	7.2	2.0	3.5	5.8	9.9	3.8
13	.55	2.0	.20	.03	.00	.55	5.3	11	3.4	5.9	52	4.2
14	.35	1.3	.16	.02	.00	1.1	6.3	17	4.2	5.0	7.6	4.9
15	.23	.90	.12	.02	.00	2.4	2.7	22	7.0	4.4	4.7	3.8
16	.20	.69	.14	4.4	.00	9.1	1.5	18	3.5	4.2	4.1	15
17	.20	.76	1.6	6.2	.00	2.8	1.5	4.4	3.7	4.1	22	27
18	.35	.69	13	1.5	.00	1.0	4.0	3.0	4.7	5.1	3.5	8.6
19	.35	.48	2.4	.62	.00	.55	1.8	2.6	13	4.2	7.6	6.1
20	.23	.41	1.2	.30	.60	.30	24	2.7	22	8.3	5.8	15
21	.16	.41	.69	.35	.35	.23	8.4	12	117	4.2	38	9.0
22	.18	.30	.41	8.4	.12	.16	2.7	14	15	2.4	16	13
23	.18	.23	.23	2.6	.09	.16	1.9	90	7.4	2.0	24	5.6
24	.14	.23	.14	1.0	.03	.16	1.6	13	5.8	6.6	8.8	4.2
25	18	.30	.10	.48	.01	.10	1.5	5.9	8.1	10	6.7	3.5
26	5.3	.35	.07	.30	.01	12	6.6	4.4	8.0	5.1	7.0	3.4
27	3.0	.23	.05	.23	.01	5.8	7.8	11	6.5	2.6	5.0	2.9
28	3.0	.18	.04	.16	.01	7.5	5.8	5.1	197	2.4	4.4	2.8
29	2.8	.20	.02	.12	---	3.4	3.2	3.2	31	4.3	5.0	2.7
30	1.1	.16	.02	.09	---	3.0	2.7	2.7	16	3.9	6.1	2.7
31	.62	---	.82	.12	---	2.5	---	2.4	---	2.8	4.6	---
TOTAL	43.77	82.81	55.28	58.89	2.04	76.95	166.44	376.4	602.5	241.3	419.3	194.6
MEAN	1.41	2.76	1.78	1.90	.073	2.48	5.55	12.1	20.1	7.78	13.5	6.49
MAX	18	27	13	18	.60	12	24	90	197	26	59	27
MIN	.14	.16	.02	.02	.00	.10	.12	2.0	2.0	2.0	3.5	2.7
AC-FT	87	164	110	117	4.0	153	330	747	1200	479	832	386

CAL YR 1977 TOTAL 1791.76 MEAN 4.91 MAX 132 MIN .02 AC-FT 3550
WTR YR 1978 TOTAL 2320.28 MEAN 6.36 MAX 197 MIN .00 AC-FT 4600

LOCATION.--Lat 21°38'20", long 158°03'27", Hydrologic Unit 20060000, on right bank at Maunawai, 25 ft (7.6 m) upstream from Elehaha Stream, 4.9 mi (7.9 km) northeast of Waiialua School, and 7.3 mi (11.7 km) southwest of Kahuku School.

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

GAGE.--Water-stage recorder. Altitude of gage is 20 ft (6.1 m), from topographic map. Prior to May 13, 1965, at datum 2.00 ft (0.610 m) higher and May 13, 1965, to May 17, 1966, at datum 1.00 ft (0.305 m) higher.

REMARKS.--Records good. No diversion above station. 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, 5,610 ft³/s (159 m³/s) Apr. 19, 1974, gage height, 10.43 ft (3.179 m), from rating curve extended above 150 ft³/s (4.25 m³/s) on basis of slope-area measurements at gage heights 6.25 ft (1.905 m), 8.13 ft (2.478 m), 10.14 ft (3.091 m), and 10.43 ft (3.179 m); no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,920 ft³/s (54.4 m³/s) June 28, gage height, 6.80 ft (2.073 m), from rating curve extended as explained above, no other peak above base of 1,300 ft³/s (36.8 m³/s); minimum, 0.01 ft³/s (<0.001 m³/s) for many days.

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.08	.37	.02	2.6	.02	1.3	1.6	2.8	3.0	16	3.0	5.2
2	.03	8.7	.01	22	.02	6.5	.80	5.1	2.6	38	25	5.0
3	.03	83	14	7.4	.02	2.3	.45	6.7	2.4	13	5.9	4.3
4	.02	16	15	2.4	.02	.87	.24	10	2.5	14	17	4.5
5	.02	5.0	3.1	1.0	.01	.39	.12	133	116	11	12	5.2
6	.02	8.0	1.6	.53	.02	.20	.07	161	80	29	8.4	9.0
7	.02	5.6	7.1	.33	.01	.11	.17	67	21	28	107	15
8	.03	3.0	3.6	.21	.03	.05	9.5	11	9.4	11	272	7.7
9	.03	2.7	1.5	.12	.02	.03	19	6.0	6.2	7.7	23	4.5
10	.05	2.2	.75	.07	.03	.03	56	4.2	5.2	7.6	8.8	3.9
11	.04	1.4	.42	.04	.04	5.3	23	3.4	4.3	5.6	6.3	3.9
12	.04	1.1	.27	.03	.03	2.0	17	3.0	3.9	5.5	10	3.9
13	.04	1.8	.18	.03	.02	.77	5.7	9.2	3.5	5.5	152	5.0
14	.04	1.4	.11	.04	.02	.30	9.1	30	3.7	4.9	15	4.3
15	.05	.87	.06	.03	.01	.86	5.5	62	6.5	4.3	7.0	4.7
16	.07	.51	.05	.03	.03	5.3	3.4	36	4.1	4.1	5.5	18
17	.08	.35	.08	9.2	.07	3.4	1.9	9.4	3.5	4.1	50	74
18	.08	.56	11	2.8	.04	1.3	3.8	5.2	4.1	5.1	8.3	19
19	.06	.31	3.4	1.0	.01	.66	2.6	4.1	12	5.4	8.5	7.8
20	.07	.20	1.3	.46	.01	.33	49	3.9	46	7.0	7.7	29
21	.04	.15	.72	.24	.01	.19	22	78	428	5.9	114	15
22	.04	.09	.47	10	.01	.12	4.7	54	38	3.7	39	24
23	.03	.05	.28	5.3	.02	.09	2.7	378	12	3.0	46	9.4
24	.04	.03	.19	2.0	.03	.06	1.9	54	8.3	3.6	15	6.1
25	48	.03	.13	.90	.03	.05	1.5	14	8.6	12	9.0	4.7
26	10	.03	.09	.49	.02	5.1	3.2	8.4	8.8	7.2	8.7	4.2
27	3.4	.03	.05	.27	.01	8.6	10	12	10	3.9	6.8	3.7
28	2.2	.03	.03	.16	.02	6.9	6.2	9.0	593	3.1	6.0	3.2
29	3.2	.02	.03	.09	---	5.5	6.0	4.8	114	3.1	5.7	2.9
30	1.5	.02	.03	.04	---	2.5	2.8	4.0	27	4.1	6.8	2.8
31	.62	---	.05	.02	---	3.2	---	3.5	---	3.3	6.0	---
TOTAL	69.97	143.55	65.62	69.83	.63	64.31	269.95	1192.7	1587.6	279.7	1015.4	309.9
MEAN	2.26	4.79	2.12	2.25	.023	2.07	9.00	38.5	52.9	9.02	32.8	10.3
MAX	48	83	15	22	.07	8.6	56	378	593	38	272	74
MIN	.02	.02	.01	.02	.01	.03	.07	2.8	2.4	3.0	3.0	2.8
AC-FT	139	285	130	139	1.2	128	535	2370	3150	555	2010	615
CAL YR 1977	TOTAL	3207.56	MEAN	8.79	MAX	352	MIN	.01	AC-FT	6360		
WTR YR 1978	TOTAL	5069.16	MEAN	13.9	MAX	593	MIN	.01	AC-FT	10050		

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 Waiialua 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.--10 years (1968-78), 11.3 ft³/s (0.320 m³/s), 8,190 acre-ft/yr (10.1 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 18,200 ft³/s (515 m³/s) Apr. 19, 1974, gage height, 22.5 ft (6.86 m), from floodmark, from rating curve extended above 300 ft³/s (8.50 m³/s) on basis of slope-area measurements at gage heights 10.54 ft (3.213 m), 14.2 ft (4.328 m), 15.34 ft (4.676 m), 17.63 ft (5.374 m), and 22.5 ft (6.86 m); no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,940 ft³/s (54.9 m³/s) June 28, gage height, 10.15 ft (3.094 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 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.02	.00	.02	.03	.45	.05	.02	.17	.83	1.7	.03	.07
2	.01	.00	.02	.03	.01	.13	.01	.04	.34	.54	.04	.67
3	.01	.00	.03	.03	.01	.29	.01	.02	1.3	.56	.14	.08
4	.01	.00	.02	.03	.01	.01	.01	.19	1.0	.36	.07	.03
5	.01	.00	.03	.02	.00	.01	.01	.30	.09	.68	1.1	.38
6	.00	.00	.14	.02	.00	.02	.01	.04	.09	.31	.10	.24
7	.00	.00	.03	.02	.00	.01	.01	.03	2.2	2.0	.07	.18
8	.19	.00	.02	.02	.00	.09	.01	.02	.07	1.4	16	.12
9	.01	.00	.02	.02	.07	.01	.01	.02	.11	.26	4.2	.14
10	.18	.00	.01	.02	.17	.19	.17	.02	.05	.23	.46	.14
11	.03	.00	.01	.01	.01	.01	.27	.02	.03	.10	.14	.14
12	.00	.00	.21	.01	.01	.01	.10	.59	.02	.07	.14	.14
13	.01	.00	.01	.02	.01	.14	.03	.12	.04	.24	.14	.14
14	.01	.00	.01	.01	.01	.02	.02	.39	.05	.06	1.6	.31
15	.02	.00	.01	.02	.08	.02	.02	.07	.08	.10	.41	.78
16	.02	.00	.02	.14	.28	.12	.02	.12	.05	.16	.26	.40
17	.02	.00	.01	.22	.01	.02	.07	.14	.03	.04	.45	.26
18	.18	.00	.01	.01	.00	.02	.04	.02	.06	.35	.54	.38
19	.16	.00	.07	.09	.00	.01	.18	.07	.10	.23	.21	1.3
20	.12	.00	.58	.01	.00	.01	.04	.08	.28	.19	.07	.21
21	.03	.00	.07	.01	.00	.01	13	.40	100	.29	23	.10
22	.02	.02	.02	.01	.17	.01	3.3	.60	18	.10	21	.22
23	.01	.01	.02	.01	.00	.42	.26	52	3.2	.03	3.6	.12
24	.01	.01	.02	.01	.00	.01	.09	37	1.1	.71	1.0	.09
25	.02	.01	.02	.01	.00	.01	.33	9.6	.14	.03	.29	.09
26	.03	.01	.02	.01	.00	.01	.34	1.9	.43	.02	.18	.12
27	.30	.01	.02	.04	.00	.02	.11	.38	.43	.02	.14	.23
28	.22	.01	.02	.01	.01	.10	.37	.23	223	.03	.12	1.0
29	.02	.01	.02	.01	---	.43	.03	.80	62	.41	.14	.53
30	.01	.02	.02	.07	---	.35	.02	.20	5.4	.11	.18	.40
31	.00	---	.03	.35	---	.02	---	.30	---	.48	.41	---
TOTAL	1.68	.11	1.56	1.32	1.31	2.58	18.91	105.88	420.52	11.81	76.23	9.06
MEAN	.054	.004	.050	.043	.047	.083	.63	3.42	14.0	.38	2.46	.30
MAX	.30	.02	.58	.35	.45	.43	13	52	223	2.0	23	1.5
MIN	.00	.00	.01	.01	.00	.01	.01	.02	.02	.02	.03	.07
AC-FT	3.3	.2	3.1	2.6	2.6	5.1	38	210	834	23	151	18

CAL YR 1977 TOTAL 502.65 MEAN 1.38 MAX 190 MIN .00 AC-FT 997
WTR YR 1978 TOTAL 650.97 MEAN 1.78 MAX 223 MIN .00 AC-FT 1290

HAWAII, ISLAND OF OAHU

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 Waiialua School.

DRAINAGE AREA.--2.98 mi² (7.72 km²).

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

REVISED RECORDS (FISCAL YEAR).--WSP 1937: 1960.

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

REMARKS.--Records 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.--19 years, 13.4 ft³/s (0.379 m³/s), 9,710 acre-ft/yr (12.0 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, 1,580 ft³/s (44.7 m³/s) June 28, gage height, 7.03 ft (2.142 m), from rating curve extended as explained above, no other peak above base of 1,200 ft³/s (34.0 m³/s); no flow Feb. 18.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.57	1.0	.42	7.9	.99	3.5	1.9	5.4	4.3	7.2	6.6	4.9
2	.53	8.1	.39	13	.61	5.9	1.2	18	7.0	29	30	5.7
3	.46	72	31	6.7	.39	2.3	.88	7.9	2.5	7.4	5.4	3.8
4	1.6	13	10	2.5	.27	1.0	.83	5.2	2.3	27	25	3.5
5	.94	13	3.0	1.4	.18	.57	.69	3.3	57	7.7	14	9.9
6	.94	14	1.8	.88	.12	.39	.69	63	41	50	10	8.6
7	.74	9.5	7.0	.65	.09	.25	26	54	13	23	70	16
8	9.7	4.2	3.4	.49	.07	.16	17	7.4	6.7	8.7	100	6.1
9	5.4	4.3	1.6	.42	.05	.12	48	4.8	4.9	6.7	12	3.6
10	4.7	3.1	1.0	.33	.04	8.9	59	3.9	4.3	7.4	6.9	3.4
11	3.5	2.2	1.5	.30	.03	8.4	38	3.3	3.3	5.2	5.7	3.9
12	1.6	5.4	1.3	.25	.02	2.5	16	3.1	7.0	5.7	16	4.0
13	.88	4.8	.79	.20	.02	1.3	8.4	26	2.9	7.7	63	6.0
14	.69	3.1	.53	.18	.02	.88	8.9	41	2.9	6.5	10	11
15	.79	7.4	.42	.25	.02	1.4	4.8	25	7.0	4.1	5.5	5.1
16	.79	4.3	.53	.57	.01	9.7	3.6	36	7.8	5.1	4.5	26
17	.53	2.2	27	5.5	.01	4.8	8.7	7.9	4.9	5.9	22	32
18	1.4	2.5	49	7.7	.00	2.1	3.4	5.4	5.9	8.4	5.9	10
19	.83	2.7	8.4	1.2	1.1	1.2	2.5	4.5	16	5.9	6.7	7.8
20	.94	1.7	4.4	.69	2.4	.74	56	10	35	17	7.1	9.3
21	1.0	1.2	2.4	.46	1.0	.65	14	19	137	7.9	72	12
22	1.4	1.0	1.6	5.4	.57	.57	4.7	13	13	4.6	33	9.4
23	.83	.99	1.2	4.5	.36	1.4	3.5	86	8.7	3.8	28	6.3
24	1.0	.99	.88	1.8	.22	1.2	3.0	11	6.3	7.7	9.1	5.3
25	32	.99	.69	.94	.14	1.6	2.8	5.7	8.7	10	6.3	4.1
26	9.5	.79	.57	.61	.09	16	4.4	4.5	16	6.3	7.9	7.3
27	7.7	.69	.49	.39	.07	8.4	13	22	20	5.0	5.2	4.7
28	10	.65	.42	.30	.08	4.7	9.2	8.4	275	4.8	4.2	3.5
29	4.9	.53	.36	.25	---	4.9	5.7	4.4	28	4.1	5.2	2.6
30	2.2	.46	.33	7.7	---	2.6	5.9	5.2	9.7	4.6	9.8	2.6
31	1.3	---	.53	2.1	---	4.3	---	4.3	---	3.8	6.1	---
TOTAL	109.36	186.79	162.95	66.56	8.97	102.43	372.69	518.6	746.1	308.2	413.1	238.6
MEAN	3.53	6.23	5.26	2.15	.32	3.30	12.4	16.7	24.9	9.94	19.8	7.95
MAX	32	72	49	13	2.4	16	59	86	275	50	100	32
MIN	.46	.46	.33	.18	.00	.12	.69	3.1	2.3	3.8	4.2	2.6
AC-F1	217	370	323	132	18	203	739	1030	1480	611	1220	473
CAL YR 1977	TOTAL	2770.20	MEAN	7.59	MAX	88	MIN	.00	AC-F1	5490		
WTR YR 1978	TOTAL	3434.35	MEAN	9.41	MAX	275	MIN	.00	AC-F1	6810		

HAWAII, ISLAND OF MOLOKAI

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16400000 HALAWA STREAM NEAR HALAWA
(National stream-quality accounting network station).

LOCATION.--Lat 21°09'31", long 156°45'53", Hydrologic Unit 20050000, on right bank 600 ft (183 m) downstream from Hipuapua Stream and 1.5 mi (2.4 km) west of Halawa.

DRAINAGE AREA.--4.62 mi² (11.97 km²).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--July 1917 to July 1932, November 1937 to current year.

REVISED RECORDS (FISCAL YEARS).--WSP 1319: 1928, 1929(M), 1930-31, 1938-50(M), drainage area. WSP 1719: 1954.

GAGE.--Water-stage recorder. Altitude of gage is 210 ft (64 m), from topographic map. Prior to June 25, 1923, at site 350 ft (107 m) upstream at different datum. June 25, 1923, to July 18, 1932, and Nov. 17, 1937, to Feb. 3, 1965, at present site at datum 2.00 ft (0.610 m) higher.

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

AVERAGE DISCHARGE.--54 years (water years, 1918-31, 1939-78), 29.0 ft³/s (0.821 m³/s), 21,010 acre-ft/yr (25.9 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 26,900 ft³/s (762 m³/s) Feb. 4, 1965, gage height, 19.91 ft (6.069 m), from floodmarks, from rating curve extended above 86 ft³/s (2.44 m³/s) on basis of slope-area measurement of peak flow; minimum, 0.76 ft³/s (0.022 m³/s) about Nov. 23, 1962.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 4,980 ft³/s (141 m³/s) May 23, gage height, 11.83 ft (3.606 m), from rating curve extended as explained above, no other peak above base of 1,900 ft³/s (53.8 m³/s); minimum, 1.4 ft³/s (0.040 m³/s) Feb. 26.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.5	13	2.3	81	2.8	156	16	20	11	14	55	32
2	6.1	18	2.0	102	2.5	14	19	38	11	47	16	16
3	4.6	94	2.7	14	2.2	4.9	8.1	14	9.4	17	26	15
4	3.8	18	12	7.1	2.0	3.5	5.8	16	33	39	27	20
5	4.1	11	4.1	5.4	2.0	3.0	4.9	137	17	14	30	60
6	5.4	6.4	2.9	4.5	1.8	12	5.3	82	23	102	14	20
7	4.1	5.5	9.4	4.0	1.8	7.0	11.5	24	10	25	79	45
8	3.4	4.8	17	3.5	13	53	34	22	11	27	87	24
9	3.2	4.5	4.8	3.2	5.8	17	31	17	11	20	17	15
10	3.7	3.8	2.8	3.0	2.5	18	16	12	8.7	13	13	16
11	3.3	3.5	2.5	3.1	2.0	18	34	9.8	8.1	13	25	13
12	4.0	3.2	2.2	2.8	2.2	7.8	18	8.6	8.1	17	26	46
13	10	3.1	2.0	2.7	2.6	5.0	30	49	7.7	13	32	18
14	4.8	3.0	3.7	2.5	3.3	27	32	44	17	9.9	12	29
15	3.0	11	2.8	2.4	2.8	11	65	20	22	9.0	10	16
16	2.8	33	31	4.8	2.4	61	72	36	29	9.4	38	70
17	4.1	5.9	194	11	3.5	9.1	46	35	25	8.9	27	70
18	2.9	3.8	128	2.8	2.6	12	13	12	17	55	26	20
19	3.2	3.2	23	2.3	7.6	9.8	10	9.1	78	34	38	27
20	3.2	2.9	9.0	2.1	2.8	13	8.3	7.8	70	23	13	46
21	11	2.8	13	2.2	2.0	16	7.2	53	34	20	188	25
22	26	2.8	7.4	35	1.7	8.1	6.3	26	15	11	41	20
23	7.9	2.7	4.9	4.4	2.0	11	6.3	455	35	9.8	46	16
24	45	2.9	4.0	3.0	1.8	13	12	37	17	12	20	13
25	58	2.8	3.5	2.8	1.6	5.5	13	21	17	35	40	12
26	7.2	2.3	3.3	2.5	1.5	71	33	36	45	16	21	16
27	5.7	2.1	3.2	2.5	2.0	11	37	31	30	16	34	12
28	7.9	2.0	2.9	2.5	2.6	40	9.1	15	160	11	22	11
29	9.6	2.1	2.8	43	---	11	47	23	23	12	38	11
30	4.9	4.0	2.7	12	---	27	17	21	21	9.9	34	15
31	11	---	18	3.7	---	8.2	---	14	---	9.0	17	---
TOTAL	277.4	278.1	523.9	377.8	83.4	683.9	771.3	1345.3	824.0	671.9	1112	769
MEAN	8.95	9.27	16.9	12.2	2.98	22.1	25.7	43.4	27.5	21.7	35.9	25.6
MAX	58	94	194	102	13	156	115	455	160	102	188	70
MIN	2.8	2.0	2.0	2.1	1.5	3.0	4.9	7.8	7.7	8.9	10	11
AC-FT	550	552	1040	749	165	1360	1530	2670	1630	1330	2210	1530

CAL YR 1977 TOTAL 7633.0 MEAN 20.9 MAX 497 MIN 2.0 AC-FT 15140
WTR YR 1978 TOTAL 7718.0 MEAN 21.1 MAX 455 MIN 1.5 AC-FT 15310

HAWAII, ISLAND OF MOLOKAI

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 1977 TO SEPTEMBER 1978

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCTI- ANCE (MICRO- MHOS)	PH (UNITS)	TEMPER- ATURE (DEG C)	TUR- BID- ITY (JTU)	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)
OCT										
17...	1430	4.2	63	7.3	23.5	4	--	8.6	26	1900
NOV										
14...	1200	2.9	62	7.4	20.5	2	--	9.6	K7	1500
DEC										
12...	1330	2.5	69	7.2	20.5	3	--	9.0	20	360
JAN										
09...	1300	3.6	62	7.2	17.5	2	--	9.8	20	1100
FEB										
06...	1330	1.8	73	6.9	18.5	1	--	9.2	12	400
MAR										
06...	1245	3.6	62	6.8	19.5	2	--	9.6	210	2800
APR										
03...	1415	7.6	59	7.4	19.5	3	--	9.4	35	470
MAY										
01...	1305	42	48	6.6	19.5	4	--	9.8	72	640
30...	1530	23	51	6.9	20.5	--	3.0	9.6	35	2000
JUL										
10...	1400	12	50	6.7	21.0	--	1.9	9.4	16	190
AUG										
08...	1230	105	38	7.3	21.0	--	21	9.0	430	1600
SEP										
05...	1335	64	41	7.0	21.5	--	23	9.8	K1300	1100

DATE	HARD- NESS (MG/L AS CAC03)	HARD- NESS, NONCAR- BONATE (MG/L CAC03)	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM AD- SORP- TION RATIO	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	BICAR- BONATE (MG/L AS HC03)	CAR- BONATE (MG/L AS CO3)
OCT										
17...	15	5	3.4	1.5	6.7	49	.8	.6	12	0
NOV										
14...	9	2	1.4	1.4	7.5	62	1.1	.6	9	0
DEC										
12...	13	4	1.9	1.9	7.8	56	1.0	.7	10	0
JAN										
09...	10	5	1.7	1.5	7.4	59	1.0	.6	7	0
FEB										
06...	16	6	3.1	2.0	8.3	52	.9	.8	12	0
MAR										
06...	11	4	1.9	1.6	7.4	57	1.0	.7	9	0
APR										
03...	10	4	1.5	1.4	7.0	60	1.0	.6	7	0
MAY										
01...	6	3	.9	1.0	5.6	64	1.0	.5	4	0
30...	7	5	1.2	.9	7.2	68	1.2	.6	--	--
JUL										
10...	8	6	1.6	1.0	6.4	61	1.0	.6	--	--
AUG										
08...	13	10	3.9	.7	4.9	44	.6	.6	--	--
SEP										
05...	6	4	1.1	.9	4.9	60	.8	.5	--	--

K Results based on colony count outside the acceptable range (non-ideal colony count).

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16400000 HALAWA STREAM NEAR HALAWA--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	ALKA- LINITY (MG/L AS CAC03)	CARBON DIOXIDE DIS- SOLVED (MG/L AS CO2)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLO- 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 CONSTITUENTS, DIS- SOLVED (MG/L)	SOLIDS, DIS- SOLVED (TONS PER AC-FT)	SOLIDS, DIS- SOLVED (TONS PER DAY)
OCT										
17...	10	1.0	3.2	10	.1	9.4	29	41	.04	.33
NOV										
14...	7	.6	2.2	12	.1	9.6	39	39	.05	.31
DEC										
12...	8	1.0	8.4	13	.0	8.5	42	47	.06	.28
JAN										
09...	6	.7	3.8	11	.2	9.7	39	39	.05	.38
FEB										
06...	10	2.4	5.4	14	.1	9.1	41	49	.06	.20
MAR										
06...	7	2.3	3.2	10	.1	7.5	33	37	.04	.32
APR										
03...	6	.4	3.2	13	.0	5.8	39	36	.05	.80
MAY										
01...	3	1.6	5.9	9.5	.0	6.0	33	31	.04	3.74
30...	2	--	3.6	10	.1	6.1	30	33	.04	1.86
JUL										
10...	2	--	3.0	10	.8	11	27	36	.04	.92
AUG										
08...	3	--	4.1	8.4	.0	2.7	36	27	.05	10.2
SEP										
05...	2	--	4.5	8.7	.0	3.7	34	26	.05	5.88

DATE	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,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)	NITRO- GEN, TOTAL (MG/L AS NO3)	PHOS- PHORUS, TOTAL (MG/L AS P)	PHOS- PHORUS, DIS- SOLVED (MG/L AS P)
OCT										
17...	.05	.07	--	--	--	--	--	--	.04	.03
NOV										
14...	.02	.01	--	--	--	.12	--	--	.03	.02
DEC										
12...	.05	.09	--	--	--	.14	--	--	.03	.03
JAN										
09...	.05	.06	--	--	--	.12	--	--	.03	.01
FEB										
06...	.10	.01	.60	.61	.00	.61	.71	3.1	.02	.02
MAR										
06...	.06	.02	.10	.12	.00	--	.18	.80	.04	.02
APR										
03...	.02	.01	.17	.18	.08	.10	.20	.89	.02	.01
MAY										
01...	.00	.01	.35	.36	.21	.15	.36	1.6	.05	.03
30...	.03	.01	--	--	--	.40	--	--	.02	.01
JUL										
10...	.04	.01	.32	.33	.00	.33	.37	1.6	.02	.02
AUG										
08...	.03	.06	.52	.58	.00	.58	.61	2.7	.09	.09
SEP										
05...	.02	.02	.59	.61	.17	.44	.63	2.8	.08	.02

16400000 HALAWA STREAM NEAR HALAWA--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	TIME	ARSENIC		ARSENIC		BARIUM,		BARIUM,		CADMIUM		CADMIUM	
		TOTAL (UG/L AS AS)	SUS- PENDE TOTAL (UG/L AS AS)	DIS- SOLVED (UG/L AS AS)	RECOV- ERABLE (UG/L AS BA)	TOTAL RECOV- ERABLE (UG/L AS BA)	DIS- SOLVED (UG/L AS BA)	TOTAL RECOV- ERABLE (UG/L AS CD)	SUS- PENDE RECOV- ERABLE (UG/L AS CD)	DIS- SOLVED (UG/L AS CD)			
NOV 14...	1200	0	0	0	300	300	0	4	1	3			
FEB 06...	1330	1	1	0	100	0	100	--	--	--			
APR 03...	1415	1	1	0	100	0	100	1	0	1			
JUL 10...	1400	0	0	0	300	0	300	--	--	--			

DATE	CHRO- MIUM, TOTAL RECOV- ERABLE (UG/L AS CR)	CHRO- MIUM, SUS- PENDE RECOV. (UG/L AS CR)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)	COBALT, TOTAL RECOV- ERABLE (UG/L AS CO)	COBALT, SUS- PENDE RECOV- ERABLE (UG/L AS CO)	COBALT, DIS- SOLVED (UG/L AS CO)	COPPER, TOTAL RECOV- ERABLE (UG/L AS CU)	COPPER, SUS- PENDE RECOV- ERABLE (UG/L AS CU)	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, TOTAL RECOV- ERABLE (UG/L AS FE)
NOV 14...	12	12	0	0	0	0	5	5	0	160
FEB 06...	10	10	0	0	0	0	2	1	1	160
APR 03...	0	0	0	0	0	0	0	0	0	250
JUL 10...	0	0	0	3	1	2	6	4	2	320

DATE	IRON, SUS- PENDE RECOV- ERABLE (UG/L AS FE)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, TOTAL RECOV- ERABLE (UG/L AS PR)	LEAD, SUS- PENDE RECOV- ERABLE (UG/L AS PB)	LEAD, DIS- SOLVED (UG/L AS PR)	MANGA- NESE, TOTAL RECOV- ERABLE (UG/L AS MN)	MANGA- NESE, SUS- PENDE RECOV. (UG/L AS MN)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY TOTAL RECOV- ERABLE (UG/L AS HG)	MERCURY SUS- PENDE RECOV- ERABLE (UG/L AS HG)
NOV 14...	--	70	74	0	74	10	2	8	.0	.0
FEB 06...	--	60	--	--	--	10	0	10	.0	.0
APR 03...	--	110	6	2	4	10	10	0	.0	.0
JUL 10...	220	100	--	--	--	10	0	10	.0	.0

DATE	MERCURY	SELE-	SELE-	SILVER,	SILVER,	SILVER,	ZINC,	ZINC,	ZINC,
	DIS- SOLVED (UG/L AS HG)	NIUM, TOTAL (UG/L AS SE)	NIUM, DIS- SOLVED (UG/L AS SE)	TOTAL RECOV- ERABLE (UG/L AS AG)	SUS- PENDE RECOV- ERABLE (UG/L AS AG)	DIS- SOLVED (UG/L AS AG)	TOTAL RECOV- ERABLE (UG/L AS ZN)	SUS- PENDE RECOV- ERABLE (UG/L AS ZN)	DIS- SOLVED (UG/L AS ZN)
NOV 14...	.0	0	0	0	0	0	10	4	6
FEB 06...	.0	0	0	0	0	0	10	0	10
APR 03...	.0	0	0	0	0	0	10	0	10
JUL 10...	.0	0	0	1	1	0	10	10	0

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16400000 HALAWA STREAM NEAR HALAWA--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

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)	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 17...	1430	2.9	--	--	APR 03...	1415	--	3.9	--
NOV 14...	1200	1.6	--	--	MAY 01...	1305	6.1	--	--
DEC 12...	1330	--	3.7	.1	MAY 30...	1530	3.2	--	--
JAN 09...	1300	2.6	--	--	JUL 10...	1400	--	3.7	.0
FEB 06...	1330	--	1.9	.0	AUG 08...	1230	8.5	--	--
MAR 06...	1245	3.2	--	--	SEP 05...	1335	12	--	--

DATE	TIME	PHYTO- PLANK- TON, TOTAL (CELLS PER ML)	PERI- PHYTON BIOMASS TOTAL DRY WEIGHT G/SQ M	PERI- PHYTON BIOMASS ASH WEIGHT G/SQ M	CHLOR-A PERI- PHYTON CHROMO- GRAPHIC FLUOROM (MG/M2)	CHLOR-B PERI- PHYTON CHROMO- GRAPHIC FLUOROM (MG/M2)	LENGTH OF EXPOS- URE (DAYS)
OCT 17...	1430	3500	4.17	2.68	.145	.066	35
NOV 14...	1200	120	--	--	--	--	--
DEC 12...	1330	130	--	--	--	--	--
JAN 09...	1300	41	--	--	--	--	--
FEB 06...	1330	740	9.06	5.98	13.9	4.45	29
MAR 06...	1245	260	--	--	--	--	--
APR 03...	1415	240	3.23	1.73	9.92	3.91	28
MAY 01...	1305	780	--	--	--	--	--
MAY 30...	1530	200	--	--	--	--	--
JUL 10...	1400	390	1.42	.315	3.42	.480	42

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	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 17...	1430	4.2	5	.06	100	APR 03...	1415	7.6	4	.08	100
NOV 14...	1200	2.9	5	.04	100	MAY 01...	1305	42	6	.68	100
DEC 12...	1330	2.5	4	.03	100	MAY 30...	1530	23	4	.25	100
JAN 09...	1300	3.6	4	.04	100	JUL 10...	1400	12	3	.10	100
FEB 06...	1330	1.8	5	.02	100	AUG 08...	1230	105	21	6.0	100
MAR 06...	1245	3.6	3	.03	100	SEP 05...	1335	64	22	3.8	100

16400000 HALAWA STREAM NEAR HALAWA--Continued

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA

PHYTOPLANKTON ANALYSES, OCTOBER 1977 TO JULY 1978

DATE TIME	OCT 17, 77 1430	NOV 14, 77 1200	DEC 12, 77 1330	JAN 9, 78 1300	FEB 6, 78 1330
TOTAL CELLS/ML	3500	120	130	41	740
DIVERSITY: DIVISION	0.4	1.7	1.1	0.0	0.7
..CLASS	0.4	1.7	1.1	0.0	0.7
...ORDER	0.8	1.7	1.1	0.0	0.8
...FAMILY	1.2	2.4	1.7	1.6	1.0
...GENUS	2.0	2.7	1.7	1.6	1.0

ORGANISM	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT
CHLOROPHYTA (GREEN ALGAE)										
..CHLOROPHYCEAE										
...CHLOROCOCCALES										
...CHARACIACEAE										
...SCHROEDERIA	* 0		--	--	--	--	--	--	--	--
...ODCYSTACEAE										
...ANKISTIRODESMUS	--	--	--	--	--	--	--	--	12	2
...SELENASTRUM	--	--	--	--	--	--	--	--	--	--
...TREUBARIA	--	--	--	--	--	--	--	--	--	--
...SCENEDESMACEAE										
...CRUCIGENIA	--	--	--	--	--	--	--	--	--	--
...SCENEDESMUS	--	--	25#	21	--	--	--	--	--	--
...TETRASTRUM	--	--	--	--	--	--	--	--	--	--
...VOLVOCALES										
...CHLAMYDOMONADACEAE										
...CHLAMYDOMONAS	--	--	--	--	--	--	--	--	--	--
CHRYSTOPHYTA										
..BACILLARIOPHYCEAE										
...CENTRALES										
...BIDDULPHIACEAE										
...BIDDULPHIA	--	--	--	--	--	--	--	--	12	2
...COSCINODISCACEAE										
...STEPHANODISCUS	* 0		--	--	--	--	--	--	--	--
...PENNIALES										
...ACHNANTHACEAE										
...ACHNANTHES	--	--	--	--	9	6	--	--	--	--
...COCONEIS	--	--	--	--	--	--	12#	29	--	--
...CYMBELLACEAE										
...AMPHORA	--	--	--	--	--	--	--	--	--	--
...GYMPHELLA	--	--	18#	16	--	--	--	--	--	--
...RHODOPALODIA	--	--	--	--	4	3	--	--	--	--
...DIATOMACEAE										
...DIATOMA	--	--	--	--	--	--	--	--	12	2
...EUNOTIACEAE										
...EUNOTIA	--	--	--	--	--	--	--	--	--	--
...FRAGILARIACEAE										
...FRAGILARIA	69	2	--	--	--	--	--	--	--	--
...SYNEDRA	* 0		--	--	--	--	--	--	--	--
...GOMPHONEMACEAE										
...GOMPHONEMA	20	1	6	5	4	3	12#	29	24	3
...NAVICULACEAE										
...GYROSIGMA	--	--	6	5	--	--	--	--	--	--
...NAVICULA	49	1	18#	16	4	3	18#	43	36	5
...STAURONEIS	--	--	6	5	--	--	--	--	--	--
...NITZSCHIA	59	2	--	--	22#	16	--	--	--	--
CYANOPHYTA (BLUE-GREEN ALGAE)										
..CYANOPHYCEAE										
...CHAMAESIPHONALES										
...CHAMAESIPHONACEAE										
...ENTOPHYSALIS	330	9	--	--	--	--	--	--	--	--
...HORMOGONALES										
...NOSTOCACEAE										
...ANABAENA	39	1	--	--	--	--	--	--	--	--
...CYLINDROSPERMUM	--	--	--	--	--	--	--	--	--	--
...NODULARIA	79	2	--	--	--	--	--	--	--	--
...OSCILLATORIACEAE										
...LYNGBYA	1200#	33	--	--	86#	65	--	--	--	--
...OSCILLATORIA	1700#	48	31#	26	--	--	--	--	630#	85
...RIVULARIACEAE										
...RAPHIIDIOPSIS	20	1	--	--	--	--	--	--	--	--
EUGLENOPHYTA (EUGLENOIDS)										
..EUGLENOPHYCEAE										
...EUGLENALES										
...EUGLENACEAE										
...TRACHELOMONAS	--	--	6	5	4	3	--	--	12	2

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 1977 TO JULY 1978

DATE TIME	MAR 6,78 1245	APR 3,78 1415	MAY 1,78 1305	MAY 30,78 1530	JUL 10,78 1400	
TOTAL CELLS/ML	260	240	780	200	390	
DIVERSITY: DIVISION	0.9	1.3	0.8	0.5	1.1	
..CLASS	0.9	1.3	0.8	0.5	1.1	
...ORDER	0.9	1.5	0.9	0.5	1.1	
...FAMILY	2.5	1.5	1.7	0.5	1.1	
....GENUS	2.5	1.5	1.7	0.5	1.1	
ORGANISM	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT
CHLOROPHYTA (GREEN ALGAE)						
..CHLOROPHYCEAE						
...CHLOROCOCCALES						
....CHARACIACEAE						
....SCHROEDERIA	--	-	--	-	--	-
....OOCYSTACEAE						
....ANKISTRODESMUS	--	-	--	-	--	-
....SELENASTRUM	--	-	--	-	--	-
....TREUBARIA	--	-	--	-	--	-
....SCENEDESMACEAE						
....CRUCIGENIA	--	-	57# 24	--	--	-
....SCENEDESMUS	--	-	--	-	--	-
....TETRASTRUM	--	-	--	-	--	-
...VOLVOCALES						93# 24
...CHLAMYDOMONADACEAE						
....CHLAMYDOMONAS	--	-	14 6	30 4	--	-
CHRYSTOPHYTA						
..BACILLARIOPHYCEAE						
...CENTRALES						
...BIDDULPHIACEAE						
....BIDDULPHIA	--	-	--	-	--	-
...COSCINODISCACEAE						
....STEPHANODISCUS	--	-	--	-	--	-
...PENNALES						
....ACHNANTHACEAE						
....ACHNANTHES	16 6		29 12	--	22 11	--
....COCCONEIS	--	-	--	-	--	-
....CYMBELLACEAE						
....AMPHORA	16 6		--	-	--	-
....CYMBELLA	--	-	--	-	--	-
....RHOPALODIA	--	-	--	-	--	-
...DIATOMACEAE						
....DIATOMA	--	-	--	-	--	-
....EUNOTIACEAE						
....EUNOTIA	--	-	--	-	--	-
....FRAGILARIACEAE						23 6
....FRAGILARIA	--	-	--	-	--	-
....SYNEDRA	16 6		--	-	--	-
...GOMPHONEMACEAE						
....GOMPHONEMA	62# 24		--	-	--	-
....NAVICULACEAE						
....GYROSIGMA	--	-	--	-	--	-
....NAVICULA	31 12		--	-	--	-
....STAURONEIS	--	-	--	-	--	-
...NITZSCHIA						
....NITZSCHIA	47# 18		--	-	--	-
CYANOPHYTA (BLUE-GREEN ALGAE)						
..CYANOPHYCEAE						
...CHAMAESIPHONALES						
....CHAMAESIPHONACEAE						
....ENTOPHYSALIS	--	-	--	-	--	-
...HORMOGONALES						
....NOSTOCACEAE						
....ANABAENA	78# 29		--	-	--	-
....CYLINDROSPERMUM	--	-	--	-	--	-
....NODULARIA	--	-	180# 23	--	--	-
...OSCILLATORIACEAE						
....LYNGBYA	--	-	480# 62	--	--	-
....OSCILLATORIA	--	-	140# 59	--	180# 89	280# 71
....RIVULARIACEAE						
....RAPHIDIOPSIS	--	-	--	-	--	-
EUGLENOPHYTA (EUGLENOIDS)						
..EUGLENOPHYCEAE						
...EUGLENALES						
....EUGLENACEAE						
....TRACHELOMONAS	--	-	--	-	--	-

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).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--December 1919 to January 1929, September 1937 to November 1947, June 1948 to August 1957, August 1971 to current year. Occasional low-flow measurements and annual maximum, water years 1968-71.

REVISED RECORDS (FISCAL YEAR).--WSP 1569: 1940(M).

GAGE.--Water-stage recorder. Altitude of gage is 552 ft (168.250 m) above mean sea level (levels by Bureau of Reclamation). Prior to Aug. 25, 1957, at site 300 ft (91 m) downstream at different datum.

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

AVERAGE DISCHARGE.--33 years (water years, 1921-28, 1938-47, 1949-56, 1972-78), 16.3 ft³/s (0.462 m³/s), 11,810 acre-ft/yr (14.6 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,120 ft³/s (117 m³/s) Nov. 20, 1940, gage height, 6.81 ft (2.076 m), from rating curve extended above 39 ft³/s (1.10 m³/s) by test on model of station site; minimum, 2.2 ft³/s (0.062 m³/s) Sept. 29, Oct. 3, 4, 6, 12-18, 1974.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of undetermined magnitude destroyed station on Jan. 26, 1948.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 772 ft³/s (21.9 m³/s) Mar. 1, gage height, 4.58 ft (1.396 m), no other peak above base of 460 ft³/s (13.0 m³/s); minimum, 2.9 ft³/s (0.082 m³/s) on several days in December.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.3	5.5	3.1	16	3.5	137	20	8.7	8.3	15	19	8.9
2	3.3	13	2.9	32	3.5	26	23	16	7.9	26	10	6.8
3	3.5	58	8.1	14	5.3	14	12	9.1	7.5	18	8.7	7.1
4	3.8	19	6.1	9.6	4.0	11	8.7	7.9	9.1	20	8.7	6.8
5	3.8	11	3.8	8.3	3.8	8.7	7.9	129	7.5	14	10	8.3
6	3.8	8.3	3.5	7.5	3.5	11	8.7	100	7.1	22	12	6.4
7	3.5	7.5	10	7.1	3.3	8.3	21	38	6.4	19	19	9.2
8	3.5	6.1	4.3	6.4	5.8	12	14	27	6.1	19	31	6.4
9	3.3	5.5	3.8	6.1	4.3	9.1	28	19	5.8	17	15	6.1
10	3.3	5.2	3.5	5.8	3.8	11	21	14	5.5	13	12	5.8
11	3.3	4.9	3.3	6.1	3.5	14	19	12	5.5	15	12	5.2
12	3.5	4.6	3.1	5.5	3.8	8.3	14	13	5.8	16	8.7	8.3
13	3.3	4.3	3.1	5.2	4.0	7.5	12	37	5.8	13	7.5	7.5
14	3.1	4.3	3.3	4.9	4.0	7.5	11	55	17	10	7.1	9.4
15	3.1	4.6	3.5	4.9	3.8	8.3	15	26	12	9.1	6.8	7.8
16	3.3	4.3	33	6.7	3.5	98	16	20	16	8.7	9.6	21
17	3.3	4.0	70	6.1	3.5	28	12	15	25	7.9	10	39
18	3.1	3.8	89	4.6	3.8	45	9.1	13	14	21	6.8	16
19	3.3	3.8	39	4.3	3.8	28	8.7	11	19	14	6.8	17
20	3.3	3.5	18	4.3	3.5	21	8.3	10	27	20	6.4	33
21	3.1	3.5	14	4.6	3.3	17	7.9	9.6	26	16	23	24
22	3.3	3.5	11	4.3	3.8	14	7.5	8.7	20	11	12	18
23	3.1	3.5	8.7	4.0	3.5	11	7.5	49	33	9.1	15	14
24	11	3.8	7.9	4.0	3.3	9.1	7.1	19	19	9.1	9.1	12
25	17	3.5	7.1	4.0	3.3	8.3	7.1	14	14	9.1	11	9.6
26	4.6	3.3	6.8	3.8	3.3	12	7.5	16	20	9.5	9.1	8.7
27	4.7	3.3	6.1	3.8	3.8	7.9	9.1	15	22	11	8.7	7.9
28	6.1	3.3	5.8	3.8	16	10	7.1	11	57	9.1	7.5	7.5
29	5.5	3.3	5.5	5.5	---	7.9	11	11	26	10	7.5	7.5
30	4.0	3.1	5.2	4.0	---	12	8.7	10	18	7.9	8.0	7.9
31	4.6	---	15	3.8	---	9.1	---	8.7	---	7.5	7.1	---
TOTAL	134.7	215.3	407.5	211.0	118.3	632.0	369.9	752.7	473.3	427.0	345.1	353.1
MEAN	4.35	7.18	13.1	6.81	4.23	20.4	12.3	24.3	15.8	13.8	11.1	11.8
MAX	17	58	89	32	16	137	28	129	57	26	31	39
MIN	3.1	3.1	2.9	3.8	3.3	7.5	7.1	7.9	5.5	7.5	6.4	5.2
AC-FT	267	427	808	419	235	1250	734	1490	939	847	685	700

CAL YR 1977 TOTAL 4861.1 MEAN 13.3 MAX 131 MIN 2.9 AC-FT 9640
WTR YR 1978 TOTAL 4439.9 MEAN 12.2 MAX 137 MIN 2.9 AC-FT 8810

HAWAII, ISLAND OF MOLOKAI

16404200 PILIPILILAU STREAM NEAR PELEKUNU

LOCATION.--Lat 21°08'08", long 156°53'09", Hydrologic Unit 20050000, on right bank 500 ft (152 m) downstream from left-bank tributary, 1.9 mi (3.1 km) south of former village of Pelekunu, and 5.8 mi (9.3 km) north of Kamalo.

DRAINAGE AREA.--0.49 mi² (1.27 km²).

PERIOD OF RECORD.--August 1968 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 1,000 ft (305 m), from topographic map.

REMARKS.--Records good except those above 8 ft³/s (0.23 m³/s), which are poor. No diversion above station. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--10 years, 1.28 ft³/s (0.036 m³/s), 927 acre-ft/yr (1.14 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 274 ft³/s (7.76 m³/s) Dec. 8, 1973, gage height, 3.78 ft (1.152 m), from rating curve extended above 3.8 ft³/s (0.11 m³/s); minimum, 0.50 ft³/s (0.014 m³/s) Sept. 2-8, 21-29, 1975, Nov. 26 to Dec. 3, 1977.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 99 ft³/s (2.80 m³/s) Mar. 1, gage height, 3.06 ft (0.933 m), from rating curve extended above 3.8 ft³/s (0.11 m³/s), no other peak above base of 80 ft³/s (2.27 m³/s); minimum, 0.50 ft³/s (0.014 m³/s) Nov. 26 to Dec. 3.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.56	.56	.50	1.3	.56	9.9	.82	.65	.71	.68	.71	.62
2	.56	.92	.50	2.7	.56	.86	1.0	.71	.68	.74	.62	.56
3	.56	2.1	.81	1.1	.62	.68	.71	.62	.68	.71	.59	.59
4	.56	.68	.62	.86	.56	.56	.68	.62	.74	.71	.59	.56
5	.56	.59	.56	.82	.56	.65	.65	4.6	.71	.68	.59	.59
6	.56	.56	.56	.78	.56	.78	.68	4.4	.68	.76	.59	.62
7	.56	.56	.84	.74	.56	.78	.82	1.4	.65	.71	.62	.59
8	.56	.56	.56	.71	.74	.82	.78	1.1	.62	.71	.68	.56
9	.53	.56	.56	.71	.56	.78	1.3	.86	.62	.68	.56	.56
10	.53	.56	.56	.71	.56	.78	1.0	.78	.62	.65	.56	.53
11	.53	.53	.56	.74	.56	.90	.82	.78	.62	.68	.59	.53
12	.59	.53	.56	.68	.56	.86	.74	.82	.62	.65	.56	.62
13	.63	.53	.56	.68	.56	.78	.71	.98	.62	.65	.56	.62
14	.56	.53	.56	.68	.56	.78	.68	1.3	.74	.62	.56	.59
15	.56	.53	.60	.68	.56	.82	.87	.86	.74	.62	.56	.59
16	.56	.53	2.6	.93	.53	1.3	.81	.78	.74	.62	.62	.81
17	.56	.53	3.7	.74	.56	.78	.74	.74	.78	.62	.62	.78
18	.56	.53	4.5	.65	.61	.98	.68	.71	.74	.74	.56	.65
19	.56	.53	1.4	.65	.59	.82	.68	.71	.78	.68	.59	.68
20	.56	.53	.90	.65	.56	.92	.72	.68	.90	.71	.56	.82
21	.56	.53	.82	.65	.56	.82	.68	.74	1.0	.71	.74	.68
22	.56	.53	.74	.65	.56	.78	.65	.68	.90	.62	.62	.62
23	.56	.53	.71	.65	.59	.78	.68	4.8	.98	.62	.62	.56
24	.91	.53	.68	.65	.56	.74	.65	.98	.90	.68	.56	.56
25	.79	.53	.68	.65	.53	.71	.62	.78	.78	.62	.62	.56
26	.59	.53	.68	.65	.53	.78	.78	.74	.78	.62	.56	.56
27	.59	.50	.68	.62	.59	.74	.68	.74	1.1	.62	.59	.53
28	.59	.50	.65	.62	.91	.78	.62	.71	2.6	.62	.59	.53
29	.59	.50	.65	.65	---	.71	.65	.71	.90	.62	.56	.53
30	.56	.50	.65	.62	---	.71	.62	.74	.78	.62	.56	.56
31	.56	---	1.4	.59	---	.68	---	.71	---	.59	.56	---
TOTAL	18.07	18.13	30.35	24.51	16.32	33.66	22.52	36.43	24.71	20.56	18.47	18.16
MEAN	.58	.60	.98	.79	.58	1.09	.75	1.18	.82	.66	.60	.61
MAX	.91	2.1	4.5	2.7	.91	9.9	1.3	4.8	2.6	.76	.74	.82
MIN	.53	.50	.50	.59	.53	.56	.62	.62	.62	.59	.56	.53
AC-FT	36	36	60	49	32	67	45	72	49	41	37	36

CAL YR 1977 TOTAL 355.05 MEAN .97 MAX 12 MIN .50 AC-FT 704
WTR YR 1978 TOTAL 281.89 MEAN .77 MAX 9.9 MIN .50 AC-FT 559

16405100 MOLOKAI TUNNEL AT EAST PORTAL

LOCATION.--Lat 21°08'38", long 156°55'16", Hydrologic Unit 20050000, on left bank 100 ft (30 m) downstream from the east portal, 5.3 mi (8.5 km) southeast of Kalaupapa, and 7.5 mi (12.1 km) northeast of Kaunakakai.

PERIOD OF RECORD.--July 1966 to current year.

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 989 ft (301.4 m), from tunnel plans.

REMARKS.--Records good. Tunnel diverts from Waikolu Stream and two tributaries; diversion is augmented by water pumped from two wells and from the stream at elevation 728 ft (221.9 m) in Waikolu Valley near the east portal. Periodic determinations of water temperature for the current year are published elsewhere in this report.

AVERAGE DISCHARGE.--12 years, 2.98 ft³/s (0.084 m³/s), 2,160 acre-ft/yr (2.66 hm³/yr).

EXTREMES FOR THE PERIOD OF RECORD.--Maximum daily discharge, 29 ft³/s (0.82 m³/s) Jan. 27, May 18, 1973; no flow at times.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.2	3.5	2.7	6.7	.90	1.3	6.9	2.0	1.5	2.3	4.7	2.0
2	1.2	6.9	2.7	1.2	.90	4.0	8.5	4.5	1.4	4.0	4.9	2.0
3	1.3	16	3.6	3.2	1.5	2.1	3.2	2.3	1.3	2.6	3.7	1.4
4	1.2	6.2	4.4	2.0	1.4	1.4	1.7	2.9	2.9	4.4	3.6	1.7
5	1.2	5.4	3.6	1.4	1.1	1.2	2.1	14	3.8	2.4	3.6	3.0
6	1.2	3.7	3.2	1.2	.99	1.4	3.1	19	2.7	4.6	4.9	3.8
7	2.3	3.4	6.0	1.1	.99	1.6	6.5	4.7	1.4	5.0	5.9	4.9
8	3.2	3.1	3.8	.99	2.4	2.4	5.3	3.5	1.3	4.0	8.5	3.7
9	3.2	3.1	3.4	.90	2.3	4.0	9.5	4.3	1.2	3.2	3.7	3.2
10	3.2	2.9	3.1	.90	1.3	3.4	5.8	2.3	1.2	2.7	3.1	3.2
11	3.2	2.9	3.1	.99	1.1	5.4	3.6	1.6	1.2	2.6	3.7	3.1
12	2.7	2.9	2.8	.99	.99	2.4	3.2	3.5	1.2	5.7	3.6	3.8
13	4.1	2.8	2.3	.90	.99	1.6	2.3	7.1	1.3	4.2	3.4	4.0
14	4.5	2.7	3.0	.90	.99	1.2	1.9	9.8	7.0	2.0	3.2	4.4
15	3.5	3.1	3.1	.90	.90	1.2	1.5	3.6	6.2	1.5	2.5	3.6
16	3.3	2.9	16	1.2	.90	18	2.8	3.4	4.6	1.4	1.3	8.9
17	3.1	3.0	22	2.7	.90	4.2	3.4	2.4	7.8	1.3	2.7	11
18	3.0	3.1	20	1.4	1.1	14	1.6	1.7	3.6	4.8	1.6	5.3
19	3.0	2.8	6.5	1.1	1.2	5.3	1.2	1.5	5.3	5.4	1.4	6.0
20	3.0	2.9	2.7	.99	.99	3.6	1.1	1.3	4.5	6.4	1.3	8.6
21	2.8	2.9	2.6	.99	.90	4.0	1.7	2.0	6.0	6.0	5.9	6.3
22	2.8	2.8	2.3	.90	.99	4.2	1.4	2.3	4.6	2.7	6.7	4.6
23	2.8	3.0	1.6	.90	1.2	1.7	1.6	12	7.3	1.9	6.4	4.0
24	5.6	2.8	1.3	.90	1.1	1.3	2.3	3.8	3.8	2.0	3.1	3.6
25	8.8	2.8	1.1	.90	.90	1.2	2.0	2.4	3.2	2.3	4.7	4.5
26	2.5	2.9	1.1	.90	.90	1.7	3.2	2.0	3.9	2.7	5.3	5.4
27	1.4	2.8	1.1	.90	.90	2.0	3.1	3.2	8.9	2.9	4.5	5.1
28	3.1	2.7	.99	.90	5.2	1.3	1.9	1.9	16	3.7	4.2	5.4
29	2.7	2.7	.99	.90	---	2.5	1.9	1.4	4.0	5.0	3.6	5.4
30	1.6	2.7	.99	.99	---	3.6	2.4	1.6	2.7	4.1	3.3	5.4
31	2.4	---	5.5	.90	---	2.0	---	2.3	---	3.5	3.0	---
TOTAL	89.1	111.4	137.57	52.54	35.93	116.9	96.7	130.3	121.8	107.3	122.0	137.3
MEAN	2.87	3.71	4.44	1.69	1.28	3.77	3.22	4.20	4.06	3.46	3.94	4.58
MAX	8.8	16	22	12	5.2	18	9.5	19	16	6.4	8.5	11
MIN	1.2	2.7	.99	.90	.90	1.2	1.1	1.3	1.2	1.3	1.3	1.4
AC-FT	177	221	273	104	71	232	192	258	242	213	242	272
CAL YR 1977	TOTAL	1378.56	MEAN	3.78	MAX	26	MIN	.90	AC-FT	2730		
WTR YR 1978	TOTAL	1258.84	MEAN	3.45	MAX	22	MIN	.90	AC-FT	2500		

HAWAII, ISLAND OF MOLOKAI

16405300 MOLOKAI TUNNEL AT WEST PORTAL

LOCATION.--Lat 21°07'27", long 156°59'50", Hydrologic Unit 20050000, on left bank 50 ft (15 m) upstream from the west portal, 2.5 mi (4.0 km) northeast of Kaunakakai, and 4.7 mi (7.6 km) south of Kalaupapa.

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.--13 years, 5.22 ft³/s (0.148 m³/s), 3,780 acre-ft/yr (4.66 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 34 ft³/s (0.96 m³/s) Feb. 5, 1972; minimum daily, 1.8 ft³/s (0.051 m³/s) Oct. 15, 1967.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.1	5.8	5.5	10	3.1	15	7.9	4.1	3.7	4.5	6.4	4.4
2	3.1	7.9	5.3	14	3.1	7.1	11	6.8	3.7	6.0	7.6	4.3
3	3.1	20	6.0	5.8	3.7	4.5	5.8	4.8	3.5	4.8	6.0	3.5
4	3.0	9.1	7.5	4.3	3.9	3.7	4.1	5.5	4.8	6.5	5.6	3.7
5	3.0	9.2	6.5	3.7	3.3	3.5	4.0	14	6.0	5.0	5.7	4.8
6	3.0	6.8	6.0	3.5	3.1	3.5	5.1	21	5.3	6.5	6.9	5.8
7	3.7	6.4	8.3	3.3	3.0	3.9	8.7	7.8	3.7	7.5	8.0	7.0
8	4.6	5.7	7.0	3.3	3.9	4.1	8.0	5.5	3.5	6.5	11	5.8
9	4.6	5.6	6.0	3.1	4.5	6.8	11	7.5	3.5	5.3	6.3	5.8
10	4.6	5.6	5.8	3.1	3.5	5.8	9.4	4.8	3.3	5.0	4.8	5.3
11	4.6	5.6	5.5	3.1	3.3	7.5	6.0	4.1	3.3	4.3	5.7	5.3
12	4.5	5.6	5.2	3.1	3.1	5.0	6.0	5.8	3.3	7.8	5.7	6.0
13	5.5	5.6	4.5	3.1	3.1	3.9	4.8	9.1	3.7	6.5	5.6	6.3
14	6.6	5.4	5.0	3.1	3.1	3.5	4.5	13	8.4	4.3	5.5	7.0
15	5.4	5.7	5.0	3.1	3.1	3.3	3.9	6.5	9.4	3.7	5.1	5.5
16	5.4	5.5	17	3.3	3.1	19	4.6	6.0	7.3	3.5	3.5	10
17	5.4	5.4	22	5.3	3.1	6.8	6.5	5.0	10	3.3	4.8	13
18	5.4	5.4	22	3.7	3.3	16	4.1	4.1	6.0	5.7	3.9	7.8
19	5.4	5.4	10	3.3	3.5	8.4	3.5	3.9	7.5	8.2	3.7	8.0
20	5.4	5.4	5.3	3.3	3.5	5.5	3.5	3.7	6.1	6.9	3.5	11
21	5.4	5.4	4.8	3.3	3.3	6.8	4.1	4.1	9.1	9.5	7.2	8.8
22	5.4	5.5	4.8	3.3	3.5	4.5	3.7	5.0	7.0	5.0	8.6	7.0
23	5.3	5.6	4.1	3.3	3.5	3.9	3.9	13	9.4	4.1	8.3	6.3
24	6.0	5.5	3.5	3.1	3.3	3.5	5.0	6.5	6.0	3.9	5.0	5.8
25	12	5.5	3.3	3.1	3.1	3.3	4.3	4.8	5.5	4.1	6.0	6.5
26	5.0	5.5	3.3	3.1	3.1	3.9	5.5	4.3	5.8	4.8	7.5	7.3
27	3.7	5.4	3.3	3.1	3.1	4.1	5.3	5.5	9.9	5.0	6.6	7.3
28	5.3	5.4	3.3	3.1	6.7	4.3	4.3	4.3	20	5.4	6.5	7.5
29	5.0	5.5	3.3	3.1	---	4.3	4.1	3.7	6.8	7.2	5.4	7.5
30	4.3	5.4	3.3	3.1	---	6.0	5.3	4.1	5.3	6.4	5.4	7.5
31	4.5	---	5.5	3.1	---	4.3	---	4.5	---	5.8	5.4	---
TOTAL	151.3	191.8	207.9	123.2	96.9	185.7	167.9	202.8	190.8	173.0	187.2	201.8
MEAN	4.88	6.39	6.71	3.97	3.46	5.99	5.60	6.54	6.36	5.58	6.04	6.73
MAX	12	20	22	14	6.7	19	11	21	20	9.5	11	13
MIN	3.0	5.4	3.3	3.1	3.0	3.3	3.5	3.7	3.3	3.3	3.5	3.5
AC-FT	300	380	412	244	192	368	333	402	378	343	371	400

CAL YR 1977 TOTAL 2140.8 MEAN 5.87 MAX 26 MIN 2.6 AC-FT 4250
WTR YR 1978 TOTAL 2080.3 MEAN 5.70 MAX 22 MIN 3.0 AC-FT 4130

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 (FISCAL YEAR).--WSP 1719: 1959. (WATER YEARS).--WSP 2137: 1963(P), 1964(M), 1965(P).

GAGE.--Water-stage recorder. Altitude of gage is 900 ft (274 m), from topographic map. Prior to July 1, 1962, at site 200 ft (61 m) upstream at datum 6.14 ft (1.871 m) higher.

REMARKS.--Records fair except those above 90 ft³/s (2.55 m³/s), which are poor. Since Nov. 16, 1960, water diverted above station at times, either into or from Molokai tunnel. Periodic determinations of water temperatures made during the year are published elsewhere in this report.

AVERAGE DISCHARGE (since Molokai tunnel diversion began).--17 years (water years, 1961, 1963-78), 7.05 ft³/s (0.200 m³/s), 5,110 acre-ft/yr (6.30 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,080 ft³/s (58.9 m³/s) Apr. 13, 1965, gage height, 6.12 ft (1.865 m), from rating curve extended above 43 ft³/s (1.22 m³/s); minimum, 0.03 ft³/s (0.001 m³/s) Dec. 13, 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.--Maximum discharge, 630 ft³/s (17.8 m³/s) Mar. 1, gage height, 3.94 ft (1.201 m), from rating curve extended above 43 ft³/s (1.22 m³/s), no other peak above base of 590 ft³/s (16.7 m³/s); minimum, 0.03 ft³/s (0.001 m³/s) Dec. 13.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.74	.28	.15	9.5	.59	87	6.2	.89	1.1	1.1	1.6	.91
2	.74	8.4	.15	29	.59	2.6	8.8	3.2	1.1	1.6	1.2	.82
3	.74	27	.46	1.4	.60	.76	1.1	.78	1.2	1.2	.92	.92
4	.74	3.9	.92	.48	.59	.69	.67	.59	1.8	2.3	1.0	.98
5	.74	1.6	.74	.46	.59	.66	.65	85	1.5	1.6	1.1	1.0
6	.74	.59	.74	.46	.62	.70	.50	52	1.5	4.6	1.3	1.1
7	.59	.46	1.1	.51	.57	.66	4.5	5.6	1.5	4.6	1.9	.98
8	.59	.36	.08	.59	.79	2.2	1.7	1.2	1.6	2.4	6.1	.74
9	.46	.28	.06	.62	.64	3.1	12	2.4	1.7	2.1	.80	.74
10	.36	.21	.06	.70	.59	2.6	4.8	.92	1.8	2.0	.74	.87
11	.28	.15	.06	.75	.59	4.6	1.0	.92	1.7	2.1	.86	.92
12	.28	.15	.06	.83	.59	1.1	1.0	1.9	1.6	2.5	.92	.94
13	1.1	.15	.05	.88	.65	.74	.96	7.8	1.4	1.3	.95	1.0
14	.59	.15	.07	.66	.59	.74	.95	14	4.9	1.1	1.0	1.1
15	.46	.21	.10	.53	.59	.74	1.0	1.8	4.0	1.1	1.1	.93
16	.46	.21	38	.82	.64	47	1.2	1.3	2.6	1.1	1.2	5.4
17	.46	.21	69	1.2	.65	5.1	1.3	1.1	5.2	1.1	1.1	11
18	.21	.21	52	.57	.69	27	.85	1.2	1.5	4.3	1.1	1.9
19	.21	.21	6.2	.53	.73	4.8	.92	1.4	3.7	4.8	1.1	1.9
20	.21	.21	.44	.59	.74	5.4	.95	1.6	2.5	3.7	1.1	6.3
21	.21	.21	.29	.59	.74	3.4	.92	3.6	6.2	5.0	3.0	2.3
22	.15	.21	.30	.59	.75	.81	.92	2.0	2.5	1.2	1.3	.57
23	.15	.21	.28	.59	.76	.74	1.1	55	8.0	1.3	2.7	.36
24	4.4	.15	.28	.59	.76	.74	1.2	2.6	2.1	1.4	.92	.36
25	6.2	.15	.28	.59	.74	.74	.85	1.1	1.8	1.4	1.1	.35
26	.36	.21	.28	.59	.74	.90	3.4	.92	2.1	1.4	1.2	.28
27	.36	.21	.32	.59	.74	.95	1.6	1.1	14	1.4	1.1	.28
28	.46	.21	.36	.59	4.7	1.7	.80	1.0	34	1.6	1.1	.23
29	.36	.15	.36	.59	---	1.1	.84	.96	2.5	1.1	.90	.15
30	.36	.15	.36	.59	---	2.1	.92	1.1	1.1	.92	.74	.14
31	.36	---	8.5	.59	---	.97	---	1.2	---	.87	.64	---
TOTAL	24.07	46.80	182.05	57.57	22.56	212.34	63.60	256.18	118.2	64.19	41.79	45.47
MEAN	.78	1.56	5.87	1.86	.81	6.85	2.12	8.26	3.94	2.07	1.35	1.52
MAX	6.2	27	69	29	4.7	87	12	85	34	5.0	6.1	11
MIN	.15	.15	.05	.46	.57	.66	.50	.59	1.1	.87	.64	.14
AC-FT	48	93	361	114	45	421	126	503	234	127	83	90
CAL YR 1977 TOTAL	1287.52			MEAN 3.53	MAX 78	MIN .05	AC-FT 2550					
WTR YR 1978 TOTAL	1134.82			MEAN 3.11	MAX 87	MIN .05	AC-FT 2250					

HAWAII, ISLAND OF MOLOKAI

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 (FISCAL YEARS).--WSP 1155: 1932(M), 1938-44(M), 1946-48(M). WSP 1319: 1923(M), 1930(M), 1932, 1938-40, 1945(M), drainage area.

GAGE.--Water-stage recorder. Datum of gage is 252 ft (76.810 m) above mean sea level (hand levels by Bureau of Reclamation). Prior to Nov. 19, 1930, at site 500 ft (152 m) upstream at different datums. Aug. 14, 1931, to July 20, 1932, and Sept. 20, 1937, to Jan. 26, 1948, at present site at datum 1.49 ft (0.454 m) higher, and July 30, 1948, to June 30, 1962, at present site at datum 1.00 ft (0.305 m) higher.

REMARKS.--Records good except those above 80 ft³/s (2.27 m³/s), which are poor. Diversion above station for domestic use in Kalaupapa, and since Nov. 16, 1960, water has been diverted above station both to and from Molokai tunnel. 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).--18 years (water years 1961-78), 14.6 ft³/s (0.413 m³/s), 10,580 acre-ft/yr (13.0 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.--Maximum discharge, 757 ft³/s (21.4 m³/s) May 23, gage height, 4.88 ft (1.487 m), from rating curve extended as explained above; minimum, 4.0 ft³/s (0.11 m³/s) Nov. 30 to Dec. 2.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.8	6.0	4.0	19	6.1	120	9.2	5.9	7.3	8.2	7.5	6.4
2	6.8	15	4.0	64	6.1	9.2	14	7.5	7.3	8.4	7.3	6.3
3	6.7	49	4.5	10	6.1	6.4	6.6	6.1	7.1	7.9	6.6	6.4
4	6.8	9.3	4.3	7.6	6.1	6.1	6.1	5.8	7.7	8.2	6.4	6.4
5	6.8	7.0	4.4	7.1	6.0	5.9	5.9	178	8.6	7.7	6.4	6.3
6	6.7	5.5	4.9	6.8	6.0	6.1	5.8	126	8.6	11	6.8	6.3
7	6.7	5.2	5.7	6.7	6.0	5.9	8.4	22	7.3	11	6.6	6.1
8	6.6	5.2	5.1	6.7	6.3	7.1	7.1	9.8	7.1	8.2	11	5.9
9	6.5	5.1	4.9	6.5	6.2	8.4	15	9.2	7.1	7.7	6.8	5.9
10	6.4	5.1	4.9	6.5	6.0	7.1	11	7.7	7.1	7.5	6.6	5.8
11	6.3	5.1	4.9	6.5	6.0	8.8	6.1	7.5	7.1	7.7	6.4	5.8
12	6.7	5.1	4.9	6.4	6.0	6.3	6.1	7.7	6.9	8.4	6.3	5.9
13	7.1	5.1	4.9	6.4	6.0	5.9	5.9	12	6.9	7.3	6.3	5.9
14	6.4	5.1	4.8	6.4	6.0	5.8	5.8	22	9.5	7.3	6.1	5.8
15	6.0	5.1	4.8	6.4	6.0	5.8	5.9	8.2	9.2	7.5	6.1	5.8
16	5.9	5.1	6.1	6.7	6.0	64	6.4	7.5	8.2	7.5	6.3	8.8
17	5.7	5.1	152	7.2	6.0	8.6	6.4	7.1	10	7.5	6.4	15
18	5.8	4.9	131	6.4	6.1	45	5.9	7.1	7.5	10	6.4	6.6
19	5.8	4.9	19	6.4	6.1	12	5.8	6.9	8.6	12	6.6	6.6
20	5.8	4.8	8.4	6.4	6.0	12	5.9	6.9	7.5	9.0	6.6	11
21	6.0	4.6	7.3	6.3	6.0	10	5.8	12	11	12	7.9	7.5
22	5.9	4.3	6.7	6.3	6.0	6.6	5.8	8.6	7.7	7.5	6.9	6.1
23	5.8	4.1	6.5	6.3	6.2	6.4	6.3	153	13	7.5	7.3	5.8
24	11	4.1	6.5	6.3	6.0	6.3	6.3	14	7.7	7.5	6.4	5.8
25	16	4.1	6.4	6.2	5.9	6.3	6.3	9.0	7.5	7.5	6.4	5.8
26	6.0	4.1	6.3	6.3	5.9	6.3	9.2	8.2	7.3	7.3	6.4	5.6
27	5.9	4.1	6.3	6.2	6.0	6.3	6.8	7.9	20	7.3	6.3	5.6
28	6.0	4.1	6.2	6.2	9.4	6.8	6.1	7.5	74	7.7	6.1	5.6
29	5.9	4.1	6.1	6.2	--	6.3	6.1	7.5	11	7.3	6.1	5.6
30	5.9	4.0	6.1	6.2	--	6.9	5.9	7.9	8.6	7.1	5.9	5.5
31	5.9	--	14	6.1	--	6.1	--	7.5	--	6.9	6.1	--
TOTAL	208.6	204.3	520.8	274.7	172.5	430.7	213.9	714.0	324.4	255.6	207.3	197.9
MEAN	6.73	6.61	16.8	8.86	6.16	13.9	7.13	23.0	10.8	8.25	6.69	6.60
MAX	16	49	152	64	9.4	120	15	178	74	12	11	15
MIN	5.7	4.0	4.0	6.1	5.9	5.8	5.8	5.8	6.9	6.9	5.9	5.5
AC-FT	414	405	1030	545	342	854	424	1420	643	507	411	393
CAL YR 1977	TOTAL	4089.8	MEAN	11.2	MAX	152	MIN	4.0	AC-FT	8110		
WTR YR 1978	TOTAL	3724.7	MEAN	10.2	MAX	178	MIN	4.0	AC-FT	7390		

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 (FISCAL YEARS).--WSP 1289: 1950-51. WSP 1569: Drainage area.

GAGE.--Water-stage recorder. Altitude of gage is 240 ft (73 m), from topographic map.

REMARKS.--Records fair. Flow has been augmented by occasional spillage from Molokai tunnel since May 1965.

AVERAGE DISCHARGE.--28 years (water years 1951-78), 1.42 ft³/s (0.040 m³/s), 1,030 acre-ft/yr (1.27 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 measurement of peak flow; no flow at times each year.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 284 ft³/s (8.04 m³/s) Mar. 1, gage height, 4.88 ft (1.487 m), from rating curve extended as explained above, no other peak above base of 280 ft³/s (7.93 m³/s); no flow most of time.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.00	27	.00	.00	.00	.00	.00	.00
2	.00	.00	.00	.00	.00	3.2	.00	.00	.00	.00	.00	.00
3	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
4	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
5	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
6	.00	.00	.00	.00	.00	.00	.00	6.1	.00	.00	.00	.00
7	.00	.00	.00	.00	.00	.00	.00	1.7	.00	.00	.00	.00
8	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
9	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
10	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
11	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
12	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.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	7.3	.00	.00	.00	.00	.00	.00
17	.00	.00	9.0	.00	.00	.95	.00	.00	.00	.00	.00	.00
18	.00	.00	2.5	.00	.00	.00	.00	.00	.00	.00	.00	.00
19	.00	.00	3.4	.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	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
23	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
24	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
25	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
26	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
27	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
28	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
29	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
30	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
31	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
TOTAL	.00	.00	37.40	.00	.00	38.45	.00	7.80	.00	.00	.00	.00
MEAN	.000	.000	1.21	.000	.000	1.24	.000	.25	.000	.000	.000	.000
MAX	.00	.00	25	.00	.00	27	.00	6.1	.00	.00	.00	.00
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	.00	.00	74	.00	.00	76	.00	15	.00	.00	.00	.00
CAL YR 1977	TOTAL	166.51	MEAN	.46	MAX	51	MIN	.00	AC-FT	330		
WTR YR 1978	TOTAL	83.65	MEAN	.23	MAX	27	MIN	.00	AC-FT	166		

HAWAII, ISLAND OF MOLOKAI

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.

AVERAGE DISCHARGE.--15 years, 0.750 ft³/s (0.021 m³/s), 543 acre-ft/yr (670,000 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, 685 ft³/s (19.4 m³/s) May 23, gage height, 6.10 ft (1.859 m), no other peak above base of 210 ft³/s (5.95 m³/s); no flow most of time.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.00	.19	.00	.00	.02	.00	.00	.00
2	.00	.00	.00	.00	.00	.19	.00	.00	.01	.00	.00	.00
3	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
4	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
5	.00	.00	.00	.00	.00	.00	.00	.85	.00	.00	.00	.00
6	.00	.00	.00	.00	.00	.00	.00	1.7	.00	.13	.00	.00
7	.00	.00	.00	.00	.00	.00	.00	.21	.00	.06	.00	.00
8	.00	.00	.00	.00	.00	.00	.00	.03	.00	.02	.01	.00
9	.00	.00	.00	.00	.00	.00	.00	.01	.00	.01	.01	.00
10	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
11	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
12	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
13	.00	.00	.00	.00	.00	.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	.24	.00	.00	.00	.00	.00
17	.00	.00	.73	.00	.00	.00	1.3	.00	.00	.00	.00	.00
18	.00	.00	.70	.00	.00	.00	.02	.00	.00	.00	.00	.00
19	.00	.00	.02	.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	2.4	.00
22	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.28	.00
23	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.12	.00
24	.00	.00	.00	.00	.00	.00	.00	.98	.00	.00	.03	.00
25	.00	.00	.00	.00	.00	.00	.00	.07	.00	.00	.01	.00
26	.00	.00	.00	.00	.00	.00	.00	.05	.00	.00	.00	.00
27	.00	.00	.00	.00	.00	.00	.00	.05	.00	.00	.00	.00
28	.00	.00	.00	.00	.00	.00	.00	.04	2.8	.00	.00	.00
29	.00	.00	.00	.00	---	.00	.00	.04	.07	.00	.00	.00
30	.00	.00	.00	.00	---	.00	.00	.03	.01	.00	.01	.00
31	.00	---	.00	.00	---	.00	---	.03	---	.00	.02	---
TOTAL	.00	.00	1.45	.00	.00	.38	1.56	26.09	2.91	.22	2.89	.00
MEAN	.000	.000	.047	.000	.000	.012	.052	.84	.097	.007	.093	.000
MAX	.00	.00	.73	.00	.00	.19	1.3	22	2.8	.13	2.4	.00
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	.00	.00	2.9	.00	.00	.8	3.1	52	5.8	.4	5.7	.00

CAL YR 1977 TOTAL 133.26 MEAN .37 MAX 41 MIN .00 AC-FT 264
WTR YR 1978 TOTAL 35.50 MEAN .097 MAX 22 MIN .00 AC-FT 70

HAWAII, ISLAND OF MAUI

155

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 (FISCAL YEARS).--WSP 1155: 1939(M). WSP 1569: Drainage area. WSP 1719: 1932-34, 1937-40, 1948, 1949-50(P), 1951, 1952-54(P), 1956-58(P). WSP 1937: 1932-38(M), 1940-47(M), 1948-49(P), 1950(M), 1951-53(P), 1956(P), 1957(M), 1958-59(P), 1960(M).

GAGE.--Water-stage recorder. Datum of gage is 1,546 ft (471 m) above mean sea level (by vertical angles). Prior to Sept. 6, 1929, at site 100 ft (30 m) upstream at different datum.

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

AVERAGE DISCHARGE.--43 years (water years, 1928, 1933-34, 1937, 1940-78), 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, 4,000 ft³/s (113 m³/s) May 23, gage height, 9.50 ft (2.896 m), from rating curve extended as explained above, no other peak above base of 3,700 ft³/s (105 m³/s); minimum, 0.01 ft³/s (<0.001 m³/s) Nov. 27-29, Jan. 1, 15, 16.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.07	8.4	.03	29	.03	198	115	32	3.2	1.4	59	.48
2	2.5	95	.47	4.9	.02	11	165	125	1.6	136	6.4	.29
3	1.8	416	.09	.07	2.1	1.9	19	79	.81	34	1.1	.15
4	1.3	125	.07	.03	.29	1.0	2.0	89	.64	77	25	.24
5	4.4	20	.03	.02	.07	.56	1.0	25	.29	11	61	21
6	.29	7.1	.03	.02	.03	1.5	33	28	.15	389	22	.41
7	.24	4.9	.02	.02	.03	.64	449	2.8	.12	97	355	5.8
8	16	1.1	.02	.02	.02	266	58	5.2	.41	87	108	.41
9	.12	.72	.02	.02	.02	145	4.1	8.5	9.6	37	10	.15
10	5.5	.48	.02	.02	.02	46	1.9	1.0	.81	12	3.0	41
11	.29	.24	.41	.02	.02	87	1.8	.64	.41	32	25	.81
12	.09	.12	.29	.02	.02	19	1.4	.29	9.6	57	26	2.8
13	.03	.03	.18	.02	.02	12	2.0	42	3.1	26	125	3.0
14	.03	33	.73	.02	23	569	39	105	182	4.5	9.7	34
15	.03	313	.03	.01	2.2	19	327	30	49	1.9	2.0	8.5
16	3.2	89	.07	.01	.29	251	40	40	95	1.5	80	87
17	8.6	5.1	48	.02	.05	11	12	34	207	1.6	26	133
18	.05	1.5	48	.02	.03	69	2.5	3.3	158	49	21	58
19	.15	1.1	77	.02	.02	44	5.3	1.8	106	6.8	38	105
20	.15	.72	.86	.02	.02	17	9.6	1.0	155	97	14	87
21	.29	.41	.12	.02	.02	24	1.5	9.3	165	78	583	91
22	.81	1.3	.05	.92	.02	31	1.1	2.9	100	16	59	39
23	.48	.29	.02	.07	9.3	18	.72	326	412	1.8	66	12
24	137	.12	.02	.09	.12	6.0	.56	51	34	.64	8.0	7.8
25	53	.07	.02	.09	.03	2.0	.35	64	9.2	1.2	34	1.2
26	47	.02	.02	.07	.03	15	.90	147	33	18	21	.64
27	8.5	.01	.02	.07	.02	1.6	4.7	171	5.4	16	9.7	.41
28	12	.01	.93	.03	.03	1.4	1.8	45	182	1.2	1.6	.29
29	29	.80	.73	2.1	---	1.2	91	87	16	34	1.4	.24
30	2.6	.94	.07	.95	---	24	33	48	5.7	44	6.1	.29
31	13	---	.05	.09	---	.91	---	13	---	6.0	.72	---
TOTAL	348.52	1126.48	178.42	38.80	37.87	1894.71	1424.23	1617.73	1945.04	1375.54	1807.72	791.91
MEAN	11.2	37.5	5.76	1.25	1.35	61.1	47.5	52.2	64.8	44.4	58.3	26.4
MAX	137	416	77	29	23	569	449	326	412	389	583	133
MIN	.03	.01	.02	.01	.02	.56	.35	.29	.12	.64	.72	.15
AC-FT	691	2230	354	77	75	3760	2820	3210	3960	2730	3590	1570
CAL YR 1977	TOTAL	17300.34	MEAN	47.4	MAX	949	MIN	.01	AC-FT	34320		
WTR YR 1978	TOTAL	12586.97	MEAN	34.5	MAX	583	MIN	.01	AC-FT	24970		

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 mi² (9.04 km²).

PERIOD OF RECORD.--January 1914 to January 1916, November 1921 to current year. Monthly discharge only April to June 1915, published in WSP 1319.

REVISED RECORDS (FISCAL YEARS).--WSP 1045: 1922-43(M). WSP 1569: Drainage area. WSP 1719: 1915(M), 1922, 1924-25, 1927, 1930-35, 1937, 1939-40, 1942-43.

GAGE.--Water-stage recorder. Datum of gage is 1,318 ft (401.7 m) above mean sea level (by vertical angles). Prior to Nov. 1, 1921, at site 50 ft (15 m) downstream at datum 0.12 ft (0.037 m) lower.

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

AVERAGE DISCHARGE.--56 years (water years 1923-78), 22.4 ft³/s (0.634 m³/s), 16,230 acre-ft/yr (20.0 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, about 5,570 ft³/s (158 m³/s) Jan. 18, 1916, gage height, 11.6 ft (3.54 m), present site and datum, from rating curve extended above 814 ft³/s (23.1 m³/s) by test model of station site; minimum, 1.2 ft³/s (0.034 m³/s) Oct. 17, 1974.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,370 ft³/s (38.8 m³/s) Aug. 21, gage height, 5.86 ft (1.786 m), no peak above base of 1,700 ft³/s (48.1 m³/s); minimum, 2.0 ft³/s (0.057 m³/s) Dec. 13-16, Feb. 17, 18, Mar. 6.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.7	3.7	2.4	1.5	2.5	2.6	9.8	5.7	3.9	6.5	12	6.6
2	2.7	6.5	2.4	4.9	2.5	2.4	2.4	6.7	3.7	9.3	8.4	6.0
3	2.7	127	2.4	11	2.5	2.2	9.5	5.0	20	13	7.7	5.5
4	2.8	34	2.6	6.0	2.4	2.2	4.5	5.1	6.8	17	7.1	6.2
5	2.8	8.3	2.4	4.6	2.4	2.1	3.9	61	4.0	16	8.2	7.3
6	2.7	5.1	2.3	4.0	2.4	3.6	16	20	3.7	9.9	10	5.4
7	2.5	4.2	2.3	3.6	2.3	4.2	24	6.3	3.5	15	23	7.3
8	2.5	3.7	2.3	3.4	2.4	20	8.7	5.5	3.5	12	14	5.4
9	2.4	3.5	2.2	3.2	2.3	11	5.5	5.3	2.4	10	8.7	4.9
10	2.4	3.1	2.2	3.1	2.2	4.5	4.7	4.4	3.3	10	7.2	17
11	2.3	3.0	2.1	3.0	2.2	4.0	4.4	4.4	3.5	21	16	6.0
12	2.3	2.8	2.1	2.9	2.2	5.7	4.4	4.3	5.3	27	8.9	5.3
13	2.2	2.7	2.1	2.8	2.2	3.8	4.0	19	4.2	16	8.7	5.8
14	2.2	5.0	2.1	2.8	2.4	4.8	9.0	47	7.2	10	6.5	8.5
15	2.2	55	2.1	2.7	2.3	7.8	7.2	23	6.4	8.9	5.8	5.6
16	4.3	4.9	2.1	2.7	2.3	234	4.7	17	15	8.3	24	21
17	4.1	3.5	4.6	2.6	2.1	14	5.5	9.1	19	9.1	21	15
18	2.5	3.2	151	2.6	2.5	9.8	8.5	6.7	21	30	8.9	12
19	2.8	3.0	92	2.5	6.2	40	4.1	5.9	47	15	7.3	18
20	2.9	2.9	8.8	2.7	2.5	34	4.2	4.9	28	31	6.4	30
21	2.8	2.9	25	4.0	2.3	17	3.8	16	36	30	16.9	20
22	8.5	2.8	6.8	2.7	2.7	10	3.6	9.1	45	11	15	19
23	3.9	2.7	4.3	2.5	4.9	5.5	3.9	7.0	224	9.0	10	8.6
24	9.6	2.7	3.7	2.7	4.0	4.1	9.1	8.2	55	7.8	7.3	11
25	24	2.6	3.4	2.6	2.9	3.7	5.2	5.1	16	7.2	12	7.7
26	25	2.6	3.1	7.4	2.6	5.4	9.2	4.7	17	7.1	11	6.0
27	5.7	2.6	3.0	4.0	2.5	3.8	13	4.3	34	9.2	18	5.2
28	5.1	2.5	2.8	3.0	2.5	3.9	11.0	4.0	40	9.7	10	4.7
29	9.5	2.5	2.7	3.2	---	3.7	10.7	4.0	9.0	16	8.6	4.5
30	4.2	2.5	2.6	2.7	---	3.9	7.4	3.8	8.1	13	11	4.3
31	3.7	---	7.3	2.6	---	3.4	---	3.7	---	9.7	7.0	---
TOTAL	242.4	370.0	398.6	297.6	119.3	608.5	237.4	336.2	692.5	513.8	498.7	289.6
MEAN	7.82	12.3	12.9	9.28	4.26	19.6	7.91	10.8	22.1	16.6	16.1	9.65
MAX	96	127	151	135	49	234	24	61	224	99	169	30
MIN	2.2	2.5	2.1	2.5	2.1	2.1	3.6	3.7	3.3	6.5	5.8	4.3
AC-FT	481	734	791	570	237	1210	471	667	1370	1020	989	574

CAL YR 1977 TOTAL 6811.8 MEAN 18.7 MAX 375 MIN 1.4 AC-FT 13510
WTR YR 1978 TOTAL 4594.6 MEAN 12.6 MAX 234 MIN 2.1 AC-FT 9110

HAWAII, ISLAND OF MAUI

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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 the report.

AVERAGE DISCHARGE.--59 years, 34.0 ft³/s (0.963 m³/s), 24,630 acre-ft/yr (30.4 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 99 ft³/s (2.80 m³/s) Apr. 27, May 11, 1963, May 25, 1964; no flow at times.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	11	21	10	28	11	11	36	29	18	36	48	34
2	11	65	10	82	10	10	58	30	17	46	38	31
3	11	88	9.9	49	9.9	9.5	39	27	36	52	35	28
4	11	74	10	34	8.9	8.9	26	27	28	60	34	30
5	11	41	9.6	28	8.6	8.7	22	37	19	49	38	34
6	11	32	9.1	24	9.0	17	41	57	17	81	43	28
7	11	27	8.8	21	9.0	18	75	33	16	66	71	32
8	11	23	8.9	19	9.0	69	45	30	16	59	62	26
9	10	21	8.7	18	8.7	45	32	28	16	51	44	24
10	10	19	8.4	17	8.4	24	28	24	15	47	38	46
11	8.8	18	8.2	16	8.3	21	26	23	15	63	56	28
12	9.1	17	7.9	15	8.2	26	25	21	19	76	43	26
13	9.3	16	8.1	14	8.4	19	23	54	17	66	44	27
14	9.1	22	8.1	14	9.5	50	33	78	28	49	34	34
15	8.9	61	7.7	13	8.6	36	33	63	25	41	31	26
16	16	28	7.9	12	8.6	80	31	69	45	38	58	45
17	17	21	31	12	7.8	56	27	47	58	38	67	53
18	11	19	90	11	10	88	23	38	60	70	45	49
19	12	18	76	11	28	81	20	33	75	60	38	65
20	13	16	36	11	12	70	20	28	65	72	33	72
21	12	16	69	17	9.8	64	18	44	80	72	80	65
22	41	15	34	12	12	49	17	42	79	53	66	65
23	22	14	25	11	60	36	18	35	85	44	54	44
24	40	13	22	11	18	29	32	34	83	39	42	46
25	58	13	19	10	14	25	23	27	63	36	52	38
26	52	12	18	24	12	30	37	25	60	35	52	32
27	29	12	17	17	11	24	46	23	66	40	68	28
28	26	11	16	13	11	23	37	21	58	40	51	25
29	36	11	15	15	---	22	40	20	45	55	44	24
30	21	11	14	12	---	22	35	19	46	51	50	23
31	20	---	24	11	---	19	---	18	---	40	38	---
TOTAL	579.2	775	647.3	662	349.4	1091.1	966	1087	1270	1627	1497	1130
MEAN	18.7	25.8	20.9	21.4	12.5	35.2	32.2	35.1	42.3	52.5	48.3	37.7
MAX	58	88	90	88	60	88	75	78	85	81	80	72
MIN	8.8	11	7.7	10	7.8	8.7	17	18	15	35	31	23
AC-FT	1150	1540	1280	1310	697	2160	1920	2160	2520	3230	2970	2240

CAL YR 1977 TOTAL 11064.9 MEAN 31.4 MAX 92 MIN 4.8 AC-FT 22740
WTR YR 1978 TOTAL 11681.2 MEAN 32.0 MAX 90 MIN 7.7 AC-FT 23170

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 (FISCAL YEARS).--WSP 1569. Drainage area. WSP 2137: 1915-16(M), 1923-25(M), 1929-31(M), 1934-35(M), 1937-39(M), 1941-43(M), 1946-47(M), 1948(P), 1949(M), 1952-53(M), 1955-56(M), 1959-60(M). (WATER YEARS).--WSP 2137: 1960(P), 1961(M), 1963(M).

GAGE.--Water-stage recorder. Datum of gage is 1,343.1 ft (409.38 m) above mean sea level (by vertical angles). Prior to Oct. 3, 1974, at present site at datum 0.50 ft (0.15 m) higher.

REMARKS.--Records good. No diversion above station. Water is diverted by Koolau ditch, 500 ft (152 m) below station, for domestic supply and irrigation of sugarcane in central Maui. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--58 years (water years, 1915, 1917, 1923-78), 34.7 ft³/s (0.983 m³/s), 25,140 acre-ft/yr (31.0 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, 3,930 ft³/s (111 m³/s) Aug. 21, gage height, 9.95 ft (3.033 m), from rating curve extended above 650 ft³/s (18.4 m³/s), no other peak above base of 1,900 ft³/s (53.9 m³/s); minimum, 1.6 ft³/s (0.045 m³/s) Feb. 18.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.8	9.1	2.6	257	2.2	3.6	18	8.1	8.1	11	15	10
2	2.8	126	2.5	90	2.1	2.8	45	8.6	7.6	17	9.6	8.9
3	2.7	206	2.5	21	2.0	2.3	19	6.6	15	22	9.4	7.3
4	3.4	63	8.0	11	2.0	2.1	9.4	6.3	11	30	8.2	8.6
5	4.6	18	3.4	7.8	1.9	2.0	7.6	120	7.5	27	9.1	10
6	4.1	11	2.6	6.5	1.8	5.4	26	44	5.4	167	12	7.1
7	3.2	8.7	2.4	5.6	1.8	9.1	29	11	4.8	23	29	12
8	2.7	7.4	2.5	5.0	2.0	34	12	9.4	4.5	17	16	7.1
9	2.5	6.7	2.2	4.5	2.6	13	8.9	7.9	8.3	14	9.5	7.0
10	2.4	5.9	2.2	4.1	1.9	5.5	7.6	6.9	3.9	14	8.3	31
11	2.3	5.3	2.1	3.9	1.7	5.1	7.9	9.7	9.6	30	24	8.1
12	2.3	5.0	2.0	3.5	1.8	6.5	6.9	7.0	8.3	38	10	7.7
13	2.4	4.9	2.0	3.3	1.7	4.1	6.1	35	6.2	21	11	12
14	2.6	10	2.4	3.1	2.1	23	18	76	8.1	13	7.7	15
15	2.3	51	2.0	3.0	1.9	12	10	37	7.3	10	6.8	8.8
16	8.6	8.0	2.8	2.8	2.1	352	20	27	20	11	53	34
17	10	5.9	98	2.7	1.7	30	10	15	27	14	37	23
18	3.1	5.1	261	2.6	2.9	182	7.2	11	30	48	13	17
19	7.1	4.7	162	2.5	9.8	75	7.5	8.7	67	21	9.8	32
20	7.3	4.3	24	4.9	2.5	53	8.1	7.5	49	45	9.6	43
21	4.1	4.0	44	5.4	1.0	36	6.3	68	44	40	399	28
22	16	3.8	15	2.9	1.9	21	5.8	26	68	15	26	29
23	5.6	3.6	8.1	2.5	97	14	7.5	25	34.3	12	15	13
24	188	3.4	5.9	2.9	5.8	12	20	14	93	9.8	11	27
25	56	3.2	5.0	2.6	3.7	8.4	10	9.1	28	9.2	17	12
26	32	3.0	4.4	15	3.0	14	18	8.0	22	8.6	17	9.6
27	11	2.9	4.2	5.5	2.8	8.1	28	7.0	56	12	32	8.3
28	13	2.9	3.7	3.3	2.7	9.7	16	6.2	70	11	20	7.5
29	25	2.7	3.4	3.2	---	7.4	13	5.7	19	23	16	7.0
30	8.8	2.7	3.2	2.5	---	7.9	11	5.3	15	16	22	6.4
31	7.1	---	17	2.3	---	6.0	---	6.3	---	13	11	---
TOTAL	445.8	598.2	699.1	492.9	167.3	967.0	419.8	643.3	1062.6	762.6	894.0	457.9
MEAN	14.4	19.9	22.6	15.9	5.98	31.2	14.0	20.8	35.4	24.6	28.8	15.3
MAX	188	206	261	257	97	352	45	120	343	167	399	43
MIN	2.3	2.7	2.0	2.3	1.7	2.0	5.8	5.3	3.9	8.6	6.8	6.4
AC-FT	884	1190	1390	978	332	1920	833	1280	2110	1510	1770	908

CAL YR 1977 TOTAL 9720.7 MEAN 26.6 MAX 547 MIN 1.2 AC-FT 19280
WTR YR 1978 TOTAL 7610.5 MEAN 20.9 MAX 399 MIN 1.7 AC-FT 15100

HAWAII, ISLAND OF MAUI

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16523000 KOOLAU DITCH NEAR KEANAE

LOCATION.--Lat 20°49'53", long 156°10'30", Hydrologic Unit 2002000, 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.--62 years (water years, 1911-12, 1918-78), 101 ft³/s (2.860 m³/s), 73,170 acre-ft/yr (90.2 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 266 ft³/s (7.53 m³/s) Apr. 19, 1935; no flow at times.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	33	76	31	220	29	39	154	85	71	114	155	100
2	32	214	30	217	28	30	203	101	64	152	113	89
3	32	224	29	170	27	26	140	74	96	156	109	81
4	36	215	35	100	25	25	82	76	95	194	97	87
5	40	147	31	77	24	24	70	101	63	144	120	109
6	41	100	28	66	24	52	138	184	53	221	144	77
7	34	81	27	58	24	74	210	102	50	199	203	101
8	32	70	28	53	25	199	132	84	49	183	184	76
9	30	64	25	49	26	127	90	82	47	152	126	75
10	30	58	25	46	23	65	78	72	44	143	105	168
11	28	54	24	43	22	59	76	89	75	185	183	86
12	27	50	23	41	22	79	71	69	77	213	133	80
13	28	49	23	39	22	51	65	164	64	194	137	98
14	28	91	25	37	28	132	136	217	99	146	96	122
15	26	178	22	36	23	92	107	186	82	122	84	86
16	56	80	28	34	26	219	127	213	146	114	178	152
17	78	60	133	33	21	182	87	152	189	128	197	166
18	34	54	218	32	29	220	70	112	197	196	140	166
19	50	50	215	31	108	221	71	93	216	180	114	209
20	52	47	154	41	31	212	69	79	186	202	102	217
21	37	44	203	61	26	197	59	134	216	205	205	202
22	172	42	114	36	26	174	56	165	216	157	183	204
23	68	40	73	31	176	115	69	127	224	130	160	138
24	104	39	60	33	55	92	148	126	221	112	116	176
25	197	37	53	31	39	75	84	89	199	104	151	121
26	176	36	48	96	34	121	145	82	193	100	165	97
27	94	34	45	53	32	75	173	71	194	129	200	84
28	95	34	42	36	31	84	143	65	195	126	156	77
29	146	32	39	44	---	70	136	63	140	176	141	74
30	73	32	37	33	---	76	111	58	146	170	158	70
31	64	---	67	31	---	60	---	58	---	133	110	---
TOTAL	1973	2332	1935	1908	1006	3267	3300	3378	3907	4880	4465	3588
MEAN	63.6	77.7	62.4	61.5	35.9	105	110	109	130	157	144	120
MAX	197	224	218	220	176	221	210	217	224	221	205	217
MIN	26	32	22	31	21	24	56	58	44	100	84	70
AC-FI	3910	4630	3840	3780	2000	6480	6550	6700	7750	9680	8860	7120
CAL YR 1977	TOTAL	33646	MEAN 92.2	MAX 224	MIN 15	AC-FI 66740						
WTR YR 1978	TOTAL	35939	MEAN 98.5	MAX 224	MIN 21	AC-FI 71280						

HAWAII, ISLAND OF MAUI

16531000 KULA DIVERSION FROM HAIPUAENA STREAM NEAR OLINDA

LOCATION.--Lat 20°28'24", long 156°13'27", Hydrologic Unit 20020000, on left bank of Haipuaena Stream, 3.4 mi (5.5 km) east of Olinda, and 6.2 mi (10.0 km) south of Kailua.

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 for period of no gage-height record and those above 6.6 ft³/s (0.19 m³/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.--33 years, 0.675 ft³/s (0.019 m³/s), 489 acre-ft/yr (603,000 m³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 10 ft³/s (0.28 m³/s) Nov. 6, 1976; no flow Nov. 4, 1964, Dec. 3, 5, 1970, Mar. 27 to Apr. 1, Apr. 10-14, 1975.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.07	1.9	.01	5.9	.02	.36	.40	.36	2.9	.54	1.4	.46
2	.06	6.4	.01	3.2	.01	.78	4.4	.54	1.3	2.2	.97	.43
3	.05	6.7	.01	.97	.01	.14	1.2	.36	.54	1.3	.99	.46
4	.07	3.5	.03	.48	.01	.07	.48	.22	.48	2.1	1.0	.42
5	.19	.97	.07	.28	.01	.03	.28	1.7	.40	1.0	.48	.50
6	.14	.48	.05	.16	.01	.02	.66	4.1	.25	8.1	.44	.40
7	.10	.28	.03	.14	.01	.08	4.7	1.5	.19	1.5	5.2	.44
8	.08	.22	.02	.10	.01	2.1	1.6	.66	.28	1.0	3.0	.37
9	.09	.16	.01	.08	.01	1.1	.66	.40	.72	.72	.91	.36
10	.07	.14	.01	.07	.01	.32	.36	.28	.54	.54	.44	3.5
11	.03	.12	.01	.05	.01	.16	.28	.19	.36	.97	.78	1.0
12	.02	.10	.01	.03	.01	.10	.88	.16	.40	1.2	3.8	.66
13	.02	.09	.01	.03	.01	.07	3.5	1.1	.28	.91	1.6	.54
14	.02	.10	.01	.02	.01	.09	3.2	5.5	.19	.48	.60	.99
15	.02	.44	.01	.02	.01	.49	3.4	1.4	.22	.72	.36	.70
16	.73	.40	.06	.01	.01	3.1	1.8	2.3	1.7	.28	5.3	1.9
17	.78	.22	5.1	.03	.01	1.1	1.2	1.3	1.7	.54	2.2	4.9
18	.19	.14	9.1	.02	.01	8.7	.60	.54	1.4	3.6	.78	1.5
19	.16	.10	5.9	.02	.02	5.5	.60	.36	4.4	1.3	.60	2.6
20	.22	.08	1.9	.03	.01	3.8	.78	.28	4.3	2.9	.36	4.0
21	.14	.06	2.3	.08	.01	2.9	.40	1.2	2.1	2.1	.78	2.7
22	.61	.04	1.2	.19	.01	1.5	.22	2.3	2.4	.84	.14	1.7
23	.48	.03	.48	.09	.10	1.2	.19	1.7	2.8	.48	1.0	1.1
24	1.8	.03	.28	.05	.10	.60	.66	1.0	.97	.98	1.0	1.4
25	1.4	.03	.19	.03	.05	.36	.78	.78	.91	1.2	1.1	.97
26	1.8	.02	.19	.26	.02	.40	1.1	1.8	.97	.97	1.3	.74
27	.78	.02	.28	.28	.01	.48	2.1	1.8	2.6	.72	1.5	.60
28	1.1	.02	.19	.12	.01	.66	.66	.91	5.1	.78	.69	.60
29	2.5	.01	.14	.07	---	.40	.60	.78	1.2	.91	.62	.50
30	.60	.01	.12	.04	---	.25	.72	.91	.72	1.0	.80	.50
31	.83	---	.24	.03	---	.19	---	.72	---	.72	.52	---
TOTAL	15.15	22.81	27.97	12.88	.53	37.05	38.41	37.15	42.32	42.20	40.66	36.94
MEAN	.49	.76	.90	.42	.019	1.20	1.28	1.20	1.41	1.36	1.31	1.23
MAX	2.5	6.7	9.1	5.9	.10	8.7	4.7	5.5	5.1	8.1	5.3	4.9
MIN	.02	.01	.01	.01	.01	.02	.19	.16	.19	.28	.14	.36
AC-FT	30	45	55	26	1.1	73	76	74	84	84	81	73

CAL YR 1977 TOTAL 380.45 MEAN 1.04 MAX 9.2 MIN .01 AC-FT 755
WTR YR 1978 TOTAL 354.07 MEAN .97 MAX 9.1 MIN .01 AC-FT 702

NOTE.--No gage-height record Aug. 23 to Sept. 30.

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.

REVISED RECORDS (FISCAL YEARS).--WSP 770: 1932-33.

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 ft³/s (0.17 m³/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.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 150 ft³/s (4.25 m³/s) Feb. 10, 1955, Feb. 18, 1956; no flow at times.

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.4	26	4.0	104	4.2	11	49	18	38	21	40	21
2	5.2	86	3.8	83	4.0	7.1	73	21	22	41	24	21
3	5.0	109	3.7	34	3.8	4.1	34	14	13	43	22	17
4	6.4	73	7.9	19	3.6	3.5	19	13	11	56	20	21
5	9.6	29	6.9	14	3.5	3.3	15	51	10	44	26	36
6	9.0	20	4.1	12	3.4	4.5	43	64	8.8	101	41	17
7	5.8	16	3.7	10	3.3	20	69	26	8.1	45	92	31
8	4.8	13	4.1	9.1	3.5	74	28	19	8.8	42	61	16
9	4.4	12	3.5	8.1	4.2	36	17	16	8.2	33	27	15
10	4.2	11	3.4	7.5	3.3	12	14	19	7.5	30	23	58
11	4.0	9.5	3.2	6.9	3.1	12	13	32	35	49	68	18
12	4.0	8.7	3.1	6.4	3.0	14	12	16	29	68	56	16
13	3.8	8.5	3.1	6.0	3.0	8.2	28	59	21	49	47	26
14	3.8	25	4.2	5.6	3.6	20	49	91	23	30	22	30
15	3.7	51	3.3	5.3	3.1	11	43	64	17	23	19	20
16	18	15	5.2	5.1	4.0	98	33	72	41	24	88	53
17	24	11	6.6	5.4	3.0	42	18	42	53	32	67	48
18	5.9	9.2	110	4.6	4.3	109	13	24	57	98	33	46
19	13	8.2	83	4.4	25	83	13	19	75	45	26	68
20	11	7.5	34	12	4.9	62	13	16	62	81	31	81
21	7.6	7.0	68	24	3.4	47	9.9	42	61	72	87	61
22	66	6.6	26	12	3.2	43	9.1	56	65	37	53	66
23	19	6.2	15	6.0	48	34	25	43	101	28	31	28
24	49	5.9	12	6.1	8.0	21	50	28	80	23	24	46
25	59	5.4	9.8	5.4	4.9	16	27	24	48	23	52	23
26	46	4.9	9.4	28	4.0	45	52	23	47	20	59	18
27	19	4.7	12	13	4.8	18	50	18	63	36	84	15
28	25	4.5	8.0	7.1	3.9	24	35	13	73	28	42	14
29	40	4.4	7.0	8.9	---	15	35	12	34	58	35	13
30	15	4.1	6.4	5.5	---	18	25	19	29	42	51	13
31	14	---	26	4.6	---	12	---	16	---	33	24	---
TOTAL	509.6	602.3	559.8	483.0	174.0	927.7	914.0	990	1149.4	1355	1375	956
MEAN	16.4	20.1	18.1	15.6	6.21	29.9	30.5	31.9	38.3	43.7	44.4	31.9
MAX	66	109	110	104	48	109	73	91	101	101	92	81
MIN	3.7	4.1	3.1	4.4	3.0	3.3	9.1	12	7.5	20	19	13
AC-FT	1010	1190	1110	958	345	1840	1810	1960	2280	2690	2730	1900
CAL YR 1977	TOTAL	9781.6	MEAN	26.8	MAX	126	MIN	2.4	AC-FT	19400		
WIR YR 1977	TOTAL	9995.8	MEAN	27.4	MAX	110	MIN	3.0	AC-FT	19830		

HAWAII, ISLAND OF MAUI

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.--46 years, 116 ft³/s (3.285 m³/s), 84,040 acre-ft/yr (104 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 300 ft³/s (8.50 m³/s) July 1, 17, 1963; no flow at times.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	32	85	30	276	28	39	152	89	78	116	151	104
2	31	239	29	248	26	29	215	104	68	163	113	94
3	31	276	28	171	25	25	143	78	92	172	110	84
4	35	232	34	102	24	24	86	79	97	213	100	90
5	39	146	30	80	23	23	73	112	65	155	119	112
6	39	101	27	67	23	44	142	205	54	274	139	81
7	33	83	26	60	22	71	220	108	50	204	233	103
8	31	71	27	53	23	213	134	94	49	182	192	80
9	29	65	25	50	25	137	92	86	47	150	126	76
10	29	58	24	46	22	68	79	74	44	140	106	178
11	27	31	24	43	21	61	78	93	81	199	184	90
12	27	28	23	40	21	76	74	71	80	244	142	84
13	27	27	23	38	20	51	69	182	65	195	141	100
14	27	84	25	37	26	126	148	253	98	143	100	125
15	25	183	22	35	22	90	120	206	85	122	87	89
16	63	80	26	34	24	257	129	236	152	115	208	155
17	80	62	154	31	20	185	91	155	205	127	209	176
18	33	55	282	30	25	272	72	115	215	229	139	162
19	49	51	248	29	107	249	72	97	255	190	115	210
20	52	47	156	38	30	224	71	83	210	217	106	225
21	36	44	223	60	24	205	60	151	236	221	260	206
22	188	42	117	34	24	174	57	175	242	154	189	211
23	67	40	76	29	191	122	71	144	270	129	162	138
24	117	39	62	31	57	98	152	132	268	112	120	178
25	203	37	54	29	39	79	88	94	204	107	153	122
26	172	35	49	92	33	127	151	86	196	102	165	101
27	95	34	24	53	30	79	184	76	215	128	219	89
28	99	33	20	36	29	87	143	68	231	124	157	81
29	146	32	19	43	---	73	136	65	141	178	142	77
30	74	31	18	32	---	78	114	60	145	166	166	73
31	64	---	71	29	---	62	---	60	---	131	114	---
TOTAL	2000	2371	1996	1976	984	3448	3416	3631	4238	5092	4667	3694
MEAN	64.5	79.0	64.4	63.7	35.1	111	114	117	141	164	151	123
MAX	203	276	282	276	191	272	220	253	270	274	260	225
MIN	25	27	18	29	20	23	57	60	44	102	87	73
AC-FT	3970	4700	3960	3920	1950	6840	6780	7200	8410	10100	9260	7330
CAL YR 1977	TOTAL	35800	MEAN	98.1	MAX	294	MIN	15	AC-FT	71010		
WTR YR 1978	TOTAL	37513	MEAN	103	MAX	282	MIN	18	AC-FT	74410		

HAWAII, ISLAND OF MAUI

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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 Kanae, 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 (FISCAL YEARS).--WSP 1719: 1918-30.

GAGE.--Water-stage recorder and sharp-crested weir. Altitude of gage is 920 ft (280 m), from topographic map.

REMARKS.--Records good. Ditch is extension of Center ditch and picks up water from streams between the Kolea and the Waikamoi for irrigation in central Maui. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--59 years (water years, 1919-24, 1926-78), 8.14 ft³/s (0.230 m³/s), 5,900 acre-ft/yr (7.27 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 142 ft³/s (4.02 m³/s) Jan. 3, 1927; no flow at times.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.16	.66	.21	71	.28	1.0	2.5	1.2	1.2	1.8	1.9	2.1
2	.16	32	.16	28	.23	.37	6.1	2.0	1.1	4.2	1.3	1.7
3	.16	79	.17	6.2	.22	.20	2.1	1.1	.86	3.6	1.6	1.6
4	.18	12	.26	3.6	.22	.16	1.2	1.1	.78	5.7	1.4	1.6
5	.19	2.4	.19	2.5	.19	.15	.97	32	.68	9.8	2.0	3.6
6	.24	1.5	.16	1.8	.16	.44	1.5	16	.61	73	2.5	1.4
7	.16	1.2	.16	1.4	.16	1.4	8.1	3.7	.55	7.7	22	1.6
8	.14	.97	.28	1.2	.16	30	3.0	2.7	.63	4.8	8.1	1.1
9	.11	.93	.17	1.0	.16	5.0	3.1	1.9	.53	3.6	3.3	.98
10	.14	.75	.16	.88	.15	1.8	4.5	1.6	.48	2.7	2.5	8.0
11	.11	.65	.16	.80	.13	1.4	2.8	1.5	.53	3.9	5.1	.93
12	.11	.57	.16	.69	.14	1.3	1.1	1.4	.60	19	6.4	.86
13	.11	.52	.16	.62	.12	1.0	1.2	6.6	.50	4.0	7.6	.78
14	.11	.77	.17	.56	.16	2.1	3.8	23	.74	2.5	3.3	1.9
15	.11	9.0	.14	.49	.16	1.1	2.9	9.4	.63	2.0	2.6	.86
16	2.0	.82	.11	.47	.19	55	2.8	12	2.1	1.8	19	14
17	1.7	.58	25	.44	.16	2.1	1.4	4.2	3.5	1.8	7.3	12
18	.15	.50	83	.38	.12	32	.94	2.4	3.9	24	3.1	4.1
19	.11	.48	33	.34	.63	4.5	.82	1.9	19	5.7	2.5	6.2
20	.11	.41	1.4	.36	.18	3.4	.74	1.6	21	9.4	3.3	9.8
21	.12	.41	4.7	1.4	.12	2.6	.65	27	7.3	13	73	9.7
22	5.5	.35	1.6	.50	.11	3.3	.60	8.5	7.2	2.6	11	7.9
23	.93	.34	1.1	.35	7.3	1.8	1.0	18	52	2.1	5.6	2.6
24	36	.31	.88	.34	.51	1.3	3.7	8.3	18	1.7	3.5	3.2
25	12	.28	.76	.32	.18	1.1	1.0	4.2	2.3	2.1	5.0	1.7
26	1.2	.28	.67	.52	.16	5.6	4.7	3.1	3.0	1.8	4.8	1.4
27	.77	.27	.60	.45	.16	1.7	3.6	2.3	14	2.1	19	1.2
28	.79	.22	.53	.32	.16	1.6	1.7	1.9	27	1.5	4.0	1.1
29	1.2	.22	.48	1.1	---	1.2	2.8	1.6	2.8	3.2	3.4	1.0
30	.60	.22	.44	.39	---	1.2	1.9	1.4	2.4	2.2	7.1	.93
31	.57	---	7.3	.30	---	.97	---	1.2	---	1.4	2.5	---
TOTAL	65.94	148.61	164.28	128.72	12.62	166.79	73.22	204.8	195.92	224.7	245.7	105.84
MEAN	2.13	4.95	5.30	4.15	.45	5.38	2.44	6.61	6.53	7.25	7.93	3.53
MAX	36	79	83	71	7.3	55	8.1	32	52	73	73	14
MIN	.11	.22	.11	.30	.11	.15	.60	1.1	.48	1.4	1.3	.78
AC-FT	131	295	326	255	25	331	145	406	389	446	487	210
CAL YR 1977	TOTAL	1744.49	MEAN	4.78	MAX	100	MIN	.04	AC-FT	3460		
WTR YR 1978	TOTAL	1737.14	MEAN	4.76	MAX	83	MIN	.11	AC-FT	3450		

HAWAII, ISLAND OF MAUI

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 Hueilo, and 2.5 mi (4.0 km) west of Kailua.

DRAINAGE AREA.--0.64 mi² (1.66 km²).

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

REVISED RECORDS (FISCAL YEARS).--WSP 1219: 1914(M), 1916-50(M). WSP 1249: 1948-50(P). WSP 1569: Drainage area.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 1,208 ft (368 m) above mean sea level (by vertical angles). Prior to June 19, 1914, nonrecording gage at same site and datum.

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

AVERAGE DISCHARGE.--67 years (water years 1912-78), 4.63 ft³/s (0.131 m³/s), 3,350 acre-ft/yr (4.13 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,710 ft³/s (162 m³/s) Nov. 18, 1930, gage height, 7.28 ft (2.219 m), from rating curve extended above 110 ft³/s (3.12 m³/s) by test of model of station site; minimum, 0.02 ft³/s (0.001 m³/s) several days in 1933, 1934.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 748 ft³/s (21.2 m³/s) Aug. 21, gage height, 3.72 ft (1.134 m), no other peak above base of 270 ft³/s (7.65 m³/s); minimum, 0.38 ft³/s (0.011 m³/s) on several days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.54	1.5	.84	8.8	1.1	2.7	3.3	1.9	2.4	3.5	3.0	3.7
2	.46	3.8	.84	8.9	.96	.96	4.1	2.1	2.3	5.0	2.5	3.3
3	.46	13	.96	3.9	.84	.54	2.7	1.7	2.0	3.5	2.5	3.2
4	.54	6.7	1.5	3.0	.84	.46	2.1	1.7	1.9	5.7	2.4	3.3
5	.54	3.5	.84	2.8	.84	.46	2.1	1.6	1.7	5.1	2.4	4.0
6	.54	2.8	.84	2.7	.84	.64	3.3	6.0	1.6	24	3.5	2.7
7	.46	2.5	.84	2.5	.74	.84	4.8	3.0	1.5	7.3	12	3.0
8	.46	2.4	.84	2.4	.74	11	2.5	2.8	1.5	6.5	4.5	2.5
9	.46	2.1	.74	2.3	.74	4.0	2.4	2.7	1.5	5.6	3.2	2.4
10	.46	2.0	.74	2.1	.64	1.5	2.3	2.9	1.5	4.7	2.8	4.8
11	.46	1.9	.74	2.0	.54	1.6	2.1	4.4	1.9	5.6	4.7	2.4
12	.46	1.7	.64	1.9	.54	1.3	2.1	2.7	1.7	10	4.1	2.3
13	.46	1.7	.64	1.7	.54	1.1	2.3	4.7	1.6	5.6	4.6	2.1
14	.46	2.4	.74	1.7	.54	1.3	2.8	8.9	1.7	4.5	3.0	2.3
15	.46	2.1	.64	1.6	.54	1.1	2.4	6.5	1.6	4.1	2.8	2.1
16	.54	1.6	.64	1.6	.54	6.7	2.4	8.4	3.1	4.1	6.3	8.7
17	.54	1.5	6.9	1.6	.54	2.3	2.0	4.9	2.6	4.3	4.1	5.6
18	.38	1.3	28	1.3	.54	6.3	1.7	4.1	2.8	11	3.5	4.1
19	.38	1.2	5.9	1.3	.84	4.3	2.4	3.7	4.6	5.1	3.0	4.6
20	.38	1.2	3.2	1.7	.54	3.9	1.9	3.3	6.9	8.1	5.0	5.8
21	.38	1.1	4.1	2.8	.54	3.2	1.6	3.8	4.1	9.1	62	6.7
22	1.8	1.1	2.5	1.7	.46	3.7	1.5	3.2	3.3	5.4	8.5	4.9
23	.74	1.1	2.1	1.3	.54	2.8	2.0	11	7.7	4.9	6.7	3.5
24	16	1.1	2.0	1.2	.46	2.4	2.7	3.5	4.9	4.3	5.6	4.0
25	4.1	1.1	1.9	1.1	.46	2.3	1.5	3.3	2.3	4.1	6.0	3.2
26	1.9	.96	1.9	1.5	.46	3.3	3.3	3.2	3.8	3.9	6.4	3.0
27	1.3	.96	1.9	1.2	.46	2.4	2.7	3.0	5.4	3.9	9.4	2.8
28	1.2	.84	1.9	1.1	.46	2.3	2.0	2.8	9.2	3.3	4.9	2.7
29	1.5	.84	1.7	1.7	---	2.1	2.4	2.7	4.3	4.3	4.9	2.5
30	1.1	.84	1.6	1.2	---	2.3	2.0	2.5	3.9	3.2	5.5	2.4
31	1.1	---	3.8	1.1	---	1.9	---	2.4	---	2.8	4.1	---
TOTAL	40.56	66.94	82.42	71.7	17.82	81.70	73.4	133.8	97.3	182.5	203.9	108.6
MEAN	1.31	2.23	2.66	2.31	.64	2.64	2.45	4.32	3.24	5.89	6.58	3.62
MAX	16	13	28	8.9	1.1	11	4.8	16	9.2	24	62	8.7
MIN	.38	.84	.64	1.1	.46	.46	1.5	1.7	1.5	2.8	2.4	2.1
AC-FT	80	133	163	142	35	162	146	265	193	362	404	215

CAL YR 1977 TOTAL 1377.78 MEAN 3.77 MAX 63 MIN .38 AC-FT 2730
WTR YR 1978 TOTAL 1160.64 MEAN 3.18 MAX 62 MIN .38 AC-FT 2300

HAWAII, ISLAND OF MAUI

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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 excellent. Wailoa ditch receives water from Koolau ditch at Alo Stream and from all streams from there west to Halehaku Gulch at altitude of about 1,200 ft (366 m). Water is used for domestic supply, power, and irrigation in Central Maui. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--55 years (water years 1924-78), 171 ft³/s (4.843 m³/s), 123,900 acre-ft/yr (153 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 326 ft³/s (9.23 m³/s) Apr. 1, 1967; no flow Jan. 24-27, 1923.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	55	131	51	271	53	125	254	172	176	221	266	208
2	54	265	49	269	50	79	289	204	170	267	220	193
3	53	268	48	261	48	47	249	146	142	249	211	168
4	59	231	70	196	46	41	173	157	154	290	193	185
5	76	190	60	153	44	39	144	214	113	257	236	261
6	73	182	48	131	43	63	209	295	97	300	266	163
7	57	160	46	94	42	105	289	230	89	291	301	226
8	52	137	49	104	43	281	245	187	92	289	291	158
9	48	124	43	95	46	224	186	173	87	276	264	143
10	47	111	42	88	40	129	153	157	81	246	216	259
11	44	102	40	83	38	119	141	227	178	282	288	179
12	43	95	38	77	38	139	134	151	193	296	287	156
13	43	90	38	73	37	94	145	246	148	289	283	176
14	43	165	44	70	45	167	251	298	185	257	221	223
15	41	257	38	66	39	132	225	288	159	233	185	169
16	61	145	41	64	45	278	240	293	235	231	288	259
17	143	108	164	66	37	236	173	277	282	248	290	289
18	56	96	266	58	38	275	135	227	278	296	279	290
19	76	89	265	56	160	294	129	194	289	291	244	295
20	86	82	175	84	51	289	133	167	280	297	239	298
21	57	78	246	173	41	282	110	202	289	299	313	290
22	230	73	176	100	38	273	103	283	286	289	299	287
23	135	70	144	64	196	237	144	253	301	262	290	267
24	130	67	120	64	85	190	266	244	292	225	245	274
25	184	64	104	59	56	150	191	202	286	220	263	232
26	188	61	95	142	47	245	254	201	286	201	293	190
27	162	58	97	112	48	160	271	177	283	265	300	166
28	159	57	82	70	44	178	246	143	297	242	288	150
29	203	54	75	105	---	143	244	135	263	273	275	143
30	135	52	71	65	---	158	222	130	257	282	289	135
31	117	---	139	57	---	121	---	130	---	286	235	---
TOTAL	2910	3662	2964	3370	1538	5293	5948	6403	6268	8210	8158	6432
MEAN	93.9	122	95.6	109	54.9	171	198	207	209	265	263	214
MAX	230	268	266	271	196	294	289	298	301	300	313	298
MIN	41	52	38	56	37	39	103	130	81	201	185	135
AC-FT	5770	7260	5880	6680	3050	10500	11800	12700	12430	16280	16180	12760
CAL YR 1977 TOTAL	53346		MEAN 146	MAX 301	MIN 25	AC-FT 105800						
WTR YR 1978 TOTAL	61156		MEAN 168	MAX 313	MIN 37	AC-FT 121300						

HAWAII, ISLAND OF MAUI

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.--60 years, 36.4 ft³/s (1.031 m³/s), 26,370 acre-ft/yr (32.5 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 182 ft³/s (5.15 m³/s) Nov. 2, 1967; no flow at times.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.33	16	.67	165	.77	2.5	79	2.3	5.0	5.3	46	4.6
2	.31	150	.53	164	.70	.86	148	11	20	79	4.2	4.0
3	.34	166	.52	87	.67	.42	60	2.1	1.8	49	3.1	3.6
4	.39	165	.79	7.3	.62	.33	2.3	5.5	2.8	144	3.0	3.5
5	.48	111	.54	4.7	.58	.31	1.8	60	1.5	41	3.5	38
6	.41	21	.47	3.8	.56	.50	48	134	1.4	169	51	3.2
7	.36	2.9	.49	24	.53	14	153	23	1.3	136	141	14
8	.27	1.9	.52	2.7	.51	140	47	5.1	1.4	108	138	2.8
9	.27	1.7	.45	2.4	.53	71	3.2	3.9	1.2	50	14	2.5
10	.31	1.6	.41	2.1	.46	2.2	2.6	3.2	1.1	38	4.6	90
11	.31	1.3	.38	2.0	.46	1.6	2.3	36	31	95	123	2.8
12	.27	1.2	.36	1.8	.46	1.6	2.2	2.7	7.0	162	77	2.1
13	.27	1.2	.33	1.7	.46	1.2	1.9	87	1.7	127	97	1.9
14	.23	6.0	.39	1.6	.52	34	66	160	4.2	36	5.5	34
15	.27	79	.37	1.5	.46	14	34	107	1.7	12	4.5	1.9
16	7.4	2.5	.34	1.5	.46	149	41	155	70	6.9	101	55
17	40	1.3	72	1.5	.42	109	4.4	79	122	23	138	93
18	.94	1.2	167	1.3	.39	165	1.7	13	119	128	32	58
19	.98	1.1	162	1.2	15	155	1.7	3.8	152	102	5.4	144
20	.41	1.0	125	1.2	.57	148	1.6	3.3	106	127	17	154
21	.36	.94	152	11	.41	113	1.4	26	151	150	168	148
22	117	.87	75	1.5	.34	90	1.3	104	141	58	149	144
23	34	.80	5.9	1.2	90	15	17	70	163	11	63	20
24	108	.74	1.6	1.1	1.1	5.6	79	52	157	4.4	13	62
25	152	.74	1.4	1.0	.45	1.6	8.2	9.3	116	5.0	64	3.6
26	127	.68	1.3	23	.35	68	62	11	111	4.0	107	3.0
27	15	.68	1.3	4.0	.31	2.6	102	2.9	87	12	161	2.6
28	9.0	.74	1.2	.99	.31	3.6	35	2.5	156	6.8	51	3.0
29	73	.74	1.1	2.7	---	1.8	48	2.3	53	78	35	2.3
30	1.4	.70	1.0	1.1	---	1.8	16	2.1	35	59	79	2.0
31	2.2	---	31	.84	---	1.7	---	2.0	---	11	11	---
TOTAL	693.51	740.53	806.36	526.73	118.40	1315.22	1071.6	1181.0	1822.1	2037.4	1409.8	1103.4
MEAN	22.4	24.7	26.0	17.0	4.23	42.4	35.7	38.1	60.7	65.7	61.6	36.8
MAX	152	166	167	165	90	165	153	160	163	149	168	154
MIN	.23	.68	.33	.84	.31	.31	1.3	2.0	1.1	4.0	3.0	1.9
AC-FT	1380	1470	1600	1040	235	2610	2130	2340	3610	4040	3790	2190
CAL YR 1977	TOTAL	13072.74	MEAN	35.8	MAX	170	MIN	.10	AC-FT	25930		
WTR YR 1978	TOTAL	13326.05	MEAN	36.5	MAX	169	MIN	.23	AC-FT	26430		

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.--64 years (water years, 1911-26, 1931-78), 37.5 ft³/s (1.062 m³/s), 27,170 acre-ft/yr (33.5 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 116 ft³/s (3.29 m³/s) Oct. 31, 1921; no flow at times.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.3	9.9	5.2	9.4	6.4	1.9	3.4	3.2	1.9	2.2	3.0	3.2
2	4.2	5.3	5.0	9.4	5.9	6.9	5.8	2.3	1.5	5.3	2.9	2.8
3	4.2	10.0	5.4	6.3	5.7	5.0	4.4	1.3	1.1	3.2	2.8	2.6
4	4.8	8.1	8.2	3.9	5.5	3.7	2.7	1.5	1.1	7.8	2.4	2.5
5	5.6	3.4	5.4	3.7	5.0	3.4	2.7	4.0	1.4	3.0	2.4	4.4
6	5.7	1.9	4.9	3.9	4.2	6.5	3.4	8.1	1.7	9.3	2.7	3.0
7	4.9	1.6	5.4	3.8	4.0	8.2	7.8	3.9	1.8	8.1	7.9	2.9
8	4.2	1.4	6.7	3.6	4.0	7.9	4.2	2.9	1.8	6.6	7.8	2.6
9	3.9	1.3	5.1	2.4	3.8	6.3	2.8	2.6	2.0	4.3	3.4	2.7
10	4.3	1.2	4.6	1.9	4.2	2.0	2.9	2.6	1.8	3.4	3.3	5.7
11	3.9	1.1	4.4	1.7	3.7	1.3	2.3	2.8	1.6	5.2	6.4	3.1
12	3.6	9.9	4.2	1.4	3.8	1.3	2.3	2.6	1.3	8.6	5.7	3.5
13	3.4	9.3	4.2	1.2	7.1	2.3	2.4	5.0	6.9	7.5	6.9	3.2
14	3.3	5.3	4.6	1.1	5.5	2.5	3.5	9.3	7.9	3.6	3.5	3.5
15	3.1	1.0	4.0	9.9	4.4	2.0	2.5	5.8	7.5	2.7	2.9	2.7
16	4.2	.01	4.1	9.6	4.4	6.7	3.8	8.1	2.1	2.6	6.1	3.2
17	2.6	.00	2.0	1.0	4.0	4.0	2.6	5.2	4.7	2.7	7.6	7.1
18	1.5	.00	10.0	8.5	3.8	8.1	2.4	2.7	5.0	7.5	4.1	3.6
19	6.4	.00	8.1	7.9	4.4	8.1	2.3	2.6	8.3	7.3	3.3	7.2
20	4.2	.00	3.6	7.9	4.2	4.8	2.4	2.4	5.8	6.5	3.5	8.4
21	3.5	.00	6.2	1.5	3.7	6.0	2.1	3.5	8.0	8.8	9.9	7.3
22	3.1	.00	4.0	9.6	3.5	4.7	2.0	5.9	6.2	4.3	5.9	7.1
23	2.8	2.5	4.2	7.7	1.8	2.7	1.4	5.3	8.6	2.8	6.5	3.2
24	4.4	4.3	2.6	7.4	1.3	2.1	3.0	6.1	8.0	2.5	5.9	4.1
25	8.2	1.8	1.2	7.1	3.8	1.9	2.5	3.5	5.6	3.1	5.9	2.7
26	4.5	1.0	8.5	7.4	3.3	4.4	3.9	3.0	4.6	3.1	6.9	2.8
27	2.4	6.1	1.1	8.5	3.1	2.7	4.9	2.7	3.7	4.1	8.1	2.9
28	3.3	5.9	8.2	7.1	3.5	1.5	3.3	2.6	9.0	4.4	5.8	2.9
29	4.2	5.7	7.1	1.1	---	2.7	3.8	2.5	4.3	5.7	4.6	2.8
30	2.6	5.5	7.1	7.7	---	2.7	3.2	2.5	2.9	3.6	6.0	2.7
31	2.0	---	3.1	6.9	---	2.6	---	2.4	---	2.0	3.7	---
TOTAL	497.7	507.61	573.3	686.2	145.9	965.7	967	1189	1080.3	1518	1578	1164
MEAN	16.1	16.9	18.5	22.1	5.21	31.2	32.2	39.4	36.0	49.0	50.9	38.8
MAX	82	100	100	94	18	81	78	93	90	93	99	84
MIN	3.1	.00	4.0	6.9	3.1	3.4	1.4	1.3	6.9	2.0	2.4	2.5
AC-FT	987	1010	1140	1360	289	1920	1920	2360	2140	3010	3130	2310
CAL YR 1977	TOTAL	9614.71	MEAN	26.3	MAX	111	MIN	.00	AC-FT	19070		
WTR YR 1978	TOTAL	10872.71	MEAN	29.8	MAX	100	MIN	.00	AC-FT	21570		

HAWAII, ISLAND OF MAUI

16594000 HAIKU DITCH AT HONOPOU GULCH, NEAR KAILUA

LOCATION.--Lat 20°55'07", long 156°14'58", Hydrologic Unit 20020000, on right bank on west side of Honopou Gulch, 160 ft (49 m) below new Government Road, 2.5 mi (4.0 km) northwest of Kailua, and 5.0 mi (8.0) east of Haiku.

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.--63 years (water years, 1911, 1914, 1916-28, 1931-78), 25.1 ft³/s (0.711 m³/s), 18,180 acre-ft/yr (22.4 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 209 ft³/s (5.92 m³/s) Nov. 13, 1934, Jan. 8, 9, Feb. 25-27, 1935, Jan. 27, 1938; no flow at times.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.58	.68	.58	83	.86	3.8	1.7	1.4	1.6	2.4	2.5	3.8
2	.40	37	.42	82	.86	1.3	22	1.3	1.6	28	2.2	3.4
3	.40	76	.46	19	.85	.88	6.4	1.2	1.5	13	2.3	3.3
4	.44	44	.90	4.7	.80	.77	1.7	1.1	1.4	58	2.3	3.1
5	.45	9.8	.48	3.9	.77	.71	1.5	31	1.3	6.2	2.5	3.5
6	.49	1.3	.44	3.2	.68	1.3	1.6	69	1.2	105	2.3	2.8
7	.46	1.1	.78	2.0	.68	1.2	49	2.8	1.2	50	65	2.8
8	.45	.97	.51	2.0	.68	57	4.8	2.0	1.3	6.3	66	2.6
9	.42	.98	.47	1.8	.67	41	2.2	1.8	1.2	4.3	4.3	2.4
10	.48	.87	.44	1.7	.65	3.9	1.9	1.6	1.1	3.7	3.7	31
11	.45	.83	.40	1.8	.63	3.0	1.8	1.6	1.1	17	23	2.7
12	.45	.78	.40	1.7	.67	2.4	1.8	1.7	1.1	82	17	2.3
13	.47	.72	.40	1.6	.63	1.7	1.6	24	1.1	20	47	2.2
14	.47	7.4	.42	1.5	.71	1.6	2.6	108	1.2	3.2	4.8	2.2
15	.47	23	.40	1.4	.66	1.4	3.2	36	1.1	2.8	4.3	2.2
16	.53	16	.44	1.2	.70	70	8.7	73	1.3	2.8	40	6.2
17	1.4	12	14	1.2	.69	21	1.5	21	36	2.8	68	49
18	.52	11	103	1.1	.68	95	1.4	2.2	19	67	5.1	3.3
19	.53	9.2	71	1.1	.68	95	1.6	1.9	99	40	4.6	34
20	.52	8.7	3.5	1.1	.65	17	1.7	2.9	40	39	4.4	74
21	.51	8.4	30	1.3	.62	40	1.4	17	82	70	88	45
22	12	8.2	3.1	1.3	.58	7.0	1.3	43	36	3.7	79	48
23	1.3	4.3	2.4	1.1	.60	2.7	1.2	40	105	2.8	38	3.9
24	20	.79	2.0	1.1	.57	2.3	1.3	21	95	2.6	7.4	6.2
25	52	.72	1.0	1.0	.55	2.2	1.1	2.9	20	3.8	11	2.9
26	5.4	.65	.74	1.1	.55	6.5	2.5	2.2	3.0	2.8	30	2.7
27	1.0	.63	.70	1.0	.54	2.6	7.4	2.0	17	2.6	87	2.5
28	.81	.61	.66	.92	.79	2.4	1.9	1.9	78	2.3	7.5	2.4
29	1.8	.59	.65	1.1	---	2.1	1.8	1.8	3.8	7.4	4.8	2.3
30	.66	.58	.62	.96	---	1.8	1.6	1.7	2.8	2.6	26	2.2
31	.65	---	6.9	.90	---	1.3	---	1.6	---	2.2	4.0	---
TOTAL	106.51	287.80	248.21	228.78	19.00	490.86	140.2	520.6	656.9	656.3	754.0	354.9
MEAN	3.44	9.59	8.01	7.38	.68	15.8	4.67	16.8	21.9	21.2	24.3	11.8
MAX	52	76	103	83	.86	95	49	108	105	105	88	74
MIN	.40	.58	.40	.90	.54	.71	1.1	1.1	1.1	2.2	2.2	2.2
AC-FT	211	571	492	454	38	974	278	1030	1300	1300	1500	704

CAL YR 1977 TOTAL 4562.26 MEAN 12.5 MAX 109 MIN .02 AC-FT 9050
WTR YR 1978 TOTAL 4464.06 MEAN 12.2 MAX 108 MIN .40 AC-FT 8850

16618000 KAHAKULOA STREAM NEAR HONOKOHAI
(National stream-quality accounting network station)

LOCATION.--Lat 20°58'54", long 156°33'26", Hydrologic Unit 20020000, on right bank 0.5 mi (0.8 km) downstream from Kapuna Stream, 1.3 mi (2.1 km) south of Kahakuloa, 2.0 mi (3.2 km) west of Puu Makawana, and 4.3 mi (6.9 km) southeast of Honokohau.

DRAINAGE AREA.--3.47 mi² (8.99 km²).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--July 1939 to August 1943, September 1947 to November 1970, December 1974 to current year.
Records for January 1913 to December 1914 (fragmentary) at site 1.0 mi (1.6 km) upstream not equivalent owing to difference in drainage areas.

REVISED RECORDS (FISCAL YEARS).--WSP 1319: 1948, 1949(M). WSP 1569: Drainage area.

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 330 ft (101 m), from topographic map.

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

AVERAGE DISCHARGE.--29 years (1940-42, 1948-70, 1976-78), 16.5 ft³/s (0.467 m³/s) 11,950 acre-ft/yr (14.7 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,800 ft³/s (108 m³/s) Nov. 25, 1970, gage height, 10.57 ft (3.222 m), from floodmarks from rating curve extended above 510 ft³/s (14.4 m³/s) on basis of slope-area measurements at gage heights 6.70 ft (2.042 m), 8.48 ft (2.585 m), and 10.57 ft (3.222 m); minimum, 3.0 ft³/s (0.085 m³/s) Feb. 9-11, 1954.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 500 ft³/s (14.2 m³/s) and maximum (*):

Date	Time	Discharge (ft ³ /s) (m ³ /s)	Gage height (ft) (m)	Date	Time	Discharge (ft ³ /s) (m ³ /s)	Gage height (ft) (m)
Jan. 2	0730	646 18.3	5.41 1.649	June 20	1700	658 18.6	5.43 1.655
May 5	1630	688 19.5	5.48 1.670	July 6	0930	512 14.5	5.17 1.576
May 23	1430	1220 34.6	6.17 1.881	Aug. 21	0630	*1380 39.1	6.38 1.945

Minimum discharge, 4.0 ft³/s (0.11 m³/s) Feb. 21, 22.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.9	13	4.5	10.6	4.7	34	9.9	6.8	8.9	10	20	8.4
2	4.9	41	4.4	110	4.6	9.1	9.3	7.4	9.6	14	8.4	7.7
3	4.8	69	4.7	13	4.6	5.3	7.5	5.9	6.9	9.4	22	7.7
4	4.6	21	11	8.1	4.4	4.9	5.4	5.3	7.0	18	17	9.8
5	4.7	8.7	6.0	6.8	4.4	4.7	5.0	115	6.5	8.1	11	21
6	4.7	6.7	4.7	6.2	4.3	4.9	9.1	73	11	17.6	18	7.4
7	4.6	6.0	5.1	5.8	4.3	6.0	51	14	5.6	14	117	12
8	4.6	5.5	6.2	5.5	5.1	81	15	7.9	6.2	11	47	7.9
9	4.6	6.9	4.9	5.3	5.2	29	6.3	6.6	5.6	12	10	6.6
10	4.4	5.6	6.1	5.2	4.4	7.0	7.4	6.0	4.9	8.0	7.8	23
11	4.4	5.3	4.7	5.1	4.3	5.8	5.5	8.7	6.3	19	16	7.4
12	4.4	5.1	4.6	5.0	4.1	5.5	5.7	14	5.5	36	34	6.9
13	4.7	5.0	4.5	4.9	4.1	5.1	10	9.2	5.1	10	16	6.7
14	4.7	8.1	5.8	4.8	5.3	4.8	10	31	4.9	7.3	8.1	8.0
15	4.4	9.3	4.7	4.7	4.4	4.8	29	22	5.0	6.5	6.8	6.0
16	6.0	12	13	4.9	4.2	43	9.3	59	7.0	6.3	53	21
17	11	5.8	73	5.1	4.2	8.5	5.6	19	19	7.8	22	35
18	5.0	5.2	153	4.7	4.2	29	5.0	7.8	20	54	18	8.0
19	4.7	5.1	23	4.6	5.4	16	4.8	6.5	51	14	9.0	10
20	5.0	5.0	8.3	5.2	4.4	21	4.7	6.0	83	14	7.0	9.2
21	5.6	4.9	25	20	4.1	13	6.5	7.8	14	10	140	6.7
22	41	4.9	9.9	8.9	4.0	8.0	4.7	13	9.4	8.3	20	6.6
23	15	4.8	6.6	5.4	20	7.4	5.4	59	29	8.2	12	6.1
24	72	4.7	5.8	5.0	5.6	6.5	33	9.8	16	7.0	8.0	6.2
25	26	4.7	5.4	5.0	4.6	5.4	14	7.2	11	9.0	15	7.1
26	8.3	4.7	6.3	9.3	4.4	40	12	10	16	8.5	19	6.0
27	6.3	4.6	13	7.4	4.5	8.0	28	9.1	13	10	45	5.7
28	17	4.6	5.7	5.8	4.8	10	11	6.0	94	11	13	5.5
29	9.6	4.6	5.3	13	---	6.5	16	6.9	13	19	23	5.3
30	6.1	4.6	5.1	6.2	---	7.3	8.3	7.2	12	9.2	26	5.9
31	11	---	22	5.0	---	5.7	---	9.6	---	6.6	8.9	---
TOTAL	319.0	296.4	462.3	411.9	142.6	447.2	354.4	576.7	506.3	562.2	798.0	290.8
MEAN	10.3	9.88	14.9	13.3	5.09	14.4	11.8	18.6	16.9	18.1	25.7	9.69
MAX	72	69	153	110	20	81	51	115	94	176	140	35
MIN	4.4	4.6	4.4	4.6	4.0	4.7	4.7	5.3	4.9	6.3	6.8	5.3
AC-FT	633	588	917	817	283	887	703	1140	1000	1120	1580	577

CAL YR 1977 TOTAL 5366.7 MEAN 14.7 MAX 352 MIN 3.7 AC-FT 10640
WTR YR 1978 TOTAL 5167.8 MEAN 14.2 MAX 176 MIN 4.0 AC-FT 10250

HAWAII, ISLAND OF MAUI

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16618000 KAHAKULOA STREAM NEAR HONOKOHAU--Continued

WATER-QUALITY RECORDS

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCTI- ANCE (MICRO- MHOS)	PH (UNITS)	TEMPER- ATURE (DEG C)	TUR- BID- ITY (JTU)	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)
OCT										
03...	1130	4.7	90	7.4	21.0	2	--	--	9	1200
NOV										
07...	1200	5.8	79	7.6	21.5	1	--	9.4	34	1600
DEC										
05...	1135	5.8	80	7.5	21.0	1	--	9.4	21	1400
JAN										
03...	1100	12	58	7.4	19.0	2	--	9.8	28	1300
31...	0830	5.0	81	7.5	18.0	1	--	9.6	8	550
MAR										
06...	1100	4.1	86	7.6	19.5	0	--	9.6	34	1400
APR										
10...	1100	7.8	71	7.4	19.5	1	--	9.8	38	940
MAY										
08...	1200	8.0	66	7.6	21.5	1	--	9.6	48	290
JUN										
05...	1200	6.2	71	7.2	22.5	1	--	9.2	20	210
15...	1030	4.9	82	8.0	21.5	--	--	9.6	--	--
JUL										
17...	1200	10	66	7.1	22.0	--	.40	9.4	77	720
AUG										
14...	1130	8.0	62	7.2	22.0	--	.90	9.4	48	570
SEP										
11...	1145	7.3	65	7.6	22.5	--	1.8	10.0	260	770

DATE	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)	SODIUM PERCENT	SODIUM AD- SORP- TION RATIO	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	BICAR- BONATE (MG/L AS HCO3)	CAR- BONATE (MG/L AS CO3)
OCT										
03...	22	0	4.2	2.7	7.2	41	.7	.9	29	0
NOV										
07...	17	0	3.5	2.1	7.2	46	.8	.8	24	0
DEC										
05...	21	2	3.9	2.7	7.3	42	.7	.8	23	0
JAN										
03...	13	3	2.5	1.7	5.7	47	.7	.7	13	0
31...	21	0	4.1	2.7	8.0	44	.8	.9	27	0
MAR										
06...	23	0	4.1	3.0	7.8	42	.7	.9	28	0
APR										
10...	18	2	3.4	2.2	6.8	45	.7	.7	19	0
MAY										
08...	18	2	3.7	2.1	6.3	42	.6	.8	19	0
JUN										
05...	20	2	3.4	2.7	7.0	42	.7	.8	21	0
15...	--	--	--	--	--	--	--	--	--	--
JUL										
17...	15	0	3.0	1.8	6.5	47	.7	.9	--	--
AUG										
14...	14	0	2.6	1.8	6.4	48	.7	.9	--	--
SEP										
11...	16	0	3.0	2.0	8.7	53	1.0	.8	--	--

16618000 KAHAKULCA STREAM NEAR HONOKOHAU--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	ALKA- LITY (MG/L AS CACO3)	CARBON DIOXIDE DIS- SOLVED (MG/L AS CO2)	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 CONSTITUENTS, DIS- SOLVED (MG/L)	SOLIDS, DIS- SOLVED (TONS PER AC-FT)	SOLIDS, DIS- SOLVED (TONS PER DAY)
OCT										
03...	24	1.8	2.4	9.9	.0	22	62	64	.08	.79
NOV										
07...	20	1.0	1.7	9.6	.0	19	51	56	.07	.80
DEC										
05...	19	1.2	2.8	9.8	.1	18	58	57	.08	.91
JAN										
03...	11	.8	7.8	8.8	.1	13	43	47	.06	1.39
31...	22	1.4	3.4	13	.1	20	60	66	.08	.81
MAR										
06...	23	1.1	2.5	10	.1	20	54	62	.07	.60
APR										
10...	16	1.2	1.9	10	.0	15	52	49	.07	1.10
MAY										
08...	16	.8	3.7	9.1	.0	15	46	50	.06	.99
JUN										
05...	17	2.1	2.8	9.2	.0	17	46	53	.06	.77
15...	--	--	--	--	--	--	--	--	--	--
JUL										
17...	16	--	2.2	8.7	.0	17	42	50	.06	1.17
AUG										
14...	15	--	2.8	8.6	.0	15	46	47	.06	.99
SEP										
11...	17	--	4.0	8.9	.0	15	49	53	.07	.97

DATE	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,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)	NITRO- GEN, TOTAL (MG/L AS NO3)	PHOS- PHORUS, TOTAL (MG/L AS P)	PHOS- PHORUS, DIS- SOLVED (MG/L AS P)
OCT										
03...	.08	.03	--	--	--	--	--	--	.02	.02
NOV										
07...	.10	.01	--	--	--	--	--	--	.02	.01
DEC										
05...	.18	.00	--	--	--	.24	--	--	.01	.00
JAN										
03...	.16	.10	--	--	--	.90	--	--	.02	.02
31...	.17	.01	.04	.05	.00	.05	.22	.97	.03	.03
MAR										
06...	.08	.02	.00	.02	.00	--	.10	.40	.04	.04
APR										
10...	.05	.03	.28	.31	.10	.21	.36	1.6	.01	.00
MAY										
08...	.06	.00	.25	.25	.15	.10	.31	1.4	.03	.02
JUN										
05...	.06	.04	.12	.16	.00	.16	.22	.97	.01	.01
15...	.06	.01	.08	.09	--	.09	.15	.70	.02	.02
JUL										
17...	.05	.00	.17	.17	.00	.17	.22	.97	.02	.00
AUG										
14...	.08	.02	.09	.11	.03	.08	.19	.84	.02	.01
SEP										
11...	.06	.01	.62	.63	.15	.48	.69	3.1	.01	.00

16618000 KAHAKULOA STREAM NEAR HONOKOHAU--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	TIME	ARSENIC		ARSENIC		BARIUM,		BARIUM,		CADMIUM		CADMIUM	
		TOTAL (UG/L AS AS)	SUS- PENDE TOTAL (UG/L AS AS)	DIS- SOLVED (UG/L AS AS)	TOTAL RECOV- ERABLE (UG/L AS BA)	SUS- PENDE RECOV- ERABLE (UG/L AS BA)	DIS- SOLVED (UG/L AS BA)	TOTAL RECOV- ERABLE (UG/L AS CD)	SUS- PENDE RECOV- ERABLE (UG/L AS CD)	DIS- SOLVED (UG/L AS CD)			
NOV 07...	1200	1	0	1	400	400	0	<10	<9	1			
JAN 31...	0830	1	1	0	100	0	100	2	0	2			
APR 10...	1100	0	0	0	100	100	0	3	1	2			
JUL 17...	1200	4	3	1	200	0	200	--	--	--			

DATE	CHRO- MIUM, TOTAL RECOV- ERABLE (UG/L AS CR)	CHRO- MIUM, SUS- PENDE RECOV. (UG/L AS CR)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)	COBALT, TOTAL RECOV- ERABLE (UG/L AS CO)	COBALT, SUS- PENDE RECOV- ERABLE (UG/L AS CO)	COBALT, DIS- SOLVED (UG/L AS CO)	COPPER, TOTAL RECOV- ERABLE (UG/L AS CU)	COPPER, SUS- PENDE RECOV- ERABLE (UG/L AS CU)	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, TOTAL RECOV- ERABLE (UG/L AS FE)
NOV 07...	12	0	12	<50	<50	0	<10	<10	0	60
JAN 31...	0	0	0	1	0	1	7	7	0	150
APR 10...	0	0	0	3	3	0	5	5	0	30
JUL 17...	0	0	0	2	0	2	4	4	0	50

DATE	IRON, SUS- PENDE RECOV- ERABLE (UG/L AS FE)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, TOTAL RECOV- ERABLE (UG/L AS PB)	LEAD, SUS- PENDE 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- PENDE RECOV. (UG/L AS MN)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY TOTAL RECOV- ERABLE (UG/L AS HG)	MERCURY SUS- PENDE RECOV- ERABLE (UG/L AS HG)
NOV 07...	--	10	<100	<97	3	8	8	0	.0	.0
JAN 31...	--	10	31	0	31	0	0	0	.0	.0
APR 10...	--	30	59	50	9	0	0	0	.0	.0
JUL 17...	20	30	--	--	--	0	0	0	.0	.0

DATE	MERCURY DIS- SOLVED (UG/L AS HG)	SELE- NIUM, TOTAL (UG/L AS SE)	SELE- NIUM, SUS- PENDE TOTAL (UG/L AS SE)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	SILVER, TOTAL RECOV- ERABLE (UG/L AS AG)	SILVER, SUS- PENDE RECOV- ERABLE (UG/L AS AG)	SILVER, DIS- SOLVED (UG/L AS AG)	ZINC, TOTAL RECOV- ERABLE (UG/L AS ZN)	ZINC, SUS- PENDE RECOV- ERABLE (UG/L AS ZN)	ZINC, DIS- SOLVED (UG/L AS ZN)
NOV 07...	.0	1	0	1	<10	<10	0	10	6	4
JAN 31...	.0	0	0	0	2	2	0	20	20	0
APR 10...	.0	0	0	0	0	0	0	10	10	0
JUL 17...	.0	0	0	0	0	0	0	10	10	0

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

HAWAII, ISLAND OF MAUI

16618000 KAHAKULOA STREAM NEAR HONOKOHAU--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

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)	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					MAY				
03...	1130	.6	--	--	08...	1200	1.7	--	--
NOV					JUN				
07...	1200	.7	--	--	05...	1200	5.4	--	--
DEC					15...	1030	.6	--	--
05...	1135	--	3.0	.2	JUL				
JAN					17...	1200	--	.8	.0
03...	1100	1.2	--	--	AUG				
31...	0830	--	.8	.0	14...	1130	1.9	--	--
MAR					SEP				
06...	1100	.7	--	--	11...	1145	2.5	--	--
APR									
10...	1100	--	1.7	--					

DATE	TIME	PHYTO- PLANK- TON, TOTAL (CELLS PER ML)	PERI- PHYTON BIOMASS TOTAL DRY WEIGHT G/500 ML	PERI- PHYTON BIOMASS ASH WEIGHT G/500 ML	CHLOR-A PERI- PHYTON CHROMO- GRAPHIC FLUORESC (MG/M2)	CHLOR-B PERI- PHYTON CHROMO- GRAPHIC FLUORESC (MG/M2)	LENGTH OF EXPO- SURE (DAYS)
OCT							
03...	1130	860	--	--	.358	.046	34
NOV							
07...	1200	28	--	--	--	--	--
DEC							
05...	1135	75	--	--	--	--	--
JAN							
03...	1100	59	--	--	--	--	--
31...	0830	40	2.52	1.34	4.12	.710	28
MAR							
06...	1100	340	--	--	--	--	--
APR							
10...	1100	43	7.64	5.75	20.7	4.01	35
MAY							
08...	1200	29	--	--	--	--	--
JUN							
05...	1200	160	--	--	--	--	--
JUL							
17...	1200	57	1.02	.797	22.0	3.72	42

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	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						MAY					
03...	1130	4.7	1	.01	100	08...	1200	8.0	1	.02	100
NOV						JUN					
07...	1200	5.8	1	.02	100	05...	1200	6.2	3	.05	100
DEC						JUL					
05...	1135	5.8	1	.02	100	17...	1200	10	2	.06	100
JAN						AUG					
03...	1100	12	3	.10	100	14...	1130	8.0	1	.02	100
31...	0830	5.0	2	.03	100	SEP					
MAR						11...	1145	7.3	3	.06	100
06...	1100	4.1	1	.01	100						
APR											
10...	1100	7.8	2	.04	100						

16618000 KAHAKULOA STREAM NEAR HONOKOHAU--Continued

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA

PHYTOPLANKTON ANALYSES, OCTOBER 1977 TO JULY 1978

DATE TIME	OCT 3,77 1130	NOV 7,77 1200	DEC 5,77 1135	JAN 3,78 1100	JAN 31,78 0830					
TOTAL CELLS/ML	860	28	75	59	40					
DIVERSITY: DIVISION	0.7	0.0	0.4	0.0	0.7					
..CLASS	0.7	0.0	0.4	0.0	0.7					
...ORDER	0.7	0.0	0.4	0.0	0.7					
...FAMILY	1.0	0.7	2.6	0.0	0.7					
....GENUS	1.7	0.7	2.6	0.0	0.7					
ORGANISM	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT
CHLOROPHYTA (GREEN ALGAE)										
..CHLOROPHYCEAE										
...CHLOROCOCCALES										
...OOCYSTACEAE										
....ANKISTRODESMUS	--	-	--	-	6	8	--	-	--	-
...VOLVOCALES										
...CHLAMYDOMONADACEAE										
....CHLAMYDOMONAS	--	-	--	-	--	-	--	-	8#	20
CHRYSOPHYTA										
..BACILLARIOPHYCEAE										
...CENTRALES										
...COSCINODISCACEAE										
....MELOSIRA	--	-	--	-	--	-	--	-	--	-
...PENNALES										
...ACHNANTHACEAE										
....ACHNANTHES	5	1	--	-	--	-	--	-	--	-
....RHOICOSPHEA	43	5	5#	17	17#	23	--	-	32#	80
...CYMBELLACEAE										
....CYMBELLA	--	-	--	-	6	8	--	-	--	-
...DIATOMACEAE										
....DIATOMA	--	-	--	-	6	8	--	-	--	-
...FRAGILARIACEAE										
....SYNEDRA	--	-	--	-	6	8	--	-	--	-
...GOMPHONEMACEAE										
....GOMPHONEMA	43	5	24#	83	12#	15	--	-	--	-
...NAVICULACEAE										
....NAVICULA	27	3	--	-	23#	31	59#	100	--	-
...NITZSCHACEAE										
....NITZSCHIA	32	4	--	-	--	-	--	-	--	-
CYANOPHYTA (BLUE-GREEN ALGAE)										
..CYANOPHYCEAE										
...HORMOGONALES										
...OSCILLATORIACEAE										
....LYNGBYA	160#	19	--	-	--	-	--	-	--	-
....OSCILLATORIA	550#	64	--	-	--	-	--	-	--	-

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 1977 TO JULY 1978

DATE TIME	MAR 6, 78 1100	APR 10, 78 1100	MAY 8, 78 1200	JUN 5, 78 1200	JUL 17, 78 1200	
TOTAL CELLS/ML	340	43	29	160	57	
DIVERSITY: DIVISION	0.0	0.0	0.0	0.0	0.0	
..CLASS	0.0	0.0	0.0	0.0	0.0	
...ORDER	0.8	0.0	0.0	0.0	0.0	
....FAMILY	1.9	0.9	1.0	1.6	0.0	
.....GENUS	1.9	0.9	1.0	1.6	0.0	
ORGANISM	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT
CHLOROPHYTA (GREEN ALGAE)						
..CHLOROPHYCEAE						
...CHLOROCOCCALES						
...DOCYSTACEAE						
....ANKISTRODESMUS	--	-	--	-	--	-
..VOLVOCALES						
...CHLAMYDOMONADACEAE						
....CHLAMYDOMONAS	--	-	--	-	--	-
CHRYSOPHYTA						
..BACILLARIOPHYCEAE						
...CENTRALES						
...COSCINODISCACEAE						
....MELOSIRA	94#	27	--	-	--	-
..PENNALES						
...ACHNANTHACEAE						
....ACHNANTHES	--	-	--	-	--	-
....RHOICOSPHEA	--	-	28#	67	67#	43
...CYMBELLACEAE						
....CYMBELLA	--	-	--	-	--	-
...DIATOMACEAE						
....DIATOMA	16	5	--	-	--	-
...FRAGILARIACEAE						
....SYNEDRA	--	-	--	-	--	-
...GOMPHONEMACEAE						
....GOMPHONEMA	160#	45	--	-	45#	29
...NAVICULACEAE						
....NAVICULA	63#	18	--	-	45#	29
...NITZSCHIACEAE						
....NITZSCHIA	16	5	14#	33	--	-
CYANOPHYTA (BLUE-GREEN ALGAE)						
..CYANOPHYCEAE						
...HORMOGONALES						
...OSCILLATORIACEAE						
....LYNGBYA	--	-	--	-	--	-
....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.

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.--62 years (water years, 1914-19, 1923-78), 39.0 ft³/s (1.104 m³/s), 28,260 acre-ft/yr (34.8 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,740 ft³/s (106 m³/s) Dec. 14, 1942, Aug. 30, 1957, gage height, 8.40 ft (2.560 m), from rating curve extended above 547 ft³/s (15.5 m³/s); minimum, 8.4 ft³/s (0.24 m³/s) May 1, 1945, Jan. 5, 1946.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 963 ft³/s (27.3 m³/s) May 5, gage height, 5.15 ft (1.570 m), from rating curve extended above 547 ft³/s (15.5 m³/s), no peak above base of 1,100 ft³/s (31.2 m³/s); minimum, 12 ft³/s (0.34 m³/s) many days in February and March.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	15	66	13	81	13	83	38	21	24	22	48	27
2	15	117	13	83	13	18	40	24	22	47	22	24
3	19	198	15	19	13	13	20	15	15	55	33	23
4	16	41	22	15	12	12	14	14	15	63	31	48
5	17	21	15	14	12	12	13	178	15	39	43	53
6	16	17	13	14	12	13	21	83	15	275	57	23
7	15	16	16	14	12	13	125	21	14	40	280	42
8	15	16	14	14	13	120	26	19	27	36	90	24
9	15	15	13	13	13	51	15	18	18	29	25	21
10	14	15	14	13	12	16	18	15	15	20	22	46
11	14	15	13	13	12	17	15	38	24	51	45	24
12	14	14	13	13	12	15	15	30	21	92	38	27
13	17	14	13	13	24	14	95	64	17	31	44	24
14	15	36	16	13	21	12	91	139	29	20	25	28
15	14	30	13	13	13	13	68	77	18	19	21	22
16	37	17	49	14	13	132	20	93	31	19	101	83
17	24	15	184	14	12	19	16	27	52	24	50	76
18	15	14	220	13	12	125	14	17	53	157	49	28
19	14	14	56	13	13	35	13	16	106	38	25	34
20	17	14	18	16	12	57	15	15	159	37	24	26
21	16	14	42	40	12	27	28	16	26	31	226	23
22	35	14	19	17	12	19	13	16	21	22	58	29
23	19	13	15	14	30	16	14	35	71	21	40	22
24	167	13	14	14	13	14	32	17	47	19	34	23
25	44	13	14	14	12	13	21	36	29	26	47	22
26	21	13	15	25	12	33	30	39	53	34	39	20
27	17	13	14	17	12	15	61	22	51	37	41	20
28	39	13	14	15	16	22	36	16	182	29	25	20
29	29	13	13	19	---	15	52	22	27	46	27	21
30	18	13	13	14	---	23	20	16	24	25	44	21
31	35	---	22	13	---	13	---	17	---	21	23	---
TOTAL	778	837	938	617	388	1000	999	1176	1221	1425	1677	924
MEAN	25.1	27.9	30.3	19.9	13.9	32.3	33.3	37.9	40.7	46.0	54.1	30.8
MAX	167	198	220	83	30	132	125	178	182	275	280	83
MIN	14	13	13	13	12	12	13	14	14	19	21	20
AC-FT	1540	1660	1860	1220	770	1980	1980	2330	2420	2830	3330	1830

CAL YR 1977 TOTAL 11793 MEAN 32.3 MAX 303 MIN 11 AC-FT 23390
WTR YR 1978 TOTAL 11980 MEAN 32.8 MAX 280 MIN 12 AC-FT 23760

HAWAII, ISLAND OF MAUI

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 Kelaweia, 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 (WATER YEARS).--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.--15 years (water years 1964-78), 3.29 ft³/s (0.093 m³/s), 2,380 acre-ft/yr (2.93 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, 420 ft³/s (11.9 m³/s) Mar. 9, gage height, 6.90 ft (2.103 m), no 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 1977 TO SEPTEMBER 1978
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	.01	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
3	.00	4.9	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
4	.00	.20	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
5	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
6	.00	.00	.00	.00	.00	.00	.00	.00	.00	.71	.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	2.1	.00	.00	.00	.00	.00	.00
10	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
11	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
12	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
13	.00	.00	.00	.00	.00	.00	.00	.04	.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	.13	.00	.00	2.2	.00	.00	.00	.00	.00	.00
17	.00	.00	3.4	.00	.00	.00	.00	.00	.00	.00	.00	.00
18	.00	.00	1.2	.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	.86	.00	.00	.00
21	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	5.2	.00
22	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
23	.00	.00	.00	.00	.00	.00	.00	.00	2.1	.00	.00	.00
24	.73	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
25	.13	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
26	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
27	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
28	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
29	.00	.00	.00	.00	---	.00	.00	.00	.00	.00	.00	.00
30	.00	.00	.00	.00	---	.00	.00	.00	.00	.00	.00	.00
31	.00	---	.00	.00	---	.00	---	.00	---	.00	.00	---
TOTAL	.86	5.11	4.73	.00	.00	4.30	.00	.04	2.96	.71	5.20	.00
MEAN	.028	.17	.15	.000	.000	.14	.000	.001	.099	.023	.17	.000
MAX	.73	4.9	3.4	.00	.00	2.2	.00	.04	2.1	.71	5.2	.00
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	1.7	10	9.4	.00	.00	8.5	.00	.08	5.9	1.4	10	.00

CAL YR 1977 TOTAL 270.43 MEAN .74 MAX 52 MIN .00 AC-FT 536
WTR YR 1978 TOTAL 23.91 MEAN .066 MAX 5.2 MIN .00 AC-FT 47

HAWAII, ISLAND OF HAWAII

179

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 (FISCAL YEARS).--WSP 2137: 1939(M), 1942(M), 1944-45(M), 1947(M), 1949(P), 1950-51(M), 1952-53(P), 1955(P), 1956(M), 1957-58(P), 1960(M).

GAGE.--Water-stage recorder and combined Parshall flume and concrete-weir control. Datum of gage is 1,934 ft (589 m) above mean sea level (by stadia survey). Prior to Jan. 21, 1938, at datum 0.23 ft (0.070 m) lower.

REMARKS.--Records good. No diversion above station. Large part of flow comes from 3 tunnels. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--48 years, 11.9 ft³/s (0.337 m³/s), 8,620 acre-ft/yr (10.6 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, 72 ft³/s (2.04 m³/s) Apr. 17, gage height, 3.18 ft (0.969 m), from rating curve extended above 160 ft³/s (4.53 m³/s), no peak above base of 100 ft³/s (2.83 m³/s); minimum, 0.20 ft³/s (0.006 m³/s) Jan. 17-19, Feb. 12, Mar. 6.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.0	12	4.6	.75	.75	.32	6.7	10	16	16	17	13
2	4.3	14	4.3	.65	.70	.32	6.7	13	16	16	16	13
3	4.0	16	4.1	.60	.60	.32	6.6	12	15	16	16	12
4	4.1	16	3.9	.65	.56	.28	6.3	11	14	16	16	12
5	3.8	15	3.7	.52	.52	.24	6.2	10	14	15	15	11
6	3.5	15	3.5	.44	.40	.20	7.7	9.6	13	36	14	11
7	3.5	14	3.3	.36	.36	.24	16	8.8	12	31	16	10
8	3.2	13	3.0	.32	.32	.60	14	8.2	11	32	17	9.6
9	3.0	12	2.8	.32	.24	1.1	13	7.6	10	31	16	9.6
10	3.0	11	2.5	.28	.20	.36	12	7.1	9.7	28	17	9.0
11	2.8	11	2.4	.28	.24	1.0	12	6.9	9.3	27	17	8.2
12	2.9	9.7	2.0	.28	.20	1.3	12	6.7	8.9	28	17	7.8
13	2.5	8.8	2.0	.28	.24	1.2	12	6.2	8.3	28	17	8.1
14	2.4	8.7	1.7	.28	.40	7.0	12	6.0	8.1	26	16	7.5
15	2.8	13	1.7	.24	.32	4.0	12	6.9	7.7	24	15	7.0
16	4.6	13	1.7	.24	.32	4.9	15	7.8	7.9	21	17	6.6
17	10	12	2.5	.24	1.2	4.5	20	8.1	8.1	19	24	6.3
18	7.1	12	3.0	.20	.65	6.0	18	7.8	11	18	19	6.2
19	6.0	11	3.5	.20	.36	7.7	17	7.9	19	18	18	6.9
20	5.4	10	2.4	.32	.36	9.3	16	7.6	17	24	17	8.8
21	6.5	9.3	2.1	2.9	.32	8.7	15	8.4	17	23	19	9.9
22	10	8.7	2.0	1.0	.32	9.2	13	9.6	17	24	18	9.9
23	9.3	8.1	1.7	.48	.80	8.9	12	11	22	21	18	9.2
24	9.3	7.5	1.6	.60	.40	8.9	12	12	23	20	17	8.5
25	9.4	6.9	1.4	.52	.36	8.7	11	14	23	18	18	7.9
26	10	6.3	1.3	2.0	.32	8.2	11	16	23	17	17	7.2
27	12	5.7	1.2	1.4	.32	7.9	11	16	21	17	17	6.9
28	13	5.4	1.1	1.1	.32	7.7	11	16	20	17	16	6.5
29	13	5.1	1.0	1.1	---	7.2	9.8	16	18	18	16	6.3
30	13	4.8	.90	.95	---	6.9	11	17	17	17	14	6.0
31	12	---	.80	.85	---	6.6	---	16	---	18	13	---
TOTAL	200.4	315.0	73.70	20.35	12.10	139.78	358.0	321.2	437.0	680	520	261.9
MEAN	6.46	10.5	2.38	.66	.43	4.51	11.9	10.4	14.6	21.9	16.8	8.73
MAX	13	16	4.6	2.9	1.2	9.3	20	17	23	36	24	13
MIN	2.4	4.8	.80	.20	.20	.20	6.2	6.0	7.7	15	13	6.0
AC-FT	397	625	146	40	24	277	710	637	867	1350	1030	519
CAL YR 1977 TOTAL	4323.44			MEAN 11.8	MAX 62	MIN .20	AC-FT 8580					
WTR YR 1978 TOTAL	3339.43			MEAN 9.15	MAX 36	MIN .20	AC-FT 6620					

HAWAII, ISLAND OF HAWAII

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

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 43 ft³/s (1.22 m³/s) Jan. 8, 1975; minimum daily, 0.55 ft³/s (0.016 m³/s) Feb. 12, Sept. 8, 9, 1978.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	9.0	14	6.2	2.6	7.4	2.6	10	12	14	14	13	12
2	8.6	15	6.0	2.6	4.0	2.6	10	13	14	14	13	12
3	8.2	17	5.7	2.8	1.5	2.5	11	16	14	13	12	12
4	8.4	19	5.4	2.9	1.5	2.4	12	16	14	14	12	12
5	8.6	18	5.1	3.0	1.5	2.3	11	16	13	14	12	11
6	8.8	16	4.9	2.8	1.4	2.1	12	15	13	18	12	11
7	8.4	14	4.6	2.6	1.4	2.1	15	14	12	24	6.8	6.7
8	8.4	12	4.1	2.5	1.2	2.2	18	13	12	21	5.9	.55
9	8.6	11	3.8	2.4	.96	3.4	17	12	11	18	10	.55
10	8.6	10	3.5	2.4	.80	4.6	15	12	11	17	8.6	.70
11	9.2	9.8	3.4	2.2	.60	4.6	14	11	11	16	9.5	.75
12	9.2	9.4	3.2	2.1	.55	5.4	12	11	11	17	7.1	5.0
13	10	9.0	2.9	2.1	.80	8.0	12	10	11	18	6.7	8.4
14	10	9.0	2.8	2.0	1.3	10	13	10	11	18	8.1	8.4
15	9.4	9.6	2.6	2.0	1.9	12	14	10	11	16	6.6	8.4
16	9.4	14	2.6	2.0	3.6	12	14	11	11	15	5.7	8.4
17	16	16	3.4	2.0	3.2	13	18	14	12	14	12	8.2
18	18	14	4.6	1.9	3.0	12	20	14	13	14	12	8.2
19	15	12	5.5	1.9	3.0	13	18	14	17	14	10	8.2
20	13	11	5.9	1.9	2.9	14	15	13	18	14	6.6	7.4
21	12	10	5.7	4.1	2.9	14	13	14	17	18	7.4	6.9
22	14	9.6	5.4	8.4	2.6	15	12	16	16	20	11	7.1
23	16	9.2	4.9	10	2.8	14	12	16	20	18	11	7.1
24	15	9.0	4.6	9.0	3.5	14	11	18	21	16	8.4	6.9
25	15	8.4	4.0	8.2	3.4	12	11	18	19	15	6.6	6.6
26	15	8.0	3.8	8.2	3.0	12	11	18	17	8.1	6.0	6.4
27	18	7.4	3.5	8.8	2.9	12	11	17	16	2.9	5.4	6.4
28	18	7.1	3.2	9.4	2.6	11	12	16	15	7.3	3.8	6.2
29	17	6.7	3.0	9.0	---	11	12	16	15	10	2.8	6.2
30	16	6.4	2.9	8.6	---	10	12	16	14	12	4.0	6.2
31	15	---	2.6	8.0	---	10	---	15	---	11	7.4	---
TOTAL	375.8	341.6	129.8	138.4	66.21	265.8	398	437	424	461.3	263.4	215.85
MEAN	12.1	11.4	4.19	4.46	2.36	8.57	13.3	14.1	14.1	14.9	8.50	7.20
MAX	18	19	6.2	10	7.4	15	20	18	21	24	13	12
MIN	8.2	6.4	2.6	1.9	.55	2.1	10	10	11	2.9	2.8	.55
AC-FT	745	678	257	275	131	527	789	867	841	915	522	428
CAL YR 1977	TOTAL	5016.30	MEAN	13.7	MAX	31	MIN	2.1	AC-FT	9950		
WTR YR 1978	TOTAL	3517.16	MEAN	9.64	MAX	24	MIN	.55	AC-FT	6980		

HAWAII, ISLAND OF HAWAII

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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).

WATER-DISCHARGE RECORDS

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

GAGE.--Water-stage recorder. Altitude of gage is 4,250 ft (1,295 m), from topographic map.

REMARKS.Records good except those above 40 ft³/s (1.13 m³/s), which are fair. No diversion above station.

AVERAGE DISCHARGE.--13 years, 2.87 ft³/s (0.081 m³/s), 2,080 acreft/yr (2.56 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,180 ft³/s (90.1 m³/s) Nov. 20, 1973, gage height, 11.00 ft (3.353 m), from rating curve extended above 18 ft³/s (0.51 m³/s); no flow at times in 1965, 1969-78.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 31 ft³/s (0.88 m³/s) July 6, gage height, 3.23 ft (0.984 m), no peak above base of 310 ft³/s (8.78 m³/s); no flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.01	.11	.00	.00	.00	.00	.01	.15	.30	.54	.54	.54
2	.01	.15	.00	.00	.00	.00	.01	.24	.30	.54	.51	.54
3	.02	.18	.00	.00	.00	.00	.09	.18	.36	.60	.51	.51
4	.02	.21	.00	.00	.00	.00	.01	.46	.30	.60	.54	.48
5	.02	.11	.00	.00	.00	.00	.01	.51	.30	.54	.51	.48
6	.01	.07	.00	.00	.00	.00	.10	.27	.30	1.5	.51	.45
7	.01	.05	.00	.00	.00	.00	.72	.18	.33	2.2	.93	.45
8	.02	.05	.00	.00	.00	.00	.48	.15	.30	1.2	3.0	.45
9	.01	.04	.00	.00	.00	.00	.18	.15	.30	.88	.72	.45
10	.01	.03	.00	.00	.00	.00	.09	.13	.30	.76	.60	.54
11	.01	.03	.00	.00	.00	.00	.05	.13	.33	.72	.60	.45
12	.04	.03	.00	.00	.00	.00	.04	.15	.30	.80	.60	.45
13	.05	.03	.00	.00	.00	.00	.07	.13	.36	.76	.64	.45
14	.03	.05	.00	.00	.00	.68	.24	.15	.39	.64	.60	.45
15	.01	.15	.00	.00	.00	.03	.18	.24	.33	.60	.57	.42
16	.19	.18	.00	.00	.00	.01	.21	.24	.36	.60	.60	.39
17	.45	.09	.03	.00	.00	.01	.15	.24	.42	.57	.68	.48
18	.15	.04	.03	.00	.00	.01	.13	.24	.45	.57	.57	.48
19	.07	.03	.01	.00	.00	.01	.11	.18	1.1	.54	.57	.64
20	.04	.03	.00	.00	.00	.03	.09	.21	.60	.92	.57	.54
21	.05	.03	.00	.00	.00	.07	.07	.30	.60	.92	1.0	.68
22	.21	.03	.00	.00	.00	.18	.07	.24	.72	.60	.64	.60
23	.11	.02	.00	.00	.00	.11	.07	.60	1.4	.60	.57	.54
24	.09	.01	.00	.00	.00	.05	.07	.42	.88	.54	.57	.51
25	.18	.01	.00	.00	.00	.01	.09	.39	.64	.57	.57	.48
26	.13	.01	.00	.00	.00	.01	.15	.39	.60	.57	.57	.45
27	.21	.01	.00	.00	.00	.00	.21	.45	.57	.54	.54	.42
28	.13	.01	.00	.00	.00	.00	.13	.42	.72	.54	.54	.42
29	.15	.01	.00	.00	---	.00	.24	.39	.57	.60	.54	.39
30	.09	.01	.00	.00	---	.00	.27	.36	.54	.60	.60	.39
31	.09	---	.00	.00	---	.00	---	.39	---	.57	.54	---
TOTAL	2.62	1.81	.07	.00	.00	1.21	4.34	8.69	15.15	36.23	21.05	14.52
MEAN	.085	.060	.002	.000	.000	.039	.14	.28	.51	1.17	.68	.43
MAX	.45	.21	.03	.00	.00	.68	.72	.60	1.4	1.5	3.0	.68
MIN	.01	.01	.00	.00	.00	.00	.01	.13	.30	.54	.51	.39
AC-FT	5.2	3.6	.1	.00	.00	2.4	8.6	17	30	72	42	29

CAL YR 1977 TOTAL 1133.20 MEAN 3.10 MAX 150 MIN .00 AC-FT 2250
WTR YR 1978 TOTAL 105.68 MEAN .29 MAX 15 MIN .00 AC-FT 210

HAWAII, ISLAND OF HAWAII

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 Waipahoe Gulch and 8.4 mi (13.5 km) west of Kaumana.

DRAINAGE AREA.--43.4 mi² (112.4 km²).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1966 to current year.

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 3,520 ft (1,073 m), from topographic map.

REMARKS.--Records good except those for period of no gage-height record, which are fair. No diversion above station. Recording rain gage located at station.

AVERAGE DISCHARGE.--12 years, 27.9 ft³/s (0.790 m³/s), 20,210 acre-ft/yr (24.9 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 9,580 ft³/s (271 m³/s) Aug. 8, 1967, gage height, 13.35 ft (4.069 m), from rating curve extended above 2,200 ft³/s (62.3 m³/s); no flow Mar. 13, 14, 1970, Jan. 13-18, Feb. 6, 7, 12, 13, 25-28, Mar. 1, 2, 4-8, 1978.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 754 ft³/s (21.4 m³/s) July 6, gage height 4.81 ft (1.466 m), from rating curve extended above 2,200 ft³/s (62.3 m³/s), no peak above base of 1,500 ft³/s (42.5 m³/s); no flow for several days January to March.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.85	3.8	.55	.31	.04	.00	1.7	4.5	5.1	15	9.0	4.0
2	.94	5.7	.55	.46	.05	.00	2.0	5.0	7.6	20	8.0	3.5
3	1.0	6.6	.55	.28	.04	.01	4.1	3.4	4.4	25	7.0	3.0
4	1.1	5.7	.52	.31	.02	.00	1.6	41	3.4	30	8.0	2.5
5	1.4	3.5	.52	.22	.01	.00	1.7	19	2.7	25	7.0	2.0
6	.97	2.8	.52	.13	.00	.00	5.4	6.5	2.4	150	6.0	2.0
7	.91	2.5	.43	.11	.00	.00	59	4.4	2.5	40	20	1.6
8	.97	2.5	.43	.06	.01	.00	15	3.8	2.4	24	15	1.7
9	.85	1.8	.40	.05	.01	.63	6.3	4.0	2.1	17	12	1.6
10	.82	1.5	.37	.04	.01	.28	3.8	2.6	2.1	13	10	9.7
11	.97	1.0	.37	.02	.02	.62	2.7	2.4	1.6	12	8.0	2.2
12	2.0	1.0	.34	.02	.00	1.1	2.2	2.0	1.7	20	7.0	1.8
13	3.0	3.0	.34	.00	.00	.67	2.5	1.7	2.7	17	9.0	2.0
14	1.1	7.0	.37	.00	.04	42	8.8	1.7	2.6	12	8.0	2.3
15	.82	10	.34	.00	.67	2.4	4.1	2.4	2.2	9.2	7.0	1.7
16	8.4	5.0	.31	.00	.28	2.3	6.6	3.1	2.3	7.2	15	1.2
17	16	4.0	.82	.00	.09	2.0	6.9	3.0	3.4	6.3	50	1.5
18	2.7	3.5	.73	.00	.11	1.6	4.9	2.2	3.8	5.4	10	1.4
19	1.6	3.0	.58	.01	.11	2.3	4.6	2.2	54	4.7	9.0	8.5
20	1.3	2.5	.37	.03	.13	2.3	3.1	2.2	16	37	8.0	2.6
21	6.5	2.0	.34	.80	.13	3.7	2.5	9.1	13	32	30	8.1
22	6.6	1.5	.34	.67	.06	8.3	2.4	4.1	20	12	15	4.4
23	3.4	1.0	.29	.22	.04	4.9	2.2	25	70	8.5	10	4.5
24	4.0	1.0	.28	.19	.02	3.0	2.0	10	21	6.3	8.0	4.0
25	5.4	.90	.25	.37	.00	2.1	2.5	7.6	11	7.6	7.0	3.5
26	4.6	.80	.22	.43	.00	1.7	3.0	8.5	10	7.0	6.5	3.0
27	6.3	.70	.19	.61	.00	1.5	4.0	11	10	5.5	6.0	2.5
28	3.7	.65	.19	.22	.00	1.3	3.5	8.5	20	5.2	5.5	2.0
29	4.6	.65	.19	.13	---	1.2	7.0	6.8	15	8.3	5.0	1.5
30	3.4	.60	.19	.11	---	1.1	6.0	5.2	15	8.0	8.0	1.0
31	3.5	---	.19	.09	---	1.1	---	5.1	---	8.5	6.0	---
TOTAL	99.70	86.20	12.07	5.89	1.91	88.11	182.1	217.8	330.0	598.7	340.0	91.3
MEAN	3.22	2.87	.39	.19	.068	2.84	6.07	7.03	11.0	19.3	11.0	3.04
MAX	16	10	.82	.80	.67	42	59	41	70	150	50	9.7
MIN	.82	.60	.19	.00	.00	.00	1.6	1.7	1.6	4.7	5.0	1.0
AC-FT	198	171	24	12	3.8	175	761	432	655	1190	674	181

CAL YR 1977 TOTAL 10044.34 MEAN 27.5 MAX 948 MIN .04 AC-FT 19920
WTR YR 1978 TOTAL 2053.78 MEAN 5.63 MAX 150 MIN .00 AC-FT 4070

NOTE.--No gage-height record July 3 to Sept. 6.

HAWAII, ISLAND OF HAWAII

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16704000 WAILUKU RIVER AT PIIHONUA
(National stream-quality accounting network station)

LOCATION (REVISED).--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.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--July 1928 to July 1940, October 1940 to December 1947, April 1948 to current year. Monthly discharge only July 1928, published in WSP 1319. Prior to July 1960, published as "above Hilo Boarding School ditch intake, near Hilo."

REVISED RECORDS (FISCAL YEARS).--WSP 865: 1929-36(M). WSP 965: 1941.

GAGE.--Water-stage recorder. Altitude of gage is 1,090 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.

AVERAGE DISCHARGE.--47 years (water years, 1929-39, 1942-47, 1949-78), 284 ft³/s (8.043 m³/s), 205,800 acre-ft/yr (254 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 63,400 ft³/s (1,800 m³/s) Aug. 11, 1940, gage height, 28.6 ft (8.72 m), from floodmarks, from rating curve extended above 11,000 ft³/s (312 m³/s); minimum, 0.25 ft³/s (0.007 m³/s) Mar. 9, 1941.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 10,500 ft³/s (297 m³/s) May 23, gage height, 15.60 ft (4.755 m), no other peak above base of 8,700 ft³/s (246 m³/s); minimum, 1.2 ft³/s (0.034 m³/s) Jan. 16, 19.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	25	134	14	4.4	8.0	4.6	57	121	129	115	253	175
2	40	312	13	5.6	7.2	4.2	85	241	194	118	176	150
3	50	351	10	6.8	6.2	3.7	183	151	116	172	136	125
4	59	344	8.6	7.1	5.2	2.8	75	422	92	244	228	120
5	61	184	8.6	7.2	4.9	2.7	77	321	74	188	145	110
6	37	135	8.1	5.3	5.1	2.4	191	139	62	3260	119	90
7	35	104	6.9	3.9	4.7	2.2	1330	90	53	955	281	80
8	50	86	6.5	3.4	4.2	8.3	635	65	49	695	716	100
9	34	71	5.7	3.1	4.7	30	288	60	44	433	278	95
10	218	58	5.6	2.7	4.6	10	166	40	40	338	259	231
11	89	55	6.1	2.4	4.2	16	115	40	37	312	246	91
12	103	50	6.1	2.8	3.7	80	87	35	45	683	230	75
13	102	43	5.7	3.1	3.6	35	119	35	73	606	334	81
14	54	116	6.2	2.6	14	632	400	20	56	377	275	79
15	49	270	7.6	2.7	23	110	150	70	66	252	192	66
16	191	305	7.6	2.2	20	220	300	119	93	196	417	40
17	619	126	35	2.0	8.0	199	700	125	103	158	1040	35
18	186	86	34	1.9	7.0	173	375	93	173	135	780	45
19	114	69	42	1.8	5.5	265	288	65	1060	159	237	154
20	87	60	20	9.5	7.4	300	173	45	379	641	190	85
21	143	50	13	140	6.8	277	130	200	317	989	854	264
22	399	35	9.4	74	5.8	453	106	150	668	568	408	162
23	219	30	7.3	27	27	272	84	1010	1630	346	338	112
24	141	25	6.4	23	18	169	70	343	626	238	253	83
25	248	20	6.8	30	10	123	74	320	366	210	235	50
26	244	26	6.0	44	7.2	100	118	331	247	198	250	45
27	434	24	5.0	48	5.5	60	97	330	188	168	225	40
28	244	20	3.9	28	4.8	40	143	258	241	181	200	35
29	248	20	3.9	23	---	30	95	241	173	380	200	25
30	174	16	4.7	19	---	25	173	172	130	341	400	20
31	146	---	4.6	13	---	30	---	151	---	314	150	---
TOTAL	4843	3225	328.3	549.5	236.3	3679.9	6884	5803	7524	13970	10045	2863
MEAN	156	108	10.6	17.7	8.44	119	229	187	251	451	324	95.4
MAX	619	351	42	140	27	632	1330	1010	1630	3260	1040	264
MIN	25	16	3.9	1.8	3.6	2.2	57	20	37	115	119	20
AC-FT	9610	6400	651	1090	469	7300	13650	11510	14920	27710	19920	5680
CAL YR 1977	TOTAL	106988.4	MEAN	293	MAX	5400	MIN	2.0	AC-FT	212200		
WTR YR 1978	TOTAL	59951.0	MEAN	164	MAX	3260	MIN	1.8	AC-FT	118900		

HAWAII, ISLAND OF HAWAII
16704000 WAILUKU RIVER AT PIIHONUA--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1972-74, 1975 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: May 1975 to current year.

WATER TEMPERATURES: May 1975 to current year.

INSTRUMENTATION.--Water-quality monitor since May 1975.

REMARKS.--Interruptions in the daily records were due to malfunctions of the instrument. No record Oct. 1 to Nov. 13, Mar. 25-28, Apr. 8 to June 8, June 19-21, 24-26, 31, Aug. 21 to Sept. 7. 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 recorded, 69 micromhos/cm Sept. 8, 1978; minimum recorded, 10 micromhos/cm Mar. 14, 1978.

WATER TEMPERATURE: Maximum recorded, 24.5°C Feb. 23, 1977; minimum recorded, 14.5°C Mar. 20, 21, 1977.

EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: Maximum recorded, 69 micromhos/cm Sept. 8; minimum recorded, 10 micromhos/cm Mar. 14.

WATER TEMPERATURE: Maximum recorded, 24.0°C July 2; minimum recorded, 16°C Dec. 24, Mar. 17.

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH (UNITS)	TEMPER- ATURE (DEG C)	COLOR (PLAT- INUM- COBALT UNITS)	TUR- BID- ITY (JTU)	TUR- BID- ITY (NTU)	OXYGEN, DIS- SOLVED (MG/L)	COLI- FORM, TOTAL, IMMED. (COLS. PER 100 ML)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)
OCT											
25...	0900	290	35	7.3	17.0	--	1	--	9.2	--	65
NOV											
28...	1015	20	43	7.2	18.0	--	4	--	8.8	160	20
29...	1200	--	40	7.2	18.5	5	1	--	--	--	--
DEC											
13...	0915	6.6	60	7.2	19.0	--	1	--	8.4	--	17
13...	1000	6.6	60	7.2	19.0	--	--	--	--	--	--
JAN											
25...	0845	32	44	6.7	17.5	--	1	--	9.0	--	58
FEB											
27...	1330	5.0	46	7.0	19.0	--	1	--	8.8	--	78
MAR											
28...	0945	51	36	6.7	19.0	--	1	--	9.0	--	K7
APR											
25...	0830	73	40	7.1	17.0	--	0	--	9.0	--	24
MAY											
09...	1830	74	40	7.1	19.0	--	--	--	--	--	--
23...	0845	99	28	7.0	17.0	--	--	.30	8.8	--	17
JUN											
12...	1000	41	39	7.3	20.0	--	0	--	8.8	--	29
JUL											
28...	0900	176	37	7.1	17.5	--	--	.30	8.6	330	35
AUG											
29...	1345	190	34	7.2	19.5	--	--	.50	8.7	--	K10
SEP											
12...	1330	72	33	7.0	20.5	--	--	1.7	9.1	370	87
12...	1345	72	33	7.0	20.5	13	--	1.8	--	--	--

K Results based on colony count outside the acceptable range (non-ideal colony count).

16704000 WAILUKU RIVER AT PIIHONUA--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	STREP- TOCOCCT FECAL, KF AGAR (COLS. PER 100 ML)	HARD- NESS (MG/L AS CAC03)	HARD- NESS, NONCAR- BONATE (MG/L AS CAC03)	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM AD- SORP- TION RATIO	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	BICAR- BONATE (MG/L AS HC03)	CAR- BONATE (MG/L AS C03)
OCT 25...	K780	12	2	3.5	.9	2.6	30	.3	.6	13	0
NOV 28... 29...	K630 --	16 --	0 --	3.6 --	1.6 --	3.3 --	30 --	.4 --	.7 --	22 22	0 0
DEC 13... 13...	>500 --	19 --	0 --	4.4 --	1.9 --	3.8 --	29 --	.4 --	.9 --	25 --	0 --
JAN 25...	800	13	1	3.1	1.3	3.3	34	.4	.7	15	0
FEB 27...	250	16	0	3.9	1.6	3.1	28	.3	.7	21	0
MAR 28...	54	11	2	2.4	1.3	2.0	27	.3	.3	12	0
APR 25...	480	13	0	3.4	1.0	2.7	31	.3	.5	17	0
MAY 08... 23...	-- 720	-- 14	-- 3	-- 3.5	-- 1.2	-- 3.0	-- 32	-- .4	-- .4	-- --	-- --
JUN 12...	270	15	1	2.6	2.0	2.7	28	.3	.4	17	0
JUL 28...	K470	12	1	2.8	1.1	2.9	34	.4	.6	--	--
AUG 29...	320	10	0	2.4	.9	2.9	38	.4	.5	--	--
SEP 12... 12...	450 --	10 --	1 --	2.0 --	1.2 --	2.3 --	32 --	.3 --	.4 --	-- --	-- --

DATE	ALKA- LITY (MG/L AS CAC03)	CARRON DIOXIDE DIS- SOLVED (MG/L AS C02)	SULFATE DIS- SOLVED (MG/L AS S04)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	SILICA, DIS- SOLVED (MG/L AS SI02)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L)	SOLIDS, DIS- SOLVED (TONS PER DAY)	SOLIDS, RESIDUE AT 105 DEG. C, SUS- PENDE (MG/L)
OCT										
25...	11	1.0	6.8	2.7	.0	11	34	35	26.6	--
NOV										
28...	18	2.2	2.5	2.9	.1	17	53	43	2.86	--
29...	18	2.2	--	--	--	--	--	--	--	3
DEC										
13...	21	2.5	3.2	3.7	.0	22	47	52	.84	--
13...	--	--	--	--	--	--	--	--	--	--
JAN										
25...	12	4.8	4.8	4.1	.1	15	37	40	3.20	--
FEB										
27...	17	3.4	3.9	3.3	.1	17	28	44	.78	--
MAR										
28...	10	3.8	1.2	3.1	.0	8.2	25	25	3.44	--
APR										
25...	14	2.2	1.5	2.5	.1	14	32	34	6.31	--
MAY										
08...	--	--	--	--	--	--	--	--	--	--
23...	11	--	3.1	2.8	.1	13	28	47	7.48	--
JUN										
12...	14	1.4	5.5	2.9	.0	12	25	37	2.77	--
JUL										
28...	11	--	3.2	2.6	.1	12	33	32	15.7	--
AUG										
29...	11	--	1.8	2.7	.1	13	29	31	14.9	--
SEP										
12...	9	--	2.7	5.6	.0	10	26	30	5.05	--
12...	12	--	--	--	--	--	--	--	--	2

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

K Results based on colony count outside the acceptable range (non-ideal colony count).

HAWAII, ISLAND OF HAWAII
16704000 WAILUKU RIVER AT PIIHONUA--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	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,NH4 + ORG. SUSP. TOTAL (MG/L AS N)	NITRO- GEN,AM- MONIA + ORGANIC DIS. TOTAL (MG/L AS N)	NITRO- GEN, TOTAL (MG/L AS N)	NITRO- GEN, TOTAL (MG/L AS NO3)	PHOS- PHORUS, TOTAL (MG/L AS P)	PHOS- PHORUS, DIS- SOLVED (MG/L AS P)	PHOS- PHORUS, ORTHO, TOTAL (MG/L AS P)
OCT											
25...	.07	.00	--	--	--	--	--	--	.01	.01	--
NOV											
28...	.15	.03	--	--	--	.22	--	--	.00	.00	--
29...	.10	.04	.02	.06	--	--	.16	.71	.01	--	.01
DEC											
13...	.09	.09	--	--	--	.03	--	--	.01	.01	--
13...	--	--	--	--	--	--	--	--	--	--	--
JAN											
25...	.14	.01	.17	.18	.09	.09	.32	1.4	.01	.01	--
FEB											
27...	.12	.01	.18	.19	.03	.16	.31	1.4	.01	.00	--
MAR											
28...	.06	.01	.08	.09	.09	.00	.15	.66	.02	.00	--
APR											
25...	.13	.01	.34	.35	.28	.07	.48	2.1	.00	.00	--
MAY											
08...	--	--	--	--	--	--	--	--	--	--	--
23...	.09	.01	--	--	--	.14	--	--	.02	.00	--
JUN											
12...	.05	.01	.11	.12	.03	.09	.17	.75	.01	.00	--
JUL											
29...	.06	.01	.16	.17	.00	.17	.23	1.0	.00	.00	--
AUG											
29...	.07	.01	.21	.22	.00	.22	.29	1.3	.01	.01	--
SEP											
12...	.05	.00	.16	.16	.00	.16	.21	.93	.00	.00	--
12...	.05	.00	.22	.22	--	--	.27	1.2	.00	--	.00

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)	BORON, DIS- SOLVED (UG/L AS B)	CADMIUM TOTAL RECOV- ERABLE (UG/L AS CD)	CADMIUM SUS- PENDED RECOV- ERABLE (UG/L AS CD)	CADMIUM DIS- SOLVED (UG/L AS CD)
DEC											
13...	0915	0	0	0	100	100	0	--	2	2	0
MAR											
28...	0945	1	0	1	0	0	0	--	--	--	--
JUN											
12...	1000	1	1	0	200	0	200	--	--	--	--
AUG											
29...	1345	--	--	--	--	--	--	230	--	--	--
SEP											
12...	1330	1	0	1	200	0	200	--	11	10	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, 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)
DEC										
13...	0	0	0	0	0	0	10	8	2	40
MAR										
28...	20	20	0	0	0	0	3	2	1	120
JUN										
12...	0	0	0	0	0	0	6	6	0	130
AUG										
29...	--	--	--	--	--	--	--	--	--	--
SEP										
12...	10	0	10	0	0	0	4	2	2	450

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16704000 WAILUKU RIVER AT PIIHONUA--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	IRON, SUS- PENDE RECOV- ERABLE (UG/L AS FE)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, TOTAL RECOV- ERABLE (UG/L AS PB)	LEAD, SUS- PENDE 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- PENDE RECOV- ERABLE (UG/L AS MN)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY TOTAL RECOV- ERABLE (UG/L AS HG)	MERCURY SUS- PENDE RECOV- ERABLE (UG/L AS HG)
DEC 13...	--	30	--	--	--	0	0	0	.0	.0
MAR 28...	--	60	--	--	--	0	0	0	.0	.0
JUN 12...	--	60	61	--	--	5	0	5	.0	.0
AUG 29...	--	--	--	--	--	--	--	--	--	--
SEP 12...	340	110	46	40	6	0	0	0	.0	.0

DATE	MERCURY DIS- SOLVED (UG/L AS HG)	SELE- NIUM, TOTAL (UG/L AS SE)	SELE- NIUM, SUS- PENDE TOTAL (UG/L AS SE)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	SILVER, TOTAL RECOV- ERABLE (UG/L AS AG)	SILVER, SUS- PENDE RECOV- ERABLE (UG/L AS AG)	SILVER, DIS- SOLVED (UG/L AS AG)	ZINC, TOTAL RECOV- ERABLE (UG/L AS ZN)	ZINC, SUS- PENDE RECOV- ERABLE (UG/L AS ZN)	ZINC, DIS- SOLVED (UG/L AS ZN)
DEC 13...	.0	0	0	0	0	0	0	10	10	0
MAR 28...	.0	30	17	13	0	0	0	10	0	10
JUN 12...	.0	0	0	0	0	0	0	0	0	0
AUG 29...	--	--	--	--	--	--	--	--	--	--
SEP 12...	.0	0	0	0	0	0	0	0	0	0

DATE	TIME	CARBON, ORGANIC TOTAL (MG/L AS C)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C)	CARBON, ORGANIC SUS- PENDE TOTAL (MG/L AS C)	DATE	TIME	CARBON, ORGANIC TOTAL (MG/L AS C)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C)	CARBON, ORGANIC SUS- PENDE TOTAL (MG/L AS C)
OCT 25...	0900	2.4	--	--	MAY 23...	0845	1.4	--	--
NOV 28...	1015	1.0	--	--	JUN 12...	1000	--	1.5	.0
DEC 13...	0915	--	.9	.0	JUL 28...	0900	1.5	--	--
JAN 25...	0845	1.6	--	--	AUG 29...	1345	1.8	--	--
FEB 27...	1330	1.0	--	--	SEP 12...	1330	--	3.6	.1
MAR 28...	0945	--	1.2	.0	12...	1345	3.8	--	--
APR 25...	0830	.6	--	--					

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16704000 WAILUKU RIVER AT PIIHONUA--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	TIME	PHYTO- PLANK- TON, TOTAL (CELLS PER ML)	PERI- PHYTON BIOMASS TOTAL DRY WEIGHT G/SQ M	PERI- PHYTON BIOMASS ASH WEIGHT G/SQ M	CHLOR-A PERI- PHYTON CHROMO- GRAPHIC FLUOROM (MG/M2)	CHLOR-B PERI- PHYTON CHROMO- GRAPHIC FLUOROM (MG/M2)	LENGTH OF EXPO- SURE (DAYS)
OCT 25...	0900	1300	--	--	--	--	--
NOV 28...	1015	49	.078	.000	.020	.000	27
DEC 13...	0915	16	--	--	--	--	--
13...	1000	--	.157	.079	.000	.000	30
JAN 25...	0845	43	--	--	--	--	--
FEB 27...	1330	250	--	--	--	--	--
MAR 28...	0945	45	--	--	--	--	--
APR 25...	0830	180	--	--	--	--	--
MAY 09...	1430	--	.630	.236	4.54	.630	50
23...	0845	81	--	--	--	--	--
JUN 12...	1000	100	--	--	--	--	--
JUL 28...	0900	110	--	--	--	--	--
SEP 12...	1330	--	1.18	.551	4.16	.270	127

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	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 25...	0900	290	1	.78	100	APR 25...	0830	73	0	.00	100
NOV 28...	1015	20	0	.00	100	MAY 23...	0845	99	4	1.1	100
DEC 13...	0915	6.6	2	.04	100	JUN 12...	1000	41	2	.22	--
JAN 25...	0845	32	5	.43	100	JUL 28...	0900	176	2	.95	100
FEB 27...	1330	5.0	0	.00	100	AUG 29...	1345	190	2	1.0	100
MAR 28...	0945	51	1	.14	100	SEP 12...	1330	72	2	.39	100

16704000 WAILUKU RIVER AT PIIHONUA--Continued

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
OCTOBER			NOVEMBER			DECEMBER			JANUARY			
1				---	---	---	52	46	50	55	50	53
2				---	---	---	52	50	51	55	50	53
3				---	---	---	55	50	52	55	50	52
4				---	---	---	54	50	53	58	54	55
5				---	---	---	56	50	54	58	50	55
6				---	---	---	58	50	55	56	50	54
7				---	---	---	56	55	55	57	50	54
8				---	---	---	59	50	57	55	50	53
9				---	---	---	58	55	57	55	50	53
10				---	---	---	59	55	58	55	51	53
11				---	---	---	61	57	59	54	50	52
12				---	---	---	61	55	59	55	50	52
13				---	---	---	62	59	60	56	50	53
14				38	36	37	62	55	61	58	55	56
15				37	19	33	62	60	61	58	55	56
16				23	16	20	62	59	61	58	55	57
17				29	22	26	61	50	58	58	55	57
18				34	26	30	53	46	49	58	55	57
19				36	31	34	48	41	43	59	57	58
20				39	31	36	46	41	44	61	57	59
21				39	36	38	44	41	42	40	34	38
22				42	36	40	43	40	42	42	36	39
23				44	39	42	42	38	40	40	34	37
24				43	41	42	44	39	42	40	36	38
25				46	41	44	47	41	44	42	30	34
26				47	41	45	48	45	47	38	32	35
27				48	44	46	48	46	47	35	30	32
28				43	43	48	49	46	47	34	28	31
29				40	42	48	52	46	48	36	30	33
30				52	46	49	53	46	50	36	30	33
31				---	---	---	53	50	52	34	28	31
MONTH				52	16	39	62	38	52	61	28	48

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
FEBRUARY			MARCH			APRIL			MAY			
1	34	30	32	49	45	47	39	36	38			
2	36	30	33	49	46	48	38	31	35			
3	36	30	33	49	46	48	34	26	30			
4	38	30	34	49	46	48	34	25	31			
5	38	34	36	49	46	48	36	31	33			
6	42	36	39	50	46	48	37	26	31			
7	44	40	42	50	46	48	26	13	20			
8	46	40	43	56	46	49	---	---	---			
9	45	40	42	56	45	48	---	---	---			
10	48	45	46	46	41	43	---	---	---			
11	48	45	46	47	31	41	---	---	---			
12	48	45	46	34	24	29	---	---	---			
13	48	45	47	31	25	28	---	---	---			
14	50	46	47	34	10	14	---	---	---			
15	49	46	47	21	12	16	---	---	---			
16	47	41	44	19	16	17	---	---	---			
17	44	41	42	28	15	22	---	---	---			
18	44	40	42	32	26	30	---	---	---			
19	44	39	41	29	26	28	---	---	---			
20	42	36	40	31	26	29	---	---	---			
21	43	36	39	31	26	28	---	---	---			
22	44	40	42	28	21	25	---	---	---			
23	67	36	48	28	24	27	---	---	---			
24	47	41	42	33	26	30	---	---	---			
25	47	41	45	---	---	---	---	---	---			
26	48	41	45	---	---	---	---	---	---			
27	47	41	45	---	---	---	---	---	---			
28	49	45	47	---	---	---	---	---	---			
29	---	---	---	41	35	38	---	---	---			
30	---	---	---	41	36	39	---	---	---			
31	---	---	---	41	36	38	---	---	---			
MONTH	67	30	42	56	10	35	39	13	31			

HAWAII, ISLAND OF HAWAII

16704000 WAILUKU RIVER AT PIIHONUA--Continued

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	JUNE			JULY			AUGUST			SEPTEMBER		
1	---	---	---	29	21	27	39	32	36	---	---	---
2	---	---	---	29	24	27	39	30	35	---	---	---
3	---	---	---	29	25	27	39	30	36	---	---	---
4	---	---	---	28	25	27	33	28	30	---	---	---
5	---	---	---	29	25	27	32	28	31	---	---	---
6	---	---	---	32	26	28	33	29	31	---	---	---
7	---	---	---	29	25	27	34	31	32	---	---	---
8	---	---	---	29	25	27	34	30	33	69	30	33
9	41	36	39	28	25	27	34	31	33	34	31	33
10	42	36	39	29	24	27	34	31	33	34	30	33
11	43	36	41	34	24	29	35	30	33	34	30	33
12	44	39	42	46	26	32	35	31	33	34	28	33
13	43	36	39	37	30	33	35	31	34	35	29	32
14	39	36	38	37	30	34	36	32	34	35	28	33
15	39	31	36	38	31	35	35	31	33	35	29	33
16	38	31	35	39	29	34	40	31	33	34	28	33
17	34	29	31	38	26	34	36	30	34	34	28	34
18	31	26	28	37	31	34	34	29	32	34	28	32
19	---	---	---	37	31	34	34	28	32	35	28	32
20	---	---	---	39	31	36	34	30	32	35	28	33
21	---	---	---	38	31	35	---	---	---	35	28	33
22	26	21	24	37	31	34	---	---	---	34	26	31
23	48	---	---	38	31	34	---	---	---	34	27	32
24	---	---	---	39	26	34	---	---	---	34	27	32
25	---	---	---	37	30	34	---	---	---	35	28	33
26	---	---	---	36	30	34	---	---	---	35	27	33
27	29	25	27	36	31	34	---	---	---	34	28	33
28	29	25	27	38	32	36	---	---	---	35	26	33
29	29	25	27	39	31	37	---	---	---	34	28	32
30	29	25	27	38	31	36	---	---	---	35	28	32
31	---	---	---	39	31	35	---	---	---	---	---	---
MONTH	48	21	33	46	21	32	40	28	33	69	26	33
YEAR	69	10	39									

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
1				---	---	---	19.5	18.5	19.0	19.0	18.0	18.5
2				---	---	---	19.5	18.5	19.0	19.0	18.0	18.5
3				---	---	---	20.0	18.0	19.0	18.5	18.0	18.5
4				---	---	---	19.5	18.5	19.0	19.0	18.0	18.5
5				---	---	---	19.5	18.5	19.0	18.5	17.0	18.0
6				---	---	---	20.0	18.0	19.0	19.5	17.5	18.5
7				---	---	---	19.5	18.5	19.0	19.5	18.0	19.0
8				---	---	---	20.0	18.5	19.0	19.5	17.5	18.5
9				---	---	---	20.0	19.0	19.5	20.0	18.0	19.0
10				---	---	---	20.0	19.0	19.5	19.5	18.0	19.0
11				---	---	---	20.0	18.5	19.5	19.5	18.0	19.0
12				---	---	---	20.5	19.0	20.0	19.5	18.0	19.0
13				---	---	---	20.5	19.5	20.0	19.5	17.5	18.5
14				19.5	19.5	19.5	20.5	19.0	20.0	19.5	17.5	18.5
15				20.0	19.0	19.5	20.5	19.0	20.0	19.5	17.5	18.5
16				19.5	19.0	19.0	19.5	19.0	19.5	19.5	18.0	19.0
17				19.0	18.0	19.0	19.5	18.5	19.0	19.5	18.0	18.5
18				19.0	18.5	18.5	19.0	18.5	19.0	19.0	18.0	18.5
19				19.0	17.5	18.5	19.0	18.0	18.5	19.0	18.0	18.5
20				19.0	17.5	18.5	18.5	17.5	18.0	19.0	18.0	19.0
21				19.0	18.0	18.5	18.5	17.5	18.0	19.0	17.5	18.0
22				19.5	18.0	19.0	18.5	17.0	18.0	19.0	17.5	18.0
23				20.0	18.5	19.0	18.0	16.5	17.5	19.0	17.0	18.0
24				20.0	18.5	19.5	18.0	16.0	17.0	19.0	17.5	18.0
25				20.0	19.0	19.5	17.5	16.5	17.0	18.5	17.5	18.0
26				19.5	18.0	19.0	18.0	16.0	17.0	18.5	17.0	18.0
27				19.5	18.0	19.0	18.5	17.0	17.5	18.5	17.0	18.0
28				20.0	18.5	19.0	18.0	17.0	18.0	18.5	17.0	18.0
29				19.5	18.5	19.0	19.0	17.0	18.0	18.5	17.5	18.0
30				19.5	18.5	19.0	19.0	17.0	18.0	19.0	17.5	18.0
31				---	---	---	19.0	17.0	18.5	18.5	17.0	18.0
MONTH				20.0	17.5	19.0	20.5	16.0	18.5	20.0	17.0	18.5

TEMPERATURE (DEG. C) OF WATER, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	FEBRUARY			MARCH			APRIL			MAY		
1	18.5	16.5	17.5	20.5	19.0	19.5	19.5	18.0	19.0			
2	19.0	17.5	18.0	21.0	19.5	20.0	19.5	18.5	19.0			
3	19.0	17.5	18.0	20.5	19.5	20.0	19.0	18.5	18.5			
4	19.5	17.5	18.5	21.0	18.5	20.0	19.5	17.5	18.5			
5	19.5	17.5	18.5	21.5	19.5	20.5	19.5	18.0	18.5			
6	20.0	17.5	18.5	22.0	20.0	21.0	19.5	18.5	19.0			
7	20.0	18.0	19.0	21.5	20.5	21.0	18.5	18.0	18.0			
8	20.0	17.5	19.0	20.5	19.5	20.0	---	---	---			
9	19.5	18.0	19.0	20.0	19.0	19.5	---	---	---			
10	19.5	18.0	19.0	20.5	18.5	19.5	---	---	---			
11	19.5	18.0	19.0	20.0	19.0	19.5	---	---	---			
12	19.0	18.0	19.0	19.5	18.5	19.0	---	---	---			
13	19.5	18.0	19.0	19.0	17.5	18.5	---	---	---			
14	19.0	18.0	18.5	18.5	17.0	18.0	---	---	---			
15	19.5	17.5	18.5	18.0	17.0	17.5	---	---	---			
16	19.5	18.0	18.5	18.5	17.0	18.0	---	---	---			
17	19.5	18.0	18.5	18.5	16.0	17.5	---	---	---			
18	20.0	17.5	19.0	18.5	17.5	18.0	---	---	---			
19	19.0	18.0	19.0	18.0	17.5	18.0	---	---	---			
20	19.5	18.0	19.0	18.0	17.0	17.5	---	---	---			
21	20.0	18.0	19.0	18.0	17.0	17.5	---	---	---			
22	20.0	18.0	19.5	18.5	17.0	17.5	---	---	---			
23	19.5	18.0	18.5	18.0	17.0	17.5	---	---	---			
24	19.5	17.5	18.5	18.5	17.5	18.0	---	---	---			
25	19.5	17.0	18.5	19.0	---	---	---	---	---			
26	20.0	17.5	19.0	---	---	---	---	---	---			
27	19.0	18.0	18.5	---	---	---	---	---	---			
28	20.0	18.5	19.0	19.5	19.0	11.5	---	---	---			
29	---	---	---	20.0	19.0	19.5	---	---	---			
30	---	---	---	20.0	19.0	19.5	---	---	---			
31	---	---	---	19.5	18.5	19.0	---	---	---			
MONTH	20.0	16.5	18.5	22.0	16.0	18.5	19.5	17.5	18.5			

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	JUNE			JULY			AUGUST			SEPTEMBER		
1	---	---	---	23.5	22.5	23.0	22.5	22.0	22.5	---	---	---
2	---	---	---	24.0	23.0	23.5	23.5	22.0	23.0	---	---	---
3	---	---	---	23.5	23.0	23.0	23.5	22.5	23.0	---	---	---
4	---	---	---	23.0	22.5	22.5	23.0	23.0	23.0	---	---	---
5	---	---	---	22.5	22.0	22.5	23.0	22.5	23.0	---	---	---
6	---	---	---	23.0	22.0	22.5	22.5	22.0	22.5	---	---	---
7	---	---	---	22.5	21.5	22.0	22.5	22.5	22.5	---	---	---
8	---	---	---	22.0	22.0	22.0	22.5	22.0	22.0	22.5	21.0	21.5
9	21.0	20.5	20.5	22.0	21.5	22.0	22.0	21.5	21.5	22.5	21.0	21.5
10	21.5	20.0	20.5	22.0	21.5	21.5	22.0	21.0	21.5	22.0	21.0	21.5
11	21.5	20.5	20.5	22.5	21.0	22.0	22.0	21.5	21.5	21.0	16.5	20.5
12	21.0	20.5	20.5	23.0	22.0	22.5	22.0	21.5	21.5	21.5	20.0	20.5
13	20.5	20.0	20.5	22.5	22.0	22.0	22.5	21.5	22.0	21.5	20.0	21.0
14	20.5	20.0	20.0	22.5	18.0	22.0	22.5	22.0	22.0	21.0	20.5	21.0
15	20.5	19.5	20.0	22.5	21.5	22.0	22.0	21.0	21.5	21.5	20.5	21.0
16	20.0	19.5	20.0	23.0	21.5	22.0	23.0	21.5	22.0	22.0	20.5	21.5
17	20.0	19.5	20.0	23.0	22.0	22.5	22.5	21.5	22.0	22.5	21.5	22.0
18	20.0	19.5	20.0	23.5	22.5	23.0	22.0	21.0	21.5	23.0	21.5	22.0
19	---	---	---	23.0	22.5	23.0	22.0	21.5	21.5	22.0	21.5	22.0
20	---	---	---	23.0	21.0	23.0	22.5	---	21.5	22.0	21.0	21.5
21	---	---	---	22.5	22.0	22.5	---	---	---	21.5	20.0	20.5
22	20.0	19.5	20.0	22.5	22.0	22.5	---	---	---	21.5	20.5	21.0
23	19.5	18.0	18.5	22.5	21.5	22.0	---	---	---	21.5	16.5	20.5
24	18.5	17.0	18.0	22.5	21.0	22.0	---	---	---	21.0	20.0	20.5
25	18.5	17.5	18.0	23.0	22.0	22.5	---	---	---	21.0	20.0	20.5
26	22.5	18.0	20.0	23.5	22.5	23.0	---	---	---	22.0	20.0	20.5
27	23.0	21.5	22.5	23.5	22.5	23.0	---	---	---	21.5	20.0	21.0
28	23.0	22.5	23.0	23.5	22.5	23.0	---	---	---	21.5	20.5	21.0
29	23.0	22.5	23.0	23.0	22.5	22.5	---	---	---	22.0	20.5	21.0
30	23.5	22.5	23.0	22.5	22.0	22.5	---	---	---	21.5	20.5	21.0
31	---	---	---	23.0	22.0	22.5	---	---	---	---	---	---
MONTH	23.5	17.0	20.5	24.0	18.0	22.5	23.5	21.0	22.0	23.0	16.5	21.0
YEAR	24.0	16.0	20.0									

16704000 WAILUKU RIVER AT PIHONUA--Continued

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA

PHYTOPLANKTON ANALYSES, OCTOBER 1977 TO JUNE 1978

DATE TIME	OCT 25, 77 0900	NOV 28, 77 1015	DEC 13, 77 0915	JAN 25, 78 0845	FEB 27, 78 1330	
TOTAL CELLS/ML	1300	49	16	43	250	
DIVERSITY: DIVISION	1.0	0.6	0.0	0.0	1.5	
..CLASS	1.0	0.6	0.0	0.0	1.5	
...ORDER	1.8	0.6	0.0	0.0	1.5	
...FAMILY	2.4	1.1	1.6	2.2	2.4	
....GENUS	2.4	1.1	1.6	2.5	2.4	
ORGANISM	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT
CHLOROPHYTA (GREEN ALGAE)						
..CHLOROPHYCEAE						
...CHLOROCOCCALES						
....COELASTRACEAE						
.....COELASTRUM	--	-	--	-	--	-
...OOCYSTACEAE						
.....ANKISTRODESMUS	--	-	--	-	--	-
....DICTYOSPHAERIUM	--	-	--	-	--	-
....TREUBARIA	--	-	7	14	--	-
..OEDOGONIALES						
...OEDOGONIACEAE						
.....OEDOGONIUM	280#	21	--	-	--	-
..VOLVOCALES						
...CHLAMYDOMONADACEAE						
....CHLAMYDOMONAS	47	4	--	-	--	-
CHRYSOPHYTA						
..BACILLARIOPHYCEAE						
...CENTRALES						
....COSCINODISCAEAE						
.....CYCLOTELLA	280#	21	--	-	--	-
..PENNALES						
...ACHNANTHACEAE						
....ACHNANTHES	240#	18	--	-	6	14
....COCCONEIS	--	-	--	-	5#	33
...CYMBELLACEAE						
....CYMBELLA	--	-	--	-	6	14
...DIATOMACEAE						
....DIATOMA	--	-	--	-	--	-
...FRAGILARIACEAE						
....SYNEDRA	--	-	--	-	--	-
...GOMPHONEMATAEAE						
....GOMPHONEMA	47	4	35#	71	5#	33
...NAVICULACEAE						
....NAVICULA	380#	29	--	-	5#	33
...NITZSCHIAEAE						
....NITZSCHIA	--	-	7	14	--	-
CYANOPHYTA (BLUE-GREEN ALGAE)						
..CYANOPHYCEAE						
...CHROCCOCCALES						
....CHROCCOCCAEAE						
.....ANACYSTIS	--	-	--	-	--	-
...HORMOGONALES						
...SCYTONEMATACEAE						
....PLECTONEMA	--	-	--	-	--	-
EUGLENOPHYTA (EUGLENOIDS)						
..EUGLENOPHYCEAE						
...EUGLENALES						
....EUGLENACEAE						
.....EUGLENOPSTS	47	4	--	-	--	-

NOTE: # - DOMINANT ORGANISM; EQUAL TO OR GREATER THAN 15%

* - OBSERVED ORGANISM; MAY NOT HAVE BEEN COUNTED; LESS THAN 1/2%

16704000 WAILUKU RIVER AT PIIHONUA--Continued

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA

PHYTOPLANKTON ANALYSES, OCTOBER 1977 TO JUNE 1978

DATE TIME	MAR 28,78 0945	APR 25,78 0830	MAY 23,78 0845	JUN 12,78 1000
TOTAL CELLS/ML	45	180	81	100
DIVERSITY: DIVISION	0.0	0.0	1.4	0.6
..CLASS	0.0	0.0	1.4	0.6
...ORDER	0.0	0.0	1.4	1.4
....FAMILY	0.0	1.0	1.4	2.2
.....GENUS	0.0	1.0	1.4	2.2

ORGANISM	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT	CELLS /ML	PER- CENT
CHLOROPHYTA (GREEN ALGAE)								
..CHLOROPHYCEAE								
...CHLOROCOCCALES								
....COELASTRACEAE								
.....COELASTRUM	--	-	--	-	--	-	--	-
....OOCYSTACEAE								
.....ANKISTRODESMUS	--	-	--	-	--	-	15	14
....DICTYOSPHAERIUM	--	-	--	-	--	-	--	-
....TREUBARIA	--	-	--	-	--	-	--	-
..OEDOGONIALES								
...OEDOGONIACEAE								
....OEDOGONIUM	--	-	--	-	--	-	--	-
..VOLVOCALES								
...CHLAMYDOMONADACEAE								
....CHLAMYDOMONAS	--	-	--	-	16# 20		--	-
CHRYSOPHYTA								
..BACILLARIOPHYCEAE								
...CENTRALES								
....COSCINODISCEAE								
.....CYCLOTELLA	--	-	--	-	--	-	29# 29	
..PENNALES								
...ACHNANTHACEAE								
....ACHNANTHES	--	-	20	11	--	-	--	-
....COCCONEIS	--	-	--	-	--	-	--	-
...CYMBELLACEAE								
....CYMBELLA	--	-	--	-	--	-	--	-
...DIATOMACEAE								
....DIATOMA	--	-	--	-	--	-	15	14
...FRAGILARIACEAE								
....SYNEDRA	45#100		140# 78		--	-	15	14
...GOMPHONEMACEAE								
....GOMPHONEMA	--	-	20	11	--	-	--	-
...NAVICULACEAE								
....NAVICULA	--	-	--	-	49# 60		29# 29	
...NITZSCHACEAE								
....NITZSCHIA	--	-	--	-	--	-	--	-
CYANOPHYTA (BLUE-GREEN ALGAE)								
..CYANOPHYCEAE								
...CHROCOCCOCCALES								
....CHROCOCCOCCAEAE								
.....ANACYSTIS	--	-	--	-	16# 20		--	-
..HORMOGONALES								
...SCYTONEMACEAE								
....PLECTONEMA	--	-	--	-	--	-	--	-
EUGLENOPHYTA (EUGLENOIDS)								
..EUGLENOPHYCEAE								
...EUGLENALES								
....EUGLENACEAE								
.....EUGLENOPSIS	--	-	--	-	--	-	--	-

NOTE: # - DOMINANT ORGANISM; EQUAL TO OR GREATER THAN 15%

* - OBSERVED ORGANISM, MAY NOT HAVE BEEN COUNTED; LESS THAN 1/2%

HAWAII, ISLAND OF HAWAII

16713000 WAILUKU RIVER AT HILO

LOCATION.--Lat 19°43'43", long 155°05'40", Hydrologic Unit 20010000, on right bank 500 ft (152 m) upstream from Wailuku bridge and 0.2 mi (0.3 km) west of Hilo Post Office.

DRAINAGE AREA.--256 mi² (663 km²), of which 81 mi² (210 km²) probably is noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--March 1977 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, 34,200 ft³/s (968 m³/s) May 23, 1978, gage height 23.30 ft (7.102 m) from floodmarks and from rating curve extended above 6,840 ft³/s (194 m³/s) on basis of slope-area measurement at gage height 23.30 ft (7.102 m); minimum, 6.9 ft³/s (0.20 m³/s) Jan. 18, 1978.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 9,500 ft³/s (269 m³/s) and maximum (*):

Date	Time	Discharge (ft ³ /s) (m ³ /s)	Gage height (ft) (m)
May 23	1830	*34200 968	23.30 7.102
July 6	0830	9610 272	12.60 3.840

Minimum discharge, 6.9 ft³/s (0.20 m³/s) Jan. 18.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	24	242	24	15	9.5	9.5	76	190	230	280	484	301
2	61	618	25	15	11	8.8	150	408	380	310	331	289
3	81	665	23	18	15	8.3	339	220	210	435	242	255
4	103	672	25	18	14	8.8	93	517	162	600	384	180
5	111	364	24	16	10	8.6	94	566	128	470	260	158
6	52	252	27	11	9.6	8.2	302	210	99	4920	200	128
7	37	192	23	16	9.2	8.6	2080	117	87	1590	621	99
8	57	150	22	15	9.0	17	1060	88	76	1250	1140	184
9	35	112	19	13	11	38	499	89	64	875	568	101
10	369	81	17	10	8.6	12	280	52	52	700	533	478
11	213	81	16	11	7.9	50	190	59	47	660	488	153
12	135	71	18	9.0	7.9	216	128	57	71	1280	452	101
13	249	46	18	9.0	8.0	70	186	35	125	1160	660	120
14	42	259	18	8.9	9.5	1230	695	34	81	750	505	112
15	24	370	18	8.8	30	210	258	106	105	560	349	87
16	309	623	18	8.0	32	414	586	208	165	452	625	59
17	985	235	81	7.3	11	342	1110	210	188	355	1750	54
18	310	144	85	6.9	7.4	277	768	112	332	310	640	57
19	171	99	153	8.4	7.6	505	522	81	1760	288	435	256
20	128	74	64	22	10	544	310	62	668	985	394	108
21	170	58	38	366	7.6	478	218	319	580	1580	1430	498
22	775	44	29	210	12	784	162	287	1030	925	750	293
23	435	38	22	78	138	452	116	1630	2430	596	640	158
24	230	35	42	45	32	255	87	721	1100	418	477	95
25	452	33	41	44	13	171	87	620	725	373	470	69
26	435	35	40	24	11	125	205	632	548	370	488	58
27	872	30	26	60	9.5	89	133	620	446	295	407	57
28	488	31	12	8.9	11	63	194	505	507	340	325	36
29	505	32	13	7.6	---	46	110	470	400	700	325	29
30	340	26	13	7.6	---	37	314	335	316	632	608	23
31	304	---	12	8.3	---	47	---	301	---	585	295	---
TOTAL	8502	5712	1006	1105.7	472.3	6532.8	11352	9861	13112	25044	17276	4596
MEAN	274	190	32.5	35.7	16.9	211	378	318	437	808	557	153
MAX	985	672	153	366	138	1230	2080	1630	2430	4920	1750	498
MIN	24	26	12	6.9	7.4	8.2	76	34	47	280	200	23
AC-FT	16860	11330	2000	2190	937	12960	22520	19560	26010	49670	34270	9120

WTR YR 1978 TOTAL 104571.8 MEAN 286 MAX 4920 MIN 6.9 AC-FT 207400

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 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, 242 mg/L May 23, 1978; minimum daily mean, 1 mg/L on several days in April, July, August, and September.

SEDIMENT DISCHARGE: Maximum daily, 5,520 tons (5,010 tonnes) May 23, 1978; minimum daily, 0.04 ton (0.04 tonne) Feb. 11-13, 18, 19.

EXTREMES FOR CURRENT YEAR.--

SEDIMENT CONCENTRATIONS: Maximum daily mean, 242 mg/L May 23; minimum daily mean, 1 mg/L on several days in April, July, August, and September.

SEDIMENT DISCHARGE: Maximum daily, 5,520 tons (5,010 tonnes) May 23, minimum daily, 0.04 ton (0.04 tonne) Feb. 11-13, 18, 19.

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH (UNITS)	TEMPER- ATURE (DEG C)	COLOR (PLAT- INUM- COBALT UNITS)	TUR- BID- ITY (JTU)	TUR- BID- ITY (NTU)	OXYGEN, DIS- SOLVED (MG/L)
OCT									
17...	0700	2300	30	6.0	18.0	--	45	--	9.4
17...	1430	950	24	5.9	19.0	--	15	--	9.6
25...	1015	490	43	7.3	19.0	--	3	--	9.2
NOV									
28...	1100	29	80	7.6	21.0	--	1	--	9.0
30...	1100	27	80	7.6	21.0	3	1	--	--
DEC									
13...	1045	18	85	7.3	20.0	--	1	--	8.6
JAN									
25...	1015	60	58	6.6	18.0	--	2	--	9.2
FEB									
28...	1000	12	83	7.1	20.0	--	2	--	8.5
MAR									
28...	1015	66	60	6.9	18.5	--	1	--	9.2
APR									
24...	1315	87	59	7.5	21.0	--	1	--	8.6
MAY									
23...	0930	104	37	7.2	19.0	--	4	--	8.4
JUN									
27...	0915	455	48	7.0	19.0	--	1	--	8.8
JUL									
06...	0830	10600	16	6.3	18.0	--	39	--	9.6
21...	0945	1760	27	6.9	20.5	70	--	2.0	9.2
27...	1130	298	46	7.5	22.0	6	--	.40	--
AUG									
29...	1145	331	51	7.5	20.0	--	1	--	8.7
SEPT									
13...	0830	106	57	7.1	19.5	--	2	--	8.6

16713000 WAILUKU RIVER AT HILO--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	COLI- FORM, TOTAL, IMMED. (COLS. PER 100 ML)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP- TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	BICAR- BONATE (MG/L AS HC03)	CAR- BONATE (MG/L AS C03)	ALKA- LINEITY (MG/L AS CAC03)	CARBON DIOXIDE DIS- SOLVED (MG/L AS C02)	SOLIDS, RESIDUE AT 105 DEG. C, SUS- PENDED (MG/L)	NITRO- GEN, NO2+NO3 TOTAL (MG/L AS N)
OCT									
17...	--	--	--	--	--	--	--	--	.16
17...	--	--	--	--	--	--	--	--	.12
25...	--	190	K1700	--	--	--	--	--	.08
NOV									
28...	K1800	110	640	--	--	--	--	--	.34
30...	--	--	--	35	0	29	1.4	5	.34
DEC									
13...	--	94	580	--	--	--	--	--	.29
JAN									
25...	--	140	1600	--	--	--	--	--	.13
FEB									
28...	--	110	780	--	--	--	--	--	.66
MAR									
28...	--	K230	170	--	--	--	--	--	.19
APR									
24...	--	46	490	--	--	--	--	--	.16
MAY									
23...	--	660	1300	--	--	--	--	--	.06
JUN									
27...	--	38	310	--	--	--	--	--	.15
JUL									
06...	--	--	--	--	--	--	--	--	.06
21...	--	--	--	--	--	4	--	2	.08
27...	1400	130	100	--	--	14	--	6	.12
AUG									
29...	--	K27	140	--	--	--	--	--	.15
SEP									
13...	--	220	390	--	--	--	--	--	.16

DATE	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)	NITRO- GEN, TOTAL (MG/L AS NO3)	PHOS- PHORUS, TOTAL (MG/L AS P)	PHOS- PHORUS, ORTHOPHOS- PHATE TOTAL (MG/L AS P)	CARBON, ORGANIC TOTAL (MG/L AS C)
OCT								
17...	.10	1.2	1.3	1.5	6.5	.29	.02	--
17...	.18	.40	.58	.70	3.1	.06	.01	9.2
25...	.00	.13	.13	.21	.93	.02	.00	2.5
NOV								
28...	.03	.00	.00	.34	1.5	.01	.01	1.0
30...	.04	.00	.00	.34	1.5	.01	.01	--
DEC								
13...	.09	.06	.15	.44	1.9	.01	.01	.7
JAN								
25...	.01	.01	.02	.15	.66	.03	.03	2.4
FEB								
28...	.08	.26	.34	1.0	4.4	.01	.01	1.0
MAR								
28...	.01	.00	.01	.20	.89	.02	.00	1.2
APR								
24...	.00	.38	.38	.54	2.4	.03	.03	.7
MAY								
23...	.01	.36	.37	.43	1.9	.04	.00	5.2
JUN								
27...	.04	.25	.29	.44	1.9	.01	.01	1.5
JUL								
06...	.01	.88	.89	.95	4.2	.24	.04	--
21...	.01	.34	.35	.43	1.9	.04	.04	7.5
27...	.00	.18	.18	.30	1.3	.01	.01	1.4
AUG								
29...	.01	.26	.27	.42	1.9	.01	.00	1.6
SEP								
13...	--	.14	.15	.31	1.4	.01	.00	--

K Results based on colony count outside the acceptable range (non-ideal colony count).

16713000 WAILUKU RIVER AT HILO--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	TIME	ARSENIC		ARSENIC		BARIUM,		BARIUM,		CADMIUM		CADMIUM	
		TOTAL (UG/L AS AS)	SUS- PENDE TOTAL (UG/L AS AS)	DIS- SOLVED (UG/L AS AS)	TOTAL RECOV- ERABLE (UG/L AS BA)	SUS- PENDE RECOV- ERABLE (UG/L AS BA)	DIS- SOLVED (UG/L AS BA)	TOTAL RECOV- ERABLE (UG/L AS CD)	SUS- PENDE RECOV- ERABLE (UG/L AS CD)	CADMIUM DIS- SOLVED (UG/L AS CD)			
OCT													
17...	0700	--	--	0	500	500	0	10	7	3			
17...	1430	--	--	0	400	400	0	<10	<7	3			
DEC													
13...	1045	1	0	1	100	0	100	4	0	4			
MAR													
28...	1015	1	1	0	0	0	0	2	0	2			
JUN													
27...	0915	1	1	0	200	0	200	--	--	--			
JUL													
06...	0830	1	0	1	300	100	200	9	0	9			
21...	0945	--	--	--	--	--	--	--	--	<1			
SEP													
13...	0830	1	0	1	100	0	100	1	1	0			

DATE	CHRO- MIUM, TOTAL RECOV- ERABLE (UG/L AS CR)	CHRO- MIUM, SUS- PENDE RECOV. (UG/L AS CR)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)	COBALT, TOTAL RECOV- ERABLE (UG/L AS CO)	COBALT, SUS- PENDE RECOV- ERABLE (UG/L AS CO)	COBALT, DIS- SOLVED (UG/L AS CO)	COPPER, TOTAL RECOV- ERABLE (UG/L AS CU)	COPPER, SUS- PENDE RECOV- ERABLE (UG/L AS CU)	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, TOTAL RECOV- ERABLE (UG/L AS FE)
OCT										
17...	50	40	10	<50	<50	0	10	8	2	23000
17...	0	0	10	<50	<50	0	<10	<8	2	3200
DEC										
13...	0	0	0	0	0	0	6	4	2	210
MAR										
28...	10	10	0	0	0	0	4	2	2	160
JUN										
27...	10	10	0	0	0	0	7	5	2	290
JUL										
06...	20	20	0	1	1	0	28	25	3	5800
21...	--	--	--	--	--	--	--	--	--	--
SEP										
13...	10	10	0	0	0	0	5	4	1	450

DATE	IRON, SUS- PENDE RECOV- ERABLE (UG/L AS FE)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, TOTAL RECOV- ERABLE (UG/L AS PB)	LEAD, SUS- PENDE 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- PENDE RECOV- ERABLE (UG/L AS MN)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY TOTAL RECOV- ERABLE (UG/L AS HG)	MERCURY SUS- PENDE RECOV- ERABLE (UG/L AS HG)
OCT										
17...	--	180	<100	<86	14	180	160	20	.0	.0
17...	--	200	<100	<82	18	50	40	8	.0	.0
DEC										
13...	--	80	90	0	90	10	10	0	.0	.0
MAR										
28...	--	40	16	0	15	10	10	0	.0	.0
JUN										
27...	200	90	--	--	--	0	0	0	.0	.0
JUL										
06...	4900	930	31	0	--	120	70	50	.0	.0
21...	--	--	--	--	4	--	--	--	--	--
SEP										
13...	350	100	9	9	0	0	0	0	.0	.0

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

HAWAII, ISLAND OF HAWAII

16713000 WAILUKU RIVER AT HILO--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	MERCURY DIS- SOLVED (UG/L AS HG)	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										
17...	.0	--	--	0	<10	<10	0	30	30	0
17...	.0	--	--	0	<10	<10	0	20	10	10
DEC										
13...	.0	0	0	0	0	0	0	30	20	10
MAR										
28...	.0	4	1	3	0	0	0	20	10	10
JUN										
27...	.0	0	0	0	0	0	0	5	0	5
JUL										
06...	.0	1	1	0	0	0	0	10	10	0
21...	--	--	--	--	--	--	--	--	--	--
SEP										
13...	.0	0	0	0	1	1	0	10	0	10

		PERI- PHYTON BIOMASS TOTAL DRY WEIGHT G/SQ M	PERI- PHYTON BIOMASS ASH WEIGHT G/SQ M	CHLOR-A PERI- PHYTON CHROMO- GRAPHIC FLUOROM (MG/M2)	CHLOR-B PERI- PHYTON CHROMO- GRAPHIC FLUOROM (MG/M2)	LENGTH OF EXPO- SURE (DAYS)
DATE	TIME					
DEC 13...		1045	3.78	1.97	14.5	5.60
						28
		STREAM- FLOW, INSTAN- TANEOUS (CFS)	SEDI- MENT, SUS- PENDED (MG/L)	SEDI- MENT DIS- CHARGE, SUS- PENDED (T/DAY)		
DATE	TIME				DATE	TIME
OCT 17...	0700	2300	152	244	APR 24...	1315
17...	1430	950	32	22		
25...	1015	490	5	6.6	MAY 23...	0930
NOV 28...	1100	24	2	.14		104
DEC 13...	1045	18	1	.05	JUN 27...	0915
JAN 25...	1015	60	4	.65		455
FEB 28...	1000	12	4	.13	JUL 06...	0930
MAR 28...	1015	66	1	.14		10600
					JUL 06...	1730
						--
					JUL 27...	1130
						208
					AUG 29...	1145
						331
					SEP 13...	0930
						--
						4
						--

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
MAY							
23...	0930	104	14	3.9	--	--	--
23...	1815	6300	2810	47800	20	31	41
DATE	TIME	SED. SUSP. FALL DIAM. % FINER THAN .016 MM	SED. SUSP. FALL DIAM. % FINER THAN .031 MM	SED. SUSP. FALL DIAM. % FINER THAN .062 MM	SED. SUSP. FALL DIAM. % FINER THAN .125 MM	SED. SUSP. FALL DIAM. % FINER THAN .250 MM	SED. SUSP. FALL DIAM. % FINER THAN .500 MM
MAY							
23...	--	--	--	--	--	--	--
23...	53	66	75	86	94	98	100

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

16713000 WAILUKU RIVER AT HILO--Continued

SUSPENDED-SEDIMENT DISCHARGE (TONS/DAY), WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

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	24	5	.32	242	4	2.6	24	3	.19
2	61	4	.66	618	8	13	25	2	.14
3	81	4	.87	665	8	14	23	2	.12
4	103	5	1.4	672	7	13	25	2	.14
5	111	5	1.5	364	5	4.9	24	2	.13
6	52	4	.56	252	4	2.7	27	2	.15
7	37	4	.40	192	3	1.6	23	2	.12
8	57	5	.77	150	3	1.2	22	2	.12
9	35	5	.47	112	3	.91	19	2	.10
10	369	161	695	81	3	.66	17	2	.09
11	213	121	95	81	3	.66	16	2	.09
12	135	50	18	71	3	.58	18	2	.10
13	249	60	40	46	3	.37	18	2	.10
14	42	18	2.0	259	9	6.3	18	2	.10
15	24	10	.65	370	25	25	18	2	.10
16	309	60	133	623	36	74	18	2	.10
17	985	64	239	235	8	5.1	81	5	1.1
18	310	10	8.4	144	5	1.9	85	5	1.1
19	171	7	3.2	99	4	1.1	153	6	2.5
20	128	5	1.7	74	4	.80	64	5	.86
21	170	10	4.6	58	3	.47	38	5	.51
22	775	22	46	44	2	.24	29	4	.31
23	435	8	9.4	38	2	.21	22	4	.24
24	230	10	6.2	35	2	.19	42	3	.34
25	452	12	15	33	2	.18	41	3	.33
26	435	12	14	35	2	.19	40	3	.32
27	872	15	35	30	2	.16	26	2	.14
28	488	6	7.9	31	2	.17	12	2	.06
29	505	6	8.2	32	2	.17	13	2	.07
30	340	5	4.6	26	2	.14	13	2	.07
31	304	4	3.3	---	---	---	12	2	.06
TOTAL	8502	---	1397.10	5712	---	172.50	1006	---	9.90
JANUARY				FEBRUARY			MARCH		
1	15	2	.08	9.5	3	.08	9.5	4	.10
2	15	2	.08	11	3	.09	8.8	4	.10
3	18	2	.10	15	4	.16	8.3	3	.07
4	18	2	.10	14	3	.11	8.8	3	.07
5	16	2	.09	10	3	.08	8.6	3	.07
6	11	2	.06	9.6	2	.05	8.2	3	.07
7	16	3	.13	9.2	2	.05	8.6	3	.07
8	15	3	.12	9.0	2	.05	17	4	.18
9	13	3	.11	11	2	.06	38	4	.41
10	10	3	.08	8.6	2	.05	12	4	.13
11	11	3	.09	7.9	2	.04	50	8	1.1
12	9.0	3	.07	7.9	2	.04	216	12	7.0
13	9.0	3	.07	8.0	2	.04	70	10	1.9
14	8.9	3	.07	9.5	2	.05	1230	68	304
15	8.8	3	.07	30	4	.32	210	12	6.8
16	8.0	3	.06	32	4	.35	414	8	8.9
17	7.3	3	.06	11	3	.09	342	5	4.6
18	6.9	3	.06	7.4	2	.04	277	5	3.7
19	8.4	3	.07	7.6	2	.04	505	8	11
20	22	4	.24	10	2	.05	544	12	18
21	366	12	12	7.6	2	.04	478	6	7.7
22	210	6	3.4	12	3	.10	784	7	15
23	78	5	1.1	138	23	12	452	5	6.1
24	45	5	.61	32	7	.60	255	5	3.4
25	44	4	.48	13	6	.21	171	4	1.8
26	24	4	.26	11	5	.15	125	4	1.4
27	60	5	.81	9.5	5	.13	89	4	.96
28	8.9	3	.07	11	4	.12	63	4	.68
29	7.6	3	.06	---	---	---	46	4	.50
30	7.6	3	.06	---	---	---	37	4	.40
31	8.3	3	.07	---	---	---	47	5	.63
TOTAL	1105.7	---	20.73	472.3	---	15.19	6532.8	---	406.84

16713000 WAILUKU RIVER AT HILO--Continued

SUSPENDED-SEDIMENT DISCHARGE (TONS/DAY), WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DAY	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
APRIL				MAY			JUNE		
1	76	5	1.0	190	2	1.0	230	2	1.2
2	150	5	2.0	408	3	3.3	380	3	3.1
3	339	8	7.3	220	2	1.2	210	3	1.7
4	93	5	1.3	517	30	42	162	3	1.3
5	94	5	1.3	566	28	43	128	3	1.0
6	302	8	6.5	210	10	5.7	99	2	.53
7	2080	29	201	117	6	1.9	87	2	.47
8	1060	12	34	88	4	.95	76	2	.41
9	499	8	11	89	3	.72	64	2	.35
10	280	4	3.0	52	3	.42	52	2	.28
11	190	3	1.5	59	2	.32	47	2	.25
12	128	2	.69	57	2	.31	71	2	.38
13	186	3	1.5	35	2	.19	125	3	1.0
14	695	14	26	34	2	.18	81	2	.44
15	258	5	3.5	106	3	.86	105	2	.57
16	586	27	82	208	3	1.7	165	3	1.3
17	1110	46	172	210	3	1.7	188	3	1.5
18	768	17	35	112	2	.60	332	5	4.5
19	522	3	4.2	81	2	.44	1760	52	265
20	310	2	1.7	62	2	.33	668	10	18
21	218	1	.59	319	20	17	580	5	7.8
22	162	1	.44	287	30	23	1030	18	50
23	116	1	.31	1630	242	5520	2430	38	279
24	87	1	.23	721	54	135	1100	8	24
25	87	1	.23	620	13	22	725	4	7.8
26	205	3	1.7	632	7	12	548	3	4.4
27	133	2	.72	620	5	8.4	446	3	3.6
28	194	2	1.0	505	4	5.5	507	3	4.1
29	110	2	.59	470	3	3.8	400	3	3.2
30	314	3	2.5	335	2	1.8	316	3	2.6
31	---	---	---	301	2	1.6	---	---	---
TOTAL	11352	---	604.90	9861	---	5856.92	13112	---	639.78
JULY				AUGUST			SEPTEMBER		
1	280	3	2.3	484	3	3.9	301	3	2.4
2	310	2	1.7	331	2	1.8	289	3	2.3
3	435	2	2.3	242	2	1.3	255	2	1.4
4	600	3	4.9	384	3	3.1	180	1	.49
5	470	3	3.8	260	2	1.4	158	1	.43
6	4920	98	1690	200	2	1.1	128	1	.35
7	1590	15	64	621	24	69	99	1	.27
8	1250	5	17	1140	12	37	184	4	2.0
9	875	3	7.1	568	3	4.6	101	4	1.1
10	700	3	5.7	533	3	4.3	478	5	6.5
11	660	3	5.3	488	3	4.0	153	4	1.7
12	1280	6	21	452	3	3.7	101	3	.82
13	1160	5	16	660	5	8.9	120	3	.97
14	750	2	4.1	505	4	5.5	112	3	.91
15	560	2	3.0	349	3	2.8	87	3	.70
16	452	1	1.2	625	15	25	59	2	.32
17	355	1	.96	1750	23	135	54	2	.29
18	310	1	.84	640	3	5.2	57	2	.31
19	288	1	.78	435	2	2.3	256	4	2.8
20	985	12	32	394	2	2.1	108	3	.87
21	1580	10	43	1430	36	256	498	8	11
22	925	4	10	750	6	12	293	5	4.0
23	596	2	3.2	640	3	5.2	158	4	1.7
24	418	2	2.3	477	2	2.6	95	4	1.0
25	373	3	3.0	470	2	2.5	69	4	.75
26	370	3	3.0	488	2	2.6	58	3	.47
27	295	3	2.4	407	1	1.1	57	3	.46
28	340	3	2.8	325	1	.88	36	3	.29
29	700	5	9.5	325	2	1.8	29	2	.16
30	632	5	8.5	608	12	20	23	2	.12
31	585	5	7.9	295	6	4.8	---	---	---
TOTAL	25044	---	1979.58	17276	---	631.48	4596	---	46.88
YEAR	104571.8		11831.70						

16717000 HONOLII STREAM NEAR PAPAIKOU
(Hydrologic bench-mark station)

LOCATION.--Lat 19°46'00", long 155°09'16", Hydrologic Unit 20010000, on left bank 0.7 mi (1.1 km) downstream from Pohakupaa Stream, 4.1 mi (6.6 km) west of Papaikou, and 4.8 mi (7.7 km) northwest of Hilo Post Office.

DRAINAGE AREA.--11.6 mi² (30.0 km²).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--June 1911 to March 1913 (published as "at Kaiwiki, near Hilo"), February 1967 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 1,540 ft (469 m), from topographic map. Prior to Aug. 27, 1911, nonrecording gage and Aug. 27, 1911, to Mar. 24, 1913, water-stage recorder, at site 0.5 mi (0.8 km) upstream at different datum.

REMARKS.--Records good. No diversion above station. During period 1911-13, Honolii ditch diverted an average of about 3.2 ft³/s (0.091 m³/s) above station for fluming cane and domestic use.

AVERAGE DISCHARGE.--12 years, 124 ft³/s (3.512 m³/s), 89,800 acre-ft/yr (111 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 22,600 ft³/s (640 m³/s) May 23, 1978, gage height, 20.00 ft (6.096 m), from floodmarks and from rating curve extended above 4,610 ft³/s (131 m³/s) on basis of slope-area measurement at gage height 20.00 ft (6.096 m); minimum, 0.8 ft³/s (0.023 m³/s) Jan. 31, 1912.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 4,400 ft³/s (125 m³/s) and maximum (*), from rating curve as explained above:

Date	Time	Discharge (ft ³ /s) (m ³ /s)	Gage height (ft) (m)
May 23	1730	*22,600 640	20.00 6.096
July 6	0915	5,190 147	12.66 3.806

Minimum discharge, 3.2 ft³/s (0.09 m³/s) Mar. 6, 7.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	17	57	13	12	16	4.4	63	60	41	33	71	61
2	34	186	13	23	13	3.8	89	148	48	46	45	58
3	41	250	12	17	11	4.1	150	55	26	77	42	43
4	42	181	12	18	9.4	3.8	42	397	21	125	76	32
5	43	54	11	15	8.3	3.5	41	120	18	95	51	30
6	29	41	10	12	7.4	3.5	155	54	15	1640	45	26
7	25	35	10	9.6	6.4	3.8	881	37	14	217	213	26
8	29	31	9.9	8.3	6.0	36	168	36	15	180	260	54
9	22	28	9.5	7.4	7.9	57	60	38	14	84	74	46
10	269	25	9.5	6.2	6.3	25	39	29	12	75	91	152
11	56	26	9.0	6.5	6.0	82	31	48	13	95	71	36
12	47	26	8.4	6.0	4.4	135	27	35	23	371	74	31
13	51	25	10	5.5	5.2	66	76	26	30	216	123	42
14	28	103	10	5.0	16	553	149	33	31	74	72	42
15	23	98	14	5.0	35	73	48	73	38	47	45	30
16	147	90	12	4.7	24	306	156	87	71	39	314	24
17	260	41	56	4.7	14	109	314	67	62	34	417	23
18	52	30	50	4.4	10	186	75	40	136	33	61	33
19	38	26	108	4.1	13	219	77	33	704	63	43	107
20	33	23	41	36	15	151	40	27	97	447	44	88
21	80	22	29	121	8.9	168	33	48	84	486	479	154
22	179	21	24	56	7.4	293	29	45	334	150	108	83
23	88	19	19	27	56	94	25	698	1020	68	82	44
24	60	18	15	32	19	51	23	100	146	45	61	31
25	103	17	12	31	11	37	39	132	65	44	80	26
26	237	16	11	50	7.9	32	66	116	44	54	82	23
27	271	15	9.4	45	6.3	28	41	98	36	58	61	20
28	95	15	8.8	26	5.6	26	52	70	60	76	48	21
29	132	14	11	22	---	24	49	71	42	197	68	18
30	69	17	11	23	---	29	99	39	34	133	114	16
31	58	---	8.8	16	---	33	---	37	---	133	46	---
TOTAL	2658	1550	587.3	659.4	356.4	2839.9	3137	2897	3294	5455	3461	1420
MEAN	85.7	51.7	18.9	21.3	12.7	91.6	105	93.5	110	176	112	47.3
MAX	271	250	108	121	56	553	881	698	1020	1640	479	154
MIN	17	14	8.4	4.1	4.4	3.5	23	26	12	33	42	16
AC-FT	5270	3070	1160	1310	707	5630	6220	5750	6530	10820	6660	2820
CAL YR 1977	TOTAL	45532.4	MEAN	125	MAX	2350	MIN	3.5	AC-FT	90310		
WTR YR 1978	TOTAL	28315.0	MEAN	77.6	MAX	1640	MIN	3.5	AC-FT	56160		

HAWAII, ISLAND OF HAWAII
16717000 HONOLII STREAM NEAR PAPAIIKOU--Continued
WATER-QUALITY RECORDS

PERIOD OF RECORD.--September 1969 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH (UNITS)	TEMPER- ATURE (DEG C)	OXYGEN, DIS- SOLVED (MG/L)	COLI- FORM, TOTAL, IMMED. (COLS. PEP 100 ML)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP- TOCOCCHI FECAL, KF AGAR (COLS. PER 100 ML)	HARD- NESS (MG/L AS CAC03)	HARD- NESS, NONCAR- BONATE (MG/L CAC03)
OCT 26...	0915	151	25	7.4	17.0	9.0	460	410	4600	8	4
NOV 28...	1330	14	90	7.5	19.0	9.0	110	K3	45	36	0
DEC 13...	1330	10	95	7.4	19.0	9.0	120	8	99	45	1
JAN 25...	1330	29	40	6.5	19.0	9.0	420	94	450	13	1
FEB 28...	0900	6.0	80	7.2	16.0	8.8	190	7	56	36	0
MAR 28...	1400	27	46	6.4	21.0	8.6	43	K8	34	17	0
APR 24...	1050	24	50	7.2	20.0	8.8	170	10	220	23	2
MAY 24...	0930	84	18	6.4	17.5	--	>800	1300	520	7	3
JUN 27...	1300	35	38	7.1	21.5	8.6	85	9	40	19	9
JUL 28...	1115	80	32	6.9	19.0	8.6	350	140	870	9	2
AUG 29...	0945	50	38	7.0	18.0	8.5	130	26	210	12	2
SEP 12...	1415	28	45	7.2	19.5	--	390	95	150	18	0

DATE	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM AD- SORP- TION RATIO	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	BICAR- BONATE (MG/L AS HC03)	CAR- BONATE (MG/L AS C03)	ALKA- LINITY (MG/L AS CAC03)	CARBON DIOXIDE DIS- SOLVED (MG/L AS C02)	SULFATE DIS- SOLVED (MG/L AS S04)
OCT 26...	1.8	.9	1.9	33	.3	.2	5	0	4	.3	4.7
NOV 28...	7.7	4.1	3.7	18	.3	.3	44	0	36	2.2	3.4
DEC 13...	10	4.8	4.1	16	.3	.4	53	0	43	3.4	6.5
JAN 25...	2.6	1.5	2.1	26	.3	.3	14	0	11	7.1	3.0
FEB 28...	7.8	4.0	3.5	17	.3	.3	44	0	36	4.4	3.2
MAR 28...	3.4	2.0	2.4	24	.3	.2	20	0	16	13	1.2
APR 24...	5.6	2.3	2.6	19	.2	.2	26	0	21	2.6	3.3
MAY 24...	2.0	.5	1.4	30	.2	.1	--	--	4	--	7.3
JUN 27...	5.1	1.4	2.0	19	.2	.2	--	--	10	--	3.3
JUL 28...	1.6	1.1	2.8	41	.4	.2	--	--	7	--	3.7
AUG 29...	2.3	1.5	2.4	30	.3	.3	--	--	10	--	2.5
SEP 12...	4.0	2.0	2.6	23	.3	.3	--	--	18	--	4.1

K Results based on colony count outside the acceptable range (non-ideal colony count).

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

16717000 HONOLII STREAM NEAR PAPAIIKOU--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	SILICA, DIS- SOLVED (MG/L AS SI02)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)	SOLIDS, RESIDUE AT 105 DEG. C, DIS- SOLVED (MG/L)	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L)	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)	PHOS- PHORUS, TOTAL (MG/L AS P)
OCT 26...	3.1	.0	3.8	27	--	19	.04	11.0	--	.02	.02
NOV 28...	3.7	.1	20	74	62	65	.10	2.80	<1	.07	.00
DEC 13...	4.2	.0	24	67	--	80	.09	1.81	--	.07	.01
JAN 25...	3.2	.0	7.6	34	--	27	.05	2.66	--	.02	.02
FEB 28...	3.7	.0	20	67	--	64	.09	1.09	--	.10	.02
MAR 28...	3.2	.0	9.4	33	--	32	.04	2.41	--	.03	.02
APR 24...	2.9	.0	12	41	--	42	.06	2.66	--	.05	.00
MAY 24...	1.8	.0	3.9	25	--	19	.03	5.67	--	.02	.06
24...	--	--	--	--	--	--	--	--	--	--	--
JUN 27...	2.9	.0	9.0	21	--	30	.03	1.98	--	.05	.00
JUL 28...	3.0	.0	5.7	26	--	22	.04	5.62	--	.06	.00
AUG 29...	3.1	.0	8.1	25	--	26	.03	3.38	--	.02	.02
SEP 12...	2.7	.0	11	38	--	38	.05	2.87	--	.02	.01

DATE	TIME	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)
OCT 26...	0915	0	100	<10	0	<10	1100
MAY 24...	0930	0	0	0	10	9	1700

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)	SELE- NIUM, TOTAL RECOV- ERABLE (UG/L AS SE)	SILVER, TOTAL RECOV- ERABLE (UG/L AS AG)	ZINC, TOTAL RECOV- ERABLE (UG/L AS ZN)
OCT 26...	<100	20	.0	0	<10	20
MAY 24...	26	40	.1	0	0	5

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

16717000 HONOLII STREAM NEAR PAPAIIKOU--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	TIME	CYANIDE TOTAL (MG/L AS CN)	NAPH- THA- LENES, POLY- CHLOR. TOTAL (UG/L)	PCB, TOTAL IN BOT- TOM MA- TERIAL (UG/KG)	ALDRIN, TOTAL IN BOT- TOM MA- TERIAL (UG/KG)	CHLOR- DANE, TOTAL IN BOT- TOM MA- TERIAL (UG/L)	DDD, TOTAL (UG/L)
OCT 26...	0915	.00	--	--	--	--	--
NOV 28...	1330	--	.00	.0	.00	.0	.00
MAY 24...	0930	.00	--	--	--	--	--

[illegible][illegible][illegible]

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16717000 HONOLII STREAM NEAR PAPAIIKOU--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	TIME	GROSS BETA, DIS- SOLVED (PCI/L AS CS-137)	GROSS BETA, SUSP. TOTAL (PCI/L AS CS-137)	GROSS BETA, DIS- SOLVED, RADON METHOD (PCI/L)
NOV 28...	1330	1.1	<.4	.11

DATE	TIME	GROSS ALPHA, DIS- SOLVED (UG/L AS U-NAT)	GROSS ALPHA, SUSP. TOTAL (UG/L AS U-NAT)	GROSS BETA, DIS- SOLVED (PCI/L AS SR/ YT-90)	GROSS BETA, SUSP. TOTAL (PCI/L AS SR/ YT-90)	URANIUM DIS- SOLVED, EXTRAC- TION (UG/L)
NOV 28...	1330	<.6	<.4	1.0	<.4	.02

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SEDI- MENT, SUS- PENDEO (MG/L)	SEDI- MENT DIS- CHARGE, SUS- PENDEO (T/DAY)	DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SEDI- MENT, SUS- PENDEO (MG/L)	SEDI- MENT DIS- CHARGE, SUS- PENDEO (T/DAY)
OCT 26...	0915	151	7	2.9	APR 24...	1050	24	0	.00
NOV 28...	1330	14	1	.04	MAY 24...	0930	84	18	4.1
DEC 13...	1330	10	0	.00	JUN 27...	1300	35	2	.19
JAN 25...	1330	29	2	.16	JUL 28...	1115	80	2	.43
FEB 28...	0900	6.0	1	.02	AUG 29...	0945	50	2	.27
MAR 28...	1400	27	2	.15	SEP 12...	1415	28	3	.23

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

HAWAII, ISLAND OF HAWAII

16717800 POHAKUPUKA STREAM NEAR PAPAALOA

LOCATION.--Lat 19°57'20", long 155°11'20", Hydrologic Unit 20010000, on right bank 200 ft (61 m) downstream from Highway 19, 2.8 mi (4.5 km) northwest of Honohina, and 3.0 mi (4.8 km) southeast of Papaaloa.

DRAINAGE AREA.--2.76 mi² (7.15 km²).

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

GAGE.--Water-stage recorder. Datum of gage is 250 ft (76.2 m) above mean sea level (by stadia survey).

REMARKS.--Records good except those for period of no gage-height record May 24 to July 3, which are fair. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--16 years, 26.8 ft³/s (0.759 m³/s), 19,420 acre-ft/yr (23.9 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,340 ft³/s (151 m³/s) Nov. 26, 1967, gage height, 13.37 ft (4.075 m), from rating curve extended above 1,100 ft³/s (31.2 m³/s); minimum, 0.28 ft³/s (0.008 m³/s) Nov. 9, 1962.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,180 ft³/s (33.4 m³/s) Feb. 23, gage height, 7.20 ft (2.195 m), from rating curve extended as explained above, no peak above base of 1,400 ft³/s (39.6 m³/s); minimum, 1.6 ft³/s (0.045 m³/s) Mar. 6.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.0	11	3.3	75	3.4	2.3	12	9.5	3.0	4.5	21	19
2	4.2	34	3.2	50	3.2	2.1	11	18	5.0	6.0	12	24
3	4.5	57	3.1	25	3.0	1.9	17	8.0	4.0	10	10	16
4	5.8	25	3.3	20	2.8	1.8	5.7	13	4.0	16	14	12
5	6.9	7.5	3.1	15	2.7	1.7	7.4	11	3.5	34	11	11
6	4.7	5.1	3.0	10	2.6	1.7	42	7.3	3.0	200	14	10
7	5.3	4.1	3.0	7.0	2.6	5.2	136	5.7	3.0	50	20	9.9
8	5.8	3.5	2.9	5.0	2.6	7.9	25	5.4	3.5	30	37	20
9	3.9	3.0	2.8	4.0	6.0	7.0	9.5	6.1	3.0	15	14	18
10	11	3.7	2.9	3.6	3.6	3.1	6.9	5.0	2.5	10	18	40
11	12	5.0	2.8	3.4	2.9	5.5	5.6	10	2.5	45	27	11
12	5.6	8.4	2.7	3.2	2.6	16	4.9	11	4.0	128	23	9.6
13	3.8	5.6	2.6	3.0	2.5	6.2	11	5.6	5.0	62	28	18
14	3.5	39	2.6	2.9	2.6	72	23	5.7	5.5	18	18	14
15	3.1	31	2.6	2.8	2.8	11	7.3	23	6.0	12	12	9.4
16	89	7.4	2.6	2.8	3.5	122	51	19	9.0	10	130	8.3
17	52	5.7	19	3.2	2.8	23	30	11	8.0	9.8	203	7.8
18	8.0	4.9	48	2.7	5.0	91	22	6.6	15	13	18	8.0
19	5.4	4.8	119	2.6	8.2	82	14	5.6	50	58	13	19
20	5.3	4.5	16	60	7.4	60	26	7.1	20	150	12	15
21	28	4.3	9.1	26	3.1	68	9.2	6.5	15	72	148	40
22	43	4.2	11	8.4	2.4	71	8.0	8.6	30	27	40	23
23	22	3.9	5.8	5.1	155	14	5.8	62	100	18	20	8.4
24	11	3.8	4.0	5.9	6.5	8.9	8.6	12	20	13	22	7.7
25	25	3.7	3.4	5.4	3.3	8.4	19	11	10	11	35	8.4
26	87	3.6	3.0	26	2.6	8.2	33	10	8.0	11	38	7.2
27	83	3.6	2.7	13	3.2	6.6	28	8.0	7.0	18	30	6.2
28	30	3.5	2.5	5.9	3.0	8.4	33	6.0	9.0	48	18	5.8
29	46	3.4	2.4	4.6	---	4.8	12	5.0	6.0	86	26	5.6
30	14	3.3	2.3	4.0	---	4.2	20	4.0	5.0	27	30	5.4
31	10	---	2.3	3.6	---	5.0	---	3.0	---	47	13	---
TOTAL	642.8	357.5	297.0	409.1	251.9	730.9	643.9	329.7	369.5	1259.3	1075	417.7
MEAN	20.7	11.9	9.58	13.2	9.00	23.6	21.5	10.6	12.3	40.6	34.7	13.9
MAX	89	84	119	75	155	122	136	62	100	200	203	40
MIN	3.1	3.0	2.3	2.6	2.4	1.7	4.9	3.0	2.5	4.5	10	5.4
AC-FT	1270	709	589	811	500	1450	1280	654	733	2500	2130	829
CAL YR 1977	TOTAL	9824.8	MEAN	26.9	MAX	352	MIN	1.4	AC-FT	19490		
WTR YR 1978	TOTAL	6784.3	MEAN	18.6	MAX	203	MIN	1.7	AC-FT	13460		

HAWAII, ISLAND OF HAWAII

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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.--14 years, 13.7 ft³/s (0.388 m³/s), 9,930 acre-ft/yr (12.2 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,400 ft³/s (68.0 m³/s) Jan. 11, 1967, gage height, 9.15 ft (2.789 m), from rating curve extended above 53 ft³/s (1.50 m³/s) on basis of computation of peak flow over dam; minimum, 0.01 ft³/s (<0.001 m³/s) Jan. 20, 21, 24-28, Feb. 20-22, 1977.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 440 ft³/s (12.5 m³/s) and maximum (*), from rating curve extended as explained above:

Date	Time	Discharge (ft ³ /s) (m ³ /s)	Gage height (ft) (m)
Dec. 31	2130	*470 13.3	5.12 1.561
Mar. 1	2330	460 13.0	5.08 1.548

Minimum discharge, 0.08 ft³/s (0.002 m³/s) Dec. 3, 4.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.65	15	.11	76	1.3	49	16	17	1.2	15	17	49
2	.59	50	.09	16	1.0	85	20	21	2.5	16	9.5	25
3	.51	49	.08	8.9	.81	5.9	23	8.5	1.3	32	4.4	8.1
4	.53	26	.31	3.8	.66	2.7	13	5.7	.96	24	16	11
5	1.9	5.1	.64	2.6	.52	30	18	4.7	.69	65	43	30
6	1.6	2.7	.40	2.2	.41	14	35	4.0	.50	110	50	6.8
7	5.9	2.0	.33	1.5	.33	61	31	3.4	1.1	27	32	4.2
8	4.9	4.8	.24	1.1	3.6	40	7.0	8.1	1.2	37	20	9.8
9	2.4	5.3	.17	.87	3.1	8.1	3.7	11	1.1	26	8.9	16
10	1.8	2.4	.79	.66	1.5	3.4	2.6	8.4	.85	37	9.9	18
11	1.4	2.7	.84	.55	1.1	2.2	2.2	29	3.0	62	21	4.4
12	14	7.1	.63	.44	.95	29	2.0	14	32	59	9.7	5.3
13	5.8	16	.47	.37	.77	8.5	2.7	17	20	41	12	9.0
14	2.5	32	2.2	.30	.69	3.5	6.3	44	14	10	14	4.3
15	2.1	26	3.9	.26	.97	6.3	3.5	36	15	4.5	16	2.5
16	45	7.3	9.5	.31	1.3	91	8.0	23	36	2.8	71	13
17	42	3.4	57	.37	1.1	22	4.3	7.1	17	4.2	74	13
18	6.2	2.1	111	.35	.83	59	3.5	3.1	26	48	6.4	7.8
19	3.3	1.5	88	.55	.67	67	3.1	2.0	72	78	3.4	17
20	5.4	1.3	18	48	.64	42	2.9	1.4	18	94	3.9	6.3
21	10	1.1	11	20	.52	16	2.8	31	11	83	32	12
22	36	.89	8.7	4.5	.43	19	2.7	11	24	19	28	8.6
23	16	.74	4.0	9.2	12	5.6	2.5	3.2	120	12	34	3.8
24	21	.61	2.4	36	5.9	3.0	3.2	1.9	22	6.6	13	2.7
25	25	.51	1.8	16	2.2	2.5	6.1	3.6	11	12	42	2.3
26	8.4	.43	1.4	42	1.3	5.0	24	8.3	17	20	27	1.7
27	24	.34	1.1	12	1.0	4.5	18	3.0	58	39	19	1.3
28	38	.31	.76	9.2	.84	19	64	2.2	42	23	6.1	1.2
29	41	.22	.58	4.0	---	5.5	35	1.6	18	46	13	1.0
30	22	.16	.49	2.4	---	8.6	34	1.3	30	16	20	1.2
31	9.6	---	93	1.7	---	13	---	1.1	---	12	5.2	---
TOTAL	399.48	267.01	419.93	322.13	46.44	731.3	400.1	336.6	617.40	1081.1	681.4	296.3
MEAN	12.9	8.90	13.5	10.4	1.66	23.6	13.3	10.9	20.6	34.9	22.0	9.88
MAX	45	50	111	76	12	91	64	44	120	110	74	49
MIN	.51	.16	.08	.26	.33	2.2	2.0	1.1	.50	2.8	3.4	1.0
AC-FT	792	530	833	639	92	1450	794	668	1220	2140	1350	588

CAL YR 1977	TOTAL	6031.20	MEAN	16.5	MAX	206	MIN	.01	AC-FT	11960
WTR YR 1978	TOTAL	5599.19	MEAN	15.3	MAX	120	MIN	.08	AC-FT	11110

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.

GAGE.--Water-stage recorder. Altitude of gage is 4,090 ft (1,247 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.--10 years, 3.86 ft³/s (0.109 m³/s), 2,800 acre-ft/yr (3.45 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 595 ft³/s (16.9 m³/s) Oct. 20, 1974, gage height, 5.65 ft (1.722 m), from rating curve extended above 33 ft³/s (0.94 m³/s); minimum, 0.03 ft³/s (0.001 m³/s) Nov. 12-15, 1968.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 100 ft³/s (2.83 m³/s) and maximum (*), from rating curve extended above 33 ft³/s (0.94 m³/s):

Date	Time	Discharge (ft ³ /s) (m ³ /s)	Gage height (ft) (m)
Jan. 1	1830	*102 2.89	2.91 0.887
May 21	1430	101 2.86	2.90 .884

Minimum discharge, 0.21 ft³/s (0.006 m³/s) Dec. 14, Feb. 22.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.43	4.8	.37	35	.46	16	3.5	3.7	.88	4.5	6.0	14
2	.42	11	.37	13	.41	11	4.3	4.0	1.6	5.1	4.0	8.1
3	.42	11	.36	3.9	.37	1.3	4.8	1.5	.84	9.2	2.5	3.2
4	.51	5.4	.36	2.5	.32	.68	3.8	.97	.63	5.6	6.0	5.2
5	.85	1.3	.36	1.1	.32	.48	4.6	.76	.53	18	10	9.4
6	.80	.80	.32	.87	.28	.39	7.6	.65	.48	24	15	2.9
7	2.5	.67	.24	.61	.28	15	7.0	.54	.93	6.8	10	2.3
8	1.6	1.9	.24	.46	.84	9.4	2.1	2.1	.87	9.6	8.0	4.3
9	.81	2.3	.24	.39	1.3	2.5	1.0	2.5	.77	8.6	4.0	7.4
10	.65	1.0	.35	.35	.53	1.0	.77	2.4	.64	12	4.5	5.3
11	.54	1.1	.33	.32	.42	.71	.65	6.9	1.8	17	8.0	2.2
12	4.1	2.1	.27	.32	.37	6.1	.60	4.0	8.0	15	4.0	2.8
13	1.5	3.6	.24	.28	.34	2.0	.82	5.8	5.6	11	5.0	4.0
14	.75	6.1	1.3	.28	.32	.94	2.0	10	3.5	2.9	6.0	2.2
15	.77	6.2	1.2	.28	.35	2.1	1.0	9.5	3.6	1.9	7.0	1.7
16	12	2.2	4.3	.28	.41	22	2.3	6.1	9.0	1.0	20	5.0
17	9.8	1.1	13	.28	.34	5.2	.95	2.2	4.1	5.2	25	4.1
18	1.6	.75	26	.28	.29	13	.70	1.2	7.7	14	3.0	3.9
19	1.0	.60	17	.31	.28	15	.57	.88	16	20	2.0	5.1
20	1.9	.54	4.5	9.5	.27	11	.52	.72	5.4	25	2.0	2.9
21	4.0	.48	3.1	8.5	.24	4.0	.50	8.2	3.3	14	10	4.8
22	11	.48	2.4	1.8	.23	4.8	.44	2.9	8.5	4.7	9.0	3.8
23	4.4	.48	1.1	.87	5.2	1.5	.43	1.2	30	4.5	10	2.2
24	5.7	.43	.70	9.9	1.1	.91	.72	.83	6.2	3.0	5.0	1.9
25	4.6	.42	.56	3.4	.59	.80	2.4	1.6	3.2	5.0	8.0	1.8
26	2.6	.42	.47	11	.42	1.6	6.2	2.8	5.6	8.0	8.8	1.6
27	5.9	.42	.41	3.2	.37	1.7	4.5	1.2	14	10	6.9	1.5
28	10	.37	.36	3.2	.33	5.4	13	1.0	10	8.0	3.0	1.2
29	8.7	.37	.32	1.3	---	1.5	7.4	.75	5.9	15	6.6	1.2
30	5.2	.37	.32	.76	---	2.1	6.1	.68	9.6	6.0	5.7	1.3
31	2.4	---	.38	.56	---	3.0	---	.60	---	5.0	2.4	---
TOTAL	107.45	68.70	81.27	114.80	16.98	163.11	91.27	88.18	169.17	299.6	227.4	117.3
MEAN	3.47	2.29	2.62	3.70	.61	5.26	3.04	2.84	5.64	9.66	7.34	3.91
MAX	12	11	26	35	5.2	22	13	10	30	25	25	14
MIN	.42	.37	.24	.28	.23	.39	.43	.54	.48	1.0	2.0	1.2
AC-FI	213	136	161	228	34	324	181	175	336	594	451	233

CAL YR 1977 TOTAL 1659.10 MEAN 4.55 MAX 48 MIN .16 AC-FI 3290
WIR YR 1978 TOTAL 1545.23 MEAN 4.23 MAX 35 MIN .23 AC-FI 3060

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 Kawaiiki Stream intake and 4.4 mi (7.1 km) north of Kamuela.

PERIOD OF RECORD.--January 1964 to current year.

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 4,020 ft (1,225 m), from topographic map.

REMARKS.--Records good except those for period of no gage-height record July 23 to Aug. 25, which are fair. Ditch diverts from Kawaiiki and Kawaiiki 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.--14 years, 8.05 ft³/s (0.228 m³/s), 5,830 acre-ft/yr (7.19 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 49 ft³/s (1.39 m³/s) Nov. 2, 1967; minimum daily, 0.05 ft³/s (0.001 m³/s) Oct. 4-6, 1965.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.67	7.0	.50	8.2	1.7	12	13	10	1.5	12	12	13
2	.63	9.3	.45	6.4	1.4	16	13	12	3.1	12	10	13
3	.56	9.5	.45	5.9	1.1	8.0	13	5.2	1.4	14	6.0	8.9
4	.63	8.8	.62	5.9	.89	3.5	12	2.7	1.0	13	10	7.0
5	1.8	5.4	.84	4.4	.78	12	12	1.8	.78	14	14	13
6	1.5	3.1	.62	3.4	.67	10	13	1.4	.67	14	14	7.8
7	6.2	2.3	.56	2.6	.62	15	13	.94	1.4	14	12	5.0
8	4.8	3.6	.45	1.7	1.4	10	7.0	4.1	1.5	14	10	10
9	2.3	6.0	.42	1.3	5.7	7.5	3.1	10	1.4	14	9.5	7.2
10	1.7	2.9	.89	1.0	2.0	3.5	2.0	7.4	.94	14	10	12
11	1.2	2.8	1.0	.89	1.4	2.4	1.4	13	3.2	14	12	5.0
12	3.8	6.6	.72	.84	1.3	11	1.2	11	13	14	10	6.2
13	5.2	5.1	.62	.72	1.0	8.0	1.9	12	13	14	10	10
14	2.5	9.5	2.4	.67	.94	3.5	5.2	14	12	10	10	5.0
15	2.4	9.6	4.4	.62	1.2	4.9	2.5	14	12	5.2	12	3.2
16	9.0	7.4	4.7	.56	1.7	15	6.1	14	13	3.1	14	5.5
17	9.5	4.0	7.4	.50	1.5	13	2.3	7.4	12	5.9	14	10
18	6.4	2.5	8.2	.50	1.0	14	1.4	3.5	13	14	8.0	6.5
19	3.9	1.8	7.6	.50	.90	14	1.1	2.1	14	14	4.0	11
20	5.9	1.5	6.6	11	.85	14	.84	1.6	12	14	5.0	7.2
21	6.2	1.3	6.5	16	.80	12	.78	7.8	10	14	13	12
22	9.3	1.1	6.4	8.2	.70	12	.67	10	14	12	12	9.5
23	8.3	.94	4.8	3.8	12	5.3	.62	3.8	15	10	13	4.4
24	7.0	.89	3.1	14	7.5	2.9	1.1	2.3	13	7.0	10	3.5
25	8.6	.78	2.4	12	3.5	2.3	4.5	4.1	11	10	13	2.9
26	6.6	.72	1.8	16	2.5	4.8	12	8.9	13	12	13	2.1
27	8.6	.67	1.4	12	2.0	4.5	9.7	3.5	14	14	12	1.6
28	8.9	.62	1.3	12	1.0	12	14	2.7	14	12	7.4	1.4
29	9.0	.62	.94	5.6	---	5.2	14	1.7	13	14	8.2	1.4
30	8.6	.56	.89	3.4	---	8.0	14	1.4	14	10	11	1.6
31	7.8	---	.89	2.4	---	9.3	---	1.2	---	10	6.2	---
TOTAL	159.49	116.90	79.86	163.00	58.05	275.6	196.41	195.54	261.89	368.2	325.3	206.9
MEAN	5.14	3.90	2.58	5.26	2.07	8.89	6.55	6.31	8.73	11.9	10.5	6.90
MAX	9.5	9.6	8.2	16	12	16	14	14	15	14	14	13
MIN	.56	.56	.42	.50	.62	2.3	.62	.94	.67	3.1	4.0	1.4
AC-FT	316	232	158	323	115	547	390	388	519	730	645	410
CAL YR 1977	TOTAL	1926.17	MEAN	5.28	MAX	14	MIN	.10	AC-FT	3820		
WTR YR 1978	TOTAL	2407.14	MEAN	6.59	MAX	16	MIN	.42	AC-FT	4770		

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.--10 years, 5.77 ft³/s (0.163 m³/s), 4,180 acre-ft/yr (5.15 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 41 ft³/s (1.16 m³/s) Aug. 18, 1972; no flow at times each year.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	4.2	.00	.90	.00	7.5	7.6	6.6	.31	10	11	12
2	.00	6.4	.00	.07	.00	9.6	8.1	7.5	1.6	10	8.2	11
3	.00	6.6	.00	.00	.00	2.5	8.7	1.9	.37	12	3.9	7.2
4	.00	5.7	.00	2.0	.00	.39	7.5	.46	.09	11	9.7	5.4
5	.07	3.1	.00	14	.00	.00	8.5	.05	.00	15	12	11
6	.05	1.3	.00	9.0	.00	.00	9.5	.01	.00	17	13	6.1
7	2.1	.73	.00	1.6	.00	.00	10	.00	.18	13	12	3.5
8	2.0	1.6	.00	10	.00	8.7	4.1	1.1	.18	13	11	7.2
9	.55	3.1	.00	8.4	.00	3.9	1.1	3.9	.07	13	8.6	6.3
10	.26	1.0	.00	17	.00	1.0	.33	2.6	.00	14	6.6	9.7
11	.05	.78	.00	8.4	.00	.21	.03	10	.72	15	11	3.6
12	1.2	2.8	1.1	7.8	.00	6.5	.01	9.6	9.7	15	8.2	4.1
13	2.7	1.9	1.1	2.4	.00	4.7	.21	8.8	10	15	9.5	7.0
14	.69	4.8	4.5	.60	.00	1.0	1.9	14	9.4	9.5	9.2	3.2
15	.44	5.2	6.9	.01	.00	1.5	.23	14	9.0	4.0	6.2	1.9
16	5.7	3.8	6.6	1.7	.00	13	2.6	13	11	2.2	14	2.8
17	7.2	1.6	3.7	.17	.00	10	.32	6.1	10	3.2	15	6.8
18	3.8	.68	3.2	.00	.00	12	.01	2.0	9.9	12	6.3	4.2
19	1.7	.31	3.0	.05	.00	13	.00	.97	14	15	3.1	8.0
20	3.1	.11	2.0	3.0	.00	13	.00	.56	10	14	3.2	4.8
21	3.3	.01	.95	1.7	.00	9.4	.00	6.1	8.5	16	11	8.4
22	6.4	.00	.49	.02	.00	9.8	.00	9.1	11	13	11	6.8
23	5.1	.00	.23	.68	.00	3.2	.00	2.3	18	10	11	2.7
24	3.8	.00	.04	2.1	1.2	1.1	.00	.98	12	6.7	9.1	2.0
25	5.4	.00	.00	1.0	.14	.65	.53	1.7	9.4	7.4	12	1.5
26	3.6	.00	.00	3.0	.00	2.1	5.9	6.2	11	12	11	.84
27	5.4	.00	3.8	1.0	.00	1.9	4.8	1.9	14	13	11	.52
28	6.1	.00	8.5	.50	.00	7.4	10	1.1	14	12	5.6	.37
29	6.1	.00	3.3	.30	---	2.4	8.8	.60	12	13	6.5	.26
30	5.4	.00	2.6	.20	---	3.8	9.4	.34	13	11	9.5	.33
31	4.5	---	1.9	.10	---	5.0	---	.17	---	8.7	4.3	---
TOTAL	86.71	55.72	53.91	92.70	1.34	155.25	110.17	133.64	219.42	355.7	283.7	149.52
MEAN	2.80	1.86	1.74	2.99	.048	5.01	3.67	4.31	7.31	11.5	9.15	4.98
MAX	7.2	6.6	8.5	14	1.2	13	10	14	18	17	15	12
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	2.2	3.1	.26
AC-FT	172	111	107	184	2.7	308	219	265	435	706	563	297
CAL YR 1977	TOTAL	1205.89	MEAN	3.70	MAX	19	MIN	.00	AC-FT	2390		
WTR YR 1978	TOTAL	1697.78	MEAN	4.65	MAX	18	MIN	.00	AC-FT	3370		

HAWAII, ISLAND OF HAWAII

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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.--14 years, 6.36 ft³/s (0.180 m³/s), 4,610 acre-ft/yr (5.68 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,420 ft³/s (40.2 m³/s) Jan. 11, 1967, gage height, 8.65 ft (2.637 m), from rating curve extended above 28 ft³/s (0.79 m³/s) on basis of computation of peak flow over dam; minimum, 0.03 ft³/s (0.001 m³/s) on several days in 1965.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 91 ft³/s (2.58 m³/s) June 23, gage height, 4.06 ft (1.237 m), from rating curve extended as explained above, no peak above base of 120 ft³/s (3.40 m³/s); minimum, 0.50 ft³/s (0.014 m³/s) Oct. 5.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.55	7.4	1.0	41	1.7	15	4.8	4.5	1.9	8.1	15	16
2	.57	16	1.0	26	1.5	18	4.6	5.5	3.7	15	10	18
3	.55	17	1.0	8.0	1.3	3.9	5.2	3.2	2.3	11	5.0	12
4	.58	8.9	1.2	5.8	1.3	2.5	4.6	2.2	1.8	28	12	5.4
5	.56	4.3	1.1	3.9	1.2	1.6	6.0	1.7	1.5	36	15	16
6	.62	3.0	1.0	3.1	1.1	1.2	7.7	1.3	1.4	15	20	11
7	1.8	2.5	1.0	2.5	1.1	18	11	1.1	1.6	14	18	4.8
8	2.8	3.2	1.0	2.0	1.3	16	4.2	1.3	2.3	15	15	4.7
9	1.8	4.7	1.0	1.6	2.9	5.1	2.7	3.5	1.9	23	10	6.3
10	1.3	3.0	1.1	1.4	1.8	3.1	2.0	3.2	1.6	34	8.0	13
11	1.1	2.7	1.0	1.3	1.4	2.1	1.5	10	1.9	25	13	9.8
12	6.2	3.8	1.0	1.2	1.3	6.8	1.2	8.7	11	19	9.0	4.8
13	4.5	3.5	.98	1.2	1.2	4.3	1.2	6.8	9.3	22	10	4.3
14	2.5	7.3	1.4	1.1	1.1	2.5	2.4	17	6.8	9.7	10	6.3
15	1.9	9.4	2.0	1.1	1.1	2.3	1.8	17	5.9	5.2	7.0	4.8
16	18	5.0	5.7	1.0	1.1	34	3.4	11	12	4.3	20	3.8
17	20	3.3	21	1.1	1.0	10	2.1	5.1	8.1	4.1	25	3.4
18	4.7	2.4	40	1.0	1.0	20	1.4	3.5	10	20	8.0	9.0
19	3.2	1.8	30	1.1	1.0	23	1.2	2.6	28	34	4.5	4.5
20	3.5	1.6	9.0	12	1.0	19	1.0	2.0	9.6	35	5.0	8.8
21	6.5	1.4	6.1	16	1.0	7.2	1.0	13	6.9	29	17	5.4
22	21	1.4	5.4	5.0	1.0	7.7	.97	6.9	11	11	15	5.0
23	9.9	1.3	3.8	3.2	6.4	3.7	.96	3.8	44	8.9	15	6.9
24	7.6	1.2	2.9	15	3.2	2.7	1.3	2.7	13	5.6	12	4.8
25	10	1.2	2.2	6.3	1.7	2.2	2.9	2.7	7.1	8.6	14	3.8
26	4.2	1.1	1.9	20	1.2	2.9	8.3	5.2	10	18	17	3.7
27	11	1.0	1.6	7.0	1.1	3.2	5.5	3.3	23	20	13	3.3
28	16	1.0	1.4	6.0	1.0	8.0	19	2.6	22	18	6.2	2.9
29	15	1.0	1.3	3.9	---	3.4	10	2.0	13	20	6.2	2.8
30	9.6	1.0	1.2	2.8	---	2.6	8.3	1.8	13	18	16	2.5
31	5.6	---	1.2	2.1	---	3.4	---	1.6	---	10	5.4	---
TOTAL	193.13	122.4	151.48	204.7	43.0	255.4	128.23	156.8	285.6	544.5	376.3	207.8
MEAN	6.23	4.08	4.89	6.60	1.54	8.24	4.27	5.06	9.52	17.6	12.1	6.93
MAX	21	17	40	41	6.4	34	19	17	44	36	25	18
MIN	.55	1.0	.98	1.0	1.0	1.2	.96	1.1	1.4	4.1	4.5	2.5
AC-FT	383	243	300	406	85	507	254	311	566	1080	746	412
CAL YR 1977	TOTAL	2119.06	MEAN	5.81	MAX	40	MIN	.18	AC-FT	4200		
WTR YR 1978	TOTAL	2669.34	MEAN	7.31	MAX	44	MIN	.55	AC-FT	5290		

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. Ditch diverts from Kawaiinui, 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.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 48 ft³/s (1.36 m³/s) Apr. 6, 1977; no flow Oct. 1-21, 1974.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.57	11	.26	47	1.6	14	14	17	1.5	26	19	24
2	.53	22	.24	43	1.1	31	14	18	6.2	26	17	24
3	.48	23	.22	23	.84	8.1	16	7.9	2.1	28	14	19
4	.49	17	.73	15	.68	2.7	13	3.7	1.2	25	23	14
5	.48	8.5	.64	6.9	.58	1.2	19	2.1	.75	36	23	23
6	.49	4.8	.35	4.7	.52	.82	21	1.4	.57	43	32	18
7	1.8	3.4	.25	4.8	.47	32	24	1.1	.66	27	24	11
8	3.5	6.0	.20	4.3	.89	30	12	1.6	1.2	28	23	18
9	1.4	12	.16	3.2	4.5	13	5.1	7.9	.92	28	18	16
10	.84	5.2	.17	2.5	1.3	5.2	2.6	4.6	.61	29	15	23
11	.54	3.2	.16	2.4	.72	2.6	1.6	17	.58	36	21	12
12	4.1	6.9	.12	1.3	.54	15	1.2	18	15	37	16	9.8
13	7.3	4.2	.08	.77	.46	13	1.0	16	15	33	18	17
14	2.3	13	.19	.67	.41	4.1	3.8	27	15	23	17	10
15	1.4	18	2.6	.59	.35	3.1	1.7	28	14	13	20	6.4
16	19	11	5.5	.54	.32	39	5.0	23	17	8.6	25	6.8
17	27	5.1	30	.51	.28	27	2.0	15	17	8.9	20	17
18	12	2.7	43	.45	.24	34	.99	7.2	18	24	13	10
19	6.3	1.7	38	.42	.25	35	.70	4.1	30	33	9.0	19
20	8.3	1.2	21	17	.23	35	.56	2.4	22	31	8.3	11
21	14	.95	13	28	.19	23	.49	9.9	19	36	22	15
22	29	.74	12	16	.22	24	.44	17	19	26	22	17
23	21	.64	6.7	6.1	15	9.8	.44	6.5	40	24	23	8.9
24	15	.55	4.0	16	4.4	5.3	1.3	3.3	29	19	19	6.1
25	18	.48	2.5	11	1.3	3.8	5.3	3.6	24	20	25	5.4
26	8.4	.43	1.8	22	.65	6.5	20	14	25	24	24	3.8
27	18	.38	1.3	10	.48	6.5	14	6.1	35	28	23	2.7
28	19	.35	.97	8.0	.38	21	30	3.4	33	22	17	2.3
29	23	.32	.75	5.4	---	7.6	23	2.0	29	25	21	2.0
30	19	.29	.65	3.8	---	6.7	24	1.4	34	19	24	2.0
31	13	---	1.3	2.4	---	8.5	---	1.1	---	16	13	---
TOTAL	296.22	185.03	188.84	307.75	38.90	468.92	278.22	291.3	466.29	804.5	608.3	374.2
MEAN	9.56	6.17	6.09	9.93	1.39	15.1	9.27	9.40	15.5	26.0	19.6	12.5
MAX	29	23	43	47	15	39	30	28	40	43	32	24
MIN	.48	.29	.08	.42	.19	.82	.44	1.1	.57	8.6	8.3	2.0
AC-FT	588	367	375	610	77	930	552	578	925	1600	1210	742
CAL YR 1977	TOTAL	3979.96	MEAN	10.9	MAX	48	MIN	.05	AC-FT	7890		
WTR YR 1978	TOTAL	4308.47	MEAN	11.8	MAX	47	MIN	.08	AC-FT	8550		

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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.

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, 11 ft³/s (0.28 m³/s) Oct. 29, Nov. 2, 3, 1977, Mar. 19, 20, 1978; no flow at times.

[illegible]

16756000 KOHAKOHU 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 except those for periods of no gage-height record, which are fair. 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 (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.--22 years, 8.31 ft³/s (0.235 m³/s), 6,020 acre-ft/yr (7.42 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, 1971-77.

EXTREMES FOR CURRENT YEAR.--Maximum discharge recorded, but may have been more during period of no gage-height record Jan. 1, discharge unknown, 234 ft³/s (6.63 m³/s) Mar. 1, gage height, 4.17 ft (1.271 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 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 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	3.0	.00	75	.52	17	3.3	3.7	.00	12	6.6	23
2	.00	5.0	.00	90	.60	42	3.5	2.9	.00	6.1	4.7	15
3	.00	15	.00	30	.18	.35	3.7	3.8	.00	14	3.0	5.7
4	.00	10	.00	10	.00	.01	3.3	1.7	.00	15	6.1	3.3
5	.00	5.0	.00	5.0	.00	.00	3.8	1.2	.00	32	23	16
6	.00	2.0	.00	3.0	.00	.00	8.6	.91	.00	67	31	4.6
7	.00	1.0	.00	1.0	.00	8.4	21	.69	.00	20	24	2.5
8	.00	.00	.00	.50	.00	20	5.1	.17	.00	23	13	3.6
9	.00	1.0	.00	.00	.00	.04	2.2	.00	.00	17	6.0	7.6
10	.00	.50	.00	.00	.00	.00	1.4	.00	.00	27	5.6	14
11	.00	.00	.00	.00	.00	.00	1.1	2.9	.00	42	13	3.1
12	8.1	.00	.00	.00	.00	1.4	.80	8.3	.00	45	5.2	2.1
13	2.3	.00	.00	.00	.00	.56	.02	2.8	.00	34	5.0	2.9
14	.00	.00	.00	.00	.00	.02	.00	19	.00	8.7	6.4	2.0
15	.00	1.0	.00	.00	.00	.00	.00	20	.00	4.1	7.6	1.4
16	3.7	.50	.00	.00	.00	45	.00	14	6.7	2.7	40	1.3
17	25	.00	15	.00	.00	19	.00	3.3	4.5	2.4	40	3.7
18	.01	.00	35	.00	.00	31	.00	1.6	4.4	18	5.5	1.9
19	.00	.00	60	.00	.00	44	.00	1.1	42	52	3.1	5.9
20	.00	.00	10	3.4	.00	30	.00	.87	9.8	58	2.2	2.1
21	.00	.00	5.0	10	.00	12	.00	21	7.1	57	11	1.7
22	15	.00	1.0	2.9	.00	12	.00	6.9	5.7	15	15	1.9
23	8.0	.00	.00	1.2	.00	3.7	.00	2.1	72	8.9	24	1.3
24	5.0	.00	.00	12	.00	2.3	.00	1.4	17	5.4	7.2	1.1
25	10	.00	.00	5.0	.00	1.8	.00	1.1	7.5	5.0	30	1.0
26	3.0	.00	.00	23	.00	1.5	.00	.10	8.1	9.9	25	.74
27	5.0	.00	.00	7.0	.00	1.4	.00	.00	27	29	14	.00
28	7.0	.00	.00	4.1	.00	5.0	14	.00	33	18	4.7	.00
29	7.5	.00	.00	2.1	---	2.0	13	.00	13	31	6.0	.00
30	7.0	.00	.00	1.3	---	1.5	13	.00	20	11	12	.00
31	5.0	---	.00	1.0	---	1.4	---	.00	---	5.9	3.5	---
TOTAL	111.61	44.00	126.00	287.50	1.30	303.58	97.82	120.54	277.80	696.1	403.4	129.44
MEAN	3.60	1.47	4.06	9.27	.046	9.79	3.26	3.89	9.26	22.5	13.0	4.31
MAX	25	15	60	90	.60	45	21	21	72	67	40	23
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	2.4	2.2	.00
AC-FI	221	97	250	570	2.6	602	194	239	551	1380	800	257

CAL YR 1977 TOTAL 2776.11 MEAN 7.61 MAX 119 MIN .00 AC-FI 5510
WTR YR 1978 TOTAL 2599.09 MEAN 7.12 MAX 90 MIN .00 AC-FI 5160

NOTE.--No gage-height record Oct. 20 to Nov. 23, Dec. 17 to Jan. 19.

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 (FISCAL YEARS).--WSP 1569: Drainage area. WSP 1937: 1948(M), 1949-S1(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.--31 years, 8.57 ft³/s (0.243 m³/s), 6,210 acre-ft/yr (7.66 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,390 ft³/s (96.0 m³/s) Oct. 23, 1957, gage height, 6.99 ft (2.131 m), from rating curve extended above 120 ft³/s (3.40 m³/s) on basis of computations of flow over dam at gage heights 5.46 ft (1.664 m) and 5.96 ft (1.817 m); minimum, 0.59 ft³/s (0.017 m³/s) Oct. 3-6, 1965.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 189 ft³/s (5.35 m³/s) Jan. 1, gage height, 3.34 ft (1.018 m), from rating curve extended as explained above, no other peak above base of 180 ft³/s (5.10 m³/s); minimum, 1.4 ft³/s (0.048 m³/s) Dec. 9, 11-14, Feb. 22.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.4	5.0	1.6	95	2.3	6.8	3.7	4.8	2.0	13	11	18
2	2.3	11	1.5	40	2.1	24	3.4	4.9	2.8	10	8.5	16
3	2.2	12	1.5	11	2.0	3.6	3.6	4.8	2.1	13	7.0	9.1
4	2.2	7.8	1.8	8.0	2.0	2.4	3.4	3.1	1.9	10	14	8.9
5	2.2	3.9	1.8	4.1	1.9	2.0	4.5	2.5	1.7	29	15	14
6	2.1	3.1	1.6	3.4	1.8	1.8	4.8	2.1	1.6	52	34	7.6
7	2.2	2.9	1.5	2.9	1.8	28	9.1	1.9	1.8	14	23	5.6
8	2.1	3.7	1.5	2.5	2.3	22	4.6	2.3	1.7	16	15	7.6
9	2.1	4.6	1.5	2.2	3.5	4.6	3.0	2.8	1.6	16	8.6	13
10	2.1	3.2	1.6	2.1	2.3	2.8	2.5	2.3	1.6	20	7.9	14
11	2.5	3.1	1.5	2.0	2.0	2.3	2.3	5.9	1.7	35	13	5.7
12	3.2	3.7	1.4	2.0	1.9	4.1	2.2	6.5	4.2	38	8.6	4.9
13	3.2	3.0	1.4	1.9	1.8	3.9	2.2	5.0	5.0	32	8.9	5.4
14	2.3	3.2	1.9	1.8	1.7	2.5	2.3	13	4.7	12	9.7	4.6
15	2.0	6.4	2.3	1.8	1.7	2.5	2.1	18	3.6	6.6	11	4.0
16	16	4.2	2.9	1.7	1.7	36	2.1	9.8	5.7	5.0	31	4.3
17	25	3.1	15	1.7	1.6	12	1.9	4.3	5.1	4.7	32	5.3
18	4.9	2.6	39	1.6	1.6	23	1.9	2.9	6.6	12	8.5	5.3
19	3.2	2.4	44	1.7	1.6	26	1.8	2.4	29	31	6.4	7.0
20	3.4	2.2	11	9.8	1.5	22	1.7	2.2	9.2	30	5.1	4.4
21	7.5	2.1	6.1	15	1.5	9.5	1.8	4.7	6.4	45	15	4.4
22	21	2.1	5.5	4.7	1.5	9.9	1.6	4.6	6.4	21	17	5.3
23	11	1.9	3.6	2.9	6.1	4.4	1.7	2.8	54	15	22	3.9
24	6.3	1.8	2.8	10	3.0	3.4	2.3	2.3	16	9.8	12	3.6
25	8.8	1.8	2.5	5.8	2.1	3.0	3.6	2.5	8.5	10	28	4.1
26	3.9	1.7	2.2	21	1.8	3.2	7.1	3.9	9.9	17	24	3.6
27	9.7	1.7	2.1	8.3	1.7	3.3	6.2	2.8	27	32	19	3.2
28	7.8	1.6	2.0	6.2	1.6	7.4	18	2.3	28	19	9.2	3.2
29	12	1.6	1.9	3.7	---	3.6	13	2.1	15	24	16	3.2
30	9.3	1.6	1.8	2.9	---	2.9	7.7	2.0	24	11	18	3.3
31	5.4	---	2.1	2.5	---	3.1	---	1.9	---	9.6	6.6	---
TOTAL	190.3	109.0	168.9	270.2	58.4	286.0	126.1	133.4	286.8	612.7	465.0	202.5
MEAN	6.14	3.63	5.45	8.72	2.09	9.23	4.20	4.30	9.56	19.8	15.0	6.75
MAX	25	12	44	85	6.1	36	18	18	54	52	34	18
MIN	2.0	1.6	1.4	1.6	1.5	1.8	1.6	1.9	1.6	4.7	5.1	3.2
AC-FT	377	216	335	536	116	567	250	265	569	1220	922	402

CAL YR 1977 TOTAL 3114.7 MEAN 8.53 MAX 114 MIN 1.4 AC-FT 6180
WTR YR 1978 TOTAL 2909.3 MEAN 7.97 MAX 85 MIN 1.4 AC-FT 5770

HAWAII, ISLAND OF HAWAII

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 ft (950.190 m) above mean sea level (Hawaii County Board of Water Supply bench mark).

REMARKS.--Records good. Diversion above station for livestock and domestic use. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--22 years, 1.45 ft³/s (0.041 m³/s), 1,050 acre-ft/yr (1.29 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 590 ft³/s (16.7 m³/s) Oct. 20, 1974, gage height, 4.18 ft (1.274 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, 77 ft³/s (2.18 m³/s) Jan. 1, gage height, 2.57 ft (0.783 m), from rating curve extended above 54 ft³/s (1.53 m³/s), no peak above base of 78 ft³/s (2.21 m³/s); minimum, 0.04 ft³/s (0.011 m³/s) Dec. 12, 13.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.12	.96	.06	27	.21	.18	.34	.53	.19	2.0	1.4	4.2
2	.12	1.4	.06	11	.18	2.9	.28	.36	.32	1.9	.95	3.3
3	.12	2.0	.06	1.9	.17	.26	.29	.51	.17	2.3	1.2	1.5
4	.13	1.0	.11	1.0	.15	.17	.28	.30	.15	1.1	2.6	1.1
5	.13	.52	.09	.56	.14	.13	.50	.21	.11	8.3	2.1	1.5
6	.11	.37	.07	.42	.14	.11	.54	.17	.09	13	10	1.1
7	.10	.33	.06	.33	.12	6.0	1.2	.15	.10	2.4	3.9	1.0
8	.10	.53	.06	.27	.26	4.1	.59	.21	.14	2.9	2.3	1.2
9	.09	.63	.05	.23	.27	.62	.33	.27	.12	3.0	1.0	3.0
10	.09	.33	.07	.21	.15	.32	.26	.19	.10	4.3	1.0	2.0
11	.09	.30	.06	.19	.13	.23	.22	1.1	.10	10	1.5	.93
12	.17	.42	.04	.17	.12	.27	.22	.87	.36	8.5	2.0	.92
13	.13	.28	.04	.17	.12	.31	.22	.80	.36	6.6	1.1	.95
14	.10	.27	.19	.17	.11	.20	.24	2.4	.37	1.7	1.1	.82
15	.10	.61	.21	.16	.10	.20	.20	4.2	.29	.89	2.2	.75
16	3.0	.39	.49	.13	.10	11	.18	1.4	.90	.64	5.9	.90
17	4.4	.28	2.6	.14	.09	2.0	.17	.55	.52	.54	3.9	.98
18	.53	.23	11	.12	.09	4.6	.16	.33	.87	2.1	1.2	.84
19	.28	.20	9.6	.13	.10	6.2	.15	.25	4.3	8.3	.97	.97
20	.31	.18	1.2	2.0	.09	4.3	.12	.22	1.2	6.2	.87	.74
21	1.1	.17	.57	1.7	.08	1.4	.12	.55	.78	8.8	3.1	.70
22	2.8	.13	.46	.47	.08	1.3	.11	.46	.70	2.8	3.2	.69
23	1.2	.09	.29	.27	.38	.62	.10	.25	13	2.1	3.9	.62
24	.84	.09	.21	1.7	.17	.46	.16	.20	2.9	1.1	2.2	.56
25	.99	.08	.17	.66	.12	.37	.20	.20	1.2	1.4	6.1	.54
26	.38	.08	.15	3.8	.10	.34	.39	.23	1.3	2.4	4.3	.48
27	1.1	.08	.12	1.1	.11	.32	.60	.20	7.3	6.5	3.1	.46
28	.92	.07	.10	.80	.09	.75	2.3	.17	4.1	2.5	1.4	.43
29	1.5	.07	.09	.42	---	.35	1.2	.16	2.1	3.8	4.8	.43
30	.95	.07	.09	.29	---	.28	.88	.14	4.6	1.4	3.3	.41
31	.57	---	.12	.24	---	.30	---	.12	---	1.5	1.1	---
TOTAL	22.57	12.16	29.49	57.75	3.97	50.59	12.55	17.70	48.74	121.97	83.69	34.02
MEAN	.73	.41	.95	1.86	.14	1.63	.42	.57	1.62	3.93	2.70	1.13
MAX	4.4	2.0	11	27	.38	11	2.3	4.2	13	13	10	4.2
MIN	.09	.07	.04	.12	.08	.11	.10	.12	.09	.54	.87	.41
AC-FT	45	24	58	115	7.9	100	25	35	97	242	166	67
CAL YR 1977	TOTAL	611.76	MEAN	1.63	MAX	42	MIN	.02	AC-FT	1210		
WTR YR 1978	TOTAL	495.20	MEAN	1.36	MAX	27	MIN	.04	AC-FT	982		

HAWAII, ISLAND OF HAWAII

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16759200 RIGHT BRANCH WAIHAH 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 (WATER YEARS).--WSP 2137: 1963-65(M).

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 3,280 ft (1,000 m), from topographic map.

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

AVERAGE DISCHARGE.--18 years, 0.322 ft³/s (0.009 m³/s), 233 acre-ft/yr (287,000 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, 88 ft³/s (2.49 m³/s) Oct. 14, gage height, 3.41 ft (1.039 m), from rating curve extended as explained above, no 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 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.00	.00	.00	.09	.16	.01	.06	.09
2	.00	.01	.00	.00	.00	.00	.00	.04	.08	.01	.04	.07
3	.00	.00	.00	.00	.00	.00	.00	.17	.06	.01	.02	.05
4	.00	.00	.00	.00	.00	.00	.00	.09	.04	.02	.01	.04
5	.00	.00	.00	.00	.00	.00	.00	.08	.04	.02	.02	.06
6	.00	.00	.00	.00	.00	.00	.00	.05	.05	.01	.06	.06
7	.00	.00	.00	.00	.00	.00	.00	.08	.04	.01	.04	.04
8	.00	.00	.00	.00	.00	.00	.01	.06	.05	.06	.05	.02
9	.00	.00	.00	.00	.00	.00	.01	.04	.04	1.2	.27	.02
10	.00	.00	.00	.00	.00	.00	.00	.02	.02	.36	.17	.01
11	.00	.00	.00	.00	.00	.00	.00	.01	.02	.21	.16	.02
12	2.3	.00	.00	.00	.00	.00	.00	.00	.01	.11	.12	.02
13	.12	.00	.00	.00	.00	.00	.00	.00	.01	.16	.06	.02
14	4.2	.00	.00	.00	.00	.00	.00	.00	.01	.55	.17	.04
15	.36	.00	.00	.00	.00	.00	.01	.00	.04	.39	.23	.04
16	.11	.00	.00	.00	.00	.00	.01	.00	.05	.11	.16	.02
17	.07	.00	.00	.00	.00	.00	.00	.00	.03	.06	2.4	.02
18	.10	.00	.00	.00	.00	.01	.00	.00	.11	.04	1.1	.08
19	.08	.00	.00	.00	.00	.00	.00	.00	.27	.02	.45	.12
20	.04	.00	.00	.00	.00	.00	.00	.00	.23	.02	.23	.08
21	.03	.00	.00	.00	.00	.00	.00	.06	.19	.01	.09	.06
22	.01	.00	.00	.00	.00	.00	.00	.02	.11	.01	.05	.12
23	.01	.00	.00	.00	.00	.00	.00	.01	.28	.01	.04	.16
24	.01	.00	.00	.00	.00	.00	.00	.04	.25	.01	.27	.09
25	.01	.00	.00	.00	.00	.00	.00	.45	.16	.01	.16	.11
26	.00	.00	.00	.00	.00	.00	.02	.45	.10	.01	.09	.12
27	.00	.00	.00	.00	.00	.00	.02	.48	.06	.00	.09	.07
28	.01	.00	.00	.00	.00	.00	.01	.30	.02	.01	.19	.05
29	.01	.00	.00	.00	---	.00	.00	.16	.02	.06	.39	.05
30	.00	.00	.00	.00	---	.00	.01	.10	.01	.16	.23	.04
31	.00	---	.00	.00	---	.00	---	.48	---	.16	.10	---
TOTAL	7.56	.01	.00	.00	.00	.01	.10	3.28	2.56	4.23	7.52	1.79
MEAN	.24	.000	.000	.000	.000	.000	.003	.11	.085	.14	.24	.060
MAX	4.2	.01	.00	.00	.00	.01	.02	.49	.28	1.2	2.4	.16
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.01	.00	.01	.01
AC-FI	15	.02	.00	.00	.00	.02	.2	6.5	5.1	8.4	15	3.6

CAL YR 1977 TOTAL 21.39 MEAN .059 MAX 4.2 MIN .00 AC-FT 42
WTR YR 1978 TOTAL 27.06 MEAN .074 MAX 4.2 MIN .00 AC-FT 54

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. 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.--20 years, 0.202 ft³/s (0.006 m³/s), 146 acre-ft/yr (180,000 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 (ft ³ /s) (m ³ /s)	Gage height (ft) (m)
Apr. 8	1700	*29 0.82	1.62 0.494
May 5	1730	28 .79	1.61 .491

No flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.00	.00	.08	.03	.10	.00	.02	.18
2	.00	.00	.00	.00	.00	.00	.10	.04	.02	.17	.01	.07
3	.00	.00	.00	.00	.00	.00	.16	.11	.16	.64	.00	.01
4	.00	.00	.00	.00	.00	.00	.24	.04	.28	.25	.01	.10
5	.00	.02	.00	.00	.00	.00	.05	3.6	.31	.04	.11	.04
6	.00	.00	.00	.00	.00	.00	.00	.37	.19	.00	.04	.10
7	.00	.00	.00	.00	.00	.00	.36	.24	.08	.02	.00	.02
8	.00	.00	.00	.00	.00	.00	3.1	.61	.13	2.7	.27	.01
9	.00	.00	.00	.00	.00	.00	.16	.07	.06	2.0	.14	.08
10	.00	.00	.00	.00	.00	.00	.01	.07	.03	.42	.58	.58
11	.00	.00	.00	.00	.00	.00	.00	.01	.07	.69	.43	.40
12	.50	.01	.00	.00	.00	.00	.01	.30	.03	.16	.24	.04
13	.03	.00	.00	.00	.00	.00	.26	.11	.02	.73	.66	.13
14	.00	.00	.01	.00	.00	1.6	1.3	.04	.43	.67	.67	.09
15	.00	.00	.01	.00	.00	.03	.60	.00	.16	.34	.65	.02
16	.00	.00	.01	.00	.00	.00	.43	.05	.22	.06	1.6	.03
17	.00	.00	.00	.00	.00	.00	.07	.07	.52	.00	.26	.03
18	.02	.00	.00	.00	.00	.00	.01	.00	.60	.00	.80	3.0
19	.03	.00	.00	.00	.00	.12	.01	.00	1.0	.00	.41	1.0
20	.00	.00	.30	.00	.00	.08	.00	.00	.90	.00	.07	.40
21	.00	.00	.05	.00	.00	.56	.00	1.2	.79	.00	.01	.14
22	.00	.00	.00	.00	.00	.06	.00	.09	.50	.12	.00	1.1
23	.00	.00	.00	.00	.00	.03	.00	1.5	2.0	.02	.01	.34
24	.00	.00	.00	.00	.00	.00	.00	.59	1.5	.00	.04	.11
25	.00	.00	.00	.00	.00	.00	.00	.22	1.0	.00	.09	.16
26	.00	.00	.00	.00	.00	.35	.00	.40	.70	.00	.04	.07
27	.00	.00	.00	.00	.00	.04	.00	.44	.50	.00	.01	.02
28	.00	.00	.00	.00	.00	.00	.00	.38	.24	.10	.01	.04
29	.00	.00	.00	.00	---	.00	.00	.84	.05	.77	.01	.06
30	.00	.00	.00	.00	---	.01	.00	.22	.00	.59	.01	.00
31	.00	---	.00	.00	---	.04	---	.31	---	.06	.85	---
TOTAL	.58	.03	.38	.00	.00	2.92	6.95	11.91	13.39	10.55	3.05	8.37
MEAN	.019	.001	.012	.000	.000	.094	.23	.38	.45	.34	.26	.28
MAX	.50	.02	.30	.00	.00	1.6	3.1	3.6	2.0	2.7	1.6	3.0
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	1.2	.06	.8	.00	.00	5.8	14	24	27	21	16	17

CAL YR 1977 TOTAL 21.36 MEAN .059 MAX 1.4 MIN .00 AC-FT 42
WTR YR 1978 TOTAL 63.13 MEAN .17 MAX 3.6 MIN .00 AC-FT 125

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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.

PERIOD OF RECORD.--February 1966 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 2,940 ft (896 m), from topographic map.

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

AVERAGE DISCHARGE.--12 years, 8.24 ft³/s (0.233 m³/s), 5,970 acre-ft/yr (7.36 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,220 ft³/s (34.6 m³/s) Dec. 30, 1966, gage height, 6.35 ft (1.935 m), from rating curve extended above 75 ft³/s (2.12 m³/s); no flow at times each year.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 826 ft³/s (23.4 m³/s) Nov. 15, gage height, 5.54 ft (1.689 m), from rating curve extended as explained above, no other peak above base of 600 ft³/s (17.0 m³/s); no flow for many days.

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.17	.65	.13	6.3	.03	.01	.16	2.0	6.6	.97	4.3	4.8
2	1.1	.17	.13	.79	.02	.00	.18	2.2	9.0	1.0	15	
3	.61	1.3	.09	.15	.01	.00	.15	.68	7.8	28	.63	2.1
4	.21	.30	.06	.05	.00	.00	.10	7.2	1.6	10	.57	16
5	.14	.09	.04	.03	.00	.00	.07	18	1.9	2.0	.62	11
6	.12	.04	.03	.01	.00	.00	.04	6.0	1.1	99	.49	1.9
7	.11	.05	.04	.01	.00	.00	32	1.0	9.9	17	6.3	1.6
8	.09	.61	.07	.00	.00	.03	8.7	.72	12	15	19	25
9	.10	20	.03	.00	.00	.07	1.7	.35	6.1	6.2	5.4	5.2
10	.07	1.4	.08	.00	.00	.00	.28	.28	2.0	2.9	16	9.1
11	.09	.18	.07	.00	.00	3.7	.15	.19	1.7	1.5	9.9	6.8
12	.85	.11	.07	.00	.00	1.8	.50	.19	28	3.1	7.4	9.6
13	.91	.08	2.2	.00	.09	1.4	7.5	.18	7.2	22	44	2.6
14	.37	.06	1.2	.00	10	71	12	12	32	16	4.6	.75
15	.17	81	.17	.00	38	3.6	1.8	11	2.7	49	1.2	.55
16	.13	8.8	.07	.00	2.7	.39	.35	12	.94	6.1	7.1	.45
17	.16	3.2	.03	.00	.17	.15	.26	3.1	.64	1.6	7.8	.70
18	1.7	.33	.23	.00	.11	.37	8.5	.61	42	1.0	9.9	12
19	.50	.19	.11	.00	.16	3.1	3.2	.29	30	.72	30	13
20	.13	.14	.03	.00	.09	20	.26	.27	23	.64	3.8	38
21	.11	.39	.25	.05	.03	12	.23	25	27	.90	.99	40
22	1.2	.24	.15	.07	.16	18	.13	3.9	32	1.6	.69	42
23	.63	.19	.02	.00	.58	3.8	.12	37	5.2	1.0	1.6	15
24	4.9	.13	.02	.79	.19	4.0	.88	27	29	1.9	14	4.3
25	1.3	.08	.01	.15	.05	2.1	1.3	8.3	8.3	25	24	9.6
26	.37	.07	.00	21	.02	.72	1.5	46	25	5.3	5.8	9.0
27	.42	.06	.00	.87	.01	.68	.48	26	2.6	4.4	2.2	4.0
28	.13	.08	.03	.11	.01	.65	.23	43	16	2.4	10	2.2
29	.09	11	.14	.60	---	.62	41	50	2.9	34	4.6	.66
30	.78	.59	.03	.29	---	.10	6.9	7.7	1.2	27	1.7	.62
31	4.1	---	.00	.07	---	.16	---	13	---	21	.62	---
TOTAL	21.76	131.53	5.53	31.34	52.43	149.35	130.67	366.06	386.38	416.23	246.21	303.13
MEAN	.70	4.38	.18	1.01	1.87	4.82	4.36	11.3	12.9	13.4	7.94	10.1
MAX	4.9	81	2.2	21	38	71	41	50	42	99	44	42
MIN	.07	.04	.00	.00	.00	.00	.04	.18	.64	.64	.49	.45
AC-FT	43	261	11	62	104	296	259	726	766	826	488	601
CAL YR 1977	TOTAL	1780.60	MEAN	4.88	MAX	186	MIN	.00	AC-FT	3530		
WIR YR 1978	TOTAL	2240.62	MEAN	6.14	MAX	99	MIN	.00	AC-FT	4440		

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.

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

AVERAGE DISCHARGE.--12 years, 2.93 ft³/s (0.083 m³/s), 2,120 acre-ft/yr (2.61 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 523 ft³/s (14.8 m³/s) Dec. 30, 1966, gage height, 7.16 ft (2.182 m), from rating curve extended above 41 ft³/s (1.16 m³/s); no flow many days each year.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 53 ft³/s (1.50 m³/s) Sept. 21, gage height, 3.47 ft (1.058 m), from rating curve extended above 41 ft³/s (1.16 m³/s), no peak above base of 310 ft³/s (8.78 m³/s); no flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.00	.00	.00	.10	.74	.00	.52	.25
2	.00	.00	.00	.00	.00	.00	.00	.00	1.5	1.4	.00	2.7
3	.30	.00	.00	.00	.00	.00	.00	.00	1.0	8.1	.00	.25
4	.00	.00	.00	.00	.00	.00	.00	.13	.00	2.6	.00	4.7
5	.00	.00	.00	.00	.00	.00	.00	1.6	.00	.09	.00	2.5
6	.00	.00	.00	.00	.00	.00	.00	.56	.00	25	.00	.16
7	.00	.00	.00	.00	.00	.00	9.1	.00	.52	4.2	.11	.00
8	.00	.00	.00	.00	.00	.00	.23	.00	1.1	2.4	3.6	5.1
9	.00	3.2	.00	.00	.00	.00	.03	.00	.18	.60	.22	.77
10	.00	.06	.00	.00	.00	.00	.00	.00	.02	.07	2.7	2.0
11	.00	.00	.00	.00	.00	.32	.00	.00	.00	.00	1.5	.78
12	.00	.00	.00	.00	.00	.00	.00	.00	6.7	.00	.77	2.2
13	.00	.00	.00	.00	.00	.00	.53	.00	1.5	4.0	9.1	.19
14	.00	.00	.00	.00	.45	20	.95	.77	9.6	2.6	.60	.00
15	.00	8.7	.00	.00	6.2	.35	.14	1.1	.29	11	.00	.00
16	.00	.70	.00	.00	.10	.00	.00	1.0	.00	.79	.91	.00
17	.00	.07	.00	.00	.00	.00	.00	.26	.00	.00	.82	.00
18	.00	.00	.00	.00	.00	.00	.37	.00	9.2	.00	.86	1.6
19	.00	.00	.00	.00	.00	.00	.27	.00	5.1	.00	8.1	5.4
20	.00	.00	.00	.00	.00	2.0	.00	.00	4.4	.00	.40	12
21	.00	.00	.00	.00	.00	1.3	.00	2.7	7.8	.00	.00	9.6
22	.00	.00	.00	.00	.00	2.5	.00	.32	10	.00	.00	12
23	.00	.00	.00	.00	.00	.78	.00	4.9	1.5	.00	.00	3.4
24	.63	.00	.00	.00	.00	.38	.00	5.5	7.7	.00	1.6	.68
25	.10	.00	.00	.00	.00	.10	.00	.74	1.3	6.0	6.1	2.2
26	.00	.00	.00	2.7	.00	.00	.00	11	7.0	.71	.85	1.3
27	.00	.00	.00	.00	.00	.00	.00	4.6	.28	.22	.02	.32
28	.00	.00	.00	.00	.00	.00	.00	7.2	.31	.16	.60	.00
29	.00	1.1	.00	.00	---	.00	11	9.0	.07	9.5	.22	.00
30	.00	.00	.00	.00	---	.00	.71	.87	.00	4.6	.02	.00
31	.00	---	.00	.00	---	.00	---	.91	---	5.2	.00	---
TOTAL	.73	12.93	.00	2.70	6.75	27.33	23.33	53.86	80.60	90.24	39.62	70.19
MEAN	.024	.46	.000	.12	.24	.88	.78	1.74	2.69	2.91	1.28	2.34
MAX	.63	8.7	.00	3.7	6.2	20	11	11	10	25	9.1	12
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FI	1.4	28	.00	7.3	13	54	46	107	160	179	79	139
CAL YR 1977	TOTAL	114.23	MEAN	.36	MAX 30	MIN	.00	AC-FI	623			
WIR YR 1978	TOTAL	410.23	MEAN	1.12	MAX 25	MIN	.00	AC-FI	814			

HAWAII, ISLAND OF HAWAII

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16767000 NINOLE GULCH NEAR PUNALUU

LOCATION.--Lat 19°10'44", long 155°33'46", Hydrologic Unit 20010000, on right bank 300 ft (91 m) downstream from forest-reserve boundary, 4.6 mi (7.4 km) northwest of Punaluu, and 6.0 mi (9.6 km) north of Honuapo.

DRAINAGE AREA.--15.5 mi² (40.1 km²).

PERIOD OF RECORD.--March 1966 to current year.

GAGE.--Water-stage recorder and sharp-crested weir. Altitude of gage is 2,080 ft (634 m), from topographic map.

REMARKS.--Records good except those above 60 cfs, which are fair. No diversion above station.

AVERAGE DISCHARGE.--12 years, 3.57 ft³/s (0.101 m³/s), 2,590 acre-ft/yr (3.19 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,430 ft³/s (68.8 m³/s) Apr. 11, 1970, gage height, 6.62 ft (2.018 m), from rating curve extended above 30 ft³/s (0.85 m³/s); no flow for many days each year.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 290 ft³/s (8.21 m³/s) Nov. 15, gage height, 4.50 ft (1.372 m), from rating curve extended above 30 ft³/s (0.85 m³/s), no peak above base of 1,000 ft³/s (28.3 m³/s); no flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.20	.00	.00	.00	.00	1.2	.00	.07	.00
2	.00	.00	.00	.00	.00	.00	.00	.00	3.8	.00	.00	.00
3	.00	.00	.00	.00	.00	.00	.00	.00	2.2	1.1	.00	.00
4	.00	.00	.00	.00	.00	.00	.00	.20	.00	.01	.00	.00
5	.00	.00	.00	.00	.00	.00	.00	1.6	.00	.00	.00	.00
6	.00	.00	.00	.00	.00	.00	.00	.00	.00	35	.00	.00
7	.00	.00	.00	.00	.00	.00	.00	.00	.00	.71	.00	.00
8	.00	.00	.00	.00	.00	.00	5.6	.00	.00	.03	.00	7.8
9	.00	5.6	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
10	.00	.00	.00	.00	.00	.20	.00	.00	.00	.00	.00	.00
11	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
12	.00	.00	.00	.00	.00	.00	.00	.00	.65	.00	.00	.00
13	.00	.00	.00	.00	.00	.00	.01	.00	.15	.00	12	.00
14	.00	.00	.00	.00	.00	2.8	1.9	.00	.00	.25	.14	.00
15	.00	35	.00	.00	16	.00	.00	.00	.00	14	.00	.00
16	.00	.19	.00	.00	.02	.00	.00	.01	.00	.23	.00	.00
17	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
18	.00	.00	.00	.00	.00	.00	.00	.00	4.5	.00	.44	.00
19	.00	.00	.00	.00	.00	.00	.00	.00	2.2	.00	6.0	1.3
20	.00	.00	.00	.00	.00	.00	.00	.00	.35	.00	.21	11
21	.00	.00	.00	.00	.00	.00	.00	10	3.9	.00	.00	8.2
22	.00	.00	.00	.00	.00	.01	.00	.00	4.2	.00	.00	19
23	.00	.00	.00	.00	.00	.00	.00	13	.24	.00	.00	2.1
24	.00	.00	.00	.00	.00	.01	.00	6.4	4.5	.00	.00	.06
25	.00	.00	.00	.00	.00	.00	.00	.20	.71	.00	.05	.55
26	.00	.00	.00	.00	.00	.00	.00	9.7	3.8	.00	.01	.01
27	.00	.00	.00	.00	.00	.00	.00	1.0	.12	.00	.00	.00
28	.00	.00	.00	.00	.00	.00	.00	11	.01	.00	.00	.00
29	.00	1.1	.00	.00	---	.00	1.2	11	.00	3.7	.00	.00
30	.00	.00	.00	.00	---	.00	.00	1.4	.00	1.8	.00	.00
31	.00	---	.00	.00	---	.00	---	1.5	---	2.7	.00	---
TOTAL	.00	41.09	.00	.20	16.02	2.82	8.71	67.01	32.53	59.13	18.92	50.03
MEAN	.000	1.40	.000	.006	.57	.091	.29	2.16	1.08	1.91	.61	1.67
MAX	.00	35	.00	.20	16	2.8	5.6	13	4.5	35	12	19
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FI	.00	83	.00	.4	32	5.6	17	133	65	117	38	99
CAL YR 1977	TOTAL	319.81	MEAN	.68	MAX	24	MIN	.00	AC-FI	634		
WTR YR 1978	TOTAL	297.26	MEAN	.81	MAX	35	MIN	.00	AC-FI	590		

HAWAII, ISLAND OF HAWAII

16770500 PAAUUA GULCH AT PAHALA

LOCATION.--Lat 19°12'39", long 155°28'48", Hydrologic Unit 20010000, on right bank 100 ft (30 m) downstream from bridge on Wood Valley Road and 0.7 mi (1.1 km) north of Pahala.

DRAINAGE AREA.--1.74 mi² (4.51 km²).

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

GAGE.--Water-stage recorder. Datum of gage is 972 ft (296.3 m) above mean sea level (by stadia survey).

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

AVERAGE DISCHARGE.--16 years, 0.759 ft³/s (0.021 m³/s), 550 acre-ft/yr (678,000 m³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,600 ft³/s (102 m³/s) Jan. 5, 1969, Jan. 8, 1975, gage height, 5.90 ft (1.798 m), from rating curve extended above 360 ft³/s (10.2 m³/s) on basis of slope-area measurement at gage height 4.40 ft (1.341 m); no flow most of time.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 95 ft³/s (2.69 m³/s) May 29, gage height, 3.34 ft (1.018 m), no peak above base of 180 ft³/s (5.10 m³/s); no flow most of time.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.00	.00	.00	.00	1.5	.00	.00	.00
2	.00	.00	.00	.00	.00	.00	.00	.00	1.3	.00	.00	.00
3	.00	.00	.00	.00	.00	.00	.00	.00	1.4	.00	.00	.00
4	.00	.00	.00	.00	.00	.00	.00	.00	.90	.00	.00	.00
5	.00	.00	.00	.00	.00	.00	.00	.00	.50	.00	.00	.00
6	.00	.00	.00	.00	.00	.00	.00	.00	.10	7.6	.00	.00
7	.00	.00	.00	.00	.00	.00	.00	.00	2.3	.08	.00	.00
8	.00	.00	.00	.00	.00	.00	.00	.00	.16	.00	.00	.00
9	.00	.00	.00	.00	.00	.00	.00	.00	.01	.03	.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	.06	.00	.00
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	.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	.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	4.8	.00	.00	.00	.00
25	.00	.00	.00	.00	.00	.00	.00	2.7	.00	.00	.00	.00
26	.00	.00	.00	.00	.00	.00	.00	.85	.00	.00	.00	.00
27	.00	.00	.00	.00	.00	.00	.00	1.1	.00	.00	.00	.00
28	.00	.00	.00	.00	.00	.00	.00	2.4	.00	.00	.00	.00
29	.00	.00	.00	.00	.00	.00	.00	14	.00	.00	.00	.00
30	.00	.00	.00	.00	.00	.00	.00	13	.00	.00	.00	.00
31	.00	.00	.00	.00	.00	.00	.00	3.8	.00	.00	.00	.00
	.00	.00	.00	.00	.00	.00	.00	9.2	.00	.00	.00	.00
TOTAL	.00	.00	.00	.00	.00	.00	.00	51.85	8.07	7.77	.00	.00
MEAN	.000	.000	.000	.000	.000	.000	.000	1.67	.27	.25	.000	.000
MAX	.00	.00	.00	.00	.00	.00	.00	14	2.3	7.6	.00	.00
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	.00	.00	.00	.00	.00	.00	.00	103	16	15	.00	.00
CAL YR 1977	TOTAL	56.00	MEAN	.15	MAX	55	MIN	.00	AC-FT	111		
WTR YR 1978	TOTAL	67.69	MEAN	.19	MAX	14	MIN	.00	AC-FT	134		

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 1978

Station No.	Station name	Location	Drainage area mi ² (km ²)	Period of record	Measurements	
					Date	Discharge (ft ³ /s)
Hawaii, Island of Kauai						
16011000	Waiaikoali 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#	10-18-77	0.65
				1914-17,	3-13-78	1.11
				1919-25#	7-26-78	2.03
				1961-62, 1964,		
				1966-70, 1972-78		
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,	10-18-77	.26
				1915-17,	3-13-78	.87
				1919-25#	7-26-78	1.14
				1961-62, 1964,		
				1966-78		
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,	12- 5-77	1.20
				1964-78	8- 7-78	.22
					9-11-78	No flow
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)	1974-78	2- 1-78	2.32
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#	10-11-77	20.6
				1977-78	11-30-77	12.6
					1-13-78	11.4
					2-27-78	9.93
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#	11-15-77	3.8
				1960-62,	12-23-77	.79
				1966,	2- 2-78	.24
				1968-78	7-21-78	4.4
16214000	Pearl Harbor Springs at Waiawa, near Pearl City	Lat 21°23'36", long 157°59'11", 0.7 mi (1.1 km) west of Pearl City and 1.5 mi (2.4 km) east of Waipahu Post Office.	-	1931-34#	3-28-78	11
				1937-64#	8-17-78	11
				1967-68, 1970-78		
16224000	Pearl Harbor Springs at Kalauao, near Aiea	Lat 21°23'05", long 157°56'46", 300 ft (91 m) downstream from Highway 90 and 0.8 mi (1.3 km) west of Aiea Post Office.	-	1931-62#	3-29-78	18
				1964-65#	8-17-78	12
				1966-68, 1970-78		
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, 1971-78	9-28-78	.81

Operated as a continuous-record gaging station.

Discharge measurements made at low-flow partial-record stations during water year 1978--Continued

Station No.	Station name	Location	Drainage area mi ² (km ²)	Period of record	Measurements	
					Date	Discharge (ft ³ /s)
Hawaii, Island of Oahu--Continued						
16283400	Kahaluu Stream near Kahaluu	Lat 21°27'14", long 157°50'17", 600 ft (183 m) above Ahuimanu Stream and 0.6 mi (1.0 km) south of Kahaluu.	1.29 (3.34)	1962-63, 1966, 1972-78	9-28-78	1.1
*16283480	Ahuimanu Stream near Kahaluu	Lat 21°27'06", long 157°50'13", at bridge on Ahuimanu Road and 0.8 mi (1.3 km) south of Kahaluu.	2.31 (5.98)	1962-63, 1965-66, 1968, 1972-78	1-25-78 9-28-78	2.0 3.2
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, 1974-78	9-29-78	17
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 ^a , 1958 ^b , 1961-62, 1966, 1971-72, 1974-78	9-29-78	2.0
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 Kawaiiena 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)	1968-78	10-13-77 12- 8-77 2- 2-78 3-24-78 8-31-78	.56 .91 .61 1.81 .99
16403500	Kawaiiena 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)	1968-78	10-13-77 12- 8-77 2- 2-78 3-24-78 8-31-78	1.28 1.29 1.29 1.75 1.29
16403600	Kapuhi Stream near Pelekunu	Lat 21°07'57", long 156°52'56", on left bank 400 ft (122 m) downstream from Kawaiiena 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 ^a , 1974-78	10-13-77 12- 8-77 2- 2-78 3-24-78 8-31-78	1.61 2.48 1.67 3.65 2.18
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)	1968-78	10-13-77 12- 8-77 2- 2-78 3-25-78 8-31-78	1.02 1.54 1.12 3.35 2.66
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)	1968-78	10-13-77 12- 8-77 2- 2-78 3-25-78 8-31-78	.22 .23 .19 1.05 .75

* Also a crest-stage partial-record station.

^a Operated as a continuous-record gaging station.^b Previously published with discharge measurements at miscellaneous sites.

Crest-stage partial-record stations

Prior to 1973, crest-stage partial-record station records for the State of Hawaii were published in an annual progress report entitled "An Investigation of Floods in Hawaii." The following table contains annual maximum discharge for crest-stage stations. A crest-stage gage is a device which will register the peak stage occurring between inspections of the gage. A stage-discharge relation for each gage is developed from discharge measurements made by indirect measurements 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 1978

Station No.	Station name	Location	Drainage area mi ² (km ²)	Period of record	Annual maximum		
					Date	Gage height (feet)	Dis- charge (ft ³ /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)	1944-78d	12- 6-77	8.03	-
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)	1950-78d	12- 6-77	3.37	-
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#, 1973-78	12- 6-77	1.80	e570
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#, 1971-78	7- 2-78	9.88	2,660
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)	1962-78d	7- 2-78	<4.62	-
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, 1970-78	12- 6-77	3.61	270
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)	1964-78	10-13-77	3.80	e25
16084500	Kapaa Stream at old high- way 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)	1962-78	5-27-78	7.47	889
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)	1964-78	5-27-78	-	e40
16097900	Puukumu Stream near Kilauea	Lat 22°13'02", long 159°25'18", at culvert on Highway 56, 0.8 mi (1.3 km) northwest of Kilauea School and 0.9 mi (1.4 km) upstream from mouth.	.91 (2.36)	1964-68, 1971-78	6- 7-78	-	e20

Operated as a continuous-record gaging station.

< Less than.

d Gage height only.

e Estimated.

DISCHARGE AT PARTIAL-RECORD STATIONS AND MISCELLANEOUS SITES

Annual maximum discharge at crest-stage partial-record stations during water year 1978--Continued

				Annual maximum			
Station No.	Station name	Location	Drainage area mi ² (km ²)	Period of record	Date	Gage height (feet)	Dis- charge (ft ³ /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)	1963-78d	12-27-77	<6.94	-
16130000	Nahomalu Valley near Mana	Lat 22°02'41", long 159°45'17", on left bank 1.1 mi (1.8 km) north- east of Mana and 5.3 mi (8.5 km) northwest of Kekaha School.	3.81 (9.87)	1962-63, 1964-71 [#] , 1972-78	5-26-78	2.34	61
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 High- way 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, 1968-78	6-28-78	18.03	1200
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 High- way 83 and 1.1 mi (1.8 km) east of Waialua High School.	10.9 (28.2)	1967-78	6-28-78	-	e250
16211300	Makaleha Stream near Waialua	Lat 21°33'49", long 158°09'21", 1.0 mi (1.6 km) southwest of Dilling- ham Ranch and 1.9 mi (3.1 km) south- west of sugar mill at Waialua.	4.15 (10.75)	1958-63, 1964-65 [#] , 1966-78	5-23-78	5.02	286
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)	1974-78	5-23-78	12.75	e75
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 light- house.	4.28 (11.09)	1958-78	5-23-78	8.95	e200
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)	1966-78	5-23-78	-	e200
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 [#] , 1973-78	4-20-78	4.40	e70
16212200	Maliililii Stream near Waianae	Lat 21°27'34", long 158°08'05", at bridge at Lualualei Naval Reser- vation and 3.4 mi (5.5 km) east of cemetery near Waianae.	1.51 (3.91)	1958-78	4-20-78	1.55	e140
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)	1968-78	4-20-78	-	e30

[#] Operated as a continuous-record gaging station.

< Less than.

d Gage height only.

e Estimated.

Annual maximum discharge at crest-stage partial-record stations during water year 1978--Continued

					Annual maximum		
Station No.	Station name	Location	Drainage area mi ² (km ²)	Period of record	Date	Gage height (feet)	Dis- charge (ft ³ /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)	1968-78	4-20-78	2.81	81
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)	1956-78	5-23-78	0.96	e35
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, 1960-78	8- 8-78	2.25	e20
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)	1958-78	4-20-78	3.63	350
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)	1974-78	4-20-78	8.95	e60
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 [#] , 1973-78	6-28-78	2.31	689
16227000	Halawa Stream at Aiea	Lat 21°22'26", long 157°55'42", 0.7 mi (1.1 km) southeast of Aiea Post Office and 6.2 mi (10.0 km) northwest of Honolulu Post Office.	8.78 (22.74)	1954-62, 1966-72, 1977-78	6-28-78	5.04	e1,200
**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)	1969-78	8-21-78	4.36	822
**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)	1971-78	8-21-78	15.54	e1,100
16228900	Kalihi Stream near Kaneohe	Lat 21°22'35", long 157°49'32", on right bank 800 ft (244 m) down- stream from Likelike Highway, and 2.8 mi (4.5 km) southwest of Castle High School in Kaneohe.	.60 (1.55)	1967-71 [#] , 1972-78	11-16-77	2.29	134
16235400	Woolani 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)	1958-78	5-23-78	0.49	e100
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)	1958-78	5-23-78	-	e100
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)	1968-78	5-23-78	9.13	4,980

** Also a water-quality partial-record station.

‡ Operated as a continuous-record gaging station.

e Estimated.

DISCHARGE AT PARTIAL-RECORD STATIONS AND MISCELLANEOUS SITES

Annual maximum discharge at crest-stage partial-record stations during water year 1978--Continued

					Annual maximum		
Station No.	Station name	Location	Drainage area mi ² (km ²)	Period of record	Date	Gage height (feet)	Dis- charge (ft ³ /s)
Hawaii, Island of Oahu--Continued							
16247500	Wailupe Gulch at Aina Haina	Lat 21°17'46", long 157°45'29", at Ani Street bridge and 1.0 mi (1.6 km) upstream from Kalaniana'ole Highway in Aina Haina.	2.35 (6.09)	1958-78	5-23-78	2.18	648
16247900	Kuliouou Valley at Kuliouou	Lat 21°17'50", long 157°43'35", at Kuliouou, 300 ft (91 m) down- stream of single-lane wooden bridge and 0.6 mi (1.0 km) up- stream from Highway 72.	1.18 (3.06)	1958-59, 1970-78	5-23-78	27.99	326
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)	1958-78	4-20-78	1.94	e100
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 [‡] , 1971-78	12- 3-77	4.38	e500
16249100	Kaelepulu Stream tributary at Kailua	Lat 21°21'44", long 157°44'22", 30 ft (9 m) upstream from Kalaniana'ole 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)	1963-78	12- 3-77	-	e20
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 [‡] , 1972-78	5-23-78	9.64	1,930
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, 1967-78 ^d	5-23-78	4.6	-
1626500	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, 1977-78	5-23-78	-	e300
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) up- stream 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, 1977-78	4-15-78	3.06	56
*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)	1959-78	5-23-78	-	e300
16279500	Heeia Stream at Kaneohe	Lat 21°25'17", long 157°49'01", 60 ft (18 m) downstream from culvert on Kahekili Highway, 0.7 mi (1.1 km) west of Kaneohe Post Office and 0.8 mi (1.3 km) southwest of Heeia.	1.80 (4.66)	1965-66, 1968-78	5-23-78	-	e200
*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)	1963-78	6-28-78	5.7	e650

* Also a low-flow partial-record station.

‡ Operated as a continuous-record gaging station.

^d Gage height only.^e Estimated.

Annual maximum discharge at crest-stage partial-record stations during water year 1978--Continued

Station No.	Station name	Location	Drainage area mi ² (km ²)	Period of record	Annual maximum		
					Date	Gage height (feet)	Dis- charge (ft ³ /s)
Hawaii, Island of Oahu--Continued							
16304500	Kaluanui Stream at Hauula	Lat 21°35'57", long 157°54'24", on left downstream wingwall of con- crete 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)	1958-78	6-28-78	4.50	e1,200
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)	1958-78	6-28-78	4.73	e200
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)	1958-78	5-23-78	7.3	e70
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)	1973-78	5-23-78	4.81	e100
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)	1968-78	5-23-78	3.11	140
16331000	Waimea Gulch near Kawaiiloa 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 Kawaiiloa Camp.	2.23 (5.78)	1968-78	5-23-78	1.48	e30
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)	1958-78	6-28-78	5.69	1,710
16350000	Opauala 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)	1956-78	6-28-78	11.98	942
Hawaii, Island of Molokai							
16411300	Kakaako Gulch Highway 46, near Mauna Loa	Lat 21°08'49", long 157°11'36", at Highway 46, 1.6 mi (2.6 km) northeast of Mauna Loa, and 1.8 mi (2.9 km) upstream from Kamakahi Gulch.	.55 (1.42)	1964-78	5-23-78	0.84	5
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)	1964-78	5-23-78	1.49	97
16411400	Kakaako Gulch near Mauna Loa	Lat 21°10'39", long 157°12'31", on left bank 1.0 mi (2.0 km) down- stream from Kamakahi Gulch and 3.0 mi (4.8 km) north of Mauna Loa School.	5.34 (13.83)	1963-72 [#] , 1973-78	5-23-78	2.90	615
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 light- house, and 3.3 mi (5.3 km) south- west of Mauna Loa.	.28 (.73)	1964-78	5-23-78	0.89	e10

[#] Operated as a continuous-record gaging station.
e Estimated.

Annual maximum discharge at crest-stage partial-record stations during water year 1978--Continued

Station No.	Station name	Location	Drainage area mi ² (km ²)	Period of record	Annual maximum		
					Date	Gage height (feet)	Dis- charge (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)	1965-78	5-23-78	2.94	412
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)	1964-78	5-23-78	0.65	8
16411900	Kaluapeelua Gulch tribu- tary 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)	1964-78	5-23-78	2.20	70
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)	1965-78	5-23-78	6.35	375
16415400	Wawaia Gulch at Kamalo	Lat 21°03'25", long 156°52'20", at Highway 45, 0.3 mi (0.5 km) up- stream from mouth, and 0.5 mi (0.8 km) northeast of Kamalo.	2.12 (5.49)	1964-78	3- 1-78	1.44	441
16419000	Pohakupili Gulch near Halawa	Lat 21°07'59", long 156°44'15", at Highway 45, 0.5 mi (0.8 km) up- stream from mouth and 1.9 mi (3.1 km) south of Halawa.	.48 (1.24)	1964-78	5-23-78	8.52	798
Hawaii, Island of Maui							
16500100	Kepuni Gulch near Kahikinui House	Lat 20°37'21", long 156°15'16", on right bank 120 ft (37 m) upstream from bridge on Highway 31, 400 ft (122 m) upstream from Kamole Gulch, 1.1 mi (1.8 km) east of Kahikinui House, and 8.5 mi (13.7 km) west of Kaupo.	1.19 (4.95)	1963-72 [#] , 1973-78	3- 1-78	3.64	97
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)	1967-78	3- 1-78	4.70	100
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 [#] , 1969-78	3-14-78	2.75	392
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)	1963-78	5-23-78	3.10	132
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)	1963-78	5-23-78	14.13	1,620
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)	1965-78	5-23-78	10.22	12,700
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)	1963-78	-	-	No flow

[#] Operated as a continuous-record gaging station.

e Estimated.

Annual maximum discharge at crest-stage partial-record stations during water year 1978--Continued

			Drainage		Annual maximum		
Station No.	Station name	Location	area mi ² (km ²)	Period of record	Date	Gage height (feet)	Dis- charge (ft ³ /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)	1967-78	7- 6-78	3.40	86
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)	1963-78	4-19-78	2.03	45
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)	1967-78	7- 6-78	-	e10
**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 [‡] , 1952-78	10-24-77	3.57	e2,000
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)	1964-78	-	-	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)	1965-78	5- 5-78	5.46	102
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)	1964-78	-	-	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, 1965-78	7- 6-78	3.39	328
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, 1964-78	7- 6-78	-	e20
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 [‡] , 1973-78	10-24-77	2.70	191
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)	1964-78	-	-	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)	1963-78	10-24-77	3.48	416
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)	1964-78	5-23-78	-	e1

** Also a water-quality partial-record station.

‡ Operated as a continuous-record gaging station.

e Estimated.

DISCHARGE AT PARTIAL-RECORD STATIONS AND MISCELLANEOUS SITES

Annual maximum discharge at crest-stage partial-record stations during water year 1978--Continued

					Annual maximum		
Station No.	Station name	Location	Drainage area mi ² (km ²)	Period of record			
					Date	Gage height (feet)	Dis- charge (ft ³ /s)
Hawaii, Island of Maui--Continued							
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) up- stream from mouth.	10.1 (26.2)	1963-78	5-23-78	6.04	187
16660000	Kulanihakoi Gulch near Kihei	Lat 20°46'06", long 156°27'03", on right bank 0.5 mi (0.8 km) north- east 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#, 1971-78	5-23-78	-	e25
16663500	Kamaole Gulch at Kamaole	Lat 20°43'36", long 156°27'02", at Kihei Road, 350 ft (107 m) up- stream from mouth, and 0.2 mi (0.3 km) south of Kamaole.	4.28 (11.09)	1972-78	-	-	No flow
16664000	Liilioholo Gulch at Kamaole	Lat 20°43'04", long 156°26'55", on upstream side of Kihei Road, 300 ft (91 m) upstream from mouth, and 0.8 mi (1.3 km) south of Kamaole.	4.12 (10.67)	1972-78	-	-	No flow
Hawaii, Island of Hawaii							
16701300	Waiakea Stream at Hilo	Lat 19°42'38", long 155°05'02", 0.3 mi (0.5 km) upstream from Kinooles Street bridge and 1.3 mi (2.1 km) southeast of Hilo Post Office.	35.8 (92.7)	1968-78	7- 6-78	1.79	5
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)	1965-78	7- 6-78	4.42	370
16717400	Kalaoa Mauka Stream near Hilo	Lat 19°48'07", long 155°06'03", at culvert on Highway 19, 1.0 mi (1.6 km) north of Papikou and 5.1 mi (8.2 km) north of Hilo Post Office.	.24 (.62)	1963-78	1- 9-78	3.99	57
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#, 1973-78	7- 6-78	3.59	238
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)	1963-78	7- 6-78	7.20	619
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)	1963-78	7- 6-78	2.74	65
16717920	Ahualoa Gulch at Honokaa	Lat 20°05'12", long 155°29'17", at Highway 24, 1.1 mi (1.8 km) north- west of Honokaa Hospital, and 1.5 mi (2.4 km) upstream from mouth.	2.27 (5.88)	1963-78	-	-	No flow
16717950	Honokaia Gulch tributary near Honokaa	Lat 20°02'58", long 155°32'19", at culvert, 4.8 mi (7.7 km) south- west of Honokaa Hospital, and 5.5 mi (8.8 km) southeast of Kukuihaele.	2.42 (6.27)	1963-78	-	-	No flow

[#] Operated as a continuous-record gaging station.

e Estimated.

Annual maximum discharge at crest-stage partial-record stations during water year 1978--Continued

Station No.	Station name	Location	Drainage area mi ² (km ²)	Period of record	Annual maximum		
					Date	Gage height (feet)	Dis- charge (ft ³ /s)
Hawaii, Island of Hawaii--Continued							
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)	1963-78	-	-	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)	1963-78	4-21-78	2.35	57
16756500	Keanuimano 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 [#] , 1973-78	6-23-78	4.64	362
16759040	Paiakuli Reser- voir 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)	1963-78	6-23-78	2.03	45
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)	1963-78	4-26-78	2.61	26
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)	1963-78	-	-	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, 1965-78	-	-	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) south- east of Honokohau School.	8.74 (22.64)	1961-78	7- 8-78	2.10	14
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) up- stream from Highway 11 at Naalehu.	2.87 (7.43)	1963-78	-	-	No flow
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)	1963-78	8-16-78	5.71	528

[#] Operated as a continuous-record gaging station.

DISCHARGE AT PARTIAL-RECORD STATIONS AND MISCELLANEOUS SITES
DISCHARGE MEASUREMENTS MADE AT MISCELLANEOUS SITES DURING WATER YEAR 1978

			Drainage area mi ² (km ²)	Measured previously (water years)	Measurements	
Stream	Tributary to	Location			Date	Discharge (ft ³ /s)
Hawaii, Island of Maui						
Koukouai	Pacific Ocean	Lat 20°40'01", long 156°04'20", 1.2 mi (1.9 km) northwest of Kipahulu at elevation 720 ft (219 m).			7-19-78	3.4
Koukouai	Pacific Ocean	Lat 20°39'07", long 156°03'45", at mouth, 0.6 mi (1.0 km) south- west from Kipahulu.			7-18-78 7-19-78	16 3.5
Palikeya	Oheo Gulch	Lat 20°40'24", long 156°03'25", 100 ft (30 m) upstream from Pipiwai Stream, 1.1 mi (1.8 km) north of Kipahulu at elevation 480 ft (146 km).			7-19-78	5.7
Pipiwai	Oheo Gulch	Lat 20°40'26", long 156°03'25", 200 ft (61 m) upstream from Palikeya Stream, 1.1 mi (1.8 km) north of Kipahulu and at eleva- tion 500 ft (152 m).			7-19-78	5.2
Oheo Gulch	Pacific Ocean	Lat 20°39'58", long 156°02'39", at mouth, 1.0 mi (1.6 km) north- east of Kipahulu.			7-19-78	16

ANALYSES OF SAMPLES COLLECTED AT WATER-QUALITY PARTIAL-RECORD STATIONS

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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 1977 TO SEPTEMBER 1978

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- PENDEO (MG/L)	SEDI- MENT DIS- CHARGE, SUS- PENDEO (T/DAY)	DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SEDI- MENT, SUS- PENDEO (MG/L)	SEDI- MENT DIS- CHARGE, SUS- PENDEO (T/DAY)
MAY 23...	1045	116	242	76	JUN 28...	0900	290	448	351
JUN 05...	0730	143	473	183	JUN 28...	1000	480	668	866
JUN 28...	0745	212	363	208	JUN 28...	1605	242	96	63

16270900 LULUKU STREAM AT ALTITUDE 220 FT NEAR KANEOHE (LAT 21°23'24" LONG 157°48'47")

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SEDI- MENT, SUS- PENDEO (MG/L)	SEDI- MENT DIS- CHARGE, SUS- PENDEO (T/DAY)
MAY 23...	1135	35	176	17

16273900 KAMOOALII STREAM AT KANEOHE (LAT 21°24'51" LONG 157°48'13")

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH (UNITS)	TEMPER- ATURE (DEG C)	DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH (UNITS)	TEMPER- ATURE (DEG C)
NOV 03...	1430	6.1	195	8.2	26.0	APR 20...	1025	12	210	8.1	23.5
DEC 12...	1515	4.6	200	8.7	29.5	MAY 25...	1505	9.0	230	7.5	25.0
JAN 25...	1000	4.8	190	8.1	24.0	JUL 10...	1535	6.9	230	8.1	29.5
MAR 08...	1010	4.9	200	8.4	23.0	AUG 21...	1420	28	190	7.1	23.5

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SEDI- MENT, SUS- PENDEO (MG/L)	SEDI- MENT DIS- CHARGE, SUS- PENDEO (T/DAY)	DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SEDI- MENT, SUS- PENDEO (MG/L)	SEDI- MENT DIS- CHARGE, SUS- PENDEO (T/DAY)
NOV 03...	1400	6.3	16	.27	JUL 10...	1530	7.5	7	.14
APR 20...	1030	11	34	1.0	JUL 17...	0715	7.8	10	.21
MAY 23...	1330	167	311	140	AUG 21...	1315	30	181	15
MAY 23...	1520	125	200	68	AUG 21...	1400	29	306	24
MAY 23...	1745	52	192	27					
MAY 25...	1515	8.5	14	.32					

ANALYSES OF SAMPLES COLLECTED AT WATER-QUALITY PARTIAL-RECORD STATIONS

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

HAWAII, ISLAND OF OAHU--Continued

16284500 WAIHEE STREAM AT KAHALUU (LAT 21°17'32" LONG 157°50'26")

DATE	TIME	TEMPER- ATURE (DEG C)	TUR- BID- ITY (JTU)	TUR- BID- ITY (NTU)	NITRO- GEN, NO ₂ +NO ₃ 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)	NITRO- GEN, TOTAL (MG/L AS NO ₃)	PHOS- PHORUS, TOTAL (MG/L AS P)	SEDI- MENT, SUS- PENDED (MG/L)
MAY 26...	1220	25.0	6	--	.25	.01	.79	.80	1.1	4.6	.06	21
JUL 06...	0935	--	--	5.0	.15	.00	.51	.51	.66	2.9	.09	30
AUG 17...	0925	--	--	15	.16	1.1	1.2	2.3	2.5	11	.33	30
SEP 18...	1100	25.0	--	4.7	.24	.16	.27	.43	.67	3.0	.12	25

NOTE.--Water-quality samples collected by Soil Conservation Service.

212732157502200 KAHALUU STREAM AT ALTITUDE 10 FT AT KAHALUU (LAT 21°27'32" LONG 157°50'22")

DATE	TIME	TEMPER- ATURE (DEG C)	TUR- BID- ITY (JTU)	TUR- BID- ITY (NTU)	NITRO- GEN, NO ₂ +NO ₃ 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)	NITRO- GEN, TOTAL (MG/L AS NO ₃)	PHOS- PHORUS, TOTAL (MG/L AS P)	SEDI- MENT, SUS- PENDED (MG/L)
MAY 26...	1205	24.5	1	--	1.5	.03	.49	.52	2.0	8.9	.03	3
JUL 06...	0910	--	--	1.6	1.1	.00	.35	.35	1.5	6.4	.08	6
AUG 17...	0910	--	--	1.6	.59	.03	.78	.81	1.4	6.2	.18	3
SEP 18...	1045	24.5	--	1.1	1.3	.01	.97	.98	2.3	10	.32	5

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	TEMPER- ATURE (DEG C)	TUR- BID- ITY (JTU)	TUR- BID- ITY (NTU)	NITRO- GEN, NO ₂ +NO ₃ 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)	NITRO- GEN, TOTAL (MG/L AS NO ₃)	PHOS- PHORUS, TOTAL (MG/L AS P)	SEDI- MENT, SUS- PENDED (MG/L)
MAY 26...	1130	28.0	7	--	.56	.04	1.1	1.1	1.7	7.2	.22	--
JUL 06...	0850	--	--	8.0	.21	.00	.81	.81	1.0	4.5	.08	15
AUG 17...	0845	--	--	6.4	.04	.05	2.9	2.9	2.9	13	.07	45
SEP 18...	1035	27.5	--	5.5	.06	.03	.39	.42	.48	2.1	.05	24

NOTE.--Water-quality samples collected by Soil Conservation Service.

ANALYSES OF SAMPLES COLLECTED AT WATER-QUALITY PARTIAL-RECORD STATIONS

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WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

HAWAII, ISLAND OF HAWAII

16701750 WAILUKU RIVER NEAR HUMUULA (LAT 19°42'55" LONG 155°18'36")

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH (UNITS)	TEMPER- ATURE (DEG C)	COLOR (PLAT- INUM- COBALT UNITS)	TUR- BID- ITY (JTU)	TUR- BID- ITY (NTU)	BICAR- BONATE (MG/L AS HCO3)	CAR- BONATE (MG/L AS CO3)	ALKA- LITY (MG/L AS CACO3)
NOV											
04...	1125	.21	31	5.6	20.0	--	--	--	--	--	--
04...	1230	.21	31	5.6	--	45	2	--	15	1	14
APR											
13...	1040	.05	38	6.3	21.0	--	--	--	--	--	--
MAY											
11...	1050	.13	34	6.6	20.0	--	--	--	--	--	--
SEP											
14...	1300	.21	35	6.9	18.5	25	--	2.4	--	--	16

DATE	CARBON DIOXIDE DIS- SOLVED (MG/L AS CO2)	SOLIDS, RESIDUE AT 105 DEG. C, SUS- PENDED (MG/L)	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)	NITRO- GEN, TOTAL (MG/L AS NO3)	PHOS- PHORUS, TOTAL (MG/L AS P)	PHOS- PHORUS, ORTHO. TOTAL (MG/L AS P)	CARBON, ORGANIC TOTAL (MG/L AS C)
NOV											
04...	--	--	--	--	--	--	--	--	--	--	--
04...	68	1	.07	.00	.22	.22	.29	1.3	.02	.02	--
APR											
13...	--	--	--	--	--	--	--	--	--	--	--
MAY											
11...	--	--	--	--	--	--	--	--	--	--	--
SEP											
14...	--	1	.01	.00	.16	.16	.17	.75	.01	.00	4.1

DATE	TIME	PERI- PHYTON BIOMASS TOTAL CPY WEIGHT G/SQ M	PERI- PHYTON BIOMASS ASH WEIGHT G/SQ M	CHLOR-A PERI- PHYTON CHROMO- GRAPHIC FLUOROM (MG/M2)	CHLOR-B PERI- PHYTON CHROMO- GRAPHIC FLUOROM (MG/M2)	LENGTH OF EXPO- SURE (DAYS)
NOV						
04...	1230	.945	.472	1.03	.360	28
SEP						
14...	1300	1.18	.670	.050	.080	125

ANALYSES OF SAMPLES COLLECTED AT WATER-QUALITY PARTIAL-RECORD STATIONS

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

HAWAII, ISLAND OF HAWAII--Continued

16701800 WAILUKU RIVER NEAR KAUMANA (LAT 19°43'15" LONG 155°16'08")

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH (UNITS)	TEMPER- ATURE (DEG C)	COLOR (PLAT- INUM- COBALT UNITS)	TUR- BID- ITY (JTU)	TUR- BID- ITY (NTU)	OXYGEN, DIS- SOLVED (MG/L)	COLI- FORM, TOTAL, IMMED. (COLS. PER 100 ML)
OCT 20...	1115	1.2	28	6.0	19.0	--	--	--	--	--
NOV 01...	1500	2.8	24	6.7	19.0	23	2	--	9.4	220
DEC 01...	1000	.55	30	6.4	17.0	--	--	--	--	--
JAN 05...	1100	.22	34	7.0	17.0	--	--	--	--	--
FEB 21...	1310	.13	34	7.2	19.0	--	--	--	--	--
APR 13...	1030	2.2	27	6.5	19.0	--	--	--	--	--
JUL 11...	1040	12	32	7.2	18.0	--	--	--	--	--
26...	1200	6.8	25	7.2	18.5	10	--	.70	8.8	770
SEP 06...	1010	1.7	29	6.7	19.0	--	--	--	--	--

DATE	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP- TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	BICAR- BONATE (MG/L AS HC03)	CAR- BONATE (MG/L AS C03)	ALKA- LINITY (MG/L AS CAC03)	CARBON DIOXIDE DIS- SOLVED (MG/L AS C02)	SOLIDS, RESIDUE AT 105 DEG. C, SUS- PENDED (MG/L)	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)
OCT 20...	--	--	--	--	--	--	--	--	--	--
NOV 01...	K11	K29	11	0	9	3.5	0	.00	.00	.03
JUL 11...	--	--	--	--	--	--	--	--	--	--
26...	150	88	--	--	7	--	9	.01	.00	.19
SEP 06...	--	--	--	--	--	--	--	--	--	--

DATE	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N)	NITRO- GEN, TOTAL (MG/L AS N)	NITRO- GEN, TOTAL (MG/L AS N03)	PHOS- PHORUS, TOTAL (MG/L AS P)	PHOS- PHORUS, ORTHO, TOTAL (MG/L AS P)	IRON, TOTAL RECOV- ERABLE (UG/L AS FE)	CARBON, ORGANIC TOTAL (MG/L AS C)	SEDI- MENT, SUS- PENDED (MG/L)	SEDI- MENT DIS- CHARGE, SUS- PENDED (T/DAY)
OCT 20...	--	--	--	--	--	--	--	--	--
NOV 01...	.03	.03	.13	.02	.02	--	2.2	--	--
JUL 11...	--	--	--	--	--	--	--	--	--
26...	.19	.20	.89	.01	.01	--	2.2	2	.04
SEP 06...	--	--	--	--	--	--	--	--	--

DATE	TIME	PEPI- PHYTON BIOMASS TOTAL DRY WEIGHT G/SG M	PEPI- PHYTON BIOMASS ASH WEIGHT G/SG M	CHLOR-A PEPI- PHYTON CHROMO- GRAPHIC FLUOROM (MG/M2)	CHLOR-B PEPI- PHYTON CHROMO- GRAPHIC FLUOROM (MG/M2)	LENGTH OF EXP- SURE (DAYS)
DEC 01...	1000	2.05	1.12	.360	.150	41
JUL 26...	1200	.630	.394	.900	.340	81

K Results based on colony count outside the acceptable range (non-ideal colony count).

OBSERVATIONS OF PHYSICAL PARAMETERS

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WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

HAWAII, ISLAND OF KAUAI

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH (UNITS)	TEMPER- ATURE (DEG C)	DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH (UNITS)	TEMPER- ATURE (DEG C)
16010000 - KAWAIKOI STREAM NR WAIMEA, KAUAI, HI (LAT 22 08 09 LONG 159 37 22)											
OCT , 1977						MAY , 1978					
18...	1335	2.2	29	6.8	22.0	08...	1210	12	26	6.2	19.0
DEC						JUN					
12...	1230	5.8	28	6.9	23.5	09...	1135	27	24	5.4	17.0
JAN , 1978						JUL					
30...	1230	5.2	33	6.1	15.5	26...	1240	8.6	26	5.8	20.5
MAR						SEP					
13...	1235	2.9	36	6.7	18.5	08...	1110	7.7	27	5.7	19.0
16014000 - KOKEE DITCH NR WAIMEA, KAUAI, HI (LAT 22 06 42 LONG 159 40 43)											
OCT , 1977						MAY , 1978					
18...	1420	3.5	44	6.9	19.0	08...	1415	21	20	6.6	17.0
DEC						JUN					
12...	1430	10	30	6.8	15.5	09...	1430	24	26	6.1	16.0
JAN , 1978						JUL					
30...	1420	9.5	40	6.2	14.5	26...	1445	16	21	6.6	18.5
MAR						SEP					
13...	1420	5.8	45	6.9	15.5	08...	1345	12	20	6.5	19.0
16036000 - MAKAWELI RIVER NR WAIMEA, KAUAI, HI (LAT 21 58 31 LONG 159 38 55)											
OCT , 1977						MAY , 1978					
17...	1410	10	165	7.4	23.5	05...	1315	19	112	7.8	23.0
DEC						JUN					
06...	1445	2050	38	7.1	19.5	08...	1350	25	100	7.5	22.0
JAN , 1978						JUL					
26...	1355	16	142	7.6	20.0	24...	1435	16	105	7.6	25.5
MAR						SEP					
14...	1115	12	165	8.0	22.5	05...	1435	12	150	8.1	23.5
16049000 - HANAPEPE RIVER BL MANUAAHI STR NR ELEELE, KAUAI, HI (LAT 21 57 20 LONG 159 33 13)											
OCT , 1977						MAY , 1978					
17...	1100	14	120	7.4	22.5	05...	1000	25	110	7.8	21.0
DEC						JUN					
08...	1110	28	130	7.6	19.5	08...	1115	65	85	7.3	22.0
JAN , 1978						JUL					
26...	1110	16	131	7.6	20.0	24...	1100	35	95	7.9	23.0
MAR						SEP					
16...	1015	23	115	8.3	19.5	05...	1100	24	120	7.8	22.0
16060000 - SF WAILUA RIVER NR LIHUE, KAUAI, HI (LAT 22 02 24 LONG 159 22 58)											
OCT , 1977						APR , 1978					
06...	0900	4.5	125	7.0	23.5	04...	1350	3.0	108	7.6	25.5
25...	1250	4.9	111	7.0	23.5	MAY					
NOV						03...	1340	25	141	7.3	26.5
22...	1400	21	108	7.2	22.0	31...	1500	30	111	7.2	24.5
JAN , 1978						JUN					
04...	1410	86	80	6.8	20.0	30...	1430	90	86	7.2	--
FEB						AUG					
01...	1415	4.1	131	7.1	21.5	03...	1400	80	85	7.6	23.5
MAR						30...	1415	53	108	7.5	24.0
01...	1340	4.5	145	7.3	21.5						
16061000 - NORTH WAILUA DITCH NR LIHUE, KAUAI, HI (LAT 22 03 56 LONG 159 28 14)											
OCT , 1977						APR , 1978					
19...	1430	20	76	7.3	21.0	20...	1200	22	67	7.6	19.5
NOV						MAY					
18...	1130	16	76	7.3	20.0	19...	1210	18	74	7.5	19.5
DEC						JUN					
20...	1145	17	73	7.3	16.0	19...	1235	20	55	8.6	19.0
JAN , 1978						JUL					
23...	1145	20	67	7.8	17.5	20...	1225	19	65	7.7	19.0
FEB						AUG					
21...	1200	13	75	8.2	17.5	18...	1310	15	81	7.9	21.0
MAR						SEP					
20...	1210	17	71	7.7	17.5	18...	1110	17	64	7.8	21.0

OBSERVATIONS OF PHYSICAL PARAMETERS
 WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
 HAWAII, ISLAND OF KAUAI--Continued

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH (UNITS)	TEMPER- ATURE (DEG C)	DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH (UNITS)	TEMPER- ATURE (DEG C)
16061200 - N WAILUA DITCH BL WAIKOKO STR NR LIHUE, KAUAI, HI (LAT 22 03 34 LONG 159 28 00)											
OCT , 1977						APR , 1978					
19...	1355	22	78	7.3	22.0	20...	1005	22	78	7.6	19.0
NOV						MAY					
18...	1030	20	77	7.4	19.0	19...	1025	20	81	7.4	19.5
DEC						JUN					
20...	1005	19	77	7.3	17.0	19...	1040	26	53	8.5	19.5
JAN , 1978						JUL					
23...	1015	20	73	7.6	18.0	20...	1115	22	70	7.6	18.5
FEB						AUG					
21...	1015	15	74	8.1	17.0	18...	1105	21	82	7.6	20.0
MAR						SEP					
20...	1020	20	74	7.8	17.5	18...	1010	22	66	7.7	20.5
16062000 - STABLE STORM DITCH NR LIHUE, KAUAI, HI (LAT 22 04 09 LONG 159 26 46)											
OCT , 1977						APR , 1978					
19...	0915	.75	90	7.3	21.0	20...	0925	.45	82	7.5	19.5
NOV						MAY					
18...	0925	.36	95	7.4	18.5	19...	0930	.25	92	7.3	20.0
DEC						JUN					
20...	0855	.28	90	7.4	17.5	19...	0920	.23	75	7.3	20.0
JAN , 1978						JUL					
23...	0905	29	90	7.6	18.5	20...	1010	.12	80	7.3	19.0
FEB						AUG					
21...	0905	18	100	7.9	17.5	18...	0920	.27	92	7.5	20.5
MAR						SEP					
20...	0900	28	79	7.7	17.5	18...	0910	.29	76	7.3	21.5
16063000 - NF WAILUA R AT ALT 650 FT NR LIHUE, KAUAI, HI (LAT 22 04 02 LONG 159 26 21)											
OCT , 1977						APR , 1978					
05...	1455	7.2	90	7.8	23.5	05...	1100	4.5	94	7.7	19.5
NOV						MAY					
01...	1415	54	76	7.3	22.0	04...	1000	40	87	7.6	23.0
29...	1425	2.6	98	7.9	21.5	JUN					
JAN , 1978						01...	0945	51	92	7.6	19.5
05...	1000	36	90	6.8	18.5	29...	1030	260	56	6.4	20.5
FEB						AUG					
02...	1020	1.5	105	7.7	19.0	04...	0935	86	72	6.9	19.5
MAR						SEP					
02...	0945	2.3	90	7.7	18.0	01...	1015	51	90	7.8	22.0
16068000 - EB OF NF WAILUA RIVER NR LIHUE, KAUAI, HI (LAT 22 04 19 LONG 159 25 05)											
OCT , 1977						APR , 1978					
25...	1035	107	76	6.9	20.5	24...	1005	21	103	7.2	20.0
NOV						MAY					
22...	1000	19	106	7.3	20.0	24...	1030	45	92	7.3	20.5
DEC						JUN					
23...	1015	15	110	7.1	18.5	26...	1050	59	90	6.9	21.0
JAN , 1978						JUL					
25...	1040	13	90	7.1	20.0	25...	1015	35	102	7.2	21.5
FEB						AUG					
22...	0930	11	118	7.8	19.5	25...	0845	59	90	6.7	20.0
MAR						SEP					
27...	0945	12	112	7.6	19.0	25...	0925	31	97	7.2	20.5
16069000 - WAILUA DITCH NR KAPAA, KAUAI, HI (LAT 22 04 34 LONG 159 24 04)											
OCT , 1977						APR , 1978					
12...	0945	31	96	7.3	24.5	20...	1405	36	88	7.4	24.5
19...	1100	37	85	7.0	24.5	MAY					
NOV						19...	1350	20	85	7.3	24.5
18...	1330	5.1	83	7.2	26.5	JUN					
DEC						19...	1420	16	78	7.5	25.0
20...	1305	26	94	7.1	21.5	JUL					
JAN , 1978						20...	1455	20	83	7.3	20.0
23...	1355	29	100	7.5	22.0	AUG					
FEB						18...	1505	19	85	7.0	27.0
21...	1340	11	109	7.8	24.5	SEP					
MAR						18...	1410	23	88	7.5	26.5
20...	1400	30	90	7.7	22.0						

OBSERVATIONS OF PHYSICAL PARAMETERS

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WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

HAWAII, ISLAND OF KAUAI--Continued

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH (UNITS)	TEMPER- ATURE (DEG C)	DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH (UNITS)	TEMPER- ATURE (DEG C)
16071000 - NF WAILUA RIVER NR KAPAA, KAUAI, HI (LAT 22 03 08 LONG 159 22 22)											
OCT , 1977						APR , 1978					
12...	1445	5.2	160	7.8	26.5	18...	0945	106	94	7.4	19.0
DEC						MAY					
02...	0930	6.4	150	7.6	22.5	26...	0935	130	98	7.0	21.5
JAN , 1978						JUL					
17...	0955	33	99	6.9	19.5	06...	0935	131	98	7.4	22.0
MAR						AUG					
03...	0930	3.7	170	7.7	19.5	15...	1015	157	78	7.6	21.5
16071500 - LEFT BRANCH OPAEKAA STREAM NR KAPAA, KAUAI, HI (LAT 22 04 44 LONG 159 23 55)											
OCT , 1977						APR , 1978					
12...	1110	.69	111	6.9	23.0	18...	1215	1.5	93	6.7	21.0
DEC						MAY					
02...	1030	.82	110	7.4	22.5	26...	1015	1.5	102	6.7	21.5
JAN , 1978						JUL					
17...	1110	.63	101	6.4	18.5	06...	1205	2.7	97	6.8	22.0
MAR						AUG					
03...	1025	.50	112	7.1	19.0	15...	1330	2.3	97	6.7	29.0
16077000 - MAKALEHA DITCH NR KEALIA, KAUAI, HI (LAT 22 07 06 LONG 159 22 04)											
OCT , 1977						APR , 1978					
04...	1430	12	65	7.2	23.0	21...	1305	3.0	94	6.8	20.5
20...	1330	8.4	95	7.1	22.0	MAY					
NOV						22...	1330	7.6	86	7.3	20.5
21...	1430	.19	115	7.2	20.0	JUN					
DEC						20...	1230	.81	85	7.3	21.0
19...	1310	7.8	100	7.3	18.0	JUL					
JAN , 1978						19...	1245	3.0	85	7.3	19.0
20...	1250	4.9	104	7.4	--	AUG					
FEB						21...	1350	19	52	7.2	20.5
17...	1310	4.6	110	8.2	20.0	SEP					
MAR						19...	1335	1.1	90	6.9	22.5
21...	1305	10	76	6.9	18.0						
16079000 - KAPAHU DITCH NR KEALIA, KAUAI, HI (LAT 22 06 09 LONG 159 22 28)											
OCT , 1977						APR , 1978					
04...	1520	2.5	125	7.6	23.5	21...	1445	7.0	120	7.9	21.0
20...	1515	3.3	136	7.3	22.5	MAY					
NOV						22...	1405	7.0	120	7.7	22.0
22...	1130	3.3	128	7.7	21.0	JUN					
DEC						20...	1355	.36	73	7.5	23.5
19...	1415	3.2	93	7.4	19.5	JUL					
JAN , 1978						19...	1515	1.6	110	7.8	19.5
20...	1355	2.2	132	7.5	21.0	AUG					
FEB						21...	1450	30	60	7.1	21.0
17...	1435	2.2	140	8.2	21.5	SEP					
MAR						19...	1410	17	92	7.5	21.5
21...	1420	6.8	100	7.9	19.5						
16080000 - KAPAA STR AT KAPAHU DITCH INTK NR KAPAA, KAUAI, HI (LAT 22 06 15 LONG 159 22 29)											
JAN , 1978						AUG , 1978					
03...	1005	11	87	7.2	18.5	31...	0940	1.0	115	7.4	22.0
JUL											
03...	0910	30	80	7.1	21.0						
16087000 - ANAHOLA DITCH WASTEWAY NR KEALIA, KAUAI, HI (LAT 22 08 16 LONG 159 22 28)											
OCT , 1977						APR , 1978					
06...	1100	.22	95	6.8	22.5	21...	1000	.05	92	6.7	20.0
20...	1020	.03	80	6.8	22.0	MAY					
NOV						22...	0940	.06	70	7.1	21.0
21...	1140	.14	85	7.0	21.0	JUN					
DEC						20...	0925	.10	70	7.4	21.0
19...	0935	.06	83	7.1	18.0	JUL					
JAN , 1978						25...	1210	.27	70	6.7	22.0
20...	0950	.07	89	6.6	19.0	AUG					
FEB						21...	1015	.32	76	6.9	22.0
17...	1005	.05	90	7.2	18.5	SEP					
MAR						19...	0920	.04	70	7.0	22.5
21...	1000	.13	82	6.5	18.5						

OBSERVATIONS OF PHYSICAL PARAMETERS
WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
HAWAII, ISLAND OF KAUAI--Continued

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH (UNITS)	TEMPER- ATURE (DEG C)	DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH (UNITS)	TEMPER- ATURE (DEG C)
16088000 - ANAHOLA DITCH AB KANEHA RES NR KEALIA, KAUAI, HI (LAT 22 08 10 LONG 159 22 28)											
OCT , 1977						APR , 1978					
06...	1050	4.0	90	7.2	22.0	21...	0915	4.7	85	7.3	19.0
20...	0925	2.0	85	7.2	23.0	MAY					
NOV						22...	0900	6.8	70	7.1	20.0
21...	1030	5.0	83	7.2	21.0	JUN					
DEC						20...	0950	11	60	7.5	20.0
19...	0855	2.8	83	7.1	18.0	JUL					
JAN , 1978						19...	1010	9.1	82	7.1	18.5
20...	0955	1.6	89	6.7	18.5	AUG					
FEB						21...	0940	7.7	75	7.1	20.0
17...	0920	1.1	100	7.7	19.5	SEP					
MAR						19...	0835	6.7	72	7.0	21.5
21...	0915	5.7	85	7.3	18.5						
16089000 - ANAHOLA STREAM NR KEALIA, KAUAI, HI (LAT 22 09 05 LONG 159 21 17)											
OCT , 1977						MAY , 1978					
04...	1115	3.6	130	7.5	24.5	02...	1020	6.4	109	7.6	22.5
31...	1030	4.5	128	7.3	23.0	JUN					
NOV						01...	1340	10	110	7.7	23.5
28...	1010	3.8	129	7.4	20.0	JUL					
JAN , 1978						03...	1215	24	102	7.4	22.5
03...	1110	7.6	105	7.2	19.0	AUG					
31...	1035	3.4	131	7.1	19.0	01...	1010	14	105	7.5	22.0
FEB						31...	1055	11	100	7.7	22.5
28...	1020	3.4	131	7.7	20.0						
APR											
06...	1000	11	106	7.6	20.5						
16091000 - LOWER ANAHOLA DITCH NR KEALIA, KAUAI, HI (LAT 22 08 14 LONG 159 19 31)											
OCT , 1977						MAY , 1978					
06...	1315	2.1	135	6.8	23.5	22...	1025	5.7	94	7.2	22.0
20...	1110	2.8	121	7.1	23.5	JUN					
DEC						20...	0920	.07	110	7.5	22.0
19...	1045	.95	138	7.1	18.0	JUL					
JAN , 1978						19...	1155	.04	115	7.2	19.5
20...	1045	3.8	106	6.7	20.5	AUG					
FEB						21...	1105	4.9	103	7.1	23.0
17...	1045	1.6	125	7.5	20.5	SEP					
MAR						19...	1015	3.6	110	6.5	23.0
21...	1100	.67	130	6.4	20.0						
APR											
21...	1105	.92	119	6.4	21.0						
16093200 - ANAHOLA STREAM AT ANAHOLA, KAUAI, HI (LAT 22 08 42 LONG 159 18 59)											
OCT , 1977						MAY , 1978					
04...	0925	4.7	160	7.2	24.5	02...	1415	8.4	127	7.8	26.0
31...	1410	6.7	143	7.1	24.5	JUN					
NOV						12...	1110	31	100	7.4	23.0
28...	1310	5.8	150	7.4	21.5	JUL					
JAN , 1978						03...	1340	52	950	7.1	27.0
03...	1345	13	130	7.0	19.5	AUG					
31...	1315	4.6	167	7.2	21.0	01...	1405	16	120	7.5	23.5
FEB						31...	1325	17	112	7.7	22.5
28...	1305	5.7	161	7.5	21.5						
APR											
06...	1140	15	143	7.6	21.5						
16097500 - HALAULANI STR AT ALT 400 FT NR KILAUE, KAUAI, HI (LAT 22 10 54 LONG 159 25 17)											
OCT , 1977						APR , 1978					
11...	1410	4.1	95	7.2	22.5	14...	1045	22	80	6.9	20.5
DEC						MAY					
01...	1030	4.7	120	7.1	21.5	25...	0930	8.1	100	7.6	19.0
JAN , 1978						JUN					
16...	1030	5.1	103	6.9	19.5	28...	0945	29	93	7.2	20.5
FEB						AUG					
27...	1340	3.7	119	8.2	22.0	14...	1030	10	98	7.5	22.0

OBSERVATIONS OF PHYSICAL PARAMETERS

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WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

HAWAII, ISLAND OF KAUAI--Continued

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH (UNITS)	TEMPER- ATURE (DEG C)	DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH (UNITS)	TEMPER- ATURE (DEG C)
16100000 - HANALEI TUNNEL OUTLET NR LIHUE, KAUAI, HI (LAT 22 05 02 LONG 159 27 50)											
OCT , 1977						APR , 1978					
05...	1040	26	76	7.6	20.0	04...	1035	21	83	7.9	18.0
NOV						MAY					
01...	1050	33	77	7.1	18.5	03...	1055	31	68	7.5	18.5
29...	1035	71	88	7.7	18.5	31...	1045	24	83	7.6	19.0
JAN , 1978						JUN					
04...	1030	25	93	6.7	18.0	30...	1020	29	80	7.5	19.0
FEB						AUG					
01...	1025	17	85	6.9	16.5	03...	1110	28	79	7.6	19.0
MAR						30...	1040	27	78	7.7	19.0
01...	1030	24	70	7.5	17.0						

16103000 - HANALEI RIVER NR HANALEI, KAUAI, HI (LAT 22 11 31 LONG 159 27 57)											
OCT , 1977						APR , 1978					
11...	1100	43	100	7.0	22.0	10...	1055	216	85	7.5	19.5
NOV						MAY					
30...	1005	55	100	7.8	21.5	23...	1100	196	77	7.3	19.5
JAN , 1978						JUN					
13...	1045	52	100	6.9	18.5	27...	1020	139	100	7.7	21.0
FEB						AUG					
27...	1000	40	108	8.2	21.0	11...	1115	176	80	7.2	21.5

16108000 - WAINIHA RIVER NEAR HANALEI, KAUAI, HI (LAT 22 08 20 LONG 159 33 38)											
OCT , 1977						MAY , 1978					
21...	1140	52	60	7.6	20.0	10...	1215	59	54	7.4	19.0
DEC						JUL					
15...	1245	40	74	6.4	19.0	17...	1025	109	50	7.8	18.0
FEB , 1978											
15...	1230	37	68	7.6	19.0						

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16200000 - NF KAUONAHUA STR AB RB NR WAHIAWA, OAHU, HI (LAT 21 31 09 LONG 157 56 53)											
OCT , 1977						MAY , 1978					
05...	1540	1.5	53	7.3	22.0	01...	1345	5.5	43	7.0	19.5
NOV						JUN					
15...	1325	5.6	53	7.0	21.0	05...	1245	96	22	6.6	19.0
DEC						JUL					
23...	1300	1.0	58	7.1	17.5	21...	1440	8.5	55	7.0	21.0
FEB , 1978						SEP					
02...	1345	.28	57	6.8	19.0	01...	1350	15	50	7.0	21.5
MAR											
22...	1225	1.1	52	6.5	18.5						

16208000 - S F KAUONAHUA STR AT E PUMP RE WAHIAWA, OAHU, HI (LAT 21 29 32 LONG 157 59 54)											
OCT , 1977						APR , 1978					
06...	1300	1.5	73	7.1	24.0	27...	1115	20	36	7.2	19.5
NOV						JUN					
16...	1545	3.8	60	7.1	22.0	13...	1145	6.0	51	6.9	24.0
DEC						JUL					
22...	1600	2.2	64	6.7	17.5	20...	1325	33	54	6.9	22.0
MAR , 1978						AUG					
15...	1120	3.6	48	6.4	21.0	31...	1600	7.9	55	6.7	25.0

16211600 - MAKAHA STREAM NR MAKAHA, OAHU, HI (LAT 21 30 16 LONG 158 10 59)											
OCT , 1977						APR , 1978					
04...	1315	.01	195	6.8	21.0	26...	1250	2.2	100	7.4	19.0
NOV						JUN					
17...	1425	.07	170	6.8	20.0	06...	1430	3.7	84	7.4	20.0
DEC						JUL					
28...	1435	.31	130	7.6	19.0	27...	1500	1.0	105	7.7	21.5
FEB , 1978						SEP					
08...	1410	.18	150	7.4	19.0	06...	1350	.20	140	7.7	21.0
MAR											
16...	1255	1.8	100	7.4	19.0						

OBSERVATIONS OF PHYSICAL PARAMETERS
WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
HAWAII, ISLAND OF OAHU--Continued

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH (UNITS)	TEMPER- ATURE (DEG C)	DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH (UNITS)	TEMPER- ATURE (DEG C)
16212800 - KIPAPA STREAM NR WAHIAWA, OAHU, HI (LAT 21 28 13 LONG 157 57 40)											
NOV , 1977						MAY , 1978					
14...	1000	.39	80	7.1	21.0	26...	1115	3.1	62	7.1	25.0
DEC						AUG					
30...	1040	.14	85	7.0	18.0	01...	1310	2.0	72	7.3	24.0
FEB , 1978						SEP					
03...	1400	.01	75	6.9	21.5	08...	1500	3.2	48	7.6	25.0
APR											
21...	1400	15	65	6.7	21.0						
16216000 - WAIKAWA STREAM NR PEARL CITY, OAHU, HI (LAT 21 23 57 LONG 157 58 51)											
OCT , 1977						MAY , 1978					
14...	1145	3.3	1500	6.6	24.0	16...	1130	73	135	7.0	21.5
NOV						JUN					
29...	1245	2.3	1450	6.2	23.0	30...	1030	29	245	7.0	24.0
JAN , 1978						AUG					
12...	1120	3.5	1200	7.0	21.0	08...	1210	156	150	6.9	22.5
FEB						SEP					
16...	1035	2.4	1200	7.2	22.0	18...	1055	28	200	7.0	23.5
APR											
06...	1215	2.4	1800	6.9	23.0						
16224500 - KALAWAO STREAM AT MOANALUA RD. AT AIEA, OAHU, HI (LAT 21 23 07 LONG 157 56 22)											
MAY , 1978						AUG , 1978					
22...	1440	3.0	180	6.7	24.0	07...	1620	14	80	6.7	24.0
JUN						SEP					
29...	1650	5.4	160	6.9	25.0	19...	1400	.14	270	7.1	27.5
16226000 - NORTH HALAWA STREAM NR AIEA, OAHU, HI (LAT 21 23 46 LONG 157 53 37)											
NOV , 1977						AUG , 1978					
25...	1145	.02	160	6.8	21.5	07...	1140	47	70	6.3	22.5
MAY , 1978						SEP					
17...	1350	1.9	135	7.3	22.0	13...	1105	.74	110	7.0	22.5
JUN											
29...	1305	16	140	7.3	22.5						
16229000 - KALIHI STREAM NR HONOLULU, OAHU, HI (LAT 21 22 00 LONG 157 50 49)											
OCT , 1977						JUN , 1978					
25...	1455	2.1	160	7.6	21.0	27...	1130	3.6	150	7.2	21.5
NOV						AUG					
22...	1425	.64	150	7.2	21.5	28...	1010	2.4	150	7.3	21.0
DEC						SEP					
27...	1030	.43	190	7.0	19.0	26...	1040	2.8	170	7.2	21.5
FEB , 1978						26...	1140	2.8	130	7.2	21.5
22...	1225	.26	145	7.6	19.5						
22...	1230	.26	145	7.6	19.5						
16232000 - NUUANU STR BL RES 2 WSTEY NR HONOLULU, OAHU, HI (LAT 21 20 57 LONG 157 49 40)											
OCT , 1977						MAY , 1978					
17...	1030	.75	140	6.6	22.0	18...	1030	1.6	140	7.2	22.0
NOV						JUL					
28...	1100	.79	140	6.8	21.0	03...	1205	5.6	140	7.5	23.0
JAN , 1978						AUG					
06...	1320	.73	145	7.2	18.0	02...	1515	4.6	170	7.3	24.0
FEB						SEP					
13...	1430	.46	140	6.6	20.0	15...	1010	3.3	130	7.4	22.5
MAR											
31...	1245	.40	150	7.0	20.5						

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WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

HAWAII, ISLAND OF OAHU--Continued

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH (UNITS)	TEMPER- ATURE (DEG C)	DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH (UNITS)	TEMPER- ATURE (DEG C)
16238500 - WAIHI STREAM AT HONOLULU, OAHU, HI (LAT 21 19 55 LONG 157 48 12)											
OCT , 1977						APR , 1978					
11...	1410	.28	210	6.7	23.5	03...	1420	.36	180	6.7	21.5
NOV						JUN					
22...	1350	.38	185	6.6	22.0	27...	1550	2.6	155	7.0	22.0
JAN , 1978						AUG					
06...	1030	.30	200	6.8	19.0	02...	1130	2.3	140	7.0	21.5
FEB						SEP					
13...	1000	.12	205	7.0	20.0	14...	1430	2.1	130	7.3	23.0
16240500 - WAIKAEKUA STREAM AT HONOLULU, OAHU, HI (LAT 21 19 53 LONG 157 48 08)											
OCT , 1977						MAY , 1978					
11...	1540	1.8	150	7.1	22.5	15...	1115	3.8	120	7.3	21.0
NOV						JUN					
22...	1210	1.6	150	6.8	21.5	27...	1320	3.8	130	7.0	21.5
JAN , 1978						AUG					
06...	0855	1.4	145	7.2	18.5	07...	0950	4.4	140	7.3	21.5
FEB						SEP					
13...	1200	1.1	140	6.8	20.5	14...	1210	3.5	140	7.4	22.5
MAR											
03...	1125	1.0	140	7.0	21.0						
16244000 - PUKELE STREAM NEAR HONOLULU, OAHU, HI (LAT 21 18 36 LONG 157 47 27)											
OCT , 1977						MAY , 1978					
12...	1200	.30	220	6.6	22.0	19...	1425	.90	220	6.6	22.5
JAN , 1978						JUN					
09...	1410	.34	220	6.7	22.0	26...	1250	1.0	215	6.8	22.5
FEB						AUG					
14...	1220	.22	220	6.5	22.0	04...	1510	1.3	190	6.5	23.0
APR						SEP					
04...	1540	.27	220	6.3	22.5	15...	1530	.78	220	6.7	23.0
16247000 - PALOLO STREAM NEAR HONOLULU, OAHU, HI (LAT 21 17 34 LONG 157 48 24)											
OCT , 1977						MAY , 1978					
12...	0830	.46	350	7.5	23.5	19...	1030	1.9	290	10.1	26.5
NOV						JUN					
23...	1100	.72	320	9.0	26.0	26...	1400	5.3	175	9.7	29.0
JAN , 1978						AUG					
09...	0945	.60	340	9.1	21.5	04...	1200	12	110	9.0	28.5
FEB						SEP					
14...	0915	.35	325	9.0	20.5	15...	1200	1.2	240	9.9	33.0
APR											
04...	1130	.34	280	9.6	27.5						
16254000 - MAKAWAO STREAM NEAR KAILUA, OAHU, HI (LAT 21 21 49 LONG 157 46 02)											
OCT , 1977						APR , 1978					
27...	1540	1.1	210	7.6	23.5	19...	1050	1.5	240	7.8	21.5
DEC						MAY					
08...	1300	1.3	200	7.4	22.0	22...	1535	2.4	240	7.5	22.0
JAN , 1978						JUL					
23...	1410	2.5	210	6.9	21.0	12...	1325	2.4	240	7.5	23.0
MAR						AUG					
01...	1210	6.6	180	7.6	20.0	15...	1430	1.6	210	6.5	23.5
16283600 - SF WAIHEE STR NR HEEIA, OAHU, HI (LAT 21 26 47 LONG 157 52 12)											
NOV , 1977						APR , 1978					
02...	1525	.68	130	6.8	20.5	18...	0935	.62	140	7.5	20.0
DEC						MAY					
16...	1020	.64	120	7.2	20.0	31...	1135	.52	140	7.7	21.0
JAN , 1978						JUL					
10...	1325	.60	120	7.1	19.0	14...	1000	.46	150	7.6	20.0
FEB						AUG					
28...	1020	.62	130	7.4	20.0	28...	1010	.54	150	7.0	20.5

OBSERVATIONS OF PHYSICAL PARAMETERS
WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
HAWAII, ISLAND OF OAHU--Continued

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH (UNITS)	TEMPER- ATURE (DEG C)	DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH (UNITS)	TEMPER- ATURE (DEG C)
16283700 - NF WAIHEE STREAM NR HEEIA, OAHU, HI (LAT 21 26 48 LONG 157 52 18)											
NOV , 1977						APR , 1978					
02...	1405	.92	130	6.9	20.0	18...	1135	.77	130	7.8	20.5
DEC						MAY					
16...	1150	.91	120	7.2	20.0	31...	1310	.80	130	7.5	20.5
JAN , 1978						JUL					
19...	1500	.91	115	7.0	19.0	14...	1230	.77	140	7.7	20.0
FEB						AUG					
28...	1115	.88	120	7.1	19.5	28...	1215	.88	140	7.0	20.0
16284000 - WAIHEE STREAM NR HEEIA, OAHU, HI (LAT 21 27 01 LONG 157 51 38)											
NOV , 1977						APR , 1978					
02...	0950	1.5	130	6.9	21.5	18...	1350	1.0	130	7.8	21.5
DEC						MAY					
13...	1640	1.2	130	7.4	21.0	31...	1535	1.3	140	7.5	21.5
JAN , 1978						JUL					
19...	1200	1.2	120	6.9	19.5	14...	1500	1.2	150	7.4	22.5
FEB						AUG					
28...	0840	1.1	130	7.4	20.0	28...	1440	1.4	140	7.5	21.5
16284200 - WAIHEE STREAM NR KAHALUU, OAHU, HI (LAT 21 27 04 LONG 157 51 36)											
NOV , 1977						APR , 1978					
02...	0910	4.0	130	7.0	20.0	18...	1445	3.4	160	7.6	20.0
DEC						MAY					
13...	1810	3.7	150	7.2	21.0	31...	1700	4.2	170	7.2	20.5
JAN , 1978						JUL					
19...	0930	3.7	150	7.4	20.5	14...	1700	4.0	180	7.4	21.0
FEB						AUG					
28...	1325	3.8	150	7.2	19.5	28...	1630	4.6	170	7.1	21.0
16294900 - WAIKANE STREAM AT ALI 75 FT AT WAIKANE, OAHU, HI (LAT 21 30 00 LONG 157 51 54)											
NOV , 1977						APR , 1978					
03...	1200	3.6	180	7.1	22.5	20...	1420	90	170	7.5	22.0
DEC						MAY					
12...	1030	1.6	180	7.4	21.5	24...	1230	18	180	7.3	22.0
JAN , 1978						JUL					
20...	1030	1.4	190	7.3	21.0	12...	1045	5.0	200	7.2	22.5
MAR						AUG					
09...	1230	1.5	180	7.5	22.0	24...	1315	7.3	165	7.3	23.0
16296500 - KAHANA STR AT ALI 30 FT NR KAHANA, OAHU, HI (LAT 21 32 37 LONG 157 53 07)											
NOV , 1977						JUN , 1978					
01...	1450	16	140	7.2	23.0	01...	1450	26	150	6.8	21.0
DEC						JUL					
14...	1330	13	140	7.0	22.5	13...	1500	28	140	7.1	22.5
JAN , 1978						AUG					
20...	1600	12	120	7.1	22.0	24...	1040	43	170	6.8	22.0
APR						SEP					
21...	1420	34	120	7.0	21.5	29...	1515	.23	140	6.8	22.0
16303000 - PUNALUU STREAM NR PUNALUU, OAHU, HI (LAT 21 33 33 LONG 157 54 06)											
OCT , 1977						MAY , 1978					
31...	1435	11	130	7.8	22.5	26...	1405	20	130	7.4	21.0
DEC						JUL					
15...	1340	7.8	140	7.2	21.5	11...	1340	13	130	7.4	21.5
JAN , 1978						AUG					
17...	1415	6.7	130	7.5	19.5	16...	1410	19	130	6.8	22.0
APR											
17...	1330	12	120	7.6	21.0						

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WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

HAWAII, ISLAND OF OAHU--Continued

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH (UNITS)	TEMPER- ATURE (DEG C)	DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH (UNITS)	TEMPER- ATURE (DEG C)
16304200 - KALUANUI STREAM NR PUNALUU, OAHU, HI (LAT 21 35 22 LONG 157 54 38)											
NOV , 1977						APR , 1978					
01...	1100	.75	85	7.4	23.0	21...	1040	2.3	75	7.6	20.0
DEC						JUN					
14...	1040	.13	75	7.0	21.5	01...	1040	1.0	80	7.0	21.0
JAN , 1978						JUL					
24...	1000	.35	80	7.0	20.5	13...	1015	1.8	70	6.7	21.5
MAR						AUG					
09...	0845	2.6	65	7.5	20.0	23...	1245	8.2	54	6.8	22.0
16325000 - KAMANANUI STR AT PUPUKEA MIL RD NR MAUNAWAI, OAHU (LAT 21 37 25 LONG 158 01 04)											
OCT , 1977						APR , 1978					
01...	1120	.33	80	7.2	23.5	25...	1540	1.4	58	6.5	24.0
NOV						JUN					
10...	1130	1.4	85	7.2	22.0	08...	1730	5.5	60	6.9	24.5
DEC						JUL					
20...	1040	1.0	82	6.7	18.5	18...	1610	6.3	90	7.4	24.0
JAN , 1978						AUG					
31...	1115	.07	80	6.5	19.0	31...	1100	4.4	81	7.3	23.5
MAR											
14...	1050	.28	73	6.8	22.5						
16330000 - KAMANANUI STREAM AT MAUNAWAI, OAHU, HI (LAT 21 38 20 LONG 158 03 27)											
OCT , 1977						APR , 1978					
01...	1405	.06	140	6.9	26.5	25...	1130	1.5	88	6.6	22.0
NOV						JUN					
10...	1515	2.2	100	6.8	23.0	08...	1315	9.1	70	7.2	23.5
DEC						JUL					
20...	1400	1.2	95	--	--	18...	1150	4.5	90	7.5	24.5
JAN , 1978						AUG					
31...	1425	.02	205	6.3	25.0	30...	1145	7.2	87	7.2	24.0
MAR											
14...	1440	.30	125	6.5	23.5						
16343000 - HELEMANO STREAM AT HALEIWA, OAHU, HI (LAT 21 34 40 LONG 158 06 12)											
OCT , 1977						JUN , 1978					
01...	1535	.01	1400	7.3	23.5	09...	1545	.04	1850	7.4	25.0
DEC						JUL					
19...	1605	.04	1350	7.7	20.0	19...	1650	.12	305	6.9	24.5
MAR , 1978						SEP					
15...	1545	.13	1800	6.8	23.5	07...	0950	.10	505	7.0	24.0
APR											
24...	1630	.05	540	6.7	23.5						
16345000 - OPAEULA STREAM NR WAHIAWA, OAHU, HI (LAT 21 33 55 LONG 158 00 10)											
OCT , 1977						APR , 1978					
03...	1035	.46	54	7.3	23.5	24...	1330	3.0	39	6.7	21.0
NOV						JUN					
09...	1730	4.2	58	7.2	21.5	09...	1130	4.7	40	6.7	23.5
DEC						JUL					
19...	1355	6.7	66	6.8	18.0	19...	1215	6.2	47	7.0	23.0
JAN , 1978						AUG					
31...	1630	1.6	76	6.2	19.0	29...	1230	6.2	48	7.1	25.0
MAR											
13...	1520	1.2	54	6.8	24.0						

OBSERVATIONS OF PHYSICAL PARAMETERS
WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
HAWAII, ISLAND OF MOLOKAI

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH (UNITS)	TEMPER- ATURE (DEG C)	DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH (UNITS)	TEMPER- ATURE (DEG C)
16400000 - HALAWA STREAM NR HALAWA, MOLOKAI, HI (LAT 21 09 31 LONG 156 45 53)											
OCT , 1977						APR , 1978					
17...	1430	4.2	63	7.3	23.5	03...	1415	7.6	59	7.4	19.5
NOV						MAY					
14...	1200	2.9	62	7.4	20.5	01...	1305	42	48	6.6	19.5
DEC						30...	1530	23	51	6.9	20.5
12...	1330	2.5	69	7.2	20.5	JUL					
JAN , 1978						10...	1400	12	50	6.7	21.0
09...	1300	3.6	62	7.2	17.5	AUG					
FEB						08...	1230	105	78	7.3	21.0
06...	1330	1.8	73	6.9	18.5	SEP					
MAR						05...	1335	64	81	7.0	21.5
06...	1245	3.6	62	6.8	19.5						
16403900 - KAWAINUI STREAM NR PELEKUNU, MOLOKAI, HI (LAT 21 07 59 LONG 156 52 38)											
OCT , 1977						MAY , 1978					
13...	1115	1.3	155	7.7	20.5	16...	1110	11	122	7.7	19.0
DEC						JUL					
08...	1200	2.0	146	7.7	19.5	06...	1230	14	102	7.3	21.5
FEB , 1978						AUG					
02...	1200	1.5	151	7.5	19.5	31...	1020	4.3	142	7.9	22.0
MAR											
23...	1315	6.0	138	7.7	19.5						
16404000 - PELEKUNU STREAM NR PELEKUNU, MOLOKAI, HI (LAT 21 08 11 LONG 156 52 43)											
OCT , 1977						MAY , 1978					
13...	1615	3.1	142	7.8	22.5	16...	1445	17	124	7.8	22.0
DEC						JUL					
06...	1530	4.0	140	7.9	20.5	06...	1545	23	108	7.4	22.0
FEB , 1978						AUG					
02...	1630	3.5	146	7.7	19.0	30...	1420	7.4	122	8.0	22.5
MAR											
23...	1700	10	138	7.7	19.5						
16404200 - PILIPILILAU STREAM NR PELEKUNU, MOLOKAI, HI (LAT 21 08 08 LONG 156 53 09)											
OCT , 1977						MAY , 1978					
13...	1130	.56	157	7.7	21.5	16...	0930	.78	151	8.0	23.0
DEC						JUL					
08...	1030	.56	165	7.7	19.5	06...	1450	.72	153	7.9	22.5
FEB , 1978						AUG					
02...	1300	.56	151	7.8	18.0	31...	1140	.56	152	7.9	22.0
MAR											
23...	1300	.85	152	7.9	20.5						
16405300 - MOLOKAI TUNNEL AT WEST PORTAL, MOLOKAI, HI (LAT 21 07 28 LONG 156 59 42)											
OCT , 1977						JUN , 1978					
18...	1540	3.8	110	7.7	18.5	01...	1500	3.5	102	7.9	19.0
DEC						JUL					
13...	1445	3.0	110	7.6	18.0	12...	1520	8.5	80	7.6	18.0
FEB , 1978						SEP					
07...	1630	3.0	110	7.6	18.0	07...	1545	7.8	90	7.7	19.0
APR											
05...	1435	5.5	103	7.9	18.5						
16408000 - WAIKOLU STR BL PIPE CROSS NR KALALAPA, MOLOKAI, HI (LAT 21 09 45 LONG 156 55 54)											
OCT , 1977						JUN , 1978					
18...	1130	5.2	126	7.6	20.5	01...	1145	7.5	118	7.9	20.5
DEC						JUL					
13...	1020	5.0	120	7.6	20.5	12...	1245	8.4	110	7.9	20.5
FEB , 1978						SEP					
07...	1200	6.0	116	7.7	19.0	07...	1115	5.9	119	7.8	21.0
APR											
05...	1220	6.1	114	8.0	19.0						

OBSERVATIONS OF PHYSICAL PARAMETERS

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WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

HAWAII, ISLAND OF MAUI

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH (UNITS)	TEMPER- ATURE (DEG C)	DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	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 , 1977						APR , 1978					
05...	1030	1.2	34	6.8	20.5	19...	1140	1.5	46	7.3	19.5
NOV						JUN					
22...	1220	.81	46	6.9	19.5	13...	1115	5.4	32	6.6	19.5
JAN , 1978						AUG					
12...	0945	.01	35	6.8	18.0	10...	1150	2.3	40	7.5	20.5
MAR											
02...	0950	9.1	35	7.3	16.5						
16508000 - HANAWI STREAM NEAR NAHIKU, MAUI, HI (LAT 20 48 37 LONG 156 07 00)											
OCT , 1977						APR , 1978					
06...	0900	2.8	47	7.2	20.0	20...	1020	4.4	43	7.6	18.5
NOV						JUN					
23...	0900	2.7	43	7.0	18.0	12...	1500	4.4	46	7.6	20.0
JAN , 1978						AUG					
13...	0945	2.8	45	7.1	15.5	11...	1000	22	42	7.5	19.5
MAR											
01...	1435	2.6	43	7.7	18.5						
16512000 - KOOLAU DITCH AT NAHIKU WEIR NR NAHIKU, MAUI, HI (LAT 20 48 56 LONG 156 07 15)											
OCT , 1977						APR , 1978					
04...	1630	11	50	7.6	20.0	18...	1530	22	47	8.0	19.0
NOV						JUN					
21...	1625	15	48	7.6	19.0	12...	1345	18	46	8.3	20.0
JAN , 1978						AUG					
11...	1400	16	50	7.7	18.0	09...	1610	43	46	7.6	19.5
MAR											
01...	1250	11	48	8.2	19.0						
16518000 - WEST WAILUAIKI STREAM NEAR KEANAE, MAUI, HI (LAT 20 49 16 LONG 156 08 37)											
OCT , 1977						APR , 1978					
04...	1300	2.9	49	7.3	21.5	18...	1340	7.1	36	7.2	18.0
NOV						JUN					
21...	1325	4.0	41	7.2	17.5	12...	1230	7.6	43	7.5	19.5
JAN , 1978						AUG					
11...	1230	4.0	42	7.4	16.5	09...	1340	9.3	40	7.5	20.5
MAR											
01...	1200	3.7	37	7.5	18.0						
16523000 - KOOLAU DITCH NR KEANAE, MAUI, HI (LAT 20 49 53 LONG 156 10 30)											
OCT , 1977						APR , 1978					
04...	1100	33	53	7.4	19.5	18...	1005	71	43	7.5	18.0
NOV						JUN					
21...	1100	45	49	7.4	17.0	12...	1005	71	48	7.6	19.5
JAN , 1978						AUG					
11...	1030	44	48	7.2	17.0	09...	1100	128	43	7.5	19.5
MAR											
01...	1000	45	45	7.6	18.0						
16531000 - KULA DIV FROM HAIPUAENA STR NR OLINDA, MAUI, HI (LAT 20 48 24 LONG 156 13 27)											
OCT , 1977						APR , 1978					
12...	1120	.02	18	5.9	15.5	26...	1430	.84	16	5.4	14.5
DEC						JUN					
01...	1015	.01	19	6.0	13.0	16...	1135	3.7	19	4.9	16.5
JAN , 1978						AUG					
24...	1115	.05	17	5.8	13.0	10...	1055	1.6	14	5.7	15.5
MAR											
13...	1000	.07	18	5.8	12.0						

OBSERVATIONS OF PHYSICAL PARAMETERS
WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
HAWAII, ISLAND OF MAUI--Continued

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH (UNITS)	TEMPER- ATURE (DEG C)	DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH (UNITS)	TEMPER- ATURE (DEG C)
16538000 - SPRECKELS DI AT HAIPUAENA w NR HUELA, MAUI, HI (LAT 20 51 15 LONG 156 11 25)											
OCT , 1977						APR , 1978					
05...	1405	7.8	44	7.4	23.0	21...	1415	9.7	39	7.4	21.0
NOV						JUN					
25...	1400	5.3	41	7.6	22.0	07...	1025	8.1	40	7.2	21.0
JAN , 1978						AUG					
16...	1545	5.1	41	7.3	19.5	02...	1400	22	35	7.3	22.0
MAR											
07...	1300	5.1	43	7.6	19.0						
16541000 - KOOLAU DITCH AT HAIPUAENA NR HUELO, MAUI, HI (LAT 20 51 17 LONG 156 11 19)											
OCT , 1977						APR , 1978					
05...	0900	40	54	7.2	20.5	21...	1150	60	47	7.6	19.0
NOV						JUN					
25...	1130	37	49	7.3	19.5	07...	1210	51	44	7.4	20.5
JAN , 1978						AUG					
16...	1300	34	51	7.2	18.0	02...	1145	113	46	7.5	20.5
MAR											
07...	1140	40	45	7.5	18.0						
16541500 - MANUEL LUIS DI AT PUOHOKAMOA GL NR HUELO, MAUI (LAT 20 51 48 LONG 156 10 59)											
OCT , 1977						APR , 1978					
06...	1230	.22	69	6.6	21.5	20...	1300	.73	58	7.3	21.5
NOV						JUN					
23...	1420	.34	61	6.7	20.5	07...	1400	.56	62	7.1	23.0
JAN , 1978						AUG					
13...	1130	.66	60	6.9	18.0	11...	1415	4.3	52	7.2	21.0
MAR											
03...	0950	.22	63	7.1	18.0						
16587000 - HONOPOU STREAM NR HUELO, MAUI, HI (LAT 20 53 20 LONG 156 15 20)											
OCT , 1977						APR , 1978					
06...	1320	.54	60	7.1	23.0	24...	1500	2.4	51	7.3	21.0
NOV						JUN					
28...	1400	.84	56	7.4	21.0	08...	1400	1.6	56	7.2	23.0
JAN , 1978						AUG					
17...	1315	1.5	58	7.2	17.5	03...	1330	2.4	55	7.5	23.5
MAR											
08...	1400	8.5	42	6.6	20.0						
16588000 - WAILOA DITCH AT HONOPOU NR HUELO, MAUI, HI (LAT 20 53 20 LONG 156 15 19)											
OCT , 1977						APR , 1978					
06...	1215	74	53	7.1	21.0	24...	1330	285	37	7.6	19.0
NOV						JUN					
28...	1500	57	50	7.3	20.0	08...	1300	96	46	7.1	21.0
JAN , 1978						AUG					
17...	1215	66	50	7.2	17.0	03...	1210	145	43	7.3	21.0
MAR											
08...	1300	288	31	6.7	19.0						
16589000 - NEW HAMAKUA DITCH AT HONOPOU NR HUELO, MAUI, HI (LAT 20 53 28 LONG 156 15 22)											
OCT , 1977						APR , 1978					
06...	1010	.46	69	6.9	23.0	24...	1150	145	36	7.5	18.5
NOV						JUN					
28...	1230	.74	63	8.2	21.0	08...	1015	1.6	62	7.1	21.5
JAN , 1978						AUG					
17...	1515	1.5	64	7.2	18.0	03...	1030	3.2	59	6.9	22.0
MAR											
08...	1105	158	34	6.7	18.5						

OBSERVATIONS OF PHYSICAL PARAMETERS

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WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

HAWAII, ISLAND OF MAUI--Continued

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH (UNITS)	TEMPER- ATURE (DEG C)	DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH (UNITS)	TEMPER- ATURE (DEG C)
16592000 - LOWRIE DITCH AT HONOPOU GULCH NR HUELŌ, MAUI, HI (LAT 20 54 57 LONG 156 15 08)											
OCT , 1977						APR , 1978					
12...	1030	3.5	88	7.2	24.0	25...	1425	26	53	7.1	22.5
NOV						JUN					
29...	1130	5.7	77	7.7	23.0	09...	1230	22	69	7.1	24.0
JAN , 1978						AUG					
18...	1430	8.5	74	7.2	20.0	04...	1230	24	66	7.2	25.5
MAR											
03...	1400	4.2	72	7.8	22.0						

16594000 - HAIKU DITCH AT HONOPOU GULCH NR KAILUA, MAUI, HI (LAT 20 55 07 LONG 156 14 58)											
OCT , 1977						APR , 1978					
06...	1500	.44	116	7.1	23.0	25...	1015	1.1	105	7.4	22.0
NOV						JUN					
29...	1430	.58	110	7.5	23.0	09...	1030	1.2	108	6.6	23.5
JAN , 1978						AUG					
18...	1045	1.1	102	6.9	20.0	04...	1020	2.3	100	6.9	23.5
MAR											
03...	1025	.92	108	7.2	21.0						

16620000 - HONOKOHAU STREAM NR HONOKOHAU, MAUI, HI (LAT 20 57 48 LONG 156 35 22)											
OCT , 1977						APR , 1978					
07...	1315	15	70	7.9	19.5	27...	1215	36	39	7.6	19.5
NOV						JUN					
30...	1415	13	71	8.3	20.0	20...	1215	19	57	7.2	19.0
JAN , 1978						AUG					
23...	1305	13	71	8.2	18.5	15...	1325	20	68	8.3	21.0
MAR											
14...	1200	12	71	8.5	19.0						

16638500 - KAHOMA STREAM AT LAHAINA, MAUI, HI (LAT 20 53 10 LONG 156 40 36)											
JUN , 1978											
23...	0940	17	35	7.0	20.0						

HAWAII, ISLAND OF HAWAII

16700000 - WAIKEA STREAM NR MOUNTAIN VIEW, HAWAII, HI (LAT 19 38 30 LONG 155 10 28)											
OCT , 1977						APR , 1978					
25...	1000	9.4	45	7.0	17.0	24...	1010	11	42	7.2	15.0
NOV						MAY					
22...	1130	8.7	40	6.1	17.0	24...	1015	12	41	7.1	17.0
DEC						JUN					
27...	0900	1.2	45	7.3	17.0	26...	1000	23	42	6.9	18.0
JAN , 1978						JUL					
25...	1200	.52	40	5.9	13.0	26...	0845	17	40	7.0	17.0
FEB						AUG					
23...	1030	1.5	45	7.5	16.0	28...	0830	16	35	7.0	17.0
MAR						SEP					
27...	1020	7.9	48	7.0	17.0	26...	0830	7.5	43	7.2	16.0

16700900 - OLAA FLUME SPRING NR KAUMANA, HI (LAT 19 41 59 LONG 155 11 13)											
OCT , 1977						APR , 1978					
03...	1330	8.0	34	6.8	16.5	05...	0940	11	35	7.1	17.0
NOV						MAY					
17...	1000	16	34	6.9	17.0	05...	1225	16	32	7.0	17.0
JAN , 1978						JUL					
06...	1015	2.5	52	6.4	11.0	14...	0900	18	31	7.1	17.0
FEB						AUG					
07...	1400	1.4	42	6.6	17.0	10...	1210	8.2	20	7.0	17.0

OBSERVATIONS OF PHYSICAL PARAMETERS
WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
HAWAII, ISLAND OF HAWAII--Continued

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCTI- ANCE (MICRO- MHOS)	PH (UNITS)	TEMPER- ATURE (DEG C)	DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCTI- ANCE (MICRO- MHOS)	PH (UNITS)	TEMPER- ATURE (DEG C)
16717800 - POHAKUPUKA STREAM NEAR PAPAALOA, HAWAII, HI (LAT 19 57 20 LONG 155 11 20)											
OCT , 1977						APR , 1978					
03...	1015	4.3	135	7.4	19.0	05...	1200	10	52	7.2	18.0
NOV						MAY					
10...	1430	5.2	105	7.9	18.0	26...	0900	12	58	7.4	18.0
JAN , 1978						JUL					
09...	1010	4.0	100	7.6	14.0	03...	1020	10	60	7.1	18.0
FEB						AUG					
22...	1100	2.4	140	6.1	13.0	23...	1425	25	56	7.0	19.0
16720000 - KAWAINUI STREAM NEAR KAMUELA, HAWAII, HI (LAT 20 05 18 LONG 155 40 58)											
OCT , 1977						MAY , 1978					
07...	1220	4.3	27	5.5	15.0	09...	1045	8.8	27	6.3	11.0
DEC						AUG					
06...	1145	.38	30	5.2	16.0	25...	1145	28	26	6.4	13.0
MAR , 1978											
09...	1340	7.2	24	6.4	15.5						
16720300 - KAWAIKI STREAM NEAR KAMUELA, HAWAII, HI (LAT 20 05 13 LONG 155 40 59)											
OCT , 1977						MAY , 1978					
07...	1145	1.5	26	5.7	15.0	09...	1015	2.4	26	6.3	12.0
DEC						AUG					
06...	1115	.32	31	5.1	16.0	25...	1050	7.5	27	6.4	15.0
MAR , 1978											
09...	1150	2.4	24	5.7	15.5						
16720500 - UPPER HAMAKUA DITCH BL KAWAIKI STR NR KAMUELA HI (LAT 20 05 15 LONG 155 40 42)											
OCT , 1977						MAY , 1978					
07...	1035	5.0	26	5.5	15.0	09...	1000	9.6	25	5.6	14.0
DEC						AUG					
06...	1040	.62	30	5.4	16.0	25...	1200	13	27	6.2	14.0
MAR , 1978											
09...	1425	7.1	22	5.6	16.0						
16724800 - UPPER HAMAKUA DITCH AB ALAKAHI STR NR KAMUELA (LAT 20 04 31 LONG 155 40 26)											
OCT , 1977						AUG , 1978					
07...	0930	2.2	28	5.6	15.0	25...	1045	11	27	6.5	14.0
MAY , 1978											
09...	1200	3.6	25	6.4	15.0						
16725000 - ALAKAHI STREAM NEAR KAMUELA, HAWAII, HI (LAT 20 04 27 LONG 155 40 25)											
OCT , 1977						MAY , 1978					
07...	0855	2.5	27	5.6	15.0	09...	1210	4.0	26	6.4	15.0
DEC						AUG					
06...	0900	1.0	28	5.4	16.0	25...	1000	14	28	6.5	14.0
FEB , 1978											
17...	1200	1.0	42	6.5	17.5						
16726000 - UPPER HAMAKUA D AB WAIMEA RES DIV NR KAMUELA HI (LAT 20 03 31 LONG 155 37 40)											
OCT , 1977						APR , 1978					
17...	1300	6.0	50	6.8	15.0	26...	1300	23	28	6.5	16.0
NOV						JUN					
22...	1340	.78	30	6.6	16.0	28...	1200	29	23	6.6	16.0
JAN , 1978						AUG					
18...	1230	.44	35	7.3	13.0	17...	1230	25	24	5.4	11.0
MAR											
09...	1400	11	30	5.5	15.0						

OBSERVATIONS OF PHYSICAL PARAMETERS

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WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

HAWAII, ISLAND OF HAWAII--Continued

DATE	TIME	SIREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH (UNITS)	TEMPER- ATURE (DEG C)	DATE	TIME	SIREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH (UNITS)	TEMPER- ATURE (DEG C)
16727000 - UPPER HAMAKUA DITCH AB PUUKAPU RES NR KAMUELA HI (LAT 20 02 53 LONG 155 37 17)											
MAR , 1978						JUN , 1978					
09...	1250	6.6	28	6.3	11.0	28...	1110	9.5	23	6.4	16.0
10...	1115	4.1	29	6.2	16.0	AUG					
APR						17...	1140	.05	24	5.5	12.0
26...	1400	.01	22	6.4	15.0						
16756000 - KOHAKOHAU STREAM NEAR KAMUELA, HAWAII, HI (LAT 20 03 02 LONG 155 40 58)											
JUN , 1978						AUG , 1978					
29...	0930	12	25	6.5	16.0	18...	1100	5.4	22	5.5	11.0
16758000 - WAIKOLOA STR AT MARINE DM NR KAMUELA, HAWAII, HI (LAT 20 02 48 LONG 155 39 58)											
OCT , 1977						APR , 1978					
14...	0940	2.2	51	6.9	15.0	27...	0915	4.4	40	6.5	12.0
NOV						JUN					
23...	0930	2.0	55	6.9	15.0	29...	0815	14	26	6.7	16.0
JAN , 1978						AUG					
19...	0930	1.7	60	6.5	15.0	18...	0855	7.8	23	5.7	10.0
MAR											
10...	0830	3.0	40	6.0	15.0						
16759000 - HAUANI GULCH NEAR KAMUELA, HAWAII, HI (LAT 20 02 28 LONG 155 39 05)											
OCT , 1977						APR , 1978					
14...	1315	.10	34	6.8	16.0	26...	1145	.50	28	6.2	14.0
NOV						JUN					
22...	1240	.14	29	6.1	16.0	28...	1315	2.3	29	6.6	15.0
JAN , 1978						AUG					
18...	1345	.12	32	7.1	15.0	17...	1400	2.7	20	6.0	13.0
MAR											
09...	1150	.56	30	6.5	14.0						
16759200 - R BR WAIHAH STREAM NEAR HOLUALOA, HAWAII, HI (LAT 19 38 41 LONG 155 54 55)											
OCT , 1977						AUG , 1978					
13...	0830	.16	48	6.8	15.0	17...	0800	.14	42	6.5	16.0
JUN , 1978											
28...	0750	.03	45	6.5	17.0						
16759800 - KIILAE STREAM NEAR HONAUNAU, HAWAII, HI (LAT 19 24 52 LONG 155 50 56)											
JUN , 1978						AUG , 1978					
27...	1500	.02	50	6.5	17.0	16...	1420	1.5	40	6.7	16.0
16764000 - HILEA GULCH TRIBUTARY NEAR HONUAPO, HAWAII, HI (LAT 19 10 27 LONG 155 35 58)											
OCT , 1977						JUN , 1978					
12...	0920	.06	60	6.9	17.0	27...	0925	2.6	35	6.9	15.0
NOV						AUG					
21...	0935	.12	54	7.2	17.0	16...	0900	11	34	6.0	11.0
APR , 1978											
25...	0900	.76	42	6.8	13.0						
16765000 - HILEA GULCH TRIB NO 2 NEAR HONUAPO, HAWAII, HI (LAT 19 10 17 LONG 155 36 05)											
JUN , 1978						AUG , 1978					
27...	1100	.09	33	7.0	16.0	16...	1015	2.5	34	6.0	11.0

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 1977 TO SEPTEMBER 1978

HAWAII, ISLAND OF KAHOOLAWA

203057156352500 KAHOOLAWA RECONNAISSANCE POOL-1 (LAT 20°30'57" LONG 156°35'25")

DATE	TIME	SPECIFIC CONDUCTANCE (MICRO-MHOS)	PH (UNITS)	TEMPERATURE (DEG C)	TURBIDITY (NTU)	COLIFORM, TOTAL, IMMED. (COLS. PER 100 ML)	COLIFORM, FECAL, UM-MF (COLS./100 ML)	STREPTOCOCCI, FECAL, KF AGAR (COLS. PER 100 ML)	HARDNESS (MG/L AS CaCO3)	CALCIUM DIS-SOLVED (MG/L AS Ca)	MAGNESIUM DIS-SOLVED (MG/L AS Mg)	SODIUM DIS-SOLVED (MG/L AS Na)
SEP 12...	0900	1100	8.2	22.5	300	5200	3400	340	82	13	12	200
12...	0910	1100	8.2	22.5	290	5100	4300	290	88	14	13	190

DATE	SODIUM PERCENT	SODIUM ADSORPTION RATIO	POTASSIUM DIS-SOLVED (MG/L AS K)	ALKALINITY (MG/L AS CaCO3)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLORIDE, DIS-SOLVED (MG/L AS CL)	FLUORIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SiO2)	NITROGEN, NH4+NO3 DIS-SOLVED (MG/L AS N)	PHOSPHORUS, DIS-SOLVED (MG/L AS P)	IRON, DIS-SOLVED (UG/L AS FE)	MANGANESE, DIS-SOLVED (UG/L AS MN)
SEP 12...	81	9.6	16	150	140	160	1.4	12	.00	.02	50	30
12...	79	8.8	15	150	150	160	1.4	12	.01	.02	670	30

203053156353000 KAHOOLAWA RECONNAISSANCE POOL-2 (LAT 20°30'53" LONG 156°35'30")

DATE	TIME	SPECIFIC CONDUCTANCE (MICRO-MHOS)	PH (UNITS)	TEMPERATURE (DEG C)	TURBIDITY (NTU)	COLIFORM, TOTAL, IMMED. (COLS. PER 100 ML)	COLIFORM, FECAL, UM-MF (COLS./100 ML)	STREPTOCOCCI, FECAL, KF AGAR (COLS. PER 100 ML)	HARDNESS (MG/L AS CaCO3)	CALCIUM DIS-SOLVED (MG/L AS Ca)	MAGNESIUM DIS-SOLVED (MG/L AS Mg)	SODIUM DIS-SOLVED (MG/L AS Na)
SEP 12...	0925	615	7.2	25.0	170	250	260	520	62	11	8.4	100

DATE	SODIUM PERCENT	SODIUM ADSORPTION RATIO	POTASSIUM DIS-SOLVED (MG/L AS K)	ALKALINITY (MG/L AS CaCO3)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLORIDE, DIS-SOLVED (MG/L AS CL)	FLUORIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SiO2)	NITROGEN, NH4+NO3 DIS-SOLVED (MG/L AS N)	PHOSPHORUS, DIS-SOLVED (MG/L AS P)	IRON, DIS-SOLVED (UG/L AS FE)	MANGANESE, DIS-SOLVED (UG/L AS MN)
SEP 12...	74	5.5	9.8	100	66	88	1.0	17	.19	.03	470	240

ANALYSES OF SAMPLES COLLECTED AT MISCELLANEOUS SITES

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WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

HAWAII, ISLAND OF HAWAII

194310155083000 KAPEHU STREAM AT PIIHONUA (LAT 19°43'10" LONG 155°08'30")

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH (UNITS)	TEMPER- ATURE (DEG C)	COLOR (PLAT- INUM- COBALT UNITS)	TUR- BID- ITY (JTU)	OXYGEN, DIS- SOLVED (MG/L)	COLI- FORM, TOTAL, IMMED. (COLS. PER 100 ML)
NOV 02...	1230	122	33	7.6	20.5	100	10	8.8	470
JUL 25...	1230	--	59	7.3	20.5	2	--	8.8	180

DATE	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP- TOCOCCI KF AGAR (COLS. PER 100 ML)	BICAR- BONATE (MG/L AS HCO3)	CAR- BONATE (MG/L AS CO3)	ALKA- LINEITY (MG/L AS CACO3)	CARBON DIOXIDE DIS- SOLVED (MG/L AS CO2)	SOLIDS, RESIDUE AT 105 DEG. C, SUS- PENDE (MG/L)	NITRO- GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO- GEN, AMMONIA TOTAL (MG/L AS N)
NOV 02...	310	4800	10	0	8	.4	11	.05	.00
JUL 25...	91	1500	--	--	20	--	5	.01	.00

DATE	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)	NITRO- GEN, TOTAL (MG/L AS NO3)	PHOS- PHORUS, TOTAL (MG/L AS P)	PHOS- PHORUS, ORTHO. TOTAL (MG/L AS P)	CARBON, ORGANIC TOTAL (MG/L AS C)	SEDI- MENT, SUS- PENDE (MG/L)	SEDI- MENT DIS- CHARGE, SUS- PENDE (T/DAY)
NOV 02...	.29	.29	.34	1.5	.04	.01	6.3	10	3.3
JUL 25...	.16	.16	.17	.75	.02	.02	.8	3	--

PERIODIC DETERMINATIONS OF WATER TEMPERATURE

WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

HAWAII, ISLAND OF OAHU

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	TEMPER- ATURE (DEG C)
------	------	---	-----------------------------

16302000 - PUNALUU DITCH NR PUNALUU, OAHU, HI (LAT 21 33 41 LONG 157 54 10)

OCT , 1977			
31...	1015	.99	21.0
DEC			
15...	0930	4.4	21.5
JAN , 1978			
17...	1010	5.4	19.0
MAR			
02...	1010	4.3	20.5
APR			
17...	0950	2.4	21.0
MAY			
26...	0945	1.8	21.0
JUL			
11...	0910	4.0	21.0
AUG			
16...	0910	.58	21.0

HAWAII, ISLAND OF MOLOKAI

16405100 - MOLOKAI TUNNEL AT EAST PORTAL, MOLOKAI, HI (LAT 21 08 38 LONG 156 55 17)

OCT , 1977			
18...	1135	3.4	18.5
DEC			
13...	1245	.99	18.5
FEB , 1978			
07...	1250	.99	18.0
APR			
05...	1150	3.6	18.0
JUN			
01...	1235	1.5	19.5
JUL			
12...	1335	6.6	19.0
SEP			
07...	1340	5.5	20.0

16405500 - WAIKOLU STR AT ALT 900 FT NR KALAUPAPA, MOLOKAI, HI (LAT 21 08 45 LONG 156 55 18)

OCT , 1977			
18...	0950	.22	18.5
FEB , 1978			
07...	1015	.44	19.0
APR			
05...	0950	.72	20.0
JUL			
12...	1035	2.29	21.5

HAWAII, ISLAND OF MAUI

16599500 - OPANA TUNNEL NR KAILIILI, MAUI, HI (LAT 20 51 04 LONG 156 16 17)

OCT , 1977			
12...	1410	.31	19.0
JAN , 1978			
24...	1420	.63	17.5

ISLAND OF KAUAI

220354159205601. Local number, 2-0320-01.

LOCATION.--Lat 22°03'54", long 159°20'56", Hydrologic Unit 20070000, in Wailua Houselots, Wailua. Owner: Kauai County, Department of Water.

AQUIFER.--Koloa Volcanic Series, Pleistocene (?) age.

WELL CHARACTERISTICS.--Drilled basal water-table well, diameter 8 in (0.2 m), depth 240 ft (73.2 m), cased to 193 ft (58.8 m), open end.

DATUM.--Land-surface datum is 155 ft (47.2 m) above mean sea level. Measuring point: Top edge of steel pumpbase at breather hole, 155.98 ft (47.543 m) above mean sea level.

REMARKS.--Water-quality records for 1960, 1966, 1972-77 are available in files of district office; those for 1978 are published elsewhere in this report. 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 1977 TO SEPTEMBER 1978

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
DEC 2	11.45	MAR 3	5.73	APR 17	10.91	MAY 24	7.82	JUL 7	a-0.48	AUG 16	a0.07
JAN 17	8.66										

a Well being pumped.

HAWAII, ISLAND OF OAHU

211718157491001 (Formerly 211718157490801). Local number, 3-1749-07 tube E.

LOCATION.--Lat 21°17'18", long 157°49'08", Hydrologic Unit 20060000, at Kaimuki High School grounds near Olokele Street, Honolulu. Owner: State of Hawaii.

AQUIFER.--Basalt of Koolau Volcanic Series, Pliocene (?) age.

WELL CHARACTERISTICS.--Drilled observation artesian basal water-table well, diameter 0.5 in (0.01 m), depth 378 ft (115 m), cased to 378 ft (115 m), open end.

DATUM.--Land-surface datum is 14 ft (4.3 m) above mean sea level. Measuring point: Top of iron cover 0.5 ft (0.2 m) above ground, 14.85 ft (4.526 m) above mean sea level.

REMARKS.--Tube E is one of five sampling tubes installed on Sept. 7, 1951 in existing 8 in (0.2 m) well. The bottom of each tube is at different depths to obtain water samples for determining vertical distribution of the chloride concentration. Water-quality records for 1951-77 are available in files of district office; those for 1978 are published elsewhere in this report.

PERIOD OF RECORD.--July 1951, October 1955 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 28.88 ft (8.803 m) above mean sea level, Feb. 6, 1957; lowest measured, 19.51 ft (5.947 m) Aug. 31, 1962.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 13	22.70	JAN 9	23.57	MAR 31	22.75	JUN 3	23.67	AUG 2	22.93	SEP 19	23.21
NOV 28	24.25	FEB 14	22.86	MAY 22	23.28						

212154158015201. Local number, 3-2101-03.

LOCATION.--Lat 21°21'54", long 158°01'52", Hydrologic Unit 20060000, in Honouliuli. Owner: Hawaii Meat Co.

AQUIFER.--Basalt of Koolau Volcanic Series, Pliocene (?) age.

WELL CHARACTERISTICS.--Drilled observation artesian basal water-table well, diameter 10 in (0.25 m), depth 355 ft (108 m), cased to 165 ft (50.3 m), open hole.

DATUM.--Land-surface datum is 11 ft (3.4 m) above mean sea level. Measuring point: Top of lowest horizontal flange, 11.16 ft (3.402 m) above mean sea level.

REMARKS.--Water-quality records for 1910-16, 1920-21, 1923-75 are available in files of district office.

PERIOD OF RECORD.--April 1910 to June 1921, September 1923 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 29.16 ft (8.888 m) above mean sea level, April 1918; lowest measured, less than 11.16 ft (3.402 m) above mean sea level, Sept. 2, 1977.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 19	<11.16	JAN 11	14.05	APR 7	11.43	JUL 5	14.04	AUG 9	12.25	SEP 20	11.54
DEC 1	11.88	FEB 17	12.00	MAY 22	13.59						

< Actual water level is known to be less than the water level shown.

HAWAII, ISLAND OF OAHU--Continued

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 (since Sept. 9, 1968).

REMARKS.--Recording gage installed Sept. 9, 1968. Water-quality records for 1923, 1928-30, 1934-68, 1972, 1974-75 are available in files of district office.

PERIOD OF RECORD.--January 1928 to February 1931, September 1934 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 25.90 ft (7.894 m) above mean sea level, Jan. 16, 1928; lowest, 13.01 ft (3.965 m) above mean sea level, Sept. 28, 1978.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	13.53	13.81	14.15	14.97	14.68	14.04	13.55	14.14	14.35	*	*	13.38
10	13.53	14.04	14.20	14.99	14.48	13.86	13.61	14.20	14.29	*	13.50	13.27
15	13.45	14.26	14.21	14.95	14.35	13.78	13.63	14.37	14.24	*	13.39	13.12
20	13.37	14.45	14.40	14.78	14.29	13.82	13.70	14.17	14.22	*	13.40	13.12
25	13.38	14.36	14.53	14.75	14.14	13.77	14.10	14.31	14.19	*	13.25	13.15
EOM	13.48	14.18	14.75	14.71	14.07	13.60	14.27	14.37	14.15	*	13.19	13.15

WTR YEAR 1978 MAX 15.07 JAN 9, 1978 MIN 13.01 SEP 28, 1978

* No record.

212927158014807. Local number, 3-2901-07.

LOCATION.--Lat 21°29'27", long 158°01'48", Hydrologic Unit 20060000, at Kamehameha Highway and Wilikina Drive, Wahiawa. Owner: U.S. Army.

AQUIFER.--Basalt of Koolau Volcanic Series, Pliocene (?) age.

WELL CHARACTERISTICS.--Dug domestic high-level water-table well, size 8 x 8 ft (2 x 2 m), length of 30-degree inclined shaft 1,148 ft (349.9 m).

DATUM.--Land-surface datum is 850 ft (259 m) above mean sea level. Measuring point: Top of pump chamber floor at recorder, 287.00 ft (87.478 m) above mean sea level.

REMARKS.--Recorder is located on the pump chamber floor at the bottom of shaft. Recording gage installed November 1938. Water-quality records for 1966-72, 1975-77 are available in files of district office; those for 1978 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, 269.90 ft (82.266 m) above mean sea level, Sept. 30, 1978.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MAXIMUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	273.40	273.13	272.91	272.71	272.26	272.02	271.53	271.18	270.87	270.64	270.43	270.27
10	273.35	272.98	272.80	272.56	272.20	271.87	271.48	271.14	270.84	270.53	270.42	270.34
15	273.22	272.95	272.76	272.61	272.16	271.81	271.54	271.11	270.76	270.55	270.16	270.09
20	273.17	273.03	272.80	272.50	272.12	271.78	271.40	271.02	270.74	270.61	270.33	270.29
25	273.15	272.93	272.71	272.43	272.08	271.92	271.34	270.97	270.69	270.47	270.38	270.03
EOM	273.02	272.91	272.68	272.42	272.28	271.60	271.24	270.95	270.62	270.48	270.11	270.20

Note: Well being pumped throughout the year.

213327157524401. Local number, 3-3352-01.

LOCATION.--Lat 21°33'27", long 157°52'44", Hydrologic Unit 20060000, at mouth of Kahana Valley and 700 ft (180 m) southwest of Kamehameha Highway (Highway 83), Kahana. Owner: Mary E. Foster Estate.

AQUIFER.--Basalt of Koolau Volcanic Series, Pliocene (?) age.

WELL CHARACTERISTICS.--Drilled artesian basal water-table well, diameter 10 in (0.25 m), depth 441 ft (134 m), cased to 177 ft (53.9 m), open hole.

DATUM.--Land-surface datum is 6 ft (2 m) above mean sea level. Measuring point: Top of blind flange, 5.76 ft (1.756 m) above mean sea level.

REMARKS.--Water-quality records for 1935-77 are available in files of district office; those for 1978 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, 14.37 ft (4.380 m) above mean sea level, Aug. 25, 1978.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

[illegible]

GROUND-WATER LEVELS

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HAWAII, ISLAND OF OAHU--Continued

213455158065901. Local number, 3-3406-01.

LOCATION.--Lat 21°34'55", long 158°06'53", Hydrologic Unit 20060000, near Weed Circle, Waialua. Owner: Waialua Sugar Co., Inc.

AQUIFER.--Basalt of Koolau Volcanic Series, Pliocene (?) age.

WELL CHARACTERISTICS.--Drilled irrigation artesian basal water-table well, diameter 6 in (0.2 m), depth 201 ft (61.3 m), cased to 114 ft (34.7 m), open hole.

DATUM.--Land-surface datum is 5 ft (2 m) above mean sea level. Measuring point: Top of blind flange on well, 4.69 ft (1.430 m) above mean sea level.

REMARKS.--Water-quality records for 1912-16, 1924-74 are available in files of district office.

PERIOD OF RECORD.--March 1911 to April 1921, February 1924 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 13.35 ft (4.069 m) above mean sea level, December 1914; lowest measured, 9.19 ft (2.801 m) above mean sea level, Apr. 24, 1946.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 18	11.20	MAR 10	10.35	MAR 23	10.07	MAY 2	9.97	JUN 16	9.96	JUL 28	10.27
JAN 3	11.19										

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 1929-77 are available in files of district office; those for 1978 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 1977 TO SEPTEMBER 1978

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 18	18.62	FEB 10	17.89	MAY 2	18.25	JUN 16	18.26	JUL 28	17.87	SEP 7	17.75
JAN 3	18.50	MAR 23	18.18								

213722157551701. Local number, 3-3755-05.

LOCATION.--Lat 21°37'22", long 157°55'17", Hydrologic Unit 20060000, at mouth of Kaipapau Valley, Hauula. Owner: Consolidated Amusement Co., Ltd.

AQUIFER.--Basalt of Koolau Volcanic Series, Pliocene (?) age.

WELL CHARACTERISTICS.--Drilled observation artesian basal water-table well, diameter 12 in (0.30 m), depth 192 ft (58.5 m), cased to 92 ft (28 m), open end.

DATUM.--Land-surface datum is 16 ft (4.9 m) above mean sea level. Measuring point: Top of PVC stilling well for water-level recorder, 23.22 ft (7.077 m) above mean sea level.

REMARKS.--Water-quality records for 1929-34, 1937-54, 1956-64 are available in files of district office. Recording gage was operated July 8, 1968 to June 15, 1977.

PERIOD OF RECORD.--July 1956 to December 1964, July 1968 to September 1975 records available in files of district office; October 1975 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level, 21.77 ft (6.635 m) above mean sea level, Feb. 24, 1969; lowest 15.52 ft (4.730 m) above mean sea level, Aug. 25, 1978.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 27	16.74	DEC 9	17.13	JAN 24	16.87	APR 14	16.94	JUN 2	17.37	AUG 25	15.52

HAWAII, ISLAND OF OAHU--Continued

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

[illegible]

HAWAII, ISLAND OF MOLOKAI

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

[illegible]

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

	WATER		WATER		WATER		WATER		WATER		WATER
DATE	LEVEL	DATE	LEVEL	DATE	LEVEL	DATE	LEVEL	DATE	LEVEL	DATE	LEVEL
OCT 21 DEC 15	2.65 2.78	FEB 9	2.68	APR 6	2.70	JUN 1	2.62	JUL 14	2.65	SEP 8	2.63

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203912156255901. Local number, 6-3925-01.

AQUIFER.--Hana Volcanic Series, Pleistocene (?) age.

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.

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.

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 18 DEC 7	0.30 0.24	JAN 25	0.14	MAR 15	0.04	MAY 3	0.00	JUN 21	-0.21	AUG 16	-0.19

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 Kalaloe 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.

REMARKS:--Water quality records for 1971, 1975 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.

[illegible]

204818156310301. Local number, 6-4831-01.

LOCATION.--Lat 20°48'18", long 156°31'03", Hydrologic Unit 20020000, on sugar plantation road 0.7 mi (1.1 km) north of Maalaea and 0.9 mi (1.4 km) southwest of intersection of Honoapiilani Highway and Kihei Road.

Owner: State of Hawaii.

AQUIFER.--Wailuku Volcanic Series, Pliocene (?) age.

WELL CHARACTERISTICS.--Drilled observation basal water-table well, diameter 8 in (0.2 m), depth 219 ft (66.8 m), cased to 187 ft (57.0 m), open hole.

DATUM.--Land-surface datum is 166 ft (50.6 m) above mean sea level. Measuring point: Top of 8 in (0.2 m) casing, 166.60 ft (50.780 m) above mean sea level.

REMARKS.--Water-quality records for 1965-67 are available in files of district office. Recording gage was operated January to July 1974.

PERIOD OF RECORD.--September 1972 to September 1975 records available in files of district office; October 1975 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 5.57 ft (1.698 m) above mean sea level, Jan. 16, 1974; lowest measured, 4.74 ft (1.445 m) above mean sea level, Mar. 16, 1977.

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 20 DEC 15	5.14 5.18	JAN 24	5.08	MAR 17	5.07	MAY 9	5.02	JUN 21	5.00	AUG 9	5.31

GROUND-WATER LEVELS

HAWAII, ISLAND OF MAUI--Continued

204909156281401. Local number, 6-4928-02.

LOCATION.--Lat 20°48'27", long 156°28'14", Hydrologic Unit 20020000, at Puunene Airport on Mokulele Highway 2.5 mi (4.0 km) north of intersection with Kihei Road, Kihei. Owner: Hawaiian Commercial and Sugar Co.

AQUIFER.--Honomanu Volcanic Series.

WELL CHARACTERISTICS.--Dug basal water-table well, 6 x 9 ft (2 x 3 m) vertical shaft, depth 53 ft (16 m).

DATUM.--Land-surface datum is 50 ft (15 m) above mean sea level. Measuring point: Top of angle iron at well, 50.08 ft (15.264 m) above mean sea level.

REMARKS.--Recording gage installed Mar. 22, 1972. Water-quality records for 1973 are available in files of district office.

PERIOD OF RECORD.--March 1972 to September 1975 records available in files of district office; October 1975 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level, 4.24 ft (1.292 m) above mean sea level, Feb. 9, 10, 1974; lowest, 3.05 ft (0.930 m) above mean sea level, Mar. 5, 6, 1977.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	3.51	3.70	3.63	3.57	3.60	3.57	3.66	3.55	3.64	3.82	3.89	3.86
10	3.50	3.86	3.58	3.55	3.53	3.52	3.70	3.48	3.56	3.84	3.90	3.82
15	3.51	3.92	3.53	3.57	3.54	3.59	3.63	3.57	3.52	3.82	3.89	3.86
20	3.52	3.98	3.53	3.51	3.52	3.65	3.61	3.63	3.50	3.92	3.92	3.82
25	3.52	3.82	3.54	3.51	3.47	3.71	3.60	3.61	3.59	4.02	3.87	3.74
EOM	3.53	3.67	3.53	3.53	3.47	3.72	3.56	3.67	3.69	3.91	3.85	3.79

WTR YEAR 1978 MAX 4.03 JUL 24-25, 1978 MIN 3.43 FEB 27, 1978

205552156193101. Local number, 6-5519-01.

LOCATION.--Lat 20°55'52", long 156°19'31", Hydrologic Unit 20020000, at Haiku School 1.0 mi (1.6 km) north of Haiku and 2.7 mi (4.3 km) northeast of Paia. Owner: State of Hawaii.

AQUIFER.--Kula Volcanic Series, Pleistocene (?) age.

WELL CHARACTERISTICS.--Drilled observation basal water-table well, diameter 8 in (0.2 m), depth 400 ft (122 m), cased to 363 ft (111 m), perforated 363 to 383 ft (111 to 117 m).

DATUM.--Land-surface datum is 365 ft (111 m) above mean sea level. Measuring point: Top of 2.5 in (0.06 m) coupling pipe attached to the casing cover, 366.26 ft (111.636 m) above mean sea level.

REMARKS.--Water-quality records for 1967 are available in files of district office.

PERIOD OF RECORD.--May 1967, December 1970, May 1972 to September 1975 records available in files of district office; October 1975 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 5.75 ft (1.753 m) above mean sea level, Dec. 10, 1973; lowest measured, 4.75 ft (1.448 m) above mean sea level, Mar. 7, 1977.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 20	5.19	JAN 18	5.28	MAR 10	5.13	APR 25	5.16	JUN 9	4.99	AUG 16	5.25
DEC 9	5.52										

205856156400101. Local number, 6-5840-01.

LOCATION.--Lat 20°58'56", long 156°40'01", Hydrologic Unit 20020000, on sugar plantation road 0.9 mi (1.4 km) east of Kahana and 1.5 mi (2.4 km) southwest of Honokahua. Owner: State of Hawaii.

AQUIFER.--Honolua Volcanic Series, Pliocene (?) age.

WELL CHARACTERISTICS.--Drilled observation basal water-table well, diameter 8 in (0.2 m), depth 274 ft (83.5 m), cased to 274 ft (83.5 m), perforated 264 to 274 ft (80.5 to 83.5 m). Hole was drilled to depth of 284 ft (86.6 m) but plugged back 10 ft (3.0 m) with cement.

DATUM.--Land-surface datum is 257 ft (78.3 m) above mean sea level. Measuring point: Top of 2.2 in (0.06 m) coupling pipe attached to casing cover 257.46 ft (78.474 m) above mean sea level.

REMARKS.--Recording gage installed Aug. 6, 1975. Water-quality records for 1964 are available in files of district office.

PERIOD OF RECORD.--June 1964 to July 1964, March 1972 to September 1975 records available in files of district office; October 1975 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 3.43 ft (1.045 m) above mean sea level, July 20, 1978; 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 1977 TO SEPTEMBER 1978
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	2.97	3.10	3.14	3.02	3.07	2.82	3.05	2.91	2.89	3.13	3.20	3.08
10	3.03	3.15	3.13	2.99	2.95	2.83	3.10	2.87	2.87	3.15	3.14	3.05
15	3.04	3.15	3.12	3.03	3.00	2.95	3.00	2.99	2.87	3.07	3.07	3.13
20	3.07	3.25	3.13	2.92	2.98	2.90	3.02	2.93	2.89	3.24	3.08	3.03
25	3.09	3.22	3.05	2.93	2.93	2.99	3.02	2.91	3.00	3.34	3.03	2.94
EOM	3.10	3.15	3.04	2.96	2.92	3.05	2.95	2.94	3.04	3.18	3.03	3.02

WTR YEAR 1978 MAX 3.43 JUL 20, 1978 MIN 2.68 MAR 6, 1978

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 Pahoā. 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 1972-77 are available in files of district office; those for 1978 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, 3.66 ft (1.116 m) above mean sea level, Sept. 21, 1976; lowest measured, 1.71 ft (0.521 m) above mean sea level, July 11, 1977.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
JAN 19	2.53	MAR 1	3.59	MAY 8	3.38	JUL 5	3.60	AUG 18	2.60

193339154594801. Local number, 8-3389-01.
 LOCATION.--Lat 19°33'39", long 154°59'48", Hydrologic Unit 20010000, 4.9 mi (7.9 km) southeast of Keaau on Orchid Land Estate subdivision. Owner: County of Hawaii.
 AQUIFER.--Puna Volcanic Series, Holocene age.
 WELL CHARACTERISTICS.--Drilled observation basal water-table well, diameter 8 in (0.2 m), depth 475 ft (145 m), cased to 403 ft (123 m), perforated 403 to 475 ft (123 to 145 m).
 DATUM.--Land-surface datum is 427 ft (130 m) above mean sea level. Measuring point: Top of casing, 428.14 ft (130.497 m) above mean sea level.
 REMARKS.--Water-quality records for 1961 are available in files of district office.
 PERIOD OF RECORD.--September 1974 to September 1975 records available in files of district office; November 1975 to current year.
 EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 20.37 ft (6.209 m) above mean sea level, Feb. 14, 1975; lowest measured, 15.99 ft (4.874 m) above mean sea level, Apr. 25, 1978.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 23	17.48	JAN 26	16.89	MAR 27	16.22	MAY 25	16.02	JUL 26	18.44	SEP 26	17.58
DEC 27	17.39	FEB 23	16.42	APR 25	15.99	JUN 26	17.03	AUG 28	18.60		

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, 1973-77 are available in files of district office; those for 1978 are published elsewhere in this report.
 PERIOD OF RECORD.--November 1971 to August 1975 records available in files of district office; November 1975 to current year.
 EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 5.34 ft (1.628 m) above mean sea level, Nov. 15, 1973; lowest measured, 2.24 ft (0.683 m) above mean sea level, Mar. 9, 1972.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 14	4.80	JAN 23	4.32	MAR 6	3.91	MAY 2	4.69	AUG 10	5.26

GROUND-WATER LEVELS

HAWAII, ISLAND OF HAWAII--Continued

194819155582301. Local number, 8-4858-01.
 LOCATION.--Lat 19°48'19", long 155°58'23", Hydrologic Unit 20010000, 3.4 mi (5.5 km) north of Huehue Ranch and 2.3 mi (3.7 km) southeast of Kaupulehu. Owner: Kona Village Resort.
 AQUIFER.--Hualalai Volcanic Series, Holocene age.
 WELL CHARACTERISTICS.--Drilled basal water-table well, diameter 4 in (0.1 m), depth 528 ft (161 m).
 DATUM.--Land-surface datum is 498 ft (152 m) above mean sea level. Measuring point: Top of concrete block at well opening, 498.05 ft (151.806 m) above mean sea level.
 REMARKS.--Water-quality records for 1960-61, 1965, 1972 are available in files of district office. Water level affected by pumping from two wells located within 100 ft (30.5 m).
 PERIOD OF RECORD.--April 1974 to August 1975 records available in files of district office; October 1975 to current year.
 EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 2.16 ft (0.658 m) above mean sea level, Aug. 26, 1975; lowest measured, 0.63 ft (0.192 m) above mean sea level, July 9, 1975.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	WATER LEVEL
NOV 10	c1.22

c Nearby well being pumped.

195947155485801. Local number, 8-5948-01.
 LOCATION.--Lat 19°59'47", long 155°48'58", Hydrologic Unit 20010000, 0.7 mi (1.1 km) east of Hapuna Beach Park and 3.1 mi (5.0 km) southeast of Kawaihae. Owner: State of Hawaii.
 AQUIFER.--Hamakua Volcanic Series, Pleistocene age.
 WELL CHARACTERISTICS.--Drilled observation basal water-table well, diameter 10 in (0.25 m), depth 268 ft (81.7 m), cased to 246 ft (75.0 m), screened 246 to 266 ft (75.0 to 81.1 m).
 DATUM.--Land-surface datum is 244 ft (74.4 m) above mean sea level. Measuring point: Hole in pumpbase, 245.0 ft (74.7 m) above mean sea level.
 REMARKS.--Water-quality records for 1970, 1973-77 are available in files of district office; those for 1978 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, 2.9 ft (0.89 m) above mean sea level, Aug. 23, 1978; 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 1977 TO SEPTEMBER 1978

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 12	2.5	MAR 14	2.4	APR 28	2.4	JUN 28	2.6	AUG 23	2.9

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 1977 TO SEPTEMBER 1978

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 12	5.1	FEB 10	5.9	APR 21	6.1	JUN 28	6.0	AUG 23	6.2

GROUND-WATER LEVELS

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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 Air-field, 3.1 mi (5.0 km) northwest of Hawi, and 1.9 mi (3.1 km) west of Hoesa 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 1973-77 are available in files of district office; those for 1978 are published elsewhere in this report.

PERIOD OF RECORD.--March 1973 to August 1975 records available in files of district office; October 1975 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 3.09 ft (0.942 m) above mean sea level, Aug. 22, 1974; lowest measured, 1.45 ft (0.442 m) above mean sea level, July 9, 1975.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 10	2.35	JAN 30	2.35	APR 21	2.07	JUL 24	2.57

QUALITY OF GROUND WATER
WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

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	77-12-09	1035	1610	21.5	--
					78-01-24	1040	680	23.0	--
					78-03-10	1030	6300	22.0	1800
					78-04-26	1100	5800	23.0	2100
					78-06-07	1030	1175	22.5	--
					78-07-28	1015	5700	22.0	1800
					78-09-06	1015	6900	22.5	2100
220136159205501	2-0120-01 W7 STATE	22 01 36	159 20 55	01	77-12-02	1505	860	24.5	160
					78-01-17	1505	900	24.0	160
					78-03-03	1505	895	24.0	140
					78-04-18	1445	900	25.0	160
					78-05-24	1430	900	26.0	160
					78-06-27	0830	890	25.0	160
					78-08-16	1515	910	25.5	160
220148159453501	2-0145-10 W45F KSC	22 01 48	159 45 35	01	78-03-10	1115	2000	20.5	490
					78-06-07	1115	2350	21.0	600
					78-07-28	1100	3400	21.5	950
					78-09-06	1100	3200	21.5	850
220354159205601	2-0320-01 W9-1A WAILUA	22 03 54	159 20 56	01	78-08-16	0845	350	24.0	46
220346159205301	2-0320-02 W9 STATE	22 03 46	159 20 53	01	78-07-07	1510	400	24.0	45
220354159205602	2-0320-03 W9-1B CNLY	22 03 54	159 20 56	02	78-03-03	1325	380	24.5	45
					78-04-17	1515	390	23.5	43
220341159453901	2-0345-04 S16 KSC	22 03 41	159 45 39	01	77-12-09	1200	1600	21.5	390
					78-01-24	1300	1600	21.5	420
					78-03-10	1300	1800	21.0	430
					78-04-26	1345	1770	22.0	450
					78-06-07	1300	1650	22.0	400
					78-07-28	1300	1850	22.0	440
					78-09-06	1300	1900	22.0	450
220530159450401	2-0545-01 W59 SAKIMANA	22 05 30	159 45 04	01	77-12-09	1315	860	23.0	160
					78-01-24	1200	890	22.5	160
					78-03-10	1210	910	22.5	160
					78-04-26	1415	870	23.5	160
					78-06-07	1215	925	23.0	160
					78-07-28	1145	950	24.0	170
					78-09-06	1215	900	24.0	160
220826159185401	2-0818-02 W90B CNLY	22 08 26	159 18 54	01	77-12-01	1510	270	23.0	22
					78-01-16	1510	270	23.0	22
					78-02-28	1420	242	24.0	22
					78-04-17	1305	255	24.0	21
					78-08-16	1215	250	24.0	20
221038159203801	2-1020-03 W78 LPC	22 10 38	159 20 38	01	78-07-07	1145	205	22.5	20
					78-08-16	1015	225	22.0	21
221141159252501	2-1125-01 CNLY, KILAUEA	22 11 41	159 25 25	01	78-05-25	1055	170	23.5	12
221141159252502	2-1125-02 CNLY, KILAUEA	22 11 41	159 25 25	02	78-01-16	1115	150	23.0	12
					78-04-14	1150	180	22.0	13
221150159264501	2-1126-01 CNLY, HANAIEI	22 11 50	159 26 45	01	77-12-01	1315	165	24.0	16
221201159293401	2-1229-03 W73 HANAIEI	22 12 01	159 29 34	01	78-01-13	1415	210	23.0	20
					78-05-23	1430	225	23.5	21
					78-08-14	1245	225	23.5	22
221247159324801	2-1232-01 W67 CNLY, HANA	22 12 47	159 32 48	01	77-11-30	1345	142	22.0	20
					78-01-13	1250	138	22.0	17
					78-06-27	1345	150	23.0	19

QUALITY OF GROUND WATER

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WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

STATION NUMBER	LOCAL IDENTIFIER	LATITUDE	LONGITUDE	SEQ. NO.	DATE OF SAMPLE	TIME	SPECIFIC CONDUCTANCE (MICRO-MHOS)	TEMPERATURE (DEG C)	CHLORIDE DIS-SOLVED (MG/L AS CL)
HAWAII, ISLAND OF KAUAI--Continued									
221318159335901	2-1333-01 w66 HAENA	22 13 18	159 33 59	01	77-11-30	1315	180	22.0	19
					78-01-13	1320	205	21.0	19
					78-02-23	0930	190	22.0	19
					78-05-23	1330	220	21.5	17
					78-06-27	1310	220	23.5	20
215454159274201	2-5427-01 w16A KOLOA	21 54 54	159 27 42	01	78-08-11	1345	225	22.0	20
					78-01-27	1350	240	23.0	25
					78-03-15	1030	240	21.5	24
					78-04-25	1125	240	23.5	25
					78-07-27	0925	240	23.0	25
215536159263501	2-5526-01 GRV FRM. KOLOA	21 55 36	159 26 35	01	78-09-07	1045	240	23.5	24
					78-01-27	1310	230	23.5	21
					78-03-15	1345	235	21.5	20
					78-04-25	1400	230	23.5	20
					78-06-06	1510	230	23.5	22
215528159303001	2-5530-02 w23 MSCO	21 55 28	159 30 30	01	78-07-27	1045	220	23.5	21
					78-09-07	1300	230	23.0	20
					77-12-08	1500	250	22.5	27
					78-01-27	1030	241	22.0	26
					78-03-15	0915	255	21.0	28
215535159302601	2-5530-03 w22 LAWAI	21 55 35	159 30 26	01	78-04-27	1040	242	22.5	26
					78-06-06	1350	255	23.0	26
					78-09-07	1005	255	22.5	26
					78-01-27	1020	220	21.0	22
					78-03-15	0915	220	21.0	23
215522159342601	2-5534-03 w25-1 MCBRYDE	21 55 22	159 34 26	01	78-04-27	1030	221	22.5	23
					78-09-07	1000	220	23.0	23
					77-12-08	1400	480	23.0	41
					78-01-27	0945	500	22.5	44
					78-03-14	1445	510	22.5	44
215508159343401	2-5534-04 S5 MCBRYDE	21 55 08	159 34 34	01	78-04-27	1100	500	23.5	43
					78-06-06	1300	490	23.5	41
					78-09-07	0930	520	23.5	50
					77-11-23	1200	1100	-- j	420
					77-12-08	1310	750	23.0	140
215635159355001	2-5635-01 S7 KAUMAKANI	21 56 35	159 35 50	01	78-01-27	0920	750	22.0	140
					78-03-14	1350	760	22.0	140
					78-04-27	1240	760	21.0	140
					78-06-06	1230	750	23.0	140
					78-07-27	0730	750	23.5	140
215803159401201	2-5840-02 w26 WAIMEA	21 58 03	159 40 12	01	78-09-07	0855	750	24.0	140
					78-01-24	1400	600	24.5	100
					78-03-10	1400	670	24.5	110
					78-04-27	1330	660	24.0	120
					78-06-07	1400	680	24.0	120
215854159424601	2-5842-02 S11 KSC	21 58 54	159 42 46	01	78-07-28	1330	700	24.5	120
					78-09-06	1330	700	25.0	130
					77-12-09	1000	750	23.5	120
					78-01-24	1000	645	23.5	120
					78-03-10	0935	760	22.5	120
					78-04-26	1000	740	23.5	--
					78-06-07	0940	750	24.0	120
					78-07-28	0940	777	24.0	130
					78-09-06	0940	800	24.0	140

j Collected by non-USGS agency.

QUALITY OF GROUND WATER
WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

STATION NUMBER	LOCAL IDENTIFIER	LATITUDE	LONGITUDE	SEQ. NO.	DATE OF SAMPLE	TIME	SPECIFIC CONDUCTANCE (MICRO-MHOS)	TEMPERATURE (DEG C)	CHLORIDE, DIS-SOLVED (MG/L AS CL)
HAWAII, ISLAND OF KAUAI--Continued									
215843159422901	2-5842-03 S10 KSC	21 58 43	159 42 29	01	77-12-09	0940	710	23.5	120
					78-01-24	0940	690	23.0	110
					78-03-10	0905	1100	23.0	230
					78-04-26	0930	--	23.0	300
					78-06-07	0910	1250	24.0	260
					78-07-28	0910	1420	24.0	340
					78-09-06	0920	180	24.0	340
215901159235301	2-5923-01 STATE	21 59 01	159 23 53	00	78-04-25	1545	270	26.0	16
215912159234401	2-5923-03 CNTY	21 59 12	159 23 44	01	78-05-03	1000	188	--	j 18
215906159395601	2-5939-01 S9 CNTY	21 59 06	159 39 56	01	77-12-09	1440	490	23.0	69
					78-01-24	1440	490	23.0	--
					78-03-10	1430	460	23.0	60
					78-04-27	1400	510	24.0	76
					78-06-07	1430	470	23.5	58
					78-07-28	1345	519	23.5	80
					78-09-06	1345	590	25.0	96
215937159434201	2-5943-01 S13 WAIKAWA	21 59 37	159 43 42	01	77-12-09	1020	1200	24.5	300
					78-01-24	1020	1400	24.5	320
					78-03-10	1010	1500	24.5	340
					78-04-26	1030	1350	24.5	350
					78-06-07	1015	1500	24.5	330
215937159434201	2-5943-01 S13 WAIKAWA	21 59 37	159 43 42	01	78-07-28	1000	1600	24.0	350
					78-09-06	1000	1600	24.0	360
215923159430101	2-5943-02 STATE	21 59 23	159 43 01	01	78-07-21	0930	--	--	j 75
HAWAII, ISLAND OF OAHU									
211646157465201	3-1646-01 W1B WAIKALAE	21 16 46	157 46 52	01	77-10-12	1320	1000	22.5	240
					77-11-28	1315	900	22.0	200
					78-01-13	0800	800	23.5	180
					78-02-14	1330	850	22.5	210
					78-03-31	1400	750	23.0	180
					78-05-22	0855	925	23.0	230
					78-09-19	0920	1000	23.5	240
211718157491002	3-1749-07 W25 TUBE D	21 17 18	157 49 08	02	77-10-13	1610	1650	23.0	440
					77-11-28	1430	1500	23.0	360
					78-01-09	1510	1500	23.0	420
					78-02-14	1410	1550	23.0	440
					78-03-31	1540	1500	24.0	430
					78-05-22	0940	1500	23.0	400
					78-07-03	1525	1425	23.0	380
					78-09-19	1040	1500	23.5	410
211718157491001	3-1749-07 W25 TUBE E	21 17 18	157 49 08	01	77-10-13	1620	950	23.0	220
					77-11-28	1440	850	23.0	200
					78-01-09	1520	850	23.0	220
					78-02-14	1415	900	23.0	230
					78-03-31	1545	900	24.0	240
					78-05-22	0950	925	23.0	230
					78-07-03	1530	900	23.0	220
					78-09-19	1045	925	23.5	230

j Collected by non-USGS agency.

QUALITY OF GROUND WATER

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WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

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										
211832157515501	3-1851-19	W102 TUBE A	21 18 32	157 51 55	01	77-10-18	0730	18000	23.5	7000
						77-11-28	1515	13000	23.5	7400
						78-01-13	1320	19000	23.0	7500
						78-02-15	0740	16000	23.0	7700
						78-04-06	0825	16000	23.5	7600
						78-05-18	1510	15000	24.0	7200
						78-07-05	1520	15000	23.5	7100
						78-09-20	1530	18000	23.5	7200
211832157515502	3-1851-19	W102 TUBE B	21 18 32	157 51 55	02	77-10-18	0740	1400	23.5	380
						77-11-28	1520	1400	23.5	380
						78-01-13	1325	1400	23.0	380
						78-02-15	0750	1350	23.0	400
						78-04-06	0835	1400	23.5	400
						78-05-18	1515	1500	24.5	400
						78-07-05	1530	1475	23.5	400
						78-09-20	1540	1550	23.5	--
212038157422501	3-2042-13	W420-1A PAC CO	21 20 02	157 42 07	01	78-04-19	0850	6000	25.0	1600
						78-05-22	1030	6000	25.0	1600
						78-08-15	0900	5500	25.0	1600
						78-09-28	1145	6000	25.5	1700
212133158035501	3-2103-03	S14 NAVY	21 21 33	158 03 55	01	77-10-19	0900	1100	23.0	230
						77-12-01	0900	1000	23.0	220
						78-01-11	1230	1075	23.0	220
						78-02-17	0915	1000	23.0	220
						78-03-22	0910	1050	24.5	220
						78-04-07	0900	1025	23.5	220
						78-05-22	1205	1075	23.5	220
						78-08-09	1145	1050	23.5	220
						78-09-20	1300	1075	23.5	220
212106157533701	3-2153-02	W153 DAMON EST	21 21 06	157 53 37	01	77-10-18	0835	420	21.5	70
						77-12-01	1505	390	21.5	70
						78-01-13	0845	420	21.0	74
						78-02-15	0840	390	21.5	70
						78-04-05	1440	390	22.0	73
						78-05-18	1115	410	22.0	70
						78-07-05	0920	390	22.0	69
						78-09-19	1200	400	22.0	70
212237158002001	3-2200-03	W234 NAVY	21 22 37	158 00 20	01	78-01-13	1030	7500	23.0	2700
212224158012401	3-2201-11	W255-1 ASATO	21 22 24	158 01 24	01	78-02-08	1300	800	23.0	200
						78-03-22	0955	915	23.0	200
						78-08-09	0945	850	23.5	200
212204158021201	3-2202-15	W263A NSCO	21 22 04	158 02 12	01	78-08-09	1220	1500	22.5	390
212252158025001	3-2202-21	S3 NSCO, EWA	21 22 52	158 02 50	01	78-03-22	0930	825	23.0	160
						78-08-09	1205	800	24.0	160
212259157554201	3-2255-35	W189-3A CRH SG	21 22 59	157 55 42	01	77-10-18	0900	900	22.0	210
						77-12-01	1415	900	22.0	230
						78-01-13	1245	850	22.5	140
						78-02-15	1305	900	22.0	220
						78-04-05	1010	900	22.0	220
						78-05-18	1140	950	22.5	220
						78-09-19	1430	850	22.5	200
212258157554201	3-2255-36	W189-3B CRHSCO	21 22 58	157 55 42	01	78-03-22	1355	875	23.0	210
						78-08-09	1235	840	23.5	200

QUALITY OF GROUND WATER
WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

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									
212238157561102	3-2256-12 w187C NAVY	21 22 38	157 56 11	02	77-11-23	0915	625	25.0	160
					78-01-12	1400	625	23.5	160
					78-02-15	1245	590	24.0	160
					78-05-18	1415	600	27.0	140
212343158001001	3-2300-11 w238 WAIANABE	21 23 43	158 00 10	01	77-10-19	1245	850	22.5	180
					77-12-01	1230	790	22.5	180
					78-01-13	1100	800	22.5	180
					78-02-17	1415	775	22.0	190
					78-03-22	0825	825	23.0	200
					78-04-06	1430	800	22.5	180
					78-05-18	1225	850	23.0	190
					78-06-30	1315	840	22.5	190
					78-08-09	1330	810	23.0	190
					78-09-20	1445	825	22.5	190
212325158003801	3-2300-21 w246-I OSCO	21 23 25	158 00 38	01	78-03-22	0835	550	22.0	110
					78-08-09	1320	540	22.0	110
212358158010901	3-2301-09, 10 w247J+I	21 23 58	158 01 09	01	77-10-19	1230	400	23.5	59
					77-12-01	1215	410	22.5	67
					78-01-13	1045	460	21.5	83
					78-02-17	1340	400	23.0	67
					78-03-22	1045	430	23.0	64
					78-04-06	1320	400	22.5	64
					78-05-18	1240	500	23.5	92
					78-07-05	1410	530	24.5	100
					78-08-09	0905	460	23.0	80
					78-09-20	1425	430	23.5	68
212321158013701	3-2301-34 w256-3A CNLY	21 23 21	158 01 37	01	78-03-22	1135	--	--	j 130
212321158013703	3-2301-36 w256-3C CNLY	21 23 21	158 01 37	03	78-08-09	1000	--	--	j 150
212318158020601	3-2302-03 CNLY, KUNIA	21 23 18	158 02 06	01	78-03-22	1300	--	--	j 110
					78-08-09	0945	--	--	j 120
212305157542601	3-2354-01 S12 CNLY	21 23 05	157 54 26	01	78-03-22	0850	--	--	j 62
					78-08-09	0839	--	--	j 62
212322157550301	3-2355-03 w189-1A CNLY	21 23 22	157 55 03	01	78-03-22	0910	--	--	j 38
					78-08-09	1004	--	--	j 37
212313157553502	3-2355-07 w189-2B OSCO	21 23 13	157 55 35	02	78-03-22	--	--	--	j 78
					78-08-09	1013	--	--	j 74
212338157555601	3-2355-09 w191-1A CNLY	21 23 38	157 55 56	01	78-08-09	0900	--	--	j 46
212339157555501	3-2355-10 w191-1B CNLY	21 23 39	157 55 55	01	78-03-22	1025	--	--	j 32
212349157562201	3-2356-56 w191-3B CNLY	21 23 49	157 56 22	01	78-03-22	1030	--	--	j 35
212320157560301	3-2356-58 CNLY, KAAMILO	21 23 20	157 56 03	01	78-03-22	1010	--	--	j 120
					78-08-09	0924	--	--	j 120
212333157575406	3-2357-13 S8 HECO, WAI'AU	21 23 33	157 57 54	06	78-03-22	1440	850	21.0	200
					78-08-09	1015	750	21.5	200
212327157573901	3-2357-21 w198-3	21 23 27	157 57 39	01	78-03-22	1445	--	--	200
					78-08-09	1345	650	27.5	190

j Collected by non-USGS agency.

QUALITY OF GROUND WATER

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WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

STATION NUMBER	LOCAL IDENTIFIER	LATITUDE	LONGITUDE	SEQ. NO.	DATE OF SAMPLE	TIME	SPECIFIC CONDUCTANCE (MICROMHOS)	TEMPERATURE (DEG C)	CHLORIDE DIS-SOLVED (MG/L AS CL)
HAWAII, ISLAND OF OAHU--Continued									
212332157582201	3-2358-02 W201 NAVY	21 23 32	157 58 22	01	77-10-18	0940	850	20.5	200
					77-11-29	1410	1050	20.0	290
					78-01-12	1310	1450	20.0	410
					78-02-16	1300	975	20.0	270
					78-03-22	1420	1080	20.5	270
					78-04-06	1500	950	20.5	260
					78-05-16	1445	1400	20.5	380
					78-06-30	1200	1300	20.5	360
					78-08-09	0950	970	21.0	260
					78-09-18	1135	890	20.5	230
212318157583401	3-2358-19 W205-1 NAVY	21 23 18	157 58 34	01	78-01-12	1320	1200	24.0	340
					78-02-16	1245	1100	24.0	330
					78-05-16	1430	1150	26.0	320
					78-06-30	1140	1000	26.5	280
212342157584301	3-2358-22 W204-4	21 23 42	157 58 43	01	77-10-18	1000	560	20.5	130
					77-12-01	1245	600	20.5	150
					78-01-13	1115	690	20.5	160
					78-02-16	1135	650	20.5	160
					78-03-22	0745	600	21.0	140
					78-04-06	0950	580	20.5	130
					78-05-16	1500	650	20.5	150
					78-06-30	1215	680	20.5	160
					78-08-09	0915	600	21.5	140
					78-09-19	1450	580	21.0	130
212333157581501	3-2358-27 W200-1	21 23 33	157 58 15	01	77-12-07	1230	670	20.0	160
					78-02-16	1320	650	20.5	158
					78-08-09	1005	650	21.5	150
212343157584701	3-2358-29 W204-9	21 23 43	157 58 47	01	77-10-18	1010	640	20.5	150
					77-12-01	1255	750	20.5	200
					78-01-13	1125	925	20.5	250
					78-02-16	1145	850	20.0	230
					78-03-22	0803	750	20.5	180
					78-04-06	1000	690	20.5	170
					78-05-16	1510	850	20.5	220
					78-06-30	1220	900	20.5	240
					78-08-09	0910	770	21.0	200
					78-09-19	1500	675	20.5	160
212335157583901	3-2358-32 W204-18	21 23 35	157 58 39	01	78-08-09	0930	420	22.0	92
212335157585201	3-2358-41 W204-31 OKANO	21 23 35	157 58 52	01	78-08-09	0850	2800	21.0	840
212336157591801	3-2359-05 W204-11 OSHITA	21 23 36	157 59 18	01	77-12-01	1310	1200	--	330
					78-01-13	1135	1400	22.0	370
					78-05-16	1520	1400	22.5	370
					78-06-30	1235	1400	22.5	380
					78-09-19	1515	1400	22.5	370
212332157592401	3-2359-06 W204-12 SASAKI	21 23 32	157 59 24	01	78-03-22	0812	1310	22.0	330
					78-08-09	0820	1280	23.0	340
212408158002602	3-2400-01 W241-1A CNTY	21 24 08	158 00 26	02	78-08-09	1010	--	--	J 58
212408158002601	3-2400-02 W241-1B CNTY	21 24 08	158 00 26	01	78-03-22	1115	--	--	J 57
212422157485601	3-2448-01 W416 STATE	21 24 22	157 48 56	01	78-01-25	1415	195	21.0	18
					78-02-23	1210	180	21.0	18
					78-04-20	1145	200	21.0	19
					78-05-30	1445	195	21.0	19
					78-08-15	1500	190	21.5	20

J Collected by non-USGS agency.

QUALITY OF GROUND WATER
WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

STATION NUMBER	LOCAL IDENTIFIER	LATITUDE	LONGITUDE	SEQ. NO.	DATE OF SAMPLE	TIME	SPECIFIC CONDUCTANCE (MICROMHOS)	TEMPERATURE (DEG C)	CHLORIDE, DIS-SOLVED (MG/L AS CL)
HAWAII, ISLAND OF OAHU--Continued									
212409157581401	3-2456-02 CNLY, WAIMALU	21 24 09	157 58 14	01	78-03-22	1045	--	--	J 27
					78-08-09	1020	--	--	J 25
212439157575901	3-2457-01 W202-2A CNLY	21 24 39	157 57 59	01	78-08-09	1050	--	--	J 30
212446157573206	3-2457-11 W196-2H CNLY	21 24 46	157 57 32	06	78-08-09	1030	--	--	J 44
212446157573202	3-2457-12 W196-2G CNLY	21 24 46	157 57 32	02	78-03-22	1050	--	--	J 36
212407157582501	3-2458-01 S9 CNLY	21 24 07	157 58 25	01	78-03-22	1125	--	--	J 44
					78-08-09	1040	--	--	J 43
212427157595201	3-2459-19 W241-2A CNLY	21 24 27	157 59 52	01	78-03-22	1110	--	--	110
212501158080701	3-2508-02 S2 CNLY	21 25 01	158 08 07	01	77-11-17	0935	1500	28.0	280
					77-12-29	0950	1350	28.5	280
					78-02-08	0950	1300	28.0	280
					78-03-24	0945	1300	28.5	280
					78-05-04	0955	1350	28.0	270
					78-06-15	1025	1650	28.0	270
					78-07-28	0945	1350	28.0	280
					78-09-11	0930	1350	28.5	280
212556157500301	3-2550-01 W407-16	21 25 56	157 50 03	01	78-02-23	1130	130	23.0	17
					78-04-21	0730	140	22.0	17
					78-08-15	1530	140	23.0	18
212510157570201	3-2557-01 W196-1A STATE	21 25 10	157 57 02	01	78-08-09	1045	--	--	J 21
212510157570202	3-2557-02 W196-1B STATE	21 25 10	157 57 02	02	77-12-07	0955	200	22.0	22
212506157582301	3-2558-10 S16 NAVY	21 25 06	157 58 23	01	77-10-18	1150	825	22.0	200
					77-12-01	1340	825	22.0	220
					78-01-12	1215	825	22.0	210
					78-02-16	1115	800	22.0	210
					78-03-22	0740	800	21.0	200
					78-04-05	1145	840	22.5	220
					78-04-08	1145	840	22.5	220
					78-05-16	1410	860	22.0	220
					78-08-09	1330	870	23.5	210
					78-08-09	1335	860	27.0	220
					78-09-18	1250	900	22.0	240
212601158004001	3-2600-01 T47 KONO	21 26 01	158 00 40	01	77-12-06	1030	245	24.0	26
212617158033801	3-2603-01 W330-B HAW CC	21 26 17	158 03 38	01	78-01-13	1000	350	22.5	48
					78-02-17	1230	350	22.0	48
					78-03-22	1100	370	22.5	50
					78-08-09	1425	360	23.0	46
					78-09-20	1030	360	22.5	47
212656158071801	3-2607-01 W277-97 NAVY	21 26 56	158 07 18	01	77-11-17	0750	380	24.0	46
					77-12-29	0755	360	24.0	44
					78-02-08	0845	360	24.0	44
					78-03-24	0810	350	24.0	44
					78-05-04	0745	355	24.0	43
					78-06-15	0830	355	24.0	43
					78-07-28	0750	350	24.0	42
					78-09-11	0745	355	24.0	43
212803158000701	3-2800-01 W250-4A CNLY	21 28 03	158 00 07	01	78-01-05	1100	165	23.5	17
					78-03-28	1325	190	23.0	18
					78-05-04	1600	160	30.0	14
					78-08-09	1355	160	26.0	17

j Collected by non-USGS agency.

QUALITY OF GROUND WATER

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WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

STATION NUMBER	LOCAL IDENTIFIER	LATITUDE	LONGITUDE	SEQ. NO.	DATE OF SAMPLE	TIME	SPECIFIC CONDUCTANCE (MICROMHOS)	TEMPERATURE (DEG C)	CHLORIDE, DIS-SOLVED (MG/L AS CL)
HAWAII, ISLAND OF OAHU--Continued									
212813158080201	3-2808-01 W277-92 NAVY	21 28 13	158 08 02	01	77-11-17	0840	1400	26.0	160
					77-12-29	0835	130	26.0	160
					78-02-08	0740	1250	26.5	160
					78-03-24	0850	1250	26.5	160
					78-05-04	0825	1260	26.0	150
					78-06-15	0920	1250	26.5	150
					78-07-28	0805	1280	26.5	150
					78-09-11	0810	1280	26.5	150
212828158092001	3-2809-06 CNTY, WAIANAE	21 28 28	158 09 20	01	77-12-28	1025	420	22.5	30
					78-02-08	1050	400	22.5	29
					78-03-16	0950	380	22.5	27
					78-04-26	0850	380	22.5	26
					78-06-15	1130	370	22.5	30
					78-07-27	0930	365	23.0	29
					78-09-06	0925	375	22.5	27
212859158124301	3-2812-01 S1 CNTY	21 28 59	158 12 43	01	77-10-04	1110	555	24.0	96
					77-12-28	1150	465	22.5	80
					78-02-08	1615	530	23.5	89
					78-03-16	1100	550	23.0	100
					78-04-26	1540	410	23.0	65
					78-06-15	1335	575	24.0	100
					78-07-27	1110	580	24.0	90
					78-09-06	1130	600	24.0	96
212927158014801	3-2901-07 S4 ARMY	21 29 27	158 01 48	01	77-10-05	1000	185	22.0	19
					77-11-15	0900	180	22.0	19
					78-01-03	1530	180	21.5	18
					78-02-02	0930	180	22.5	18
					78-03-23	0945	170	21.5	18
					78-05-01	1000	180	21.5	18
					78-06-20	0835	175	22.0	17
					78-07-21	0925	165	22.5	18
					78-09-01	0940	180	22.0	18
212945158014301	3-2901-09 W330-6 CNTY	21 29 45	158 01 43	01	77-12-28	1700	190	21.5	19
					78-02-07	1700	200	21.5	20
					78-03-17	1640	195	21.5	20
					78-05-04	1540	190	27.0	20
					78-06-09	1630	195	21.0	20
					78-07-25	1635	190	21.5	20
					78-08-30	1620	192	21.5	20
212939158112301	3-2911-02 WDCO, MAKAHA	21 29 39	158 11 23	01	77-10-04	1340	275	21.0	25
					77-11-17	1500	285	21.0	22
					77-12-28	1300	270	21.0	25
					78-02-08	1230	280	21.0	26
					78-03-16	1130	270	21.0	22
					78-04-26	1315	265	20.5	25
					78-06-06	1605	260	21.0	26
					78-07-27	1530	265	21.0	26
					78-09-06	1450	270	21.0	26
213224158135901	3-3213-06 W277-101 PAGE	21 32 24	158 13 59	01	77-10-04	1030	920	25.0	210
					77-11-17	1210	950	24.5	210
					77-12-28	1100	890	24.5	200
					78-02-08	1520	875	24.5	200
					78-03-16	1030	870	24.0	200
					78-04-26	1450	900	24.5	200
					78-06-15	1300	850	24.5	200
					78-07-27	1020	900	25.0	200
					78-09-06	1030	860	24.5	200

QUALITY OF GROUND WATER
WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

STATION NUMBER	LOCAL IDENT- IFIER	LAT- ITUDE	LONG- ITUDE	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									
213243157510001	3-3251-01 W406 SWANZY	21 32 43	157 51 00	01	77-11-01	1550	900	23.5	250
					77-12-14	1500	900	23.5	250
					78-01-24	1530	900	23.5	240
					78-03-02	1500	900	24.0	250
					78-04-21	1515	1000	24.0	250
					78-06-02	1430	1000	24.0	250
					78-07-07	1400	1000	23.0	250
					78-08-28	1315	1000	23.0	250
					78-11-01	1500	270	23.5	37
					77-12-14	1400	250	23.0	36
213327157524401	3-3352-01 W405 FOSTER	21 33 27	157 52 44	01	78-01-24	1400	260	23.0	40
					78-04-21	1120	280	23.0	36
					78-06-02	1400	300	22.5	36
					78-07-13	1530	280	23.0	36
					78-08-25	1300	280	23.0	35
					77-10-01	1555	590	22.0	110
					77-11-11	0905	625	22.0	120
					77-12-19	1635	595	22.0	120
					78-02-07	1230	740	22.0	160
					78-02-10	1210	680	22.0	150
213427158055501	3-3405-02 W323-2 CNTY	21 34 27	158 05 55	01	78-03-14	1700	650	22.0	140
					78-06-06	1715	750	22.5	180
					78-07-25	1605	800	23.0	190
					78-09-07	1040	550	22.0	100
					77-10-06	0845	2400	22.5	620
					77-11-18	0830	2600	22.5	650
					78-01-05	0800	1700	22.0	440
					78-02-10	0835	2350	22.5	660
					78-05-04	1330	2300	22.5	660
					78-06-16	0840	2400	22.5	660
213455158065301	3-3406-01 W326 WSCO	21 34 55	158 06 53	01	78-07-28	1310	2420	22.5	700
					78-09-11	1300	2600	22.5	700
					77-10-06	0845	2400	22.5	620
					77-11-18	0830	2600	22.5	650
					78-01-05	0800	1700	22.0	440
					78-02-10	0835	2350	22.5	660
					78-05-04	1330	2300	22.5	660
					78-06-16	0840	2400	22.5	660
					78-07-28	1310	2420	22.5	700
					78-09-11	1300	2600	22.5	700
213411158074501	3-3407-25 W320 CNTY	21 34 11	158 07 45	01	78-03-23	1540	3300	24.0	850
					78-05-02	1420	3600	24.5	940
					78-06-16	1120	3950	25.0	1100
					78-07-28	1335	4900	25.0	1500
					78-09-07	1135	5350	25.0	1700
					77-10-06	0925	850	22.5	180
					77-11-18	0900	860	22.0	180
					78-01-05	0845	870	21.5	180
					78-02-10	1040	825	21.5	180
					78-03-23	1600	810	22.0	180
213444158075501	3-3407-30 W318-2 WSCO	21 34 44	158 07 55	01	78-05-02	1440	840	21.5	180
					78-06-16	0910	820	22.0	170
					78-07-28	1400	810	23.0	180
					78-09-07	1330	820	23.0	180
					77-10-06	0925	990	22.0	260
					77-11-18	0900	950	20.0	260
					78-01-05	0845	925	20.0	260
					78-02-10	1055	975	20.0	260
					78-03-23	1625	900	21.0	250
					78-05-02	1600	945	22.5	260
213446158104901	3-3410-08 W286 WSCO	21 34 46	158 10 49	01	78-06-16	1050	900	22.0	240
					78-07-28	1425	1060	22.0	250
					78-09-07	1220	1060	22.0	250
					77-10-06	0925	990	22.0	260
					77-11-18	0900	950	20.0	260
					78-01-05	0845	925	20.0	260
					78-02-10	1055	975	20.0	260
					78-03-23	1625	900	21.0	250
					78-05-02	1600	945	22.5	260
					78-06-16	1050	900	22.0	240

QUALITY OF GROUND WATER

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WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

STATION NUMBER	LOCAL IDENTIFIER	LATITUDE	LONGITUDE	SEQ. NO.	DATE OF SAMPLE	TIME	SPECIFIC CONDUCTANCE (MICRO-MHOS)	TEMPERATURE (DEG C)	CHLORIDE, DIS-SOLVED (MG/L AS CL)
HAWAII, ISLAND OF OAHU--Continued									
213512158061601	3-3506-03,04 W329A,B	21 35 12	158 06 16	01	77-12-19	1445	520	21.5	96
					78-02-07	1110	535	21.5	96
					78-03-15	1635	530	21.5	100
					78-04-24	1430	540	21.0	100
					78-07-19	1455	510	22.0	92
					78-09-11	1315	525	22.0	93
213513157534701	3-3553-07 W402-2D CNTY	21 35 13	157 53 47	01	77-10-28	1340	460	21.0	110
213636158053701	3-3605-03 W334C WSCO	21 36 36	158 05 37	01	77-11-18	1305	1500	21.0	430
					77-12-20	1600	1600	21.0	430
					78-02-07	0940	2000	21.0	560
					78-03-14	1640	2000	21.0	550
					78-04-28	1630	2150	21.0	560
					78-06-16	1225	1500	21.5	390
213636158053702	3-3605-21 W334U WSCO	21 36 35	158 05 40	02	78-07-26	1615	1500	21.5	400
					78-08-30	1400	2450	21.0	660
					77-11-18	1255	1500	21.0	380
					77-12-20	1545	1400	21.0	380
					78-02-07	0915	1400	21.5	380
					78-03-14	1625	1400	21.0	380
213656157550401	3-3655-01 W394 CNTY	21 36 56	157 55 04	01	78-04-28	1620	1500	21.0	380
					78-06-16	1210	2200	21.5	590
					78-07-26	1550	2300	21.5	650
					78-08-03	1415	1340	21.5	400
					77-10-28	1300	240	22.0	34
					77-12-09	1115	230	22.0	34
213902157561601	3-3956-04 W366 KAHAWAI	21 39 02	157 56 16	01	78-01-24	1315	240	22.0	34
					78-04-14	1320	240	21.5	34
					78-06-02	1315	250	21.5	34
					78-07-07	1300	240	22.0	34
					78-08-25	1200	240	21.5	34
					77-10-28	1130	600	22.0	150
214050157573301	3-4057-01 W353A KAHUKU	21 40 50	157 57 33	01	77-12-09	1055	570	22.0	150
					78-01-24	1230	600	22.0	160
					78-02-24	1230	600	22.0	140
					78-04-14	1240	600	22.0	140
					78-06-02	1200	460	21.5	130
					78-07-07	1240	540	22.0	120
214050157573301	3-4057-01 W353A KAHUKU	21 40 50	157 57 33	01	78-08-25	1030	530	22.0	110
					77-12-09	1035	480	23.0	100
					78-01-24	1030	480	22.0	95
					78-04-14	0815	460	21.5	94
					78-06-02	0800	480	21.0	99
					78-07-07	0800	470	21.5	88
214029157570101	3-4057-06 W357 CMPBL EST	21 40 29	157 57 01	01	78-08-25	0940	490	22.0	95
					78-04-14	1130	1400	22.0	400
					78-06-02	1145	1400	22.0	390
					78-07-07	1215	1350	22.0	400
					78-08-25	1000	1400	22.5	400
					78-07-07	0910	390	21.5	61
214157158000101	3-4100-01 W338 DEL WEBB	21 41 57	158 00 01	01	78-08-25	0805	380	21.0	67
					77-10-28	1045	240	21.0	38
					77-12-09	0930	220	21.5	34
					78-01-24	1200	230	21.5	34
					78-02-24	1050	220	21.5	34
					78-06-02	1015	240	21.0	33
214131158011601	3-4101-08 W337-6 CNTY	21 41 31	158 01 16	01	78-07-07	1020	240	21.0	34

QUALITY OF GROUND WATER
WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

STATION NUMBER	LOCAL IDENT- I- FIER	LAT- I- ITUDE	LONG- I- ITUDE	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)
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HAWAII, ISLAND OF OAHU--Continued

214233157583501	3-4258-04 W345 RCA	21 42 33	157 58 35	01	77-10-28	0800	1700	24.0	520
					77-12-09	0745	1500	23.0	520
					78-01-24	1100	1650	23.0	520
					78-02-24	0815	1650	23.0	510
					78-04-14	0845	1700	23.0	520
					78-06-02	0820	1700	23.0	530
					78-07-07	0815	1700	24.0	520
					78-08-25	0745	1700	25.0	520

HAWAII, ISLAND OF MOLOKAI

210402156495801	4-0449-01 S6 CNTY	21 04 02	156 49 58	01	77-12-12	1705	340	--	61
					78-04-03	1725	335	19.5	60
					78-07-10	1715	330	20.0	61
210419156570501	4-0457-01 S4 CNTY	21 04 19	156 57 05	01	77-12-12	1805	335	23.0	70
					78-04-03	1820	420	22.5	95
					78-07-10	1810	370	22.5	75
210605157012001	4-0601-01 W11 MO RANCH	21 06 05	157 01 20	01	77-10-21	1015	410	24.0	64
					77-12-15	0830	420	23.5	68
					78-02-09	0835	410	24.0	72
					78-04-06	0840	430	23.0	70
					78-06-01	1725	440	23.5	78
					78-07-14	0855	450	23.5	77
					78-09-08	0845	500	23.5	87
210856157011201	4-0801-01 W16 HHC, KALAE	21 08 56	157 01 12	01	77-10-18	0800	364	--	J 76
					78-02-08	0820	360	--	J 76
					78-05-31	0900	--	--	J 75
					78-09-06	0900	--	--	J 78
210903157013001	4-0901-01 W17 DEL MONTE	21 09 03	157 01 30	01	77-10-19	0935	300	20.0	57
					77-12-14	0955	280	20.0	54
					78-07-09	0935	325	21.0	70
					78-04-04	0930	290	20.0	56
					78-06-02	1450	330	20.0	64
					78-07-11	0855	300	20.0	60
					78-09-08	1020	390	20.0	77

HAWAII, ISLAND OF MAUI

203835156065001	6-3806-01 KAUPA RANCH	20 38 35	156 06 50	01	78-05-23	0930	670	19.0	170
					78-09-12	1100	950	20.0	240
203908156041201	6-3904-01 KIPAHULU	20 39 08	156 04 12	01	78-07-20	0850	2000	19.0	550
203940156040301	6-3904-03 KIPAHULU	20 39 40	156 04 03	01	78-07-20	1435	85	19.0	5.9
203947156261201	6-3926-03 WAILEA PUMP 8,	20 39 47	156 26 12	01	77-10-18	1215	3000	--	J 850
					77-12-07	0945	3100	--	J 850
					78-06-21	1015	3200	19.0	J 820
204126156262101	6-4126-02 W78-1 ARB INC	20 41 26	156 26 21	01	77-10-18	1125	1800	20.0	480
					77-12-07	0920	1750	20.5	450
					78-01-25	0950	1800	20.0	450
					78-05-03	0850	2000	19.0	480
					78-06-21	0940	2000	19.0	490
					78-08-16	1000	1950	19.5	510

J Collected by non-USGS agency.

QUALITY OF GROUND WATER

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WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

STATION NUMBER	LOCAL IDENTIFIER	LATITUDE	LONGITUDE	SEQ. NO.	DATE OF SAMPLE	TIME	SPECIFIC CONDUCTANCE (MICRO-MHOS)	TEMPERATURE (DEG C)	CHLORIDE, DIS-SOLVED (MG/L AS CL)
HAWAII, ISLAND OF MAUI--Continued									
204601156001501	6-4600-01 W55 HANA RANCH	20 46 01	156 00 15	01	77-10-05	1415	600	21.5	110
					77-11-21	1715	600	20.5	110
					78-01-12	1440	580	21.0	110
					78-03-01	1605	610	20.0	110
					78-04-18	1640	640	20.5	110
					78-06-12	1650	600	20.0	100
					78-08-09	1700	575	22.0	92
204633156003201	6-4600-03 STATE WELL B	20 46 33	156 00 32	01	78-01-11	1510	620	19.0	150
					78-03-02	0740	700	18.0	180
					78-04-19	0700	610	18.5	150
					78-06-12	1635	390	18.0	78
					78-08-10	1540	230	19.0	44
204634156271101	6-4627-08 W225 HASHIMOTO	20 46 34	156 27 11	01	77-10-18	1500	1600	23.5	320
					78-01-25	1600	1650	24.0	300
					78-05-03	1130	1640	23.0	310
					78-08-16	1240	1650	23.5	320
204635156270101	6-4627-14 W226 HASHIMOTO	20 46 35	156 27 01	01	77-12-07	1335	1380	22.5	300
					78-03-15	1430	1500	22.0	300
					78-06-21	1300	1480	23.0	300
204845156255001	6-4825-01 S15 HC&S	20 48 45	156 25 50	01	77-10-27	0820	1590	--	J 340
					77-12-23	0800	1630	--	J 350
					78-01-27	1000	1640	--	J 350
					78-02-23	0800	1620	--	J 340
					78-05-04	0730	1590	--	J 310
					78-06-26	0800	1730	--	J 350
					78-09-22	0930	1600	--	J 320
204931156371201	6-4937-01 S10 PNR MILL	20 49 31	156 37 12	01	77-12-02	1020	3250	--	J 980
					77-12-30	1400	4400	--	J 1400
					78-02-03	1400	4950	--	J 1600
					78-02-23	1445	5330	--	J 1700
					78-04-05	0830	5650	--	J 1600
					78-04-28	1420	5940	--	J 1800
					78-05-31	1410	5880	--	J 1800
					78-07-05	1355	3330	--	J 920
					78-08-02	1030	4390	--	J 1300
					78-08-26	1415	2360	--	J 620
205014156212701	6-5021-01 LANDCO	20 50 14	156 21 27	01	78-09-28	1415	4720	--	J 1400
					78-05-02	1320	1830	21.5	480
205102156282501	6-5128-02 S16 HC&S	20 51 02	156 28 25	01	77-10-27	0800	1930	--	J 430
					77-12-22	0800	1930	--	J 420
					78-02-24	0530	1930	--	J 400
					78-05-04	1245	2190	--	J 480
					78-07-10	--	1720	--	J 330
205243156243201	6-5224-02 S22 HC&S	20 52 43	156 24 32	01	78-09-22	0815	2140	--	J 440
					77-10-28	0730	1600	--	J 380
					77-12-23	0530	1610	--	J 390
					78-01-26	0915	1610	--	J 390
					78-02-23	0915	1610	--	J 380
					78-05-04	0530	1730	--	J 400
					78-07-10	0900	1750	--	J 400
					78-09-26	0930	1750	--	J 400

J Collected by non-USGS agency.

QUALITY OF GROUND WATER
WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

STATION NUMBER	LOCAL IDENTIFIER	LATITUDE	LONGITUDE	SEQ. NO.	DATE OF SAMPLE	TIME	SPECIFIC CONDUCTANCE (MICRO-MHOS)	TEMPERATURE (DEG C)	CHLORIDE DIS-SOLVED (MG/L AS CL)
HAWAII, ISLAND OF MAUI--Continued									
205257156294401	6-5229-01 A8B, WAI'ALE	20 52 57	156 29 44	01	78-02-15	--	300	--	14
					78-03-02	--	--	--	14
					78-03-13	0835	1170	22.0	260
					78-03-13	0845	2050	21.5	540
					78-03-13	0900	2200	21.5	550
					78-03-13	0910	2325	21.5	--
					78-03-13	0915	2600	21.5	680
					78-03-13	0955	2700	21.5	690
					78-04-15	0757	40000	21.5	--
					78-04-15	0806	40000	21.5	--
					78-04-15	0813	40000	21.5	--
					78-04-15	0829	40000	21.5	--
205311156284302	6-5328-45 CNTY, KAHULUI	20 53 11	156 28 43	02	78-05-08	1010	32000	23.0	--
					78-06-30	1345	27000	22.5	--
					78-06-30	2035	24000	22.0	--
					78-07-07	1200	27000	23.0	--
					78-07-10	1230	34500	23.5	--
					78-07-14	1145	29000	23.0	--
					78-07-21	1245	31000	23.0	10000
					78-07-21	2155	25400	21.5	11000
					78-07-31	1245	27000	23.0	--
					78-08-04	1020	30000	22.5	--
					78-08-14	1055	29050	23.5	--
205301156294601	6-5329-18 A8B, WAI'ALE	20 53 01	156 29 46	01	78-05-10	1145	450	22.5	--
					78-05-10	1205	380	22.0	--
					78-05-10	1320	480	22.0	--
					78-05-10	1340	4500	22.0	--
					78-05-10	1430	6300	22.5	--
					78-05-10	1450	6350	22.0	--
					78-06-30	1410	3750	23.5	--
					78-07-21	1325	380	23.5	28
					78-07-21	1345	5600	23.0	1600
					78-07-21	1400	11000	23.0	3700
					78-07-21	2040	465	23.0	62
					78-07-21	2100	6000	22.5	1900
					78-07-21	2115	11000	22.5	3800
205305156304401	6-5330-05 S33 WSCD	20 53 05	156 30 44	01	77-10-20	1430	340	21.0	52
					77-12-15	1050	340	21.5	54
					78-01-24	1350	340	21.5	51
205329156305502	6-5330-09 W15A CNTY	20 53 29	156 30 55	02	78-03-17	1320	670	22.0	125
					78-06-21	0930	710	22.5	140
205329156305501	6-5330-10 W15B CNTY	20 53 29	156 30 55	01	77-12-15	1200	460	23.5	95
					78-05-09	1130	480	22.0	88
205330156305401	6-5330-11 W15F CNTY	20 53 30	156 30 54	01	77-10-20	1410	340	23.0	47
					78-01-27	1115	390	23.0	59
					78-06-21	0945	370	23.0	46
					78-08-09	1330	370	23.0	48
205322156394501	6-5339-01 W291 CNTY	20 53 22	156 39 45	01	77-10-17	1330	1100	22.0	270
					78-01-20	0945	1070	22.5	220
					78-03-09	1420	1070	21.0	200
					78-04-28	1400	1200	--	270
					78-08-11	1110	1300	22.0	290

QUALITY OF GROUND WATER

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WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

STATION NUMBER	LOCAL IDENT- IFIER	LAT- ITUDE	LONG- ITUDE	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									
205320156394501	6-5339-02 W292 CNTY	20 53 20	156 39 45	01	77-12-02	1325	1000	21.5	220
					78-06-19	0930	850	21.0	170
205343156401101	6-5340-02 S5 PNR MILL	20 53 43	156 40 11	01	77-12-02	0845	2670	--	J 780
					77-12-30	1200	3010	--	J 900
					78-02-03	1200	3370	--	J 1000
					78-02-23	1230	3960	--	J 1200
					78-04-05	0945	4400	--	J 1200
					78-04-28	1205	4850	--	J 1400
					78-05-31	1420	3570	--	J 1000
					78-07-05	1220	2370	--	J 610
					78-07-27	0745	3840	--	J 1100
					78-08-26	1145	3400	--	J 940
205416156244301	6-5424-01 S24 HCRS	20 54 16	156 24 43	01	77-10-28	0915	2380	--	J 650
					77-12-23	0845	2350	--	J 640
					78-01-27	0930	2410	--	J 640
					78-02-23	0930	2380	--	J 630
					78-05-04	1045	2590	--	J 650
					78-06-28	1230	2220	--	J 550
					78-09-22	1300	2650	--	J 680
205511156222101	6-5522-01 S31 HCRS, PAIA	20 55 11	156 22 21	01	77-10-27	0940	1260	--	J 300
					77-12-22	1200	1200	--	J 290
					78-01-27	1245	1210	--	J 290
					78-02-24	0805	1240	--	J 300
205651156401001	6-5640-01 S36 PNR MILL	20 56 51	156 40 10	01	77-12-02	0925	1180	--	J 300
					77-12-30	1320	1230	--	J 320
					78-02-03	1320	1520	--	J 410
					78-02-23	1320	1590	--	J 430
					78-04-05	1020	1600	--	J 400
					78-04-28	1320	1710	--	J 440
					78-05-31	1315	1250	--	J 310
					78-07-05	1315	1420	--	J 360
					78-07-27	1015	1510	--	J 390
					78-08-26	1320	1240	--	J 300
					78-09-28	1320	2040	--	J 530
205837156384601	6-5838-01 STATE, NAPILI	20 58 37	156 38 46	01	77-10-17	1450	610	21.0	150
					77-12-02	1030	670	21.5	160
					78-01-20	1035	670	21.5	160
					78-03-09	1030	680	20.0	150
					78-04-28	1015	680	21.5	160
					78-06-19	1300	680	21.5	160

HAWAII, ISLAND OF HAWAII

190347155354301	8-0335-01 STATE, NAALEHU	19 03 47	155 35 43	01	77-11-08	1255	172	19.0	9.0
					78-02-07	1305	176	19.0	8.0
190832155310901	8-0831-02 HWN INVEST CO	19 08 32	155 31 09	01	77-11-08	1150	615	18.0	150
					78-02-07	1150	655	18.0	160
191108155281701	8-1128-02 HWN ORCHARDS	19 11 08	155 28 17	01	78-03-22	1310	120	19.0	10
					78-05-19	1330	120	18.5	10
192108155021201	8-2102-01 W9-10 STATE	19 21 08	155 02 12	01	78-01-19	1500	1050	25.5	280
					78-03-01	1125	950	25.5	250
					78-05-08	1300	950	26.0	260
					78-07-05	1320	975	26.0	250
					78-08-18	1040	900	25.5	240

J Collected by non-USGS agency.

QUALITY OF GROUND WATER
WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

STATION NUMBER	LOCAL IDENTIFIER	LATITUDE	LONGITUDE	SEQ. NO.	DATE OF SAMPLE	TIME	SPECIFIC CONDUCTANCE (MICRO-MHOS)	TEMPERATURE (DEG C)	CHLORIDE, DIS-SOLVED (MG/L AS CL)
HAWAII, ISLAND OF HAWAII--Continued									
192456154571901	8-2487-01 W9-7 CNTY	19 24 56	154 57 19	01	78-01-19 78-03-03	1600 1100	400 400	23.5 23.5	86 85
192646155532001	8-2653-01 CNTY, HONAUANA	19 26 46	155 53 20	01	78-08-10	1200	--	--	J 28
192738155534201	8-2753-01 W12-4 CNTY	19 27 38	155 53 42	01	78-02-07	1530	670	19.0	160
192731155534101	8-2753-02 W12-8 CNTY	19 27 31	155 53 41	01	77-11-11 78-02-07 78-03-23 78-07-06 78-08-24	0835 1505 0820 1355 0740	774 720 750 750 775	19.0 19.0 19.0 19.0 19.0	200 180 200 190 200
192728154530101	8-2783-01 W9-9 STATE	19 27 28	154 53 01	01	78-01-19 78-03-03 78-05-08 78-07-05 78-08-22	1150 1000 1010 1050 1000	10750 15000 15000 15000 14500	54.0 55.0 54.0 54.0 54.0	2800 5500 5400 5500 5000
192924154564701	8-2986-01 W9-5B CNTY	19 29 24	154 56 47	01	78-03-01 78-05-08	0945 0900	125 120	22.5 22.5	5.5 6.0
192923154564701	8-2986-02 W9-5A CNTY	19 29 23	154 56 47	01	78-08-18	0945	125	22.5	6.0
193017154502101	8-3080-02 S9 CNTY	19 30 17	154 50 21	01	78-01-19 78-08-18	1255 1300	1175 1050	25.5 25.5	210 170
193113154555801	8-3185-01 W9-11 HAW BCH	19 31 13	154 55 58	01	78-08-17	1405	135	21.0	16
193510155570801	8-3557-01 W12-5 CNTY	19 35 10	155 57 08	01	77-11-11 78-02-08 78-03-23 78-05-03 78-07-07 78-08-24	1005 0805 0935 1510 0850 0930	190 240 260 165 180 180	20.0 20.0 19.5 20.0 19.5 20.0	22 40 44 18 20 20
193505155570801	8-3557-02 W12-6 CNTY	19 35 05	155 57 08	01	78-02-08 78-05-03	0840 1440	420 390	20.0 20.0	91 80
193508155570701	8-3557-03 CNTY, KAHALUU	19 35 08	155 57 07	01	78-05-03	1500	150	20.0	19
193805155020201	8-3802-03 PUNA SGR CO	19 38 05	155 02 02	01	77-10-05 78-01-23 78-03-17 78-05-17 78-08-10	1030 1325 1020 1050 1425	82 80 70 80 82	19.0 18.5 18.5 18.5 18.5	4.0 4.0 4.0 4.5 4.0
193937155004301	8-3900-01 W9-2 RYL HWN	19 39 37	155 00 43	01	78-03-17 78-05-17	1110 1125	300 320	24.0 19.5	62 67
194040155035201	8-4003-02 CNTY, PANAEWA	19 40 40	155 03 52	01	77-10-05 78-01-23 78-03-17 78-05-17 78-08-10	1140 1430 1330 1200 1330	90 95 85 85 83	20.0 19.5 19.5 19.5 19.5	4.5 4.5 5.0 4.5 4.0
194134155005601	8-4100-01 HAW PROSE PARK	19 41 34	155 00 56	01	77-10-14 78-01-23 78-03-06 78-05-02 78-08-10	1005 0950 1005 1345 0955	1350 1375 1360 1200 1300	19.0 19.5 18.0 18.0 19.0	380 380 390 380 370
194222155034801	8-4203-06 W8-28 HELCO	19 42 22	155 03 48	01	77-10-31 78-01-23 78-03-17 78-05-17 78-08-10	1025 1135 0940 0945 1125	135 142 185 255 155	25.0 25.0 25.0 24.0 24.0	18 22 24 52 25

J Collected by non-USGS agency.

QUALITY OF GROUND WATER

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WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

STATION NUMBER	LOCAL IDENTIFIER	LATITUDE	LONGITUDE	SEQ. NO.	DATE OF SAMPLE	TIME	SPECIFIC CONDUCTANCE (MICRO-MHOS)	TEMPERATURE (DEG C)	CHLORIDE, DIS-SOLVED (MG/L AS CL)
HAWAII, ISLAND OF HAWAII--Continued									
194337155041801	8-4304-01 HELCO, WAIKAE	19 43 37	155 04 18	01	77-10-14	1130	9600	20.5	5000
					78-01-23	1515	15000	20.0	8750
					78-03-17	0915	26000	20.0	15000
					78-05-17	1005	21500	20.0	8500
194337155041601	8-4304-03 HELCO, WAIKAE	19 43 37	155 04 16	01	78-07-31	1505	34000	18.5	14000
194818155582301	8-4858-02 KONA VILLAGE	19 48 18	155 58 23	01	78-02-08	1150	1900	22.0	380
					78-07-07	1050	1800	20.5	390
					78-08-23	1355	1800	21.0	400
194820155582401	8-4858-03 ISL COPRA	19 48 20	155 58 24	01	77-11-10	1400	2500	20.0	560
					78-03-23	1120	2400	20.5	550
					78-05-04	0925	2600	20.5	550
195043155053801	8-5005-02 PFPEKEO SGR	19 50 43	155 05 38	01	77-10-05	0905	192	22.0	14
					78-02-15	1050	206	22.0	19
					78-04-27	0930	190	22.0	15
					78-06-29	0910	200	21.5	14
					78-08-11	1110	180	22.0	14
195049155051601	8-5005-04 HILO CSI PROC	19 50 49	155 05 16	01	78-06-29	0940	16500	17.5	5900
					78-08-11	1145	15500	17.5	5500
195051155051501	8-5005-05 HILO COAST	19 50 51	155 05 15	01	78-02-15	1120	7250	18.0	3600
195546155480301	8-5548-01 BOISE CASCADE	19 55 46	155 48 03	01	77-10-12	1145	1850	28.0	520
					77-11-17	1515	2000	28.0	540
					78-04-28	1050	1950	28.5	560
					78-06-28	1210	2000	28.0	550
195724155455301	8-5745-01 BOISE CASCADE	19 57 24	155 45 53	01	78-04-28	1120	300	26.5	29
195722155455201	8-5745-02 BOISE CASCADE	19 57 22	155 45 52	01	78-02-10	1025	350	26.5	44
					78-04-28	1120	300	26.0	30
					78-06-28	1120	290	26.0	28
195857155142301	8-5814-01 CNTY	19 58 57	155 14 23	01	78-05-02	0950	380	18.5	110
					78-08-11	1030	350	18.5	70
195947155485801	8-5948-01 STATE	19 59 47	155 48 58	01	77-10-12	1410	1600	25.5	440
					78-03-14	1130	1600	25.5	440
					78-04-28	1345	1550	25.5	440
					78-06-28	1430	1550	25.5	440
					78-08-23	1155	1550	26.0	440
200122155480901	8-6148-01 W14 CNTY	20 01 22	155 48 09	01	77-10-12	1335	1460	27.0	360
					78-02-10	1305	1350	27.0	360
					78-04-21	1330	1450	27.0	360
					78-06-28	1350	1350	27.0	360
					78-08-23	1120	1300	27.5	360
201603155521801	8-7652-01 S1 KOHALA SGR	20 16 03	155 52 18	01	77-11-10	1140	2000	22.0	550
					78-01-30	1245	2000	22.0	560
					78-04-21	1100	1900	22.0	570
					78-07-24	1155	1800	21.5	520

QUALITY OF GROUND WATER
WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

LOCAL IDENTI- FIER	LAT- ITUDE	LONG- ITUDE	SEQ. NO.	STATION	NUMBER	DATE OF SAMPLE	TIME	SPE- CIFIC CON- DUCTI- ANCE (MICRO- MHOS)	PH (UNITS)	HARD- NESS (MG/L AS CACO3)
HAWAII, ISLAND OF KAUAI										
2-5923-03 CNIY, KILOHANA	21 59 12	159 23 44	01	215912159234401		78-05-03	1000	188	7.4	49
2-5943-02 STATE, KEKAHA	21 59 23	159 43 01	01	215923159430101		78-07-21	0930	--	--	140

LOCAL IDENTI- FIER	DATE OF SAMPLE	ALKA- LINITY (MG/L AS CACO3)	CARBON DIOXIDE DIS- SOLVED (MG/L AS CO2)	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 CONSTITUENTS, DIS- SOLVED (MG/L)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)
HAWAII, ISLAND OF KAUAI									
2-5923-03 CNIY, KILOHANA	78-05-03	56	4.3	6.2	18	.1	25	120	1.1
2-5943-02 STATE, KEKAHA	78-07-21	150	--	18	75	.2	72	--	2.6

QUALITY OF GROUND WATER

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WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

LOCAL IDENTI- FIER	DATE OF SAMPLE	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)	SODIUM AD- SORP- TION RATIO	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	BICAR- BONATE (MG/L AS HCO3)	CAR- BONATE (MG/L AS CO3)
HAWAII, ISLAND OF KAUAI									
2-5923-03 CNIY, KILOHANA	78-05-03	0	6.3	8.1	17	42	1.1	1.0	68
2-5943-02 STATE, KEKAHA	78-07-21	--	16	24	60	48	2.2	2.1	--

LOCAL IDENTI- FIER	DATE OF SAMPLE	PHOS- PHORUS, DIS- SOLVED (MG/L AS P)	IRON, DIS- SOLVED (UG/L AS Fe)	MANGA- NESE, DIS- SOLVED (UG/L AS Mn)	AGENCY COL- LECTING SAMPLE (CODE NUMBER)
HAWAII, ISLAND OF KAUAI					
2-5923-03 CNIY, KILOHANA	78-05-03	--	20	0	j 9999
2-5943-02 STATE, KEKAHA	78-07-21	.12	40	1	j 9999

j Collected by non-USGS agency.

QUALITY OF GROUND WATER
WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

LOCAL IDENT- I- FIER	LAT- I- TUDE	LONG- I- TUDE	SEQ. NO.	STATION	NUMBER	DATE OF SAMPLE	TIME	SAMP- LING DEPTH (FT)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS)	PH (UNITS)
HAWAII, ISLAND OF MAUI										
6-3904-01 KIPAHULU	20 39 08	156 04 12	01	203908156041201		78-07-20	0850	--	2000	7.6
6-3904-03 KIPAHULU	20 39 40	156 04 03	01	203940156040301		78-07-20	1435	--	85	8.3
6-5229-01 A&B, WATALE	20 52 57	156 29 44	01	205257156294401		78-03-13	0835	160	1170	--
						78-03-13	0845	230	2050	--
						78-03-13	0900	250	2200	--
						78-03-13	0915	270	2600	--
						78-03-13	0955	272	2700	--
6-5328-45 CN1Y, KAHULUI	20 53 11	156 28 43	02	205311156284302		78-07-21	1245	130	31000	7.4
						78-07-21	2155	130	25400	7.4
6-5329-18 A&B, WATALE	20 53 01	156 29 46	01	205301156294601		78-07-21	1325	260	380	7.1
						78-07-21	1345	340	5600	7.2
						78-07-21	1400	410	11000	7.1
						78-07-21	2040	260	465	7.2
						78-07-21	2100	340	6000	7.2
						78-07-21	2115	410	11000	7.2

LOCAL IDENT- I- FIER	DATE OF SAMPLE	SODIUM AD- SORP- TION RATIO	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	BICAR- BONATE (MG/L AS HCO3)	CAR- BONATE (MG/L AS CO3)	ALKA- LINITY (MG/L AS CACO3)	CARBON DIOXIDE DIS- SOLVED (MG/L AS CO2)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)
HAWAII, ISLAND OF MAUI										
6-3904-01 KIPAHULU	78-07-20	8.1	12	40	0	33	1.6	75	550	.0
6-3904-03 KIPAHULU	78-07-20	.9	1.7	38	0	31	.3	2.3	5.9	.0
6-5229-01 A&B, WATALE	78-03-13	4.3	8.4	140	--	110	--	40	260	.5
	78-03-13	6.6	14	130	--	110	--	75	540	.4
	78-03-13	6.8	14	120	--	98	--	86	550	.4
	78-03-13	7.4	16	120	--	98	--	88	680	.3
	78-03-13	7.8	17	120	--	98	--	98	690	.3
6-5328-45 CN1Y, KAHULUI	78-07-21	43	220	110	0	90	7.0	1400	10000	.1
	78-07-21	42	250	100	0	82	6.4	1500	11000	.1
6-5329-18 A&B, WATALE	78-07-21	2.3	3.7	160	0	130	20	9.7	28	.4
	78-07-21	14	36	140	0	110	14	230	1600	.2
	78-07-21	26	82	140	0	110	18	480	3700	.3
	78-07-21	2.9	4.2	160	0	130	16	14	62	.4
	78-07-21	16	41	140	0	110	14	250	1900	.3
	78-07-21	25	87	140	0	110	14	510	3800	.3

QUALITY OF GROUND WATER
WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

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LOCAL IDENT- I- FIER	DATE OF SAMPLE	TEMPER- ATUR- (DEG C)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP- TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARD- NESS (MG/L AS CAC03)	HARD- NESS, NONCAR- BONATE (MG/L CAC03)	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	SODIUM PERCENT
HAWAII, ISLAND OF MAUI										
6-3904-01 KIPAHULU	78-07-20	19.0	--	--	260	220	27	46	300	71
6-3904-03 KIPAHULU	78-07-20	19.0	--	--	21	0	4.1	2.5	9.2	47
6-5229-01 A&B, WAI'ALE	78-03-13	22.0	--	--	200	82	26	32	140	60
	78-03-13	21.5	--	--	320	210	39	54	270	64
	78-03-13	21.5	--	--	340	240	44	56	290	64
	78-03-13	21.5	--	--	370	270	45	63	330	65
	78-03-13	21.5	--	--	400	300	49	68	360	65
6-5328-45 CNTY, KAHULUI	78-07-21	23.0	<1	24	3400	3300	270	660	5700	77
	78-07-21	21.5	K6	24	3900	3800	300	770	6000	76
6-5329-18 A&B, WAI'ALE	78-07-21	23.5	<1	K4	79	0	12	12	48	55
	78-07-21	23.0	<1	K2	710	600	71	130	880	72
	78-07-21	23.0	<1	<1	1200	1100	120	230	2100	77
	78-07-21	23.0	<1	K1	97	0	14	15	65	58
	78-07-21	22.5	<1	<1	760	650	74	140	1000	73
	78-07-21	22.5	<1	K1	1300	1200	130	240	2100	76

LOCAL IDENT- I- FIER	DATE OF SAMPLE	SILICA, DIS- SOLVED (MG/L AS SiO2)	SOLIDS, SUM OF CONSTITUENTS, DIS- SOLVED (MG/L)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	PHOS- PHORUS, ORTHO, DIS- SOLVED (MG/L AS P)	PHOS- PHATE, ORTHO, DIS- SOLVED (MG/L AS PO4)	IRON, DIS- SOLVED (UG/L AS FE)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)
HAWAII, ISLAND OF MAUI								
6-3904-01 KIPAHULU	78-07-20	18	1050	.38	.02	.06	30	10
6-3904-03 KIPAHULU	78-07-20	17	63	.25	.03	.09	10	0
6-5229-01 A&B, WAI'ALE	78-03-13	61	648	2.3	.33	1.0	10	20
	78-03-13	61	1130	2.3	.24	.74	10	30
	78-03-13	61	1170	2.3	.24	.74	0	20
	78-03-13	60	1350	2.3	.24	.74	0	30
	78-03-13	60	1410	2.3	.23	.71	10	40
6-5328-45 CNTY, KAHULUI	78-07-21	34	18300	.08	.06	.18	830	540
	78-07-21	35	19900	.10	.07	.21	780	600
6-5329-18 A&B, WAI'ALE	78-07-21	71	280	3.5	.32	.98	20	0
	78-07-21	60	3090	2.7	.23	.71	10	0
	78-07-21	56	6850	2.7	.26	.80	20	30
	78-07-21	71	341	3.6	.28	.86	20	0
	78-07-21	60	3550	2.7	.26	.80	20	0
	78-07-21	56	7000	2.6	.24	.74	20	20

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

K Results based on colony count outside the acceptable range (non-ideal colony count).

QUALITY OF GROUND WATER
WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

LOCAL IDENT- I- FIER	LAT- I- TUDE	LONG- I- TUDE	SEQ. NO.	STATION	NUMBER	DATE OF SAMPLE	TIME	HARD- NESS (MG/L AS CACO ₃)	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)
HAWAII, ISLAND OF HAWAII										
8-2653-01	CNTY, HONAUNAU	19 26 46	155 53 20	01	192646155532001	78-08-10	1200	36	6.0	5.1

LOCAL IDENT- I- FIER	DATE OF SAMPLE	NITRO- GEN, NO ₂ +NO ₃ 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)	AGENCY COL- LECTING SAMPLF (CODE NUMBER)
HAWAII, ISLAND OF HAWAII						
8-2653-01	CNTY, HONAUNAU	78-08-10	1.1	.12	30	0 j 9999

j Collected by non-USGS agency.

QUALITY OF GROUND WATER

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WATER QUALITY DATA, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

LOCAL IDENTI- FIER	DATE OF SAMPLE	SODIUM, DIS- SOLVED (MG/L AS NA)	SODIUM AD- SORP- TION RATIO	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	ALKA- LINEITY (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)
HAWAII, ISLAND OF HAWAII									
B-2653-01 CNLY, HONAUVAU	78-08-10	22	55	1.6	2.5	34	10	28	43

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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
<i>Length</i>		
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)
<i>Area</i>		
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)
<i>Volume</i>		
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)
<i>Flow</i>		
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)
<i>Mass</i>		
tons (short)	9.072×10^{-1}	megagrams (Mg) or metric tons

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